

Tom Swift and His Electric Locomotive
or
Two Miles a Minute On the Rails

by Victor Appleton

1922

Contents

1	A Tempting Offer	5
2	Trouble Starts	11
3	Tom Swift's Friends	15
4	Much to Think About	19
5	Barbed Wire Entanglements	23
6	The Contract Signed	27
7	The Man with Big Feet	33
8	An Enemy In the Dark	39
9	Where Was Koku?	43
10	A Strange Conversation	49
11	Touch and Go	53
12	The Try-Out Day Arrives	57
13	Hopes and Fears	61
14	Speed	65
15	The Enemy Still Active	69
16	Off for the West	73
17	The Wreck of Forty-Eight	77
18	On the Hendrickton & Pas Alos	81
19	Peril, The Mother of Invention	87

20	The Result	91
21	The Open Switch	95
22	A Desperate Chase	99
23	Mr. Damon at Bay	103
24	Putting the Enemy to Flight	107
25	Speed and Success	111

Chapter 1

A Tempting Offer

“An electric locomotive that can make two miles a minute over a properly ballasted roadbed might not be an impossibility,” said Mr. Barton Swift ruminatively. “It is one of those things that are coming,” and he flashed his son, Tom Swift, a knowing smile. It had been a topic of conversation between them before the visitor from the West had been seated before the library fire and had sampled one of the elder Swift’s good cigars.

“It is not only a future possibility,” said the latter gentleman, shrugging his shoulders. “As far as the Hendrickton and Pas Alos Railroad Company goes, a two mile a minute gait—not alone on a level track but through the Pas Alos Range—is an immediate necessity. It’s got to be done now, or our stock will be selling on the curb for about two cents a share.”

“You do not mean just that, do you, Mr. Bartholomew?” asked Tom Swift earnestly, and staring at the big-little man before the fire.

Mr. Richard Bartholomew was just that—a “big-little man.” In the railroad world, both in construction and management, he had made an enviable name for himself.

He had actually built up the Hendrickton and Pas Alos from a narrow-gauge, “jerkwater” road into a part of a great cross-continent system that tapped a wonderfully rich territory on both sides of the Pas Alos Range.

For some years the H. & P. A. had a monopoly of that territory. Now, as Mr. Bartholomew intimated, it was threatened with such rivalry from another railroad and other capitalists, that the H. & P. A. was being looked upon in the financial market as a shaky investment.

But Tom Swift repeated:

“You do not mean just that, do you, Mr. Bartholomew?”

Mr. Bartholomew, who was a little man physically, rolled around in his chair to face the young fellow more directly. His own eyes sparkled in the firelight. His olive face was flushed.

“That is much nearer the truth, young man,” he said, somewhat harshly because of his suppressed emotion, “than I want people at large to suspect. As I have told your father, I came here to put all my cards on the table; but I

expect the Swift Construction Company to take anything I may say as said in confidence.”

“We quite understand that, Mr. Bartholomew,” said the elder Swift, softly. “You can speak freely. Whether we do business or not, these walls are sound-proof, and Tom and I can forget, or remember, as we wish. Of course if we take up any work for you, we must confide to a certain extent in our close associates and trusted mechanics.”

“Humph!” grunted the visitor, turning restlessly again in his chair. Then he said: “I agree as the necessity of that last statement; but I can only hope that these walls are soundproof.”

“What’s that?” demanded Tom, rather sharply. He was a bright looking young fellow with an alert air and a rather humorous smile. His father was a semi-invalid; but Tom possessed all the mental vigor and muscular energy that a young man should have. He had not neglected his Athletic development while he made the best use of his mental powers.

“Believe me,” said the visitor, quite as harshly as before, “I begin to doubt the solidity of all walls. I know that I have been watched, and spied upon, and that eavesdroppers have played hob with our affairs.

“Of late, there has been little planned in the directors’ room of the H. & P. A. that has not seeped out and aided the enemy in foreseeing our moves.”

“The enemy?” repeated Mr. Swift, with mild surprise.

“That’s it exactly! The enemy!” replied Mr. Bartholomew shortly. “The H. & P. A. has got the fight of its life on its hands. We had a hard enough time fighting nature and the elements when we laid the first iron for the road a score of years ago. Now I am facing a fight that must grow fiercer and fiercer as time goes on until either the H. & P. A. smashes the opposition, or the enemy smashes it.”

“What enemy is this you speak of?” asked Tom, much interested.

“The proposed Hendrickton & Western. A new road, backed by new capital, and to be officered and built by new men in the construction and railroad game.

“Montagne Lewis—you’ve heard of him, I presume—is at the head of the crowd that have bought the little old Hendrickton & Western, lock, stock and barrel.

“They have franchises for extending the road. In the old days the legislatures granted blanket franchises that allowed any group of moneyed men to engage in any kind of business as side issues to railroading. Montagne Lewis and his crowd have got a ‘plenty-big’ franchise.

“They have begun laying iron. It parallels, to a certain extent, our own line. Their surveyors were smarter than the men who laid out the H. & P. A. I admit it. Besides, the country out there is developed more than it was a score of years ago when I took hold.

“All this enters into the fight between Montagne Lewis and me. But there is something deeper,” said the little man, with almost a snarl, as he thrashed about again in his chair. “I beat Montagne Lewis at one big game years ago. He is a man who never forgets—and who never hesitates to play dirty politics if he has to, to bring about his own ends.

"I know that I have been watched. I know that I was followed on this trip East. He has private detectives on my track continually. And worse. All the gunmen of the old and wilder West are not dead. There's a fellow named Andy O'Malley—well, never mind him. The game at present is to keep anybody in Lewis's employ from getting wise to why I came to see you."

"What you say is interesting," Mr. Swift here broke in quietly. "But I have already been puzzled by what you first said. Just why have you come to us—to Tom and me—in reference to your railroad difficulties?"

"And this suggestion you have made," added Tom, "about a possible electric locomotive of a faster type than has, ever yet been put on the rails?"

"That is it, exactly," replied Bartholomew, sitting suddenly upright in his chair. "We want faster electric motor power than has ever yet been invented. We have got to have it, or the H. & P. A. might as well be scrapped and the whole territory out there handed over to Montagne Lewis and his H. & W. That is the sum total of the matter, gentlemen. If the Swift Construction Company cannot help us, my railroad is going to be junk in about three years from this beautiful evening."

His emphasis could not fail to impress both the elder and the younger Swift. They looked at each other, and the interest displayed upon the father's countenance was reflected upon the features of the son.

If there was anything Tom Swift liked it was a good fight. The clash of diverse interests was the breath of life to the young fellow. And for some years now, always connected in some way with the development of his inventive genius, he had been entangled in battles both of wits and physical powers. Here was the suggestion of something that would entail a struggle of both brain and brawn.

"Sounds good," muttered Tom, gazing at the railroad magnate with considerable admiration.

"Let us hear all about it," Mr. Swift said to Bartholomew. "Whether we can help you or not, we're interested."

"All right," replied the visitor again. "Whether I was followed East, and here to Shopton, or not doesn't much matter. I will put my proposition up to you, and then I'll ask, if you don't want to go into it, that you keep the business absolutely secret. I have got to put something over on Montagne Lewis and his crowd, or throw up the sponge. That's that!"

"Go ahead, Mr. Bartholomew," observed Tom's father, encouragingly.

"To begin with, four hundred miles of our road is already electrified. We have big power stations and supply heat and light and power to several of the small cities tapped by the H. & P. A. It is a paying proposition as it stands. But it is only paying because we carry the freight traffic—all the freight traffic—of that region.

"If the H. & W. breaks in on our monopoly of that, we shall soon be so cut down that our invested capital will not earn two per cent.—No, by glory! not one-and-a-half per cent.—and our stock will be dishd. But I have worked out a scheme, Gentlemen, by which we can counter-balance any dig Lewis can give us in the ribs.

“If we can extend our electrified line into and through the Pas Alos Range our freight traffic can be handled so cheaply and so effectively that nothing the Hendrickton & Western can do for years to come will hurt us. Get that?”

“I get your statement, Mr. Bartholomew,” said Mr. Swift. “But it is merely a statement as yet.”

“Sure. Now I will give you the particulars. We are using the Jandel locomotives on our electrified stretch of road. You know that patent?”

“I know something about it, Mr. Bartholomew,” said the younger inventor. “I have felt some interest in the electric locomotive, though I have done nothing practical in the matter. But I know the Jandel patent.”

“It is about the best there is—and the most recent; but it does not fill the bill. Not for the H. & P. A., anyway,” said Mr. Bartholomew, shortly.

“What does it lack?” asked Mr. Swift.

“Speed. It’s got the power for heavy hauls. It could handle the freight through the Pas Alos Range. But it would slow up our traffic so that the shippers would at once turn to the Hendrickton & Western. You understand that their rails do not begin to engage the grades that our engineers thought necessary when the old H. & P. A. was built.”

“I get that,” said Tom briskly. “You have come here, then, to interest us in the development of a faster but quite as powerful type of electric locomotive as the Jandel.”

“Stated to the line!” exclaimed Mr. Bartholomew, smiting the arm of his chair with his clenched fist. “That is it, young man. You get me exactly. And now I will go on to put my proposition to you.”

“Do so, Mr. Bartholomew,” murmured the old inventor, quite as much interested as his son.

“I want you to make a study of electric motive power as applied to track locomotives, with the idea of utilizing our power plants and others like them, and even with the possibility in mind of the continued use of the Jandel locomotives on our more level stretches of road.

“But I want your investigation to result in the building of locomotives that will make a speed of two miles a minute, or as near that as possible, on level rails, and be powerful enough to snake our heavy freight trains through the hills and over the steep grades so rapidly that even two engines, a pusher and a hauler, cannot beat the electric power.”

“Some job, that, I’ll say,” murmured Tom Swift.

“Exactly. Some job. And it is the only thing that will save the H. & P. A.,” said Mr. Bartholomew decidedly. “I put it up to you Swifts. I have heard of some of your marvelous inventions. Here is something that is already invented. But it needs development.”

“I see,” said Mr. Swift, and nodded.

“It interests me,” admitted Tom. “As I say, I have given some thought to the electric locomotive.”

“This is the age of speed,” said Mr. Bartholomew earnestly. “Rapidity in handling freight and kindred things will be the salvation, and the only salvation, of many railroads. Tapping a rich territory is not enough. The road that can

offer the quickest and cheapest service is the road that is going to keep out of a receivership. Believe me, I know!"

"You should," said Mr. Swift mildly. "Your experience should have taught you a great deal about the railroad business."

"It has. But that knowledge is worth just nothing at all without swift power and cheap traffic. Those are the problems today. Now, I am going to take a chance. If it doesn't work, my road is dished in any case. So I feel that the desperate chance is the only chance."

"What is that?" asked Tom Swift, sitting forward in his chair. "I, for one, feel so much interested that I will do anything in reason to find the answer to your traffic problem."

"That's the boy!" ejaculated Richard Bartholomew. "I will give it to you in a few words. If you will experiment with the electric locomotive idea, to develop speed and power over and above the Jandel patent, and will give me the first call on the use of any patents you may contrive, I will put up twenty-five thousand dollars in cash which shall be yours whether I can make use of a thing you invent or not."

"Any time limit in this agreement, Mr. Bartholomew?" asked Tom, making a few notes on a scratch pad before him on the library table.

"What do you say to three months?"

"Make it six, if you can," Tom said with continued briskness. "It interests me. I'll do my best. And I want you to get your money's worth."

"All right. Make it six," said Mr. Bartholomew. "But the quicker you dig something up, the better for me. Now, that is the first part of my proposition."

"All right, sir. And the second?"

"If you succeed in showing me that you can build and operate an electric locomotive that will speed two miles a minute on a level track and will get a heavy drag over the mountain grades, as I said, as surely as two engines of the coal-burning or oil-burning type, I will pay you a hundred thousand dollars bonus, besides buying all the engines you can build of this new type for the first two years. I've got to have first call; but the hundred thousand will be yours free and clear, and the price of the locomotives you build can be adjusted by any court of agreement that you may suggest."

Tom Swift's face glowed. He realized that this offer was not only generous, but that it made it worth his while dropping everything else he had in hand and devoting his entire time and thought for even six months to the proposition of developing the electric locomotive.

He looked at his father and nodded. Mr. Swift said, calmly:

"We take you on that offer, Mr. Bartholomew. Tom has the facts on paper, and we will hand it to Mr. Newton, our financial manager, in the morning. If you will remain in town for twenty-four hours, the contract can be signed."

"Suits me," declared Richard Bartholomew, rising quickly from his chair. "I confess I hoped you would take me up quite as promptly as you have. I want to get back West again."

"We will see you in the office of the company at two o'clock tomorrow," said Tom Swift confidently.

“Better than good! And now, if that trailer that I am pretty sure Montagne Lewis sent after me does not get wise to the subject of our talk, it may be a slick job we have done and will do. I admit I am rather afraid of the enemy. You Swifts must keep your plans in utter darkness.”

After a little talk on more ordinary affairs, Mr. Bartholomew took his departure. It was getting late in the evening, and Tom Swift had an engagement. While old Rad, their colored servant, was helping him on with his coat preparatory to Tom’s leaving the house, his father called from the library:

“Got those notes in a safe place, Tom?”

“Safest in the world, Dad,” his son replied. But he did not go into details. Tom considered the “safest place in the world” just then was his own wallet, which was tucked into an inside pocket of his vest “I’m going to see Mary Nestor, Father,” said Tom, as he went to the front door and opened it.

He halted a moment with the knob of the door in his hand. The porch was deep in shadows, but he thought he had seen something move there.

“That you, Koku?” asked Tom in an ordinary voice. Sometimes his gigantic servant wandered about the house at night. He was a strange person, and he had a good many thoughts in his savage brain that even his young master did not understand.

There was no reply to Tom’s question, so he walked down the steps and out at the gate. It was not a long distance to the Nestor house, and the air was brisk and keen, in spite of the fact that threatening clouds masked the stars.

Two blocks from the house he came to a high wall which separated the street from the grounds of an old dwelling. Tom suddenly noticed that the usual street lights on this block had been extinguished—blown out by the wind, perhaps.

Involuntarily he quickened his steps. He reached the archway in the wall. Here was the gate dividing the private grounds from the street. As he strode into the shadow of this place a voice suddenly halted Tom Swift.

“Hands up! Put ’em up and don’t be slow about it!” A bulky figure loomed in the dark. Tom saw the highwayman’s club poised threateningly over his head.

Chapter 2

Trouble Starts

The fact that he was stopped by a footpad smote Tom Swift's mind as not a particularly surprising adventure. He had heard that several of that gentry had been plying their trade about the outskirts of the town. To a degree he was prepared for this sudden event.

Then there flashed into Tom's mind the thought of what Mr. Richard Bartholomew had said regarding the spy he believed had followed him from the West. Could it be possible that some hired thug sent by Montagne Lewis and his crooked crowd of financiers considered that Tom Swift had obtained information from the president of the H. & P. A. that might do his employers signal service?

Tom Swift had fallen in with many adventures—and some quite thrilling ones—since, as a youth, he was first introduced to the reader in the initial volume of this series, entitled “Tom Swift and His Motor Cycle.” His first experiences as an inventor, coached by his father, who had spent his life in the experimental laboratory and workshop, was made possible by his purchase from Mr. Wakefield Damon, now one of his closest friends, of a broken-down motor cycle.

Through a series of inventions, some of them of a marvelous kind, Tom Swift, aided by his father, had forged ahead, building motor boats, airships, submarines, monoplanes, motion picture cameras, searchlights, cannons, photo-telephones, war tanks. Of late, as related in “Tom Swift Among the Fire Fighters,” he had engaged in the invention of an explosive bomb carrying flame-quenching chemicals that would, in time, revolutionize fire-fighting in tall buildings.

The matter that Mr. Richard Bartholomew, the railroad magnate, had brought to Tom's and his father's attention had deeply interested the young inventor. Thought of the electric locomotive, the development of which the railroad president stated was the only salvation of the finances of the H. & P. A., had so held Tom's attention as he walked along the street that being stopped in this sudden way was even more startling than such an incident might ordinarily have been.

Tom was a muscular young fellow; but a club held over one's head by a burly thug would have shaken the courage of anybody. Dark as it was under the archway the young fellow saw that the bulk of the man was much greater than his own.

"That's right, sonny," said the stranger, in a sneering tone. "You got just the right idea. When I say 'Stick 'em up' I mean it. Never take a chance. Ah—ah!"

The fellow ripped open Tom's overcoat, almost tearing the buttons off. Another masterful jerk and his victim's jacket was likewise parted widely. He did not lower the club for an instant. He thrust his left hand into the V-shaped parting of the young fellow's vest.

It was then that Tom was convinced of what the fellow was after. He remembered the notes he had made regarding the contract that was to be signed on the morrow between the Swift Construction Company and President Richard Bartholomew of the H. & P. A. Railroad. He remembered, too, the figure he thought he had seen in the dark porch of the house as he so recently left it.

Mr. Bartholomew had considered it very possible that he was being spied upon. This was one of the spies—a Westerner, as his speech betrayed. But Tom was suddenly less fearful than he had been when first attacked.

It did not seem possible to him that Mr. Bartholomew's enemies would allow their henchman to go too far to obtain information of the railroad president's intentions. This fellow was merely attempting to frighten him.

A sense of relief came to Tom Swift's assistance. He opened his lips to speak and could the thug have seen his face more clearly in the dark he would have been aware of the fact that the young inventor smiled.

The fellow's groping hand entered between Tom's vest and his shirt. The coarse fingers seized upon Tom's wallet. Nobody likes to be robbed, no matter whether the loss is great or small. There was not much money in the wallet, nor anything that could be turned into money by a thief.

These facts enabled Tom, perhaps, to bear his loss with some fortitude. The highwayman drew forth the wallet and thrust it into his own coat pocket. He made no attempt to take anything else from the young inventor.

"Now, beat it!" commanded the fellow. "Don't look back and don't run or holler. Just keep moving—in the way you were headed before. Vamoose."

More than ever was Tom assured that the man was from the West. His speech savored of Mexican phrases and slang terms used mainly by Western citizens. And his abrupt and masterly manner and speech aided in this supposition. Tom Swift stayed not to utter a word. It was true he was not so frightened as he had at first been. But he was quite sure that this man was no person to contend with under present conditions.

He strode away along the sidewalk toward the far corner of the wall that surrounded this estate. Shopton had not many of such important dwellings as this behind the wall. Its residential section was made up for the most part of mechanics' homes and such plain but substantial houses as his father's.

Prospering as the Swifts had during the last few years, neither Tom nor his father had thought their plain old house too poor or humble for a continued

residence. Tom was glad to make money, but the inventions he had made it by were vastly more important to his mind than what he might obtain by any lavish expenditure of his growing fortune.

This matter of the electric locomotive that had been brought to his attention by the Western railroad magnate had instantly interested the young inventor. The possibility of there being a clash of interests in the matter, and the point Mr. Bartholomew made of his enemies seeking to thwart his hope of keeping the H. & P. A. upon a solid financial footing, were phases of the affair that likewise concerned the young fellow's thought.

Now he was sure that Mr. Bartholomew was right. The enemies of the H. & P. A. were determined to know all that the railroad president was planning to do. They would naturally suspect that his trip East to visit the Swift Construction Company was no idle jaunt.

Tom had turned so many fortunate and important problems of invention into certainties that the name of the Swift Construction Company was broadly known, not alone throughout the United States but in several foreign countries. Montagne Lewis, whom Tom knew to be both a powerful and an unscrupulous financier, might be sure that Mr. Bartholomew's visit to Shopton and to the young inventor and his father was of such importance that he would do well through his henchmen to learn the particulars of the interview.

Tom remembered Mr. Bartholomew's mention of a name like Andy O'Malley. This was probably the man who had done all that he could, and that promptly, to set about the discovery of Mr. Bartholomew's reason for visiting the Swifts.

Without doubt the man had slunk about the Swift house and had peered into one of the library windows while the interview was proceeding. He had observed Tom making notes on the scratch pad and judged correctly that those notes dealt with the subject under discussion between the visitor from the West and the Swifts.

He had likewise seen Tom thrust the paper into his wallet and the wallet into his inside vest pocket. Instead of dogging Mr. Bartholomew's footsteps after that gentleman left the Swift house, the man had waited for the appearance of Tom. When he was sure that the young fellow was preparing to walk out, and the direction he was to stroll, the thug had run ahead and ensconced himself in the archway on this dark block.

All these things were plain enough. The notes Tom had taken regarding the offer Mr. Bartholomew had made for the development of the electric locomotive might, under some circumstances, be very important. At least, the highwayman evidently thought them such. But Tom had another thought about that.

One thing the young inventor was convinced about, as he strode briskly away from the scene of the hold-up: There was going to be trouble. It had already begun.

Chapter 3

Tom Swift's Friends

Tom was still walking swiftly when he arrived in sight of Mary Nestor's home. He was so filled with excitement both because of the hold-up and the new scheme that Mr. Richard Bartholomew had brought to him from the West, that he could keep neither to himself. He just had to tell Mary!

Mary Nestor was a very pretty girl, and Tom thought she was just about right in every particular. Although he had been about a good deal for a young fellow and had seen girls everywhere, none of them came up to Mary. None of them held Tom's interest for a minute but this girl whom he had been around with for years and whom he had always confided in.

As for the girl herself, she considered Tom Swift the very nicest young man she had ever seen. He was her beau-ideal of what a young man should be. And she entered enthusiastically into the plans for everything that Tom Swift was interested in.

Mary was excited by the story Tom told her in the Nestor sitting room. The idea of the electric locomotive she saw, of course, was something that might add to Tom's laurels as an inventor. But the other phase of the evening's adventure—"Tom, dear!" she murmured with no little disturbance of mind. "That man who stopped you! He is a thief, and a dangerous man! I hate to think of your going home alone."

"He's got what he was after," chuckled Tom. "Is it likely he will bother me again?"

"And you do not seem much worried about it," she cried, in wonder.

"Not much, I confess, Mary," said Tom, and grinned.

"But if, as you suppose, that man was working for Mr. Bartholomew's enemies?"

"I am convinced that he was, for he did not rob me of my watch and chain or loose money. And he could have done so easily. I don't mind about the old wallet. There was only five dollars in it."

"But those notes you said you took of Mr. Bartholomew's offer?"

"Oh, yes," chuckled Tom again. "Those notes. Well, I may as well explain to you, Mary, and not try to puzzle you any longer. But that highwayman is

sure going to be puzzled a long, long time.”

“What do you mean, Tom?”

“Those notes were jotted down in my own brand of shorthand. Such stenographic notes would scarcely be readable by anybody else. Ho, ho! When that bold, bad hold-up gent turns the notes over to Montagne Lewis, or whoever his principal is, there will be a sweet time.”

“Oh, Tom! isn't that fun?” cried Mary, likewise much amused.

“I can remember everything we said there in the library,” Tom continued. “I'll see Ned tonight on my way home from here, and he will draw a contract the first thing in the morning.”

“You are a smart fellow, Tom!” said Mary, her laughter trilling sweetly.

“Many thanks, Ma'am! Hope I prove your compliment true. This two-mile-a-minute stunt—”

“It seems wonderful,” breathed Mary.

“It sure will be wonderful if we can build a locomotive that will do such fancy lacework as that,” observed Tom eagerly. “It will be a great stunt!”

“A wonderful invention, Tom.”

“More wonderful than Mr. Bartholomew knows,” agreed the young fellow. “An electric locomotive with both great speed and great hauling power is what more than one inventor has been aiming at for two or three decades. Ever since Edison and Westinghouse began their experiments, in truth.”

“Is the locomotive they are using out there a very marvelous machine?” asked the girl, with added interest.

“No more marvelous than the big electric motors that drag the trains into New York City, for instance, through the tunnels. Steam engines cannot be used in those tunnels for obvious, as well as legal, reasons. They are all wonderful machines, using third-rail power.

“But that Jandel patent that Mr. Bartholomew is using out there on the H. & P. A. is probably the highest type of such motors. It is up to us to beat that. Fortunately I got a pass into the Jandel shops a few months ago and I studied at first hand the machine Mr. Bartholomew is using.”

“Isn't that great!” cried Mary.

“Well, it helps some. I at least know in a general way the ‘how’ of the construction of the Jandel locomotive. It is simple enough. Too simple by far, I should say, to get both speed and power. We'll see,” and he nodded his head thoughtfully.

Tom did not stay long with the girl, for it was already late in the evening when he had arrived at her house. As he got up to depart Mary's anxiety for his safety revived.

“I wish you would take care now, Tom. Those men may hound you.”

“What for?” chuckled the young inventor. “They have the notes they wanted.”

“But that very thing—the fact that you fooled them—will make them more angry. Take care.”

“I have a means of looking out for myself, after all,” said Tom quietly, seeing that he must relieve her mind. “I let that fellow get away with my wallet; but I won't let him hurt me. Don't fear.”

She had opened the door. The lamplight fell across porch and steps, and in a broad white band even to the gate and sidewalk. There was a motor-car slowing down right before the open gate.

“Who’s this?” queried Tom, puzzled.

A sharp voice suddenly was raised in an exclamatory explosion.

“Bless my brakeshoes! is that Tom Swift? Just the chap I was looking for. Bless my mileage-book! this saves me time and money.”

“Why, it’s Mr. Wakefield Damon,” Mary cried, with something like relief in her tones. “You can ride home in his car, Tom.”

“All right, Mary. Don’t be afraid for me,” replied Tom Swift, and ran down the walk to the waiting car.

“Bless my vest buttons! Tom Swift, my heart swells when I see you—”

“And is like to burst off the said vest buttons?” chuckled the young fellow, stepping in beside his eccentric friend who blessed everything inanimate in his florid speech.

“I am delighted to catch you—although, of course,” and Tom knew the gentleman’s eyes twinkled, “I could have no idea that you were over here at Mary’s, Tom.”

“Of course not,” rejoined the young inventor calmly. “Seeing that I only come to see her just as often as I get a chance.”

“Bless my memory tablets! is that the fact?” chuckled Mr. Damon. “Anyway, I wanted to see you so particularly that I drove over in my car tonight—”

“Wait a minute,” said Tom, hastily. “Is this important?”

“I think so, Tom.”

“Let me get something else off of my mind first, then, Mr. Damon,” Tom Swift said quickly. “Drive around by Ned’s house, will you, please? Ned Newton’s. After I speak a minute with him I will be at your service.”

“Surely, Tom; surely,” agreed the gentleman.

The automobile had been running slowly. Mr. Damon knew the streets of Shopton very well, and he headed around the next corner. As the car turned, a figure bounded out of the shadow near the house line. Two long strides, and the man was on the running board of the car upon the side where Tom Swift sat. Again an ugly club was raised above the young fellow’s head.

“You’re the smart guy!” croaked the coarse voice Tom had heard before. “Think you can bamboozle me, do you? Up with ’em!”

“Bless my spark-plug!” gasped Mr. Wakefield Damon.

Either from nervousness or intention, he jerked the steering wheel so that the car made a sudden leap away from the curb. The figure of the stranger swayed.

Instantly Tom Swift struck the man’s arm up higher and from under his own coat appeared something that bulked like a pistol in his right hand. He had intimated to Mary Nestor that he carried something with which to defend himself from highwaymen if he chose to. This invention, his ammonia gun, now came into play.

“Bless my failing eyesight!” exclaimed Mr. Damon, as he shot the motor-car ahead again in a straight line.

The man who had accosted Tom so fiercely fell off the running board and rolled into the gutter, screaming and choking from the fumes from Tom's gun.

"Drive on!" commanded the young inventor. "If he keeps bellowing like that the police will pick him up. I guess he will let us alone here-after."

"Bless my short hairs and long ones!" chuckled Mr. Damon. "You are the coolest young fellow, Tom, that I ever saw. That man must have been a highwayman. And it is of some of those gentry that I drove over to Shopton this evening to talk to you about."

Chapter 4

Much to Think About

Although it was now nearing ten o'clock on this eventful evening, Tom knew that he would find Ned Newton at home. When Mr. Damon's car stopped before the house there was a light in Ned's room and the front door opened almost as soon as Tom rang. Mr. Damon left the car and entered with the young inventor at his invitation.

"What's up?" was Ned's greeting, looking at the two curiously as he ushered them in. "I see this isn't entirely a social call," and he laughed as he shook the older man's hand.

"Bless my particular star!" exclaimed the latter excitedly. "Of all the thrilling adventures that anybody ever got into, it is this Tom Swift who cooks them up! Why, Newton! do you know that we have been held up by a highwayman within two blocks of this very house?"

"And that of course was Tom's fault?" suggested Ned, still smiling.

"It wouldn't have happened if he had not been with me," said Mr. Damon.

"I am curious," said Ned, as they seated themselves. "Who was the footpad? What drew his attention to you two? Tell me about it."

"Bless my suspender buckles!" exclaimed Mr. Damon. "You tell him, Tom. I don't understand it myself, yet."

"I think I can explain. But whatever I tell you both, you must hold in secret. Father and I have been entrusted with some private information tonight and I am going to take you, Ned, and Mr. Damon, into the business in a confidential way."

"Let's have it," begged Newton. "Anything to do with the works?"

"It is," answered Tom gravely. "We are going to take up a proposition that promises big things for the Swift Construction Company."

"A big thing financially?"

"I'll say so. And it looks as though we were mixing into a conspiracy that may breed trouble in more ways than one."

Tom went on to sketch briefly the situation of the Hendrickton & Pas Alos Railroad as brought to the attention of the Swifts by the railroad's president. First of all his two listeners were deeply interested in the proposition Mr. Richard

Bartholomew had made the inventors. Ned Newton jotted down briefly the agreement to be incorporated in the contract to be drawn and signed, by the Swift Construction Company and the president of the H. & P. A. road.

"This looks like a big thing for the company, Tom," the young manager said with enthusiasm, while Mr. Damon listened to it all with mouth and eyes open.

"Bless my watch-charm!" murmured the latter. "An electric locomotive that can travel two miles a minute? Whew!"

"Sounds like a big order, Tom," added Ned, seriously.

"It is a big order. I am not at all sure it can be done," agreed Tom, thoughtfully. "But under the terms Mr. Bartholomew offers it is worth trying, don't you think?"

"That twenty-five thousand dollars is as good as yours anyway," declared his chum with finality. "I'll see there is no loophole in the contract and the money must be placed in escrow so that there can be no possibility of our losing that. The promise of a hundred thousand dollars must be made binding as well."

"I know you will look out for those details, Ned," Tom said with a wave of his hand.

"That is what I am here for," agreed the financial manager. "Now, what else? I fancy the building of such a locomotive looks feasible to you and your father or you would not go into it."

"But two miles a minute!" murmured Mr. Damon again. "Bless my prize pumpkins!"

"The idea of speed enters into it, yes," said Tom thoughtfully. "In fact electric motor power has always been based on speed, and on cheapness of moving all kinds of traffic.

"Look here!" he exclaimed earnestly, "what do you suppose the first people to dabble in electrically driven vehicles were aiming at? The motor-car? The motor boat? Trolley cars? All those single motor sort of things? Not much they weren't!"

"Bless my glove buttons!" exclaimed Mr. Damon, dragging off his gauntlets as he spoke. "I don't get you at all, Tom! What do you mean?"

"I mean to say that the first experiments in the use of electricity as a motive power were along the electrification of the steam locomotive. Everybody realized that if a motor could be built powerful enough and speedy enough to drag a heavy freight or passenger train over the ordinary railroad right of way, the cost of railroad operation would be enormously decreased.

"Coal costs money—heaps of money now. Oil costs even more. But even with a third-rail patent, a locomotive successfully built to do the work of the great Moguls and mountain climbers of the last two decades, and electrically driven, will make a great difference on the credit side of any rails road's books."

"Right-o!" exclaimed Ned. "I can see that."

"That was the object of the first experiments in electric motive power," repeated Tom. "And it continues to be the big problem in electricity. The Jandel locomotive is undoubtedly the last word so far as the construction of an electric locomotive is concerned. But it falls down in speed and power. I thought so myself when I saw that locomotive and looked over the results of its

work. And this Mr. Bartholomew has assured father and me this evening that it is a fact.

“It has a record of a mile a minute on a level or easy grade; but it can’t show goods when climbing a real hill. It slows up both freight and passenger traffic on the Hendrickton & Pas Alos road. That range of hills is too much for it.

“So the Swift Construction Company is going to step in,” concluded the young inventor eagerly. “I believe we can do it. I’ve the nucleus of an idea in my head. I never had a problem put up to me, Ned and Mr. Damon, that interested me more. So why shouldn’t I go at it? Besides, I have dad to advise me.”

“That’s right,” agreed Ned. “Why shouldn’t you? And with such a contract as you have been offered—”

“Bless my bootsoles!” ejaculated Mr. Damon, getting up and tramping about the room in his excitement. “I thought the trolley cars that run between Shopton and Waterfield were about the fastest things on rails.”

“Not much. The trolley car is a narrow and prescribed manner of using electricity for motive power. The motor runs but one car—or one and a trailer, at most,” said Tom. “As I have pointed out, the problem is to build a machine that will transmit power enough to draw the enormous weight of a loaded freight train, and that over steep grades.

“A motor for each car is a costly matter. That is why trolley car companies, no matter how many passengers their cars carry, are so often on the verge of financial disaster. The margin of profit is too narrow.

“But if you can get a locomotive built that will drag a hundred cars! Ah! how does that sound?” demanded Tom. “See the difference?”

“Bless my volts and amperes!” exclaimed Mr. Damon. “I should say I do! Why, Tom, you make the problem as plain as plain can be.”

“In theory,” supplemented Ned Newton, although he meant to suggest no doubt of his chum’s ability to solve almost any problem.

“You’ve hit it,” said Tom promptly. “I only have a theory so far regarding such a locomotive. But to the inventor the theory always must come first. You understand that, Ned?”

“I not only appreciate that fact,” said his chum warmly; “but I believe that you are the fellow to show something definite along the line of an improved electric locomotive. But, whether you can reach the high mark set by the president of that railroad—”

“Two miles a minute!” breathed Mr. Damon in agreement. “Bless my wind-gauge! It doesn’t seem possible!”

Tom Swift shrugged his shoulders. “It is the impossible that inventors have to overcome. If we experimenters believed in the impossible little would be done in this world, to advance mechanical science at least. Every invention was impossible until the chap who put it through built his first working model.”

“That’s understood, old boy,” said Ned, already busily scratching off the form of the contract he proposed to show the company’s legal advisers early in the morning.

When he had read over the notes he had made Tom O.K.'d them. "That is about as I had the items set down myself on the sheet that fellow stole from me."

"Wait!" exclaimed Ned, as Tom arose from his chair. "Do you know what strikes me after your telling me about your second hold-up?"

"What's that?" asked his chum.

"Are you sure that was the same fellow who stole your wallet?"

"Quite sure."

"Then his second attack on you proves that he got wise to the fact that your notes were in shorthand. He had a chance to study them while you visited with Mary Nestor."

"Like enough."

"I wonder if it doesn't prove that the fellow has somebody in cahoots with him right here in Shopton?" ruminated Ned.

"Bless my spare tire!" ejaculated Mr. Damon, who had already started for the door but now turned back.

"That's an idea, Ned," agreed Tom Swift. "It would seem that he had consulted with some superior," said the young manager of the Swift Construction Company. "This hold-up man may be from the West; but perhaps he did not follow Bartholomew alone."

"I'd like to know who the other fellow is," said Tom thoughtfully. "I would know the man who attacked me, both by his bulk and his voice."

"Me, too," put in Mr. Damon. "Bless my indicator! I'd know the scoundrel if I met him again."

"The thing to do," said Ned Newton confidently, "is to identify the man who robbed you tonight as soon as possible and then, if he hangs around Shopton, to mark well anybody he associates with."

"Perhaps they will not bother me any more," said Tom, rather carelessly.

"And perhaps they will," grumbled Mr. Damon. "Bless my self-starter! they may try something mean again this very night. Come on, Tom. I want to run you home. And on the way, I tell you, I've got something to put up to you myself. It may not promise a small fortune like this electric locomotive business; but bless my barbed wire fence! my trouble has more than a little to do with footpads, too."

He led the way out of the house and to the motor car again. In a minute he had started his engine, and Tom, jumping in beside him, was borne away toward his own home.

Chapter 5

Barbed Wire Entanglements

“This gets us to your particular trouble, Mr. Damon,” Tom Swift said, while the motor car was rolling along. “You intimated that you had something to consult me about.”

“Bless my windshield! I should say I had,” exclaimed the eccentric gentleman, swinging around a corner at rather a fast clip.

“And has it to do with highwaymen?” asked Tom, much amused.

“Some of the same gentry, Tom,” declared Mr. Damon. “I haven’t any peace of my life, I really haven’t!”

“Who is troubling you, sir?”

“Why, what nonsense that is, to ask that!” ejaculated the gentleman. “If I knew who they were I wouldn’t ask odds of anybody. I’d go after them. As it is, I’ve left my servant with a gun loaded with rock-salt watching for them now.”

“Burglars?” exclaimed Tom, with real interest.

“Chicken-house burglars! That’s the kind of burglars they are,” growled Mr. Damon. “Two or three times they have tried to get my prize buff Orpingtons. Last night they got me out of bed twice fooling around the chicken house and yard. Other neighbors have lost their hens already. I don’t mean to lose mine. Want you to help me, Tom.”

“Is that all that is worrying you, Mr. Damon?” laughed the young fellow.

“Bless my radiator! isn’t that enough?”

“I know you set your clock by those buff Orpingtons,” agreed Tom.

“That’s right. That ten-months cockerel, Blue Ribbon Junior, never fails to crow at three-thirty-three to the minute. Bless my combs and spurs; a wonderful bird!”

“But let’s see how I can help you regarding the chicken thieves,” Tom said, as they sighted the lights of the Swift house beyond the long stockade fence that surrounded the Construction Company’s premises.

“You know I have a barbed wire entanglement around the whole yard and

hen-house. I don't take any more chances than I can help. Those prize buff Orpingtons are a great temptation to chicken lovers—both blond and brunette," and in spite of his anxiety, Mr. Damon could chuckle at his own joke. "Even your old Eradicate's friend fell for chickens, you know."

"And Rad promptly cured him of the disease," laughed Tom.

"And I'm trying to cure these others. I've charged my shotgun with rock-salt as he did. My servant has orders to shoot anybody who tampers with my chicken house tonight.

"But bless my shirt!" exclaimed Mr. Damon, "I'll never be able to sleep comfortably until I know that no thief can get at my buff Orpingtons. I want you to fix it so I can sleep in peace, Tom."

He slowed to a stop in front of the Swift's door. Tom stared at his eccentric friend questioningly.

"Bless my gaiters!" ejaculated Mr. Damon, "don't you see what I want? And your head already full of this electrified locomotive you are going to build?"

"Hush!" murmured Tom, with his hand upon his companion's arm. "But what do you want me to do?"

"I want you to fix it so that I can turn a current of electricity into that barbed wire chicken fence at night that will shock any thief that touches the wires. Not kill 'em—though they ought to be killed!" declared the eccentric man. "But shock 'em aplenty. Can't you do it for me, Tom Swift?"

"Of course it can be done," said the young fellow. "You use electricity in your house. There is a feed cable in the street. We will have to change your lighting switch for another. Fix it with the Electric Supply Company. It will cost you more—"

"Bless my pocketbook! I don't care how much it costs. It will be ample satisfaction to see just one low-down chicken thief squirming on those wires."

Tom laughed again. He meant to help his friend; but he did not propose to rig the wires so that anybody, even a chicken thief, would be seriously injured by the electric current passing through the strands.

"I'll come down to Waterfield tomorrow in the electric runabout and fix things up for you. Get a permit from the Electric Supply Company early in the morning. Tell them I will rig the thing myself. They can send their inspector afterward."

"That's fine, Tom! What—Ugh! what's this? Another footpad?"

Out of the darkness beside the fence a bulky figure started. For a moment Tom thought it was the same man who had attacked him twice. Then the very size of this new assailant proved that suspicion to be unfounded.

"Koku!" exclaimed Tom. "What's the matter with you, Koku?"

The huge and only half-tamed giant gained the side of the car in seemingly a single stride. In the dark they could not see his face, but his voice distinctly showed excitement.

"Master come good. 'Cause there be enemy. Koku find—Koku kill!"

"Bless my magnifying glass!" ejaculated Mr. Damon. "That fellow is the most bloodthirsty individual that I ever saw."

“All in his bringing up,” chuckled Tom who knew, as the saying is, that Koku’s bark was a deal worse than his bite. “Killing and maiming his enemies used to be Koku’s principal job. But he has his orders now. He doesn’t kill anybody without consulting me first.”

“Bless my buttons!” murmured Mr. Damon. “That is certainly a good thing too. What’s the matter with him now?”

That is exactly what Tom himself wanted to know. He had dropped a hand upon the arm of the giant as he stood beside the car.

“Who is the enemy, Koku?” he asked.

“Not know, Master. See him footmarks. Follow him footmarks. Not find. When do find—kill!”

“That is, after first obtaining my permission,” said Tom dryly.

“It is so,” agreed the imperturbable Koku. “See! Show Master footmarks. Him look in at window. See! Koku have got the wonder lamp.”

He flashed the electric torch in his hand. He left the car and strode into the yard. Tom followed him, and Mr. Damon’s curiosity brought him along.

The giant pointed the ray of the flashlight at the ground below the porch. Several footprints—the marks of boots at least number twelve in size—were imbedded in the soil. Koku went around the house to the other side, following repeated marks of the same boots.

“How came you to find them, Koku?” asked Tom softly.

“Me look. All around stockade,” and he waved a generous gesture with his free hand including the fence about the works. “Enemy may come. Anytime he come. Now he come.”

“Bless my slippery shoes!” exclaimed Mr. Damon, who had hard work to keep up both physically and mentally with the giant. “What does he mean?”

“Koku has always had it in his head,” explained Tom, “that we built that fence about the works to keep out enemies. And, to tell the truth, we did! But all that is over—”

“Is it?” asked Mr. Damon pointedly. “Enemy here,” added Koku, flashing the lamplight upon the footprints on the ground.

“Those bootmarks,” added Mr. Damon, “are doubtless those of that fellow who jumped upon the running board of the car.”

“Humph! And who robbed me of my wallet,” added Tom musingly. “Well, it might be. And, if so, Koku is right. The enemy has come.”

“Me kill!” exclaimed the giant, stretching himself to his full height.

“We’ll consider the killing later,” said Tom, who well knew his influence with this big fellow. “You are forbidden to kill anybody, or chase anybody away from here, until I have a talk with them. Enemy or not—understand?”

“Me understand,” said Koku in his deep voice. “Master say—me do.”

“Just the same,” Tom said, aside to Mr. Damon, “there has been somebody around here. I guess Mr. Bartholomew was right. He is being spied upon. And now that we Swifts are going to try to do something for him, we are likely to be spied upon too.”

“Bless my statue of Nathan Hale!” murmured the eccentric gentleman. “I believe you. And you’ve been already attacked twice by some thug! You are

positively in danger, Tom.”

“I don’t know about that. Save that the fellow who robbed me was sore because I fooled him. Naturally he might like to get square about those shorthand notes. He knows no more now about Mr. Bartholomew’s business with us than he did before he held me up.”

“That is a fact,” agreed Mr. Damon.

“And that brings me to another warning, Mr. Damon,” added Tom earnestly, as his friend climbed into the motor car again. “Keep all that has happened, and all that I told you and Ned about the H. & P. A. railroad, to yourself.”

“Surely! Surely!”

“If Mr. Bartholomew’s rivals continue to keep their spies hanging around the works here, we’ll handle them properly. Trust Koku for that,” and Tom chuckled.

“And don’t forget my barbed wire entanglements,” put in Mr. Damon, starting his engine. “I want to fix those chicken thieves.”

“All right. I’ll be over tomorrow,” promised Tom Swift.

Then he stood a minute on the curb and looked after the disappearing lights of Mr. Damon’s car. The latter’s problem dovetailed, after all, into this discovery of possible marauders lurking about the Swift premises. Koku had made no mistake in bringing his attention to the matter of the footprints. Tom had seen somebody dodging into the darkness outside the house when he had come out on his way to visit Mary Nestor.

“And sure as taxes,” muttered Tom, as he finally turned toward the front door again, “the fellow who twice attacked me this evening wore the boots the prints of which Koku found.

“Those fellows, whoever they are, whether Montagne Lewis and his associates, or not, have bitten off several mouthfuls that they may be unable to chew. Anyhow, before they get through they may learn something about the Swifts that they never knew before.”

Chapter 6

The Contract Signed

Tom Swift went to bed that night without the least fear that the man who had twice attacked him in the streets of Shopton would be able to trouble him unless he went abroad again. Koku was on guard.

The giant whom Tom had brought home from one of his distant wanderings was wholly devoted to his master. Koku never had, and he never would, become entirely civilized.

He was naturally a born tracker of men. For generations his people had lived amid the alarms of threat and attack. He could not be made to understand how so many "tribes," as he called them, of civilized men could live in anything like harmony.

That somebody should prowl about the Swift house at night with a desire to rob his young master or injure him, did not surprise Koku in the least. He accepted the fact of the marauder's presence as quite the expected thing.

But the man who had robbed Tom and later tried to repay him for playing what appeared to be a practical joke on the robber, did not trouble the Swift premises with his presence before morning. Koku, thrusting Eradicate Sampson aside and striding to his bedroom to report this fact, was what awoke Tom at eight o'clock.

"Hey! What you want, tromping in here for, man?" demanded old Rad angrily. "An' totin' that spear, too. Where you t'ink yo' is? In de jungle again? Go 'way, chile!"

Both Rad and Koku were rapidly outliving the sudden friendship of Rad's sick days, when it was thought he might be blind for life, and were dropping back into their old ways of bickering and rivalry for Tom's attention.

"I report to the Master," declared the giant, in his deep voice.

"You tell me, I tell him," Rad said pompously. "No need yo' 'sturbing Massa Tom at dis hour."

"Koku go in!" declared the giant sternly.

"Jes' stay out dere on de stair an' res' yo'self," said Rad.

Koku lost his temper with old Rad. There was a feud between them, although deep in their hearts they really were fond of each other. But the two

were jealous of each other's services to young Tom Swift.

Suddenly Tom heard the old negro utter a frightened squeal. The door which had been only ajar, burst inward and banged against the door-stop with a mighty smash.

Rad went through the big bedroom like a chocolate-colored streak, entered Tom's bathroom, and the next moment there was the sound of crashing glass as Eradicate Sampson went through the lower sash of the window, headfirst, out upon the roof of the porch!

"What do you mean by this?" shouted Tom, sitting up in bed.

Koku paused in the doorway, bulking almost to the top of the door. His right arm was drawn back, displaying his mighty biceps, and he poised a ten foot spear with a copper head that he had seized from a nest of such implements which was a decoration of the lower hall.

Had the giant ever flung that spear at poor Rad's back, half the length of the staff might have passed through his body. Little wonder that the colored man, having roused the giant's rage to such a pitch, had given small consideration to the order of his going, but had gone at once!

"You want to scare Rad out of half a year's growth?" Tom pursued sternly, slipping out of bed and reaching for his robe and slippers. "And he's broken that window to smithereens."

"Koku come make report, Master," said the giant.

"You go put that spear back where you found it and come up properly," commanded the young fellow, with difficulty hiding his amusement. "Go on now!"

He shuffled into the bathroom while the giant disappeared. He peered out of the broken window. It was a wonder Rad had not carried the sash with him! The broken glass was scattered all about the roof of the porch and the old colored man lay groaning there.

"What did you do this for, Eradicate?" demanded Tom. "You act worse than a ten-year-old boy."

"I's done killed, Massa Tom!" groaned Rad with confidence. "I's blood from haid to foot!"

There was a scratch on his bald crown from which a few drops of blood flowed. But with all his terror, Eradicate had put both arms over his head when he made his dive through the window, and he really was very little injured.

"Come in here," repeated Tom. "Fix something over this broken window so that I can take my bath. And then go and put something on that scratch. Don't you know better yet, than to cross Koku when he is excited?"

"Dat crazy ol' cannibal!" spat out Rad viciously. "I'll fix him yet. I'll pizen his rations, dat's what I'll do."

"You wouldn't be so bad as that, Rad!"

"Well, mebbe not," said the colored man, crawling in through the bathroom window. "It would take too much pizen, anyway, to kill that giant. Take as much as dey has to give an el'phant to kill it. Anyways, I's bound to fix him proper some time, yet."

These quarrels between Eradicate and Koku were intermittent. They almost always arose, too, because of the desire of the two servants to wait upon Tom or his father. They were very jealous of each other, and their clashes afforded Tom and his friends a good deal of amusement.

While the young inventor was in his bath the giant strode back into the bedroom, out of which Rad had scurried by another door, and proceeded to report the result of his night watch about the premises.

He had not much to tell. In fact, after Tom had gone into the house Koku had seen nobody lurking about at all. The fact remained that, earlier in the evening, somebody had made a close surveillance of the Swift house, but the mysterious marauder had not come back.

"All right, Koku. Keep your eyes open. I expect that enemy may return sometime. Too bad," he added to himself, "that I didn't get a better look at him."

"Koku know him next time," declared the giant.

"Why! you didn't even see him this time," cried Tom.

"See him boots. See marks him boots make. Know him boots. Waugh!"

"Waugh! yourself," returned Tom, shaking his head. "You are altogether too sure, Koku. You couldn't tell a man from his bootprints in the mud."

"Koku know," said the giant, just as confidently. "Wait. Him catch—see—show Master."

"Don't you go to grabbing every stranger who comes around the house or the works for a spy, and make me trouble. Remember now."

Koku nodded gravely and went away. When he met Rad suddenly in the hall with Mr. Swift's breakfast tray, the giant said "boo!" and almost cost the old colored man the loss of the tray.

"Dat big el'phant ought to be livin' in a barn," declared Rad. "Look at dat spear he come near runnin' me t'rough wid! If he had, yo' could ha' driv a tipcart full o' rubbish in after it. Lawsy me!"

But an hour later when Tom and his father started for the offices of the Swift Construction Company down the street, Rad and Koku were sitting before an enormous breakfast in the back kitchen and chatting together as companionably as ever.

The old inventor and his son arrived at the offices of the Swift Construction Company not long ahead of Mr. Richard Bartholomew. Tom had merely found time to read over the contract that had been jointly prepared by Ned Newton and the firm's legal advisers, before the railroad man came.

"No getting out of the provisions of that paper, Tom," Ned had whispered, when he saw Mr. Bartholomew coming into the outer office. "Is this your man?"

"Yes."

"A sharp looking little fellow," commented Ned. "But even if he were bent on tricking us, this contract would hold him. He is solvent and so is his road—as yet. If it has a bad name in the market that is more because of slander by the Montagne Lewis crowd than from any real cause. I've found that out this morning."

"Faithful Ned!" chuckled Tom. "Aren't going to let the Swifts get done, are you?"

"Not if I can help it," declared Ned Newton emphatically.

A clerk brought Mr. Bartholomew into the private office and he was introduced to Newton. If he considered the financial manager of the Swift Construction Company very young for his responsible position, after he had read the contract he felt considerable respect for Ned Newton.

"You've got me here, young man, hard and fast," Mr. Bartholomew said. "If I was inclined to want to wriggle out, I see no chance of it. But I don't. You have set forth here exactly my meaning and intent. I want your best efforts in this matter, Mr. Swift, and if you give them to me I'll foot the bill as agreed."

"You've got me interested, I confess," said Tom. "By the way, were your friends following you when you came here this morning?"

"My friends?" repeated Mr. Bartholomew, for a moment puzzled.

"The spy that you mentioned," said Tom, smiling.

"That Andy O'Malley?" exclaimed Bartholomew. "Haven't spotted him today."

"He spotted me last night," said Tom grimly, and proceeded to relate what had happened.

"You fooled 'em that time, young man!" exclaimed the railroad president, with satisfaction. "I am convinced that Montagne Lewis is behind it. Look out for these fellows when you get to work, Mr. Swift. They will stop at nothing. I tell you that the fight is on between the Hendrickton & Pas Alos and the Hendrickton & Western. I have either got to break them or they will break me."

"You seem very sure that there is a conspiracy against you, Mr. Bartholomew," said the senior Swift reflectively.

"I am sure," was the reply. "And I am likewise sure that this scheme of electrification of my road through the Pas Alos Range is the only salvation for my railroad."

"I should call it a big contract," Ned Newton said, thoughtfully.

"You have said it! But it is not a visionary scheme I have in mind. You must know—you Swifts—how successful such an electrification through the Rockies has been made by the Chicago, Milwaukee & St. Paul Railway."

"I've looked that up," confessed Tom, with enthusiasm. "That was a great piece of work."

"It is. It is. But I hope for even a greater outcome of your experiments, Mr. Swift. Of course, I do not expect to compete with that great road. They had millions to spend, and they spent them. Those Baldwin-Westinghouse locomotives the Chicago, Milwaukee & St. Paul built in nineteen hundred and nineteen are wonderful machines. They have got forty-two freight locomotives, fifteen passenger locomotives and four switchers of that new type.

"The Jandel patent that my road uses is, in some degree, the equal of those Baldwin-Westinghouse locomotives. At least, our machines equal the C., M. & St. P. on our level road. They can reach a mile-a-minute gait. But when it comes to speed and pull on steep grades—Ah! that is where they fail."

“You will have to get power in the hills for your stations,” suggested Tom, thoughtfully.

“I know that. I know where the power is coming from. I gathered those waterfalls in years ago. Lewis and his crowd can’t shut me off from them. But I have got to have a speedier and more powerful type of electric locomotive than has ever yet been built to protect the Hendrickton & Pas Alos Railroad from any rivalry.

“I am looking to you Swifts to give me that. I am risking this twenty-five thousand dollars upon your succeeding. And I am offering you the hundred thousand dollars bonus for the right to purchase the first successful locomotives that can be built covered by your patents. Is it plain?”

“It is eminently satisfactory,” said Mr. Swift, quietly.

“I will do my very best,” agreed Tom, warmly. “There isn’t a thing the matter with the agreement,” declared Ned Newton, with confidence. “Gentlemen, sign on the dotted line.”

Five minutes later the twin contracts were in force. One went into the safe of the Swift Construction Company. The other, Mr. Richard Bartholomew bore away with him.

Chapter 7

The Man with Big Feet

The consultation in the private office of the Swift Construction Company after the departure of Mr. Richard Bartholomew between the two Swifts and Ned Newton had more to do with a vision of the future than with mere present finances.

“I expect you know just about how you are going to work on this new invention, Tom?” suggested the financial manager, and Tom’s chum.

“Haven’t the first idea,” rejoined the young inventor, promptly.

“What do you mean?” ejaculated Ned. “You talked just now as though you knew all about electric locomotives.”

“I know a good deal about those that have been built, both under the Jandel patent and those built for the Chicago, Milwaukee & St. Paul in the great Philadelphia shops.

“But when you ask me if I know how I am going to improve on those patents so as to make my locomotive twice as speedy and quite as powerful as those other locomotives—well, I’ve got to tell you flat that I have not as yet got the first idea.”

“Humph!” grumbled Ned. “You say it coolly enough.”

“No use getting all heated up about it,” returned his friend. “I have got to consider the situation first. I must look over the field of electrical invention as applied to motive power. I must study things out.”

“I don’t just see myself,” Ned Newton remarked thoughtfully, “why there should be such a great need for the electrification of locomotives, anyway. Those great mountain-hogs that draw most of the mountain railroad trains are very powerful, aren’t they? And they are speedy.”

“Locomotives that use coal or oil have been developed about as far as they can be,” said Mr. Swift, quietly. “A successful electric locomotive has many advantages over the old-time engine.”

“What are those advantages?” asked the business manager, quickly. “I confess, I do not understand the matter, Mr. Swift.”

“For instance,” proceeded the old gentleman, “there is the coal question alone. Coal is rising in price. It is bulky. Using electricity as motive power

for railroads will do away with fuel trains, tenders, coal handling, water, and all that. Of course, Mr. Bartholomew will generate his electricity from water power—the cheapest power on earth.”

“Humph! I’ve got my answer right now,” said Ned Newton. “If there is no other good reason, this is sufficient.”

“There are plenty of others,” drawled Tom, smiling. “Good ones. For instance, heat or cold has nothing to do with the even running of an electric locomotive. It can bore right through a snowbank—a thing a steam engine can’t do. It runs at an even speed. Really, grade should have nothing to do with its speed. There is a fault somewhere in the construction of the Jandel machine or the H. & P. A. would have little trouble with those locomotives on its grades.

“Then, all you have to do to start an electrified locomotive is to turn a handswitch. No stoking or water-boiling. Does away with the fireboy. One man runs it!”

“Why!” cried Ned, “I never stopped to think of all these things.”

“No ashes to dump,” went on Tom. “No flues to clean, no boilers to inspect, and none to wear out. And they say that on the Chicago, Milwaukee & St. Paul, at least, their freight locomotives handle twice the load of a steam locomotive at a greatly reduced cost.”

“Sounds fine. Don’t wonder Mr. Bartholomew is eager to electrify his entire tine.”

“On the side of passenger traffic,” continued Tom Swift, “the electric locomotive is smokeless, noiseless, dirtless, and doesn’t jerk the coaches in either stopping or starting. And in addition, the electric locomotive is much easier on track and roadbed than the old ‘iron horse’ driven by steam generated either from coal or oil.”

“It is a great field for your talents, Tom!” cried Ned, warmly.

“It is a big job,” admitted Tom, and he said this with modesty. “I don’t know what I may be able to do—if anything. I would not feel right in taking Mr. Bartholomew’s twenty-five thousand dollars for nothing.”

“Quite right, my boy,” said Mr. Swift, approvingly.

“Never mind that,” said the financial manager, rather grimly. “It was his own offer and his risk. That twenty-five thousand comes to our account.”

Tom laughed. “All business, Ned, aren’t you? But there is more than business for the Swift Construction Company in this. Our reputation for fair dealing as well as for inventive powers is linked up with this contract.

“I want to show the Jandel people—to say nothing of the bigger firms—that the Swifts are to be reckoned with when it comes to electric invention. Other roads will be electrifying their lines as fast as it is proved that the electric-driven locomotive has the bulge on the steam-driven.

“In the case of the Hendrickton & Pas Alos there are very steep grades to overcome. Supposedly an electric motor-drive should achieve the same speed on a hill as on the level. But there is the weight of the train to be counted on.

“The H. & P. A. has a two per cent. grade in more than one place. Mr. Bartholomew confessed as much to me last night. The electric-driven locomotive

of the powerful freight type, which the Jandel people built for Mr. Bartholomew, can make about sixteen miles an hour on those grades, although they can hit it up to thirty miles an hour on level track.

“His passenger locomotives turn off a mile a minute and more, on the level road; but they can not climb those steep grades at a much livelier pace than the freight engines. That is why he is talking about two-mile-a-minute locomotives. He must get a mighty speedy locomotive, for both freight and passenger service, to keep ahead of Montagne Lewis’s rival road, the Hendrickton & Western.”

“You don’t suppose it can be done, do you?” demanded Ned. “The two-mile-a-minute locomotive, I mean, Tom.”

“That is the target I am to aim for,” returned his friend, soberly. “At any rate, I hope to improve on the type of locomotive Mr. Bartholomew is now using, so that the hundred thousand dollars bonus will come our way as well as this first twenty-five thousand.”

“That wouldn’t pay for one engine, would it?” cried Ned.

“Nor is it expected to. The bonus has nothing to do with payment for any model, or patent, or anything of the kind. To tell you the truth, Ned, I understand those big locomotives used by the Chicago, Milwaukee & St. Paul cost them about one hundred and twelve thousand dollars each.”

“Whew! Some price, I’ll tell the world!” murmured the youthful financial manager of the Swift Construction Company.

When the conference was over, and Tom had been through the workshop to overlook several little jobs that were in process of completion by his trusted mechanics, it was lunch time. He left word that he would not be back that day, for this new task he was to attack was not to be approached with any haphazard thought.

Tom knew quite as well as his father knew that the idea of improving the Jandel patent on electric locomotives was no small thing. The Jandel people had claimed that their patent was the very last word in electric motor-power. And Tom was quite willing to acknowledge that in some ways this claim was true.

But in invention, especially in the field of electric invention, what is the last word today may be ancient history tomorrow.

It was because this field is so broad and the possibility of improvement in every branch of electrical science so exciting, that Tom had accepted Mr. Bartholomew’s challenge with such eagerness.

Tom went back to the house for lunch, and as he joined his father in the dining room he remarked to Eradicate:

“I want the electric runabout brought around after lunch. I am going to Waterfield. Tell Koku, will you, Rad?”

“Tell that crazy fellow?” demanded the old colored man heatedly. “Why should I tell him, Massa Tom? Ain’t I able to bring dat runabout out o’ de garbidge? Shore I is!”

“You can’t do everything, Rad,” said Tom, soberly. “That is humanly impossible.”

“But dat Koku can’t do nothin’ right. Dat’s inhumanly possible, Massa Tom.”

“Give him a chance, Rad. I have to take Koku with me this afternoon. You must give your attention to the house and to father.”

“Huh! Umm!” grunted Eradicate.

Rad was jealous of anybody who waited on Tom besides himself. Yet he was proud of responsibility, too. He teetered between the pride of being in charge at home and accompanying his young master, and finally replied:

“Well, in course, you ain’t going to be gone long, Massa Tom. And yo’ father does like to get his nap undisturbed. And he’ll want his pot o’ tea afterwards. So I’ll let dat irresponsible Koku go wid yo’. But yo’ got to watch him, Massa Tom. Dat giant don’t know what he’s about half de time.”

As Koku was not within hearing to challenge that statement, things went all right. When Tom came out of the house after eating, he found his very fast car waiting for him, with the giant standing beside it at the curb.

“Get in at the back, Koku,” said Tom. “I am going to take you with me.”

“Master is much wise,” said Koku. “That man with big feet will not hurt Master while Koku is with him.”

To tell the truth Tom had quite forgotten the supposed spy that had attacked him the night before. He needed Koku for a purpose other than that of bodyguard. But he made no comment upon the giant’s remark.

They stopped at one of the gates of the works, and Tom instructed Koku to bring out and put into the car certain boxes and tools that he wished to take with him. Then he drove on, taking the road to Waterfield.

This way led through farmlands and patches of woods, a rough country in part. A mile out of the limits of Shopton the road edged a deep valley, the sidehill sparsely wooded.

Almost at once, and where there was not a dwelling in sight, they saw a figure tramping in the road ahead, a big man, roughly dressed, and wearing a broad-brimmed hat. Somehow, his appearance made Tom reduce speed and he hesitated to pass the pedestrian.

The man did not hear the runabout at first; or, at least, he did not look over his shoulder. He strode on heavily, but rapidly. Suddenly the young inventor heard the giant behind him emit a hissing breath.

“Master!” whispered the giant.

“What’s up now?” demanded Tom, but without glancing around.

“The big feet!” exclaimed Koku.

The giant’s own feet were shod with difficulty in civilized footgear, but compared with his other physical dimensions his feet did not seem large. The man ahead wore coarse boots which actually looked too big for him! Koku started up in the back of the car as the latter drew nearer to the stranger.

The man looked back at last and Tom gained a clear view of his features—roughly carved, dark as an Indian’s, and holding a grim expression in repose that of itself was far from breeding confidence. In a moment, too, the expression changed into one of active emotion. The man glared at the young inventor with unmistakable malevolence.

“Master!” hissed Koku again. “The big feet!” The fellow must have seen Koku’s face and understood the giant’s expression. In a flash he turned and leaped out of the roadway. The sidehill was steep and broken here, but he went down the slope in great strides and with every appearance of wishing to evade the two in the motor-car.

The giant’s savage war cry followed the fugitive. Koku leaped from the moving car. Tom yelled:

“Stop it, Koku! You don’t know that that is the man.”

“The big feet!” repeated the giant. “Master see the red mud dried on Big Feet’s boots? That mud from Master’s garden.”

Again Koku uttered his savage cry, and in strides twice the length of those of the running man, started on the latter’s trail.

Chapter 8

An Enemy In the Dark

The situation offered suggestions of trouble that stung Tom to immediate action. The impetuosity of his giant often resulted in difficulties which the young inventor would have been glad to escape.

Now Koku was following just the wrong path. Tom Swift knew it.

“Koku, you madman!” he shouted after the huge native. “Come back here! Hear me? Back!”

Koku hesitated. He shot a wondering look over his shoulder, but his long legs continued to carry him down the slope after the dark-faced stranger.

“Come back, I say!” shouted Tom again. “Have I got to come after you? Koku! If you don’t mind what you’re told I’ll send you back to your own country and you’ll have to eat snakes and lizards, as you used to. Come here!”

Whether it was because of this threat of a change of diet, which Koku now abhorred, or the fact that he had really become somewhat disciplined and that he fairly worshiped Tom, the giant stopped. The man with the big shoes disappeared behind a hedge of low trees.

“Get back up here!” ejaculated Tom sternly. “I’ll never take you away from the house with me again if you don’t obey me.”

“Master!” ejaculated the giant, slowly approaching. “That Big Feet—”

“I don’t care if he made those footprints in the yard last night or not. I don’t want him touched. I didn’t even want him to know that we guessed he had been sneaking about the house. Understand?”

“Of a courseness,” grumbled Koku. “Koku understand everything Master say.”

“Well, you don’t act as though you did. Next time when I want any help I may have to bring Rad with me.”

“Oh, no, Master! Not that old man. He don’t know how to help Master. Koku do just what Master say.”

“Like fun you do,” said Tom, still apparently very angry with the simple-minded giant. “Get back into the car and sit still, if you can, until we get to Mr. Damon’s house.” Then to himself he added: “I don’t blame that fellow, whoever he is, for lighting out. I bet he’s running yet!”

He knew that Koku would say nothing regarding the incident. The giant had wonderful powers of silence! He sometimes went days without speaking even to Rad. And that was one of the sources of irritation between the voluble colored man and the giant.

“’Tain’t human,” Rad often said, “for nobody to say nothin’ as much as dat Koku does. Why, lawsy me! if he was tongue-tied an’ speechless, an’ a deaf an’ dumb mute, he couldn’t say nothin’ more obstreperously dan he does—no sir! ’Tain’t human.”

So Tom had not to warn the giant not to chatter about meeting the stranger on the road to Waterfield. If that person with dried red mud on his boots was the spy who had followed Mr. Richard Bartholomew East and was engaged by Montagne Lewis to interfere with any attempt the president of the H. & P. A. might make to pull his railroad out of the financial quagmire into which it was rapidly sinking, Tom would have preferred to have the spy not suspect that he had been identified after his fiasco of the previous evening.

For if this Western looking fellow was Andy O’Malley, whose name had been mentioned by the railroad man, he was the person who had robbed Tom of his wallet and had afterward attempted reprisal upon the young inventor because the robbery had resulted in no gain to the robber.

Of course, the fellow had been unable to read Tom’s shorthand notes of the agreement that he had discussed with Mr. Bartholomew. Just what the nature of that agreement was, would be a matter of interest to the spy’s employer.

Having failed in this attempt to learn something which was not his business, the spy might make other and more serious attempts to learn the particulars of the agreement between the railroad president and the Swifts. Tom was sorry that the fellow had now been forewarned that his identity as the spy and footpad was known to Tom and his friends.

Koku had made a bad mess of it. But Tom determined to say nothing to his father regarding the discovery he had made. He did not want to worry Mr. Swift. He meant, however, to redouble precautions at the Swift Construction Company against any stranger getting past the stockade gates.

Arrived at Mr. Damon’s home in Waterfield, Tom got quickly to work on the little job he had come to do for his old friend. Of course, Tom might have sent two of his mechanics from the works down here to electrify the barbed wire entanglements that Mr. Damon had erected around his chicken run. But the young inventor knew that his eccentric friend would not consider the job done right unless Tom attended to it personally.

“Bless my cracked corn and ground bone mixture!” ejaculated the chicken fancier. “We’ll show these night-prowlers what’s what, I guess. One of my neighbors was robbed last night. And I would have been if I hadn’t set a watch while I drove over to see you, Tom. Bless my spurs and hackles! but these thieves are getting bold.”

“We’ll fix ’em,” said Tom, cheerfully, while Koku brought the tools and wire to the hen run. “After we link up your supply of the current with this wire fence it will be an unhappy chicken burglar who interferes with it.”

“That was an unhappy fellow who got your charge of ammonia last evening,” whispered Mr. Damon. “Heard anything more of him?”

“I think I have seen him. But Koku spoiled everything by trying to eat him up,” and Tom laughingly related what had occurred on the way from Shopton.

“Bless my boots!” said Mr. Damon. “You’d better see the police, Tom.”

“What for?”

“Why, they ought to know about such a fellow lurking about Shopton. If he followed that Western railroad president here—”

“We’ll hope that he will follow Mr. Bartholomew away again,” chuckled Tom. “Mr. Bartholomew won’t stay over today. When that chap finds he has gone he probably will consider that there is no use in his bothering me any further.”

Whether Tom believed this statement or not, he was destined to realize his mistake within a very short time. At least, the fact that he was being spied upon and that the enemy meant him anything but good, seemed proved beyond a doubt that very week.

Having done the little job for Mr. Damon, Tom allowed no other outside matter to take up his attention. He shut himself into his private experimental workshop and laboratory at the works each day. He did not even come out for lunch, letting Rad bring him down some sandwiches and a thermos bottle of cool milk.

“The young boss is milling over something new,” the men said, and grinned at each other. They were proud of Tom and faithful to his interests.

Time was when there had been traitors in the works; but unfaithful hands had been weeded out. There was not a man who drew a pay envelope from the Swift Construction Company who would not have done his best to save Tom and his father trouble. Such a thing as a strike, or labor troubles of any kind, was not thought of there.

So Tom knew that whatever he did, or whatever plans he drew, in his private room, he was safely guarded. Yet he always took a portfolio home with him at night, for after dinner he frequently continued his work of the day. Naturally during this first week he did not get far in any problem connected with the proposed electric locomotive. There were, however, rough drafts and certain schedules that had to do with the matter jotted down.

It was almost twelve at night. Tom had sat up in his own room after his father had retired, and after the household was still.

Eradicate was in bed and snoring under the roof, Tom knew. Just where Koku was, it would have been hard to tell. Although a fine and penetrating rain was falling, the giant might be roaming about the waste land surrounding the stockade of the works. The elements had no terrors for him.

Tom locked his portfolio and stepped into his bathroom to wash his hands before retiring. Before he snapped on the electric light over the basin he chanced to glance through the newly set windowpane which had replaced the one Rad had shattered in escaping threatened impalement on Koku’s spear.

Although the clouds were thick and the rain was falling, there was a certain humid radiance upon the roof of the porch under the bathroom window. At

least, the wet roof glistened so that any moving figure on or beyond it was visible.

“What’s that?” muttered Tom, and he sank down lower than the sill and crept slowly to the window. He merely raised himself until his eyes were on a level with the sill.

Coming up over the edge of the porch roof was a bulky figure. It was so dimly outlined at first that Tom could scarcely be sure that it was that of a man.

However, it was not possible that any creature but a man would be able to mount the lattice supporting the honeysuckle vines and so creep out upon the porch roof. Once making secure his footing, the enemy in the dark approached directly the bathroom window at which Tom crouched.

Chapter 9

Where Was Koku?

Tom reached up swiftly and pushed over the lever that locked the two window sashes. In doing this he set his own patent burglar alarm. If that lever was turned back again, or broken, the buzzers would be set ringing all over the house, and in Koku's room over the garage.

He did not believe that the marauder on the roof of the porch could have seen the flash of his shirt-sleeved arm. But he took no chance of being observed from outside by rising to his feet.

On his hands and knees he crept away from the window, and out of the bathroom. Once there, he stood up, grabbed the portfolio, and without coat or vest and as he was, dashed out of the bedroom. He had been positive that nobody but himself was astir in the big house, and he was right.

He did not punch the light button when he entered the library. He knew where to put his hand upon an electric torch in the table drawer, and he gained possession of this.

Then he went to the safe and twirled the knob and watched the indicator find the four numbers which were the "open sesame" to the burglar and fire-proof door.

He flung the portfolio into the inner compartment, closed both doors, and twirled the combination-knob. Then Tom tiptoed to the foot of the front stairs to listen. He could hear no sound from above.

He did not want his father to be startled, if the enemy did break in; and he knew that old Rad, awakened out of a sound sleep, would be worse than useless at such a time.

After all, the giant, Koku, was his main dependence under these circumstances. Tom crept to the outer door, opened it carefully, and slipped out, letting the spring lock click behind him. For the first time he realized that he was in his shirt and trousers and wore only felt slippers on his feet.

But he was locked out now. He had no key. He must run the risk of the fine rain and the chill of the night air.

He stepped off the end of the porch and ran around the house. It was to the roof of the rear porch that the marauder had climbed. But peer as he

might from down in the yard, Tom could see no moving figure up there near the bathroom window. It was pitch dark against the wall of the house.

He turned to glance up at the window of the sleeping room over the garage where Koku was supposed to spend the night. But Tom knew the giant was seldom there during the dark hours. He was as much of a night-prowler as a wildcat or an owl.

There was no light there in any case. But Koku did not use a light much. He could see in the dark, like a wild animal. Tom did not want to call him. If he must have Koku's help, he would have to climb the stairs to his bedside. The giant always aroused as wide awake as at noonday.

But while the young inventor hesitated a sudden, but muffled, snap—the breaking of metal—sounded. Tom knew instantly the direction from which the sound came.

Although he could see nothing up there at the bathroom window because of the rain and the deep shadow, he knew that the snapping sound meant the severing of the window lock that he had so recently closed. Some instrument had been forced under the bottom of the lower sash and pressure enough been brought to bear to break the thin steel lever.

On the heels of this sound came another. A muffled buzzing somewhere in the house—again! again! And then, startlingly clear from the room over the garage, the burglar alarm went off in Koku's chamber.

"It's all off now!" gasped Tom, and he ran to the foot of the honeysuckle ladder up which he knew the enemy had climbed to get to the roof of the porch. "If he comes down I'll have him!" muttered Tom, staring up into the mist and gloom.

"Fo' de lawsy's sake! 'Tain't mawnin', is it?" Rad's sleepy voice was heard to announce. "No, it's da'k as—" And the voice trailed off into silence.

"Tom! Tom!" the young fellow heard his aroused father shouting.

Tom knew that his father was in no danger. In fact Mr. Swift's voice did not even betray apprehension. It was to the garage Tom looked for an explosion. But none came.

If Koku was up there the prolonged buzzing of the alarm did not awake him. Therefore he could not be there. Tom realized that if the burglar was to be taken the whole affair fell upon his shoulders.

"And I've got my hands full, if it is the fellow with the big feet that we saw on the Waterfield Road the other day," muttered the young inventor.

Nothing stirred on the porch roof. Moment after moment slipped by. Tom began to grow more than amazed. He was worried. What would happen next?

His father had not cried out again. Stepping around to the end of the roofed porch, Tom saw a light in Mr. Swift's room. Rad had evidently gone to sleep again. It would take more than an intermittent buzzer to rouse fully that colored man.

"When old Morpheus has a strangle hold on Rad, Gabriel's trump would scarcely awaken him," Tom muttered.

What had become of the enemy? If it was an ordinary burglar he would have feared the electric alarm instantly. The buzzers were still working. But

there was no sign of the man who had set them off at the bathroom window.

Suddenly Tom heard a door slam. It was from the front of the house. Had his father come downstairs to look around and see what the matter was?

The young fellow started around the house on a run. He heard heavy boot-soles spurning the gravel of the path to the front gate. He arrived at the far corner of the house in time to see a man dash through the gateway and run down the street, disappearing finally into the fast-driving rain.

"Fooled me! He went in and right through and down the stairs! Out the front door!" gasped Tom. "Did he get anything? I wonder!"

He sprang up to the front porch and tried the door. It was locked again, of course. Should he ring the bell and get Rad or his father down to the door?

And then, of a sudden, the principal mystery of all this affair bit into Tom Swift's mind. The burglar had made his escape. He could relieve his father's anxiety later. It was his own puzzlement of mind that he first wished to ease.

Where was Koku?

Even had the giant been circling the stockade around the shops he surely must have come up to the home premises by this time. His keen ears could not fail to hear the buzzers. They were still going and would go until the switch was turned.

If the giant was in his room—Tom turned suddenly and started on a run for the rear premises. He still carried the hand-lamp and it lit his way into the garage door and up the narrow stairway. He shot the round beam of the lamp into Koku's room.

He had been obliged to have an iron bedstead made to order for the giant. It stood against one wall of the room. The buzzer was snarling like a huge bumblebee above the head of the couch. Below it sprawled the giant, eyes tightly closed and mouth slightly ajar. From the lips of Koku were emitted sounds worthy of Rad Sampson in his deepest slumbers!

"Asleep?" gasped Tom, stepping cat-like into the room.

And then he was suddenly aware of a sickish, heavy odor in the chamber. The window had been closed. But it was something more than stale air that Tom smelled.

A folded cloth lay on the floor beside the couch. The young fellow saw at once that it had been originally placed over the giant's face, but had slid off. And lucky for Koku that it had been dislodged!

"Chloroform!" muttered Tom. "He's drugged. It is no wonder he did not hear the burglar alarm."

In any event, the incident made one deep impression on Tom's mind. The spies who he believed were working for the Hendrickton & Western Railroad and its owner, Montagne Lewis, were desperate men. Tom could not believe that the fellow with the big feet was alone in Shopton and was unaided in his attempts to find out what Tom was doing.

This attempt to burglarize the house betrayed the caliber of the enemy. In chloroforming Koku he had taken the risk of murdering the giant. Only the fact that the pad of saturated cloth had fallen off Koku's face had, perhaps, saved the man from suffocation.

Tom did not tell the giant when he aroused what the matter with him was. Koku was ill enough! He was wrenched by interior spasms that seemed almost to tear his huge body to pieces.

“What done got into dat big lump o’ bone an’ grizzle?” demanded Eradicate. “He looks like, he swallowed a volcano, and it just got to wo’kin’ right. My lawsy!”

“He is a sick man, all right,” admitted Tom. “Looks like he wouldn’t try to stab me to deaf wid no spear no mo’,” went on Rad, inclined to approve of Koku’s sufferings.

“If he died you’d be mighty sorry, old man,” declared Tom, sternly.

“Sho’ would. Be a mighty hard job to bury him,” was the callous response.

Just the same, the crotchety old colored man began to hop around in lively fashion with hot water, and later with coffee and other stimulants; and he nursed Koku all day as though he were a big baby.

Koku, who had never been ill before in his life, was inclined to lay the trouble to an evil genius of some kind. Perhaps, in spite of his half-civilized state, he was still a devil-worshiper. At any rate, he had a vital respect for the forces of evil.

Naturally he considered this unknown and unexpected misery he suffered the result of malignant influences of some kind. Tom did not want him to suspect that the man with the big feet had any possible part in the mystery. Had Koku suspected this, and had he got his hands on the spy, the latter could never have been successfully used in that sort of work again. In all probability he would have said that he had had enough.

Meanwhile Tom made a point of considering each step he took alone thereafter with particular care. He had a bodyguard—usually the giant after the latter had recovered—between the works and the house. He did not bring home any more the schedules or drawings connected with the electric locomotive that he proposed to have built and to test inside the stockade of the Swift Construction Company.

He even put a private detective to work on the matter of finding a man named Andy O’Malley who might be lurking around Shopton. He had a pretty clear description of the fellow, for he had not only seen him once, face to face by daylight, but Tom had written to the president of the H. & P. A. and had got from that gentleman a clear picture in words of the spy whom Mr. Bartholomew believed was working in the interests of Montagne Lewis.

“If O’Malley appears in Shopton, look out. He is a bad character. He is not only a notorious gunman, with several warrants out for him in these parts, but he is a cruel and desperate man in any event. The minute you mark him, have him arrested and telegraph me. We’ll get him extradited and put him through for ten years or more right in this county.” The private investigator, however, as the weeks went by, could not find any man who filled O’Malley’s description.

Meanwhile Tom Swift had got what he called “a lead” and was working day and night upon the invention that he believed might make even the Jandel people respectful, if not a bit envious.

First of all Tom had arranged to have built all around inside the stockade a track of rails heavy enough to stand the wear and tear of the heaviest locomotive built. Meanwhile the various parts of his locomotive were being built in several shops, but would be shipped to the Swift Construction Company and assembled in Tom's try-out shed.

Great secrecy was of course maintained. Aside from the fact that the new invention had something to do with electric motive power, nobody about the shops could say what the new industry portended. Save, of course, the Swifts themselves, Ned Newton, and Mr. Damon, who was the Swifts' closest friend and sometimes had furnished additional capital for Tom's experiments.

There was a thing that Mr. Damon furnished Tom at this time that proved in the end to be of much importance. Before Tom had seized upon this idea of his eccentric friend, and had made proper use of it, something happened that came near to wrecking utterly Tom's invention and completely putting an end to Tom himself as an inventor.

Chapter 10

A Strange Conversation

Mr. Wakefield Damon frequently came to the shops, for he was not alone very friendly with the Swifts, but he was greatly interested in Tom's new invention.

"If it goes as good as what you did for my chicken run," he declared, chuckling, "bless my dampers! you'll beat all the electric locomotives in the market."

"That is easy, perhaps," said Tom smiling. "There are not many in the market at the present time. But I don't know what mine will be. This is going to be some job."

"Bless my flues and clinkers!" cried Mr. Damon, "you are not losing hope, Tom Swift? Look what you did for my chicken run. And believe me, that entanglement will give a shock that makes a man stand right up and shake."

"Have you tried it yourself?" asked Tom.

"No. But my servant did. I saw him through the window of my study doing some kind of a shimmy with the shovel. Thought he'd gone crazy. Then I saw what he had done. It was early in the morning and I hadn't turned the current off, and he had put one hand against the wires. When he dropped the shovel as I told him to, bless my plyers and nippers! he was all right."

"The current would not seriously hurt him," said Tom. "I was careful about that."

"It killed two tomcats," said Mr. Damon. "I certainly was glad of that, for those two ash-barrel cats kept the whole neighborhood awake. Bless my claws and whiskers! how those two cats did use to yell. But when one tried to climb the wires and the other sprang on him, it was all over! That is, all over but the burial party."

Mr. Damon was on the ground when the mechanical equipment and a part of the electrical equipment of the new locomotive arrived and was set up in the erection shed. The length of the machine was what first impressed Ned Newton as well as Mr. Damon.

"Bless my yardstick!" exclaimed the eccentric man, "it's as long as a gossip's tongue. What a monster it will be!"

"How long is it, Tom?" asked Ned Newton.

"When completed, and standing on its drivers and bogie truck and trailer

truck, from cow-catcher to rear bumper it will be a few inches over ninety feet. And that is slightly longer than the biggest electric locomotive so far built. But length does not so much enter into the value of the machine. I would have it built more compactly if I could."

"What is the horsepower?" asked Mr. Damon.

"I figure on forty-four hundred horsepower. The power must be received from a three thousand-volt direct-current trolley. There are twelve driving-wheels, as you can see. Each pair of drivers will be driven by a twin-motor geared to the axles through a system of flexible spring drive. Remember, I have got to obtain both speed as well as power in this locomotive, for it is being built to pull a passenger train—a fast cross-continent express—to compete with the best passenger equipment in the country."

"Bless my combination ticket!" murmured Mr. Damon. "You have picked out some task, and no mistake, Tom Swift."

"He'll do it," cried Ned, with his usual optimism when Tom had once started on any experimental work. "Of course he will. Just as she stands there now, only half put together, I would be willing to bet a farm that she is a better locomotive than the Jandel patent."

"Three cheers!" laughed Tom. "Ned is as enthusiastic as usual. But believe me, friends, we are not going to turn out a better locomotive than the Jandel without both thought and work."

His friends' enthusiasm was heartening, however. No doubt of that. He never let them into his experiment room, any more than he allowed his workmen in there. Aside from his own father, nobody really knew what Tom Swift was doing behind that always-locked door.

The huge structure of the locomotive was set up on the driving wheels and leading and trailing trucks by Tom's chief foreman and a picked crew. Just such another locomotive had never been seen anywhere about Shopton. Naturally the men at work on the monster began to speak of it outside the works.

Not that they betrayed any secrets regarding the locomotive. In fact, as yet none of them knew anything about what Tom intended to do with the big machine. But the story soon circulated that Tom Swift, the young inventor, was about to show all the previous builders of electric locomotives how such machines should be built.

It was even whispered that Tom's objective was a two-mile-a-minute locomotive. And when this was publicly known the information was not long in seeping to the ears of certain men who had been keeping as close a watch as they dared on the Swift Construction Company and the activities of Tom himself.

Ned Newton went to the bank one Friday for money for the payroll of the working and clerical force of the Swift Company. It was an errand he never relegated to any employee.

Ned had once worked himself in the bank, and naturally he knew many of its employees as well as the officials. With his back to the general waiting room, he sat at the vice president's desk discussing some minor matter. Only a railing divided the vice president's enclosure from the long settee on which waiting customers of the bank were seated.

Ned knew that there were two men directly behind him, whispering together; but he paid no attention to them until he heard this phrase:

“It’s timed to explode in just five hours; then good-night to that invention, whatever it is.”

This statement might mean almost anything—or nothing. Ordinarily Ned Newton might not have paid any consideration to the words. But “invention” was a term that he could not overlook. His mind then was fixed upon Tom’s invention almost as closely as the mind of the young inventor himself.

Ned turned around slowly, as though idly, indeed, and tried to see the faces of the two men behind him. One was a small, neatly dressed man of professional appearance. He wore a Vandyke beard and eyeglasses. The other’s face Ned could not see; but as they both rose just then and strolled toward the door of the bank he could observe that the fellow was big and burly.

Ned wheeled to his friend, the vice president, and asked:

“Who are those men, Mr. Stanley? Do you know them?”

The pair were just going out through the revolving door. The vice president craned his neck for a look at them.

“Don’t know the small man, Ned. But the other is named O’Malley, I believe. Somebody introduced him here and he gets a check cashed occasionally. Not a customer of the bank.”

At that moment the name “O’Malley” did not mean anything to Ned Newton. But he bade his friend good-bye and went out after the two men. They had disappeared.

Rad was in the electric runabout, waiting for him. The words spoken by O’Malley (Ned thought it must have been he who spoke of the invention because of his deep voice) continued to disturb Ned’s thought.

“Rad,” he said, as he got into the runabout, “did you ever hear the name O’Malley?”

“Sure has,” declared the colored man. “And it’s a bad name and a bad man owns it.”

“Do you mean that?” exclaimed the financial manager of the Swift Construction Company, with increasing apprehension. “Who is he?”

“Why, Mr. Newton, don’t you ’member dat man?”

“Who is he?” repeated Ned.

“Dat Andy O’Malley is de one what tried to hold up Massa Tom dat time. O’Malley is de man what’s been spyin’ on Massa Tom—”

“Great grief!” exclaimed Ned, breaking in with excitement. “I’ll drive as fast as I can, Rad. There is something wrong at the works, I do believe!”

“What’s wrong, Mr. Ned?” demanded Rad. “We just come from dere, and everyt’ing was all right.”

“I just heard something that O’Malley said. I want to get back in a hurry. I believe that scoundrel is attempting to blow up Tom’s locomotive. We’ve got to get to the works just as quick as we can.”

Chapter 11

Touch and Go

The mechanical equipment of the new locomotive was now complete and Tom was establishing the electrical equipment as rapidly as possible. He not only acted as overseer of this work, but in overalls and jumper he was doing a good share of the work himself.

The weight of the electrical equipment when it was finally set up was not far from two hundred thousand pounds. Altogether, when the oil, sand, and water tanks were filled, the great machine would weigh two hundred and eighty-five tons—a monster indeed!

“She is going to take a lot of current to run her,” said Tom to his father, who was standing by. “When I come to arrange with the Shopton Electric Company for power, it’s a question if they can give me all I need. And I must have plenty of current to make sure that my motors fill the bill.”

“As your tests will be made in the daytime, the company should be able to furnish the power you need,” rejoined Mr. Swift. “At night, of course, when they must furnish so much light as well as power, it might be difficult for them to give you the proper current.”

“Forty-four hundred horsepower is a big demand,” went on Tom. “I’ve got to have at least a three-thousand-volt direct-current to feed my motors. I will soon have to take up the matter with the Electric Company.”

The heavy work of setting the electrical parts of the locomotive had been finished the day previous, and the track-derrick was removed. Tom was engaged in adjusting the more delicate parts of the equipment and had merely stepped down from the cab to speak to Mr. Swift.

Now he climbed back into the interior of the great machine which, in a general way, looked like a box car. An electric locomotive has not much of the appearance of a steam engine. The machinery is all boxed in and the entire floor of the locomotive is above even the drivers.

These six pairs of driving wheels were about seventy inches in diameter, while the diameter of the leading and following truck-wheels was but half that number of inches.

Mr. Swift had turned away from the locomotive when Tom put his head out

of the door again.

“Do you hear that, father?” he demanded in a puzzled tone.

“Hear what, Tom?” asked the old inventor, looking up.

“That ticking sound? I declare, I’d think it was one of those death-watch beetles had got in here. Sounds like a big watch ticking. I can’t make it out.”

“Where is it? What is it?” repeated Mr. Swift. “I hear nothing down here on the floor of the shed.”

“Well, it gets me,” muttered Tom, and disappeared again. In a moment he called out: “Say, you fellows! who left his bundle of overalls in here? Better take ’em out to be manicured. Whose are these?”

Two or three of the mechanics working near looked up from their tasks. Mr. Swift turned back to the door of the cab again.

“What is the matter now, Tom?” he asked, in added curiosity.

“That bundle, Dad.”

Tom once more appeared and addressed the workmen: “Whose bundle of dirty overalls is this in here? Come and take ’em away. They shouldn’t have been left here.”

“Why, Mr. Tom,” said the foreman who was near, “I didn’t see any soiled overalls in there when I left last evening. Any of you fellows,” he asked the group of hands, “know anything about any overalls?”

“The bundle is here all right. Pushed back against the third series motors. Come up here, one of you fellows.”

Suddenly there was a noise at the end of the shed where the door to the offices lay. Two figures burst through from the glass doors and charged down the lanes between the lathes and cranes. Ned Newton led, Rad Sampson, his face a mouse-gray with fear, followed.

“Massa Tom! Massa Tom!” shouted the colored man. “Look out fo’ de bomb! Look out fo’ de bomb!”

The foreman sprang toward the high door of the locomotive where Tom stood, staring out. The young inventor, quick as his mind usually functioned, did not understand at all what Eradicate meant.

“There’s something wrong in there, Mr. Tom!” shouted the foreman. “Come down, sir, and let me get up there and see what it is.”

But Mr. Barton Swift grasped the meaning of what was going on more quickly than anybody else. Tom’s father, Tom frequently said, had spent so many years investigating chemical and mechanical mysteries that he saw more clearly and more exactly into and through most problems than other people.

His raised voice now cut through the rumble of machinery and all the other noises of the shop. Even Rad Sampson’s delirious cry was dwarfed by Mr. Swift’s sharp tone:

“Tom! The ticking of that watch! That means danger!”

The declaration seemed to rip away a curtain from Tom’s thoughts. Perhaps Rad’s cry about “de bomb” aided the young inventor to understand the peril that threatened.

The faint ticking sound that had begun to annoy him during the past few minutes betrayed the nature of the threatening peril. Tom swung back from

the open doorway of the locomotive cab, reached in to the space between the motors, and seized the bundle of overall stuff that he had previously spied.

He knew instantly that the rapid ticking came from that bundle. It could be nothing but a time bomb. He had heard of such things and, indeed, had seen one before, an infernal machine which, set like an alarm clock, would go off at a certain time. That indicated time might be an hour hence, or might be within a few seconds! Ned Newton, almost at the spot, shouted to Tom when the latter reappeared with the bundle in his hands:

“Get down out of that, Tom Swift! Quick! For your life!”

But Tom was cool enough now. He saw his father’s white, strained face at one side and the young inventor could even smile at him. Behind the foreman was set a barrel of water in which tools were cooled and tempered.

“Stoop, McAvoy!” Tom shouted, and tossed the bundle from him.

Had the infernal machine exploded in midair Tom would not have been surprised. But McAvoy dodged, Rad clapped his hands over his ears, and, even Ned Newton halted like a bird-dog at point.

The bundle splashed into the barrel of water. It sank to the bottom. There was no explosion. When a few seconds had passed the group of excited men began to relax. The barrel was carried carefully to a neighboring field.

“Fo’ de lawsy sake!” gasped Rad, and got a full breath again.

“That was touch and go, sure enough,” muttered Ned Newton.

“Those overalls sure went to the wash, Boss,” declared the foreman. “What was in ’em? And who put ’em in the cab up there?”

But Tom dropped down the ladder and went to his father. Their hands sought each other and gripped, hard.

“Better not tell Mary about this,” whispered Tom. “She’s worried enough as it is.”

“Right, Tom,” agreed the old inventor. “From this time on we cannot be too careful. If there proves to be an infernal machine in that package we may be sure that we are dealing with desperate men. We’ve got to keep our eyes open.”

“Wide open,” added Ned.

“I’ll say we have,” said Tom.

Chapter 12

The Try-Out Day Arrives

It did not need Ned Newton's story of what he had overheard at the bank to prove that an attempt had been made to blow to pieces Tom Swift's electric locomotive before even it had been tested.

An examination of the water-soaked package in the open yard of the shops of the Swift Construction Company, proved that there was enough explosive in the bomb to blow the shed itself to pieces. But the stopping of the clockwork attachment of course made the bomb harmless.

"The main thing to be explained," Tom said, when he and his father and Ned discussed the particulars of the affair, "is not who did it, or what it was done for. Those are comparatively easy questions to answer."

"Yes," agreed Ned. "O'Malley did it, or caused it to be done; and it was an attempt to balk Mr. Bartholomew and the H, & P. A. rather than a direct attack upon the Swift Construction Company."

"I am afraid, however," remarked Mr. Swift, "that Tom has aroused the personal antagonism of this spy from the West. We must not overlook that."

"I don't," replied the young inventor. "O'Malley has it in for me. No doubt of that. But he could not be sure that I would be hurt by the explosion he arranged for."

"True," said his father.

"The attempt was against my invention. And O'Malley was doubtless urged to destroy the locomotive that I am building because my success will aid Mr. Bartholomew and his railroad."

"Quite agreed," said Ned. "But—"

"But the important question," interrupted Tom, "is this: How did the bomb get into the interior of the electric locomotive? That is the first and most important problem. Its having been done once warns us that it can be done again until our system of guarding the works is changed."

"We have five watchmen on the job at night, and the gates are never opened in the daytime to anybody for any purpose without a pass," declared Ned. "I don't see how that fellow got in here with the time bomb."

"Exactly. It shows that there is a fault in our system somewhere," said Tom

grimly. "We cannot surround the place at night with an armed guard. It would cost too much. Even Koku cannot be everywhere. And I have reason to know that he was wandering about the stockade last night as usual."

"The fellow was pretty sharp to slip by," Ned observed.

"The stockade is no mean barrier, especially with the rows of barbed wire at the top," said Mr. Swift.

"Barbed wire! That's it!" exclaimed Tom. It was just here that Mr. Damon's idea for guarding his prize buff Orpingtons came into play in Tom's scheme of things. "Barbed wire doesn't seem to keep out spies," he added slowly. "But believe me, something else will!"

For Tom to think of a thing was to start action without delay. Immediately he called a gang from the shops and set them to work stringing copper wire along the top of the stockade.

He was sure that the man who had set the time bomb in place had got into the enclosure over the fence. If he tried the same trick again he was very apt to have the surprise of his life!

Each night when the shops closed and the watchmen went on duty, a current of electricity was turned into those copper wires entwined with the barbed wire entanglement at the top of the stockade that would certainly double up any marauder who sought to get over the top.

However, no further attempt was made against Tom's peace of mind and against his invention during the immediate weeks that followed. The young inventor was so closely engaged in his work that he scarcely left the house or the confines of the shops. Even Mary Nestor saw very little of him.

But Mary realized fully that at such a time as this Tom must give all his thought and energy to the task in hand. She was proud of Tom's ability and took a deep interest in his inventions.

"I want to see the test when you try the locomotive, Tom," she told him, when she came to the shops the first time to look at the monster locomotive. "What a wonderful thing it is!"

"Its wonder is yet to be proved," rejoined the young inventor. "I believe I've got the right idea; but nothing is sure as yet."

In addition to his mechanical contrivances inside the locomotive, Tom had to arrange for an increased supply of electric power to drive the huge machine around the track that was being built inside the stockade.

A regular station had to be built for receiving the electricity in a 100,000-volt alternating current and delivering it to the locomotive in a 3,000-volt direct current. Therefore, this station had two functions to perform—reducing the voltage and changing the current from alternating to direct.

The reduction of the voltage was accomplished as follows: The 100,000-volt alternating current was received through an oil switch and was conveyed to a high-tension current distributor made up of three lines of copper tubing, thus forming the source of power for this station.

From the current distributor the current was conducted through other oil switches to the transformers—entering at 100,000 volts and emerging at 2,300

volts. Then the current was conducted from the transformers through switches to the motor-generator sets and became the power employed to operate them.

The motor generator consisted of one alternating current motor driving two direct current generators. The motor Tom established in his station was of the 60-cycle synchronous type, which means that the current changes sixty times each second.

There were two sets, each generating a 1,500 or 2,000 volt direct current; and the two generators being permanently connected, delivered a combined direct current of 3,000 volts—as high a direct voltage current, Tom knew, as had ever been adopted for railroad work. The current voltage for ordinary street railway work is 550 volts.

“I could run even this big machine,” Tom explained to Ned Newton, “with a much lighter current. But out there on the Hendrickton & Pas Alos line the transforming stations deliver this high voltage to the locomotives. I want to test mine under similar conditions.”

“This is going to be an expensive test, Tom,” said Ned, grumbling a little. “The cost-sheets are running high.”

“We are aiming at a big target,” returned the inventor. “You’ve got to bait with something bigger than sprats to catch a whale, Ned.”

“Humph! Suppose you don’t catch the whale after all?”

“Don’t lose hope,” returned Tom, calmly. “I am going after this whale right, believe me! This is one of the biggest contracts—if not the very biggest—we ever tackled.”

“It looks as if the expense account would run the highest,” admitted the financial manager.

“All right. Maybe that is so. But I’ll spend the last cent I’ve got to perfect this patent. I am going to beat the Jandels if it is humanly possible to do so.”

“I can only hope you will, Tom. Why, this track and the overhead trolley equipment is going to cost a small fortune. I had no idea when you signed that contract with Mr. Bartholomew that so much money would have to be spent in merely the experimental stage of the thing.”

Ned Newton possessed traits of caution that could not be gainsaid. That was one thing that made him such a successful financial manager for the Swift Company. He watched expenditures as closely now as he had when the business was upon a much more limited footing.

The rails laid along the inside of the stockade made a two-mile track, as well ballasted as any regular railroad right of way. In addition the overhead equipment was costly.

To eliminate any possibility of the trolley wire breaking, a strong steel cable, called a catenary, was slung just above the trolley wire. To this catenary the trolley wire was suspended by hangers at short intervals.

These cables were strung from brackets so that a single row of poles could be used, save at the curves, at which cross-span construction was used. The trolley wire itself was of the 4/0 size, and was the largest diameter copper wire ever employed for railroad purposes.

Several weeks had now passed since the great locomotive had been assembled in the erection shed and the cab of the locomotive completed. It really was a monster machine, and any stranger coming into the place and seeing it for the first time must have marveled at the grim power suggested by the mere bulk of the structure.

When the day of the first test arrived Tom allowed only his most intimate friends to be present. Mary Nestor accompanied Mr. Swift into the shops at the time appointed, and she was as excited over the outcome of the test as Tom himself.

Ned Newton and the mechanical force of the shops knocked off work to become spectators at the exhibition. The only other outsider was Mr. Damon.

“Bless my alternating current!” cried the eccentric gentleman. “I would not miss this for the world. If you tried to shut me out, Tom, I’d climb over the stockade to get in.”

“You’d better not,” Tom told him, dryly. “If you tried that you’d get a worse shock than any chicken thief will get that tries to steal your buff Orpingtons.”

Chapter 13

Hopes and Fears

Tom climbed into the huge cab of the electric locomotive. In fact, the cab was the most of it, for every part of the mechanism save the drivers was covered by the eighty-odd foot structure. From the peak of the pilot to the rear bumper the length was ninety feet and some inches.

As Tom slid the monster out upon the yard track the small crowd cheered. At least, the locomotive had the power to move, and to the unknowing ones, at least, that seemed a great and wonderful thing.

What they saw was apparently a box-car—like a mail coach, only with more high windows—ten feet wide, its roof more than fourteen feet from the rails, its locked pantagraph adding two feet more to its height.

Just what was in the cab—the water and oil tanks, the steam-heating boiler to supply heat and hot water to the train the monster was to draw, the motors and the many other mechanical contrivances—was hidden from the spectators.

In fact, since completing the electrical equipment of the Hercules 0001, as Tom had named the locomotive, the young inventor had allowed nobody inside the cab, any more than he allowed visitors inside his private workshop. Even Mr. Swift did not know all the results of Tom's experimental work. In a general way the older inventor knew the trend of his son's attempts, but the details and the results of Tom's experiments, the latter told to nobody.

But as the huge locomotive rolled into the yard and followed the more or less circular track inside the yard fence, it was plain to all of the onlookers that the motive-power was there all right! Just what speed could be coaxed from the feed-cable overhead was another question.

Nor did Tom Swift try for much speed on this first test of the Hercules 0001. He went around the two-mile track several times before bringing his machine to a stop near the crowd of onlookers. He came to the open door of the cab.

"One thing is sure, Tom!" shouted Ned. "It do move!"

"Bless my slippery skates!" exclaimed Mr. Damon, "it slides right along, Tom. You've done it, my boy—you've done it!"

"It looks good from where I stand, my son," said Mr. Barton Swift.

It was Mary who suspected that Tom was not wholly satisfied—as yet, at least—with the test of the Hercules 0001. She cried:

“Tom! is it all right?”

“Nothing is ever all right—that is, not perfect—in this old world, I guess, Mary,” returned the young inventor. “But I am not discouraged. As Ned says, the old contraption ‘do move.’ How fast she’ll move is another thing.”

“What time did you make?” asked Mr. Swift.

“Not above fifteen miles an hour.”

“Whew!” whistled Ned dolefully. “That is a long way from—”

Tom made an instant motion and Ned’s careless lips were sealed. It was not generally known among the men the speed which Tom hoped to obtain with his new invention.

“It is a wide shoot at the target, that is true,” Tom said, soberly. “But remember I cannot test it for speed on this short and almost circular track. Right at the start, however, I see that something about the power-feed must be changed.”

“What is that?” asked Mary, curiously.

“I have only had rigged here one trolley wire. There must be two attached alternately to the catenary cable. Such a form of twin conductor trolley will permit the collection of a heavy current through the twin contact of the pantagraph with the two trolley wires, and should assure a sparkless collection of the current at any speed. You noticed that when I took the sharper curves there was an aerial exhibition. I want to do away with the fireworks.”

The fact that the Hercules 0001 was a going and apparently powerful draught engine satisfied most of the onlookers that Tom Swift was on the road to final and overwhelming success. The mechanics, indeed, saw no reason why the locomotive could not be run right out of the yard on the freight track and coupled to the first train going West. Of course, the Hercules 0001 could not be delivered to the Hendrickton & Pas Alos under its own power.

When the locomotive was run back into the shed and stood once more on the erection track, Tom confessed to Mary and Ned, while Mr. Damon and Mr. Swift were looking through the huge cab, that he was not at all pleased with the action of the machine.

“I have the best equipment of any electric locomotive on the rails today. I am sure of that,” he said. “The Hercules Three-Oughts-One is not as long as those electric locomotives of the C. M. & St. P. But that’s all right. I have built mine more compactly and, properly geared, it should have all the power of either the Baldwin-Westinghouse or the Jandel locomotive.”

“Then, Tom dear, what is wrong?” cried Mary.

“Speed. That is what troubles me. Have I got anything like the speed I am aiming for?”

“Two miles a minute!” breathed Ned Newton. “Some speed, boy!”

“And must you have such great speed, Tom?” repeated Mary.

“That is in my contract. Not only that, but to be of much use to the H. & P. A. this locomotive must have such speed—or mighty near it. Of course, under ordinary conditions, two miles a minute for a locomotive and train of

heavy freights would burn up the track—maybe melt the flanges and throw everything out of gear.”

“Why try for it, then?” demanded Mary.

“It is the power suggested by the possession of such speed that we want in the Hercules Three-Oughts-One. That two miles a minute is a fiction of the imagination, cannot be claimed. It is possible. It is humanly possible. It is coming.”

“Then you must be the fellow to first accomplish it, Tom Swift,” Ned declared.

“Of course, if anybody can do it, you can, Tom,” agreed the girl complacently.

“Thanks—many, many thanks,” laughed the young inventor. “I’d be able to harness the sun and stars, and put a surcingle around the moon if I came up to my friends’ opinion of my ability.

“Nevertheless, two-miles-a-minute is my objective point, and I do not believe it is visionary. Consider the motor-cycle. Ninety miles an hour has long been possible with that, and some tests have shown a speed of over a hundred and ten. That is not far from my mark.

“Some Mallet locomotives of the oil-burning type have achieved from eighty-five to ninety-five miles an hour with a heavy load behind them. They are very powerful machines. The Mogul mountain climbers are powerful, too, although they are not built for speed.

“The electric Goliaths built for the C. M. & St. P., and the Jandels, are both very speedy under certain conditions. The former has a maximum speed of sixty-five miles and the Jandel slightly faster.”

“But that is only half what that Mr. Bartholomew demands of your invention, Tom!” Mary cried.

“That is a fact. I must reach twice sixty miles an hour, anyway, to meet his demand and gain that hundred thousand bonus. But I have the advantage of a knowledge of all that has been done before my time in the matter of electrical locomotive construction.”

“The world do move,” repeated Ned. “You believe that you have the edge on all the other inventors?”

“Along the line of this development—yes,” said Tom. “I am taking up the work where former experimenters ended theirs. Why shouldn’t I find the right combination to bring about a two-miles-a-minute drive?”

“Oh, Tom!” cried Mary, with clasped hands, “I hope you do.”

“I hope I do, too,” said Tom, grimly. “At least, if trying will bring it, success is going to come my way.”

Chapter 14

Speed

More than four months had passed since the contract had been signed, when Tom made his first yard-test of the Hercules 0001. For a month nothing had been seen or heard of Andy O'Malley, whose identity as the spy, set by Montagne Lewis to cripple Tom's attempt to help the Hendrickton & Pas Alos Railroad, had been determined beyond any doubt.

The private inquiry agent that Tom had engaged to find O'Malley had been unsuccessful in his work. The spy had disappeared from Shopton and the vicinity. Nevertheless, the inventor did not for a moment overlook the possibility that the enemy might again strike.

Every night the electric current was turned into the wires that capped the stockade of the Swift Construction Company enclosure. Koku beat a path around the enclosure at night, getting such short sleep as he seemed to need in the forenoon.

"Dat crazy cannibal," grumbled Rad, "got it in his haid dat he's gwine to he'p Massa Tom by walkin' out o' nights like he was dis here Western, de great sprinter, Ma lawsy me! Koku ain't got brains enough to fill up a hic'ry nut shell. Dat he ain't."

Nothing anybody else could do for Tom ever satisfied Rad. The colored man fully believed that he was the only person really necessary for Tom's success and peace of mind. In fact, Rad thought that even Ned Newton's duties as financial manager of the firm were scarcely of as much importance.

When he heard that Tom was going West, after a time, with the electric locomotive, to try it out on the tracks of the H. & P. A., Rad was quite sure that if he did not go along, the test would not come out right.

"O' course yo'll need me, Massa Tom," he said, confidently. "Couldn't git along widout me nohow. Yo' knows, sir, I allus has to go 'long wid yo' to fix things."

"Don't you think father will need you here, Rad?" Tom asked the faithful old fellow. "You're getting old—"

"Me gittin' old?" cried, the colored man. "Huh! Yo' don't know 'bout dis here chile. I don't purpose ever to git old. I been gray-haided since befo' yo'

was born; but I ain't old yit!"

Mr. Damon chanced to be present at this conversation, and he was highly amused, yet somewhat impressed, too, by the colored man's statement.

"Bless my own antiquity!" he exclaimed. "I agree with Rad, Tom. It's us old fellows who know what to do when an emergency of any kind arises. Experience teaches more than inspiration."

"Oh," said Tom, laughing, "I do not deny the value of old friends at any stage of the game."

"Bless my roving nature! I am glad to hear you say that. For I tell you right now, Tom, I want to be out there when you make your final test of the locomotive."

"Do you mean that you will go West when I take out the Hercules Three-Oughts-One?" cried Tom.

"It's just what I want to do. Bless my traveling bag, Tom! I mean to be present at your final triumph."

"What will happen to your buff Orpingtons while you are gone?" asked the young inventor, gravely.

"I have got my servant trained to look after those chickens," declared Mr. Damon. "And this invention of yours is really more important than even my buff Orpingtons."

"Just the same," remarked Tom to his eccentric friend, when Rad had left the room, "I've got to fix it so that Eradicate stays at home with father. He doesn't really know how old and broken he is—poor fellow."

"His heart is green, Tom. That's what is the matter with Rad."

"He is a loyal old fellow. But I shall take Koku with me, not Rad," and the young inventor spoke decidedly. "And that is going to trouble poor Rad a lot."

The prospect of going West, however, was not the main subject of Tom's thoughts at this time. As the weeks passed and the end of the six months of experiment came nearer, the inventor was more and more troubled by the principal difficulty which had from the first confronted him. Speed.

That was the mark he had set himself. A maximum speed of two miles a minute on a level track for the Hercules 0001. With the speed already attained by both steam and electric locomotives in the more recent past, this was by no means an impossible attainment, as Tom quite well knew.

But he became convinced that the conditions under which he labored made it impossible for him to be positive of just how great a speed on a straight, level track his invention would attain.

There was no electrified stretch of railroad near Shopton on which the Hercules 0001 might be tested. The track inside the Swift Company's enclosure did not offer the conditions the inventor needed. He felt balked.

"I believe I have hit the right idea in my improvements on the Jandel patents," he told Ned Newton when they were discussing the matter. "But believing is one thing. Knowing is another!"

"Theoretically it works out all right, I suppose?" questioned Ned.

"Quite. I can prove on paper that I've got the speed. But that isn't enough. You can see that."

“Impossible to be sure on the trackage already built here, Tom?”

“I haven’t dared give her all she’ll take,” grumbled Tom. “If I did, I fear she’d jump the rails and I’d have a wreck on my hands.”

“And maybe kill yourself!” exclaimed Ned. “You want to have a care.”

“Oh, that’s all right! I’ve taken risks before. I don’t want to risk the safety of the locomotive, which is more important. That machine has cost us a lot of money.”

“I’ll say so!” agreed Ned. “You’ll have to wait till you can get the locomotive out there on the H. & P. A. tracks before you get a fair speed-test.”

“And suppose instead of a triumph it is a fiasco?” Tom said, doubtfully. “I tell you straight, Ned: I never was so uncertain about the outcome of one of my inventions since I began dabbling with motive power.”

“We could build several miles of straight track in the waste ground behind the works,” Ned said, thoughtfully.

“Not a chance! There is neither time nor money for such work. Besides, I should have to rebuild my transforming station if I supplied longer conduit wires with current.”

“You don’t really consider that you have failed, do you, Tom?” and Ned’s anxiety made his voice sound very woeful indeed.

“I tell you that my belief doesn’t satisfy me. I hate to go West without being sure—positive. I want to know! I have tried the locomotive out in the yard half a dozen times. It runs like a fine watch. There doesn’t seem to be a thing the matter with it now. But what speed can I attain?”

“I don’t see but you’ll have to risk it, Tom.”

“I mean to give her one more test. I’ll run her out tonight when there is nobody about but the watchmen—and you, if you want to come. I’ll arrange with the Electric Company for all the current they can spare. By ginger! I’ve got to take some risk.”

“By the way, Tom,” said his chum, “did it ever strike you as odd that that private detective agency never got any trace of O’Malley?”

“Well, he’s gone away. We needn’t worry about him. Maybe the detective wasn’t very smart, at that.”

“And yet he was here in town after you put the inquiry on foot. I saw him in the bank. He came there occasionally. And either he, or somebody he hired, placed that bomb in the locomotive.”

“All those being facts, what of it?”

“Besides, there was that other fellow—the man with the Vandyke beard. Might be a shyster lawyer, or something of the kind. He wasn’t spotted, either.”

“To tell the truth, I didn’t bother to give the Detective Agency the description of that fellow, although you gave it to me,” and Tom laughed. “I must confess that I depend more upon my man-trap electric wires to protect the invention than I do on the private inquiry agent.”

“It’s funny, just the same. If I had another job for a detective I should not submit it to the Blatz Agency,” grumbled Ned.

“I fancy Montagne Lewis and his crowd called off their Wild West gunman,” said Tom. “In any case, every attempt he made to bother us turned out a fizzle.”

I am not, however, forgetting precautions, my boy.”

Ned Newton realized that his chum had determined to make this night test of the electric locomotive the pivotal trial of the whole affair. He came back to the works after dinner and was let in by the office watchman at about nine o'clock.

“Mr. Tom here yet?” he asked the man.

“Yes, Mr. Newton. The young boss didn't go home to supper, even. That colored man brought something down for him, and he's in the shed yet.”

“Rad is here, you mean?”

“Yes, sir. At least, he didn't go out this way, and we watchmen have instructions to let nobody in or out by the yard gates at night.”

“I'll say Tom is being careful,” thought Ned, as he stepped out through the runway toward the erection shed.

Before he reached the entrance to the huge shed, however, Ned chanced to look down the enclosure. There were several arc lights burning, but even these only furnished a dim illumination for the whole yard.

He supposed that four watchmen were tramping their several beats along the inside of the stockade and close to the trolley-track. But when he saw an instant gleam of light down there, close to the ground, Ned did not believe that it was the flash of a torch in the hand of any sentry.

“Funny,” he muttered. “That's outside the fence, or I'm much mistaken. I wonder now—”

He turned from the door of the shed, left the runway, and began walking toward the distant point at which he had seen the mysterious flash of light.

Chapter 15

The Enemy Still Active

Ned was dressed in a dark business suit, so he was not likely to be observed from a distance, for it was a starless night. Half way to the end of the great yard he began to wonder if the light he had seen might not have been an hallucination.

He doubted very much if anybody was creeping about outside the fence. The boards were close together, with scarcely a crack half an inch wide anywhere. A light out there—

It flashed again. He was positive of it this time, and of its locality as well. It could be nobody who had any honest business about the Swift Construction Company's premises. It was not Koku, for ordinarily the giant would not use an electric torch.

Ned did not know where any of the watchmen were who were acting as sentinels. In fact, as it appeared later, three of them had been called off their beats by Tom himself to help in some necessary task inside the shed. The young inventor was getting ready to run the huge locomotive out upon the yard-track.

Remembering vividly the attempt which had been made some weeks before to blow up the Hercules 0001, it was only natural that Ned should suspect that the flash of light he had seen revealed the presence of some ill-conditioned person lurking just beyond the fence.

A man might be crouching there prepared to hurl an explosive bomb over the fence when the locomotive was brought around as far as that spot. Or was the villain foolish enough to attempt to enter the enclosure by surmounting the fence?

Ned, keeping close to the ground, crossed the rails in the fortunate shadow of one of the posts. There he found a place where, with his back to a pole-prop right at this curve in the trolley system, the shadow enfolded him completely.

Had his movements been marked by the person outside the fence? Ned waited several long and anxious minutes for some move from out there. Then something rather unexpected occurred. For the past ten minutes he had forgotten about the test of the Hercules 0001 which Tom had promised.

With a blast of its siren the huge electric locomotive burst out of the shed and thundered around the track. It smote Ned Newton's mind suddenly that

the inventor was going to “take a chance” on this evening and try to get some speed out of the huge machine.

The electric headlight cast a broad cone of white and dazzling light across the yard. It suddenly struck full upon the spot where Ned Newton crouched; but the upright against which he leaned was broad enough to hide him completely.

Looking up at the top of the stockade at that moment of illumination, the young financial manager of the Swift Construction Company beheld a crawling figure nearing the wire entanglements on the summit of the fence.

The unknown man was climbing by means of a notched pole. Ned could not see that he bore any bulky object in his hands; indeed, he needed both of them to aid him to climb. But the man’s right hand was reaching upward, above his head.

The Hercules 0001 came roaring on. Its cone of light passed beyond Ned’s station. In a few seconds it reached the spot, and roared on. Ned had not made a move. It seemed to him that he could not move or speak.

The onrush of the electric locomotive all but swept the young fellow from his feet. It had come and gone in an instant!

“He’s making more than fifteen or twenty miles an hour, all right,” muttered Ned.

Then he flashed another glance up at the figure outside the fence. The man’s cap showed above the top of the boards. He seemed to be dragging something up to him from below—something that hung and swung around and around a few feet from the ground.

Ned was about to dart out of concealment and hail the fellow. He was not armed, nor could he get out of the stockade near this point. He feared what the marauder intended, and he felt that he must frighten him away.

“Suppose that is a bomb and he means to fling it in front of Tom’s locomotive?” thought the anxious Ned.

He again saw the stranger’s right hand reach up above his head. But he had no bomb in his hand. Ned suddenly shrieked a word of warning! It had come to him what the man was doing and what the result of his act would be.

The wire-cutters bit on one of the copper wires. There followed a flash of blue flame, and the man screamed. He dropped the thing swinging below him and involuntarily grabbed at the wires with his left hand.

He was caught, then! The crackling intermittent shocks of electric fluid passed through his body in fiery sequence. His limbs writhed. He mouthed horribly, and croaking gasps came from between his wide open jaws.

The Hercules 0001 had rounded the enclosure and was coming down upon its second lap. The cone of white radiance from the headlight fell upon the writhing body of the victim on the wires. The locomotive siren emitted a blast that almost deafened Ned.

The monster ground to a stop. Tom swung himself half out of the cab window beside the controller.

“Who’s that?” he yelled. Then he saw Ned below him. “Who is that fellow?”

“No friend of yours, Tom, I believe,” returned his financial manager in a shaking voice.

“Where’s Rad? Rad!” Tom shouted at the top of his voice.

“T’s comm’, Massa Tom,” rejoined the colored man.

“Never mind coming here! Get a move on, and get to the switchboard. Turn the current out of the fence wires.”

“Yis, sir, I’ll go Massa Tom,” declared the old man.

“Is he a spotter, Ned?” demanded the inventor.

“He’s no friend. I am going out by the gate. He’s got something there that means harm, I believe. Do you think he’s killed, Tom?”

“Only ought to be. Not enough current to kill him. But he’s badly burned and—and—well! I bet he won’t care to fool around the works again.”

Ned dashed away to an entrance. A watchman came running, opened the small gate, and followed Ned into the open.

Before they arrived at the vicinity of the accident Rad had got to the switchboard. The electricity was shut out of the stockade wires.

Ned uttered another shout. He saw the writhing body of the shocked man fall from the stockade. When he and the watchman got to the spot the fellow lay upon his back, groaning and sobbing; but Ned saw at once that he was more frightened than hurt.

“Well, you did it that time!” exclaimed the young financial manager. “And I hope you got enough.”

“You—you demons!” gasped the man. “I’ll have the law on you—”

“Sure you will,” cackled the watchman. “You had every right in the world to try to cut those wires, of course, and get into the yard of the works. Sure! The judge will believe you all right.”

Ned was, meanwhile, staring closely at the fallen man. Tom had come down from the locomotive and was close to the fence.

“Who is he?” demanded the inventor. “Not O’Malley?”

Ned stepped to the fence and whispered:

“It’s the other fellow. The little chap with the Vandyke. He’s dressed like a tramp, but it’s the same man.”

“Is he badly hurt?” demanded Tom.

“His temper is, Boss,” said the watchman callously. “And say! I know this fellow. He works for the Blatz Detective Agency. I used to work for those folks myself. His name is Myrick—Joe Myrick.”

“Ned,” said Tom sternly, “go to the office and call the police. I’ll make him tell why he was here. And I’ll make the Blatz people explain, too. Hullo! what’s that?”

Ned had seized the rope he had seen in Myrick’s hand, and from a patch of weeds drew a two-gallon oil-can.

“What you got there, Ned?” repeated the young inventor.

“Whatever it is, I am going to be mighty easy with it. I think this scoundrel was trying to get it over the fence and into the way of the locomotive.”

“You can’t hang anything on me,” said Myrick, suddenly. “I was just climbing up to the top of the fence to get a squint at that contraption you’ve built. You can’t hang anything on me.”

“He’s evidently feeling better,” said Tom, scornfully. “Nugent, don’t let him get away from you. Go call the police, Ned. And take care of that can until we can find out what’s in it.”

Later, when the police had removed Joe Myrick and the mysterious can had been deposited in a tub of water in the open lot until its contents could be examined, Tom said to his chum:

“I was just working up some speed on the locomotive. The speedometer indicated fifty-five when I saw that fellow sprawling up there on the fence. I would not have dared go much faster in any case.”

“Why, you weren’t half trying, Tom!” cried the delighted Ned.

“She did slide around easy, didn’t she? Fifty-five on an almost circular track is a good showing. I am not so scared as I was, my boy.”

“You think that on a straight track you might accomplish what you set out to do?”

“It looks like it. At any rate, I shall risk a trial on the H. & P. A. tracks. I’m going to take her West. Be ready on Monday, Ned, for I shall want you with me,” declared Tom Swift.

Chapter 16

Off for the West

Of course, as Tom supposed they would, the Blatz Detective Agency denied that Joe Myrick, their one-time operative, had been engaged through their bureau either to spy upon the Swift Construction Company or to injure Tom's invention of the electric locomotive.

Nevertheless, three points were indisputable: Myrick had been caught spying; in his possession was a can of explosive which could be set off by concussion; and it was a fact that to Myrick had been first entrusted the matter of hunting for Andy O'Malley when Tom had put the search for the Westerner up to the Blatz people.

"He played traitor both to you, Mr. Swift, and to our agency," declared Blatz to Tom. "I wash my hands of him. I hope the police send him away for life!"

"He'll go to prison all right," said Tom, confidently. "But the main point is that one of your operatives fell down on a simple job. I wanted that Andy O'Malley traced. He's out of the way, now, of course. If you had put an honest man to work for me, O'Malley would be behind the bars himself."

"Some doubt of that, Mr. Swift," grumbled Blatz.

"Why?"

"Where's your evidence that this O'Malley was connected with the attempt to blow up your locomotive the first time? Mr. Newton's testimony would need corroboration."

"Never mind that," rejoined the young inventor, with a smile. "I'd have him for highway robbery. I recognized him. He robbed me of a wallet. Guess we could put O'Malley away for awhile on that charge. And by the time he got out again my job for that Western railroad would be completed."

"Humph! Nothing personal in your going after the fellow, then?" queried the head of the detective agency.

"No. But I frankly confess that I am afraid of O'Malley. He is undoubtedly in the employ of men who will pay him well if he wrecks my invention. But there really is no personal grudge between O'Malley and me. At least, I feel no particular enmity against the fellow."

There was a pause.

"If you say so we will give you a couple of good men as bodyguards on your trip West," suggested Blatz, licking his lips hungrily.

"As good men as Myrick?" retorted Tom, rather scornfully. "No, thank you. Just make your bill out to the Swift Construction Company to date, and a check will be sent you the first of the month. I will take my own precautions hereafter."

And those precautions Tom considered sufficient. When the Hercules 0001 was towed out of the enclosure belonging to the Swift Construction Company early on Monday morning, each door and window of the huge cab was barred and locked. Inside the cab rode Koku, the giant.

Koku had his orders to allow nobody to enter the Hercules 0001 until Tom or Ned Newton came to relieve him of his responsibility as guard. The giant had a swinging cot to sleep on and sufficient food—of a kind—to last him for a fortnight if necessary.

He was not armed, for Tom did not often trust him with weapons. The young inventor, however, did not expect that any armed force would attack the electric locomotive.

If Montagne Lewis desired to wreck the new invention which might mean so much to Mr. Bartholomew and the H. & P. A., he surely would not allow his hirelings to attack openly the locomotive while it was en route.

On the other hand, Tom did not really believe that Andy O'Malley would attempt any reprisal against him personally. Of course, the Western desperado might feel himself abused by Tom, especially in the matter of Tom's use of his ammonia pistol.

But that had happened months ago. O'Malley had undoubtedly been hired by Mr. Bartholomew's enemies to obtain knowledge of the contract signed between the young inventor and the railroad president; and later it was certain that the spy had tried his best to wreck the electric locomotive.

As for any personal assault so many weeks after O'Malley had clashed with him Tom Swift did not expect it. With Ned in his company on this journey to Hendrickton, the young inventor had good reason to consider that he was perfectly safe.

Mary Nestor and Mr. Swift came to the station to see the two young men off on Monday evening. Mary had heard about the second attempt made to blow up the Hercules 0001 and she begged Tom to take every precaution while he was in the West.

"You will be in the enemy's country out there, Tom dear," she warned him. "You won't be careless?"

"I know I shall be mighty busy," he told her, laughing. "I'll let Ned play watch-dog. And you know, his is a cautious soul, Mary."

"I've every confidence in Ned's faithfulness," the girl said, still with anxious tone. "But those men who are trying to ruin Mr. Bartholomew's road will stop at nothing. I must hear from you frequently, Tom, or I shall worry myself ill."

"Don't lose your courage, Mary," rejoined the inventor, more gravely. "I do not think they will attack me personally again. Remember that Koku is on

the job, as well as Ned. And Mr. Damon declares he will follow us West very shortly," and again Tom chuckled.

"Even Mr. Damon may be a help to you, Tom," declared Mary, warmly. "At least, he is completely devoted to you."

"So is Rad Sampson," said Tom, with a little grimace. "I certainly had my hands full convincing him that father needed him here at home. At that, Rad is pretty warm over the fact that I sent Koku on with the locomotive. If anything should chance to happen to my invention, Eradicate Sampson is going to shout 'I told you so!' all over the shop."

Mary dabbed her eyes a little with her handkerchief, and Tom patted her shoulder.

"Don't worry, Mary," he said more cheerfully. "There won't a thing happen to me out there at Hendrickton. I'll keep the wires hot with telegrams. And I'll write to both you and father, and give you the full particulars of how we get along. You'll keep your eye on father, Mary, won't you?"

"You may be sure of that," said the girl. "I will not leave him entirely to the care of Rad," and she tried hard to smile again. But it was a difficult matter.

Such a parting as this is always hard to endure. Tom wrung his father's hand and warned him to be careful of his health. The train came along and the two young men boarded it with their personal luggage.

They had a flash of the two faces—that of Mr. Swift's and Mary's blooming countenance—as the express started again, and then the outlook from the Pullman coach showed them the fast-receding environs of Shopton.

"We're on our way, my boy," said Tom to his chum.

"We certainly are," said Ned, thoughtfully. "I wonder what the outcome of the trip will be? It may not be all plain sailing."

"Don't croak," rejoined the young inventor, with a grin.

"I don't see how you can appear so cheerful., Why! you don't even know if that electric locomotive is safe. Something may have already happened to it. The freight train might be wrecked. A dozen things might happen."

"I am not crossing any bridges before I come to them," declared Tom. "Besides, I propose to keep in touch with the Hercules Three-Oughts-One in a certain way—Hullo! Here it is."

"Here what is?" demanded Ned.

The Pullman conductor at that moment came in through the forward corridor. He had a telegram in his hand, and intoned loudly as he approached:

"Mr. Swift! Mr. Thomas Swift! Telegram for Mr. Swift."

"That is for me, Conductor," said Tom briskly, offering his card.

"All right, Mr. Swift. Just got it at Shopton. Operator said you had boarded my car. This is railroad business, you'll notice. Have you any reply, sir?"

Tom ripped open the envelope and unfolded the telegram. He held it so that Ned could read, too. It was signed: "N. G. Smith, Conductor, Number 48."

"What's that?" exclaimed Ned, reading the message.

"'Locomotive and crazy man in it all right at Lingo,'" repeated Tom aloud, and chuckled.

"No, Conductor, there is no answer."

“Good!” exclaimed Ned. “You arranged to get reports en route from the conductors handling the Hercules Three-Oughts-One?”

“Surest thing you know,” replied Tom. “And I guess, from the wording of this message, that the crew of Forty-eight have already found out that Koku is not an ordinary guard.”

“He’s a great boy,” smiled Ned. “Glad he is on the job.”

Chapter 17

The Wreck of Forty-Eight

The two chums sought their berths that night in high fettle. Even Ned sloughed off his mood of apprehension which he had worn on boarding the train at Shop-ton.

For, true to the arrangement Tom had made with the railroad people, another reassuring telegram was brought to him before bedtime. The second conductor responsible for the management of the Western bound freight to which the Hercules 0001 was attached, sent back a brief statement of the safety of the electric locomotive.

Naturally the two chums would have passed the freight and got well ahead of it before reaching Hendrickton. But Tom had business in Chicago, and they stayed over in that city for twenty-four hours. The freight train went around the city, of course. But the telegrams continued to reach Tom promptly, even at the hotel where he and Ned stopped in the city.

Occasionally the trainmen in charge of the freight mentioned Koku. His eccentric behavior doubtless somewhat puzzled the railroaders.

“That’s all right,” chuckled Ned. “Let them think Koku is dangerous if they want to. That O’Malley person believed he was!”

“I’ll say so!” replied Tom. “The way he ran when Koku started after him that time on the Waterfield Road seemed to prove that he didn’t want to mix with Koku.”

“If he—or other spies—learns that Koku is with the Hercules Three-Oughts-One, it ought to warn them away from the locomotive.”

This was Ned’s final speech before getting into his berth. He, as well as Tom, slept quite as calmly on this first night out of Chicago as they had before.

They knew exactly where the electric locomotive was. It was on the same road as this train they were traveling in, and, although on a different track, it was not many miles ahead. In fact, if the two trains kept to schedule, the transcontinental passenger train would pass the freight in question about five o’clock in the morning.

It lacked half an hour of that time when the Pullman train came suddenly to a jolting stop. Both Tom and Ned were awakened with the rest of the passengers

in their coach.

Heads were poked out between curtains all along the aisle and a chorus of more or less excited voices demanded:

“What’s the matter?”

“Nothin’s the matter wid dis train, gen’lemens an’ ladies,” came in the porter’s important voice. “Jest nothin’ at all’s happened. It’s done happened up ahead of us, das all.”

“Well, what has happened ahead of us, George?” asked Ned.

“Jest another train, Boss, been splatterin’ itself all ober de right of way. We sort o’ bein’ held up, das all,” replied the porter.

“That’s good news—for us,” said Ned, preparing to climb back into his berth. But he halted where he was when he heard his chum ask:

“What train left the track, George?”

“A freight train, sah. Yes, sah. Number Forty-eight. She jumped de rails, side-swiped de accommodation dat was holdin’ us back, and has jest done spread herself all over de right of way.”

“My goodness!” gasped Ned.

“Hear that, Ned?” exclaimed Tom. “Scramble into your clothes, boy. The Hercules Three-Oughts-One is hitched to Forty-eight.”

“Suppose she’s off the track?” murmured Ned.

“It’s lucky if she isn’t smashed to matchwood,” groaned Tom, and almost immediately left the Pullman coach on the run.

Ned was not far behind him. When they reached the cinder path beside the freight train it was just sunrise. Long arms of rosy light reached down the mountain side to linger on the tracks and what was strewed across them. A glance assured the two young fellows from the East that it was a bad smash indeed.

Several of the rear boxcars were slung athwart the passenger tracks. The passenger train that had been ahead of the Pullman train on which Tom and Ned rode, had been badly beaten in all along its side. Scarcely a whole window was left on the inner side of the five cars. But those cars were not derailed. It was merely some of the freight cars that retarded the further progress of the transcontinental flyer. A derrick car must be brought up to lift away the debris before the fast train could move on.

Tom and Ned walked forward along the length of the wreck. Suddenly the anxious young inventor seized Ned’s arm.

“Glory be!” he ejaculated. “It’s topside up, anyway.”

“The Hercules Three-Oughts-One?” gasped Ned.

“That’s what it is!”

Tom quickened his pace, and his financial manager followed close upon his heels. The forward end of Forty-eight had not left the track and the electric locomotive stood upright upon the rails, being near the head end of the train.

“If this wreck was intentional, and aimed at your invention, Tom,” whispered Ned Newton, “it did not result as the wreckers expected.”

Tom scouted the idea suggested by his chum. And in a few moments they learned from a railroad employee that a broken flange on a boxcar wheel had

caused the wreck.

"So that disposes of your suspicion, Ned," said Tom, approaching the huge electric locomotive.

"Hey, gents!" exclaimed another railroad man, one of the crew of the wrecked freight. "Better keep away from that locomotive."

"What's the matter with it?" Ned asked, curiously.

"Got some kind of an aborigine caged up in it. You put your hand on any part of it and he's likely to jump out and bite your hand off, or something. Believe me, he's some savage."

Both Tom and Ned burst into laughter. The former went forward to the door of the cab and knocked in a peculiar way. It was a signal that the giant recognized instantly.

"Master!" Koku cried from inside the cab. "Master! Him come in?"

"No, Koku," said Tom. "I'm not coming in. Are you all right?"

"Yes. Koku all right. Him come out?"

"No, no!" laughed Tom. "You are not at your journey's end yet, Koku. Keep on the job a while longer."

"Sure. Koku stay here forever, if Master say so."

"Forever is a long word, Koku," said Tom, more seriously. "I'll tell you when to open the door. I'll be at the end of the journey to meet you."

"It all right if Master say so. But Koku no like to travel in box," grumbled the giant.

Tom turned from the electric locomotive to see Ned staring across the tracks at a man who was talking to several of the train crew of the side-swiped accommodation train. That train was about to be moved on under its own power. None of the wreckage of the freight interfered with the progress of the accommodation.

Tom stepped to Ned's side and touched his arm. "Who is he?" the inventor asked.

The man who had attracted Ned's attention and now held Tom's interest as well was a solid looking man with gray hair and a dyed mustache. He was chewing on a long and black cigar, and he spoke to the train hands with authority.

"Well, why can't you find him?" he wanted to know in a hoarse and arrogant voice.

"Who is he?" asked Tom again in Ned's ear.

"I've seen him somewhere. Or else I've seen somebody that looks like him. Maybe I've seen his picture. He's somebody of importance."

"He thinks he is," rejoined the young inventor, with some disdain.

In answer to something one of the railroad men said the important looking individual uttered an oath and added:

"There's nobody been killed then? He's just missing? He was sitting in the coach ahead of me. I saw him just before the wreck. You know O'Malley yourself. Do you mean to say you haven't seen him, Conductor?"

"I assure you he disappeared like smoke, sir," said the passenger conductor. "I haven't an idea what became of him."

“Humph! If you see him, send him to me,” and the solid man stepped heavily aboard the nearest coach and disappeared inside.

Tom and Ned stared at each other with wondering gaze. O’Malley! The spy who had represented Montagne Lewis and the Hendrickton & Western Railroad in the East.

“What do you know about that?” demanded Ned, wonderingly.

“Hold on!” exclaimed Tom. He sprang across the rails after the conductor of the accommodation train that was just starting on. “Let me ask you a question.”

“Yes, sir?” replied the conductor.

“Who was that man who just spoke to you?” “That man? Why, I thought everybody out this way knew Montagne Lewis. That is his name, sir—and a big man he is. Yes, sir,” and the conductor, giving the watching engineer of his train the “highball,” caught the hand-rail of the car and swung himself aboard as the train started.

Chapter 18

On the Hendrickton & Pas Alos

The transcontinental was delayed three hours by the strewn wreckage of the rear of Number Forty-eight. When she went on the two young fellows from Shopton gazed anxiously at the Hercules 0001, which stood between two gondolas in the forward end of the freight train.

“Just by luck nothing happened to it,” muttered Ned.

“Just luck,” agreed Tom Swift. “It was a shock to me to learn that Andy O’Malley was right there on the spot when the accident happened.”

“And his employer, too,” added Ned. “For we must admit that Mr. Montagne Lewis is the man who sicked O’Malley on to you.” “True.”

“And they were both in the accommodation that was sideswiped by the derailed cars of Number Forty-eight.”

“That, likewise is a fact,” said Tom, nodding quickly.

“But what puzzles me, as it seemed to puzzle Lewis, more than anything else, is what became of O’Malley?”

“I guess I can see through that knot-hole,” Tom rejoined.

“Yes?”

“I bet O’Malley got a squint at me—or perhaps at you—as we walked up the track from this coach, and he lit out in a hurry. There stood the Three-Oughts-One, and there were we. He knew we would raise a hue and cry if we saw him in the vicinity of my locomotive.”

“I bet that’s the truth, Tom.”

“I know it. He didn’t even have time to warn his employer. By the way, Ned, what a brute that Montagne Lewis looks to be.”

“I believe you! I remember having seen his photograph in a magazine. Oh, he’s some punkins, Tom.”

“And just as wicked as they make ’em, I bet! Face just as pleasant as a bulldog’s!”

“You said it. I’m afraid of that man. I shall not have a moment’s peace until

you have handed the Hercules Three-Oughts-One over to Mr. Bartholomew and got his acceptance."

"If I do," murmured Tom.

"Of course you will, if that Lewis or his henchmen don't smash things up. You are not afraid of the speed matter now, are you?" demanded Ned confidently.

"I can be sure of nothing until after the tests," said Tom, shaking his head. "Remember, Ned, that I have set out to accomplish what was never done before—to drive a locomotive over the rails at two miles a minute. It's a mighty big undertaking."

"Of course it will come out all right. If Koku is faithful."

"That is the smallest 'if' in the category," Tom interposed, with a laugh. "If I was as sure of all else as I am of Koku, we'd have plain sailing before us."

Two days later Tom Swift and Ned Newton were ushered into the private office of the president of the H. & P. A. at the Hendrickton terminal. The two young fellows from the East had got in the night before, had become established at the best hotel in the rapidly growing Western municipality, and had seen something of the town itself during the hours before midnight.

Now they were ready for business, and very important business, too.

Mr. Richard Bartholomew sat up in his desk chair and his keen eyes suddenly sparkled when he saw his visitors and recognized them.

"I did not expect you so soon. Your locomotive arrived yesterday, Mr. Swift. How are you, Mr. Newton?"

He motioned for them to take chairs. His secretary left the room. The railroad magnate at once became confidential.

"Nothing happened on the way?" he asked, pointedly. "There was a freight wreck, I understand?"

"And we chanced to be right at hand when that happened," said Tom.

"So was your friend, Mr. Lewis," remarked Ned Newton.

"You don't mean to say that Montagne Lewis—"

"Was there. And Andy O'Malley," put in Tom.

Then he detailed the incident, as far as he and Ned knew the details, to Mr. Bartholomew, who listened with close attention.

"Well, it might merely have been a coincidence," murmured the railroad president. "But, of course, we can't be sure. Anyhow, it is just as well if your servant, Mr. Swift, keeps close watch still upon that locomotive."

"He will," said Tom, nodding. "He is down there in the yard with the Hercules Three-Oughts-One, and I mean to keep Koku right on the job."

"Good! Let's go down and look at her," Mr. Bartholomew said, eagerly.

But first Tom wanted to go into the theoretical particulars of his invention. And he confessed that thus far his tests of the locomotive had not been altogether satisfactory.

"I have got to have a clear track on a stretch of your own line here, Mr. Bartholomew, and under certain conditions, before I can be sure as to just how much speed I can get out of the machine."

"Speed is the essential point, Mr. Swift," said the railroad man, seriously.

“That is what I have been telling Ned,” Tom rejoined. “I believe my improvements over the Jandel patents are worthy. I know I have a very powerful locomotive. But that is not enough.”

“We have got to shoot our trains through the Pas Alos Range faster than trains were ever shot over the grades before, or we have failed,” said Mr. Bartholomew, with decision.

“But—” began Ned; but Tom put up an arresting hand and his financial manager ceased speaking.

“I have not forgotten the details of our contract, Mr. Bartholomew,” he said, quietly. “Two-miles-a-minute is the target I have aimed for. Whether I have hit it or not, well, time will show. I have got to try the locomotive out on the tracks of the H. & P. A. in any case. The Hercules Three-Oughts-One has been dragged a long distance, and has been through at least one wreck. I want to see if she is all right before I test her officially.”

“I’ll arrange that for you,” said Mr. Bartholomew, briskly, putting away his papers. “I will go with you, too, and take a look at the marvel.”

“And a marvel it is,” grumbled Ned. “Don’t let him fool you, Mr. Bartholomew. Tom never does consider what he’s done as being as great as it really is.”

“Everything must be proved,” Tom said, cautiously. “If it was a financial problem, Mr. Bartholomew, believe me it would be Ned who displayed caution. But I have seldom built anything that could not—and has not—later been improved.”

“You do not consider your electric locomotive, then, a completed invention?” asked Mr. Bartholomew, as the three walked down the yard.

“I have too much experience to say it is perfect,” returned Tom. “I can scarcely believe, even, that it is going to suit you, Mr. Bartholomew, even if the speed test is as promising as I hope it may be.”

“Humph!”

“But before I shall be willing to throw up the sponge and say that I have failed, I shall monkey with the Hercules Three-Oughts-One quite a little on your tracks.”

“Your six months isn’t up yet,” said Mr. Bartholomew, more cheerfully. “And it doesn’t matter if it is. If you see any chance of making a success of your invention, you are welcome to try it out on the tracks of the H. & P. A. for another six months.”

“All right,” Tom said, smiling. “Now, there is the Hercules Three-Oughts-One, Mr. Bartholomew. And there is Koku looking longingly through the window.”

In fact, the giant, the moment he saw Tom, ran to unbar and open the door of the cab on that side.

“Master! If no let Koku out, Koku go amuck—crazy! No can breathe in here! No can eat! No can sleep!”

“The poor fellow!” ejaculated Ned.

“What’s the matter with him?” asked Mr. Bartholomew, curiously.

“Get out, if you want to, Koku. I’ll stay by while you kick up your heels.”

No sooner had the inventor spoken than the giant leaped from the open door of the locomotive and dashed away along the cinder path as though he actually had to run away. Tom burst into a laugh, as he watched the giant disappear beyond the strings of freight cars.

“What is the matter with him?” repeated the railroad president.

“He’s got the cramp all right,” laughed Tom Swift. “You don’t understand, Mr. Bartholomew, what it means to that big fellow to be housed in for so many days, and unable to kick a free limb. I bet he runs ten miles before he stops.”

“The police will arrest him,” said the railroad man.

It was then Ned’s turn to chuckle. “I am sorry for your railroad police if they tackle Koku right now,” he said. “He’d lay out about a dozen ordinary men without half trying. But, ordinarily, he is the most mild-mannered fellow who ever lived.”

“He will come back, if he is let alone, as harmless as a kitten,” Tom observed. “And when I am not with the Hercules Three-Oughts-One, and while I continue making my tests, Koku will be on guard. You might tell your police force, Mr. Bartholomew, to let him alone. Now come aboard and let me show you what I have been trying to do.”

They spent two hours inside the cab of the great locomotive. Mr. Richard Bartholomew was possessed of no small degree of mechanical education. He might not be a genius in mechanics as Tom Swift was, but he could follow the latter’s explanations regarding the improvements in the electrical equipment of this new type of locomotive.

“I don’t know what your speed tests will show, Mr. Swift,” said the railroad president, with added enthusiasm. “But if those parts will do what you say they have already done, you’ve got the Jandels beat a mile! I’m for you, strong. Yes, sir! like your friend, Newton, here, I believe that you have hit the right track. You are going to triumph.”

But Tom’s triumph did not come at once. He knew more about the uncertainties of mechanical contrivances than did either Mr. Bartholomew or Ned Newton.

The very next day the Hercules 0001 was got out upon a section of the electrified system of the Hendrickton & Pas Alos Railway, and the pantographs of the huge locomotive for the first time came into connection with the twin conductor trolleys which overhung the rails.

Ned accompanied Tom as assistant. Koku was allowed by the inventor to roam about the hills as much as he pleased during the hours in which his master was engaged with the Hercules 0001. Tom did not think any harm would come to Koku, and he knew that the giant would enjoy immensely a free foot in such a wild country. The two young fellows, dressed in working suits of overall stuff, spent long hours in the cab of the electric locomotive. Their try-outs had to be made for the most part on sidetracks and freight switches, some miles outside Hendrickton, where the invention would not be in the way of regular traffic.

Speed on level tracks had been raised in one test to over ninety-five miles an hour and Mr. Bartholomew cheered wildly from the cab of a huge Mallet

that paced Tom's locomotive on a parallel track. No steam locomotive had ever made such fast time.

But Tom was after something bigger than this. He wanted to show the president of the H. & P. A. that the Hercules 0001 could drag a load over the Pas Alos Range at a pace never before gained by any mountain-hog.

Therefore he coaxed the electric locomotive out into the hills, some hundred or more miles from headquarters. He had to keep in touch with the train dispatcher's office, of course; the new machine had often to take a sidetrack. Nor was much of this hilly right-of-way electrified. The Jandels locomotive had been found to be a failure on the sharp grades; so the extension of the trolley system had been abandoned.

But there was one steep grade between Hammon and Cliff City that had been completed. The current could be fed to the cables over this stretch of track, and for a week Tom used this long and steep grade just as much as he could, considering of course the demands of the regular traffic.

The telegraph operator at Half Way (merely a name for a station, for there was not a habitation in sight) thrust his long upper-length out of the telegraph office window one afternoon and waved a "highball" to the waiting electric locomotive on the sidetrack.

"Dispatcher says you can have Track Number Two West till the four-thirteen, westbound, is due. I'll slip the operator at Cliff City the news and he'll be on the lookout for you as well as me, Mr. Swift. Go to it."

Every man on the system was interested, and most of them enthusiastic, about Tom's invention. The latter knew that he could depend upon this operator and his mate to watch out for the western-bound flyer that would begin its climb of the grade at Hammon less than half an hour hence.

The electric locomotive was coaxed out across the switch. Tom was earnestly inspecting the more delicate parts of the mechanism while Ned (and proud he was to do it) handled the levers. Once on the main line he moved the controller forward. The machine began to pick up speed.

The drumming of the wheels over the rail joints became a single note—an increasing roar of sound. The electric locomotive shot up the grade. The arrow on the speedometer crept around the dial and Ned's eye was more often fastened on that than it was on the glistening twin rails which mounted the grade.

Black-green hemlock and spruce bordered the right of way on either hand. Their shadows made the tunnel through the forest almost dark. But Tom had not seen fit to turn on the headlight.

"How is she making out?" asked the inventor, coming to look over his chum's shoulder.

"It's great, Tom!" breathed Ned Newton, his eyes glistening. "She eats this grade up."

"And it's within a narrow fraction of a two per cent," said the inventor proudly. "She takes it without a jar—Hold on! What's that ahead?"

The locomotive had traveled ten miles or more from Half Way. The summit of the grade was not far ahead. But the forest shut out all view of the station at Cliff City and the structures that stood near it.

Right across the steel ribbons on which the Hercules 0001 ran, Tom had seen something which brought the question to his lips. Ned Newton saw it too, and he shouted aloud:

“Tree down! A log fallen, Tom!”

He did not lose completely his self-control. But he grabbed the levers with less care than he should. He tried to yank two of them at once, and, in doing so, he fouled the brakes!

He had shut off connection with the current. But the brake control was jammed. The locomotive quickly came to a halt. Then, before Tom could get to the open door, the wheels began spinning in reverse and the great Hercules 0001 began the descent of the steep grade, utterly unmanageable!

Chapter 19

Peril, The Mother of Invention

Tom Swift's first thought was one of thankfulness. Thankfulness that he did not have a drag of fifty or sixty steel gondolas or the like to add their weight to the down-pull. The locomotive's own weight of approximately two hundred and seventy tons was enough.

For when the inventor pushed Ned aside and tried to handle the controllers properly, he found them unmanageable. There was not a chance of freeing them and getting power on the brakes. The Hercules 0001 was hacking down the mountain side with a speed that was momentarily increasing, and without a chance of retarding it!

The young inventor at that moment of peril, knew no more what to do to avert disaster than Ned Newton himself.

It flashed across his mind, however, that others beside themselves were in peril because of this accident. The fast express from the East that should pass Half Way at four-thirteen, might already be climbing the hill from Hammon. Hammon, at the foot of the grade, was twenty-five miles away. Nor was the track straight.

If the operator at Half Way did not see the runaway locomotive and telephone the danger to the foot of the grade, when the Hercules 0001 came tearing down the track it might ram something in the Hammon yard, if it did not actually collide with the approaching westbound express.

Such an emergency as this is likely either to numb the brains of those entangled in the peril or excite them to increased activity. Ned Newton was apparently stunned by the catastrophe. Tom's brain never worked more clearly.

He seized the siren lever and set it at full, so that the blast called up continuous echoes in the forest as the locomotive plunged down the incline. He ran to the door again, on the side where Half Way station lay, and hung out to signal the operator who had so recently given him right of way on this stretch of mountain road.

“We’re going to smash! We’re going to smash!” groaned Ned Newton.

Tom read these words on his chum’s lips, rather than heard them, for the roar of the descending locomotive drowned every other sound. Tom waved an encouraging hand, but did not reply audibly.

Meanwhile his brain was working as fast as ever it had. He had instantly comprehended all the danger of the situation. But in addition he appreciated the fact that such an accident as this might happen at any time to this or any other locomotive he might build.

Automatic brakes were all right. If there had been a good drag of cars behind the Hercules 0001, on which the compressed air brakes might have been set, the present manifest peril might have been obliterated. The brakes on the cars would have stopped the whole train.

But to halt this huge monster when alone, on the grade, was another matter. Once the locomotive brake lever was jammed, as in this case, there was no help for the huge machine. It had to ride to the foot of the grade—if it did not chance to hit something on the way!

And with this realization of both the imminent peril and the need of averting it, to Tom’s active brain came the germ of an idea that he determined to put into force, if he lived through this accident, on each and every electric locomotive that he might in the future build.

This monster, flying faster and faster down the mountain side, was a menace to everything in its track. There might be almost anything in the way of rolling stock on the section between Half Way and Hammon at the foot of the grade. If this thunderbolt of wood and steel collided with any other train, with the force and weight gathered by its plunge down the mountain, it would drive through such obstruction like a projectile from Tom’s own big cannon.

Tom realized this fact. He knew that whatever object the Hercules 0001 might strike, that object would be shattered and scattered all about the right of way. What might happen to the runaway was another matter. But the inventor believed that the electric locomotive would be less injured than anything with which it came into collision.

At any rate, thought of the peril to himself and his invention had secondary consideration in Tom Swift’s mind. It was what the monster which he could not control might do to other rolling stock of the H. & P. A. that rasped the young fellow’s mind.

The grade above Half Way had few curves. Tom soon caught the first glimpse of the station. Would the operator hear the roar of the descending runaway and understand what had happened?

He leaned far out from the open doorway and waved his cap madly. He began to shout a warning, although he saw not a soul about the station and knew very well that his voice was completely drowned by the voice of the siren and the drumming of the great wheels.

Suddenly the tousled head of the operator popped out of his window. He saw the coming locomotive, the drivers smoking!

To be a good railroad man one has to have his wits about him. To be a good operator at a backwoods station one has to have two sets of wits—one set

to tell what to do in an emergency, the other to listen and apprehend the voice of the sounder.

This Half Way man was good. He knew better than to try the telegraph instrument. He grabbed the telephone receiver and jiggled the hook up and down on the standard while the Hercules 0001 roared past the station.

It did not need Tom's frantically waving cap to warn him what had happened. And he remembered clearly the fact of the expected westbound flyer.

"Hammon? Get me? This is Half Way. That derved electric hog has sprung something and is coming down, lickity-split!"

"Yes! Clear your yard! Where's Number Twenty-eight? Good! Side her, or she'll be ditched. Get me?"

The voice at the other end of the wire exploded into indignant vituperation. Then silence. The Half Way operator had done his best—his all. He ran out upon the platform. The electric locomotive had disappeared behind the woods, but the roar of its wheels and the shrill voice of its siren echoed back along the line.

The sound faded into insignificance. The operator went back into his hut and stayed close by the telephone instrument for the next ten minutes to learn the worst.

If the operator's nerves were tense, what about those of Tom Swift and his chum? Ned staggered to the door and clung to Tom's arm. He shrilled into the latter's ear:

"Shall we jump?"

"I don't see any soft spots," returned Tom, grimly. "There aren't any life nets along this line."

Ned Newton was frightened, and with good reason. But if his chum was equally terrified he did not show it. He continued to lean from the open door to peer down the grade as the Hercules 0001 drove on.

Around curve after curve they flew. It entered Ned's tortured mind that if his chum had wanted speed, he was getting it now! He realized that two miles a minute was a mere bagatelle to the pace now accomplished by the runaway locomotive.

Chapter 20

The Result

As Ned Newton, fumbling at the controls when he saw the fallen tree across the tracks, had jammed the brakes, the station master at Hammon, at the bottom of this long grade on the Hendrickton & Pas Alos, had stepped out to the blackboard in the barnlike waiting room and scrawled with a bit of chalk:

“No. 28—Westbound—due 3:38 is is 15 m. late.”

The fact, thus given to the general public or to such of it as might be interested, averted what would have been a terrible catastrophe.

The fast express was late. When the babbling voice of the Half Way operator over the telephone warned Hammon of the coming of the runaway electric locomotive, there was time to shift switches at the head of the yard so that, when Number Twenty-eight came roaring in, she was shunted on to a far track and flagged for a stop before she hit the bumper.

Thirty seconds later, from the west, the Hercules 0001 roared down the grade and shot into the cleared west track in a halo of smoke and dust. Speed! No runaway had ever traveled faster and kept the rails. The story of the incident was embalmed in railroad history, and no history is so full of vivid incident as that of the rail.

When the first relay of excited railroad men reached the electric locomotive after it had stopped on the long level, even Ned Newton had pulled himself together and could look out upon the world with some measure of calmness. Tom Swift was making certain notes and draughting a curious little diagram upon a page of his notebook.

“What happened to you, Mr. Swift?” was the demand of the first arrival.

“Oh, my foot slipped,” said the young inventor, and they got nothing more out of him than that.

But to Ned, after the crowd had gone, the inventor said:

“Ned, my boy, they used to say that necessity was the mother of invention. Therefore a loaf of bread was considered the maternal parent of the locomotive. I’ve got one that will beat that.”

“Whew!” gasped Ned. “How can you? I haven’t got my breath back yet.”

“It is peril that is the mother of invention,” Tom went on, still jotting down

his notes. "Believe me! that jolt gave me a new idea—an important idea. Suppose that operator at Half Way had been out back somewhere, and had not seen or heard us flash by?"

"Well, suppose he had? What's the answer?" sighed Ned.

"Like enough we would have rammed something down here."

"And I hardly understand even now why we didn't do just that," muttered his chum, with a shake of his head.

"Wake up, Ned! It's all over," laughed Tom. "While it was happening I admit I was guessing just as hard as you were about the finish. But—"

"Your recovery is better," grumbled his friend. "I'm scared yet."

"And it might happen again—"

"No—not—ever!" exclaimed Ned. "I shall never touch those controllers again. I'll drive your airscout, or your fastest automobile, or anything like that. But me and this electric locomotive have parted company for good. Yes, sir!"

"All right. It wasn't your fault. It might happen to any motor-engineer. And the very fact that it can happen has given me my idea. I tell you that danger is the mother of invention."

"As far as I am concerned, it can be father and grandparents into the bargain," Ned declared, with a smile.

"Wake up!" cried his friend again. "I have got a dandy idea. I wouldn't have missed that trip for anything."

"You are crazy," interrupted Ned. "Suppose we had bumped something?"

"But we didn't bump anything, except my brain tank. An idea bumped it, I tell you. I am going to eliminate any such peril as that here-after."

"You mean you are going to make it impossible for this locomotive ever to slide down such a hill again if the brakes won't work? Humph! Meanwhile I will go out and make the nearest water-fall begin to run upward."

"Don't scoff. I do not mean just what you mean."

"I bet you don't!"

"But although I cannot be sure that a locomotive will never again fall down-hill," said Tom patiently, "I'm going to fix it so that warning need not be given by some operator along the line. The engineer must be able to send warning of his accident, both up and down the road."

"Huh? How are you going to do that?" demanded Ned.

"Wireless telephone. I may make some improvements on the present models; but it is practicable. It has been used on submarines and cruisers, and lately its practicability has been proved in the forestry service.

"Every one of these electric locomotives I turn out will be supplied with wireless sets. The expense of making certain telegraph offices along the line into receiving stations will be small. I am going to take that up with Mr. Bartholomew at once. And I am going to fix these brake controls so that nobody need ball them up again."

If, out of such a desperate adventure, Tom could bring to fruition really worthwhile improvements in relation to his invention, Ned acknowledged the

value of the incident. Just the same, he had a personal objection to having any part in a similar experience.

He was brave, but he could not forget danger. Tom seemed to throw the effect of that terrible ride off his mind almost instantly. Ned dreamed of it at night!

However, from that time things seemed to go with a rush. Mr. Bartholomew approved of the young inventor's suggestion regarding the use of the wireless telephone as a method of averting a certain quality of danger in the use of the proposed monster locomotive. The railroad man was convinced that Tom's ideas were finally to culminate in success, and he was ready to spend money, much money, in pushing on the work.

It was not long before a private test of the Hercules 0001 up the grade from Hammon to Cliff City showed Mr. Bartholomew that the speed he had required in his contract was attainable. With a drag fully as heavy as any two locomotives had been able to get over the same sector, the new locomotive alone marked a forty-five mile an hour pace.

This attainment was kept quiet; not even the train crew knew what the monster had done when they reached the summit of the mountain. But Mr. Bartholomew, who rode with Tom and Ned in the cab, had held his own watch on the test and compared it every minute with the speedometer.

"I am satisfied that you are going to do more than I had really hoped, Mr. Swift," the railroad president said at the end of the run. "Already you could drive this locomotive at a two-mile-a-minute clip on level rails, I am sure. Keep at it! Nobody will be more delighted than I shall be if you pull down that hundred thousand dollars' bonus."

"That's a fine way to talk, sir," cried Ned, with enthusiasm.

"I mean every word of it, Mr. Newton. The money is his as soon as he makes good."

Both Tom and his financial manager left the president's office in a satisfied state of mind.

"Great news to send home, Tom," remarked Ned, when they were alone.

"Righto, Ned. My father will be glad to hear it."

"And what about Mary?" And Ned poked his chum in the ribs.

"I guess she'll be glad too," Tom replied, his face reddening.

That night Tom sent word to Mary and also a telegram, in code, to his father, saying the prospects were now bright for a quick finish of the task that had brought him West.

Chapter 21

The Open Switch

Meanwhile the work of electrifying another division of the Hendrickton & Pas Alos Railroad had been pushed to completion. As Mr. Bartholomew had in the first place stated, the road controlled water rights in the hills which would supply any number of electric power stations, and his enemies could not shut his road off from these waterfalls.

Tom had not warned his faithful servant, the giant Koku, to watch out for Andy O'Malley in particular; the inventor knew that the giant would be as cautious about any stranger as could be wished. But personally Tom was amazed that either O'Malley or some other henchman of the president of the Hendrickton & Western did not make an attempt to injure the electric locomotive.

"Perhaps Mr. Bartholomew's police are really of some good," said Ned Newton, when his chum mentioned his surprise on this point. "Has Koku seen nobody lurking about at night?"

"He certainly has not seen the man he calls 'Big Feet,'" chuckled Tom. "If he had spotted O'Malley, there certainly would have been an explosion."

"Tell you what," Ned said reflectively, "the longer Lewis keeps off you, the more suspicious I should be."

"You think he is a bad citizen, do you?"

"And then some, as the boys say out here," replied Ned. "I wouldn't trust that man any farther than I would a nest of hornets or a shedding rattlesnake."

"I am inclined to believe, with you, Ned, that Lewis is hatching up something and is keeping mighty whist about it. I sounded Mr. Bartholomew on the idea and he, too, is puzzled."

"I guess he knows that hombre," grumbled Ned.

"Mr. Bartholomew admits that several roads have sent representatives to make inquiries about my locomotive. They have got wind of it, and, after all, most railroads work in unison. What means progress for one is progress for all."

"That same rule does not seem to apply in the case of the H. & P. A. and the H. & W.," remarked Ned.

"No. They are out and out rivals. And Lewis and his gang have done this road dirt—no two ways about that. But when I am convinced that my

locomotive has got all the speed and power contracted for, Mr. Bartholomew wants to invite a bunch of his brother railroaders to see the tests—to ride in the Hercules Three-Oughts-One, in fact.”

“How about it? You going to agree? Suppose they have some inventive sharp along who will be able to steal some of your mechanical contrivances—in his head, I mean,” and Ned seemed quite suddenly anxious.

“I had thought of that. But before the test I shall send my blueprints to Washington. Our patent attorney there has already filed tentative plans and applied for certain patents that I consider completed. Don’t fret. I’ll make it impossible for anybody to steal our patents legally.”

“Yes! But illegally?”

“That we cannot help in any case, and you know it,” Tom said. “If some road tries to build anything like the Hercules Three-Oughts-One for the first two years without arranging with the Swift Construction Company, you know that that railroad can be made to suffer in the courts, and you are the boy, Ned, to put them over the jumps for it.”

“Sure,” grumbled his chum. “It’s always up to me to save the day.”

“Exactly,” chuckled Tom. “And in your character of life saver, do look out for anybody who looks suspicious hanging about the Hercules Three-Oughts-One. I’ll take care of rival inventors. You and Koku keep your eyes peeled for the H. & W. spies. Especially for that Andy O’Malley. I feel that he will again show up. Maybe by ‘the pricking of my thumb’ as Macbeth’s witch used to remark.”

Every day save Sunday the electric locomotive had some kind of try-out. On a level track Tom was sure of his monster invention’s qualities; but in the hills, at a distance from the Hendrickton terminal, it was another matter.

The grades were steep; but the road was well ballasted. There was plenty of power. He saw the Jandel locomotives hurry back and forth with the local trains and realized that this rival invention was by no means to be despised.

It was at about this time, too, that Mr. Damon appeared in Hendrickton. Early one forenoon, when Tom and Ned were preparing to take the Hercules 0001 out of the yard, and Koku was going to his lodgings to get a little sleep, Tom’s eccentric friend came across the tracks, waving his cane at Tom.

“Bless my frogs and switch-targets!” he ejaculated, “I’ve walked a mile from that station to get here. Where are you going with that big contraption? How does it work? Does it make all the speed you want, Tom Swift? Bless my rails and sleepers!”

“We’re going about a hundred miles out on the road to a good, stiff grade,” Tom told him, having shaken hands in welcome. “If you want to, get aboard.”

“They haven’t blown you up yet, or otherwise wrecked the locomotive,” remarked Mr. Damon, grinning broadly. “I’ll have to write right back to your father—and to a certain young lady who shows a remarkable interest in your welfare—that you are all right.”

“They should already be sure of that,” laughed Tom. “Ned and I have kept the post-office department and the telegraph company very busy.”

“They are waiting for my report,” announced Mr. Damon, with confidence. “And I am waiting for yours. Tell me, Tom: Is the locomotive a success?”

“It’s going to be,” declared the inventor, with decision.

“Bless my trolley wires!” cried Mr. Damon, “I am glad to hear that. Then you will surely pull down the extra hundred thousand dollars?”

“I believe I shall fulfill every clause of the contract Mr. Bartholomew and I signed,” said Tom.

“Then it’s more than a success!” cried his friend. “You have invented another marvel, Tom Swift!”

“Marvel or not,” rejoined Tom, “I believe that the Hercules Three-Oughts-One will top anything so far built in the way of electric locomotives.”

“Hurrah!” cried Mr. Damon. “Bless my controller! But your father and Mary Nestor will be glad to hear that!”

Mr. Damon was quite as much interested in this invention as he always was in anything the young inventor worked upon. When he had once seen the Hercules 0001 work on an up-grade he was doubly enthusiastic. To his sanguine mind the locomotive was already completed. He could see no possibility of failure.

Tom, however, had to prove to his own satisfaction the success of every detail of his invention before he was willing to tell Mr. Bartholomew that he was ready for a public test. Mr. Damon, nor even Ned, could scarcely see the reason for Tom’s caution.

Tom’s favorite try-out grade was between Hammon and Cliff City. He could obtain a right of way order from the train dispatcher on that grade, sometimes of an hour’s duration. He often snaked a load of gondolas or cattle cars up the grade, relieving both the puller and pusher steam locomotive. By this time the H. & P. A. system had stopped using the Jandel machines on any grades. They had proved their lack of power for such work.

“But the Hercules Three-Oughts-One shows at every test that it has the kick,” Mr. Damon cried.

In his enthusiasm he was out every day with Tom and Ned. And sometimes Koku remained in the cab during the trial runs as well.

On one such occasion Tom had drawn a heavy train over the mountain, taking it down the grade beyond Cliff City to Panboro in the farther valley. This was over a newly built stretch of the electrified road. The power station charged the trolley cables with an abundance of current, and the Hercules 0001 made a splendid trip.

“Bless my cuff-links!” ejaculated Mr. Damon, his rosy face one beaming smile. “You couldn’t expect to do better than this. You save one locomotive on the haul, and you beat the schedule ten minutes, so that you had to lay by to get right of way into the yard here. Why linger longer, Tom?”

“I agree with Mr. Damon,” Ned said. “It seems to work perfectly. And you have, I believe, established your required speed.”

“Can’t be too perfect,” said the young inventor, smiling. “But I will tell Mr. Bartholomew when we get back that he can set his time for the big test whenever he pleases. I have already sent our patent attorney in Washington the final blueprints. Now, if nothing happens—”

“Bless my stickpin!” exclaimed Mr. Damon, “What can happen now that the locomotive is practically perfect?”

That question was answered in one way, and a most startling way, within the hour. Tom got right of way back over the mountain and pushed the electric locomotive up-grade at almost top speed. He drew no train on this occasion, and the speed made by the Hercules 0001 was really remarkable.

They topped the rise at Cliff City and got orders from the dispatcher to proceed on the time of Number Eighty-seven, which chanced to be late. With that release Tom might have made the entire distance of a hundred and ten miles to Hendrickton had it not been for the accident—the unexpected something that so often happens in the railroad business.

Tom was a careful driver; the chatter of Ned and Mr. Damon did not take the inventor’s mind off his business for one instant. He was quite alert at his window, looking ahead, as Koku was at the open doorway of the cab.

Not a mile outside of Cliff City, and on this eastbound side of the right of way, was a long siding and a shipping point for timber. It was sometimes a busy point; but at this time of year there were no lumbermen about and no activities in the adjacent forest.

The Hercules 0001 came spinning along from the Cliff City yards, and Tom Swift gave scarcely a glance to the joint of the switch ahead. He had been over it so many times of late, and knew that it was always locked. The railroad did not even keep a man here at this season.

Suddenly Koku emitted a wild yell. He startled everybody else in the cab, as he flung his huge body more than half out of the doorway and prepared to jump—or so it seemed.

Ned shrieked a warning to the big fellow. Mr. Damon began to bless everything in sight. But it was Tom, quite as excited as his friends, who understood what Koku shouted:

“Big Feet! Big Feet! I see um Big Feet, Master!”

The next moment he threw himself from the rapidly moving locomotive. He might have been killed easily enough. But fortunately he landed feet first in the drift beside the rails, and remained upright as he slid down into the ditch.

Tom, glancing ahead again, saw the flash of a man in a checked Mackinaw running up through the open wood and away from the right of way. He could not be sure of Andy O’Malley’s figure at that distance; but he could be pretty confident of Koku’s identification.

And then, with a shock that gripped and almost paralyzed his mind, Tom saw again the switch ahead of the pilot of the Hercules 0001. The switch was open, and at the speed the electric locomotive had attained, if she did not jump the rails, it seemed scarcely possible that she could be stopped before hitting the bumper at the end of the siding!

Chapter 22

A Desperate Chase

These moments were fraught with peril, and not alone peril to the huge machine that Tom Swift had built, but peril to those who remained in the cab of the electric locomotive, as her forward trucks struck the open switch.

There was a mighty jerk that brought a shout from Ned Newton's lips and a grunt from Mr. Damon. Tom clung to his swivel-seat, staring ahead.

The pilot of the electric locomotive shot over on the siding; the forward trucks followed, then the great drivers. The whole locomotive swerved into the siding, but for several breathless seconds Tom was not at all sure that the monster would not jump the rails and head into the ditch!

Meanwhile his gaze measured the speed of that flying figure in the Mackinaw as it scuttled up the slope through the open grove of hard wood and pine. He could not at first see Koku, but he knew the giant was headed for the fugitive, whether the latter proved to be Andy O'Malley or not.

Tom's gaze flashed to what lay ahead of the electric locomotive. As it seemed to joggle back into balance, gain its uprightness, as it were, the inventor saw the great, log-braced bumper between the two rails at the end of the siding. With what force would the locomotive hit that obstruction?

Until the trailers were over the switch Tom dared not give her the brakes. To lock the brake shoes upon the wheels might easily throw the locomotive off the rails. But the instant he felt the tail of the long locomotive swerve off the switch he jabbed the compressed air lever and the wild shriek of the brake shoes answered to his effort.

Then the bumper was but a few yards ahead. The electric locomotive was bound to collide with it. And under the speed at which it had been running, now scarcely reduced by half, the collision was apt to be a tragic happening!

Weeks of effort might be ruined in that moment! If the crash was serious, thousands of dollars might be lost! In truth, Tom Swift apprehended the possibility of a disaster, the complete results of which might put the test of his invention forward for weeks—perhaps for months.

Nor could he do a thing to avert the disaster. He had reversed and set the brakes immediately after the last wheel of the trailer was on the siding.

Nothing more could he do as the great electric locomotive bore down upon the solid timber at the far end of this short track.

Those few seconds, as the locked wheels slid toward the end of the siding, were about as hard to bear as any experience the young inventor had ever gone through. It was not so much the peril of the accident, it was the possibility of what might happen to the locomotive.

Within those few moments, however, Tom considered more than the safety of his companions and himself, and more than the peril of wreck to his locomotive. He considered the schedule of the trains on this division of the Hendrickton & Pas Alos and remembered all those that might be within this sector at this time.

If the locomotive smashed into the bumper with force enough to wreck the structure, would some approaching train on the westbound track not be endangered?

The thought was parent to Tom's act before the collision occurred. With a single swift motion he reached for the signaling apparatus which he had established in connection with his wireless telephone.

Just the moment before the head of the locomotive rammed that seemingly immovable barrier at the end of the siding there flashed into the air from Tom's annunciator the code word agreed upon announcing a wreck, and the number of the sector on which the electric locomotive was then running.

The next moment the crash occurred.

Tom had leaped up with a shout of warning. "Hang on!" was his cry. But when the locomotive had struck and rebounded Ned, from far down the aisle of the locomotive, wanted to know in a very peevish tone what he should have hung on to?

"My elbows!" he groaned. "I've skinned 'em, and my back has got a twist in it like the Irishman thought he had when he put on his overalls hind-side to. What's happened?"

"Bless my radiolite!" growled Mr. Damon. "My watch crystal is broken all to finders, if you want to know. Bless my shock-absorbers! you won't do this locomotive a bit of good, Tom Swift, if you stop it so abruptly."

"And that's the surest word you ever said" responded Tom, hurrying to the door. "I don't know what's broken, but we're still on the rails. The most immediate thing to learn, is the where-abouts of the fellow who did this."

"Who opened the switch?" cried Ned.

"I believe it was Andy O'Malley. Come on, Ned! Koku is after him and I don't want him to tear O'Malley apart before I get there."

"O'Malley has got powerful interests behind him, and it might go hard with Koku if he injured the spy and some of these Westerners caught him," suggested Mr. Damon.

"They ought to thank Koku for manhandling the fellow—if he does," said Ned.

"As a matter of fact," replied Tom, "Koku will merely hold to the fellow until we get there. But my giant's strength is enormous, and he does not always know the strength of his grasp. He might hurt the fellow. Come on," and Tom leaped from the doorway of the electric locomotive.

Ned leaped down the ladder after his chum.

"Which way did they go?" he asked.

"Across the ditch and up the hill," said Tom. "Mr. Damon!" he called back to that eccentric man, "will you please remain there and watch the locomotive?"

"I certainly will. And I'm armed, too," shouted Mr. Damon. "Don't fear for this locomotive, Tom. I am right on the job."

Tom waved his hand in reply, leaped the ditch, and started up through the wood. Ned was close behind him, and the two young men ran as hard as they could in the direction Tom had seen Andy O'Malley, followed by the giant, running.

In places the earth was slippery with pine needles, and the ground was elsewhere rough. Therefore the chums did not make much speed in running after the giant and his quarry. But Tom was sure of the direction in which the two had disappeared, and he and Ned kept doggedly on.

They went over the crest of the hill and lost sight of the siding and the locomotive. Here was a sharp descent into a gulch, and some rods away, in the bottom of this gully, the young fellows obtained their first sight of Koku. He was still running with mighty strides and was evidently within sight of the man he had set out after in such haste.

"Hey! Koku!" shouted Tom Swift.

The giant's hearing was of the keenest. He glanced back and raised his arm in greeting. But he did not slacken his pace.

"He must see O'Malley, Tom," cried Ned Newton.

"I am sure he does. And I want to get there about as soon as Koku grabs the fellow," panted Tom.

"He'll maul O'Malley unmercifully," said Ned.

"I don't want Koku to injure him," admitted Tom, and he increased his own stride as he plunged down into the gully.

The young inventor distanced his chum within the next few moments. Tom ran like a deer. He reached the bottom of the gully and kept on after Koku's crashing footsteps. At every jump, too, he began to shout to the giant:

"Koku! Hold him!"

The giant's voice boomed back through the heavy timber: "I catch him! I hold him for Master! I break all um bones! Wait till Koku catch him!"

"Hold him, Koku!" yelled Tom again. "Be careful and don't hurt him till I get there!"

He could not see what the giant was doing. The timber was thicker down here. It might be that the giant would seize the man roughly. His zeal in Tom's cause was great, and, of course, his strength was enormous.

Yet Tom did not want to call the giant off the trail. Andy O'Malley must be captured at this time. He had done enough, too much, indeed, in attempting the ruin of Tom's plans. Before the matter went any further the young inventor was determined that Montagne Lewis' spy should be put where he would be able to do no more harm.

But he did not want the man permanently injured. He knew now that Koku was so wildly excited that he might set upon O'Malley as he would upon an

enemy in his own country.

“Koku! Stop! Wait for me!” Tom finally shouted.

Now the young inventor got no reply from the giant. Had the latter got so far ahead that he no longer heard his master’s command?

Tom pounded on, working his legs like pistons, putting every last ounce of energy he possessed into his effort. This was indeed a desperate chase.

Chapter 23

Mr. Damon at Bay

Mr. Wakefield Damon was a very odd and erratic gentleman, but he did not lack courage. He was much more disturbed by the possible injury to Tom Swift's invention by this collision with the bumper at the end of the timber siding than he had been by his own danger at the time of the accident.

He did not understand enough about the devices Tom had built in the forward end of the locomotive cab to understand, by any casual examination, if they were at all injured. But when he climbed down beside the track he saw at once that the forward end of the locomotive had received more than a little injury.

The pilot, or cow-catcher, looked more like an iron cobweb than it did like anything else. The wheels of the forward trucks had not left the track, but the impact of the heavy locomotive with the bumper had been so great that the latter was torn from its foundations. A little more and the electric locomotive would have shot off the end of the rails into the ditch.

While Mr. Damon was examining the front of the locomotive, and Tom and Ned remained absent, he suddenly observed a group of men hurrying out of the forest on the other side of the H. & P. A. right of way. They were not railroad men—at least, they were not dressed in uniform—but they were drawn immediately to the locomotive.

The leader of the party was a squarely built man with a determined countenance and a heavy mustache much blacker than his iron gray hair. He was a bullying looking man, and he strode around the rear of the locomotive and came forward just as though he was confident of boarding the machine by right.

Mr. Damon, knowing himself in the wilderness and not liking the appearance of this group of strangers, had retired at once to the cab, and now stood in the doorway.

"Where's that young fool Swift?" growled the man with the dyed mustache, looking up at Mr. Damon and laying one hand upon the rail beside the ladder.

"Don't know any such person," declared Mr. Damon promptly.

"You don't know Tom Swift?" cried the man.

"Oh! That's another matter," said Mr. Damon coolly. "I don't know any fool named Swift, either young or old. Bless my blinkers! I should say not."

"Isn't he here?" demanded the man, gruffly.

"Tom Swift isn't here just now—no."

"I'm coming up," announced the stranger, and started to put his foot on the first rung of the iron ladder.

"You're not," said Mr. Damon, promptly.

"What's that?" ejaculated the man.

"You only think you are coming up here. But you are not. Bless my fortune telling cards!" ejaculated Mr. Damon, "I should say not."

At this point the black-mustached man began to splutter words and threats so fast that nobody could quite understand him. Mr. Damon, however, did not shrink in the least. He stood adamant in the doorway of the cab.

Finding little relief in bad language, the enemy made another attempt to climb up. For one thing, he was physically brave. He did not call on his companions to go where he feared to.

"I'll show you!" he bawled, and scrambled up the rungs of the ladder.

Mr. Damon did show him. He drew from some pocket a black object with a bulb and a long barrel. Somebody below on the cinder path shouted:

"Look out, boss he's got a gun!"

At that moment the marauder reached out to seize Mr. Damon's coat. Then the object in Mr. Damon's hand spat a fine spray into the florid face of the enemy!

"Whoo! Achoo! By gosh!" bawled the big man, and he fell back screaming other ejaculations.

"Bless my face and eyes!" cried Mr. Damon. "What did I tell you? And you other fellows want to notice it. Tom Swift isn't here just at this precise moment; but he is guarding his locomotive just the same. He invented this ammonia pistol, and I should say it was effectual. Do you?"

The eccentric man was shrewd enough now to keep behind the jamb of the cab door. For some of these fellows, he realized, might be armed with more deadly weapons than his own.

"Hey, Mr. Lewis!" cried one big fellow, "d'you want we should get that fellow for you?"

"I want to know how badly that blamed thing is smashed," replied the big man with the dyed mustache savagely. "Where's O'Malley?"

"O'Malley's lit out, Boss, like I told you. That giant and them other fellows is after him."

"Break into that cab! Oh! My eyes! I'll kill that old fool! Break a way in there—What's that?"

In pain as he was, his other senses were alert. He was first to hear the screeching whistle of the on-coming freight.

"Think they got wind of this so quick?" demanded Montagne Lewis, for it was he. "Are they sending help from Cliff City?"

"It's a regular freight," returned one of his men.

“She’s comm’ a-whizzin’,” added another. “Right down the eastbound track. If the crew see us—”

“Wait!” commanded Lewis. “Isn’t that switch open?”

“You bet it is, Boss.”

“Let it be, then,” cried the chief plotter. “Let ’em run into it. That freight will smash up this electric locomotive more completely than we could possibly do it. Stand away, men, and let her go!”

A sharp curve in the right of way hid the siding, as well as the open switch into it, from the gaze of the engineer who held the throttle of the coming freight. His locomotive drew a string of empties, eastbound, and having had a heavy pull of it coming up the grade to Cliff City, as soon as he had got the highball from the yardmaster there, he had “let her out,” and was now coming to the head of the down grade to Hammon at high speed.

As it chanced, the wireless receiving station of Tom’s new telephone system was not yet completed at Cliff City. The news of the wreck of the Hercules 0001 and her position had not been relayed to the master of the Cliff City yards.

That employee of the H. & P. A. had taken a chance in letting the string of empties through his block. He knew the electric locomotive was somewhere ahead, but he thought it would be making its usual time and would have already passed Half Way.

But the situation was serious. The freight was coming along at top speed and the switch into the siding was still open. Montagne Lewis and his crew of ruffians might well stand back and let what seemed sure to happen, happen! The driving freight must do more harm to Tom Swift’s invention than they could have hoped to do with the sledges and bars they had brought with them to the spot.

Mr. Wakefield Damon had shown his courage already. He would have been glad to do more to save Tom’s locomotive from further injury, but he did not realize what was threatening. He did not hear the shriek of the freight engine’s whistle.

Chapter 24

Putting the Enemy to Flight

The pilot and headlight of the freight locomotive came around the turn and the freight thundered on toward the switch. Seeing the group of men standing by the stalled electric locomotive, and the locomotive itself in the clear of the siding, the driver of the freight did not suppose the switch was open. Nobody who was not a criminal would have stood by idly in such an emergency and let the freight run into an open switch.

Therefore, for the first minute, the coming engineer did not observe his danger. Lewis and his gang stared at the head of the freight and did nothing. They had moved hastily back from the siding so as to be clear of the wreckage. Mr. Damon was in the front of the cab of Hercules 0001 and had no idea of the approaching menace.

But of a sudden a loud shout echoed through the wood. Tom Swift came over the ridge and started toward his invention at top speed. From that height he saw the freight train coming, he observed the men standing at the siding, and he recognized Montagne Lewis, roughly as the railroad magnate was dressed.

Instantly Tom realized what was about to happen—what would surely occur—and he saw what must be done if the utter wreck of his locomotive was to be averted. Yelling at the top of his voice, he leaped down the slope.

“That’s Swift!” shouted Lewis. “Stop him!” But the men he had hired to do his wicked work fell back instead of trying to halt the young inventor. It was not Tom’s appearance that made them quail. Over the ridge there appeared a second figure—and a more fearful or threatening apparition none of them had ever before seen!

Koku came running with the limp body of Andy O’Malley slung over his shoulder like a bag of meal. The fellows knew it was Andy from his dress.

The giant came down the slope after Tom as though he wore the seven-league boots. The fellows Lewis had hired to wreck the electric locomotive shrank back from before both Tom and the giant.

“Get him!” yelled the half blinded Lewis again.

“Get your grandmother!” bawled one of the men suddenly. “Good-night!”

He turned tail and ran, disappearing almost instantly into the thicker woods. And his mates, after a moment of wavering, sped after him. Lewis was left alone, quite helpless because of the ammonia fumes.

As a matter of fact not all of O’Malley’s predicament was due to Koku. The rascal, exhausted by his run and half blind through fright and rage, had stumbled, fallen, and struck his head on a root, which rendered him unconscious.

This, of course, Lewis and his ruffians did not know. All the men of the railroad president’s gang saw was the gigantic Koku coming along in great strides, bearing the unconscious O’Malley, who was a burly fellow, as though he were a featherweight. No wonder they fled from such a monster.

Tom had reached the switch, and he was several seconds ahead of the freight locomotive. The engineer saw the open switch then; but he was too late to stop his train.

Going into reverse, however, helped some. Tom seized the switch lever and threw it over, locking it in place, just as the forward trucks thundered upon the joint. The train swept by in safety, and the engineer leaned from his cab window to wave a grateful hand at the young inventor.

Neither the engineer nor the crew of the freight understood the meaning of the scene at the timber siding. All they learned was that Tom Swift had saved the freight from a possible wreck.

The young inventor turned sharply from the switch and motioned with his hand to Koku.

“Throw that fellow into the cab, Koku,” he commanded.

The giant did as he was told, just as Ned Newton came panting to the spot.

“Did they do any harm, Tom?” he cried. Then he saw Montagne Lewis standing by, and he seized his chum’s arm. “Do you see what I see, Tom?” he demanded, earnestly.

“I guess we both see the same snake,” rejoined his chum. “And I mean to scotch it.”

“Montagne Lewis!” murmured Ned. “And we’ve got his chief tool.”

Tom said nothing to his chum, but he approached Lewis with determined mien.

“I can see something has happened to you, Mr. Lewis, and I can guess what it is. The effect of that ammonia will blow away after a time. Ask your friend, Andy O’Malley. He knows all about it, for he sampled it back East, in Shopton.”

“I’m going to get square for this, young man,” growled the railroad magnate. “You know who I am. And that fellow in the cab knew me, too. How dared he shoot that stuff into my face and eyes?”

“I fancy it didn’t take much daring on Mr. Damon’s part,” and Tom actually chuckled. “A big crook isn’t any more important in our eyes than a little crook. We’ve got your henchman, O’Malley—”

“And you’d better let him go. I’m telling you,” snarled Lewis. “I’ll ruin you in this country, Tom Swift. I’ve got influence—”

“You won’t have much after this thing comes out. And believe me, I mean to spread it abroad. I’ve got nothing to win or lose from you, Mr. Lewis. As for O’Malley, I’ll put him behind the bars for a good long term.”

“You’ll do a lot—”

“More than you think,” said Tom. “Koku!” The giant had pitched O’Malley, who was still senseless, into the cab, and now was coming up behind Lewis.

“Yes, Master,” said the giant.

“Get him!”

“Yes, Master,” said Koku, and to Lewis’ startled amazement, the next instant he was in the hands of the giant!

He screamed and threatened, and even kicked, to no avail. When he was pitched into the electric locomotive he was held under the threat of Mr. Damon’s ammonia pistol until Tom and Ned and the giant entered and the door was shut. Then Koku proceeded to tie both the prisoners by wrist and ankle while the others examined the mechanism of the Hercules 0001.

The pantagraph had been torn off the trolley wires when the locomotive had gone on the siding. But now Tom climbed to the roof of the locomotive, and with Koku’s aid managed to set the rear pantagraph at such an angle that its wheels caught the trolley cables again, and once more the current was pumped into the Hercules 0001.

Tom tried out the several parts of the mechanism and found that, despite the jar of the collision, nothing was really injured.

“I built this thing to withstand hard usage,” he declared with pride. “The Swift Hercules Electric Locomotives will not be built for parlor ornaments. She is going to run into Hendrickton under her own power, in spite of a smashed cows catcher and target lights.”

“Is nothing really injured, Tom?” asked Mr. Damon. “Bless my dinner set! I thought everything had gone to smash when she hit that bumper.”

“She will be as good as new in a week,” declared Tom, with conviction.

This prophecy of the young inventor proved to be true. A week from that day the public test of the electric locomotive on the Hendrickton & Pas Alos Railroad was held. A picked delegation of railroad men was present to observe and marvel, with Mr. Bartholomew; but Montagne Lewis, the president of the H. & W., was not one of those who attended.

Of course, Lewis soon got out of jail on bail. But the accusation against him was a serious one. His guilt would be proved by his own employee, Andy O’Malley, who was in a hospital for the time being.

O’Malley had got enough. He had turned State’s evidence and implicated his employer. Influential and wealthy as Lewis was, he could not escape trial with O’Malley when the time came.

“One thing sure, Lewis has got all he wants. He isn’t likely to try any more crooked work against the H. & P. A.,” Mr. Bartholomew said. “I can thank you for that, Tom Swift, as well as for your invention. You have saved the day for my railroad.”

“You can thank Koku,” chuckled Tom. “If he hadn’t spied and identified ‘Big Feet,’ we might not have caught O’Malley, and, through O’Malley, implicated

Montagne Lewis. You give Koku a new suit of clothes, Mr. Bartholomew, and we will call it square. But be sure and have the pattern of the goods loud enough.”

This conversation took place while the party of guests was gathering to board Mr. Bartholomew’s private car, attached to the Hercules 0001. Mr. Damon was one of the guests and so was Ned Newton. Tom took into the cab a crew of H. & P. A. men who would hereafter drive the huge locomotive and take care of her.

The semaphore signal dropped and the electric locomotive started as quietly as a baby going to sleep! There was not a jar as the train moved off the siding and over the switches to the main line.

The dispatcher had arranged a clear road for them. Tom knew that he had a free track ahead of him—a level of ninety-odd miles to the Hammon yards. As he passed the Hendrickton shops he touched the siren lever for a moment, and the shrill voice of the Hercules 0001 bade the town good-bye.

The next minute the visitors in the private car grabbed out their split-second watches and began to murmur. The electric locomotive had begun to travel!

Chapter 25

Speed and Success

“What town is that?”

“Looks like a splotch of paint on a board fence, we went by so quick.”

“I’ve lost count, Bartholomew. Where are we?”

Ned Newton listened to these comments from the visiting railroad men with delight. In reply to a question of his neighbor, the grinning financial manager of the Swift Construction Company paid:

“No, sir. That isn’t a picket fence. It’s the telegraph poles you see, and they are no nearer together than on another railroad. But we’re going some.”

“Bless my railroad stock!” shouted Mr. Damon, “I should say we were.”

The electric locomotive and the private car were hurled toward the Pas Alos Range at a speed that almost frightened some of the guests.

“Three-quarters of an hour!” gasped one man as they began to see the outskirts of Hammon. “And ninety-six miles? Great Scott, Bartholomew! that’s over two miles a minute!”

“That is the speed we set out to get,” Mr. Richard Bartholomew said, with quite as much pride as though he had done it all himself.

But it had been his suggestion and his money that had accomplished this wonder. Tom Swift was willing to give the railroad president his share of the fame.

The train scarcely slackened speed at Hammon, for Tom got the signal announcing a clear track ahead, and he bucked the grade with all the power he could get from the feed wires. This hill, so well known to him now, was surmounted at a slightly decreased speed; but it was a wonderful display of power after all.

They went down the other side to Panboro and there linked up with an east-bound freight that the Hercules 0001 snatched over the mountain to Hammon at a pace slightly exceeding forty-five miles an hour—at least twice the speed that any two oil-burning locomotives could attain. As for the Jandels, they were not in the same class at all with Tom Swift’s locomotive!

“Bless my speedometer!” exclaimed Mr. Damon, when the train pulled down and stopped again at the Hendrickton terminal. “This is the greatest test of

speed and power I ever heard of. Why, a coal burner or an oil burner isn't in it with this Hercules locomotive! What do you say, Mr. Bartholomew?"

"I'll say I am satisfied—completely and thoroughly satisfied, Mr. Damon," said the president of the Hendrickton & Pas Alos Railroad frankly. "Mr. Swift has fulfilled his contract in every particular."

An hour later the young inventor and his two friends were in conference with Mr. Bartholomew over a new contract. The bonus of a hundred thousand dollars would be paid at once to the Swift Construction Company. But as the elder Swift's name would be needed on the new contract for the building of other Hercules locomotives, Tom had an idea.

"We won't send the papers East for father to sign," he said. "I want him to see the locomotive in real action. And I know where he can borrow a private car and come out here in comfort. Rad can come with him."

"Bless my valentines!" ejaculated Mr. Damon, "I bet somebody else will come too."

Mr. Damon must have been a prophet, for a fortnight later, when the borrowed car got in to the Hendrickton terminal at the tail of the transcontinental flyer, Tom Swift saw first of all Mary Nestor's rosy face on the platform of the car.

"Tom! are you all right?" she cried, beaming down upon the young inventor.

"No. Half of me is left," he said, grinning up at her. "You look great, Mary!"

"Do you think so?" she cried, dimpling. "Well, if anybody should ask you, Mr. Tom Swift, you look very good to me."

"Don't make me swell all up, Mary," he laughed. "How's father?"

"Splendid! And Rad—"

"Eradicate Sampson is sho' 'nough puffedly all right," broke in the voice of the old colored man, eager to make himself heard and seen. "Here I is, Massa Tom. What dat lizard doin' here? Ain't he a sight?"

The old man had caught sight of Koku in the wonderful new suit Mr. Bartholomew had ordered made for the giant. A Navajo blanket had nothing on that suit for a mixture of colors, and Koku strutted like a turkey-gobbler.

"My lawsy!" gasped Rad again, "he's as purty as a sunset. Is dat de way de tailors out here build a man up? Sure's yo live, Massa Tom, I needs a new suit of clo'es myself."

And before he got away from Hendrickton, Rad Sampson sported a suit off the same piece of goods as that of Koku's. Otherwise there might have been a lasting feud between the giant and the Swift's ancient serving man.

Mr. Barton Swift had stood the easy journey in the private car very well. Before he would sign the contract that Mr. Bartholomew offered, he wished to see for himself just how good his son's invention was.

They made another test from Hendrickton to Panboro, over the "official route," as Ned called it. The time made by Hercules 0001 was even a little better than before.

That the invention was well nigh perfect, and that it could do even more than Mr. Bartholomew had hoped or Tom had claimed, was Mr. Swift's conviction.

“Tom,” he said to his son, “you have done a wonderful thing. Not only have you completed a marvelous invention and gained thereby a lot of money, and more in prospect, but you have aided in the world’s progress to no small degree.

“Speed in transportation is the big problem before the world of commerce today. To move goods from point to point safely and cheaply, as well as rapidly, is the great task of this age. We are entering the Age of Speed. The railroads must solve the problem to compete with motor-truck traffic and fast boats on the lakes and rivers of our land.

“You have, by your invention, shoved the clock of progress forward. I am proud of you, my boy. I know now that, no matter what may happen to me, you will make an enviable mark in the world of invention.

“You have done much before for the Government in time of stress. But war engines of any kind are not worthy examples of inventive genius beside such a thing as this.

“It is the inventions of peace, rather than those of war, that stand for human progress.”

Coming back over the mountain, Mary Nestor rode in the cab with Tom. She sat on the swivel stool, in fact, and handled the controls for part of the way. But she gave up the driver’s place to Tom before they reached the timber siding east of Cliff City.

“I cannot go by that place without a shudder,” Mary said to the inventor. “Ned and Mr. Damon told me all about that accident. Suppose you had been killed, Tom!”

“I see I’ll have to build an invention that will make that impossible,” chuckled the young fellow. “Make what impossible?”

“Some invention that will make it positively certain that no matter what I do or where I go, nothing can harm me. Nothing else will suit you, Mary, I plainly see.”

“Well,” returned the girl, smiling fondly at him. “I admit that would satisfy me completely!”

THE END