

**VOLTAGAL, GENIUS OF
ELECTRICITY: OR, NED
BENSON'S ADVENTURES AND
TALK WITH ONE OF THE GENII**

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Voltagal, Genius of Electricity: Or, Ned Benson's Adventures and Talk with One of the Genii by
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VOLTAGAL,

Genius of Electricity;

OR,

Ned Benson's Adventures and Talk with
One of the Genii.

By "A MAN,"

OF THE "GREAT ROCK ISLAND ROUTE."

Respectfully Dedicated to the Boys and Girls of America, by the General Ticket and
Passenger Agent of the Chicago, Rock-Island & Pacific Railway.

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"Canst thou send lightnings, that they may go,
and say unto thee, Here we are!"

—Job xxxviii : 35.

"Their line is gone out through all the earth,
and their words to the end of the world."

—Ps. xix : 4.

INTRODUCTION.

WHEN, last year, the "A Man," of the "GREAT ROCK ISLAND ROUTE," prepared the little Christmas book entitled "WATT-STEPHEN, THE GENIUS OF STEAM, OR NED'S ADVENTURES WITH ONE OF THE GENII," he determined, God willing, that he would prepare a companion to it for Christmas, 1885, upon the equally instructive subjects of Electricity and Magnetism.

Nearly everything now accepted as demonstrated truth in regard to electricity, has been learned within the past one hundred years; and wonderful as have been the discoveries, and marvelous as has been the application of electricity to the uses of mankind, we are only on the threshold, so to speak, of our knowledge of this greatest of all natural forces.

When Franklin flew his kite with an iron point in its upper frame, and drew the lightning down the string to the key he had tied a little above his hand, he solved a problem that has done all the world good, for he set men to thinking in new lines, and thought induces study; study, the patient observation of phenomena; and knowledge of phenomena brings discovery of scientific principles, and the application of those principles marks the milestones along the highway of human progress and invention.

One man observes, at a given point, certain results from the operation of natural forces; another observes the same phenomena from another point, and they by and by compare the records of their watching and arrive at certain conclusions. What has been learned during the past one hundred years in relation to electricity has been learned by the study, observation and comparison of many, many men, at very many places on the globe; and while scientific men have arrayed, collated and arranged the facts, other

men not so learned in the lore of books, but more ingenious, have perfected the machinery that has made the telegraph, the telephone, the electric light and the electric motor possible.

One writer upon electricity asserts that one hundred men at least have given ten years each to the study of this great force, while hundreds of others have devoted months and years to the same subject. Probably the combined study has been equal to the study of one man for at least two thousand years, with this great advantage, that these investigations have been made all over the earth; and through the beneficent aid of the "printer's art," each investigator has had the benefit of the results obtained, and conclusions reached, by every other man's research.

In this little book the author has tried to tell the history of the efforts that have been made; the foundation truths, from knowledge of which all else has been learned, and has given certain simple experiments that are easily performed; and in all, he has tried to be accurate, and to narrate it in simple language that boys and girls can understand. He wishes it to be understood that this is not a scientific work; it is simply a narrative designed to stimulate inquiry in a field where the rewards are great.

He now launches the book, he trusts, upon the sea named public favor, hoping it will instruct and amuse those who read it, as did Watt-stephen, its predecessor. Although many thousands of Watt-stephen were printed, they were eagerly sought, and the edition early exhausted.

In conclusion, "A Man" begs to commend the great line of railway he represents to the little ones who read this volume, and to their fathers, mothers, cousins, uncles and aunts, and desires to impress upon them the fact, that when they travel, they should by all means go over our railway, if they would be carried both safely and speedily. Finally, "A Man" wishes each and every reader a most MERRY CHRISTMAS and the happiest of HAPPY NEW YEARS.

I am as always before, dear children,

Yours and the "Great Rock Island's"

Most Obedient Servant,

"A MAN."

CHAPTER I.

Ned Benson could hardly realize that Watt-stephen had really gone, and he looked around, rather expecting to again catch a glimpse of the genial Genius, whose talk and experiments had so interested him during the ride from Englewood to Davenport. Much however as Ned wanted once more to see Watt-stephen, he could not; but right by his side was the alert, active, dark-complexioned and mysterious Voltagal, whose every word came with a sudden start, like the lightning he was the Genius or impersonation of, and whose every movement made Ned involuntarily think of a Jack-in-the-box, as it seemed Voltagal was a bundle of springs endowed with life.

If Ned had been amazed at the celerity, or rapidity, of Watt-stephen's movements, he was much more surprised at the quick way Voltagal moved from place to place; and every time the Genius touched Ned, the latter heard a little snapping noise and felt that sudden tingling sensation which had so surprised him when they first shook hands on the shore of Lake Michigan.

"All aboard!" cried the conductor; the words were hardly out of his mouth before Ned found himself again in the state-room which he had before occupied with Watt-stephen.

He did not fly there; it was too rapid a movement to be called flying; the Genius simply took his hand, and quicker than a wink he and Ned, were in the car.

"Oh, my!" thought Ned, "this is the most astonishing thing that ever happened to a boy."

"I wonder what Mamma would say to see me going that fast?"

When the Genius said, "Be seated, Ned," the wonder of the latter grew greater yet, for right at the feet of Voltagal, was a valise, the exact counterpart of the one Watt-stephen had taken all his models from.

Now, Ned was perfectly sure that Watt-stephen took his valise with him, and that Voltagal did not have one in his hand on the platform; but there it was, and Ned was certain it contained a

lot of models that Voltagal was going to show him and make experiments with.

"The Genii are queer beings," mused Ned; "they go, and you don't see them go; they say come, and you are there."

"I really should be dreadfully frightened if Watt-stephen had not pledged me his word that I should get home all right."

"Ned," exclaimed Voltagal, "you need not be frightened; I will take just as good care of you as Watt-stephen did; and I am going to show you some more wonderful things than he showed you. I was just talking with your mother, and she wanted me to say to you that she knows where you are, and that you may stay away as long as I want you."

"Talking with my mother!" exclaimed Ned in amazement; "I do not see how you could talk with her when she is nearly two hundred miles away; and besides, I have been here all the time, and I did not hear you,"

"Just put your mouth here," said Voltagal, "and cry hallo!" Then Ned saw hanging on the black walnut wall of the state-room an oblong box, with a little silver-plated crank on the upper half of the case, while right below it was a round orifice from which protruded a mouth-piece of ebony, while hanging to the side of the case was a long wire to which was attached a tube of black hard rubber, and from which, when Ned placed it to his ear, as the Genius directed, he distinctly heard his mother's voice inquiring, "Is that you, Ned?"*

Ned of course replied, "Yes, Mamma," and thereupon proceeded to tell her where he was, and what a good time he had had with Watt-stephen.

This talk astonished Ned more than anything that had happened before. "I see you are very surprised," said the Genius; "that is the telephone, and before we part I shall explain it to you."

"I thought it would be a pleasure to both your Mamma and yourself to talk to each other when so many miles apart."

"I thank you very much," replied Ned, "and I do want to understand how it is possible."

"You shall by and by," answered Voltagal.

"Now, Ned," said Voltagal, "we have so much to say and do, we had better commence, as Watt-stephen told you, at the beginning."

* see Chapter VI for full description of the telephone.

"First, it is best to tell you something of what man has discovered about electricity, and the manner of transmission of messages, which is called telegraphy, from two Greek words, one signifying far, far off, and the other, to write."

"The word electricity is also derived from a Greek word, *electron*, meaning amber.

"The term was invented by one Gilbert, an Englishman, who used it with reference to the well-known attractions and repulsions which amber displays when excited by friction."

"Theophrastus, 321 B. C., Thales, 600 B. C., and Pliny, 70 A. D., mention in their writings, that the amber has power, when so excited, to attract straws and dry leaves."

"Pliny wrote, 'that there was a fish called the Torpedo, which is also called the cramp fish, and is a repulsive looking creature, which is found in the Mediterranean Sea and the Atlantic Ocean, that has the power, when touched by a spear, to paralyze the muscles of the arms, and when trod upon will arrest the feet.' Aristotle added that it benumbed men and fishes which it seized for prey."

"The influence of electricity on the human body, as well as the electricity of the human body, was early known." "Anthero, a freedman of Tiberius, had the gout, and was cured by a shock from the Torpedo."

"Other ancients were cured of divers complaints, including the headache. Notwithstanding, it is only about a century ago that men began to study the science in an intelligent way, and to get from this great force results practical to humanity."

"A. the present day, when men talk of telegraphing, they are understood as meaning the sending or transmission of signals over a wire by means of electricity."

"For ages past, men have greatly desired to communicate with each other through space, the sending of letters or messages by people afoot, on horse-back, or by slow sailing vessels, being early recognized as too slow to meet certain great exigencies in human affairs."

"Among the ancient Gauls (natives of France) when there was important news to transmit, some loud-voiced young man was sent to the top of a hill or other eminence, and there he shouted the news to all points of the horizon, the words being taken up