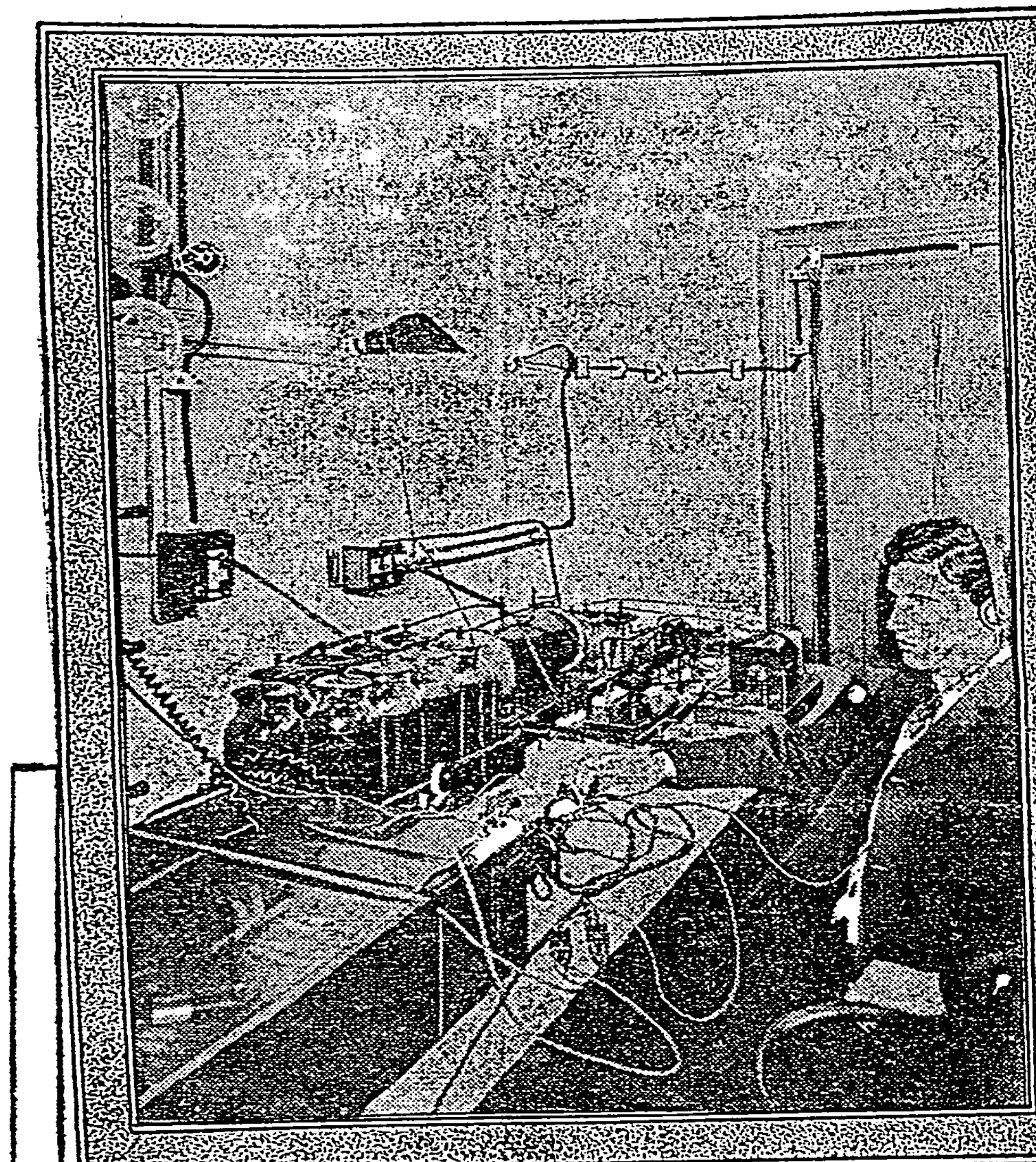
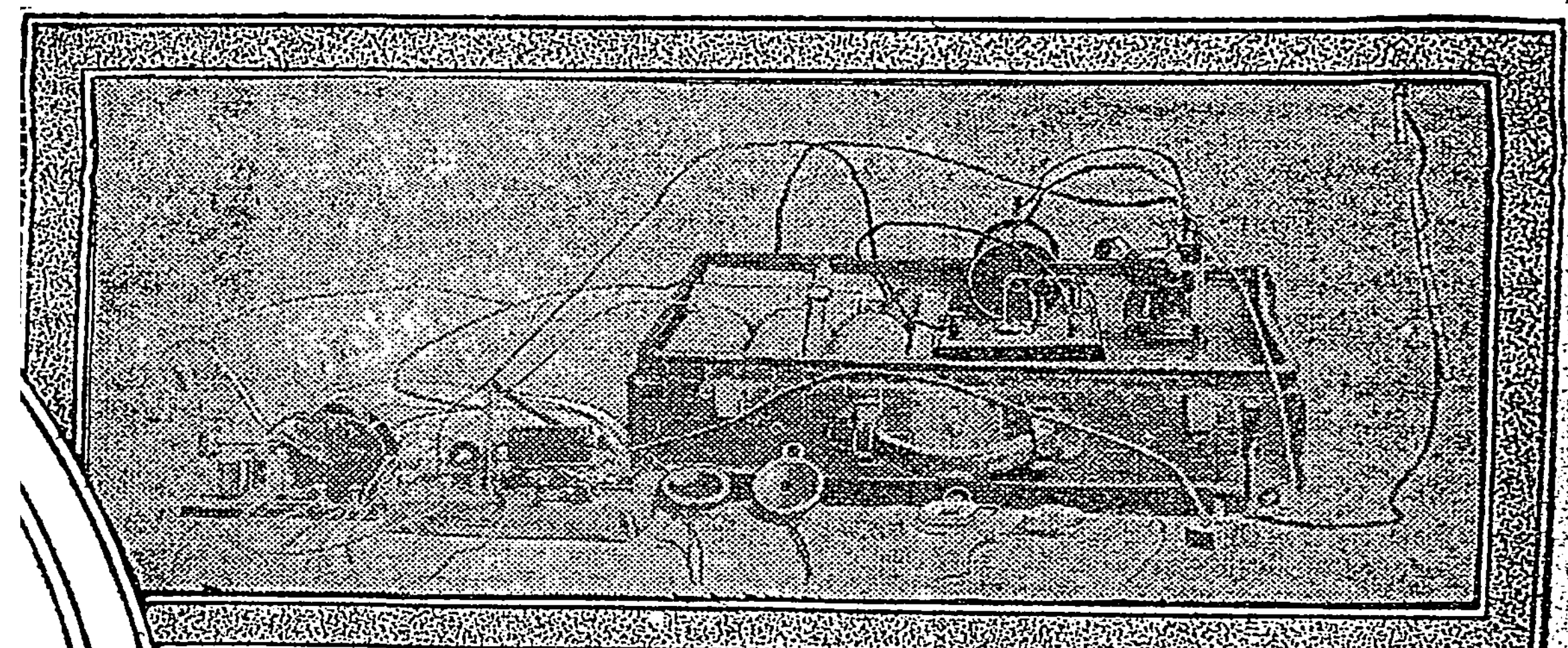
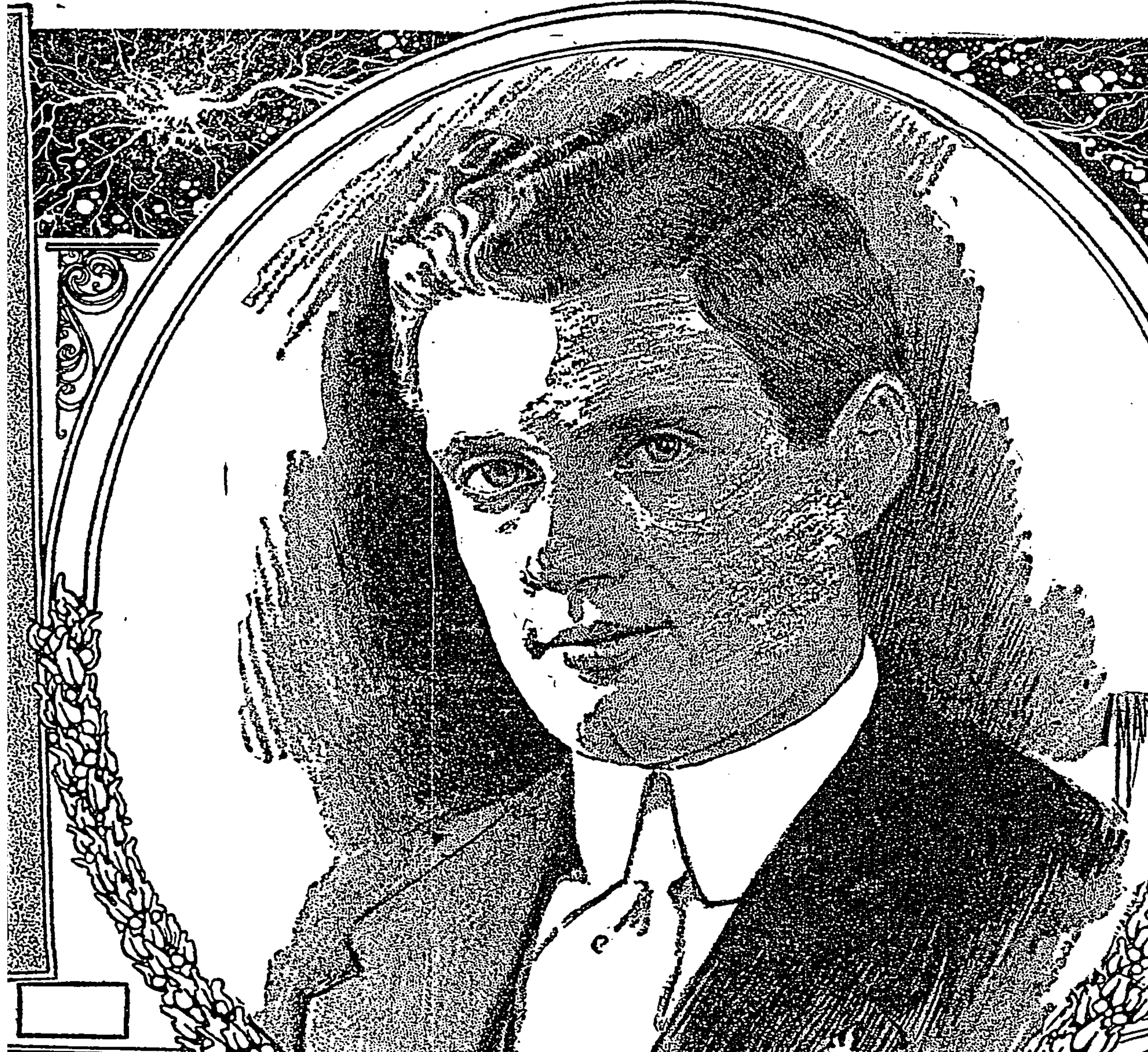


# NEW WONDERS WITH 'WIRELESS'—AND BY A BOY



MR. WILLENBORG SENDING A WIRELESS MESSAGE



A SUIT CASE WIRELESS OUTFIT

**Twenty-Year-Old Inventor Has Perfected Wireless so that His Messages Will Be Sent and Received Without Interference or Detection by Any Present System.**

**Walter J. Willenborg, in Hoboken, After Hearing Clifden Talk, Says He Will in December Send and Receive Messages Between New York, Berlin, and Paris.**

**T**HREE men with their heads almost rubbing and with their ears covered with telephone receivers, which they pressed close to their skulls, crouched over the mass of instruments in the wireless station of Walter J. Willenborg in Hoboken one day last week, and waited.

Willenborg, gray eyed, clear-cut of feature, intent, and with his brow furrowed as he strained to catch the sound, heaved a sigh of relief. "There's Glace Bay sending," he said. From the receiving instrument, through the green-covered telephone wires, and to the covered ears of his two companions, there came the distant buzz of dots and dashes in sound. The message was in cipher, and its contents, therefore, safe from eavesdroppers.

It was a brief message. There came a pause of a minute that seemed an hour.

Very faint, as faint as might be the sound of a droning bee to the ears of a dying man, came the answering call from Clifden.

The telephone receivers were pressed closer to our ears, and we breathed so lightly that there was no sound from our respiration.

## A Voice from Across Sea.

Soon we became accustomed to the void that stretched across the deep and from the breast of the wide-spreading Atlantic into infinity. We were in the blackness of what Sir Hiram Maxim termed the imponderable, and yet we were pondering, and the imponderable was not only in the grasp of our minds, but was also being made to give up to our instrument its most distant sound.

We made out and translated one word of the cipher message, and the Clifden signature.

They were enough. New York and Clifden, Ireland, were connected.

On the night of Oct. 17, far up in the tower of Madison Square Garden building, Peter Cooper Hewitt, one of the foremost electrical scientists of the day, told me, as we sat listening to the wireless babel floating over New York City, that it was only a question of time when New York would be in direct wireless communication with the cities across the Atlantic.

That very morning, when the world was talking about the opening of the intercontinental service between Glace Bay and Clifden by Marconi, Mr. Hewitt met Prof. R. A. Fessenden, an indefatigable worker in "wireless," and was told by him that he had managed to pick up a message from Clifden at his station at Broad Rock, Mass.

That was much nearer to New York than Glace Bay, and the question whether this city and the great cities of Europe would be soon talking together naturally followed. As to the probability thereof Mr. Hewitt then said:

"I should say that there is extreme probability. The only question is that of atmospheric condition, and Prof. Fessenden has discovered that a wave of 81,000 a second is less interfered with than any other wave length. With increased horse power generating the spark, and with the knowledge of the wave best measured to combat adverse atmospheric conditions, there will soon be direct communication of sufficient speed and accuracy between London and New York to meet demands of in-

tercontinental communication between these two cities."

That was ten days before Willenborg picked up Clifden in Hoboken.

"In December," said Willenborg yesterday, "I shall send a receiving instrument to Paris. It will be put in place, and from this very room I will send messages as fast as the fastest Western Union operator can send over a wire. We will be able to talk with Paris night and day and under any atmospheric conditions, and with a speed as great as wire telegraphy will now permit between two cities not far distant."

"Where will you get the horse power?" he was asked.

"From the electric-light company that supplies me with electric lights," he replied. "I will need no more. One-fifth horse power will do. My alternators will do the rest, and, moreover, it will be impossible for any one to pick up a single message I send or is sent me."

"Is there to be any finale to the use of the air electrically?" he was asked.

"Not that I know of," he replied. "My work has been out along the line of perfecting wireless communication. I have stuck to the task of finding means of sending and receiving messages at great distances, and sending them so that they will be strictly beyond the reach of any one who might desire to cut in and hear them. I have achieved this, and would have had my stations on this side and on the other side in place and in working order had my alternators been put in place by the manufacturers on the day they promised."

## Waves Elude Discovery.

"Has your device of preventing cutting-in been tested?" he was asked.

"Yes. I sent for two hours to a ship 1,900 miles away while a station further north spent that time in trying to get in tune with me. It was impossible to detect my waves."

The tests by Willenborg have been so carefully made and so carefully studied by scientists that enough about them has leaked out to bring upon him inquiry from many people. The Scientific American, which always has its ear close to the ground or its nose high in the air for the very latest news of a scientific nature, sent a representative to have a talk with the Hoboken man. An article was prepared, and it never got the sanction of the inventor for publication. All of the great dailies of New York have struggled to learn more of his secrets, without success. He has never said a word about his work until now.

Willenborg is only 20 years old, and

being healthy, happy in his work, and having his work at home—on the roof of his father's little brownstone house—he insists on having fun when he is not laboring with the one-time imponderable.

Over at Stevens Institute they are proud of him, and have given him permission to build a mast on the top of the institute, from which stretch his antennae to the mast over his father's house. But he is no prodigy. What he has done has been done by hard work. He began at fifteen in a little closetlike room on the top floor of his house. He developed so great a genius for the pursuit of electrical science that a wall of the room had to be torn out to give him elbow swing among his instruments. Then, there being no more room on that floor, he saved through the ceiling, built a ladder above, and a shack on the roof. Here he put a cot, a desk for the records of his work, some of his heavier instruments, and the station is thus to-day.

## Breaking Up Dispatches.

The young man has a mind that finds seriousness only in the huge things of science.

The question of the use of wireless in time of war and the destruction of the enemies' service has already engaged his attention.

The Germans have attacked this proposition, and at a recent gathering of wireless scientists in Berlin the Germans remarked, when it looked as if no comfortable agreement could be reached on a certain score, that they would proceed to destroy every message in the air, and thus wipe out wireless telegraphy. They had the plant to do it with near Berlin.

But the Germans are not the only ones who can play at this game just now. Willenborg has acquired such high frequency of wave force, or oscillation, that he can, when picking up a message, send shooting into the receiving machine taking it such a clamor that the message is immediately destroyed.

"Can you do it now, this moment?" he was asked.

"Let's see," he replied.

We adjusted our telephone headpieces and listened. There came the sounding dots and dashes once more, this time strong and clear. They were being sent by an operator at Atlantic Highlands.

Willenborg cut off the receiving instrument, arranged his sending instrument, and began work with the large brass key he uses. A steady streak of sharply cracking electrical flame smacked and flashed between the poles of the instrument.

The aerial above the shack on the

roof began to shoot forth air waves that crowded each other and with great violence. He kept this up for about thirty seconds, and we returned to the receivers.

"Lay off, New York," came the call from the Highlands man.

Again Willenborg shoved out his air waves.

"Go to h—i" came from the Highlands man.

"Certainly," we replied, and again began the clamor.

"O. K.," finally sent the Highlands man, meaning that he would wait and we could proceed with our message. He thought that we were unintentionally doing this deed.

"Tell us who you are sending to?" asked Willenborg.

"What business is it of yours?" suspiciously demanded Highlands.

Again the clamor to hector him, but Highlands, not understanding that all of this was intentional, went back to cover after another "O. K."

We began prodding about Willenborg's den of wizardry, chatting and

## A Custom House Tale

GERMANY is jealous of the foreign candy-maker and exacts a rigorous toll upon anything in the shape of confectionery that comes across its borders. Ignorant of this, one of Uncle Sam's sons in the course of the Summer just past disembarked from a liner at a German port carrying in his hand a five-pound box of candy bearing a New York trademark. At sight of the box the Teutonic customs official exhibited marked activity and prepared to seize upon it, declaring that it must be weighed and examined for the purpose of computing a duty payment.

"Not for mine," said the American. "I won't give up a box. I'd rather eat the stuff here and now." He opened the box and commenced to dispose of its contents without delay. Everybody in sight was offered a handful. Nobody declined except the customs officer, who said blandly that he had not a sweet tooth. The traveler himself ate many pieces. It was not long before the last bit had been eaten.

As soon as the box was empty the official seized the traveler by the arm. "The gentleman," he announced, "will accompany me to the bureau, where we'll make out his bill for duty. Come it is at the other end of the dock."

"Never," said the American. "You have no right to charge me duty. I didn't bring it in. I'll see my Consul right away and he'll send a big fleet and bombard this blooming town."

"Softly," said the officer. "You'll pay duty all right. There are fifteen witnesses to prove that that candy of yours was consumed on German soil."

The duty was paid and the Consul has not as yet been consulted.

laughing over the plight of the Atlantic Highlands man, when our host turned to his big brass key again and sounded:

"-----"

It was the familiar "O. K." of our Atlantic Highlands man, and it meant to him that everything was all right and he might go ahead talking to his ship beyond the horizon.

"I find," said Willenborg, "I will be able to drive high frequency waves into other messages and break them up, that with my perfected apparatus, even the apparatus I am using right now, it will be impossible for any one to destroy my messages. They can't find them to destroy them, and they must know where to drive their waves before they can hit the target."

Young as he is, Willenborg has been employed by the United States to perfect wireless tests aboard ship, and has been highly paid for his work. France has been after him also, and he has received offers from inventors, but has accepted none.

The inventor's father is a well-to-do man, and would give him abundant means for continuing his studies, but Willenborg doesn't need money. He is so frequently called as an expert witness in so many important suits over electrical matters that his fees give him ample resources.

## Ten "Pick-ups" in Ten Minutes.

When with Mr. Hewitt in his Madison Square Garden workshop I learned how easy it was to sit quietly by and listen to the chatter of other people who used the air as wings for their messages. In ten minutes with Mr. Hewitt we picked up messages from ten different sources. We listened to an operator sending from a ship far out at sea, we heard Galilee, N. J., complaining bitterly to the De Forest man in the top of 42 Broadway for having given him the wrong wireless "steer," we heard the Sound steamers talking to their offices and sending messages for passengers to all parts of the world, we heard ocean-going tugs talking to their owners, and up and down the coast, inland and out to sea, sprung the buzzing babel toward the Madison Square Garden tower and into our ears. The millions below us knew nothing of this strange intercourse through the night above, nor had they even noticed that from the gilded heel of Diana, capping the tower, to the roof of the building, wires were stretched to catch up and convey all of this hidden, mystic jabbering in the folds of night to a man-made machine that would untangle it all and render it clear, syllable by syllable, word by word, message by message.

Mr. Hewitt, being an inventor in electricity, used his own receiving instrument then. He had a glass globe set amid many wires on a table in his laboratory. About the base of this he balanced many great magnets, and within the globe twisted, rose, and fell a pale blue flame, the Hewitt vapor light. It was a bit ghastly. He adjusted the magnets so that the light glowed steadily, and then we began to hear things.

But all that was in the aeon ago—ten days spanning the aeon. Things

happen in ten days in wireless electricity. Wireless telegraphy itself is hardly ten years old, and yet messages have been sending between ships and overland for five of the ten years.

Willenborg has made use of his ten days since Marconi ripped a path through the void and started England and America, by way of Ireland, (Ireland always seems to be in the neighborhood when there are things doing,) talking at will without the use of wire or cable. From what Tim Tams reporter could learn from his scientists and his study of them and of their achievements, it looks as if the speed of attainment in wireless electrical invention and perfection will almost attain the speed of the air waves juttled forth nightly from the aerials of the many scores, if not hundreds, of wireless stations.

And as Marconi began as a boy of fifteen, and attained great things in his twenties, I found, after the visit to the more elderly scientist, Hewitt, that Willenborg was using more improved apparatus than his seniors and doing things at a rate that was almost alarming. For instance, Mr. Hewitt had a receiving apparatus in his studio, but no sending machine. Again, while he could tune his instruments to pick up messages from everywhere to everywhere in reasonable range, he knew neither the Morse nor the continental code sufficiently well to read off the messages he was receiving.

But the wizard across the street from Stevens Institute could read both codes as rapidly as the messages fell upon his ear and could hammer out messages in both as fast as they could be taken. Moreover, he not only had every necessary bit of equipment for the highest class station, but he could handle it so well that not long ago the Hamburg-American Line, desiring to get a message to its chief engineer when one of its great ships was out of reach of the operators here, called on him for help. He picked up the ship, and the general manager of the company read to him a message in cipher. He sent it for the company, receiving the thanks of the chief engineer, nearly 2,000 miles away, bade him good night, received the thanks of the general manager, bade him good night, and resumed the interesting and wireless, tireless tenor of his way.

## Catching Ships in Mid-ocean.

Willenborg read the messages passing through the air with the greatest ease. He picked up a ship far out to sea, over a thousand miles out. It was calling for Sable Island, hundreds of miles away from New York. When it got the operator at Sable Island the ship sent this message, which we read in the continental code:

"Northeast winds. Barometer 29. Point 9. 41 degrees. E. S."

Then we caught two transatlantic ships in communication. The message being sent was what Willenborg called a "sweetheart message." He enjoyed hearing it, but said that it wouldn't be right to hand it around to us. The sweethearts were passing each other, the man hurrying across seas to New York, and the woman on her way

abroad. It must have been a very tender message, for Willenborg seemed highly pleased with the reading thereof. Then we picked up a constant buzzing of:

"-----" the letter "V," repeated many times.

The operators were getting in tune. Finally one of them sent the message: "Report poor coil—Mowen."

That meant that the receiving apparatus of one of the operators needed a new coil.

Bayonne, N. J., was finishing a message to Babylon, L. I., and asked the correct time. Babylon flashed it back, and Bayonne and Babylon stepped out of the air.

Messages from Fort Hamilton, Seal Gate, Cape Race, Cape Cod, Glace Bay, Bayonne, Sandy Hook, ships in mid-ocean, all of the Sound steamers, ships far up the coast and on their way down the coast, Jersey towns and Long Island towns, messages from everywhere to everywhere and back buzzed into our receiving instrument. Only those in cipher escaped us.

For intrigue, plot, and counterplot, in business or in love or science take to the air and tread its paths, sounding your way for the foothill of your friend's or enemy's message. There is a romance, a comedy, and a tragedy yet to be written. There will be only two scenes. One the station of a wireless plant, and the other the ether that encompasses, the unseen and unseeable, the thing through which ghosts tiptoe by night and fade into security, by day—the air. It is known only to the spark that is sent to the wires over the wireless station, and leaps from there into the void.

## No Traces Left Behind.

The spark has no more of a wake than the arrow that cleaves the space it travels. On very dark and moist days you may see a faint, blue, nebulous suggestion of light under the aerial. It is the spark trying to reach the earth, which is repulsing it always and aiding it to pursue its course to the distant detector and receiver. There is no trace left behind.

A thousand years before Christ, philosophers were wrangling over the abstract question whether the interstellar space had any invisible filling. They felt for it, reaching out their hands and their minds, debated over the invisible, and gave it up.

Nikola Tesla wrote to Tim Tams the other day that from his tower on Long Island he had sent to Washington for patents, one of which was for the transmission of power for commercial use through the air!

Willenborg, as a pastime, goes on in an electric launch for a trip up the river, and with a little wireless telephone instrument of his own makes hears his phonograph play a Chopin nocturne at a distance of four miles. He also carries a wireless telegraph instrument in a dress suit case and uses it for many more miles after he has exhausted the use of his telephonic wireless instrument.

One of the freak things that the young man has done recently, and one which may mean a vast deal in the everyday life of mundane existence, is the building of a vest-pocket wireless sender and receiver. I saw this miniature apparatus. The transformer is on a board about eight by three inches and the sending machine is half as small.

"What do you do about the aerial for this?" I asked.

He pulled out a tiny stretch of wire, built in the same form as is the aerial over a big station. He then tucked it with a pin inside of his coat near the collar and let it hang. The rest of his little wireless outfit was strapped about his waist with a buckle. He has sent messages to his house from a point eight miles distant.

In explaining how he sends his messages so that they cannot be intercepted, Willenborg let drop a sentence which shows the mental attitude of the scientist to the imponderable.

"I send my spark perpendicularly to the plane of the earth," said Willenborg. "At least I send it nearly so. If I did send it perpendicularly then it would proceed into infinity."

Infinity he treated as a thing a few degrees from his range—just a few degrees.