

# America's Greatest War Invention

## The Rogers Underground Wireless

(Special Interview to the ELECTRICAL EXPERIMENTER.)

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(Associate Member Institute Radio Engineers.)

An invention which has been termed the greatest American war achievement is the Rogers underground and sub-sea radio system. The Rogers system does away entirely with aerial wires, and it is only a matter of months now before all aerial wire systems the world over will be pulled down. Wonderful things have been accomplished by the new Rogers underground system, chief of which is the total elimination of static and the increase of the loudness of received signals, which is often as high as 5000 times the usual strength. Interference, too, is done away with almost entirely now. The Rogers invention is of tremendous importance and revolutionizes our previous ideas on wireless to an extent never dreamt of before. We urge every one interested in radio to read the accompanying authoritative article which discloses the full technical data on the new system for the first time in any periodical.

**T**HE greatest invention in the field of wireless telegraphy since Marconi first placed commercial radio-communication on a firm basis by his historic experiments in Italy, and later in England, is without a shade of doubt this latest triumph of radio research—the "Underground and Sub-sea Wireless", conceived and developed to a working stage by an American scientist and inventor, James Harris Rogers. Mr. Rogers is known as a second Edison, among his towns-people in Hyattsville, Maryland, where he has lived for many years, and now the whole world acclaims him.

It is Revealed Now That the Navy Department Had Been Using a Powerful Undersea Wireless During the War. The Instruments and System Were Invented by James H. Rogers, of Hyattsville, Md., and were Adopted by the Navy Department as an Invaluable Addition to the Wireless System of the Navy. The Two Lower Photos Show the Inventor, Mr. Rogers, in His Laboratory at Hyattsville.

**Who is Mr. Rogers?**

James Harris Rogers, practically unknown a few years ago in radio circles, except by a few select radio men who were investigating his invention for the Navy Department, has practically become overnight the center of all attractions in the field of science. Mr. Rogers is a son of the confederacy and a veteran of the great Civil War. He has followed electrical experimenting ever since and has been a strong devotee of radio telegraphy since Marconi performed his first experiments in this new branch of applied science. He is a refined, cultured southern gentleman who makes you feel at home at once; an invariable attribute of all of the truly great. Mr. Rogers was one of the first inventors of the "printing telegraph" and his full-sized working models saw actual commercial service on a circuit between



Baltimore and Washington, also in New York, back in 1880. These were seen by the writer and are wonderful pieces of mechanism.

The Rogers laboratory, which comprises several large rooms, is lined on all sides with glass cabinets containing electrical apparatus which he has invented from time to time thru his studious career. A novel and original high frequency generator was another of the devices that greatly interested the writer. It employed a jet of water shunted by a large capacity, the stream of water being connected to a high potential source of direct current. High frequency currents

Top Photo Shows Antenna Wires Being Placed in River by Mr. Rogers' Assistants. The Inventor Has Found that His System Works Just as Well Under Water as Thru the Earth. All of the High Power Stations in the World, from Nauen and Lyons to Honolulu, Are Heard in Mr. Rogers' Laboratory at Hyattsville, Md., Shown in the Center and Lower Views Here-with. The Author of This Article Also Heard the Transatlantic Stations Coming in Loud and Clear. Mr. Rogers' invention is the Greatest in the War and is so Recognized by the Government.



of any range up to the limit of audibility, or about 30,000 cycles per second, could be readily obtained with this apparatus. The writer merely cites these facts to substantiate the standing of Mr. Rogers in the scientific field. Hundreds of other electrical inventions have been made by this modest genius of the quiet little Maryland town of Hyattsville, and the principal outstanding fact of all of his work is that he can show you a working model of each of these inventions, unlike many other inventors whose ideas exist only on paper, and which often fall down, miserably, when actually built and tested.

In this connection it is interesting to consider for a moment that not one of the new wireless "static and interference preventers" proposed to the government radio experts during the war, proved practicable in the least.



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The Rogers Undersea Wireless Opens Up an Entirely New Field to Submarines and Ship Communication. Marconi Recently Stated that Submarines Had to Come to the Surface to Intercept Radio Messages, but the Rogers Invention Has Upset All This. On a Recent Test a U.S. Subsea Boat Submerged Off the American Coast to a Depth of 8 Feet and Picked Up Nauen, the German Station. At Depths of 21 Feet Stations with Wave Lengths over 12,000 Meters Were Easily Picked Up. Transmission to Submarines Has Also Been Accomplishd.

Official recognition of Mr. Rogers as the one and only original inventor of "Under-ground and Sub-sea Wireless Communication," was soon forthcoming, and here it is in brief. These two official letters of recognition of Mr. Rogers' wonderful and revolutionizing invention represent but a

been in use by the Navy Department, may be judged by the fact that radio men everywhere are amazed at this feat. The distinguished radio savant Prof. George W. Pierce of Harvard University, congratulated Mr. Rogers heartily when he first tested and heard the new system work thru salt water, which he at first thought absolutely impossible.

Below we give the two letters of official recognition by the Navy Department of Mr. Rogers' accomplishments, which are all that we have space for.

In response to an inquiry from Clarence J. Owens, director general of the Southern Commercial Congress, Admiral Griffin, U. S. N., chief of the bureau of steam engineering, wrote under date of December 27, 1918, as follows:

"In reply to your question regarding the originator of the underground radio system, you are advised that Mr. J. H. Rogers of Hyattsville, Md., was the originator of this system. There have been other claimants to methods of underground radio signalling, but none were useful, within the Navy Department's knowledge to the extent of being a valuable asset to the general scheme of radio communications. The introduction of Mr. Rogers' receiving system marked the beginning of the use of underground aërials for receiving, to great advantage over raised aërials, and has been valuable to the Navy during the war."

Rear Admiral Strother Smith, then Capt. Smith, wrote Mr. Rogers on December 7, 1917:

"It is a great pleasure to me to feel that I have been instrumental in bringing the result of your work before the Navy Department and assisting somewhat in putting it into actual practise. Out of the many thousand ideas presented you can realize that a very, very small percentage are valuable and it is worth at least a year's work to get one that I feel will give lasting benefit to the service that I take pleasure in serving."

#### The Navy Department Interested.

Thru Dr. George H. Lamar and Senator Blair Lee the discovery and the status of the patents were brought to the attention of Secretary Daniels of the Navy. Secretary Daniels ordered inquiry into Mr. Rogers' claims, which showed that his invention worked, and requested Secretary Lane to give special consideration to pending patent applications.

Secretary Daniels then submitted the Rogers system to Rear Admiral (then Captain) Strother Smith, who called into consultation Capt. Hooper. These officers made a thoro study of the system and found it practicable. Capt. Hooper ordered it installed at New Orleans first and since then it has been employed at Belmar, N. J.,\* and other stations.

\* At the time of writing this article the Belmar Trans-Atlantic Receiving Station is still employing the Rogers underground antenna.

For a decade Mr. Rogers has been studying radio subjects, and long before the United States entered the war he had experimented with the problem of ridding aërial communication of this static atmospheric electricity. He disagreed with all authorities who believed that the air, and

Hyattsville, Md.,  
January 13, 1919.

Dr. Nikola Tesla,  
New York City, N. Y.

Dear Dr. Tesla:—

I have just read with great interest your article in the *Electrical Experimenter*. For years I have been a firm believer in the theory that far distant aërials were actuated thru the medium of the Earth and not thru the ether above, and it is a source of great satisfaction that so illustrious a personage as yourself has held to the same belief. I have never met a scientist who would entertain such a proposition until I demonstrated to them results described in the enclosed paper, illustrating one of the ways I have found for utilizing the energy so clearly and forcibly described by you. I am, nevertheless, confronted by some who will not give up old theories. If you could do me the great honor of writing a few lines upon the scientific feature I would deem it a great favor.

Should you chance to be in Washington at any time I will be highly gratified to have you visit my laboratory and witness the results obtained.

Very sincerely,

(Signed) J. Harris Rogers.

very small fraction of those he has received from radio engineers of high repute in all parts of the world, congratulating him on his masterly work. The Navy Department has just permitted information on the Rogers system to be given out, and how well they kept their secret during the World War, during which time this system has

#### To the American Radio Amateur:

WITHIN the next few months peace will be declared and the amateur will be allowed to operate his station as before. Thanks to Mr. James H. Rogers, it will not, however, be necessary for you to put up an aerial again—at least not for receiving. Elevated aërials will be a thing of the past, and well they may.

But ordinarily the amateur would not be permitted to use the underground aerial system on account of Mr. Rogers' fundamental patents. The writer, however, in conversation with Mr. Rogers, prevailed upon him to allow amateurs the free use of his revolutionary, as well as epoch-making invention.

Mr. Rogers thru the *ELECTRICAL EXPERIMENTER* therefore wishes to announce that he personally has no objection if amateurs use his system privately. It should be understood that the inventor only gives this permission to amateurs as such, and that this permission, of course, does not extend to firms or corporations or to individuals engaged in commercial Radio work.

We wish to congratulate our readers upon this important decision of Mr. Rogers, who certainly deserves the everlasting gratitude of all American Radio Amateurs.

H. GERNSBACK.

not the earth and water, was best suited for wireless communication.

At first Mr. Rogers used the earth alone for sending messages to amateurs stationed near by. Using an audion bulb, he then buried a wire from his laboratory and heard Philadelphia and other stations. Further experiments were conducted at a laboratory

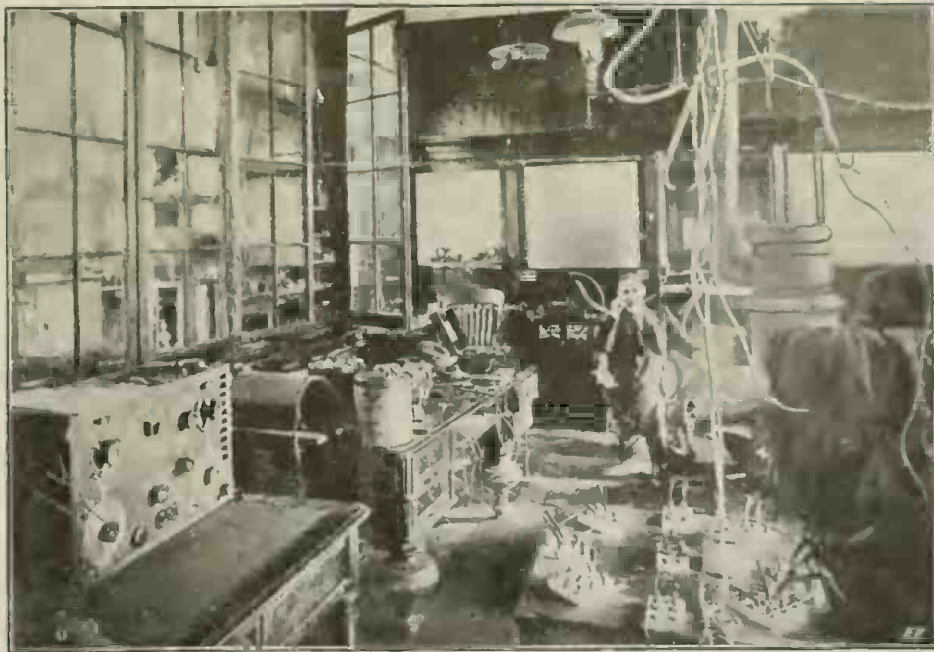
near Bladensburg, which he calls "Mount Hooper," in honor of Commander Hooper of the Navy, who rendered excellent service in adapting the invention to the needs of the Navy Department.

When Mr. Rogers first stated that messages could be received and sent from submarines when submerged it was unanimously declared to be impossible and the officials of the Bureau of Standards were not alone in this belief, as no less a personage than Marconi declared at a banquet given in his honor in Washington, that when wireless was used on submarines, "it was necessary for the submarine to come to the top in order to catch the ether waves."

To demonstrate more clearly the underground system and to show how it could be used in trench warfare, Mr. Rogers constructed an underground station, wholly inclosed beneath the surface of the earth, there being no visual existence of it outside. This place in Prince Georges county was visited by some very noted men, including Dr. Abraham, the head of the French Scientific Commission, who, upon entering the cave at Mount Hooper expressed his amazement and remarked, "the Germans can't get us here." Lieutenant Paternot, of the French Scientific Commission and the radio representative of France, also heard his native stations talking and expressed equal satisfaction, pleasure and amazement.

How He Conceived the Underground System.

The writer asked Mr. Rogers just how he came to form the idea of the "Underground and Sub-sea Radio." He explained that from his very first study of the method of transmitting radio signals by means of an elevated antenna, the question constantly presented itself to his mind—"If 50 units of power are past into the aerial, then what becomes of the equal amount of energy which passes into the



Another View of Mr. Rogers in His Laboratory. Note the Glass Instrument Cases, and in the Background May Be Seen His Early Printing Telegraph Model.

he has proved it. Another early idea of his in the theoretical aspect of radio-communication was as follows, and very logical it was, too, as you will agree: He held that if the outer crust of the earth is a conductor, and the surrounding atmospheric envelope is an insulator, then how infinitely better must the former be for the transmission of any form of electric current.

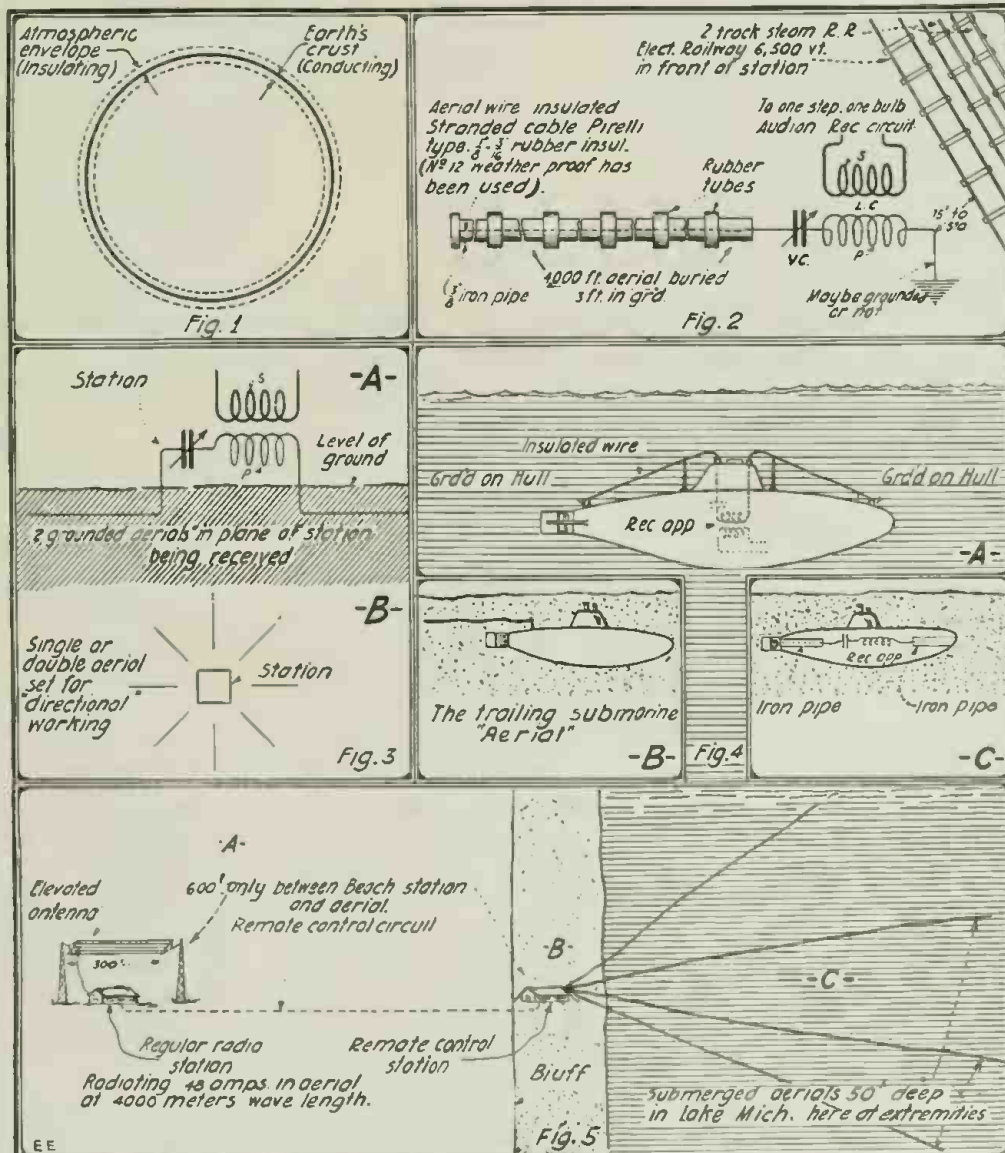
To Mr. Rogers' mind it was more reasonable to suppose that the energy liberated at the base of an aerial was propagated thru the earth as well as thru the ether above, and that an elevated aerial, at great distance, would be actuated by them as effectually as if the waves reached the same point thru the ether above; when the waves thru the earth reached the base of the aerial the potential of the plate would be raised and lowered and the aerial would accordingly be energized. Thus was his basic and original idea conceived and settled upon.

Mr. Rogers' first trial with the underground wireless to nearby radio amateurs began about seven years ago, but his theory of the reason why it must work was formulated over ten years ago. Further, he conjectured that much less power would be required to propagate a wave or current thru the earth's conducting crust, which for one thing has smaller geometrical dimensions, than to propagate it thru the insulating atmospheric envelope alone. See Fig. 1.

The Theory of Operation.

A number of other radical ideas were entertained for several years by Mr. Rogers, and in the course of time he has found that his ideas were correct—it worked! it worked! it worked! And now the radio experts far and wide are holding a post mortem inquest on their theories and how it all happened. To start with, Mr. Rogers stated, "special credit is due the following gentlemen, who have re-

(Cont. on page 832)



Various Arrangements of the Rogers Ground Aerial System, Including the Submarine "Under-water" Antenna.