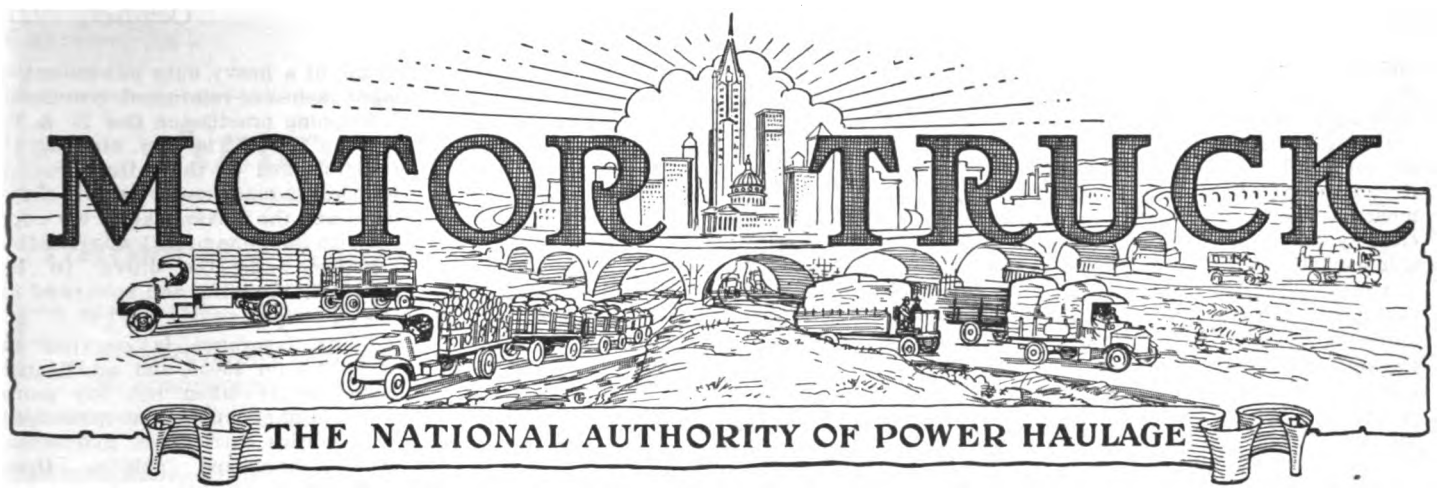


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# Radiophone Adapted to Trucks

## Unique Sending Set Allows Truck Drivers to Receive Messages from Home Office—Equipment Inexpensive and Operates as Easily as House Telephone.

**IT IS probable that nearly every truck driver has read in the newspapers and magazines devoted to new mechanical and electrical ideas, descriptions of vehicles controlled by a new element called Radio, which is able, at the will of the operator and at a distance from the object so controlled, to make the vehicle perform in a manner similar to that when an operator is aboard and operating the vehicle himself. Small automobiles have been used in an experimental way for this purpose and in some instances larger models which very nearly approach the conventional sized motor truck. Such vehicles are equipped with the necessary instruments for controlling the vehicle and closely resemble those used by the operator.**

**The United States government has accomplished much in this line and uses the principles of radio control to manoeuver obsolete war ships employed for targets in big gun practise.**

THE operator and the set of instruments controlling the movements of the vessel are usually located on a second vessel, which is kept at a safe distance from the target and all movements of the target, which may include turning in a circle, going ahead, backing up, changing speed, from slow to fast, etc., are entirely at the mastery of the operator.

Wireless or radio telegraphy has been in use for some years, and practically every high-school boy is more or less familiar with its working principles. As soon as the boy gets interested in the subject he rigs up a wireless set at his home with antennae on the roof of the house and suitable instruments in his room, usually home-made, but often purchased, and receives great enjoyment from listening in to the talk of other school boys in his immediate vicinity or, if his instruments are powerful enough, he may be able to attune them to the right pitch and hear conversations of the major government stations.

Each state has an ever-increasing number of amateur wireless operators and the call for instruments to fill this demand tends to show the interest taken in this subject by young America. The conversation is carried on entirely by the Morse code of dots and dashes and for this reason is more adaptable to stationary outfits than for portable use. Although some operators who are particularly skilled, have made portable sets which can be transported in a suit case, such outfits are more of a novelty as their working radius is short.

Many amateurs have shown great ingenuity in making their instruments, and this has naturally caused improvement and advancement in the older forms, forcing manufacturers of this type of apparatus to devise and offer for sale instruments and apparatus that are up to date.

Radio operators in all parts of the country are becoming more or less interested in the newer form of wireless and are studying and experimenting with the latest, the radiophone, a form of intercommunication without connecting wires. That it will not conflict with the usual form of telephone service using wires either now or in the future, is a foregone conclusion because it occupies a field entirely separate from the older form using connecting wires, and large telephone companies are already established to handle the business of cities and towns, which the radiophone cannot handle. Again the radiophone loses its acoustic powers in large cities on account of the number of steel frame buildings that absorb its current, weakening the tone and preventing it from functioning at its best.

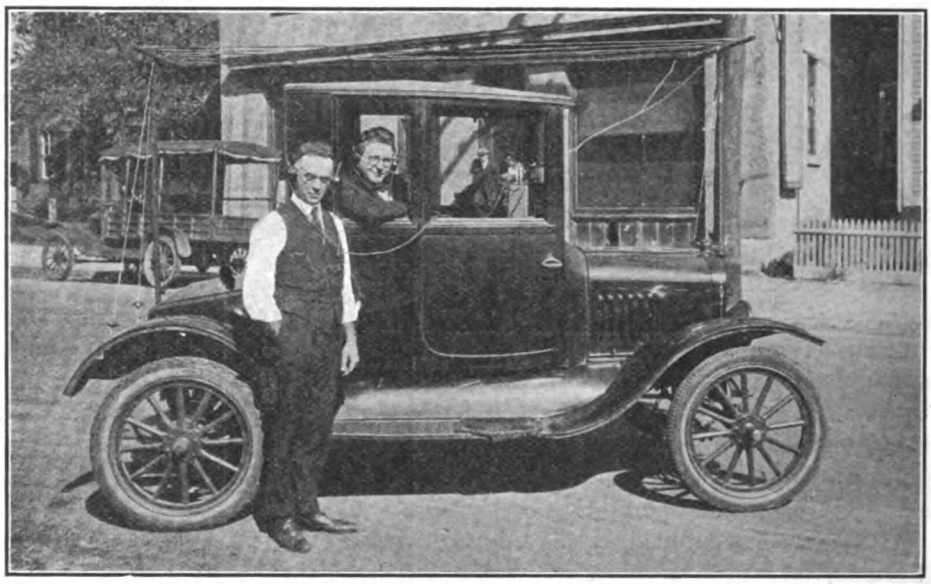
During the war great strides were made in both radio telegraphy and radio telephones, especially in the latter, as they were used largely between isolated points of observation for sending and receiving orders from headquarters. Messages were sent in code form that were not readily translated by the enemy and the usefulness of this form of telephoning was amply demonstrated.

In its improved form and simplified apparatus radiophone messages may now be sent practically any distance without the use of wires, depending simply upon the sending voltage and the ability of the receiving instruments to receive and make the message clear.

### Principle of Operation.

Throw a stone into a pond of water and waves radiate out from the point where the stone entered, spreading in all directions till they eventually reach the shore or are lost in the larger body of water. Cause a spark to jump a gap in the atmosphere and waves of like nature are set up which travel in like manner from the point of contact. The ether of the atmosphere is the medium which transmits wave movements, caused by the electric spark to travel with the velocity of light to distant points, the distance travelled depending upon the amount of initial motion or the intensity of the spark. For this reason sparks of high frequency, voltage or pressure are required in wireless telegraphy or wireless telephony. The intensity of the spark determines the wave length, while the calling or called station depends upon a certain tone to the wave for sending and answering and is termed tuning; that is, one station will have a certain tone which it uses in sending and receiving messages, while another station to receive the messages must meet that tone exactly to receive the message.


**Ford Coupe Owned by Mr. Giblin, Pawtucket, R. I., Equipped with the Radiophone Receiving Set Capable of Receiving Messages a Distance of 150 Miles from Sending Station—The Antennae Are Strung Only a Few Inches Above the Coupe Top.**



**Mr. Giblin Demonstrating the Radiophone to the Writer—This Illustration Gives a Good Idea of the Manner in Which the Antennae Are Attached.**

Heretofore it has been necessary to have large generating sets and high towers to carry the antennae for transmitting the messages over long distances. These are still necessary in the large major stations owned by the United States and foreign governments, but for the smaller installations of amateurs the masts carrying the antennae are not as high, but the results are sufficient for experimental purposes. Powerful coils composed of many turns of copper wire are used to raise the voltage given by the generator to a sufficient height for transmitting the message, and coils of equal power are used at the receiving end.

Wireless telephony, on the other hand, does not demand such expensive equipment, as the wave lengths are shorter and high masts are not required. In fact good results have been obtained by burying the antennae wires in the ground, having several of them run in different directions so that it is possible to pick up a message from any point of the compass. A switch, connected to each wire by contacts and a revolving arm makes contact with the connectors, providing means of selecting the wire which points in the right direction.

### Developed Duo-Lateral Inductance Coil.

A young man who is very much interested in this subject and who has done much to further the cause is Thomas P. Giblin of Pawtucket, R. I., who is responsible for the development of the Duo-Lateral inductance coil.

### Radiophone Adapted to Motor Vehicle Service.

The honeycomb wound coil, contrary to popular belief, is not a new invention, as approximately 15 years ago it was conceived and samples were actually made.

The unique machine which winds this type of efficient inductance is manufactured by the Universal Winding Co., an eastern concern, which is primarily the maker of textile winding machines, which include apparatus to accomplish the winding of everything from fine silk thread to heavy rope, as well as wire. Who would believe that this famous inductance coil was in any way connected with the ordinary cotton yarn winding machine? Shortly after the war started the "bank" form of winding made its entry into commercial radio apparatus. The winding was literally snapped up on account of its small distributed capacity within a minimum space area. Its great fault, however, was that the inductance made after this fashion had to be wound by hand, which proved very costly.

The sudden demand for radio receiving apparatus forced manufacturers to seek some method of winding the coils by machinery. This problem was submitted to the Universal Winding Co. and was neatly solved by the use of one of their winding machines. Mr. Giblin, an electrical engineer, a real and enthusiastic radio amateur, being connected with the company, took up the matter of this proposed bank winding machine and after careful study and experimentation with the assistance of mechanical experts, decided that such a machine could not be developed in the limited time allowed by the government; the primary consideration being to manufacture great numbers of receiving instruments as soon as possible for use during the war emergency.

After the armistice was signed, late in 1918, one of the large radio manufacturers became desirous of bringing out new apparatus. Experts were sent East and the subject of the basket wound coil was again taken up. Mr. Giblin was not to be again side-tracked in his belief that this type of coil and method of winding would prove effective for radio work, and continued his experiments so that in February, 1919, he developed the first practical honeycomb coil.

After a number of exhaustive tests at the Bureau of Standards and leading radio colleges, as well as by large radio manufacturers, several designs were perfected, making this type of winding most suitable and effective for short and long wave reception. Several months after the fame of the honeycomb coil had travelled far and wide and as an example of its highly successful commercial value, it has been estimated that from July, 1919, to April 1920, approximately 80,000 coils were distributed throughout the world. At present over 12,000 coils are being sold each month.

### Duo-Lateral Inductance Coil a Decided Improvement.

Not being fully satisfied with the characteristics of the honeycomb coil, the inventor later brought out a new type of inductance called the Duo-Lateral, which is stated to by far exceed other coils in efficiency. Although this later coil much resembles the former, it has decided electrical advantages, and these are made possible through its peculiar mechanical construction.

Laboratory experiments at reputable colleges and also by reputable manufacturers, have proved that this coil, in comparison with other similar types, has 15 per cent. less distributed capacity, 12 per cent. more inductance, as well as 7½ per cent. less high-frequency resistance and natural period. Not only this, but it is

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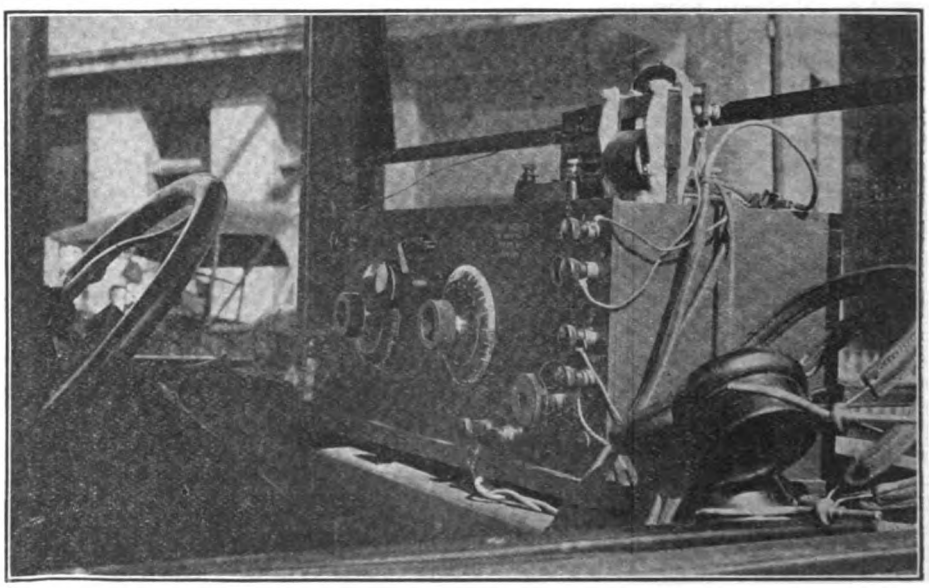

**Receiving Set Occupies but Little Space in Coupe at Right of Driver—The Sensitive Receivers Are at Extreme Right, While Knurled Buttons on Front of Set Enable Operator to Tune It to Correspond with Transmitting Set—Wire at Left Connects Antennae on Roof of Ford Car with Set.**

(Continued from Page 564.)

much smaller in size for given distance than any machine wound coil on the market.

These inductances can be wound to any size and shaped to any desired inductance. This is on account of its mechanical construction, whereby greater inductance can be secured and, owing to its regulated construction, it is a very strong, compact unit.

The Duo-Lateral coil differs from the honeycomb coil winding in that the alternate layers of wires are positioned above and between the wires of the lower layer in the former and parallel with the wires of the lower layer of wires in the latter.

In recent tests with a Mexico City radio station, it was found that on a wave length of 4500 meters the signals were 100 per cent. louder than given by other existing types of inductance coils.

The Duo-Lateral inductance coil has attracted the attention of the "Big Three" (the three largest radio manufacturing companies). Dr. J. H. Rogers is at present using them in connection with his underground circuit, and is also employing them in his experiments to determine whether or not Mars is signalling the earth.

Signals, barely audible, and in some cases inaudible, are easily readable with the Duo-Lateral coil, which marks this as undoubtedly the greatest step forward in the radio art since the introduction of the vacuum tube.

By means of several of these Duo-Lateral coils, together with one or two variable condensers and a vacuum tube unit, it becomes possible to receive a high range of signals, it is stated, and to cover exceptional distances. In brief, such a combination represents the ultra-efficient in radio receiving with or without amplification.

### Tests Radiophone with Coupe.

Mr. Giblin recently equipped his Ford coupe with a radiophone outfit and demonstrated to his friends the possibilities of this form of telephoning.

Tests took place recently at a local battery station owned by Harry Hanlon, a man well versed in electrical work through long years of practical experience on storage batteries and steam engine practise for the local trolley company. The Ford coupe was driven into the basement of the station and conversation carried on between Mr. Giblin's home and the receiving set in the Ford coupe. An ordinary house radio receiving set was used, and the conversation was unusually clear for the short distance transmitted, about a mile, and the fact that more or less noise from the street interfered. The sound of the voice was distinct and so intense that it was necessary for Mr. Giblin to hold the receivers away from his ears to hear with comfort.

The car was next driven out of the city for several miles and communication again established with Mr. Giblin's home. The voice at the receiving set in the Ford coupe was heard clearly and without the sharp tones experienced in the battery station. To still further test the abilities of the phone the car was driven due east to Middleboro, Mass., a distance of about 30 miles, and the resulting conversation between the two points was transmitted more successfully than at the shorter distance. The following day the car was driven to Plainville, Mass., a distance of about 20 miles, and the experiment was repeated. Connections were easily established and the conversation heard as clearly as at the 30-mile distance of the day before, proving that the radiophone worked better at longer distances than it did near by. Although tests were not given at this time to demonstrate the full limit of the 'phones, confidence is expressed by Mr. Giblin that it would easily answer for establishing communication between points 150 miles apart, as for instance, between truck drivers away from their home office on trips.

The receiving set used in the Ford coupe was a house set somewhat larger than required for radiophone work in a car or truck, and is capable of being reduced in size and still retain its ability to receive over the distances specified. To install a transmitting set to be used in conjunction with the receiving set would probably cost in the neighborhood of $150 for a direct current generator of sufficient size to generate current of sufficient voltage for transmitting.

As stated above two factors enter into the successful operation of the radiophone, one being the voltage of the generator, which must be a direct-current machine of about 350 to 500 volts capacity and the other the amperage which, in the case mentioned, is about .5 of an ampere.

The current necessary to operate the receiving set in the Ford coupe was taken from the storage battery of the car and for the short time that the conversation was carried on caused very little drain on the battery; so small in fact that it was unnoticeable.

The antennae were conveniently located on the top of the car, but seven feet from the ground, and the car was necessarily insulated from the ground by the four rubber tires. No ground connection was used in any of the tests and it was found that conversation was carried on successfully without it.

Mr. Giblin feels that he has added something to the benefits of mankind by the results thus far obtained. He has been an enthusiast in this subject for a number of years and although still in his thirties, he has wide experience in government wireless service and has been a deep student of all that is going on in the wireless world. Mr. Giblin is at present superintendent of the Standard Radio & Electric Co., Pawtucket, R. I., manufacturer of small electrical units, including cut-outs for automobile wiring systems, storage batteries, radio coils and units of various descriptions. His prediction that great strides will be made during the next five years in radio work compels more than passing thought of this, the latest and newest science which is interesting mankind both old and young. He states that he feels very sure that the radiophone will be very generally adopted and widely used by motor vehicles because it reveals opportunities heretofore considered impossible and opens a wide field of usefulness for radio apparatus of the telephone type.

The Ford Motor Co., through its local state agent, Dutee Wilcox Flint, has become very much interested in this project, as a Ford coupe was used for the experimental work. What this will eventually lead to cannot be predicted, but one can conjecture that it will be their endeavor to interest commercial houses in the possibilities to be gained by equipping Ford salesman's cars with radiophones so that the house sales manager may be in constant touch with his salesmen while on the road. The benefits of this feature are readily understood when one realizes that salesmen for commercial houses are often on the road for weeks at a time and often far from points of communication with the home office.

Doctors are often wanted out of office hours when they are making their calls. With a radiophone installed in the office and a similar set in the doctor's car it would be a simple matter to summon him in emergency cases. Fleet owners often wish to re-route their trucks from some distant point; this is now often impossible, but the radiophone with its wide range could quickly locate the missing truck, deliver its message and send the truck and its driver to a point designated where additional work is available.

### Other Uses for Radiophone.

The Westinghouse Electric Co. quite recently mounted a sensitive wireless receiving outfit on a motor truck using a loop aerial as antenna. The truck is driven parallel to a high-tension power line to discover the leakage of the insulators. Wherever there is a bad leakage the crackling sound in the receivers of the radio outfit will quickly reveal the energy going to waste. An insulator may look all right from the outside, but it might be porous and thus waste a lot of the company's power. The radio receiver will instantly detect the bad insulator. Power companies in the West are now opening and closing switches in distant sub-power plants by radio. Instead of keeping an operator at each sub-station

### ALREADY IN USE.

**The Radiophone is being used by several heads of fire and police departments with marked success. In at least two recent instances the use of this device has resulted in the capture of criminals. A story is told of a fire department chief who used his Radiophone to summon additional apparatus when the local telephone service was interrupted, the fire being in the outskirts of the city and too far away from the call box to admit using that system.**

to throw the switches in and out, this is now accomplished without the touch of human hands.

Other possible uses will suggest themselves such as trailing stolen automobiles by sound, pursuing automobile thieves, detecting bodies of mineral ore, hidden treasure and large bodies of oil. These are just a few ideas and methods of working them out will no doubt occur to radio operators of experience.

The government also plans to send certain information to farmers at a certain hour in order those wishing it may be advised of the hour to expect it.

The British government is already considering the appointing of a commission composed of representatives of all of her colonies to consider the practical means available for the development of imperial communication by land, sea, air, radio telegraphy and radio telephony.

Some experiments with wireless telephone apparatus have recently been made between Sainte Assise (near Melu) and Beauvais, France. Transmission and receiving were effected by means of valve sets manufactured by the Societe Francaise Radio-electrique using a transmitting energy of not more than five watts. The distance between the two stations is 74 miles, but no difficulty was experienced throughout the entire test.