

STELTJE'S TYPE-PRINTING TELEGRAPH.

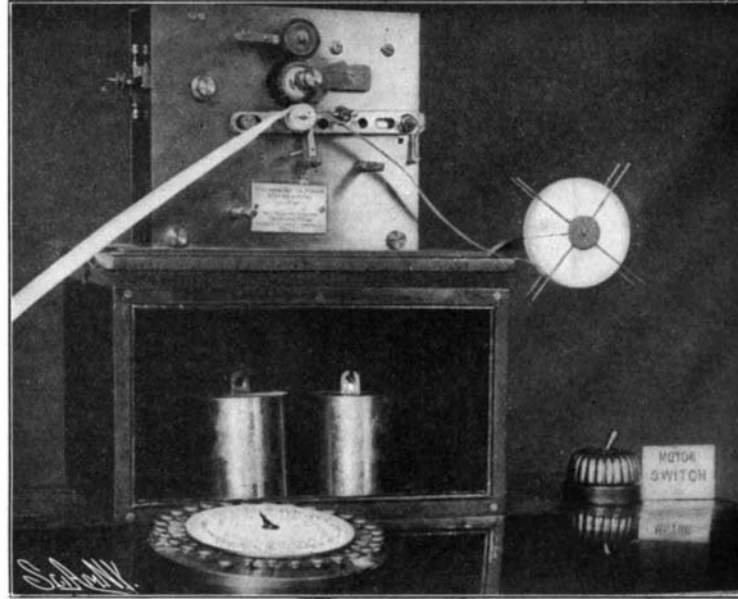
The leading features of the Steltje's type-printing telegraph, improved by the Type Printing Telegraph Corporation, are that no batteries are required, no expert telegraphists needed, and the message is printed automatically at both ends of the lines.

The sending part of the Steltje's telegraph recorder is essentially the same as the well-known Wheatstone A B C instrument, the keys being arranged round a dial on which are marked the characters to which they correspond.

The receiver, however, differs in that the letters are printed on a continuous tape instead of being merely pointed to by a moving needle, which cannot easily be followed if worked beyond a certain rate. Hence no operator is required at the receiving end. The instrument, like the ordinary tape machine, prints its message in plain characters, but will work with currents of 8 milliamperes generated by a small magneto. The keyboard permits of 58 different characters being dispatched. The apparatus can be used on an ordinary telephone line without in any way interfering with its use for speaking over.

The receiving instrument consists of a train of clock work actuating a typewheel and controlled by two magnets. One of these is called the busy magnet, and the other the lazy magnet. The current operating the instrument is a high-tension alternating current generated either by turning a handle, by working a pedal, or by a small electric motor. As long as the current is kept flowing, the receiving instrument remains at rest, but on the depression of one of the keys in the transmitter, pulsations are transmitted along the line to the busy magnet, and rotate the typewheel synchronously with the rotation of the needle of the transmitter. The pointer of the transmitter comes to rest opposite the key depressed and the current is cut off. It is this cutting off of the alternating current altogether which operates the lazy magnet, allowing its armature to fall away and thereby releasing a second train of clockwork which brings the paper into contact with the typewheel to print a letter. There is an exceedingly beautiful arrangement for changing from letters to figures. The key opposite the word "Figures" is depressed on the transmitter, whereby the typewheel at once takes up a corresponding position at the receiving end. No impression takes place because there is no letter on the typewheel at that particular spot, but the typewheel carries a small projection on its axis, which in this particular position is caught by a projection on the printing lever, or lever which lifts the paper into contact with the typewheel, and the typewheel is thereby shifted longitudinally on its axis and prints figures until it is returned to its letter-printing position in a similar way. The method of obtaining synchronism is very interesting. Of course it is necessary that the typewheel and the pointer on the transmitting dial should revolve accurately together and should start together from the zero point. This is accomplished by means of a lever at the receiving end, which slowly rises as the typewheel revolves and after three or four revolutions gets into the path of a projection on the typewheel shaft, thus stopping it in the zero position. The first movement of the printing lever returns the lever to its normal position and allows the typewheel to rotate again to get into position for the next letter.

The advantages—not merely claimed, but practically established—are simplicity of working, celerity, and accuracy. Mr. Steltje's novel and ingenious instrument possesses moreover the great advantage of providing a record of all that passes at each end of the circuit simultaneously for subsequent reference and confirmation, and thus furnishes the missing link so long desired. It appears that the instruments work admirably in series, so that a message can be transmitted from one station to six or more stations at once, at all of which a printed record will be produced; and moreover, owing to the very small current required to operate the mechanism,



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ism, it appears that messages can be sent along an uninsulated wire lying on the ground. Messages can be dispatched at a very rapid rate; the instrument weighs no more than 28 pounds. Last October the invention was tried by the German military authorities

with excellent results. In Vienna 50 soldiers were one afternoon instructed in the working of the instrument, and it was not found necessary for any expert engineer to interfere during the whole of the trials, which lasted a week. The fact also that Steltje's apparatus can be worked over their cavalry wire cannot be too highly appreciated. The necessary wire for purposes of telegraphic communication can be carried by men on the march. The instrument has been adopted by most of the continental armies, and has become popular in Austria, Siam, Spain, Nicaragua, etc. This apparatus is one likely to be also useful in large offices where messages have to be sent privately from one room to another which may be far away, without the disadvantage of a personal journey being necessary. The system would seem to have a good prospect of success in the commercial world, because enormous possibilities are undoubtedly open for the utilization of this invention.

French Academy Prizes.

At the annual public session of the Academy on October 26, President Perrot announced a number of prizes, including \$1,400 for experiments at the Sorbonne Laboratory to settle the differences between French and American scientists in connection with electrodynamics. The Academy awarded the prize of \$20,000 for the most remarkable scientific work to Dr. Roux, who continues to carry out the work begun by the late Prof. Pasteur. Dr. Roux accepted the prize on condition that the amount be devoted to the scientific investigations of the Pasteur Institute.

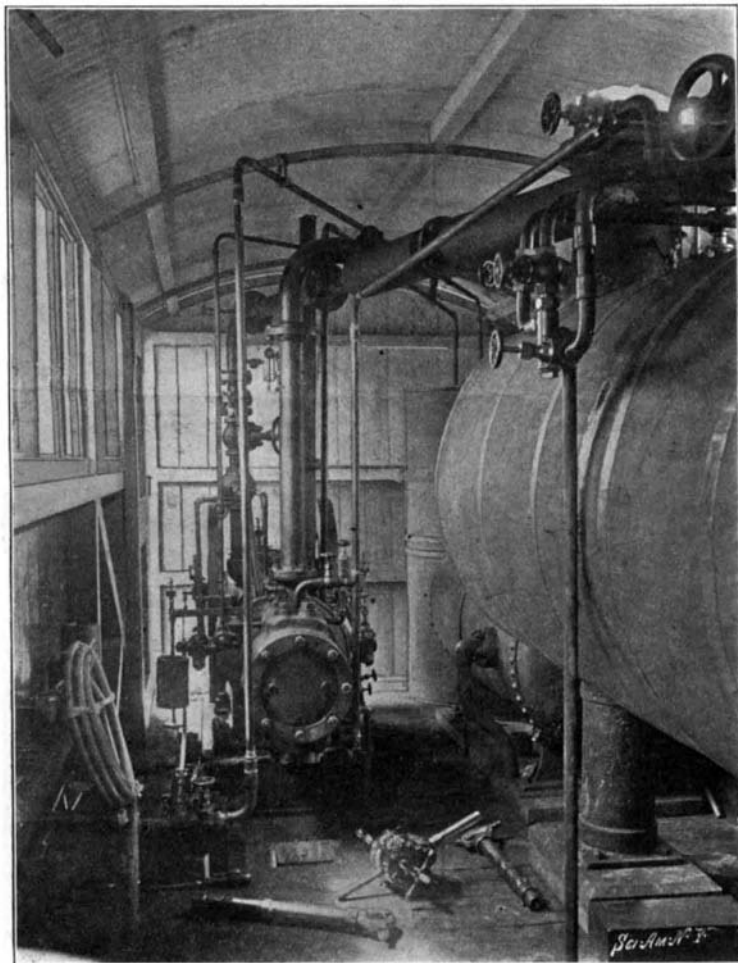
A PORTABLE PNEUMATIC TOOL OUTFIT FOR RAILROADS.

BY THE ENGLISH CORRESPONDENT OF THE SCIENTIFIC AMERICAN.

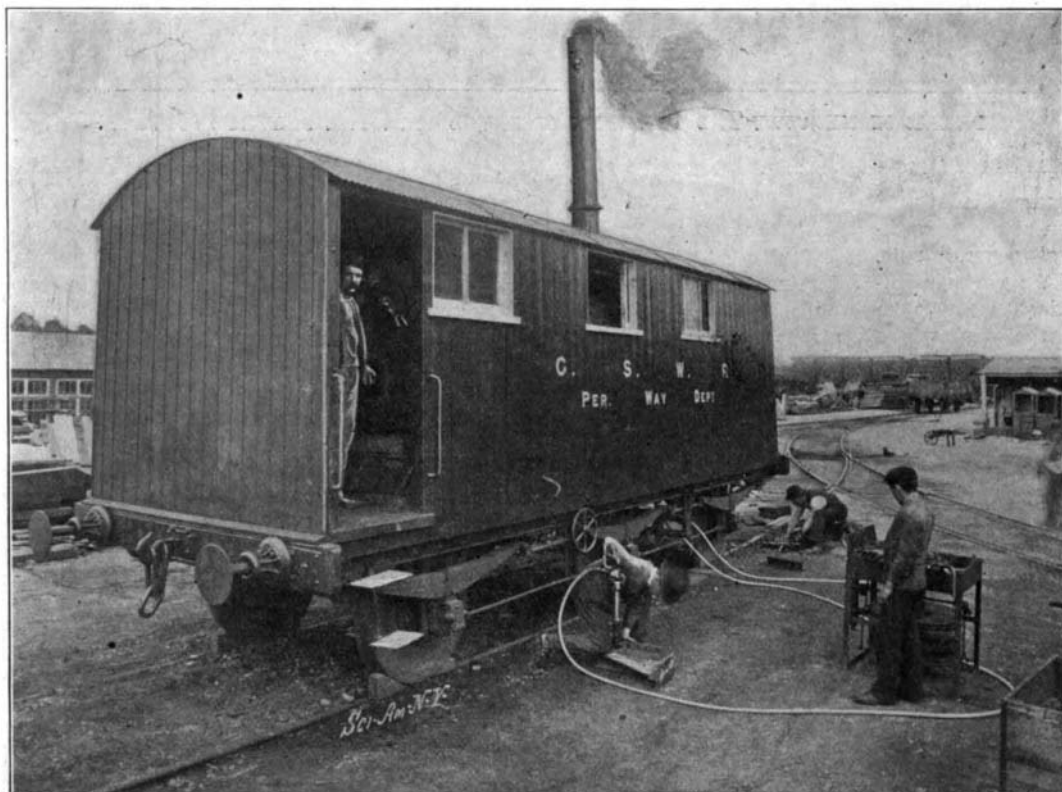
A compact and well-equipped complete portable pneumatic tool installation has recently been designed for the Great Southern & Western Railroad of Ireland by the International Pneumatic Tool Company. There are many phases of work and repairs upon a railroad for which such a pneumatic outfit is peculiarly adapted, notably the repair of bridges, relaying of the rails, and drilling operations, which can be more expeditiously and economically carried out by the aid of pneumatic tools than by the ordinary means of manual labor. The only difficulty in such work is the provision of the necessary air-compressing plant to operate the tools. The Great Southern & Western Railroad have had the car which we illustrate herewith specially constructed and fitted up with a complete installation necessary for emergency purposes.

The power for driving the air-compressing plant comprises a 12-horsepower semi-portable boiler, complete with steam injector and the other necessary fittings. The air compressor is of the horizontal straight-line, steam-driven type, with water jacket and automatic speed and pressure regulators, and it has a capacity of 134 cubic feet of free air per minute. This part of the plant is mounted on a sub-base fixed on the floor of the truck. Beneath the floor of the wagon is suspended a steel air tank. This reservoir is 6 feet in length by 2 feet 6 inches diameter, and is fitted with a flexible hose. The plant in the wagon itself also comprises a water-circulating tank, which for economy of space and weight fulfills a dual purpose—cooling the air-compressing cylinder and feed-water tank for the steam engine boiler.

The pneumatic tools provided with the plant consist of two long-stroke hammers capable of closing down rivets of one inch diameter, and two pneumatic holders for use with them; two No. 2 "Little Giant" drills for boring holes up to 1 1/4 inches diameter, several lengths of 1/2 inch metallic covered flexible hose, to enable the tools to be operated at a distance from the vehicle, air filters, air-cocks, hose-clips, etc. The plant, which has been in operation for some weeks, has proved a great benefit for general and temporary work, both in the saving of labor, the expedition of the work in hand, and cheapening of the



INTERIOR OF THE REPAIR-CAR, EQUIPPED WITH PNEUMATIC TOOLS.



A PORTABLE PNEUMATIC TOOL OUTFIT FOR USE IN RAILWAY-BRIDGE REPAIRING.