

SOME INTERESTING FEATURES OF THE ELECTRICAL EXHIBITION.

Not long since we illustrated a new system of wireless telegraphy, designed by Mr. E. J. Clarke, of the United States Electrical Supply Company, of this city. Since then the system has been improved in many ways, and he is now giving an exhibition at the Electrical Show in the Madison Square Garden which is attracting a great deal of attention.

In a showcase in the center of the south gallery is placed an automatic transmitter, which is insulated. A storage battery of four cells is placed in the lower part of the case, which feeds the primary of a 4-inch spark coil, the current from the battery first passing through an automatic circuit breaker (not shown). This automatic circuit breaker does not take the place of the vibrator of the coil (that being provided as usual), but is so arranged that it will make and break the circuit in the same manner as a telegraph operator would when manipulating his Morse key in the act of calling N. Y. N. Y. N. Y., which is the well known telegraph call for New York City. In this way it will be seen that the sparks from the secondary of the coil are intermittent, and their duration is governed by the length of the time during which the automatic circuit breaker allows the circuit to be closed while making the dots and dashes. Immediately in front of the induction coil is placed the improved oscillator, which consists of two solid brass balls about four inches in diameter, as shown at 2 in our illustration, mounted so that the distance between them is adjustable. Outside these balls are placed two smaller balls about an inch and a half in diameter attached to sliding brass rods, on the outer end of which are other balls one inch in diameter, so that the distance between the large and the small balls can be easily adjusted. The secondary terminals of the coil are connected to binding posts on the base of the oscillator which connect direct with the brass standards that serve as supports for the sliding brass rods. The distance between the balls being properly adjusted and the current turned on from the battery, the sound of the secondary sparks passing between the balls can quite easily be recognized as the dots and dashes of the signal N. Y. So apparent is this that telegraph operators visiting the exposition are immediately attracted by the sound. One terminal of the oscillator is connected to earth and the other to a brass rod about ten feet in length placed on top of the showcase.

In the center of the north gallery directly opposite and about 200 feet distant is placed the receiver, which consists of a Clarke coherer relay and receiving instrument constructed almost precisely in the manner described in our issue of April 2, with the exception that a large six-inch vibrating bell is connected up in the local circuit in addition to the telegraph sounder. This six-inch bell is continually ringing out the Morse

signals N. Y. N. Y. N. Y., and by holding down the hammer of the bell the sounder can be distinctly heard repeating the same call. Considerable trouble has been experienced in overcoming the effects of self-induction in this apparatus, but now it is claimed the difficulty has been overcome.

In the center of the garden is placed a large tank of water, and four times each day a miniature warship about three feet in length is placed in this tank, and floated over a submarine mine, which is connected to

an ordinary electric fuse. The apparatus at the tank is placed on the outside, so that visitors to the exposition can readily understand the arrangements, but that is not necessary in any way, as Mr. Clarke is prepared to blow up mines in this way with all the apparatus contained in a waterproof box connected directly to the mine.

We understand a carefully insulated wire has been run from the transmitter to the highest point of the tower of the garden, and that during the next few days it is intended to send messages many miles from the city.

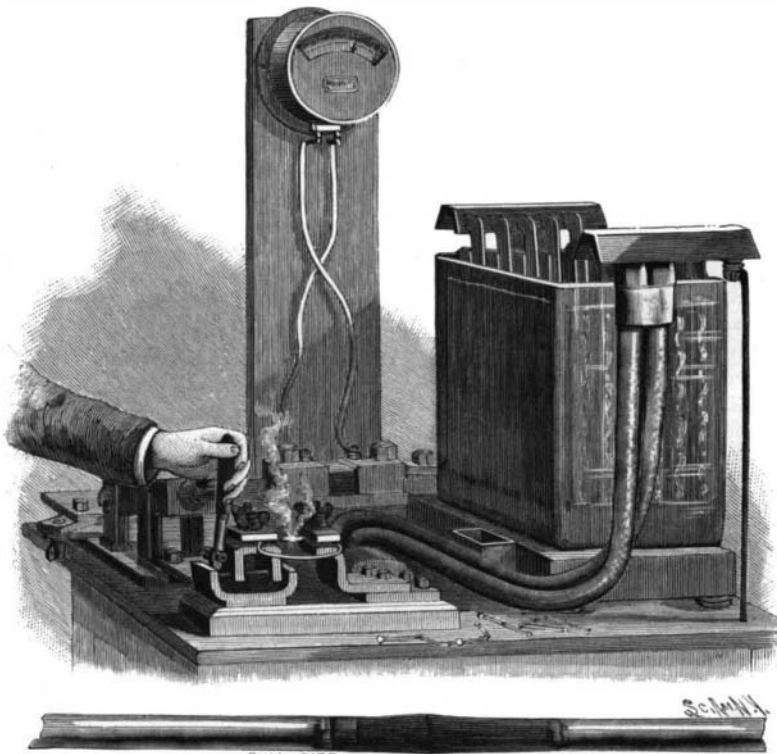
Among the interesting things to be seen at the Electrical Exhibition, now in progress, is the electrical welding outfit shown by the Electric Storage Battery Company, of Philadelphia and New York. The welding is done by one chloride accumulator element known as type F-11, consisting of eleven plates, each 10½ by 10½ inches. These plates are immersed in dilute sulphuric acid in a glass jar resting upon an insulated tray filled with sand. At the side of the cell, and connected to it through heavy cables, is a copper clamp, one jaw of which moves on a sliding contact. The metal to be welded is gripped in the clamps, and when brought to the proper heat, is forced together by means of the movable jaw. The usual method of the exhibition is to place a solid bar in the clamps, heat it to the melting point, break it by means of the sliding jaw, and then weld it. The power required depends upon the size of the bar operated upon.

The bars generally used take 800 amperes for a few seconds and the current then drops to 400 amperes, at which point the weld is completed. The cell operates at 2 volts, and the power required is, therefore, from 1.6 kilowatts to 0.8 kilowatt. The normal discharge rate of the cell is 50 amperes. The outside dimensions of the glass jar are

10½ inches by 12½ inches long by 15½ inches high. This outfit appears to be a very desirable one for the smaller welds required in many branches of manufacture. A very interesting souvenir furnished to visitors consists of two wire nails welded together at the point, as shown in the small detail figure.

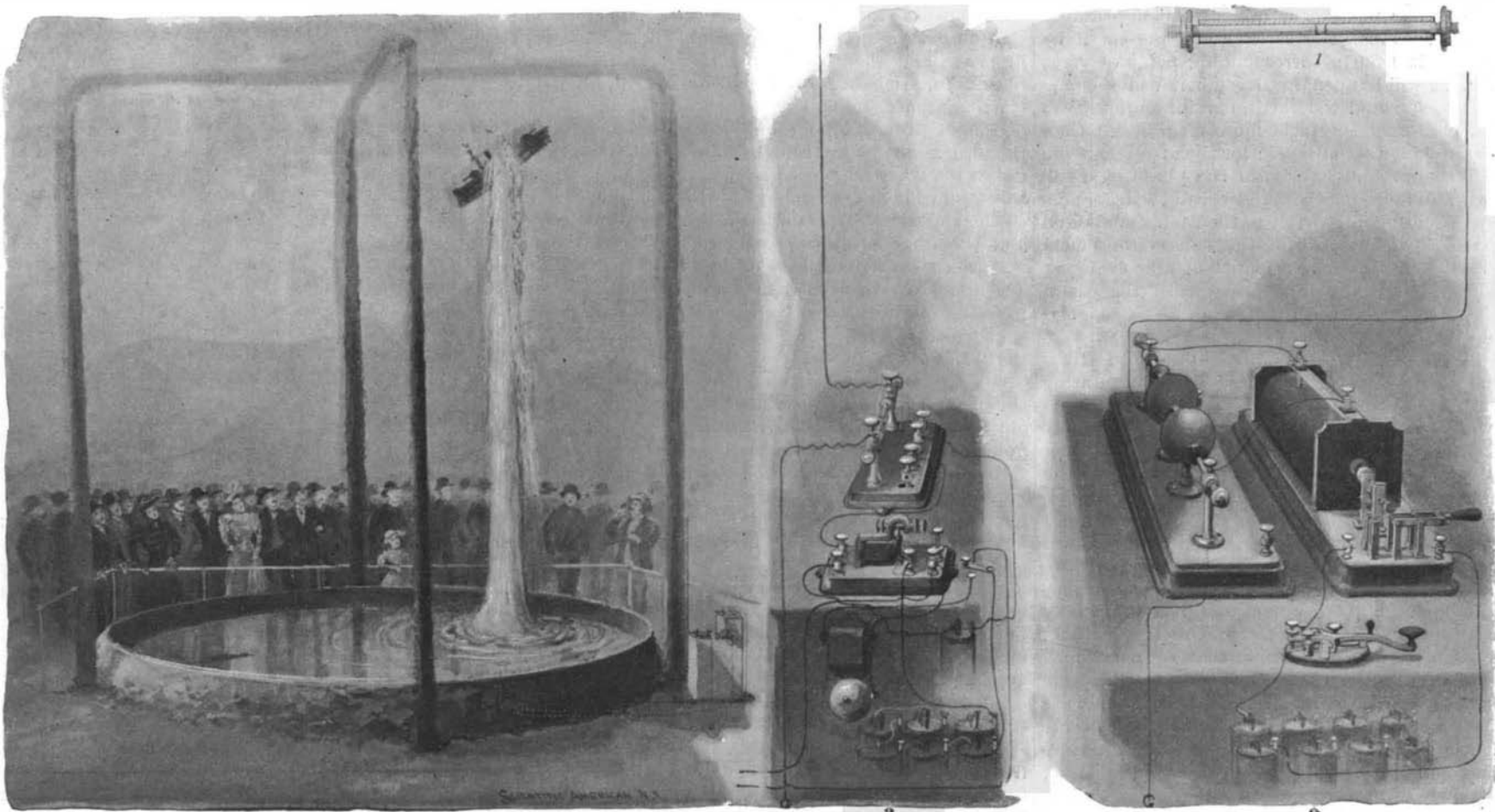
Training the Sight.

Mr. R. Brudenell Carter, F.R.C.S., in a lecture before the London Society of Arts, directs attention to the fact that acuteness of vision may be increased by training. He suggests that the average acuter vision of country over town children is due to the fact that the latter see chiefly large objects and under large visual angles, while the former are habitually attending to smaller and more distant objects, seen at smaller angles. He suggests, therefore, that school teachers should be instructed to test the vision of new pupils and record the same in a register, informing the parents of any defects observed.—Medical Times.



ELECTRIC WELDING BY MEANS OF AN ACCUMULATOR, AND A SAMPLE OF WORK.

a coherer, relay and battery placed immediately outside of the tank in the manner shown at 3 in our engraving (the coherer tube being shown enlarged at 1). One terminal of the coherer is connected to earth, and the other to an insulated wire rising about ten feet in the air. When the time comes for exploding the mine under the warship, the oscillator in the south gallery is stopped and connection made at the tank between the coherer and the vibrating bell which is used for testing purposes. The oscillator is now started for an instant to see if the bell at the tank rings, thus proving that the coherer is in proper adjustment. The bell is now disconnected, and connection made to the submarine mine instead, and at a signal from the attendant the man at the transmitter again presses the button, which throws the current into the oscillator, the coherer completes the local circuit and the mine instantly explodes, breaking the warship into splinters, and throwing it and the water high in the air. Of course it is understood that the mine is provided with



1. The coherer. 2. The transmitter. 3. Relay and testing bell.

EXPLOSION OF A SUBMARINE MINE BY ELECTRICAL WAVES FROM TRANSMITTER USED IN WIRELESS TELEGRAPHY.