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SIGNAL OFFICE, WAR DEPARTMENT.

INSTRUCTIONS FOR ERECTING

THE

ECCARD TELEPHONE APPARATUS

AND

LOCATING PRINCIPAL FAULTS.

U. S. Army, Signal corps.

INSTRUCTIONS NO. 82.



WASHINGTON CITY:
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WAR DEPARTMENT,
Washington, October 19, 1883.

I. The following instructions for erecting the Eccard Telephone apparatus and locating principal "faults," are published for the information and guidance of all concerned.

II. Instructions are in preparation for other models.

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9-3701

INSTRUCTIONS FOR ERECTING THE ECCARD TELEPHONE APPARATUS AND
LOCATING PRINCIPAL FAULTS.

I.—*To erect the apparatus.*

Select a place for the apparatus, Fig. 1, where there is no danger of its being jarred, and fasten it against a wall at such a height that the speaker's mouth will be opposite the mouth-piece of the transmitter, T-M.

II.—*To connect the battery.*

Fill the battery jar, as directed on the label, and place it in the battery-box, B; connect the battery to the wires terminating in battery-box.

III.—*To connect the hand-telephone to the call-box, C-B.*

Fasten the terminals of the telephone cord to the two binding-posts, T and T', Fig. 1, and hang the hand-telephone, Fig. 3, on the automatic switch, S, as shown in Fig. 1.

Care must be taken to replace the telephone on the switch, S, when not in use, as otherwise the battery will be exhausted.

IV.—*To connect the apparatus to the line.*

At the two terminal stations of the line, connect the line wire to the binding-post, L, and the ground wire to the binding-post, L', and run a short wire from binding-post, L', to binding-post, G, as shown in Fig. 1.

At the intermediate stations of the line (if there should be such), connect the two line wires to the binding-posts, L and L', and run a separate wire from the binding-post, G, to the ground.

V.—*To make ground connections.*

Ground wires should be prepared by burying a copper plate, two or three feet square, and to which a stout copper wire is securely soldered, to a sufficient depth to reach *moist* earth; or by soldering the copper wire securely to a water or gas pipe previously filed bright; the free end of the wire must then be connected to the binding-post, L', at terminal stations, and to the binding-post, G, at intermediate stations, as heretofore explained.

VI.—*To call up the other station.*

Turn the crank, C, of the generator, Fig. 1, in quick succession, which will produce a current of sufficient strength to ring the bell at the distant station, as well as your bell; wait until the call is answered, then take off the hand-telephone from the switch, S, and the instrument is ready for conversation.

If there are intermediate stations on a line, separate signals for each station must be adopted, such as the turning of the crank at stated intervals, two, three, or more times, as previously agreed upon.

VII.—*To locate trouble on the line.*

1. If in calling up the other station your bell should fail to ring, either the line is broken or your instrument is out of order; to test the latter, insert the plug, P, between the two metal plates on top of the call-box, C-B, which will short-circuit your own instrument; turn the crank, and, if your bell rings, it indicates that your instrument is all right. The trouble is outside of your own apparatus, and the line and ground wires must be examined for a break. If your bell fails to ring, the trouble is in the call-box, C-B, which should be replaced by another.

2. If in calling up the other station your bell should ring but no reply be received, it would indicate that either the line is grounded or your instrument is short-circuited.* To ascertain the cause, remove the line wire from the binding-post, L, and turn the crank, C; if your bell does not ring, then the trouble will be found in the line, it being either grounded or crossed with another wire; if your bell *does* ring, your apparatus is short-circuited. The inside connections of the switch, &c., should be examined, and if the trouble cannot be found, another call-box should be substituted.

Trouble from short-circuiting will scarcely ever occur.

3. In case the transmitter, T-M, or the hand-telephone, should fail to work, it should first be ascertained if the fault is in your instrument or in the one at the other end. To do this, short-circuit your instrument by inserting the plug, P, Fig. 1, as mentioned before; then slightly tap the door of, or speak into, the transmitter, which should be distinctly heard in your telephone. In case such a result is not

*A connection in the apparatus itself, usually caused by lightning, which prevents the current from passing to the line wire.

obtained, the battery and its connections should be examined, and, if in good condition, the transmitter should next be examined. Open the door of the transmitter and see that the two carbon pencils, N and N', Fig. 2, are resting loosely in their bearings; should this not be the case, loosen the two screws, X and X', to give the desired space. See that all the connections are secure.

4. The cord of the hand-telephone should be carefully examined; rough handling of, or dropping, the telephone will sometimes break the connections or short-circuit the two wires within the cord.

5. In case there is danger of induction from other wires on the same poles, it will be best to employ a metallic circuit, *i. e.*, run a line of two wires instead of making the earth a part of the circuit. Telephone lines thus constructed always give better results than with single wires.

6. Every morning, at a fixed time previously agreed upon, the apparatus should be tested by calling up each station.

Fig. 1.

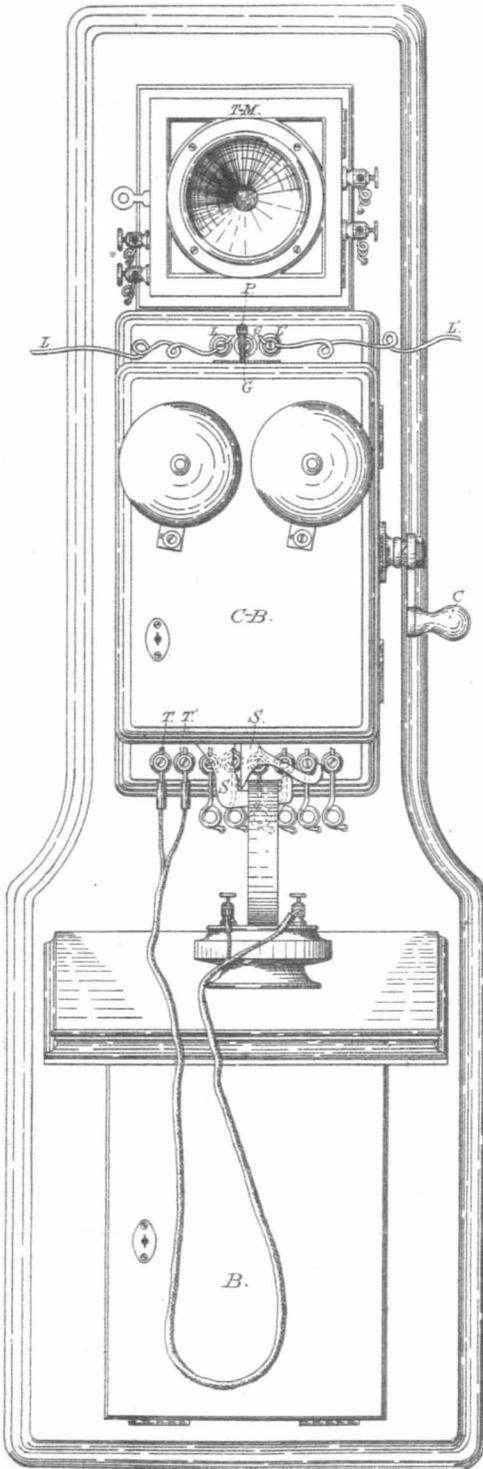


Fig. 3.

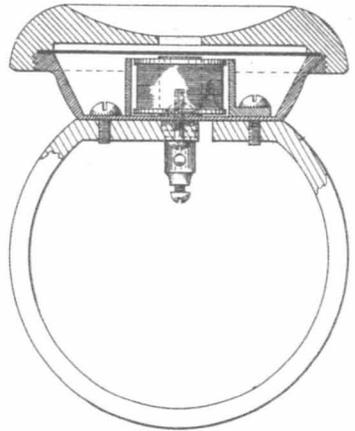
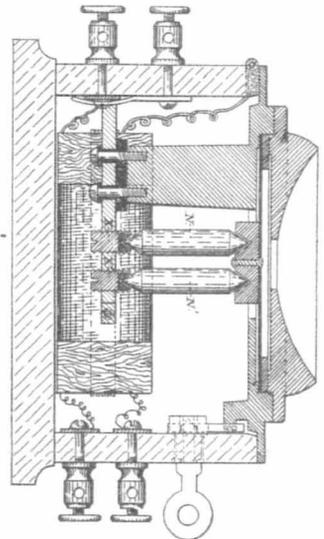


Fig. 2.



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