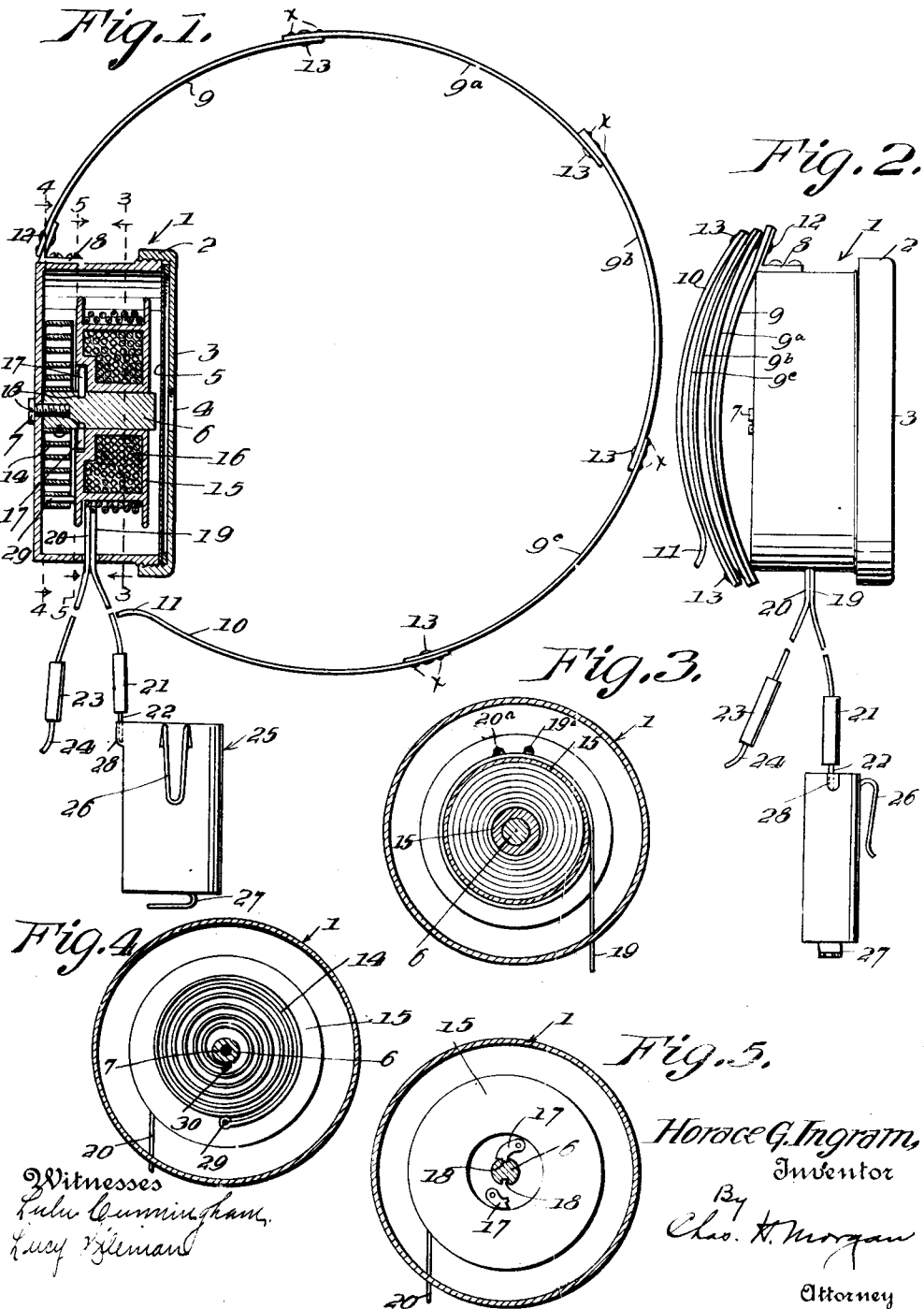


H. G. INGRAM.
ELECTRICAL TESTING APPARATUS.
APPLICATION FILED MAR. 21, 1912.

1,056,995.

Patented Mar. 25, 1913.



UNITED STATES PATENT OFFICE.

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ELECTRICAL TESTING APPARATUS.

1,056,995.

Specification of Letters Patent.

Patented Mar. 25, 1913.

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To all whom it may concern:

Be it known that I, HORACE G. INGRAM, a citizen of the United States, residing at Juniata, in the county of Blair and State of Pennsylvania, have invented new and useful Improvements for Electrical Testing Apparatus, of which the following is a specification.

The object of my invention is to provide an apparatus which is exceedingly sensitive, compact and convenient for use in places that are not readily accessible, which can, of course, be used in any place but is particularly intended for places where the operator has the use of only one hand. With this and other objects in view my invention consists of a combination and arrangement of parts shown in the accompanying drawing, in which—

Figure 1 is a sectional view of the receiver, and also of the other parts in elevation. Fig. 2 is a side view of the receiver showing the sectional head spring folded and turned back for use as a hook to secure it to a belt or other part of the clothing. Fig. 3 is a sectional view on line "3—3" Fig. 1, looking in the direction of the arrows. Fig. 4 is also a sectional view on line "4—4" Fig. 1, looking in the direction of the arrows. Fig. 5 is a sectional view on line "5—5" Fig. 1, looking in the direction of the arrows.

Similar views, letters and figures refer to similar parts throughout the drawing.

My invention consists of a casing "1" such as is used for an ordinary telephone receiver for operators in which a spring passing over the head holds it permanently to the ear, thereby leaving the hands of the operator free. This casing "1" has a cap "3" which has a downwardly bent flange "2" containing a screw thread. At the center of the cap "3" is an opening "4," which permits the free entrance of the air and thereby transmits the vibrations of the diaphragm "5," which is held over the central support or magnet "6" in the ordinary manner by being gripped between the screw cap "3" and the outer edge of the casing "1." The magnet is held permanently to the casing "1" by means of a screw "7," and any means ordinarily employed for that purpose can be used to prevent rotation of the magnet "6" by reason of the strain put upon it, as will be shown hereafter. Ordinarily it is sufficient to merely employ a fric-

tional resistance between the inner end of the magnet "6" and the casing "1." At the upper portion of the casing "1" is an L shaped piece "8" secured thereto by means of screws. The free end of this piece has rotatably secured to it a sectional spring "9" by means of a rivet "12." Projections and depressions formed on the sliding portion between "9" and "12" may be employed to hold the spring in the proper position when extended, and at diametrically opposite points when closed. The other sections of the spring are shown at "9^a," "9^b," "9^c" and "10." These various sections are secured together by rivets "13" and are held in position in the same way as the first section "9." The lower end of the portion "10" is bent slightly outward, as shown at "11," so as to prevent catching on the hair of the operator. This sectional spring "9" folds back in the same manner as a sectional foot rule, such as is in common use today. When folded and turned down it is as shown in Fig. 2. In this position it forms a hook by means of which the casing can be secured to the belt by merely sliding the hook over the upper edge, or it may be secured in a pocket or over the upper band of the trousers.

Pivoted on the magnet "6" is a spool "15" containing insulated magnet wire "16", which may be in one or two coils, such as is ordinarily employed in a telephone receiver. If it is in two coils, a small switch is used to employ either one or both coils, thereby increasing or decreasing the strength of the receiving apparatus. Over these coils of wire is placed a band of material which may be separated from the spool or fastened thereto. The object of this is to cover the wire and leave a smooth surface upon which to wind a double cord "19" and "20". The terminals of the inner coil of magnet wire are brought out to points "19^a" and "20^a". These points may have binding screws or any other means of fastening may be used. To these same points are fastened the ends of the double cord "19" and "20". To the spool "15" are secured pawls "17" having projections which are adapted to enter notches "18" in the magnet "6" in the same manner as on a shade roller. A spring "14" is secured at one end by a pin "29" to the spool "15", and at its other end by a pin "30" to the

magnet "6". From this construction it will be readily seen that if the spool "15" is wound up the spring "14" will exert a torsional pull upon the same and if the cord "19" and "20" is fastened by its ends to the terminals "19^a" and "20^a" a slight pull and a sudden release, such as are employed in operating a shade roller, will cause the spring "14" to wind the cord "19" and "20" upon the outer portion of the spool "15", thereby bringing the ends "21" and "23" close to or against the casing "1".

When used for testing one terminal, such as "21" having a point "22", is inserted in the one pole "28" of a pocket battery "25", and the other pole of the battery is brought out of the casing at a point, such as "27". A spring hook, such as shown at "26", is fastened to the casing for the battery, so that it can readily be secured on the edge of a garment. From this construction it can readily be seen that the operator can work in places where he is compelled to use one hand, because he can detachably secure one end of the circuit to be tested to the hook "27" using the terminal "24" to touch the other side of the circuit, which will give him a click in the ear if short-circuited. If it is open there will be no sound produced and the two portions of the circuit are, therefore, securely insulated from each other. This arrangement for testing is very compact and complete and can readily be carried by a lineman or mechanic having use for the same.

I do not wish to confine myself absolutely

to the specified construction shown, but any other suitable means that may be substituted without altering the essential portions of my invention, are contemplated as a part thereof.

I am aware that telephone receivers of the general character shown here are old, and it is also old to hold such receivers to the ear by means of a spring.

Therefore, what I claim is—

1. The combination in a receiver of a casing, a central support in said casing, a spool pivoted on said support, a coil of magnet wire on said spool, a terminal cord attached to said spool and magnet wire, means for holding said spool in any adjusted position, and means for automatically rotating said spool upon the release of said holding means for winding the terminal cord on said spool.

2. The combination in a receiver of a casing, a central support in said casing adapted to act as a pivot and also as a magnet, a spool rotatable on said central support, means for holding the said spool in any adjusted position, means for automatically rotating said spool when released from said holding means, magnet wire wound on said spool, and a flexible cord attached by its terminals to the ends of said magnet wire and said spool, so that it will be automatically wound on said spool when it is rotated by said means.

HORACE G. INGRAM.

Witnesses:

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