Sept. 8, 1925. 1,552,424

E. A. EVERETT

WIRE CONNECTER

Filed Jan. 14, 1924

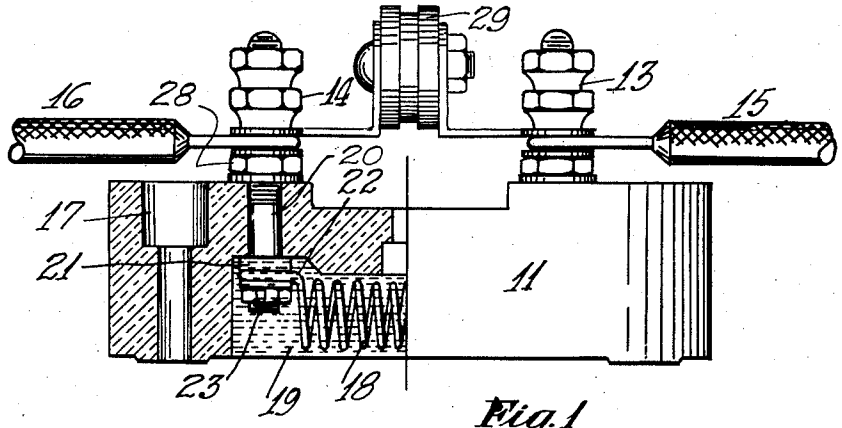


Fig. 1

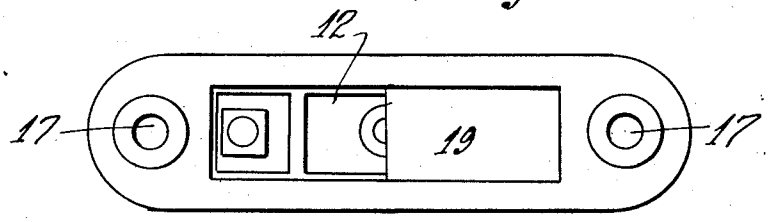


Fig. 2

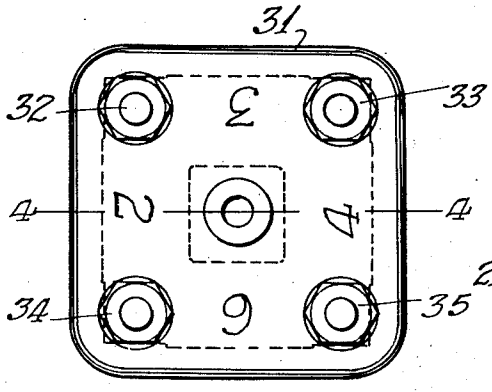


Fig. 3

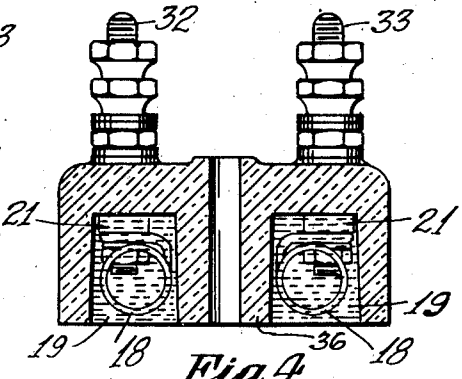


Fig. 4

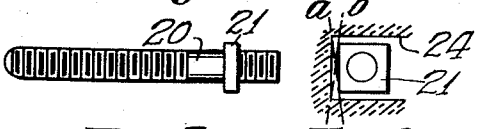


Fig. 5

Fig. 6

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UNITED STATES PATENT OFFICE.

EDWARD A. EVERETT, OF NEW YORK, N. Y.

WIRE CONNECTER.

Application filed January 14, 1924. Serial No. 685,949.

To all whom it may concern:

Be it known that I, EDWARD A. EVERETT, a citizen of the United States, and resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Wire Connecters, of which the following is a specification.

This invention relates to wire connecters and has for an object to provide connecters of this kind which will maintain a reliable contact with unvarying resistance between conductors which are exposed to the elements and which are subject to movement as wires are changed. This invention also includes a resistance wire clamped to a stem which is subject to movement without changing the position of the resistance wire relative to the stem. These and other objects of the invention will be understood from the following specification and the accompanying drawings in which, Fig. 1, is a half sectional elevation of a form of porcelain terminal using my invention, Fig. 2 is a bottom plan view of the terminal shown in Fig. 1, Fig. 3 is a plan view of another type of terminal using my invention and Fig. 4 is a sectional elevation of Fig. 3, Fig. 5 is a detail of the stem used in carrying out this invention and Fig. 6 shows its application.

The devices shown in the illustrations are known as terminal blocks and are used to connect two or more conductors in such a way that these conductors can readily be disconnected or changed. These devices also provide means for introducing resistance coils or choke coils in series with the conductors. The resistance coils are enclosed by the terminal block and are covered by a high melting point sealing wax. Suitable screw stems extend through the block from the resistance coil to the binding nuts which clamp the conductor. Terminal blocks as described have been on the market for a considerable time and are extensively used especially in the circuits controlling railway signals.

In practice it has been found that the stem which is clamped to the porcelain base in time becomes loose due to temperature changes and as the binding screws are unscrewed there is a torsion applied to the stem causing it to partially rotate in the porcelain. Before this invention the stem clamped the resistance wire against the porcelain and as the porcelain has greater friction than the stem, the stem turned upon the loop of the resistance wire thus bringing new surfaces into contact. These surfaces are oxidized by pouring the sealing compound around the terminal and the movement just described introduces considerable resistance and in fact has been known to open the circuit.

This condition is further aggravated by reason of the fact that the resistance wire is made from a special alloy which will not fuse, which cannot be soldered and which has a hard scaly surface which must be ground off where the connection is made and a movement of the wire relative to the stem is liable to bring part of the unprepared surface into contact with the stem. As this connection is used in resistance units it is important that the value of the resistance does not vary and therefore the connection between the resistance coil and the stem should not vary in resistance. The construction in the present invention secures a connection which does not vary and which is not influenced by the partial rotation of the stem. This construction is of a simple character and does not change the construction of the porcelain base.

In Fig. 1, 11 is the porcelain base in which a hollow rectangular slot 12 is formed in the lower side. Terminal binding posts 13 and 14 are supported by 11 and to these posts the conductors 15 and 16 of the circuit are connected. The base 11 may be secured to a terminal board by screws through the holes 17 thus forming a fixed terminal to which the wires are connected.

The resistance coil 18 is placed in the rectangular opening in the porcelain and connects to the stem 20 of the binding posts 13 and 14 so that this coil forms part of the circuit between conductors 15 and 16. When the coil is in place it is sealed in the slot 12 by a high melting point sealing wax as indicated at 19. This sealing compound is poured into the slot in a liquid state covering the stem and the coil.

The stem of the binding posts is constructed as shown in Fig. 5 having both ends threaded and the square collar 21 as shown. This stem is inserted in the opening in the porcelain base 11 until the collar 21 engages the porcelain where it is clamped in position by the clamp nut 28. The loop 22 of the resistance coil 18 is placed against

collar 21, a washer is placed against this loop and the connection is clamped by nut 23. It will thus be observed that the connection between coil 18 and stem 20 is clamped and maintained in fixed relation without regard to the movement of the stem with relation to the porcelain base.

Due to variations in temperature, vibration or other causes the clamping nut 28 works loose and the stem 20 is free to turn to the extent permitted by the square collar 21 abutting against the porcelain wall as indicated in Fig. 6. When the binding nuts work stiffly on stem 20 the collar turns in the direction of the line *a* and the line *b*. It is not possible to manufacture porcelain with a close tolerance so that there is variation in the cores the space between the porcelain and the square collar is likely to vary and permit of the turning of the stem to a greater or less degree. By clamping the coil 18 to the end of the stem it is apparent that this part of the coil will move with the stem and there can be no variation in the resistance of this connection. If the loop 22 were clamped by the collar 21 against the porcelain it is apparent that half the contacting surface of the loop would be made against the porcelain and, as the porcelain is unglazed there would be less friction between the collar and the loop than between the loop and the porcelain so that the collar would turn on the loop and thus bring new surfaces into contact. These new surfaces due to oxidization introduce a resistance in the connection which it is the purpose of the present invention to avoid.

The construction shown in Figs. 1 and 2 include a porcelain terminal block which may be used to support the lightning arrester 29 of the type described in application, Serial No. 485,223, and in which 18 becomes a choke coil, however, with the arrester removed, the coil 18 becomes a fixed resistance. The construction in Figs. 3 and 4 show the application of my invention to a fixed resistance unit in which 31 is a porcelain base, 32, 33, 34 and 35 are binding posts to which the conductors are connected. These binding posts have a stem similar to that shown in Fig. 5. The porcelain base is hollow as indicated by the dotted lines in Fig. 3 and has a central core 36 with a hole therethrough which is used for a fastening screw. A coil connects each of the terminal posts as indicated at 18 and having a resistance value indicated by the figures on top of the porcelain shown in Fig. 3. These resistances are of comparatively low value and it is important that they should not vary in resistance after the lapse of time when used in outdoor construction on railways and similar exposed places.

The circuits with which this device is associated are usually on pole lines or are connected with the track rails. In either case heavy lightning discharges past through the resistance coil. Frequently these discharges will melt away the sealing compound and expose the bare coils of the resistance unit. If ordinary resistance wire were used in the construction of these coils they would fuse together under these conditions, thereby destroying the resistance and affecting the controlled circuits in such a way as might lead to unsafe conditions. On this account the coils are made of a special alloy wire which will not fuse under heat and while the turns of the coil, if exposed, may come into contact when heated, these turns will immediately separate as the coil cools restoring normal conditions. Since this wire will not fuse it cannot be welded by the ordinary methods of construction used in a workshop and it cannot be soldered. The surface of the wire is covered by a hard scale which is, to some extent, an insulator and which has to be ground off on the ends that are used for the connections.

It will thus be observed that the peculiar character of the resistance coil and the uses for which the device is intended require a special connection differing from the ordinary methods of construction and which are provided for in the present invention in a simple, effective and comparatively inexpensive manner.

The term "resistance coil" is used in the specification and claims in a generic sense. In one application, this coil is used on direct current circuits where a constant ohmic resistance is desired. When used for a choke with lightning arresters, however, it is designed to offer a high resistance to the lightning discharge, while its ohmic resistance may be very low and the coil may be made from ordinary copper wire. In the latter case the lightning arrester is arranged to discharge the lightning under definite conditions and an unvarying contact between the post and the coil is necessary to the maintenance of these conditions.

Having thus described my invention, I claim:

1. In a wire connecter, the combination of a porcelain base, a stem threaded at both ends with an integral collar thereon extending through said base, means for clamping said collar against said base, binding nuts on the exposed end of said stem for clamping a conductor thereto, a coil of resistance wire, a nut for clamping the ends of said coil against said collar and a sealing compound for covering the connection of said coil to said stem.

2. In a wire connecter, the combination of a hollow porcelain base, a stem having an integral square collar and threaded at both ends extending through said base, means for clamping said collar against said

base and for clamping a conductor to the exposed end of said stem, a coil of resistance wire in said hollow base and a nut for clamping the end of said coil against said collar.

3. In a wire connecter, the combination of a hollow porcelain base, a stem having a square collar and threaded at both ends extending through said base, means for clamping said collar against said base so arranged that said collar engages said base to prevent said stem from turning, means for clamping a conductor to the exposed end of said stem, a resistance coil and a nut on the other end of said stem for clamping the end of said coil against said collar.

4. In a wire connecter, the combination of a porcelain base having a hollow rectangular opening, a stem having a square-collar and threaded at both ends, one end extending through an opening in said porcelain base with the square collar engaging the sides of said opening, a nut clamping said stem on said base, binding nuts for securing a conductor to said stem, a coil of alloy wire in the rectangular opening in said base, the end of said coil looped around the end of said stem, a nut for clamping said wire against said collar and a sealing compound for covering said stem and said coil.

Signed at New York, in the county of New York and State of New York, this 16th day of November, A. D. 1923.

EDWARD A. EVERETT.