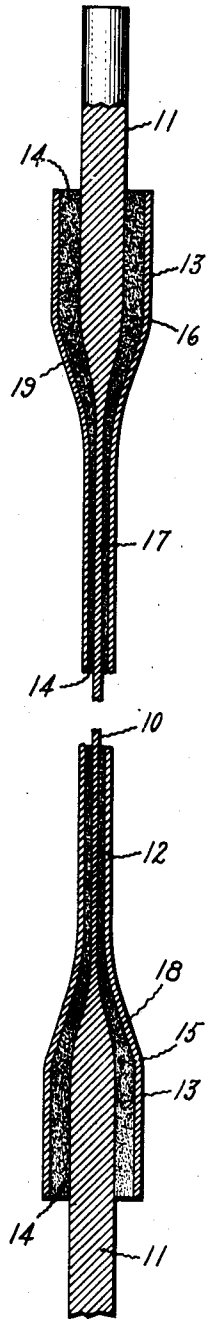
W. R. WHITNEY.

SHEATHED WIRE TERMINAL.

APPLICATION FILED OCT. 17, 1912.

1,093,512. Patented Apr. 14, 1914.



Witnesses:

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UNITED STATES PATENT OFFICE.

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SHEATHED-WIRE TERMINAL.

1,093,512. Specification of Letters Patent. Patented Apr. 14, 1914.

Application filed October 17, 1912. Serial No. 726,205.

To all whom it may concern:

Be it known that I, WILLIS R. WHITNEY, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Sheathed-Wire Terminals, of which the following is a specification.

My invention relates to connecting terminals for electric conductors and more particularly to terminals for what are known as "metal sheathed" conductors. A metal sheathed conductor or wire consists of an inner conductor surrounded by a metallic sheath which is separated from the conductor by insulating material. One method of making these conductors is to first form an ingot consisting of an inner core of the metal of which the conductor is to be formed and an outer shell to form the sheath, the two being separated by the insulating material which is preferably granular in form. This ingot is then swaged down so as to simultaneously reduce the conductor and the sheath to the proper dimensions. Wire of this character, especially where the inner conductor is drawn down to a small diameter, is difficult to provide with connecting terminals. This is especially true where the sheath wire is used for electric heaters since the conductor is of small cross section and is subjected to relatively high temperature. If it were attempted to connect the small exposed end of the conductor to an external conductor without protecting the same in some way the connection would be easily broken or burned away.

One object of my invention is to provide a suitable terminal for a metal sheathed wire of this character which will be of such dimensions as to make it strong enough to withstand the wear and strain incident to the ordinary uses to which such a conductor would be put.

In carrying out my invention I form the terminal integral with the conductor. In swaging down the conductor I leave the terminal portion considerably larger than the conductor so that it will be of sufficient dimensions to safely make circuit connections. This I preferably do by beginning the swaging at a sufficient distance from one end and ending it at a sufficient distance from the opposite end so as to leave short portions of the ingot of a former greater cross section to constitute terminals. The point at which the large and small portions of the conductor join is thus within the sheath and the connection is unlikely to be broken by flexure or otherwise. By cutting away the end of the sheath the enlarged terminal is left exposed.

My invention will be more clearly understood by reference to the accompanying drawing in which is shown in section partially broken away a metal sheathed wire unit embodying my invention.

In the aforesaid drawing is shown a unit consisting of the inner resistance wire 10 having terminal portions 11 of much larger cross section and integral therewith. The resistance wire may be of any well known resistance material. The said resistance wire and portions of the terminals are surrounded by a metal sheath 12 which may be of iron or steel or other suitable metal. The end portions 13 of the said sheath which surround portions of the terminals 11 are of larger diameter than the intermediate or body portions in about the same proportion as the terminals are larger than the intermediate or body portions of the resistance wire. Between the sheath and the inner wire is packed electrical insulation 14 which may be lime or other insulation which is ordinarily used in connection with the sheathed wire. This insulation extends to the ends of the sheath and surrounds portions of the terminal 11.

One method of making a metal sheathed wire unit according to my invention is to cut off a section of the said wire of a cross section equal to the portion 13 or greater than the same. This section should be of such a length that the subsequent swaging to bring the same down to proper dimensions will produce a length suitable for use in a given apparatus. If the wire is not small enough in cross-section for the terminals the first step is to swage it down to such a cross section. When this point has been reached the swaging should begin a short distance from the end of the wire as at 15 and terminate a short distance from the other end as at 16. The intermediate or body portion 17 of the wire should be small enough in cross section to produce the required resistance and should be uniform so as to avoid weak spots. The

swaging should be so conducted that between the large portion 13 and the small portion 17 there will be tapered portions as at 18 and 19. This gives additional mechanical strength. When this operation has been completed portions of the sheath and insulation may be removed so as to expose portions of the terminals 11.

Various modifications of the above described process and product will readily suggest themselves to those skilled in the art and are to be considered as coming within the scope of my invention which is set forth in the following claims.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. An electric unit comprising an inner continuous conductor having insulation surrounding the same and a metal sheath surrounding said insulation, an end portion of said inner conductor being larger in cross section than the body portion thereof to constitute a terminal.

2. An electrical resistance heating unit consisting of a resistance conductor of small cross section, insulation surrounding the same, a metal sheath surrounding said insulation, and terminals of larger cross section than said resistance conductor and integral therewith projecting beyond said sheath and insulation.

3. A metal sheathed wire unit consisting of a middle or body portion of small cross section and end portions of larger cross section than said body portion, the sheath and resistance wire of said end portions being integral with the corresponding elements of said body portion.

4. An electrical resistance heating unit consisting of a resistance conductor of small cross-section, insulation surrounding the same, a metal sheath surrounding said insulation, and terminals of larger cross-section than said resistance conductor and integral therewith, the connecting portion between the resistance and the terminal being tapered.

5. The method of making a metal sheathed wire unit which consists in reducing a portion of an ingot of the sheathed wire in which the inner conductor is of the proper cross section for a terminal so that the inner conductor of the reduced portion is of a proper cross section for use in a particular apparatus.

6. The method of making a metal sheathed wire resistance unit which consists in reducing the middle portion of an ingot in which the inner conductor is of the proper cross section to constitute a terminal so that the resistance of said middle portion and the length thereof are suitable for a given apparatus, leaving the end portions of said ingot of the original size.

7. The method of making an electric resistance heating unit which consists in swaging a metal sheathed wire ingot so that the main portion of the inner conductor thereof will be of sufficiently small cross section and proper length to have the requisite resistance for a given apparatus and the end portions thereof will be of larger cross section so as to be suitable for terminals.

8. The method of making an electric resistance heating unit from an ingot comprising a metal conducting core surrounded by insulation and inclosed in a metal sheath which consists in swaging the ingot until the metal core is of the proper size to form a terminal and then swaging down the intermediate portion of the ingot until the core attains the proper size for use in a particular apparatus.

In witness whereof, I have hereunto set my hand this 15th day of October, 1912.

WILLIS R. WHITNEY.

Witnesses:
HELEN ORFORD,
GEORGE WEISHEIT.