

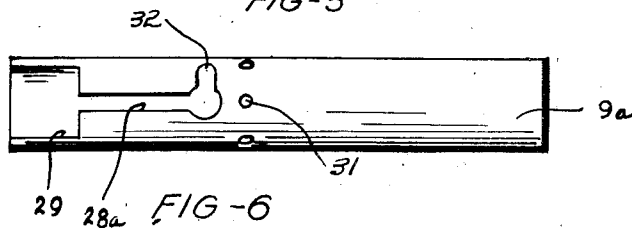
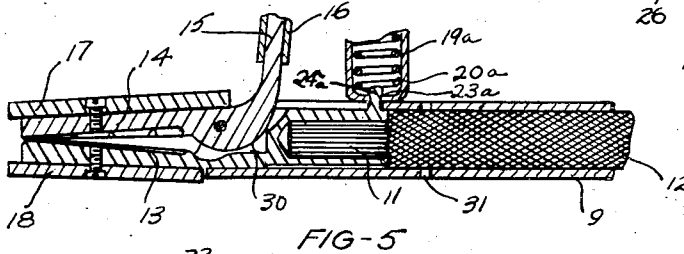
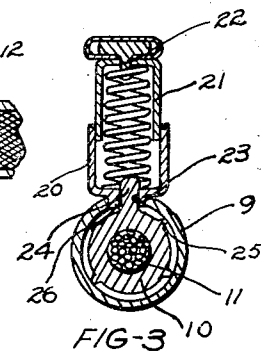
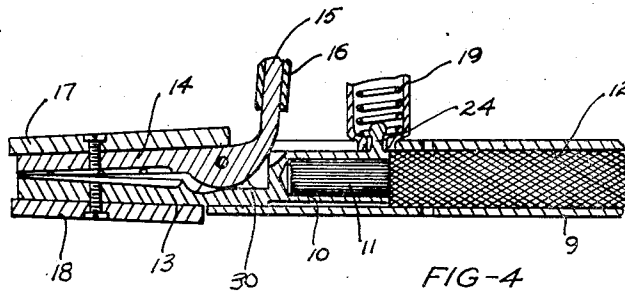
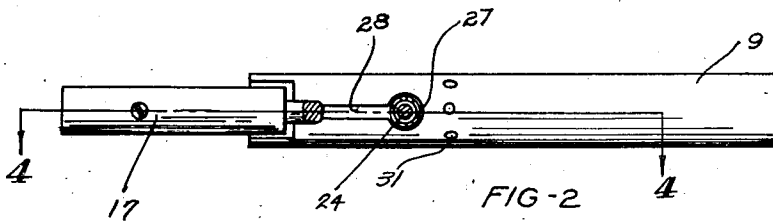
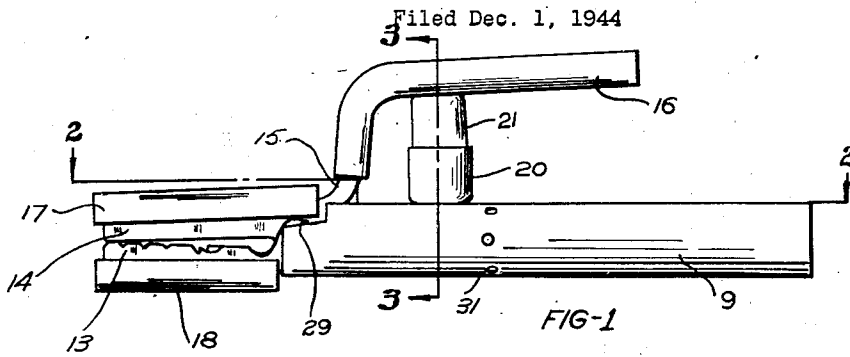
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ELECTRODE HOLDER

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ELECTRODE HOLDER

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My invention relates to a new and useful improvement in an electrode holder adapted for use in arc welding operations. In electrode holders, a common difficulty encountered is a heating of the handle. Part of this heating is due to the heat generated by electrical resistance and part is due to radiated and conducted heat proceeding from the burning metal. Experience has shown that the heat in the holder centers in the metallic part thereof and that the handle becomes hottest at that portion in which the metallic parts are located. Consequently, with a holder constructed so that the operator cannot place his hand on that part which encloses the metallic parts, the operator is prevented from gripping that portion of the handle which may be undesirably hot. It is an object of the present invention to provide an electrode holder so constructed and arranged that the metallic parts enclosed by the handle shall be positioned forwardly of that portion of the handle which ordinarily is gripped by the operator when performing a welding operation and also provided with means for preventing the operator, in the normal use of the holder, from placing his hand on that portion of the handle which encloses the metallic parts.

The heat generated from the heat of electrical resistance is generally encountered because the holder itself is not formed from metal of as high conductivity as the material of the cable through which the current flows. In the construction of an electrode holder, it is desired that durability of the holder be provided and generally it is necessary, in order to obtain the desired durability, to sacrifice conductivity. In electrode holders, the forward end is provided with the gripping portion which is usually termed "jaws." The cable is connected to a cup-shaped member which forms a well into which the bared end of the cable is inserted and this portion is usually called a "cable connector." The cable connector is generally connected to the jaws by an intermediate portion which may be referred to as a "shank" or "tongue." In the construction of electrode holders, it is customary to form the cable connector and shank or tongue and jaw portion of the same material, with the result that the current passing from the cable must pass through the cable connector and the tongue or shank before reaching the jaw portion in which the electrode is clamped. It is believed obvious that by reducing the length of the material of low electrical conductivity through which the current must pass, the heat of electrical resistance would be reduced and by terminating the cable closer to

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the jaws, a more efficiently operating electrode holder would be provided. It is an object of the present invention to accomplish this and to this end, I project the jaws directly from the cup-shaped cable connector without the use of intervening portions.

Another object of the invention is the provision of an electrode holder which, in addition to providing a cool handle, will also be light and highly efficient in use.

Another object of the invention is the provision of an electrode holder having a minimum amount of metal employed in its fabrication and one which may be economically manufactured and easily and quickly assembled.

Another object of the invention is the provision of an electrode holder having novel means for securing the cable connector on the handle and the provision of a construction whereby easy and quick assembly and disassembly of the holder may be effected.

Other objects will appear hereinafter.

It is recognized that various changes and modifications may be made in the detail of structure illustrated without departing from the invention itself and it is intended that such variations and modifications shall be encompassed within the scope of the claims which form a part hereof.

Forming a part of this specification is a drawing in which,

Fig. 1 is a side elevational view of an electrode holder embodying the invention;

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a sectional view taken on line 3—3 of Fig. 1;

Fig. 4 is a fragmentary, sectional view taken on line 4—4 of Fig. 2;

Fig. 5 is a view similar to Fig. 4, showing a slight modification;

Fig. 6 is a side elevational view of the handle, showing a slight modification.

In the drawing, I have illustrated an electrode holder embodying a tubular handle 9 of suitable insulating material, such as fiber or the like. Inserted into one end of this handle 9 is a metallic cup-shaped cable connector 10 in which the bared end 11 of an electric cable 12 is inserted and secured. Projecting directly from the forward end of this cable connector 10 is a lower clamping jaw or gripping member 13 on which is pivotally mounted an upper clamping jaw or gripping member 14 having the rockable handle 15 projecting therefrom and encased by the insulating covering 16. A layer 17 of insulating

material serves to cover the major portion of the upper jaw 14 and a layer 18 of insulating material serves to cover the outer face of the lower jaw 13. These jaws or gripping members 13 and 14 are normally urged into engagement with each other by means of a spring 19 and together form a gripping or clamping mechanism to grip or clamp an electrode in position for a welding operation. The members 13 and 14 may be termed an electrode gripping or clamping mechanism which is movable to gripping and non-gripping positions. The handle 15 may be termed a spring pressed actuating handle for the gripping mechanism. The spring 19 bears at one end against the handle 15 and upon rocking the handle in one direction against the compression of the spring, the gripping mechanism is moved to non-gripping position and the spring tends to retain the handle 15 rocked to position for retaining the gripping or clamping members in gripping or clamping relation.

I have enclosed this spring in a pair of telescoping cups 20 and 21. The cup 21 is provided with an opening in its base through which projects a pin 22 carried by the rockable handle 15. The lower cup 20 is provided with an opening 23 in its base through which projects the stud or pin 24 extending outwardly from the periphery of the cable connector 10 adjacent the open or rear end thereof. This cable connector 10 is held in spaced relation to the handle 9 by means of suitable peripheral projections 25. In the form shown in Fig. 3 and Fig. 4, the lower cup 20 is provided with an outwardly projecting neck 26.

Formed in the handle 9 is an opening 27 of sufficient size to receive the neck 26 of the cup 20. Extending forwardly from this opening 27 is a slot 28. The forward end of the handle is cut away as at 29 to provide the desired clearance for the insulating plate 17 and permit the handle to be thrust forwardly sufficiently to cover the point of pivotal connection between the jaws or gripping members 13 and 14. This pivoting is effected on spaced apart plates 30 which project upwardly from the rear end of the lower jaw 13. The pins or studs 22 and 24 serve as locating or retaining means for locating the position of mounting of the spring and retaining the spring in position so as to prevent its undue dislodgement. When the enclosing cups are used, the pins also serve as retaining means for preventing undue dislodgement of the insulating cups.

In making the necessary connections, the handle 9 is slid onto the cable 12, the bared end 11 is then inserted into the socket 10 so that its end terminates at substantially the base wall of this socket and this bared end 11 is secured in the socket of the cup-shaped cable connector 10 in any suitable manner. The handle is then slid into position and in this sliding movement, the groove 28 will serve to receive the stud or pin 24 and the end of the lower cup 20 will ride on the handle. When the forward movement continues so that the opening 27 is brought into registration with the neck 26, this neck will snap into the opening 27 until the parts rest in the position shown in Fig. 4, whereupon, the lower cup 20 will serve to resist undue removal of the handle. It is believed obvious that, if desired, the handle may also be secured to the shank 10 by a screw projected through the handle into the shank 10. In this construction, it is obvious, particularly from Fig. 4, that the operator cannot grip the handle 9 at that portion which contains the metallic parts; the spring or the spring en-

casement would prevent the sliding of the hand forwardly on the handle a sufficient distance to grip that portion which encloses the metallic parts. If desired, openings 31 may be formed in the handle 9 just rearwardly of the end of the cable connector 10 so that these openings would provide a means of escape of heat which may be localized in the metallic part 10. It is thus seen that I have mounted a means on the electrode holder to the rear of the metallic parts which prevents the operator from sliding his hand forwardly over the part covering the metallic parts. It is also to be noted that I have used a coil spring actuated holder having a cup-shaped cable connector with the spring located at its lower end at substantially the rear end of the cable connector itself instead of being located forwardly of the cable connector as is customary on coil spring actuated holders of this type. It is also to be noted that the cable is brought close to the jaws which clamp the electrode so that the distance between the electrode and the terminal end of the cable is considerably reduced over that required where an intermediate connecting means between the jaw and the cable is used. In Figs. 4 and 5, I have shown a slight modification in which the spring 19a is encased by a lower cup 20a and an upper cup 21a. The lower cup 20a is provided with an opening 23a in its base but the neck 26, which is shown in Fig. 3 and Fig. 4, has been eliminated from the lower cup 20a. The handle 9a is provided with a longitudinally directed slot 28a communicating with the lateral extension 32. When the handle is slid in position, the handle may be slightly rotated until the stud 24a engages in the slot 32. The pressure of the lower cup 20a will normally serve to resist a rotation of the handle 9a and resist undue removal of the handle 9a. With a holder constructed in this manner, lightness is attained and a cool handle is provided, thus relieving the operator of fatigue resulting from a hot handle and greater weight and also producing a holder of greater efficiency due to the shortened distance between the electrode and the electric conductor.

What I claim as new is:

1. An electrode holder of the class described comprising: a metallic cup-shaped cable connector adapted for reception of one end of an electric conductor; a clamping jaw mounted on and positioned forwardly of said cable connector; an auxiliary jaw in pivotal relation to said first mentioned jaw for clamping an electrode thereagainst; a handle connected to said auxiliary jaw and overlying said cable connector; a spring positioned between said handle and said cable connector for normally urging said jaws into clamping relation; means on the hollow portion of said cable connector adjacent the rear end for determining the location of the lower end of said spring and retaining the lower end of said spring in such location; and an insulating covering means for the lower end of said spring terminating at a point rearwardly of the rear end of said cable connector.

2. An electrode holder of the class described comprising: a metallic cup-shaped cable connector adapted for reception of one end of an electric conductor; a clamping jaw mounted on and positioned forwardly of said cable connector; an auxiliary jaw in pivotal relation to said first mentioned jaw for clamping an electrode thereagainst; a handle connected to said auxiliary jaw and overlying said cable connector; a spring positioned between said handle and said cable con-

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connector for normally urging said jaws into clamping relation; means on the hollow portion of said cable connector adjacent the rear end for determining the location of the lower end of said spring and retaining the lower end of said spring in such location; an insulating covering means for the lower end of said spring terminating at a point rearwardly of the rear end of said cable connector, and a tubular handle mounted on said cable connector and extending forwardly of said locating means and rearwardly thereof, said handle having a longitudinally directed slot proceeding inwardly from its forward end for reception of said retaining means.

3. An electrode holder of the class described comprising: a metallic cup-shaped cable connector adapted for reception of one end of an electric conductor; a clamping jaw mounted on and positioned forwardly of said cable connector; an auxiliary jaw in pivotal relation to said first mentioned jaw for clamping an electrode thereagainst; a handle connected to said auxiliary jaw and overlying said cable connector; a spring positioned between said handle and said cable connector for normally urging said jaws into clamping relation; means on the hollow portion of said cable connector adjacent the rear end for determining the location of the lower end of said spring and retaining the lower end of said spring in such location; an insulating covering means for the lower end of said spring terminating at a point rearwardly of the rear end of said cable connector; and a tubular handle mounted on said cable connector and extending forwardly of said locating means and rearwardly thereof, said handle having a longitudinally directed slot proceeding inwardly from its forward end for reception of said retaining means, and provided at the inner end of said slot with an enlarged opening for reception of a portion of said covering means.

4. An electrode holder of the class described comprising: a cup-shaped metallic cable connector adapted for the reception of one end of an electric conductor; a clamping jaw mounted on and projecting forwardly of said cable connector; an auxiliary jaw in pivotal relation to said first mentioned jaw for clamping an electrode thereagainst; a rearwardly projecting handle on said auxiliary jaw overlying, in spaced relation to, said cable connector; a stud projecting outwardly from the periphery of said cable connector adjacent the open end thereof; a tubular handle mounted on said cable connector and extending forwardly and rearwardly of said stud, the forward end of said handle being provided with a longitudinally directed slot for reception of said stud; a spring positioned between said first mentioned handle and said tubular handle for normally urging said jaws into clamping relation, the lower end of said spring being centered about said stud.

5. An electrode holder of the class described comprising: a cup-shaped metallic cable connector adapted for the reception of one end of an electric conductor; a clamping jaw mounted on and projecting forwardly of said cable connector; an auxiliary jaw in pivotal relation to said first mentioned jaw for clamping an electrode thereagainst; a rearwardly projecting handle on said auxiliary jaw overlying, in spaced relation to, said cable connector; a stud projecting outwardly from the periphery of said cable connector adjacent the open end thereof; a tubular handle mounted on said cable connector and extending

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forwardly and rearwardly of said stud, the forward end of said handle being provided with a longitudinally directed slot for reception of said stud; a spring positioned between said first mentioned handle and said tubular handle for normally urging said jaws into clamping relation, the lower end of said spring being centered about said stud; and a cup-shaped covering for the lower end of said spring having an opening in its base for reception of said stud and retained in position by said stud to project at its periphery rearwardly of the rear end of said cable connector.

6. An electrode holder of the class described comprising: a metallic cup-shaped cable connector adapted for the reception of one end of an electric conductor; a clamping jaw mounted on and projecting forwardly from said cable connector; an auxiliary jaw pivoted on said first mentioned jaw for gripping an electrode thereagainst; a handle connected to said auxiliary jaw and projecting rearwardly therefrom to overlie, in spaced relation, said cable connector; a spring positioned between said handle and said cable connector for normally urging said jaws into clamping relation, the lower end of said spring terminating adjacent the rear end of said cable connector; means underlying said spring for spacing the lower end thereof from said cable connector; means for retaining and locating the lower end of said spring adjacent the rear end of said cable connector; and insulated covering means for the lower end of said spring with its periphery lying rearwardly of the rear end of said cable connector.

7. An electrode holder of the class described comprising: a cup-shaped metallic cable connector adapted for the reception of one end of an electric conductor; a clamping jaw mounted on and projecting forwardly of said cable connector; an auxiliary jaw in pivotal relation to said first mentioned jaw for clamping an electrode thereagainst; a rearwardly projecting handle on said auxiliary jaw overlying, in spaced relation to, said cable connector; a stud projecting outwardly from the periphery of said cable connector adjacent the open end thereof; a tubular handle mounted on said cable connector and extending forwardly and rearwardly of said stud, said tubular handle having an opening formed therethrough for reception of said stud, said stud projecting beyond the periphery of said tubular handle; a spring positioned between said first mentioned handle and said tubular handle for normally urging said jaws into clamping relation, the lower end of said spring being centered about said stud.

8. An electrode holder of the class described comprising: a cup-shaped metallic cable connector adapted for reception of one end of an electric conductor; a clamping jaw mounted on and projecting forwardly of said cable connector; an auxiliary jaw in pivotal relation to said first mentioned jaw for clamping an electrode thereagainst; a rearwardly projecting handle on said auxiliary jaw overlying, in spaced relation to, said cable connector; a stud projecting outwardly from the periphery of said cable connector adjacent the open end thereof; a tubular handle mounted on said cable connector and extending forwardly and rearwardly of said stud, said tubular handle being provided with an opening through which said stud projects, said stud projecting beyond the periphery of said tubular handle; a spring positioned between said first mentioned handle and said tubular handle for normally urging said jaws into clamping relation; and a cup-shaped covering for the lower end of

said spring engageable with said stud and retained in position by said stud to project at its periphery beyond the rear end of said cable connector.

9. In an electrode holder of the class described, a structure embodying a metallic cable connector adapted for connection to one end of an electric conductor and a clamping jaw mounted on and extending forwardly of said cable connector; a cooperating jaw pivotally mounted on said structure for clamping an electrode against said first mentioned jaw; a tubular hand grip of insulating material extending at one end over and enclosing said cable connector; a handle connected to said cooperating jaw and extending rearwardly therefrom and overlying the forward portion of said hand grip, in spaced relation thereto; a spring positioned between said hand grip and said handle and engaging both of the same for normally urging said jaws into clamping relation; and means on said cable connector at the rear end thereof projecting beyond the periphery of said hand grip for determining the location of the lower end of said spring and retaining the lower end of said spring in such location, said hand grip having an opening therethrough through which said means may project.

10. An electrode holder of the class described comprising: a metallic structure embodying a cable connector adapted for attachment to one end of an electric conductor and a clamping jaw mounted on and extending forwardly of said cable connector; a cooperating jaw pivotally mounted on said structure for cooperating with said first mentioned jaw for clamping against an electrode positioned between said jaws; a tubular handle mounted on said cable connector, and underlying said jaw handle; a spring positioned between said tubular handle and said jaw handle for normally urging said jaws into clamping relation; an insulating covering means for the lower end of said spring; outwardly projecting means on said cable connector adjacent the rear end thereof and projecting through and extending beyond the periphery of said tubular handle for determining the location of said insulating covering and the lower end of said spring and retaining the same in such location.

11. In an electrode holder of the class described a structure embodying a metallic cable connector adapted for connection to one end of an electric conductor and embodying a metallic clamping jaw mounted on and extending forwardly of said cable connector; a cooperating jaw pivotally mounted on said structure for clamping an electrode against said first mentioned jaw; a handle connected to said cooperating jaw and extending rearwardly therefrom and overlying, in spaced relation, said cable connector a spring positioned between said cable connector and said handle for normally urging said jaws into clamping relation; a cup-shaped insulating member embracing the lower end of said spring; outwardly projecting means on said cable connector at the rear end thereof inter-engaging with said insulating member and determining the location of the lower end of said spring and retaining the same in such location; a tubular handle on said cable connector and projecting forwardly and rearwardly of said outwardly projecting means and slidable on to said cable connector to lie between said cable connector and said insulating member and provided with an opening for reception of said outwardly projecting means; said outwardly projecting

means extending beyond the periphery of said tubular handle.

12. In an electrode holder of the class described a structure embodying a metallic cable connector adapted for connection to one end of an electric conductor and embodying a metallic clamping jaw mounted on and extending forwardly of said cable connector; a cooperating jaw pivotally mounted on said structure for clamping an electrode against said first mentioned jaw; a handle connected to said cooperating jaw and extending rearwardly therefrom and overlying, in spaced relation, said cable connector a spring positioned between said cable connector and said handle for normally urging said jaws into clamping relation; a cup-shaped insulating member embracing the lower end of said spring; outwardly projecting means on said cable connector at the rear end thereof inter-engaging with said insulating member and determining the location of the lower end of said spring and retaining the same in such location; a tubular handle on said cable connector and projecting forwardly and rearwardly of said outwardly projecting means and slidable on to said cable connector to lie between said cable connector and said insulating member and provided with an opening for reception of said outwardly projecting means, said outwardly projecting means extending beyond the periphery of said tubular handle; and means for resisting slidable movement of said tubular handle relative to said cable connector, after sliding of the same thereon.

13. An electrode holder of the class described, comprising: a cup-shaped metallic cable connector adapted for the reception of one end of an electric conductor; a clamping jaw mounted on and projecting forwardly of said cable connector; an auxiliary jaw in pivotal relation to said first mentioned jaw for clamping an electrode thereagainst; a rearwardly projecting handle on said auxiliary jaw overlying, in spaced relation to, said cable connector; a spring positioned between said cable connector and said handle for normally urging said jaws into clamping relation; an insulating member positioned about one end of said spring and lying between the same and said cable connector; a tubular handle slidable onto said cable connector in enveloping relation thereto and lying between said cable connector and said insulation about said spring; and means for preventing axial movement of said insulation and said end of said spring relatively to said cable connector upon the sliding of said handle into enveloping position relatively to said cable connector.

14. In an electrode holder of the class described, a gripping mechanism for clamping an electrode and embodying a pair of relatively movable parts, movable into gripping and non-gripping positions; a rockable handle connected to one of said members and operative, upon rocking, for moving said members into gripping and non-gripping position; a cable connector connected to one of said members and adapted for connection to one end of an electric conductor, said rockable handle overlying said cable connector in spaced relation; a tubular handle embracing said cable connector and projecting rearwardly therefrom and forwardly of the rear end thereof; a stud projecting outwardly from said cable connector beyond the periphery of said tubular handle, said tubular handle having a slot formed therein, inwardly from one end thereof for accommodating said stud upon the sliding of said tubular handle forwardly onto

said cable connector; and a spring positioned between said tubular handle and said rockable handle for normally urging said members into gripping position, said spring being centered at one end around stud.

15. An electrode holder of the class described, a metallic cable connector adapted for connection to one end of an electric conductor, a clamping member mounted on and projecting forwardly of said cable connector; a co-operating clamping member for clamping an electrode against said first named clamping member and movable relatively thereto into clamping and non-clamping position; a rockable actuating handle associated with said clamping members and projecting rearwardly therefrom and overlying said cable connector, in spaced relation thereto, and adapted, upon rocking in one direction, for moving said clamping members into clamping position and upon rocking in the opposite direction for moving said clamping members into non-clamping position; a stud projecting outwardly from the periphery of said cable connector, adjacent the rear end thereof; a tubular handle mounted on said cable connector and extending forwardly and rearwardly of said stud, the forward end of said tubular handle being provided with a longitudinally directed slot for reception of said stud, said stud projecting through said slot beyond the periphery of said tubular handle; a spring positioned between said actuating handle and said tubular handle for normally urging the clamping members into clamping relation, the lower end of said spring being centered about said stud; and a cup shaped cover for the lower end of said spring, having an opening in its base for reception of said stud and retained in position by said stud.

16. In an electrode holder of the class described, a metallic cable connector adapted for attachment to one end of an electric conductor; a rockable actuating handle associated with said cable connector and over-lying same, in spaced relation thereto; a stud projecting outwardly from the periphery of said cable connector adjacent the rear end thereof; a tubular handle mounted on said cable connector and extending forwardly and rearwardly of said stud, the forward end of said tubular handle being provided with a longitudinally directed slot for the recep-

tion of said stud, said stud projecting through said slot beyond the periphery of said tubular handle; a spring positioned between said actuating handle and tubular handle and engaging at its opposite ends with said handles for normally rocking said rockable handle away from said tubular handle, one end of said spring being centered about said stud.

17. In an electrode holder of the class described, a metallic cable connector adapted for attachment to one end of an electric conductor; a rockable actuating handle associated with said cable connector and over-lying same, in spaced relation thereto; a stud projecting outwardly from the periphery of said cable connector adjacent the rear end thereof; a tubular handle mounted on said cable connector and extending forwardly and rearwardly of said stud, the forward end of said tubular handle being provided with a longitudinally directed slot for the reception of said stud, said stud projecting through said slot beyond the periphery of said tubular handle; a spring positioned between said actuating handle and tubular handle and engaging at its opposite ends with said handles for normally rocking said rockable handle away from said tubular handle, one end of said spring being centered about said stud; and a cup shaped covering for one end of said spring and lying between one end of said spring and said tubular handle, said cup shaped covering having an opening in its base for the reception of said stud.

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