Oct. 27, 1942. H. A. JACKSON 2,300,295

ELECTRODE HOLDER

Filed Feb. 27, 1941

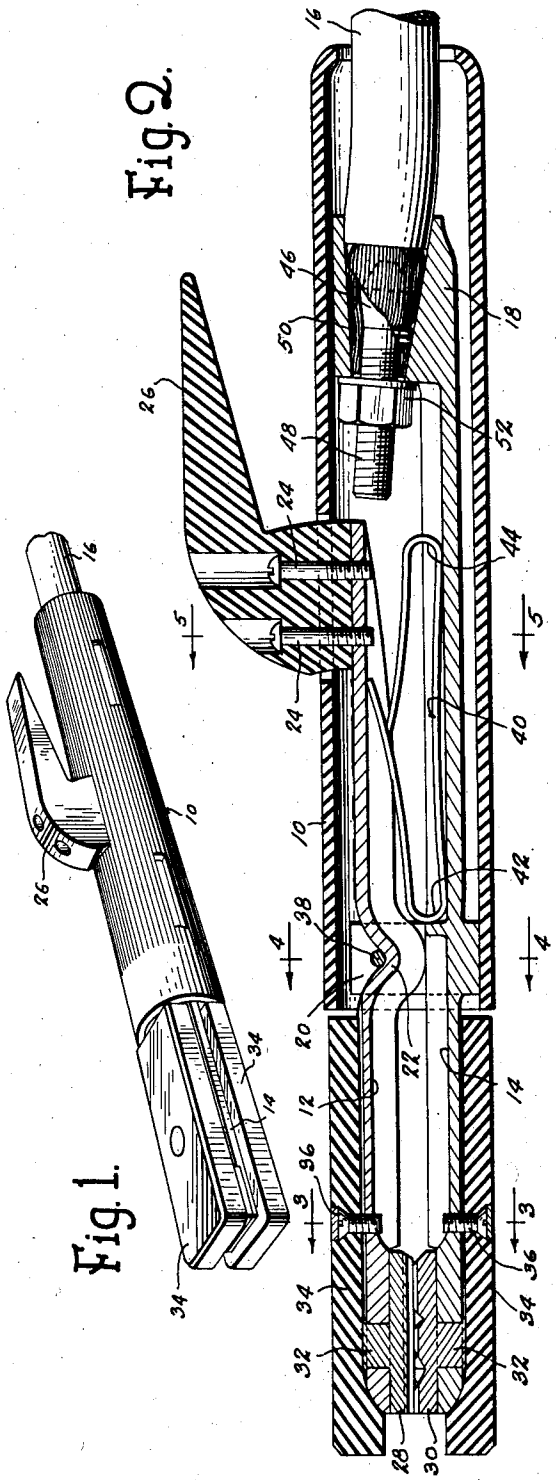


Fig. 1.

Fig. 2.

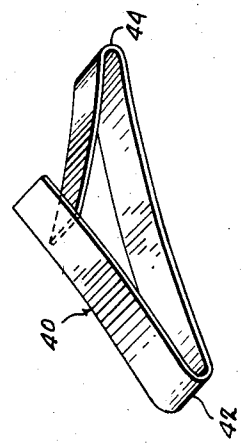


Fig. 6.

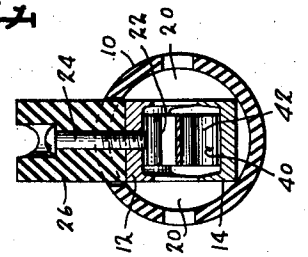


Fig. 5.

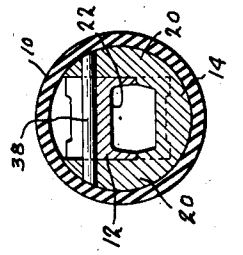


Fig. 4.

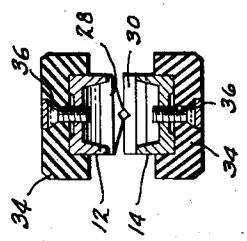


Fig. 3.

INVENTOR.
Honel A. Jackson

BY Parker and Burton
Attorneys

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ELECTRODE HOLDER

Honel A. Jackson, Detroit, Mich.

Application February 27, 1941, Serial No. 380,903

10 Claims. (Cl. 219—8)

This invention relates to electrode holders and particularly to improvements in the type of electrode holders described and claimed in United States Patent of Henry J. Wagner, No. 2,179,440.

An important object of this invention is to provide an improved electrode holder formed out of parts which are easily and inexpensively manufactured and assembled, and which form a rugged holder capable of withstanding hard usage and abuse. Another important object of this invention is to provide improvement in the construction of the jaw members which expedite their assembly, strengthen the grip on the electrode, and increase the life of the holder.

An important feature of the invention is the provision of cast metal jaw members provided with integrally formed portions which cooperate with one another so as to mount one member for rocking movement with respect to the other member and to receive novel electrode gripping surfaces on the projecting ends thereof. Another important feature of the invention is the provision of novel resilient means in the form of a spring metal blade so shaped that the life thereof is increased very much beyond the spring member described in the aforesaid patent. The new spring blade is arranged in a novel formation so that both ends serve to impress a yielding pressure tending to close the jaws.

Various other objects, advantages and meritorious features of this invention will become more fully apparent from the following specification, appended claims and accompanying drawing, wherein:

Figure 1 is a perspective view of my improved electrode holder,

Fig. 2 is a longitudinal sectional view through the holder,

Figs. 3, 4 and 5 are cross-sectional views through the holder along lines 3—3, 4—4 and 5—5, respectively on Fig. 2, and

Fig. 6 is a perspective view of my improved form of spring blade member.

The general arrangement of the parts is described in the aforesaid patent. Briefly, the electrode holder comprises an elongated case 10 of insulating material. The case is preferably in the form of an open ended sleeve. Projecting from one end of the case are two members 12 and 14 arranged side by side in parallel relation. About half the length of each member extends inside the case as shown in Fig. 2. The opposite end of the case receives a cable 16 which delivers electrical current from a source of electricity.

An important feature of the invention is the fact that the two members or blades 12 and 14 are cast in the form shown. These members are preferably formed of a metal alloy which is relatively highly electrically conductive. In order to perform the casting operation and expedite the assembly operation, I have shaped the members 12 and 14 in a particularly desirable way. The members are cast in a general channel formation as indicated in the section views Figs. 3 to 5 inclusive. The outside ends of both members are provided with an aperture for a purpose to be described hereinafter. The inside end of member 14 is shaped in the form of a sleeve 18 provided with a tapering bore which is adapted to receive the open end of cable 16 as shown. About midway between its end, member 14 is formed in the casting operation with two arm-like portions 20—20 (Fig. 4) which project above the side sections of the channel and are spaced apart a distance equal to the width of member 12. These arm portions 20—20 are formed with outer circular faces which are adapted to be snugly received within the interior of the case 10 as shown in Fig. 4.

Member 12 is cast with a distinct return bend 22 about midway between its ends. On the channel side of the member this bend forms a protuberance or bulge; on the other side a transverse saddle-like recess or notch. The inner end of the member 12 is formed with holes internally threaded which receive bolts 24 for securing a hand-engaging part or handle 26 thereto.

As previously mentioned, the outer end of members 12 and 14 are provided with apertures. These apertures extend from the outside to the inside faces of the respective members. Mounted within the channels are cast metal jaw elements 28 and 30. The opposed faces of these jaw elements are lined with grooves improving the gripping action thereof. The side sections of the channel are preferably cut away slightly on the end of the members 12 and 14 in order that the gripping faces of the jaw elements may extend the full width of the members. The jaw elements are, as previously mentioned, cast metal parts. They preferably are formed on an alloy especially resistant to heat yet highly conductive of electrical current. Cast integrally on the back side of each jaw element is a stud pin 32 which is of a size to tightly fit within the apertures in the end of the members 12 and 14, and when fully inserted thereinto these pins project slightly beyond the outside surface of the members. Thus, in the assembly operation the jaw elements are easily positioned in place with the stud pins projecting through the holes to the outside of the members, and a few quick blows by a hammer or other tool is all that is necessary to peen over the projecting end of the stud pins to secure the jaw elements securely in place on the end of the jaw members in the manner shown in Fig. 1.

Extending over the exposed portions of the jaw members 12 and 14 are insulating protecting shields of the character described and claimed in my Patent No. 2,003,196. These shields, in-

dicated at 34, are channel-shaped as shown in Fig. 3 to partially embrace the jaw members, although it is not absolutely essential that they be channel shaped. Screws 36 removably secure these shields in place.

In the assembly operation the two jaw members are disposed side by side with their channels facing toward one another. In this position the protuberance formed by the bend 22 forms a fulcrum about which member 12 may rock. When properly assembled, the fulcrum point is located between the cast arm portions 20—20, the latter holding member 12 against lateral displacement relative to the jaw member 14. After the parts have been assembled to this extent, a pin 38 is provided which bridges the ends of the arm portion 20—20 and extends transversely to the jaw members through the notch above the bend 22. This pin functions to hold the member 12 against longitudinal displacement relative to the member 14. The rounded character of the pin 38 permits the jaw member 12 to rock on its fulcrum relative to the other member.

In the aforesaid Wagner patent a U-shaped spring metal blade is used to exert pressure bringing the electrode gripping parts together. Although this type of spring blade shown in the Wagner patent is satisfactory for general use, it tended to give way and break after considerable use. This is especially true at the bend. I have found that a stronger gripping force can be obtained and longer life insured by forming the spring metal blade in a novel formation. Instead of one bend, I have doubly bent the blade and brought the two ends into juxtaposition so that both ends act to exert a yielding force on the jaw members. Fig. 6 shows the novel formation. The spring metal blade is generally indicated at 40. It is doubly bent at 42 and 44 and the ends brought close together. Preferably the blade is bent so that the ends overlap as shown in Fig. 2. Thus the end section toward the jaw members is assisted by the other end in yieldingly maintaining the grip of the jaw members. When the end section of the blade toward the front end of the holder is compressed by depression of the handle 26, the inside end section is likewise compressed, and both together function to resist opening movement of the jaw members.

The cable is preferably connected to the fixed jaw member 14 by bending the strands of the cable wire about an enlarged conical shaped head 46 carried on the end of a bolt 48. The wire strands are bent over the enlarged head 46 and joined tightly together by wires 50 around a reduced portion adjacent to the head. The head 46 with the cable attached is drawn into the taping bore of the sleeve 18 and into close engagement with the walls thereof by a nut 52 threaded on the end of the bolt.

What I claim is:

1. An electrode holder of the class described including an elongated case of insulating material having one end opened, a pair of cast metal jaw members extending partially into the case through the opened end thereof, one of said members having on that section inside the case a portion cast integral therewith which is of general circular configuration having a diameter which causes it to snugly fit within the case, said cast metal portion being opened on one side forming a longitudinal slot adapted to receive the other jaw member, and a pin extending across said slot and connected to said cast metal portions, said pin engaging the jaw member received in said slot and acting to hold the two jaw members together while permitting pivotal movement of one with respect to the other.

2. An electrode holder of the class described including a hollow cylindrical case of insulating material having one opened end, a pair of cast metal jaw members each extending partially into the case through the opened end thereof, both of said members being cast in channel formation and arranged in the case with the channels facing toward one another, one of said members being cast at an intermediate part with a transverse notch on the side opposite the channel and a protuberance on the channel side which is adapted to bear against the other member to form a fulcrum about which it may rock, said other member being provided with a part cast integrally therewith which is circularly formed to snugly fit within the case and extends partially around the other member opposite the notch and protuberance of the latter, and a separate element extending transversely to the members through said notch and connected to said circular part to hold the notched member to the other member while permitting rocking movement of the former relative to the latter.

3. An electrode holder of the class described including an elongated case of insulating material having one end opened, a pair of cast metal jaw members extending into the case through the opened end thereof, one of said members being cast with a protuberance on one side and a notch on the other side, the other member being cast with spaced arm portions which are shaped to snugly fit the interior of the case, said jaw members arranged in parallel arrangement with the side of the one carrying the protuberance bearing against the other member so that the protuberance forms a fulcrum point for rocking of the former about the latter member, said arm portions partially embracing the notched member to hold the two against lateral displacement relative to one another, and means connected to the ends of said arm portions and extending across through the said notch acting to hold the members against longitudinal displacement relative to one another while permitting rocking movement of one with respect to the other.

4. An electrode holder of the class described including an elongated case of insulating material having an opened end, a pair of jaw members arranged side by side and extending partially into the opened end of said case, one of said members provided on the part inside said case with a protuberance on one side which bears against the other member to form a fulcrum about which the former may rock and also provided with a notch on the opposite side thereof in line with the fulcrum, said other member provided with a pair of arms partially embracing said first described member at the fulcrum point, said arms shaped on their exterior to snugly fit the interior of the case, and an element bridging the distance between the ends of the arms and lying within the notch.

5. An electrode holder of the class described including a hollow cylindrical case of insulating material having an opened end, a pair of jaw members arranged side-by-side and extending partially into the opened end of said case, one of said members provided on that part inside said case with a protuberance on one side which

bears against the other member to form a fulcrum about which the former may rock and further provided with a notch on the side opposite the protuberance but at the same place on the length of the member, said other member provided with a pair of arms which have an outside curvature snugly fitting the interior of the case and extending past the sides of the first described member in line with the fulcrum and the notch thereof, an element bridging the distance between the ends of said arms and extending through said notch, said case provided with an aperture thereof opposite the inner end section of the jaw member carrying the protuberance and the notch, a hand engaging part extending through said aperture and fixed to the inner end section of said last mentioned jaw member, and a spring means between the inner end sections of said jaw members yieldingly spacing the same apart.

6. An electrode holder comprising, in combination, a pair of members assembled together in generally parallel side by side relation and provided on one of their ends with jaws for gripping an electrode therebetween, said members being channel shaped in cross section throughout the major portions of their lengths and arranged with the channels thereof facing toward one another and the side walls of the channels in line with one another, a hollow open ended substantially cylindrical case of insulating material enclosing the end sections of said members opposite the jaws, one of said members provided inside the case intermediate its length with a U-shaped bend projecting toward the other member and forming a saddle-like depression on the opposite side thereof, the side walls forming the channel at said U-shaped bend bearing on the side walls of the channel of the other member and by virtue of the U-shape of said bend forming a rocking fulcrum, said other member provided inside the case opposite said U-shaped bend with opposite side portions which project around the opposite sides of said U-shaped bend to points in line with one another above said saddle-like depression, a pin extending across said saddle-like depression and connected to said side portions to thereby hold the members against longitudinal displacement with respect to one another but permitting rocking of one with respect to the other, and spring means inside said case between said members yieldingly urging the inside sections of the members away from one another.

7. The invention described in claim 6 characterized by the fact that said spring means comprises a spring metal blade doubly bent upon itself in such a manner that the ends overlap upon one another and both ends act to exert a force urging the sections of said members inside the case away from one another.

8. An electrode holder comprising, in combination, a hollow open ended cylindrical case of insulating material having a circular interior wall and an opening through the side of the case intermediate its ends, a pair of members having opposed jaw shaped ends for gripping an electrode assembled side by side and mounted with the opposite ends extending into said case at least as far as said opening therethrough, said members being channel-shaped in cross section throughout the major portion of their lengths and arranged with the channels thereof facing toward one another and the side walls of the channels in line with one another, a handle fixed to the inside end of one of said members and projecting through said opening to the exterior of the case, said member having the handle provided inside the case intermediate its ends with a U-shaped bend projecting toward the other member and forming a saddle-like depression on the side opposite to the bend, the side walls of the channel at said U-shaped bend bearing on the side walls of the channel of the other member and by virtue of the U-shape of said bend forming a rounded fulcrum, said other member provided with opposite side portions snugly fitting the inside circular wall of the case and extending past the opposite sides of said U-shaped bend to points in line with one another above said saddle-like depression, a pin extending across said saddle-like depression and connected to said side portions to thereby hold said members against longitudinal displacement with respect to one another but permitting rocking movement of the member having said U-shaped bend upon the other member, and a spring between the members inside the case yieldingly urging the inside sections of the members away from one another.

9. An electrode holder comprising, in combination, a hollow opened ended substantially cylindrical case of insulating material, a pair of members assembled together in generally parallel side by side relation and provided on one of their ends with opposed jaws for gripping an electrode therebetween, said members mounted with their opposite ends extending into said case, one of said members having side portions formed integrally therewith which snugly fit the inside dimension of the case adjacent the end of the case from which said members project and extending past opposite sides of the other member, said side portions having inside parallel walls spaced apart a distance equal to the width of the said other member and acting to hold the latter against sidewise lateral displacement, and a pin extending from one side portion to the other and through the plane of the said other member acting to hold the same from longitudinal and vertical displacement while permitting rocking movement of one member with respect to the other.

10. An electrode holder including, in combination, an elongated case of insulating material, a pair of members assembled together in generally parallel side-by-side relation and provided on one of their ends with opposed jaws for gripping an electrode therebetween, said members having their opposite ends extending into one end of said case, one of said members having integrally formed side portions inside said case intermediate its ends which extend past opposite sides of the other member, said side portions having inside parallel walls forming a longitudinal slot of substantially the width of the said other member and in which the latter lies and is held from sidewise lateral displacement relative to the first described member, and an element bridging said slot from one side portion to the other side portion and acting to hold the said other member from longitudinal and vertical movement relative to the first described member while permitting rocking movement of one member with respect to the other.

HONEL A. JACKSON.