March 4, 1941. J. C. SMITH 2,234,026

STREET LAMP PULLER

Filed June 6, 1940

Fig. 1

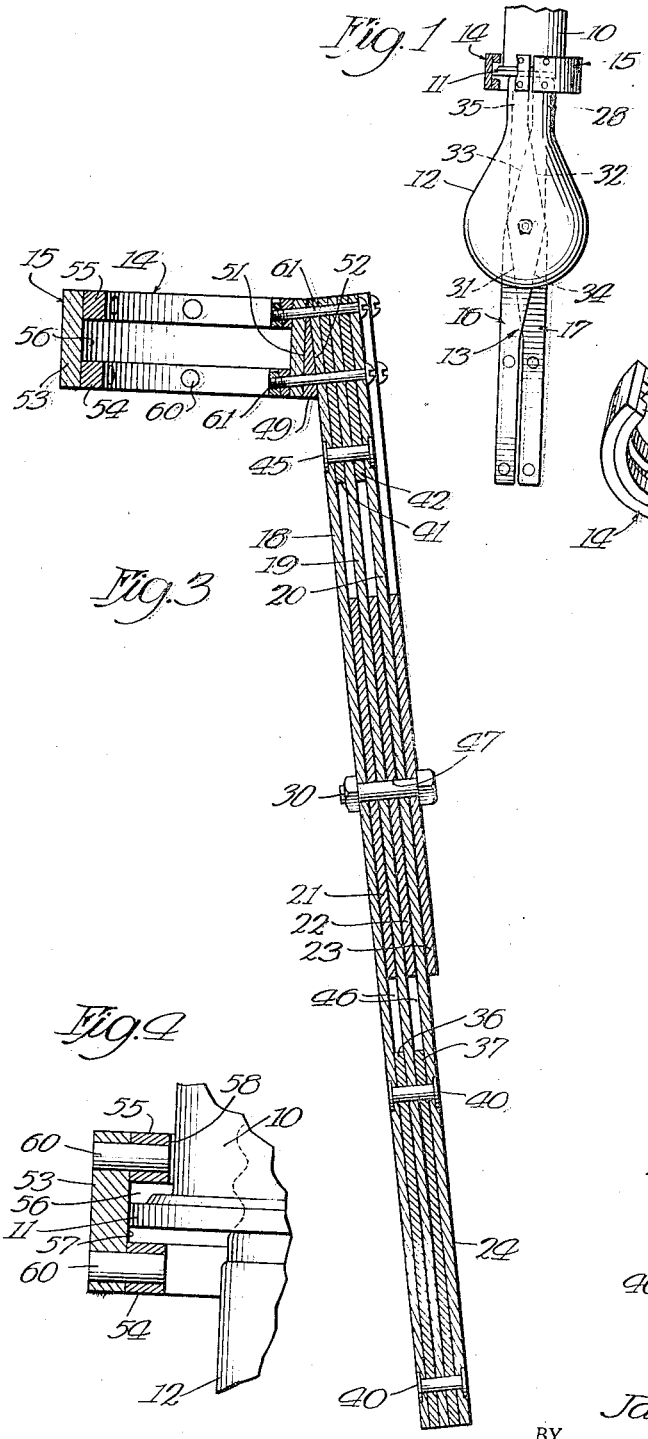

Fig. 2

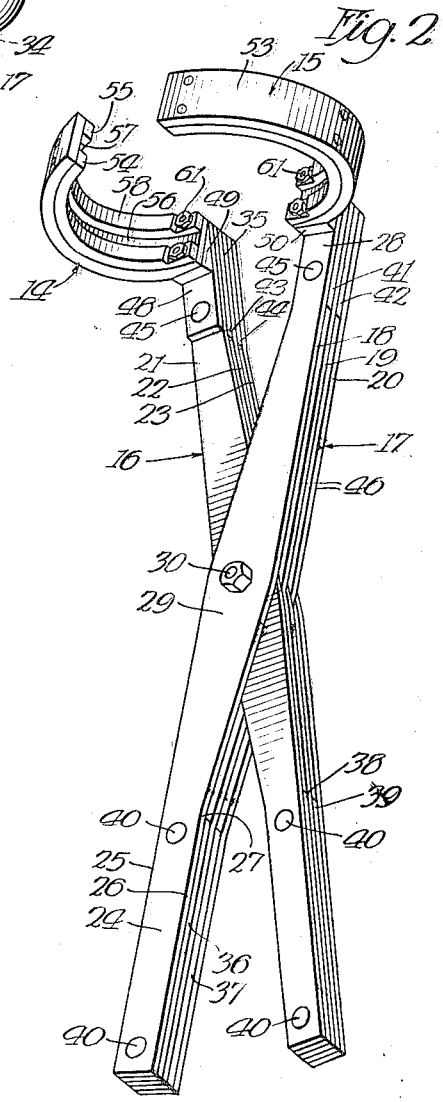

Fig. 3

Fig. 4

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STREET LAMP PULLER

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11 Claims. (Cl. 294—20)

The present invention relates to street lamp pullers, and is particularly concerned with devices adapted to be used in pulling or disconnecting incandescent lamps of the type having a socket that is provided with prongs adapted to be disengaged from the circuit by a pull in the general direction of the axis of the socket.

Such sockets are used upon standard street light installations, and it is necessary for the lineman to climb a pole in order to make a lamp renewal, except in the case of a span lamp, where the lamp may be let down until it is within reach of the ground.

When the incandescent lamp burns out in arrangements of this kind, the wires leading to the lamp are still energized, until the lamp and socket are removed from the lighting circuit.

Such bulbs are very apt to break because the glass has become crystallized, and when such bulbs are touched by a lineman, they frequently break or crumble in the hand, puncturing the rubber gloves worn by the lineman. There is a possibility of serious shock, or possibly death, on such circuits because they frequently carry a considerable load, i. e., a very high amperage.

Another reason for hazardous conditions in renewing such lamps lies in the fact that the gloves may be wet. Such street lighting circuits are usually constant current circuits, and they are operated at a relatively high current, and they are rendered particularly dangerous by the fact that any break in the circuit brings the full voltage across the entire series of lamps into operation at the break in the circuit.

One of the objects of the invention is the provision of an improved street lamp puller which is more adequately insulated than any of the devices of the prior art, which is adapted to be used for pulling such street lamps and sockets with a high degree of safety.

Another object of the invention is the provision of an improved street lamp puller of the class described which is adapted to be constructed at a very low cost so that it may be placed within the means of a vast number of the purchasing public.

Another object of the invention is the provision of an improved street lamp puller of the class described, which cannot be damaged by ordinary electric arcs, or by the application of heat or moisture, and which is adapted to be used for a long period of time without necessity for any repair or replacement.

Another object of the invention is the provision of an improved street lamp puller of the class described which may be practically wholly constructed of insulating materials of types that may be purchased on the open market.

Another object of the invention is the provision of an improved street lamp puller of the class described which places no particular strain upon the lamp, and which is peculiarly adapted to operate on the lamp socket so that the lamp may be wholly disconnected from the circuit, and thereafter removed from its socket.

Other objects and advantages of the invention will be apparent from the following description and the accompanying drawing, in which similar characters of reference indicate similar parts throughout the several views.

Referring to the single sheet of drawings accompanying this specification,

Fig. 1 is a vertical elevational view of the street lamp puller shown in connection with an incandescent bulb and a socket of the type on which it is intended to operate, the puller being partially broken away to show the structure of its clamping means;

Fig. 2 is a view in perspective of the street lamp puller with the clamping members spread apart;

Fig. 3 is a vertical sectional view taken on the plane of the line 3—3 of Fig. 2, showing the details of construction;

Fig. 4 is a fragmentary full sized sectional view showing the same details as are broken away in Fig. 1.

Referring to Fig. 1, 10 indicates in its entirety a standard street lamp socket having an outer insulating housing which is usually provided at its lower end with a radially projecting rib 11. The socket is, of course, provided with the usual screw type connector and contact for the center of the bulb, and it is of the type having a pair of axially projecting prongs which are to be engaged in a constant current circuit.

The circuit is usually so arranged that the removal of a lamp and socket from the circuit leaves the circuit closed by virtue of contacts which engage as the socket is removed. 12 indicates the incandescent bulb in the socket 10, which is to be renewed, or it may indicate the new bulb in the course of being renewed.

The street lamp puller is indicated by the numeral 13, and it preferably comprises a pair of clamping members, indicated at 14, 15, and a pair of lever assemblies 16, 17. These lever assemblies and the clamping members 14, 15 are preferably made of indurated fiber, otherwise

known as fiber board, which is an insulating material of high insulating value.

This material is relatively strong, tough, and resilient, and it may be purchased in the form of tubes, sheets, or other forms. The levers 16, 17 are preferably made up of a plurality of lever members, which may be indicated by the numerals 18, 19 and 20 in the lever assembly 17, and the members 21, 22, and 23 in the lever assembly 16.

These lever members 18 to 23 are substantially identical in shape, but are reversed in position in the two lever assemblies, and each lever assembly is made up of a plurality of these lever members secured together in spaced relation to each other so that there is room between the respective members of one lever 17 for those of the other lever 16.

As to shape, each of the lever members is preferably provided with a lower handle portion 24, which may be provided with the relatively straight sides 25, 26 up to the point 27. At the opposite end there may be a similar shorter straight portion at 28, where the spacing members are located for spacing the lever members apart at this end.

The lever members 18 to 23 are preferably widened at the central portion 29 for the reason that such levers are subjected to bending strains like a beam, and the place of maximum bending strain is adjacent the center or point of pivot at the bolt 30. Thus, this design of lever makes the clamping lever of maximum strength at the place where there is maximum strain.

It is also true that the particular shape of the lever member in question permits the two handle formations 24 to be side by side when the lamp puller is engaged with a socket 10, as shown in Fig. 1, so that the handles may be treated as a single handle member, which the hand may engage to hold the lamp puller and keep it in clamping engagement with the socket.

The width of the handle portions 24 is such that the hand may very conveniently embrace both of the handle portions 24 at one time.

Referring to Fig. 1, it will be seen that the medial portion 21 of the lever members is defined by the diagonally extending lines 31, 32, 33, and 34. In effect, the lever member 16 extends upward, and at a point just past the handle portion 24, it becomes wider and extends diagonally over toward the right hand side, where it carries the straight portion 28.

In the same way the lever 17 extends upward at the handle portion, and thereafter diagonally toward the left to support the straight portion 35 at the top. This brings the upper end portions 28 and 35 into such position that a squeezing of the handle portions 24 causes the clamping members 14 and 15 to engage the lamp socket 10.

The handle portions 24 are preferably separated from each other by the rectangular pieces 36, 37, 38, 39, which are interposed between the lever members 18 to 23. For example, the spacer 36 is between the lever members 18 and 19. The spacer 37 is between the lever members 19 and 20. Spacer 38 is between the lever members 21 and 22. Spacer 39 is between the lever members 22 and 23.

These spacer portions 36 to 39 are similar in area and shape to the handle portions 24. When the parts are assembled as shown, they may all be clamped together by means of metal rivets 40, passing through the spacer members and lever members.

At the upper end portions 35 and 28 the ends of the levers are again separated by the use of similar spacer portions 41 to 44. These lever members and spacers are likewise secured by the rivets 45, which pass through the lever members and spacer members, and clamp them fixedly together. This leaves the wider medial portions 29 of all of the lever members 18 to 23 with spaces 46 between them, which are as wide as the thickness of the fiber which is used to make the lever members 18 to 23.

Before the rivets 40 or 45 are secured, the two lever assemblies 16 and 17 are arranged as shown in Fig. 2, with the lever members 21 to 23 in between the lever members 18 to 22, and vice versa.

This makes a pair of lever assemblies which are adapted to be pivotally secured together by a single bolt, and which permit of no wabbling or unnecessary play, on account of the flat engagement between the faces of the lever members 18 to 20 with the faces of lever members 21 to 23.

All of the lever members 18 to 23 are provided with the centrally located registering apertures 47, through which the bolt 30 passes in Figs. 2 and 3. Any convenient form of pivotal member may be used, such as a bolt or rivet.

The front faces of the lever assemblies 16 and 17 at the upper ends in Fig. 2 are preferably in the same plane. Therefore, an additional plate of fiber is included in the lever assembly 16, as indicated at 48, and secured by the same rivet.

As the clamping members 14 and 15 engage the socket, the two lever assemblies 16 and 17 might engage the bulb and force it laterally if it were not for the fact that the angular blocks 49 and 50 are carried by the end portions 35 and 28 of the lever assemblies so that the levers extend diagonally downward and toward the right, as shown in Fig. 3. This spaces the lever assemblies downwardly toward the right from the bulb, and permits the clamping members to engage the socket without interference between the lever assemblies and the bulb.

These blocks 49 preferably have the flat faces 51 and 52, which extend diagonally tooward each other; that is, the blocks taper toward the top, as shown in Fig. 3. The clamping members 14 and 15 are identical in structure, but reversed as to location; and therefore only one of them need be described in detail.

Whereas the lever assemblies 16 and 17 may be made up out of members that are punched or cut from sheets of indurated fiber, the clamping members are preferably formed out of the tubular stock.

Each clamping member preferably comprises a substantially half cylindrical outer supporting member 53 and a pair of inner annular stop members 54, 55. The supporting portions 53 may be formed out of half annular portions of a tube of indurated fiber which is large enough to embrace the socket 10 at the outer portion of its rib 11.

The members 54 and 55 may comprise half annular protions of a tube, the outer surfaces of which fit the inner surface of the tube of which member 53 is made. These half annular stop members 54, 55 are secured in spaced relation and parallel to each other on the inside of the supporting members 53 in such manner as to leave a groove 56 between the stop members 54 and 55.

The thickness of the stop members 54 and 55 may be such that the groove is deep enough to embrace entirely the rib 11 on the socket so that the clamping is effected at the inner surface 57

of the members 53; that is, at the base of the groove.

In other embodiments of the invention the clamping may be done at the inner cylindrical surface 58 of the stop members 54 and 55. As the dimensions of such a rib 11 on a lamp socket 10 may vary, it is not of great importance which of the surfaces 58 or 57 engages the socket first.

The stop members 54 and 55 should, however, be arranged above and below the rib 11 when the lamp socket 10 is engaged between the clamping members 14 and 15. These half annular members 54 and 55 are secured to the supporting members 53 by a plurality of through rivets 60 and by bolts or rivets 61, a pair of which extend through the clamping members 14 and 15 and through the spacing wedges 49 and through the end portions 35 and 28 of the lever assemblies to secure the clamping members to the lever assemblies. The heads and/or nuts of these bolts 61 are preferably located in countersunk recesses so that nothing but the fiber engages the socket 10.

The operation of my street lamp puller will be evident from the foregoing description of its parts. The clamping members 14, 15 may be separated and passed around the socket 10. When the lever assemblies 16, 17 are brought together, the handle portions 24 may be grasped by one hand.

The operator may with one hand hold the clamping members in engagement with the socket 10, and by means of an axial pull, remove the socket member from engagement with the circuit. Thereafter, when the lamp is out of the circuit entirely, it may be unscrewed from the socket 10 and replaced with a new lamp, and the same lamp puller may be used for replacing the socket in a circuit by means of an axial push.

The present lamp puller is practically wholly constructed of insulating materials, except for the rivets or bolts which fasten the parts together, and these are located at spaced points. Those which are at the clamping members are completely out of engagement and insulated from those which are located in the handle.

The interlocking lever assemblies are adapted to operate pivotally together without any play or other movement than pivotal movement on the central stud 30.

There is absolutely no possibility of one lever twisting with respect to the other in such manner as to release the socket or cause any accident. The operator can remove street lamps with this puller without possibility of breakage of the lamp or possibility of puncturing his rubber gloves, and rubber gloves may be wholly eliminated, if desired, and other heat insulating gloves used for removing the lamps from the sockets, after the sockets have been pulled.

The present lamp puller may be constructed of stock materials that can be purchased on the open market. These materials can be placed in proper form by means of a few cutting or punching and drilling operations so that the device can be manufactured with a minimum amount of machine work.

While I have illustrated a preferred embodiment of my invention, many modifications may be made without departing from the spirit of the invention, and I do not wish to be limited to the precise details of construction set forth, but desire to avail myself of all changes within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a street lamp puller, the combination of a pair of insulating levers pivotally mounted on each other and traversing each other, said levers each carrying at one end a pair of semi-annular clamping members, said clamping members each being formed with a semi-annular groove, and the other ends of said levers serving as handles, whereby a gripping of the handle ends of the levers is adapted to hold the clamping members in engagement with a lamp socket having an outward projection thereon.

2. In a street lamp puller, the combination of a pair of insulating levers pivotally mounted on each other and traversing each other, said levers each carrying at one end a pair of semi-annular clamping members, said clamping members each being formed with a semi-annular groove, and the other ends of said levers serving as handles, whereby a gripping of the handle ends of the levers is adapted to hold the clamping members in engagement with a lamp socket having an outward projection thereon, said clamping members being formed of short half sections of a tubular member provided with inner shoulder formations forming said groove.

3. In a street lamp puller, the combination of a pair of insulating levers pivotally mounted on each other and traversing each other, said levers each carrying at one end a pair of semi-annular clamping members, said clamping members each being formed with a semi-annular groove, and the other ends of said levers serving as handles, whereby a gripping of the handle ends of the levers is adapted to hold the clamping members in engagement with a lamp socket having an outward projection thereon, said clamping members being secured to said lever members at such an obtuse angle that the levers extend diagonally away from the socket in order to prevent interference with the lamp bulb in the socket.

4. In a street lamp puller, the combination of a pair of insulating levers pivotally mounted on each other and traversing each other, said levers each carrying at one end a pair of semi-annular clamping members, said clamping members each being formed with a semi-annular groove, and the other ends of said levers serving as handles, whereby a gripping of the handle ends of the levers is adapted to hold the clamping members in engagement with a lamp socket having an outward projection thereon, each of said levers being made up of a plurality of plates secured together in such manner that predetermined plates of one lever are between predetermined plates of the other lever.

5. In a street lamp puller, the combination of a pair of insulating levers pivotally mounted on each other and traversing each other, said levers each carrying at one end a pair of semi-annular clamping members, said clamping members each being formed with a semi-annular groove, and the other ends of said levers serving as handles, whereby a gripping of the handle ends of the levers is adapted to hold the clamping members in engagement with a lamp socket having an outward projection thereon, each of said levers being made up of a plurality of plates secured together in such manner that predetermined plates of one lever are between predetermined plates of the other lever, said lever plates being each formed with a centrally located diagonally extending portion of greater width at the point of pivotal connection between said levers.

6. In a street lamp puller, the combination of a pair of insulating levers pivotally mounted on each other and traversing each other, said levers each carrying at one end a pair of semi-annular clamping members, said clamping members each being formed with a semi-annular groove, and the other ends of said levers serving as handles, whereby a gripping of the handle ends of the levers is adapted to hold the clamping members in engagement with a lamp socket having an outward projection thereon, all of said clamping members and levers being made of insulating material.

7. In a street lamp puller, the combination of a pair of insulating levers pivotally mounted on each other and traversing each other, said levers each carrying at one end a pair of semi-annular clamping members, said clamping members each being formed with a semi-annular groove, and the other ends of said levers serving as handles, whereby a gripping of the handle ends of the levers is adapted to hold the clamping members in engagement with a lamp socket having an outward projection thereon, said clamping members and levers being constructed of indurated fiber.

8. In a street lamp puller, the combination of a plurality of insulating plates forming a pair of lever assemblies, said lever assemblies being pivotally secured together at a point between their ends, and said plates being arranged so that the assembly comprises a plate of each lever assembly alternately, and a pair of insulating semi-annular clamping members carried by one end of each of said lever assemblies.

9. In a street lamp puller, the combination of a plurality of insulating plates forming a pair of lever assemblies, said lever assemblies being pivotally secured together at a point between their ends, and said plates being arranged so that the assembly comprises a plate of each lever assembly alternately, and a pair of insulating semi-annular clamping members carried by one end of each of said lever assemblies, said clamping members each comprising a semi-annular piece of tubular stock provided on its inner surface with a pair of semi-annular shoulder members fitting inside said first-mentioned semi-annular member.

10. In a street lamp puller, the combination of a plurality of insulating plates forming a pair of lever assemblies, said lever assemblies being pivotally secured together at a point between their ends, and said plates being arranged so that the assembly comprises a plate of each lever assembly alternately, and a pair of insulating semi-annular clamping members carried by one end of each of said lever assemblies, said clamping members each comprising a semi-annular piece of tubular stock provided on its inner surface with a pair of semi-annular shoulder members fitting inside said first-mentioned semi-annular member, said clamping members being arranged at an angle greater than a right angle to said lever members by means of an interposed wedge-like spacing member.

11. In a street lamp puller, the combination of a plurality of insulating plates forming a pair of lever assemblies, said lever assemblies being pivotally secured together at a point between their ends, and said plates being arranged so that the assembly comprises a plate of each lever assembly alternately, and a pair of insulating semi-annular clamping members carried by one end of each of said lever assemblies, said clamping members each comprising a semi-annular piece of tubular stock provided on inner surface with a pair of semi-annular shoulder members fitting inside said first-mentioned semi-annular member, said clamping members being arranged at an angle greater than a right angle to said lever members by means of an interposed wedge-like spacing member, said plates being secured together with spacing members between each of the adjacent plates of each assembly at each end thereof.

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