

Jan. 5, 1932.

H. W. BODENDIECK

1,840,150

FUSE PULLER

Original Filed Dec. 6, 1926

Fig. 1.

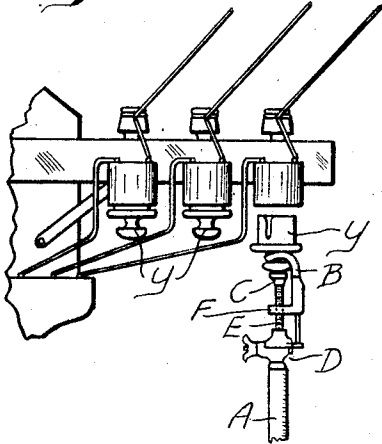


Fig. 2.

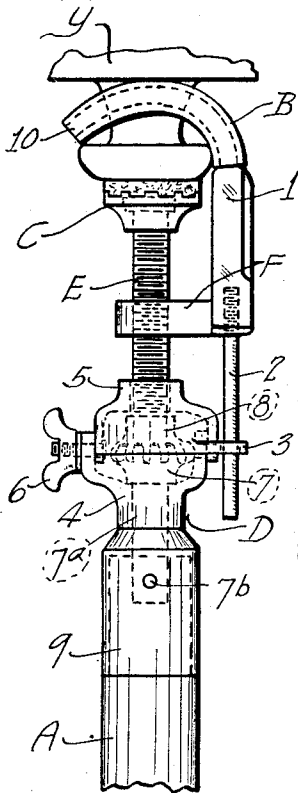
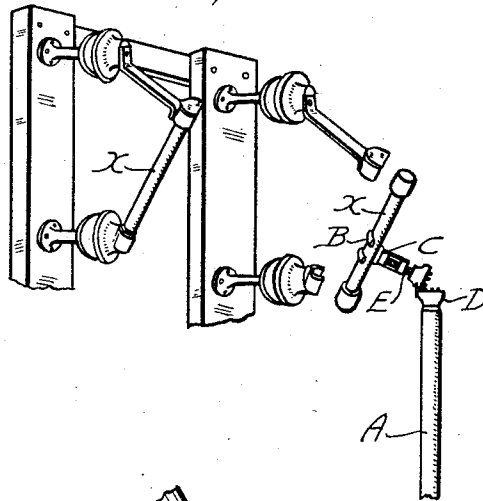


Fig. 3.

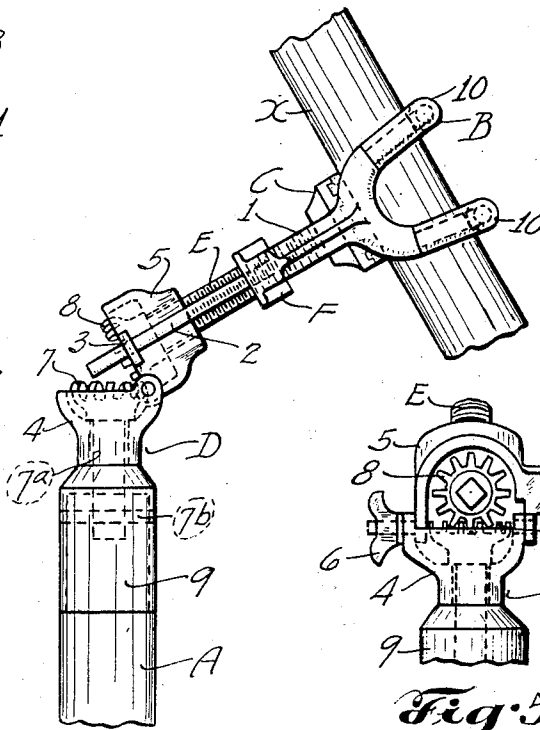


Fig. 4.

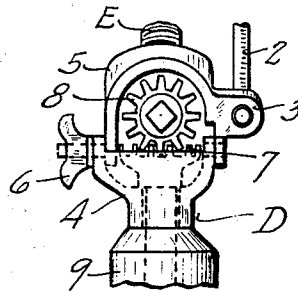


Fig. 5.

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HENRY W. BODENDIECK, OF TAYLORVILLE, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO TIP'S TOOL COMPANY, INCORPORATED, OF TAYLORVILLE, ILLINOIS, A CORPORATION OF ILLINOIS

FUSE PULLER

Application filed December 6, 1926, Serial No. 153,003. Renewed October 19, 1929.

This invention relates to devices of the kind commonly referred to as high tension fuse pullers, which are used in the maintenance of high tension lines for removing and replacing overhead fuses which generally are located from twenty to thirty feet above the ground.

One object of my invention is to provide a device of the general type referred to that can be used successfully for installing or removing a glass expulsion fuse arranged in a vertical or inclined position without liability of breaking the glass portion of the fuse and without exposing the operator to danger.

Another object of my invention is to provide a device of the general type mentioned, which, in addition to being capable of use with an expulsion fuse that is disposed vertically or in an inclined position, can also be used for installing or removing a plug type fuse.

And still another object is to provide a device for installing or removing overhead fuses that is constructed in a novel manner, which permits it to be quickly engaged with and disengaged from the fuse that is being removed or installed.

Figure 1 of the drawings is a perspective view, illustrating my improved device used for installing or removing a plug type fuse.

Figure 2 is a perspective view, illustrating said device being used for installing or removing a glass expulsion fuse that is arranged in an inclined position on an overhead supporting structure.

Figure 3 is an enlarged view of the device, showing the gripping members of same engaged with a plug type fuse.

Figure 4 is an enlarged view, showing the gripping members of the device engaged with the glass portion of an expulsion fuse; and

Figure 5 is a side elevational view of the device, taken at right angles to Figure 4.

My device is designed primarily to be used for removing or installing a glass expulsion fuse α that is arranged either in a vertical position or in an inclined position on an overhead supporting structure, as shown in Figure 2, and it is also capable of being used

for removing or installing a plug type fuse γ , as shown in Figure 1. A glass expulsion fuse comprises a tubular member constructed of glass, and when such a fuse is arranged in a vertical or inclined position, it is necessary to grip the glass portion of the fuse and move it laterally or in a general horizontal direction, during the operation of removing the fuse from its holder or introducing it into its holder. A plug type fuse is disposed in its holder in such a way that it has to be subjected to a straight downward pull to withdraw it from its holder and subject it to a straight upward push to install it in its holder. Consequently, a device that is capable of being used with the two different types of fuses above mentioned must be of such construction that the fuse gripping members are capable of being arranged in an angular position with relation to the pole or operating member of the device when an expulsion fuse is being removed or installed, or arranged in longitudinal alignment with the pole or operating member of the device when a plug type fuse is being removed or installed, in order that the operator can exert a substantially direct pull or thrust on the fuse when it is being withdrawn from or inserted in its holder. The device herein illustrated, which represents the preferred form of my invention, has both of the characteristics above mentioned, and while I prefer to construct the device in this manner, so that it can be used for handling both types of fuses that a lineman encounters in the maintenance of high tension lines, I wish it to be understood that certain features of my invention are applicable to a device designed solely for use with inclined or vertically-disposed glass expulsion fuses, and certain features are applicable to a device designed solely for use with a plug type fuse.

Referring to the drawings which illustrate the preferred form of my invention, A designates a long pole or operating handle constructed either from wood or from some suitable non-conducting material, B and C designate opposed gripping members arranged at the upper end of said handle and adapted to be engaged with an overhead fuse,

which, as previously stated, may either be a glass expulsion fuse *x* of the kind shown in Figure 2, or a plug type fuse *y* of the kind shown in Figure 1, D designates as an entirety a head piece on the upper end of the operating member A, E designates a rotatable screw journaled in the head piece D and connected with the gripping member C, and F designates a nut connected with the gripping member B and provided with an internally screw-threaded hole through which the screw E passes. The gripping member B is arranged above the gripping member C and is provided with a depending shank 1 to which the nut F is attached, and in order to hold the gripping members B and C in proper relation and prevent the nut F from turning with the screw E, the shank 1 of the gripping member B is provided with a guide 2 that passes through a hole in a lug 3 on the head piece D. When the screw E is rotated in one direction, after the gripping member B has been engaged with the fuse that is to be removed from its holder, the co-operating screw threads on the nut F and screw E will draw the members B and C together, and thus cause said members to tightly grip the fuse. Likewise, when the screw E is rotated in the opposite direction, the co-operating screw threads on said screw and on the nut F will cause the gripping members B and C to separate sufficiently to permit said members to be disengaged from the fuse after it has been inserted in its holder.

The head piece D of the tool herein illustrated is constructed in such a manner that it can be adjusted so as to permit the gripping members B and C to be arranged in an angular position with relation to the operating member A, as shown in Figure 4, or to be arranged in direct longitudinal alignment with the operating member A, as shown in Figure 3. While this can be accomplished in various ways without departing from the spirit of my invention, I prefer to form the head piece D of the tool from a base part 4 and an adjustable top part 5 that is hinged or rockably mounted on the base part 4, thereby enabling the adjustable part 5 of the head piece to be tilted when it is desired to arrange the gripping members B and C so that they project laterally from the operating member A. Any suitable means can be used for holding the tiltable or rockable part 5 of the head piece in adjusted position, such, for example, as a wing nut 6 that is adapted to be tightened so as to draw co-operating portions on the base part 4 and on the adjustable part 5 of the head piece D into snug clamping engagement with each other. Obviously, when the tool is designed solely for use with a plug type fuse, it is not necessary that the head piece D be provided with an adjustable portion like the part 5, and it is

also obvious that when the tool is designed solely for use with a vertically-disposed or inclined expulsion fuse, the head piece D of the tool may be provided with a rigid or non-adjustable part disposed so as to hold the gripping members B and C at right angles or in an inclined position with relation to the operating member A of the tool.

Rotary movement is imparted to the screw E by rotating the handle or operating member A, and while various means can be used for transmitting rotary movement from the handle A to the screw E, I prefer to provide the parts 4 and 5 of the head piece D of the tool with co-operating gears 7 and 8 which are so constructed that they will always remain in mesh with each other, irrespective of the position in which the part 5 of the head piece is adjusted, the gear 8 being attached directly to the lower end of the screw E and the gear 7 being attached to a spindle 7^a, which, in turn, is fastened by a cross pin 7^b, or in any other suitable manner, to a socket member 9 secured to the upper end of the operating member A.

The gripping members B and C can be constructed in various ways, but I prefer to use a bifurcated gripping member B that is composed of two hook-shaped portions arranged in spaced relation, as such a gripping member can be slipped laterally over the reduced shank of a plug type fuse, as shown in Figures 1 and 3, or it can be hooked around the tubular glass portion of an expulsion fuse, as shown in Figures 2 and 4. The gripping member C simply consists of a disk-shaped device that is swiveled on the upper end of the screw E or connected with said screw in such a way that it will not turn or rotate when said screw rotates. In order to prevent the gripping members B and C from chipping, marring, cracking or breaking the portions of the fuses which said members engage, the fuse engaging portions of said members are provided with pads 10 of rubber or some other suitable material.

When the device is to be used for removing a glass expulsion fuse of the kind shown in Figure 2, the head piece D of the tool is adjusted and clamped in such a position that the gripping members B and C will be disposed at substantially an obtuse angle with relation to the operating member A. Said operating member is then rotated in a direction to separate the gripping members B and C, and after the member B has been hooked around the tubular glass portion of the fuse, the operating member A is rotated in the opposite direction, so as to draw the members B and C together and cause them to be tightly clamped to the tubular glass portion of the fuse. After being engaged with the fuse in this manner, the operator manipulates the pole or operating member A so as to exert a direct outward pull on the fuse, thus caus-

ing it to be withdrawn from its holder. To install an expulsion fuse the gripping members B and C of the tool are clamped tightly to the tubular glass portion of the fuse while the fuse is on the ground, and thereafter, the operator raises the pole A and manipulates it so as to exert a direct push on the fuse in a direction to force it into its holder. When the tool is to be used for removing a plug type fuse of the kind shown in Figures 1 and 3, the adjustable part 5 of the head piece D of the tool is swung into longitudinal alignment with the base part 4 and clamped in adjusted position, thus causing the gripping members B and C to be arranged in direct longitudinal alignment with the operating member A. After said gripping members have been separated by rotating the handle A in one direction, the gripping member B is slipped laterally over the reduced shank of the fuse and the operating member A is then rotated in the opposite direction, so as to close the gripping members, or cause them to tightly clamp the fuse. The operator can then easily withdraw the fuse from its holder by exerting a direct downward pull on the operating handle A of the tool.

A tool of the construction above described is easy to operate, as the fuse engaging members of the tool can be clamped tightly to the fuse simply by rotating the operating handle A, and after the gripping members have been engaged with the fuse, the operator, by moving the handle A in the proper direction, can easily pull the fuse out of its holder. Moreover, such a tool can be used for removing and installing either plug type fuses or glass expulsion fuses that are arranged vertically or in an inclined position without liability of injuring the fuse or subjecting the operator to danger.

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

1. A device for installing or removing overhead fuses, comprising a pole or operating member, a head piece at the upper end of said pole provided with a hinged part that is adapted to be adjusted in various positions, a screw journaled in said part and provided with a fuse gripping member, an opposed fuse gripping member provided with a nut through which said screw passes, and means for causing said screw to rotate when said pole is turned or revolved in said head piece.

2. A device for installing and removing overhead fuses, comprising a pole or operating member, a head piece at the upper end of said pole provided with a pivotally mounted part that is adapted to be adjusted in various positions, a screw journaled in said part and provided with a fuse gripping member, an opposed fuse gripping member provided with spaced hook-shaped portions, a shank

on said opposed gripping member provided with a guide that passes through an opening in the pivotally mounted part of the head piece, a nut on said shank through which said screw passes, and co-operating gears attached to said screw and to said pole so as to permit said gripping members to be closed and separated by rotary movement of said pole.

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