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OPERATING DEVICE FOR HOT LINE CLAMPS

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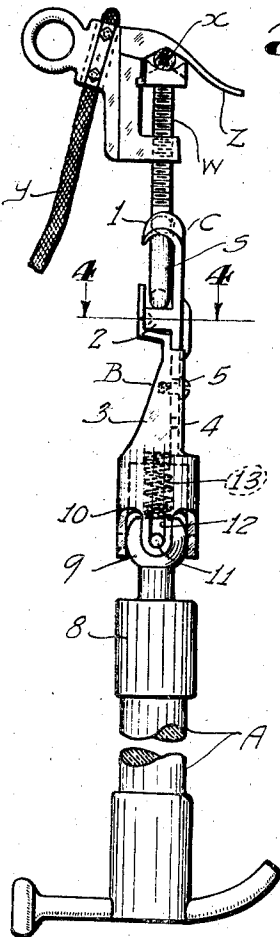


Fig. 1.

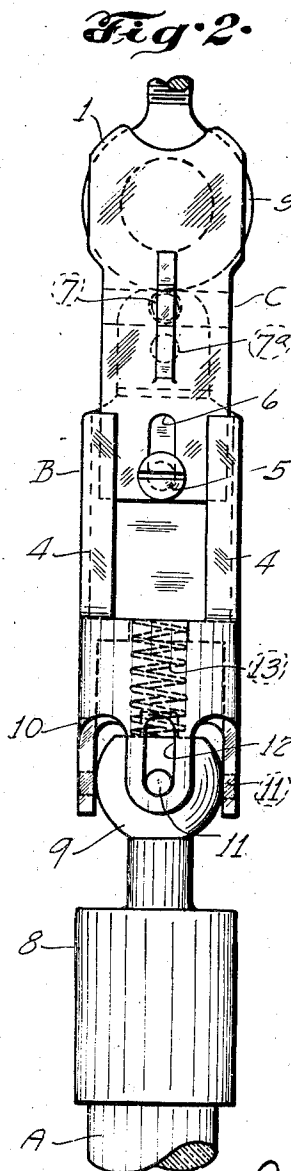


Fig. 2.

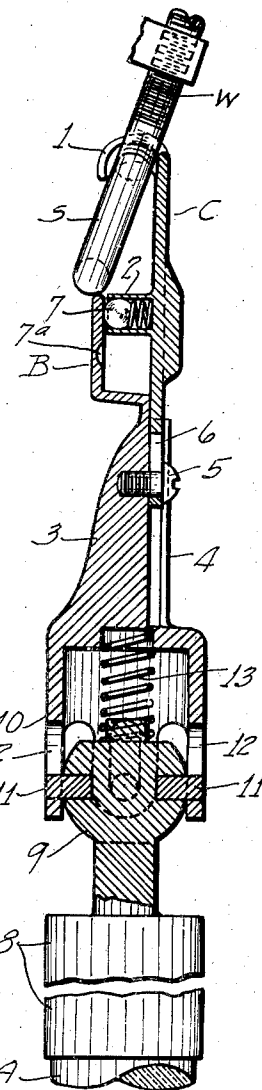


Fig. 3.

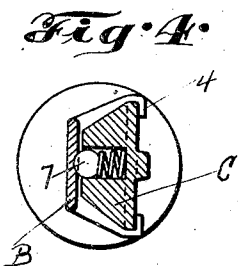


Fig. 4.

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OPERATING DEVICE FOR HOT-LINE CLAMPS

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This invention relates to a tool or operating device for tightening and releasing the screw member of a clamp that is used for connecting an electrical conductor, such, for example, as a jumper or branch line, to a "hot" line, i. e., a high tension supply line through which electric current is flowing.

The main object of my invention is to provide an operating device for a hot line clamp of the kind referred to, that affords complete protection to the user and which is of such construction that it will firmly grip the screw member of the clamp and can be easily connected with and disconnected from said screw member.

Another object of my invention is to provide a tool which is of such design that a lineman on a pole can use the tool to position a clamp on a hot line or to tighten or release the screw member of a clamp mounted on a hot line and located at a point above the lineman and a considerable distance to one side of the pole. Other objects and desirable features of my invention will be hereinafter pointed out.

Figure 1 of the drawings is a side elevational view of an operating device for a hot line clamp constructed in accordance with my invention, illustrating the device arranged in operative engagement with the screw member of the clamp.

Figure 2 is an enlarged front elevational view of said device.

Figure 3 is a longitudinal sectional view of the device, illustrating how it is engaged with the disengaged from the screw member of the clamp; and

Figure 4 is a horizontal sectional view, taken on the line 4—4 of Figure 1.

Referring to the drawings which illustrate the preferred form of my invention, *x* designates a high tension supply line and *y* designates an electric conductor, such, for example, as a jumper or branch line that is connected with the supply line *x* by a clamp *z* that comprises a screw member *w* which is adapted to be rotated in one direction to cause co-operating portions of the clamp to engage the line *x* and rotate it in the opposite

direction to release the clamp and permit it to be removed from the supply line *x*.

My improved tool or operating device comprises a handle *A* of any preferred length, constructed of wood or any other suitable insulating material, and co-operating members or jaws *B* and *C* at the upper end of the handle *A* designed so that they can be arranged in operative engagement with the eye or head piece *s* on the screw member *w* of the clamp by moving the handle *A* in one direction, and disengaged from said eye or head piece by moving said handle in the opposite direction. The co-operating jaws *B* and *C* can be constructed in various ways without departing from the spirit of my invention, but in the form of my invention herein illustrated said jaws are arranged in sliding relationship and are so designed that the upward, longitudinal movement of the handle *A* causes said jaws to firmly grip the head piece *s* on the screw member *w*, thereby enabling said screw member to be turned or rotated, and downward, longitudinal movement of the handle *A* cause the said jaws to assume such a position that they can be easily disengaged from the head piece on the screw member.

The jaw *B* is of substantially angle shape in vertical cross section, as shown in Figure 3, and the jaw *C* is of plate-like form and is provided at its upper end with a bifurcated hook *1* that is adapted to be slipped over the upper side of the eye or head piece *s* of the screw member of the clamp. The vertically-disposed portion of the jaw *C* which carries the bifurcated hook *1* is arranged in opposed relation with the vertically-disposed leg of the jaw *B* and is spaced away from said leg a distance approximately equal to the thickness of the eye or head piece on the screw member *w* of the clamp, so that when the jaws *B* and *C* are arranged in their closed position, as shown in Figure 1, the head piece or eye of the screw member *w* of the clamp will be held against turning by the opposed, vertically-disposed portions of the jaws *B* and *C*. The jaw *C* is also preferably provided with a laterally-projecting lug *2* that is arranged in longitudinal

alignment with the bifurcated hook 1 and spaced away from same a distance approximately equal to the height or depth of the head piece *s* of the screw member of the clamp, so as to form an open-sided pocket for receiving said head piece. The jaws B and C are combined in such a manner that they can reciprocate relatively to each other so as to cause the vertical leg of the jaw B to move towards or away from the bifurcated hook 1 of the jaw C in the operation of engaging the device with the screw member *w* of the clamp or disengaging said device from said screw member.

In the form of my invention herein illustrated the shank 3 of the tool that carries the jaw B is provided at one side with parallel, longitudinally-disposed flanges 4 that embrace the side edges of the plate-like portion of the jaw C and form a guideway in which the jaw C moves vertically. Any suitable means can be used for limiting the reciprocating movement of the jaw C relatively to the jaw B, or vice versa, such, for example, as a screw or stud 5 on the shank 3 that projects into an elongated slot 6 formed in the jaw C. In order to hold the jaws B and C in their open position and in their closed position, the laterally-projecting lug 2 on the jaw C is equipped with a spring-pressed ball or other suitable friction device 7 that acts on the inner side of the vertically-disposed leg of the jaw B, it being preferable to form a notch or recess 7^a in the inner face of said leg adjacent the lower end of same so as to receive the ball 7 when the jaws B and C are in their closed position. The recess 7^a is not absolutely essential, however, as the frictional pressure which the device 7 exerts on the vertical leg of the jaw B eliminates the possibility of said jaws moving accidentally relatively to each other, either when the jaws are closed and in engagement with the head piece *s* on the screw member *w* of the clamp, as shown in Figure 1, or separated so as to permit them to be disengaged from said head piece.

In order that the device may be used conveniently to rotate the screw member of a clamp that is positioned on a hot line located at a point a considerable distance above and to one side of the lineman who is using the device, a ball and socket joint is arranged between the shank 3 that carries the jaw B and the operating handle A of the device. Any suitable type of universal joint can be used between these parts, but in the tool herein shown the handle A is provided at its upper end with a socket piece 8 that carries a ball member 9 which is embraced by a socket member 10 attached to the shank 3, said ball member 9 being provided with a plurality of laterally-projecting pins 11 that are positioned in elongated slots 12 in the socket member 10. A spring 13 is arranged between the

ball member 9 and the socket member 10, so as to normally hold said parts separated with the pins 11 on the ball member positioned at the lower ends of the slots 12 in the socket member, thereby holding the shank 3 in longitudinal alignment with the handle A. If it is desired to arrange the shank 3 in angular relationship with the handle, as is sometimes necessary when the operator is using the device, it is only necessary to exert an upward thrust on the handle A sufficiently to compress the spring 13 and locate the pins 11 some distance above the lower ends of the slots 12 in the socket member, and then swing the handle laterally out of longitudinal alignment with the shank 3.

In using the device to remove a clamp from a hot line, the lineman first arranges the jaws B and C in their open position, shown in Figure 3, by pulling the jaw C upwardly or pulling the jaw B downwardly. The bifurcated hook 1 at the upper end of the jaw C is then slipped laterally over the eye or head piece *s* on the screw member of the clamp, and the handle A is then swung laterally so as to arrange the plate-like portion of the jaw C in parallel relationship with the eye *s* of said screw member. Thereafter, the handle A is pushed upwardly so as to move the jaw B upwardly into such a position that the vertical leg of same will lap over the head piece *s* of the screw member *w* of the clamp, and thus act as a closure for the open-sided pocket on the jaw C as shown in Figure 1, the jaw C remaining at rest when the handle A is pushed upwardly, due to the fact that the lug 2 on same is then in engagement with the lower end of said headpiece. After the jaws of the device have been closed, as above described, the handle A can be rotated either to release or tighten the screw member *w* of the clamp, without liability of the jaws B and C turning relatively to the head piece of said screw member, and without liability of said jaws becoming accidentally disengaged from said head piece. When it is desired to disengage the jaws B and C from the head piece of the screw member *w*, it is only necessary to pull the handle A downwardly, which operation causes the vertical leg of the jaw B to move downwardly into such a position that the upper end of same will clear the lower end of the head piece *s* of the screw member, the jaw C remaining at rest during this operation, due to the fact that the bifurcated hook 1 at the upper end of said jaw is then resting upon the head piece *s* of the screw member. After the jaws have been separated, as above described, the handle A can be swung laterally and the hook 1 at the upper end of the jaw C can be lifted out of engagement with the head piece *s* of the screw member of the clamp. In using the tool to position a clamp on a hot line, the head piece on the screw

member of the clamp is arranged in operative position between the jaws of the tool when said jaws are open, and after said jaws have been closed to firmly grip the head piece on said screw member, the handle of the tool is manipulated so as to arrange the clamp in operative position on the hot line. Thereafter, the handle of the tool is rotated so as to rotate the screw member of the clamp in the direction to cause the clamp to be securely fastened to the hot line.

From the foregoing it will be seen that a tool of the construction above described can be used to position a clamp on a hot line and to tighten or release the screw member of a clamp mounted on a hot line, without subjecting the operator to danger, due to the fact that the jaws B and C of the tool are carried by a handle A of wood or other suitable insulating material. After the jaws of the tool have been engaged with the head piece on the screw member of the clamp, there is no liability of said jaws accidentally slipping off of said head piece, and as the jaws can be closed or opened simply by pushing the handle A of the tool upwardly or pulling it downwardly, it is a very simple matter to connect the jaws of the tool with the screw member of the clamp or disengage said jaws from said screw member. While the ball and socket joint or universal joint between the jaws of the tool and the operating handle A are not essential, I prefer to construct the tool in this manner, so as to make it possible to open or close the jaws when the handle A of the tool is disposed at an angle to said jaws, as, for example, when the clamp that is being positioned, tightened or released is located on a hot line at a point a considerable distance above the lineman on the pole and a considerable distance at one side of the pole.

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

1. An operating device for a hot line clamp, comprising a jaw having portions for engaging the upper side and lower end of a head piece on the screw member of the clamp, a co-operating jaw for preventing accidental disengagement of said head piece and the jaw that receives same, and a handle for changing the relative position of said jaws.

2. An operating device for a hot line clamp, comprising a handle, jaws at the upper end of said handle that are adapted to engage a head piece on the screw member of the clamp, said jaws being adapted to be opened by moving the handle longitudinally in one direction and adapted to be closed by moving the handle longitudinally in the opposite direction, opposed portions on said jaws between which said head piece lies, means for preventing said head piece from moving longitudinally relatively to one of said jaws, and a universal

joint arranged between said handle and jaws.

3. An operating device for a hot line clamp, comprising a handle, a jaw at the upper end of said handle provided with an open-sided pocket that is adapted to receive a head piece on the screw member of the clamp, and a co-operating jaw for holding said head piece in said pocket, adapted to be rendered operative by moving the handle longitudinally in one direction, and rendered inoperative by moving the handle longitudinally in the opposite direction.

4. An operating device for a hot line clamp, comprising a handle, co-operating jaws at the upper end of said handle constructed so as to embrace the opposite side faces and the upper and lower end of the head piece on the screw member of the clamp and designed so that longitudinal movement of said handle in opposite directions reciprocates one jaw relatively to the other, and a friction device combined with said jaws for preventing accidental movement of said jaws relatively to each other.

5. An operating device for a hot line clamp, comprising a handle, two jaws at the upper end of said handle constructed so that one jaw can be slid relatively to the other by moving the handle longitudinally, spaced elements on one of said jaws that are adapted to be arranged in engagement with the upper end and lower end of the head piece on the screw member of the clamp, and a part on the other jaw for preventing said head piece from becoming accidentally disengaged from said spaced elements.

6. An operating device for a hot line clamp, comprising a handle, two jaws at the upper end of said handle constructed so that vertical movement of the handle will cause one jaw to move longitudinally relatively to the other, a hook on one jaw that is adapted to be engaged with the top side of a head piece on the screw member of the clamp, a lug on said jaw that is adapted to engage the lower end of said head piece, and a part on the other jaw arranged so as to prevent said hook and lug from becoming accidentally disengaged from the head piece of the clamp when the jaws are in their closed position.

7. An operating device for a hot line clamp, comprising a shank provided with a jaw, a co-operating jaw reciprocatingly mounted on said shank and provided with portions arranged so that they can be engaged with the head piece on the screw member of the clamp when said jaws are in their open position, and means for closing said jaws.

8. An operating device for a hot line clamp, comprising a handle, a jaw at the upper end of said handle provided with a vertically-disposed portion, a co-operating jaw slidingly combined with the jaw first referred to, and laterally-projecting portions on said co-operating jaw adapted to be arranged in engage-

ment with the upper end and lower end of a head piece on the screw member of the clamp, the vertically-disposed portion of the jaw first referred to being adapted to be moved upwardly so as to overlap said head piece.

9. An operating device for a hot line clamp, comprising a handle, a shank at the upper end of said handle, a rigid jaw on said shank provided with a vertically-disposed portion, a co-operating jaw reciprocatingly combined with said shank, a bifurcated hook at the upper end of said co-operating jaw, and a laterally-projecting lug on said co-operating jaw arranged in spaced relation with said hook.

10. An operating device for a hot line clamp, comprising a handle provided with a jaw, a shank at the upper end of said handle, a co-operating jaw reciprocatingly mounted on said shank and provided with an open-sided pocket that is adapted to be closed by the jaw on the shank, and a friction device on one of said jaws that bears against the other jaw and thus tends to hold said jaws in the position into which they have been adjusted.

11. An operating device for a hot line clamp, comprising a handle provided with a jaw, a shank at the upper end of said handle, a co-operating jaw reciprocatingly mounted on said shank and provided with a plurality of angularly-disposed portions that co-operate with the jaw on the shank to form a space for receiving the head piece on the screw member of the clamp, a friction device on one of said jaws that bears against the other jaw and thus tends to hold said jaws in the position into which they have been adjusted, and a universal joint arranged between said handle and shank.

12. An operating handle for a hot line clamp, comprising a handle, a shank at the upper end of said handle, a substantially L-shaped rigid jaw on said shank, guides on said shank, a co-operating jaw slidably mounted in said guides, a laterally-projecting lug on said sliding jaw provided with a friction device that bears against the vertical leg of said L-shaped jaw, and a hook on said sliding jaw arranged in spaced relation with said lug.

13. An operating device for a hot line clamp comprising a handle, jaws at the upper end of said handle that are adapted to engage a head piece on the screw member of the clamp, said jaws being adapted to be opened by moving the handle longitudinally in one direction and adapted to be closed by moving the handle longitudinally in the opposite direction, and a connection between said jaws and handle that normally holds the handle and jaws in longitudinal alignment with each other but which is adapted to be manipulated so as to provide for a lateral movement of the handle relatively to the jaws.

14. An operating device for a hot line clamp, comprising a handle, jaws at the upper end of said handle that are adapted to engage a head piece on the screw member of the clamp, a universal joint arranged between said handle and jaws, and a means that normally maintains said universal joint in an inactive condition and adapted to be manipulated by an upward thrust of the handle to render said universal joint operative when it is desired to move the handle laterally with relation to said jaws.

15. An operating device for a hot line clamp, comprising a handle, jaws at the upper end of the handle, and a universal joint between said handle and jaws comprising a ball member, a socket member that receives said ball member, a slot and pin connection between said ball member and socket member, and a spring that normally prevents the ball member from turning relatively to the socket member but which is adapted to be compressed so as to permit the ball member to turn slightly relatively to the socket member.

16. An operating handle for a hot line clamp, comprising a handle, jaws at the upper end of said handle, a connection between said jaws and handle comprising a ball and socket joint, and a spring for normally holding said ball and socket joint in an inactive condition adapted to be compressed by an upward thrust of the handle so as to render said ball and socket joint active and thus permit the handle to be swung laterally with relation to the jaws.

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