

Feb. 12, 1935.

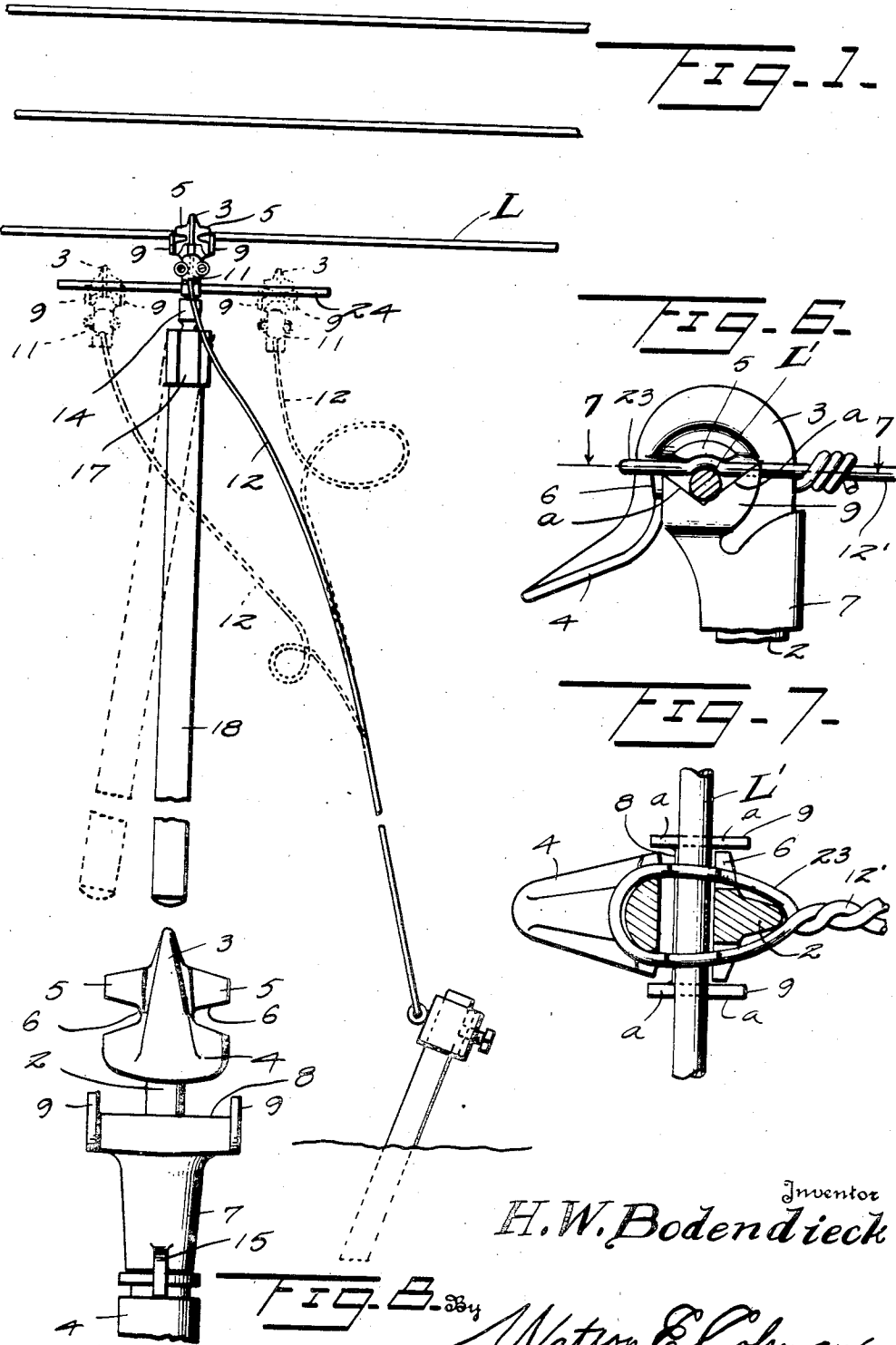
H. W. BODENDIECK

1,990,928

WIRE CLAMP

Filed Jan. 5, 1928

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

FIG. 2.

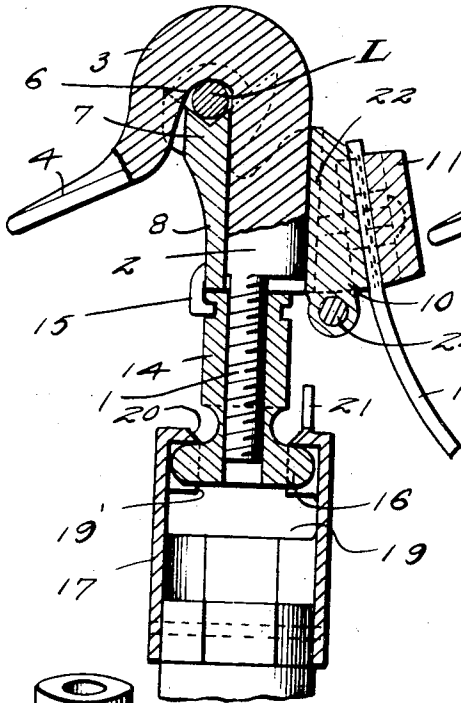


FIG. 3.

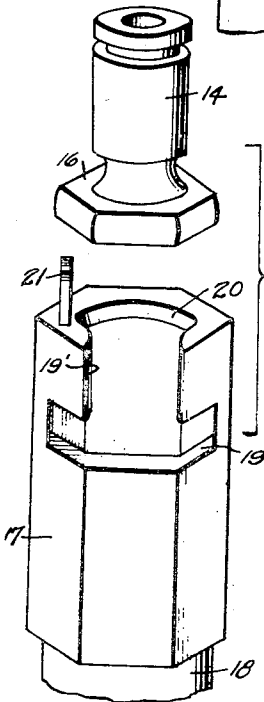
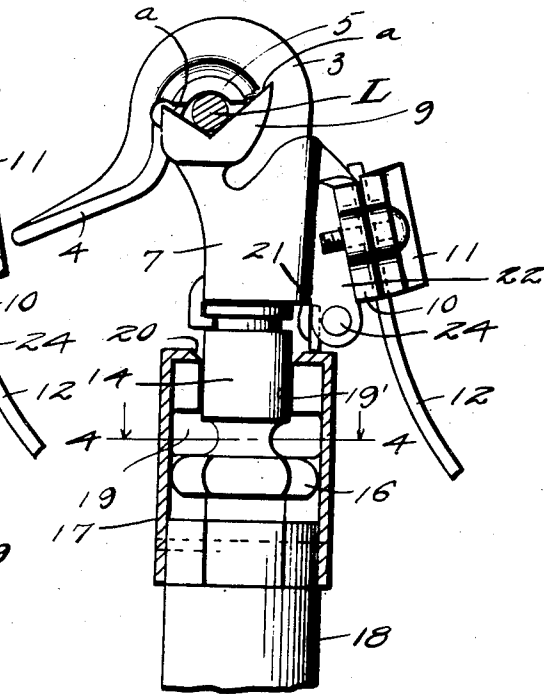


FIG. 9.

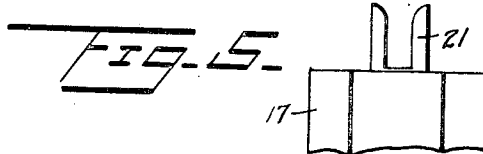
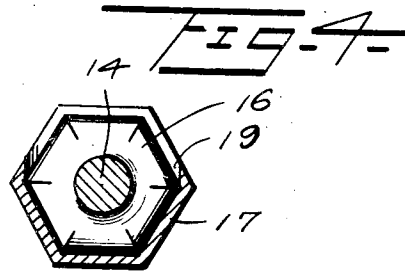


FIG. 5.

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UNITED STATES PATENT OFFICE

1,990,928

WIRE CLAMP

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corporation of Illinois

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17 Claims. (Cl. 173—273)

This invention relates to wire clamps especially designed and adapted for use in connection with a power line and it is primarily an object of the invention to provide a clamp of this kind which, when in applied or working position, engages the wire or line in a manner to assure effective electrical connection therewith.

It is also an object of the invention to provide a device of this kind comprising two relatively movable clamping members or jaws between which the wire or line is adapted to be engaged, together with means to effect the desired relative movement of said jaws or members to engage the same with or disengage the same from the wire or line.

Another object of the invention is to provide a device of this kind provided with means whereby when the device is in effective engagement with a line or wire also operates to hold in effective engagement therewith a second or lead off wire or line, or jumper as generally termed in the trade.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved wire clamp whereby certain important advantages are attained and the device rendered simpler, less expensive and otherwise more convenient and advantageous for use, as will be hereinafter more fully set forth.

The novel features of my invention will hereinafter be definitely claimed.

In order that my invention may be the better understood, I will now proceed to describe the same with reference to the accompanying drawings, wherein:—

Figure 1 is a view in elevation illustrating a clamp constructed in accordance with an embodiment of my invention applied, a second position of the handle being indicated by broken lines, said device being illustrated for use in connection with a grounding jumper or take-off, additional clamps being also indicated by broken lines;

Figure 2 is a view partly in section and partly in elevation of a clamp as illustrated in Figure 1, an associated handle being in fragment;

Figure 3 is a view in side elevation of the structure as shown in Figure 2 with parts in section, and the body of the clamp being shown in a second position with respect to the socket member carried by the handle;

Figure 4 is a detailed sectional view of the socket taken substantially on the line 4—4 of Figure 3;

Figure 5 is a fragmentary elevational view of the socket member as herein employed;

Figure 6 is a fragmentary view in side elevation illustrating a clamp applied in accordance with another assembly;

Figure 7 is a detailed sectional view taken substantially on the line 7—7 of Figure 6;

Figure 8 is a front elevational view of my improved clamp with the stationary jaw and movable jaw in separated relation;

Figure 9 is a view in perspective from above of the socket and coating sleeve as herein embodied in separated relation, other parts of the device being omitted.

As disclosed in the accompanying drawings, the clamp comprises a threaded shank 1 provided at one extremity with an elongated head 2 extending in the same general direction as the shank 1. This head 2 is flattened and extends beyond one side of the shank 1 and has its outer end portion returned to provide an inwardly facing fixed jaw 3. The outer end of the jaw 3 is continued by an elongated extension or tongue 4 disposed on desired angle and which serves effectively as a guide to facilitate the application of the clamp, or more particularly the jaw 3, upon a wire or line L.

The inner faces of the jaw 3 are defined by the oppositely disposed and laterally directed flanges 5, each of which adjacent to the inner clamping surface of the jaw 3 is provided with notches or recesses 6 for a purpose to be hereinafter particularly referred to.

Slidably mounted upon the inner or straight portion of the head 2 is an elongated sleeve 7 provided at its upper portion with a transversely disposed cross member 8 underlying the jaw 3, said cross member 8 constituting a movable jaw and being adapted to be adjusted toward or from the jaw 3 as the occasions of practice may necessitate. The cross member or jaw 8 is of a length to extend slightly beyond the side faces of the jaw 3 and the flanges 5 thereof. Each extremity of the cross member or jaw 8 has formed therewith a guide plate 9 having its upper portion cut away to provide the angularly related edges a converging downwardly toward the transverse center of the cross member 8, said plate being disposed substantially at right angles to and beyond the face of the cross member or jaw 8 opposed to the jaw 3, or more particularly the inner bearing surface of said jaw 3. It is also to be noted that each plate 9 is entirely positioned outwardly of the adjacent flange 5 and that said plate also projects beyond the opposite sides of the member or jaw 8 in a direction transversely of the jaw 3 so that the end portions of the

plate lap or overlies the adjacent flange 5a points in relatively close proximity thereto so that, as illustrated in Figures 3 and 6, said plate may extend over the recesses or notches 6 and thus provide means to retain a wire or the like within said recesses or notches 6 as particularly illustrated in Figure 6. The low point of such cut away portion of the plate 9 is also positioned at substantially the longitudinal center of the portion of the adjacent flange 5 intermediate the recesses or notches 6 hereinbefore referred to. Each of the plates 9 serves as a guiding means to assure the proper positioning of a line or wire upon the working face of the cross member or jaw 8. These cut out plates 9 also permit the clamp to be effectively employed with wires or lines of varying gauge or sizes, the variance in gauge or size being readily and effectively accommodated by the converging edges *a*. The plates 9 together with the converging edges *a* thereof are also of decided advantage when the clamp is being used in connection with a stranded wire or cable.

It is a very easy matter to crush a stranded wire or cable between the clamping members but with the edges *a* of the plates 9 in the device as herein disclosed the strands of a stranded wire or cable are effectively held in an even and circular condition during the period the clamp is engaged or in working position upon the stranded line.

The rear portion of the sleeve 7, as particularly illustrated in Figures 2 and 3, carries a clamping jaw 10 with which is associated a movable clamping plate 11. The clamping jaw 10 and plate 11 coact to effectively couple to the sleeve 7 a lead-off or jumper 12, said lead-off or jumper 12, as illustrated in Figure 1, being employed for the purpose of grounding the line L. This grounding of the line L is of particular importance in line maintenance as when working on a cold line because by grounding a line in advance of the working operation, provision is made for protecting the lineman against injury by charging of the line accidentally or otherwise. It is to be understood, however, that the lead-off or jumper 12 may be employed for various purposes, as for lightning arresting, transformers and the like. This clamping or connecting of a lead-off or jumper 12 to the sleeve 7 is also of decided advantage as it assures no hindrance or obstruction being offered by said lead-off or jumper in engaging the fixed jaw 3 upon a high tension line. This is due to the fact that it is necessary to move the sleeve 7 away from the jaw 3 before the jaw 3 can be engaged with a wire. This is of particular advantage where it is necessary to use the tool or implement in a restricted space as often occurs in actual practice.

Threaded upon the shank 1 is a sleeve 14 which is in swiveled connection, as at 15, with the adjacent or inner end portion of the sleeve 7, it being understood that the sleeve 14 is operatively engaged with the sleeve 7 before application upon the shank 1. The outer end portion of the sleeve 14 is provided with a hexagon head 16 which is engaged within a socket member 17 mounted upon and secured to an end portion of an elongated handle 18. The periphery of the socket member 17 in its outer portion is provided with a T-slot 19, the stem 19' of which being upwardly or outwardly disposed and continued by an inwardly directed slot 20 in the outer end or head of the socket member 17. By the provision of the slots 19 and 20 the sleeve 14 may be operatively en-

gaged with the socket member 17 as the head 16 will readily pass into the socket member 17 through the lower head of the slot 19 and when the head 16 is positioned above said head of the slot 19, as a result of endwise movement of the handle member 18 the sleeve 14 and the socket member 17 are effectively held against relative rotation. The slot 20 is also of such width and design to readily permit the handle 18 to be swung with respect to the sleeve 14, as indicated by broken lines in Figure 1, to facilitate the application of the clamp to a line.

Removal of the sleeve 14 from the socket member 17 will be reverse to the operation just explained with respect to its application.

During the application of the fixed jaw 3 to a line it is important that it be held against rotation with respect to the sleeve 14. As is particularly illustrated in Figures 2, 3 and 4, the outer end or head of the socket member 17 to one side thereof is provided with outstanding fingers 21 which, when the sleeve 14 moves inwardly of the socket member 17 as illustrated in Figure 3, straddles the web or member 22 interposed between the jaw 10 and the sleeve 7. These fingers 21 constitute shoulders affording the required butting action with the web or member 22.

After the jaw 3 has been properly engaged with the line L the handle 18 is turned in a direction to cause the sleeve 14 to move inwardly of the shank 1 thereby forcing the jaw 8 carried by said sleeve into requisite contact with the line L and thereby effectively clamping the line between the jaws 3 and 8. During this operation the head 16 of the sleeve 14 is engaged within the socket member 17 outwardly of the head of the slot 19 and said portion of the socket member in cross section corresponds to the peripheral contour of the head 16, thus assuring the socket member 17 and head 16 to be properly locked to accomplish the required rotation. When it is desired to remove the device from a line L, it is only necessary that the sleeve 14 be rotated in a reverse direction.

In Figures 6 and 7 I illustrate an embodiment of the invention wherein a lead-off or jumper 12' is shown as generally employed in connection with telephone lines strung along with high voltage lines and under which conditions it is essential that the lead-off or jumper 12' have a tight contact with the telephone line L'. In this operation an end portion of the lead-off or jumper 12' is looped, as at 23, around the jaw 3 with the side members of the loop engaged within the recesses or notches 6 in the flanges 5 and the line L', and as the sleeve 7 is forced outwardly the side members of such looped portion 23 are tightly and effectively clamped with a three point contact as is thought to be clearly illustrated in Figure 6 of the accompanying drawings.

In this assembly it is to be understood that the applied clamp is maintained in working position as long as required and under which conditions, of course, it is not necessary to employ a handle 18 as the lineman can readily apply the clamp to working position by effecting requisite turning movement of the sleeve 14 direct from the head 16 with any suitable implement, preferably pliers.

In the invention as illustrated in Figures 1, 2 and 3, the lower portion of the web 22 has disposed therethrough an elongated rod 24 preferably extending equi-distances beyond opposite sides of the clamp. This rod 24 provides means whereby additional clamps may be supported out

of the way so that if only a single clamp is in use the liability is eliminated of a workman or other party coming into contact with an unused clamp and thereby being subjected to an electric shock. It is to be understood that when the device is employed for the purpose of grounding, the clamps are arranged in gang and electrically connected with a common conductor, as indicated in Figure 1.

After an initial application of a clamp, the handle member 18 may be removed from such applied clamp and operatively engaged with one of the remaining unapplied clamps to remove the same from the supporting rod 24 and then to apply said second clamp to another line. This operation may be repeated in accordance with the number of clamping devices carried by the rod 24.

In referring in certain of the claims to the handle member 18 having endwise movement it is to be understood that this distinction is also intended to include movement of the sleeve 14 and its head 16 in a direction endwise of the handle member.

From the foregoing description it is thought to be obvious that a wire clamp constructed in accordance with my invention is particularly well adapted for use by reason of the convenience and facility with which it may be assembled and operated, and it will also be obvious that my invention is susceptible of some change and modification without departing from the principles and spirit thereof and for this reason I do not wish to be understood as limiting myself to the precise arrangement and formation of the several parts herein shown in carrying out my invention in practice except as hereinafter claimed.

I claim:—

1. A wire clamping device comprising a pair of relatively movable jaws, an outstanding shank carried by one of the jaws, the second jaw being slidable on said first named jaw, a sleeve threaded upon the shank and in swiveled connection with the second jaw for movement therewith in a direction lengthwise of the shank, a member slidable with respect to the sleeve, and means carried by said member operatively engaging the sliding jaw to hold said sliding jaw and sleeve against relative rotation.

2. A wire clamping device comprising two relatively movable jaws, means for moving said jaws one with respect to the other, one of said jaws extending beyond opposite side faces of the second jaw, the extended portions of the first named jaw being provided with guide plates disposed in a general direction towards the second jaw to assure the proper positioning of a line wire, said side faces of the second jaw being provided with wire receiving notches, the end portions of the plates extending over said notches when the movable jaws are at the limit of movement one towards the other.

3. A wire clamping device comprising two relatively movable jaws, means for moving said jaws one with respect to the other, one of said jaws extending beyond opposite side faces of the second jaw, the extended portions of the first named jaw being provided with guide plates disposed in a general direction towards the second jaw to assure the proper positioning of a line wire, each of said plates having its upper portion cut away to provide angularly related edges converging towards the transverse center of the first named jaw.

4. A wire clamping device comprising a pair of relatively movable jaws, an outstanding shank

carried by one of the jaws, the second jaw being slidable on the first named jaw, a sleeve threaded upon the shank and in swiveled connection with the second jaw, an operating member for the sleeve having shifting movement lengthwise of the sleeve, an outstanding member carried by the sliding jaw, and spaced shoulders carried by the operating member to receive therebetween the member of the sliding jaw upon movement of the operating member in one direction along the sleeve to hold said sliding jaw and sleeve against relative rotation.

5. A wire clamping device comprising a pair of relatively movable jaws, an outstanding shank carried by one of the jaws, the second jaw being slidable on the first named jaw, a sleeve threaded upon the shank and in swiveled connection with the second jaw for movement therewith in a direction lengthwise of the shank, said sleeve being provided with a head for rotating the same, an operating handle provided with a socket in which the head of the sleeve is received, said socket allowing limited shifting movement of the operating handle along the sleeve to position the head at different points along the socket, said head and socket having coacting means allowing the operating handle and the sleeve to rotate together, said socket also having means allowing the handle to have lateral swinging movement with respect to the sleeve when the operating handle and sleeve have been adjusted to position the head adjacent to the outer end of the socket.

6. A wire clamping device comprising two jaws movable one toward the other, a member in threaded engagement with one of the jaws, the second jaw being in swiveled connection with said member, rotation of said member moving the jaws one with respect to the other, an operating handle, means for connecting said operating handle to the member, said handle member having limited independent movement lengthwise of the first member, said handle member having lateral movement when in its outward position, and coacting means carried by the handle member and the clamping device for holding the clamping device in a rigid position with respect to the handle member when the clamping device is in its lowered position with respect to the operating member.

7. A conductor clamp comprising two jaws, means for moving one jaw toward the other to clamp a conductor line therebetween, means carried by one of the jaws for holding a lead-off wire for direct contact with the conductor, said last named means comprising notches in the side faces of the jaw to receive the lead-off wire, and means for holding said lead-off wire within the notches while the jaws of the clamp are being engaged with the conductor.

8. A conductor clamp comprising two jaws, means for moving one jaw toward the other to clamp a conductor line therebetween, means carried by one of the jaws for holding a lead-off wire for direct contact with the conductor, said last named means comprising notches in the side faces of the jaw to receive the lead-off wire, and guards carried by the other of the jaws of the clamp to prevent the lead-off wire from becoming disengaged from the notches after applying the jaws of the clamp to the conductor.

9. A conductor clamp comprising two jaws, means for moving one jaw toward the other to clamp a conductor line therebetween, means carried by one of the jaws for holding a lead-off wire for direct contact with the conductor, said

last named means comprising notches in the side faces of the jaw to receive the lead-off wire, and guards carried by the other of the jaws of the clamp to prevent the lead-off wire from becoming disengaged from the notches after applying the jaws of the clamp to the conductor, said guards having means for guiding the conductor into proper position between the jaws.

10. A wire clamping device comprising a pair of relatively movable jaws, means for moving one of said jaws with respect to the other, said means being provided with a head for rotating the same, and a handle member for rotating the head, said member being provided with a socket having a T-slot to permit application of the head within the socket, the head of the T-slot being inwardly disposed, said socket being of a depth to allow endwise movement of the handle member independently of the head, said head and socket member coacting to rigidly lock the socket member and head when the handle member has been moved endwise in one direction and to allow lateral movement of the handle member independently of the head when the handle member has been moved endwise in the opposite direction, the periphery of said head and the internal wall of the socket having coacting means for locking the same for unitary movement.
11. A clamping device of the character described comprising a pair of relatively movable jaws, means for moving one of said jaws with respect to the other, said means being provided with a head for rotating the same, and a handle member for rotating the head, said member being provided with a socket, said socket having an opening in a side wall thereof to permit entrance of the head within the socket, said socket being of a depth to allow endwise movement of the handle member independently of the head, said head and socket member coacting to rigidly lock the socket member and head when the handle member has been moved endwise in one direction and constructed to allow lateral movement of the handle member independently of the head when the handle member has been moved endwise in the opposite direction.

12. A clamping device of the character described comprising a pair of relatively movable jaws, a threaded member carried by one of the jaws, the second jaw being slidable on the first named jaw, an extended threaded member in swivel connection with the second jaw, a member slidable with respect to the extended threaded member, and means carried by said slidable member engageable with the sliding jaw to hold said sliding jaw and threaded member against relative rotation.

13. A wire clamping device comprising a pair of relatively movable jaws, a member in threaded engagement with one of the jaws, the threaded

member being in swivel connection with the second jaw, an operating member for the threaded member having shifting movement lengthwise of the threaded member, an outstanding member carried by the sliding jaw, and spaced shoulders carried by the operating member to receive therebetween the member of the sliding jaw upon movement of the operating member in one direction to hold said sliding jaw and threaded member against relative rotation.

14. A wire clamp device comprising two relatively movable jaws, the second jaw being slidable on the first named jaw, a threaded member being in swivel connection with the second jaw for movement therewith in a direction lengthwise of the shank, said threaded member being provided with a head for rotating the same, an operating handle provided with a socket in which the head of the threaded member is received, said socket allowing limited shifting movement of the operating handle along the threaded member to position the head at different points along the threaded member, said head and socket having coacting means allowing the operating handle and the threaded member to rotate together, said socket also having means allowing the handle to have lateral swinging movement with respect to the threaded member when the operating handle and threaded member have been adjusted to position the head adjacent to the outer end of the socket.

15. As a new article of manufacture, a handle member provided with a socket having an opening to permit application of a headed member within the socket, said socket being of a depth to allow endwise movement of the handle member independently of the headed member, said headed member and socket member coacting to rigidly lock the socket member and headed member when the handle member has been moved endwise in one direction and to allow lateral movement of the handle member independently of the headed member when the handle member has been moved endwise in the opposite direction, the periphery of said headed member and the internal wall of the socket having coacting means for locking the same for unitary movement.

16. A conductor clamp comprising two jaws, means for moving one jaw toward the other to clamp a conductor line therebetween, and a short stiff rod carried by one of the jaws and extending beyond opposite sides thereof, said rod affording support for additional clamps in parallel.

17. A conductor clamp comprising two jaws, means for moving one jaw toward the other to clamp a conductor line therebetween, and a short stiff rod carried by one of the jaws and extending laterally therefrom, said rod affording support for additional clamps in parallel.

HENRY W. BODENDIECK.