May 10, 1932. H. W. BODENDIECK 1,858,133

FUSE AND SWITCH HANDLING DEVICE

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Fig. 1

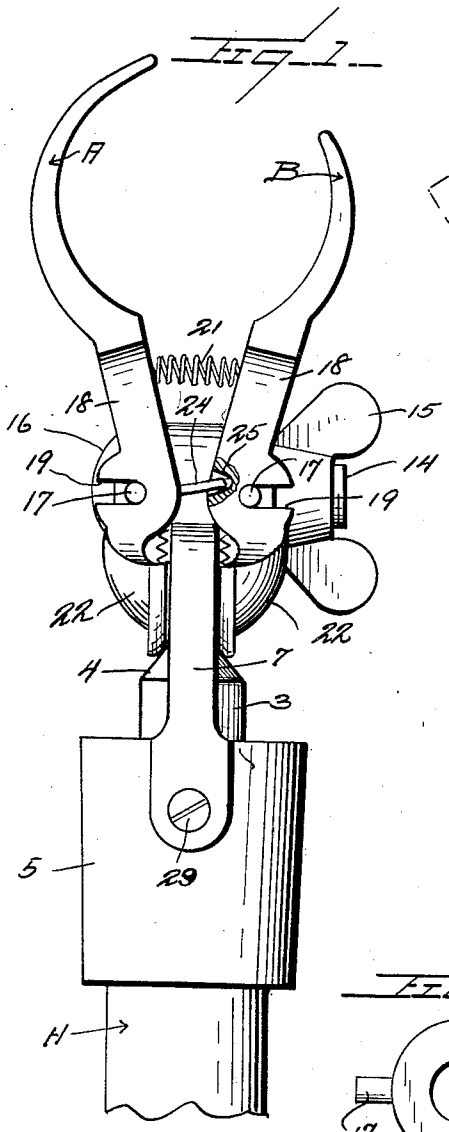


Fig. 2

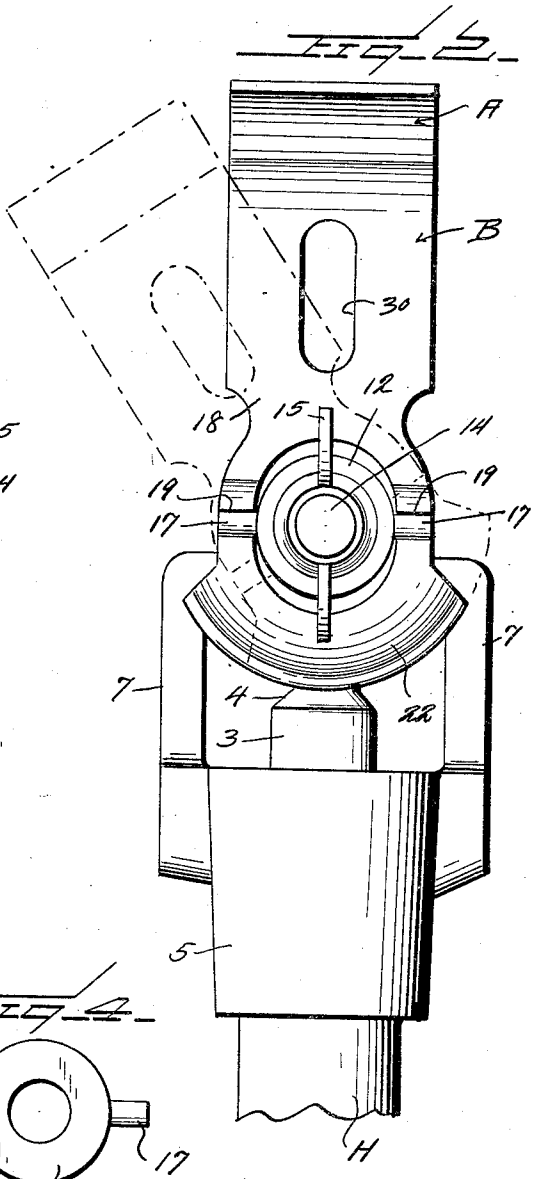
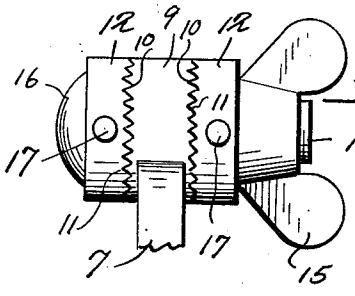


Fig. 4

Fig. 3



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FUSE AND SWITCH HANDLING DEVICE

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Fig. 5

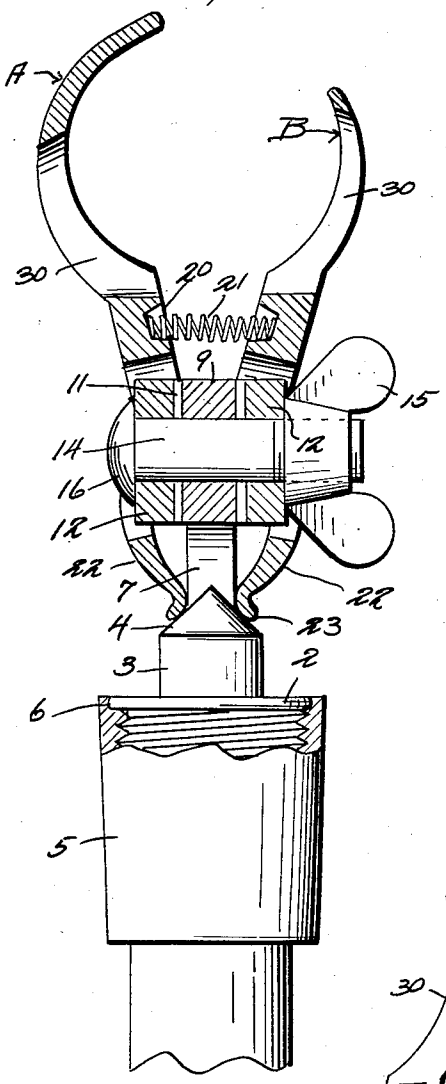


Fig. 6

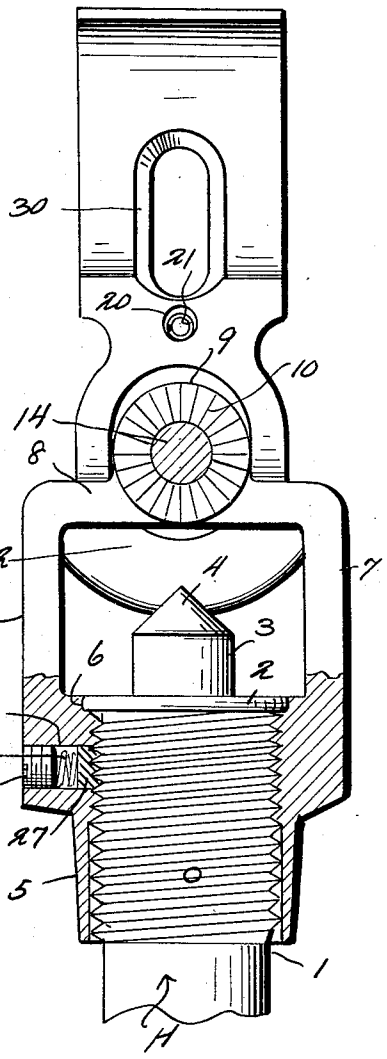
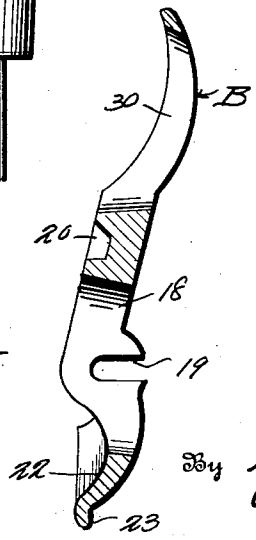


Fig. 7



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FUSE AND SWITCH HANDLING DEVICE

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Fig. 8.

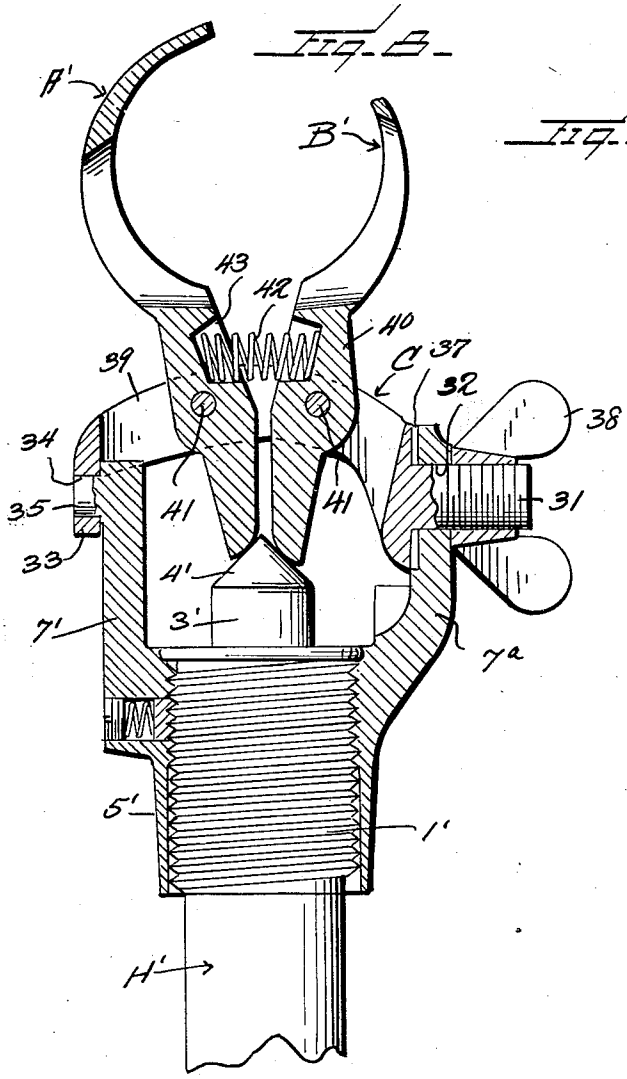


Fig. 9.

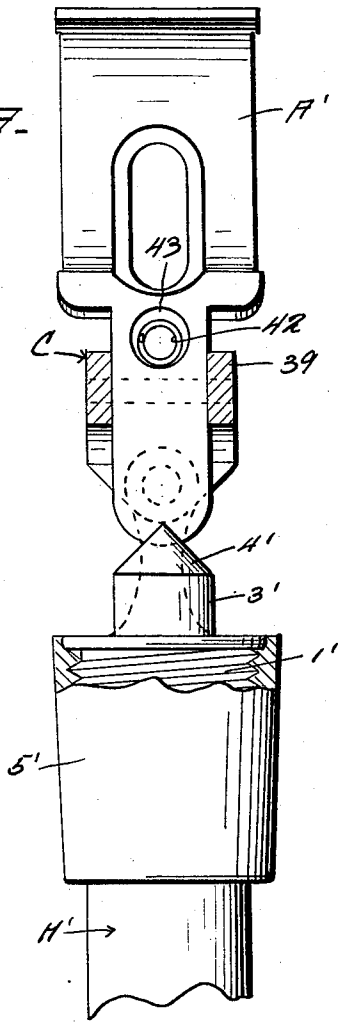


Fig. 10.

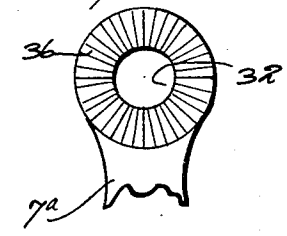
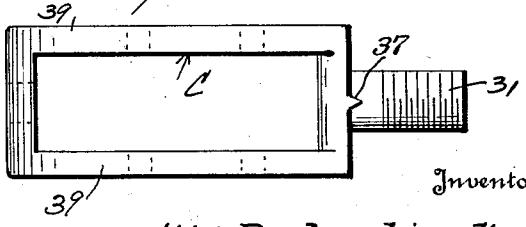


Fig. 11.



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UNITED STATES PATENT OFFICE

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FUSE AND SWITCH HANDLING DEVICE

Application filed October 15, 1929. Serial No. 399,822.

This invention relates to a fuse and switch handling device, and it is an object of the invention to provide a device of this kind which can be employed with safety in applying or removing fuses mounted vertically, horizontally or at any angle, or in disconnecting or closing switches mounted vertically, horizontally or at any angle.

Another object of the invention is to provide a device of this kind comprising an insulated operating member or handle carrying normally separated clamping jaws, together with means operating upon rotation of the handle to cause said jaws to move one towards the other for desired clamping engagement with a fuse or switch.

A further object of the invention is to provide a device of this kind comprising an operating member or handle having a part operatively supported thereby for swinging movement in a direction angular to the longitudinal axis of the operating member or handle and wherein said part carries a pair of normally separated clamping jaws, said clamping jaws being supported for relative movement in a direction angular to the direction of swinging movement of said part.

An additional object of the invention is to provide a device of this kind comprising an operating member or handle together with a pair of relatively movable clamping jaws operatively carried by the member or handle at a location beyond an end of the member or handle and laterally adjustable with respect to said member or handle, together with means operable from the member or handle for moving the jaws one towards the other for clamping action.

The invention consists in the details of construction and in the combination and arrangement of the several parts of my improved fuse and switch handling device 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 side elevation of a device for handling fuses and switches constructed in accordance with an embodiment of my invention, the operating handle or member being shown in fragment;

Figure 2 is a view in front elevation of the structure as illustrated in Figure 1;

Figure 3 is a fragmentary view in elevation illustrating the members for laterally adjusting the clamping jaws, said jaws being omitted;

Figure 4 is a view in front elevation of one of the adjusting members illustrated in Figure 3;

Figure 5 is a view partly in side elevation and partly in section of the device as illustrated in Figure 1;

Figure 6 is a view similar to Figure 2 with a portion in section;

Figure 7 is a sectional view taken lengthwise through one of the clamping jaws unapplied;

Figure 8 is a view partly in side elevation and partly in section illustrating a device constructed in accordance with a further embodiment of my invention;

Figure 9 is a view partly in front elevation and partly in section of the device as illustrated in Figure 8;

Figure 10 is a fragmentary view in elevation of the locking arm as comprised in Figure 8;

Figure 11 is a view in top plan of the swinging yoke or head as comprised in Figures 8 and 9 unapplied.

In the form of my invention as embodied in Figures 1 to 7 inclusive, H denotes an operating member or handle of wood to provide requisite insulation, and fixed to one end portion of the handle H is a metallic cap 1 having its outer end closed, said outer closed end being defined by an outstanding continuous flange 2. At its axial center the closed end of the cap 1 carries an outstanding and relatively short lug 3, the outer end portion 4 of which is conical in form. A sleeve 5 surrounds the cap 1 and the outer portion

of said sleeve is in threaded engagement with the cap 1, the outer end portion of the bore of the sleeve 5 being enlarged to provide a rabbet 6 to receive the flange 2 whereby the outward movement of the sleeve 5 with respect to the cap 1 is limited.

The flange 2 hereinbefore referred to in order to permit the desired assembly of the cap 1 and sleeve 5 initially is separable from the cap 1, but after being applied may be keyed or otherwise secured in desired position.

As for all intents and purposes the flange 2 constitutes a part of the cap 1 it is not believed necessary that a particular means for holding the flange 2 in applied position need be illustrated.

The cap 1 is suitably affixed to the handle H for rotation therewith so that upon rotation of the handle H the cap 1 and sleeve 5 will have relative movement in a direction lengthwise of the handle H.

At diametrically opposed points the outer end of the sleeve 5 is provided with the parallel arms 7 disposed in a direction parallel to the longitudinal axis of the sleeve 5 but in a direction therefrom. These arms 7 are preferably integrally formed with the sleeve 5 as is also the cross member 8 connecting the outer ends of the arms 7. The central portion of the cross member 8 is provided with an outwardly disposed plate 9 having its side faces substantially parallel with the side faces of the cross member 8. Each side face of the plate 9 together with the portion of the associated side face of the cross member 8 is formed with an annular series of teeth 10 with which are adapted to interlock similarly formed teeth 11 carried by an annular member 12.

As is clearly illustrated in Figures 3 and 5 the members 12 are positioned at opposite sides of the plate 9 and said members 12 and plate 9 are maintained in desired assembled relation through the medium of a headed shank 14 disposed axially through said assembled members. In threaded engagement with the free extremity of the shank 14 is a wing nut 15 or the like adapted for close contact with the outer face of one of the members 12 while the head 16 of the shank 14 is arranged for close contact with the outer face of the second member 12.

By rotation of the nut 15 in one direction said nut 15 and head 16 coact to maintain the members 12 in locked engagement with the plate 9 whereby said members 12 are held against rotation. By retrograde rotation of the nut 15 the members 12 may be disengaged from the plate 9 to allow said members 12 to be rotated in either direction as may be desired.

At diametrically opposed points each of the members 12 has extending outwardly therefrom the pins or trunnions 17 to provide mountings for a clamping jaw A or B. The jaw A, as herein disclosed, is of a length greater than that of the jaw B and as clearly illustrated in Figures 1 and 5 said jaws A and B are longitudinally curved on different radii. By having this difference in radius with one jaw longer than the other the efficiency of the device is materially increased especially in view of the fact that the range of the clamping action of the jaws A and B is materially increased.

The inner ends of the jaws A and B are provided with the spaced arms 18 which straddle a member 12, and said arms 18 in their outer margins are provided with the suitably positioned open slots 19 to receive the pins or trunnions 17 whereby said arms 18 are supported for swinging movement in a general direction lengthwise of the shank 14 or in a general direction substantially perpendicular to the direction of rotation of the members 12. The inner end portions of the jaws A and B are provided with the opposed pockets 20 which receive the extremities of an interposed expansion member 21, herein disclosed as a coil spring, which operates to constantly urge the jaws A and B in a direction one away from the other. The inner or free end portions of the arms 18 are connected by an arcuate member 22 integral with said arms 18 and having its periphery disposed on a desired curvature, said outer marginal portion being also outwardly flared as at 23.

This arcuate member 22 is constantly in contact with the conoidal portion 4 of the lug 3 and is of a length to maintain such contact irrespective of the extent the associated jaw A or B may be rotated about the shank 14.

Any desired means may be employed to cause the jaws A and B to swing in unison and in the same direction relative to the shank 4 but, as herein disclosed, the arm 18 of the jaw A is provided with a pin 24 of a length to have its outer end portion at all times received within a recess 25 provided in the opposed face of an arm 18 of the jaw B. While this pin 24 will cause the jaws A and B to swing in unison, yet the recess 25 will permit the relative swinging movement of the jaws A and B one with respect to the other without hindrance or interference by the pin 24.

The sleeve 5 at a desired point thereon is provided therethrough with an opening 26 in which is arranged a fibre disc 27 or the like which is constantly urged into contact with the threaded periphery of the cap 1 by the expansible member or coiled spring 28 interposed between said disc 27 and a plug 29 engaged within the outer portion of the opening 26. By this means the disc 27 has sufficient frictional contact with the cap 1 to serve as a brake to normally prevent relative turn-

ing movement between the cap 1 and sleeve 5 to offset any such tendency of turning movement which would otherwise be liable to occur by the weight of the jaws A and B.

When the jaws A and B are positioned substantially in alignment with the handle H as illustrated in the drawings said jaws are in position for engagement with horizontally disposed fuses or switches but as the angle of these fuses or switches vary between the horizontal and vertical, the jaws A and B will be substantially correspondingly adjusted with respect to the longitudinal axis of the operating member or handle H and which adjustment is under control of the shank 14 and associated nut 15.

The jaws A and B are each provided with an elongated opening or slot 30 which facilitates the use of the device with plug fuses.

Upon relative movement of the sleeve 5 and cap 1 lengthwise of the member or handle H as a result of rotation of the member or handle H, the jaws A and B will be moved into requisite clamping action or to permit the same to have requisite separating movement to release said jaws from their work.

In the embodiment of my invention as illustrated in Figures 8 to 11 inclusive, the outwardly disposed arms 7′ and 7ª carried by the sleeve 5′ have associated therewith an elongated and longitudinally curved yoke C. One end of the yoke has extending outwardly therefrom a shank 31 which is freely disposed through an opening 32 provided in the outer end portion of the arm 7ª while the opposite end portion of the yoke is provided with a flange 33 overlying the outer face of the arm 7′ at its free extremity. This flange 33 has an opening 34 which receives an outstanding pin or trunnion 35 carried by the arm 7′. By this means the yoke C is supported by the arm 7′ or 7ª for swinging movement in a direction laterally of the operating handle H′. The arm 7ª in its inner face is provided with an annular series of teeth 36 surrounding the opening 32 and between which is adapted to be selectively engaged a tooth 37 carried by the adjacent end of the yoke C whereby by tightening the nut 38, threaded upon the outer end portion of the shank 31, the yoke C will be effectively locked in desired position from either side of its longitudinal alignment with the handle H′ or in such alignment.

As herein disclosed, the nut 38 coacts with the outer face of the arm 7ª in effecting this locking action and it will be self-evident that upon retrograde movement of the nut 38 the yoke C in its entirety may be moved lengthwise in a direction away from the arm 7ª to release the locking engagement between the yoke C and the arm 7ª.

Between the side members 39 of the yoke C are pivotally mounted the shanks 40 of the clamping jaws A′ and B′ and said shanks outwardly of the pivotal mountings 41 for said shanks 40 have interposed therebetween an expansible member or coil spring 42, the extremities of which are received within the pockets 43 formed in the opposed faces of the shanks 40. This expansible member or spring 42 operates to maintain the inner end portions of the shanks 40 at all times in contact with the conical portion 4′ of the lug 3′ so that upon relative movement of the sleeve 5′ and cap 1′ upon rotation of the handle or member H′, the jaws A′ and B′ will be moved one toward the other into requisite clamping action or permitted to have desired separating movement to release said jaws from their work.

It is to be particularly noted from the foregoing description that the mounting of the jaws A and B and also of the jaws A′ and B′ is such to allow said jaws to be adjusted from a point at what may be termed in axial alignment with the handle H to an angle of 90° with the longitudinal axis of said handle or at substantially any intermediate angle. This in a tool of this kind is of utmost importance as it materially increases the field of operation for the tool and more especially when working in a congested location.

From the foregoing description it is thought to be obvious that a fuse and switch handling device 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 handling device of the class described comprising a handle, a sleeve in threaded engagement therewith, a part carried by the sleeve, clamping jaws mounted upon said part for movement one towards the other in a general direction angular to the general direction of swinging movement of the part, said handle upon rotation in one direction moving the jaws one towards the other, said jaws being also adjustable from a position substantially in alignment with the handle to an angle of substantially 90° with respect to such handle, the rotation of the handle in one direction moving the jaws one toward the other irrespective of the adjustment of said jaws with respect to the handle.

2. A handling device of the class described comprising a handle, a sleeve in threaded engagement therewith, a part carried by the sleeve, clamping jaws mounted upon said

part for movement one towards the other in a general direction angular to the general direction of swinging movement of the part, said handle upon rotation in one direction moving the jaws one towards the other, said jaws being also adjustable from a position substantially in alignment with the handle to an angle of substantially 90° with respect to such handle, the rotation of the handle in one direction moving the jaws one toward the other irrespective of the adjustment of said jaws with respect to the handle, and means for locking the swinging part in a selected position in alignment with the handle or to a side thereof.

3. A handling device of the class described comprising a handle, a sleeve in threaded engagement therewith, a part carried by the sleeve, clamping jaws mounted upon said part for movement one towards the other in a general direction angular to the general direction of swinging movement of the part, said handle upon rotation in one direction moving the jaws one towards the other, said jaws being also adjustable from a position substantially in alignment with the handle to an angle of substantially 90° with respect to such handle, the rotation of the handle in one direction moving the jaws one toward the other irrespective of the adjustment of said jaws with respect to the handle, and means for constantly urging one of said jaws away from the other.

4. A handling device of the class described comprising a handle, a sleeve in threaded engagement therewith, a part carried by the sleeve, clamping jaws mounted upon said part for movement one towards the other in a general direction angular to the general direction of swinging movement of the part, said jaws including shanks, and a tapered member carried by the handle for coaction with said shanks to move the jaws one towards the other upon rotation of the handle in one direction, said jaws being also adjustable from a position substantially in alignment with the handle to an angle of substantially 90° with respect to such handle, said tapered member of the handle having effective coaction with the shanks irrespective of the adjustment of the jaws.

5. A handling device of the class described comprising a handle, a sleeve in threaded engagement with an end portion of the handle, a part carried by the sleeve and positioned beyond the end of the handle with which the sleeve is engaged, members positioned at opposite sides of said part, means for supporting said members for rotation independently of the part and for holding said members against such rotation, jaws pivotally carried by said members for movement one towards the other, and coacting means carried by the jaws and handle for moving said jaws one towards the other upon rotation of the handle, said means being effective in each selective rotary adjustment of the members.

6. A handling device of the class described comprising a handle, a sleeve in threaded engagement with an end portion of the handle, a part carried by the sleeve and positioned beyond the end of the handle with which the sleeve is engaged, members positioned at opposite sides of said part, means for supporting said members for rotation independently of the part and for holding said members against such rotation, jaws pivotally carried by said members for movement one towards the other, coacting means carried by the jaws and handle for moving said jaws one towards the other upon rotation of the handle, said means being effective in each selective rotary adjustment of the members, and means to cause the members to rotate in unison and in the same direction.

7. A handling device of the class described comprising a handle, a sleeve in threaded engagement with an end portion of the handle, a part carried by the sleeve and positioned beyond the end of the handle with which the sleeve is engaged, members positioned at opposite sides of said part, means for supporting said members for rotation independently of the part and for holding said members against such rotation, jaws pivotally carried by said members for movement one towards the other, and coacting means carried by the jaws and handle for moving said jaws one towards the other upon rotation of the handle, said means being effective in each selective rotary adjustment of the members, and means for constantly urging the jaws one away from the other.

8. A fuse handling device comprising a pole or operating member, an adjustable part carried by the pole beyond an end thereof, said part being adjustable from a position substantially in alignment with the pole or operating member to a point substantially at right angles to said pole or operating member, gripping members carried by said part, means operating upon rotation of the pole in one direction for forcing one of the gripping members towards the other irrespective of the adjusted position of the part, and means for constantly urging one of said members away from the other.

9. A fuse and switch handling device comprising a handle, clamping jaws, means for supporting said jaws beyond an end of the handle, said supporting means permitting the jaws to be adjusted in a position substantially in alignment with the handle to a position substantially at right angles thereto, and means operating upon rotation of the handle in one direction for moving the jaws one toward the other irrespective of the adjustment of said jaws with respect to the handle.

10. A handling device of the class described

comprising a handle, a sleeve in threaded engagement with an end portion of the handle, arms carried by the sleeve and extending beyond the adjacent end of the handle, a yoke pivotally connected with the outer portions of said arms, means for holding the yoke against swinging movement, clamping jaws pivotally mounted upon the yoke for movement one toward the other, and means operating upon rotation of the handle in one direction for forcing said jaws one toward the other.

In testimony whereof I hereunto affix my signature.

HENRY W. BODENDIECK.