

May 10, 1938.

S. N. BUCHANAN

2,117,112

WIRE CONNECTER

Filed July 8, 1935

2 Sheets-Sheet 1

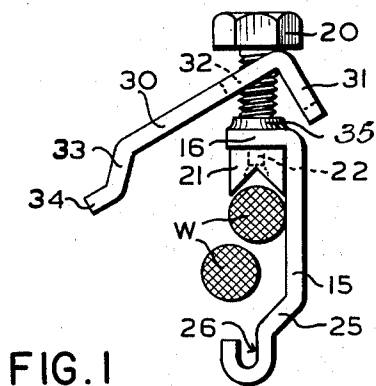


FIG. 1

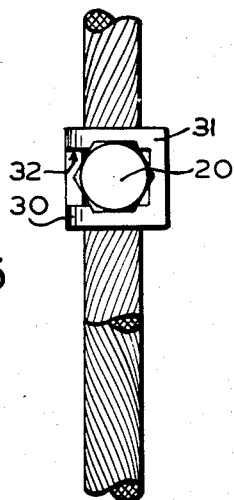


FIG. 5

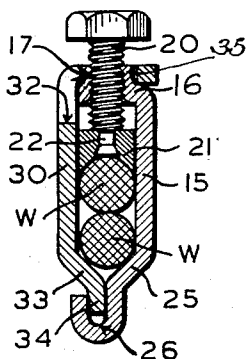


FIG. 2

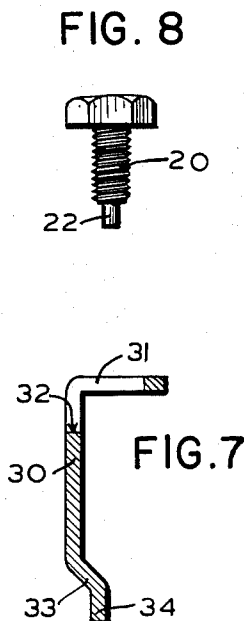


FIG. 8

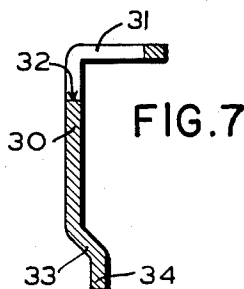


FIG. 7

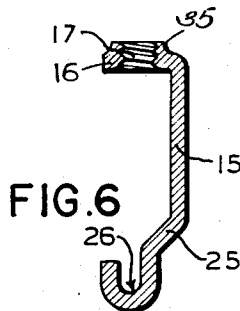


FIG. 6

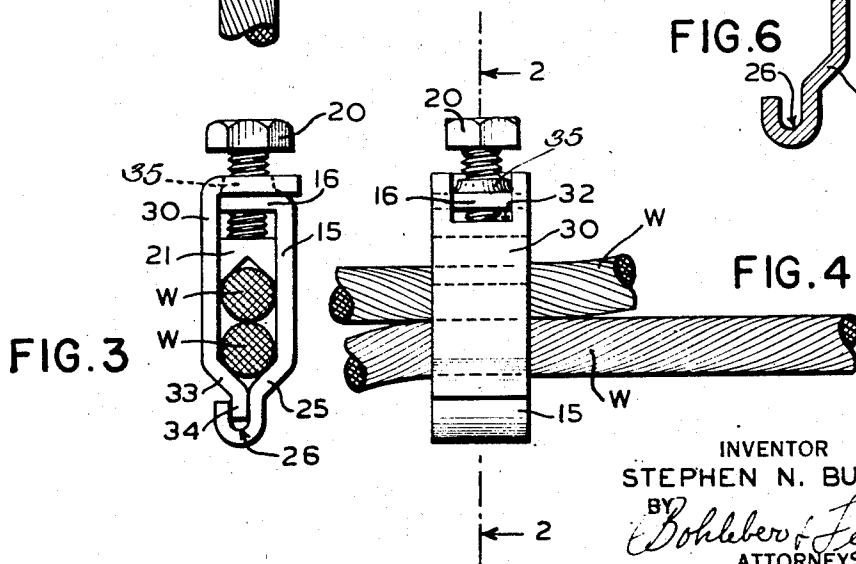


FIG. 3

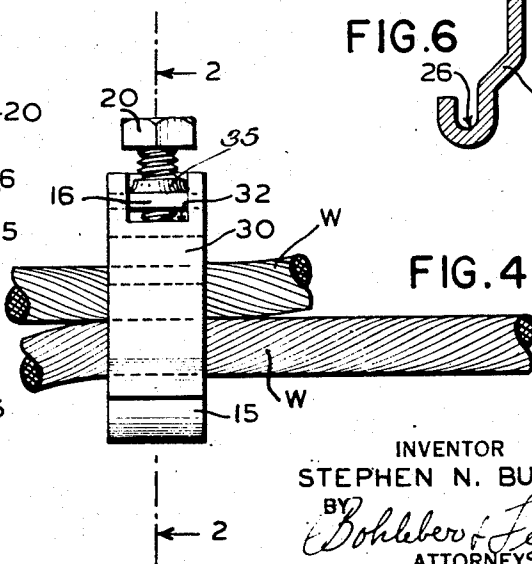


FIG. 4

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WIRE CONNECTER

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2 Sheets-Sheet 2

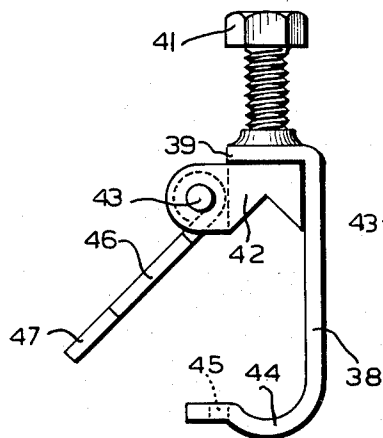


FIG. 9

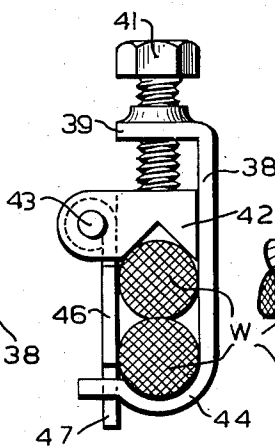


FIG. 10

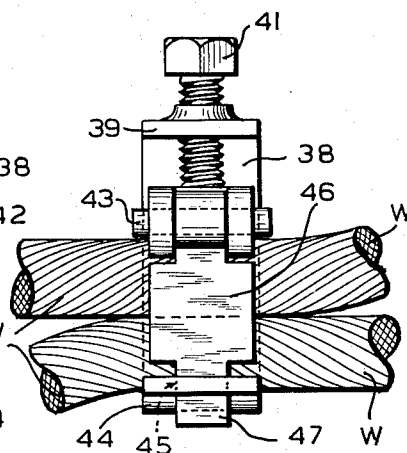


FIG. 11

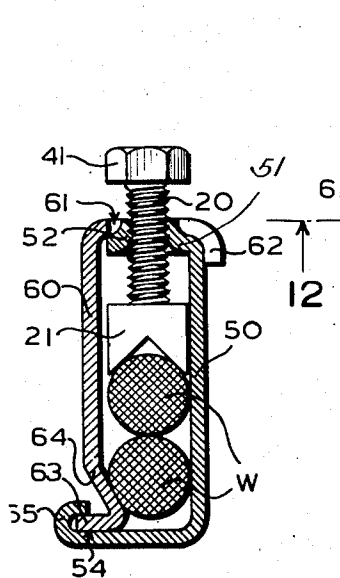


FIG. 12

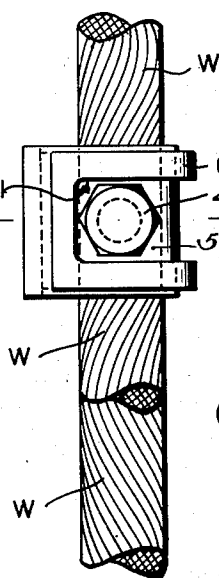


FIG. 13

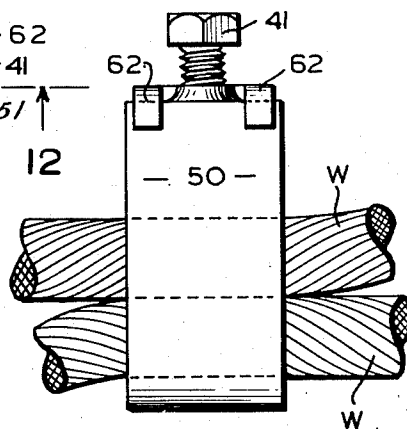


FIG. 14

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2,117,112

WIRE CONNECTER

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Application July 8, 1935, Serial No. 30,306

18 Claims. (Cl. 173—263)

The invention relates to a wire connecter adapted to clamp a single wire therein, but intended primarily to clamp two wires together in contact with each other. This form of wire connecter is more generally designated as a line tap.

An object of the invention is to devise a wire connecter of the line tap type having two members, one of which is movable relatively to the other. This movement enables the wires to be readily inserted into clamping position. Thereafter, tightening of the clamping or operating means clamps the wires within the wire connecter and at the same time locks the two parts in spaced parallel position.

Another object is to produce a wire connecter of the line tap type and having two members which are hinged relatively to each other in order that the wires may be readily inserted into clamping position. The hinged construction enables all of the parts to be retained together and they need not be separated in order to insert the wire or wires therein or to finally clamp the wires in the connecter. In the preferred construction, all of the parts are assembled so that they cannot be separated without destroying a permanent connection which secures two parts together, or without destroying some other part of the connecter.

A still further object is to construct a wire connecter of the line tap type in which two of the principal parts are made of sheet material bent into the desired form.

Other objects of the invention will be more apparent from the following description taken in connection with the accompanying drawings showing preferred embodiments of the invention, in which:

Figures 1 through 8 illustrate the preferred form of the wire connecter because of the fact that all parts are permanently retained together against separation even when the connecter is opened so that the wires to be clamped therein may be inserted.

Figure 1 is a side view of the wire connecter in open position, or with one of the parts moved or pivoted away from the other, so that the wires to be clamped therein can be readily inserted within the wire connecter. It will be noted that the movable part is not separable from the connecter even though it is movable relatively to the other parts.

Figure 2 is a cross section through the wire connecter taken on line 2—2 of Figure 4 with two wires clamped therein and the movable or hinged member locked in closed or assembled position.

This view also shows the hinge slot which permits relative swinging movement of the hinged member.

Figure 3 is an end view of the wire connecter or line tap having two wires clamped therein and the two parts of the connecter locked in position.

Figure 4 is a front view of the wire connecter and shows the hinge slot extending downwardly around the bend in the hinged member.

Figure 5 is a top view of the connecter and shows the hinge slot in the hinged member as it appears in the end of the hinged member which extends at a right angle from the main portion of this member.

Figure 6 is a section through the threaded member alone, or separate from the other parts, in order to show this part more clearly.

Figure 7 is a section through the hinged member so that the hinge slot in the hinged or movable member will be more clearly shown.

Figure 8 shows the operating means or screw without the clamp block upon its end and shows the cylindrical rod or pin by which the clamp block is secured to the operating screw so that it cannot be removed therefrom after the screw has been assembled in its threaded hole.

Figures 9 through 11 show another form of the invention in which the movable or hinged member is not necessarily engaged by the wires when they are clamped in the wire connecter and the locking of the two members in closed position is obtained by a different relation of a recess upon one member and an extension on the other member. This form of the invention also shows that the hinged member need not be carried upon any particular part of the wire connecter.

Figure 9 is an elevation of the modified form of the wire connecter which is shown in open position or with the movable member in the position in which the wires to be clamped may be inserted.

Figure 10 is an end view of the connecter of Figure 5 with two wires clamped therein and with the movable member of the two members forming the wire connecter locked in position relatively to the other member.

Figure 11 is a front view of the wire connecter of Figures 5 and 6 with the end of the hinged member in closed and locked position in its recess and the operating means clamping two wires therein.

Figures 12 through 14 show still another form of the invention in which the movable member

is not hingedly secured to or mounted upon some other part of the connector.

Figure 12 is a cross section through the third form of the wire connector in which the movable member is retained upon the other member in such a manner that it is not only movable relatively to the other member, but is also removable therefrom. In this construction the movable member is not hinged upon the connector as in the other constructions illustrated.

Figure 13 is a top view of the wire connector of Figure 12.

Figure 14 is a front view of the wire connector of Figure 12 showing the prongs or hooks which retain the movable member in fixed position relatively to the other member when the wires are clamped therein.

The wire connectors, illustrated in the drawings and to be described herein, are formed of two principal members, one of which members is movable to an open position relatively to the other member so that a wire or wires may be readily inserted into a wire receiving space formed by the members. The two members are retained in spaced relation with each other in order to form a wire receiving space therebetween. Means are then provided or the members are so formed that upon tightening of the operating or clamping means to secure the wire or wires therein, the two members are locked or positively retained in assembled position relatively to each other so that the wire connector cannot be opened so long as the operating means is clamping the wires. The wire connector in its preferred form is so constructed that no part is separable from the connector and yet one of the members is movable and particularly hinged in position relatively to the other so that the wires to be clamped may be readily inserted therein. After the insertion of the wires, the movable member is moved into closed position in which position it is positively retained and may also be clamped upon actuation of the operating means to clamp the wires within the wire connector. The wire connector is of such form that the two members may be formed from sheet material and bent into the shapes desired to form the wire connector.

The wire connector shown in Figures 1 through 8 comprises a member 15 having one end 16 thereof extending at right angles and which end carries a boss 35 having a threaded hole 17 therethrough to receive an operating means, the force of which is directed parallel to the side of the member. The operating means is preferably a screw 20. The screw also may carry a V-shaped clamping block 21 upon its end for engaging a wire. The V-block aids in holding one wire in vertical relation with the other. The clamping block is secured to the end of the screw in any suitable manner, that particularly shown utilizing a cylindrical pin 22 carried by the screw and shown integral therewith, which pin extends through a hole in the V-block 21. The end of the cylindrical pin 22 is mashed or expanded to permanently secure the V-block to the end of the screw 20 and also to permanently secure the operating means to the member 15.

The other end of the member 15 has an angular portion 25 against which the wire W rests and aids in retaining the wires in vertical relation, as will appear more fully hereinafter. This end of the member 15 also carries a recess 26, the opening of which is preferably directed towards the operating screw 20 and is also prefer-

ably in the plane of the axis thereof. The recess may be otherwise positioned as desired, such as in a plane parallel to the axis. The term an axial parallel plane has been arbitrarily selected to designate a plane which may be parallel to the axis of the operating screw or may be in the axis of the operating screw. When the member 15 is formed from sheet material which is bent into desired form, the recess 26 is formed by bending the end of the member into a U-shape as shown.

A second member 30 has a portion 31 extending at right angles thereto in which there is an elongated or hinge opening 32. The elongated opening 32 is shown as extending a substantial distance around the point of intersection of the right angular portion 31 in order that the second member 30 may be moved or pivoted laterally into the wide open position shown in Figure 1. It is clear that a substantially shorter elongated opening would be satisfactory for all practical purposes and it is not essential that this second member shall be movable to as wide an open position as that illustrated. It will also be noted that the operating screw and recess prevent side-wise movement of this end of the second member at all times and particularly when a wire is clamped within the connector.

The second or movable member 30 has an angular or wire engaging portion 33 at the other end thereof from the right angular portion 31. This end terminates in an extension 34 which is received into the recess 26. The end of the movable member 30 may also be described as being so formed as to be received into the recess 26 since it involves no separate structure, but is merely the end of this member.

The elongated opening 32 is of such a size that it is hingedly or movably retained upon the connector between the head of the operating screw 20 and the member 15. This elongated opening in the forms shown in Figures 1 through 8 is so formed and of such size that the movable or hinged member 30 is incapable of being removed therefrom after the connector has been assembled without destroying some part. In other words, all of the parts of the connector are inseparably retained together or permanently assembled. The hinged or movable member 30 is in one sense hingedly mounted upon the operating means or screw 20, which operating means, however, except for rotation is fixedly secured to the first member 15 so that in another sense the movable or hinged member is hingedly mounted upon the first member 15. It is immaterial upon what part of the wire connector the hinge member 30 is carried so long as it may be hinged or moved laterally to open position so that one or more wires may be inserted into the connector and thereafter returned to closed position.

The recess 26 and the extension or end 34 of the movable member 30 form interengaging means which lock or retain the two members in assembled position when the clamping screw 20 is operated to clamp one or more wires therein, as will be described in greater detail hereinafter. The interengaging means also retain the members 15 and 30 in spaced parallel relation so that a wire receiving passage is formed therebetween. The interengaging means may take any desired form so long as they secure the two members in spaced parallel relation and lock these two ends of the members together upon clamping of one or more wires within the connector. The particular form of interengaging means illustrated in Figures 1

through 8 provides a recess at one end of the member 15 which carries the operating means 20. The movable or hinged member 30 provides a wire engaging portion and the end thereof is so formed that it is received into the recess 26 upon relative longitudinal movement to lock the two members together in assembled relation upon clamping of a wire or wires W therein. In a broad aspect, the interengaging means includes a recess at or adjacent the end of one member and the end of the other member carries a portion so formed that it is received within the recess to lock the two members together in assembled relation upon clamping of one or more wires therein.

In clamping the two wires particularly shown as being clamped in the wire connector, the movable or hinged member 30 is opened whereupon the two wires W are inserted into the wire receiving space, as shown in Figure 1. The hinged member 30 is then pivoted or swung around until the extension 34 engages in the recess 26. Upon tightening of the operating means 20, the V-block 21 is pushed against one wire W until the lower wire W presses against the wire engaging portion 33 and securely clamps and locks the extension 34 in the recess 26. It should be noted that the angular wire engaging portions 25 and 33 form a V-section or wire seat which aids in centering the lower wire and holding the same in vertical relation with the other wire W.

The two members 15 and 30 of the wire connector are preferably formed of sheet metal. Each member is bent into the forms illustrated to produce the two parts of the wire connector. The right angular portions 16 and 31 are formed merely by bending the ends of the blanks at right angles to the main portion of the member. The recess 26 is also formed by bending the other end of the member 15 into a U-shape. The cost of producing the wire connector is very materially reduced when formed of sheet metal. The boss 35 is formed by punching the opening 17 and thereafter threading the hole formed. The boss provides more threads in the member 15 for the operating screw 20.

A somewhat different form of hinged construction and interengaging means is shown in Figures 9, 10 and 11. In this form of wire connector, the member 38 has one end 39 thereof extending at right angles thereto, which end has a threaded opening 40 to receive an operating screw 41. This operating screw carries a V clamping block 42 upon which is mounted a hinge or pivot pin 43. The other end of the member 38 is bent to form a wire receiving portion 44 and carries a recess 45 like that shown in Figures 1 through 8.

The movable or hinged member 46 is hingedly secured to the pivot provided by the pin 43 so that the member is movable or pivotal outwardly to permit the wires W to be inserted into the connector. Thereafter, the hinged member 46 is pivoted into closed position and the operating screw 41 is rotated so that the V-block 42 engages the wires W to clamp them within the connector. The movement of the V-block to clamp the wires within the connector moves the end 47 of the movable member 46 into the recess 45 and locks the two members 38 and 46 together in assembled or closed relation.

It will be observed that in this construction the two members 38 and 46 are locked together in assembled relation by the relative movement between the two members brought about solely through the movement of the operating means 41

in clamping the wires within the connector. In other words, a wire engaging portion upon the hinged member 46 is dispensed with in obtaining the locking together of the interengaging means formed by the recess 45 upon one member, or particularly the member 38, and a portion of the other member, such as the end 47 of the hinged member 46, being received into the recess 45. It is immaterial upon what part of the wire connector the hinged member 46 is carried and upon which part the recess 45 is carried so long as one part of the interengaging means is upon one member and the other part is on the other member.

Figures 12 through 14 show another form of the invention herein in which a member 50 has one end 51 extending at right angles, which end has a threaded hole 52 to receive the screw 20 of the operating means. The operating means is identical with that shown in Figures 1 through 8 and consequently will not be described in detail. The other end 53 of the member 50 also extends at right angles and carries a recess 54 formed by the U-shaped means 55. The recess 54 is directed at an angle to the axis of the operating means and is shown particularly at right angles thereto.

The movable member 60 has a slot or slotted opening 61 into which the operating screw 20 is received, and the ends 62 of the portions formed by the slot 61 are bent so that they fit around the member 50 and form locking ends 62 when a wire or wires are clamped in the connector. This movable member 60 is removable from the wire connector, if desired, in order to insert wires therein. An extension 63 is carried upon the end of the movable member which is received in the recess 54. In the form of connector shown in Figures 12 through 14, the ends 62 as well as the recess 54 and the extension 63 form part of the interengaging means which retain the members 50 and 60 in spaced parallel relation so as to form a wire receiving space therebetween. The interengaging means also lock the movable member 50 in position upon clamping of the wire or wires within the connector.

The movable member 60 in Figure 12 is shown as carrying a wire engaging portion 64 which extends at an angle with respect to the extension 63 and also with respect to the axis of the operating means or screw 20. The wire engaging portion 64 is also shown in such position that the lower wire W is clamped thereagainst and thereby secures two functions, namely, positive clamping of the extension 63 in the recess 54, as well as locking it therein so that it cannot be removed therefrom. It is not necessary for the wire to be clamped against this portion. All that is necessary is that one of the wires W, when both wires are being clamped, will prevent the extension 63 from being removed from the recess 54 so that the locking function is obtained. This can be accomplished by merely using the wire W as an obstruction, abutment or stop which prevents the member 60 from swinging or moving inwardly and upwardly and thereby releasing the interengaging means. The inwardly directed angular portion 64 may be upon either member 50 or 60. Its purpose is primarily to reduce the lower dimension of the wire receiving passage since the upper portion, in the particular construction shown, should be wide enough to permit inward movement of the movable member 60 far enough so that the extension 63 may be inserted into and removed

from the recess 54 with the wires in the upper part of the wire receiving passage. The interengaging means 26, 34 of Figures 1 through 8 are interchangeable with the interengaging means 54, 63 of Figures 12 through 14.

It will be noted, therefore, that one member is provided in all forms of the invention which carries an operating means. The other member is carried upon one of the parts of the wire connector and is movable relatively to the first member so that wires may be inserted within the wire receiving space or passage between the members. After the wires have been inserted within the connector, the movable member is moved to its closed position after which actuation of the operating means to clamp a wire or wires therein, locks the interengaging means against separation. It will be noted also that actuation of the operating means brings the head of the operating screw 20 nearer to the movable member and to this extent further secures the movable member against separation or movement.

Various modifications will occur to those skilled in the art in the configuration, composition and disposition of the component elements going to make up the invention as a whole, as well as in the selective combination or application of the respective elements, and no limitation is intended by the phraseology of the foregoing description or illustrations in the accompanying drawings.

What is claimed is:

1. A wire connector to clamp one or more wires therein comprising a member having one end extending at right angles thereto; operating means carried by the end extending at right angles and moving parallel with the member and spaced therefrom to engage a wire; a second member inseparably carried by the first member and movable away from the first member to permit a wire or wires to be inserted therebetween; and interengaging means retaining the members in spaced parallel relation thereby forming a wire receiving space therebetween including a recess upon one member, and a portion of the other member which engages in the recess, the interengaging means requiring relative longitudinal movement between the members in order to engage the aforesaid means, the interengaging means locking the two members against separation and in spaced parallel position upon clamping the wires in the connector with the operating means.

2. A wire connector to clamp one or more wires therein comprising a member having one end extending at right angles thereto; operating means carried by the end extending at right angles and moving parallel with the member and spaced therefrom to engage a wire; a second member inseparably carried upon the first member and movable away from the first member to permit a wire or wires to be inserted therebetween; and interengaging means retaining the members in spaced parallel relation thereby forming a wire receiving space therebetween including a recess upon the first member, and a portion of the second member which engages in the recess, the interengaging means requiring relative longitudinal movement between the members in order to engage the aforesaid means, the interengaging means locking the two members in spaced parallel position upon clamping the wires in the connector with the operating means.

3. A wire connector to clamp one or more wires therein comprising a member having one end

extending at right angles thereto; operating means carried by the end extending at right angles and moving parallel with the member and spaced therefrom to engage a wire; a second member inseparably carried upon the first member and movable away from the first member to permit a wire or wires to be inserted therebetween; and interengaging means retaining the members in spaced relation thereby forming a wire receiving space therebetween including a recess upon one member directed in an axial parallel plane with respect to the axis of the operating means, and a portion of the other member which engages in the recess, the interengaging means requiring relative longitudinal movement between the members in order to engage the aforesaid means, the interengaging means locking the two members in spaced parallel position upon clamping the wires in the connector with the operating means.

4. A wire connector to clamp one or more wires therein comprising a member having one end extending at right angles thereto; operating means carried by the end extending at right angles and moving parallel with the member and spaced therefrom to engage a wire; a second member inseparably carried upon the first member and movable away from the first member to permit a wire or wires to be inserted therebetween; a wire engaging portion upon the second member; and interengaging means retaining the members in spaced parallel relation thereby forming a wire receiving space therebetween including a recess upon one member, and a portion of the other member which engages in the recess, the interengaging means requiring relative longitudinal movement between the members in order to engage the aforesaid means, the interengaging means locking the two members in spaced parallel position by a wire contacting with the wire engaging portion upon clamping the wires in the connector with the operating means.

5. A wire connector to clamp one or more wires comprising, a member, a second member hingedly retained relatively to the first member and having a wire engaging portion, interengaging means carried by the members which retain the members in spaced relation thereby forming a wire receiving space therebetween, the interengaging means being engageable upon relative longitudinal movement between the members and being locked together in spaced parallel position by a wire pressing upon the wire engaging portion, and operating means carried by the first member and moving into the wire receiving space whereby it is adapted to engage and clamp at least one wire in the wire receiving space against the wire engaging portion.

6. A wire connector to clamp one or more wires comprising, a member having a threaded hole therethrough, a second member hingedly retained relatively to the first member and having a wire engaging portion, interengaging means carried by the members which retain the members in spaced parallel relation thereby forming a wire receiving space therebetween, the interengaging means being engageable upon relative longitudinal movement between the members and being locked together in spaced parallel position by a wire pressing upon the wire engaging portion, and operating means including an operating screw received in the threaded hole and moving into the wire receiving space whereby it is adapted to engage and clamp at least one wire in the

wire receiving space against the wire engaging portion.

7. A wire connector to clamp one or more wires therein comprising, a member having one end extending at right angles thereto and carrying a threaded hole therethrough, operating means including an operating screw received in the threaded hole to clamp at least one wire in the connector, a recess formed at the other end of the member directed towards the operating screw, a second member hingedly retained upon the first member and having a wire engaging portion, the second member being formed at one end to engage in the recess upon relative longitudinal movement between the members and retain the members in spaced parallel relation thereby forming a wire receiving space therebetween, the recess on the first member and the end of the second member locking the two members in spaced parallel position by a clamped wire pressing upon the wire engaging portion.

8. A wire connector to clamp one or more wires therein comprising, a member having a threaded hole therethrough, a second member hingedly retained relatively to the first member and having a wire engaging portion; interengaging means carried by the members which retain the members in spaced parallel relation thereby forming a wire receiving space therebetween including a recess carried by the first member, and means carried by the second member and engaging in the recess upon relative longitudinal movement between the members to lock the members in spaced parallel position by a wire pressing upon the wire engaging portion; and operating means including an operating screw received in the threaded hole and adapted to engage and clamp at least one wire in the wire receiving space against the wire engaging portion.

9. A wire connector to clamp one or more wires therein comprising, a member having a threaded hole therethrough, operating means including an operating screw received in the threaded hole, a second member hingedly retained upon the first member by means of the screw and having a wire engaging portion, and interengaging means carried by the members which retain the members in spaced parallel relation thereby forming a wire receiving space therebetween, the interengaging means being locked in spaced parallel position by the operating means engaging and clamping at least one wire in the wire receiving space and the wire pressing upon the wire engaging portion.

10. A wire connector to clamp one or more wires therein comprising, a member having one end extending at right angles thereto and carrying a threaded hole therethrough, operating means including an operating screw received in the threaded hole to clamp at least one wire in the connector; a recess at the other end of the member directed towards the operating screw, a second member hingedly retained upon the first member by means of the operating screw and having a wire engaging portion, and means carried by the second member which engages in the recess and retains the members in spaced parallel relation thereby forming a wire receiving space therebetween, the interengaging means being locked in spaced parallel position by a wire pressing upon the wire engaging portion.

11. A wire connector to clamp one or more wires therein comprising a sheet metal member having one end bent at right angles thereto and carrying a threaded hole therethrough, operat-

ing means including an operating screw received in the threaded hole to clamp at least one wire in the connector, a recess formed by bending the other end of the sheet metal member into a U-shape with the recess directed towards the operating screw, a second member hingedly retained upon the first member by means of the operating screw and having a wire engaging portion, and means carried by the second member which engages in the recess and retains the members in spaced parallel relation thereby forming a wire receiving space therebetween, the interengaging means being locked in spaced parallel position by the clamped wire pressing upon the wire engaging portion.

12. A wire connector to clamp one or more wires therein comprising, a member having one end extending at right angles thereto and carrying a threaded hole therethrough, operating means including an operating screw received in the threaded hole to clamp at least one wire in the connector, a recess at the other end of the member directed towards the operating screw, a second member having one end extending at right angles thereto and having a hole therein to loosely receive the operating screw whereby the second member is hingedly retained upon the first member by means of the operating screw, the other end of the second member having a wire engaging portion, and a projection engaging in the recess which retains the members in spaced parallel relation thereby forming a wire receiving space therebetween, the projection being locked in the recess by the clamped wire pressing upon the wire engaging portion.

13. A wire connector to clamp one or more wires therein comprising, a sheet metal member having one end bent at right angles thereto and carrying a threaded hole therethrough, operating means including an operating screw received in the threaded hole to clamp at least one wire in the connector, a recess formed by bending the other end of the member into a U-shape with the recess directed towards the operating screw, a second sheet metal member having one end bent at right angles thereto and having an elongated opening therein to receive the operating screw and thereby hingedly retain the same upon the first member, the other end of the second member being bent to form a wire engaging portion and projecting means which engages in the recess and retains the members in spaced parallel relation thereby forming a wire receiving space therebetween, the projecting means being locked in the U-shaped recess by a clamped wire pressing upon the wire engaging portion.

14. A wire connector to clamp one or more wires therein comprising, a member having a side and one end extending at right angles thereto, operating means carried by the end extending at right angles and movable parallel to the side of the member, a second member retained upon the first member and movable towards and away from the first member to permit a wire or wires to be inserted therebetween; and interengaging means upon the members requiring relative longitudinal movement between the members in order to interengage including a recess at one end of one member, a portion of the end of the other member which engages in the recess and retains one end of the members in spaced parallel relation, and means at the other end of one of the members engaging the adjacent end of the other member to retain this end in spaced relation thereby forming a wire receiving space

therebetween, the wire or wires locking the interengaging means in interengaging relation by preventing relative longitudinal movement of the interengaging means upon clamping the wires in the connector with the operating means.

15. A wire connector to clamp one or more wires therein comprising a member, a second member movably retained upon the first member and spaced therefrom to form a wire receiving space therebetween, the second member being movable relatively to the first member to permit a wire or wires to be inserted therebetween, a wire engaging portion adjacent the end of each member so that together they form a wire seat, interengaging means carried by the members which retain them in spaced parallel relation and engageable upon relative longitudinal movement between the members, and operating means carried by the first member and moving into the wire receiving space to engage and clamp at least one wire in the wire receiving space against both wire engaging portions thereby preventing relative longitudinal movement between the members and the disengagement of the interengaging means.

16. A wire connector to clamp one or more wires therein comprising a first member, an operating screw carried by the first member, a second member having a recess within which the operating screw is received to retain the second member in position against movement relatively to the first member in a sidewise direction, the second member being spaced from the first member to form a wire receiving space therebetween and being movable away from the first member to permit a wire or wires to be inserted therebetween, a wire engaging portion adjacent the end of the first member forming a wire seat, interengaging means carried by the members which retain them in spaced parallel relation and requiring relative longitudinal movement between the members in order to interengage, and the operating screw moving into the wire receiving space to engage and clamp at least one wire therein against the wire engaging portion thereby preventing relative movement between the members and the disengagement of the interengaging means.

17. A wire connector to clamp one or more wires therein comprising a first member, an operating screw carried by the first member, a sec-

ond member having an elongated hole within which the operating screw is received to inseparably retain the second member upon the first member and to retain the second member spaced from the first member to form a wire receiving space therebetween, the second member being swingable away from the first member to permit a wire or wires to be inserted therebetween, a wire engaging portion adjacent the end of each member so that they form a wire seat, interengaging means carried by the members which retain them in spaced parallel relation and engageable upon relative longitudinal movement between the members, and the operating screw moving into the wire receiving space to engage and clamp at least one wire therein against both wire engaging portions thereby preventing relative longitudinal movement between the members and the disengagement of the interengaging means.

18. A wire connector to clamp one or more wires therein comprising a first member, a second member having means at one end thereof to retain the second member in position against movement relatively to the first member in a sidewise direction when a wire is clamped in the connector and permitting movement of the other end relatively to the first member, the second member being spaced from the first member to form a wire receiving space therebetween and being movable relatively to the first member to permit a wire or wires to be inserted therebetween, a wire engaging portion adjacent the other end of the first member forming a wire seat, interengaging means carried by the members adjacent the wire engaging portion which retain the members in spaced parallel relation and require relative movement of one member with respect to the other member in a direction to decrease the size of the wire receiving space in order to interengage and disengage the interengaging means, and operating means carried by the first member and moving into the wire receiving space to engage and clamp at least one wire therein against the wire engaging portion and thereby obstruct relative movement of the second member in a direction to decrease the size of the wire receiving space so that disengagement of the interengaging means is prevented.

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