

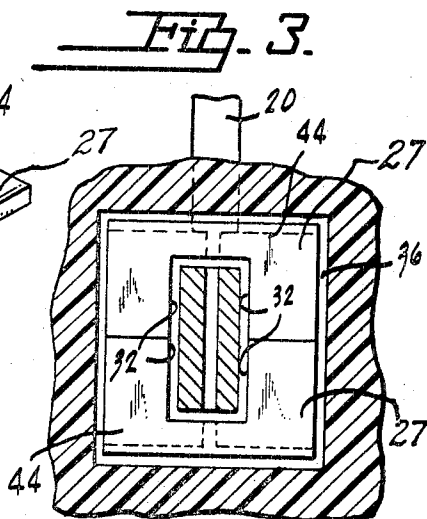
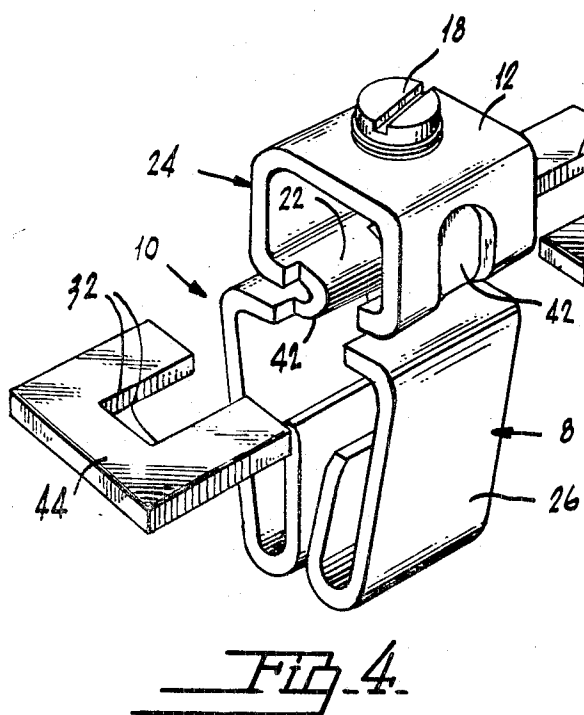
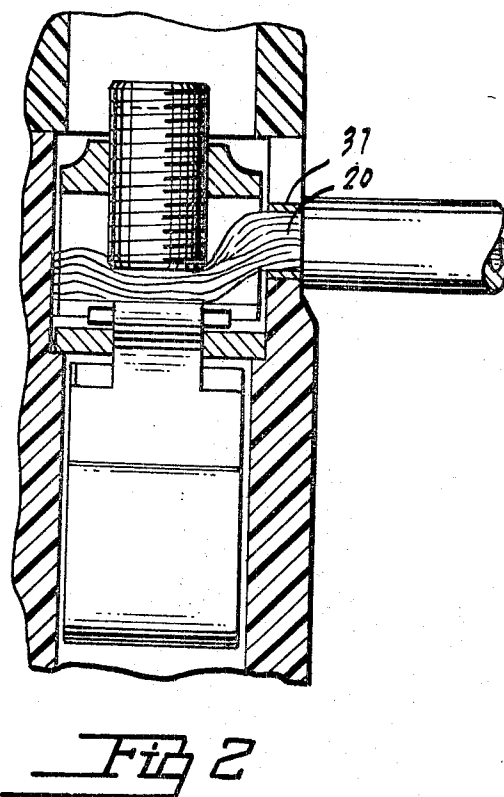
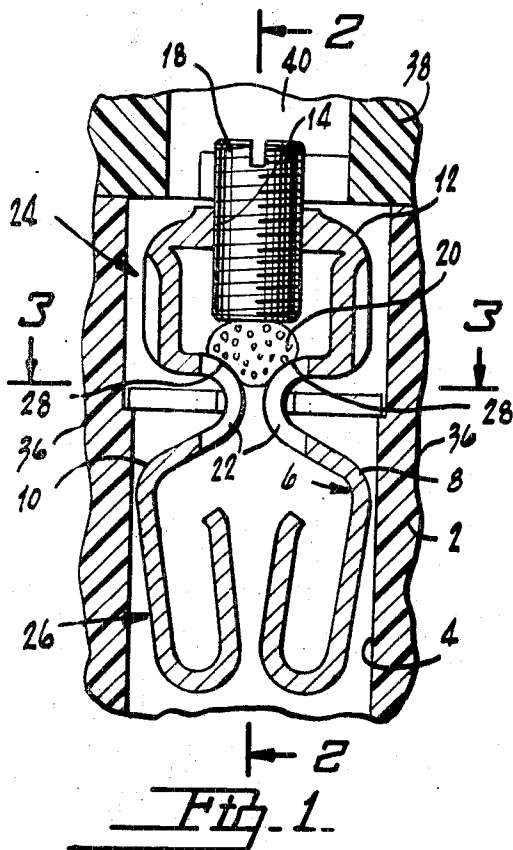
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HEAVY DUTY RECEPTACLE AND BLADE ASSEMBLY

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1

2

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**HEAVY DUTY RECEPTACLE AND BLADE
ASSEMBLY**

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6 Claims

ABSTRACT OF THE DISCLOSURE

A receptacle and blade assembly particularly adapted for use with the heavy duty connectors employed on stoves, dryers, domestic heating circuits and the like. The blade is a one piece element designed to cooperate with means within the receptacle to establish a conductor holding portion which is so isolated from a connector receiving portion of the blade that the effectiveness of the electrical connection between a conductor and the blade will not be impaired by reason of flexing of the connector receiving portion of the blade.

FIELD OF INVENTION

This invention relates to assemblies comprising an electrical receptacle having a yieldable female contact element housed therein for receiving the blades or pins of a male connector.

THE PRIOR ART

Those wiring devices used in handling heavy current loads must be so designed as to assure continued and positive contact between relatively movable parts in order to avoid any loosening of the elements with resulting increase in resistance to current flow and overheating of the parts. On the other hand it is sometimes necessary for one or more elements of an assembly to possess sufficient resiliency to permit ready attachment and detachment of elements, as exemplified by the plug and socket connections of domestic equipment such as electrical stoves, dryers or heating devices.

It has been usual practice heretofore to provide such electrical connectors with a receptacle having a yieldable female contact mounted therein to afford a wiping contact with a blade or pin carried by a male cap or plug. The electrical conductor by which current is supplied to the yieldable female member is generally attached thereto by a terminal screw. However, relative movement of the female member with respect to the conductor and terminal screw normally occurs each time the female contact is flexed upon insertion or removal of the male member of the assembly. As a result the connection established between the conductor and female member may be subjected to repeated movements which tend to weaken or impair the effectiveness of the connection between the conductor, terminal screw and contact member.

SUMMARY OF THE INVENTION

In accordance with the present invention an insulating receptacle has a connector located therein and consisting of a single piece blade having a central portion with a threaded opening therein for receiving a terminal screw engageable with a conductor. The blade also has female contact portions yieldable to afford a wiping contact with the male contact element of a connector such as a plug or cap carried by a flexible wire. However, the assembly of the present invention includes means located within the receptacle and engageable with the single piece blade to hold the conductor engaging surfaces of the blade and the terminal screw carried by the blade in fixed positions with respect to the receptacle and conductor at all times

after proper assembly thereof. Such means serve at the same time to isolate the stationary portions of the assembly from the female or yieldable portions of the blade whereby movement of the female portions will not result in displacement or movement of the fixedly positioned conductor, terminal screw, and conductor engaging surfaces of the blade. The effectiveness of the connection between the conductor and the blade is thereby maintained for long periods of time without danger of loosening or overheating of any of the elements of the assembly.

THE DRAWINGS

FIG. 1 is a vertical sectional view through a portion of a typical assembly embodying the present invention;

FIG. 2 is a vertical sectional view of the construction shown in FIG. 1 taken on the line 2—2 thereof;

FIG. 3 is a horizontal sectional view of the assembly shown in FIG. 1 taken on the line 3—3 thereof; and

FIG. 4 is an exploded view of the metallic inserts embodied in the assembly of FIGS. 1, 2, and 3.

PREFERRED EMBODIMENT OF THE INVENTION

In that form of the invention chosen for purposes of illustration in the drawings, the assembly embodies a receptacle 2, having a recess 4 therein, in which is located a one piece blade element 6. The blade element 6 is generally U-shaped in vertical cross section as shown in FIGS. 1 and 4, and has opposite legs indicated at 8 and 10. The upper or central portion 12 of the single piece blade 6 has a threaded opening 14 therein which is adapted to receive a terminal screw 18. Each of the legs 8 and 10 is provided midway of the length thereof, with an inwardly bent anchor portion 22 which divides the blade 6 into an upper conductor holding portion 24 and a lower contact portion 26. One or more clips 27 embrace the legs 8 and 10 of the blade 6 and fit about the anchor portions 22 of the legs 8 and 10 as shown in FIG. 3. In this way the clips 27 embrace both of the legs 8 and 10 and limit outward movement thereof which would permit spreading apart of the anchor portions 22. Such spreading of the anchor portions 22 will tend to take place when terminal screw 18 urges the conductor 20 downward against the inwardly and downwardly sloping and converging conductor engaging surfaces 28 of the anchor portion 22. When the conductor is forced downward by the terminal screw 18 it bears against the upper side of the conductor 20 so as to urge the conductor against the conductor engaging surfaces 28 to establish an effective electrical contact with the anchor portions 22. At the same time, such downward pressure tends to spread the legs 8 and 10 and the anchor portions 22 thereof apart and against the side portions of the clips 27. The end portions 44 of the clips are in turn pressed against the inner walls of the recess 4 in the receptacle whereby the elements cooperate to establish a fixed and positive relation between the conductor 20 and the upper conductor holding portion 24 of the blade element 6.

The cooperation between the anchor portions 22, clips 27, conductor 20 and terminal screw 18 by reason of their fixed relation one with the other, serves to isolate the conductor receiving portion of the blade element 6 from the flexible blade receiving portion 26 of the blade element 6. Accordingly, the lower ends of the two legs 8 and 10 of the blade element 6 are relatively movable toward and away from each other to afford a spring or wiping contact with a male element inserted between the reversely turned or spring portions 26 at the lower ends of the legs 8 and 10. Moreover, the movement of the portions 26 toward and away from each other, takes place about the edges or sides 32 of the legs of the clips 27 as shown in FIG. 3. Thus, the anchor portions 22 serve the dual function of providing a positive seat for

3

4

the conductor 20 when it is urged against the anchor portion by the terminal screw 18 and of providing a fixedly located fulcrum about which the resilient or yieldable extremities 26 of the legs 8 and 10 of the blade element 6 are pivotally movable.

In the construction shown in the drawings the recess 4 in the receptacle 2 is provided with a shoulder 36 against which the marginal portions of the clips 27 may seat to hold the blade element 6 and the conductor 20 in fixed positions within the recess 4.

The upper end of the recess 4 is referably provided with a notch 37 for receiving the conductor when the blade element 6 is inserted into the cavity 4. In addition, a cover member 38 is provided and has an opening 40 therein through which access may be had to the terminal screw 18 when desired.

As shown most clearly in FIG. 4, the anchor portions 22 of the blade element 6 are provided on the opposite edges thereof with dimples or notches 42 for receiving the base or end portions 44 of the clips 27 when the clips are moved into embracing engagement with the anchor portions 22 of the legs 8 and 10 shown in FIG. 3 of the drawings. When the clips are thus assembled in engagement with the legs 8 and 10 of the blade element 6, the assembled clips and blade element are readily inserted into the upper end of the recess 4 until the clips seat against the ledges 36 about the inner side walls of the recess 4. The conductor 20 is then inserted through the opening 37 in the side wall of the recess 4 into a position beneath the terminal screw 18 after which the terminal screw is turned down to forcibly engage the upper surface of the conductor 20. The terminal screw thereby serves to urge the conductor against the converging conductor engaging surfaces 28 of the anchor portions 22 of the blade element 6 and force is thus applied. The anchor portions 22 of the clips 27 are urged outward until the end portions 44 of the clips abut against the side walls of the recess 4 in the receptacle. When thus seated the clips 27 and legs 8 and 10 of the blade 6 are held against further movement and a positive and rigid assembly is established permitting yielding movement of the female portions 26 of the blade 6 without danger of movement or loosening of the conductor 20 with respect to the conductor holding portion 12 of the blade element 6.

The manner in which the elements of the combination are assembled may of course be varied as desired. Similarly the shape of the yieldable extremities 26 of the element 6 may be chosen to afford a wiping contact with the mating or male members of any type of cooperating connector whether a pin, a blade, or otherwise formed. Moreover, the novel features of the present invention may be embodied in switch assemblies, circuit breakers, and the like if desired.

I claim:

1. An electrical assembly comprising a receptacle having a recess therein, an electrically conductive blade element located in said recess, said blade element being generally U-shaped to provide thereon a mid-portion and legs extending therefrom, said legs being formed with resiliently spreadable distal portions providing electrical contacts, proximal portions at opposite sides of the mid-portion, and inwardly offset anchor portions between the proximal and distal portions, said mid-portion having a threaded opening therein for receiving a terminal screw, the anchor portions presenting cooperating converging conductor engaging surfaces positioned opposite said threaded opening, and means within the recess in the receptacle limiting relative spreading movement of said conductor engaging surfaces under the pressure of a conductor urged toward said surfaces by a terminal screw threaded into said opening while leaving the distal portions free to be spread apart by an inserted male contact, said means within the recess in the receptacle comprising at least one clip embracing the anchor portions adjacent said conductor engaging surfaces to limit the distance said

surfaces may move away from each other in response to the pressure of said conductor.

2. An electrical assembly comprising a receptacle having a recess therein, an electrically conductive blade element located in said recess, said blade element being generally U-shaped to provide thereon a mid-portion and legs extending therefrom, said legs being formed with resiliently spreadable distal portions providing electrical contacts, proximal portions at opposite sides of the mid-portion, and inwardly offset anchor portions between the proximal and distal portions, said mid-portion having a threaded opening therein for receiving a terminal screw, the anchor portions presenting cooperating converging conductor engaging surfaces positioned opposite said threaded opening, and means within the recess in the receptacle limiting relative spreading movement of said conductor engaging surfaces under the pressure of a conductor urged toward said surfaces by a terminal screw threaded into said opening while leaving the distal portions free to be spread apart by an inserted male contact, said means comprising two oppositely facing U-shaped clips surrounding said blade element adjacent said conductor engaging surfaces.

3. An electrical assembly comprising a receptacle having a recess therein, a single piece blade element located in said recess and embodying a central portion having a threaded opening therein for receiving a terminal screw, resiliently spreadable legs integral with said central portion and located on opposite sides of said blade element, said legs presenting inwardly and downwardly inclined conductor engaging surfaces intermediate their ends converging toward each other and positioned to support a conductor engaged by a terminal screw located in the threaded opening in the central portion of said blade element, and means engaging the intermediate portions of the legs of said blade element and an inner wall of the recess in said receptacle limiting relative movement of said conductor engaging surfaces, and of those end portions of the legs located between said means and the central portion of the blade element, outward away from each other when a conductor supported on said surfaces is urged against the same by a terminal screw threaded into said threaded opening, the other end portions of the legs being free to be resiliently spread apart by an inserted male contact.

4. An electrical assembly as defined in claim 3 wherein the means engaging the legs of said blade element and an inner wall of the recess in the receptacle are in the form of U-shaped clips facing in opposite directions and embracing the legs of the blade element near said conductor engaging surfaces.

5. A combined female contact and terminal for mounting in a blade recess of a heavy duty electrical receptacle, comprising a blade assembly including a generally U-shaped, electrically conductive, one-piece blade element having a central portion and a pair of resiliently spreadable legs extending therefrom, the central portion having a threaded opening for receiving a terminal screw, said assembly further including clip means lying transversely of said legs intermediate the ends of the legs, said assembly including a conductor-receiving surface opposite the screw for clamping of a conductor between the screw and said surface, said clip means having side portions embracing the legs in the said area of said surface providing abutments limiting spreading of the legs in the inserted position of a conductor, over the portion of said assembly disposed at one side of the clip means and extending between the clip means and central portion, whereby said central portion constitutes a rigidified holder for the inserted conductor, the portion of the assembly disposed at the other side of the clip means being comprised wholly of free end portions of the legs, resiliently spreadable by an inserted male contact and constituting a female contact isolated from the rigidified conductor holder by said clip means.

5

6. A combined female contact and blade assembly as in claim 5 wherein the legs are crimped inwardly where embraced by the clip means providing convergent conductor-receiving surfaces spreadable by a conductor forced there against by the screw, said surfaces being spreadable to a limited extent as permitted by the clip means for wedging of the conductor tightly between said surfaces when the blade assembly is in use.

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