May 22, 1945. P. H. ROBAR 2,376,812

CONNECTORS FOR BINDING POSTS

Filed Dec. 18, 1943

FIG. 1.

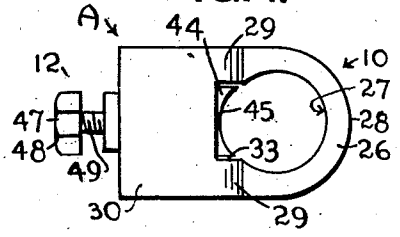


FIG. 2.

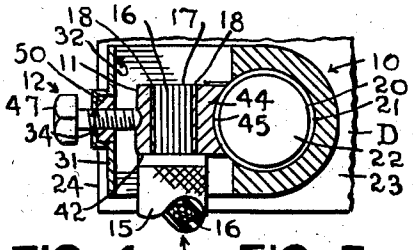


FIG. 3.

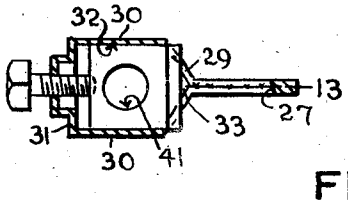


FIG. 4.

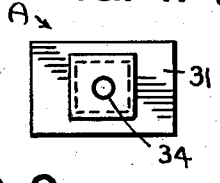


FIG. 5.

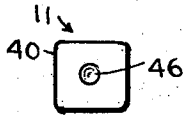


FIG. 6.

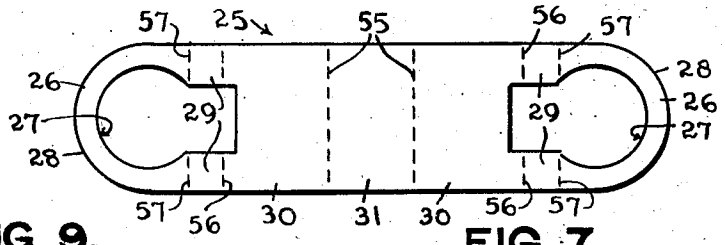


FIG. 9.

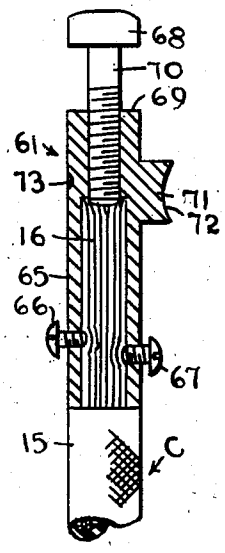


FIG. 8.

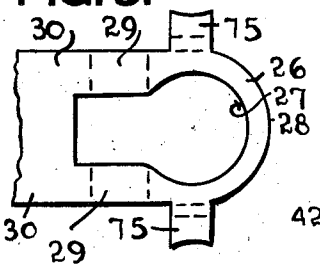


FIG. 7.

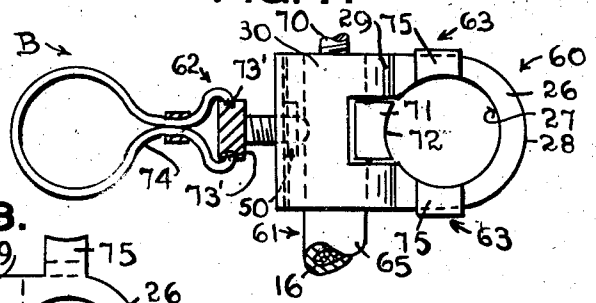
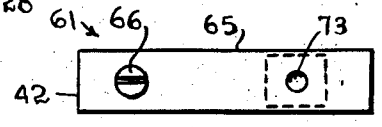


FIG. 10.



INVENTOR.
Paul H. Robar

BY Lancaster, Allen & Rommel
ATTORNEYS.

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CONNECTOR FOR BINDING POSTS

Paul H. Robar, Syracuse, N. Y.

Application December 18, 1943, Serial No. 514,831

5 Claims. (Cl. 173—259)

This invention relates to connectors for binding posts, such as battery terminals.

An important object is to provide a removable connection between a binding post and a conductor, wherein a means attached to the free end of the conductor is forced into direct contact with the post, in contradistinction to a conductor secured to the post-encircling connector body itself with flow of electric current from the conductor, to the connector body and thence to the post, or also differing from a connector in which the conductor itself is clamped directly to the post.

Another important object is to provide a removable connection between binding post and a conductor, comprising but two major portions, a post-encircling portion and a conductor-attaching portion, removable from the post-encircling portion, whereby the connector may be readily detached from the post-encircling portion, or the post-encircling portion may be readily detached from the post.

Still another important object is to provide a post-encircling portion of a connector, which may be constructed from a sheet of suitable material, stamped out and otherwise formed to provide one of the two major portions comprising the connector.

Another important object is to provide a metallic sheath for attachment to the free end of a conductor, for association with the post-encircling portion described above, this sheath being adapted to be inserted into the post-encircling portion and provided with an integral arcuate-faced lug adapted to be clamped against the binding post or terminal, so that neither the post-encircling portion nor the sheath will become detached from the post, except when it is desired to remove the connector.

Yet another important object is to provide a clamping screw type connector for a binding post, wherein the screw travels toward and from the vertical axis of the post and normal to the conductor, rather than parallel to a straight line drawn through the post and intersecting said axis, or parallel with the longitudinal axis of the conductor. The disposal of the screw places its head outside the vertical planes of the vertical walls of a conventional battery box, for instance, so that a wrench may be freely employed to attach the novel connector to the battery terminals, without interference with these vertical walls.

The novel construction just described also has the purpose of leaving the vent closures of a conventional battery box clear of projecting or near-by portions of the connector, since the screw is not inserted into or near the post-encircling parts of the connector.

Other objects and advantages of this invention will be apparent during the course of the following detailed description of the invention, taken in connection with the accompanying drawing, forming a part of this specification, and in which drawing:

Figure 1 is a top plan view of one form of the novel connector.

Figure 2 is a horizontal section thereof, with a conductor attached thereto and a portion of a battery box shown in top plan.

Figure 3 is a vertical section of the connector.

Figure 4 is an end elevation of the post-encircling portion of the novel connector.

Figure 5 is a side elevation of a conductor-attaching sheath forming one of the two major portions of the novel connector.

Figure 6 is a flattened blank forming the post-encircling portion of the connector.

Figures 7 to 10 illustrate a modification of the novel connector of Figures 1 to 6.

Figure 7 is a top plan thereof.

Figure 8 is a fragment of the flattened blank forming the post-encircling portion thereof.

Figure 9 is a top plan of a conductor-attaching sheath forming one of the two major portions of the novel modified connector, with a portion of conductor attached thereto.

Figure 10 is a side elevation of the sheath of Figure 9.

In the drawing, wherein for the purpose of illustration is shown a preferred and a modified form of the invention and wherein similar reference characters designate corresponding parts throughout the several views the letter A may designate the preferred form and the letter B the modified form of the invention, while the letter C may designate a portion of an electrical conductor, and the letter D a portion of a device having a binding post such as a storage battery.

The connector A of Figures 1 to 6, includes a post-encircling portion 10, preferably formed of strip material, a conductor-attaching portion 11, cooperating therewith, means 12 for moving portion 11 with respect to the portion 10 and retaining it in various moved positions, and means 13 for retaining together certain parts of said strip.

The portion of electrical conductor C illustrated, includes a sheath 15 of suitable dielectric material, wires or strands 16 of electric current conducting material normally within the sheath 15, but with a part of the sheath removed at the free end 17 of

the conductor, so as to bare the strands 16, for attachment of the connector A or B, and a suitable means 18 for attaching the free end 17 to the portion 11.

The device D includes a suitable binding post or terminal 20, which is shown as having a smooth upwardly sloping periphery 21, flattened top 22, and extending from a battery box 23, having a vertical face 24, with the post 20 set inwardly of the face 24, all being conventional construction.

The post-encircling portion 10 is, preferably, formed from a single strip or length 25 of suitable metallic material, as shown in Figure 6, and includes a relatively narrow wall 26 having an arcuate inner face 27, which may or may not slope slightly inwardly. In practice, this arcuate inner face 27 may form substantially 315° of a circle, although the arc may vary in degree and it is this face 27 that contacts the periphery 21 of the binding post 20. The outer face 28 of the wall 25 may follow the curve of the face 27, whereby the wall 26 forms a loop.

Extending from the wall 25 are four, preferably curved, walls 29, which are narrower than the strip 20. Two extend upwardly in substantially the same plane, and two extend downwardly in a like plane.

From the curved walls 29 extend paralleling spaced-apart horizontal walls 30 which may be the full width of the strip 20, with their horizontal planes paralleling the planes of the horizontal faces of the wall 25, and are joined by a vertical end wall 31, so that the walls 30 and 31 form a substantially U-shaped part.

There are no side walls, so that the recess 32 formed by the walls 29, 30 and 31 is open at its sides and open at one end, this last opening 33 being formed, of course, by the narrowed walls 29 and communicates with the space about the arcuate inner face 27.

A perforation 34 is in the end wall 31 for a purpose later detailed. This perforation 34 is at the intersection of the longitudinal and transverse axes of the wall 31.

The conductor-attaching portion 11 of the connector A is shown more particularly in Figures 2 and 5 and includes a sheath 40 of electric current conducting metal, preferably shorter than the width of the walls 30. It may have a smooth bore 41 for accommodation of the bared free end 17 of the conductor C and with the end of the conductor sheath 15 abutting one end 42 of the sheath 40. The outer diameter of the sheath 40 is less than the distance apart of the inner faces of the horizontal walls 30 and this sheath 40 may have flattened outer faces. The free end 17 of the conductor C may be secured to the sheath 40 as by solder 18.

Extending from the outer surface of the sheath 40 is a lug 44 having an arcuate outer face 45 with this lug adapted to be accommodated in the opening 33 for sliding into and out of the opening. The arc of this face 45 may be substantially 45° and, with the arcuate face 27, complete 360° of a circle. However this arc need not be strictly 45° since the face 45 need not be wholly in face to face contact with the battery post 20. The sheath 40 may have a slight depression 46 in its side opposite that containing the lug 44.

Means 12 for moving the portion 11 with respect to the portion 10 and retaining the portion 11 in various moved positions, may comprise a set screw 47 with its head 48 exteriorly of the portion 11, its shank 49 extending through the perforation 34 in the end wall 31 and with its screw threads cooperating with those of a suitable member, such as a nut 50 preferably soldered or otherwise secured to the interior face of the wall 31, and with the free end of the shank 49 within the depression 46.

Means 13 for retaining or securing together the face-to-face parts of the strip 25, comprising the narrow wall 26, may be solder.

Again referring to the strip 25, shown in Figure 6, it may be bent along the dotted lines 55 to form the vertical end or bight wall 31, and to form the two paralleling horizontal walls 30, normal to the wall 31, curved from the dotted lines 56 to 57 to form the curved narrow walls 29 and the flat, narrow wall 26 formed from the two ends of the strip containing the arcuate openings. Other reference characters applied to Figure 6 designate corresponding parts of the complete post-encircling portion 10.

The modified connector B, shown in Figures 7–10 inclusive, includes a post-encircling portion 60, also preferably formed of strip material, a conductor-attaching portion 61, cooperating therewith, means 62 for moving the portion 61 with respect to the portion 60 and retaining it in various moved positions, and means 63 for retaining together certain parts of the strip.

Since the two portions 10 and 60 have substantially all features in common, similar reference characters designate corresponding parts of both.

The conductor-attaching portion 61 shown particularly in Figures 9 and 10 includes a sheath 65, preferably longer than the sheath 40, provided with, generally, conductor-engaging set screws 66 and 67 extending radially of its bore and a screw 68 extending from its outermost end 69, with said end having a perforation and screw threads therein adapted to cooperate with the screw threads of the shank 70 of the screw 68. When bared conductor strands are inserted into the bore of the sheath 65 and the set screws 66 and 67 tightened, the screw 68 may be turned to force its free end against the free ends of the conductor strands and jam them into tight contact with the sheath 65.

The sheath 65 carries a lug 71, quite like the lug 44 and positioned as is the latter. It has an arcuate outer face 72, positioned as is the arcuate face 45, and the sheath 65 may have a depression 73 like the depression 46, in its side opposite that containing the lug 71.

The means 62 is substantially like the means 12 and functions similarly, but the screw head 48 of the means 62 has a pair of axially aligned perforations 73' in its side faces, accommodating the ends of a suitable handle 74, obviating the needs of a wrench in turning the screw 47.

Means 63 differs from means 13 and comprises a pair of lugs 75 preferably integral with the flattened blank, a fragment of which is shown in Figure 8. These lugs extend outwardly from the blank and are adapted to be bent either upwardly or downwardly (depending upon which end of the blank they occupy) when the portion 60 is formed, and over the overlapping end of the blank not containing the lugs 75, so that the two overlapping end parts are held together by the lugs 75 instead of by solder or the like. However, both the lugs and solder may be employed on the same portion 60 and the lugs 75 may be soldered, also.

In applying either combined binding post and conductor connector clamp A or B with the screw 47 loosened so that the lug 44 or 71, as the case may be, retracted in the opening 33, the clamp

A or B is slipped over the binding post and the screw 47 tightened to bring the lug into binding contact with the post, thus securing the clamp thereto.

The conductor attaching portions 11 or 61 are readily removed from or attached to their associated post-encircling portions 10 or 60, for attachment of a new conductor.

A volume of grease or the like may be inserted into the recess 32, substantially filling it, if desired, so that the juncture of the sheaths 40 and 15 will be well covered by anti-battery acid compound and attachment of the portions 10 and 11, due to acid action will be avoided.

Either major portion of the clamps A or B may be discarded without dicarding the other portion.

The conductor wires or strands 16 are protected by the metallic sheaths 40 or 65 and are not severed, flattened and weakened, or badly deformed, as would be the case where a means, similar to the set screw means 12 or 62, bore directly against the wires 16, forcing them directly against the curved post 20.

The combined clamps A or B may be disposed so that the outer portions of means 12 or 62 extend away from vent caps, whereby use of a wrench or the like, will not damage such caps and, when so positioned, the conductors will also be disposed so as to be well removed from such caps.

The novel clamps A and B are lighter in weight than solid metal clamps, yet are sturdy.

Various changes may be made to the forms of the invention herein shown and described without departing from the spirit of the invention or scope of the following claims.

What is claimed is:

1. In a combination binding post and conductor clamp, a post-encircling portion, including a loop section, having substantially paralleling upper and lower faces, and a hollow U-shaped section, open at its sides and open at one of its ends, integral with said first-named portion, with said open end facing said first-named section, said second-named section having upper and lower walls with the horizontal planes of said faces within the horizontal planes of said walls, and a conductor-carrying portion having a metallic sheath and a metallic lug extending from the periphery of said sheath adjacent one end thereof, said lug having an arcuate face facing said loop section, said lug and the immediate part of said sheath being slidably accommodated within said hollow section through either of said open sides thereof, and means forcing said lug toward and into said open end, toward said loop section, and retaining said lug in various forced positions, comprising an exteriorly screw threaded member and cooperating screw threads in the bight of said U-shaped section, with said screw threads in cooperative engagement, the free end of said member bearing upon said sheath.

2. In a combination binding post and conductor clamp, a post-encircling portion, including a loop section, having substantially paralleling upper and lower faces, and a hollow U-shaped section, open at its sides and open at one of its ends, integral with said first-named portion, with said open end facing said first-named section, said section-named section having upper and lower walls with the horizontal planes of said faces within the horizontal planes of said walls, and a conductor-carrying portion having a metallic sheath and a metallic lug extending from the periphery of said sheath adjacent one end thereof, said lug having an arcuate face facing said loop section, said lug and the immediate part of said sheath being slidably accommodated within said hollow section through either of said open sides thereof, and means forcing said lug toward and into said open end, toward said loop section, and retaining said lug in various forced positions, comprising an exteriorly screw threaded member and cooperating screw threads in the bight of said U-shaped section with said screw threads in cooperative engagement, the free end of said member bearing upon said sheath, and the length of said sheath being less than the shortest distance from one of said open sides to the other of said open sides.

3. In a combination binding post and conductor clamp, a post-encircling portion, including a loop section, having substantially paralleling upper and lower faces, and a hollow U-shaped section, open at its sides and open at one of its ends, integral with said first-named portion, with said open end facing said first-named section, said second-named section having upper and lower walls with the horizontal planes of said faces within the horizontal planes of said walls, and a conductor-carrying portion having a metallic sheath and a metallic lug extending from the periphery of said sheath adjacent one end thereof, said lug having an arcuate face facing said loop section, said lug and the immediate part of said sheath being slidably accommodated within said hollow section through either of said open sides thereof, and means forcing said lug toward and into said open end, toward said loop section, and retaining said lug in various forced positions, the greatest width of said conductor-carrying portion being less than the width of either of said open sides of said hollow U-shaped section.

4. In a binding post and electrical conductor connector, a one-piece post-encircling portion, comprising a metallic strip provided with a pair of arcuate openings adjacent the ends thereof, said strip being folded upon itself with said openings in register and the walls thereof in contact, said strip being narrowed into spaced-apart arms diverging from said openings, and said strip then being widened and extending thence horizontally in planes substantially paralleling the horizontal planes of that part of said strip containing said openings, said horizontally extending parts of said strip being spaced apart and joined by a bight part, being that part of said strip farthest removed from said openings, a conductor-carrying portion slidable between said widened parts of said strip, provided with a lug, having an arcuate face, with said lug extending between said arms and said face facing said registering openings, means for moving said conductor-carrying portion away from said bight part and retaining it in various moved positions, and means retaining together said folded-upon-itself parts of said strip.

5. In a binding post and electrical conductor, a one-piece post-encircling portion, comprising a metallic strip provided with a pair of arcuate openings, adjacent the ends thereof, said strip being folded upon itself with said openings in register and the walls thereof in contact, said strip being narrowed into spaced-apart arms diverging from said openings, and said strip then being widened and extending thence horizontally in planes substantially paralleling the horizontal planes of that part of said strip containing said openings, said horizontally extending parts of said strip being spaced apart and joined by a bight part, being that part of said strip farthest re-

moved from said openings, a conductor-carrying portion slidable between said widened parts of said strip, provided with a lug, having an arcuate face, with said lug extending between said arms and said face facing said registering openings, means for moving said conductor-carrying portion away from said bight part and retaining it in various moved positions, and means retaining together said folded-upon-itself parts of said strip, comprising a pair of clips extending from said strip, being integral with one of the folded-upon-itself parts of said strip and folded upon the outer face of the other of said folded-upon-itself parts of said strip.

PAUL H. ROBAR.