C. H. BISSELL & E. G. SMITH.

ELECTRICAL SOCKET AND PLUG.

APPLICATION FILED JULY 29, 1911.

1,176,515.

Patented Mar. 21, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

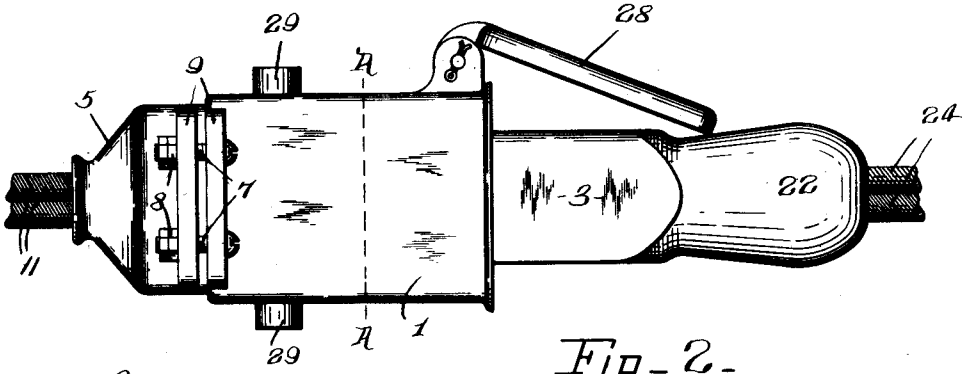


Fig. 2.

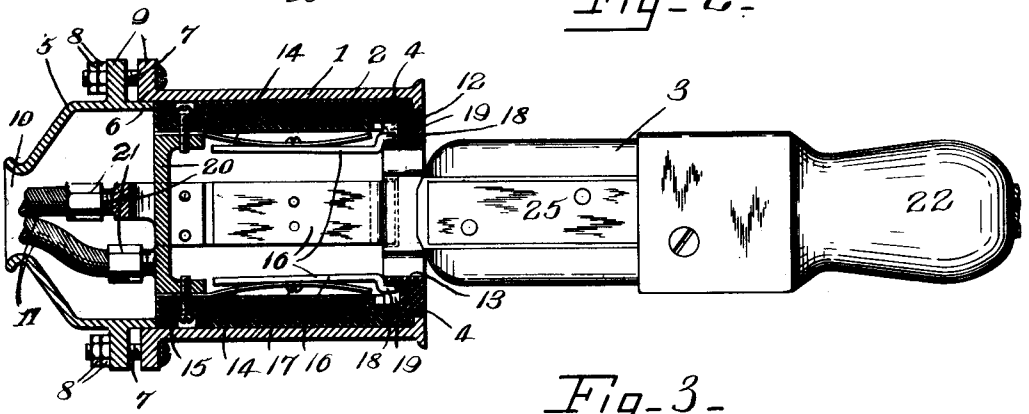
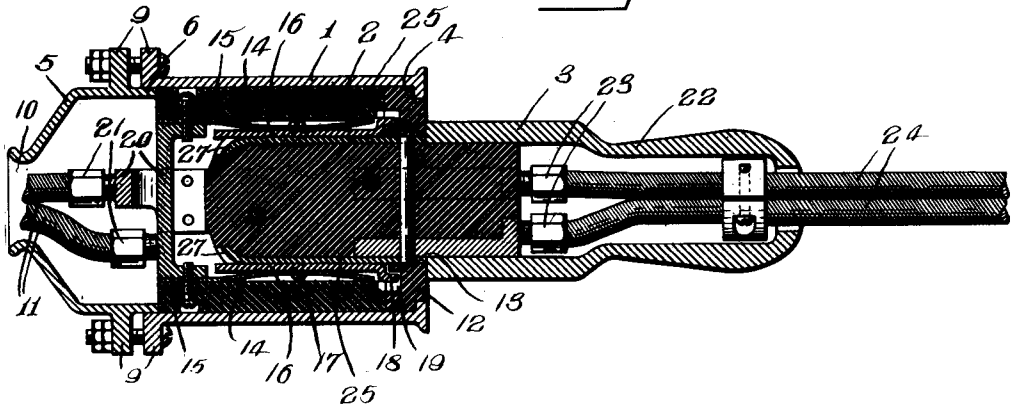


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

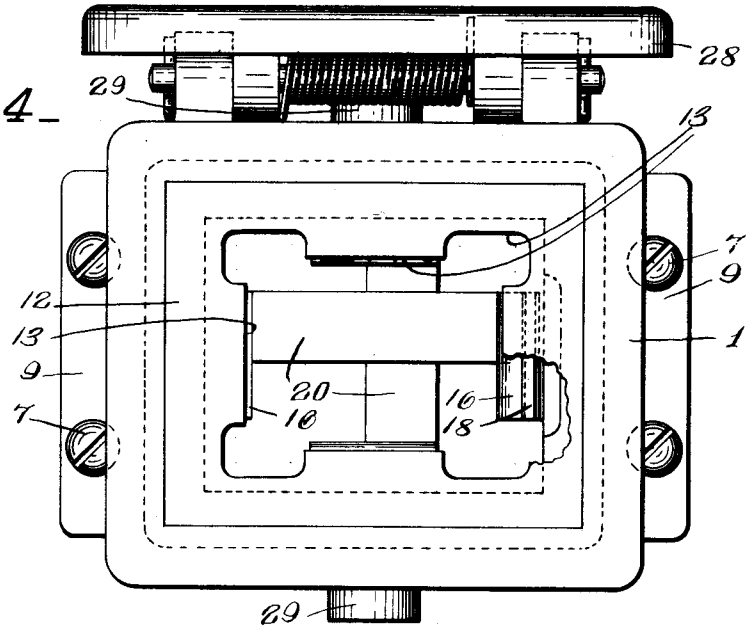
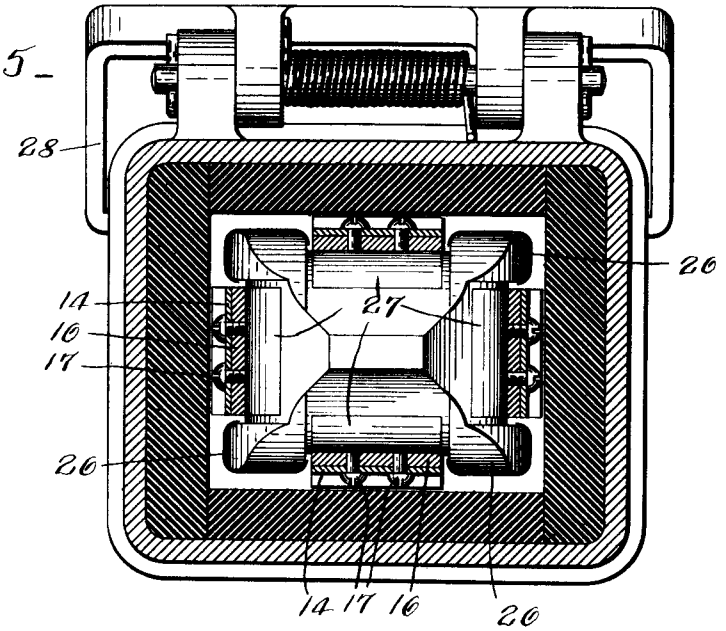


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ELECTRICAL SOCKET AND PLUG.

1,176,515. Specification of Letters Patent. Patented Mar. 21, 1916.

Application filed July 29, 1911. Serial No. 641,325.

To all whom it may concern:

Be it known that we, CARL H. BISSELL and ELDA G. SMITH, of Syracuse, in the county of Onondaga and State of New York, have invented a certain new and useful Electrical Socket and Plug, of which the following is a specification.

This invention has for its object the production of an electrical socket and plug which is particularly simple in construction, economical in manufacture and highly efficient and durable in use and it consists in the combinations and constructions hereinafter set forth and claimed.

In describing this invention reference is had to the accompanying drawing in which like characters designate corresponding parts in all the views.

Figure 1 is a side elevation of this socket and plug, the plug being arranged in the socket. Fig. 2 is a sectional view of parts seen in Fig. 1, the plug being withdrawn and also shown in elevation. Fig. 3 is a view similar to Fig. 2, the plug being inserted in the socket and being also shown in section. Fig. 4 is an enlarged end elevation of the socket. Fig. 5 is a sectional view on line "A—A" Fig. 1.

The socket comprises, generally, a box 1 including a body open at its opposite ends, a support 2 of insulation slidable in the body through one end thereof, and a terminal carried by the support in position to coact with the terminals of the plug 3.

The body 1 is here shown as rectangular and is provided with a shoulder 4 at one end for preventing the support 2 from sliding through the box, such support being insertible in the box through the other end thereof, said support 2 being rectangular in cross section and fitting within the box 1 and having its opposite ends open.

5 is a cap for the end of the box through which the support is movable, the cap having a flange 6 telescoping within the box 1 and abutting against the edge face of the support 2. The cap is clamped in position by suitable means as bolts 7 and nuts 8 screwing thereon, the bolts 7 extending through outwardly extending flanges 9 formed respectively on the box 1 and the cap 5. The cap is also formed with a suitable opening 10 for the line wires 11.

12 is an entrance piece in the socket, said piece being formed of insulation and interposed between the edge face of the support 2 and the shoulder 4 and formed with a passage 13 for the plug 3.

The support 2 and the plug 3 are provided respectively with coacting terminals and the terminals of one of said parts 2 and 3 are yieldable rectilinearly in a direction radially relatively to the axis of the socket in order that when the plug is moved into the socket, such yielding terminals will not tilt but will remain with their engaging faces parallel to the axis of the socket in order to engage throughout their entire extent with the terminals of the other of said parts.

In the illustrated embodiment of my invention the terminals of the socket are yieldable rectilinearly against the action of spring means, such terminals consisting of bowed springs 14, each being fixed at one end as at 15 and a shoe 16 secured as by a screw 17 between its ends to the intermediate portion of the bowed spring 14, the ends of these shoes 16 toward the entrance of the socket being offset or deflected outwardly as at 18 and extended into grooves or recesses 19 formed in the opposing face of the entrance piece 12 and the edge face of the support 2. The fixed ends of the springs 14 located diametrically opposite each other are connected by yokes 20 which are provided with suitable binding devices 21 for connection with the line wires 11. The terminals connected by one yoke are of opposite polarity to those connected by the other yoke and thus terminals located diametrically opposite each other are of the same polarity.

The plug 3 may be of any desirable form, size and construction and is provided with a suitable handle 22 within which are located suitable binding devices 23 for connection with wires 24. Said plug 3 is rectangular in cross section and is formed with grooves in its sides in which the terminals 25 are located, such grooves extending throughout the greater area of the sides so that the corner portions 26 are projected as seen in Fig. 5.

The terminals 25 are arranged with their faces depressed below the planes of the grooved face; and the ends of the grooves curve into the end face of the plug while

the advance ends of such terminals 25 are bent to conform to the grooves as shown at 27.

The passage 13 of the entrance piece conforms to the plug 3. When the plug is not in the socket the end of the box 1 is closed by a spring pressed door 28 which is raised by hand preliminary to the insertion of the plug in the socket. During the insertion of the plug into the socket, the advance ends 27 of the terminals 25 engage the advance ends of the shoes 16 pressing the shoes outwardly, and owing to the springs supporting such shoes 16 the yielding movement is in a rectilinear direction so that when the plug moves into the socket, the shoes will lie flatwise on the terminals 28 giving large contacting surfaces the instant the plugs engage the shoes 16.

This socket and plug is particularly applicable for railway cars having storage batteries for supplying the electric lights of the car, the box 1 being carried by the car and provided with trunnions 29 by which it is swiveled to the car. The plug 3 is connected by the wires 24 to a suitable supply station, the plug and wires 24 normally lying between the car tracks. If the trainman should neglect to remove the plug, when the car is started the box 29 will swing around to a position parallel with the car tracks and the plug will be withdrawn during the movement of the car.

This socket is particularly advantageous in that the internal parts of the socket are carried by a support which is readily removable, and. owing to the cross sectional form of the plug it is difficult for two terminals 25 of opposite polarity to short circuit through the ground.

What we claim is:

1. An electrical socket comprising a box including a body open at its opposite ends and provided with an internal shoulder near one end. a hollow support of insulation slidable axially into the body through the opposite end thereof, an entrance piece inserted through said opposite end of the body in advance of the support into engagement with said shoulder and having a passage alined with the passage of the support and being smaller than the same, and terminals carried by the support and extending into the passage thereof and located behind the inner margin of the entrance piece, substantially as and for the purpose described.

2. An electrical socket comprising a box including a body open at its opposite ends and provided with an internal shoulder near one end. a hollow support of insulation slidable axially into the body and through the opposite end thereof, an entrance piece inserted through said opposite end of the body in advance of the support into engagement with said shoulder, said piece having a passage alined with that of the support and having a portion lapping the inner edge of said shoulder to insulate the shoulder, and terminals carried by the support and extending into the passage thereof, substantially as and for the purpose specified.

3. An electrical socket comprising a box including a body open at its opposite ends and provided with an internal shoulder near one end, a cap for the opposite end of the body, the cap having a flange extending into the body, and means for clamping the cap toward the body, a hollow support of insulation slidable into the body through the end thereof provided with the cap, when the cap is removed, an entrance piece located between the advance edge of the support and said shoulder, the entrance piece abutting against the shoulder and having a passage alined with and being of smaller diameter than that of the support, the flange and the shoulder abutting against opposite ends of the support and the entrance piece, respectively, and terminals carried by the support and extending into the passage thereof and located behind the inner margin of the entrance piece, substantially as and for the purpose set forth.

4. An electrical socket comprising a rectangular box open at its opposite ends, a hollow rectangular support of insulation slidably fitting within the rectangular body through one end thereof, terminals carried by the support and extending into the passage thereof, terminals of the same polarity being arranged on opposite walls of the support, and yokes at one end of the support, the yokes extending crosswise of each other, and each yoke being connected to terminals of like polarity and the yokes having means for connection with line wires, substantially as and for the purpose described.

5. The combination of a support and a terminal carried by the support. the support having a surface underlying the terminal and the terminal including a bow-shaped spring fixed at one end and a shoe mounted intermediate of its ends on the intermediate portion of the bow-shaped spring, the free end of the bow-shaped spring being opposed to said surface and being movable into engagement therewith when pressure is applied to the shoe. substantially as and for the purpose specified.

6. The combination of a support and a terminal carried by the support including a bow-shape spring fixed at one end and having its other end normally free. and a flat shoe mounted intermediate of its ends on the intermediate part of the bow-shape spring, the free end of the spring being arranged to engage the support after the shoe is initially depressed, substantially as and for the purpose specified.

7. An electrical socket comprising a hol-

low rectangular terminal support of insulation open at its opposite ends, terminals carried by the support and located within the same, terminals of the same polarity being arranged on opposite walls of the support, and yokes at one end of the support extending crosswise of each other, each yoke being connected to terminals of like polarity, substantially as and for the purpose set forth.

8. An electrical socket comprising a hollow rectangular terminal support of insulation open at its opposite ends, terminals carried by the support and located within the same, the support having walls underlying the terminals, terminals of the same polarity being arranged on opposite walls of the support, yokes at one end of the support extending crosswise of each other, each yoke being connected to terminals of like polarity, the terminals including shoes, and springs supporting the shoes and having their ends inserted between opposite ends of the yokes and the underlying walls of the support, substantially as and for the purpose described.

9. An electrical socket comprising a hollow rectangular terminal support of insulation open at its opposite end, terminals carried by the support and located within the same, terminals of the same polarity being arranged on opposite walls of the support, the support having surfaces underlying the terminals, yokes at one end of the support extending crosswise of each other, each yoke being connected to terminals of like polarity, and the terminals including shoes, and springs supporting the shoes and having their ends inserted between opposite ends of the yokes and the underlying walls of the support, the springs being bow-shape and being connected to the shoes between the ends of the same, substantially as and for the purpose set forth.

10. An electrical plug socket comprising a hollow terminal support of insulation having an entrance piece opposed to one end of the support, and formed with a recess in its rear face and a terminal mounted on the inner wall of the support and comprising a shoe, and spring means secured to the support and to the shoe, the advance end of the shoe being normally arranged in position to be engaged by a plug passing into said passage and being deflected outwardly at its advance end and extending into the recess, substantially as and for the purpose described.

11. An electrical plug socket comprising a hollow terminal support of insulation, a terminal located in the passage of the support, the terminal comprising a bow-shape spring fixed at one end and having its other end free, and a shoe secured between its ends to the intermediate portion of the spring, substantially as and for the purpose specified.

12. An electrical plug socket comprising a hollow terminal support of insulation, an entrance piece of insulation at one end of the support and having an opening of less size than the interior of the body of the support, a terminal located in the passage thereof, a spring for supporting the shoe, the advance end of the shoe being deflected outwardly into a position behind a portion of the entrance piece, substantially as and for the purpose set forth.

13. An electrical plug socket comprising a hollow support of insulation, an entrance piece of insulation at one end of the support and being of less diameter than the interior of the body of the support, the entrance piece having a recess in its rear face, a terminal located in the passage of the support and comprising a bow-shape spring fixed at one end and having its other end free, and a shoe secured between its ends and the intermediate part of the spring, the advance end of the shoe being deflected outwardly and extending into said recess, substantially as and for the purpose described.

14. An electrical plug socket comprising a box including a body, a hollow support of insulation arranged in the body, and a terminal mounted on an inner wall of the support, and comprising a shoe and spring means secured to the support and to the shoe, the advance end of the shoe being deflected outwardly, substantially as and for the purpose set forth.

15. An electrical plug socket comprising a box including a body, a hollow support of insulation arranged in the body, and having an entrance piece of insulation opposed to one end of the support and formed with a recess in its rear face, and a terminal mounted on the inner wall of the support and comprising a shoe and spring means secured to the support and to the shoe, the advance of the shoe being normally arranged in position to be engaged by means passing into said passage, and said advance end having an outwardly deflected portion extending into said recess, substantially as and for the purpose described.

16. An electrical plug socket comprising a box including a body, a hollow support of insulation arranged in the body, and a terminal located in the passage of the support, the terminal comprising a bow shaped spring fixed at one end and having its other end free, and a shoe secured between its ends to the intermediate portion of the spring, substantially as and for the purpose specified.

17. An electrical plug socket comprising a box including a body, a hollow support of insulation arranged in the body, an entrance piece of insulation opposed to one

end of the support and formed with a recess in its rear face, and a terminal located in the passage thereof, the terminal comprising a bow shaped spring fixed at one end and having its other end free, and a shoe secured between its ends to the intermediate portion of the spring, the advance end of the shoe being deflected outwardly and extended into one of the recesses of the entrance piece, substantially as and for the purpose set forth.

18. An electrical socket comprising a box including a body open at its opposite ends and provided with an internal shoulder at one end, a cap for the other end of the body, and means for holding the cap in position, a hollow support of insulation slidable in the body through the end provided with the cap and toward said shoulder, an entrance piece located between the opposing edge surface of support and said shoulder, the cap abutting against the other edge surface of the support, the entrance piece being formed of recesses on its rear face, and terminals carried by the support on the inner wall thereof, each comprising a bow shaped spring secured at one end and having its other end free, and a shoe mounted between its ends on the intermediate part of the bow, the shoe being normally arranged substantially parallel to the axis of the support, and each shoe having an outwardly deflected portion at its advance end extending into one of said recesses, substantially as and for the purpose described.

In testimony whereof, we have hereunto signed our names in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 10th day of July, 1911.

CARL H. BISSELL.
ELDA G. SMITH.

Witnesses:
C. C. SCHOENECK,
WM. CORNELL BLANDING.