G. W. GOODRIDGE.

ATTACHMENT PLUG AND RECEPTACLE.

APPLICATION FILED JAN. 2, 1912.

1,166,349. Patented Dec. 28, 1915.

Fig. 2.

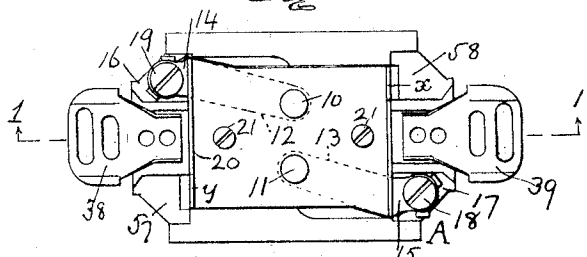
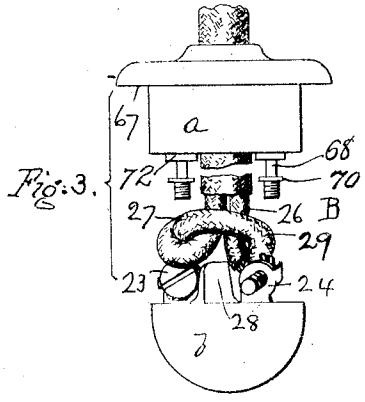


Fig. 3.



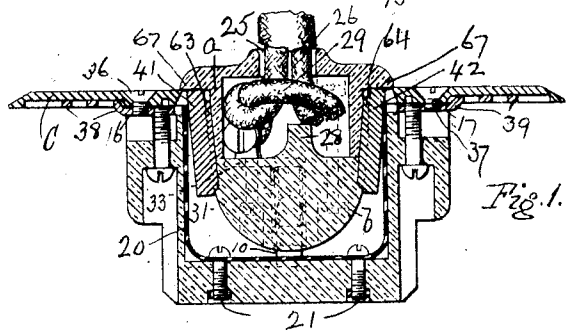


Fig. 1.

Fig. 4.

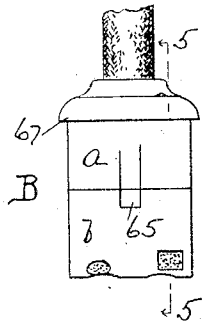


Fig. 6.

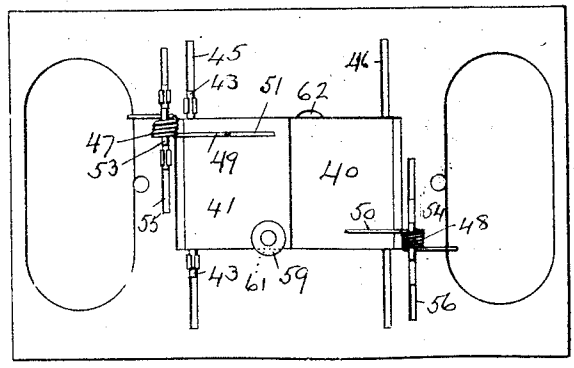
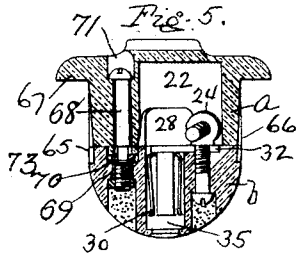


Fig. 5.



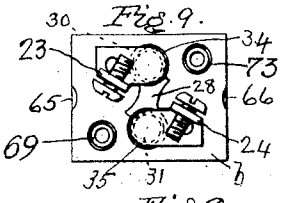
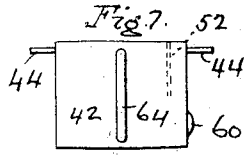


Fig. 9.

Fig. 7.



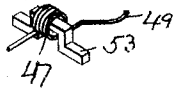


Fig. 8.

WITNESSES

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UNITED STATES PATENT OFFICE.

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ATTACHMENT-PLUG AND RECEPTACLE.

1,166,349. Specification of Letters Patent. Patented Dec. 28, 1915.

Application filed January 2, 1912. Serial No. 668,961.

To all whom it may concern:

Be it known that I, GILBERT W. GOODRIDGE, a citizen of the United States of America, and residing in the city of Bridgeport, in the county of Fairfield, in the State of Connecticut, have invented a certain new and useful Improvement in Attachment-Plugs and Receptacles, of which the following is a specification.

My invention relates to electrical attachment plugs and receptacles and particularly to what are commonly known as flush receptacles, the object of my invention being to provide an improved device of this character.

In the accompanying drawings, Figure 1 is a vertical section through the receptacle on the line 1—1, Fig. 2, with the cover plate on and plug inserted; Fig. 2 is a plan of the receptacle alone; Fig. 3 is a dropped elevation of the plug showing the manner of wiring; Fig. 4 is an elevation of the plug assembled and at right angles to Fig. 3; Fig. 5 is a vertical section through the plug on the line 5—5, Fig. 4 with the wires removed; Fig. 6 is an inverted partial plan of the cover plate, with one door removed; Fig. 7 is a plan of one of the doors; Fig. 8 is a perspective of a detail; and Fig. 9 is a plan view of one part of the plug detached.

In the embodiment of my invention illustrated, the receptacle A comprises a plug-receiving chamber or well the walls of which are of insulating material, such as porcelain. Within this chamber line terminals in the form of upstanding studs 10, 11 are arranged, which are connected through angled metallic straps 12 and 13 to the wire terminals. The latter are formed by angling the strap ends 14, 15 over recessed shoulders 16, 17 on the end walls of the receptacle, the binding screws 18, 19 entering threaded perforations therein. A lining 20 of insulating material, such as paper, is fitted within the receptacle overlying the straps 12, 13 and extending above the wire terminals, so that these are completely protected against accidental contact, and the only exposed conductors within the receptacle chamber are the studs 10 and 11 which project upward from the floor of the chamber through perforations in the lining 20. Screws 21 entering the base of the receptacle serve to hold the lining in position therein.

The attachment plug B comprises a substantial and rugged body of insulating material, preferably of fiber, so that it may withstand the knocks and rough usage to which it is ordinarily subjected when detached. This plug body is composed of two buttons *a* and *b*, suitably recessed on their meeting faces to form an inclosed chamber 22 into which the binding posts 23, 24, carried by the button *b* project from one side, while an aperture 25 affords an entrance for the wires 26, 27, from the other side. A barrier 28, arranged between the posts 23, 24, serves to space the latter apart and to confine the wire ends to their respective posts, so that danger of short circuiting is minimized. The chamber is large enough to accommodate a knot 29 in the wires, thus relieving the terminals 23, 24 from strain incident to the manipulation of the plug by grasping the wire cable. Split socket members 30, 31 forming the plug terminals are mounted on the binding post bases 23, 24 and project into the passages 34, 35 in the entrance end of the plug. It will be noted that these sockets are wholly incased by the surrounding walls or the button *b* and are thus not only protected against mechanical injury, but are prevented from coming into accidental contact with conductors when the plug is out of the receptacle. The two buttons *a* and *b* are held together in assembled position by screws 68 which enter threaded sockets 69 in the entering button *b*. The outer button *a* carries the screws 68 which are held against falling out by split washers 70 sprung onto the screws 68 at a point of reduced diameter, said washers being of greater width than the holes through which the screws pass. The heads of the screws lie in the seating recesses 71 exposed and readily accessible to enable the buttons to be taken apart for wiring. It is desirable also to provide one of the buttons. *e. g., a*, with bosses 72 through which the screw bolts 68 pass. These bosses enter corresponding wells 73 in the button *b*, thus positioning the buttons accurately with relation to each other and insuring the registry of the screws 68 with relation to their threaded sockets 69.

The receptacle is provided with a face plate C which is preferably secured to the receptacle by screws 36, 37, entering ears 38, 39 mounted on the shoulders 16, 17 at the opposite ends of the receptacle, although any suitable securing means may be provided.

The central aperture 40, through which the plug is introduced into the receptacle is normally closed by a pair of inwardly swinging doors 41, 42, hinged to the bottom of the plate by dowel pins 43, 44 lying in cross slots 45, 46, the edges of which are pinched over the pins after the latter are in position. These doors are subjected to the action of springs 47, 48, the extended ends 49, 50 of which bear against the rear faces of the doors and preferably slide in guide grooves 51, 52 formed in the latter. A simple mounting for the springs is provided by strips of metal 53, 54 in bridge form, the free ends of which lie in pinched-over slots 55, 56. In adjusted position upon the receptacle these spring-carrying strips lie above the recessed shoulders 57, 58 at the upper edges of the ends of the receptacle and the lining 20 is cut away at *x* and *y* to permit the free play of the springs 47, 48 as the doors are swung open. Lugs 59, 60 on the sides of the doors, engaging in recesses 61, 62 reamed out of the lower face of the plate, position the doors in closed position flush with the face of the plate, thus completely closing the plug aperture and excluding dust and dirt from the receptacle. On the outer faces of the doors, ribs 63, 64 are formed. These serve the double function of first, taking up wear incident to the insertion of the plug, thus protecting the face of the door from frictional contact with the plug and maintaining its finish, and, second, frictionally retaining the plug in inserted position. This second function is secured through lateral recesses 65, 66, in the sides of the plug which receive these ribs when the plug is pushed fully home in the receptacle. The rounded or beveled ends of these ribs 63, 64 then bear against the shoulders at the lower ends of the recesses 65, 66, as seen in Fig. 1, but on applying force to pull out the plug, the doors will first be pressed backwardly on their hinges against the action of the springs 47, 48, sufficiently to permit the plug to be then withdrawn, and the doors to close. A peripheral flange 67 on the button *a* of the plug limits the extent to which the latter may be inserted and forms a snug joint with the face plate serving to exclude dust and dirt from the receptacle when the plug is in position, in like manner as do the doors when the plug is out.

While the structure illustrated has been described in detail, various modifications of structure will readily suggest themselves, and the specific device shown is to be regarded merely as illustrative of my invention.

I claim as my invention:—

1. In a device of the type described, a plug receptacle, a cover plate for said receptacle apertured to permit the insertion of an attachment plug, in combination with swinging doors normally closing said apertures and wearing ribs on the exposed faces of said doors, substantially as described.

2. In a device of the type described, a plug receptacle, a cover plate therefor apertured to permit the insertion of an attachment plug, hinged doors normally closing said aperture, but adapted to swing inwardly into the receptacle on insertion of the plug, in combination with an attachment plug and means on the plug-engaging faces of said doors for frictionally engaging and holding said plug in inserted position.

3. In a device of the type described, a plug receptacle, a cover plate therefor apertured to permit the insertion of an attachment plug, inwardly swinging doors normally closing said aperture, and being ribbed in combination with an attachment plug adapted upon its insertion to displace said doors, said plug being laterally recessed to engage the ribs on said doors.

4. In a device of the type described, a plug receptacle having a plug receiving chamber with end walls having downwardly offset shoulders, wire terminals overlying the shoulders in said end walls, upstanding studs in said receptacle forming plug receiving terminals and angled straps lying in said chamber connecting said wire terminals to said plug receiving terminals, a cover plate for said receptacle having a plug aperture and inwardly swinging doors normally closing the same, together with a cup shaped insulating lining for said receptacle perforated to permit the passage of said stud contacts therethrough and serving to insulate from entering members all conductors within the receptacle save said stud contacts, together with means carried by said receptacle for holding said lining in position.

5. In a device of the type described, a plug receptacle having a plug receiving chamber, upstanding stud contacts therein, wire terminals and exposed conductors connecting the latter to said stud terminals, a cover plate for said receptacle having a plug aperture and inwardly swinging doors normally closing the same, in combination with an insulating lining perforated to pass over said stud contacts and serving to insulate from the interior of the receptacle both the wire terminals and the conductors extending therefrom to the stud contacts, together with means carried by said receptacle for holding said lining in position substantially as described.

6. In a device of the character described, an attachment plug comprising a pair of juxtaposed insulating buttons of substantially coextensive area on their meeting faces, the button at the entering end of the plug being rectangular in cross section but having a rounded end to facilitate its entry into the receptacle, wire terminals confined within the upper button and plugging contacts elec-

trically connected therewith and confined within the lower button, the latter being apertured in alinement with said contacts to permit their engagement with coöperating contacts in a receptacle.

7. In a device of the character described, an attachment plug comprising a pair of juxtaposed insulating buttons of like peripheral outline at their meeting faces, wire terminals mounted on the meeting face of one of said buttons, each of said terminals comprising a base plate lying against the face of the button and adapted to receive a securing screw passing through the button, a binding screw terminal plate upstanding from said base at an angle to the face of the button to facilitate wiring, plugging contacts electrically connected to said wire terminal bases and arranged within the button, the meeting face of the coöperating button being recessed to form a chamber inclosing said binding screw terminal plates and apertured to afford a passage into the chamber for the leading-in wires.

8. In a device of the type described, an attachment plug having shouldered recesses in combination with spring-pressed cover plates adapted to swing inwardly on insertion of the plug and provided with means to engage said shouldered recesses on the latter, substantially as and for the purpose described.

9. In a device of the type described, an attachment plug having on the sides of its entering end shouldered recesses in combination with a face plate apertured to permit the insertion of the plug and provided with spring-pressed plates having ribs to coöperate with said shouldered recesses, substantially as and for the purpose described.

10. In a device of the character described, a pair of juxtaposed insulating buttons of like peripheral outline at their meeting faces, one of which is recessed on its meeting face to form an inclosed wire terminal chamber, the other button having on its juxtaposed face and upstanding at angle thereto a pair of wire terminals extending into said chamber, together with spring stud-receiving contacts mounted within said button and carried by their respective wire terminals, and means independent of said stud-receiving terminals for securing the wire terminals and contacts in position, said button being apertured at its entering end to afford independent insulated passages in which said plug contacts lie, substantially as described.

11. In a device of the character described, a pair of juxtaposed insulating buttons of like peripheral outline at their meeting faces, one of said buttons being recessed on its meeting face to form an inclosed wire terminal chamber, the other button having on its juxtaposed face and upstanding at an angle thereto a pair of wire terminals extending into said chamber, an insulating barrier separating said wire terminals, together with spring stud-receiving contacts mounted within said button and carried by their respective wire terminals, means independent of said contacts for securing the terminal plates to the button, said button being apertured at its entering end to afford independent insulated passages in which said plug contacts lie, substantially as described.

12. In a device of the character described, a plug receptacle having a plug-receiving chamber, a cover plate overlying the same and apertured to permit the insertion of an attachment plug, a pair of swinging doors hinged at opposite sides of the aperture and inwardly swinging on the insertion of the plug to expose substantially the entire interior of the receptacle, a pair of upstanding stud terminals in said chamber, a pair of angled conducting straps arranged within said chamber and extending from said stud terminals to opposite ends of the chamber, in combination with an insulating lining for said chamber, overlying said straps but perforated to permit the passage of said studs therethrough and thus serving to insulate from entering members all conductors within the receptacle save said stud contacts, substantially as described.

13. In a device of the character described, an attachment plug of generally rectangular shape in cross section, but arched at its entering end and horizontally divided to form a pair of insulating buttons of like peripheral outline at their meeting faces, one having on its meeting face and upstanding at an angle thereto binding screw terminals, plugging contacts electrically connected to said terminals and confined within the periphery of the button, the latter being apertured at its entering end in register with said plugging contacts, the other of said buttons being recessed on its meeting face to receive said binding screw terminals and having an entrance aperture for admitting wires to the terminal chamber.

14. In a device of the character described, an attachment plug comprising a pair of insulating buttons, one arched at the entering end of the plug and the other provided with a peripheral flange at the outer end of the plug, securing screws piercing said outer button, means on said screws for preventing the longitudinal escape thereof in either direction from said outer button, threaded sockets therefor mounted in the entering button, together with plugging contacts carried within said entering button, binding screw terminals mounted on the meeting face of said entering button and electrically connected to said plugging contacts, the outer button having its meeting face recessed

to accommodate said wire terminals and having an entrance aperture for the leading-in wires, substantially as described.

15. An attachment plug comprising a pair of insulating buttons, threaded sockets carried by one button, headed screw bolts piercing the other button and engaging said threaded sockets to unite the buttons in the assembled plug, each of said bolts having a reduced area projecting beyond the button face opposite that engaged by the screw head, and split washers fitted on said reduced areas to prevent the accidental escape of said screws when the buttons are separated, plug jacks and wire terminals carried by the plug, said wire terminals being accessible for wiring only when the buttons are separated, substantially as described.

16. An attachment plug comprising a pair of insulating buttons, threaded sockets carried by one button, headed screw bolts piercing and carried by the other button and engaging said threaded sockets to unite the buttons in the assembled plug, bosses on said button through which said screw bolts pass, said bosses being pierced by said screws, and wells in the meeting face of the other button to receive said bosses whereby the buttons are accurately positioned with relation to each other and the alinement of the screws with the threaded sockets assured, together with plug jacks and wire terminals carried by the plug, said wire terminals being accessible for wiring only when the buttons are separated.

17. In an attachment plug receptacle, a cup-shaped insulating body, wire terminal plates on the walls thereof, conductors leading down the inner face of the walls and across the bottom of the receptacle chamber, contact studs projecting upward from the bottom of the receptacle chamber and connected to said conductors, together with an insulating cup-shaped lining fitting within said receptacle chamber and protecting the conductors and wire terminals from contact with the jacks of an entering plug.

18. In an attachment plug receptacle, a cup-shaped insulating body having upstanding contacts mounted on the bottom of the receptacle, conductors within the receptacle chamber leading to said contacts, a cup-shaped insulating lining within the receptacle covering said conductors but through which said contacts pass, together with screws passing through the base of the receptacle and holding said lining in position within the latter.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

GILBERT W. GOODRIDGE.

Witnesses:
GEO. B. THOMAS,
H. M. WICHERT.