H. R. SARGENT.

PLUG RECEPTACLE AND PLUG THEREFOR.

APPLICATION FILED FEB. 2, 1914.

1,111,406. Patented Sept. 22, 1914.

Fig. 1.

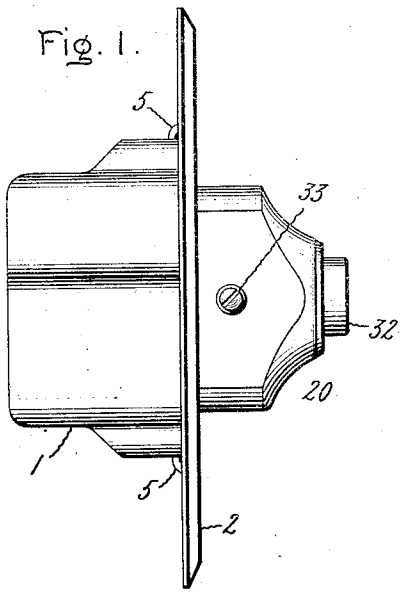


Fig. 3

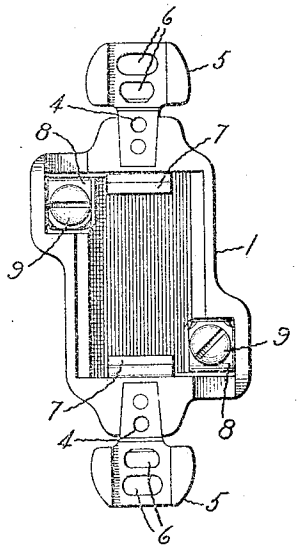


Fig. 6.

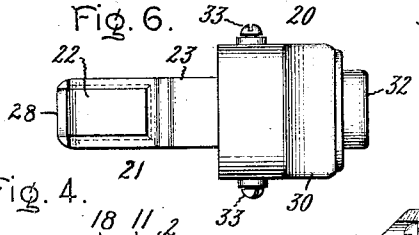


Fig. 2.

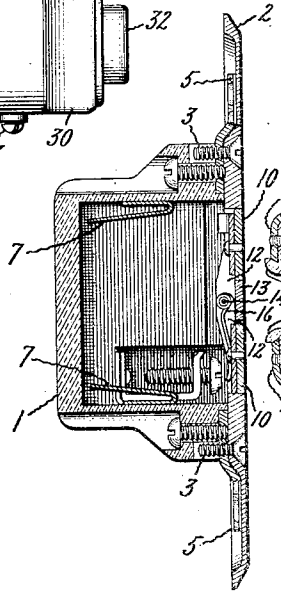


Fig. 4.

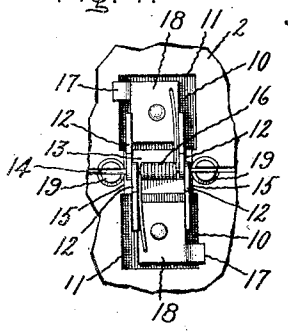
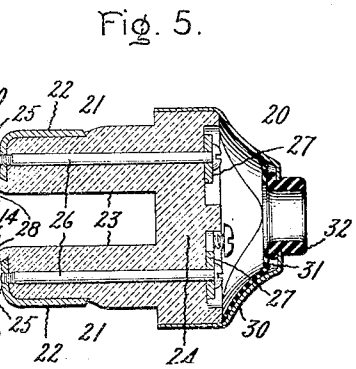


Fig. 5.



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UNITED STATES PATENT OFFICE.

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PLUG-RECEPTACLE AND PLUG THEREFOR.

1,111,406. Specification of Letters Patent. Patented Sept. 22, 1914.

Application filed February 2, 1914. Serial No. 815,919.

To all whom it may concern:

Be it known that I, HOWARD R. SARGENT, a citizen of the United States, residing at Schenectady, in the county of Schenectady, State of New York, have invented certain new and useful Improvements in Plug-Receptacles and Plugs Therefor, of which the following is a specification.

My invention relates to plug receptacles and plugs for making connections to electric circuits, and especially to receptacles suitable for installation in walls, floors, and other situations where temporary electrical connections are from time to time desired. It is my aim that everything necessary to the making of the connection shall be effected by merely inserting the plug device in the receptacle, and that when the plug is withdrawn the interior of the receptacle and the electrical contact means therein shall be protected by automatic closure of the plug opening or openings, so that the receptacle will be at once thoroughly safe and in the highest degree convenient and sightly.

An important advantage of my invention is that it can easily be applied to various commercial types of receptacles that do not possess these features, and that in the case of such receptacles already installed and in use this can be done as easily as in the case of receptacles not installed, without removal of the receptacle proper from its setting, disturbance of its electrical parts or connections, or disfigurement of its surroundings. Other advantages obtainable in connection with the invention include simplicity, ruggedness, and durability of construction; ease and cheapness of manufacture; facility of installation; freedom from derangement; and good appearance under all conditions of use.

In accordance with my invention, I provide the receptacle with a front or face plate apertured for the insertion of the plug device, and I also provide closure means or doors for said front that automatically tend to close and remain closed but open inward to admit the plug device when the same is pressed against them, securing or mounting the doors so that they approach one another as they open, as by pivoting them at their adjacent sides. Application of the invention to receptacles of previous commercial types is facilitated by securing the doors to the front of the receptacle, and this is also advantageous as tending to insure that they shall close properly and not get out of adjustment. As for the plug device, I provide it with plug members separated so that they may pass at either side of the opening doors, which thus lie between them when the plug is in place in the receptacle. These plug members comprise contact means for engagement with the contact means of the receptacle and insulating means for preventing short-circuit during or after insertion of the plug device.

I have herein illustrated and described a receptacle having an easily removable front or face plate provided with two separate openings for the plug members and with doors pivoted at adjacent sides behind the portion thereof between said openings, and I have shown a plug device whose plug members proper comprise plug parts of insulating material and contacts secured at the remote sides of such parts. While, however, my invention extends to these and other specific features and details and combinations and arrangements of parts embodied in these particular structures,—which are the best for the purposes of the invention at present known to me,—yet the invention is not confined thereto, but can be otherwise carried out and applied.

In the accompanying drawing, Figure 1 1 is a side view of a receptacle constructed in accordance with my invention with a plug device in place in it. Fig. 2 is a similar sectional view of the receptacle. Fig. 3 is a plan or interior view of the receptacle with its front removed. Fig. 4 is a fragmentary rear view of a portion of the front of the receptacle. Fig. 5 is a sectional side view of the plug device in position for insertion in the receptacle of Fig. 2. Fig. 6 is a view of the plug device at an angle of ninety degrees from its position as shown in Fig. 5.

Referring first to Figs. 1, 2, and 3, it will be seen that the receptacle structure shown comprises an oblong box-like body or receptacle proper 1 of porcelain, bisque, or other insulating material and a metal front or cover plate 2. The front 2 is secured to the body 1 by means of screws 3 that engage in holes 4 in brackets or feet 5 attached to

said body and provided with other holes 6 for the screws that will ordinarily be used to secure the receptacle in place. The contacts 7 of the receptacle are arranged in the body 1 at opposite ends thereof, and they are carried by terminal pieces 8 secured in lateral recesses at diagonally opposite corners of the body and provided with screws 9 for the attachment of current supply conductors. The contacts 7 are preferably made resilient so as to hold the plug device firmly in place and make good electrical connection with its contacts,—since resilient contacts on the plug device would be continually liable to accidental distortion or breakage. As shown, each of the contacts 7 consists of an originally L shaped piece of cold rolled sheet copper or other suitable material with the bottom portion of the L secured to the terminal so as to extend part way across the end wall of the body 1 and the other portion bent over so as to extend at a slight angle with the end wall almost to the bottom wall.

Referring now to Figs. 2 and 4, it will be seen that the doors 10 for the rectangular plug openings 11 in the front plate 2 are proportioned and arranged to fit said openings closely (though not tightly) with their front surfaces flush with the surface of said front 2, so that when closed they will be as inconspicuous and as nearly invisible as possible. These doors 10 have at their adjacent sides or edges pivot-receiving means in the form of lugs 12 that extend behind the "bridge" portion 13 of the front plate between the openings 11, and a common pivot 14 extends along the middle of the bridge 13 through the lugs 12 of both doors. The doors 10 and the bridge 13 for most of its length are of equal thickness and thinner than the front plate 2 as a whole, and the lugs 12 are arranged to lie against one another and between the shoulders 15 at the ends of the thin part of the bridge 13 so that the doors will swing without lateral play. The tendency of the doors 10 to close and remain closed is due to a helical spring 16 coiled around the pivot 14 between adjacent lugs 12 with its ends against the doors, this spring being under such tension that it continually urges the doors apart and outward into closed position with ample though yielding force. The doors 10 are prevented from opening outward under the action of the spring 16 by engagement of their adjacent edges with the corresponding edges of the bridge 13, by engagement of the lugs 12 with the rear surface of said bridge, and by means of stop lugs 17 near the free edges of the doors that engage the rear surface of the front plate 2. As shown, the lugs 12 and 17 of each door 10 are bent up from a metal piece 18 riveted to the back of the door, and the ends of the pivot 14 are clamped in slots in rearwardly extending studs 19 secured in the plate 2 about flush with the shoulders 15.

Coming, now, to the plug device 20 shown in Figs. 1, 5 and 6, it will be seen that each of its plug members 21 comprises a contact 22 for engagement with one of the receptacle contacts 7 and insulating means between the two contacts 22. The insulating means shown consist of approximately rectangular plug parts 23 of molded insulating compound or other suitable material united by an integral body piece 24, and the contacts 22 consist of metal strips a little narrower than the plug parts 23 secured at the remote sides of the latter by any suitable means, these strips being bent so that portions 25 of them extend around on the ends of the parts 23. As shown, the contact strips 22 have beveled edges that are slightly embedded in the material of the plug parts 23 when the latter are molded, and they are also held in place by bolt-like members 26 forming part of the electrical connections to them. These members 26 extend through terminals 27 seated in depressions at the outer side of the body 24 and through holes molded in said parts 23 and are threaded into the end portions 25 of said contacts 22. At their inner adjacent edges 28 the plug parts 23 project beyond the end portions 25 of the contacts 22 so as to engage the doors 10 as the plug device 20 is inserted in the receptacle and withdrawn, and they are slightly rounded at all their edges to facilitate their movement in contact with the various parts of the receptacle. A metal cap or cover 30 having a lining 31 of fiber or other insulating material and an insulating nipple or bushing 32 for the passage of the current conductors is secured over the body piece 24 by screws 33 that enter recesses (not shown) in the sides of said body.

When the plug device 20 is inserted in the receptacle the doors 10 approach one another and recede from the receptacle contacts 7, being finally accommodated between the plug members 21 where they are invisible and rather tend to reinforce the contacts 7 in holding the plug device firmly but yieldingly in place than to force said device out of the receptacle. With the various parts arranged and proportioned as shown, it will be found impossible to insert the plug device 20 in such a way as to cause a short circuit through contact of the strips 22 with any of the other metal parts after they engage either or both of the receptacle contacts 7.

By proper location of the holes for the screws 3 or the like and proper arrangement and proportioning of the doors 10, a cover plate 2 such as I have illustrated and described can be designed for almost any of the old styles of receptacles now in use, and a

plug device 20 suitable for any such re-equipped receptacle can be designed with very little more trouble.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. The combination of a plug device having suitably separated plug members proper comprising electrical contact means, a plug receptacle having therein electrical contact means for engagement with the contact means of said plug device and also having a front apertured for the insertion of the plug device, and automatically closing doors for said front which open inward to admit said plug members so mounted as to approach one another in opening and lie between the plug members when open.

2. The combination with a plug receptacle having electrical contacts therein and a front apertured for the insertion of a plug device between said receptacle contacts, of automatically closing doors for said front which open inward to admit the plug members proper of said plug device, said doors being pivoted at their adjacent sides so as to approach one another and recede from the receptacle contacts as they open.

3. A front for a plug receptacle apertured for the insertion of a plug device and having automatically closing doors which open inward to admit the plug members proper of said device, said doors being so mounted and secured on said front as to approach one another in opening and to lie between the plug members when open.

4. A front for a plug receptacle apertured for the insertion of a plug device and having automatically closing doors which open inward to admit the plug members proper of said device, said doors being pivoted at their adjacent sides and thus approaching one another as they open.

5. A front for a plug receptacle apertured for the insertion of a plug device and having automatically closing inwardly opening doors for the admission of the plug members proper of said device, said doors being pivoted at their adjacent sides on a common pivot.

6. The combination with a front for a plug receptacle apertured for the insertion of a plug device, of two doors for the admission of the plug members proper of said device having pivot-receiving means at their adjacent sides and also having means for preventing them from opening outward, a common pivot extending through the pivot-receiving means of both doors and secured to said front, and a spring coiled around said pivot with its ends against said doors whereby they are yieldingly urged outward into closed position.

7. A front for a plug receptacle having openings for the insertion of the plug members proper of a plug device and also having automatically closing inwardly opening doors for said openings pivoted at their adjacent sides behind the portion of the front between said openings.

8. A plug device for making connection with electrical contacts in a receptacle comprising separate plug parts of insulating material and a body uniting them, contacts for engagement with the receptacle contacts exposed on the remote sides and the ends of said plug parts, and members forming part of the electrical connections to said plug contacts extending through said plug parts to the other side of said body and serving to secure the plug contacts in place.

In witness whereof, I have hereunto set my hand this 31st day of January 1914.

HOWARD R. SARGENT.

Witnesses:

BENJAMIN B. HULL,

HELEN ORFORD.