

H. G. OSBORNE & E. RICHTER.
PLUG BOX FOR ELECTRIC CIRCUITS.

APPLICATION FILED MAY 23, 1904.

2 SHEETS—SHEET 1.

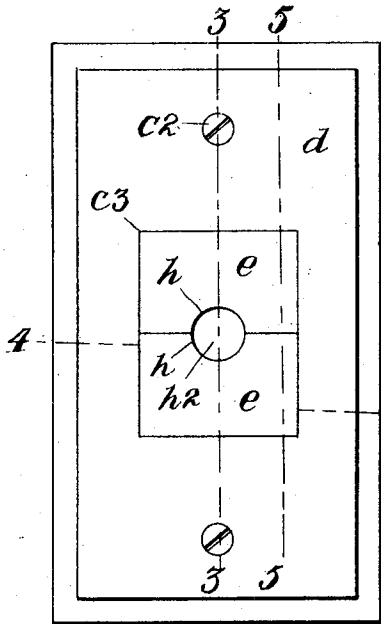


Fig. 1

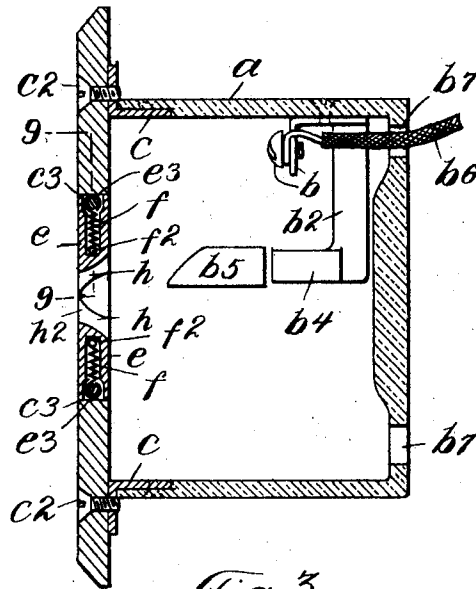


Fig. 3.

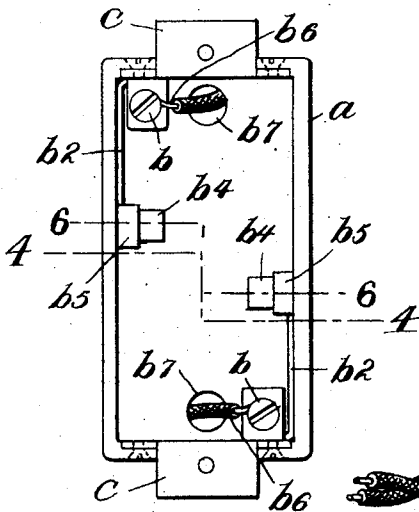


Fig. 2.

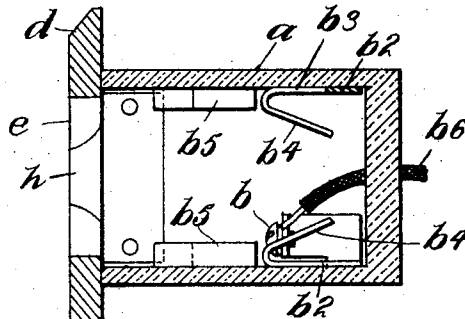


Fig. 4.

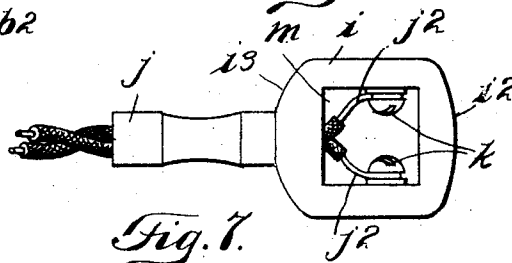


Fig. 7.

WITNESSES

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No. 797,215.

PATENTED AUG. 15, 1905.

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2 SHEETS—SHEET 2.

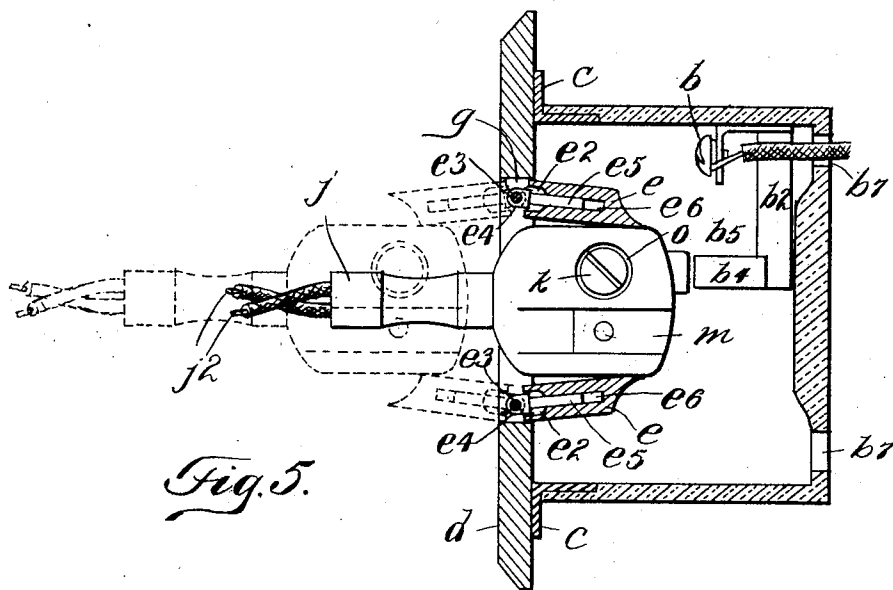


Fig. 5.

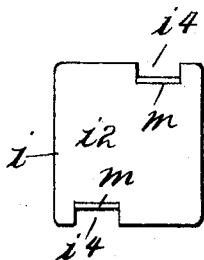


Fig. 8.

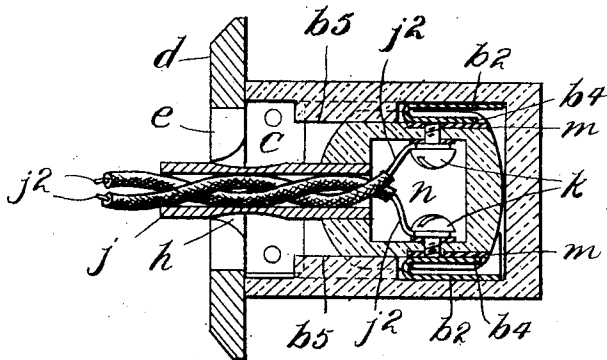


Fig. 6.

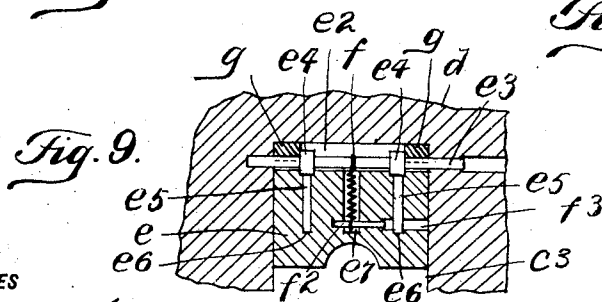


Fig. 9.

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UNITED STATES PATENT OFFICE.

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PLUG-BOX FOR ELECTRIC CIRCUITS.

No. 797,215.

Specification of Letters Patent.

Patented Aug. 15, 1905.

Application filed May 23, 1904. Serial No. 209,220.

To all whom it may concern:

Be it known that we, HENRY G. OSBORNE and EDWARD RICHTER, citizens of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Plug-Boxes for Electric Circuits, of which the following is a specification, such as will enable those skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in plug-boxes for electric circuits; and the object thereof is to provide an improved device of this class which is simple in construction and operation and which is provided with spring-doors which swing both inwardly and outwardly, the said doors swinging inwardly when the plug is inserted and being automatically closed after the plug is inserted and being also so formed that they swing outwardly in the operation of pulling out the plug, a further object being to provide a plug-box for electric circuits and a plug for operation in connection therewith, both of which possess novel features of construction, as hereinafter described and claimed.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which the separate parts of our improvement are designated by suitable reference characters in each of the views, and in which—

Figure 1 is a face view of our improved plug-box; Fig. 2, a similar view showing the face-plate removed; Fig. 3, a section on the line 3 3 of Fig. 1; Fig. 4, a section on the line 4 4 of Fig. 1 and on the line 4 4 of Fig. 2; Fig. 5, a section on the line 5 5 of Fig. 1; Fig. 6, a section on the line 6 6 of Fig. 2; Fig. 7, a side view of the plug which we employ; Fig. 8, an inner end view thereof, and Fig. 9 a section on the line 9 9 of Fig. 3.

In the practice of our invention we provide a plug-box *a*, which in the construction shown is oblong and rectangular in form, and this box is composed of porcelain, hard rubber, or any other suitable non-conducting material. Within the box *a* are two binding-posts or similar devices *b*, which consist of bracket-plates secured to the opposite ends of said box, and each is provided with an arm *b*¹, flush with and adjacent to the adjacent side portions of said box, and each of these arms *b*¹ is provided with an upright member *b*², having an inwardly and downwardly directed spring contact device *b*⁴. Each side of the box *a* is

also provided with a vertically-arranged bearing member *b*⁵, and these bearing members are placed directly over the spring contact devices *b*⁴ and serve as guides for the plug when it is inserted into the box, as hereinafter described, and the circuit-wires *b*⁶ are passed through the back or inner wall of the box, as shown at *b*⁷, and connected with the posts *b* in the usual manner. Secured to the front end portions of the box *a* are bracket-plates *c*, and the face-plate *d* of said box is secured to these bracket-plates by screws *c*². The face-plate *d* is provided with a rectangular central opening *c*³, and hinged to the opposite sides of said opening are doors *e*. The doors *e* are hinged in the following manner: Each of said doors is provided with a groove *e*², and the face-plate *d* is provided with a pin *e*³, which is passed thereto or therethrough transversely thereof, and this pin passes through the groove *e*² in the corresponding door. Mounted on the pin *e*³ of each of the doors are two collars *e*⁴, each of which is provided with a pin *e*⁵, free to slide in a corresponding recess *e*⁶ in the door. The recesses *e*⁶ and pins *e*⁵ range at right angles to the pin *e*³ of each door, and each door is also provided centrally with a recess *e*⁷, midway between the recesses *e*⁶ and parallel therewith, and secured to the pin *e*³, centrally thereof, is a spiral spring *f*, which is located in the recess *e*⁷ and the inner end of which is secured, as shown at *f*², to a pin which is driven inwardly from one side of the door through a recess *f*³, formed therein, and at the opposite sides of the opening *c*³ and back of the pin *e*³ of each door are blocks or bearings *g*, the front and top and bottom of which are segmental in form, and the top and bottom edges of the adjacent part of the door press on these bearings as the door swings inwardly and outwardly, as is clearly shown in Fig. 5. Each of the doors *e* is provided centrally of its free edge with a segmental recess *h*, and these recesses *h* form a central circular opening *h*² when the door is closed.

We also provide a contact-plug *i*, which is of the form shown in Figs. 5, 6, 7, and 8 and which is adapted to be inserted through the opening *c*³ into the box *a*. The inner end of the plug *i* is segmental in form, as shown at *i*², and the outer end thereof is similarly formed, as shown at *i*³, and said plug is provided centrally of its outer end with a sleeve or tube *j*, which forms a handle therefor and which is secured therein, and electric wires or conductors *j*² are passed through the sleeve

or tube j and connected with binding-posts k within said plug and at the opposite sides thereof. The binding-posts k consist of screws which pass outwardly through the opposite sides of the plug i , and said opposite sides of said plug are provided on the outer sides thereof with grooves i^4 , and secured therein are contact devices m , consisting of metal plates which are held in place by the screws or posts k , and in the operation of inserting the plug i into the box a the bearing members b^5 on the inner opposite sides of the box a pass through the grooves i^4 in the plug i , and the contact devices b^4 thereof come in contact with and bear on the plates or contact devices m , and the circuit is completed through the wires j^2 .

In inserting the plug i into the box a all that is necessary is to take hold of the handle which is formed by the sleeve or tube j and force said plug backwardly into the said box. In this operation the inner end of the plug strikes the doors e and forces said doors inwardly, as shown in Fig. 5, and when the plug has been fully inserted, as shown in Fig. 6, the doors e swing outwardly into the closed position, as shown in Figs. 1, 3, 4, and 6, and when the plug is pulled outwardly this operation is reversed, the doors e swing outwardly, as shown in dotted lines in Fig. 5, and when the plug has been fully withdrawn the doors e swing backwardly into the closed position. It will therefore be seen that the operation of the doors e is automatic and said doors e are free to swing in both directions, or inwardly and outwardly, and are normally held in the closed position by the springs f , and the operation of these springs, which are always under tension, permits of the operation of the doors e , as herein described.

It will be observed that the box a is closed when the plug i is therein and is also closed when said plug is not therein, and this result is automatically accomplished by the doors e , and when said plug is fully within the box the handle formed by the sleeve or tube j always projects through the circular opening h^2 between the doors e , so that it may be easily grasped in order to withdraw the plug, and when said plug is in use it is entirely concealed.

The adjacent faces of the doors e are concave in cross-section, so as to facilitate the operation thereof and prevent the same from binding when the doors are operated by the insertion and withdrawal of the plug. It will be observed that the contact-plates m in the opposite sides of the plug i are not in the same transverse line and the plug i is provided with a large central transverse opening n and in the opposite sides thereof are formed circular openings o , through which the screws or posts k are passed, and a screw-driver may be inserted through these openings in the operation of securing said posts or screws in position and connecting the wires j^2 therewith.

By making or hinging the door of our improved plug in the manner described we provide means, as hereinbefore stated, whereby the doors are moved in both directions by the mere act of inserting and withdrawing the plug, and this facilitates this operation and renders the same less difficult and also saves time, and this feature is of great importance when plug-boxes of this kind are used in conjunction with portable electric-heating devices, as it fulfils the requirements of the fire-underwriters, which are for separable connections which will open the circuit when an undue strain is placed on conductors. It will also be apparent that the plug i need not be made exactly as hereinbefore described, as the posts or screws k may be arranged differently or may be passed inwardly from the outer sides of said plug, all that is necessary in this connection being that the set-screws or posts serve for the purpose herein specified—namely, as connections for the wires j^2 and for the purpose of completing the circuit or circuits through the contact-pieces m —and said screws or posts need not necessarily be placed in separate transverse lines passing through the plug, and, if desired, the contact-pieces m may be omitted, and the outer ends of the binding screws or posts will serve as contact-pieces.

The doors e herein shown and described are not limited in the use thereof in connection with plug-boxes for electric circuits, as it is evident that swinging doors of this class provided with the hinges herein shown and described may be employed in other relations or wherever doors are required to swing in opposite directions, all that is necessary being to provide a suitable frame in which said doors are hinged, and the said hinges, or doors hinged in this manner, are made the subject of a separate application for Letters Patent of the United States.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A plug-box for electric circuits, the face-plate of which is provided with a central opening, and double-acting spring-operated doors hinged at the opposite sides of said opening so as to swing both inwardly and outwardly, said doors being provided in their free edges with recesses which form a central opening when the doors are closed.

2. A plug-box for electric circuits, the face-plate of which is provided with a central opening, and double-acting spring-operated doors hinged at the opposite sides of said opening so as to swing both inwardly and outwardly, said doors being provided in their free edges with recesses which form a central opening when the doors are closed, and said doors being normally held in the closed position.

3. A plug-box for electric circuits, said plug-box being provided with a face-plate having

a central opening, double-acting doors hinged at the opposite sides of said opening, and springs connected with the hinges of said doors so as to hold them normally closed, said doors being provided in their free edges with recesses which form a central opening when the doors are closed.

4. A plug-box for electric circuits, said plug-box being provided with a face-plate having a central opening, double-acting doors hinged at the opposite sides of said opening, and springs connected with the hinges of said doors so as to hold them normally closed, said doors being provided in their free edges with recesses which form a central opening when the doors are closed, and said doors being normally held in the closed position.

5. A plug-box for electric circuits, said box being provided with a face-plate having a central opening, double-acting doors hinged at the opposite sides of said opening so as to swing both inwardly and outwardly, springs connected with the hinges of said doors and operating to hold said doors normally in the closed position, said doors being also provided in their free edges with recesses which form a central opening when the doors are closed, and a contact-plug provided with a handle through which wires are passed, and the insertion of which into the box forces said doors inwardly and allows them to swing outwardly into the closed position, and the withdrawal of which forces said doors outwardly and allows them to swing into the closed position.

6. A plug-box for electric circuits, said box being provided with a face-plate having a central opening, double-acting doors hinged at the opposite sides of said opening so as to swing both inwardly and outwardly, springs connected with the hinges of said doors and normally holding said doors in a closed position, said doors being also provided at their free edges with recesses forming a central opening when the doors are closed, and a contact-plug provided with a tubular handle and through which circuit-wires are passed into said plug, said box being also provided at the opposite sides thereof with contact devices and circuit-wires connected therewith.

7. A plug-box for electric circuits, said box being provided with a face-plate having a central opening, and double-acting doors hinged at the opposite sides of said opening so as to swing both inwardly and outwardly, the hinges of said doors being provided with springs which normally hold the doors in the closed position.

8. A plug-box for electric circuits, said box being provided with a face-plate having a central opening, double-acting doors mounted at the opposite sides of said opening and movable both inwardly and outwardly, substantially as shown and described.

9. A plug-box for electric circuits, said box being provided with a face-plate having a cen-

tral opening, double-acting doors mounted at the opposite sides of said opening and movable both inwardly and outwardly, and means for holding said doors normally in the closed position, substantially as shown and described.

10. A plug-box for electric circuits, said box being provided with a face-plate having a central opening, double-acting doors mounted at the opposite sides of said opening and movable both inwardly and outwardly, and means for holding said doors normally in the closed position, said doors being provided in their adjacent edges with recesses which form a central opening when the doors are closed.

11. A plug-box for electric circuits, said box being provided with a face-plate having a central opening, and oppositely-arranged doors adapted to close said opening, said doors being normally held in a closed position, and a circuit-closing plug the insertion of which will open said doors and allow them to close, and the withdrawal of which will also open said doors and allow them to close, substantially as shown and described.

12. A plug-box for electric circuits, said box being provided with a face-plate having a central opening, doors mounted at the opposite sides of said opening and normally held in a closed position, and a circuit-closing plug the insertion of which opens said doors and allows them to close thereover, and the withdrawal of which opens said doors and allows them to close thereafter.

13. A plug-box for electric circuits having spring contact devices at its opposite sides, and a contact-plug insertible into said box and provided with contact devices on its opposite sides, said contact-plug being also provided with a large transverse opening and at one end thereof with a tubular handle through which circuit-wires are passed, and devices within said plug at the opposite sides of the transverse opening for connecting said circuit-wires with the contact devices on the opposite sides of said plug, said plug being also provided in its opposite sides and at right angles to the transverse opening therein with side openings communicating with said transverse opening.

14. A contact-plug for use in connection with plug-boxes for electric circuits, said plug having a large transverse opening therein and provided at one end with an opening communicating with the large transverse opening, said plug being also provided in the sides thereof and at right angles to the large transverse opening with other openings which communicate with the transverse opening, and said plug being also provided in said transverse opening with binding screws or posts which are connected with the opposite sides thereof, substantially as shown and described.

15. A plug-box for electric circuits, said box being provided with a face-plate having

a central opening, doors hinged at the opposite sides of said opening so as to swing both inwardly and outwardly, springs connected with the hinges of said doors for holding them normally closed, and a circuit-closing plug the opposite ends of which are rounded to facilitate its insertion into and withdrawal from said box.

16. A plug-box for electric circuits having spring contact devices at its opposite sides which are located in different transverse lines, and a contact-plug adapted to be inserted into said box and provided with a large transverse opening, said contact-plug being provided at its opposite sides with contact devices which are in different transverse lines and also with openings in the opposite sides thereof through which binding posts or screws may be passed.

17. A contact-plug for use in connection with plug-boxes for electric circuits, said plug having a large transverse opening therein, contact-plates secured to the outer opposite sides of said plug, and binding posts or screws secured to the inner sides of said plug opposite said contact-plates and at the opposite sides of the transverse opening, said plug being also provided in its opposite sides with openings through which said posts or screws are passed.

18. A contact-plug for use in connection with plug-boxes for electric circuits, said plug having a large transverse opening therein, contact-plates secured to the outer opposite sides of said plug, and binding posts or screws secured to the inner sides of said plug opposite said contact-plates and at the opposite sides of the transverse opening, said plug being also provided in its opposite sides with openings through which said posts or screws are passed, and at one end thereof with a tubular handle through which circuit-wires are passed.

19. A contact-plug for use in connection with plug-boxes for electric circuits, said plug being provided with a large transverse opening, contact-plates secured to the opposite sides of said plug, binding posts or screws passed through said sides of said plug and the heads of which are within the transverse opening, said binding posts or screws serving to secure said contact-plates in position, said plug being also provided at one end with an opening through which circuit-wires are passed.

20. A contact-plug for use in connection with plug-boxes for electric circuits, said plug being provided with a large transverse opening, contact-plates secured to the opposite sides of said plug, binding posts or screws passed through said sides of said plug and the heads of which are within the transverse opening,

said binding posts or screws serving to secure said contact-plates in position, said plug being also provided at one end with an opening through which circuit-wires are passed and in the opposite sides thereof with openings through which the binding posts or screws are passed.

21. A plug-box of the class described, said box being provided in its opposite sides with contact devices and with guides in line therewith, and a contact-plug provided on its opposite sides with grooves adapted to receive said guides and in which are secured contact devices.

22. A plug-box for electric circuits, said box being provided with a face-plate having a central opening and oppositely-arranged doors adapted to close said opening, said doors being tensionally held in a closed position, and said doors being also adapted to be swung inwardly by the insertion of the plug and to be swung outwardly by the withdrawal of the plug, substantially as shown and described.

23. A plug-box for electric circuits, said box being provided with a face-plate having a central opening, doors mounted at the opposite sides of said opening and normally and tensionally held in a closed position, said doors being swung inwardly and allowed to swing outwardly by the insertion of the plug and being swung outwardly and allowed to swing inwardly by the withdrawal of the plug, substantially as shown and described.

24. A contact-plug for the plug-box of an electric circuit, said box being provided with spring contact devices at its opposite sides, and said plug being adapted to be inserted into said box, said plug being also provided at its opposite sides with contact devices to engage the contact devices at the opposite sides of the box, and said plug being also provided at one end thereof with a tubular handle through which are passed circuit-wires, and devices in the transverse opening therein for connecting said circuit-wires with the contact devices at the opposite sides of the box, said plug being also provided in its opposite sides and at right angles to the transverse openings therein with side openings which communicate with said transverse opening, substantially as shown and described.

In testimony that we claim the foregoing as our invention we have signed our names, in presence of the subscribing witnesses, this 17th day of May, 1904.

HENRY G. OSBORNE.
EDWARD RICHTER.

Witnesses:

F. A. STEWART,
C. J. KLEIN.