

No. 616,148.

Patented Dec. 20, 1898.

C. E. SCRIBNER.  
MAGNETIC SWITCH.

(Application filed Apr. 23, 1897.)

(No Model.)

Fig. 1

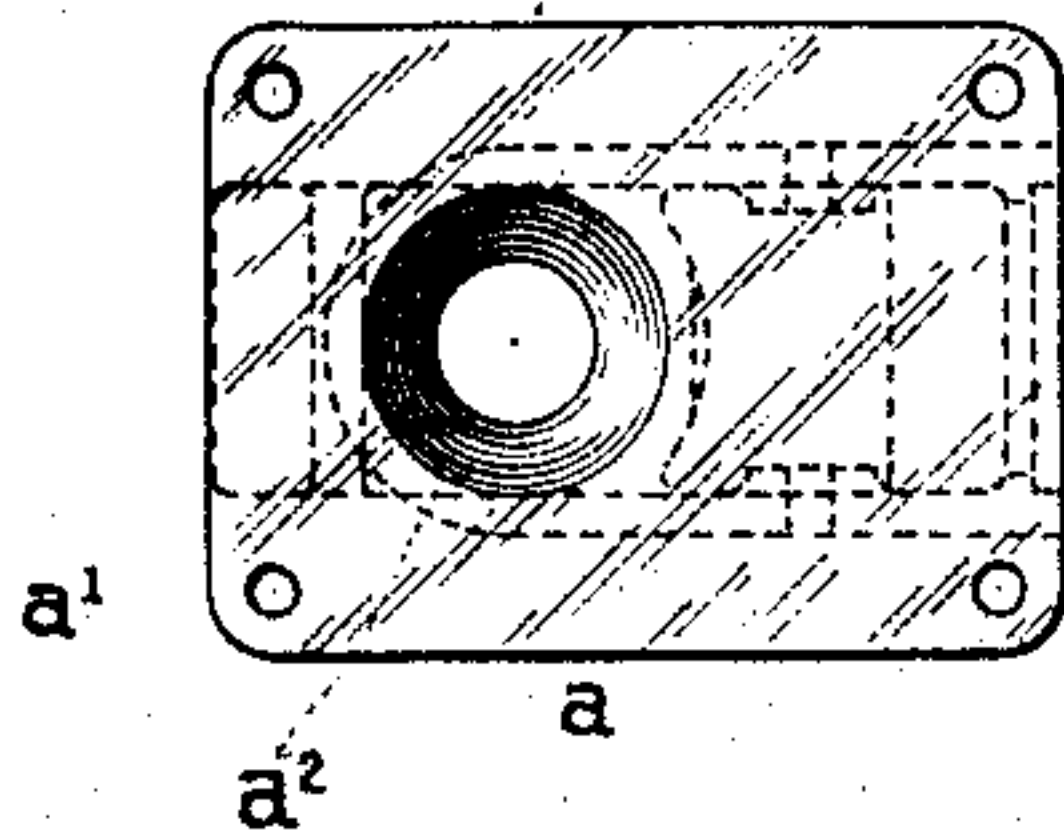


Fig. 3

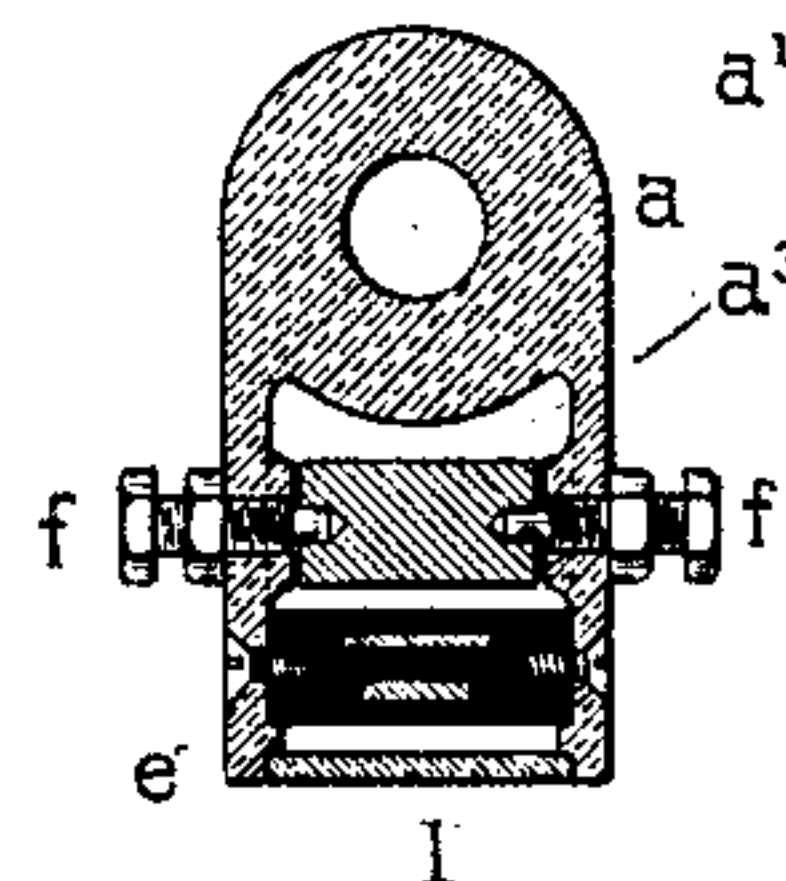


Fig. 2

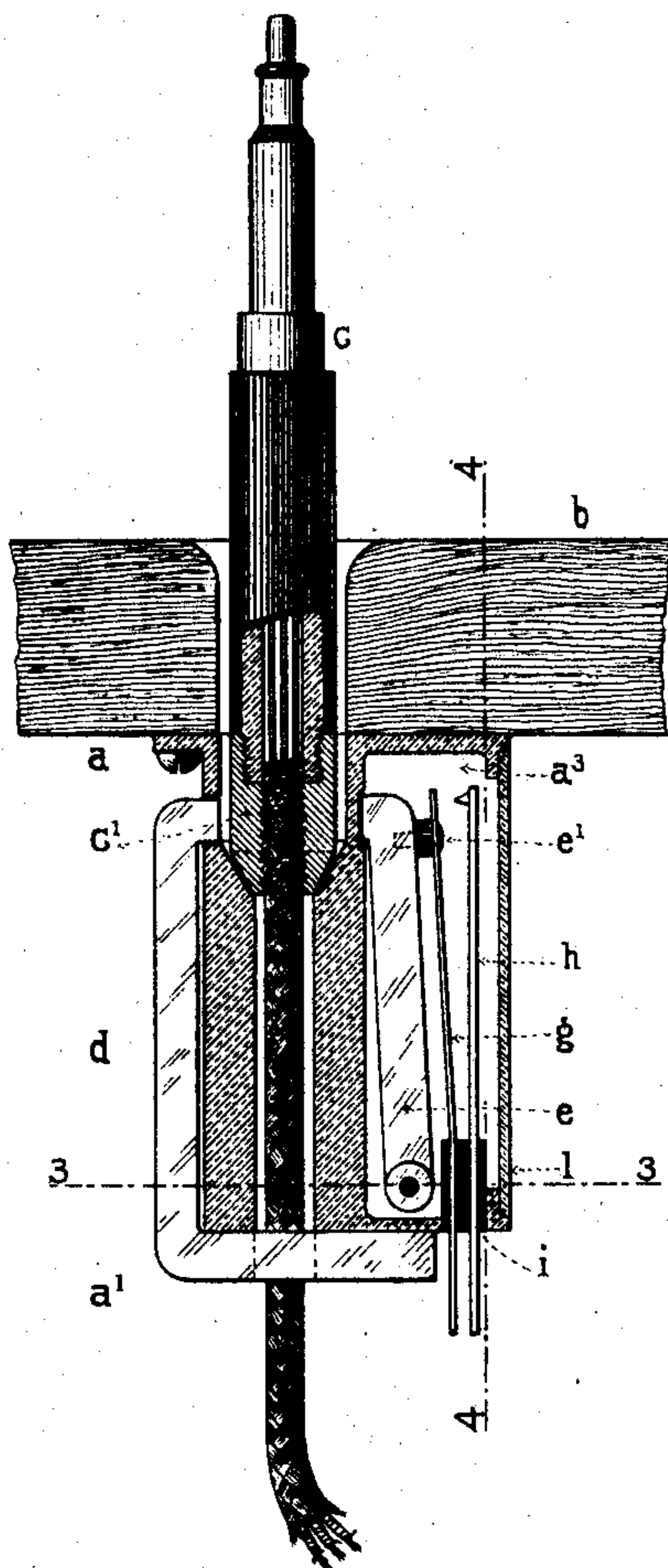
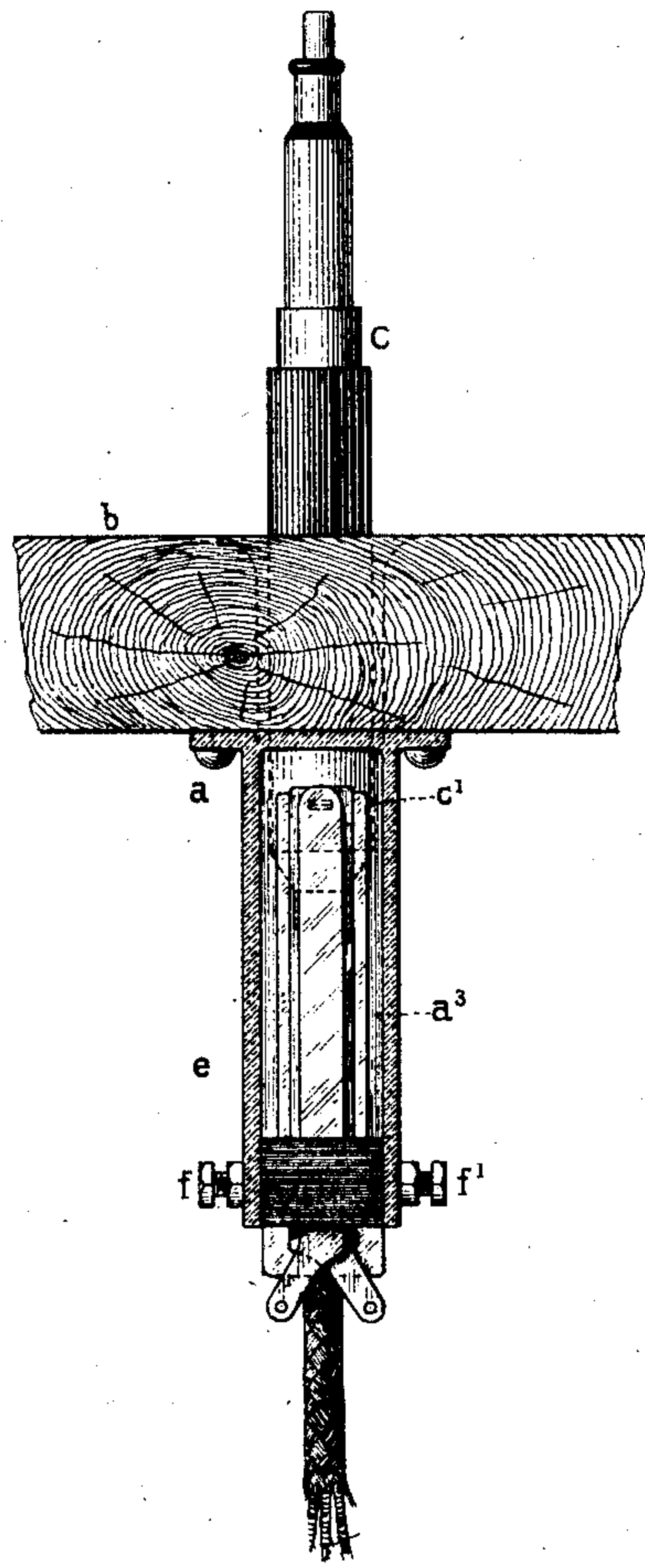


Fig. 4



Witnesses:

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by *Barton Brown* his Att<sup>y</sup>



# UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN  
ELECTRIC COMPANY, OF SAME PLACE.

## MAGNETIC SWITCH.

SPECIFICATION forming part of Letters Patent No. 616,148, dated December 20, 1898.

Application filed April 23, 1897. Serial No. 633,446. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Magnetic Switches, (Case No. 443,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention is a plug-seat switch for use in telephone-switchboards. Its object is to provide an appliance in which the presence of the plug in or adjacent to its socket shall determine the application to the switch-contacts controlled by the plug of a force much greater than the weight of the plug and its attachments. To this end I employ an armature or body of magnetic material controlling switch-contacts and a magnet adapted to attract and move the armature, the application of the magnetic force to the armature being determined by the presence of the plug in its resting-socket.

A feature of the invention consists in a new magneto-mechanical device, which I make use of as affording a peculiarly efficient form for the plug-seat switch. This comprises a permanent magnet, a movable armature therefor, and a removable section of magnetic material normally forming part of the magnetic circuit of the magnet. The permanent magnet, the armature, and the switch-contacts controlled by the armature may be located in suitable fixed positions in the switchboard. The removable section of magnetic material may be a block or ring of iron associated with or forming part of the connecting-plug and adapted to be brought into position to fill a space between the magnet and armature to increase the attraction of the former upon the latter when the plug is in its socket.

The use of the permanent magnet and the above-described means for employing its attraction upon the armature to move switch-contacts permits the application to the switch-contacts of a force much greater than the weight of the plug and its attachments through the agency of the plug. It also per-

mits the inclosure of the switch-contacts and the moving parts in a sealed case, wherein they may be protected from dust and corrosion.

The invention is shown in the attached drawings.

In the drawings, Figure 1 represents a plan of the plug-seat switch and plug. Fig. 2 is a vertical central sectional view of the plug-seat switch. Fig. 3 represents a transverse section taken on line 3 3 of Fig. 2. Fig. 4 is a front elevation of the appliance, the case inclosing the moving parts being shown in vertical section on line 4 4 of Fig. 2.

The plug-seat switch comprises a suitable base or frame *a*, adapted for attachment to the under side of the plug-shelf *b*, usual in telephone-switchboards. In this frame is formed a vertical tubular perforation *a'*, which opens into a socket or seat *a<sup>2</sup>* for the plug at its upper extremity. The plug *c* is designed to rest in this socket, projecting through the plug-shelf *b* and being accessible from the upper surface thereof, the flexible conductor attached to the plug being passed through the opening *a'*. This frame carries a permanent magnet *d*, one of whose extremities projects into or near the socket *a<sup>2</sup>* and whose other extremity is brought into juxtaposition to a movable armature *e*, whose upper extremity lies near socket *a<sup>2</sup>*.

The plug *c* may be in general of any usual construction, but carries at its lower extremity a ring or collar *c'* of iron or other magnetic material. When the plug *c* rests in its socket, the collar *c'* is designed to nearly or quite bridge the space between the upper extremities of magnet *d* and armature *e*. At such time the magnet *d* forms a part of a nearly complete rectangular circuit of magnetic material.

The armature *e* lies in a recess *a<sup>3</sup>* of the frame *a* and is pivoted therein upon trunnions *f* and *f'*, which extend through the walls of the recess and engage the lower end of the armature. In the same recess and adjacent to the armature lie a switch-spring *g* and its contact-anvil *h*, suitably supported at their lower extremities in a block *i* of insulating material, filling the lower end of the recess *a<sup>3</sup>*.



The switch-spring *g* is given tension away from the armature *e* and toward its contact-piece *h*, but it is in mechanical connection with the armature through an insulating-pin *e'*. The tension of the spring is so adjusted to the strength of the magnet *d* that when the plug is removed from its socket, leaving the space between the pole of the magnet and the armature vacant, the spring draws the armature away from the magnet and closes upon its contact-anvil *h*. Any other desired arrangement of the contact-pieces may of course be made whereby the movement of the armature may be caused to change circuits.

The recess *a'* is covered and sealed by a plate *l*, fitting over it and secured to the frame by screws. Thus the moving parts and the switch-contacts of the plug-seat switch are completely inclosed and protected from dust and corrosion.

When the plug is in its socket, the upper pole of magnet *d* is extended, so to speak, toward the armature *e*, so that the latter is attracted and moves the switch-spring *g* away from its contact-piece *h*. When the plug is removed from its socket, the circuit of magnetic material is widely broken and the spring is permitted to close upon its contact, retracting the armature *e* in its movement. The force exerted upon the switch-spring is obviously independent of the weight of the plug, being determined by the attraction of magnet *d* upon its armature.

This invention is not limited to the particular device by which the force of attraction of the magnet is applied to the armature to move the switch-springs, inasmuch as other dispositions of the magnet and armature might be made whereby the removal of the plug from its socket would diminish the attraction between a magnet and armature to permit movement of the armature. Neither is the utility of the device comprising the magnet, the movable armature, and the removable section of magnetic material confined to its use in plug-seat switches.

I claim as my invention—

1. The combination with a base having a socket for a plug formed in it, of a movable armature and switch-contacts controlled thereby near the socket, a plug and a mass of magnetic material associated therewith, said mass of magnetic material or said armature being magnetized, whereby the arma-

ture is moved when the plug is in its socket, as described.

2. The combination with a base and a socket formed therein for a connecting-plug, of a plug in the socket, an armature adjacent to the socket, switch-contacts controlled by the armature, and a mass of magnetic material moved in the movement of the plug adapted to attract said armature to operate the switch-springs, as described.

3. The combination with a base and a socket formed therein for a plug, of an armature near the socket, and switch-contacts controlled thereby, a case inclosing said armature and switch-contacts, a plug in the socket and a mass of magnetic material associated therewith to be moved when the plug is removed from the socket, either said mass of magnetic material or said armature being magnetized to attract the other when said plug is in its socket, substantially as described.

4. The combination of a permanent magnet, an armature therefor, switch-contacts controlled by the armature, a pole-piece of soft iron for said magnet presented to the armature, said pole-piece being removable and associated with a movable appliance, substantially as described.

5. The combination of a permanent magnet, an armature and switch-contacts controlled by the armature, said magnet and armature being separated by a considerable space, and a connecting-plug and a mass of iron associated therewith, said mass of iron being adapted to bridge the space between the magnet and the armature to cause the movement of the armature when the plug is in proper position, as described.

6. The combination with a base having a socket formed therein, of a permanent magnet having its pole adjacent to the socket, and an armature therefor also near the socket, switch-contacts controlled by the armature, and a plug and a mass of iron carried thereon adapted to nearly bridge the space between the magnet and the armature when the plug is in its socket, substantially as described.

In witness whereof I hereunto subscribe my name this 25th day of January, A. D. 1897.

CHARLES E. SCRIBNER.

Witnesses:

ELLA EDLER,  
MYRTA F. GREEN.