No. 894,703. PATENTED JULY 28, 1908.

F. W. SANFORD.

FLUSH RECEPTACLE AND PLUG.

APPLICATION FILED SEPT. 12, 1905.

Fig. 1.

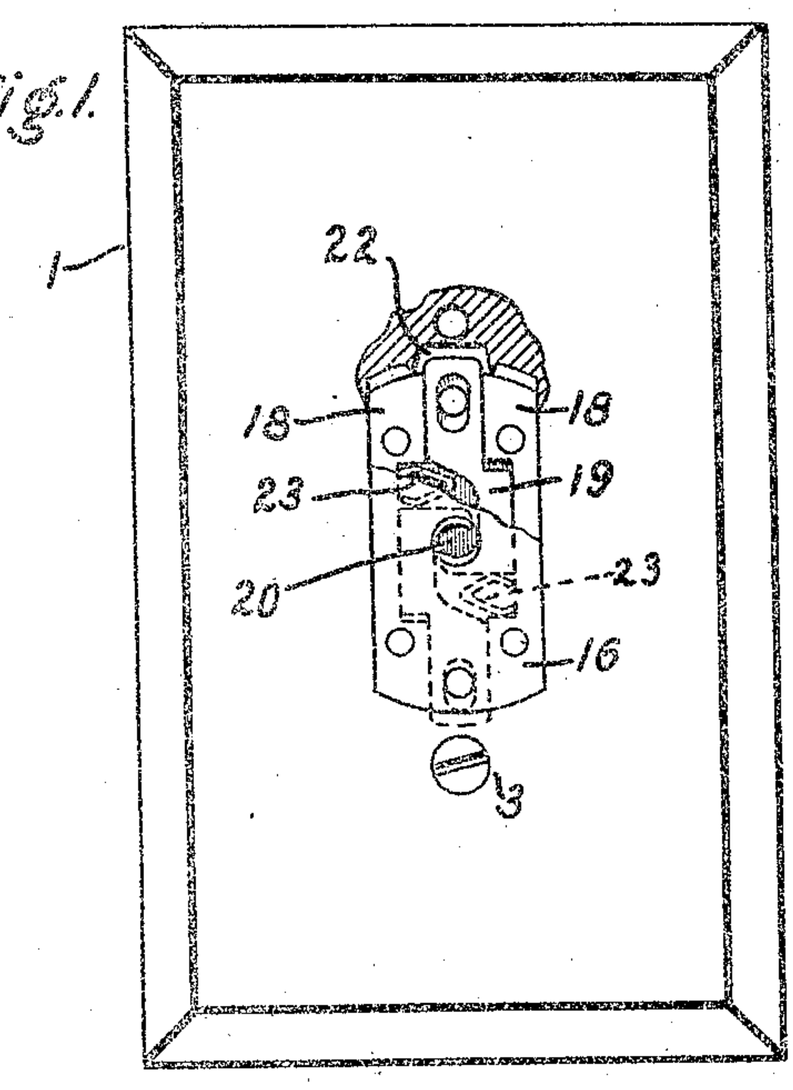


Fig. 2.

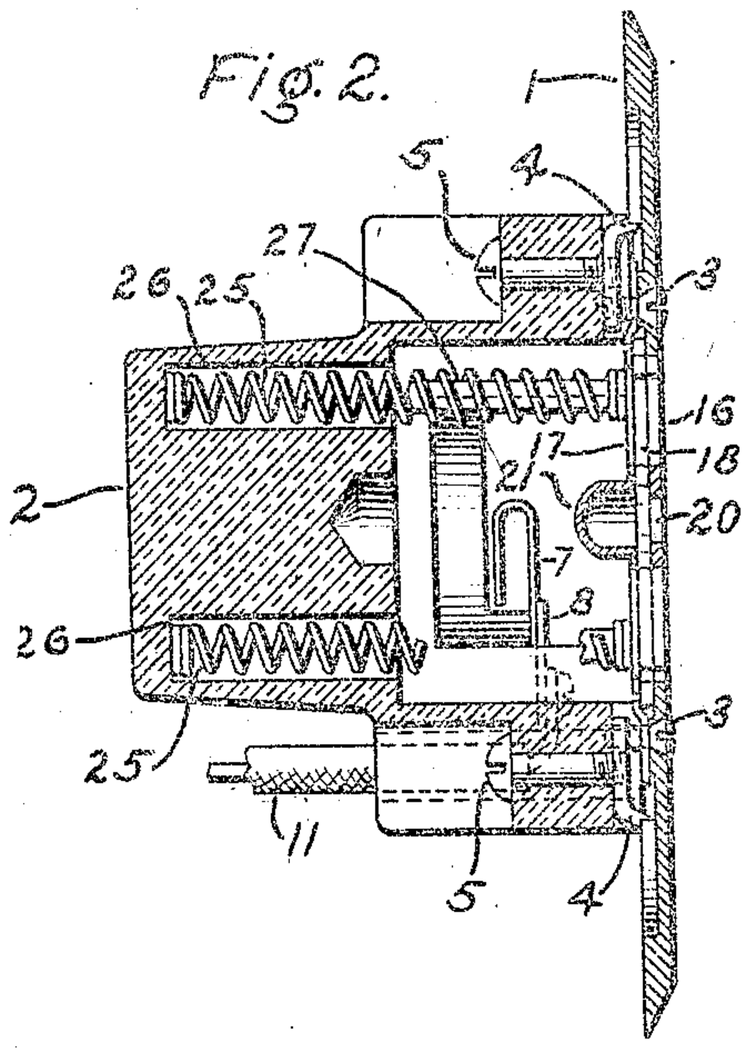


Fig. 3.

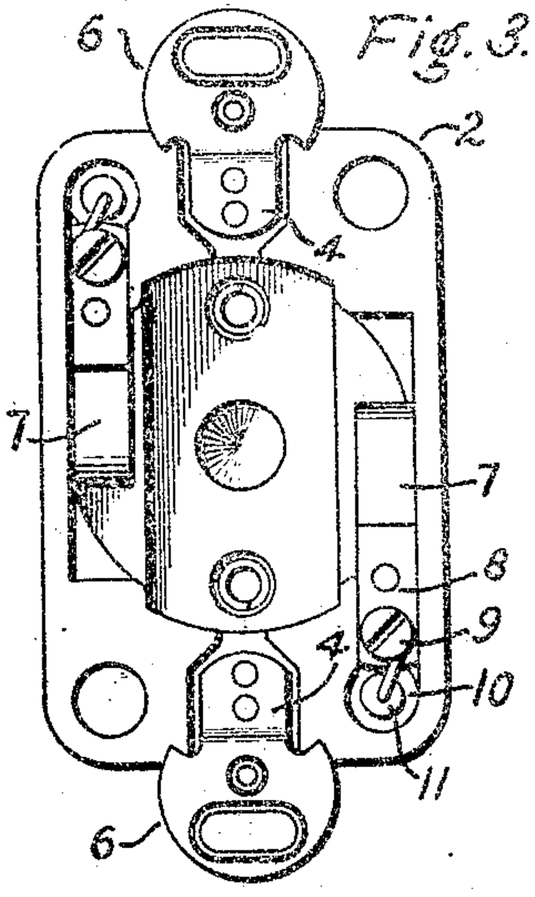


Fig. 4

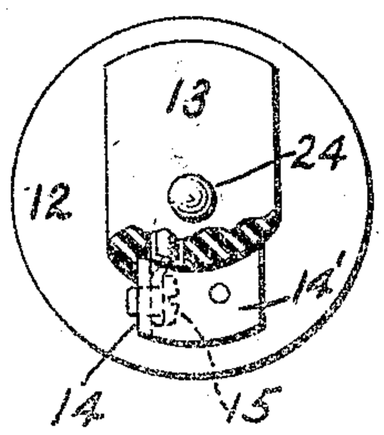


Fig. 5.

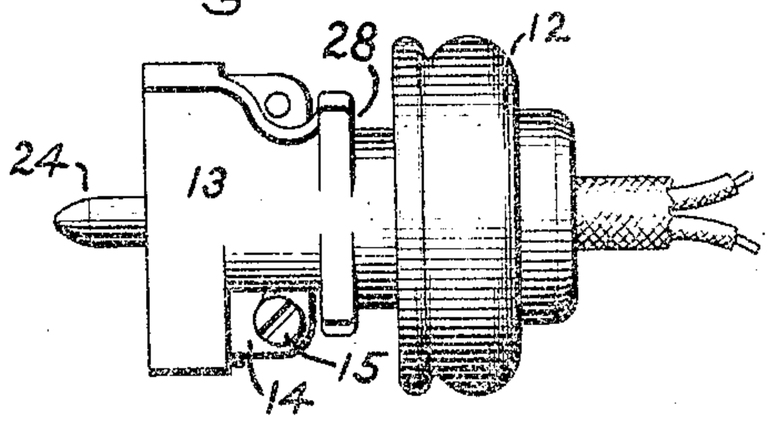


Fig. 7.

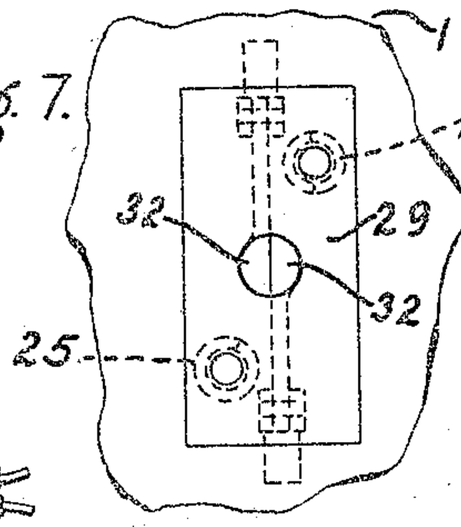


Fig. 8.

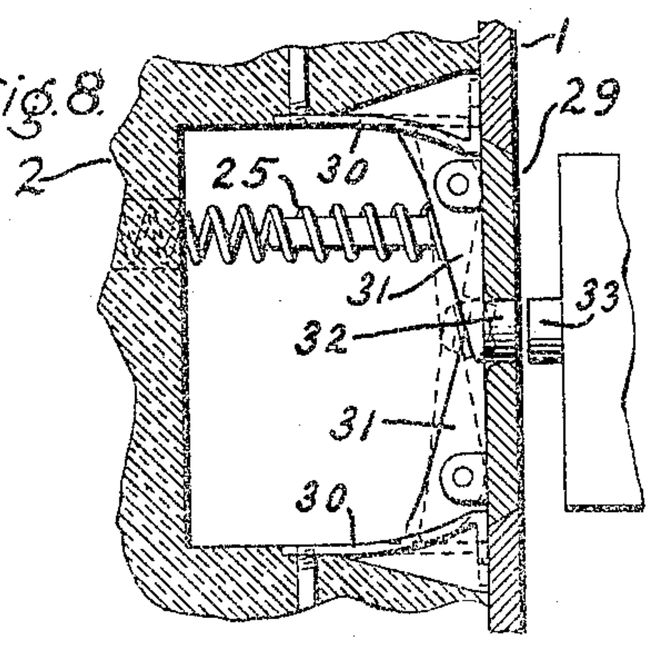


Fig. 6.

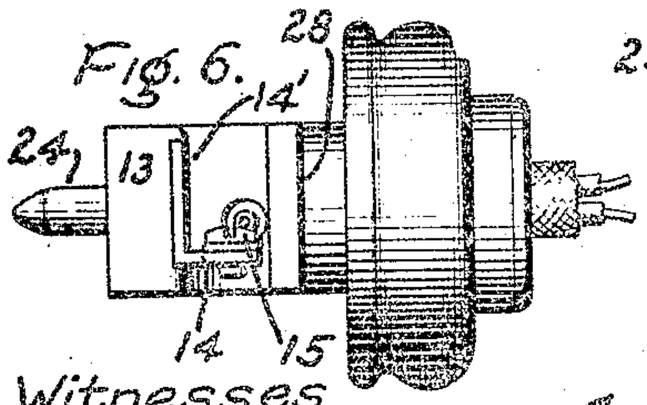
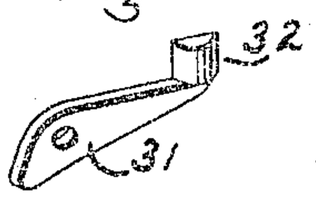


Fig. 9.



Witnesses

William B. Hull

Helen Orford

Inventor:

Frank W. Sanford.

by Albert G. Davis

Atty.

UNITED STATES PATENT OFFICE.

FRANK W. SANFORD, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK

FLUSH RECEPTACLE AND PLUG.

No. 894,703. Specification of Letters Patent. Patented July 28, 1908.

Application filed September 12, 1905. Serial No. 278,137.

To all whom it may concern:

Be it known that I, FRANK W. SANFORD, a citizen of the United States, residing at Schenectady, county of Schenectady, and State of New York, have invented certain new and useful Improvements in Flush Receptacles and Plugs, of which the following is a specification.

This invention relates to connectors for electric circuits, of the type in which a receptacle containing main-line terminal contacts is let in flush with a wall or floor, while the terminal contacts of the branch line are carried on a plug, adapted to be thrust into the receptacle in such a position as to bring the two sets of contacts together and connect the branch line with the main line.

Heretofore, when the plug was withdrawn the mouth of the receptacle has been closed by one or more covers or shutters, either hinged or arranged to slide laterally. In either case they required to be opened by hand before the plug could be inserted. Moreover, there was no way to lock the shutter so as to prevent its being opened and the circuit contacts exposed and meddled with or injured.

The object of my invention is to provide a flush receptacle with a shutter which will be opened automatically when the plug is pressed against it, but which will be locked against unauthorized tampering when the plug is withdrawn.

To this end the invention consists in a wall receptacle having stationary line terminals, a yielding shutter provided with locking devices, and a plug carrying branch-line terminals and means for unlocking the shutter, so that said shutter can be unlocked and forced inward when the plug is pressed against it. The specific construction is hereinafter set forth, and is particularly pointed out in the claims.

In the accompanying drawing, Figure 1 is a front elevation of my improved wall receptacle, partly in section; Fig. 2 is a longitudinal section of the same; Fig. 3 is a front elevation with the face-plate and shutter removed; Fig. 4 is an end view of the plug, partly in section; Fig. 5 is a side view of the plug; Fig. 6 is an edge view of the same; Fig. 7 is a front view of a modified shutter and lock; Fig. 8 is a section of the same; and Fig. 9 is a detail.

The receptacle has a metal face-plate 1 containing an oblong opening which is closed by the yielding shutter hereinafter described. The face-plate is secured to a casing 2 of insulating material, such as porcelain, by means of screws 3 which enter tapped holes in small plates of metal 4 fastened to the casing by screws 5 and preferably having offset portions 6 let into shallow recesses in the back of the face-plate, to assist in retaining said plate in place.

The casing has an oblong cavity registering with the opening in the face-plate, and adapted to receive a plug of similar cross-section. At each side of the cavity are lateral recesses in each of which is located a line-terminal contact, consisting preferably of a strip 7 of resilient metal bent into U-shape, with one leg secured to a metal plate 8 carrying a binding-screw 9. A hole 10 is formed through the casing adjacent to said plate to enable one of the line-conductors 11 to be led in and connected by the binding-screw with the contact 7. The plug is made of insulating material, and has a head 12 and a body 13, the latter being oblong in cross-section and of a size suitable to pass through the hole in the face-plate and enter the cavity in the casing. Each edge of the plug has a recess in which is held an L-shaped piece of metal 14 constituting one of the branch-line terminal contacts, the branch lines being led through a passage in said plug and clamped to the contacts 14 by binding-screws 15. When the plug is thrust into the casing and given a quarter turn, the portions 14′ of the contacts are carried under the free ends of the contacts 7, thereby placing the branch line in circuit with the main line and also locking the plug in the receptacle.

When the plug is withdrawn, the opening in the face-plate is automatically closed by a shutter, which is provided with locking devices, preferably spring-actuated. The shutter consists preferably of a shallow box composed of a top-plate 16, a bottom-plate 17, and side-pieces or spacing-strips 18, all riveted together, with openings in the ends. The spring catches which lock the shutter are preferably mounted therein. Those illustrated in Fig. 1 of the drawings consist of flat bolts 19 slidably arranged between the plates 16, 17, with their noses projecting through the holes in the ends of the shutter. The shanks of the bolts pass by each other and have L-shaped ends forming laterally-projecting lugs which overlap and are preferably

slightly notched in their meeting faces. Small holes 20 are drilled in the plates 16, 17 in line with these notches, and in order to keep out dust a cup 21 is preferably secured to the bottom-plate 17 concentric with the hole 20. In the face-plate, at the ends of the oblong opening, are formed recesses 22 to receive the noses of the bolts, which are urged outwardly by springs 23. By thrusting a wedge-shaped or tapering implement into the hole 20, the L-shaped ends of the bolts will be forced apart and their noses withdrawn from the recesses, thereby unlocking the shutter.

In order to unlock the shutter automatically when the plug is inserted into the receptacle, said plug is provided with a tapered pin 24 projecting from its end and adapted to enter the hole 20 when the plug registers with the opening in the face-plate.

The shutter is yieldingly supported on helical springs 25 seated in sockets 26 in the casing and encircling guide-pins 27 projecting inwardly from the shutter. In order to arrest the shutter with its top-plate flush with the face-plate, the ends of the bottom-plate 17 project slightly, as shown in Fig. 1, so as to engage the under-side of the face-plate when the shutter is urged outwardly by the springs.

The operation is as follows: The plug is placed in line with the shutter and the pin 24 is pushed into the hole 20, thereby unlocking the shutter. By a continuous inward movement, the plug can be thrust into the receptacle, pushing the shutter inward before it against the tension of the springs 25. When fully home, the plug can be rotated a quarter turn, to close the circuit and lock the plug, the shoulders 28 thereon passing under the face-plate at the sides of the oblong opening.

In the modification shown in Figs. 7 and 8 of the drawing, the shutter 29 is a solid plate yieldingly supported, as before, on the springs 25. The shutter is locked in its closed position by two spring catches 30 secured at the ends of the cavity in the casing. These catches spring in under the ends of the shutter when it has become flush with the face-plate. To unlock said catches, the shutter carries on its under side two bell-crank levers 31, whose short arms bear against the catches while the long arms have studs 32 projecting up through a hole in the shutter. Each stud is preferably semi-cylindrical, as shown, so that the two together fill the cylindrical hole. On the plug is a cylindrical pin 33 having a blunt end adapted to engage with said studs and force them inwardly, thereby causing the levers to spread apart the two spring catches and release the shutter. The plug can then be pushed into the receptacle and rotated to close the circuit. The shutter locks automatically when the plug is withdrawn.

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

1. In a flush receptacle, the combination with the casing and the face-plate, of a shutter yieldingly supported, and means for locking it in its closed position.

2. In a flush receptacle, the combination with the casing and the face-plate, of a shutter yieldingly supported, and spring-actuated catches for locking it in its closed position.

3. In a flush receptacle, the combination with the casing and the face-plate, of a shutter yieldingly supported, and locking devices carried by said shutter for retaining it in its closed position.

4. In a flush receptacle, the combination with the casing and the face-plate, of a shutter yieldingly supported, and sliding bolts mounted on said shutter for retaining it in its closed position.

5. In a flush receptacle, the combination with the casing and the face-plate, of a shutter yieldingly supported, sliding bolts on said shutter having overlapping lugs, and springs urging said bolts outwardly.

6. In a flush receptacle, the combination with the casing and the face-plate, of a shutter yieldingly supported and comprising a top-plate and a bottom-plate, sliding bolts between said plates having overlapping lugs, and springs urging said bolts outwardly, said plates having holes in line with the meeting faces of said lugs.

7. In a flush receptacle, the combination with the casing and the face-plate, of an inwardly-movable shutter, guide-pins projecting inwardly from both ends of the shutter, springs encircling said pins, and locking devices for said shutter.

8. In a flush receptacle, the combination with the casing and the face-plate, of an inwardly-movable shutter, one or more guide-pins thereon, springs encircling said pins, and locking devices for said shutter, movable transverse to the line of movement of said shutter.

9. The combination with a plug, of a flush receptacle therefor comprising a casing and face-plate, a yielding shutter, spring catches for said shutter, and a pin on said plug for actuating said catches to unlock them.

10. The combination with a plug, of a flush receptacle therefor comprising a casing and face-plate, a shutter yieldingly supported, sliding bolts on said shutter having overlapping lugs, and a tapering pin on said plug adapted to enter between said lugs.

In witness whereof, I have hereunto set my hand this 11th day of September, 1905.

FRANK W. SANFORD.

Witnesses:
BENJAMIN B. HULL,
HELEN ORFORD.