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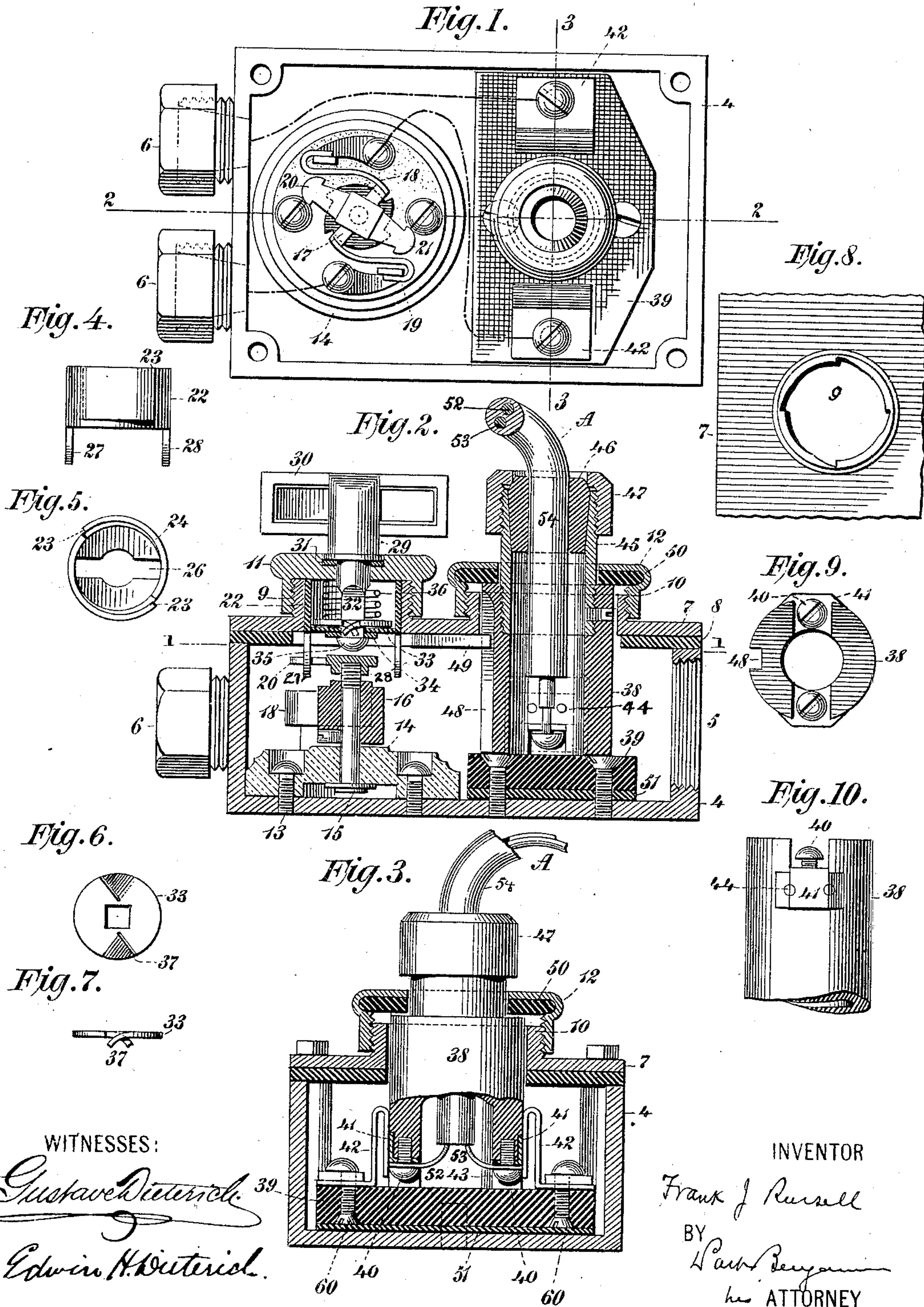
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F. J. RUSSELL.

COMBINED SWITCH AND PLUG RECEPTACLE BOX.

(Application filed May 1, 1901.)

(No Model.)



UNITED STATES PATENT OFFICE.

FRANK JOSHUA RUSSELL, OF NEW YORK, N. Y.

COMBINED SWITCH AND PLUG RECEPTACLE-BOX.

SPECIFICATION forming part of Letters Patent No. 696,597, dated April 1, 1902.

Application filed May 1, 1901. Serial No. 58,290. (No model.)

To all whom it may concern:

Be it known that I, FRANK JOSHUA RUSSELL, of the city, county, and State of New York, have invented a new and useful Improvement in a Combined Switch and Plug Receptacle-Box, of which the following is a specification.

My invention is a combined switch and plug receptacle constructed and arranged in a box the joints whereof are made water-tight.

My invention consists more particularly in the arrangement of the switch within the box and of the means for operating said switch on the exterior thereof, the said means being so constructed that while the operating-handle may be turned in either direction the switch mechanism is actuated only when said handle is turned in one direction; also, in the arrangement of the plug so that the same may be secured firmly and accurately in place in its receptacle and shall rest at its bottom portion upon an insulating-block; also, in the various combinations and instrumentalities more particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a horizontal section of the device on the line 1 1 of Fig. 2. Fig. 2 is a vertical longitudinal section on the line 2 2 of Fig. 1. Fig. 3 is a vertical transverse section on the line 3 3 of Fig. 1. Fig. 4 is a side elevation of the cup. Fig. 5 is a plan view of the cup looking into it. Fig. 6 is a plan view, and Fig. 7 a side view, of the washer 33. Fig. 8 is a plan view of the socket formed by the nipple 9, in which socket the cup is placed. Fig. 9 is a bottom view of the terminal plug, and Fig. 10 is a side view of the same. In Fig. 10 the plug is shown with its upper portion broken away and inverted.

Similar numbers of reference indicate like parts.

The containing-box 4 is of metal or any material suitable for an electric wire way-junction and has any suitable means for connecting the conductor-wires to it. Thus a threaded opening is shown at 5 for the attachment of a pipe carrying the wires, while at 6 6 are shown stuffing-box glands for the same purpose. The box is provided with a cover 7, resting on packing material 8 and secured in place by screws. On the cover are formed two threaded nipples 9 and 10, adapt-

ed to receive the nuts 11 and 12, by means of which the switch-operating device and also the plug, hereinafter described, are secured in position.

Referring first to the switch and the device for operating the same, secured in the bottom of the box 4 by means of the screws 13 is the base 14, of insulating material, through which passes the pin 15, which carries the switch-ratchet 16. The ratchet 16 is of the usual construction of insulating material and has a bar of conducting material 17 extending through it, against the ends of which bar the spring-terminals 18 and 19 bear when the ratchet is suitably turned.

The switch construction so far described is that in ordinary use. The upper end of pin 15 is threaded to receive the shouldered arms 20 and 21, by means of which arms the switch-ratchet is turned to interrupt or establish circuit between the springs 18 and 19.

The switch-operating device which I am now about to describe is designed to prevent the switch-ratchet 16 from being turned other than in one direction—namely, in the direction which will cause the inclined sides of the ratchet-teeth to slide under the springs 18 and 19. In switches of this type when the ratchet is turned in the opposite direction the effect is to cause the shoulders of the ratchet-teeth to compress the springs and ultimately to bend or break them, thus soon destroying the value of the switch. By my construction, now to be explained, this is rendered impossible, because, as I have stated, the switch-ratchet can by means of the device to be described be turned in but one direction.

In the nipple 9 is placed a cup 22, Figs. 4 and 5, of metal, the sides of which are cut, as shown at 23, so that portions of them project to form pawls. The inner periphery of the nipple 9 is correspondingly formed to produce a ratchet, as shown in Fig. 8. Hence when the cup is inserted in said nipple the pawls 23 engage with the shoulders thereon, and thus the cup is prevented from being rotated other than in one direction. The bottom of the cup 22, Fig. 5, is transversely slotted, as shown at 26. Below the bottom extend two arms 27 and 28, which when the cup is rotated engage with the arms 20 and 21 of the switch-pin 15. Extending through the nut 11 and

cup 22 is a rod 29, at the upper portion of which is the operating-handle 30. In the upper part of nut 11 is a recess carrying a packing-washer 31, upon which the shoulder of rod 29 seats itself. In the nut 11 the rod is circular, so as freely to turn therein. Below the circular portion the rod is square, as shown at 32, the squared portion then passing through the similarly-shaped aperture in the washer 33, Figs. 6 and 7. The rod then passes through the round central portion of the slot 26 in the bottom of cup 22, this round open portion being large enough to permit the squared part 32 of the rod to turn freely therein. Finally below the bottom of the cup there is a washer 34 and the enlarged head 35 of the rod. Between the washer 33 and nut 11 is interposed a spiral spring 36, the effect of which is to hold the washer 33 seated firmly against the bottom of cup 22 and the shoulder on the upper part of the nut also seated firmly against the washer 31. The washer 33 is slit at its edges, as shown at 37, and the slit portions are bent outward so as to form pawls. The washer is placed in the bottom of the cup 22 with the bent-up portions turned downward, as shown in Fig. 7. As a consequence when the washer is suitably placed these downward projecting edges of the pawls 37 will engage with the sides of the slot 26, formed in the bottom of the cup 22. Pawls 37 and slot 26 thus produce another ratchet mechanism.

The operation of the parts so far described can now be easily followed. When the handle 30 is turned in one direction—that is to say, from left to right of the drawings—the pawls 23 on the cup 22 will engage with the interior of the nipple 9. Consequently the cup 22 will not be turned, and the arms 27 and 28 thereon will remain stationary, so as not to act upon the switch-arms 20 and 21. The projections 37 on the washer 33, which washer will of course be rotated with the handle, will then run over the edges of the slot in the bottom of cup 22 without engaging in said slot. The net result then of the turning of the handle 30 in the direction indicated is that it does not actuate the switch. Now assume the handle to be turned in the opposite direction. Then the projections 37 on the washer 33 do engage with the edges of the slot 26 in the bottom of cup 22 and tend to turn that cup. The cup is free to turn, because the pawls 23 on its outer periphery then slide over the inclined projections within the nipple 9. Then also the arms 27 and 28 at the bottom of the cup engage with the switch-arms 20 and 21, and so the switch-ratchet 16 is revolved to make or break circuit, as the case may be. It will be seen, therefore, that the handle 30 may be turned in either direction and that when it is turned to the right its square end actuates the washer 33, causing the bent portions 37 thereon to engage in the slot 26 in the bottom of cup 22, and the cup is then free to revolve and so to operate the switch. On the other hand, if the han-

dle 30 be turned to the left the cup is prevented from revolving by the pawls 23 engaging with the shoulders in the wall of the nipple, the bent portions of the washer 33 slip over the slot in the bottom of cup 22, and so the switch-handle 30 is permitted to revolve idly. Therefore in the latter case the switch itself is not operated, there is no danger of the projections on the switch-ratchet 16 bending or breaking the contact-springs, and equally no danger of the handle becoming screwed off from its supporting-rod if it is connected thereto by a screw connection. It will also be obvious that by simply unscrewing the nut 11 the handle and its rod, together with the cup 22 and all of its associate parts, may be readily removed from the box.

Referring now to the arrangement of the plug, the body thereof is a hollow cylinder 38 of insulating material, which when inserted in place in the box rests directly on the block 39, also of insulating material, which is secured by the screws shown to the bottom of the box. On opposite sides of the bottom of the cylindrical plug 38 are recesses to receive the heads of the screws 40, by means of which contact-plates 41 are secured on each side of said cylinder. Secured to the base 39 are spring-clips 42, which when the plug is inserted in place, as shown in Fig. 3, bear against the contact-plates 41. The contact-plates 41 extend, as shown, to the inside of the cylindrical plug, as represented at 43, and metal pins also project from said contact-plates to the inside of the plug, as represented at 44, Fig. 2. The insulating portion 38 of the plug is secured to the threaded sleeve 45, within which is a rubber gasket 46. The upper part of the sleeve 45 is threaded to receive a nut 47. On the side of plug 38 is a vertical score 48, which receives the projection 49 on the under side of the box-cover. The object of this projection is to allow the plug to be properly centered when it is inserted through the nipple 10.

It will be observed that the plug 38 rests directly upon the insulating-base 39 and is forced into close contact therewith by means of the nut 12 engaging with the threaded nipple 10. This nut screws down upon the gasket 50.

In connection with plug 38, arranged as described, are the usual conductors 52 and 53, inclosed in any suitable insulating-sheath 54 and secured to the plug 38 by passing through the gland-nut 47 and rubber gasket 46 at the terminal end of the plug. These conductors are attached to the terminal plates 41 by means of screws 40.

Between the insulating-base 39 and the bottom of the box may be inserted any suitable packing 51 to separate the screws 60 from the box 4.

The circuit connections are indicated in dotted lines in Fig. 1, and proceed as follows: from one terminal 6 to the switch-spring 19, through the switch to the opposite spring 18,

to the spring-clip 42, through the plug to the opposite clip 42, and so to the other terminal 6.

I desire to call attention to the fact that the gasket 50 is clamped down by the nut 12 upon the top of the plug 38 and not upon the nipple 10, so that the joint is made between plug and gasket and not between nipple and gasket.

I claim—

10 1. The combination with an inclosing box and a switch therein having an actuating-arm 20, of the cup 22 having arm 27 and provided on its periphery with a pawl 23, nipple 9 adapted to receive said cup and formed inter-
15 nally with a shoulder for the engagement of said pawl, and means for rotating said cup in said nipple.

20 2. The combination with an inclosing box and a switch therein having an actuating-arm 20, of the cup 22 having arm 27 and provided on its periphery with the pawl 23, and having the slot 26 in its bottom, nipple 9 adapted to receive said cup formed internally with a shoulder for the engagement of said pawl,
25 washer 33 having pawl projection 37 disposed within said cup, nut 11 on said nipple and actuating-rod 29 having its bearing in said nut and engaging with said washer 33.

30 3. The combination with a box having inclosed within it an insulating-base and contacts and provided with a threaded nipple, of a shouldered plug of insulating material adapted to enter said nipple and to be seated

upon said base, contact-plates on said plug adapted to make electrical connection with
35 said contacts when said plug is seated as afore-said and a flanged nut adapted to engage with said nipple and to have a bearing on the shoulder of said plug.

4. The combination with the box 4 having the threaded nipple 10, of the base 39, spring-
40 clips 42 thereon, plug 38 having contact-plates 41, and nut 12 adapted to engage with said nipple 10 and with a shoulder on said plug.

5. The combination with a box 4 having the cover 7 and threaded nipple 10, of the base 39, spring-clips 42 on said base, plug 38 hav-
45 ing contact-plates 41 and provided with the score 48, nut 12 adapted to engage with said nipple 10 and with a shoulder on said plug, and projection 49 on cover 7 adapted to enter the score 48.

6. The combination with a box, a rotary switch therein, an actuating-rod for rotating
55 said switch and a handle on said rod exterior to said box, of two ratchet-and-pawl mechanisms interposed between said rod and said switch; the said mechanisms being constructed and arranged so that when one of said
60 ratchets is free to rotate the other is held from rotation by its pawl.

FRANK JOSHUA RUSSELL.

Witnesses:

H. R. MOLLER,
I. A. VAN WART.