

R. B. BENJAMIN.
SEPARABLE ATTACHMENT DEVICE.
APPLICATION FILED APR. 1, 1915.

1,352,776.

Patented Sept. 14, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

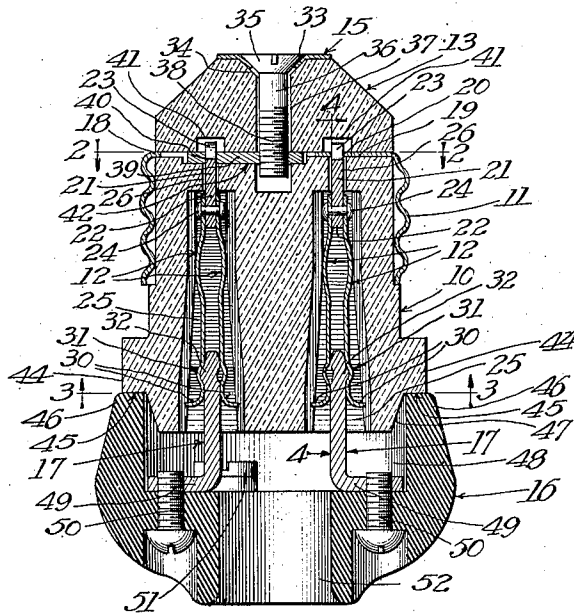


Fig. 2.

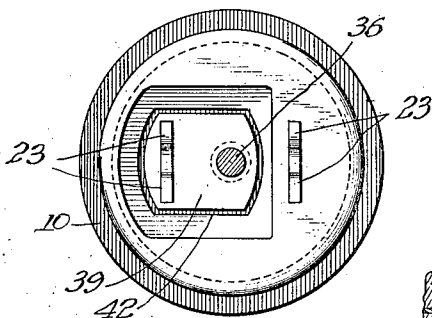


Fig. 3.

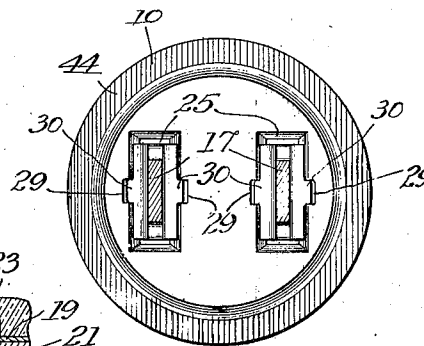
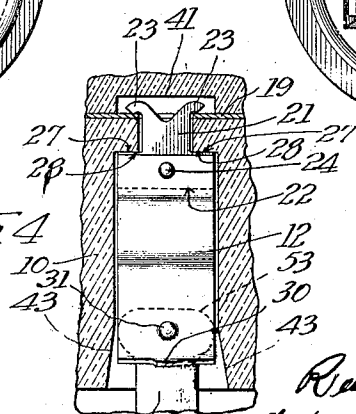


Fig. 4.



Witnesses:
Robert H. Weir

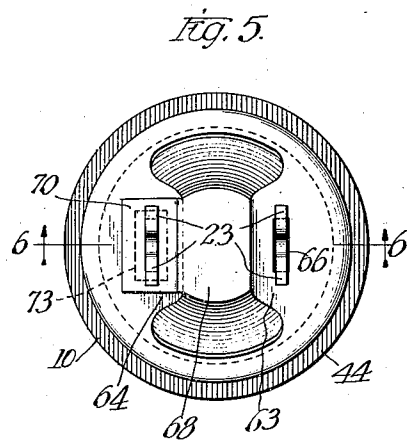
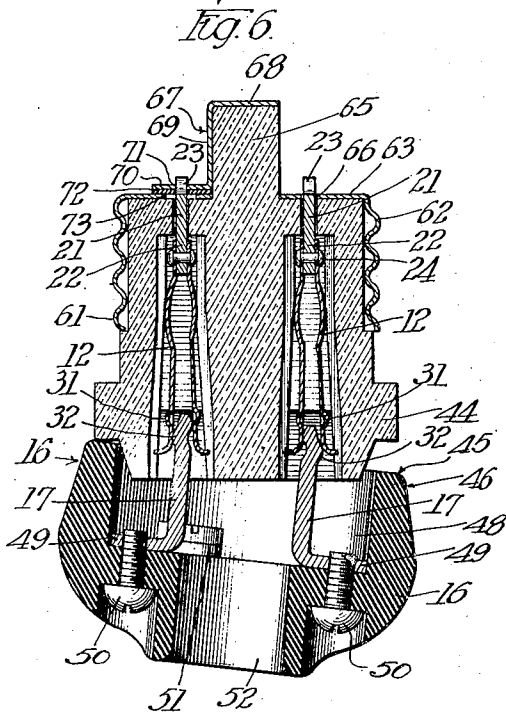
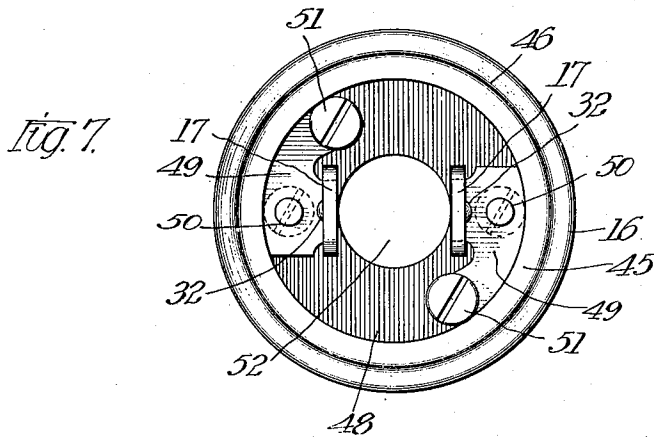
Inventor
R. B. Benjamin
17 Jones Abington, Mass. (By) (Attys.)

R. B. BENJAMIN.
SEPARABLE ATTACHMENT DEVICE.
APPLICATION FILED APR. 1, 1915.

1,352,776.

Patented Sept. 14, 1920.

2 SHEETS—SHEET 2.



Witnesses:
Robert F. Weir

Inventor
Ruben B. Benjamin
Jones Addington Ames & Seelye
Attys.

UNITED STATES PATENT OFFICE.

REUBEN B. BENJAMIN, OF CHICAGO, ILLINOIS, ASSIGNOR TO BENJAMIN ELECTRIC MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

SEPARABLE ATTACHMENT DEVICE.

1,352,776.

Specification of Letters Patent. Patented Sept. 14, 1920.

Application filed April 1, 1915. Serial No. 18,455.

To all whom it may concern:

Be it known that I, REUBEN B. BENJAMIN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Separable Attachment Devices, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention relates to a separable attachment device, and more specifically to plugs comprising an insertible portion carrying center and shell contacts and a detachable or cap portion carrying binding terminals and contacts for engagement with the contacts of the insertible portion.

Among the objects of my invention is to provide an improved device of this character which shall be simple in construction, efficient in use and in which the cap or terminal carrying portion can be easily separated from the insertible portion by other than the straight line movement.

Further objects of my invention will appear from the detailed description to follow taken in connection with the appended claims.

In the accompanying drawings in which I have illustrated two embodiments of my invention—

Figure 1 is an axial section of a separable plug embodying my invention showing the manner in which the contacts of the terminal carrying portion engage the contacts of the insertible portion, and showing the manner in which the contacts are held in place on the insertible portion;

Fig. 2 is a section substantially on the line 2—2 of Fig. 1 showing the manner in which the securing means for the contacts of the insertible portion are riveted onto the insertible portion;

Fig. 3 is a section substantially on the line 3—3 of Fig. 1 showing the manner in which the contacts engage;

Fig. 4 is a section substantially on the line 4—4 of Fig. 1 showing the manner in which the contact on the insertible portion is held in place and showing the enlarged upper end of the contact carried by the cap;

Fig. 5 is a plan view of a modified form of my device showing the manner in which

the shell and center contacts are supported on the insulating base;

Fig. 6 is a section along the line 6—6 of Fig. 5 showing the manner in which the contacts are held in place on the insulating base, and showing the cap or terminal carrying member partially separated from the insertible portion; and

Fig. 7 is a plan view of the cap showing the manner in which the binding plates are secured thereon.

Referring now to the drawing in detail, and first to the modification of Figs. 1, 2, 3 and 4, the plug of this modification comprises an insulating base 10 for supporting the shell contact 11 and the spring contacts 12, a second insulating member or button 13 supporting the center contact 15 and a binding terminal carrying portion or cap 16 to which are secured the contacts 17 which engage the contacts 12 of the insertible portion. The contact shell 11 has an inwardly extending flange 18 held in place between the portion 10 and button 13. A portion of this flange 18 extends farther inwardly than the rest, as shown at 19, and is provided with an opening 20 through which extends a reduced portion 21 of a securing member 22. The reduced portion 21 has two prongs which are bent over above the inwardly extending portion 19 of the flange, as shown at 23, to hold the retaining member 22 in position, and also to hold the contact shell 11 in place. The contacts 12 are secured to the member 22 in any suitable manner as by rivets 24. The contacts 12 are located in a recess 25 in the insulating portion or base 10 from which recess 25 an opening 26 leads through which the reduced portion 21 of the retaining member extends. The retaining member 22 has a shoulder 27 which engages an abutment 28 formed at the upper end of the recess 25 to properly position the retaining member 22 and contacts 12. The sides of the recess 25 are provided with longitudinally extending grooves 29, the lower ends of which provide clearance for the lugs 30 at the tips of the contacts 12, the lugs 30 being provided to guide the contacts 17 in between the contacts 12 and to prevent the contacts 17 from entering between one of the contacts 12 and the side of the recess 25. The upper end of the grooves 29 provide clearance for the rivets

24. The contacts 12 are provided with struck up projections 31 whereby depressions are formed for engagement with a corresponding projection 32 on the upper ends of the contacts 17. The center contact 15 has a conical portion 33 seated in a countersunk depression 34 in the button 13. The center contact 15 is held in place on the button by means of the head 35 of the screw 36 which extends through an opening 37 in the button 13 and into a threaded opening 38 in the conducting plate 39 which lies between the button 13 and base 10. The conducting plate 39 has an opening 40 there-through through which extends the reduced portion 21 of the retaining member 22, the reduced portion 21 having prongs riveted over above the conducting plate 39, as shown at 23. The button 13 has a recess 41 in its lower face to provide clearance for these prongs 23. The base 10 has a recess 42 in its upper face to accommodate the conducting plate 39. The lower end of the recess 25 flares outwardly, as shown at 43 (Fig. 4) to permit easy separation of the plug parts by other than a straight line movement. The insulating base 10 is provided adjacent its lower end with an annular flange 44 having a lower shoulder 45 for engagement with the upstanding annular flange 46 on the cap 16. The plug 10 below the flange 44 is provided with a frusto-conical portion 47 for centering the cap 16. The cap 16 has a recess 48 in its upper face to accommodate the binding plates 49 which are secured to the cap 16 by means of screws 50. Binding screws 51 are secured to the binding plates 49 to which are secured the conductors leading to any suitable translating device which extend outwardly through the central opening 52 in the cap.

In assembling the plug of this modification the contacts 12 riveted to the retaining members 22 are dropped in place in the recesses 25, the reduced portions 21 extending through the opening 26. The shell contact 11 is then slipped over the base 10, the reduced portion 21 entering through the opening 20 in the portion 19 of the flange. The conducting plate 29 is then placed in the recess 42, the reduced portion 21 extending through the opening 40 in the plate. The prongs 23 are then riveted down to hold all of the contacts secured in place.

It will be noted that in this construction the contacts 12 are definitely located in place so that the distance of their ends 30 from the entrance to the recesses 25 will be a definite distance. This is due to the fact that in molding the base 10 the parts of the mold which form the lower face of the base 10 and the upper shoulder 28 of the recess 25 are fixed with respect to each other so that the distance between the shoulder 28

and the lower face of the base 10 is definite. The circuit through the plug of this modification is as follows: from the center contact 15 through the screw 36, conducting plate 39, retaining member 22, contacts 12 and 17, through the circuit of the translating device to the contacts 17, through the other contacts 12 and the retaining member 22 to the threaded shell contact 11.

To permit of easy separation of the plug by other than a straight line movement it is desirable that the distance to which the contacts 17 extend into the recesses 25 would be as small as possible.

To this end the upper ends of the contacts 17 are widened out as shown at 53 (Fig. 4) and the contacts 12 are made to engage on both sides of the contacts 17 so as to secure as much contact surface as possible between the contacts 12 and 17 for a given length of contact. In order to facilitate the separation of the two parts of the plug by other than the straight line movement provision is made whereby the fulcrum between the two parts will be located above the lower face of the base 10, the flange 44 forming the fulcrum about which the cap 16 moves when it is separated from the base, the upstanding flange 46 engaging the flange 44 as the parts are separated (see Fig. 6).

It will be noted that the plane of the shoulder 45 passes through the tips of the contacts 12 and 17 when the latter are in engaging position, as shown in Fig. 1, so that when the cap is tilted about the flange 44, as shown in Fig. 6, the tips of the contacts 17 will move substantially directly downward with very little sidewise movement, thus facilitating easy separation of the parts.

In the modification of Figs. 5 and 6 the cap 16, contacts 17 and 12 and the retaining members 21 are substantially the same as the modification of Figs. 1 to 4. The insulating base 61 supports a threaded shell contact 62 which has inwardly extending flange portions 63 and 64 which engage the flat sides of an upright projection 65 to prevent rotation of the shell 62 with respect to the base 61. The flange portion 63 has an opening 66 therein through which extends the reduced portion 21 of the retaining member 22, the prongs 23 being riveted over above the flange 63 to hold the retaining member 22 in place and to hold the shell 62 in place on the base 61. The center contact 67 comprises a horizontal portion 68 for engagement with the center contact of the receptacle, a vertical portion 69 engaging one of the flat sides of the upright projection 65 and a horizontal portion 70 having an opening 71 therethrough through which the portion 21 of the retaining member 22 extends to hold the retaining mem-

ber 22 in place and also to hold the center contact 67 and the shell contact 62 in place on the base.

An insulating strip 72 is provided between the portion 70 and the flange portion 64 of the shell contact, the flange portion 64 being provided with an enlarged opening 73 through which the reduced portion 21 extends, the walls of the opening 73 being spaced from the reduced portion 21 to prevent electrical contact. In this modification the cap 16 separates from the base in the same manner as in the modification of Figs. 1, 2, 3 and 4. The circuit through the plug is from the center contact 68, through the retaining member 22, contacts 12 and 17, through the circuit of the translating device to the contacts 17, through the contacts 12 and retaining member 22 to the threaded shell contact 62.

While I have shown and described my invention in connection with the separable attachment plug it is obvious that in some of its aspects the invention is not limited to attachment plugs.

Certain subject-matter shown herein is claimed in my copending application, Serial No. 350,369, filed January 9, 1920.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

1. In a device of the character described, an insulating base having a recess therein provided with an abutment, and an opening leading from said recess adjacent said abutment, a flat metal retaining member extending through said opening and having a shoulder engaging said abutment, and a pair of spring contacts within said recess secured to opposite sides of said retaining member out of engagement with said abutment.

2. In a device of the character described, an insulating base having an elongated recess therein, a pair of contact blades extending longitudinally of said recess, the walls of said recess extending beyond said blades, the ends of said blades having guide portions narrower than said blades extending away from each other, said base hav-

ing additional recesses narrower than said blades to afford clearance for the projecting ends of said fingers.

3. An attachment plug receptacle having an insulating body pierced to afford a contact chamber, a receptacle terminal in said chamber and a tongue and groove engagement between said terminal and a wall of said chamber, said tongue being arranged to prevent the entry of the jack of a cooperating plug into engagement with one side of said terminal for the purpose described.

4. An attachment plug receptacle having an insulating body pierced to afford a contact chamber, a receptacle terminal in said chamber and a tongue and groove engagement between the free end of said terminal and the wall of said chamber, said tongue being arranged to prevent the entry of the jack of a cooperating plug into engagement with one side of said terminal.

5. An attachment plug receptacle having an insulating body pierced to afford a contact chamber, a receptacle terminal in said chamber and a tongue and groove engagement between said terminal and the wall of said chamber, said tongue being arranged to prevent the entry of the jack of a cooperating plug into engagement with one side of said terminal, the engaging parts being of less width than the width of the terminal.

6. An attachment plug receptacle having an insulating body pierced to afford a contact chamber, a groove opening to said chamber and a terminal located in said chamber and having a portion extending into said channel to deflect the jack of a cooperating plug into engagement with one face of said terminal.

7. An attachment plug receptacle having an insulating body pierced to afford a contact chamber, a groove opening to said chamber, and a terminal located in said chamber and having at its free end a portion extending into said groove to deflect the jack of a cooperating plug into engagement with one face of said terminal.

In witness whereof, I have hereunto subscribed my name.

REUBEN B. BENJAMIN.