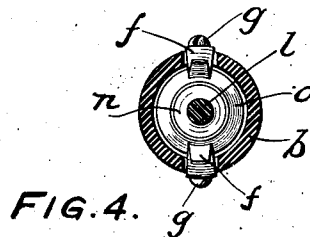
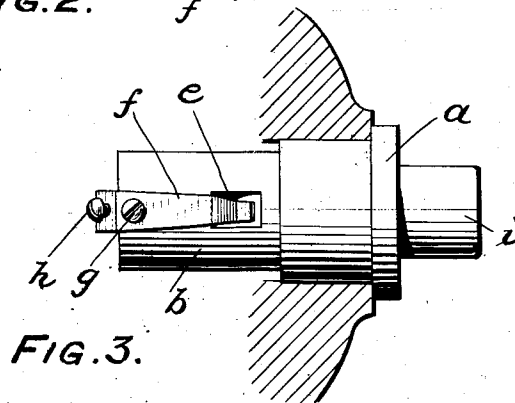
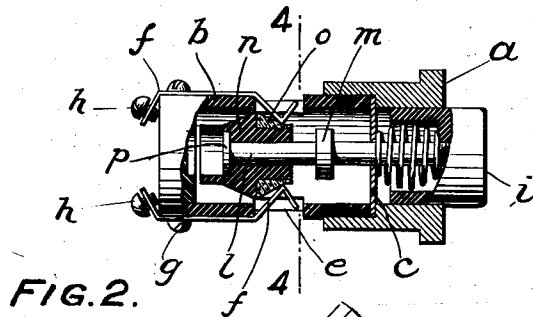
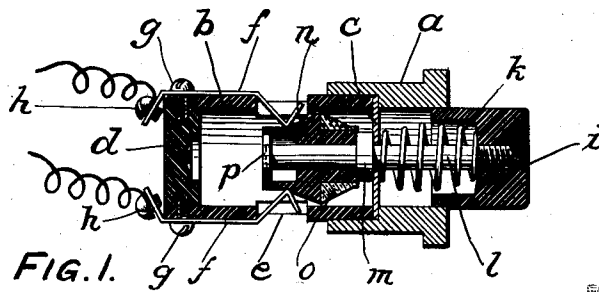


F. E. ALTEMUS.
 PUSH BUTTON.
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994,493.

Patented June 6, 1911.



WITNESSES:

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FORREST E. ALTEMUS, OF PHILADELPHIA, PENNSYLVANIA.

PUSH-BUTTON.

994,493.

Specification of Letters Patent.

Patented June 6, 1911.

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To all whom it may concern:

Be it known that I, FORREST E. ALTEMUS, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Push-Buttons, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to push buttons for high tension currents in open or closed circuit work, and has for its special object to prevent arcing and consequent burning of the contact points and at the same time enable the same to be constructed cheaply and inexpensively.

In the drawings: Figure 1 is a longitudinal section through the push button. Fig. 2 is a similar view showing the push-button in a retracted position; Fig. 3 is a side elevation. Fig. 4 is a section on the line 4-4, of Fig. 2.

a is a holding sleeve, preferably of brass, having in its rear end an annular internal recess in which is inserted a cylindrical shell *b*, of fiber or other insulating material. *c* is a disk confined between the front end of the shell *b* and the internal shoulder formed by said recess. The rear end of shell *b* is closed by the head *d*, also of fiber. The member *b* is provided, in its circular wall, with oppositely disposed orifices *e*, into which extend the V-shaped front ends of spring contact strips or fingers *f*. Near their rear ends, these contact strips are secured to shell *b* by screws *g* which extend through strips *f* and shell *b* and into head *d*, by which means also the head *d* is secured in place. The ends of the strips *f* are, beyond screws *g* bent inwardly at an angle, where they are engaged by the binding screws *h*, adapted to connect them respectively with opposite poles of an electric circuit.

Extending into the front end of holding sleeve *a* is a button or finger piece *i*, also of fiber, having a rearwardly extending annular flange forming a recess to receive the front end of a coiled spring *k*, which surrounds the front end of a rod or stem *l*, threaded into the head of finger piece or button *i* and extending rearwardly through the disk *c* beyond the front ends of the con-

tact strips *f*. The spring *k* is confined between the finger piece *i* and the disk *c*.

Secured to the stem *l*, in the rear of disk *c*, is a collar *m*. Loosely sleeved on the stem *l* is a contact carrier *n*, circular in cross-section, also of fiber. The front part of carrier *n* is provided with an external annular recess, in which is inserted a beveled annular bridging contact or contact ring *o*, of brass or other conducting material, whose outer face slopes inwardly and forwardly. From the outer rear edge of ring *o*, the carrier *n* slopes inwardly and rearwardly. The rear end of carrier *n* comprises an annular flange spaced from the stem *l*. Threaded on the rear end of stem *l* is a collar *p* which fits loosely within the recess formed by the last-named flange.

The operation of the push-button is as follows: When the finger piece *i* is pressed rearwardly, against the tension of spring *k*, the collar *m* pushes rearwardly the carrier *n*, the spring contact strips *f* riding up the rear beveled face of carrier *n* and being meanwhile pressed outwardly. As soon as the contacts *f* reach and override the ridge at the junction of the oppositely beveled faces of the carrier *n*, the latter, under the impetus of the spring contacts *f*, is quickly pushed rearwardly along the stem *l* until its movement is arrested by the collar *p*, as shown in Fig. 2. During this movement, and so long as the finger piece is depressed, the two contact strips *f* are in electrical connection through the conducting ring *o*, allowing current to pass from one strip *f* to the other. When the pressure on the finger piece *i* is released, the spring *k* pushes the same and the stem *l* forwardly. The collar *p* carries forward the carrier *n* until the ridge thereof underrides the contact strips *f*, and then the latter, in springing inwardly toward their normal positions, push forwardly the carrier *n* until its movement is arrested by the engagement of collar *m* with disk *c*.

By the foregoing construction, contact is broken very quickly, while the current is opened simultaneously at two widely separated points, thus minimizing arcing and enabling the push-button to be employed in connection with currents of comparatively high voltage.

Having now fully described my invention,

what I claim and desire to protect by Letters Patent is:

1. A push button comprising a movable contact carrier, a collar against which said contact carrier normally rests, means to manually move said collar in one direction thereby moving said contact carrier a part of its travel in one direction, a second collar also connected with said manual means, a spring compressed by said manual means and adapted when expanded to return said collars to their normal position, thereby moving the contact carrier a part of its travel in the opposite direction, and a spring normally inoperative but adapted in said partial movement of the contact carrier to be rendered operative to move said contact carrier from one collar to the other to complete its movement in either direction.

2. A push button comprising a contact carrier having a face sloping inward toward its end, spring-operating means adapted to ride along said face, and manually operated means adapted to move said carrier into position to cause said spring-operating means to ride on to said sloping face, said carrier being movable independently of said manually-operated means to permit the spring-operating means to slide along the sloping face of the carrier and thereby complete the movement of the carrier.

3. A push button comprising a contact carrier having a face sloping inward toward its end, spring-operating means adapted to ride along said face, a second spring-operating means adapted to move said carrier into position to cause the first spring-operating means to ride onto said sloping face, said carrier being movable independently of the second spring-operating means to permit the first spring-operating means to slide along the sloping face of the carrier and thereby complete the movement of the carrier.

4. A push button comprising a movable contact carrier, a bridging contact piece carried thereby, said carrier having a beveled face back of said bridging contact, spring-operated contacts arranged to engage said bridging contact and adapted, when they ride to the rear of said bridging contact, to ride along said beveled face and propel the carrier forwardly, and manually operated and spring operated means connected with the carrier and adapted to move said bridging contact toward and along said spring operating contacts.

5. A push button comprising a movable contact carrier, spring operating contacts, a bridging contact carried by the carrier, and spring-operated means connected with, and having a limited movement relatively to, the carrier and adapted to operate the carrier to move it substantially into position to cause the connection between the bridging contact and the spring operating contacts to

be broken, said carrier having an inwardly sloping wall behind said bridging contact adapted to be engaged by said spring-operating contacts, whereby the movement of the carrier is completed.

6. A push button comprising a contact carrier having faces sloping inwardly in opposite directions, a contact on the forward sloping face, spring-operating contacts adapted to ride along said faces, and manually operated means adapted when operated to move said carrier into position to cause said spring-operating contacts to override the high point of the carrier onto the sloping contact face, said carrier being movable independently of said manually operated means to permit the spring-operating contacts to slide along the sloping contact face of the carrier and thereby move the latter.

7. A push button comprising a contact carrier having faces sloping inwardly in opposite directions, a contact on the forward sloping face, spring-operating contacts adapted to ride along said faces, and spring-operating means adapted to move said carrier into position to cause said spring-operating contacts to override the high point of the carrier beyond the sloping contact face, said carrier being movable independently of said spring-operating means to permit the spring operating contacts to ride along the rear sloping face of the carrier and thereby move the latter.

8. A push button comprising a contact carrier having an inwardly and forwardly sloping contact face, spring-operating contacts adapted to ride along said sloping contact face, means connected with said carrier adapted when operated to move said carrier rearwardly into position to cause said spring-operating contacts to ride onto said sloping contact face, said carrier being movable independently of said operating means to permit the spring-operated contacts, under their own impulse, to slide along the sloping face of the carrier and thereby complete and accelerate its rearward movement.

9. A push button comprising a contact carrier having an inwardly and rearwardly sloping face, a contact on said carrier in front of said sloping face, spring-operating contacts pressing against said carrier and adapted to ride along said sloping face and said contact, means connected with said carrier adapted when operated to move said carrier forwardly into position to cause said spring-operating contacts to ride onto said sloping face, said carrier being movable independently of said operating means to permit the spring-operated contacts, under their own impulse, to slide along the sloping face of the carrier and thereby complete and accelerate its forward movement.

10. A push button comprising a contact carrier having faces sloping in opposite di-

reactions, spring-operating contacts adapted, by engaging said sloping faces, to move said carrier in opposite directions, a bridging contact carried by the carrier and adapted, 5 by said engagement of the spring-operating contacts therewith, to electrically connect the same, a device connected with, and having a limited movement relatively to, the carrier and adapted to be operated to move 10 the carrier into position to be actuated by said spring-operating contacts in one direction, and a spring connected with and actuating said device in the other direction and thereby adapted to move the carrier into 15 position to be actuated by said spring contacts in the other direction.

11. A push button comprising a contact carrier having faces sloping inwardly in opposite directions, a contact on the forward sloping face, a rod on which said carrier is sleeved, collars on said rod between which the carrier is movable, spring contact fingers engaging opposite sides of the carrier and along which the sloping faces of the 25 carrier are relatively movable, a finger piece on said rod by means of which the same is pushed in one direction and a spring tending to push said rod in the opposite direction.

30 12. A push button comprising a holder, a shell having orifices, a disk within the holder whose edge is confined between the holder and shell, a rod extending longitudinally through said disk and within the 35 holder and shell, a finger piece on the rod and movable along the holder, a spring confined between the disk and finger piece, a contact carrier on the rod, said contact carrier having adjacent beveled faces sloping 40 inwardly in opposite directions, one of said beveled faces being formed of conducting material, collars on said rod between which the carrier is movable, and spring contact fingers secured to the shell and extending

through the orifices therein and along which 45 the beveled faces of the carrier are relatively movable.

13. A push button comprising a shell having opposing orifices, a head inserted in the rear thereof, spring contact fingers attached 50 to said shell and head and extending along the outside of the shell and projecting through said orifices, a contact carrier within the shell, having faces, sloping inwardly in opposite directions, adapted to contact 55 with and slide along said fingers, one of said beveled faces being formed of conducting material, a rod on which the carrier is supported, a finger piece secured to the rod, and a spring connected with and adapted to re- 60 turn the rod after it is moved in one direction by said finger piece.

14. A push button comprising a shell having opposing orifices, a head inserted in the rear thereof, spring contact fingers attached 65 to said shell and head and extending along the outside of the shell and projecting through said orifices, a contact carrier within the shell, having faces, sloping inwardly in opposite directions, adapted to slide 70 along said fingers, one of said beveled faces being formed of conducting material, a rod on which said carrier is sleeved, collars on the rod between which said carrier is movable, a holder for the shell, a disk at the 75 end of the shell confined at its edge between the shell and holder, a finger piece secured to the rod and movable along the holder, and a spring confined between the disk and 80 finger piece.

In testimony of which invention, I have hereunto set my hand, at Philadelphia, on this 19th day of February, 1909.

FORREST E. ALTEMUS.

Witnesses:

M. M. HAMILTON,
E. E. WALL.