

F. J. RUSSELL.

ROTARY SWITCH.

APPLICATION FILED MAY 13, 1907.

904,897.

Patented Nov. 24, 1908.

Fig. 1.

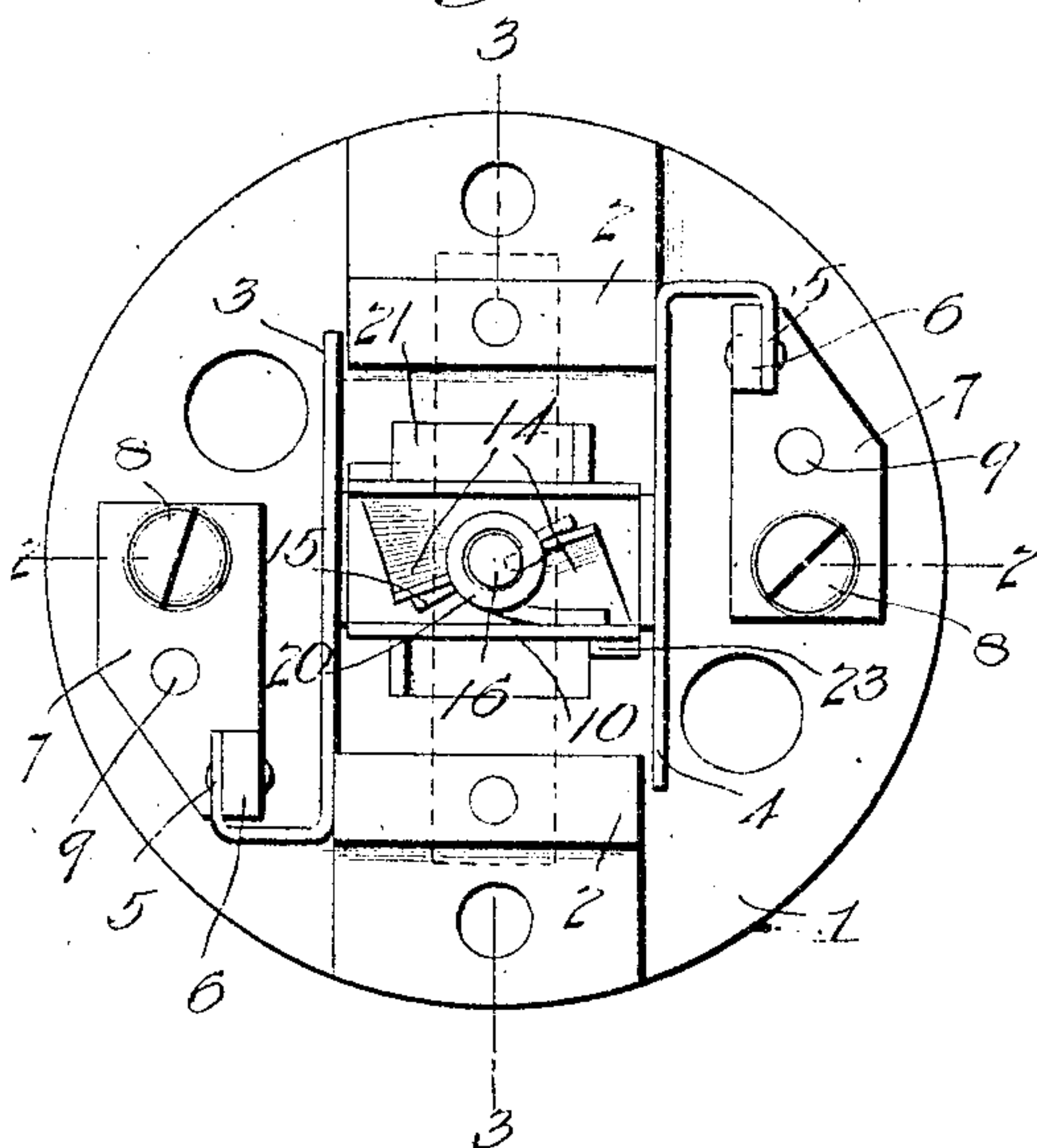


Fig. 2.

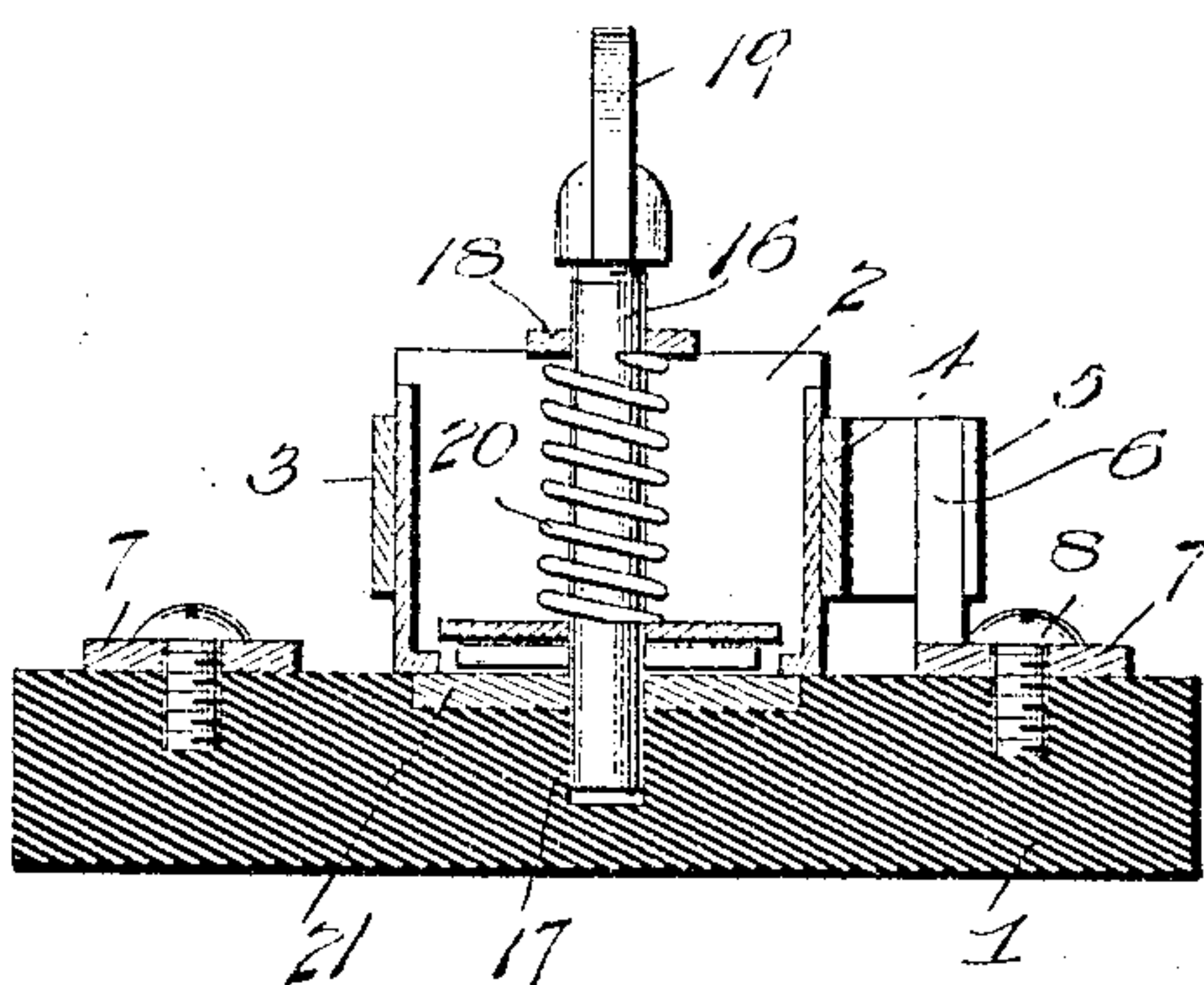
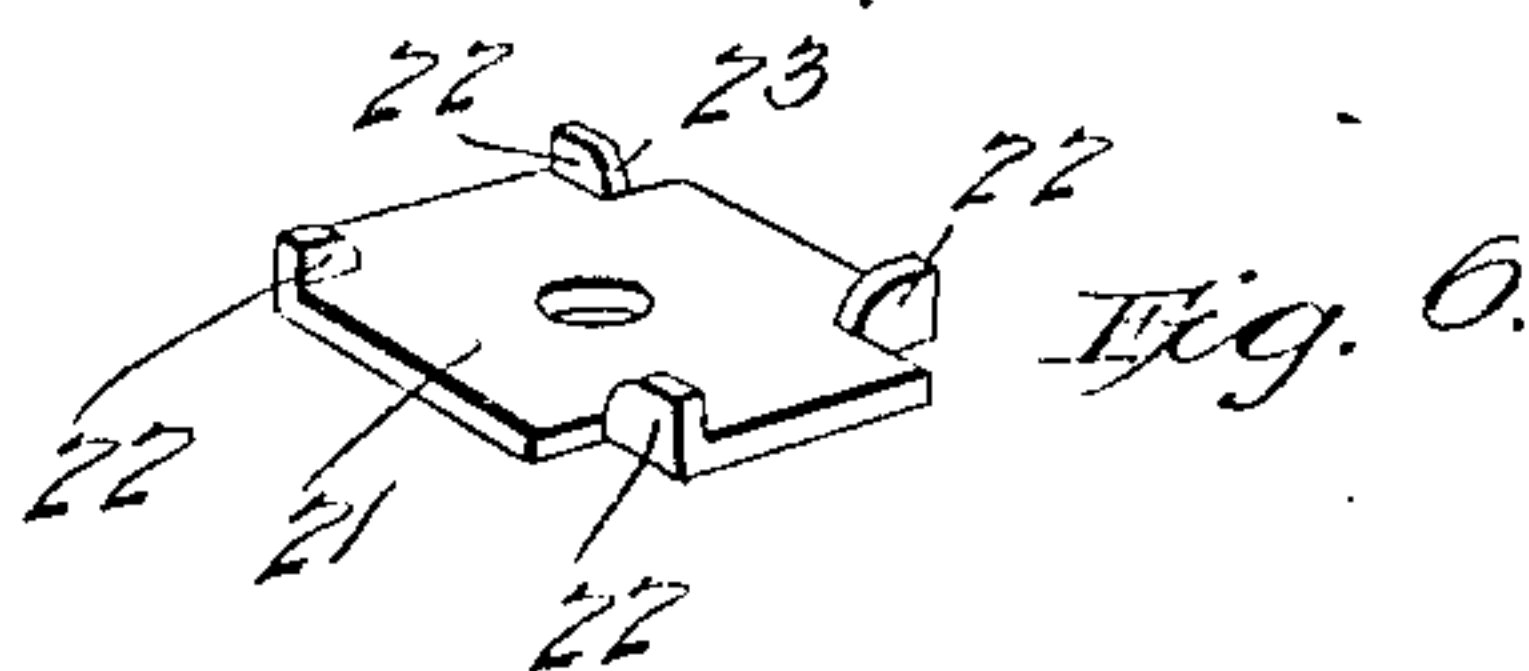
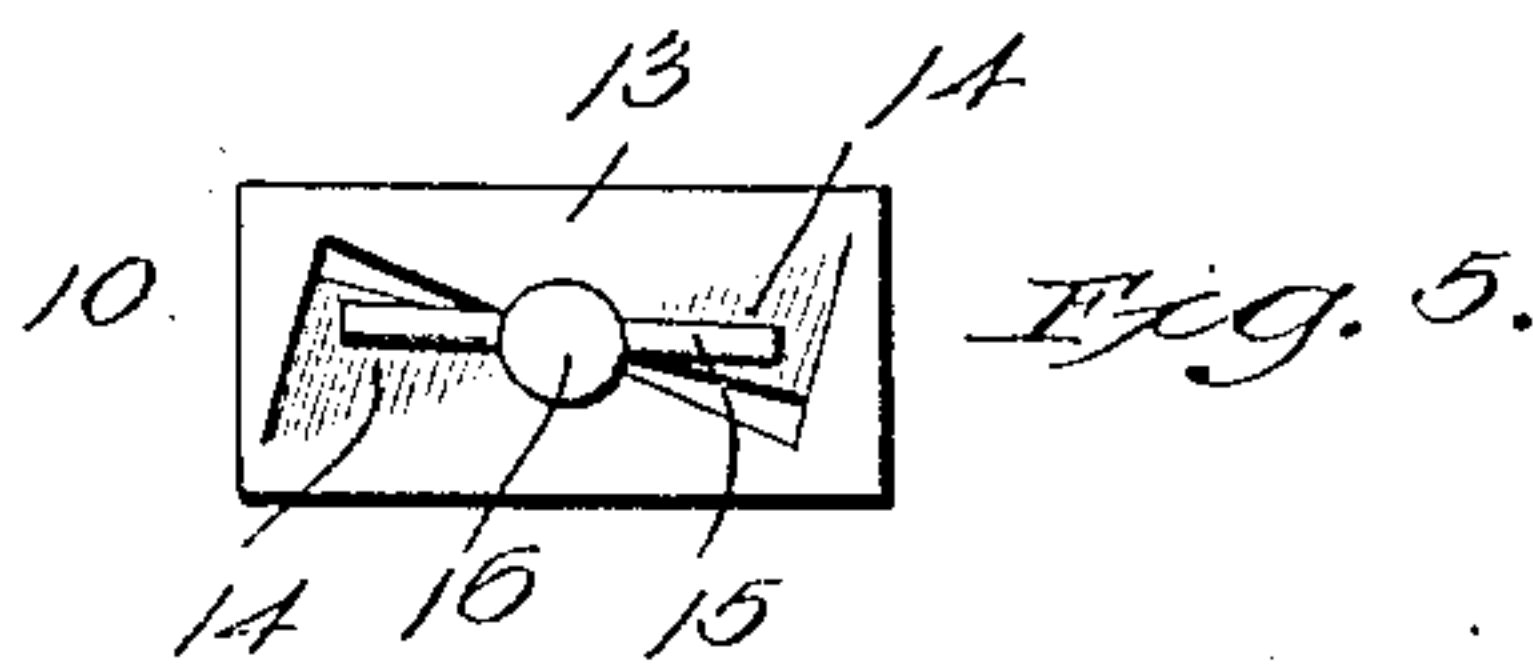
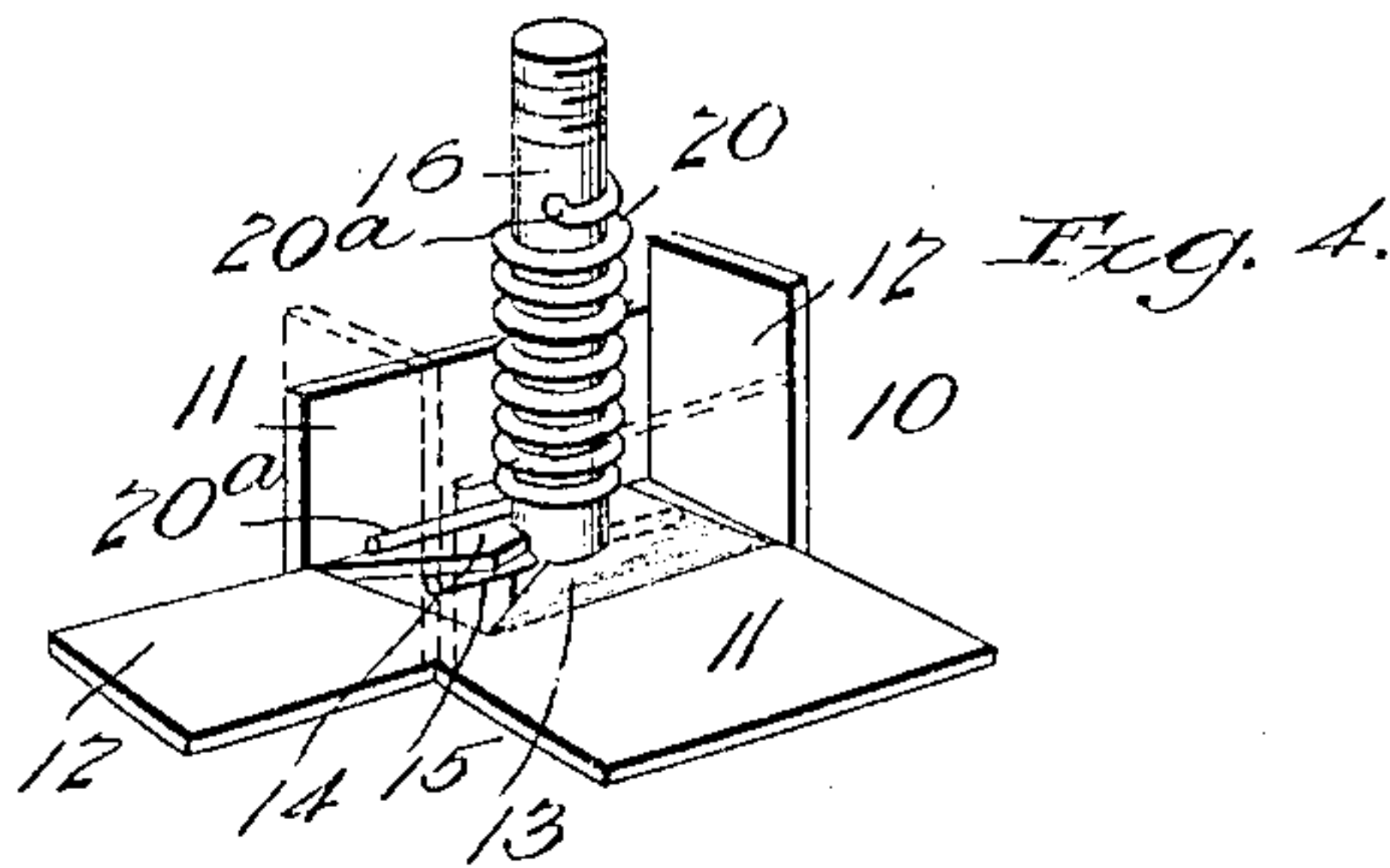
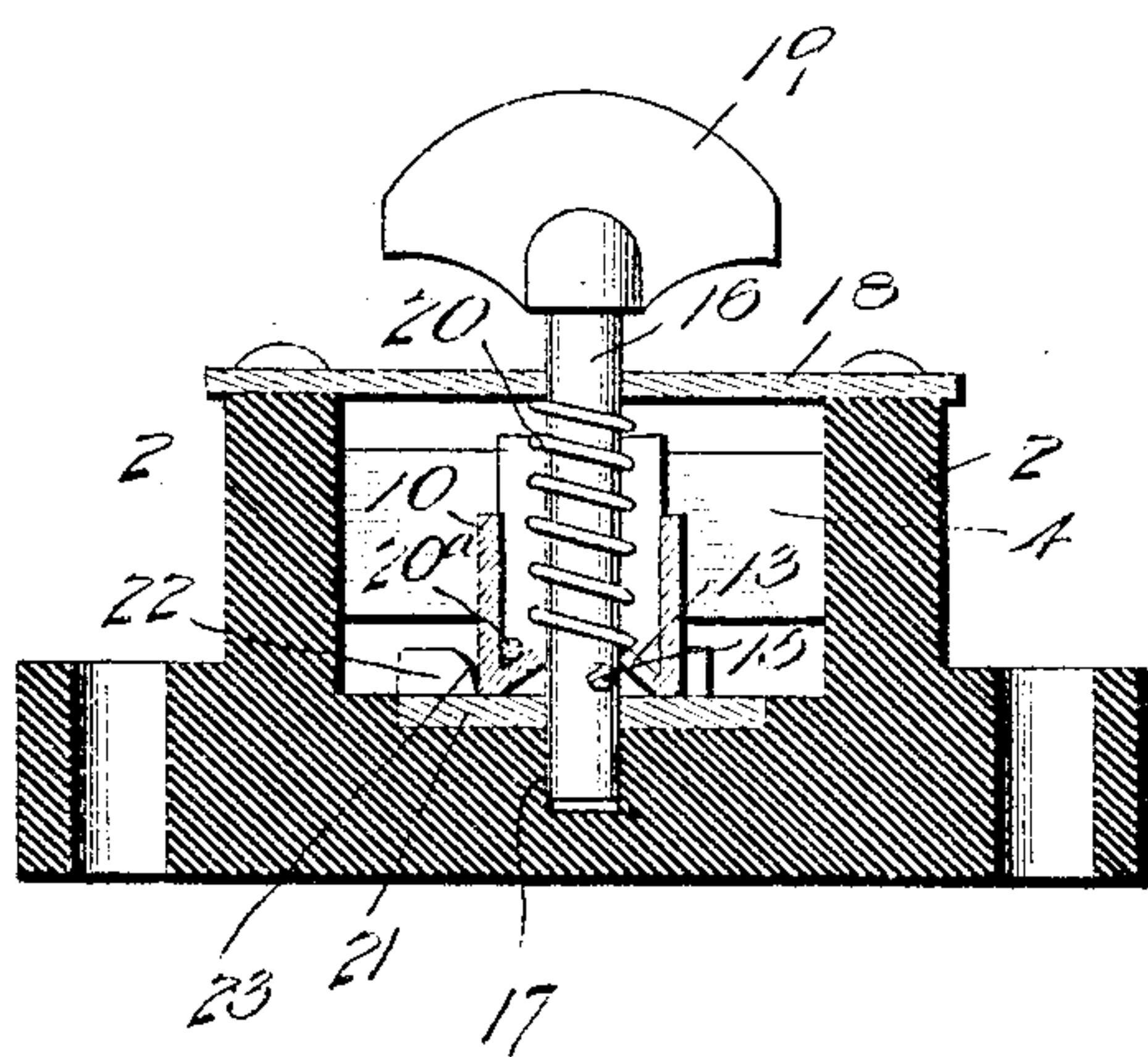


Fig. 3.



Witnesses

*G. L. Mock*  
*R. C. Braddock.*

Inventor

*Frank J. Russell*

By

*D. P. Wolhaupter.*

Attorney



# UNITED STATES PATENT OFFICE.

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

## ROTARY SWITCH.

No. 904,897.

Specification of Letters Patent.

Patented Nov. 24, 1908.

Application filed May 13, 1907. Serial No. 373,457.

*To all whom it may concern:*

Be it known that I, FRANK J. RUSSELL, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Rotary Switches, of which the following is a specification.

This invention relates to electric switches of the rotary type, and has in view a simple and practical device of this character embodying a minimum number of parts, while at the same time so constructed as to provide a very rapid action in the making and breaking of the circuit, thus permitting a large current to be carried by a small sized switch.

The invention further contemplates a switch construction wherein means are provided for normally locking against rotation the rotary switch part, thus positively securing the switch in an open or closed position. Also, in this connection, the invention has in view a simple, practical and thoroughly effective means for automatically disengaging the rotary switch part from its locking means by the act of turning the switch spindle, and for sharply and rapidly snapping or projecting said switch part forward when disengaged from its lock.

Another general object of the invention, is to provide a construction of switch having wide and full contact surfaces, and also involving a self-cleaning action for such surfaces.

With these and many other objects in view which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

The essential features of the invention, involved in carrying out the objects above indicated, are necessarily susceptible to structural change without departing from the scope of the invention, but a preferred embodiment of the latter is shown in the accompanying drawings, in which—

Figure 1 is a plan view (with the cover removed) of a rotary electric switch, constructed in accordance with the present invention. Fig. 2 is a sectional view of the switch on the line 2—2 of Fig. 1. Fig. 3 is a similar view on the line 3—3 of Fig. 1. Fig. 4 is a detail in perspective of the rotary

switch part or plug, illustrating the body thereof opened up. Fig. 5 is a bottom plan view of the rotary switch plug, and the switch spindle associated therewith. Fig. 6 is a detail in perspective of the locking member or plate for the plug.

Like references designate corresponding parts in the several figures of the drawings.

The improved switch claimed herein includes in its general organization, an insulating supporting or carrying base 1 usually of circular form, and made of the conventional or any suitable insulating material.

The base 1 has preferably formed thereon with a pair of integral, offstanding bracket arms 2 arranged in spaced relation and forming therebetween what may be characterized as a housing for the rotary switch part to be presently referred to, and also constituting abutments for the oppositely located stationary spring contacts 3 and 4. These contacts 3 and 4 are preferably in the form of oblong spring blades arranged in parallel relation to each other and also parallel to the base, and so disposed as to rest with a slight spring pressure against the sides of the bracket arms 2, as best shown in Fig. 1 of the drawings. Each of the opposite stationary spring contact blades 3 and 4 is secured fast at one end as at 5, to an offstanding supporting arm 6 carried by a wire terminal connection consisting of a terminal plate 7 and a binding screw 8 mounted in said plate, the latter being held to the base by a fastening screw 9.

Coöperating with the oppositely arranged stationary spring contacts 3 and 4, is the rotatable switch part designated in its entirety, by the reference number 10. This switch part may be properly termed a switch plug, inasmuch as the same constitutes the sole bridging connection for closing the electrical circuit between the opposite contacts, and in this connection it will be observed that the said plug consists of a sheet metal body stamped up from a single blank of sheet metal into rectangular form and having its side and end walls 11 and 12, bent up from the edges of a bottom piece 13. This bottom piece is slitted or cut obliquely to provide the triangularly shaped bearing wings 14 which are arranged in diagonally opposite relation, and are deflected inwardly within the body of the plug so as to set at an inclination and thereby form opposite reversely, but spirally, arranged wedge inclines, adapted to be



engaged by the opposite projecting portions of a lifting pin 15. The said pin 15 is fitted in the inner end portion of the rotary switch spindle 16 having a step bearing at its inner  
5 extremity as at 17, in the base 1, and having its outer end portion turn in a bearing opening provided in the cross bar 18 connecting, and secured to, the opposite bracket arms 2. The outer extremity of the spindle 16 has fitted thereto the usual turn button or handle  
10 19 which is grasped by the fingers in the usual manner for operating the switch.

The spindle 16 loosely receives thereon the rotatable switch plug 10 and the latter is  
15 adapted to be projected or snapped forward under the influence of a coiled snapping spring 20 arranged about the spindle and having one terminal connected with the latter and the other terminal as at 20<sup>a</sup>, engaged  
20 with the body of the plug 10.

The loose mounting of the plug on the spindle permits the plug to shift axially into and out of engagement with the locking member 21. This locking member is preferably in the form of a plate seated in the  
25 face of the base at the bottom of the housing between the arms 2 and provided at its corners with bent-up holding lugs 22 preferably formed with beveled guiding edges 23, to facilitate the seating of the bottom part of the plug on to the plate 21 between the lugs,  
30 as may be clearly seen in Figs. 1 and 3 of the drawings.

Normally, whether the switch is open or  
35 closed, the spring holds the plug seated on the locking plate between the lugs 22, and hence locked against rotation. Upon rotation of the spindle 16 in a direction for placing stress upon the spring 20, the lifting pin 15 is carried under the wedge inclines 14 with the result of causing the plug to be moved axially and lifted out of the plane of the holding lugs 22, whereupon the spring, under tension, sharply snaps the  
40 switch plug a quarter of a revolution around to either close or open the switch, and then the switch plug automatically shifts back and reseats itself into locking engagement with the locking member or plate.

50 The action of the switch plug serves to

keep the contact surfaces clean, while the construction of the plug itself affords a wide full contact with the stationary contacts.

It will of course be understood that changes in the form, proportion and minor  
55 details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

I claim—

1. In an electric switch, a base having  
60 stationary contacts, a rotatable switch plug having a bottom face slit to form triangular-shaped bearing wings, a spindle having projections engaging with said wings, a spring connection between the spindle and the plug,  
65 and locking means for normally engaging the said plug.

2. In an electric switch, a base having stationary contacts, and a rotatable switch plug stamped up from a single blank of sheet  
70 metal into rectangular form, the bottom wall of said plug being slit to form bearing wings.

3. In an electric switch, the combination with the stationary contacts, of a rotatable  
75 switch plug stamped up from a blank of sheet metal and having a bottom piece provided with deflected wings forming diagonally opposite cams, a stationary lock for the plug, a rotary spindle carrying a pin engaging said cams, and a spring connection  
80 between the spindle and plug.

4. In an electric switch, a base having off-standing bracket arms, oppositely disposed parallel spring contact blades each supported at one end, the free end of each blade  
85 abutting against one of said arms, a rotatable switch plug housed between the bracket arms and the said contact blades, whereby said blades will be moved away from said  
90 arms when in engagement with said plug, and means for locking, releasing and advancing the plug.

In testimony whereof I hereunto affix my  
95 signature in the presence of two witnesses.

FRANK J. RUSSELL.

Witnesses:

HELEN M. McCUE,  
ALBERT D. STOLL.