

L. KELLNER.  
TWO POLE SNAP SWITCH.  
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943,831.

Patented Dec. 21, 1909.

Fig. 1.

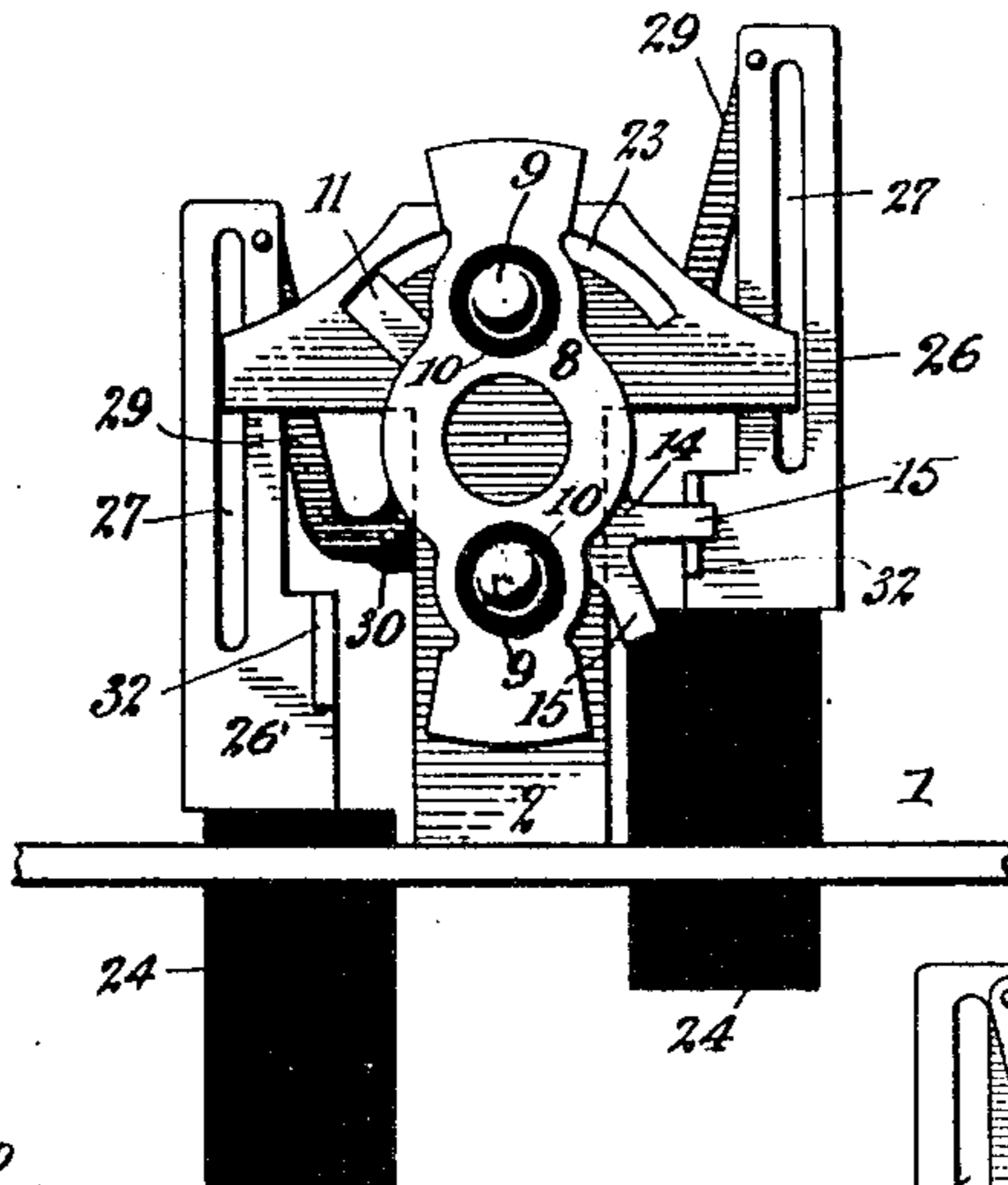


Fig. 2.

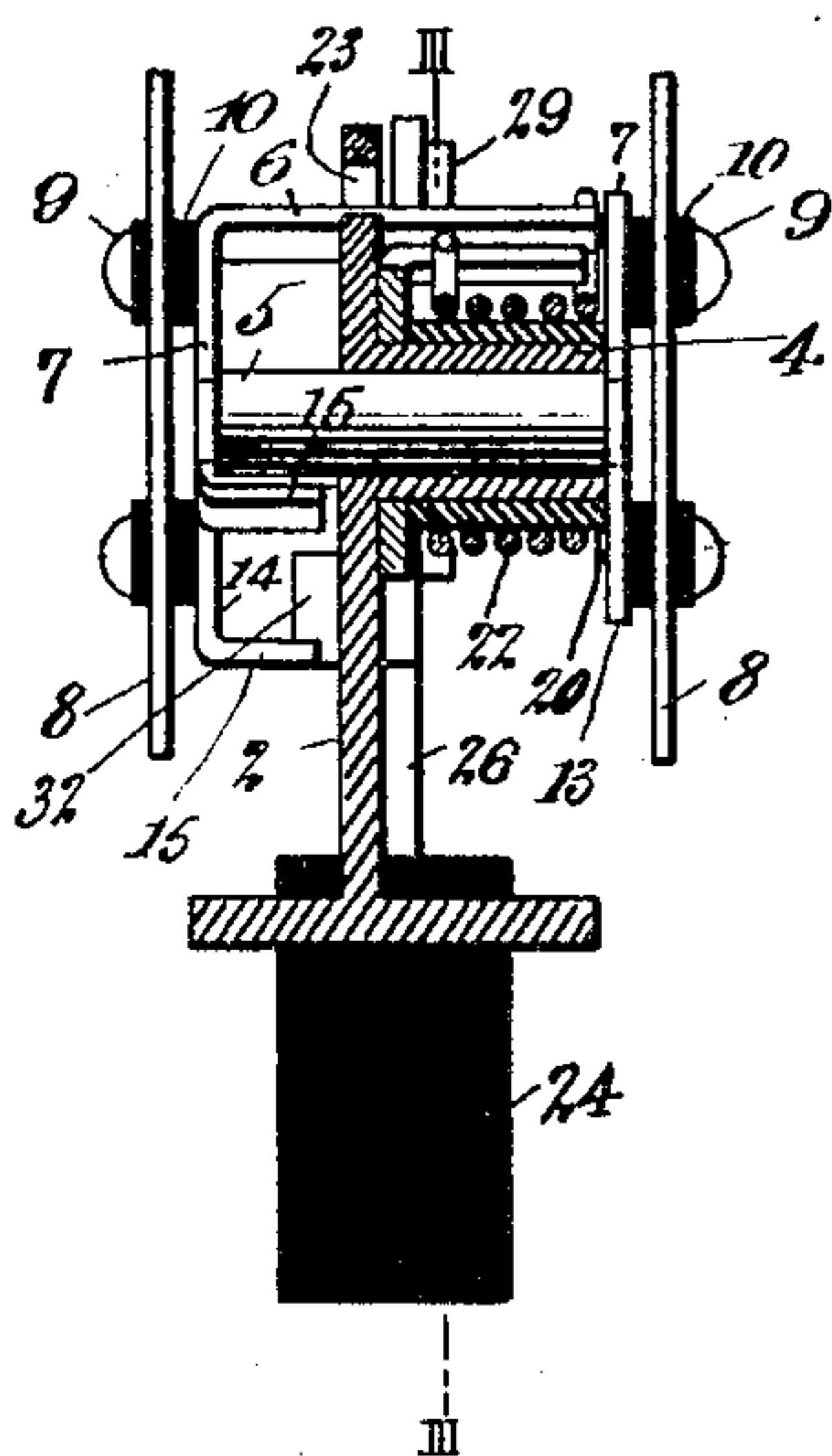


Fig. 3.

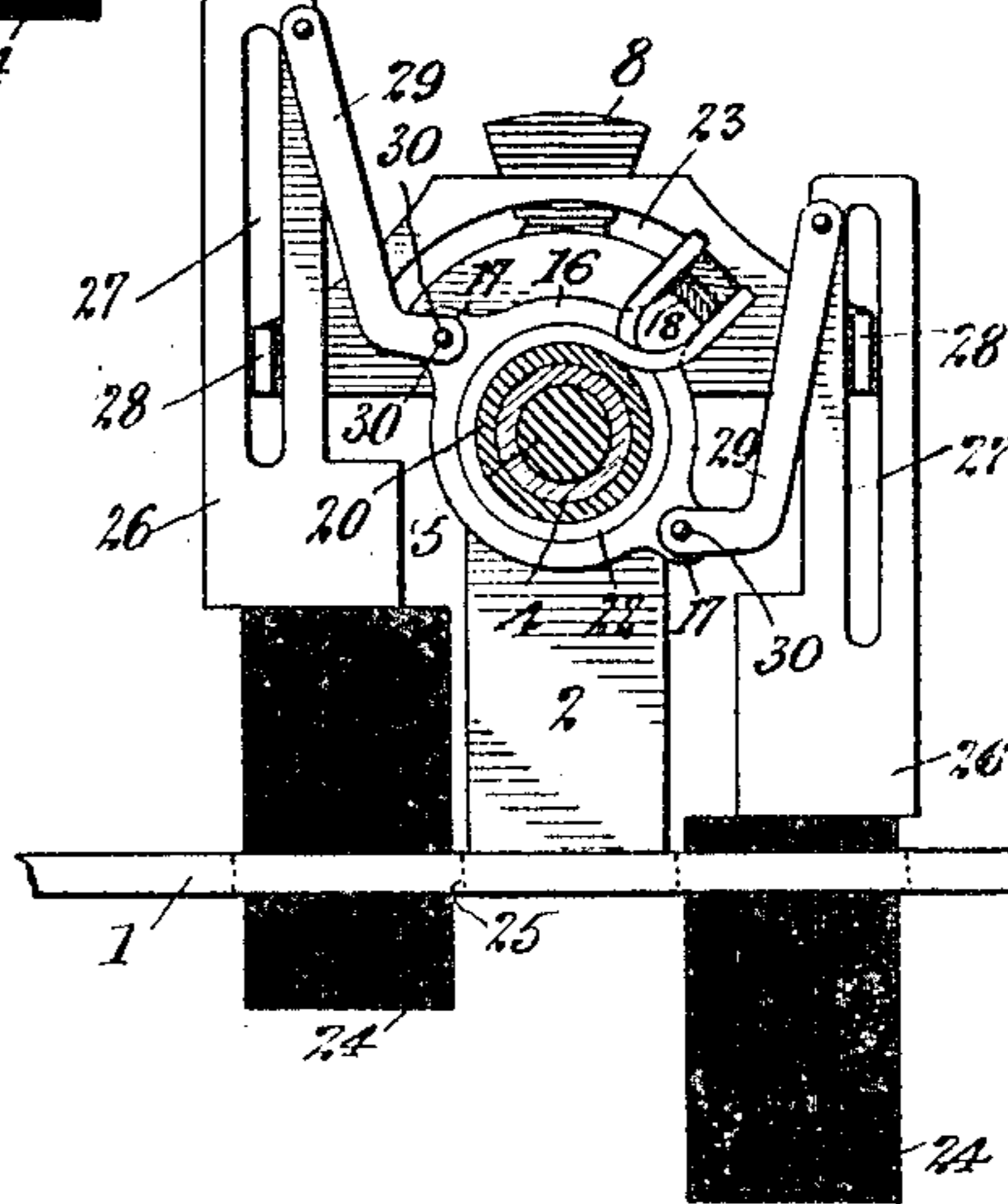


Fig. 4.

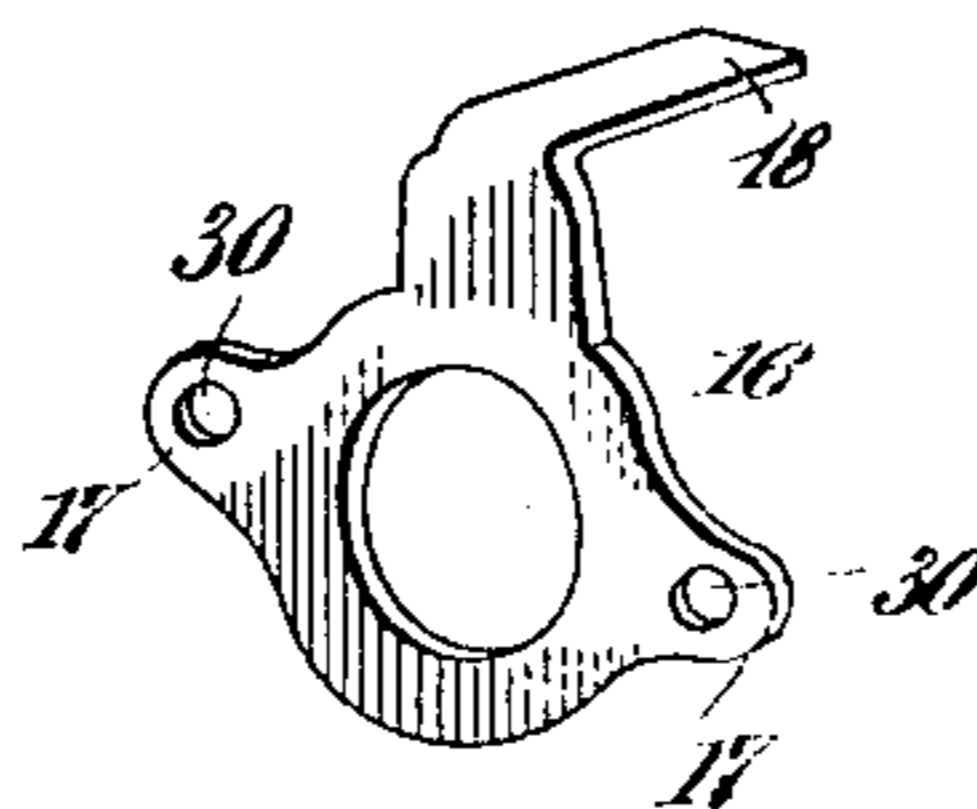


Fig. 5.

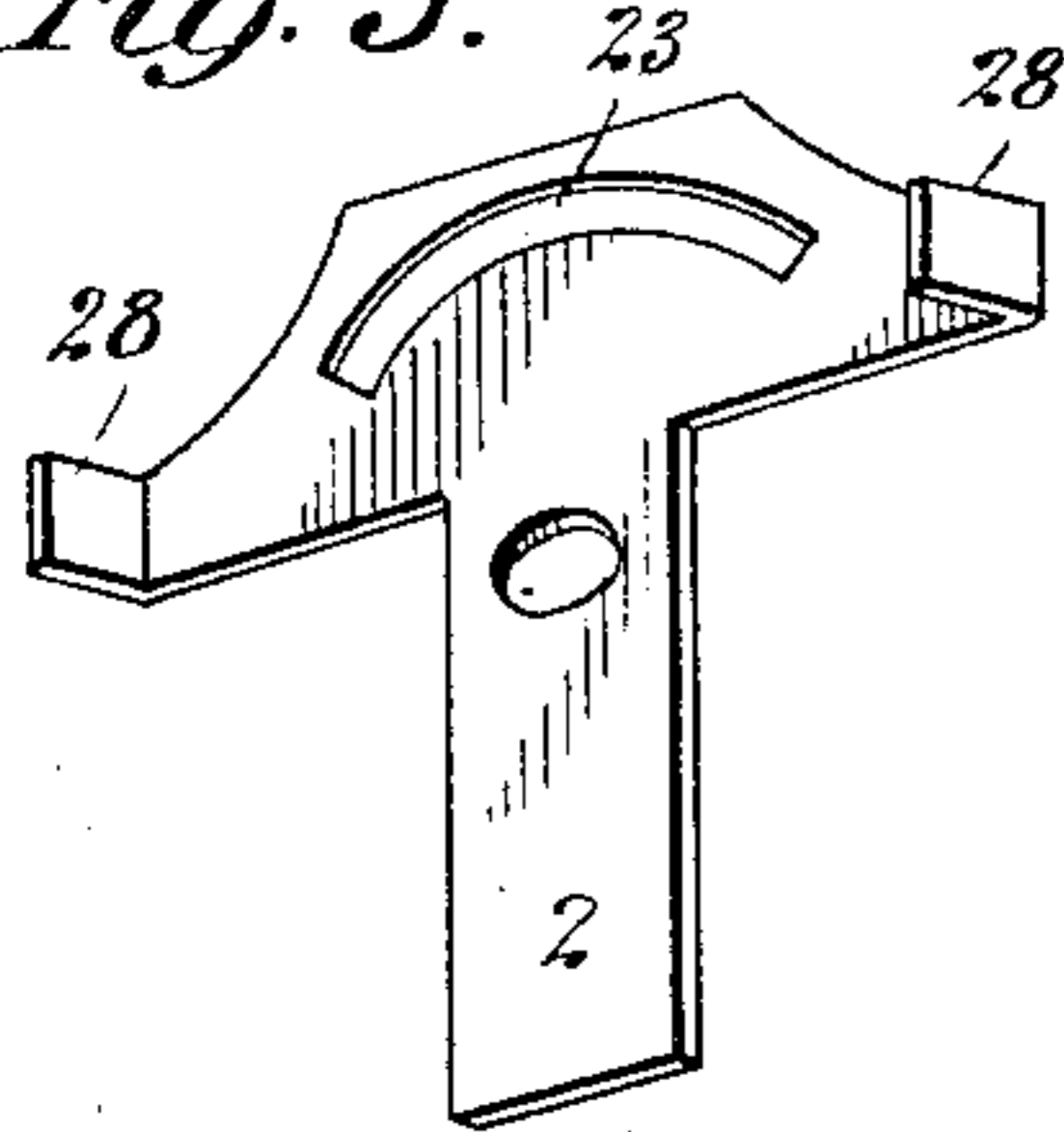


Fig. 6.

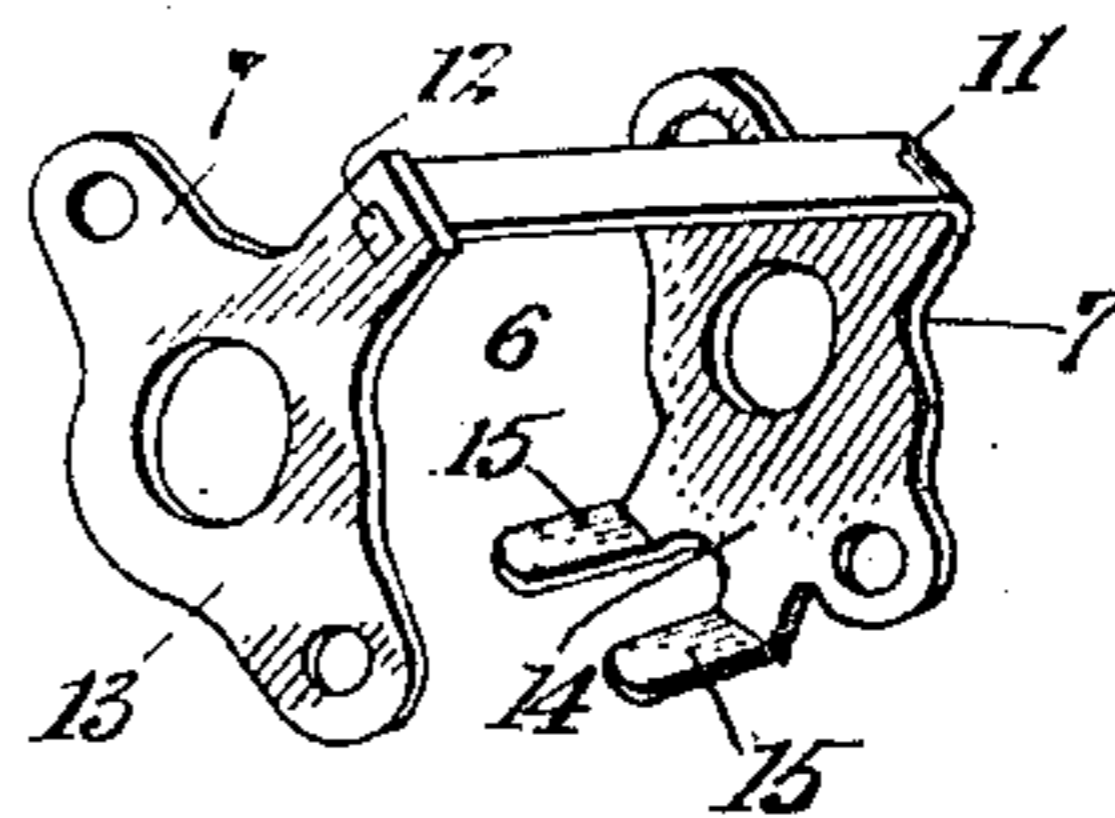
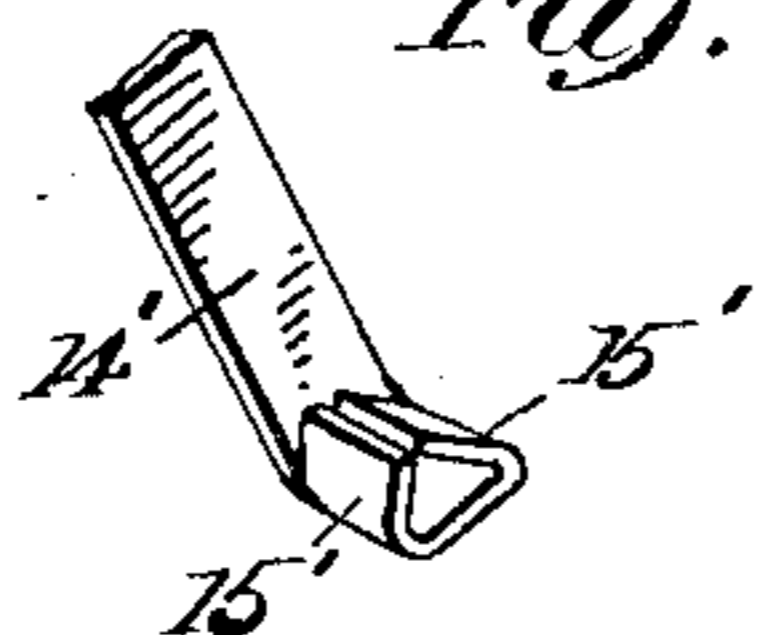


Fig. 7.



Witnesses:  
*Gauss. O. B.*  
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By his Attorneys  
*Rosenbaum & Stockbridge*

# UNITED STATES PATENT OFFICE.

LOUIS KELLNER, OF NEW YORK, N. Y., ASSIGNOR TO METROPOLITAN SWITCHBOARD CO., A CORPORATION OF NEW JERSEY.

## TWO-POLE SNAP-SWITCH.

943,831.

Specification of Letters Patent.

Patented Dec. 21, 1909.

Application filed November 17, 1908. Serial No. 463,037.

*To all whom it may concern:*

Be it known that I, LOUIS KELLNER, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Two-Pole Snap-Switches, of which the following is a full, clear, and exact description.

10 My invention relates to wall switches, particularly that type which is embedded in the wall, so as to be substantially flush with the surface thereof, and including a two button snap switch by which a circuit or  
15 plurality of circuits are controlled.

The present invention relates particularly to a mechanism for operating the switch elements abruptly in their circuit closing and circuit opening movements, and further insuring a 90° throw, so that the circuit is ruptured by the greatest possible sparking distance.

The present switch is designed to be of greater compactness and simplicity than the  
25 constructions hitherto used, making use of the stems of the operating buttons as detents to temporarily resist movement of the switch elements, until the operating spring has been tensioned enough to cause an abrupt throw. In connection with the dogs  
30 on the stems of the operating buttons, I provide a detent arm fixed to the switch elements and which is bent around so as to be engaged by the operating spring. The operating spring is tensioned by a rocker arm  
35 having link connections with the operating buttons.

With the foregoing and other objects in view, my invention consists of the features  
40 of construction and combination as herein-after set forth and claimed.

In the drawings: Figure 1 is a side elevation of a switch embodying the principles of my invention. Fig. 2 is a vertical sectional view of the same. Fig. 3 is a section  
45 on the line III—III of Fig. 2. Figs. 4, 5 and 6 are respectively detail perspective views of different parts employed. Fig. 7 is a detail view showing a modification.

50 Referring to the drawings in which like

parts are designated by the same reference sign, 1 designates a base which may be stamped of sheet metal, and carries a frame or standard 2, which supports the operating mechanism of the switch. The standard 2 is made in the form of a central vertical plate, to which is rigidly fixed a stud  
55 4 axially perforated to form a journal or bearing for the spindle 5, which carries the switch elements. The switch blades or elements may be fixed to the spindle 5 in any desired way. I prefer to make use of a U shaped bail or frame 6, having enlarged extremities 7 in which the spindle is received and which are riveted to the switch blades 8.  
60 Screws or rivets 9 with insulating bushings and washers 10 may be used for connecting the switch blades to the enlarged extremities of the bail 6. The switch blades are mounted at about a 45° angle with the radial plane of the bail 6, so that they swing from a horizontal to a vertical position when the bail is impelled between its two 45° positions, as will be later described. I conveniently construct the bail in two parts, one of which,  
75 (designated 11 in the drawings), is L shaped and has a reduced extremity 12; the other part 13 is a straight arm and is perforated at its outer end to receive the reduced extremity of the arm 11, which is peened or  
80 riveted over therein so as to make a substantially unitary structure. The bail also has a rigid downwardly extending detent arm 14 which is forked or bifurcated at its lower extremity into two divisions or ears  
85 15, which are bent at right angles therefrom and which extend in planes convergent toward each other at an angle of about 45° with a central radial plane of the arm.

Adjacent to the standard 2 and pivoted  
90 on the stud 4 I provide a rocker plate 16 having two laterally extending arms 17, which are provided with pivot connections, later described. The plate also has a bent over L shaped arm 18.

20 designates a sleeve or collar loosely surrounding the stud 4 and serving as a distance piece to hold the plate 16 firmly against the face of the standard 2, the other end of the collar abutting against the bail  
100

6 which is fixed to the spindle and carries the switch elements, as already described. This collar constitutes a drum upon which is received a spiral spring 22 having radi-  
 5 ally projecting extremities which embrace the arms 11 and 18 of the rocker plate and the bail respectively. The spring tension is such that the extremities of the spring are impelled toward one another and tend to  
 10 constrain the arms 11 and 18 which they embrace into the same radial plane of the spindle. If, for example, the arm 18 is deflected from any position, the bail tends to follow in such movement. The movement  
 15 of the bail carrying the switch blades is limited to a 90° throw by a curved slot 23 in the standard 2, through which the bail extends.

Any suitable means may be provided for  
 20 displacing the rocker plate 16 through its required angular movement of about 90°. I prefer a pair of push buttons 24 loosely received in holes 25 of the base 1, and which have stems 26 with slots 27, in which are  
 25 received corresponding bent over ears 28 of the standard 2. At its extremity each stem 26 has a link 29 pivoted thereto which extends inward and is pivoted to the arm 17 of the rocker plate at the point 30. It is  
 30 evident that the rocker plate may be displaced to its alternate position of throw by pushing inward one or another of the push buttons.

Each of the stems 26 of the push buttons  
 35 has a dog 32 formed by merely bending inward a portion of the edge of the stem, and this dog is in a path to intercept the movement of the detent ears 15 under certain circumstances. The length or longitudinal ex-  
 40 tent of each dog 32 is made just sufficient to receive an ear 15 past its outer end when the button is at its innermost position, and permit the passage of the ear past the other or inner end of the dog when the button is  
 45 at its outermost limit of throw.

The use in operation is as follows: Assuming the parts to be in the positions shown in Fig. 1 it is evident that inward pressure on the left-hand button will deflect the  
 50 rocker plate 6 and tension the spring 22 so as to impel the bail 6 and switch elements to their alternate positions. From the very beginning of the movement of the push button, and before the rocker plate has had any  
 55 opportunity to tension the spring and move the switch elements, the right-hand dog 32 has been passed behind the ear 15 of the detent arm so that the switch elements are prevented from moving, notwithstanding the  
 60 tension of the spring. This condition continues until the push button has been depressed to practically its limit of movement

and the spring is fully tensioned. At this time the dog 32 passes out of the path of the ear 15 so that the detent arm with the switch  
 65 elements is free to swing to its alternate position of throw, as impelled by the spring. Inasmuch as the other button is now at its outermost position of throw, the other dog 32 is out of the path of its ear 15, which  
 70 therefore swings in behind said dog to a position ready for the next actuation. The button returns somewhat when pressure thereon is released, due to the spring 22, locking the ear 15 behind dog 32.  
 75

By the foregoing process, the switch elements have assumed their alternate position of throw, which may correspond to 90° of angular movement. The result is a very abrupt make and break of the circuit, and  
 80 by a throw of the maximum possible distance.

It will be observed that the mechanism is very simple, no cams or other parts are employed, and the only detent is that formed  
 85 by the lugs on the stems of the push buttons. The bail which is embraced by the operating spring also serves the additional functions of limiting the angular movement and supporting the switch blades.  
 90

It is evident that no reliance is placed on the strength of the connection of any part to the operating spindle, which is not adapted to be made securely and should not be relied upon to transmit the operating strains of the mechanism.

In Fig. 7 a long detent arm 14' is employed on part 7 and having ears 15' which both swing past the dogs 32 and are deflected to properly cooperate therewith. This  
 100 is an obvious mechanical equivalent of the structure first described. This single detent arm serves all the functions of the two separate ears 15 of my first described construction. The detent arm 14' is made rather  
 105 long so that its lower extremity swings far enough to pass the dogs 32 on both sides. The ears 15' are retained by their contact with the dogs after they have been moved past the same.  
 110

What I claim is:

1. In a switch of the class described, a standard having ears 28, push buttons having slotted stems engaging said ears, switch mechanism having a rocker-plate, and link  
 115 connections from said push buttons to said rocker plate.

2. In a switch of the class described, a standard having ears 28, push buttons having slotted stems engaging said ears, switch  
 120 mechanism having a rocker plate, link connections from said push buttons to said rocker plate, and integral ears on said stems for temporarily resisting movement of the

switch elements, whereby they move abruptly to their alternate positions of throw at each actuation.

3. In a switch of the class described, a T-  
5 shaped standard having ears 28 at its outer extremities and having an intermediate curved slot, push buttons having slotted stems engaging said ears, switch mechanism having a rocker plate with an arm entering

the curved slot of said standard, and link 10 connections from said push buttons to said rocker plate.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

LOUIS KELLNER.

Witnesses:

WALDO M. CHAPIN,  
JAMES DE ANTONIO.