

H. E. LEPPERT.

SWITCH.

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999,808.

Patented Aug. 8, 1911.

Fig. 1.

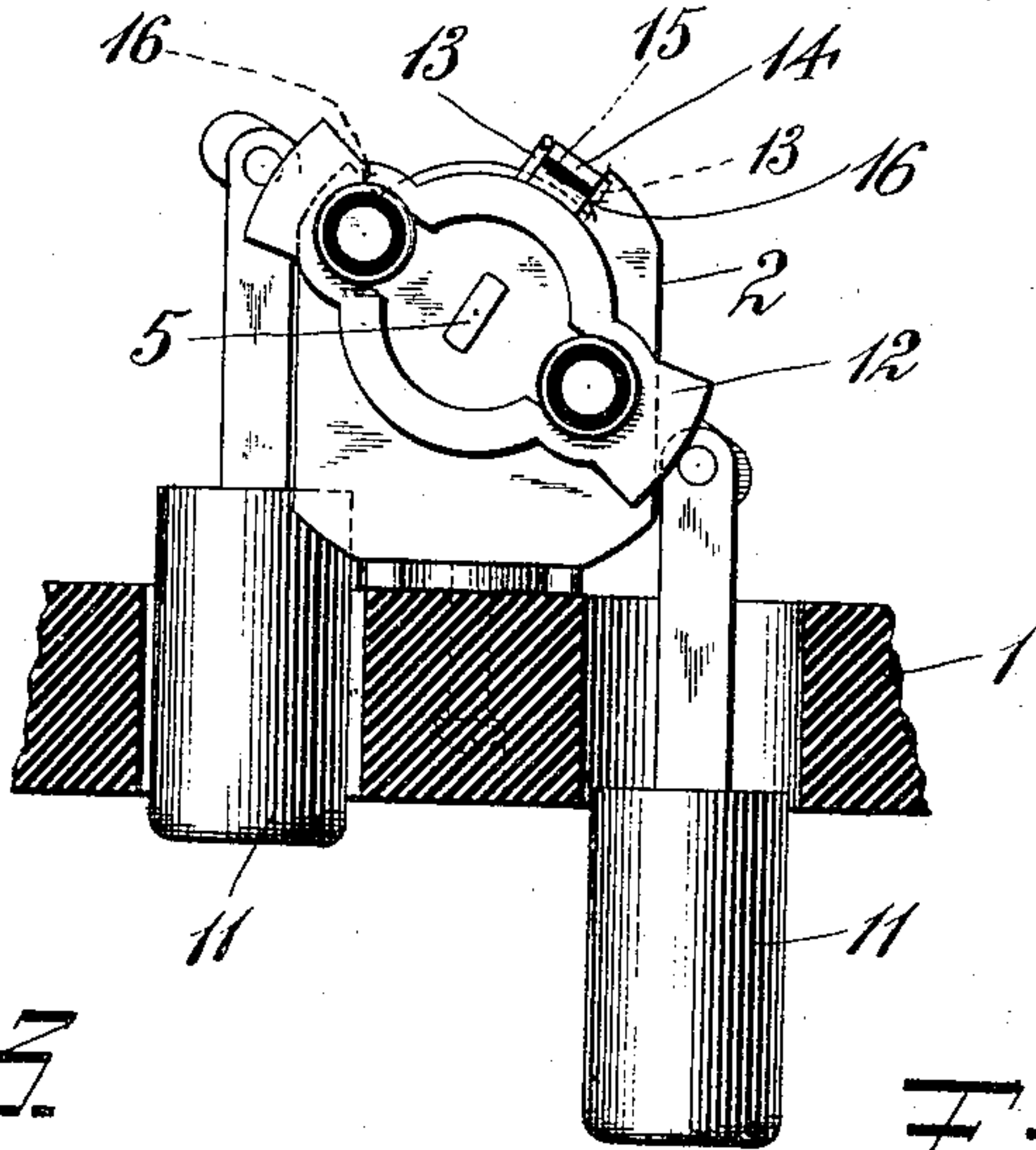


Fig. 3.

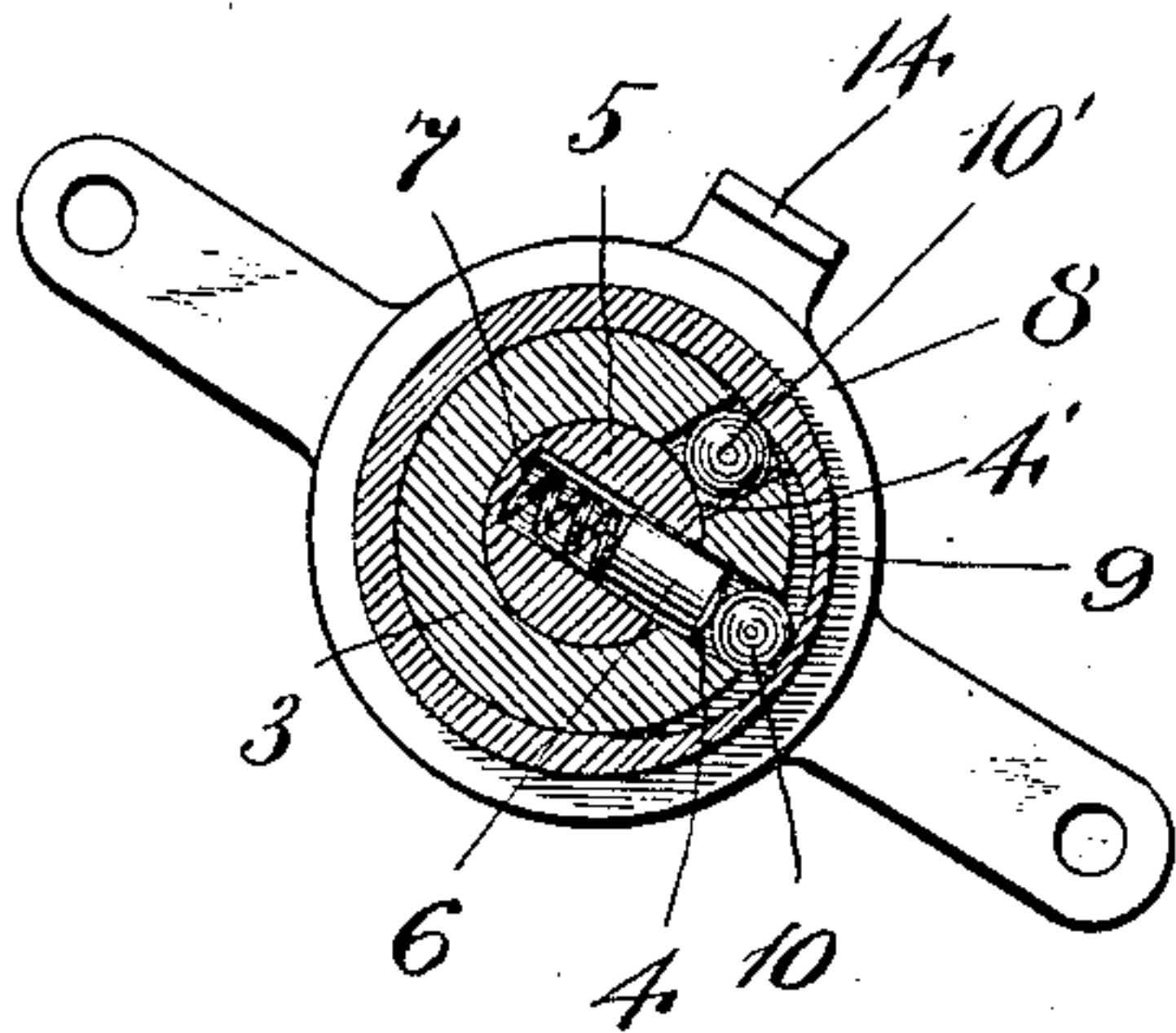


Fig. 4.

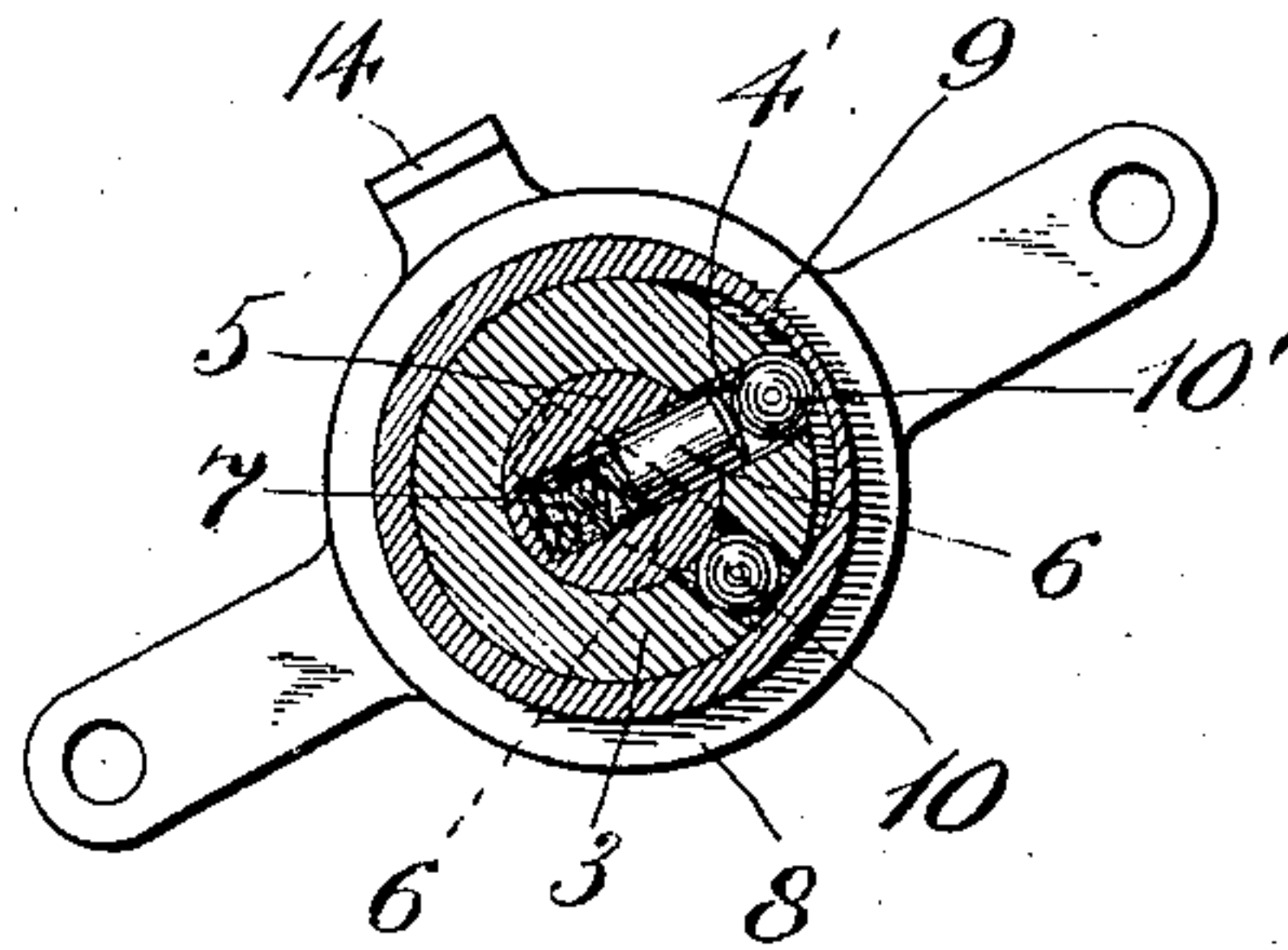


Fig. 2.

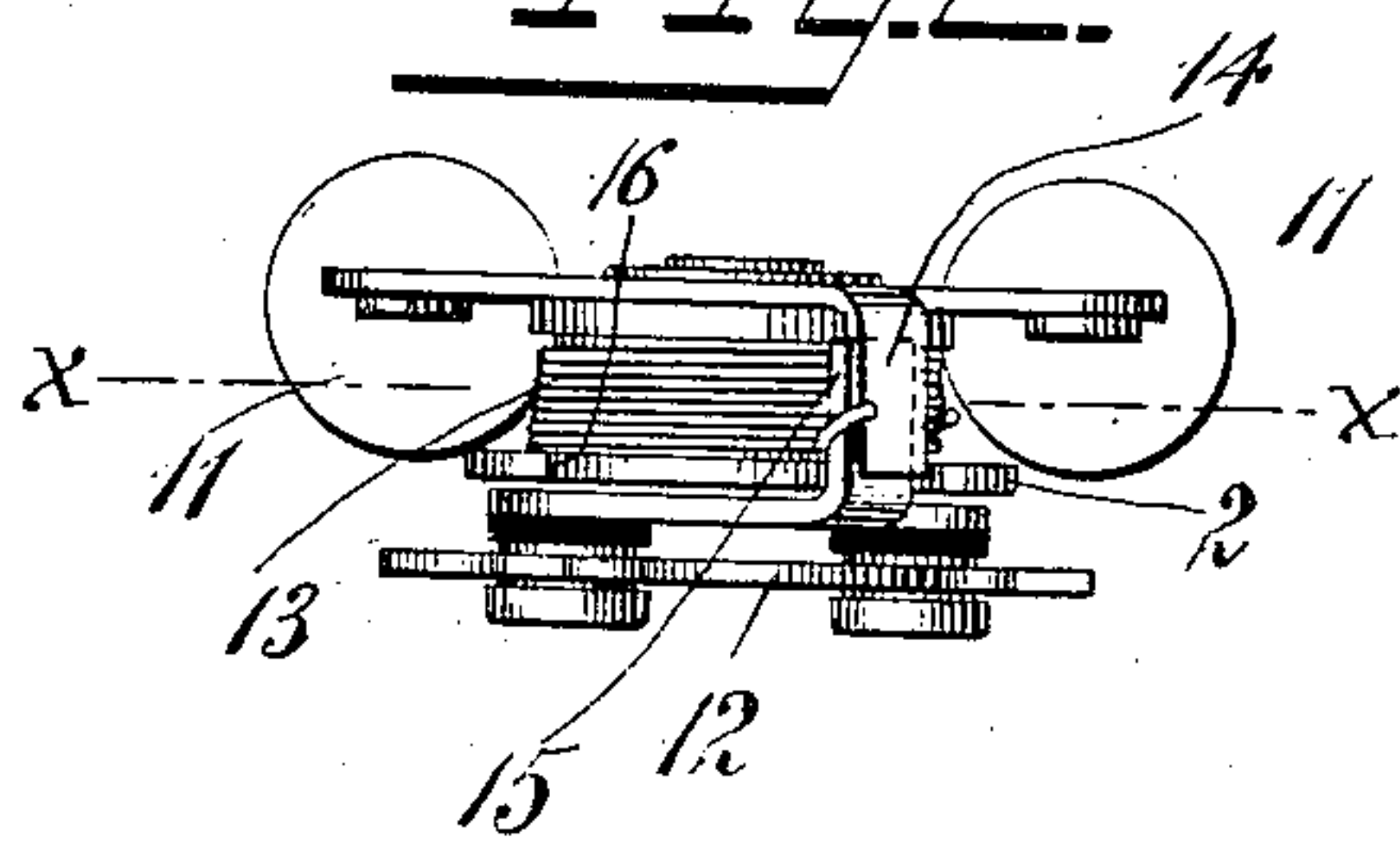


Fig. 5.

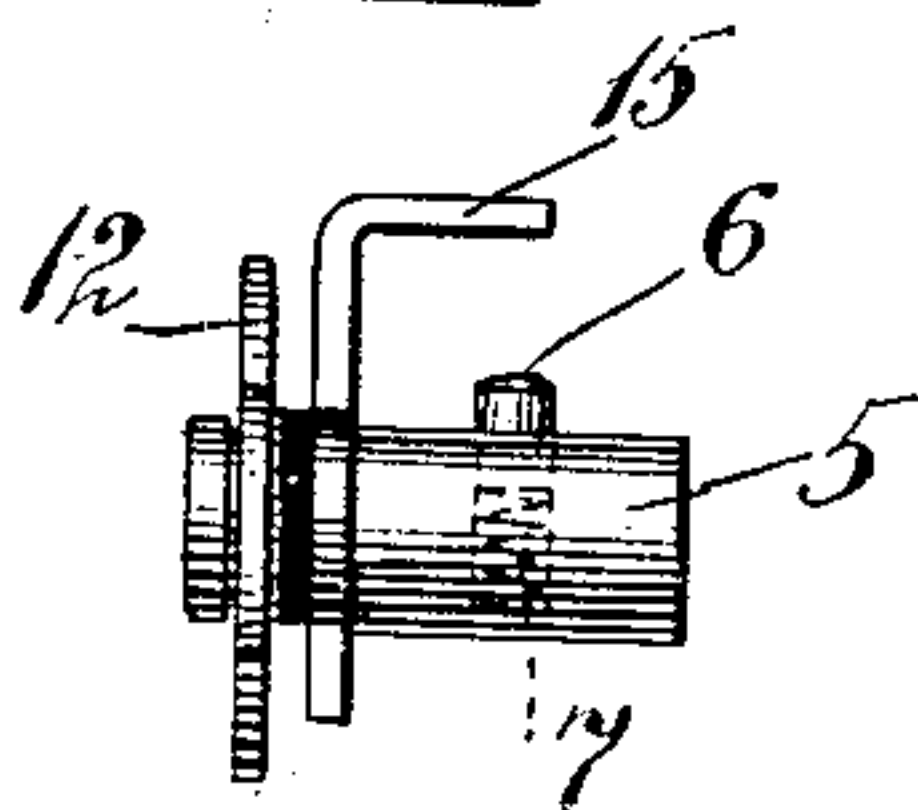


Fig. 6.

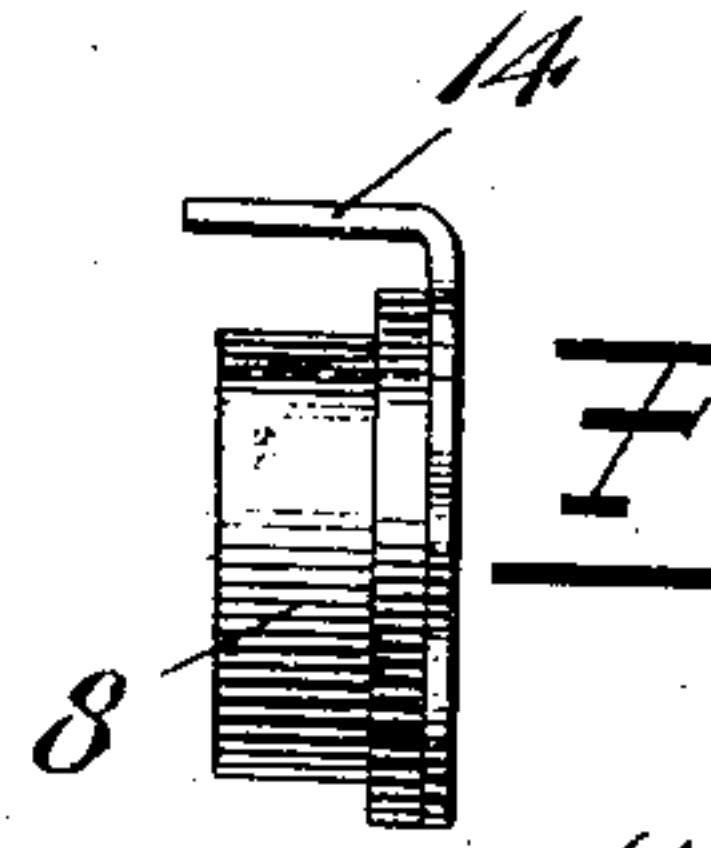


Fig. 8.

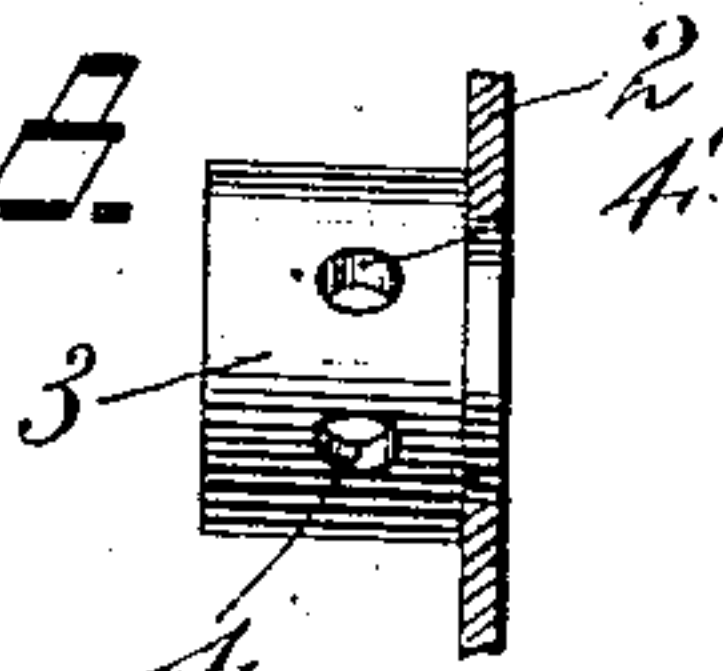
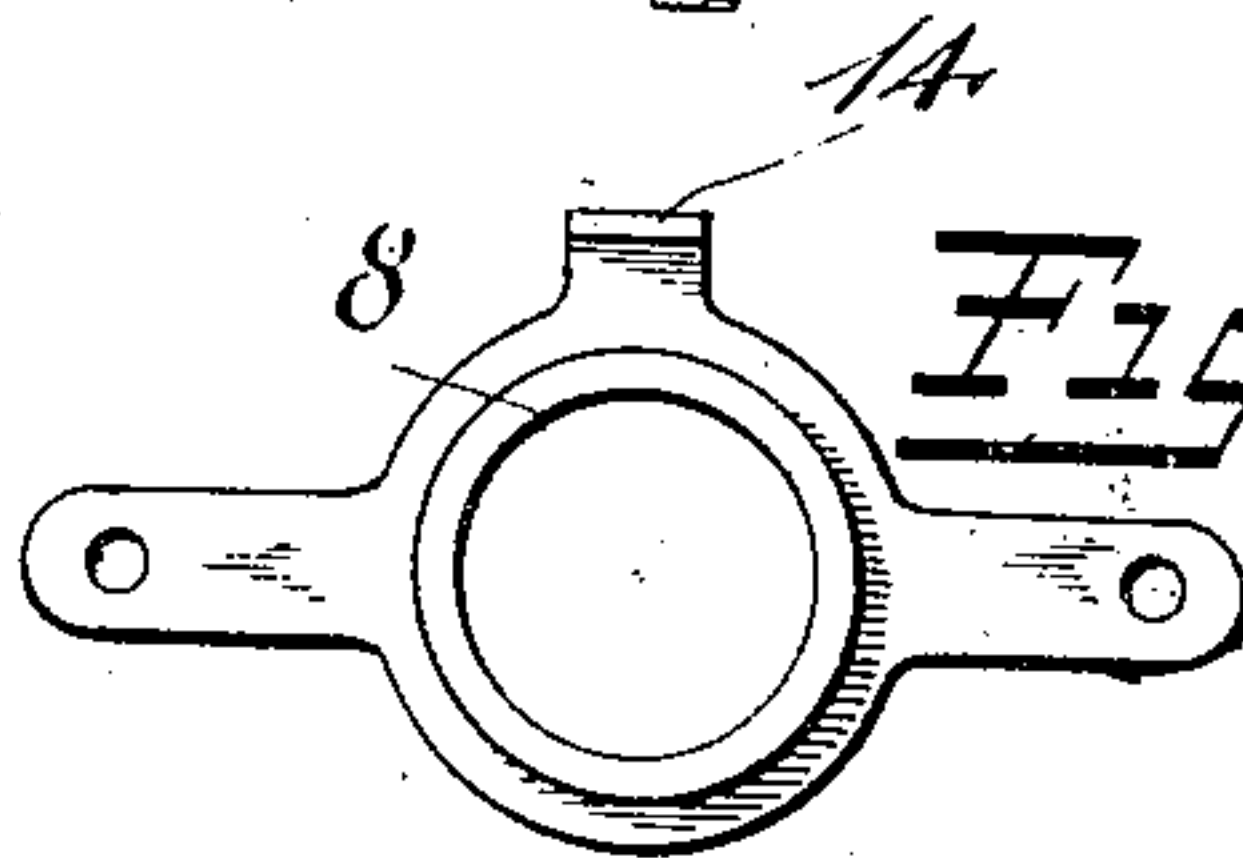


Fig. 7.



Witnesses:
Fred H. M. Dannenfelser
Chas. W. Reed

Inventor
HENRY E. LEPPERT
By *Barrett, Phinney & Mitchell*
Attorneys

UNITED STATES PATENT OFFICE.

HENRY E. LEPPERT, OF NEW BRITAIN, CONNECTICUT, ASSIGNOR TO THE HART MANUFACTURING COMPANY, OF HARTFORD, CONNECTICUT, A CORPORATION OF NEW JERSEY.

SWITCH.

999,808.

Specification of Letters Patent.

Patented Aug. 8, 1911.

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To all whom it may concern:

Be it known that I, HENRY E. LEPPERT, a citizen of the United States, residing at New Britain, county of Hartford, State of Connecticut, have invented certain new and useful Improvements in Switches, of which the following is a full, clear, and exact description.

My invention relates to improvements in switches, more particularly to quick-acting switches, and has for its object to provide a new and improved switch arm actuating mechanism dispensing with delicate parts and projections that are liable to be worn or broken. It is particularly applicable to switches in which the switch arm has a movement about an axis.

The following is a description of an embodiment of my invention, in its preferred form, in an oscillating push-button switch, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a two push-button switch embodying my invention. Fig. 2 is a plan view of the same. Figs. 3 and 4 are sections on the line $x-x$ Fig. 2, with the parts in two positions on enlarged scale. Fig. 5 is a side elevation of a detent and detent-carrying member. Figs. 6 and 7 are side and front elevations of the cam bearing member. Fig. 8 is a side elevation of the annular boss showing the holes containing the spacers.

Referring more particularly to the drawings, 1 is a portion of a porcelain base to which a standard 2 is secured. On this standard is formed an annular boss 3 having within it, in the case of an oscillating as distinguished from a rotary switch, two holes or recesses 4-4', extending through the ring. Inside the ring is a movable member 5, which in the embodiment shown has a recess containing a bolt or detent 6, against which bears a spring 7 tending to move it toward the annular boss. Outside the ring, in the embodiment shown, is a movable member 8 having a cam surface 9, which coacts with spacers 10-10' in the holes 4-4'. The spacers are preferably in the form of balls, the length of the spacer or diameter of the ball being equal to the thickness of the wall of the annular member. To the cam bearing surface 8 is connected actuating means, such means in the present instance consisting of push-buttons 11-11'. To the detent

carrying member 5 a switch arm 12, insulated in the usual manner, is connected, the same being adapted to engage suitable stationary circuit contacts (not shown). It is to be noted that in the embodiment shown the cam bearing member is on the outside of the boss 3 and the detent carrying member is on the inside thereof, this being the preferable arrangement when the invention is embodied in an oscillating switch. The two movable members 5 and 8 are connected by a coiled spring 13, whose ends engage opposite sides of two lugs 14-15, carried by the two movable members respectively. The lugs at the limits of their throw engage stop faces 16 which are positioned so that when the lug 15 engages either face the detent 6 will stop opposite one of the holes 4-4' in the annular boss, and when the lug 14 engages either of them, a low part of the cam surface 9 will stop opposite one of said holes or recesses. When the low surface 9 and the detent 6 are opposite the same hole 4 or 4' the detent enters the hole and forces the spacer therein outward so as to engage the low surface of the cam, as shown in Fig. 3 or Fig. 4.

When the parts are in the positions shown in Fig. 3, and the cam member is moved counter-clockwise by the actuating means, the cam surface acts upon the spacer 10 in engagement therewith, moving it inward, together with the detent 6, until a high portion of the cam surface is in contact with the spacer, as 10, shown in Fig. 4, the position of the detent at that time being shown in dotted lines in Fig. 4. The detent is thereby moved out of the hole in the annular boss into which it had been thrust by its spring. The detent bearing member with its switch arm is thereby released and snaps counter-clockwise under the influence of the connecting spring, which by the movement of the cam bearing surface was put under tension. When the detent member has thus snapped, the detent stops opposite the other hole in the annular member, moving into it under the action of its spring and pushing the spacer outward against the low point of the cam surface which is now opposite, as shown in Fig. 4. A clockwise movement of the cam bearing member produces, in a similar way, a snap movement of the detent bearing member and switch arm in the opposite direction.

As will be evident to those skilled in the art, my invention permits of various modifications within the claims hereto appended and without departing from the spirit thereof.

What I claim is:

1. In a switch, the combination of a stationary member having a plurality of recesses therein, two independently movable members on opposite sides thereof, one of said movable members having a recess therein and the other having a cam surface, a spring-actuated detent in the recess in said one movable member and adapted to partially enter the recesses in said stationary member, spacers within the recesses in said stationary member coacting with said cam surface and detent, and a spring connecting said two movable members.

2. In a switch, the combination of an annular stationary member having a plurality of recesses, two members, one on the outside and the other on the inside of said annular member, independently movable about the center of the stationary member as an axis, one of said movable members having a recess and the other having a cam surface, a spring-actuated detent in the recess of said one movable member and adapted to partially enter the recesses in said stationary member, spacers within the recesses of said stationary member coacting with said cam surface and detent, a spring connecting said two movable members, and actuating means connected to the cam surface member.

3. In a switch, the combination of a stationary member having a plurality of recesses therein, two independently movable members on opposite sides thereof and mounted to oscillate about an axis, one of said movable members having a recess therein and the other having a cam surface, a spring-actuated detent in the recess in said one movable member and adapted to partially enter the recesses in said stationary member, spacers within the recesses in said stationary member coacting with said cam surface and detent, a spring connecting said two movable members, a rocking lever connected to said cam surface member, and push buttons connected to said lever.

4. In a switch, the combination of an annular stationary member having a plurality of recesses therein, a movable member within said annular member and having a recess, a second movable member provided with a cam surface and mounted on the outside of said annular member so as to move about the center thereof as an axis, a spring-actuated detent in the recess of said first movable member and adapted to partially enter the recesses in said stationary member, spacers within the recesses in said stationary member, coacting with said detent

and said cam surface, a spring connecting said two movable members, and actuating means connected to said cam surface member.

5. In a switch, the combination of an annular stationary member having a plurality of recesses therein, a movable member within said annular member and having a recess, a second movable member provided with a cam surface and with a hub mounted on the outside of said annular member so as to move about the center thereof as an axis, a spring-actuated detent in the recess of said first movable member, spacers within the recesses in said stationary member coacting with said cam surface and said detent, and a spring connecting said two movable members, said spring surrounding said hub on said second movable member.

6. In a switch, the combination of an annular stationary member having a plurality of recesses therein, a movable member within said annular member and having a recess, a second movable member provided with a cam surface and with a hub mounted on the outside of said annular member so as to move about the center thereof as an axis, a spring actuated detent in the recess of said first movable member and adapted to partially enter the recesses in said stationary member, spacers within the recesses in said stationary member coacting with said cam surface and said detent, a spring connecting said two movable members, said spring surrounding said hub on said second movable member, push buttons connected to said second movable member, and a switch arm connected to said first movable member.

7. In a switch, the combination of a stationary member having two recesses therein, two independently movable members on opposite sides thereof, one of said movable members having a recess therein and the other having a cam surface, a spring-actuated detent in the recess in said one movable member and adapted to partially enter the recesses in said stationary member, spacers within the recesses in said stationary member coacting with said cam surface and detent, and a spring connecting said two movable members, said stationary member having oppositely facing stop surfaces, and said first recessed movable member having a stop coacting therewith so as to stop said recessed member when said detent is opposite the recesses in said stationary member alternately.

8. In a switch, the combination of a stationary member having an annular projection provided with a plurality of recesses therein, a movable member within said annular member and having a recess, a second movable member provided with a cam surface and with a hub mounted on the outside of said annular member so as to move

about the center thereof as an axis, a spring
actuated detent in the recess of said first
movable member, spacers within the recesses
in said stationary member coacting with said
5 cam surface and said detent, a spring con-
necting said two movable members, said
spring surrounding a hub on said second
movable member, push buttons connected to
said second movable member, and a switch
10 arm connected to said first movable mem-

ber, said stationary member and first mov-
able member having stop surfaces limit-
ing the movements of said first movable
member so as to stop said detent opposite
the recesses in said stationary member alter- 15
nately.

HENRY E. LEPPERT.

Witnesses:

H. A. HART,
J. T. CLARKE.

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Washington, D. C."