

(No Model.)

J. F. McLAUGHLIN.
PUSH BUTTON.

No. 521,808.

Patented June 26, 1894.

Fig. 1.

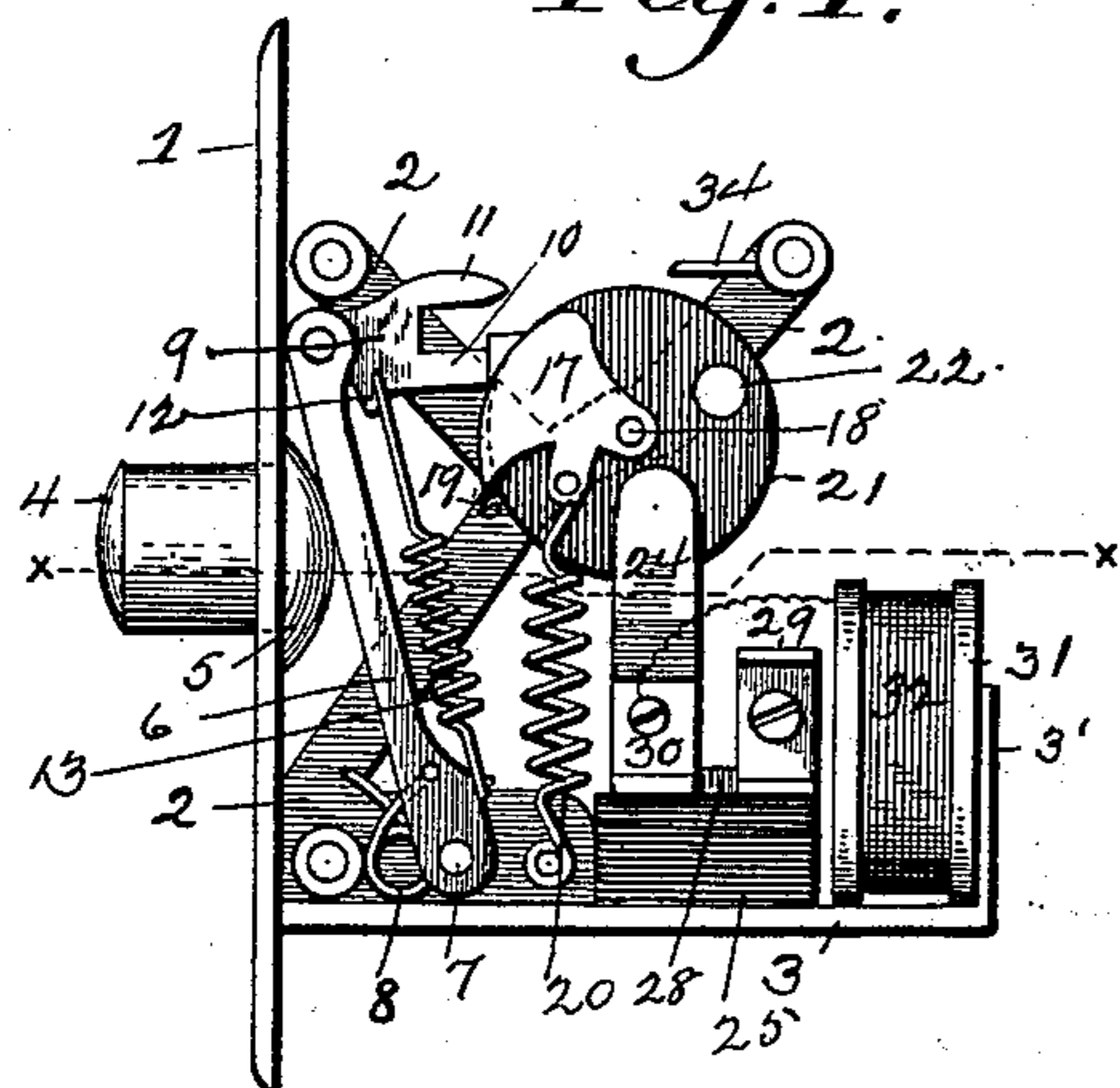


Fig. 2.

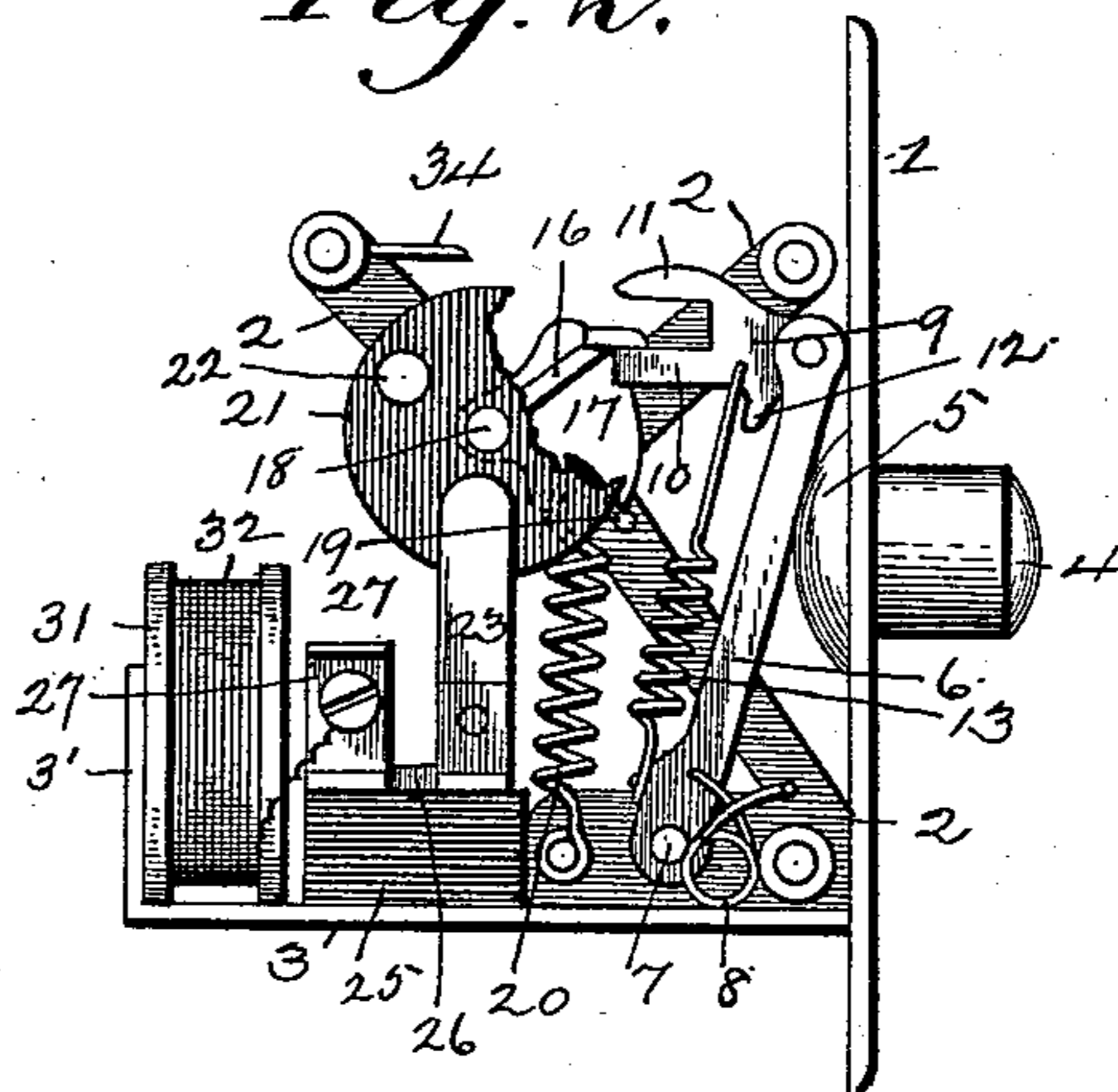


Fig. 3.

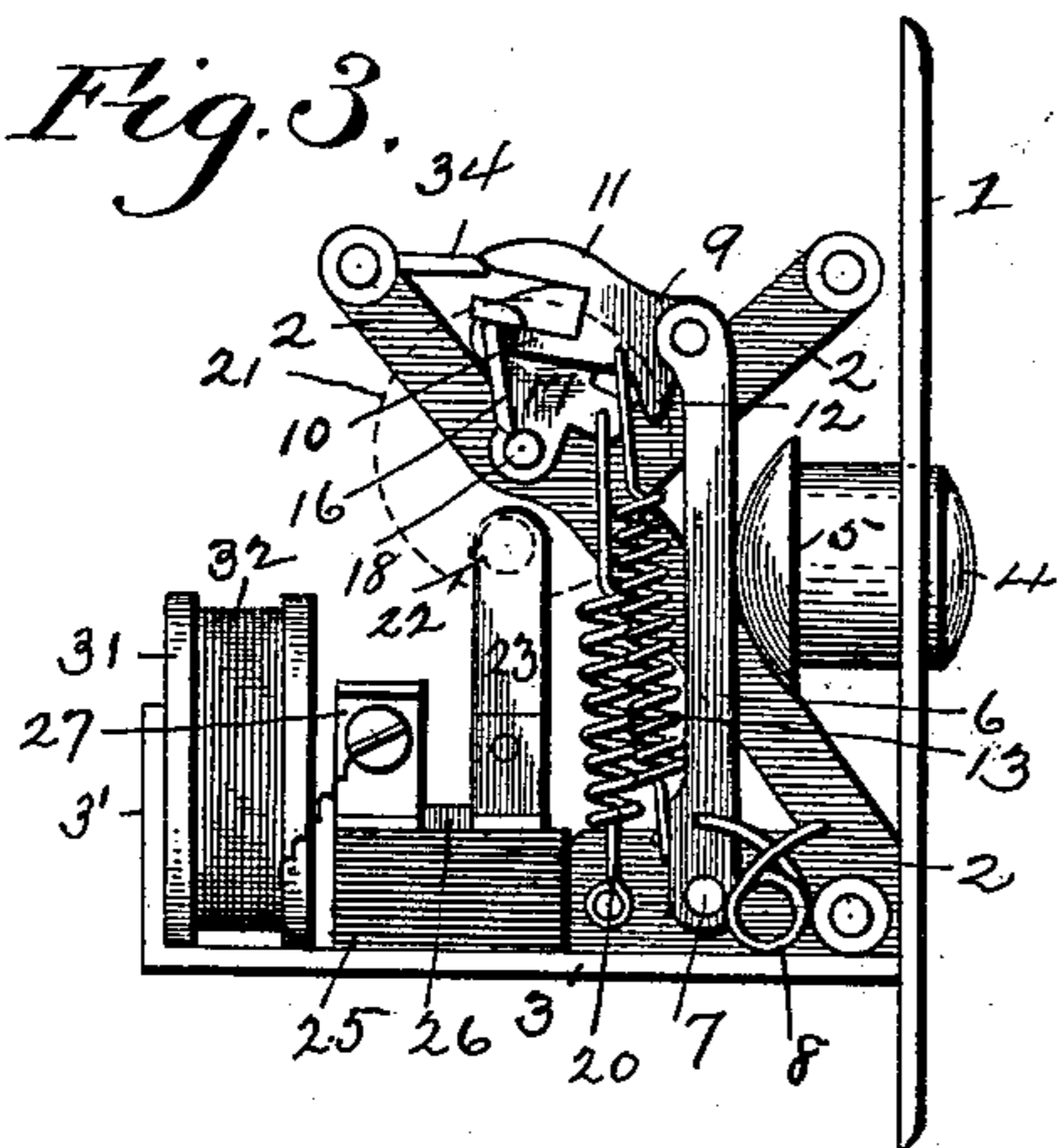


Fig. 4.

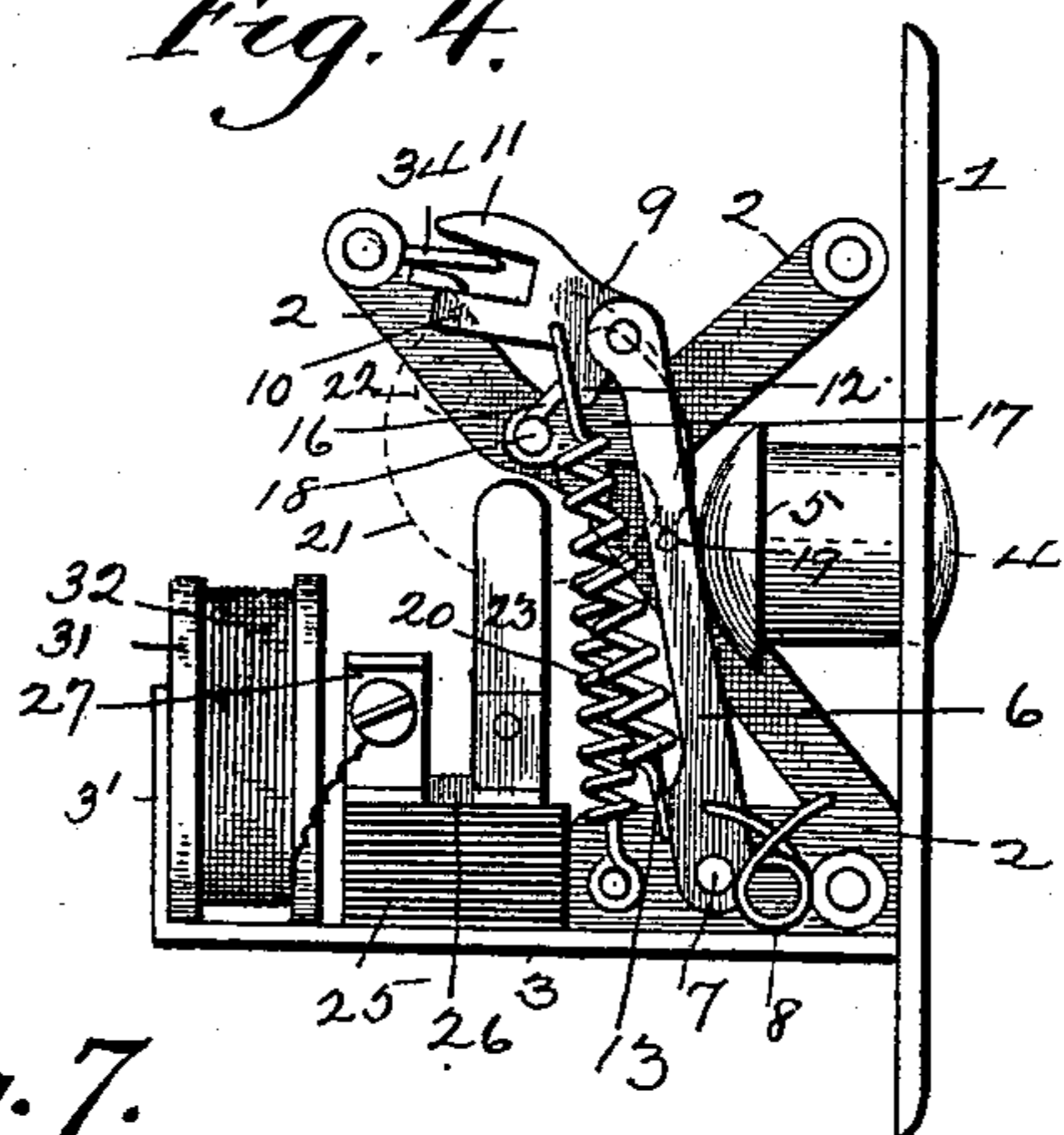


Fig. 7.

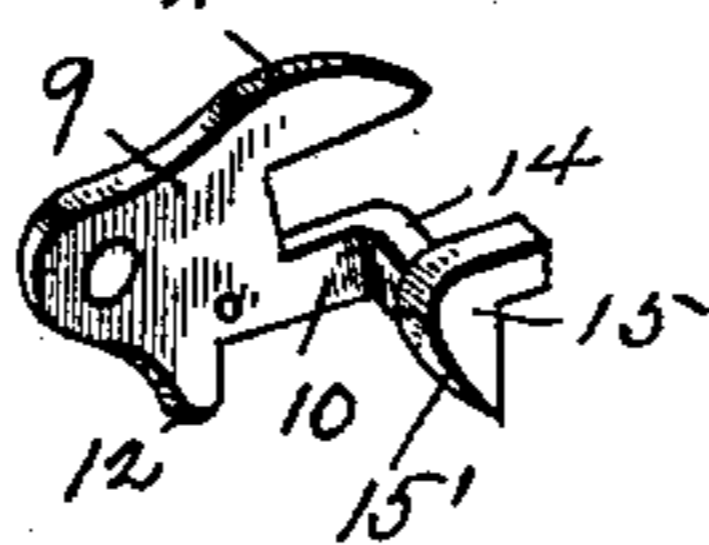


Fig. 5.

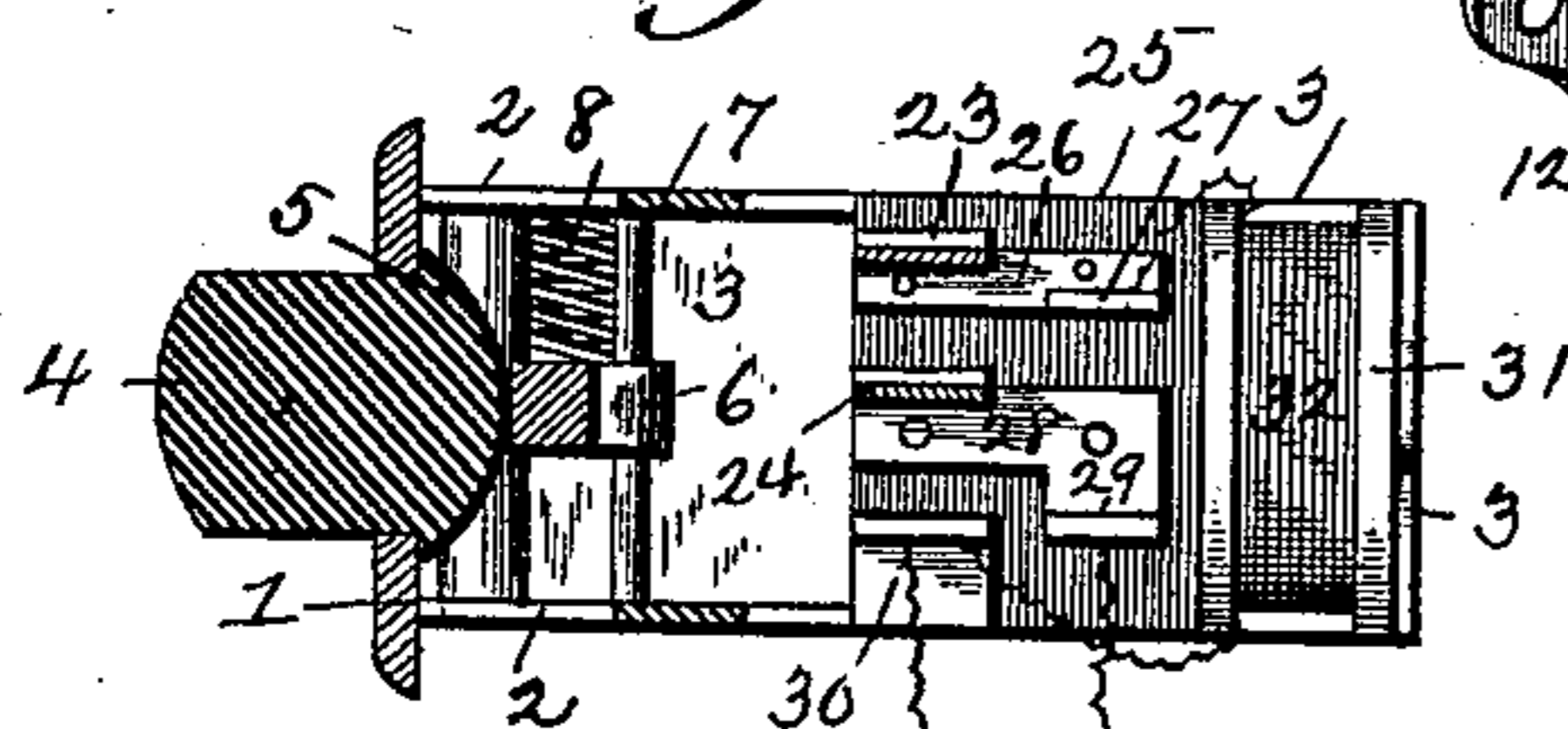
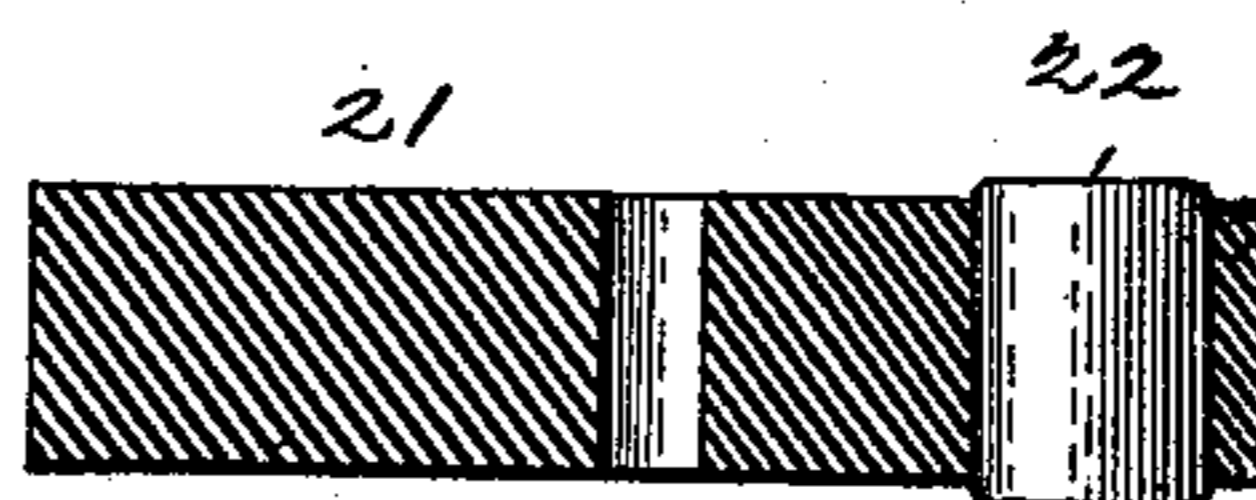


Fig. 6.



Witnesses: 33 33

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UNITED STATES PATENT OFFICE.

JAMES F. McLAUGHLIN, OF PHILADELPHIA, PENNSYLVANIA.

PUSH-BUTTON.

SPECIFICATION forming part of Letters Patent No. 521,808, dated June 26, 1894.

Application filed March 22, 1893. Serial No. 467,133. (No model.)

To all whom it may concern:

Be it known that I, JAMES F. McLAUGHLIN, a citizen of the United States, and a resident of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Push-Buttons, of which the following is a specification.

My invention has reference to improvements in push-buttons, designed to close an electric circuit momentarily when the button is operated and then to open the circuit again, automatically, irrespective of the intent of the operator.

In certain electrical translating devices, which are included in a circuit carrying currents of considerable strength, and which devices are designed to be actuated for a moment only at a time, it frequently happens that with ordinary push-buttons or keys for closing such circuit, the operator allows his finger to rest upon the push button or key, thoughtlessly and without any particular purpose, thus keeping the circuit closed beyond the time that is required for actuating the translating device. When this happens the current flows through the translating device longer than the particular winding of the same will permit without heating the apparatus; the apparatus then becomes hot and frequently burns out. This is notably the case in electric bells of large size which are designed to operate with a single stroke and which require a strong current to be operated effectively, but require that current only for a very short time. The same is the case with electrically operated switches actuated from a distance, and particularly is it the fact with electric-lamp lighters, the circuit of which is closed at a considerable distance from the lamp. In other translating devices, such as electric bells of small size, trembler bells and the like, the source of current is, as a rule, a battery, and when the circuit of such battery is closed unduly long, it becomes exhausted in a short time.

My improvement is designed to overcome these defects of ordinary push-buttons, in that it is so arranged that when the push-button is actuated, the circuit will be closed only for a predetermined and very short time, just sufficient to actuate the distant trans-

lating device, and will then again be automatically opened, irrespective of the action or volition of the user. All this will more fully appear from the following detail description with reference to the accompanying drawings, in which—

Figure 1 is a side elevation of the improved push-button with a portion of the frame work removed. Fig. 2, is a similar view from the opposite side. Fig. 3, is a view similar to Fig. 2, but with the parts in the position in which the circuit is closed. Fig. 4, is a like view showing the position of the parts when the circuit has been opened without releasing the push-button. Fig. 5, is a cross section on the line $x-x$ of Fig. 1, with parts removed. Fig. 6, is an enlarged section of the circuit closing disk, and Fig. 7, is a perspective view of a portion of the mechanism.

Like numerals of reference indicate like parts throughout the drawings.

Referring to the drawings, there is shown a face plate 1, having secured to it, in any suitable manner, a frame 2, and another plate 3, which latter will be hereinafter referred to as the base plate. The frame 2 and base plate 3, carry the operating mechanism of the push-button, and the face plate 1, has a central opening through which projects a thumb or push piece 4, composed of hard rubber or other insulating material, having a flange 5, formed at its inner end and acting as a stop for limiting its outward movement.

The push piece 4, bears against an upright lever 6, about midway of the length of the latter, and this lever is secured at its lower end to a spindle 7, journaled in the frame 2, and is held against the said push piece 4, by means of a helical spring 8, secured at one end to the lower end of said lever, and at the other end to the frame 2. The lever 6, has pivoted to its upper end, a pawl 9, having two approximately parallel fingers 10, 11, at its free end, and a lug 12, adjacent to the lever 6, for limiting its downward movement. This pawl 9, is urged downward by means of a helical spring 13, connected at one end to said pawl, and at the other end, to the lower end of the lever 6. At the end of the finger 10, there is an offset 14, projecting to one side of the pawl and provided with an L-shaped tooth 15. The other finger 11, has the under

side or edge rounded off toward its free end as shown, for a purpose that will hereinafter appear. The upper branch of the tooth 15, rests normally on the upper end of a guiding flange 16, on one side of a segmental block 17, fast on a shaft 18, journaled in the frame 2. The flange 16, extends along one edge of the block 17, which is normally held against a stop pin 19, on the frame 2, by means of a helical spring 20, secured at one end to a lug on the block 17 and at the other end to the lower end of the frame 2. The lower branch of the tooth 15 normally engages the flange 16, and has one edge 15', rounded or curved for a purpose that will presently appear. The shaft 18, has a disk 21, secured to it, the said disk being formed of hard rubber or other insulating material and having a cylindrical metallic block 22, extending through it near the periphery as shown in Fig. 6. In the path of this block 22, the ends of which are slightly rounded at the edges, are two contact springs or brushes 23, 24, rising from a block 25, of insulating material secured to the base piece 3, and these springs normally rest against the sides of the disk 21. The brush 23, is secured to a metallic plate 26, having a binding post 27, formed on it, and the other brush 24, is secured to a metallic plate 28, having a binding post 29, formed on it. The two plates 26 and 28, are secured to the block 25, out of contact with each other, and there is another binding post 30, also secured to the block 25, and also out of contact with either plate 26, or 28.

Mounted on the base plate 3, and secured to the upturned end 3', of the latter is an insulating spool 31, on which is wound a resistance coil 32, one terminal being secured to the binding post 27, and the other to the binding post 30. The leading-in-wires 33, 33, connect with the binding posts 29 and 30, respectively, so that the circuit, when completed by bridging the brushes 23, 24, in the manner hereinafter described will be through the binding post 29, plate 28, brush 24, to the other brush 23, plate 26, binding post 27, resistance coil 32, binding post 30, and out through the leading wire connected therewith.

If the resistance coil is not to be included in the circuit, one of the leading-in-wires will be connected to the binding post 27, instead of the binding post 30.

A push-button constructed as hereinbefore described, will operate in the following manner: The push-piece 4, is forced inward from the position shown in Fig. 2, to that shown in Fig. 3, causing the tooth 15, which engages the flange 16, of the block 17, to force the latter to turn with its shaft, the disk 21, participating in such movement. The flange 16, it will be observed in traveling from its normal position (Fig. 2) to the position shown in Fig. 3, will elevate the pawl 9, against the action of its spring, and the spring acting on

the block 17, will, itself, be put under tension. The elevation of the pawl 9, causes its finger 11, to engage over a pin 34, fixed to the frame 2, in the path of the said finger. In the position of the parts shown in Fig. 3, the circuit through the brushes 23, 24, is completed by the conducting block 22, in the disk 21, which then bridges the ends of said brushes as shown by the dotted lines; and any mechanism in the circuit controlled by the current will be operated so long as this relation of the parts of the push-button is maintained. However, the push-piece 4, has not yet reached the limit of its travel, so that when still farther forced inward to the position shown in Fig. 4, the finger 11, of the pawl 9, will ride up on the pin 34, until the lower branch of the tooth 15, is lifted above the flange 16, of the block 17, and the latter, under the action of its spring, will immediately return to its normal position and the disk 21, turning with the said block 17, will also return to its normal position with the conducting block 22, out of contact with the brushes 23, 24, which then rest against the sides of the insulative disk and are thereby insulated one from the other, thus breaking the circuit. Thus it will be seen that the pin 34, acts upon the pawl 9 as a trip disengaging said pawl from the movable element of the switch and allowing the latter to be automatically withdrawn from the closed position, a moment after it has arrived in that position. When the push-piece is released, the spring 8, returns the lever 6 to its normal position. During the return movement of the lever, the finger 11, of the pawl 9, first escapes from the pin 34, and under the influence of the spring 13, the pawl moves downward until the rounded or curved edge 15', of the tooth 15, engages the outer face of the flange 16, on the block 17, which flange, it will be seen, is in an inclined position when the block 17, is in its normal position. The spring 8, is made sufficiently strong to easily overcome the spring 13, and cause the rounded edge 15', of the tooth 15, to ride up the flange 16, until it ultimately passes over the said flange and the pawl again drops down until the upper branch of the tooth 15, again rests on the upper end or edge of the flange 16. Further retraction of the lever 6, is prevented by the face-plate 1, against which the lever strikes when in its normal or retracted position. The return movement of the lever 6, again projects the push piece 4, and the parts assume the position shown in Figs. 1 and 2.

The length of time the circuit remains closed, is determined by the width of the brushes 23, 24, or the diameter of the block 22, as will be readily understood and these contacts are so proportioned that the circuit is kept closed only long enough to properly actuate the distant mechanism controlled by the current.

Having now fully described my invention, I claim and desire to secure by Letters Patent—

1. A push-button comprising a switch and
5 a spring tending to open the same, in combination with a push-piece and intermediate mechanism for closing the switch, and a trip
10 timed with reference to the intermediate mechanism to uncouple the switch from the latter when it arrives in the closed position, whereby the switch is automatically open after having been momentarily closed, substantially as described.

2. In a push-button, the combination of a
15 stationary and a rotatable element of a switch, and a spring tending to rotate the latter in one direction; with a pawl constructed and related to the movable member to engage and actuate the same in the other direction, and
20 means for throwing the pawl out of engagement at a predetermined length of stroke, and a lever and thumb piece for actuating the pawl, substantially as described.

3. In a push-button, the combination of a
25 stationary and a spring controlled rotatable element of a switch, a double toothed pawl engaging the rotatable element with one of said teeth for rotating the same in one direction against the action of the spring, and
30 a fixed pin in the path of the second tooth for disengaging the pawl; with a lever and a thumb-piece for actuating the pawl, substantially as described.

4. A push-button comprising a stationary and a movable element of a switch, a spring
35 tending to maintain the two elements of the switch out of contact, a pawl engaging the movable element for actuating it against the action of its spring, a fixed pin in the path of the pawl for disengaging it from the movable
40 element, a spring actuated lever carrying the pawl, and a push piece for actuating the lever against the action of its spring, substantially as described.

5. A push-button comprising a switch com-
45 posed of a spring retained rotatable insulating disk with a metal conducting plug passing eccentrically through it, and two fixed conducting springs in the path of the plug; and means for actuating the disk against the
50 action of its spring consisting of a spring retained lever carrying a spring retained pawl, a guide mounted to rotate with the disk and normally engaged by the pawl, a fixed pin in the path of the pawl for directing it out of
55 engagement with the guide, and a push piece for actuating the pawl-lever in one direction, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of
60 two subscribing witnesses.

JAMES F. McLAUGHLIN.

Witnesses:

F. T. CHAPMAN,
JOS. FORREST.