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PATENTED APR. 14, 1903.

D. T. SPRING, A. LONG & G. H. EBELING.
CIRCUIT BREAKER FOR FIRE ALARM SYSTEMS.

APPLICATION FILED JUNE 23, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

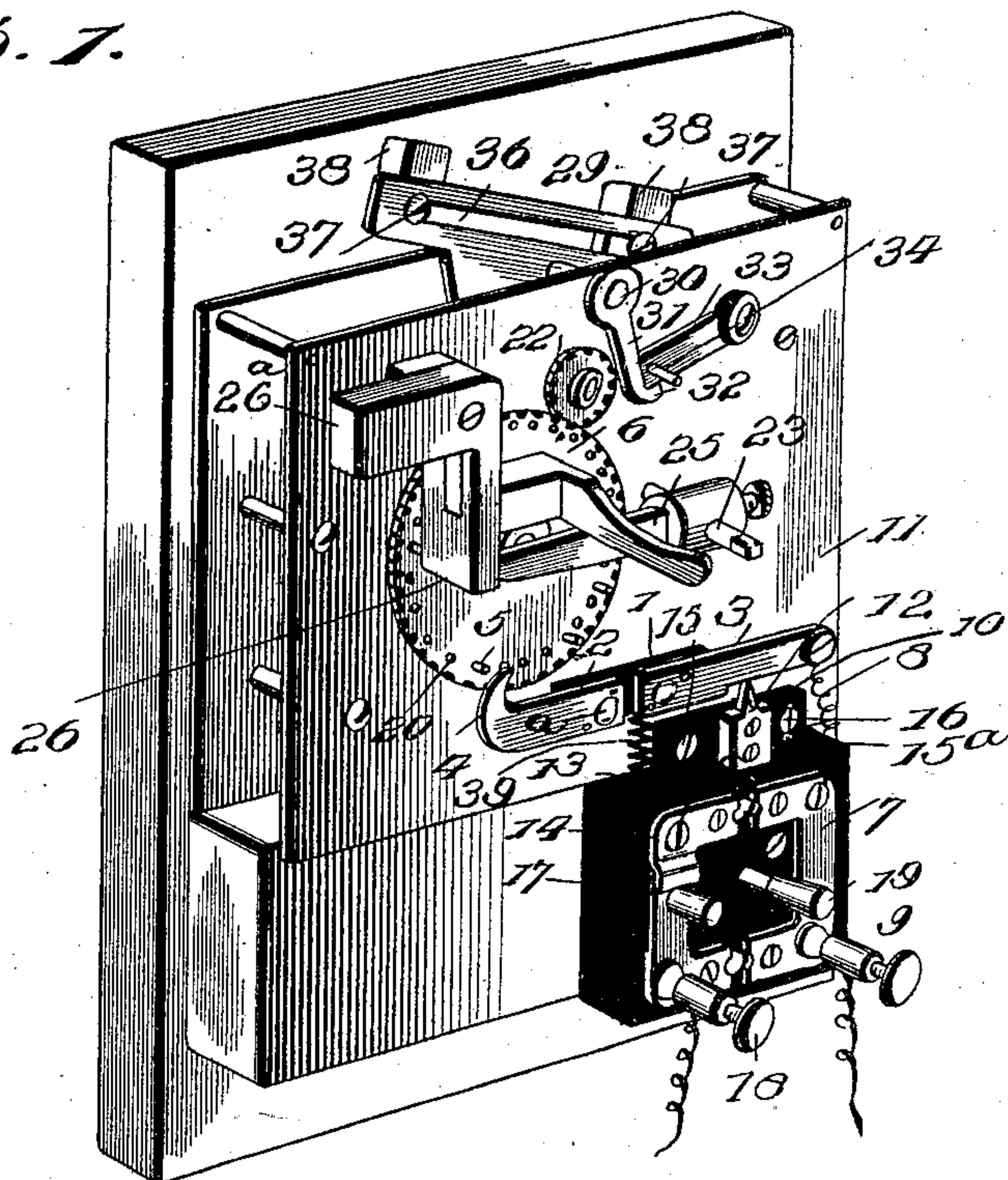


Fig. 5

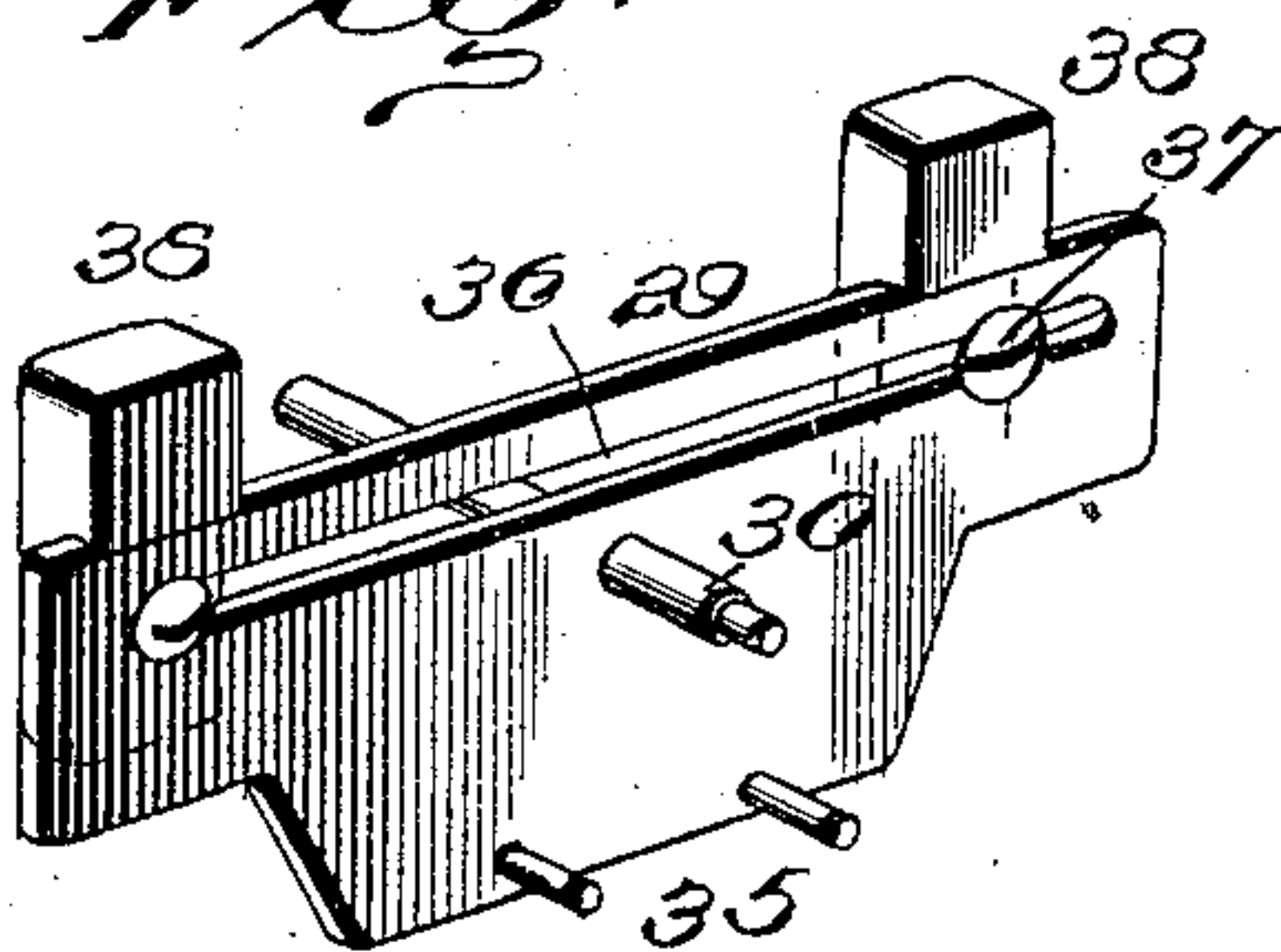


Fig. 6.

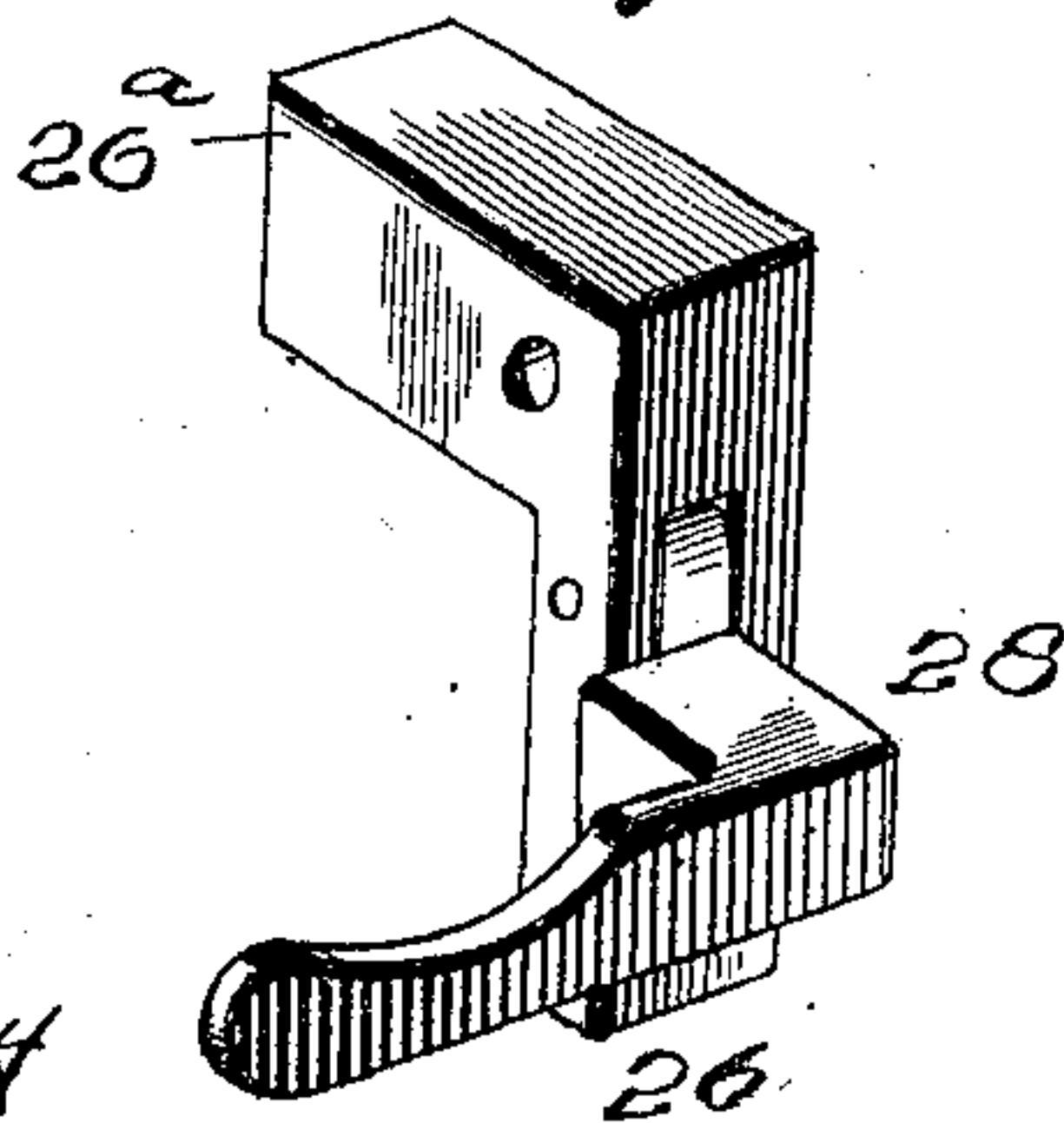
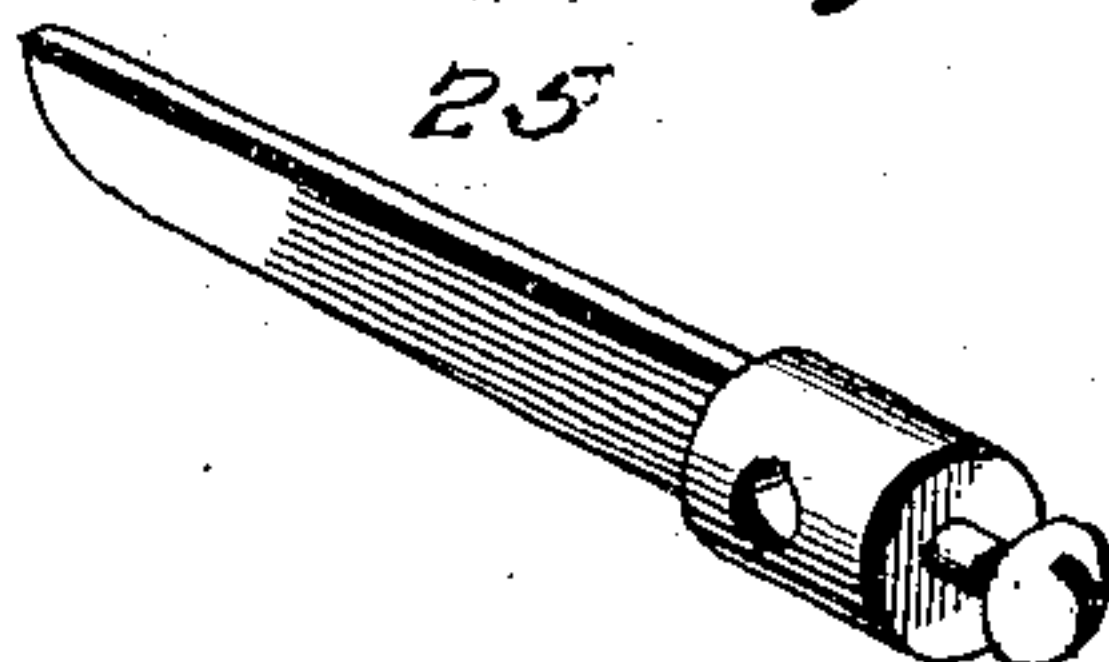


Fig. 7



Inventors

Witnesses

George Watt

By

D. T. Spring

A. Long

G. H. Ebeling

R. H. Racey

Attorneys

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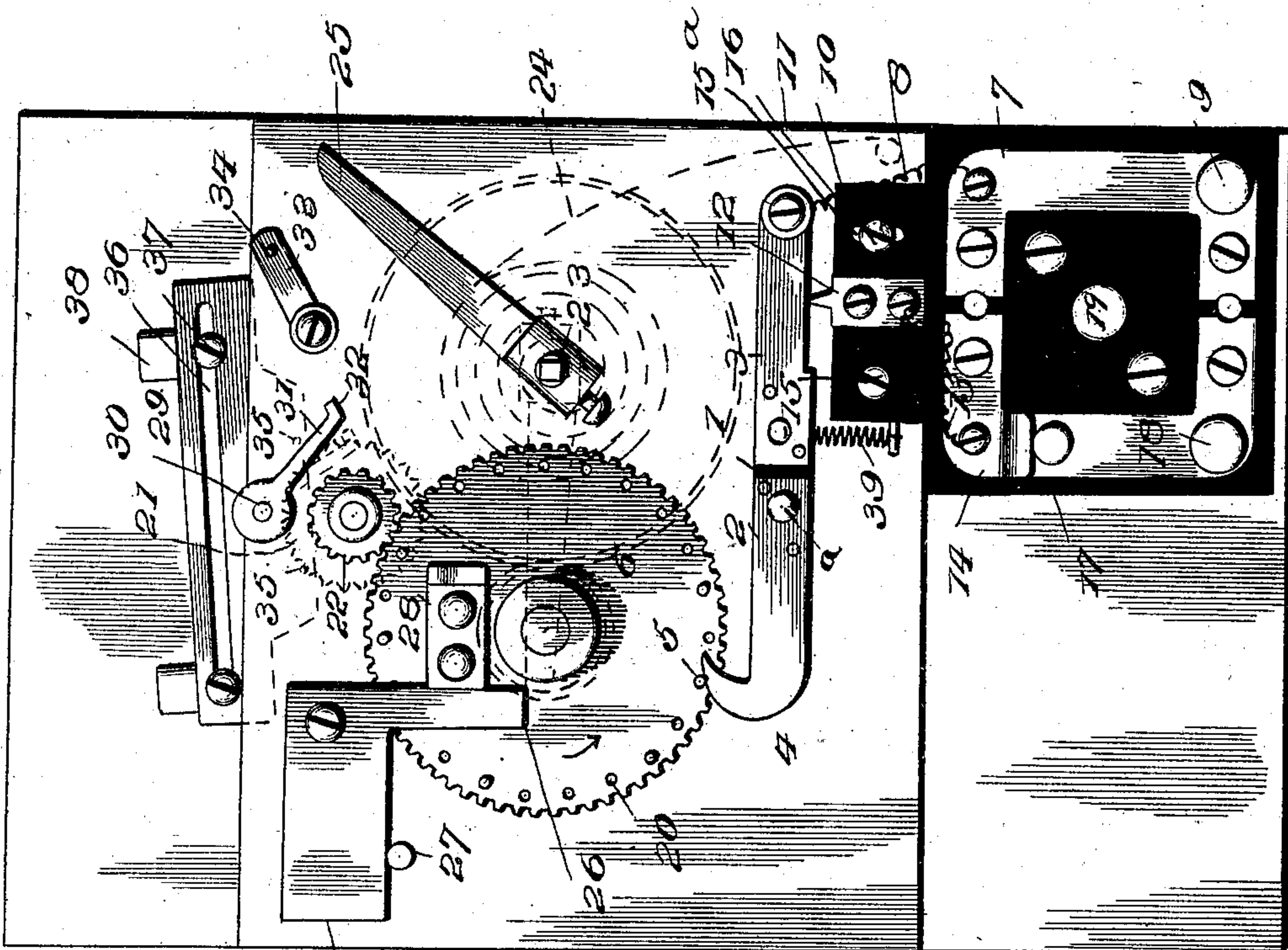
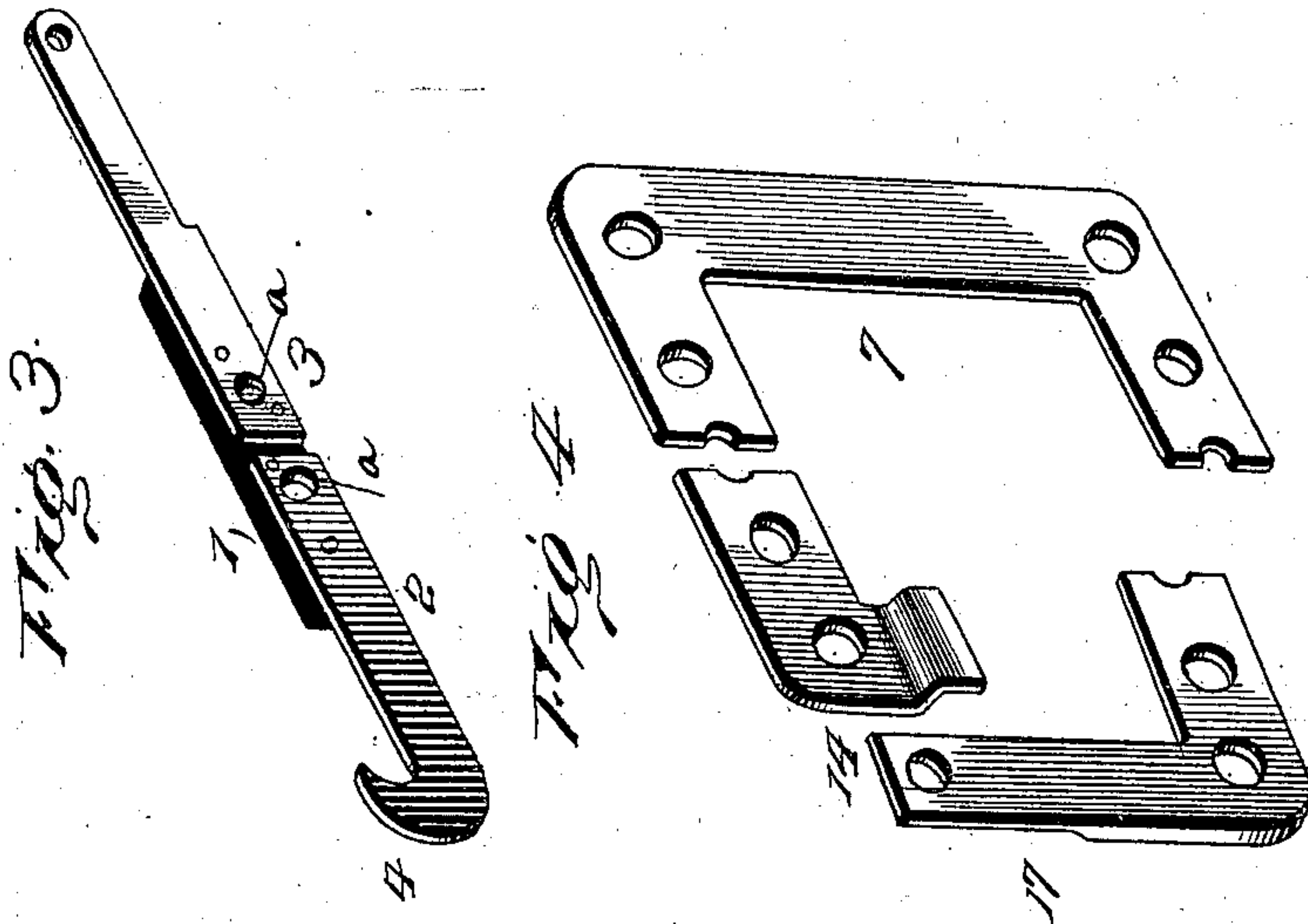
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2 SHEETS—SHEET 2.



Witnesses

George Watt
Wm. J. Jacob

Fig. 2

D. T. Spring
A. Long
G. H. Ebeling

By
R. H. Racy

Inventors

Attorneys.

UNITED STATES PATENT OFFICE.

DANIEL T. SPRING, ANDREW LONG, AND GEORGE H. EBELING, OF
WHEELING, WEST VIRGINIA.

CIRCUIT-BREAKER FOR FIRE-ALARM SYSTEMS.

SPECIFICATION forming part of Letters Patent No. 725,602, dated April 14, 1903.

Application filed June 23, 1902. Serial No. 112,925. (No model.)

To all whom it may concern:

Be it known that we, DANIEL T. SPRING, ANDREW LONG, and GEORGE H. EBELING, citizens of the United States, residing at Wheeling, in the county of Ohio and State of West Virginia, have invented certain new and useful Improvements in Circuit-Breakers for Fire-Alarm Systems, of which the following is a specification.

10 This invention appertains to fire-alarm systems, and more particularly to the mechanism for turning in an alarm from a given point to admit of the location being readily determined.

15 The principal characteristic of the present invention is to wholly obviate what is popularly termed "pumping" fire-alarm boxes, since the mechanism when released will operate automatically without regard to the continued pulling or operation of the hook or other releasing mechanism, thereby insuring a positive and correct operation of the mechanism, so that the exact point from which the alarm is turned in may be determined beyond
25 doubt.

A further purpose of the invention is to control the speed of the mechanism so as to insure distinct strokes and proper spacing between the groups of strokes representing a predetermined number, thereby obviating confusion and enabling the number of the box to be quickly and correctly ascertained.

Other advantages and objects are contemplated and will suggest themselves to one skilled in the art as the structural details of the apparatus are comprehended, and for this purpose reference is to be had to the following description and the drawings hereto attached, in which—

40 Figure 1 is a perspective view of a circuit-breaking mechanism for fire-alarm systems embodying the invention. Fig. 2 is a front view showing the train of gearing released and the operation of the mechanism when turning in an alarm. Fig. 3 is a detail perspective view of the circuit-breaking lever. Fig. 4 is a detail perspective view of the electric switch. Fig. 5 is a detail perspective view of the pallet-lever. Fig. 6 is a detail
45 perspective view of the pull-hook. Fig. 7 is a detail perspective view of the restraining-arm.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same
55 reference characters.

The mechanism comprises a train of gearing, an electric switch, and circuit-breaking mechanism, the several elements being mounted as found most convenient and in practice
60 are suitably housed for protection against the weather and tampering by mischievous persons. The circuit-breaking lever is pivoted at *a* and comprises, essentially, three parts—an insulated section 1 and metal sections 2
65 and 3, secured at their inner ends to the section 1, so as to be electrically insulated from each other. The section 2 is provided with a cam 4 at its outer end extended into the path of tappets or pins 5, projected laterally from
70 the circuit-breaking wheel 6. The section 3 is electrically connected with a plate 7 of the electric switch by means of a wire 8, said plate having a binding-post 9 for connection therewith of one end of the lead-wire of the
75 circuit including the circuit-breaking mechanism. A plate or block 10, of insulating material, is connected to the frame 11 of the mechanism and is provided with an electric contact 12, adapted to coöperate with the
80 metal section 3 of the circuit-breaking lever and connected by a wire 13 with a plate or element 14 of the switch. The plate or block 10 is connected by a pivot-fastening 15 with the frame 11 and is provided with a slot 15^a,
85 through which a fastening 16 passes to hold the said part 10 in an adjusted position. The adjustment of the plate or block 10 admits of movement up or down of the electric contact 12, whereby, in effect, the time of contact be-
90 tween the circuit-breaking lever and the said part 12 is regulated when the mechanism is in operation, and the circuit-breaking lever is oscillated by means of the tappets or pins 5. A spring 17 coöperates with the plate or
95 element 14 and connects with the binding-post 18, to which the wire of the circuit connects. Pressure upon the spring 17 interrupts the circuit, and the mechanism may be cut out of circuit by bridging the terminals
100 of the elements of the switch by means of a pin or cut-out 19.

The circuit-breaking wheel 6 is attached to the outer end of an arbor of a train of gear-

ing and provided near its periphery with a series of holes 20, into which the tappets or pins 5 are fitted, said holes or openings 20 being regularly spaced, whereby the intervals between groups of tappets or pins may be uniform. The tappets or pins 5 may be secured in the openings or holes 20 in any substantial way, so as to prevent their casual displacement, but yet admit of their removal when it is required to change the number of the box. The arbor carrying the scape-wheel 21 is provided with a pinion 22, in mesh with the teeth of the circuit-breaking wheel 6, and is driven therefrom. The arbor of the circuit-breaking wheel is included in the train of gearing adapted to be operated by spring or in any accustomed way. The winding-arbor 23, to which one end of the spring 24 is attached, is provided with a restraining-arm 25, normally held in check by a detent 26 of elbow form and pivoted to the frame 11 at the elbow and having its horizontal member 26^a weighted, so as to insure bringing the vertical member of the detent into the path of the restraining-arm 25. A stop 27 projects from the frame 11 to properly position the detent and limit the downward movement of its weighted horizontal member. The pull-hook 28 is pivoted to the vertical member of the detent 26 and is adapted to move upward out of the way of the restraining-arm when the latter is released from the detent 26, but is limited in its downward movement to cause pivotal movement of the detent when the pull-hook is pressed upon to effect a release of the restraining-arm 25 when it is desired to turn in an alarm.

The regulator comprises the scape-wheel 21 and pallet-lever 29, the latter being secured to an arbor 30, journaled in the front and rear plate comprising the frame 11. An arm 31 is secured to the front end of the arbor 30 and is provided at its outer end with a shoulder or stop 32, which limits the movement of a pivoted check comprising an arm 33, pivoted at one end to the frame 11 and provided at its opposite end with a pin 34 to come in contact with the arm 31 and forming a grip to enable the check to be thrown into and out of operation. The pallet-lever 29 is provided with pins 35 for coöperation with the teeth of the scape-wheel 21 in the usual way and has a longitudinal slot 36 for reception of the fastenings 37, by means of which the weights 38 have adjustable connection therewith to admit of poising the pallet-lever after the apparatus has been installed, so as to insure correct, positive, and proper working of the regulator in the operation of the mechanism when tripped to turn in an alarm. When the arm 33 is turned to bring the pin 34 in the path of the arm 31, as shown in Fig. 1, the latter is prevented from oscillating when the arm 25 is released from the detent 26. However, when the arm 33 is turned

to throw the pin 34 out of the path of the arm 31, as shown in Fig. 2, the pallet-lever and scape-wheel are free to operate when the pull-hook 28 is actuated to release the arm 25 from the detent 26.

The casing for the mechanism may be of any construction and design to prevent tampering with the working parts and protect same from the elements. The spring 24 is kept wound, and when it is required to turn in an alarm the restraining-arm 25 is released by pressing down upon the pull-hook 28. As the circuit-breaking wheel revolves in an anticlockwise direction, as indicated by the arrow in Fig. 2, the cam 4 of the circuit-breaking lever is acted upon by the tappets or pins 5, thereby oscillating said lever and interrupting the circuit, whereby the alarm is given in the accustomed way. To insure positive action of the circuit-breaking lever, a retractile spring 39 is interposed between it and the plate or block 10. When the arm 25 is released, the operation of the mechanism cannot be interfered with in the least by a continued movement up and down of the pull-hook. Hence the correct number of the box will be given at the station or other place for receiving the alarm. When the restraining-arm makes a complete revolution, it will come in contact with the detent and the mechanism automatically stopped until liberated by again pressing upon the pull-hook.

The mechanism is intended to work on a closed circuit, which enters at 9 and passes thence through 7, 8, 3, 12, 13, 14, 17 and out through 18. Each time the circuit-breaking lever is actuated by means of a tappet 5 the circuit is interrupted and the alarm-electromagnet (not shown) demagnetized for the purpose well understood.

Having thus described the invention, what is claimed as new is—

In an alarm mechanism, the combination of a train of gearing, including a circuit-breaking wheel, a circuit-breaking lever, an electric contact coöperating with the circuit-breaking lever, an elbow-shaped detent pivoted at the elbow, a restraining-arm attached to an arbor of the train of gearing and adapted to engage the vertical arm of the said detent, and a pull-hook pivoted to the vertical arm of the said detent to effect a release of the restraining-arm and adapted to turn to admit of the said restraining-arm passing thereby when released from the detent, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

DANIEL T. SPRING. [L. S.]
ANDREW LONG. [L. S.]
GEORGE H. EBELING. [L. S.]

Witnesses:

JAMES SMITH,
ROBERT A. PURCELL.