

C. P. BOSTIAN.
FIRE AND BURGLAR ALARM SYSTEM.

No. 598,410.

Patented Feb. 1, 1898.

Fig. 1.

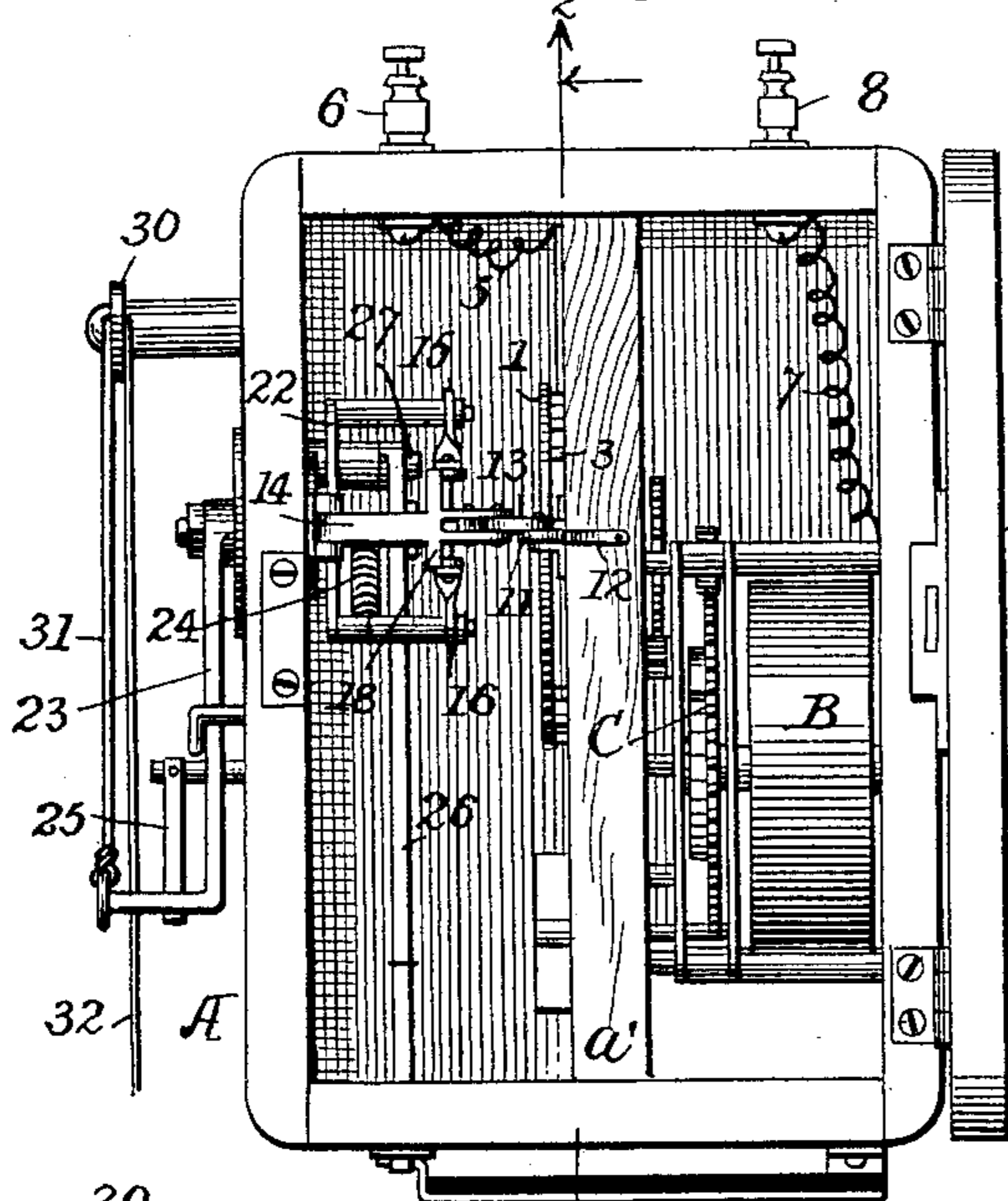


Fig. 2.

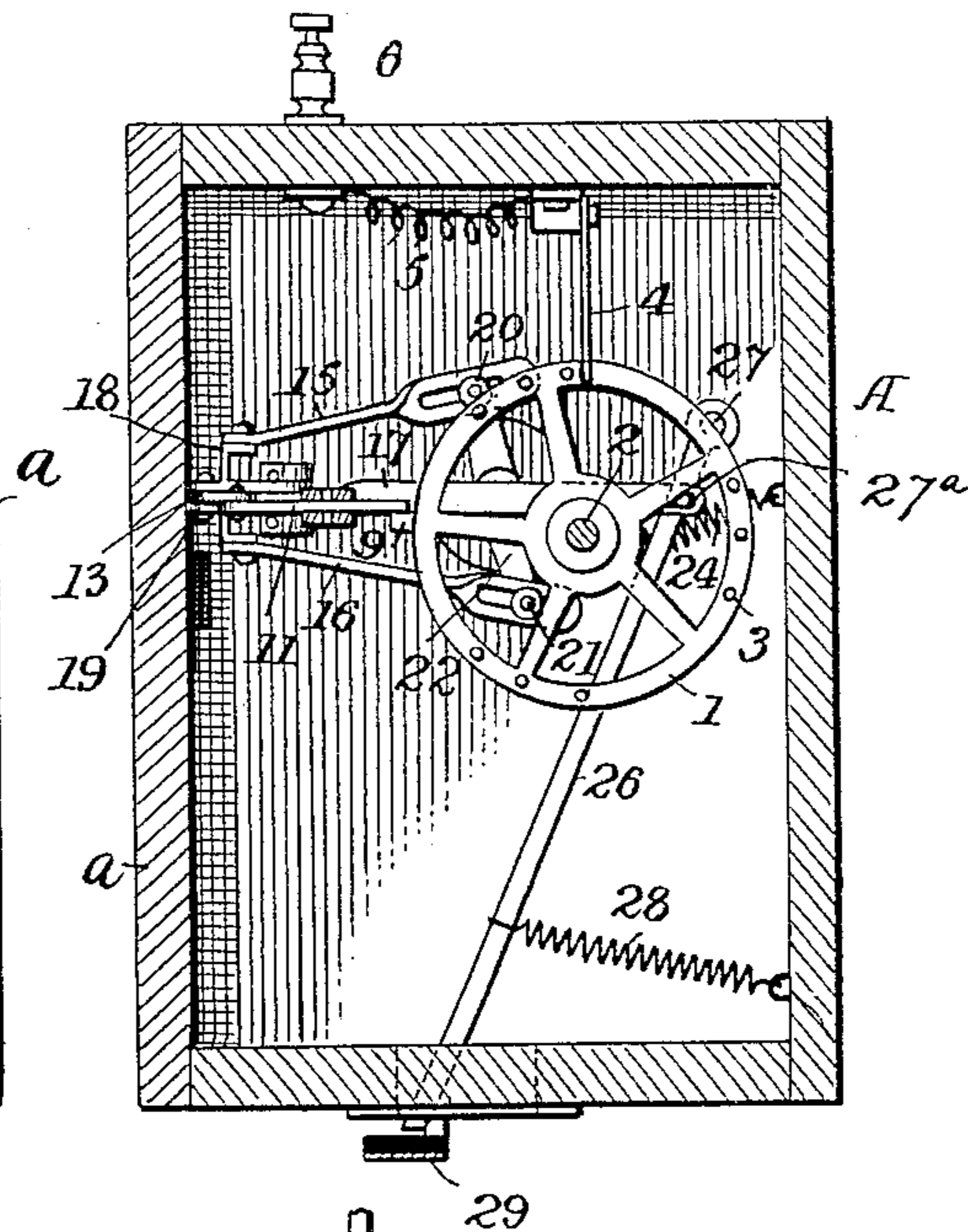


Fig. 3.

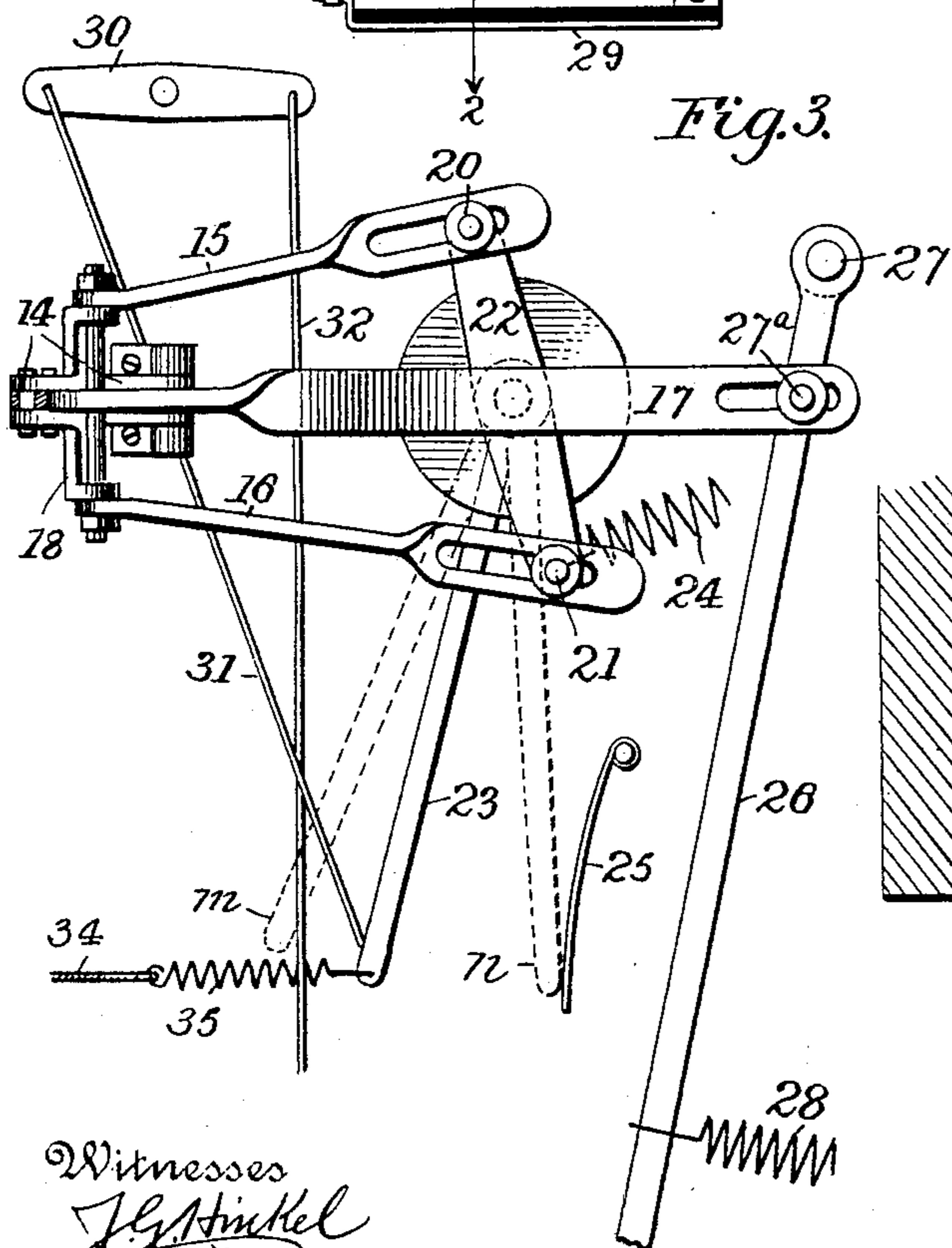
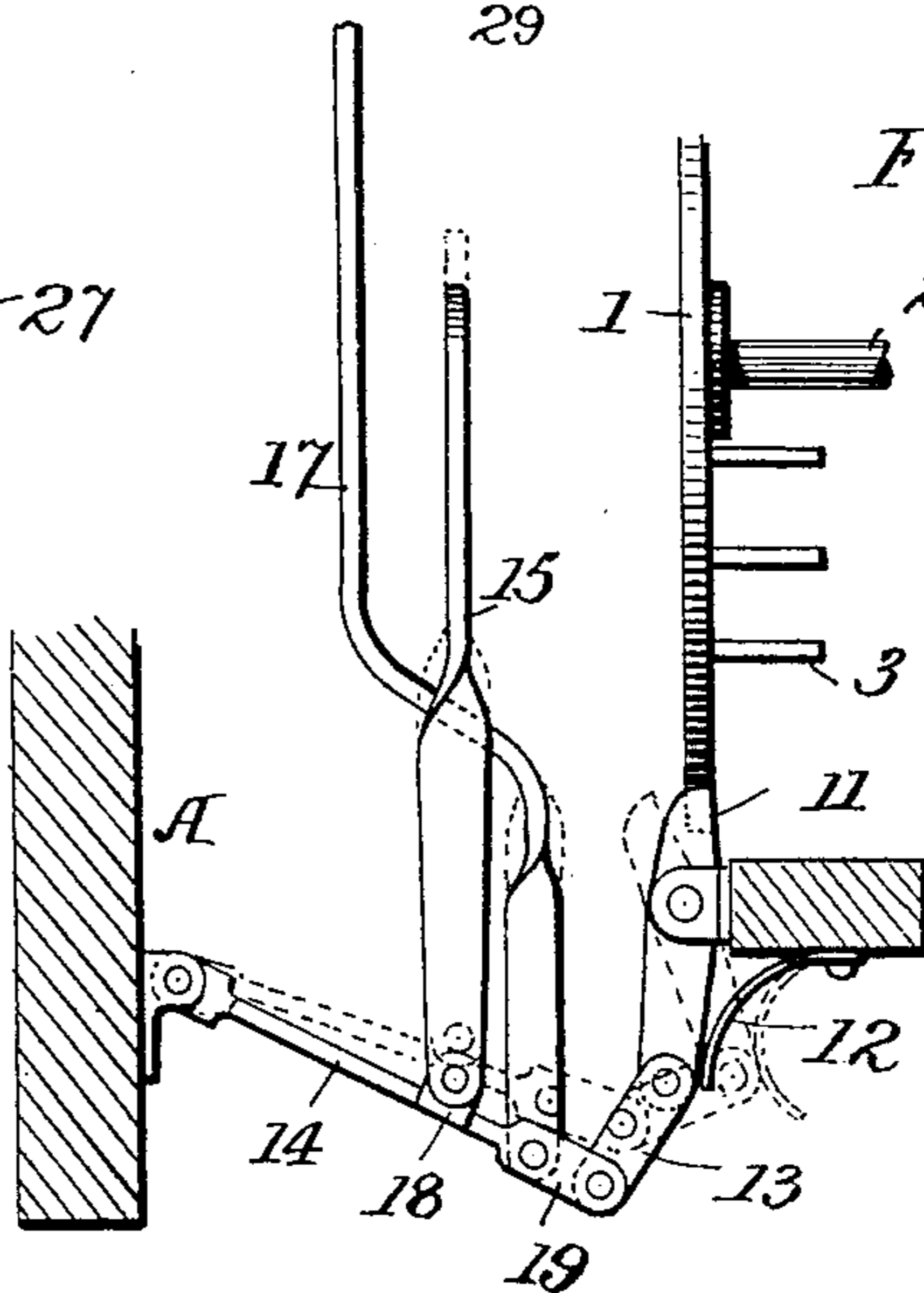


Fig. 4.



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Fig. 5.

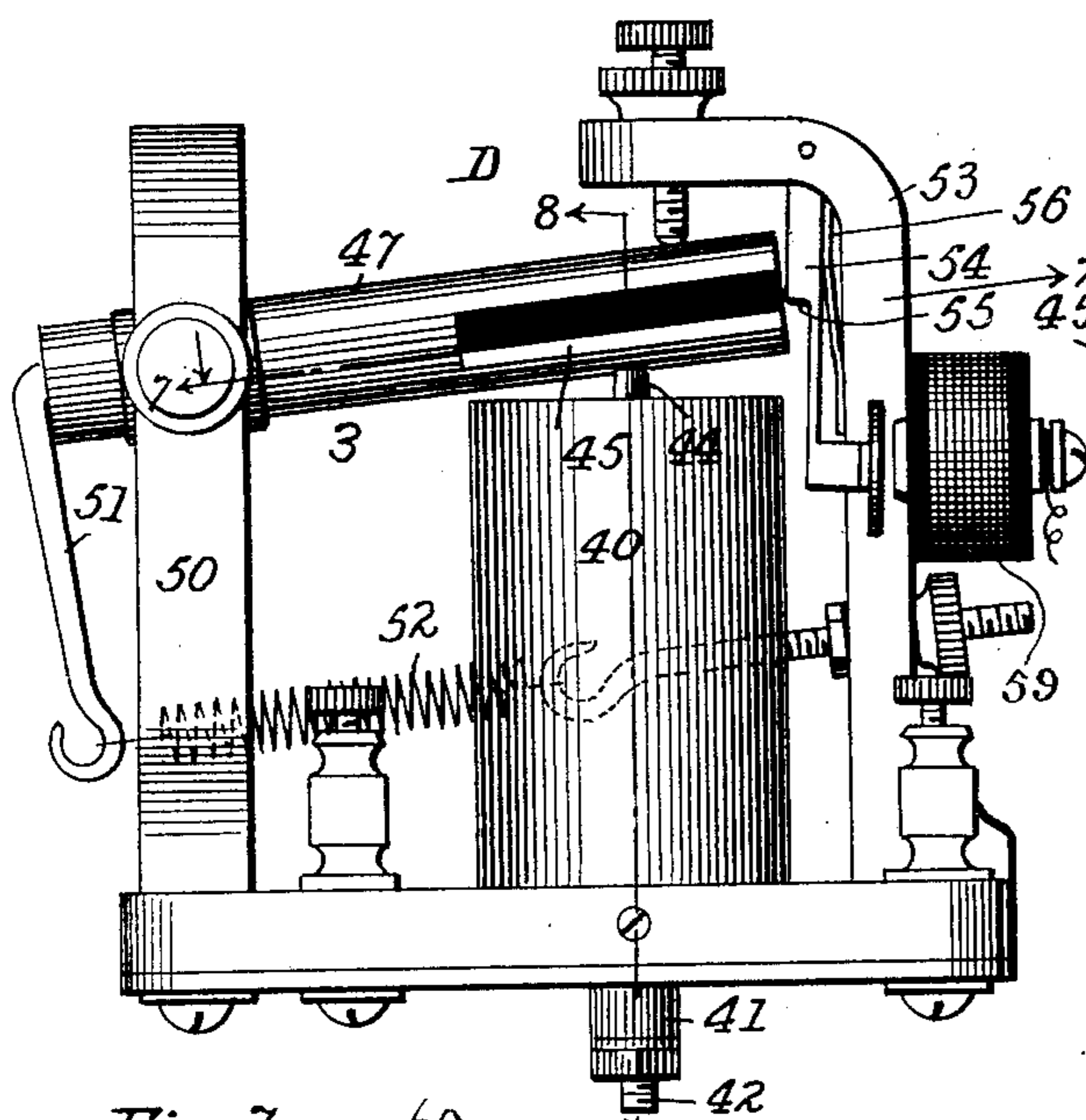


Fig. 6.

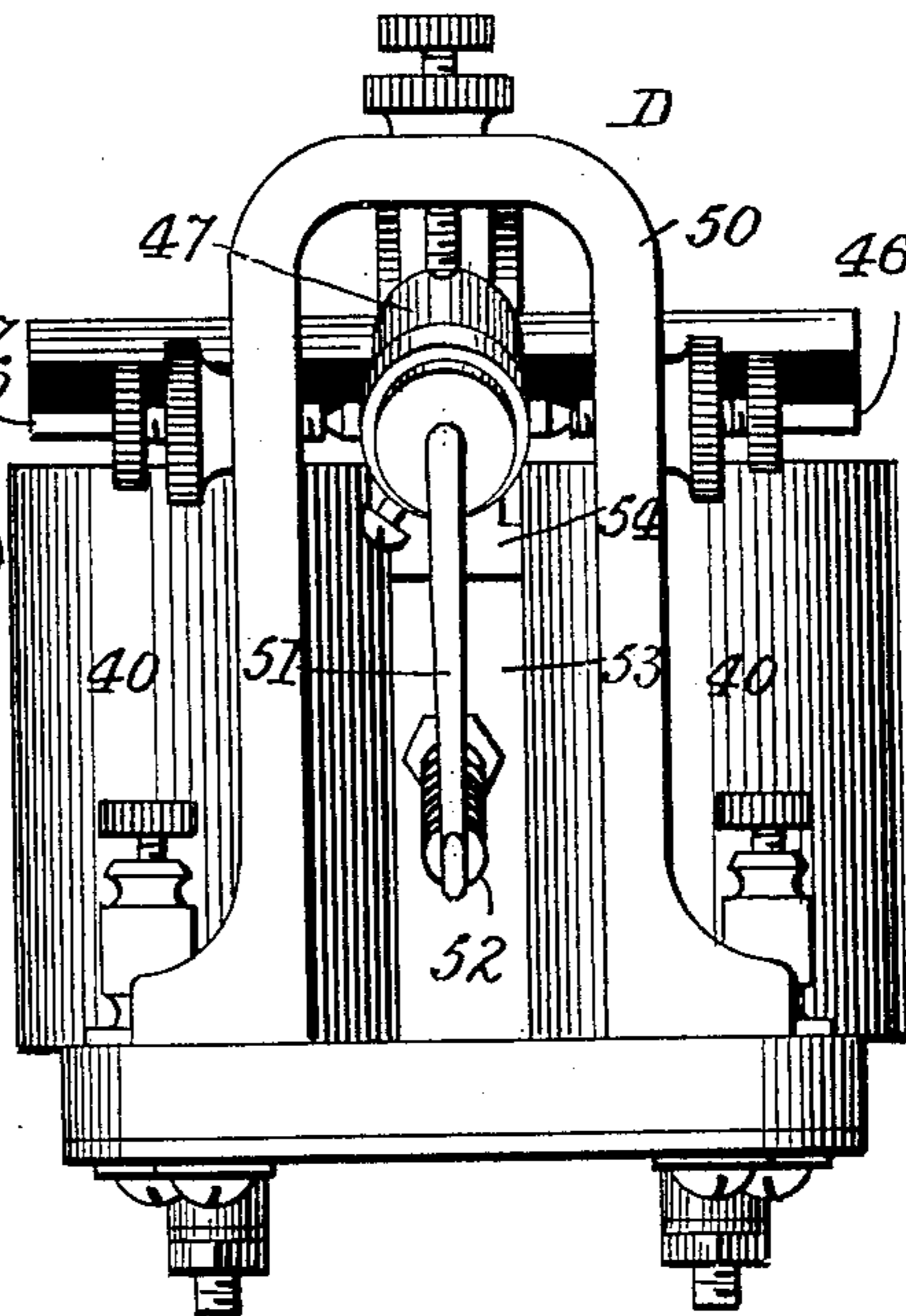


Fig. 7.

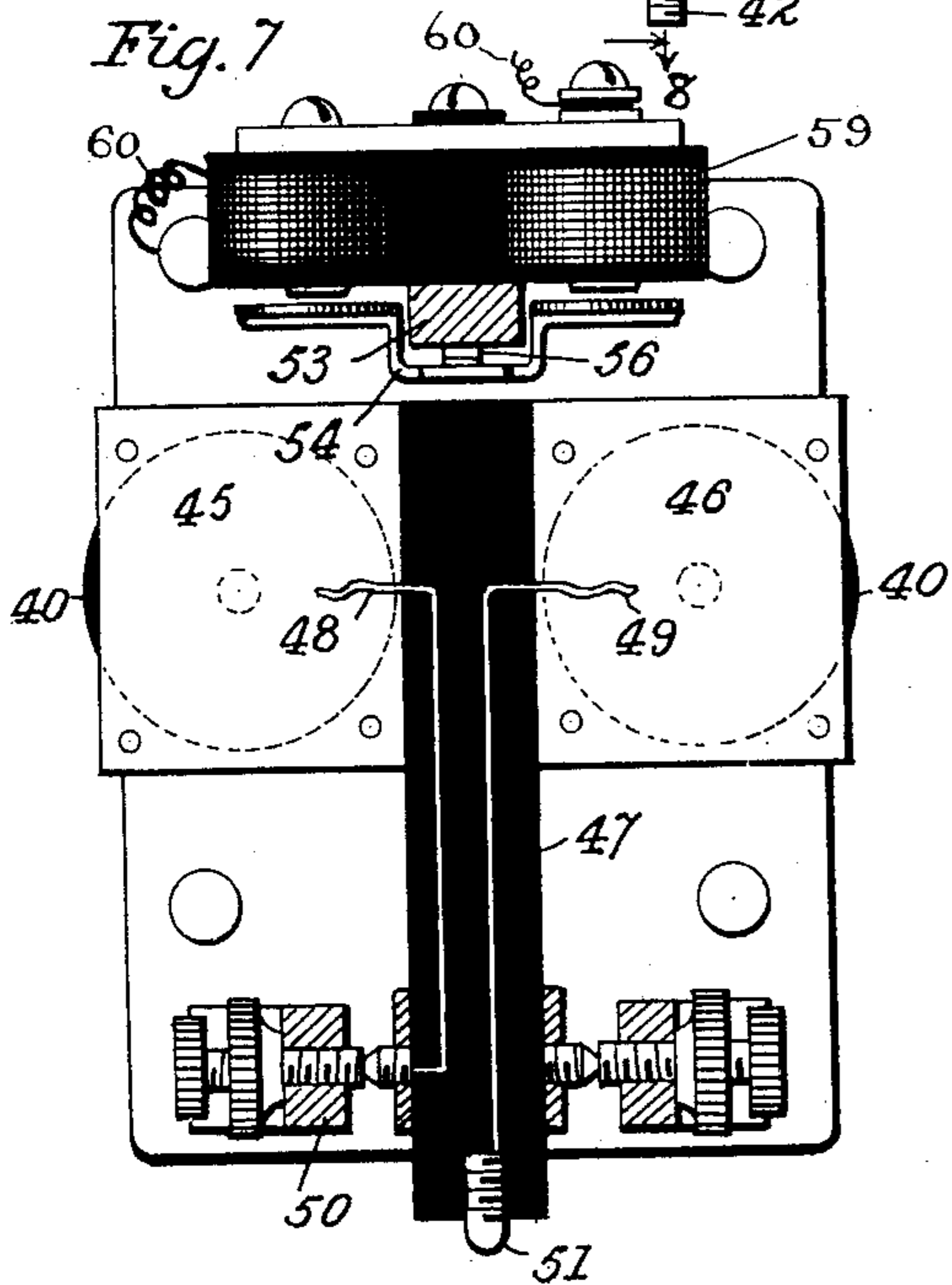
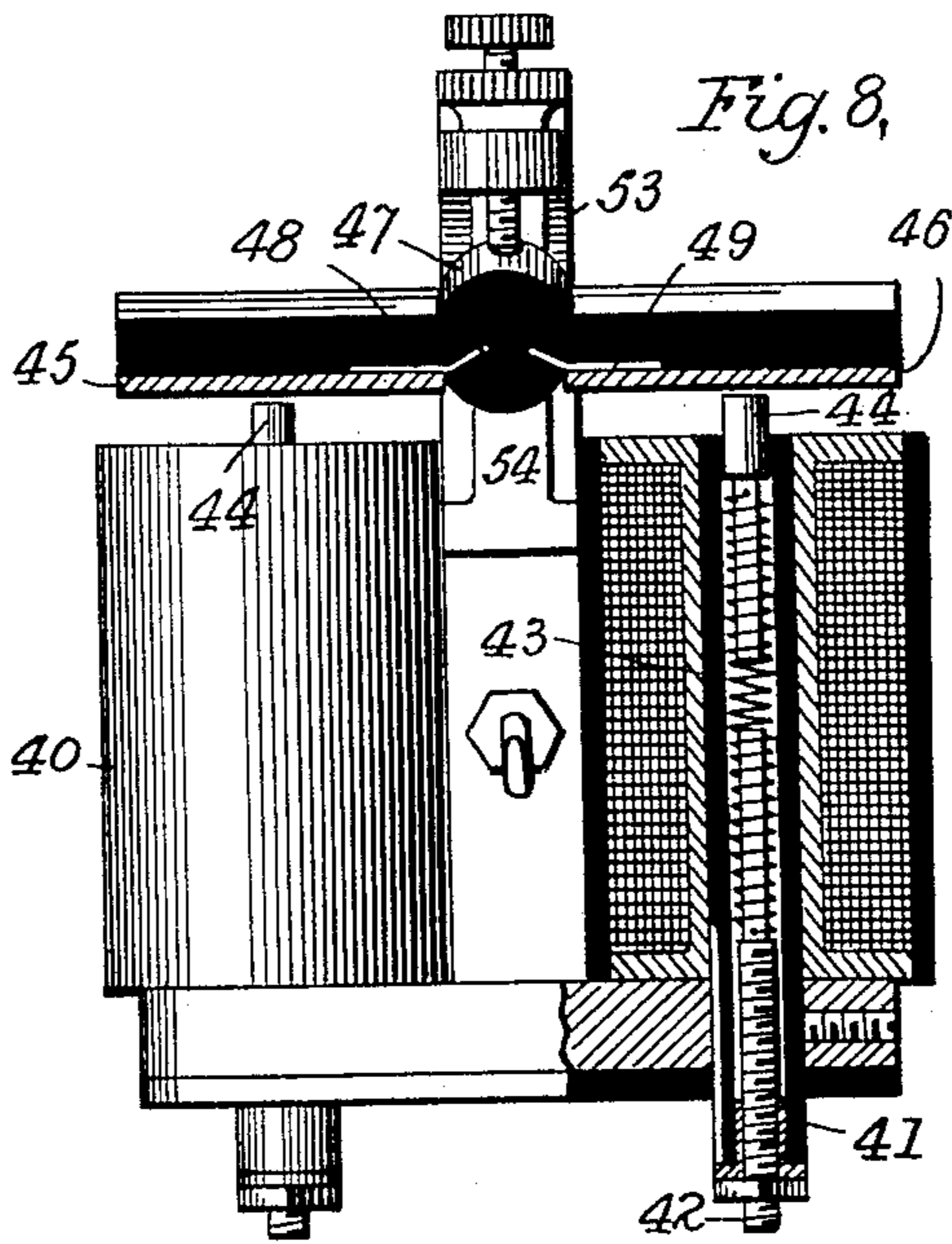


Fig. 8.



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Fig. 9.

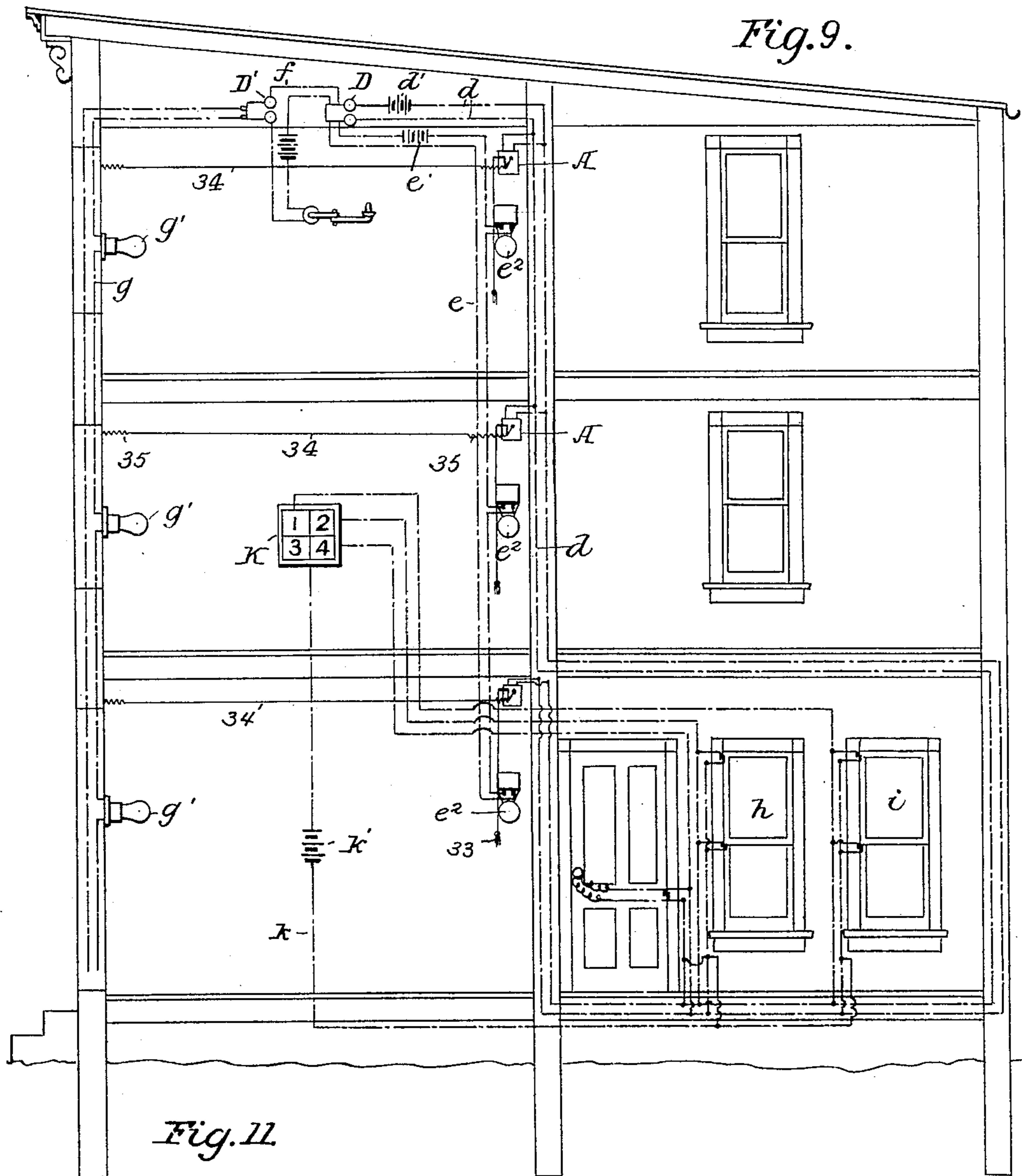
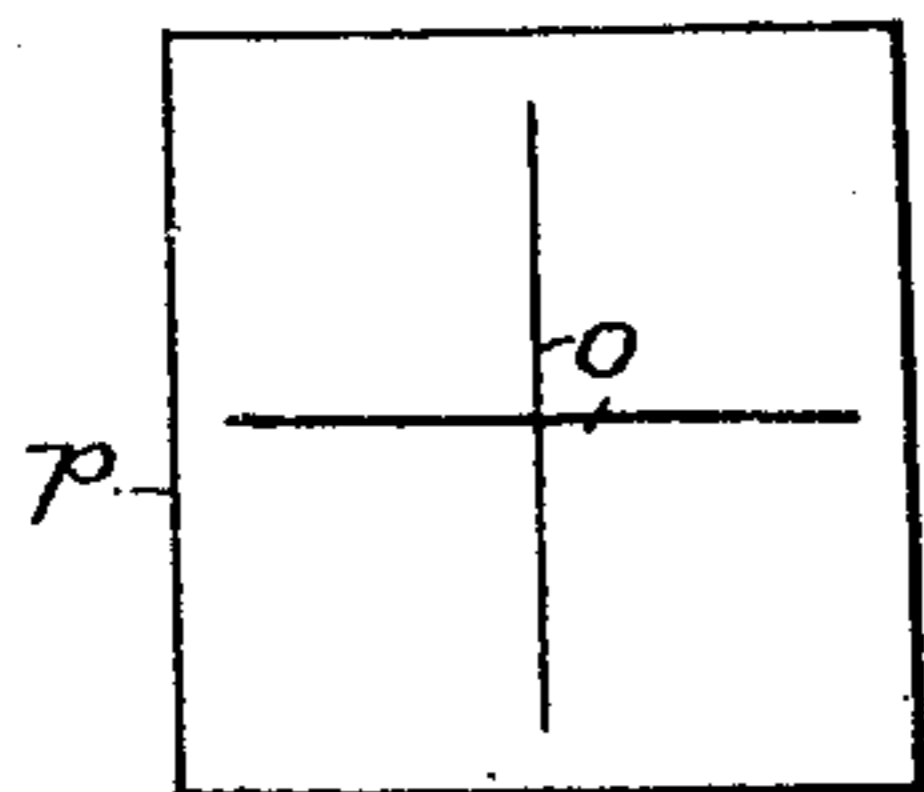


Fig. 11



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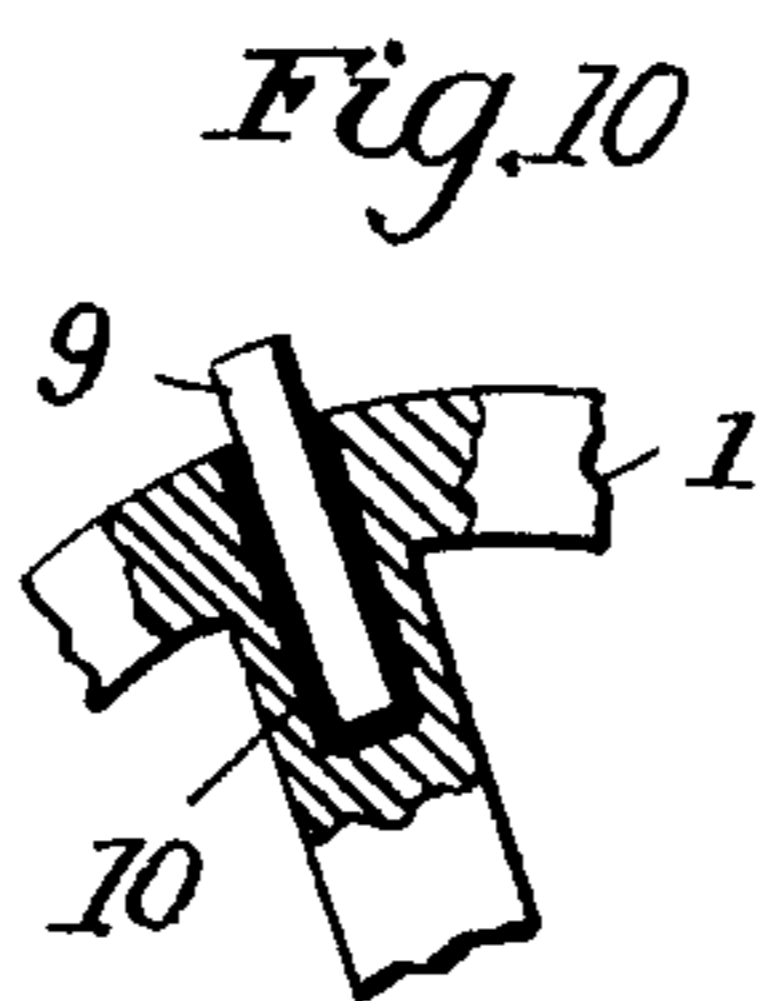
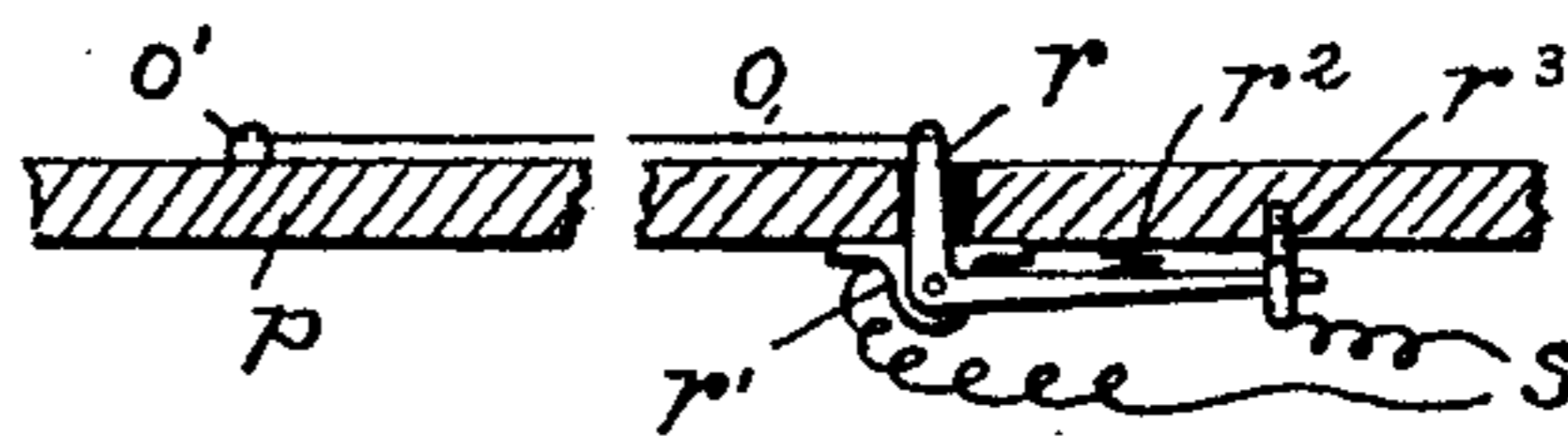


Fig. 12



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UNITED STATES PATENT OFFICE.

CHARLES P. BOSTIAN, OF MILTON, PENNSYLVANIA, ASSIGNOR TO THE BOSTIAN AUTOMATIC BURGLAR AND FIRE ALARM CO., OF SAME PLACE.

FIRE AND BURGLAR ALARM SYSTEM.

SPECIFICATION forming part of Letters Patent No. 598,410, dated February 1, 1898.

Application filed April 27, 1897. Serial No. 634,155. (No model.)

To all whom it may concern:

Be it known that I, CHARLES P. BOSTIAN, a citizen of the United States, residing at Milton, in the county of Northumberland and State of Pennsylvania, have invented certain new and useful Improvements in Fire and Burglar Alarm Systems, of which the following is a specification.

The object of this invention is to provide a combined fire and burglar alarm system for use in private dwellings, factories, hotels, and other buildings which it may be desired to protect both from fire and burglary.

The invention consists in a novel arrangement of circuits and in novel devices for closing the circuits at all points where there may be danger of fire or liability of unauthorized entry on the premises, and devices for sounding alarms at any desired points, for lighting the gas or electric lamps through the building, and for indicating at a central point the exact location at which a fire has occurred or where any doors, windows, or other openings have been tampered with.

In the accompanying drawings, Figure 1 is a front view of one of the signal-boxes with which the various apartments are provided. Fig. 2 is a section on the line 2 2 of Fig. 1. Fig. 3 is an enlarged view of a part of Fig. 2. Fig. 4 is a plan view of a portion of the devices shown in Fig. 1. Fig. 5 is a side view of the preferred form of relay. Fig. 6 is an end view of the same. Fig. 7 is a section on the line 7 7 of Fig. 5. Fig. 8 is a partial section on the line 8 8, Fig. 5. Fig. 9 is a diagram illustrating the general system and the details of the electric connections. Fig. 10 is a detail of part of Fig. 2. Fig. 11 is a plan view, and Fig. 12 is a detail, of a floor alarm device.

Referring to the drawings, Figs. 1 to 4, inclusive, illustrate one of the alarm-boxes which are placed in the apartments to be protected. The box or casing A has a door a, by which it may be closed, and a support a' for a portion of the mechanism. A clockwork C, driven by a spring B, operates the mechanism of the box. A wheel 1, mounted on a shaft 2, connected with the clockwork, is provided with a series of pins 3, which are grouped in any desired manner in order to

produce signals corresponding to the apartments in which boxes are placed. As shown, the pins are arranged in three groups of three pins each. Signals are turned in by the contact of the pins with a spring-arm 4, which is connected to the side of the box. The arm 4 is connected by a conductor 5 with a binding-post 6, and the clockwork is connected by a conductor 7 with a binding-post 8. Upon the wheel 1 is an insulated tooth 9, set in a socket 10, and the wheel is normally held from movement by the engagement of this tooth with a pivoted stop-lever 11, said stop-lever being held normally in the path of the pawl by a spring 12. As shown in Figs. 1 and 4, the stop-lever 11 is connected to toggle-levers 13 14, the latter lever being connected to the frame. When the toggle-joint is partially straightened, as shown in dotted lines, Fig. 4, the pawl 11 is disengaged from the tooth 9, and the wheel 1 rotates under the influence of the clockwork, and the circuit through the binding-posts is completed each time a pin engages the arm 4. The pawl 11 is operated in several different ways by means which will now be described. To the toggle-lever 14 are connected three links 15 16 17, each having a slot in its free end. The links 15 and 16 are connected to the lever 14 at the upper and lower ends of a cross-arm 18, while the link 17, as shown, is connected to the bifurcated end 19 of lever 14. The manner of connecting the links to the lever 14 is, however, a matter of detail and unimportant. Pins 20 and 21 upon a centrally-pivoted lever 22 engage, respectively, with the links 15 and 16. The lever 22 is connected with an arm 23, which, as shown, is upon the outside of the box. The arm 23 is drawn backward strongly by a spring 24, and when in its normal position it rests against a spring 25, Figs. 1 and 3. A second arm 26 is pivoted to the box at 27 and connected with a spring 28, which tends to draw the lower end of the arm to the rear. The free end of the arm 26 is engaged under normal temperatures with the free end of a compound thermostatic bar 29, consisting, as shown, of a plate of metal and a plate of hard rubber riveted together. In the position shown in Figs. 2 and 3 the spring 28 is under tension and

adapted to draw the lever 26 back forcibly when released by the thermostat. The slots in the links 15 16 17 are so proportioned that the rearward movement of the lever 26 or the movement in either direction of the arm 23 will move the arm 14 into the dotted position, Fig. 4, and release the signal-lever 1. A small lever 30 is pivoted to the box, and one end of said lever is connected by a suitable cord or wire 31 with the free end of lever 23. The opposite end of the lever is provided with a depending cord 32, which terminates in a suitable tassel or handle 33, Fig. 9.

The operation of the signal-box will be understood better by an inspection of Fig. 9 in connection with Figs. 1 to 4. The instrument is attached to the side wall of a room at or close to the ceiling. A cord 34 of inflammable material is stretched across the room and connected with the arm 23 of the box, the arm being drawn into the position indicated in full lines, Fig. 3. One or more springs 35 may be connected to the cord to keep it always drawn tight and to permit of slight variations due to the conditions of the atmosphere without starting the signal-box. If, however, a fire should occur in the room, the cord would soon be burned, and the instant it parted the arm 23 would be drawn backward by the spring 24, its momentum being sufficient to carry it to the dotted position marked *n* in Fig. 3, which movement would draw back the link 16 and disengage the stop-lever from the signal-wheel. The arm 23 would then immediately resume a middle position under the influence of the spring 25, and the stop-lever would engage and stop the signal-wheel after it had made one revolution. This inflammable cord is used to insure an alarm being turned in in case the thermostat should fail to operate. The thermostat 29 should release the arm 26 when the temperature rises to a certain degree, and a spring 28 should thereupon draw the arm 26 quickly backward, and the pin 27^a on said arm operating through the link 17 should move the toggle-levers and disengage the stop-levers from the signal-lever. In case of fire being discovered before it has made sufficient progress to affect the signal-box, an alarm may be sent in by pulling the cord 32, which, acting through lever 30 and cord 31, will draw the arm 23 to the extreme left, causing the pin 20 to engage the link 15 and release the signal-wheel from the stop-lever. This position of arm 23 is shown in dotted lines *m*, Fig. 3.

The signal-boxes are connected in multiple with an open circuit *d*, which extends through all of the rooms of the building. In the circuit *d* is a relay D, preferably of the construction illustrated in Figs. 5 to 8, inclusive, which will be hereinafter described. The circuit is also provided with a suitable battery *d'*. When one of the alarm-boxes is operated, the circuit is completed through the relay each time a pin on the signal-wheel

strikes the spring-contact arm 4, closing a bell-circuit *e*, which extends throughout the building. The bell-circuit is provided with a suitable battery *e'*. The relay also closes a light-circuit *f*, which circuit is arranged to turn on and light the gas or electric lights throughout the building. When gas is used, the first impulse over the circuit *f* lights the gas, and it continues to burn thereafter until turned off. When electric lights are used, a special circuit *g* carries the electric-light current throughout the building through a series of electric lamps *g'*, said lamps being independent of the lamps used for ordinary illumination. The first impulse through the circuit *f* closes the circuit *g* by means of a relay D', which is immediately locked in its closed position, so that it will not open when the current ceases to flow in *f*.

Burglar-detecting instruments in the nature of circuit-closers are placed on the windows and doors and connected in multiple with the circuit *d* above described. Thus the windows *h* and *i* are provided with instruments for the top and bottom sashes, and the door *j* is provided with instruments at the lock and at the hinged side, and any tampering with the doors or windows will close the circuit *d* and ring a continuous alarm on the bells *e*², at the same time lighting the gas or electric lamps in the building.

In order to locate the cause of a burglar-alarm, the detective instruments on each door and window are connected with an annunciator K by means of a circuit *k*, having one outgoing wire and a series of return-wires, said circuit being provided with a battery *k'*.

The batteries *d'* *e'* and the relays D D' are preferably located in the upper part of the building. The fire-detecting boxes are placed in all the apartments of the building. The burglar-detecting instruments need only be placed on the first and second floors, and the annunciator is usually located in the room most likely to be occupied at night, such as a bedroom or a room occupied by a watchman.

In Figs. 11 and 12 I have shown a device for detecting burglars which I also contemplate using in my system. In Fig. 11 *o* indicates two wires above the floor *p*. These wires are tightly stretched at a distance of about a quarter of an inch above the floor, not sufficient to project above the general surface of the carpet, the carpet being laid over the wires. One end of each wire is connected rigidly to a suitable fastening *o'*, while the other end is connected to an elbow-lever *r*, which is pivoted to a hanger *r'*, set in the floor, Fig. 12. The lever *r* is right-angled and its free end is pressed down by a spring *r*², which spring thus stretches the wire *o*. The end of the lever *r* is adjacent to a suitable contact *r*³, which, as shown, is a screw-eye. The lever and the screw-eye are connected to the circuit *d*, running through the building, by a branch circuit *s*. It will be obvious that when the wire is stepped on lever

r will be operated and the circuit closed, thus ringing the alarm-bells throughout the house and lighting the various apartments.

The relay D, which I prefer to use, is illustrated in Figs. 5 to 8, inclusive. In these figures, 40 indicates a pair of magnets through which the line *g* passes. The cores of these magnets are hollow and provided with an insulated lining 41, into the lower end of which a conducting-rod 42 is inserted. This rod is connected by a spring 43 with a spring-sustained contact-pin 44, the spring being electrically connected with the parts 42 and 44.

The armature consists of a pair of plates 45 46, supported on an armature-lever 47, which is composed of insulating material, such as hard rubber. The armature-lever carries two conductors 48 49, which connect, respectively, with the plates 45 46. The conductor 48 connects with the yoke 50, which supports the armature-lever, and the conductor 49 connects through an arm 51 and spring 52 with a post 53. When the line-current passes through the magnets 40, the armature is drawn down and two independent circuits are closed through the pins 44. One of these circuits is the bell-circuit *e*, and the other circuit is the light-circuit *f*. The instrument D' may be the same construction as the instrument above described, with the exception that it is provided with a detent, such as that shown in Fig. 5, for holding the armature down. The detent consists in a pivoted lever 54, having a shoulder 55, adapted to engage and lock the armature-lever 47 when it is drawn down. The lever 54 is pressed inward by a plate-spring 56, which bears upon the standard 53. The armature can be released by passing a current through the magnets 59 and circuit 60.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a fire and burglar alarm system, a series of alarm-boxes connected in multiple in a normally open circuit extending throughout the apartments to be protected, each alarm-box having a clockwork, a circuit-closing signal-wheel provided with groups of pins, a spring-contact arm, a projecting tooth on the

wheel, a stop-lever, an arm 23 for operating the stop-lever through intermediate connections, and two springs normally holding said stop-lever in the path of the tooth, but permitting the arm to be moved in either direction to disengage the stop-lever from the tooth, substantially as described.

2. The combination with a signal-wheel having groups of contact-pins, of a contact-spring 4 adapted to engage said pins as the wheel rotates, a stop-pin projecting from the wheel, a stop-lever normally in the path of said pin, a lever 14 connected with said stop-lever and adapted to move the same, a slotted link connected with said lever, a vibratory lever engaging the slot of said link, an inflammable cord arranged to hold the stop-lever in its normal position; and a spring adapted to throw said lever out of the path of the tooth when the cord is severed, substantially as described.

3. The combination with a signal-wheel and contact-spring, of the stop-lever, mechanism for throwing said stop-lever out of the path of the pin, including three slotted links, a vibratory lever engaging two of said links, an arm connected with said lever, an inflammable cord connected to said arm, a manually-operated cord also connected to said arm, a lever engaging the slot of the third link, a spring for operating said lever and a thermostatic detent for said lever, substantially as described.

4. In a fire and burglar alarm system, the combination with a series of alarm-boxes constructed to send in distinguishing signals, of a normally open circuit to which said boxes are connected, a relay in said circuit, a circuit *f* adapted to be closed temporarily by said relay, a relay in the circuit *f* arranged to close an electric-light circuit *g*, and means for locking said latter relay in closed position, substantially as described.

In testimony whereof I affix my signature, in presence of two witnesses, this 14th day of April, 1897.

CHARLES P. BOSTIAN.

Witnesses:

J. A. WATSON,
ROBERT WATSON.