

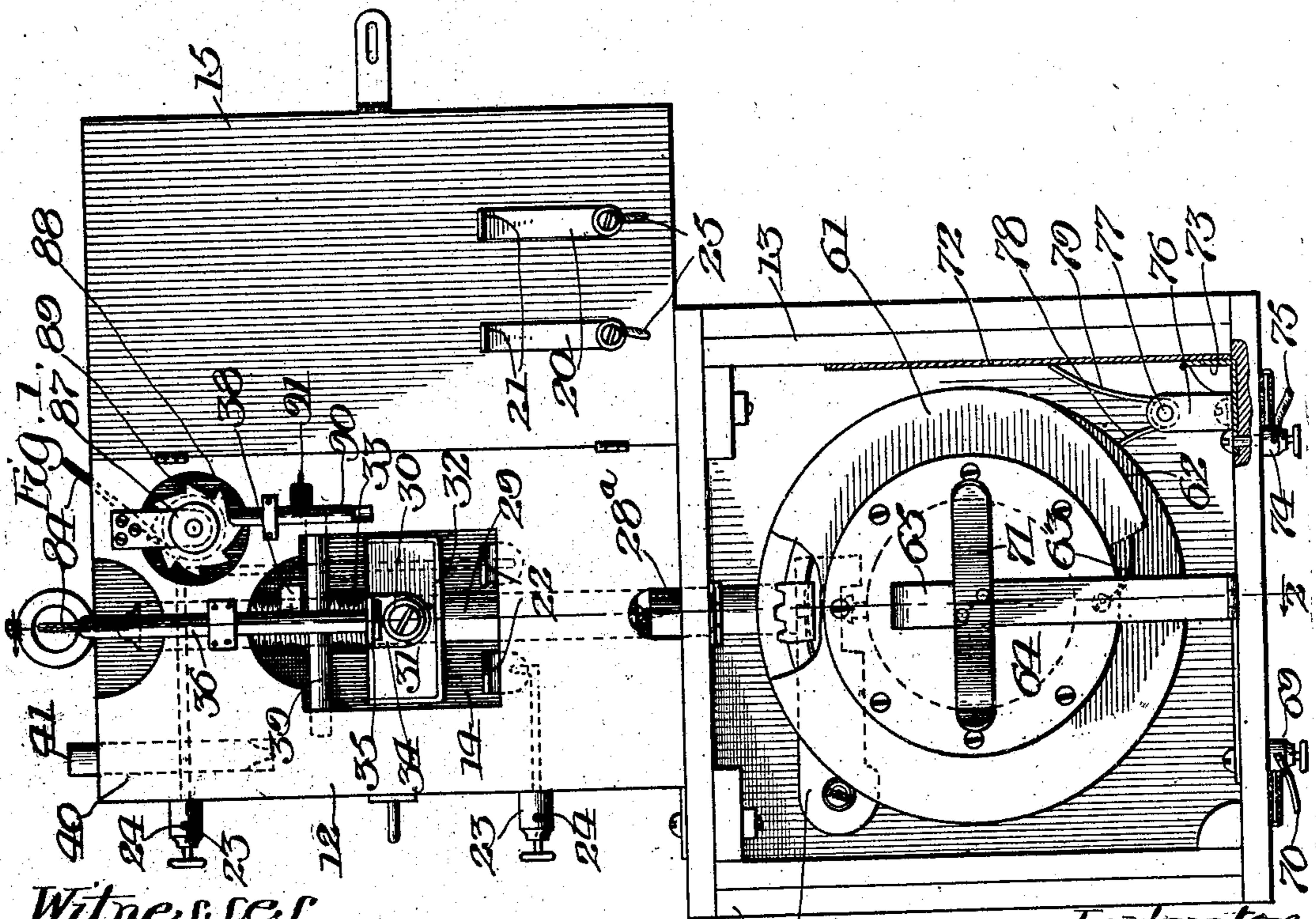
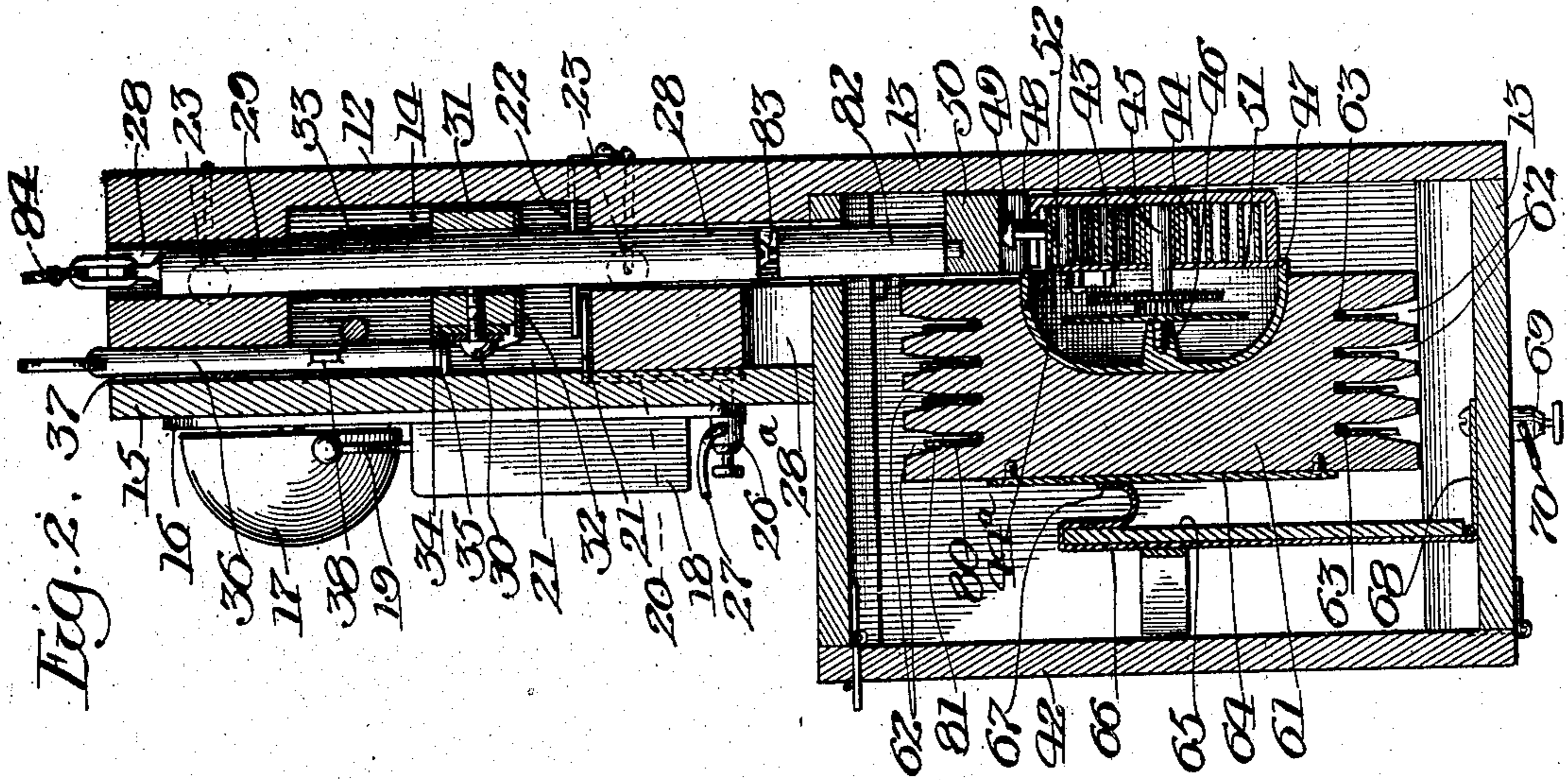
V. KALL.
FIRE ALARM.

APPLICATION FILED JULY 8, 1908.

Patented Feb. 9, 1909.

3 SHEETS—SHEET 1.

911,730.



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3 SHEETS—SHEET 2.

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Fig. 3.

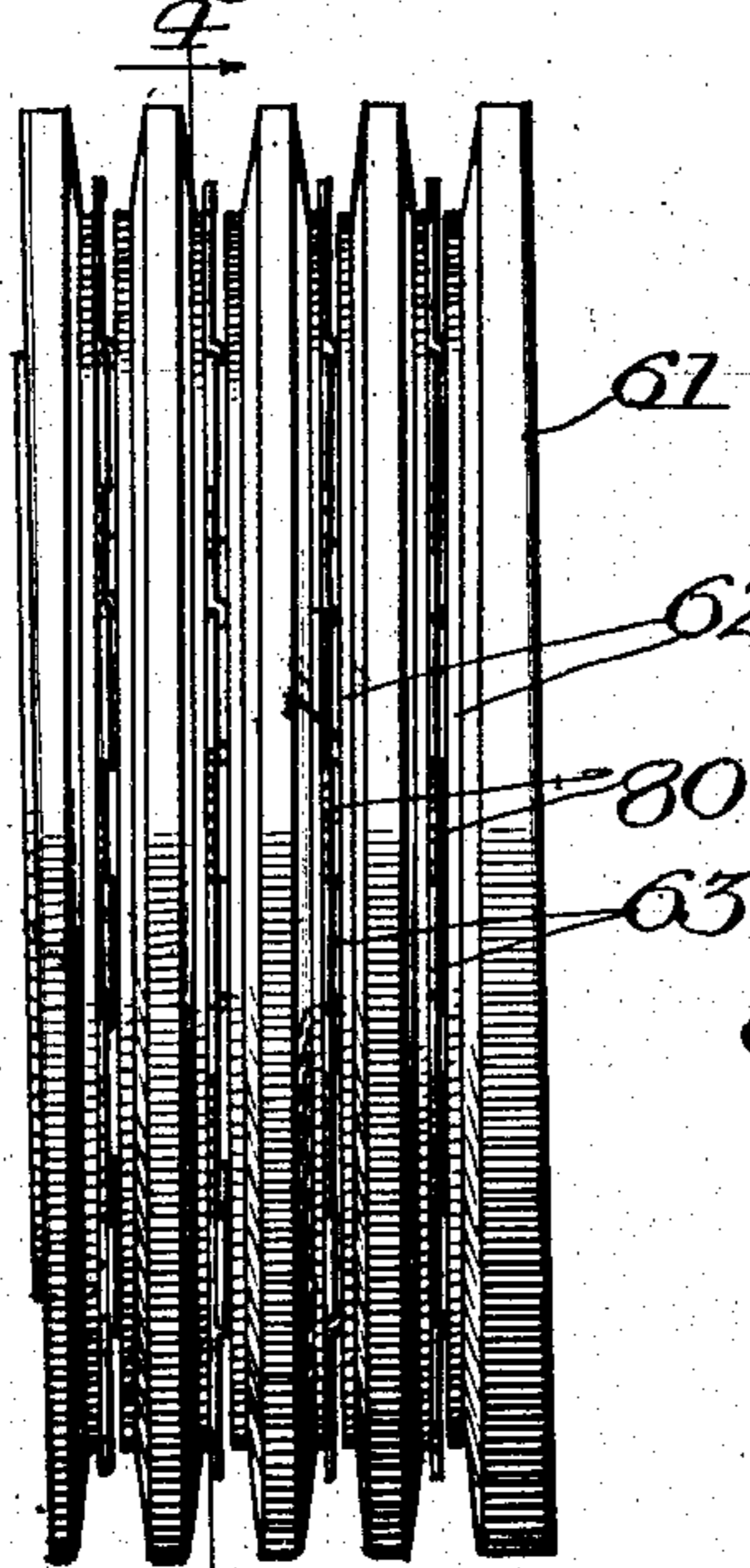


Fig. 4.

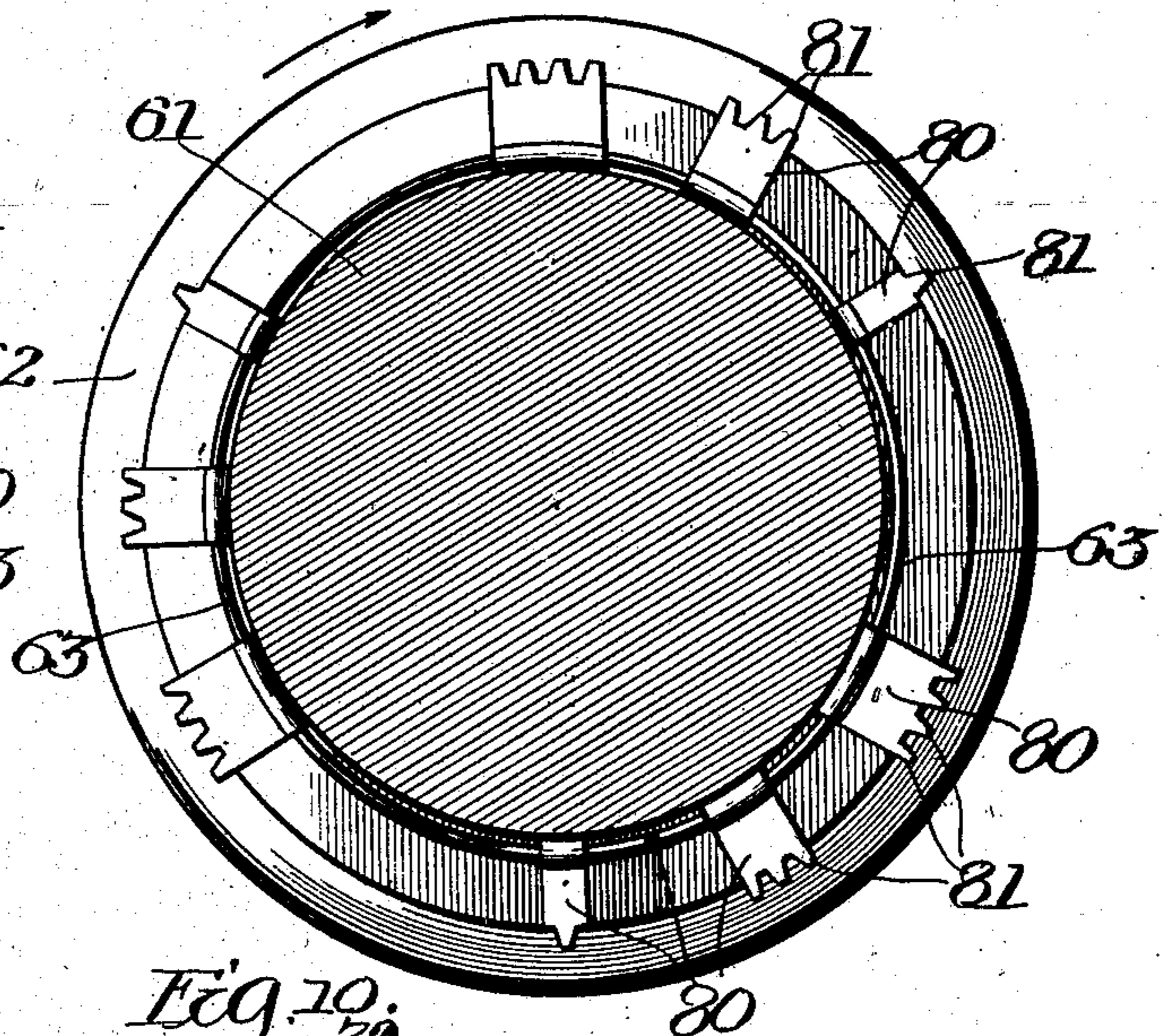


Fig. 5.

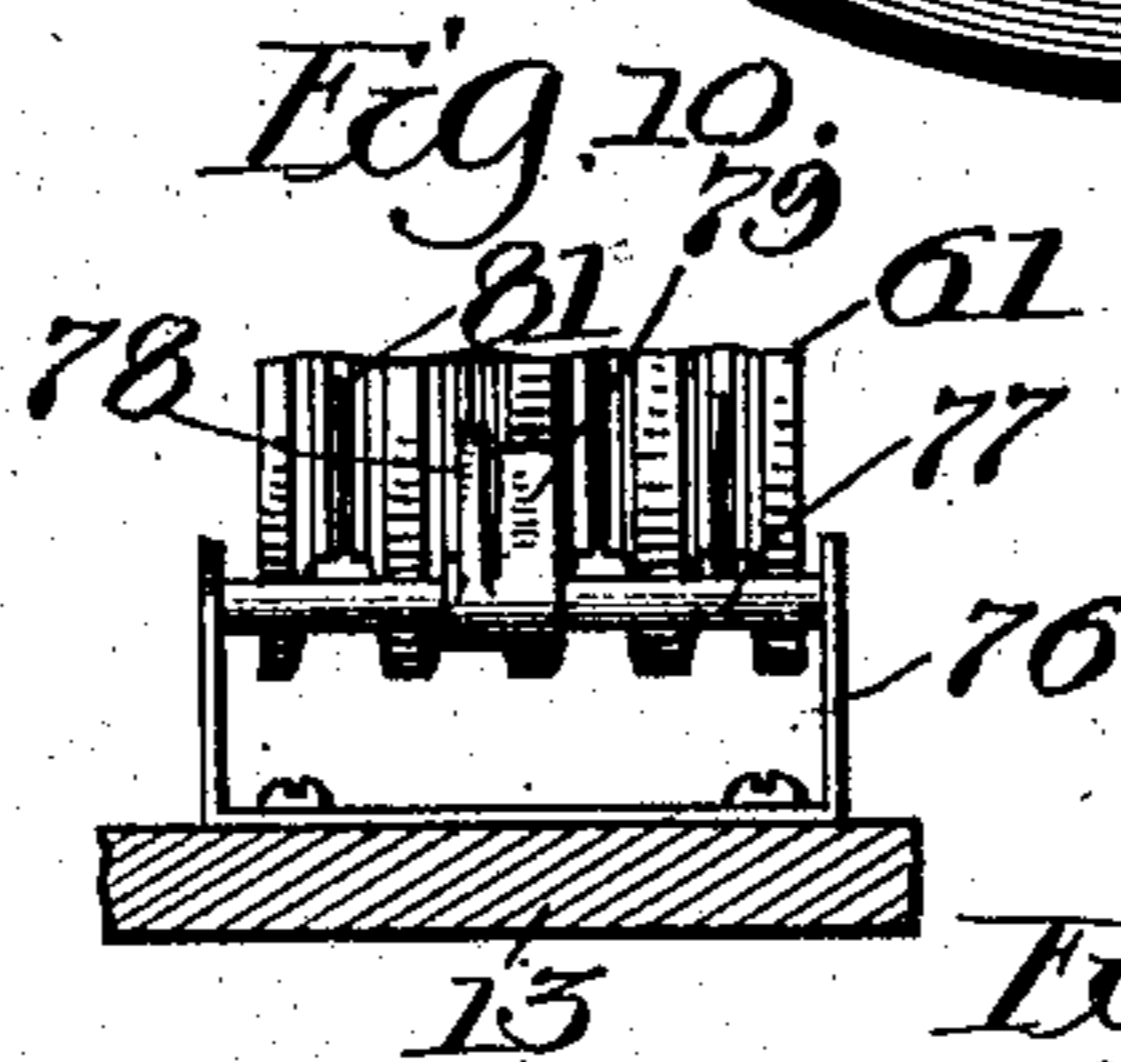
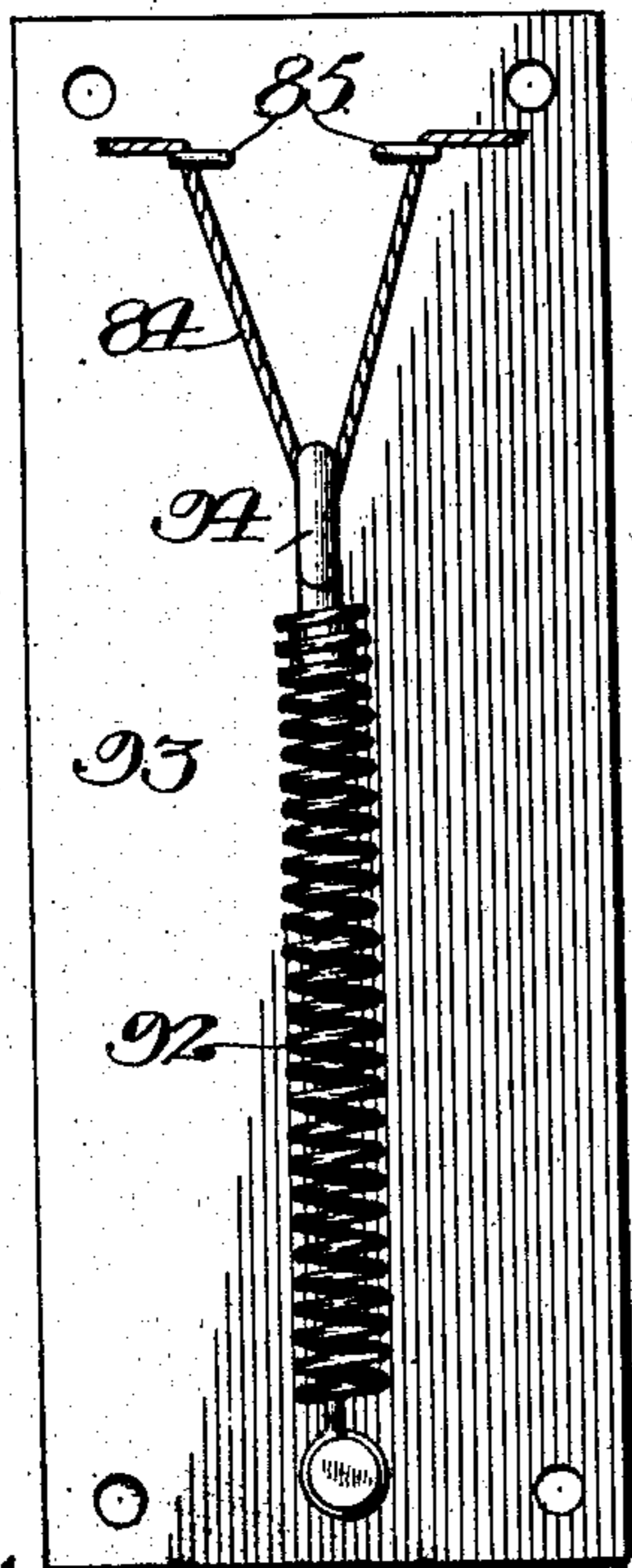


Fig. 6.

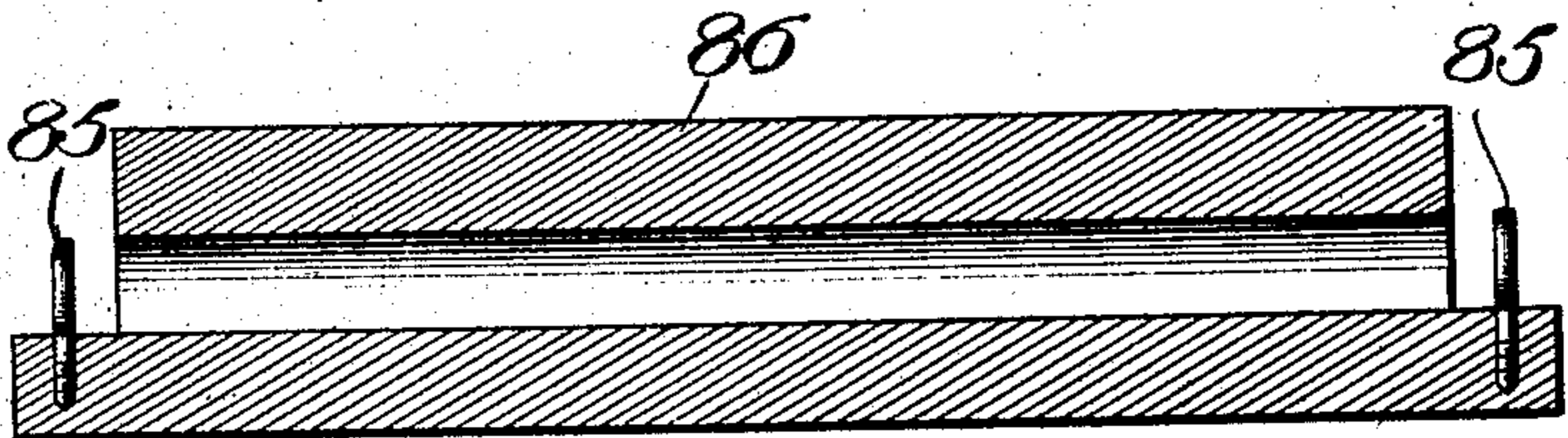
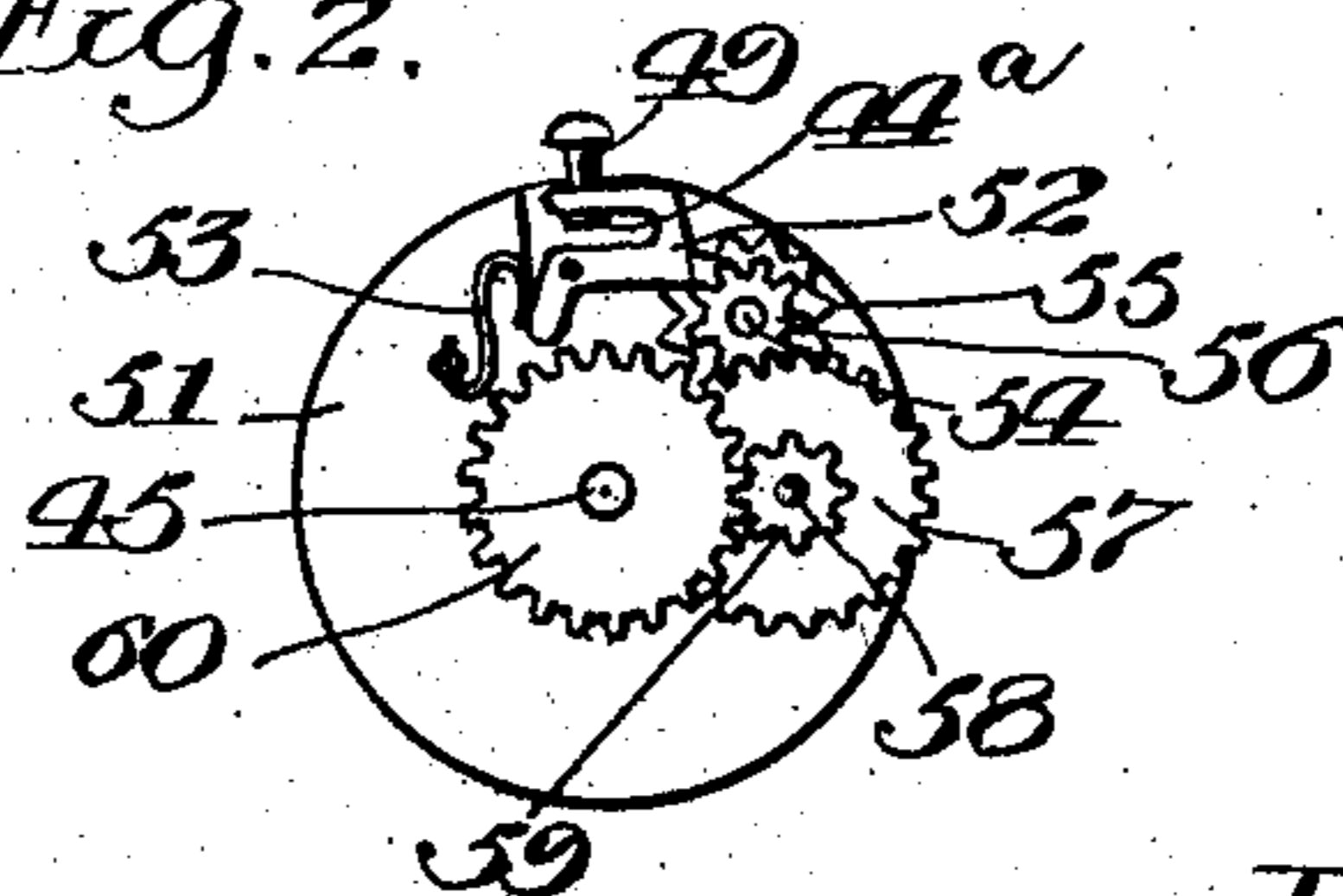


Fig. 2.



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Fig. 7.

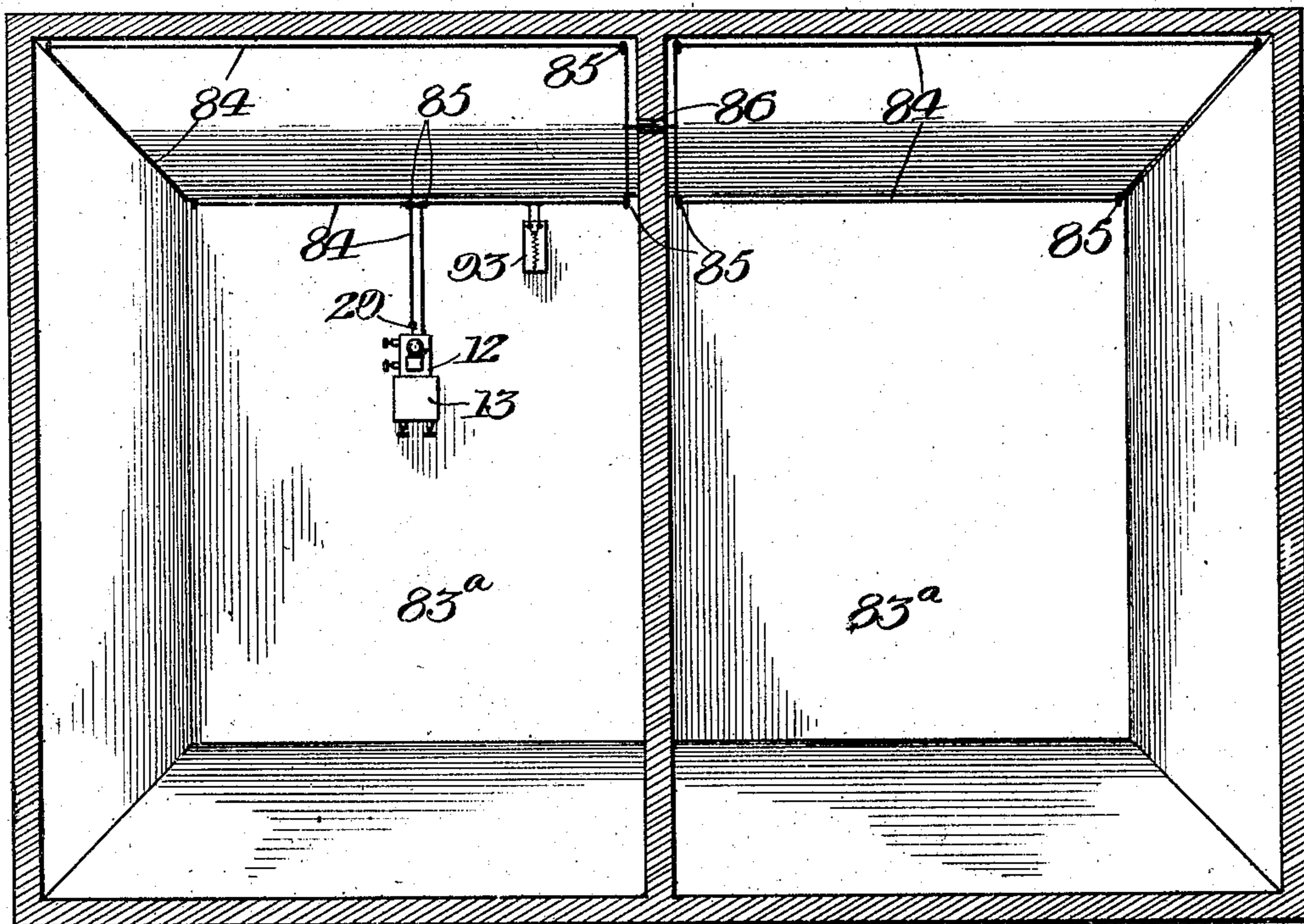


Fig. 8.

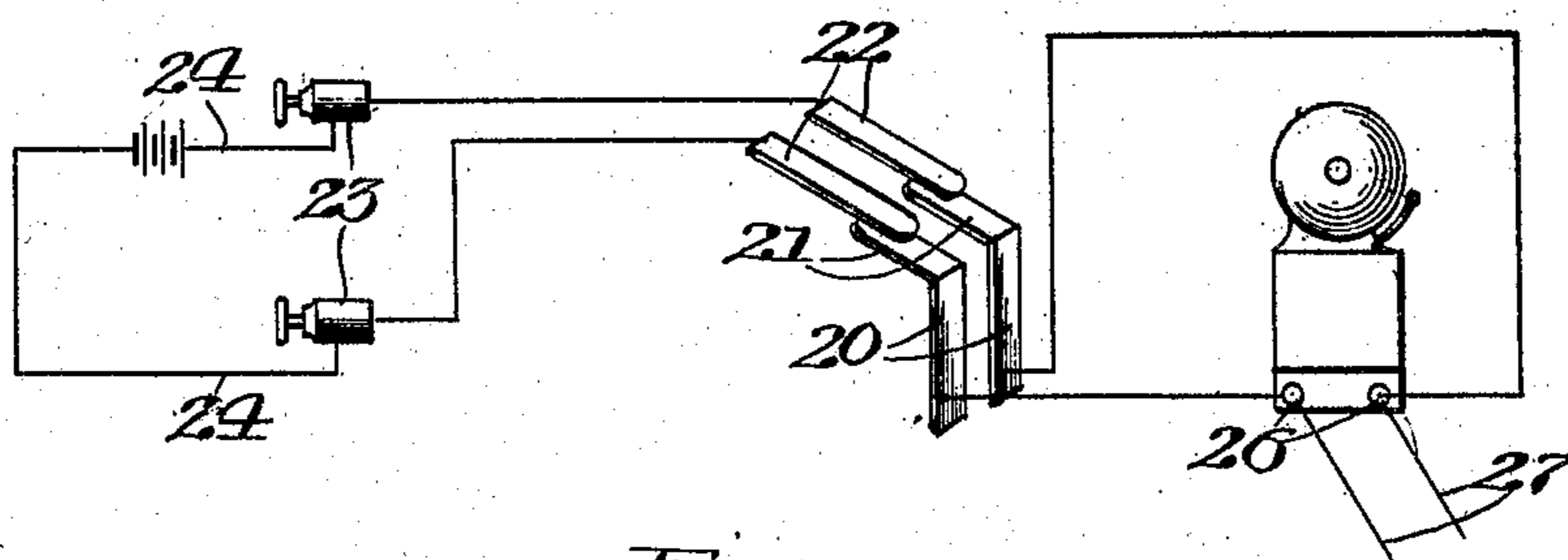
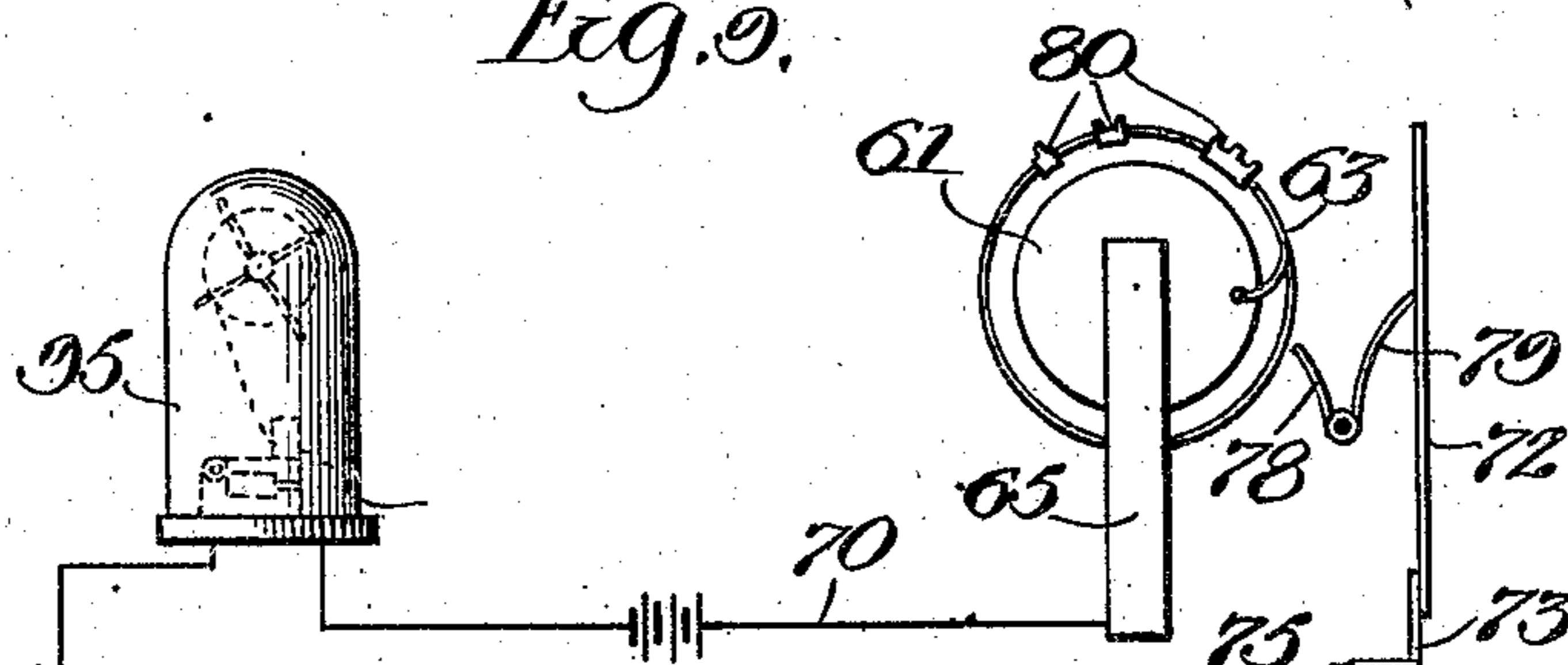


Fig. 9.



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UNITED STATES PATENT OFFICE.

VERNER KALL, OF ROCKFORD, ILLINOIS.

FIRE-ALARM.

No. 911,730.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed July 8, 1908. Serial No. 442,478.

To all whom it may concern:

Be it known that I, VERNER KALL, a subject of the King of Sweden, residing at Rockford, in the county of Winnebago and State of Illinois, have invented certain new and useful Improvements in a Fire-Alarm, of which the following is a specification.

This invention relates to improvements in an apparatus to be used for automatically producing or giving an alarm in case of fire in one or more parts of a building, and when desired, for transmitting said alarm to the fire department or station thereof; and it consists in certain peculiarities of the construction, novel arrangement, and operation of the various parts thereof, as will be hereinafter more fully set forth and specifically claimed.

The principal object of the invention is to provide an automatic fire alarm, which shall be simple and inexpensive in construction, strong, durable and efficient in operation, and which shall be so made that it may be easily installed and, when desired, may be connected with the electric circuit of the fire department so that the alarm may be quickly transmitted thereto and the location of the building from which the alarm is sent indicated.

Numerous other objects and advantages of the invention will be disclosed in the subjoined description and explanation.

In order to enable others skilled in the art to which my invention pertains, to make and use the same, I will now proceed to describe it, referring to the accompanying drawings, in which—

Figure 1 is a view in front elevation of the casings which hold the operating mechanisms of the alarm and alarm transmitting device, showing the door of the former open and that of the latter removed; Fig. 2 is a vertical sectional view taken on line 2—2 of Fig. 1 looking in the direction indicated by the arrows, but showing the doors of the casings closed; Fig. 2^A is a view in elevation of a portion of the clock mechanism which operates the alarm transmitting drum; Fig. 3 is an enlarged side view of the spirally grooved drum of the alarm transmitter; Fig. 4 is a sectional view thereof taken on line 4—4 of Fig. 3 looking in the direction indicated by the arrows; Fig. 5 is a face view of a tension spring and its plate used for imparting the proper tension to the destructible or inflammable cords used in connection with the

alarm; Fig. 6 is an enlarged longitudinal sectional view of one of the guide tubes for the destructible cords; Fig. 7 is a perspective view partly in section of two rooms or compartments of a building, showing the alarm and transmitter therefor in position on one of the walls of one of the rooms and illustrating the manner of securing the destructible or combustible cords to the ceilings and also showing the means for normally holding the same taut; Fig. 8 is a diagrammatic view of the bell or alarm circuit; Fig. 9 is a similar view of the alarm transmitting circuit; and Fig. 10 is a side view partly in section and partly in elevation of a portion of the transmitting drum, showing the movable contact piece mounted near the same and one of its prongs in engagement with the grooves of said drum.

Like numerals of reference, refer to corresponding parts throughout the different views of the drawings.

The reference numeral 12 designates the casing or frame for the alarm mechanism and the numeral 13 the casing or frame for the alarm transmitting mechanism, which casings or frames may be made of any suitable size, form and material, but preferably of wood and rectangular in shape, as shown. The body of the casing 12 is provided with a central cavity 14 and has hinged to the front of one of its sides a door 15 to the outer surface of which is secured a metal plate 16 on which is mounted an alarm bell 17 and a box-like casing 18 in which is contained a mechanism of the ordinary or any suitable kind for operating a clapper 19 so as to cause it to strike the bell 17 and produce an alarm. Secured at one of their ends to the inner surface of the door 15 are two contact strips or plates 20 which have their free ends intumed as at 21 so as to be brought into contact with two other contact points or strips 22 which are secured to the frame 12 at a slight distance above the bottom of the cavity 14 therein, and which points or strips are electrically connected to binding posts 23 on one side of the frame 12, which posts are connected through conductors 24 with an electric battery, not shown. The contact strips 20 have connections 25 which pass through the door 15 with a pair of binding posts 26 which are connected by means of conductors 27 having a switch with a battery, which switch and battery are not shown. The frame 12 is provided with a

vertical opening 28 for the reception and operation of an operating rod or bolt 29 which has secured thereon at about its middle by means of a screw 30 or otherwise a block 31 which is provided on its lower surface and ends with a metallic plate 32 to impinge against the contact points 22. As shown in Figs. 1 and 2 the block 31 is located within the cavity 14 and is pressed by means of a spring 33 which surrounds the bolt 29 and rests at one of its ends on the block 31 and at its other end against the upper surface of said cavity. Secured to the front portion of the block 31 is a plate 34 which has at one of its ends an outturned apertured portion 35 in the aperture of which is swiveled one end of a key 36 which is located in a vertical opening 37 extended through the top of the frame 12, and has between its ends a lug or lateral projection 38 to engage a rod 39 which is transversely disposed across the cavity 14 of said frame. The upper portion of the frame 12 is also provided with a vertical opening 40 for the reception of a pin or plug 41 which preferably has its lower end pointed as shown in Fig. 1 and is to be used for the purpose presently to be explained.

As shown in Figs. 1 and 2 the casing 13 for the alarm transmitting mechanism is box-like in shape and has communication through the vertical opening 28 with the cavity 14 of the casing 12, and it will also be seen by reference to said figures that the bolt 29 terminates a slight distance above the bottom of the casing 12 which casing is provided in its front portion with an opening 28^a which communicates with the vertical opening 28, thus permitting access to the lower portion of said opening when the door 15 is open. The front of the casing or compartment 13 is closed by means of a door 42 which may be hinged to the lower portion of said casing, as is clearly shown in Fig. 2 of the drawings. Secured to the rear wall of the casing or compartment 13 at about its middle is a circular casing 43 in which is located a spring 44 which has one of its ends secured to a rotatable shaft 45 which extends through the outer face of the casing, and has its outer end screw-threaded to engage a socketed projection 46 of another portion 47 of the clock mechanism casing. The other end of the spring 44 is secured to the casing 43 which latter is provided in its upper portion with an opening 48 for the reception and operation of a pin 49 which is extended through said opening and rests at one of its ends on the spring 44 and at its other end against a dog or detent 50 which is pivotally secured near one of its ends to the rear wall of the casing 13, as is clearly shown in Fig. 1 of the drawings. Pivotaly secured on the intermediate plate 51 of the casing for the clock mechanism and near the opening in the upper portion thereof is a

pawl 52 which extends at its upper portion over a laterally projecting part 44^a of the spring 44 (see Figs. 2 and 2^A of the drawings). The lower portion of the pawl 52 is pressed by means of a spring 53 secured at one of its ends to the plate 51. Journaled near the upper portion of the pawl 52 on the plate 51 is a shaft 54 which has mounted thereon a ratchet wheel 55 to engage the pawl and also a pinion 56 to engage a gear 57 which is journaled on a shaft 58 mounted on the plate 51 near the driving-shaft 45. Mounted on the shaft 58 is another pinion 59 which meshes with a gear 60 on the driving-shaft.

As before stated, the outer end of the driving-shaft 45 is screw-threaded and engages the socket 46 in the portion 47 of the mechanism casing, which portion has rigidly mounted thereon a drum 61 which is provided on its periphery with a spiral groove 62 in which is located and extends from one end of the groove to the other a wire 63 which has one of its ends secured to a metal plate 64 which is fastened to the outer surface of the drum 61 by means of screws or otherwise. Pivotally secured to the bottom of the casing 13 is a bar 65 which carries a metallic strip 66, which is formed at its free end with a contact point 67 to rest against the plate 64 and has its other end connected by means of a conductor 68 to a binding post 69 from which a conductor 70 may lead to the electric circuit of the fire department. The bar 65 is provided on its outer surface with a bow-spring 71 to rest against the door 42 when the same is closed so as to hold the point 67 in contact with the plate 64 on the drum. Secured to the inner surface of one side of the casing 13 is a metallic plate 72 which has connection through a conductor 73 with a binding post 74 secured to the bottom of the casing from which a conductor 75 may lead to a battery, as is shown in Fig. 9 of the drawings. Horizontally supported on the bottom of the casing 13 near the side thereof on which the plate 72 is secured by means of brackets 76 is a rod 77 on which is movably mounted a forked contacting piece, the shorter prong 78 of which is adapted to project into the spiral groove 62 of the drum 61 while the longer prong 79 will contact with the plate 72 which is in electric connection with the binding post 74, as before stated. Mounted on each coil of the wire 63 are a series of groups of spaced apart projections 80 which extend at their free ends to near the outer edge of the groove 62, and have on their free ends one or more spaced apart projections 81 which are adapted to contact successively with the shorter arm or prong 78 of the movable contact piece. Movably located in the lower portion of the vertical opening 28 of the frame 12 and extended through an opening in the top of the casing 13 is a bolt

82 which engages at its lower end an opening in the dog 50 and is provided at its upper end with an adjusting screw 83 to rest against the lower end of the bolt 29, as is evident by reference to Fig. 2 of the drawings.

From the foregoing and by reference to the drawings, and particularly to Figs. 1, 2 and 7 thereof, in which latter view is shown a portion of two rooms 83^a of a building, it will be readily understood and clearly seen that, the casings or frames 12 and 13 may be secured to the wall of a room, when by connecting the upper portion of the operating bolt 29 to one end of a destructible or combustible cord 84, which may be suspended around the perimeter of the ceiling of the room or rooms by means of screw-eyes 85, or otherwise, and extended through suitable openings in the walls of the building in which may be located tubes 86, of any suitable material, and brought back and secured at its other end to a spool 87 rotatably mounted in an opening 88 in the casing 12, which spool may be provided with a ratchet wheel 89 to engage a pawl 90 which is pressed into engagement with the ratchet wheel by means of a spring 91, and which spool may be turned by any suitable means so as to wind the cord thereon. When the destructible cord is thus connected to the upper parts of the casing, it is evident that it may be made taut by turning the spool 87, but in order to maintain the cord at a proper tension and to compensate for the contraction and expansion thereof, a compensating spring 92 secured at one of its ends to a plate 93 and having at its other end a hook 94 to engage the cord 84, and which plate may be secured to the wall of a room, may be employed.

When the parts are arranged as above-described and as shown in Figs. 2 and 7 of the drawings, it is apparent that if a fire should occur in either of the rooms and burn or sever the cord 84 it would at once become slack and would permit the operating bolt to be forced downwardly by means of the spring 33 which surrounds the same, in which operation the block 31 carried by the bolt 29 will force the contact pieces 22 against the pieces 21, thereby establishing an electric circuit and causing the bell ringing mechanism contained in the casing 18 to operate the clapper 19 against the bell 17 and give forth an alarm. In the downward movement of the operating bolt 29, it is evident that if the bolt 82 in the upper portion of the transmitter casing is employed it will force the dog 50 downwardly against the pin 49 which will release the pawl 52 from the clock mechanism and permit the same to rotate the drum 61, in which operation it will be understood that the shorter prong 78 of the movable contact piece will travel in the

spiral groove 62 of the drum and will contact successively with the points 81 on the projections 80, which, as before stated, are mounted on the wire 63 of the drum. As the projections 80 are spaced apart, and as the electric circuit to the fire department circuit will be completed each time the contact prong 78 comes in contact with the points 81, it is apparent that the electric impulses will be transmitted to the fire department 95 and the location of the fire indicated at said point, for it will be understood that a number of projections 80 having a predetermined number of points 81 to correspond with the number of a block of houses registered at the fire department may be employed, for instance, in the present case, by reference to Fig. 4 it will be seen, that the projections 80 are arranged in groups of three each, and that one of said projections has one point, the next one three and the third one four points. Now, as the drum rotates in the direction indicated by the arrow, it is apparent that the prongs 78 of the movable contact piece will first strike the single pointed projection, and after an interval will strike the three points of the next projection in quick succession, and after another interval will strike the projection having four points thereon, thus indicating that the fire is located in block number 134. As the drum rotates further, it is apparent that this number will be repeated a number of times.

If it is desired to disconnect the alarm from the transmitting mechanism, the bolt 82 may be removed, when it is apparent that the alarm will be operated as above described, or if it should be desired, the bolt 82 may be allowed to remain in its position and the screw 83 removed, when by removing the pin 41 from the top of the casing 12 and inserting it through the opening 28^a (see Fig. 2) into the opening 28 and pressing down on the bolt 82, the alarm may be transmitted in this way to the fire department or station.

As the key 36 is swiveled to the block 31, it is apparent that by raising the parts to the positions shown in Figs. 1 and 2 and turning the key so that the projection 38 thereon will engage the transverse rod 39 the circuit will be broken and the alarm rendered inoperative so that the cords may be removed from the ceiling to permit cleaning thereof, or may be adjusted without giving an alarm.

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

1. A fire alarm and alarm mechanism consisting of a suitably supported alarm frame or casing and a transmitter frame or casing, an electrically operated alarm mechanism mounted on the alarm casing, an operating

bolt movably mounted on said casing and extended into the same, a cord connected to the operating bolt and tautly supported, a clock mechanism mounted in the transmitter casing, a spirally grooved drum mounted on the clock mechanism and adapted to be driven thereby, an electric conductor located in said groove and extended from one end thereof to the other and having electric connection at one of its ends, means connecting the inner end of the operating bolt with the main spring of the clock mechanism whereby said mechanism will be set in operation by the inward movement of said bolt, a series of pointed projections mounted on the conductor within the spiral groove, a forked contact movably mounted within the transmitter casing and having one of its arms extended into the groove of the drum, the movably mounted contact having electric connection, and means within the alarm frame or casing to complete the electric circuit by the inward movement of the operating bolt.

2. A fire alarm consisting of a suitably supported frame or casing, an electrically operated alarm mechanism mounted thereon and having inwardly extending contact points, inwardly extending yielding contact points mounted on the rear portion of the casing and having electric connections, a spring-actuated operating bolt movably mounted on the casing and extended at one of its ends into the same, a block mounted on said bolt near the rear contact points, and a tautly supported cord connected to the operating bolt to normally hold it in its retracted position.

3. A fire alarm consisting of a suitably supported frame or casing, an electrically operated alarm mechanism mounted thereon, an operating bolt movably mounted on the casing and extended at one of its ends into the same, a ratcheted spool journaled in the casing, a spring-pressed pawl to engage said ratchet, a cord connected at one of its ends to the operating bolt and at its other end to said spool, means to support the cord, and means within the casing to close the electric circuit by the inward movement of said bolt.

4. A fire alarm consisting of a suitably supported frame or casing, an electrically operated alarm mechanism mounted thereon, an operating bolt movably mounted on the casing and extended at one of its ends into the same, a key movably mounted on

the casing and in loose connection at one of its ends with said bolt and provided between its ends with a projection, a rod transversely secured on the casing and adapted to be engaged by said projection, a cord connected to the operating bolt and tautly supported, and means within the casing to close the electric circuit by the inward movement of said bolt.

5. A fire alarm consisting of a suitably supported frame or casing, an electrically operated alarm mechanism mounted thereon, an operating bolt movably mounted on the casing and extended at one of its ends into the same, a key movably mounted on the casing and in loose connection at one of its ends with said bolt and provided between its ends with a projection, means mounted on the casing and adapted to be engaged by said projection, a ratcheted spool journaled on the casing, a spring-pressed pawl to engage said ratchet, a cord connected at one of its ends to the operating bolt and at its other end to said spool and suitably supported, and means within the casing to close the electric circuit by the inward movement of said bolt.

6. In a fire alarm, the combination with a suitably supported alarm casing or frame, of an electrically operated alarm mechanism mounted thereon, an operating bolt movably mounted on the casing and extended at one of its ends into the same, means within the casing to close the electric circuit by the inward movement of said bolt, a transmitter frame or casing mounted near the alarm casing, a spirally grooved drum rotatably mounted in the transmitter casing, a conductor located in the spiral groove of the drum and extending from one end to the other thereof and having at one of its ends an electric connection, a series of pointed projections mounted on the conductor in the said groove, a forked contact piece movably mounted within the transmitter casing and having one of its prongs extended into the groove of the drum, electric connections uniting said movable piece with a battery, a driving mechanism to rotate the drum, and connections between the driving mechanism and inner portion of the operating bolt to set said mechanism in operation by the inward movement of said connections.

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