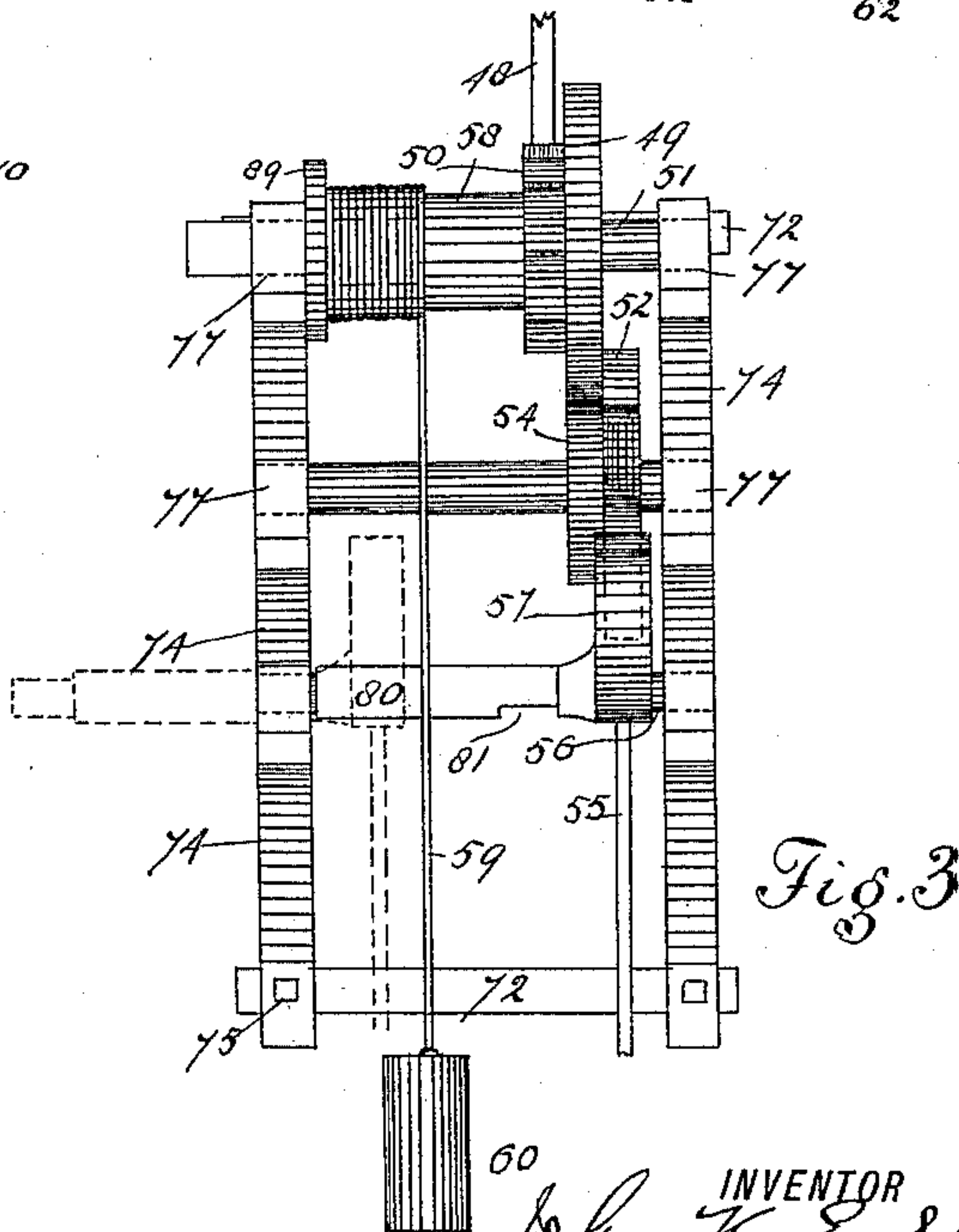
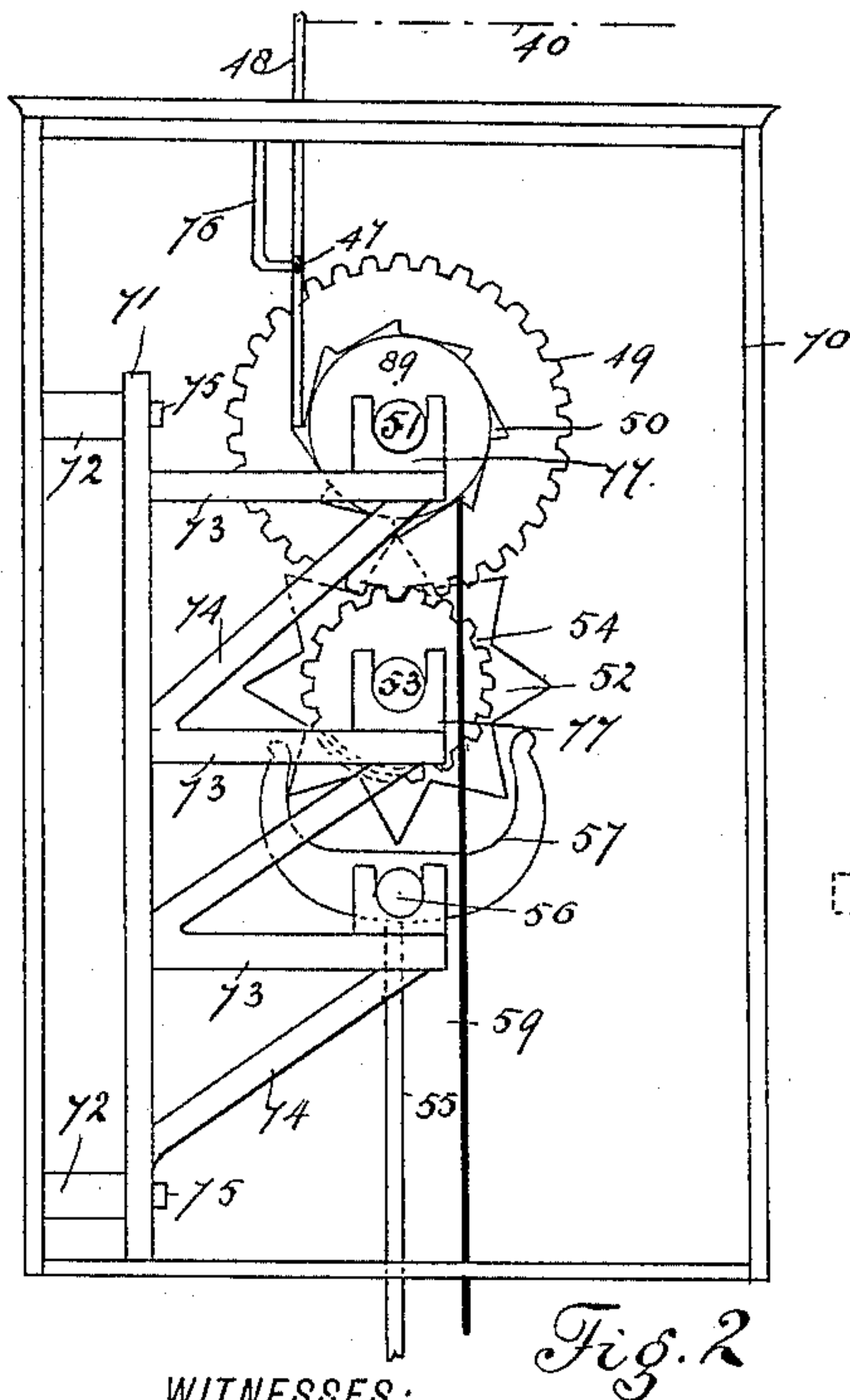
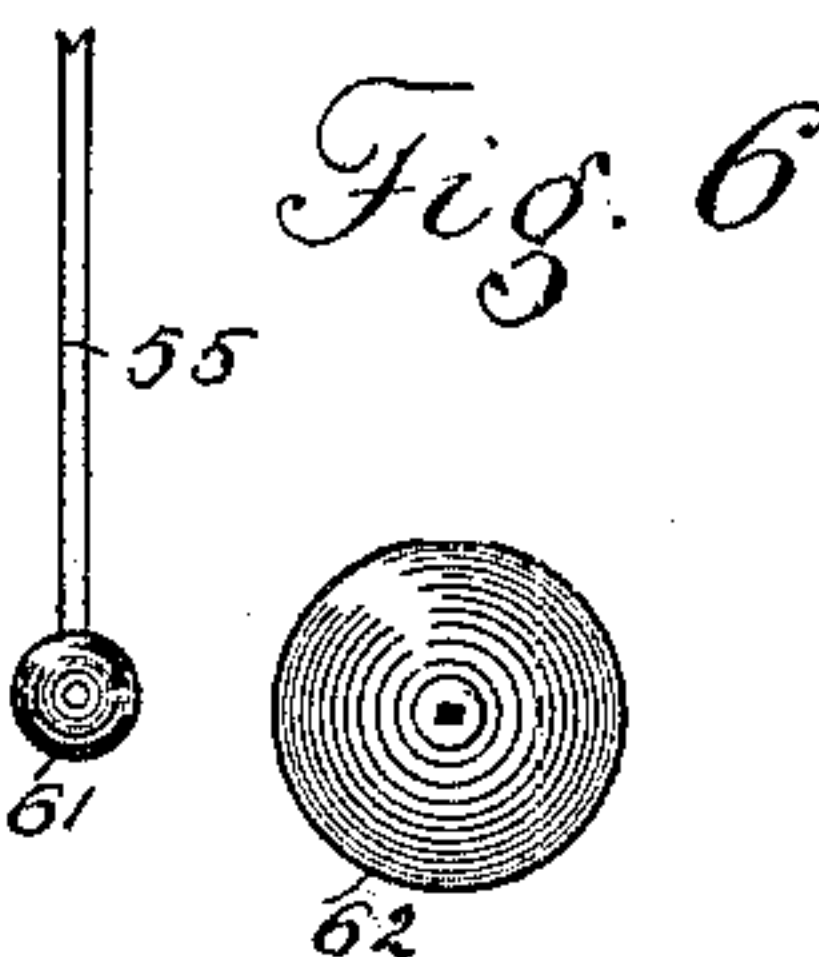
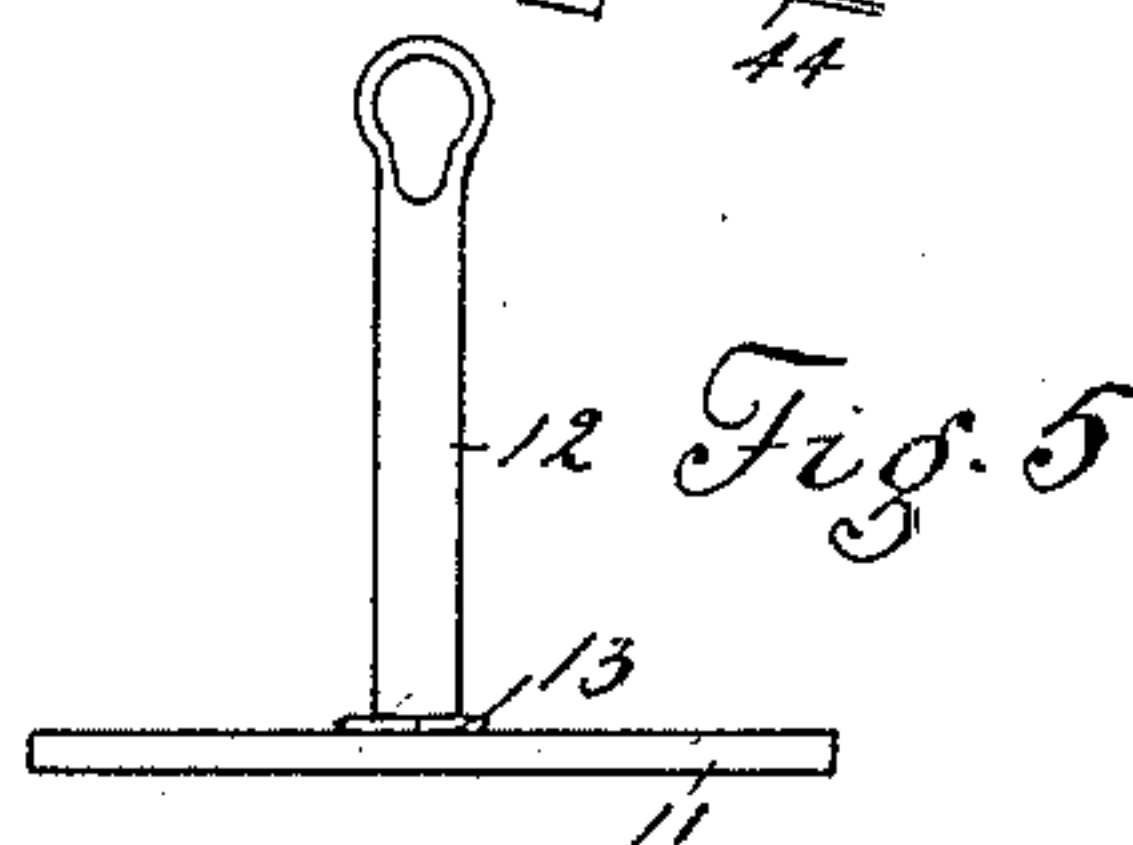
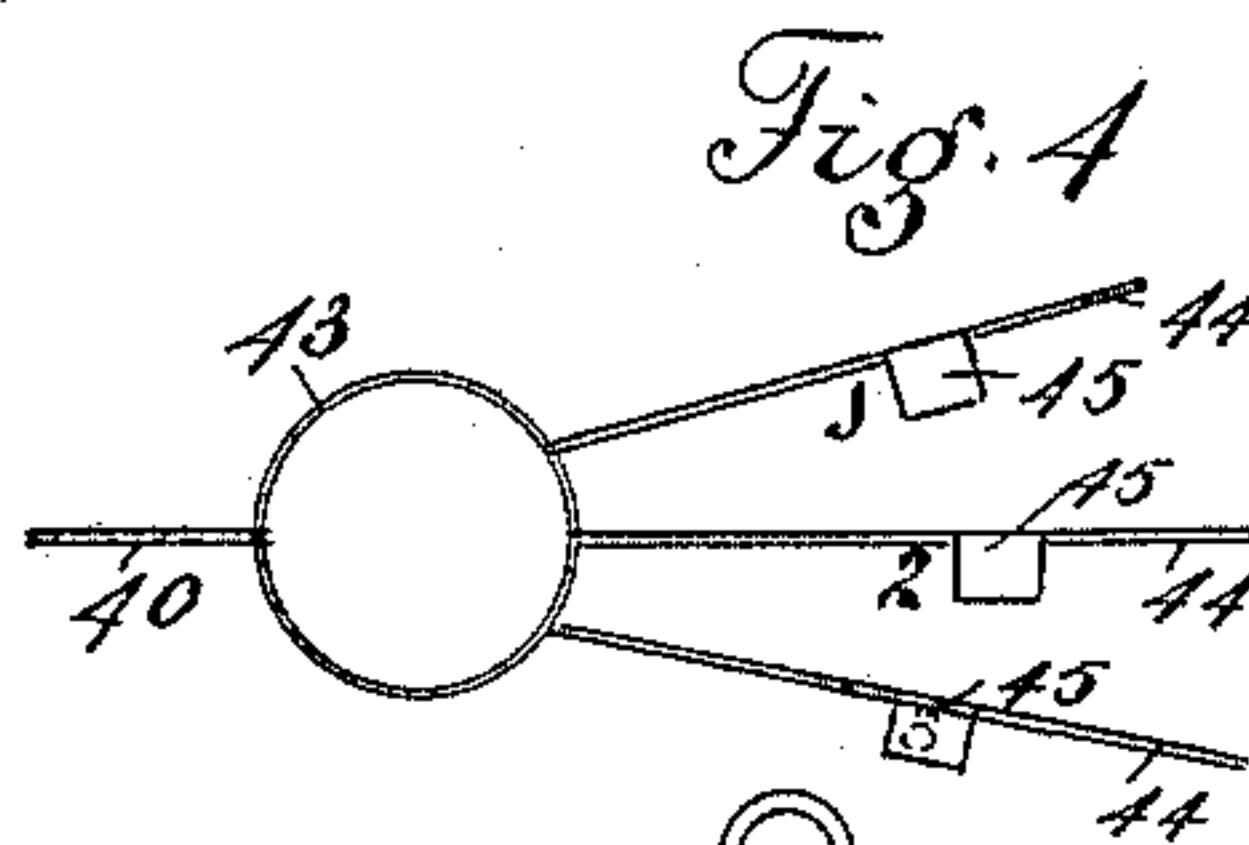
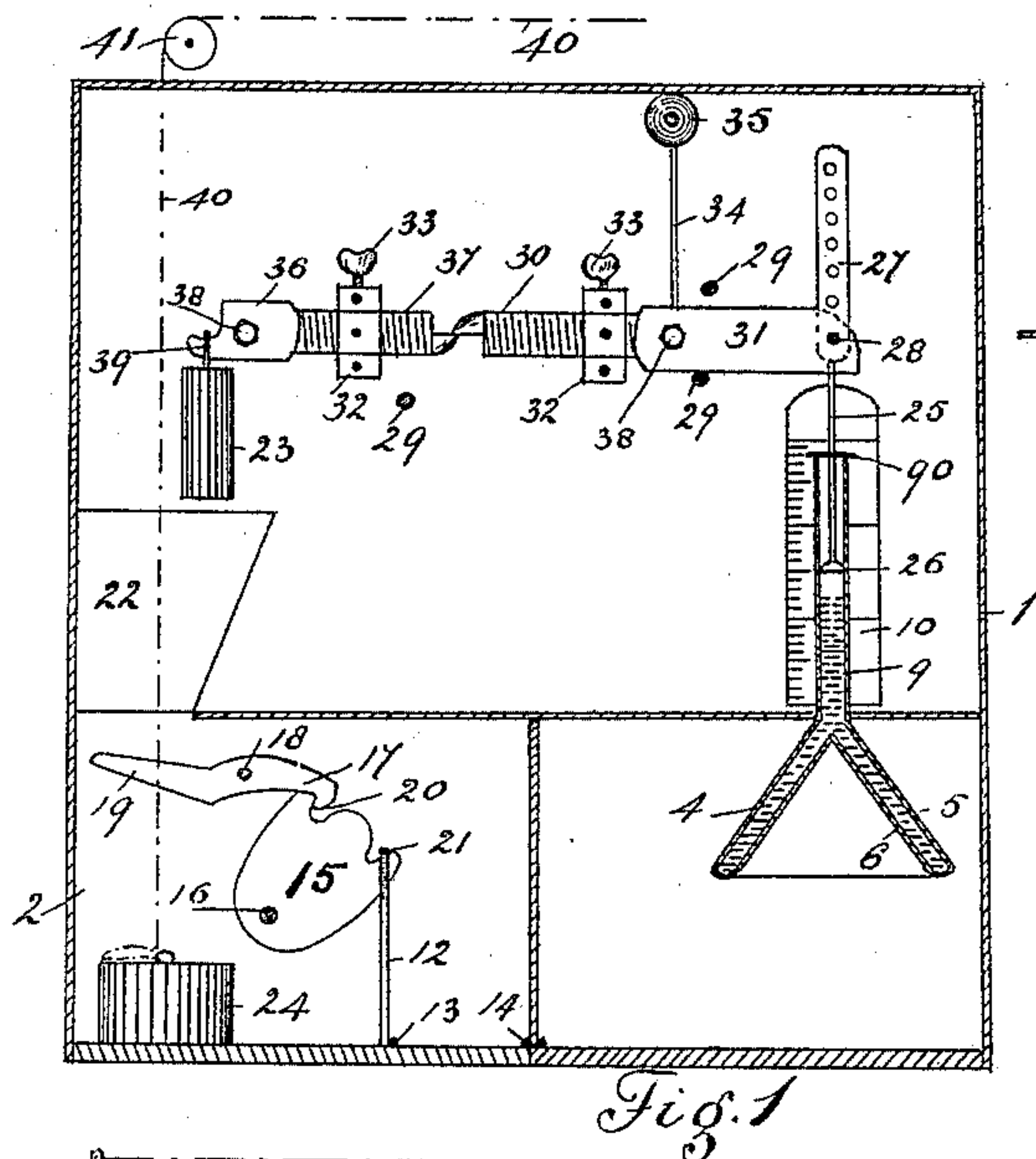


(No Model.)

J. H. EARLES.
FIRE ALARM.

No. 436,869.

Patented Sept. 23, 1890.



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN H. EARLES, OF DENVER, COLORADO.

FIRE-ALARM.

SPECIFICATION forming part of Letters Patent No. 436,869, dated September 23, 1890.

Application filed May 6, 1890. Serial No. 350,798. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. EARLES, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Fire-Alarms; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to a new and improved form and construction of fire-alarm, and relates more particularly to that class called "automatic fire-alarms," the object of my invention being to produce a device of the class stated which shall be so arranged as to give an alarm automatically when the temperature of the apartment in which said device is located is raised to or above some determined point; to produce an automatic fire-alarm which may have branches located in different parts of the building, and shall be fitted and adapted to sound the alarm and register the number of the room on the outbreak of a fire in its vicinity, the device to be an improvement on my prior United States Letters Patent which is numbered 351,753, and dated the 2d day of November, 1886, and to be of simple and economical construction, safe and reliable in use, and not liable to get out of repair.

To these ends my invention consists of the features, arrangements, and combinations more particularly hereinafter described and claimed.

In the drawings is illustrated an embodiment of my invention, wherein—

Figure 1 is a front elevation of a casing or box containing my improved mechanism, the front portion being removed to better show the interior mechanism. Fig. 2 is an end view of the alarm mechanism. Fig. 3 is a front view of the same. Fig. 4 is a means by which the alarm is sounded from different parts of the building. Fig. 5 is an enlarged view of a portion of the mechanism shown in Fig. 1. Fig. 6 is a view showing the lower part of Figs. 2 and 3, said part being dis-

joined from said figures on account of the lack of space.

Reference being made to the accompanying drawings, the numerals 1 and 2 designate a suitable box or casing, which may be secured to the wall of the room or to any other convenient place of support. Within said casing is fixedly secured a thermometer or receptacle containing mercury, the shape of said thermometer being that of an inverted funnel. The lower or funnel part is composed of two layers or walls 5 and 6, formed of glass or other suitable transparent material, said walls being united at the bottom and having a mercury chamber or receptacle between them, the outer part 5 terminating in a stem or tube 9, secured to a standard 10, which is provided with a suitable graduated scale. It will be seen that by the use of this form of thermometer the air is permitted to surround the cone and also to rise in the conical space formed in the under part of said cone, and that a very thin layer of mercury is used, thereby exposing a greater surface of a smaller body of mercury to the temperature of the surrounding atmosphere and at the same time rendering it more sensitive to a slighter change of temperature and subject to a more sudden rise or fall than would be the case in a more compact body of mercury.

It will be understood that the term "mercury" is herein used as typical of any fluid possessing a high coefficient of expansion.

Slidingly fitted within the tubular or upper portion of the thermometer is a piston 26, having a piston-rod 25 extending upwardly therefrom. The upper portion of said rod is provided with a series of apertures 27, by means of which it is pivoted by a pin 28 to a lever 31, fulcrumed on a suitable pin 38. The object of apertures 27 is to regulate the depth to which rod 25 and its piston 26 may penetrate the tubular portion of the thermometer, thereby regulating the temperature at which the alarm is to be tripped, as will be more particularly hereinafter described.

Lever 31 connects with another lever 36, each being fulcrumed on a suitable pin 38. The outer end of lever 36 is hooked at 39, and adapted to support a weight 23, suspended therefrom while said lever is in a horizontal

position. The inner portions of levers 31 and 36 are threaded, as at 30 and 37, respectively, and provided with nuts 32, adapted to be screwed thereon, said nut having threaded apertures into which the set-screws 33 are screwed, thereby securing the nuts in any desired position on said levers. The object of nuts 32 is to regulate the weights of the inner extremities of the levers so that they may be more or less easily tripped, as may be desired. The inner extremities of levers 31 and 36 are so fashioned that when both levers are in or approximately in a horizontal position they will engage each other and so remain until the outer end of lever 31 is raised, when they will disengage.

To lever 31, directly above the fulcrum 38, is rigidly secured the standard 34, to the upper extremity of which is rigidly secured or made integral therewith the weight 35, the object of said weight being to facilitate the tripping of the mechanism when the mercury rises in tube 9.

The reference-numeral 17 designates a suitable lever fulcrumed at 18, and provided with the arm 19 at one extremity and a hook at its opposite extremity, said hook engaging a corresponding hook or projection 20 on the eccentric cam 15.

Depending from a suitable hook or projection 21 of eccentric cam 15 is a bar 12, in the upper extremity of which is formed a loop adapted to slip over said hook 21. The lower end of bar 12 is hinged at 13 to a trap-door 11, which is hinged to the main casing at 14 and supports the weight 24. From the weight 24 extends a cord or wire 40, which passes over a suitable pulley 41 and connects with the pawl, which is pivoted at 47 to the arm 76, pendent from the upper part of the casing, and engages the ratchet-wheel 50.

51 is a shaft journaled in a suitable framework composed of arms 73 and 74, which project from a standard 71, said standard being secured to the casing 70 by means of the projections 72. The shaft 51 is provided with a drum 58 and a cog-wheel 49, rigidly secured thereto, said wheel 49 meshing with a cog-wheel 54, secured to shaft 53, and to which is secured the escapement-wheel 52. Shafts 51, 53, and 56 are mounted, preferably, in open bearings or boxes, as shown at 77 in the drawings, Fig. 2.

The reference-numeral 57 designates a suitable escapement, to which is secured rod 55 and a hammer 61, as shown in the drawings, (see Figs. 2 and 6,) said hammer being adapted to ring gongs 62.

When it is desired to wind up the striking mechanism, in order that the escapement may not be operated by the escapement-wheel and ring the gongs during the entire operation, provision is made for the disengagement of the escapement with the escapement-wheel, which is as follows: On the under side of shaft 80, to which is secured the escapement,

is made a notch 81, of suitable shape, size, and location that when shaft 80 is raised from its normal position and placed so that said notch shall rest on the bearing or boxing at the end opposite the one on which the escapement is secured it shall fit snugly thereon, thereby supporting the shaft and the escapement while in such position. This is best illustrated by dotted lines in Fig. 3. It will thus be seen that by means of this mechanism the device may be wound up without the escapement operating in the meantime.

Dependent from the drum 58 is a weight 60, suspended by a cord wound around said drum.

The numerals 29 29, &c., designate suitable pins or lugs, which extend from the back of the box or casing containing the mechanism, and are adapted to regulate the movement allowed to the levers 31 and 36 about their pivotal points 38.

In the operation of my improved device it will be observed that on the outbreak of a fire in the vicinity of the herein-described mechanism the mercury rises in the tube 9 by virtue of its expansion from heat, raises the piston 26 and its rod 25, elevates the outer extremity of the lever 31, and throws the center of gravity of the weight 35 to the opposite side of the pivot 38, where said weight facilitates the disengagement of the levers 31 and 36. It will also be observed that by the use of different apertures 27 in the piston-rod 25 the device may be tripped at different degrees of temperature, as may be desired, the device being tripped when the mercury comes in contact with piston 26, which would occur sooner if said piston 26 were lower down in the tube 9.

On the disengagement of the levers 31 and 36 the weight 23 overbalances the lever 36, becomes disengaged therefrom, is received into a chute or hopper 22, falls upon the arm 19 of the lever 17, and causes it to become disengaged from the hook 20 of the eccentric 21, whereupon the weight 24 on the trap-door 11 causes the eccentric 15 to revolve about its pivotal support 16, resulting in the disengagement of the bar 12 from the hook 21 and the freeing of the weight 24, which in turn draws the cord or its equivalent 40, throws off the pawl 48, and releases the weight 60, thereby causing the shaft 51 to revolve, and thus imparting motion to the escapement and causing the hammer 61 to ring the gongs 62.

Having thus described my invention, what I claim is—

1. In a fire-alarm, the combination of a mercury-receptacle consisting of an outer wall 5 and an inner wall 6, a tube leading from the top of the receptacle and communicating with the mercury-chamber, a piston fitting within said tube and having a rod leading upward therefrom, a lever 31, having a fulcrum 38, said lever being pivoted to the piston-rod at 28, and provided with a weighted standard rigidly secured to the lever, preferably just

above the fulcrum, whereby as the mercury rises in the tube and lifts the piston a movement will be given to lever 31, an alarm mechanism, and suitable means connected with lever 31 for operating the same, substantially as described, and for the purpose set forth.

2. In a fire-alarm, the combination of the levers 31 and 36, each having a suitable fulcrum, their inner extremities engaging when in a horizontal position, the outer extremity of lever 36 being provided with a removable weight, the outer extremity of lever 31 being connected with a suitable tripping mechanism, lever 31 being also provided with a standard 34, rigidly secured to the lever, preferably just above the fulcrum, said standard being provided with a weight 35, substantially as and for the purpose set forth.

3. In a fire-alarm, levers 31 and 36, suitably fulcrumed and having their inner extremities in contact when in the horizontal or approximately horizontal position, the outer extremity of lever 36 being provided with a removable weight and the outer extremity of lever 31 connected with a suitable tripping mechanism, each lever being provided with an adjustable weight or nut 32, substantially as and for the purpose set forth.

4. In a fire-alarm, the combination of an eccentric cam pivoted at 16 to a suitable support and provided with notches or recesses 20 and 21, a hooked lever pivoted at 18 and having its hook end engaging the cam, a rod 12, having a hook or loop in one end adapted to engage notch 21 of the cam, a hinged door 11, opening downward, to which rod 12 is hinged,

a suitable weight resting upon door 11, a cord or its equivalent connecting this weight with the alarm mechanism, and suitable means of disconnecting the hooked lever from the eccentric cam, substantially as and for the purpose set forth.

5. In a fire-alarm, the combination, with an escapement-wheel mounted upon a shaft journaled in a suitable frame, and means for operating said wheel, consisting of drum 53, upon which is wound a cord or its equivalent supporting a weight, a gear-wheel 49, secured to said drum, another gear-wheel 54, mounted upon the same shaft as the escapement-wheel and meshing with gear-wheel 49, of the adjustable escapement 57 and suitable alarm mechanism connected therewith, a shaft or bar 80, upon which said escapement is rigidly secured, said shaft or bar being provided with a notch or recess 81 and having its extremities loosely secured within a suitable casing and capable of such adjustment as to disengage the escapement from its corresponding wheel, notch 81 at the same time engaging the casing and supporting the escapement in the disengaged position, whereby the drum may be rotated for the purpose of winding up the cord and elevating the weight without actuating the escapement and sounding the alarm, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN H. EARLES.

Witnesses:

ISHAM R. HOWZE,
WM. MCCONNELL.