

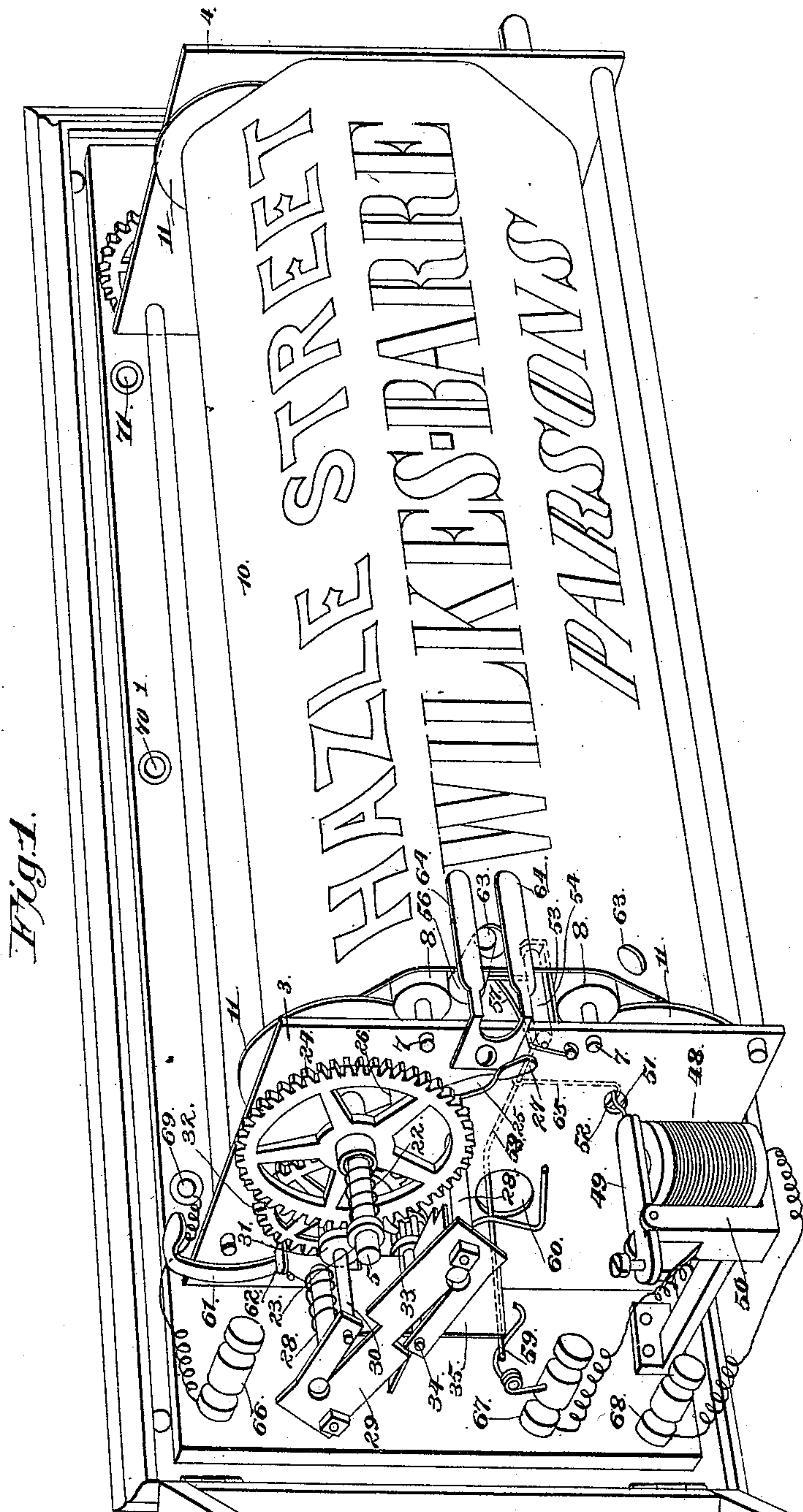
(No Model.)

4 Sheets—Sheet 1.

G. H. KIRWAN.  
ELECTRIC STATION INDICATOR.

No. 439,015.

Patented Oct. 21, 1890.



Witnesses

*M. Fowler*

*W. S. Siggers*  
*Wm. Baggett*

By *his* Attorneys,

*C. A. Snow & Co.*

Inventor

*George H. Kirwan*

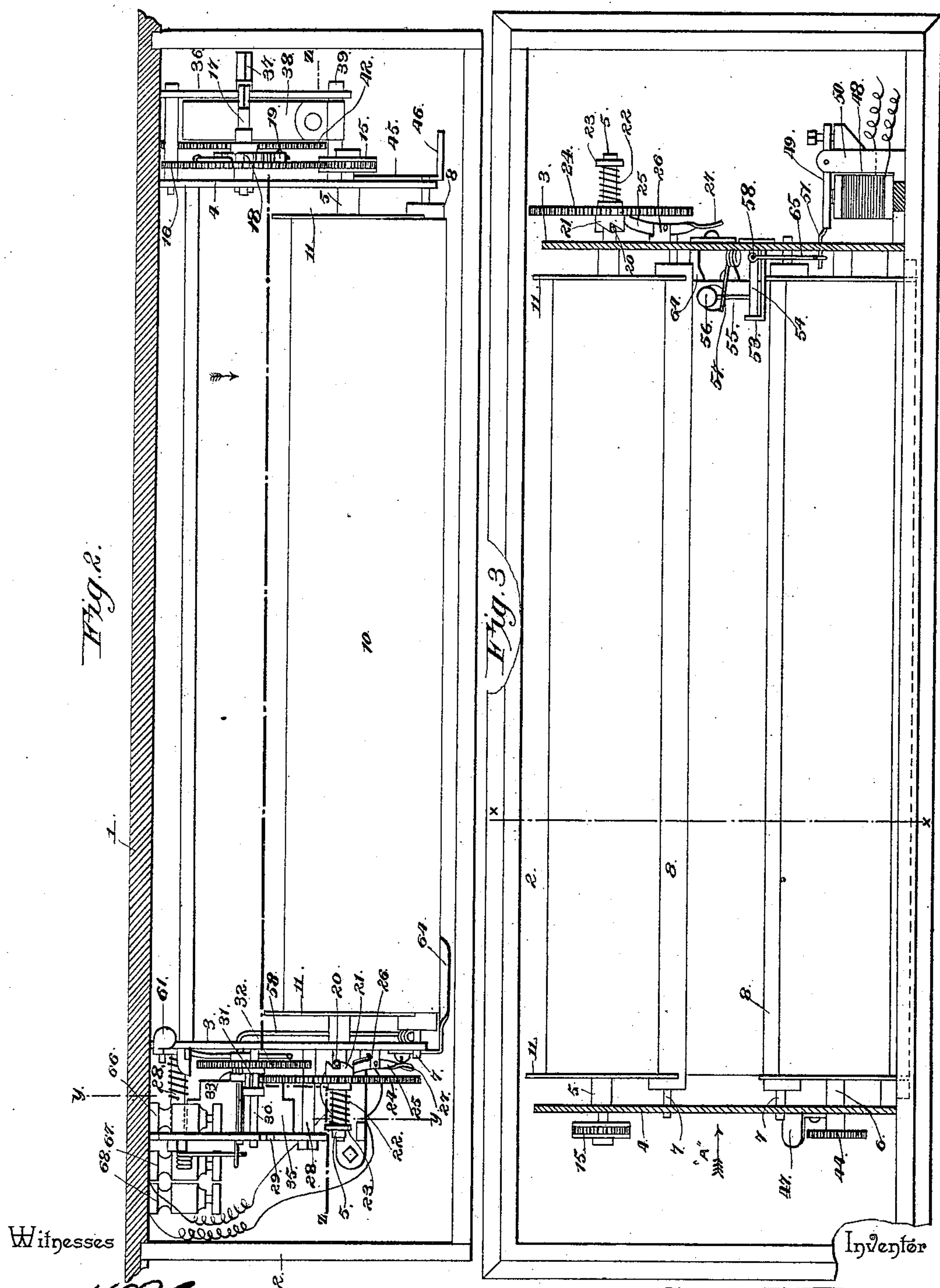
(No Model.)

4 Sheets—Sheet 2.

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Witnesses

Inventor

McFowler  
S. S. Eggers  
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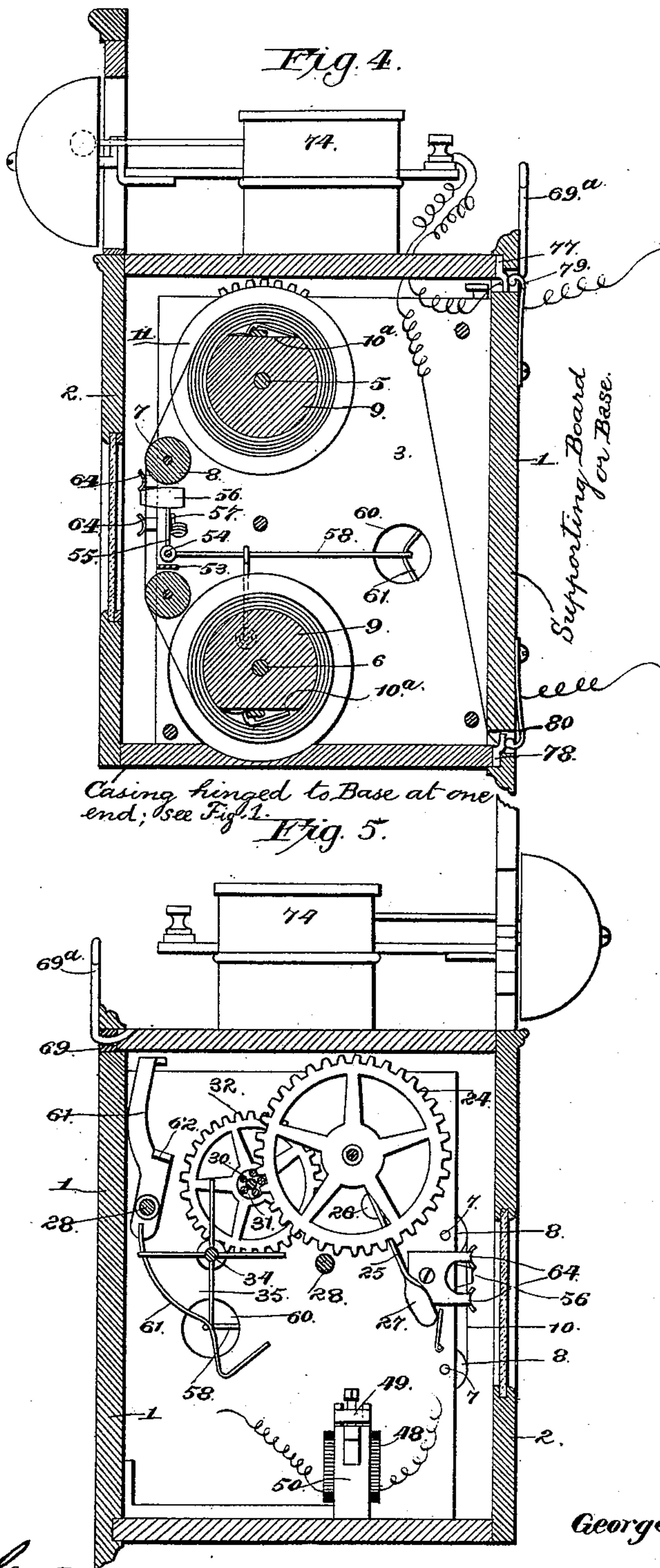
Chas. Knowlton



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Witnesses

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Inventor  
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(No Model.)

4 Sheets—Sheet 4.

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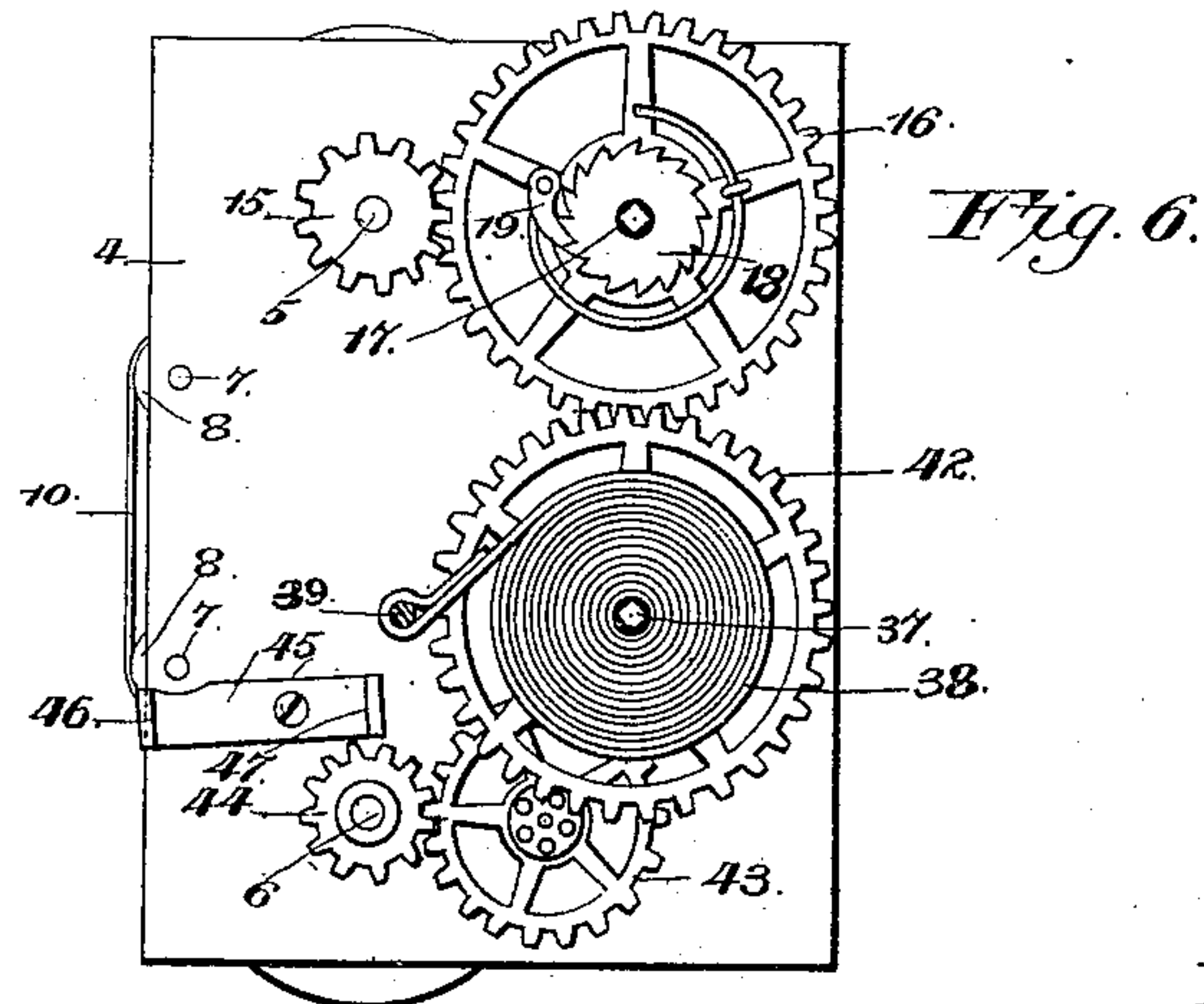


Fig. 7.

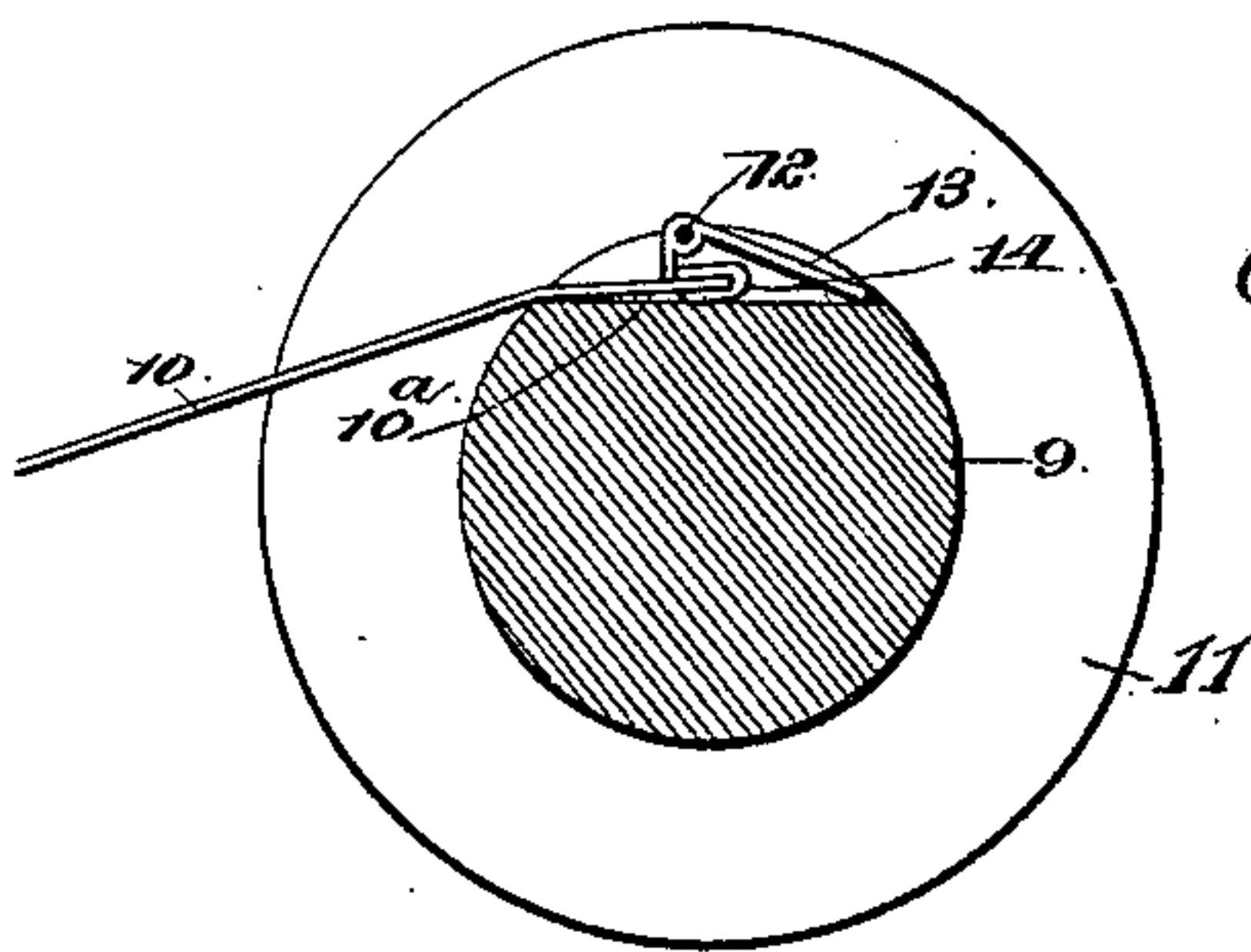


Fig. 9.

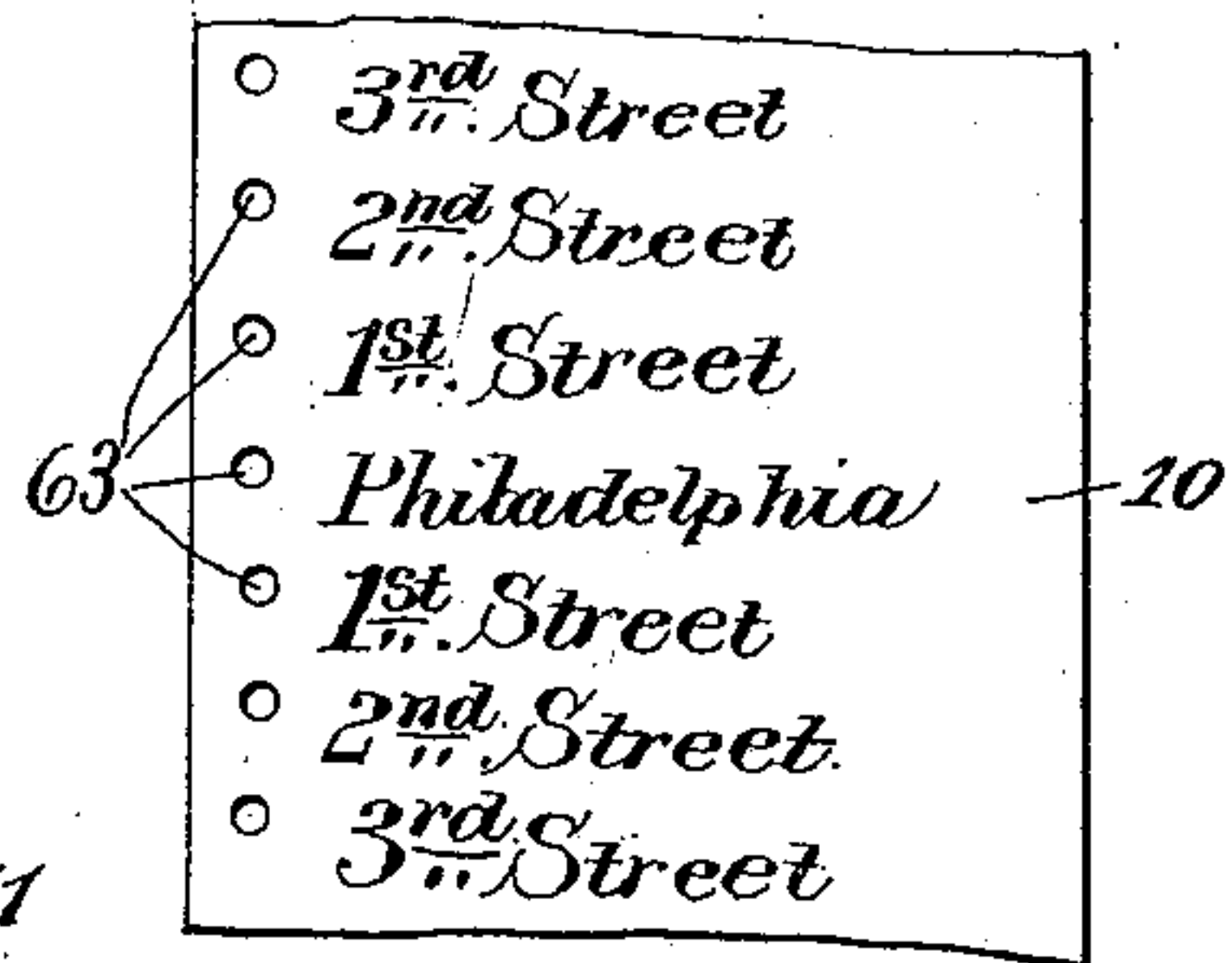
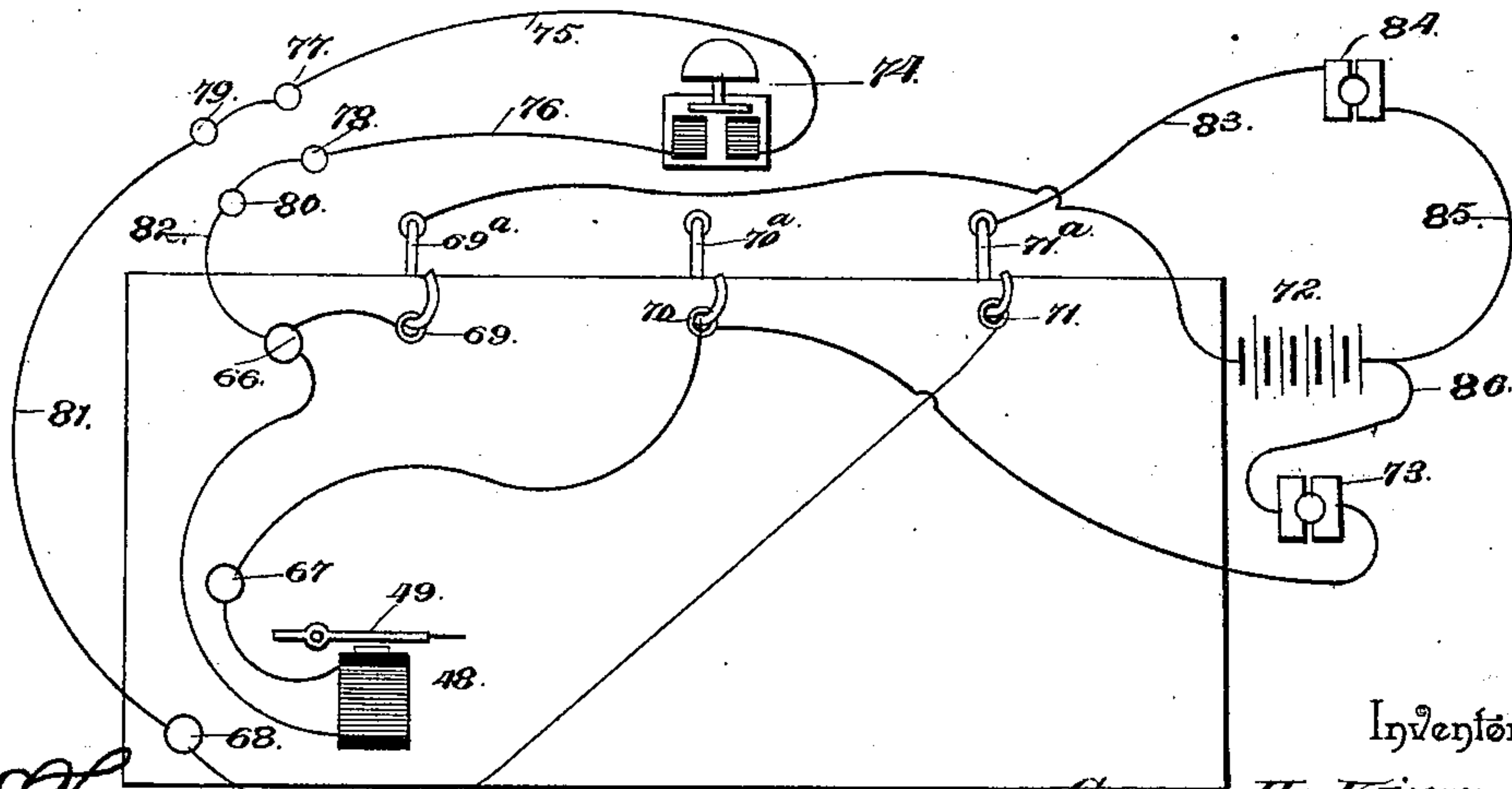


Fig. 8.



Witnesses

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# UNITED STATES PATENT OFFICE.

GEORGE H. KIRWAN, OF WILKES-BARRÉ, PENNSYLVANIA.

## ELECTRIC STATION-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 439,015, dated October 21, 1890.

Application filed January 8, 1890. Serial No. 336,315. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE H. KIRWAN, a citizen of the United States, residing at Wilkes-Barré, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Electric Station-Indicator, of which the following is a specification.

This invention relates to electric station-indicators; and it is an improvement on the device for which Letters Patent of the United States No. 388,690 were granted to myself on the 28th day of August, 1888.

My present invention has for its object to provide a device which shall possess superior advantages in point of simplicity, durability, and general efficiency; and with these ends in view it consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view showing my improved station-indicator in position for operation, the exterior casing being swung open so as to expose the interior mechanism. Fig. 2 is a top view. Fig. 3 is a longitudinal sectional view taken on the line  $z z$  in Fig. 2, looking in the direction of the arrow. Fig. 4 is a vertical transverse sectional view taken on the line  $x x$  in Fig. 3. Fig. 5 is a vertical transverse sectional view taken on the line  $y y$  in Fig. 2. Fig. 6 is an end view looking in the direction indicated by the arrow A in Fig. 3. Fig. 7 is a detail view showing the method of attaching the endless apron to the rollers. Fig. 8 is a diagram to illustrate the electric circuits. Fig. 9 is a plan view of the scroll or apron used in connection with my invention and having the names of the stations.

Like numerals of reference indicate like parts in all the figures.

1 designates a back board, which supports the operating mechanism of my improved indicator, and to one end of which, as shown in Fig. 1, is hinged the casing 2, which may be folded over so as to protect the said operating mechanism, the free end of said casing being secured by means of a lock of suitable construction.

To the back board 1, near the ends of the same, are secured the vertical parallel plates

3 and 4, which are provided near their upper and lower front corners with bearings for the shafts 5 and 6, in front of and between which are journaled additional shafts 7 7, carrying the guiding-rollers 8. The shafts 5 and 6 carry each a drum or cylinder 9, as shown in Fig. 4.

10 designates an endless scroll or apron, upon which the names of the stations are printed or inscribed in the manner to be hereinafter specified. Each of the drums or cylinders 9 has a flat or cut-away side 10<sup>a</sup>, and is provided with heads 11, in which are journaled the spindles 12, extending from the ends of an angular L-shaped cam-plate 13. (See Fig. 7.) The ends of the scroll or apron 10 are provided with metallic binding-strips 14, which, when the cam-plates 13 are in a raised position, may be inserted under the same. By depressing the free end of the cam-plates until they rest upon the cylinders 9 it will thus be seen that the ends of the scroll may be connected securely and detachably to the latter.

The upper shaft 5 is provided at one end with a pinion 15, (see Fig. 6,) meshing with a spur-wheel 16, which is journaled loosely upon a post 17, which is journaled in the frame piece or plate 4. The post 17 has a ratchet-wheel 18, engaging a spring actuated pawl 19, which is mounted pivotally upon the spur-wheel 16. The opposite end of the shaft 5 has a transverse pin 20, (see Fig. 2,) which is adapted to engage a clutch-collar 21, which is mounted to slide upon the outer end of said shaft 5, and which is normally forced in an inward direction and into engagement with the pin 20 by the action of an extensile spring 22, coiled upon the shaft 5 between the said clutch-collar and a flange or collar 23 upon the extreme outer end of the shaft. The clutch-collar 21 carries a spur-wheel 24. 25 (see Figs. 1, 2, and 5) designates a lever, which is pivoted to a bracket 26, that extends laterally from the frame-piece 3. The lower end of the lever 25 has a thumb-piece 27, and its upper end is adapted to bear against the inner side of the spur-wheel 24, which may thus, by operating the lever 25, be moved in an outward direction upon the shaft 5 against the tension of the spring 22 until the clutch-



collar 21 shall be disengaged from the pin 20, thus disengaging or uncoupling the spur-wheel 24 from the shaft 5.

28 28 designate a pair of posts extending laterally from the frame-piece 3 near the upper rear corner of the latter, as shown clearly in Fig. 1, and connected at their outer ends by a frame-piece 29 of suitable construction, which, together with the frame-piece 3, affords bearings for the shafts of mechanism which will now be described.

30 is a shaft arranged parallel to the shaft 5 and carrying a pinion 31, meshing with the spur-wheel 24, and also carrying a spur-wheel 32, meshing with a pinion 33 upon a shaft 34. The latter also carries an escapement-fan 35.

Suitably secured upon the outer side of the frame-piece 4, near the lower rear corner of the latter, is a casing 36, having bearings for a spring-arbor 37, (see Figs. 2 and 6,) upon which is coiled the main spring 38, one end of which is attached to said shaft or arbor, and the other end of which is made fast to one of the posts 39 of the casing 36. The shaft or arbor 37 carries a ratchet-wheel engaging a spring-actuated pawl, which is mounted pivotally upon a spur-wheel 42, which is journaled upon the shaft or arbor 37. The spring-actuated spur-wheel 42 is connected by means of a train of gearing 43 with a pinion 44, mounted upon the outer end of the shaft 6, which said shaft is thus actuated by means of the spring-motor consisting of the parts just enumerated. 45 designates a lever, which is mounted pivotally upon the frame-piece 4, and which is provided at its outer end with a handle 46 and at its inner end with a catch 47, adapted to engage the teeth of the pinion 44, and thus prevent the latter from rotating. It will thus be seen that the lever 45 acts in the nature of a brake, by means of which the roller-shaft 6 may be prevented from rotating when it shall be desired to suspend the operation of the device.

The scroll or apron 10 is at the start wound upon the drum or cylinder 9 upon the upper roller-shaft 5. The spring-motor when wound serves to transmit motion through the train of gearing 43 and pinion 44 to the shaft 6, carrying the lower drum 9 upon which it will thus be wound, while it is at the same time unwound from the drum 9 upon the upper roller-shaft 5. Motion is thus communicated to the latter and from thence through the spur-wheel 24, pinion 31, spur-wheel 32, and pinion 33 to the shaft 34, carrying the escapement-fan 35, by means of which the operation of the device is regulated and controlled in the manner which I shall now proceed to describe.

48 designates an electro-magnet which is suitably attached to the back board 1, which forms the support of the mechanism, as will be best seen in Fig. 1. The armature 49 of said electro-magnet is hinged to a bracket 50, and is provided with an arm 51, which extends through an opening 52 in the frame-

piece 3. The inner side of the latter is provided with a bracket 53, having bearings for a rock-shaft 54, having an upwardly-extending arm 55, the upper end of which carries a hammer 56, which is forced in a forward direction by the action of a spring 57, which is attached to the inside of the frame-piece 3. The rock-shaft 54 is provided with a rearwardly-extending arm 58, provided at its rear end with a lateral extension 59, extending through an opening 60 in the frame-piece 3 and lying in the path of the escapement-fan 35. Suitably pivoted to the outer side of the frame-piece 3 is a lever 61, the lower end of which is adapted to engage the arm 59, so as to throw it out of the path of the escapement-fan when desired. The lever 61 is also provided with a catch 62, adapted to engage the teeth of the spur-wheel 32, so as to lock the latter when desired.

The endless scroll or apron 10 is provided near one of its edges with a series of perforations 63, registering with the names of the stations printed upon the said scroll and adapted to receive the head of the hammer 56, which is adapted to project forwardly through any one of the said perforations. A pair of flat loose springs 64 64, slightly curved in cross-section, are attached to the frame-piece 3 above and below the hammer 56, for the purpose of holding the edge of the endless scroll 10 in contact with the latter.

Normally the arm 59 of the lever 58, extending from the rock-shaft 54, lies in the path of the escapement-fan, which is thus caused to remain stationary as well as the remainder of the operating mechanism. When the electro-magnet is momentarily excited, it attracts the armature 49, the arm 51 of which depresses the arm 58 of the rock-shaft, said arm 58 being provided with a downwardly-extending bracket 65, upon which the inner end of the arm 51 of the armature rests. The rock-shaft 54 is thus vibrated with the double result of withdrawing the hammer 56 from the perforation 64 in the scroll 10, through which it was extending, and of moving the arm 59 out of the track of the escapement-fan. The latter is thus caused to rotate under the impulse of the spring-motor, motion from which is transmitted in the manner previously described, thus causing the roller mounted upon the shaft 9 to rotate and wind upon itself a portion of the endless scroll or apron until the perforation 63, registering with the name of the next station, comes in the path of the hammer 56. The latter, actuated by the spring 57, is now forced through the said perforation 64, thus vibrating the rock-shaft 54 with the result of bringing the arm 59 back into the path of the escapement-fan, thus preventing the latter from rotating and stopping the mechanism from further operation until again actuated under the impulse of the electro-magnet.

The back board of the casing which supports the operating mechanism of the device



is provided with binding-posts 66, 67, and 68, and it is provided with three eyes or perforations 69, 70, and 71, having metallic linings which are in electrical connection with the said binding-posts. The car in which the apparatus is used is provided with metallic hooks or supports 69<sup>a</sup>, 70<sup>a</sup>, and 71<sup>a</sup>, upon which the apparatus may be hung or suspended by means of the eyes or perforations described, and with which they make electrical contact.

72 designates an electric generating-battery, suitably located in the car and having one of its poles connected electrically with the metallic support 69<sup>a</sup>, and through the latter with the binding-post 66. The other pole of the battery is electrically connected with one of the electrodes of a push-button or circuit-closer 73, the other electrode of which is in electrical connection with the metallic support 70<sup>a</sup>, and through the latter with the binding-post 67. The binding-posts 66 and 67 are connected with opposite ends of the winding of the electro-magnet 50. It will thus be seen that when the push-button 73 is operated to close the circuit the said electro-magnet is momentarily excited and the actuating mechanism of the indicator is thrown into operation, as previously described.

74 designates an electric bell of suitable construction, which is secured to the upper side of the hinged casing 2. Conducting-wires 75 and 76 connect the electrodes of said bell with metallic contacts or points 77 and 78, extending from the hinged casing 2 and adapted to engage contact-springs 79 and 80 upon the supporting-board 1. The contact-spring 79 is connected by an electrical conductor 81 with the binding-post 68, and the contact-spring 80 is similarly connected by a conductor 82 with the binding-post 66. The binding-post 68 is in electrical connection with the metallic contacts 71 and 71<sup>a</sup>, and the latter is connected by a conducting-wire 83 with one of the electrodes of a push-button or circuit-closer 84, the other electrode of which is connected by conducting-wire 85 with the conductor 86, which connects one electrode of the circuit-closer 73 with one pole of the battery 72. The other pole of the battery is connected, as previously described, with the contacts 69<sup>a</sup> and 69, which latter is in electrical connection with the binding-post 66, thus completing the circuit of the bell 74. It will thus be seen that by operating the circuit-closer 84 the alarm-bell 74 may be sounded or actuated independently of the actuating mechanism of the indicator-operating mechanism.

Upon the endless scroll or apron 10 the names of the stations are to be printed or inscribed, first in regular succession and then in inverse order, in order that the said scroll or apron may continue its operation for a round trip without being rewound. At the end of the round trip the scroll or apron will have been unwound from the roller 9 upon the shaft 5 and wound upon the roller 9 upon the shaft 6. To rewind the scroll or apron upon the

former roller, the lever 61 is first actuated so as to throw the arm 59 out of the path of the escapement-fan, at the same time operating the rock-shaft 54 so as to throw the hammer 56 out of the path of the perforations 63 in the apron. The clutch-collar 21 is then disengaged by means of the lever 25 from the transverse pin 20 in the shaft 5, thus permitting the latter to be freely revolved. The winding is performed by means of a key fitted to the post 17, carrying the spur-wheel 16, which engages the pinion 15 upon the said shaft 5. The latter is thereby rotated, and it will be seen that by the act of winding the apron upon the roller mounted upon the shaft 5 the roller mounted upon the shaft 6 is likewise rotated in a reverse direction, thus transmitting motion through the train of gears 43 to the main arbor of the spring-motor, the spring of which is thus wound.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of my invention will be readily understood. At the start the scroll or apron is wound upon the roller mounted upon the shaft 5. When the train reaches a station, the circuit-closers 73 and 84 are operated, thus sounding the bell 74 and actuating the electro-magnet 48. By means of the armature of the latter the rock-shaft 54 is operated, as above described, thus withdrawing a hammer 56 from the perforation 63, in which it rests, and at the same time throwing the lever-arm 59 out of the path of the escapement-fan 35. The spring-motor is thus caused to operate the shaft 6, winding the scroll upon the latter until the hammer 56 engages the next perforation in the scroll. The rock-shaft 54 is then restored to its original position, the arm 59 is moved into the path of the escapement-fan, and the operation ceases until the electric circuit shall again be closed when the next station is reached. The names of the stations inscribed upon the scroll are visible through a glass pane in the front side of the hinged casing.

By placing the indicator-operating mechanism and the alarm-bell in separate circuits it is obvious that the said alarm-bell may be sounded for any desired length of time without danger of causing the scroll to be wound upon the roll of the upper shaft 5 for the space of more than one station.

In some cases I may put the electrical connections in each car, and thus dispense with the use of couplings between the cars; also, I may use exactly the same apparatus, but dispense with the electrical connections and operate the same by hand for use on tramways.

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

1. In a station-indicator, the combination of the shafts carrying the drums or rollers, a spring-motor, a train of gearing connecting the latter with one of said shafts, a spur-wheel mounted upon the other roller-shaft and con-



5 nected therewith by the clutch mechanism, a  
train of gearing connecting said spur-wheel  
with an escapement-fan, a rock-shaft pro-  
vided with a bent arm extending in the path  
of said escapement-fan, a hammer mounted  
upon said rock-shaft, the endless scroll  
mounted upon the rollers and having perfora-  
tions to receive said hammer, and an electro-  
magnet the armature of which is adapted to  
actuate said rock-shaft, substantially as and  
for the purpose herein set forth.

2. In a station-indicator, the combination  
of the rollers, the spring-motor geared to one  
of the said rollers, an escapement-fan geared  
to the other roller, the scroll or apron having  
perforations registering with the names of the  
stations inscribed thereon, a rock-shaft hav-  
ing a hammer adapted to engage said perfora-  
tions and a bent arm extending in the path  
of the escapement-fan, the leaf-springs ar-  
ranged to hold the scroll in contact with the  
said hammer, and the electro-magnet the ar-  
mature of which is adapted to actuate the  
rock-shaft, substantially as and for the pur-  
pose set forth.

3. In an electric station-indicator, the com-  
bination of the rollers, the spring-motor geared  
to one of the said rollers, an escapement-fan  
geared to the other roller, the scroll or apron  
having perforations registering with the  
names of the stations inscribed thereon, a  
rock-shaft having a hammer adapted to en-  
gage said perforations and a bent arm ex-  
tending in the path of the escapement-fan,  
an electro-magnet, as 48, the armature of  
which is adapted to actuate the rock-shaft, an  
electric bell, as 74, mounted upon the casing  
of the indicator, and devices for closing the  
circuits of the electro-magnet 48 and the bell  
74 independently of each other, substantially  
as set forth.

4. In an electric station-indicator, the com-  
bination of the supporting-piece 1, having the  
eyes or perforations 69, 70, and 71 lined with  
metal, so as to form electrical conductors with  
the metallic supports 69<sup>a</sup>, 70<sup>a</sup>, and 71<sup>a</sup>, and  
the electrical conducting-wires connecting  
the latter with the electric generating-bat-  
tery and the circuit-closers and the former  
with the electrodes of an electro-magnet  
adapted to actuate the indicator-operating  
mechanism, and with those of an electric  
bell, substantially as herein shown and speci-  
fied.

5. The combination, with the supporting-  
board 1, having the spring-contacts 79 80, of  
the hinged casing 2, having the contact-points  
77 and 78, said spring-contacts being connect-  
ed with the poles of a battery and said con-

tact-points being connected with the elec- 60  
trodes of an electric bell mounted upon the  
hinged casing, whereby by closing the said  
casing the circuit of the electric bell shall be  
made, substantially as set forth.

6. In a station-indicator, the combination, 65  
with the drums 9, having cut-away sides, as  
herein described, and provided with the heads  
11, of the L-shaped cam-plates connected piv-  
otally with the said heads and the scroll or  
apron provided at its ends with binding-strips, 70  
substantially as and for the purpose herein  
set forth.

7. In a station-indicator, the combination  
of the rollers, the spring-motor geared to one  
of said rollers, an escapement-fan geared to 75  
the other roller, the scroll or apron attached  
to said rollers, having the names of the sta-  
tions inscribed thereon, first in regular and  
then in reverse order, and provided with per-  
forations registering with the names of the 80  
stations, a rock-shaft having a hammer adapt-  
ed to engage said perforations and a bent arm  
extending in the path of the escapement-fan,  
and an electro-magnet the armature of which  
is adapted to engage the rock-shaft, substan- 85  
tially as and for the purpose set forth.

8. In a station-indicator, the combination  
of the roller-shafts, a spring-motor, a train of  
gearing connecting the latter with the lower  
roller-shaft, an escapement-fan, a train of 90  
gearing connecting the latter with a spur-  
wheel mounted upon the upper roller-shaft  
and connected therewith by a clutch mech-  
anism, a pinion mounted upon the opposite end  
of the upper roller-shaft, a spur-wheel mount- 95  
ed loosely upon a post adjacent to the upper  
roller-shaft and meshing with the pinion upon  
the latter, a ratchet-wheel secured upon said  
post and engaging a spring-actuated pawl piv-  
oted upon the spur-wheel, and a scroll or apron 100  
wound upon and having its ends connected  
with the shafts upon the two rollers, whereby  
by rotating the post adjacent to the upper  
roller-shaft the scroll may be wound upon the  
said upper roller-shaft and unwound from the 105  
lower roller-shaft, from which motion is there-  
by transmitted to the spring-arbor of the mo-  
tor, causing said spring to be wound, sub-  
stantially as and for the purpose herein set  
forth.

In testimony that I claim the foregoing as  
my own I have hereto affixed my signature in  
presence of two witnesses.

GEORGE H. KIRWAN.

Witnesses:

ERNEST V. JACKSON,  
T. R. PETERS.