(No Model.)

2 Sheets—Sheet 1.

D. C. & J. M. JONES.

STATION INDICATOR.

No. 598,099. Patented Feb. 1, 1898.

FIG. 1.

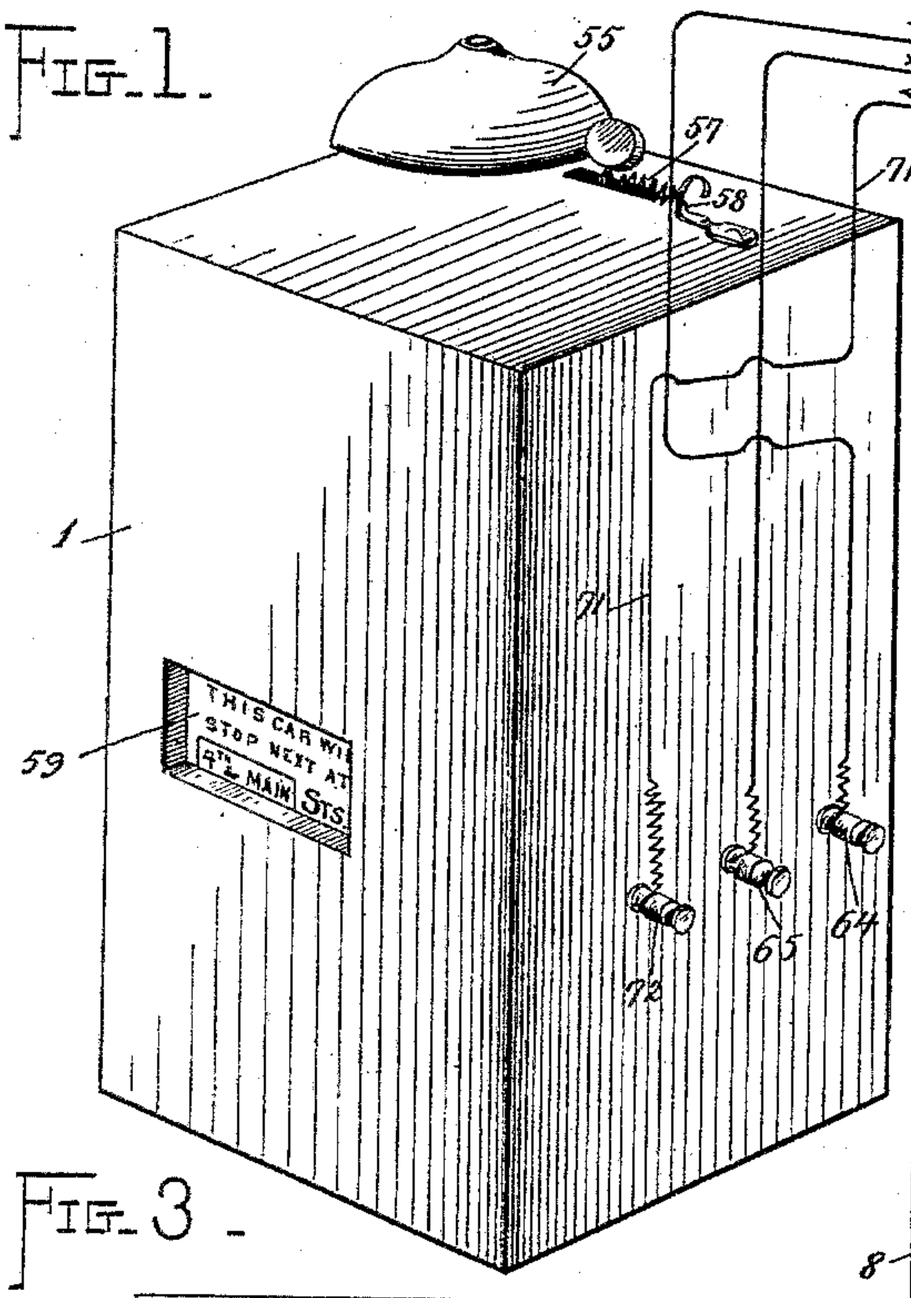


FIG. 2.

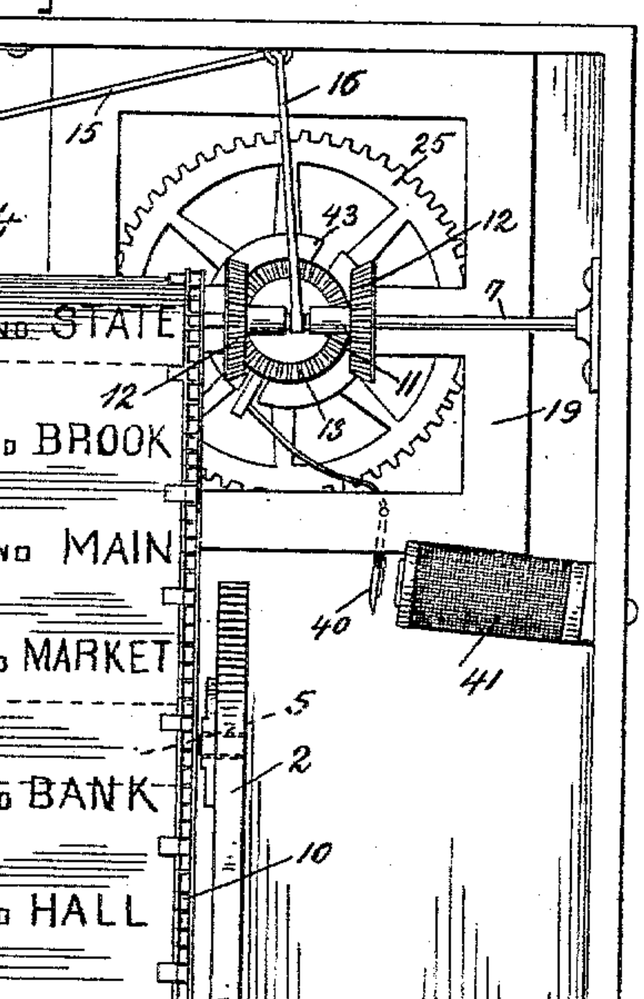
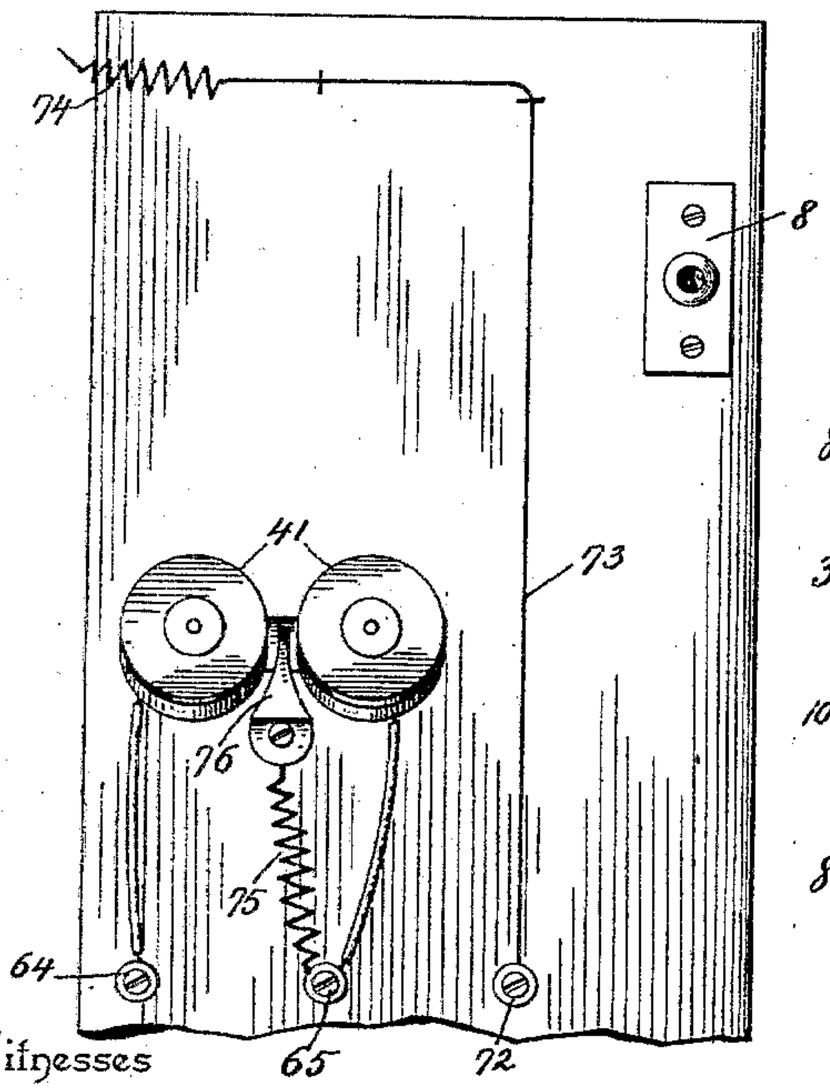


FIG. 3.



Witnesses
John T. Deutferwald
Edwin Cruse.

Inventors
DUDLEY C. JONES.
By their Attorneys, JACOB M. JONES.
C. A. Snow & Co.

(No Model.) 2 Sheets—Sheet 2.

D. C. & J. M. JONES.

STATION INDICATOR.

No. 598,099. Patented Feb. 1, 1898.

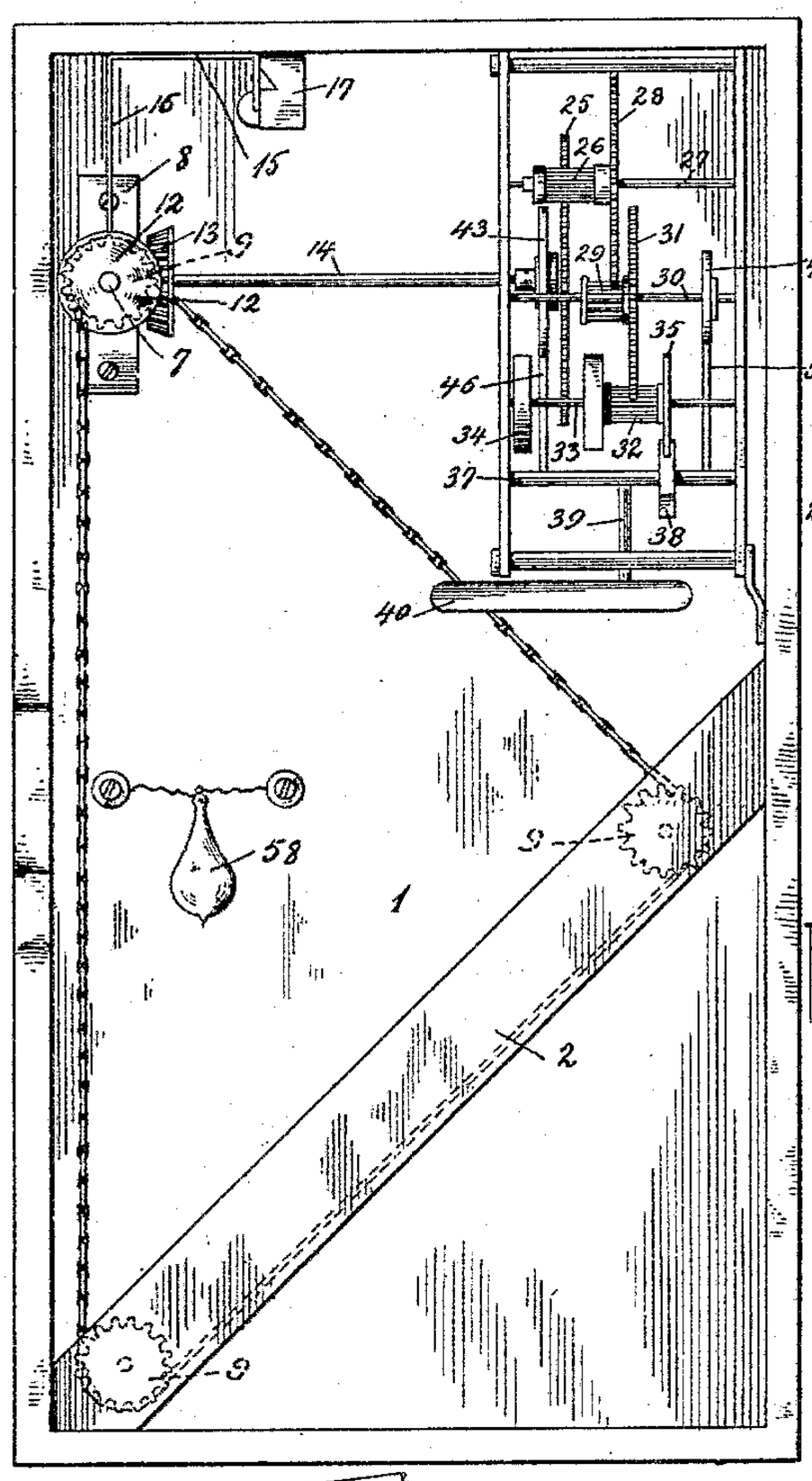


FIG. 4.

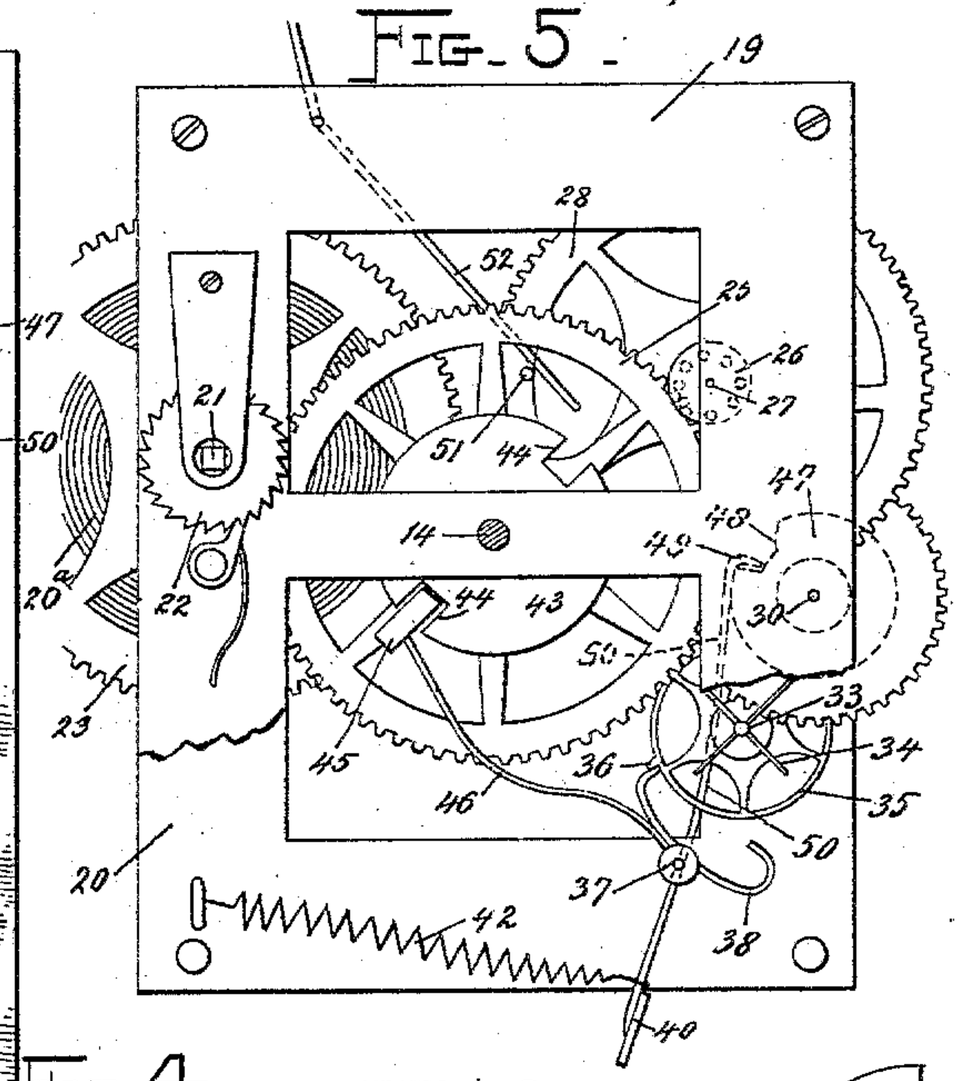


FIG. 5.

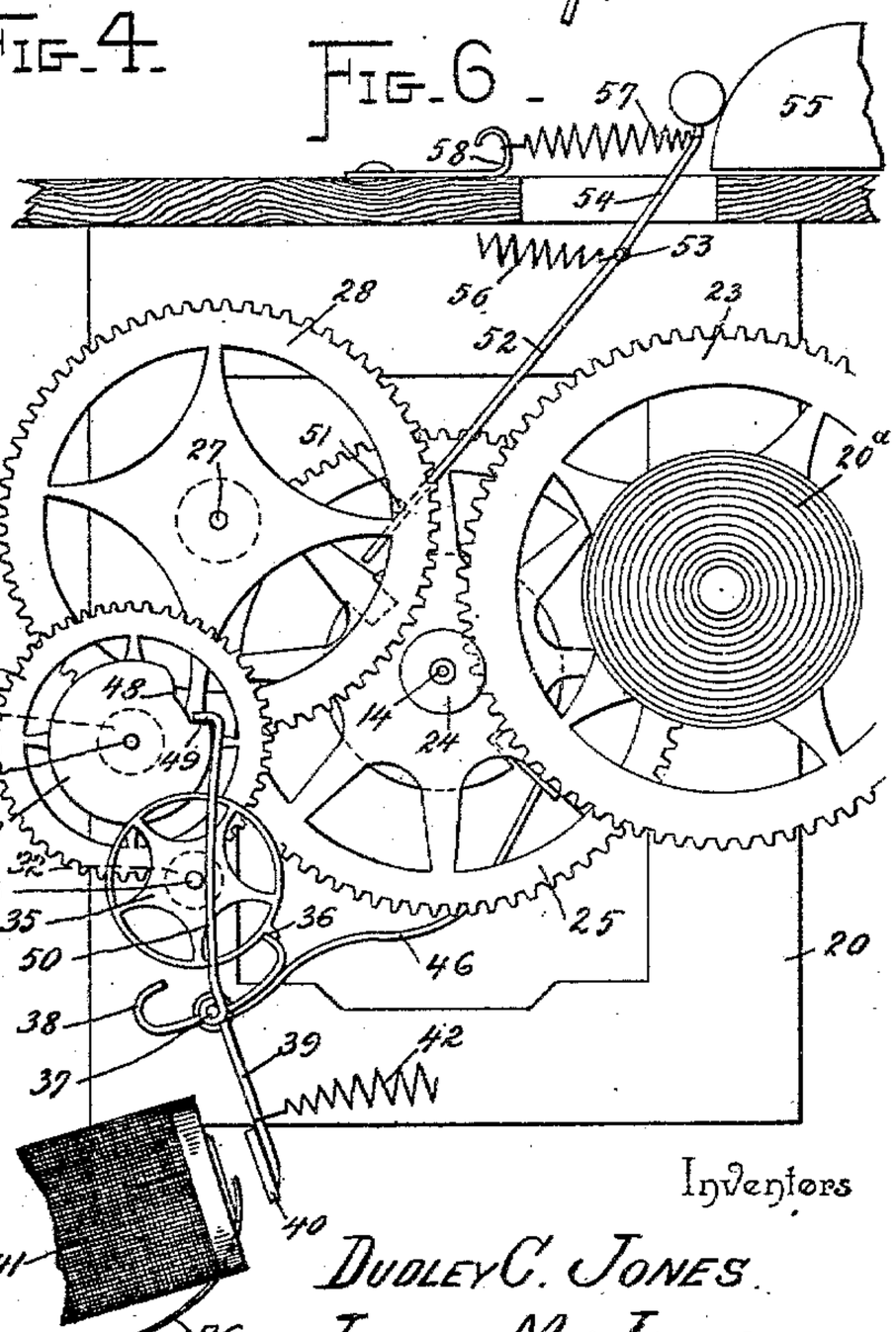


FIG. 6.

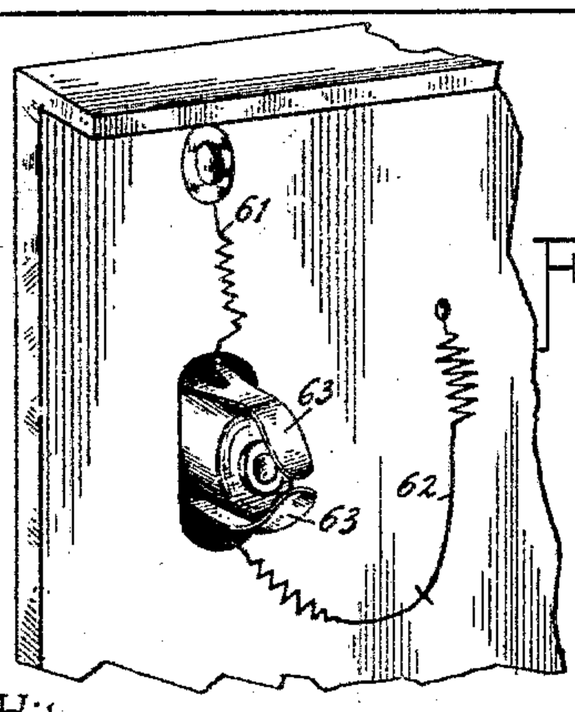


FIG. 7.

Witnesses
John F. Dewerwerk.
Edwin Louse

Inventors
Dudley C. Jones.
Jacob M. Jones.
By their Attorneys,
C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

DUDLEY C. JONES AND JACOB M. JONES, OF ST. JOHN, KENTUCKY.

STATION-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 598,099, dated February 1, 1898.

Application filed March 26, 1897. Serial No. 629,400. (No model.)

To all whom it may concern:

Be it known that we, DUDLEY C. JONES and JACOB M. JONES, citizens of the United States, residing at St. John, in the county of Hardin and State of Kentucky, have invented a new and useful Station-Indicator, of which the following is a specification.

This invention relates to station-indicators, the actuating mechanism of which consists of a spring-actuated train of gearing, the movement of which is controlled by a device spring-actuated to hold the said mechanism at rest and electrically operated to release it.

The principal objects of the invention are to improve the construction of devices of this character whereby the releasing of the mechanism may be easily and surely effected and the stopping thereof at the proper time be positively insured, and whereby also the fact that the mechanism has been released will be signaled to the operator.

With these and other objects in view the invention consists of the several details of construction and combination of the several parts, as will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of the improved station-indicator and the circuit controlling and signaling device. Fig. 2 is a front elevation of the station-indicator with the front wall of the casing removed. Fig. 3 is a view showing the arrangement of the magnets and conducting-wires within the casing. Fig. 4 is a side elevation of the indicator with the side wall of the casing removed. Fig. 5 is a front view of the spring-actuated train of gearing. Fig. 6 is a rear view of the same. Fig. 7 is a rear perspective view of the circuit-closer.

Similar reference-numerals indicate similar parts in the several figures.

1 indicates the casing of the indicator, which is preferably an oblong rectangular box. 2 indicates a bar secured within the casing to form a support for one end of two of the rollers over which the endless strip of material passes on which the names of the stations are printed. This strip is indicated by 3, and the rollers on which it is supported are indicated by 4, 5, and 6, respectively. The rollers 5 and 6 are supported in the side of the casing and the bar 2. The shaft 7, which carries the roller 4, is journaled in bearings 8 on the sides of the casing, and this roller is the actuating-roller for the strip. Each roller is provided at each end with a sprocket-wheel 9, and sprocket-chains 10 are attached to each edge of the strip 3 and run over the said sprocket-wheels. The sprocket-chains move the strip positively and keep it stretched, and the sprocket-wheels hold the strip out of close frictional contact with the rollers and thereby reduce the wear of the strip, while the rollers support the strip and prevent it from bagging. As many rollers as may be necessary to properly support the strip will be used, and the strip may be of any desired translucent material.

On the shaft 7 a sleeve 11 is mounted to turn therein and also to move longitudinally thereon, and this sleeve carries at each end a bevel-gear 12, adapted to engage a bevel-gear 13 on the end of the shaft 14, which latter is driven by a spring-actuated train of gearing to be hereinafter described. This sleeve is moved longitudinally by a crank-lever 15, pivotally supported at the top of the casing, the vertical arm of said lever being connected at its lower end to the sleeve by a strap connection, as indicated at 16. The longitudinal member of the lever is adapted to engage the plate 17 and be locked thereto in any suitable manner to hold it firmly in position at the extreme limits of its movement. By actuating the lever 15 the bevel-gears 12 may be alternately engaged with the gear 13, and the strip 3, therefore, be moved in opposite directions. The reversal of movement of the strip will occur at each end of the trip.

The train of gearing which actuates the shaft 14 is somewhat like a clock mechanism, and will now be described.

The front and rear frames are indicated by 19 and 20, and these frames serve as bearings for all the spindles and shafts of the various gears and pinions in the train.

20^a indicates the mainspring, and 21 the winding-shaft, having the usual pawl-and-ratchet devices 22 to prevent backward movement. The main driving-wheel is indicated

by 23, loose on the winding-shaft and connected to the outer end of the spring 20^a in the usual manner. This wheel meshes with a pinion 24 on the shaft 14, and the strip-operating mechanism is thereby driven. The shaft 14 also carries a gear-wheel 25, which meshes with a pinion 26 on the shaft 27, and this shaft also carries a gear 28, which meshes with a pinion 29 on a shaft 30. The shaft 30 carries a gear 31, which meshes with a pinion 32 on a shaft 33. This latter shaft carries a fan-governor 34 and a disk 35, which is provided with a single tooth 36 on its periphery.

37 indicates a rock-shaft to which is rigidly connected an escapement-lever 38, the hooked ends of which are adapted to be engaged with the tooth 36 on the disk 35. An arm 39 projects downwardly from the shaft 37 and carries at its outer end an armature 40, which is adapted to be attracted by the magnet 41 when the latter is energized. The armature is normally held out of engagement with the magnet by a spring 42, secured at one end to the arm 39 and at its other end to a fixed part of the frames. On the shaft 14 a disk 43 is rigidly mounted, and this disk is provided with two recesses 44 at opposite points, into which the head 45 on the end of a rod 46 is adapted to fall. The other end of the rod 46 is rigidly connected to the rock-shaft 37. On the shaft 30 is also secured a disk 47, which is provided with a notch or recess 48 in its periphery, into which the bent end 49 of a rod 50 is adapted to fall. The other end of the rod 50 is connected to the rock-shaft 37.

When the gearing is at rest, the several parts of the actuating mechanism will be in the position indicated in Figs. 5 and 6. As soon, however, as the magnet 41 is energized it will attract the armature 40 and thereby rock the shaft 37. This will cause the escapement-lever to rock also, and the tooth 36 will be disengaged by one end of the said lever and the disk 35 be partially rotated until its tooth engages the other end of the lever. This rocking of the shaft 37 will also cause the disengagement of the heads on the rods 46 and 50 from the recesses in the disks 43 and 47; but the train of gearing will not move farther as long as the armature is held against the magnet. As soon, however, as the current is broken the armature will be released by the magnet and the spring 42 will partially retract it and thereby release the escapement-lever from the tooth 36, thereby permitting the entire train of gearing to move by the action of the mainspring. In the meantime during the first movement of the disk 35, that carried its tooth 36 from engagement with one end of the escapement-lever to engagement with the other end, the disk 47 will have been moved sufficiently to move the notch or recess 48 away, so that when the shaft 37 is rocked by the retraction of the armature the bent end 49 of the rod 50 will engage the periphery of the disk 47, and the shaft will therefore not rock entirely back to its normal position, and consequently both ends of the escapement-lever will be held out of engagement with the tooth 36. In the meantime, before the disk 47 makes a complete revolution, the disk 43 will have moved sufficiently to cause the head 45 on the rod 46 to engage the periphery of the disk 43, and this will prevent the shaft 37 from completing its backward rocking movement and the movement of the train of gearing will continue until the disk 43 completes a half-revolution and the head 45 of the rod 46 is brought opposite one of the recesses 44, when the shaft 37 will be free to complete its backward rocking movement and cause the head 45 to drop into one of the recesses 44 and at the same time cause the bent end of the rod 50 to enter the recess 48 in the disk 47 and the escapement-lever to engage the tooth 36 of the disk 35, when the entire train of gearing will be stopped. The parts are so arranged that while the disk 43 is making a half-revolution the disk 47 will make several complete revolutions and the disk 35 several more complete revolutions than the disk 43. As the escapement or releasing lever is located at the end of the train of gearing farthest from the mainspring, it is obvious that very little power will be required to move it, and consequently the current of electricity necessary to energize the magnet will not have to be very strong, and a current of sufficient power to operate the indicators on a train of six or eight cars can be generated from a small battery—say of about five cells—that can be carried on either the motor or one of the passenger cars. Neither the head 45 on the rod 44 nor the bent end 49 of the rod 50 frictionally engage the sides of the recesses into which they enter, and consequently the only frictional resistance to be overcome in releasing the train of gearing is that between the escapement-lever 38 and the tooth 36.

The gear-wheel 28 carries a stud 51, adapted to engage the end of an arm 52, extending downwardly from a shaft 53, journaled in the upper end of the frame. This shaft also carries a hammer 54, which extends upwardly through the casing and is adapted to strike a bell 55, secured on the top of the casing. A spring 56 is attached at one end to the arm 52 and at its other to the frame, and another spring 57 is connected at one end to the hammer 54 and at its other end to a hook 58 on the top of the casing. The arm 52 will be moved by the stud 51 against the force of the spring 56 and the hammer will be retracted from the bell, and as soon as the stud 57 becomes disengaged from the arm 52 the spring 56 will retract it and cause the hammer to strike the bell 55, and the spring 57 will aid the hammer to rebound and also hold it out of contact with the bell, thereby permitting the latter to give a clear sound.

58 indicates an incandescent lamp arranged back of the strip 3 within the casing just opposite the glass-covered opening 59 in the front of the casing, through which the names of the stations or streets are successively seen. This lamp will be lighted by a shunt-circuit from the trolley-wire if used on an electric railway or from a circuit connected to a storage or other battery.

The controlling device for the circuit which leads from the battery to the magnet will preferably be located on the motor or engine where it can be operated by the motorman or the engineer. The circuit-closer is indicated by 60 and is of the usual push-button type, and the wires 61 and 62 are connected to the contact-points 63 and also to the binding-posts 64 and 65 of the magnet. The current starts from the positive pole of the battery 66 over the wire 61 to the binding-post 64, through the magnet 41 to the binding-post 65, over wire 62 to one of the contacts 63, thence through the circuit-closer 60 to the other contact 63, and over wire 61 to the battery.

67 indicates an alarm-bell, and 68 and 69 are the binding-posts of the magnet which operates the bell.

70 indicates a small battery, from the positive pole of which a wire 71 leads to a binding-post 72, secured to the casing, from which a wire 73 leads to the metallic frame of the train of gearing and is connected thereto at 74. From the binding-post 65 a wire 75 leads to a contact-point 76, located between the two poles of the magnet 41. The current from the battery 70 goes over the wire 71 to the binding-post 72, thence over wire 73 to the metallic frame of the train of gearing, thence through the armature 40 to the contact-point 76, thence through wire 75 to binding-post 65, thence over wire 62 to binding-post 68, through bell 67 to binding-post 69, and thence through wire 77 to battery 70. It will thus be seen that as soon as the operator closes the circuit to energize the magnet 41 as soon as the armature 40 is attracted it will close the alarm-bell circuit, and thereby notify the operator that the escapement-lever for the gearing has been released preparatory to setting the gearing in motion. It will also be observed that until the operator releases the circuit-closer 60 the train of gearing will not move to operate the station-indicating strip, and therefore the latter cannot possibly be moved more than the desired distance at one time to successively display the names of the stations.

It will be understood that changes in the form, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of this invention.

Having thus described our invention, what we claim is—

1. In a station-indicator, an endless station-indicating strip mounted on rollers, a spring-actuated train of gearing to operate one of said rollers, an escapement-lever at the end of said train farthest from the actuating-spring, a magnet and an armature to primarily operate the escapement-lever to permit a partial movement of the train of gearing and to again stop it until the armature is released, a spring to retract the lever when the current is broken and again release the escapement-wheel, and means to hold the escapement-lever out of engagement with the escapement-wheel until the necessary movement of the train of gearing is completed, substantially as described.

2. In a station-indicator, a station-indicating strip, a train of spring-actuated gearing adapted to intermittently move said strip, an escapement at the end of the train of gearing farthest from the actuating-spring, an armature connected to the escapement-lever, a magnet for said armature, an alarm-bell, a contact-point between the poles of the magnet, an electric circuit including the armature, the alarm-bell and said contact-point, and an electric circuit in which said magnet is included, substantially as and for the purpose described.

3. In a station-indicator, an endless station-indicating strip, a series of rollers on which said strip is supported, a spring-actuated train of gearing to operate one of said rollers, an escapement at the end of the train farthest from the actuating-spring, an armature connected to the escapement-lever to move it in one direction, a spring to move said lever in the opposite direction, an escapement-disk having a single tooth adapted to be engaged by the ends of the escapement-lever, a magnet for the armature, a disk in the train of gearing having a recess, a rod connected to the rock-shaft on which the escapement-lever is mounted, and a head on said rod adapted to enter the recess in the disk when the gearing is at rest, and to engage the periphery of the disk to temporarily hold the escapement-lever out of engagement with the tooth on the escapement-wheel, substantially as described.

4. In a station-indicator, the combination of an endless station-indicating strip, a train of spring-actuated gearing to intermittently move said strip, an escapement, an armature and a magnet to operate the escapement-lever, a contact-point between the poles of the magnet, an electric circuit including the magnet, a circuit-closer in said circuit, an alarm-bell adjacent to the circuit-closer, a second circuit including the alarm-bell, the armature and the said contact-point, and an independent battery for each circuit, substantially as described.

5. In a station-indicator, the combination of a station-indicating strip, a train of spring-actuated gearing adapted to intermittently move said strip, an escapement at the end of the train of gearing farthest from the actuating-spring, an armature connected to the es-

capement-lever, a magnet for said armature, an alarm-bell, a contact-point between the poles of the magnet, an electric circuit including the armature, the alarm-bell and said contact-point, an electric circuit in which said magnet is included, the two circuits having a common return-wire, and an independent battery for each circuit, substantially as and for the purpose described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in the presence of two witnesses.

DUDLEY C. JONES.
JACOB M. JONES.

Witnesses for Dudley C. Jones:
EDWIN CRUSE,
JOHN H. SIGGERS.
Witnesses for Jacob M. Jones:
W. A. BARRY,
S. WELLS.