No. 846,513. PATENTED MAR. 12, 1907.

T. W. SMALL.

STREET INDICATING MECHANISM.

APPLICATION FILED MAY 17, 1905.

2 SHEETS—SHEET 1.

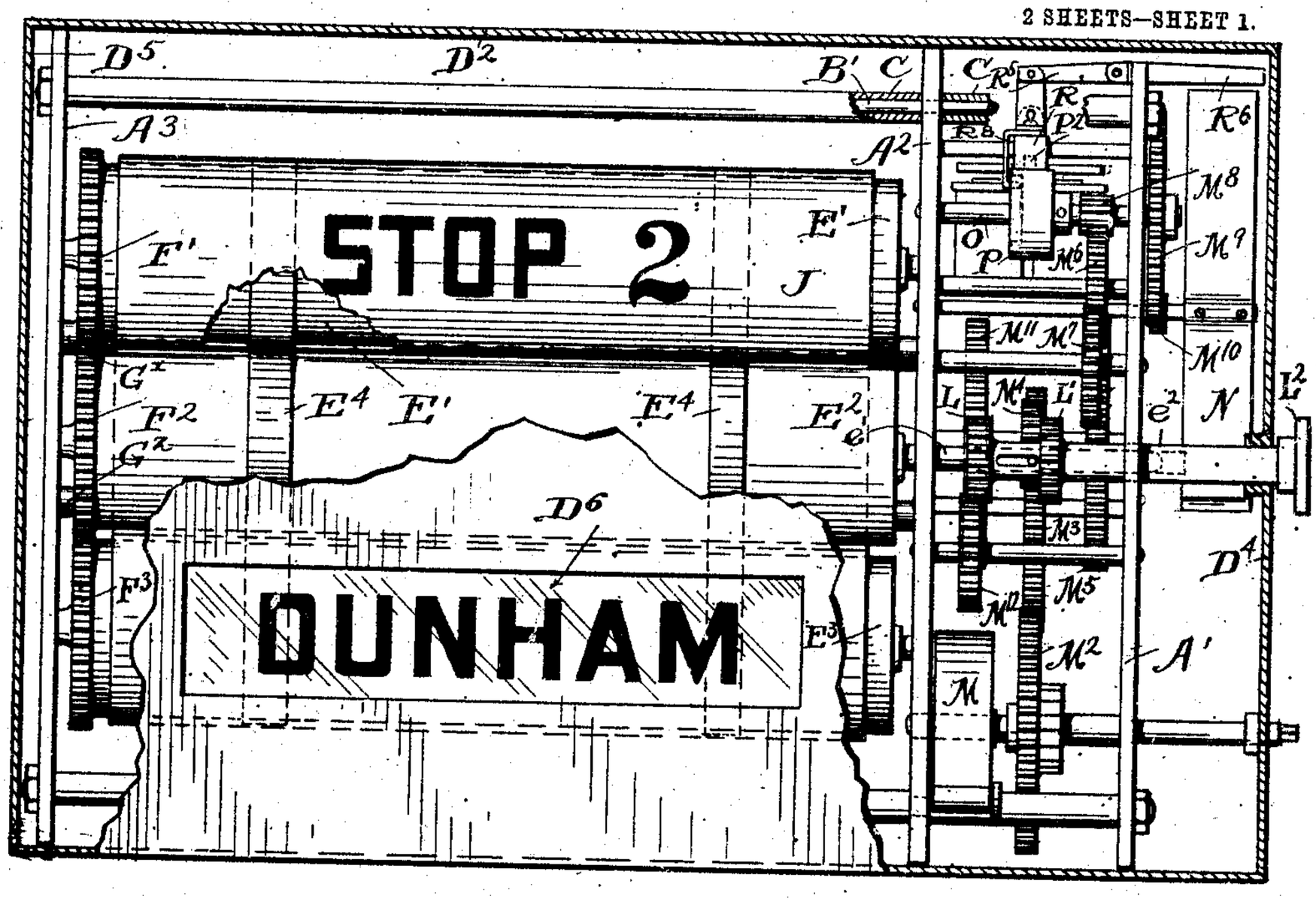


Fig. 1.

Fig. 2.

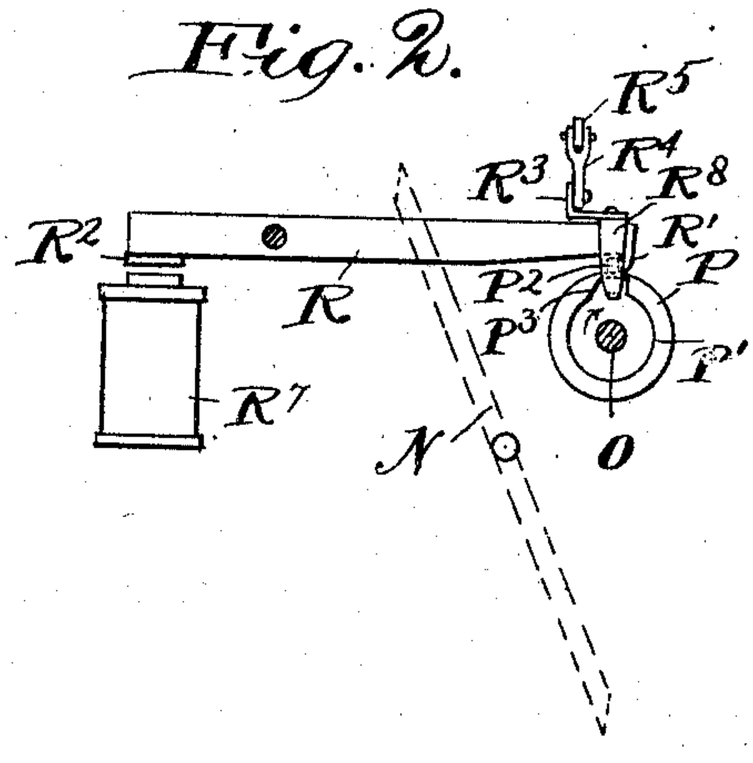
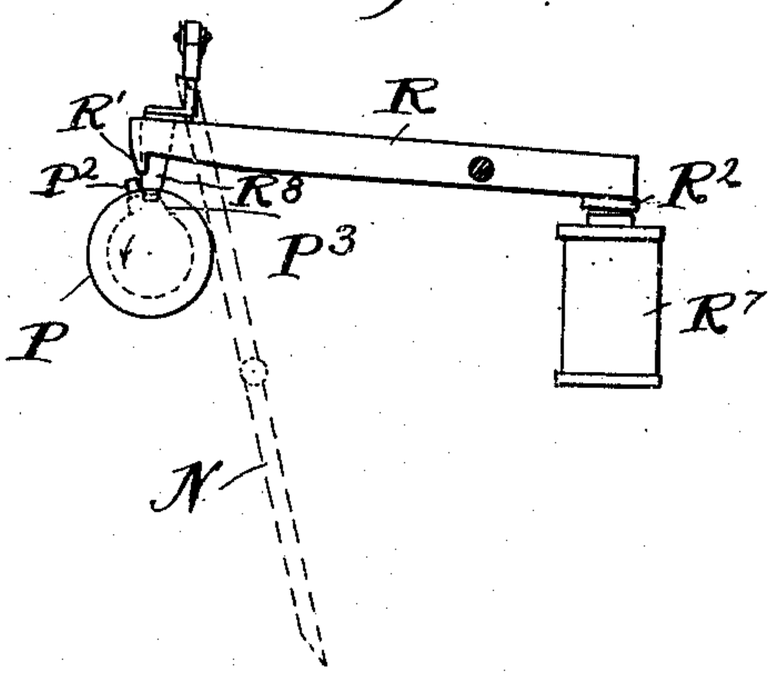


Fig. 3.



Witnesses.
E. B. Gilchrist
J. S. Kohn

Inventor:
Thomas W. Small,
By his Attorneys,
Thurston & Bates.

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2 SHEETS—SHEET 2.

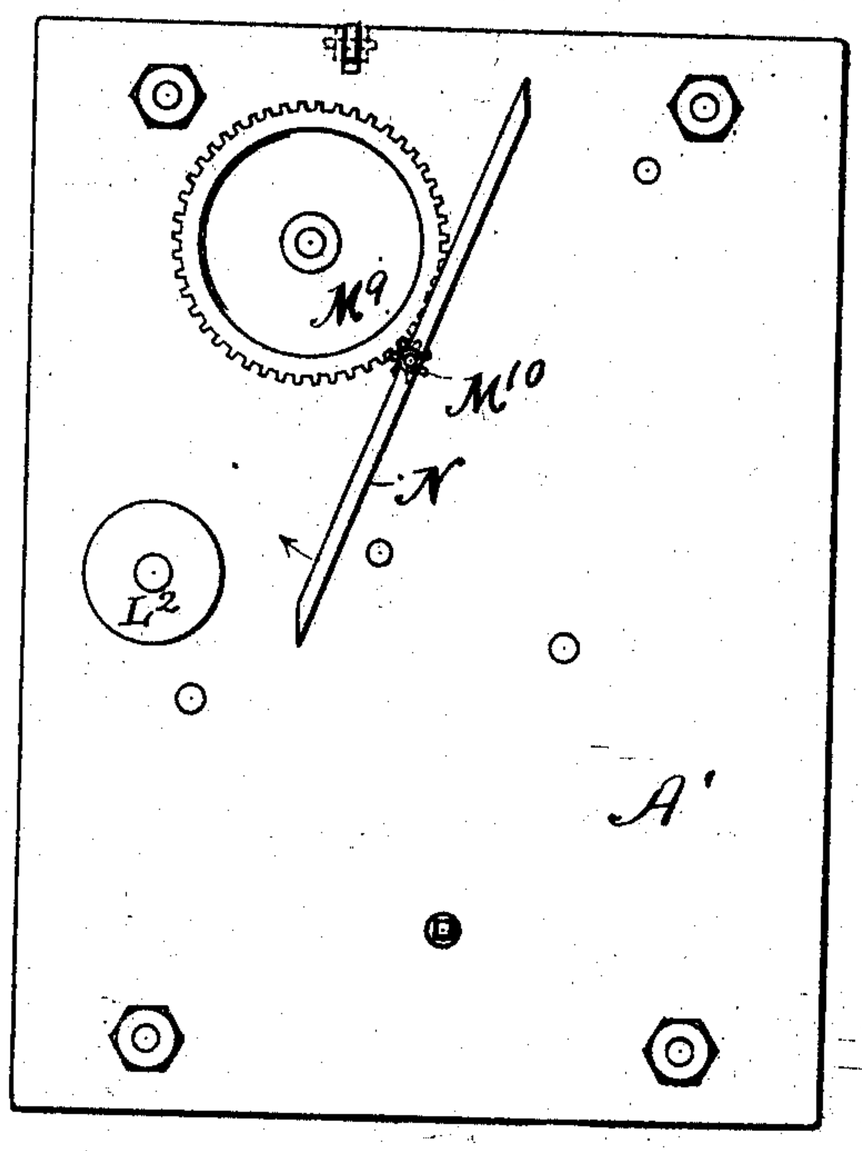

Fig. 4.

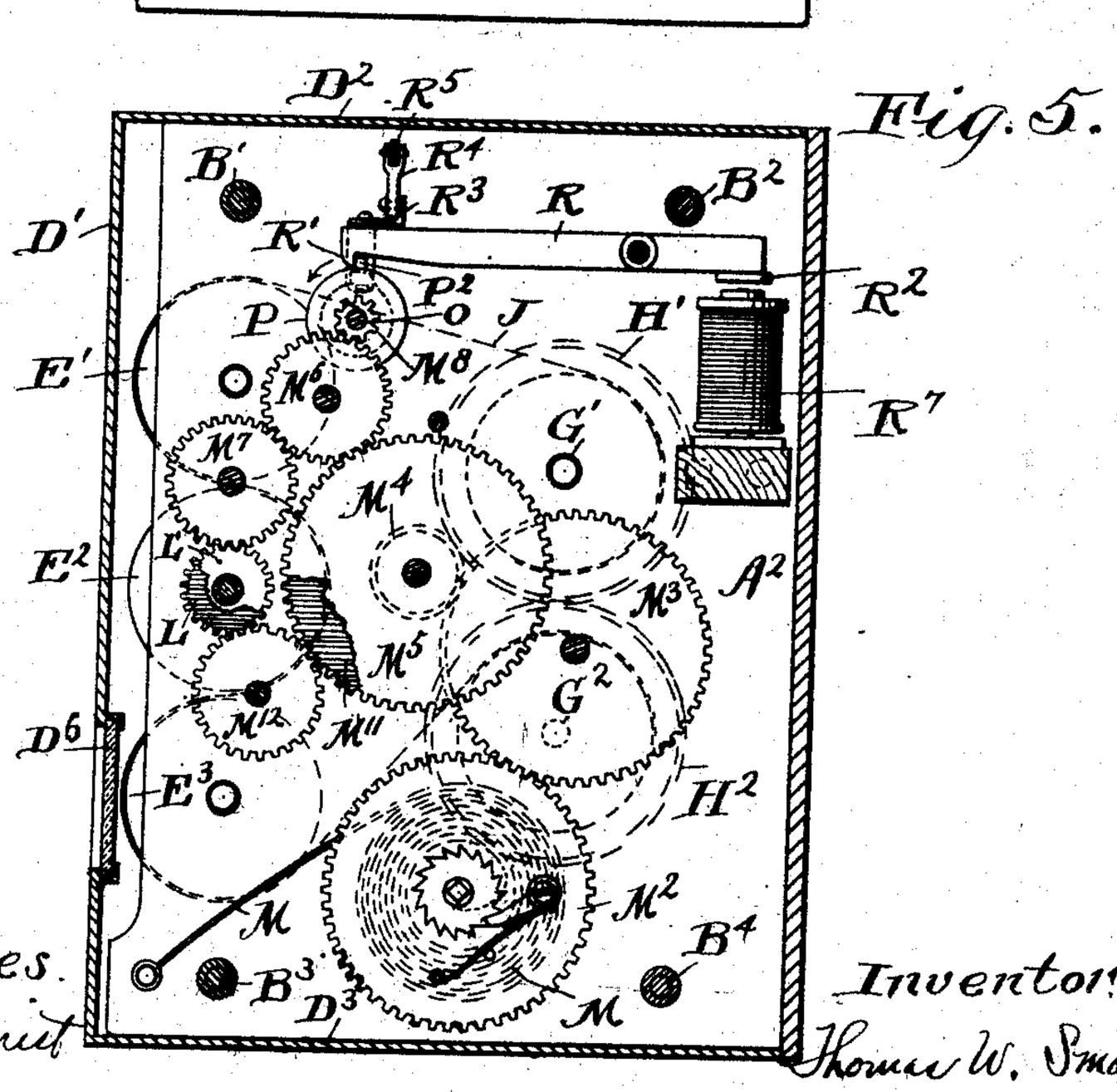

Fig. 5.

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UNITED STATES PATENT OFFICE.

THOMAS W. SMALL, OF CLEVELAND, OHIO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE ACME AUTOMATIC STREET INDICATING COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

STREET-INDICATING MECHANISM.

No. 846,513. Specification of Letters Patent. Patented March 12, 1907.

Application filed May 17, 1905. Serial No. 260,771.

To all whom it may concern:

Be it known that I, THOMAS W. SMALL, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Street-Indicating Mechanism, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

The object of this invention is to provide an efficient and operative street or station indicator for cars and similar uses.

My indicator is positively driven by suitable motor mechanism in the form shown by means of a coil-spring and controlled in its movements by some suitable controlling device, such as the electromagnet shown, the controlling device being actuated either positively, as by hand, or automatically, as by means of some projection placed in the path of the cars of the trolley.

The indicator disclosed is of that type which includes a strip having the names of the streets or stations placed thereon in separate spaces, rollers for guiding the strip, arrangements for keeping the strip taut, a clockwork for driving the strip in either direction.

More particularly, the present invention relates to controlling mechanism for limiting the operation of the driving mechanism, so that for each actuation of the controlling device the driving mechanism shall only operate to the extent of advancing the strip a single space.

My indicator is an improvement upon that patented by me on September 8, 1903, under the Patent No. 738,366.

In the drawings illustrating my invention, Figure 1 is a sectional elevation with the front plate of the casing and certain detailed portions of the mechanism broken away. Fig. 2 is an end view of the electromagnetic controlling mechanism. Fig. 3 is a view of the electromagnetic-controlling mechanism, taken from the side opposite to that of Fig. 2 and showing the position of the parts immediately after the circuit has been closed. Fig. 4 is an end view taken from the right hand of Fig. 1, with the casing removed. Fig. 5 is an end view, partly in section, of the driving-gear with the end plate of the casing and the cross-plate of the frame removed.

The frame of the indicator consists of the cross-plates A' A^2 A^3, held together by transverse rods B' B^2 B^3 B^4. Distance-sleeves C C are placed on the rods between the several plates. Surrounding the mechanism is a casing having the front plate D', top plate D^2, bottom plate D^3, and end plates D^4 D^5. In the front plate D' is an opening, preferably provided with some transparent substance D^6, through which the designations on the strip may be read.

Mounted on shafts supported in the cross-plates A^2 A^3 are three rollers in substantially vertical alinement E' E^2 E^3, each provided with friction-bands E^4 and suitably geared together at one end by the gears F' F^2 F^3, respectively. Back of these rollers are a pair of spring-barrel rollers G' G^2, geared together at one end by the gears H' H^2—that is, the gears are connected with the respective rollers through the intermediacy of the springs within the rollers. The springs of these rollers are wound in the same direction with the design of giving each a tendency to wind up the strip J, one end of which is secured to G', the other end being secured to G^2. The strip J passes over the front of the rollers E' and E^3 and behind the intermediate roller E^2. A shaft e' of the roller E^2 projects through the plate A^2 and is connected by some suitable means, as a pin-and-slot connection, with a sleeve e^2 in such a manner as to secure rotatable connection between the two, while permitting longitudinal movement of the sleeve. The sleeve e' has at its outer end a handpiece L^2 and bears near its inner end two pinions L L', designed, respectively, to mesh with the driving-gears moving in opposite directions, but so spaced that but one can be in gear at a time. The driving-gears are operated by any suitable means, in this instance by an ordinary coil-spring M, associated with the usual winding-stem and pawl-and-ratchet mechanism. The spring M drives the gear M^2, meshing with the gear M^3, which meshes with the pinion M^4, fixed upon the same shaft with a large gear M^5. The gear

M^5 transmits motion through the pinion M^6 to the pinion M^7 and also the pinion M^8. M^8 is rigidly secured to a shaft O, and its motion is transmitted to the gear M^9, thereby tending to turn the pinion M^{10} and the fan N. Upon the same shaft with the pinion M^4 and the gear M^5 is a gear M^{11}, which meshes with and tends to turn a gear M^{12}.

The sliding sleeve e^2, bearing the pinions L L′, is so arranged that it can be moved to throw the pinion L into mesh with the gear M^{12} or can throw the pinion L′ into mesh with the pinion M^7. It is obvious upon an inspection of the drawings that by this means a reversal of the direction of movement of the intermediate roller E^2, and consequently a reversal in the direction of the strip J, can thus be secured, although the driving-gear wheel M^2 always turns in the same direction.

Referring now to the device for controlling the operation of the driving mechanism, it will be seen that the shaft O, with which the driving-gear is in constant connection, bears a detent device P, rigidly attached thereto. This detent device is provided with an overhanging flange P′ at one end and has projecting from its periphery a stop P^2. Engaging this stop and preventing its movement in the direction of rotation is the detent-finger R′ at the end of the oscillating lever R.

To the other end of the oscillating lever R is attached the armature R^2, placed above an electromagnet R^7 and arranged to approach the same upon the closing of the circuit. At the end of the lever R alongside of or near the detent-finger R′ is secured an overhanging finger R^8, which projects under the flange P′. In the flange P′ is a cut-away portion P^3, provided with a cam-surface at one side for a purpose hereinafter to be described. Secured to the finger R^8 and the lever R is a bracket R^3, connected by a pivoted link R^4 with the end of a locking-arm R^5. The locking-arm is pivoted and has one end R^6 projecting over the fan N in such a manner that upon the depression of the end R^6 it shall come into the path of the fan and lock it against rotation.

It will be seen by the arrangement of the parts above described that whenever through any means, automatic or otherwise, the circuit in the electromagnet R^7 is closed and the armature R^2 is caused thereby to approach the same the finger R′ will be raised, releasing the stop P^2 of the detent device. Upon such release the driving-spring M will immediately, through the gears M^2 M^3 M^4 M^5 M^6 M^8, start the rotation of the shaft O and move the stop P^2 forward, as seen in Fig. 3. Simultaneously with this movement motion will be transmitted through the shaft O and gear M^9 and pinion M^{10} to the fan N. It will be observed that immediately upon the attraction of the armature R^2 and the elevation of the detent-finger R′ the locking-arm R^5 will be kicked up through the link R^4, and the end R^6 of this locking-arm will fall in the path of the fan N, thereby at once blocking all movement on the part of the driving mechanism. From this it will be apparent that it is absolutely immaterial, so far as the driving mechanism is concerned, how long the circuit through R^7 remains closed, and the driving mechanism will not advance the strip J at all during that period, having been allowed to move but the slightest degree, merely sufficiently to allow the stop P^2 to be thrown forward out of the control of the detent-finger R′. When, however, the circuit through the electromagnet is broken, either by positive or automatic means, such as the car moving away from the device which closes the circuit, the oscillating lever R will immediately fall at the end R′ by reason of its being overbalanced at that end and will pull down with it one end of the locking-lever R^5, thereby lifting the end R^6 clear of the fan N. When this takes place, there will be no lock interposed in the mechanism, and the gears will be free to turn, feeding the strip J forward. Immediately upon the starting of the driving mechanism the cam-surface P^3 will engage the overhanging finger R^8 and will slide the finger under the flange P′. This latter arrangement insures that the lever will be held down in such way that the detent-finger R′ will be in position to catch the stop P^2 after it makes one revolution. Upon this engagement of the stop P^2 by the detent-finger R′ all movement in the mechanism will of course be blocked.

By the proper proportioning of the parts described it will be seen that with each revolution of the detent device the strip J may be moved forward whatever distance is required.

Having described my invention, I claim—

1. In a machine of the character described, an indicating device, means for advancing the same, a projection provided upon one of the moving parts of said advancing mechanism, a lever having a detent-finger normally in the path of said projection, a cam rotatable with said projection and connected with said lever to normally prevent the removal of said detent, a locking device connected with said lever, and an electromagnet for operating said lever.

2. In a machine of the character described, an indicating device, means for advancing the same, a projection provided upon one of the rotating parts of said advancing mechanism, an oscillating lever having at one end a detent-finger normally in the path of said projection, an internal cam rotatable with said projection and having a recess, a mem-

ber carried by the lever and engaging said cam and adapted to hold said finger in the path of said projection, said recess relieving said member when the projection engages the detent, an electromagnet for operating said lever, and a locking device controlled by said lever.

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

T. W. SMALL.

Witnesses:
E. B. GILCHRIST,
W. L. MCGARRELL.