No. 818,483. PATENTED APR. 24, 1906.

J. E. TAPLEY & A. E. HOVEY.

STATION INDICATOR.

APPLICATION FILED APR. 5, 1904. RENEWED JULY 11, 1905.

3 SHEETS—SHEET 1.

Fig. 1.

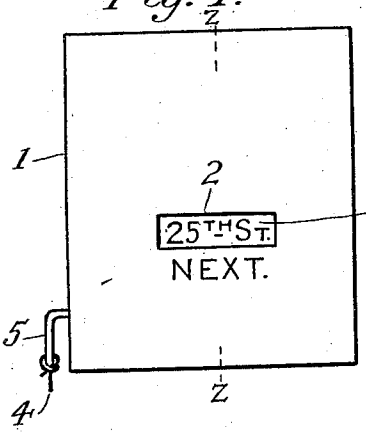


Fig 2.

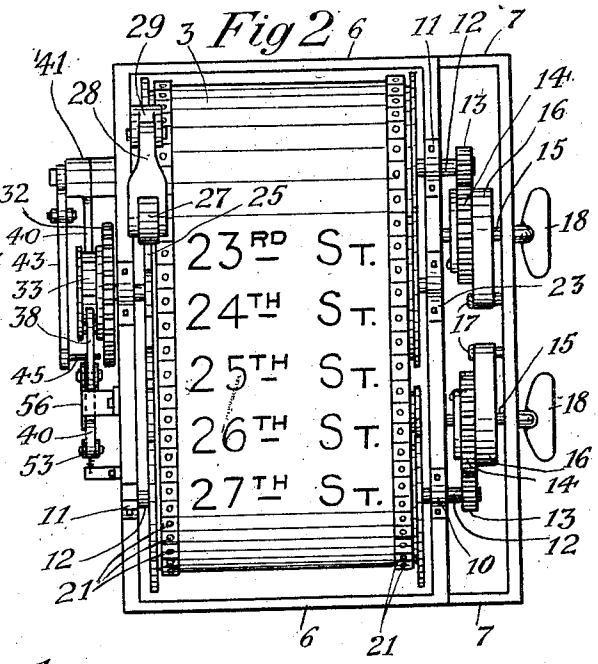
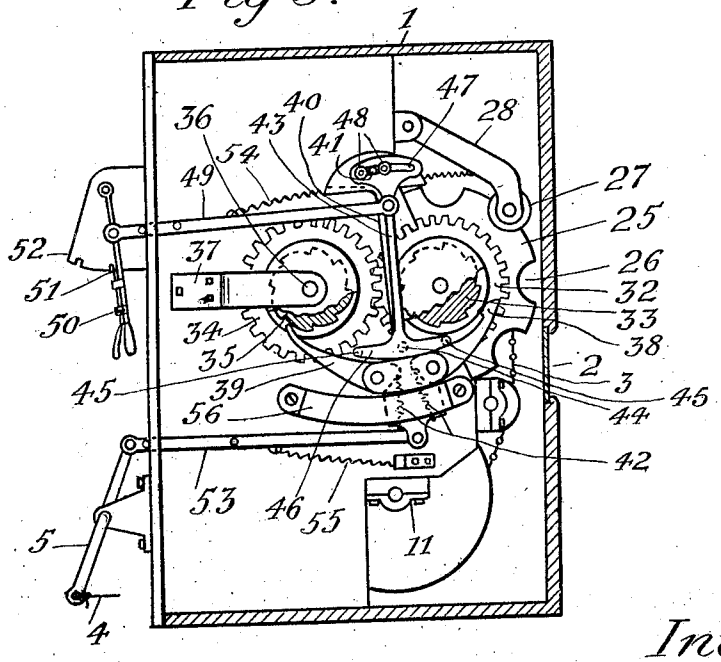


Fig 3.



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3 SHEETS—SHEET 2.

Fig 4

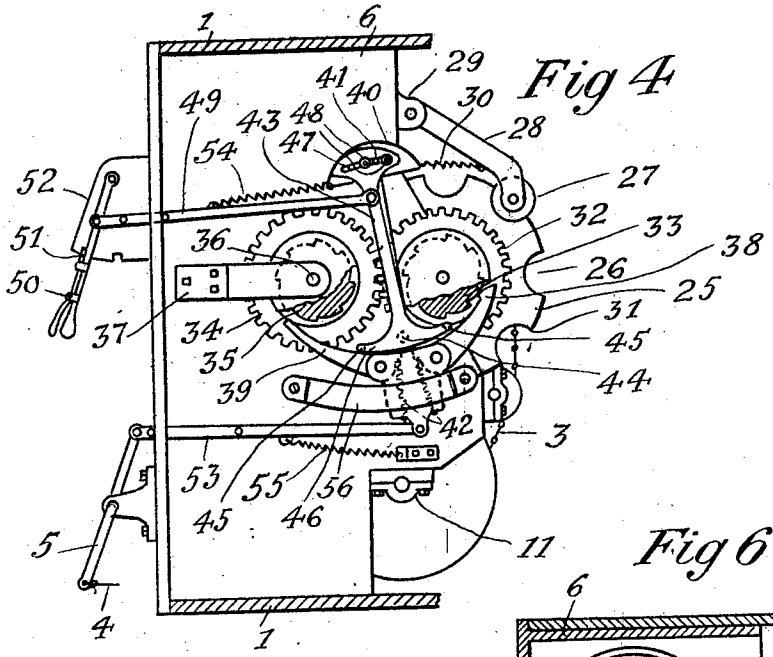


Fig 5

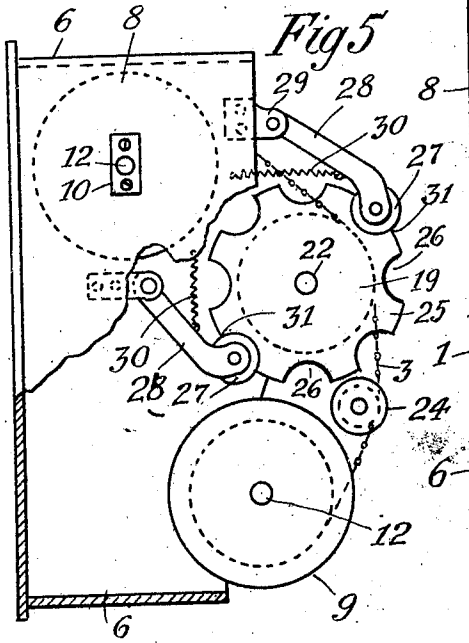
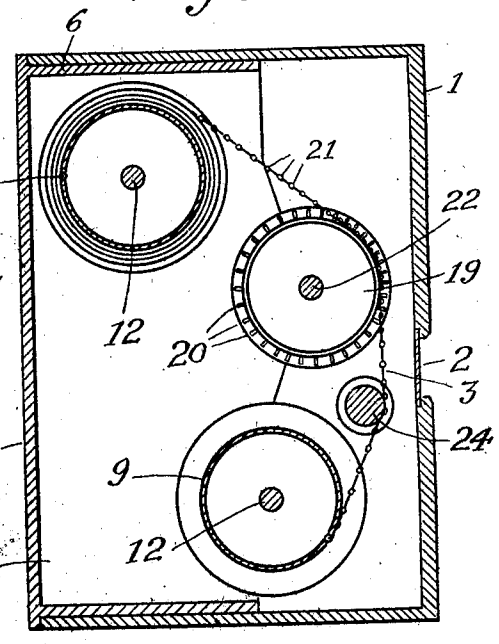


Fig 6



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3 SHEETS—SHEET 3.

Fig 7

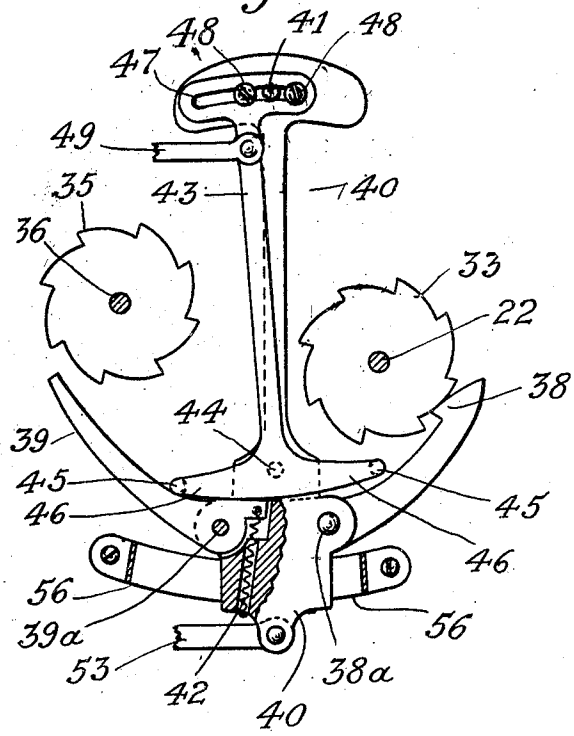


Fig 8.

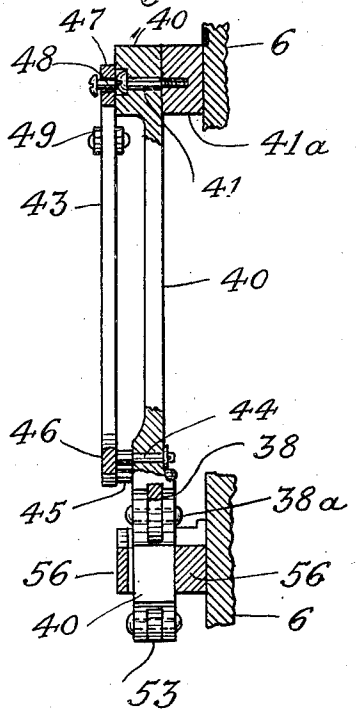


Fig. 10.

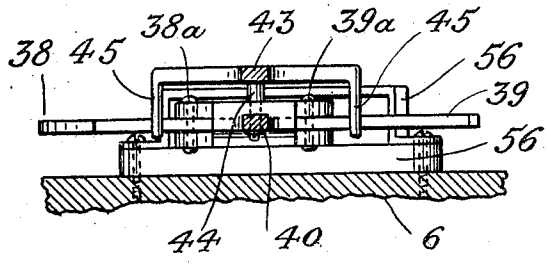
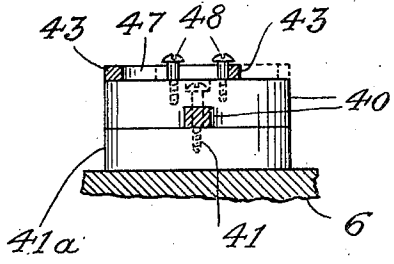


Fig. 9.



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UNITED STATES PATENT OFFICE.

JOHN E. TAPLEY AND ALFRED E. HOVEY, OF CASS LAKE, MINNESOTA.

STATION-INDICATOR.

No. 818,483. Specification of Letters Patent. Patented April 24, 1906.

Application filed April 5, 1904. Renewed July 11, 1905. Serial No. 269,274.

To all whom it may concern.

Be it known that we, JOHN E. TAPLEY and ALFRED E. HOVEY, citizens of the United States, residing at Cass Lake, in the county of Cass and State of Minnesota, have jointly invented certain new and useful Improvements in Station-Indicators, of which the following is a specification.

Our invention relates to that class of indicators particularly designed for use on railway-cars, street-cars, and other vehicles for displaying or otherwise indicating the names of the streets or stations along the route.

The object of the invention is to provide an inexpensive, durable, and efficient device of this character in which a pair of intermeshing toothed drums are actuated through the medium of suitable levers to wind and unwind a ribbon, belt, or similar indicating device upon a pair of rollers, so as to display a symbol at an opening in the casing or housing at predetermined intervals.

A further object of the invention is to provide a pawl-carrying bar pivotally mounted between the intermeshing drums and upon which are pivoted a push-pawl and a pull-pawl adapted to alternately engage the teeth on the drums for rotating the same, and, further, to provide a reversing-lever for changing the direction of rotation of said drums, said lever serving to lock one of the pawls in inoperative position.

A still further object of the invention is to provide a pair of spring-actuated rollers adapted to be rotated with a step-by-step movement for winding or unwinding the indicator belt or ribbon, and, further, to provide means for regulating the spring tension upon said rollers and means for limiting the extent of movement of the ribbon or belt.

With these and other objects in view the invention consists in the construction and novel combination and arrangement of parts hereinafter fully described, and illustrated in the accompanying drawings, it being understood that various changes in the form, proportions, and minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention within the scope of the appended claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a front elevation of a casing or housing containing the indicator mechanism, a portion of the ribbon being exposed at an opening in the front. Fig. 2 is a front elevation of the interior frame and operating mechanism removed from the casing. Fig. 3 is a side elevation viewed from the left of Fig. 2, showing the operative parts in position for moving the ribbon upwardly. Fig. 4 is a similar view showing the operative parts in position for moving the ribbon in the reverse direction. Fig. 5 is a side elevation with the intermeshing drums and other portions of the device removed. Fig. 6 is a vertical sectional view on the line *z z* of Fig. 1 viewed toward the right and enlarged. Figs. 7, 8, 9, and 10 show detached views of certain of the operating-levers and their connections.

In the drawings, 1 designates the indicator box or casing, preferably located in the front portion of the car and having in its face a transverse opening 2, through which may be seen a portion of the indicator ribbon or belt 3. A cord 4 is attached to the arm of a lever 5, with its free end extended the desired direction and distance to enable the conductor, motorman, or other proper person to operate the ribbon. On the face of the casing adjacent to the slot or opening 2 may appear the word "Next," as shown, or other suitable word or words. Within the casing 1 is secured a main frame 6 and supplemental frame 7 of any suitable construction for supporting the operating mechanism.

The ribbon 3 has its ends attached to the rollers or spools 8 and 9, the journal-bearings of which are in boxes 10 and 11, provided on the frame 6. At one side of the frame the spool arbors or shafts 12 carry pinions 13, which mesh with gears 14, and the latter are borne by arbors 15, journaled on the main frame 6 and supplemental frame 7. Clock-springs 16 or equivalent coiled springs have their ends connected, respectively, to the arbors 15 and the studs 17 on the frame 7, and rings or handles 18 on the arbors enable the spring to be wound to the proper extent to exert the desired tension through the arbors and gears upon the ribbon-spools. By these means the proper tension in opposite directions may be exerted and maintained upon the ribbon to keep it taut as it is being wound or unwound from either spool to the other, for the reason that the arbors carrying the springs and gear-wheels will make comparatively few turns, while the shafts or arbors carrying the pinions and spools make the greater number of rotations necessary to wind or unwind the ribbon.

For moving the ribbon from one spool toward the other there is provided an intermediate drum or cylinder 19, having upon it pins 20 or other suitable projections arranged at intervals in circular courses near its ends and adapted to engage suitable openings or perforations, preferably provided with eyelets 21, arranged at corresponding intervals in the ribbon, or the opening may be formed in a band or chain attached to the margins of the ribbon.

The axis or shaft 22 of the drum has bearings in journal-boxes 23 on the frame 6. An idle roller 24, supported by the frame, may be utilized for holding the ribbon in proper place close to the casing-opening 2.

For stopping and holding the feed drum or cylinder 19 in position when it has been rotated a predetermined distance a disk or wheel 25 is secured to the shaft or axis 22, said wheel being provided with a series of spaced notches or recesses 26 for the reception of rollers 27, carried by pivoted levers or dogs 28. The dogs 28 are pivotally supported on studs 29 and held in engagement with the notched wheel by springs 30. The pivoted dogs not only serve to hold the drum in place while the feed-pawls are disengaged, but also serve to rotate it slightly forward or backward by pressure of the rollers on the notched wheels at the points 31 of entrance to the notches when the feed movements of the pawls fail to rotate the drum the exact distance required. This operation is effected by having the tension of the dog-springs sufficient to overcome the resistance of the springs 16, that control the ribbon-spools, and its purpose is to insure the presentation of the proper portion of the ribbon at the opening in the indicator box or casing, whether the feed movements of the ribbon are in an upward or downward direction.

The devices for operating the drum or cylinder 19 are as follows: Mounted on one end of the shaft or axis 22 is a toothed drum 33, which meshes with a similar toothed drum 35, mounted on an arbor or shaft 36, having bearings in the frame 6 and in a bracket 37 thereon, the drums being provided with gear-wheels 32 and 34, respectively, to permit said drums to intermesh. It will be apparent from the meshing of the two gear-wheels that the rotation of the toothed drum 33 will serve to revolve the cylinder 19 in the same direction, while the similar rotation of the toothed drum 35 will serve to revolve the cylinder in the opposite direction, the rotation of the drums being effected by means of a pull-pawl 38 and a push-pawl 39. The pawls 38 and 39 are pivoted on the lower portion of a bar 40, as indicated at 38^a and 39^a, respectively, the upper end of the bar being connected by a pivot 41 to a block 41^a, which is secured on the frame 6, whereby the pawl-carrying bar is fulcrumed at its upper end and its lower end free to be oscillated. The inner end of each pawl is connected to the end of the bar 40 by a spring 42, which tends to hold the outer end of the pawl in engagement with the appropriate toothed drum. To hold one of the pawls in operative position and the other in inoperative position, a reversing-lever 43 is connected by a pivot 44 to the bar 40 near the pawls, said lever being provided with a substantially T-shaped head 46, the arms of which are provided with laterally-projecting pins 45, which extend inwardly past the pawls 38 and 39 to positions to alternately engage the pawls when the lever is swung on its fulcrum to move the engaged pawl away from contact with its toothed drum or ratchet-wheel and so place it in inoperative position. The extent of the rocking movements of the arms 46 is limited by means of a curved slot 47 in the widened upper end of the lever 43 and pins 48, projecting into the slot from the corresponding end of the bar 40. These pins fit loosely in the slot 47, so that the upper end of the lever 43 is free to move laterally on the upper end of the bar 40 to the extent permitted by the slot and pins. To the upper portion of the lever 43 is connected a bar 49, adapted to actuate said lever to thereby change the direction of rotation of the indicator belt or ribbon. The outer end of the bar 49 projects outside the box or casing and is there connected to a suitable hand-lever 50, having a spring-dog 51 for engagement with the notched plate 52. In Fig. 3 the regulating-lever 50 and the adjusted parts are in position to cause the ribbon to be moved step by step in an upward direction, while in Fig. 4 the same devices are shown in position to produce a reverse movement of the ribbon. In the former the pawl 39 is in position to engage its toothed drum, while in the latter figure the pawl 38 is in operative position. In both cases the movement of the ribbon is effected by the oscillatory bar 40 through the medium of a horizontally-disposed bar 53, the latter forming a pivotal connection between the lower end of the bar and the operating-lever 5, as shown. The bar 49 may be provided with a retractile spring 54. A similar spring 55 is provided for actuating the bar 53, the outward or feeding movement of the latter being effected by the operation of the lever 5 by means of the cord 4. The pawl-carrying bar 40 is also mounted for movement in a curved plate or guide 56.

In operation to move the indicator belt or ribbon upwardly one step, as from the position shown in Fig. 1, where the characters "25th St." are shown as coincident with the slot 2, it is only necessary to operate the lever 5 sufficiently to cause the pawl 39 to make its thrust and move the toothed drum the space of one tooth. Such movement will cause the gear-wheel 34 to turn the gear-

wheel 32 a partial rotation in its opposite direction, and thereby correspondingly partially turn the cylinder 19, and by engagement of the pins 20 with the eyelets 21 feed the ribbon upward one step or so as to present the next indicator character or characters (in this instance "26th St.") opposite the slot or opening 2. To reverse the direction of movement of the ribbon, the regulator-lever 50 must be moved, as from its position in Fig. 3 to that shown in Fig. 4, so as to shift the reversing-lever 43 and move the pawl 39 to inoperative position and the pawl 38 into position to engage teeth on the adjacent drum, whereby the operation of the lever 5 will pull the latter pawl downward, and thereby turn the toothed drum 33 and the cylinder 19 one step in a direction opposite that of its former movement. The free movement of the lower end of the bar 40 is not interferred with by the connection of the lever 43 to its upper end, because the slot 47, in which the pins 48 fit loosely, permits the bar 40 to swing the necessary distance, although the bar 49 limits the movement of the upper portion of the lever 43. The tension of the springs 16 in opposite directions upon the two spools serves to hold the ribbon taut, whether it is equally or unequally distributed upon the spools.

Having thus described the invention, what is claimed is—

1. In a station or street indicator, an indicator-ribbon, a pair of spools upon and from which it is wound, coil-springs for exerting tension upon the spool-axes, an intermediate rotary feed device having means for engaging the ribbon to move it, a gear-wheel on the feed-device axes, a second gear-wheel in mesh therewith, toothed drums mounted for rotation with said gear-wheels, a pawl-carrier, a pair of pawls mounted thereon, means for adjusting said pawls to move the same alternately to inoperative position, and means for operating the pawls.

2. In a station or street indicator, an indicator-ribbon, a pair of spools upon and from which it is wound, coil-springs for exerting tension upon the spool-axes, an intermediate rotary feed device, having means for engaging the ribbon to move it, a gear-wheel on the feed device axis, a second gear-wheel in mesh therewith, toothed drums mounted for rotation with said gear-wheels, a pawl-carrier, a pair of pawls carried thereby, means for adjusting said pawls to move the same alternately to inoperative position, means for actuating the pawls, spring-dogs provided with rollers on their engaging ends, and a wheel or disk on the axis of the feed device and provided with a series of peripheral sockets in which said rollers register.

3. In a station or street indicator, an indicator-ribbon, a pair of spools upon and from which it is wound, coil-springs for exerting tension upon the spool-axes, an intermediate rotary feed device having means for engaging the ribbon to move it, a gear-wheel on the feed-device axis, a second gear-wheel in mesh therewith, toothed drums mounted for rotation with said gear-wheels, a pawl-carrier, spring-pawls mounted thereon, a lever fulcrumed on said carrier and having arms arranged to move either pawl out of operative position, means for positioning said lever, and means for actuating the pawl-carrier.

4. In a station or street indicator, an indicator-ribbon, a pair of spools upon and from which it is wound, coil-springs for exerting tension upon the spool-axes, an intermediate rotary feed device having means for engaging the ribbon to move it, a gear-wheel on the feed-device axis, a second gear-wheel in mesh therewith, toothed drums mounted for rotation with said gear-wheels, a pawl-carrier, spring-pawls mounted thereon, a lever fulcrumed on said carrier and having arms arranged to move either pawl out of operative position, means outside the casing and interior connections for adjusting said lever on its fulcrum to control the positions of the pawls, and means outside the casing and interior connections for reciprocating the pawl-carrier to actuate the operative pawl.

5. In a device of the class described, an indicator-ribbon having perforations near its edges, a pair of spools upon and from which it is wound, coil-springs for exerting tension upon the spool-axes, an intermediate rotary feed device having projections for engaging the ribbon-perforations, to move it, a gear-wheel on the feed-device axis, a second gear-wheel in mesh therewith, toothed drums mounted for rotation with the gear-wheels, a pair of pawls, means for adjusting said pawls alternately to inoperative position, means for actuating the pawls to turn the feed device, and means for holding said feed device in place upon completion of the feed movement.

6. In a device of the class described, an indicator-ribbon having perforations near its edges, a pair of spools upon and from which it is wound, coil-springs for exerting tension upon the spool-axes, an intermediate rotary feed device having projections for engaging the perforations in the ribbon to move the latter, a pair of intermeshing gear-wheels, toothed drums mounted for rotation with said gear-wheels, a swinging pawl-carrier, a pair of pawls carried thereby, a reversing-lever fulcrumed on said carrier and having arms arranged to move either pawl out of operative position, means for positioning said lever, and means for actuating the pawl-carrier.

7. In a device of the class described, a casing provided with a display-opening, an indicator-operating means including a pair of intermeshing toothed drums, a pawl-carrying

bar pivoted between said drums, a pair of pawls carried by the pivoted end of the bar and adapted to alternately engage the teeth on the drums, an indicator operable by said drums to successively display a symbol at said opening, and means for normally holding one of said pawls out of engagement with the teeth of the adjacent drum.

8. In a device of the class described, an indicator-operating means including a push-pawl, a pull-pawl, an operating means connecting the two, a pair of intermeshing toothed drums engaged by said pawls, an indicator operable by said drums, and means for alternately throwing said pawls into and out of engagement with the drums to thereby reverse the direction of movement of the indicator.

9. In a device of the class described, an indicator-operating means including a pair of intermeshing toothed drums, a pawl-carrying bar pivoted between said drums, pawls carried by the bar and adapted to alternately engage the teeth on the drums, an indicator operable by the latter, and a reversing-lever pivoted to and movable with the pawl-carrying bar and adapted to disengage one of the pawls from the teeth on the adjacent drum to thereby reverse the direction of movement of the indicator.

10. In a device of the class described, an indicator-operating means including a plurality of intermeshing gear-wheels, toothed drums secured to said gears, a pawl-carrying bar pivoted between the drums, pawls pivoted to the bar and adapted to engage the teeth on said drums, an indicator operable by the drums, means for adjusting said pawls alternately to inoperable position to thereby reverse the direction of movement of the indicator, and means for locking one of said pawls in inoperative position.

11. In a device of the class described, the combination with a casing, shafts journaled in the casing, intermeshing toothed drums mounted on the shafts, a pawl-carrying bar pivoted between said drums, an indicator operable by the drums, a notched wheel fixed to the shaft of one of the drums, pawls carried by the pivoted end of the bar and adapted to engage the teeth on said drums, a reversing-lever pivoted to the bar for moving the pawls alternately to inoperative positions to thereby reverse the direction of rotation of the indicator, and a spring-pressed lever provided with a terminal roller adapted to engage the notched wheel.

12. In a device of the class described, the combination with a casing, intermeshing toothed drums mounted for rotation therein, an indicator operable by said drums, a pawl-carrying bar pivoted between the drums and provided with a push and a pull pawl adapted to engage the teeth on said drums, and a reversing-lever pivoted to said bar at a point intermediate the ends of the latter and adapted to alternately move the pawls to inoperative positions to thereby reverse the direction of movement of the indicator.

13. In a device of the class described, a casing provided with a display-opening, an indicator-operating means including a push-pawl, a pull-pawl, an operating means connecting the two, an indicator operable by said pawls to successively display a symbol at said opening, and a reversing-lever having a substantially T-shaped head provided with laterally-extending pins adapted to engage said pawls for moving the latter alternately to inoperative position.

14. In a device of the class described, a casing provided with a display-opening, an indicator operating means including a pawl-carrying bar having a push and a pull pawl pivoted thereto, an indicator operable by said pawls to successively display a symbol at said opening, a reversing-lever pivoted to said bar and having one end thereof slotted and its opposite end provided with laterally-extending pins adapted to engage said pawls, and a pin secured to said bar and adapted to engage the slot in the reversing-lever.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 26th day of March, 1904.

JOHN E. TAPLEY.
ALFRED E. HOVEY.

Witnesses:
GEORGE A. LYDICK,
T. LEISEN.