

(Model.)

2 Sheets—Sheet 1.

H. E. BISSELL.
STATION INDICATOR.

No. 298,162.

Patented May 6, 1884.

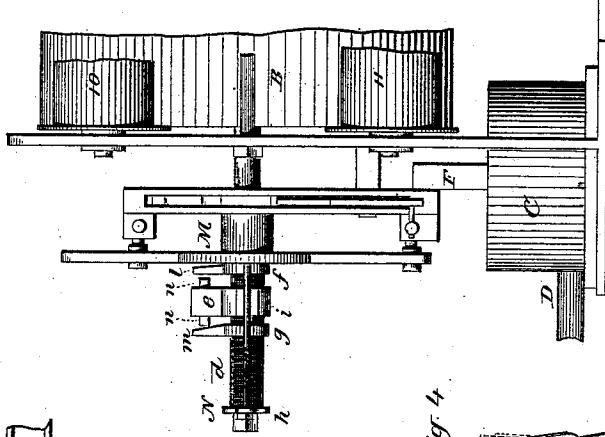


fig. 3

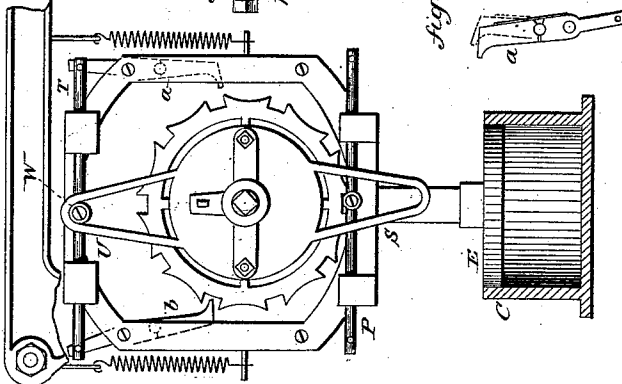


fig. 2

fig. 4

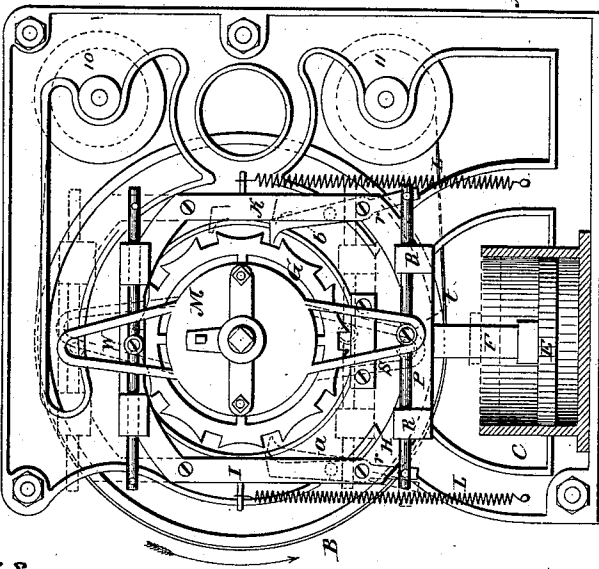


fig. 1

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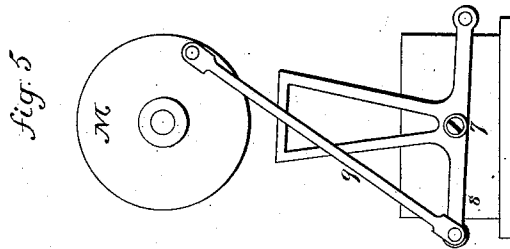
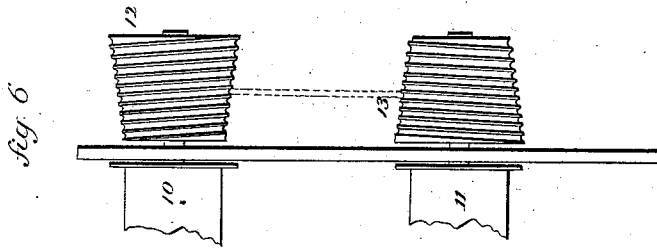
(Model.)

2 Sheets—Sheet 2.

H. E. BISSELL.
STATION INDICATOR.

No. 298,162.

Patented May 6, 1884.



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Jos. C. Earle

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UNITED STATES PATENT OFFICE.

HENRI E. BISSELL, OF HARTFORD, CONNECTICUT, ASSIGNOR TO THE BISSELL RAILWAY STATION INDICATOR COMPANY, OF SAME PLACE.

STATION-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 298,162, dated May 6, 1884.

Application filed February 26, 1883. (Model.)

To all whom it may concern:

Be it known that I, HENRI E. BISSELL, of Hartford, in the county of Hartford and State of Connecticut, have invented a new Improvement in Station-Indicators; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a sectional end view, showing the apparatus as arranged for compressed air as a motor; Fig. 2, a partial end view, showing the arrangement as for vacuum as the motor; Fig. 3, a side view; Fig. 4, the pawl detached; Fig. 5, a modification of the shifting mechanism; Fig. 6, a partial side view, showing the drums by which the two rolls which carry the slip are worked.

This invention relates to mechanism to be arranged in railway-cars to indicate the station which the train is approaching, so that passengers in the car may be advised of the next station before the arrival of the train at that station, and is an improvement on the station-indicator for which Letters Patent of the United States were granted to me August 1, 1882, No. 261,825. In that invention a roller is arranged to feed a strip on which are the names of the stations of the road, and so that at the proper time the name indicating the next station will be presented in view of the passengers in the car. As the cars on a line are not reversed, it is necessary that the indicator should be reversible, so as to run in opposite directions—that is to say, having presented the stations going in one direction, on the return to present the station it is necessary that the roll should revolve in the opposite direction. In my patent referred to the mechanism for operating the roll consists of two cylinders to be operated by compressed air or vacuum, as the case may be, the piston of one cylinder operating a pawl upon one side of the ratchet on the roller-shaft, the other operating a pawl on the opposite side, one piston operating when the roll is going in one direction and the other in the opposite direction, the mechanism being such that the exhaust or

pressure is automatically shifted from one cylinder to the other.

The object of my present invention is to employ but a single cylinder and piston to work in either direction, as the case may be, and also to adapt the mechanism to being worked by vacuum or by compressed air without changing the relation of the connecting-pipe with the cylinder; and the invention consists in the construction, as hereinafter described, and more particularly recited in the claims.

A represents the supporting-frame which carries the mechanism, and also carries the roller B in suitable bearings. The roller and the slip with the names of the stations upon it are the same as in my previous patent, and do not require particular description in this specification.

C is the cylinder, open to the atmosphere at the top, and from which a pipe, D, leads, with proper connections, to the engine or other point where the vacuum or pressure, as the case may be, is to be applied.

As represented in Fig. 1, the mechanism is arranged for compressed air, and I will first describe the apparatus as so arranged.

Within the cylinder is the piston E, carrying a rod, F, suitably guided, the normal condition of the piston being down.

G is the ratchet affixed to the shaft of the roller B.

To the piston F a cross-bar, H, is attached, and from it an arm, I, on one side, and K on the opposite side, extend up each side the ratchet.

In the arm I is a pawl, *a*, and in the arm K is a pawl, *b*, and to the frame or arms I K springs L are attached, the action of which is to force the arms with the piston downward into the normal position, as shown. The pawl *b* is represented as engaged with the ratchet, and the pawl *a* as withdrawn from the ratchet; hence, as the piston ascends, the pawl *b* will engage a tooth of the ratchet and turn the roller in the direction indicated by the arrow. As in my previous patent, the power is applied by the engineer at the proper time, say, as he leaves one station he applies the pressure to raise the piston, as indicated in broken lines; Fig. 1, to turn the roller and present the

next station, and so soon as the pressure is removed the springs react, return the piston and the frame which it carries, bringing the pawl *b* down into engagement with the next tooth, so that at the next application of the pressure the ratchet and roller will be turned another point, presenting the next station, and so continue to do. The roller-shaft extends forward through the ratchet and is screw-threaded, as at *d*, Fig. 3, and on this screw-threaded portion is a traveling nut, *e*, and on the screw, at one side of the nut, is a stop, *f*, and on the opposite side a corresponding stop, *g*, these stops being adjustable toward or from the nut, as the case may be, and secured to the shaft by suitable set-screws, so as to turn with it.

M is a disk arranged loose on the shaft, but held to prevent its longitudinal or axial movement. Forward of the nut *g* is an arm, *N*, also loose on the shaft and connected by rods *h* with the disk, and from the nut *e* arms *i* extend into connection with the rods *h*, but so as to move longitudinally on said rods. As the shaft is rotated, the rods prevent the nut from turning with the shaft. The stops *f g* are provided, respectively, with a finger, *l m*, extending radially outward, and on each side of the nut is a lug, *n*, against which one of the fingers will strike when the nut arrives in a position to bring the corresponding lug *n* into the path of such finger. The stops *f g* are arranged distant from each other, so that in going from one end of the line to the other the nut will travel from one stop to the other. Arriving at one end of the line, the finger of one stop will strike the nut and impart to the nut a rotation corresponding to the last movement of the stop, and this rotary movement of the nut is imparted to the disk *M*. Arriving at the other end of the line, the lug on the opposite side of the nut is engaged by the finger on the stop on that side, and the disk turned in the opposite direction.

On the lower part of the frame which carries the pawls is a horizontal slide, *P*, arranged in suitable bearings, *R*, and so as to move up and down with the piston and frame. The pawls *a b* are connected, respectively, with the opposite ends of the slide *P*. The pawls are jointed, as seen in Fig. 4, above the pivot *v*, on which they are hung, so that the nose is free to turn backward independent of the tail portion, as seen in broken lines, Fig. 4, so as to escape from the tooth of the ratchet as the frame descends. The tails of the ratchets are pivoted to the slide *P*, as before stated.

From the disk *M* a V-shaped arm, *S*, extends downward, and within it stands a stud, *t*, which projects from the slide *P*, the said stud working up and down within the V-shaped arm, as indicated in broken lines, Fig. 1, and as the movement is imparted to the nut *e* by the ascent of the piston it follows that the disk *M*, with the arm *S*, will also turn while the piston and frame and the stud *t* are ascending. Such turning of the disk and the arm *S* will

bring one side of the *V* into the path of the stud *t* when it descends, as seen in broken lines, Fig. 1. Therefore, after the disk has been turned—say as in broken lines, Fig. 1—the next descent of the piston will bring the stud *t* into contact with the side of the arm *S* in its path, and that side, being inclined to the path of the stud, will cause the stud to follow that incline and move the slide *P* accordingly, which movement will throw the pawl *b* out of engagement with the ratchet and throw the pawl *a* into engagement with the ratchet, as in broken lines, Fig. 1. Then, when the piston next ascends, the roll will be turned in the opposite direction, because of the throwing of the pawl into the opposite side of the ratchet. The starting-point therefore being adjusted so that, say, the finger *l* of the stop *f* will just clear the lug on the nut, and the other stop, *g*, adjusted so that at the end of the route or last station the finger *m* will engage the nut, it follows that each movement of the piston will correspondingly turn the roller and move the nut until at the last station the stop *g* will engage the nut and turn the disk to throw the slide *P* and change the pawls, the disk turning in one direction at one terminus and in the opposite direction at the other. If on the road certain stations are to be omitted, the engineer gives to the piston a movement for each station to be passed until the proper stop is indicated. He, having a corresponding indicator in view, knows at all times the station indicated throughout his train.

It will be understood that this mechanism is intended to be worked by the same apparatus which operates the brakes, and which is necessarily under the control of the engineer. In some cases this is compressed air, and in others vacuum. It is therefore desirable to construct the apparatus so that it may be used for either compressed air or vacuum. To this end I construct the frame to extend above the ratchet, as shown, and fit it with bearings above for the pawls *a b*, as seen in Fig. 2, and arrange a slide, *T*, above, corresponding to the slide *P* below, and with which the tails of the pawls are connected; and from the disk a V-shaped arm, *U*, extends upward, corresponding to the V-shaped arm *S* below, and within which a stud, *W*, on the slide *T* works, the same as the stud below. In this case the normal condition of the piston is up, as seen in Fig. 2, and the springs are arranged, as shown in Fig. 2, to draw the piston upward. In this arrangement, as seen in Fig. 2, the apparatus is set to be worked by vacuum. In the first case compressed air forces the piston upward. In the second case, as seen in Fig. 2, the vacuum will draw the piston downward; but in either case the single piston operates to turn the roller in either direction, according to which the train is moving. When the terminals are to be changed, the stops *f g* are adjusted accordingly, so that at the proper time they will make their respective engagements

with the nut and turn the disk. The feeding or automatic device for throwing the pawls in and out may be dispensed with, they being so thrown in and out by hand at the respective terminals of the route.

The mechanism between the shaft and the slide, whereby at a predetermined time an automatic movement is imparted to said slide to throw out or in the respective pawls, as the case may be, may be omitted without departing from my invention. I therefore do not wish to be understood as limiting the automatic movement of the slides to the precise mechanism described.

Instead of making the V-shaped arm which serves to throw the horizontal slides as a fixed or integral part of the said disk, it may be hung, as seen in Fig. 5, upon an independent pivot, 7, so as to swing in a plane parallel with the plane of the disk, with an arm, 8, extending to one side, and a connecting-rod, 9, between said disk and arm, so that the rotation of the disk will be imparted to the arm to present the insides of the arm to the stud on the slides and throw the slides, as before described. I therefore do not wish to be understood as limiting the invention to the disk and arm as first described, it only being essential that the disk shall impart to the arm having the inclined inner sides a movement on the return of the piston whenever the disk itself shall be operated upon as described. By the term "V-shaped" I wish to be understood as meaning an arm which presents oppositely-inclined surfaces to the stud by which the slide is moved. In this case, as in my previous patent, the slip is arranged upon two rolls, 10 and 11, and intermediately the slip passes over the roller B, the movement of the said roller B drawing the slip from one roll, and in order that the slip may be wound upon the other roll the two rolls 10 and 11 are provided, respectively, with a drum, 12 and 13. A cord is wound upon the surface of one drum in the opposite direction to the winding of the slip upon the roll, the other end of the cord fastened to the surface of the other drum, and so as to be wound upon that roll in the opposite direction to the winding of the slip; hence when the feed-roller turns it draws the slip from one roll, and the drum on that roll draws and winds the cord from the other roll, imparting to that other roll a winding operation to draw the slip as it is fed, and vice versa, so that the unwinding of the slip from one roll causes its drum to draw the cord from the drum of the other roll and impart a winding movement to that roll, and vice versa. In my previous patent these drums are of equal diameter throughout, and as the velocity of revolution of the roll and its drum will increase as the slip is drawn from it the other will correspondingly decrease; hence with drums of equal diameter there will be a slackening of the cord, which will prevent the proper coaction of the two drums. I therefore provided a

take-up for this slack, which somewhat complicated the apparatus. To obviate this complicated take-up I construct the two drums, as seen in Fig. 6, in shape the frustum of a cone, and having a spiral groove in their surface, the larger diameter of the one, 12, being outward from the roller 10, and the larger diameter of the other, 13, being toward the roller; and I make the gradually-diminishing diameter to correspond to the thickness of the fabric or material of which the slip is composed, and then apply the cord, extending from one drum to the other, so that as it winds from the smaller diameter of one it runs onto the larger diameter of the other, and follows the spiral groove, varying the rotation of the rolls accordingly; hence the rotation of the two drums will correspond to the rotation of their respective rollers—that is, the one gradually increasing as the slip is drawn from it, and the other decreasing in the same proportion as the slip is rolled upon it, and this variation corresponds to the varying diameters of the two drums; hence I avoid the take-up required in my previous patent.

I claim—

1. The combination of the cylinder C, its piston and rod carrying the frame I K, the pawls *a b*, hung, respectively, in opposite sides of the frame, the ratchet G, in connection with the roller B, a slide arranged to be moved at right angles to the axis of the piston and in connection with the said pawls, and mechanism, substantially such as described, between the shaft and slide, whereby at predetermined times a longitudinal movement will be automatically imparted to said slide to engage one pawl with the ratchet and throw out the other, substantially as described.

2. The combination of the cylinder C, its piston and rod carrying the frame I K, the pawls *a b*, arranged, respectively, in opposite sides of said frame, the ratchet G, in connection with the roller B, and with which said pawls will engage, two slides arranged at right angles to the axis of the piston—the one above and the other below the ratchet—the said pawls made interchangeable in the frame, to be engaged with either of said slides, as the case may be, substantially as described.

3. The combination of the cylinder C, its piston and rod carrying the frame I K, the pawls *a b*, arranged, respectively, in opposite sides of said frame, the ratchet G, in connection with the roller B, and with which said pawls will engage, two slides arranged at right angles to the axis of the piston—the one above and the other below the ratchet—the said pawls made interchangeable in the frame, to be engaged with either of said slides, as the case may be, and mechanism, substantially such as described, between the shaft and the said slides, whereby at predetermined times a movement may be imparted to said slides to engage the one pawl with the ratchet and disengage the other, substantially as described.

4. The combination of the cylinder C, its piston and rod carrying the frame I K, the pawls *a b*, arranged, respectively, in opposite sides of said frame, the ratchet G, in connection with the roller B, and with which said pawls will engage, a slide arranged at right angles to the axis of the pistons and engaged with the said two pawls, the disk M, provided with the V-shaped arm, within which a stud on the slide works, a nut, *e*, arranged on a correspondingly-screw-threaded portion of the shaft and in connection with said disk, stops *f g* on said screw-threaded portion of the shaft, arranged to engage said nut at predetermined times and impart to said disk and V-shaped arm a rotary movement, and thereby impart to said slide a movement to reverse the pawls, substantially as described.

5. The combination of the cylinder C, its piston and rod carrying the frame I K, the pawls *a b*, arranged, respectively, in opposite sides of said frame, the ratchet G, in connection with the roller B, the two slides P T, arranged at right angles to the axis of the piston—the one above and the other below—the pawls interchangeable, to be engaged with either of said slides, the disk M on the shaft provided with

the V-shaped arm S below, and corresponding arm, U, above, with a stud projecting from the respective slides into said arms, and so as to work therein, the nut *e*, arranged to travel on a screw-threaded portion of the shaft, and in connection with said disk, with stops *f g*, fixed on said screw-threaded portion of the shaft, to engage said nut at predetermined times and turn it with the disk, substantially as described, and for the purpose of converting the apparatus from compressed air as a motor to vacuum, or vice versa, substantially as described.

6. In a station-indicator, the combination of the roller by which the slip is moved, two rolls to which the ends of the slip are respectively attached, mechanism, substantially such as described, to impart intermittent rotation to said moving roller, a drum in connection with each of said rolls, the surface of said drums' frustum of cone shape, their bases in opposite directions, and a cord running from one of said drums onto the other, substantially as and for the purpose described.

HENRI E. BISSELL.

Witnesses:

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