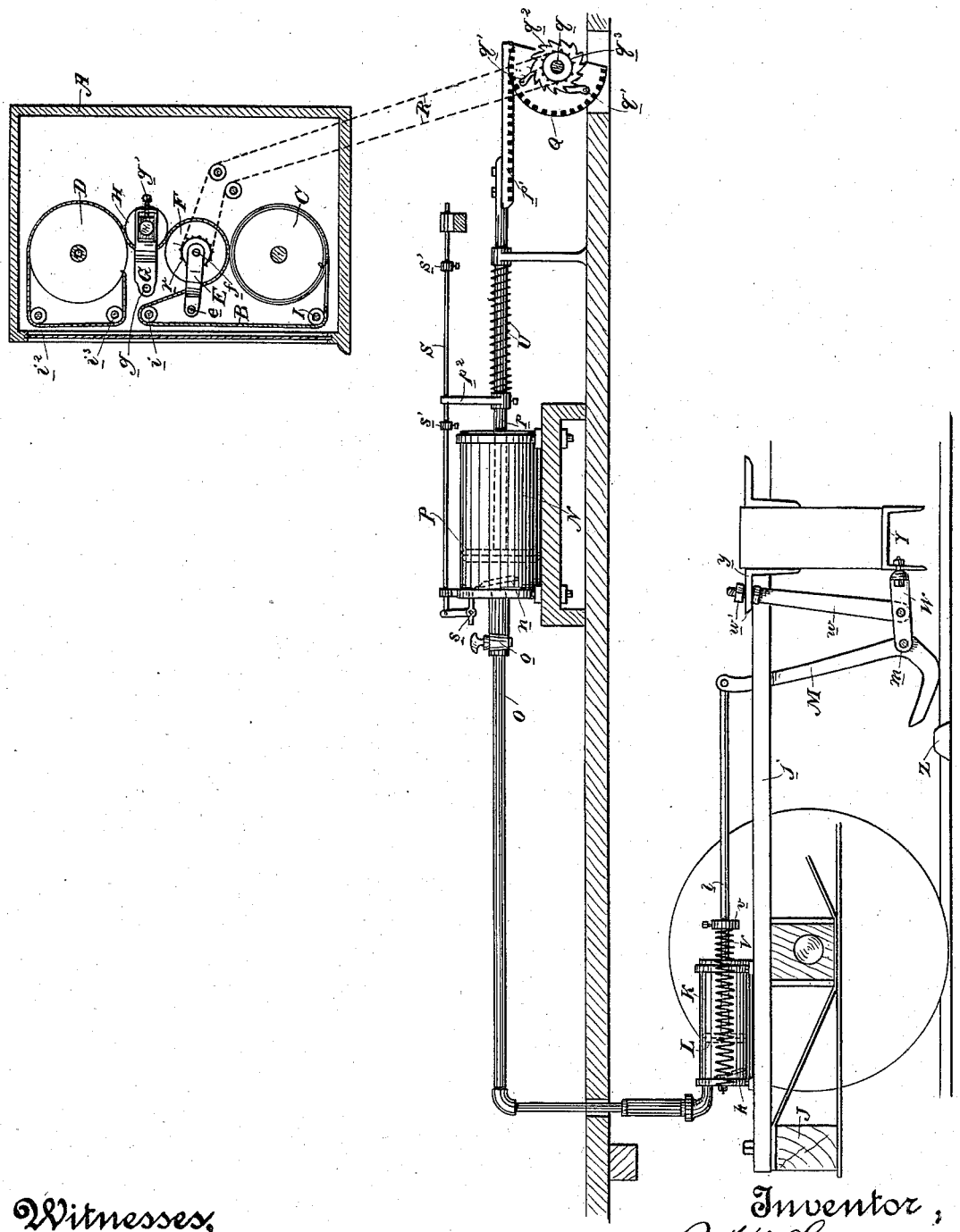
(No Model.)

B. W. LYON.

STATION INDICATOR.

No. 385,314. Patented June 26, 1888.



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UNITED STATES PATENT OFFICE.

BENJAMIN W. LYON, OF SAN FRANCISCO, CALIFORNIA.

STATION-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 385,314, dated June 26, 1888.

Application filed April 2, 1888. Serial No. 269,360. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN W. LYON, of the city and county of San Francisco, State of California, have invented an Improvement in Station-Indicators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of station-indicators in which a ribbon bearing the names of the streets or stations or other matter is caused to travel periodically by means of power derived from the contact of suitable mechanism with lugs or obstructions in the road-bed; and my invention consists in a novel automatically-operating pneumatic mechanism, by which the power is transmitted to the indicator, and in a novel arrangement of the ribbon-driving mechanism within the box or casing of the indicator, all of which I shall hereinafter fully describe.

The object of my invention is to provide a simple and effective station-indicator and advertising medium to be used upon steam and street cars and in other suitable places.

Referring to the accompanying drawing, the figure is a vertical section of the indicating apparatus and a side elevation of the power mechanism.

A is the box or casing, which is situated in any convenient position within the car, and having a window at its front, through which the periodically-traveling ribbon B may be seen and the names of the streets and stations and the advertising or other matter observed. Within the casing or box, at its lower portion, is a drum, C, to which one end of the ribbon is attached, and in the upper portion of the box is a drum, D, to which the other end of the ribbon is attached. Pivoted at *e* within the casing is a bearing, E, in the free end of which is journaled a shaft, *f*, which carries the driving-drum F, which rests and operates in contact with the top of the lower drum, C. Pivoted at *g* is the bearing G, in which is mounted an idler-drum, H, which rests and operates between and in contact with the driving-drum F and the upper drum, D, said idler being adjusted to position by means of the set-screw *g'* operating against the box of the drum. The course of the ribbon B is from the lower drum outwardly to the guide-roller I, thence upwardly to the second guide-roller, *i*, and thence downwardly around the driving-drum F and between it and the lower drum, and thence around the idler-drum and between it and the upper drum, and thence around said upper drum to the guide-roller i^2, and down around another guide-roller, i^3, to its point of attachment with the upper drum. The general object of this arrangement of drums for directing the course of the ribbon is to avoid the inaccuracy of movement which is found in indicators where the main drums are geared together and the power is applied to the center of one of the drums, which inaccuracy is due to the constantly-increasing diameter of the drum on which the ribbon is winding and the constantly-decreasing diameter of the drum from which it is unwinding.

Instead of what is known as a "center drive," my arrangement provides for a surface or rim drive by making the drum F the driver of the ribbon and by providing for the constant frictional contact of the drums through the driver and the idler, both of which, being mounted in swinging or pivoted bearings, as described, yield to the continuous diametrical changes of the main drums, being enabled to move up or down, according as the upper or lower drum increases in diameter, or the reverse, as the ribbon winds or unwinds from each. Thus a given movement of the driving-drum imparts a given movement to the ribbon at all times and independent of the main or winding drums.

J is the truck of the car, which supports the plank *j*, on which is located an air-cylinder, K, provided at its end with an inwardly-swinging valve, *k*. Within the cylinder is a piston, L, the rod *l* of which extends through the open end of the cylinder, and is connected with the upper end of a bent or elbow lever, M, pivoted at its angle at the point *m*, and having its lower arm adapted to come in contact with a fixed lug or obstruction, Z, in the road-bed. Supported on the floor of the car is an air-cylinder, N, having a closed end provided with a valve, *n*, and connected at said end by means of a pipe, O, and suitable couplings with the end of the lower cylinder, a cock, *o*, controlling the admission of air through said pipe into the upper cylinder.

Within the cylinder N is the piston P, the rod *p* of which extends through the other end of the cylinder, and is provided with a rack, *p'*, which meshes with a gear, Q, mounted loosely on a shaft, *q*, and adapted to rotate said shaft in one direction by means of pawls *q'* engaging with a ratchet, q^2, on the shaft. A chain-pulley, q^3, is also fixed to said shaft, over which the endless chain R passes upward to a chain-pulley, *r*, on the shaft *f* of the driving-drum F in the casing above.

S is the cut-off rod of the upper cylinder, N, the rear end of the rod being connected with the discharge-valve *s* at the end of the cylinder, and having the stop *s'* on its other end, with which an arm, p^2, of the piston-rod *p* comes in contact on its forward stroke, in order to effect the cut-off at the proper time.

U is a spring about the piston-rod *p*, for returning the piston P after it has completed its stroke, and V are springs connected by the cross-head *v* with the piston-rod *l* of the lower cylinder, K, whereby its piston L is returned.

The bent lever M, the end of which is adapted to come in contact with the fixed lug or obstruction Z in the road-bed, has its fulcrum in a bracket, W, the rear end of which is rounded, so as to provide a bearing on which it may turn through an arc in a vertical plane, said end being bolted to a fixed portion, Y, of the car-truck. A hanger or bolt, *w*, is secured at its lower end to the bracket W, and has its upper end threaded and passing through a fixed portion, *y*, of the car-truck above, and receiving nuts *w'*, whereby the bolt may be adjusted up and down to move the bracket W and adjust it according to the wear of the truck, so as to keep the bent lever M in proper position.

The operation of the indicator is as follows: The lower arm of the bent lever M, coming in contact with the fixed lug or obstruction Z in the road-bed, is forced upwardly, thereby throwing its upper arm backwardly, and through the connecting piston-rod *l* drawing the piston L toward the end of the cylinder, whereby air is drawn in through the valve *k*. The contact of the lever with the lug in the road-bed is sufficient to draw back the piston against the power of the springs V; but as soon as this contact ceases the springs throw the piston forward again, whereby the air within the cylinder is forced through the pipe O into the upper cylinder, N, thus starting its piston P upon its forward stroke. This movement of the upper piston effects through the rack *p'* on the end of its piston-rod the rotary movement of the gear Q, the pawls *q'* of which, engaging with the ratchet q^2, causes the rotation of the shaft *q*, which, through its chain-pulley q^3 and endless chain R and the chain-pulley *r* in the indicator above, effects the rotation of the driving-drum F. This rotation of the driving-drum causes the movement of the indicating-ribbon, as heretofore described. When the piston P has nearly reached its forward stroke, the cut-off takes place, and thereupon the spring U returns it to its normal position, this movement being permitted through the loosely-mounted gear Q on the shaft *q*.

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

1. In a station-indicator, the lower and upper winding-drums and the indicating-ribbon attached to each, in combination with the driving drum for the ribbon, and operating on the periphery of one of the winding-drums, the idler-drum operating between and in contact with the driving-drum and the other winding-drum, and means for operating the driving-drum, substantially as herein described.

2. In a station-indicator, the lower and upper winding-drums and the indicating-ribbon attached to each, in combination with the driving-drum for the ribbon, mounted in a swinging bearing and operating on the periphery of one of the winding-drums, the idler-drum mounted in a swinging bearing and operating between and in contact with the driving-drum and the periphery of the other winding-drum, and means for operating the driving-drum, substantially as herein described.

3. In a station-indicator, the lower and upper winding-drums, the swinging driving-drum operating on the periphery of the lower main drum, and the swinging adjustable idler-drum operating between and in contact with the driving-drum and the periphery of the upper winding-drum, in combination with the indicating-ribbon attached at each end to the winding-drums and passing in connection with the driving-drum and the idler-drum, and suitable guide-rollers for directing its course, and an endless chain for operating the driving-drum, substantially as herein described.

4. In a station-indicator, the lower winding-drum, the upper winding-drum, and the indicating-ribbon attached to both, in combination with the pivoted bearing E, the shaft *f* in said bearing, the driving-drum on the shaft, and the chain-pulley and endless chain by which the shaft is rotated, the swinging bearing G, the idler-drum mounted in said bearing, and the adjusting-screw for said idler-drum, all arranged and adapted to operate substantially as herein described.

5. In a station-indicator, and in combination with the indicating mechanism, the means for operating it, consisting of a pivoted lever for coming in contact with a fixed lug or obstruction in the road-bed, an air-cylinder supported on the car-truck, a reciprocating piston therein connected with the lever, whereby it is operated, and connections between said cylinder and the indicating mechanism, by which the air in the cylinder is made to effect the operation of the indicator, substantially as herein described.

6. In a station-indicator, and in combination with the indicating mechanism, the means for operating it, consisting of a pivoted lever

for coming in contact with a fixed lug or obstruction in the road-bed, a valved air-cylinder supported on the car-truck, a piston therein connected with the lever, whereby it is moved in one direction to draw air into the cylinder, springs for returning the piston, whereby the air is forced out of the cylinder, and connections between the cylinder and the indicating mechanism, by which the air is made to effect the operation of the indicator, substantially as herein described.

7. In a station-indicator, and in combination with the indicating mechanism, the means for operating it, consisting of a pivoted lever for coming in contact with a fixed lug or obstruction in the road-bed, an air-cylinder supported on the car-truck, and reciprocating piston therein connected with the pivoted lever, a second air-cylinder between the first cylinder and indicating mechanism, having the reciprocating piston and communicating with the first air-cylinder, and gearing between the piston of the second air-cylinder and the indicating mechanism, whereby the latter is operated, substantially as herein described.

8. In a station-indicator, and in combination with the indicating mechanism, the means for operating it, consisting of a pivoted lever for coming in contact with a fixed lug or obstruction in the road-bed, a valved air-cylinder adjacent to said lever, a piston therein connected with the lever, whereby it is moved in one direction to draw air into the cylinder, springs for returning the piston, whereby the air is forced out of the cylinder, a second valved air-cylinder between the first cylinder and indicating mechanism and communicating with said first cylinder, a piston therein moving forward under the air-pressure, a spring for returning it to position, and gearing between the piston of the second air-cylinder and the indicating mechanism, whereby the latter is operated, substantially as herein described.

9. In a station indicator, and in combination with the indicating mechanism, the means for operating it, consisting of the pivoted lever for coming in contact with a fixed lug or obstruction in the road-bed, the air-cylinder on the car-truck, with the reciprocating piston connected with the pivoted lever, the second air-cylinder on the floor of the car, with reciprocating piston and piston-rod and communicating with the first air-cylinder, a rack on the piston-rod of the second air-cylinder, a gear meshing with the rack, a shaft carrying the gear and having a chain-pulley, and an endless chain from said pulley to the drive-pulley of the indicating mechanism, substantially as herein described.

10. In a station-indicator, and in combination with the indicating mechanism, the means for operating it, consisting of the pivoted lever for coming in contact with a fixed lug or obstruction in the road-bed, an air-cylinder near the lever, with reciprocating piston and piston-rod connected with said pivoted lever, a second air-cylinder between the first cylinder and indicating mechanism, with reciprocating piston and piston-rod and communicating with the first air-cylinder by a pipe, the rack on the end of the piston-rod of the second air-cylinder, a gear meshing with the rack, a shaft on which the gear is loosely mounted, a ratchet on the shaft, and pawls on the gear, whereby they are connected in one direction and are free in the other, a chain-pulley on the shaft, and an endless chain from said pulley, by which motion is transmitted to the indicating apparatus, substantially as herein described.

11. In a station-indicator, and in combination with the indicating mechanism, the means by which it is operated, consisting of a pivoted lever for coming in contact with a fixed lug or obstruction in the road-bed, a valved air-cylinder on the car-truck, a piston in said cylinder and having a rod connected with the pivoted lever, whereby the piston is moved in one direction, and the springs for returning it, the second valved air-cylinder on the floor of the car, the pipe communicating with the two air-cylinders, the piston in the second air-cylinder and spring for returning it, the piston-rod provided with a rack, the loosely-mounted gear meshing with the rack, the shaft, and the pawl-and-ratchet connection between the gear and the shaft, and the chain-pulley and endless chain by which the power is transmitted to the indicating mechanism, all arranged and adapted to operate substantially as herein described.

12. In a station-indicator, and in combination with the indicating mechanism, the means by which it is operated, consisting of the pivoted lever for coming in contact with a fixed lug or obstruction in the road-bed, a valved air-cylinder on the car-truck, a piston in said cylinder and having a rod connected with the pivoted lever, whereby the piston is moved in one direction and the springs for returning it, the second valved air-cylinder on the body of the car and communicating with the other air-cylinder, the piston in the second cylinder having a rod, a cut-off valve and connections for operating it, a spring for returning the piston, the rack on the piston-rod, and gearing between said rack and the indicator, whereby the latter is operated, substantially as herein described.

In witness whereof I have hereunto set my hand.

BENJAMIN W. LYON.

Witnesses:
S. H. NOURSE,
H. C. LEE.