

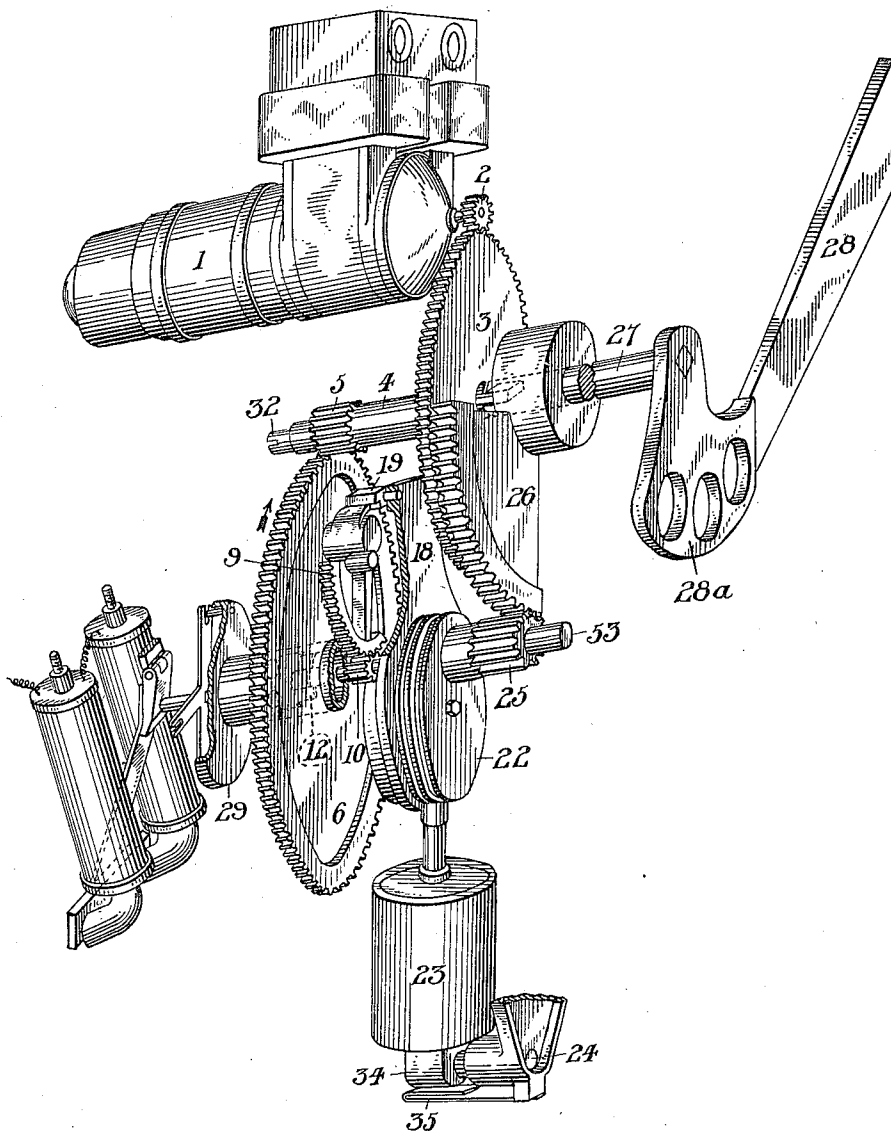
J. P. COLEMAN.
RAILWAY SIGNAL.
APPLICATION FILED DEC. 27, 1910.

994,060.

Patented May 30, 1911.

3 SHEETS—SHEET 1.

FIG. 1



WITNESSES:

J. P. Coleman,
A. L. Verrill

INVENTOR.

John P. Coleman
BY
His ATTORNEY.

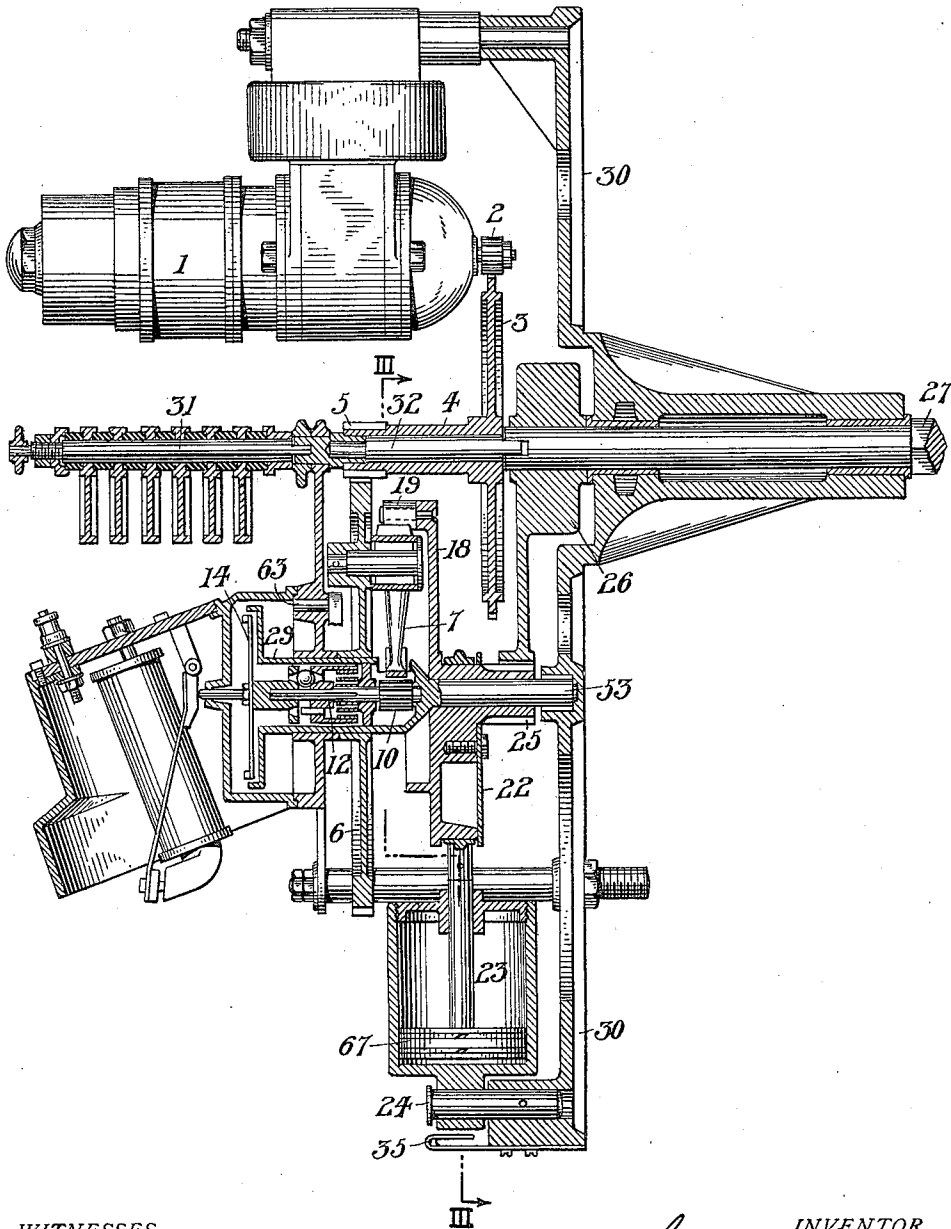
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3 SHEETS-SHEET 2.

FIG. 2



WITNESSES:

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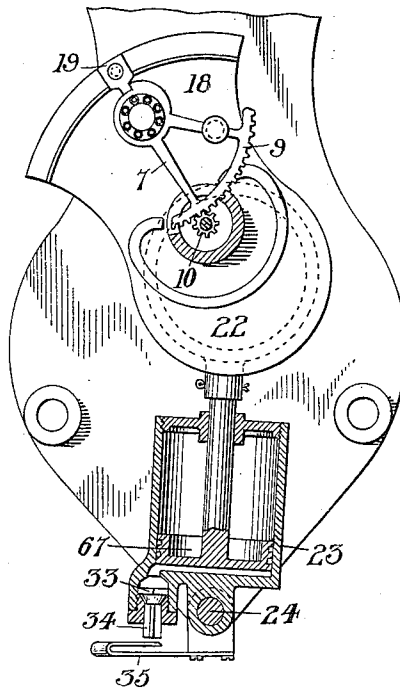
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Patented May 30, 1911.
3 SHEETS—SHEET 3.

FIG. 3



WITNESSES:

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UNITED STATES PATENT OFFICE.

JOHN P. COLEMAN, OF NEW YORK, N. Y., ASSIGNOR TO THE UNION SWITCH & SIGNAL COMPANY, OF SWISSVALE, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

RAILWAY-SIGNAL.

994,060.

Specification of Letters Patent.

Patented May 30, 1911.

Original application filed May 2, 1910, Serial No. 558,984. Divided and this application filed December 27, 1910. Serial No. 599,244.

To all whom it may concern:

Be it known that I, JOHN P. COLEMAN, a citizen of the United States, residing in the borough of Manhattan, in the city and county of New York and State of New York, have invented new and useful Improvements in Railway-Signals, of which the following is a specification.

My invention relates to railway signal mechanisms, and particularly to railway signal mechanisms comprising a semaphore capable of a plurality of positions of indication, and an electric motor for moving the semaphore against the action of gravity. The present application is a division of my application Serial No. 558,984, filed May 2, 1910.

I will describe a railway signal mechanism embodying my invention, and then point out the novel features thereof in claims.

In the accompanying drawings, Figure 1 is a perspective view partly in section showing the several parts or devices comprised in a railway signal mechanism and embodying my invention. Fig. 2 is a sectional side view of the railway signal mechanism shown in Fig. 1. Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2 looking in the direction of the arrows.

Similar reference characters refer to similar parts throughout the several views.

A feature of my invention is the combination with a semaphore signal capable of three or more positions of indication, of a single buffer device which acts to cushion the semaphore while the latter is moving under the influence of gravity from any position of indication to any other position of indication.

Referring to the drawings, the semaphore device comprises a blade 28 and a weight 28^a, which weight also serves as a spectacle to hold colored glass or lenses. The semaphore is suitably fixed on a shaft 27, and when free to move, always assumes a horizontal position under the influence of gravity. In the drawings, I have shown the semaphore blade as being moved from its horizontal position upwardly to two other positions of indication, but it may be made to move from its horizontal position downwardly to its other positions of indication

equally as well. These arrangements are understood by those skilled in the art and involve merely mechanical changes in the operating mechanism which need not be described herein.

1 designates an electric motor by means of which the blade 28 is moved to its inclined and vertical positions. In this invention the blade is held in its inclined and vertical positions by means of an electrically controlled clutch device 12.

23 is a dash pot which acts as a buffer to the return movements of the semaphore 28 toward its horizontal position.

2 designates a pinion which is operatively connected with the armature of the motor 1, and which drives a gear 3 secured to a sleeve 4. Also secured to the sleeve 4 is a pinion 5 which drives a gear 6. The sleeve 4 is mounted to rotate freely on a shaft 32 which is connected with the semaphore shaft 27 by tongue and groove connection, and which is connected with a circuit controlling device 31 in a similar manner. Pivotaly secured to the face of the gear 6 is a lever or dog 7 provided with gear teeth 9. These teeth 9 mesh with a pinion 10 journaled within a hollow shaft 29 of the gear 6.

26 designates a quadrant gear fixed on the shaft 27. This quadrant 26 is driven by a pinion 25 secured to a disk 18. This disk 18 is free to rotate on an extension 53 of the hollow shaft 29. The ratio between the radii of the quadrant gear 26 and the pinion 25 is such that the pinion 25, and therefore the disk 18, make substantially a complete revolution for each movement of the semaphore between horizontal and inclined and between inclined and vertical positions. Secured to the face of the disk 18 is a pin or stud 19 arranged to lie in the path of a projecting face of the dog 7, as shown in Fig. 3. Thus, when the dog and the stud come into contact, the tendency is to rotate the dog on its pivot out of contact with the stud. This rotation of the dog is prevented under predetermined conditions by means of a suitable clutch device 12, such for example as the clutch device described in my copending application Serial No. 558,984, of which the present application is a division.

It will be evident from the foregoing de-

5 description that the duty devolving upon the means for arresting the semaphore in its movement from the vertical to the inclined position will be severe, if the momentum of the moving parts be not checked just before reaching the inclined position. Similarly, the shock to the entire structure will be severe if a like check to the momentum be not effected just before the semaphore reaches the horizontal or danger position. To this end I employ a novel buffing device illustrated in Figs. 1, 2 and 3, and which I will now describe. The pinion 25 which meshes with the segmental gear 26, has a radius of substantially one-eighth the radius of the segmental gear. Hence for each 45° movement of the segmental gear and the semaphore 28 attached thereto, a full revolution of the pinion is effected. The shaft for the pinion is formed into an eccentric 22 by which is operated a piston 67 working in an oscillating cylinder 23. This cylinder is pivoted to the frame by a pin 24. Each revolution of the pinion shaft thus imparts a full forward and backward stroke to the piston, the forward stroke drawing air into the cylinder through a check valve 33, and the backward stroke compressing the air and thus checking the momentum of the moving parts. The top of the cylinder is open to the outside air at all times. It will be seen that by this means a single dash-pot may be used to give equal retardation to the speed of the movement of the semaphore from the vertical or inclined positions, just before reaching the inclined or horizontal positions, respectively. A comparatively small amount of energy in the clutch device 12 is thus enabled to arrest the moving parts at the inclined position, and all shock is removed from the mechanism on the return of the parts to the horizontal position of the semaphore.

45 While the buffing device as thus far described would serve the purpose of absorbing the momentum of the moving parts on the return of the semaphore by gravity, it might without further provision, constitute an undesirable "load" on the signal motor during the latter's operation of the semaphore at certain points in its movement, because the compression stroke of the piston would be equally effective whether the eccentric be driven backward by the semaphore, as described, or forward by the motor. To nullify this possible objection, I take advantage of the oscillating movement of the cylinder, which is in one direction on the compression stroke when the motor is moving the semaphore, and in the reverse direction on the compression stroke while the semaphore is moving by gravity toward its danger position. By virtue of this motion, I arrange the check valve 33 to be forced open during the compression

stroke of the piston while the motor is driving the semaphore, but to be unaffected during the compression stroke while the semaphore is moving in the reverse direction. The opening of the valve may be effected by means of a valve-stem 34 secured to the valve 33 and projecting outward to engage with a stationary piece 35, secured to the framework 30, when the cylinder is rocked to the proper side.

It will be noted from the foregoing description that by the use of a buffing device such as I have described, a simple and effective means is provided for absorbing the momentum of the moving parts during their return to their caution and danger positions.

Having thus described my invention, what I claim is:

1. In combination a railway signal biased by gravity toward one of its positions of indication, means for moving it to one or more other positions of indication, a shaft operatively connected with said signal and making, substantially, a complete revolution for each movement of the signal between any two of its adjacent positions of indication, and a pneumatic buffing device for cushioning the signal in its return movements toward its normal position, comprising a cylinder and a piston, said buffing device being operated by each revolution of the said shaft.

2. In combination a railway signal biased by gravity toward a horizontal position of indication, a motor for moving it to inclined and vertical positions of indication, a shaft operatively connected with said signal and making, substantially, a complete revolution for each movement of the signal between any two of its adjacent positions of indication, and a buffing device for cushioning the signal in its reverse movements from its vertical and inclined positions toward its horizontal position, comprising a cylinder and a piston, said buffing device being operatively connected with the said shaft.

3. In combination a railway signal biased by gravity toward one of its positions of indication, a motor for moving it to one or more other positions of indication, a shaft operatively connected with the said signal and making, substantially, a complete revolution for each movement of the signal between any two of its adjacent positions of indication, and a pneumatic buffing device for cushioning the signal in its return movements toward its normal position, comprising a cylinder and a piston connected with the said shaft, a valve in said cylinder, means for holding said valve open during the compression strokes of the piston while the signal is being moved by the motor, said means becoming inoperative during the compression strokes while the signal is moving toward its normal position by gravity.

4. In combination a railway signal biased by gravity toward one of its positions of indication, means for moving said signal to one or more other positions of indication, a shaft operatively connected with said signal and making, substantially, a complete revolution for each movement of the signal between any two of its adjacent positions of indication, and a buffing device for cushioning the signal in its return movements toward its normal position, comprising a cylinder and a piston, one of which is operatively connected with the said shaft.

5. In combination a railway signal biased by gravity toward one of its several positions of indication; a prime mover for shifting the signal from one of its positions of indication to another of its positions of indication against the force of gravity; means for retaining the signal in any of its positions of indication, and means comprising a cylinder and piston therein for retarding the speed of the signal's return by gravity, said latter means involving a compression and a suction stroke during each movement of the signal from any one of its positions of indication to any next adjacent position of indication.

6. In combination a railway signal biased by gravity toward one of its several positions of indication; a prime mover for shifting the signal from one of its positions of indication to another of its positions of indication against the force of gravity; means for retaining the signal in any of its positions of indication, and means comprising a cylinder and piston therein for retarding the speed of the signal's return by gravity, said latter means involving a compression and a suction stroke during each movement of the signal from any one of its positions of indication to any next adjacent position of indication; and means for rendering such strokes effective when produced by action of gravity in moving the signal, and ineffective when produced by action of the prime mover in moving the signal.

7. In combination a railway signal biased by gravity toward one of its several positions of indication; a prime mover for shifting the signal from one of its positions of indication to another of its positions of indication against the force of gravity; means for retaining the signal in any of its positions of indication, and means comprising a cylinder and piston therein for retarding the speed of the signal's return by gravity, said latter means involving a compression and a suction stroke during each movement of the signal from any one of its positions of indication to any next adjacent position of indication; and means for rendering said suction stroke ineffective as a medium of resistance during all movements of the signal.

8. In combination a railway signal biased

by gravity toward one of its several positions of indication; a prime mover for shifting the signal from one of its positions of indication to another of its position of indication against the force of gravity; means for retaining the signal in any of its positions of indication, and means comprising a cylinder and piston therein for retarding the speed of the signal's return by gravity, said latter means involving a compression and a suction stroke of the piston or cylinder during each movement of the signal from any one of its positions of indication to any next adjacent position of indication; and means for rendering the compression strokes effective when produced by action of gravity in moving the signal and ineffective when produced by action of the prime mover in moving the signal.

9. In combination a railway signal biased toward one of its several positions of indication, a shaft operatively connected therewith, a buffing device connected with said shaft and comprising a piston and a cylinder, to one of which a reciprocating motion is imparted by each successive movement of the signal from any one of its positions of indication to another position of indication, for retarding the speed of the signal's movements.

10. In combination a railway signal biased toward one of its several positions of indication, a shaft operatively connected therewith, a buffing device connected with said shaft and comprising a piston and a cylinder, to one of which a reciprocating motion is imparted by each successive movement of the signal from any one of its positions of indication to another position of indication, for retarding the speed of the signal's movements; and means for rendering the buffing device ineffective when the signal is moved in one of its two directions.

11. In combination, a signal or like device, a shaft connected therewith, an eccentric secured to the said shaft, a buffing device for retarding the speed of the shaft during a predetermined part or parts of its movement in one direction, said buffing device comprising a cylinder and a piston, one of which is operated by the eccentric, and the other of which is pivotally mounted at a fixed point with relation to the shaft, so that a forward and reverse movement of one part of the buffing device with relation to the other are effected by each revolution of the shaft, and means effective during the rotation of the shaft in one of its directions for maintaining the cylinder at, substantially, atmospheric pressure.

12. In combination, a signal or like device, a shaft connected therewith, an eccentric carried by the said shaft, a buffing device for retarding the speed of the shaft during a predetermined part or parts of its

movement in one direction, said buffing device comprising a piston actuated by the eccentric, a cylinder containing the piston and pivotally mounted at a point bearing a fixed
5 relation to the shaft, so that every revolution of the shaft produces a forward and reverse movement of the piston, and means effective during the revolution of the shaft in the opposite direction for maintaining the

air within the cylinder at, substantially, 10 atmospheric pressure.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JOHN P. COLEMAN.

Witnesses:

J. S. HOBSON,

M. D. HANLON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
