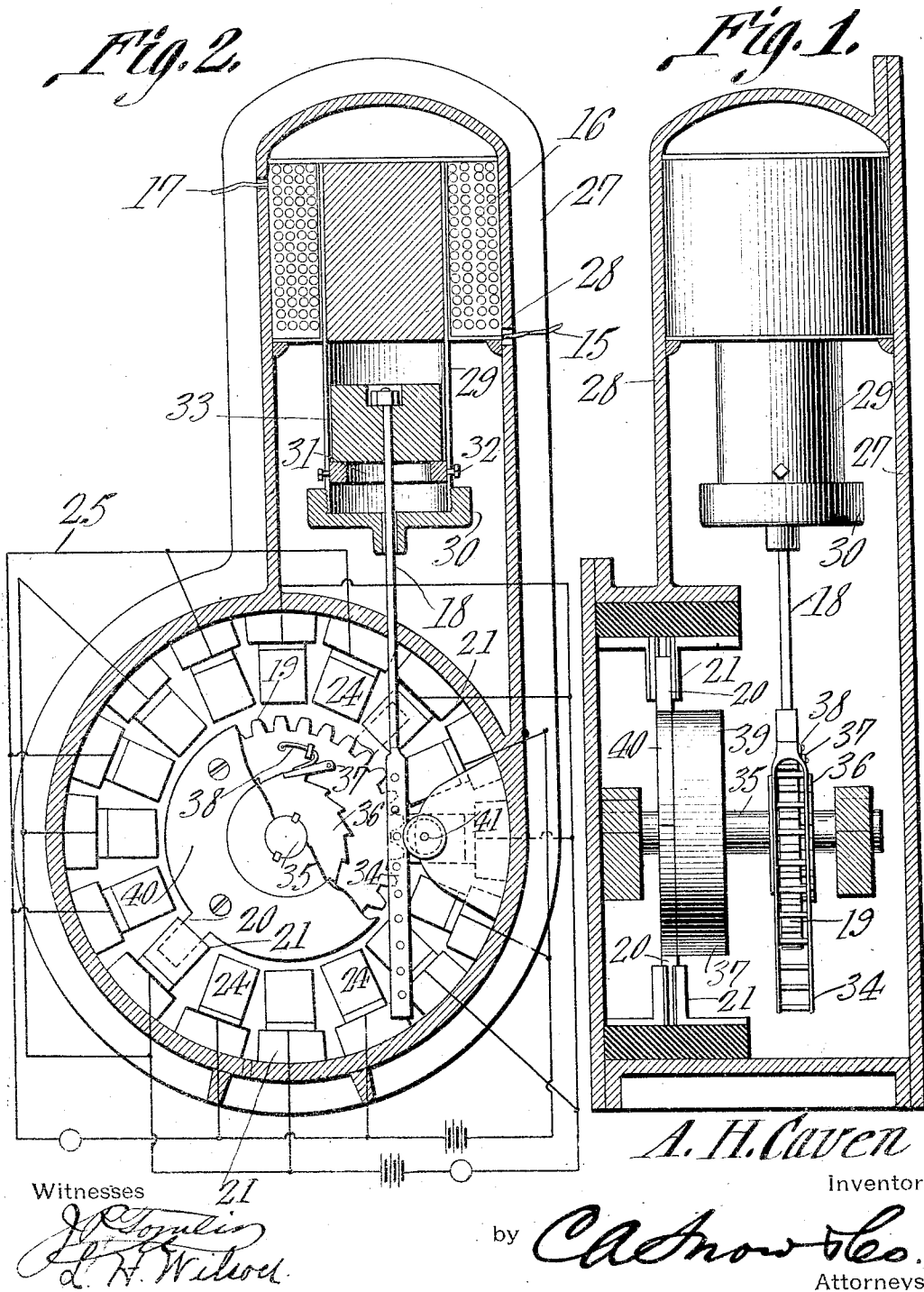


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ELECTROMECHANICAL DEVICE FOR CONTROLLING ELECTRIC SIGNALS.
APPLICATION FILED FEB. 8, 1911.

1,032,880.

Patented July 16, 1912.

2 SHEETS—SHEET 1.

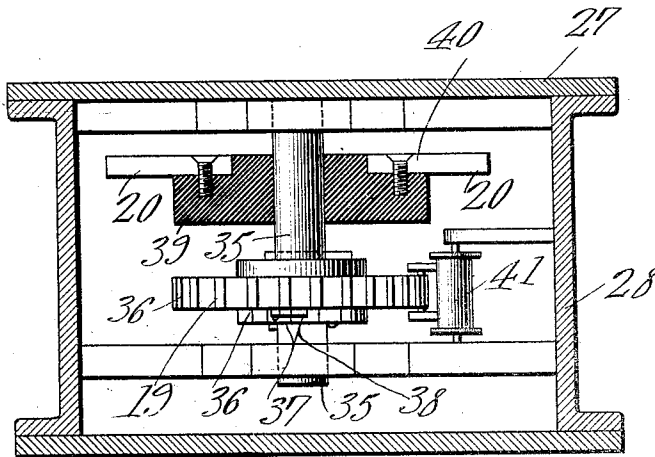


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Witnesses

J. H. Tomlin
L. H. Wilson

A. H. Caven, Inventor

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UNITED STATES PATENT OFFICE.

ALVA HAYS CAVEN, OF YOUNGWOOD, PENNSYLVANIA.

ELECTROMECHANICAL DEVICE FOR CONTROLLING ELECTRIC SIGNALS.

1,032,880.

Specification of Letters Patent.

Patented July 16, 1912.

Application filed February 8, 1911. Serial No. 607,253.

To all whom it may concern:

Be it known that I, ALVA H. CAVEN, a citizen of the United States, residing at Youngwood, in the county of Westmoreland and State of Pennsylvania, have invented a new and useful Electromechanical Device for Controlling Electric Signals, of which the following is a specification.

It is the object of this invention to provide electrically operated means whereby lamp-circuits may be opened and closed alternately, to permit the lighting and extinguishing of the signal-lamps in a block signal system, through the medium of a passing car or train, without necessitating the stopping of such car or train, to permit the lamps to be lighted and extinguished manually.

Specifically, it is one object of the invention to provide electromechanical means whereby the signal lamps will be extinguished and lighted automatically, whereby a car-carried means for opening and closing the circuit will cause the actuation of the electromechanical means.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings,—Figure 1 is a vertical longitudinal section of the electromechanical means whereby the lamps are immediately extinguished and lighted; Fig. 2 is an elevation of the structure shown in Fig. 1, parts being broken away and removed; Fig. 3 is a transverse section of the mechanism shown in Figs. 1 and 2.

In the drawings, the electromechanical device, which is disposed at predetermined intervals along the right of way of a railway system, comprises an electromagnet or solenoid 16, and an armature rod 18, meshing with a pinion 19, adapted to operate the oppositely disposed arms 20. These arms 20 bear upon fixed terminals 21, interposed in a lamp or signal circuit. Adjacent the terminals 21, and disposed in a common arc therewith, are other terminals 24 interposed in another lamp or signal circuit. Alternate terminals 21 are interposed in one lamp or

signal circuit, the terminals 24 which lie between the terminals 21, being interposed in the other lamp or signal circuit, the construction being such that when the pinion 19 is rotated by the armature rod 18, the arms 20 will close alternately, the lamp or signal circuits, the lamps in the circuits being lighted and extinguished, as their respective circuits are closed and opened. The electromagnet 16 will thus be energized, attracting the armature 18, and moving the pinion 19. By this means the arms 20 are moved from one set of terminals, as for instance the terminals 21, to the other set of terminals as for instance 24, and by this means the lamp signal circuit containing the terminals 21 are thus broken, and the lamps extinguished, while the other lamp or signal circuit is closed, and its signal energized. Thus one set of signals is energized and the other is deenergized, and vice versa.

The mechanism whereby the arms are operated, will now be described.

Upon a suitable support 27, is mounted a casing 28 in which the electromagnet 16 is housed. The electromagnet surrounds a tube 29, equipped at its lower end with a cap 30. Within the tube 29 is a stop ring 31, held in place by set screws 32, or by other means adapted to a like end. This stop ring 31 serves as an abutment for the armature 33, the armature rod 18 being slidably mounted in the cap 30 and being operatively connected with the armature 33, so that when the armature 33 is elevated, by the attraction of the electromagnet 16, the armature rod 18 will be elevated likewise.

The armature rod 18 is supplied adjacent its free end, with a rack 34, adapted to mesh into the pinion 19, hereinbefore referred to, the pinion 19 being loose upon a shaft 35, supported for rotation in the casing 28. Fixed upon the shaft 35, to one side of the pinion 19, is a ratchet 36, adapted to be engaged by a pawl 37, pivoted to the pinion 19, a suitable pawl-engaging spring 38, carried by the pinion 19, serving to maintain the pawl in engagement with the ratchet 36. Secured to the shaft 35, is an insulating disk 39, carrying upon one of its faces, a contact plate 40, the arms 20 being secured to, or formed integrally with this contact plate 40. The terminals 21 and 24 are mounted in circular relation upon the casing 28, oppositely disposed

pairs of the terminals being adapted to be engaged successively by the arms 20, so as to open and to close the lamp circuits in the manner hereinbefore described. At this point it may be stated that the terminals 20 and 24, and the arms 21, may be positioned in any desired manner with respect to each other, so as to close and open alternately, the two signal circuits, the invention being capable of use in connection with many common and well known forms of pole changing switches.

If desired, in order to maintain the rack 34 of the armature rod 18 normally in engagement with the pinion 19, a frame supported roller 41, seen most clearly in Fig. 3, may be positioned to bear against the armature rod 18, as the latter reciprocates.

The operation of the device, referring particularly to the structures shown in Figs. 1 and 2, is as follows: When the electromagnet 16 is energized, the armature 33 will be drawn upwardly, carrying with it, the armature rod 18, the rack 34 of which will mesh into the pinion 19, causing a rotation of the pinion, the pawl 37 upon the pinion 19, engaging the ratchet 36, and causing a rotation of the shaft 35, the shaft 35, in its rotation, causing a rotation of the disk 39 and of the contact plate 40, the arms 20 of the contact plate 40 moving, for instance, from the terminals 21 to the terminals 24 thereby closing one and opening the other signal circuit. When the magnet 16 is deenergized, the armature 33 will fall by its own weight, and by reason of the fact that the pinion 19 is loose upon the shaft 35, the shaft, under such circumstances, will not be rotated, the pawl 37 moving freely over the ratchet 36.

Having thus described the invention what is claimed:—

1. In a device of the class described, a rotatably mounted shaft; a pinion loose upon said shaft; a rack bar meshing into the pinion; an armature secured to the rack

bar; an electromagnet within which the armature moves; means for operatively connecting the pinion with the shaft; spaced circuit terminals; and means under the control of the shaft for bridging the terminals.

2. In a device of the class described, a rotatably mounted shaft; a pinion loose upon the shaft; a rack bar adapted to mesh into the pinion; an armature carried by the rack bar; an electromagnet disposed in operative relation to the armature; pawl and ratchet mechanism operatively connecting the shaft with the pinion; spaced circuit terminals; and means under the control of the shaft for bridging the terminals.

3. In a device of the class described, an electromagnet; a tube located within the electromagnet; an armature slidable within the tube; a stop adjustably mounted within the tube and adapted to serve as an abutment for the armature; spaced circuit terminals; and means under the control of the armature for bridging the terminals.

4. In a device of the class described, an electromagnet; a tubular member mounted therein; a stop adjustably held within the tubular member; an armature mounted for reciprocation in the tube and adapted to rest upon the stop; a rack bar connected with the armature; a pinion into which the rack bar meshes; a rotatably mounted shaft upon which the pinion is loose; pawl and ratchet mechanism operatively connecting the pinion with the shaft; a frame supported roller bearing against the rack bar and adapted to hold the same in mesh with the pinion; spaced circuit terminals; and means upon the shaft for bridging the terminals.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ALVA HAYS CAVEN.

Witnesses:

C. E. SMITH,
J. E. LOHR.