(No Model.)

J. H. JOHNSON & D. J. McKEITHEN.

N. A. McKEITHEN, Administrator of D. J. McKEITHEN, Deceased.

AUTOMATIC PNEUMATIC RAILROAD SWITCH.

No. 590,153. Patented Sept. 14, 1897.

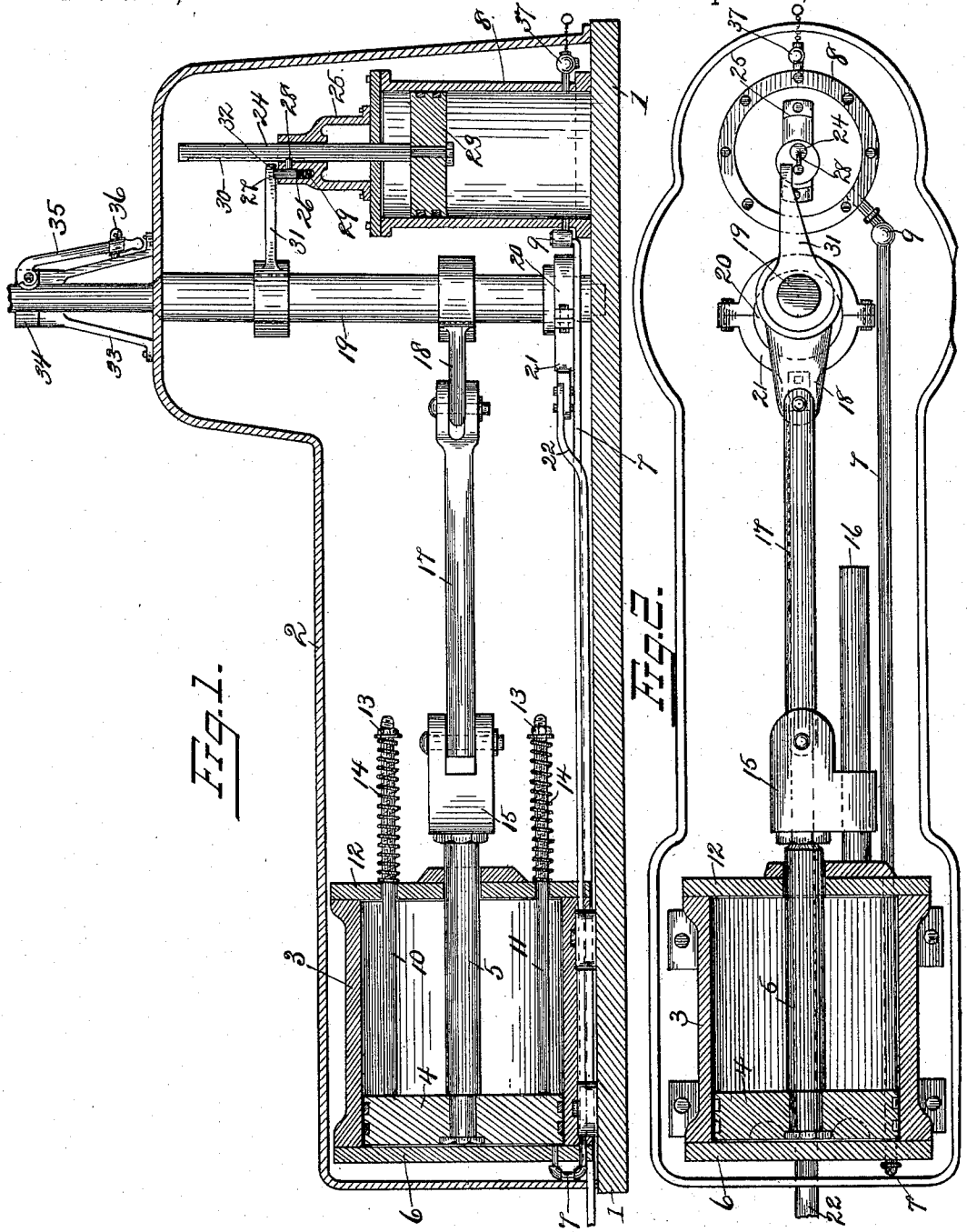

Fig. 1.

Fig. 2.

WITNESSES.

Albert Popkins.

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INVENTOR

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UNITED STATES PATENT OFFICE.

JOHN H. JOHNSON, OF RALEIGH, AND NEILL A. McKEITHEN, OF ABERDEEN, NORTH CAROLINA, ADMINISTRATOR OF DANIEL J. McKEITHEN, DECEASED.

AUTOMATIC PNEUMATIC RAILROAD-SWITCH.

SPECIFICATION forming part of Letters Patent No. 590,153, dated September 14, 1897.

Application filed June 18, 1897. Serial No. 641,383. (No model.)

To all whom it may concern:

Be it known that I, JOHN H. JOHNSON, residing at Raleigh, in the county of Wake, North Carolina, did invent, jointly with DANIEL J. McKEITHEN, deceased, (NEILL A. McKEITHEN, of Aberdeen, in the county of Moore and State of North Carolina, administrator of the said DANIEL J. McKEITHEN, deceased,) certain new and useful Improvements in Automatic Pneumatic Railway-Switches, of which the following is a specification, reference being had to the accompanying drawings.

The invention relates to apparatus for operating a railway-switch by pneumatic pressure; and its object is to provide simple but efficient mechanism for the purpose.

The characteristic features of the invention will be fully disclosed hereinafter, and defined in the appended claims.

In the accompanying drawings, Figure 1 is a sectional side elevation of mechanism embodying the improvements, and Fig. 2 is a plan view of the same with the top of the housing or casing removed.

The reference-numeral 1 indicates a base upon which the casing 2 and its contained mechanism are supported. At one end of the base is located an air-cylinder 3, having a piston 4 and piston-rod 5. The outer head 6 of the cylinder 3 communicates, by means of a pipe 7, with a second cylinder 8, a valve 9 being arranged in the pipe near the cylinder 8. The piston 4 is provided with two guide-rods 10 and 11, arranged parallel to the piston-rod 5 and extending through the inner head 12 of the cylinder. The projecting ends of the rods are screw-threaded to receive nuts 13, and between these nuts and the head 12 coil-springs 14 are arranged for the purpose of retracting the piston, as will be further explained hereinafter.

The piston-rod 5 is connected to a cross-head 15, which is formed with an opening to receive a guide-rod 16, projecting from the cylinder.

The cross-head is connected by a connecting-rod 17 with a crank-arm 18, secured to the switch-staff 19, which has bearing in the base 1. Below the crank-arm 18, upon the staff 19, is rigidly secured an eccentric 20, having a sectional strap 21, connected to one end of a rod 22, the opposite end of which is connected to the switch-point.

The cylinder 8, which may be termed the "receiving-cylinder," since it receives compressed air from the cylinder 3, contains a piston 23, having a rod 24, extending through the upper head of the cylinder and passing through a yoke 25, which is slotted to form a seat 26 for a catch 27, having a lateral projecting pin 28 and supported upon a spring 29. The upper portion of the piston-rod 24 is longitudinally slotted, as at 30, to receive the pin 28, which is adapted to contact with the upper end wall of the slot 30 in the rod 24. The spring-catch 27 is arranged to engage an arm 31, fixed upon the switch-staff and having at its outer end a slot 32, into which the catch 27 is forced by its spring 29.

The switch-staff extends through the top of the casing 2 and is supported by a yoke-standard 33, secured to the top of the housing 2. A collar 34 surrounds the switch-staff above the standard 33, and a lever 35 is fulcrumed in a bearing in said ring, said lever constituting the switch-throwing lever and adapted, as illustrated in Fig. 1, to normally depend from the ring, so that it may be locked to a track at 36 on the standard 33.

The cylinder 8 is provided with a relief-valve 37 to permit of the escape of air from the cylinder. The size of the escape-opening in the valve 37 determines the length of time the switch remains in the position to which it is thrown by the switch-lever, and the size of the valve-opening may of course be varied, so that the switch may remain open a predetermined length of time and then automatically closed, or the valve 37 may be operated so as to immediately close the switch.

The operation of the mechanism above described is as follows: To throw the switch, the lever 35 is raised to a horizontal position and then turned through an angle of ninety degrees to revolve the switch-staff. This movement of the staff 19 forces the piston 4 forward against the tension of the springs 14 and compresses the air in the cylinder 3, the compressed air passing through the pipe 7 into the cylinder 8. The movement of the staff 19 brings the arm 31 into position above the catch 27, so that the latter enters the slot

in said arm and locks the switch-staff. The switch is turned through the medium of the rod 22 and eccentric 20. As the compressed air enters the cylinder 8 below the piston 23 the latter rises. The lever 35 may then be returned to its normal position and locked by any suitable locking means. As the compressed air escapes from the cylinder 8 through the valve 37 the piston 23 gradually lowers until the upper end wall of the slot 30 in the piston-rod 24 contacts with the pin 28, thus depressing the catch 27 out of engagement with the arm 31 and releasing the staff 19. The spring 14 will then retract the piston and through the medium of the rods 17 and 7 return the switch-point to its first position.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In pneumatic switch-operating apparatus, the combination with a switch-staff and connections between the staff and switch-point of an air-compressing cylinder and piston, an air-receiving cylinder communicating by a suitable pipe with the compressing-cylinder, a piston within said receiving-cylinder having a piston-rod, a locking device for said switch-staff, and means for unlocking the switch-staff when the air in the receiving-cylinder escapes.

2. In pneumatic switch-operating apparatus, the combination with a switch-staff of an air-compressing cylinder, a piston within said cylinder provided with spring-retracting rods, a rod a connection between the piston and switch-staff, a rod for connecting the switch-staff and switch-point, a receiving-cylinder having a pipe connection with the air-compressing cylinder, and a locking device adapted to be released by the piston-rod of the receiving-cylinder.

3. In pneumatic switch-operating apparatus, the combination with the air-compressing cylinder and piston, the latter operated by the turning of the switch-staff, of a connection from the switch-stand for throwing the switch-point, an air-receiving cylinder having a pipe connection with the air-compressing cylinder, an escape-valve for the receiving-cylinder, a piston in said receiving-cylinder having a slotted piston-rod adapted to release a locking device to permit the switch-staff to return to its normal position.

4. In pneumatic switch-operating apparatus, the combination with the air compressing and receiving cylinders connected by an air-pipe, of a piston within the compressing-cylinder provided with parallel rods extending beyond the cylinder and provided with coil-springs, connections for operating said piston and throwing the switch-point from the switch-staff, and releasing mechanism whereby the springs are permitted to retract said piston.

5. The combination with the compressing-cylinder and its piston, piston-rod and spring-operated rods, of the switch-staff connected by a cross-head and connecting-rod with said piston-rod, a connection for throwing the switch-point, and an air-receiving cylinder communicating with the compressing-cylinder by a valved connection and having an escape-valve, a device for locking the switch-staff after the switch is thrown, and a catch adapted to be depressed by the downward movement of the piston of the air-receiving cylinder.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN H. JOHNSON.
NEILL A. McKEITHEN,
Administrator of the estate of Daniel J. McKeithen, deceased.

Witnesses:
H. A. PAGE,
D. A. MCLAUCHLIN.