MECHANISM FOR AUTOMATICALLY ACTUATING AIR BRAKES.

APPLICATION FILED NOV. 25, 1904.

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PATENTED NOV. 21, 1905.

2 SHEETS—SHEET 1.

Witnesses

Claus P. Geritz, Inventor.

Attorneys
To all whom it may concern:

Be it known that I, CLAUS PETER GERITZ, a citizen of the United States, residing at Kingsland, in the county of Bergen and State of New Jersey, have invented a new and useful Mechanism for Automatically Actuating Air-Brakes, of which the following is a specification.

This invention relates to apparatus of that general type employed for automatically stopping railway-trains in the event of the engineer running past a danger-signal.

The principal object of the invention is to provide a device of this character in which the train-pipe pressure will be automatically reduced to an extent sufficient to set the brakes throughout the length of the train, and, further, to so construct the apparatus that there will be but little danger of accidental operation through contact of the train-carried member of the apparatus with obstructions other than those intended to effect the operation—as, for instance, an accumulation of snow on the sides of the track.

A further object of the invention is to provide a device of this character which will be immediately under the control of the engineer, so that the latter may close the train-pipe after the pressure has been reduced to the desired extent, the parts being set either for a graduated or an emergency application.

With these and other objects in view, as will more fully hereinafter appear, the invention consists in certain novel features of construction and arrangement of parts, hereinafter fully described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is an elevation of an automatic brake-applying apparatus constructed in accordance with the invention and showing a semaphore centered in position. Fig. 2 is a transverse sectional elevation through the valve-chamber and illustrating generally the mechanism carried by the engine. Fig. 3 is a detail perspective view of the valve-operating arm to be actuated by a tappet on the road-bed. Fig. 4 is a detail view of the tappet-arm proper detached. Fig. 5 is a detail perspective view of the slide through which movement is communicated from the valve-operating lever to the valve.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

At suitable intervals along the road-bed are placed semaphore supports 1, to which are pivoted semaphore arms 2 of any ordinary construction, these being operated generally by a signal-man in the tower at the end of each block. The semaphore arm is connected to a stem 3, which in turn is connected to a rocker-rod carried by a shaft 4, extending out through the side of the supporting-casing 1. To the outer end of the rock-shaft is secured an arm 6, having a link connection with a bell-crank lever 6. The bell-crank lever is operatively connected to a tappet-rod 7 mounted in suitable guideways and so arranged that when the semaphore is at "danger" the end of the tappet-rod will be projected to a position to engage the valve-operating lever carried by the engine or other portion of the train.

Bolted to the frame of the engine at a convenient point is a casing 10, the front plate of which is provided with an opening for the passage of a bolt 11, on which is pivoted the upper end of a valve-operating lever 12. The upper and largest end of this lever forms a cam, the upper surface being cut away as indicated at 13, and forming a flat face on which rests the lower end of a slide 15, adapted to suitable guideways at the front of the casing, and when the lever is turned in either direction the flat upper face of its head will be moved from a horizontal plane, and the slide 15 will be elevated to an extent proportioned to the angular movement of the lever.

From the rear face of the slide projects an arm 16, that is disposed immediately in the rear of the lower end of a rod 17, carrying a valve 18. The valve 18 rests on a seat 19 and normally closes communication between two chambers 20 and 21, the chamber 20 being in communication with a branch pipe 22, that is connected to the train-pipe and the chamber 21, communicating with the atmosphere. If the valve is raised, the two chambers are placed in communication, and the train-pipe pressure gradually reduces through the pipe 22 to chambers 20 and 21, resulting in the setting of the brakes in the usual manner.

In the casing 10 is a cylinder 23, containing a piston 24, and from the piston extends a
plunger 25, that is normally pressed by a spring 26 in the direction of the slide 15. At the outer end of the plunger is a tooth 27, adapted to engage with the teeth of a rack 28, formed on the rear face of the slide 15, and as said slide is moved up the teeth of the rack will pass the holding-tooth 27, the latter serving to maintain the slide in its elevated position to hold the valve 18 open. The plunger is held from rotary motion by a transversely-extending pin 30, which passes through a suitable slot 31, formed in the plunger, so that the tooth will at all times be maintained in proper position with respect to the teeth of the rack. The cylinder is provided with a pressure inlet-port 33, that is in communication by a valved pipe 34 with the main reservoir or other source of pressure-supply, and after the valve 18 has been held open a sufficient length of time to reduce the train-pipe pressure to the desired point the engineer may open the valve in the pipe 34, and air under pressure entering the cylinder 23 will force the piston to the rear, thus disengaging the tooth 27 from the rack 28 and permitting the slide 15 to fall. This results in the closing of the valve 18, so that the train-pipe pressure may be again restored and the brakes released. The cylinder is provided with drainage-openings 34', through which accumulations of moisture may pass, and the chamber 29 is provided with a suitable chamber 36, which may be provided with a petcock to permit the discharge of accumulated moisture.

In devices of this class much difficulty is experienced from accidental opening of the train-pipe by contact of the tappet arm or lever with the obstructions along the track, and the devices become useless after heavy snowstorms, contact of the levers with snow-banks being sufficient to cause the setting of the brakes. In carrying out the present invention the valve-operating lever is held in a vertical position, and on its inner face is formed a small depression 36' for the reception of spring-pressed pin 37, the pin forming a lock which will prevent movement of the lever when it strikes a slight obstruction. To hold the lever from movement, the lock shown in Fig. 3 is employed. This comprises a pair of pivot-arms 38, connected to the lower end of the lever and provided at their upper ends with hooks 39, adapted to engage the opposite arms of a yoke 40, carried by the front plate of the casing. The yoke members are arranged practically in a horizontal plane of the axis of pivot-bolt 11, and under normal conditions these yokes will firmly lock the valve-operating member and prevent its movement should any minor obstruction be encountered, particularly by the contact of the lower end of the lever with any obstructions. When one of the tappet-rods 7 is in operative position, it will be engaged by one or other of the hooks 38, and said hook will first be moved to unlocking position, and then as the train continues its movement the lever 12 will come into contact with the hook first engaged and will then be moved an angular distance, governed by the length of the lever and the height of the tappet-rod. When the parts are released by the entrance of air under pressure to the cylinder 23, the descent of the slide 15 will swing the lever around to vertical position as the slide descends the cam-face 13, or said lever may be sufficiently weighted to immediately return to its position by gravity, leaving the slide in elevated position and locked by the tooth 27. To permit the free swinging movement of the lever and the return of the same to its normal position, the upper ends of the hooks 39 are arranged on lines curving inward toward each other, these portions of the hooks riding against the inner face of the arms of the hook.

Having thus described the invention, what is claimed is:

1. In an automatic brake-applying apparatus for railway-trains, a valve disposed in a train-pipe connection, a tappet-actuated member for opening said valve, a lock for retaining the valve in open position, and a fluid-pressure-actuated means controllable from the engine-cab for moving said lock to release position and permitting closing movement of the valve after a sufficient reduction of train-pipe pressure.

2. In an automatic brake-applying mechanism, for railway-trains, a valve disposed in a train-pipe connection, means for opening the valve, means for locking the valve in open position, a piston connected to the locking means, a cylinder in which said piston is disposed, and means for connecting the piston to a source of pressure-supply.

3. In an automatic brake-applying mechanism for railway-trains, a valve disposed in a train-pipe connection, means for opening said valve, a spring-pressed plunger having at one end a tooth for locking the valve in open position, a piston carried by the plunger, a cylinder within which the said piston is disposed, and means for connecting the cylinder to a source of pressure-supply.

4. In apparatus for automatically applying railway-brakes, a casing communicating with the train-pipe and with the outer air, a valve disposed in said casing, a slide guided by the casing and adapted to engage the stem of the valve, a rack on said slide, a plunger, a locking-tooth carried by the plunger and engaging the rack, a spring tending to maintain the plunger in locking position, a piston on the plunger, a cylinder within which the piston is disposed, means for connecting said cylinder to a source of fluid-pressure supply, and a pivoted cam-lever arranged on the slide and operable by contact with a tappet or other obstruction in the road-bed.
5. In apparatus for automatically applying railway-brakes, a tappet-actuated lever carried by the train, means for communicating movement from the lever to the brake-applying devices, a hook pivotally connected to the lever and adapted to be engaged by the tappet, and a stationary member with which the hook engages.

6. In apparatus for automatically applying railway-brakes, a tappet-actuated lever carried by the train, means for communicating movement from the lever to the brake-applying devices, a hook pivotally connected to the lower end of the lever, and an arm with which said hook engages thereby to prevent accidental movement of the lever.

7. In apparatus for automatically applying railway-brakes, a tappet-actuated lever carried by the train, means for communicating movement from the lever to the brake-applying devices, a pair of hooks pivotally connected to the lower end of the lever, and a yoke having arms adapted to engage said hooks thereby to prevent accidental movement of the lever.

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

CLAUS PETER GERITZ.

Witnesses:

JACOB LEMPERT,
CHARLES A. VAN WINKLE.