No. 834,855. PATENTED OCT. 30, 1906.

B. M. WOODMAN & W. H. BRIDGES.

FLUID BRAKE MECHANISM.

APPLICATION FILED JAN. 14, 1905.

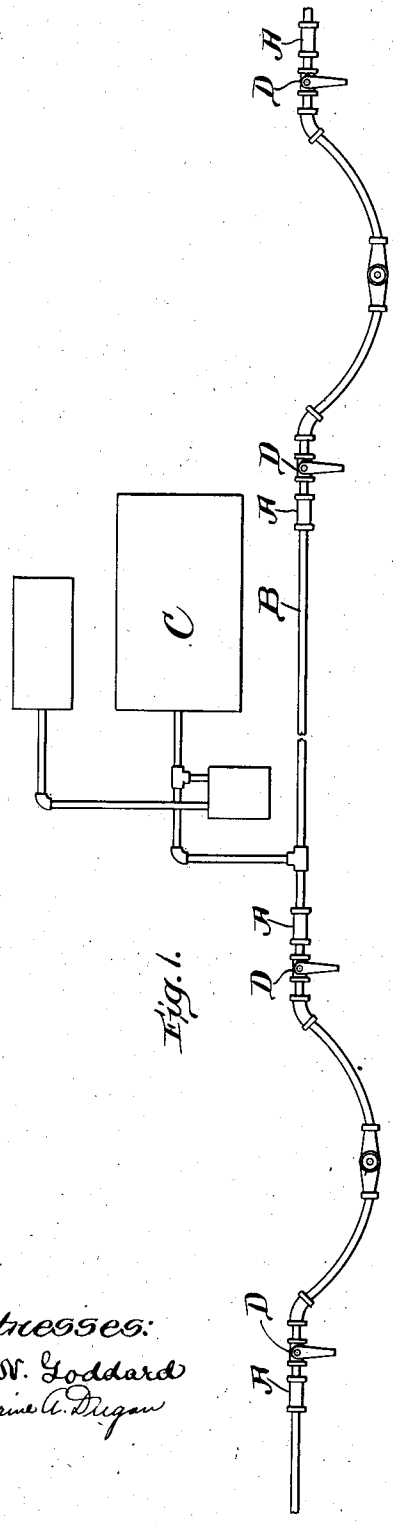
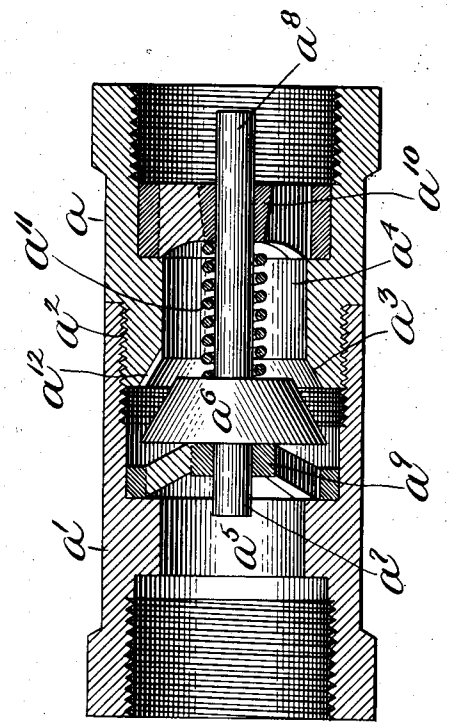


Fig. 1.

Fig. 2.



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UNITED STATES PATENT OFFICE.

BURT M. WOODMAN AND WALTER H. BRIDGES, OF PORTLAND, MAINE.

FLUID-BRAKE MECHANISM.

No. 834,855. Specification of Letters Patent. Patented Oct. 30, 1906.

Application filed January 14, 1905. Serial No. 241,017.

To all whom it may concern:

Be it known that we, BURT M. WOODMAN and WALTER H. BRIDGES, of Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Fluid-Brake Mechanism, of which the following is a specification.

The invention relates to fluid-pressure brake mechanism, and has for its object to prevent the sudden application of the brakes upon the breaking apart of the train or upon the occurrence of any other accident, such as bursting of the coupling-hose, which suddenly releases the air in the train-pipe.

Heretofore it has been proposed to prevent the sudden application of the brakes by introducing into the train-pipe of each car on opposite sides of its connection with the auxiliary reservoir a valve which was intended to remain open under usual conditions and to close automatically in case of accident, such as breaking apart of the train or bursting of the coupling-hose. These valves as heretofore constructed, however, have been unreliable in action and have not, so far as we are aware, gone into practical use, and a large proportion if not all trains to-day are unprovided with means for preventing the sudden application of the brakes in case of accidents such as referred to.

By our invention we provide a valve which closes quickly and positively upon the sudden release of the air in the train-pipe beyond the valve and will thus form a reliable and satisfactory means for quickly closing the pipe and preventing the escape of sufficient air past the valve to apply the brakes. In practicing our invention we introduce a valve in the train-pipe of each car on each side of the auxiliary reservoir, and we so arrange the valve with relation to the air-inlet to the valve-chamber that it is directly across or at right angles to the line of movement or flow of the air. The full force and impact of the air as it rushes toward the outlet through the valve-seat acts directly upon the top of the valve and instantly closes it before any material escape of air between the valve and valve-seat takes place. The valve is held from its seat by a heavy spring, so that during the service or emergency application of the brake mechanism the valve remains open and does not interfere with the flow of air through the train-pipe. It is only when there is a sudden rush of air due to some accident, as the breaking apart of the train and coupling-hose, that the impact of the moving column of air on the top of the valve closes it against the tension of the spring. In embodying this feature of our invention in a practical device which may be readily attached to existing brake mechanism we have employed certain further features of invention which are of importance in contributing to the simplicity and efficiency of the device.

All the features of invention will be understood from the following detailed description of the mechanism shown in the drawings, in which—

Figure 1 is a diagrammatic view illustrating the arrangement of our valve in the train-pipe, and Fig. 2 is a sectional view through the valve-casing.

The valves A may be located anywhere in the train-pipe B on opposite sides of its connection with the auxiliary reservoir C of the brake mechanism and are shown arranged in the pipe just inside of the usual stop-cocks D.

The valves A consist of a cylindrical casing formed in two sections a a', connected by a screw-joint a^2. Each section is internally screw-threaded at its outer end for connection with the train-pipe and is provided with a polygonal portion for the reception of a wrench. This construction is for convenience in manufacture and to facilitate the coupling of the valve to the train-pipe.

In the inner ends of the section a is a valve-seat a^3, surrounding the outlet or passage a^4, through which the air flows in the normal working of the brake mechanism. The space inside the valve-seat forms a valve-chamber which communicates with the train-pipe through the inlet or passage a^5. The valve a^6 is arranged transversely across the valve-chamber between the inlet a^5 and the valve-seat and directly in front of the inlet, so that any current of air passing through the inlet will strike directly against the top of the valve. The valve is supported and guided by valve-stems a^7 a^8, which pass through the guiding-spiders a^9 a^{10}.

During the normal working of the brake mechanism the valve is held from its seat by the spring a^{11}, which is strong enough to prevent any movement of the valve under such conditions. If the train should part, however, the parting of the coupling-hose will suddenly release the air from the ends of the train-pipes on each side of the break. The air in the pipes will therefore tend to rush out

of the pipes through the passages a^5 and past the valves. The force and impact of the air passing through the inlet-passage a^5 strikes directly upon the top of the valve a^6 and carries it suddenly forward against the force of the spring a^{11}, thereby closing the valve. By reason of the arrangement of the valve across the current of air through the passage a^5 the full force of the air is effectively applied to the valve, and the valve moves forward with and in the direction of movement of the air. The valve is therefore forcibly and instantly closed before sufficient air can escape from the pipe to cause the brakes to be applied. After the valve is closed air from the train-pipe gradually passes the valve through a small vent a^{12}, formed through the valve or casing. This escape of air does not materially affect the pressure in that part of the train which is connected with the engine, since the air is supplied to counteract the leakage. On the detached section of the train, however, the escape of air gradually reduces the pressure in the train-pipe, so that the brakes are gradually applied until the reduction of pressure is sufficient to release the valve a^6, when the spring a^{11} opens the valve, causing the brakes to be fully set.

In constructing the valves A we prefer to so proportion the top of the valve and the passage a^5 that the valve is greater in diameter than the passages, as this produces a more effective impact of the air upon the valve.

What we claim, and desire to secure by Letters Patent, is—

1. A cut-off valve for air-brake mechanism consisting of a casing adapted to be connected with the train-pipe, a valve-seat in the casing, an inlet in line with the opening through the valve-seat, a valve having a top of larger diameter than the inlet extending across the casing in front of the inlet, means for yieldingly holding the valve from the seat, and a vent for allowing the air to gradually pass the valve when closed.

2. A cut-off valve for air-brake mechanism, consisting of a casing adapted to be connected with the train-pipe, a valve-seat a^3 surrounding a passage a^4, a passage a^5 in line with the passage a^4, a valve a^6 extending across the casing between said passages and provided with valve-stems a^7,a^8, bearings for said valve-stems, a spring a^{11} for holding the valve away from its seat, and a vent a^{12}, substantially as described.

3. A cut-off valve for air-brake mechanism consisting of a casing formed of two sections a, a', a passage a^4 and valve-seat a^3 in section a, a passage a^5 in section a', spiders a^9, a^{10}, a valve a^6 provided with stems a^7, a^8, a spring a^{11} and a vent a^{12}, substantially as described.

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

BURT M. WOODMAN.
WALTER H. BRIDGES.

Witnesses:
K. C. HESSIAN,
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