

(No Model.)

2 Sheets—Sheet 1

W. T. HAMILTON.

AUTOMATIC SANDING APPARATUS FOR RAILWAY CARS.

No. 567,856.

Patented Sept. 15, 1896.

Fig. 1.

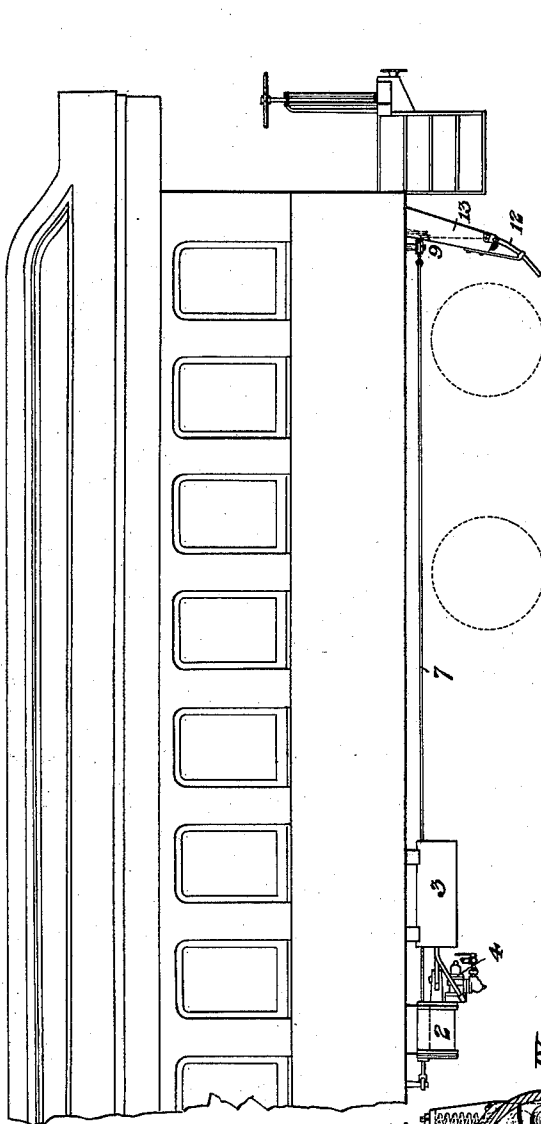


Fig. 2.

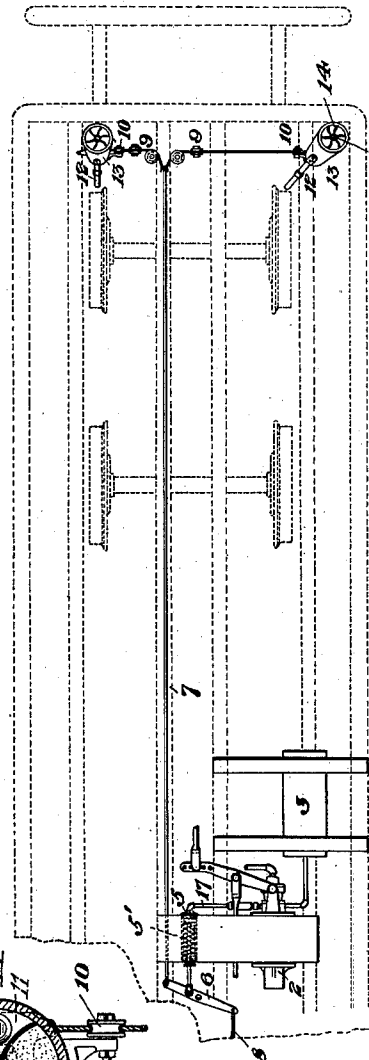


Fig. 3.

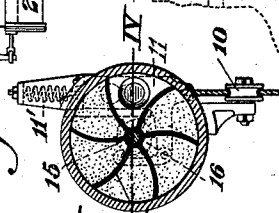
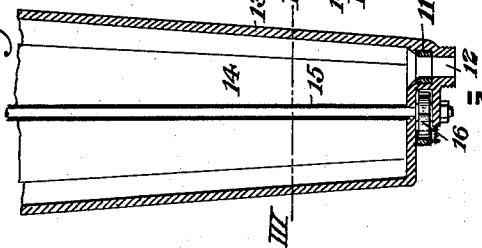


Fig. 4.



WITNESSES

Thomas W. Baxendale
J. H. Combs

INVENTOR

W. T. Hamilton

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2 Sheets—Sheet 2.

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Fig. 5.

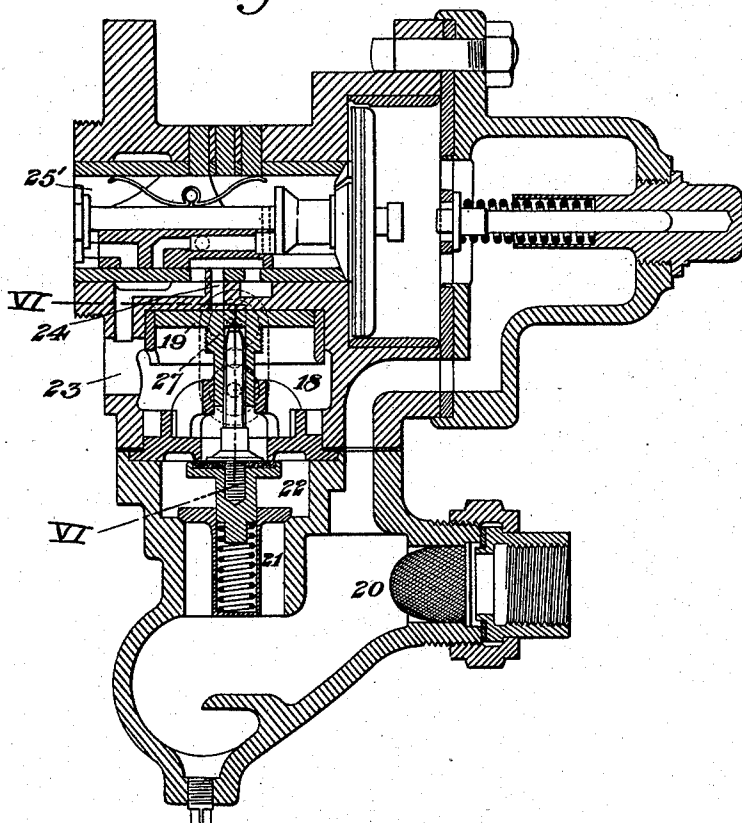
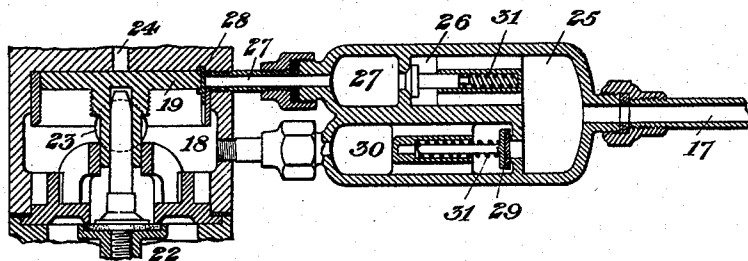


Fig. 6.



WITNESSES

Thomas W. Baxendale
T. A. G. [Signature]

INVENTOR

W. T. Hamilton

UNITED STATES PATENT OFFICE.

WILLIAM T. HAMILTON, OF ALLEGHENY, PENNSYLVANIA.

AUTOMATIC SANDING APPARATUS FOR RAILWAY-CARS.

SPECIFICATION forming part of Letters Patent No. 567,856, dated September 15, 1896.

Application filed April 14, 1896. Serial No. 587,522. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM T. HAMILTON, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Automatic Sanding Apparatus for Railway-Cars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of a part of a railway-car provided with my improved apparatus. Fig. 2 is a plan view, the parts which especially relate to my invention being shown in full lines and the other parts of the car being shown by dotted lines. Fig. 3 is a horizontal cross-section on the line III III of Fig. 1, showing on a larger scale the preferable construction of the sand-hopper and the means by which the sand is delivered therefrom. Fig. 4 is a vertical section on the line IV IV of Fig. 3. Fig. 5 is a sectional view showing the triple valve of an air-brake apparatus adapted to apply the brake by the ordinary-service stop and also by more sudden and violent emergency stop. Fig. 6 is a partial vertical section on the line VI VI of Fig. 5, showing the connection of my improved valve apparatus for controlling the cylinder which operates the sand-hopper to cause the discharge of sand when the emergency-valve of the air-brake mechanism is put into action.

It is the object of my invention to provide means whereby the sanding of railway-tracks can be effected automatically, not at every application of the air-brakes, but only when there is an emergency application applied for the purpose of bringing the train suddenly to a stop. When such emergency application is made, it is very desirable that all the conditions should favor the quick stopping of the train, and, as one of these conditions, it is beneficial to apply sand at once to the tracks. In ordinary-service stops, however, the sand is not only unnecessary, but is undesirable for many reasons. It is wasteful and is apt to clog the tracks and to injure the wearing-surface of the wheels. The principle upon which my invention operates is that I employ in connection with the air-brake apparatus a special cylinder connected with and adapted to control the discharge of sand

from a sand-hopper, and I admit air to operate that cylinder by means of a valve forming part of the air-brake-controlling valve and put into operation whenever the latter acts to cause an emergency stop.

In the drawings, Figs. 1 and 2, 2 represents the brake-cylinder of an ordinary air-brake apparatus. 3 is the auxiliary reservoir. 4 is the triple valve. 5 is a special cylinder which I employ for operating the sand-hopper valve. The piston of this cylinder is provided with a spring 5', adapted to retract it after it has been projected by air-pressure, as hereinafter explained, and is connected to a lever 6, which, by means of rods 7 8, is connected to chains 9 at the ends of the car. These chains 9 pass around pulleys 10, as shown, and extend to a valve 11, which controls the discharge-opening 12 of a sand-hopper 13 and is fitted with a retracting-spring 11', so that whenever the rod 7 or 8 is pulled in a direction away from its sand-hopper it shall open the valve to permit of the discharge of sand upon the rails in advance of the wheels and that when the pulling on the valve ceases the valve will be retracted to close the hopper. In order that only the sand-hoppers at the forward end of the car shall operate, I connect the rods 7 8 detachably with the lever 6, so that whenever the direction of motion of the car is reversed the rod 7 or 8 of the hoppers then at the rear end of the car may be detached from the lever 6 and the rod of the front hopper connected.

To improve the efficiency of the hopper, I prefer to place within it a vertical spider-frame 14, which rotates around a central axis 15 and divides the hopper into several compartments. The slide-valve 11 is connected with the axis 15 by a pawl and ratchet 16, so that at each motion of the slide-valve the spider will be turned partially so as to bring a fresh compartment full of sand directly over the outlet-passage 12. By this means I prevent the entire contents of the hopper from being discharged at any one time.

I shall now describe the means by which the sand-controlling cylinder 5 is set into operation. Said cylinder 5 is indirectly connected by an air-supply pipe 17 to the chamber 18 of the triple valve 4. It will not be necessary to describe all the parts of the

triple valve, for in its general features it is a device well known and not of my invention. The piston-head 19 of the emergency-valve is unseated on the application of the emergency-stop in order to admit air directly from the train-pipe 20 through the passages 21 and 22 to the port 23, leading to the brake-cylinder.

24 is a port which connects with the auxiliary-reservoir port 25', as shown, and is normally closed by the piston-head 19.

25 is a valve-chamber interposed between the triple valve and the pipe 17 and having two valves seating in opposite directions, one a valve 26, which is set in a passage 27, the end of which leads into the triple-valve case and is closed by a slide 28 when the emergency-valve is in closed position, said slide being moved by or forming part of the emergency-valve or of its piston-head, so that when the piston-head is moved downwardly the end of the passage 27 shall be uncovered and shall be connected with the port 24, leading from the auxiliary reservoir. The other valve, 29, in the chamber 25 is set in the passage 30, which opens into the chamber 18 below the piston-head 19. The valves 26 and 29 are provided with suitable springs 31, which tend to hold them to their seats. As thus constructed the operation is as follows:

In the ordinary-service stop of the air-brake apparatus the port 27 remains closed and the valves 26 and 29 do not operate. The sand-controlling cylinder 5 therefore remains inactive, the port of the valve 26 being closed and the check-valve 29 being held to its seat by its spring and by the pressure of the air in the chamber 18. When, however, there is an emergency application of the brakes, which is caused, as will be understood, by the downward motion of the piston-head 19, such motion of the piston-head will uncover the port 27 and will thus admit air from the auxiliary reservoir through said port, the pressure of which air will unseat the valve 26, permitting the air to pass through the pipe 17 to the cylinder 5, thus projecting the piston of the cylinder, rocking the lever 6, and operating the sand-hopper mechanism, as explained above. During this operation the check-valve 29 is held to its seat by the spring and by the pressure of air in the chamber 18. When, however, the emergency application of the brakes is at an end and the piston-head 19 is moved back to its normal position, (shown in Figs. 5 and 6,) it will cover the port 27, so as to prevent entrance of air therethrough, thus shutting off the pressure from the sand-hopper cylinder. At the same time the reduction of pressure in the chamber 18 will permit the compressed air contained in the pipe 17 and cylinder 5 to unseat the valve 29, whereupon the air therefrom will escape through the port 30 into the chamber 18, and thence to the exhaust-port with the exhaust-air from the brake-cylinder.

The advantages of my invention will be

appreciated by those skilled in the art. The apparatus which I have described is simple and very safe and reliable, and, within the principles of the invention, as defined in the claims, the skilled mechanic will be enabled to make modification in the form and construction.

I claim—

1. In apparatus for sanding railway-tracks, the combination of a sand-discharge apparatus, a cylinder for operating the same, valve mechanism controlling the air-brakes of the car, and (in addition to the service-stop mechanism) provided with an emergency-valve for applying a more powerful emergency stop, and a port for supplying air to the sand-discharge cylinder, said port being opened only by motion of the emergency-valve; substantially as described.

2. In apparatus for sanding railway-tracks, the combination of a sand-discharge apparatus, a cylinder for operating the same, air-brake-valve mechanism, comprising an emergency-valve which moves on the occasion of an emergency stop, a valve which admits air to the sand-discharge cylinder and is opened by motion of the emergency-valve, and a second oppositely-acting discharge-valve from the sand-discharge cylinder, which valve opens into the chamber 18 of the air-brake valve; substantially as described.

3. In apparatus for sanding railway-tracks, the combination of a sand-discharge apparatus, a cylinder for operating the same, air-brake-valve mechanism, comprising an emergency-valve which moves on the occasion of an emergency stop, a port which connects the auxiliary air-reservoir with the sand-discharge cylinder, and means for opening said port on motion of the emergency-valve; substantially as described.

4. In apparatus for sanding railway-tracks, the combination of a sand-discharge apparatus, a cylinder for operating the same, valve mechanism which controls the air-brakes of the car and is adapted to apply thereto a service stop and more powerful emergency stop, a port connecting the sand-discharge cylinder with the air-brake valve, and a slide on the emergency-valve which controls said port; substantially as described.

5. In apparatus for sanding railway-tracks, the combination of a sand-discharge apparatus, a motor for operating the same, an air-brake-valve mechanism containing an emergency-valve, and means controlled by the emergency-valve for actuating said motor; substantially as described.

6. In apparatus for sanding railway-tracks, the combination of a sand-discharge apparatus, a cylinder for operating the same, valve mechanism which controls the air-brakes of the car and is adapted to apply thereto a service stop and more powerful emergency stop, a port connecting the sand-discharge cylinder with the air-brake valve, and a slide on the emergency-valve which controls said port,

and a check-valve in said port; substantially as described.

7. In apparatus for sanding railway-tracks, the combination of a sand-discharge apparatus, air-brake-valve mechanism comprising an emergency-valve, an auxiliary air-reservoir, and a port which connects with the air-reservoir and is opened by motion of the emergency-valve to permit the passage of air

to operate the sand-discharge mechanism; substantially as described.

In testimony whereof I have hereunto set my hand.

WILLIAM T. HAMILTON.

Witnesses:

T. W. BAKEWELL,
H. M. CORWIN.