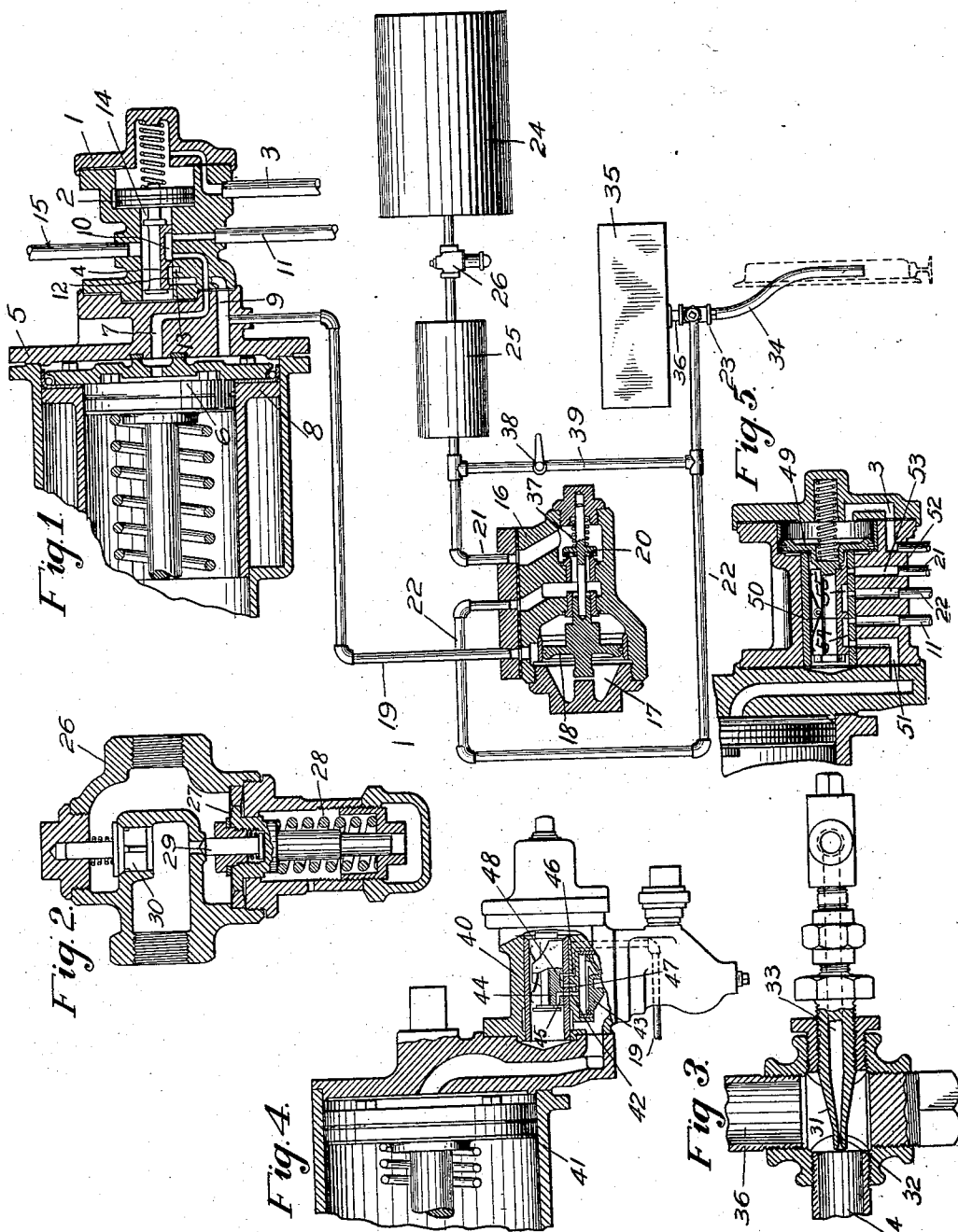


F. P. LIVINGSTON.
 AUTOMATIC TRACK SANDING DEVICE.
 APPLICATION FILED AUG. 6, 1910.

1,015,899.

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WITNESSES
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UNITED STATES PATENT OFFICE.

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AUTOMATIC TRACK-SANDING DEVICE.

1,015,899.

Specification of Letters Patent.

Patented Jan. 30, 1912.

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To all whom it may concern:

Be it known that I, FREMONT P. LIVINGSTON, a citizen of the United States, residing at Denver, in the city and county of Denver and State of Colorado, have invented new and useful Improvements in Automatic Track-Sanding Devices, of which the following is a specification.

This invention relates to sanding devices, and more particularly to a sanding device adapted to supply sand to the rails upon an emergency application of the brakes.

The principal object of my invention is to provide improved means for automatically sanding the rails, comprising a valve device adapted to effect an application of the brakes upon a reduction in train pipe pressure, a track sander, and a valve mechanism controlled by said valve device for supplying air to the sander.

In the accompanying drawing; Figure 1 is a diagrammatic view of a track sanding apparatus embodying my improvement; Fig. 2 a sectional view of the duplex check valve employed with the above track sanding apparatus; Fig. 3 a sectional view of a pneumatically operated sander; Fig. 4 a sectional view of a slightly modified construction embodying my invention; and Fig. 5 a central sectional view of a triple valve device illustrating an arrangement of ports employed in connection with another form of my invention.

According to the construction shown in Fig. 1 of the drawing, my invention is illustrated as applied to a combined straight air and automatic emergency brake equipment comprising an emergency valve device 1 having a piston 2 open on one side to the train pipe 3 and a slide valve 4 adapted to be operated by the piston 2. The emergency valve device controls the admission and release of air to and from a duplex brake cylinder 5 having a small service brake piston 6 connected to a passage 7, leading to the seat of slide valve 4 and a large emergency brake piston 8 connected to a passage 9 also leading to the seat of slide valve 4. In the normal release position of the emergency valve device, the passage 7 is connected by a cavity 10 in slide valve 4 with a straight air pipe 11, admission and release of fluid to and from which is adapted to be controlled by a brake valve in the

usual manner. Passage 9 is connected by a cavity 12 in the slide valve 4 with an exhaust port 13 when the slide valve is in the normal release position, but upon a sudden reduction in train pipe pressure the piston 2 and slide valve 4 are operated to open passage 9 to valve chamber 14 so that fluid under pressure is supplied to the large brake piston 8 from a source of pressure which is connected to the valve chamber 14 by a pipe 15.

As so far described the equipment is similar to that covered in a pending application of W. V. Turner, Serial No. 343,357, filed November 14, 1906.

According to my invention, a valve device for controlling the supply of air to the sander is provided, comprising a casing 16 having a piston chamber 17 containing a piston 18, the chamber at the outer face of piston 18 being connected by a pipe 19 to passage 9 leading to emergency brake piston 8. The piston 18 operates a puppet valve 20 for controlling communication from pipe 21, leading to a source of fluid pressure supply, to a pipe 22, leading to a pneumatic sander 23. Preferably the supply of air is obtained from the main reservoir 24, and in order to prevent excessive use of air from said reservoir and possible undesirable depletion of pressure therein, an additional or supplemental sanding reservoir 25 is provided and a duplex check valve 26 is interposed between the main reservoir 24 and the supplemental reservoir 25. This check valve is similar to that covered in Patent No. 665,341 of January 1, 1901, and comprises as shown in Fig. 2, a diaphragm 27 subject on one side to the pressure of an adjustable spring 28 and on the opposite side to the pressure in the main reservoir 24. The diaphragm 27 is adapted to operate a valve 29 for controlling the admission of fluid from the main reservoir 24 to the sanding reservoir 25. A check valve 30 is also provided for permitting flow of air from the sanding reservoir 25 to the main reservoir in case the main reservoir falls below the pressure in the sanding reservoir while the same prevents flow of air from the main reservoir to the sanding reservoir.

The spring 28 may be adjusted to permit the diaphragm 27 to open the valve 29 at any desired pressure, but preferably is ad-

justed to a pressure two or three pounds less than the pressure at which the pump or compressor governor is adjusted to cut in. Thus no air will be supplied from the main reservoir to the sanding reservoir when the main reservoir pressure is less than the degree at which the spring 28 is set and consequently the sanding device can not unduly bleed down the main reservoir pressure in case of leakage or otherwise.

It is not material as to the type of pneumatic sander employed, but in Fig. 3 a sander is shown of the ejector type having a conical nozzle 31 with a restricted outlet 32 to which air is supplied through a passage 33 leading to supply pipe 22. The nozzle 31 directs the air supply into sand pipe 34 leading to the track rails and thereby induces a flow of sand from the sand box 35 and pipe 36 to sand pipe 34. Normally, the passage 9 is connected to exhaust port 13 and thus the pipe 19 maintains the chamber at the outer face of piston 18 at atmospheric pressure and also, due to leakage around said piston, the chamber at the opposite side of the piston is at atmospheric pressure, so that a spring 37 acting on valve 20, maintains said valve seated. Upon a sudden reduction in train pipe pressure, the emergency piston 14 is actuated to shift the slide valve 4 to emergency position in which passage 9 and the emergency piston 8 is supplied with fluid under pressure. Air is also supplied to pipe 19 and thence to the outer face of piston 18, operating the same to open valve 20. Fluid from the sanding reservoir 25 is thereupon supplied from pipe 21 to pipe 22, and the sand ejector then acts to supply sand to the track rails. Fluid pressure finally equalizes upon opposite sides of piston 18 and the spring 37 then returns the parts to close the valve 20 and cut off further supply of sand to the rails. If desired, a normally closed hand operated cock 38 may be provided in a by-pass pipe 39 leading from pipe 21 to pipe 22, so that air may be manually supplied to the sander 23 when necessary.

My invention may be applied to various other types of brake apparatus, as will be apparent, for example, in Fig. 4 of the drawing an ordinary standard quick action triple valve device 40 and brake cylinder 41 are shown, the triple valve device having the usual emergency port 42 leading to the emergency piston 43 and the triple slide valve 44 having the usual port 45 which is adapted in emergency position of the parts to register with port 42.

In order to operate the sanding device, the pipe 19 may be connected to a passage 46, leading to the seat of the slide valve 44, and a port 47 may be provided leading from said seat to the emergency port 42, a cavity 48 in the slide valve 44 being adapted to

connect the passage 46 with the port 47 in emergency position. Air is thus supplied to the pipe 19 and the sander in emergency applications to accomplish the same purpose as the construction shown in Fig. 1.

In Fig. 5 of the drawing an emergency valve device for supplying air to a single brake cylinder piston is shown, comprising a piston 49 and a slide valve 50 adapted to be operated by the piston. In this construction, the valve seat is provided with a straight air port 11, brake cylinder port 51, a port 52 connected directly to the sander pipe 22, and a port 53 connected to the sand reservoir pipe 21. The slide valve 50 has a cavity 54 adapted to connect the straight air pipe 11 with the brake cylinder port 51 in release position, for supplying and releasing air to and from the brake cylinder, and a cavity 55 adapted to connect the sand reservoir port 53 with the sander port 52 in the emergency position of the slide valve. With this construction, air is supplied from the sand reservoir directly to the sander, as will be evident.

The employment of an auxiliary valve mechanism for controlling the supply of air to the sander prevents possible loss of air from leakage and as the air is taken from a separate sanding reservoir the action of the brakes is not interfered with in any way, the amount of air supplied to pipe 19 to operate the piston 18 being very small.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a fluid pressure brake, the combination with a valve device adapted upon a sudden reduction in train pipe pressure to effect an emergency application of the brakes, of a pneumatically operated track sander and a valve mechanism operated by air controlled by said valve device for supplying air to said sander.

2. In a fluid pressure brake, the combination with a train pipe and an emergency valve device operated by a sudden reduction in train pipe pressure for effecting an emergency application of the brakes, of a pneumatically operated track sander, a valve for controlling the supply of air to said sander, and a movable abutment operated by fluid pressure supplied by the movement of said emergency valve device to emergency position for actuating said valve.

3. In a fluid pressure brake, the combination with a train pipe, a valve device operating upon a reduction in train pipe pressure for effecting an application of the brake, and a main reservoir from which fluid under pressure is supplied to the brake system, of a track sander, a reservoir adapted to be charged from the main reservoir for supplying air to operate said sander, and means for preventing flow of air from the

main reservoir to the sanding reservoir when the pressure in the main reservoir is reduced to a predetermined degree.

4. In a fluid pressure brake, the combination with a train pipe and an emergency valve device operating upon a reduction in train pipe pressure for effecting an application of the brakes, of a track sander, an air supply valve therefor, and a movable abutment operated by fluid under pressure supplied upon movement of said emergency valve device for actuating said supply valve.

5. In a fluid pressure brake, the combination with a train pipe and an emergency valve device operating upon a reduction in train pipe pressure for effecting an application of the brakes, of a track sander, and a valve mechanism controlled by fluid pres-

sure from said emergency valve device for supplying air to said sander.

6. The combination with a pneumatically operated track sander and a source of fluid under pressure, of a reservoir adapted to be charged from said source and from which air is supplied to said sander and means for cutting off communication from said source to the reservoir upon reduction of the pressure of said source to a predetermined degree.

In testimony whereof I have hereunto set my hand.

FREMONT P. LIVINGSTON.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."