(No Model.) 4 Sheets—Sheet 1.

C. W. SHERBURNE.

TRACK SANDING APPARATUS.

No. 489,720. Patented Jan. 10, 1893.

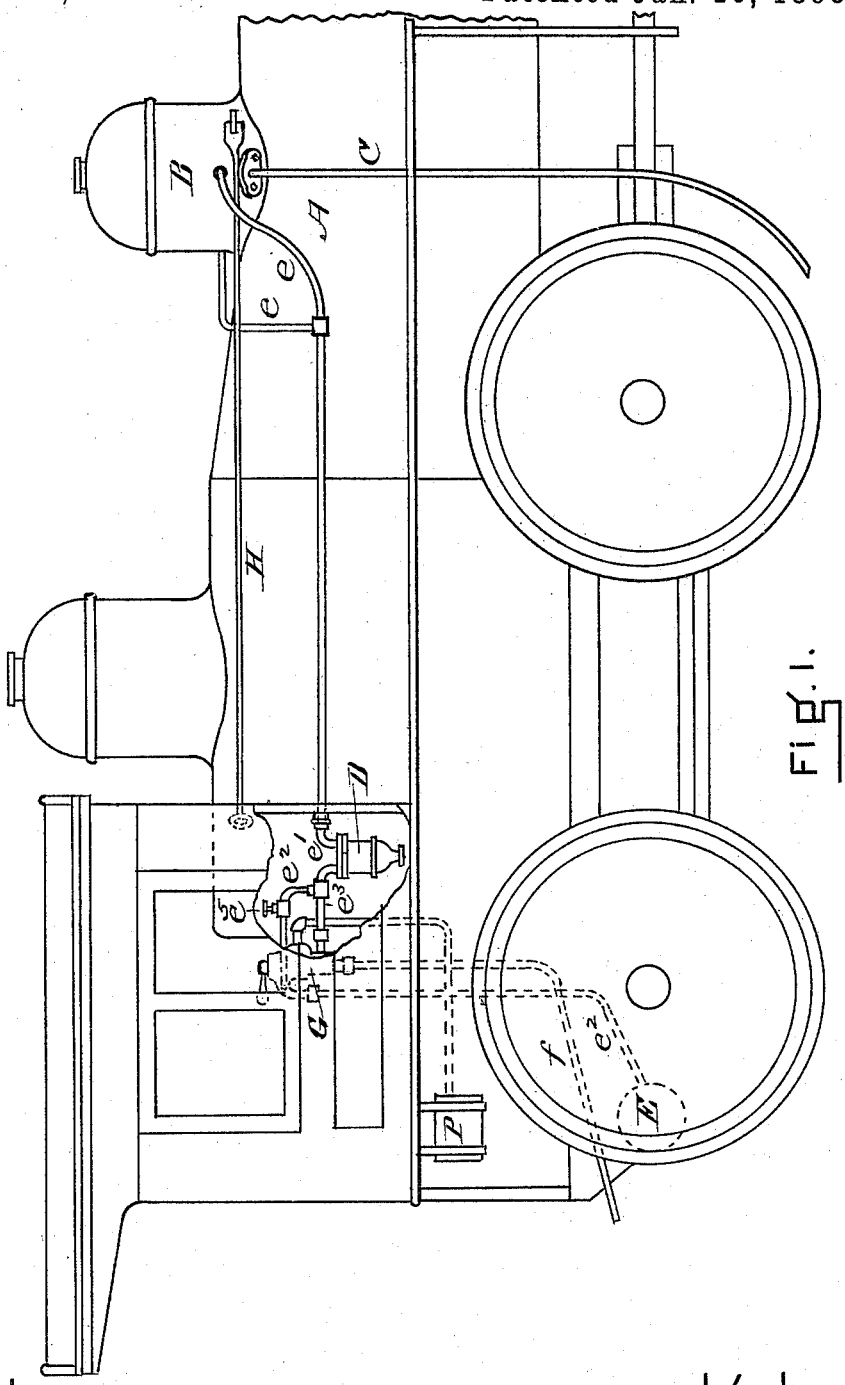

FIG. 1.

WITNESSES.
J. M. Dolan.
M. Lynch.

INVENTOR.
Chas. W. Sherburne
by his Attys
Clarke & Raymond

(No Model.) 4 Sheets—Sheet 2.

C. W. SHERBURNE.

TRACK SANDING APPARATUS.

No. 489,720. Patented Jan. 10, 1893.

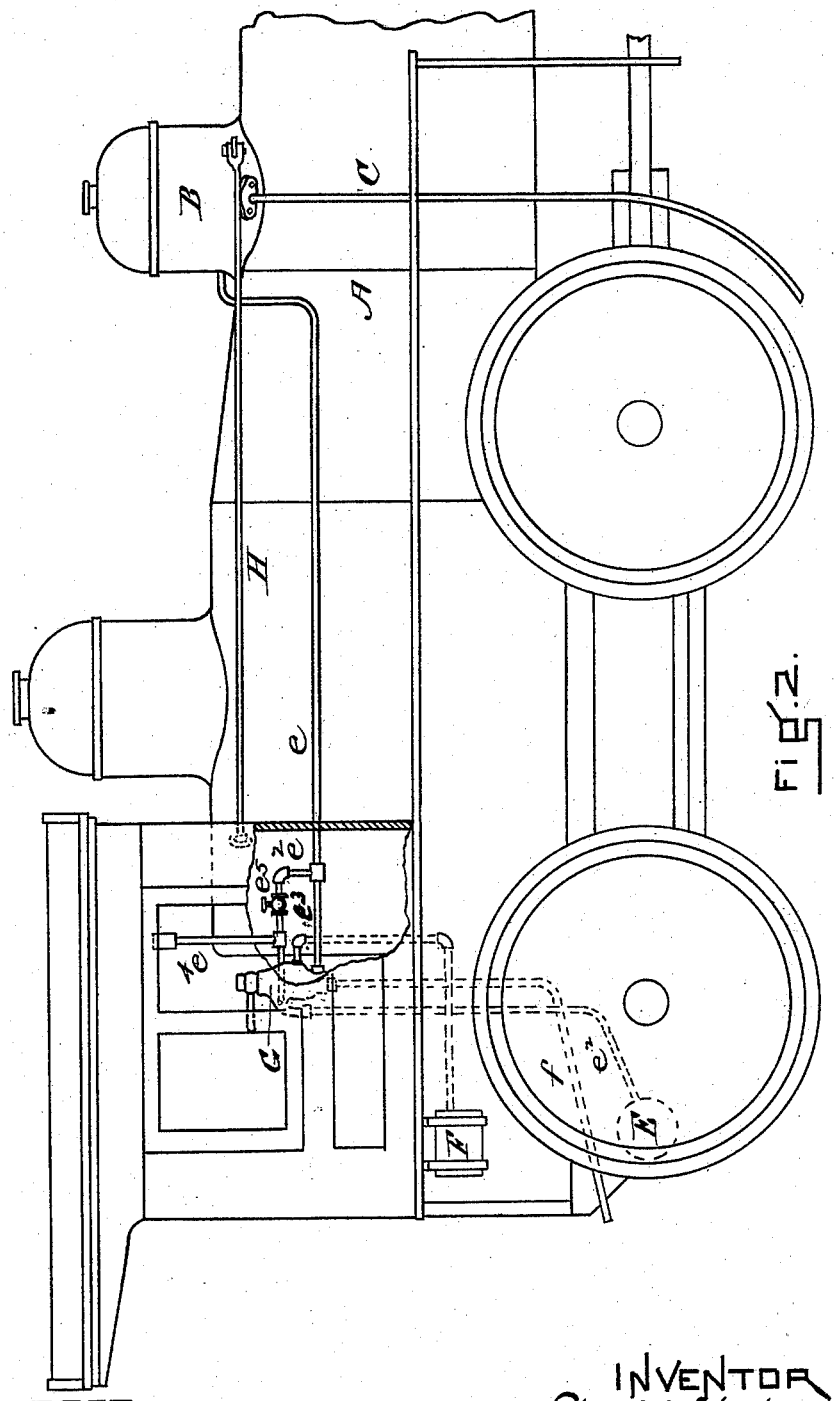

Fig. 2.

WITNESSES
J. M. Dolan
M. Lynch

INVENTOR
Chas. W. Sherburne
by his Attys
Clarke & Raymond

(No Model.) 4 Sheets—Sheet 3.

C. W. SHERBURNE.

TRACK SANDING APPARATUS.

No. 489,720. Patented Jan. 10, 1893.

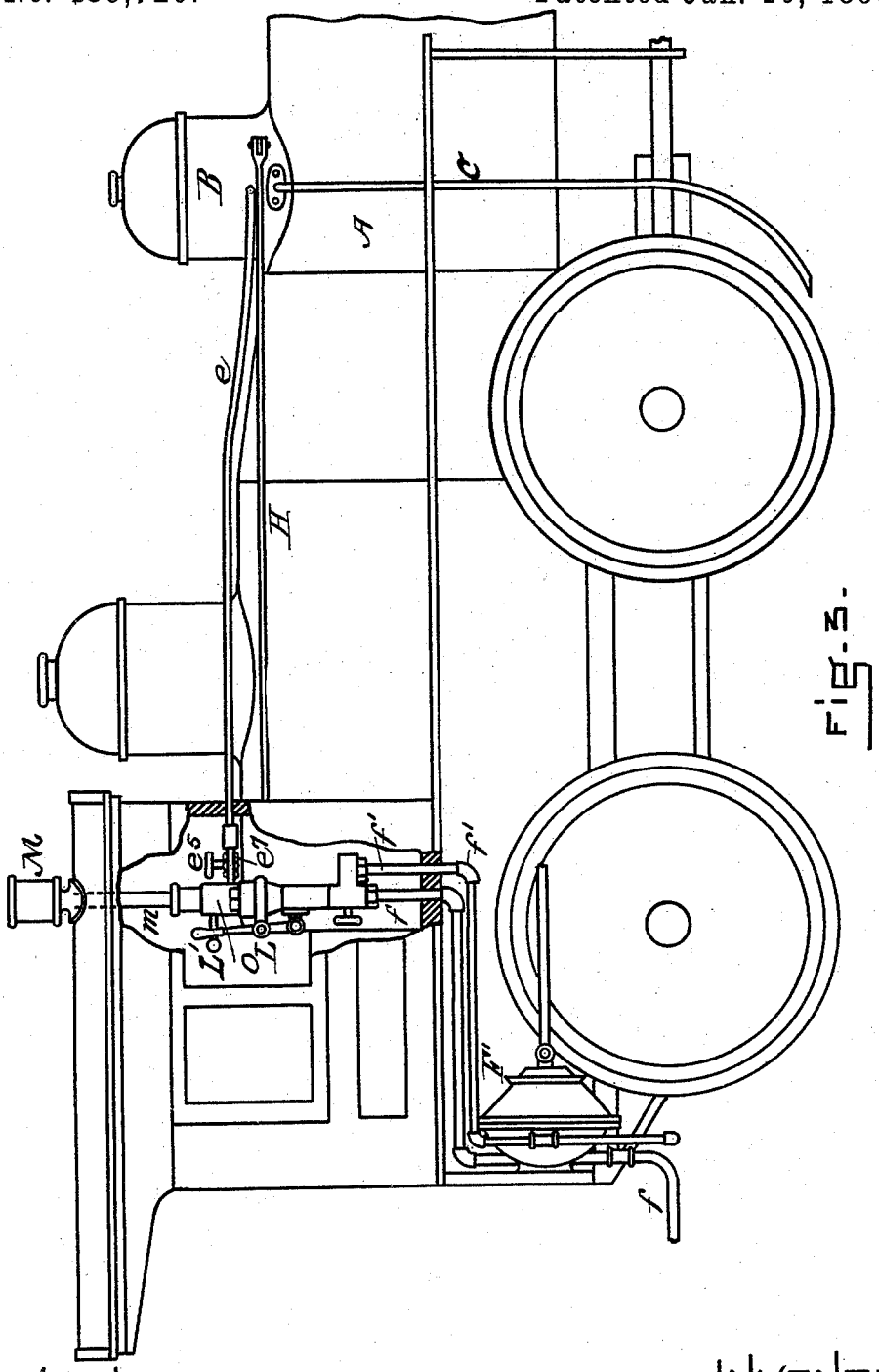

FIG. 5.

WITNESSES
J. M. Dolan
J. M. Lynch

INVENTOR
Chas. W. Sherburne
by his Attys
Clarke & Raymond

(No Model.) 4 Sheets—Sheet 4.

C. W. SHERBURNE.

TRACK SANDING APPARATUS.

No. 489,720. Patented Jan. 10, 1893.

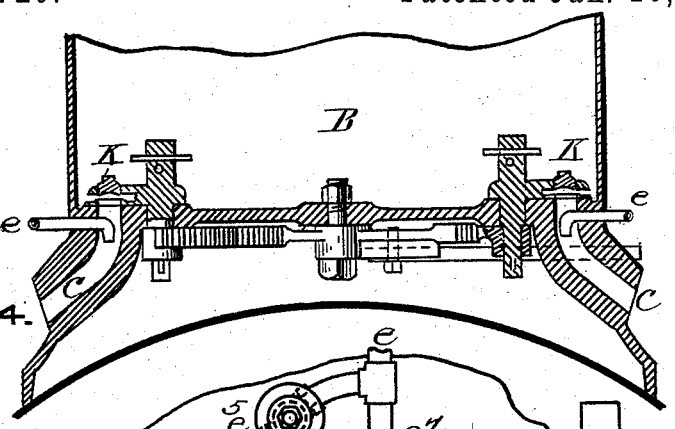

FIG. 4.

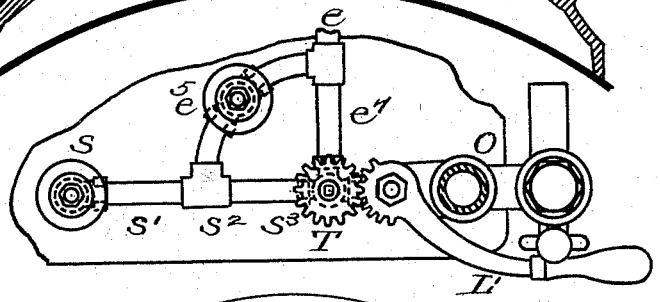

FIG. 6.

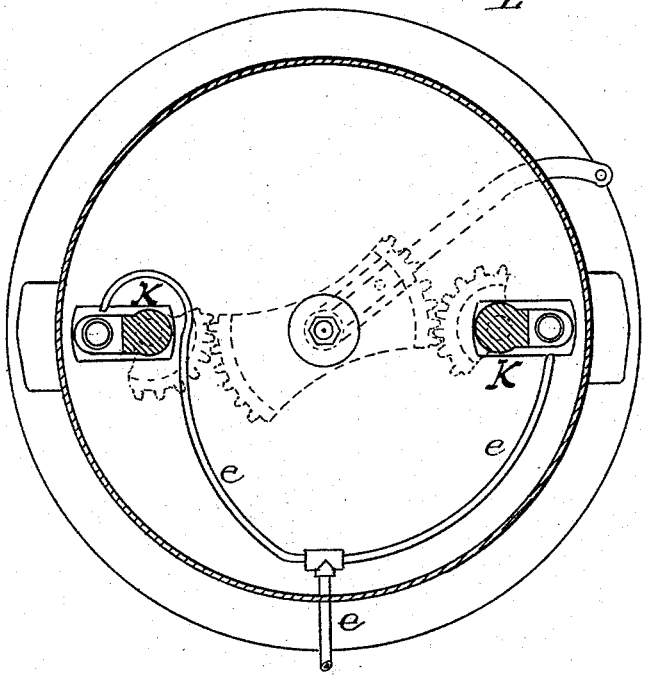

FIG. 5.

WITNESSES

J. Mc. Dolan

M. Lynch

INVENTOR

Chas. W. Sherburne

by his Attys

Clarke & Raymond

UNITED STATES PATENT OFFICE.

CHARLES W. SHERBURNE, OF BOSTON, MASSACHUSETTS.

TRACK-SANDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 489,720, dated January 10, 1893.

Application filed November 25, 1892. Serial No. 452,989. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. SHERBURNE, of Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented a new and useful Improvement in Track-Sanding Apparatus, of which the following is a full, clear, and exact description, sufficient to enable others skilled in the art to make and use my invention, reference being had to the accompanying drawings, forming a part of this specification, without further invention on their part.

The art of combining the track sanding apparatus with the Westinghouse air brake system has already been introduced into the art, but the air blast employed in combinations hitherto made has been a secondary air blast derived from a storage cylinder the opening of which to the sand box depended upon lowering the pressure in the pipe of the train line. This involved the employment of a somewhat elaborate apparatus,—such for instance, as a triple or signal valve in connection with the sanding system. Again, the apparatus used with the Westinghouse air brake system hitherto is not adapted to be used with the vacuum brake; whereas, the appatus which I am about to describe can be combined with the vacuum brake and the air brake with very trifling modifications.

In the drawings: Figure 1 is the side elevation of locomotive equipped with a Westinghouse air brake in combination with the track sanding apparatus. Fig. 2 is side elevation of a locomotive representing an apparatus substantially similar to that in Fig. 1 with some modification of detail. Fig. 3 is a side elevation of locomotive equipped with a vacuum brake in combination with the track sanding apparatus. Fig. 4 is a section of the sand box and its attachments, illustrating the manner in which this apparatus is applied. Fig. 5 is a plan illustrating the manner in which the Westinghouse apparatus has been combined with the sand box. Fig. 6 shows in plan the system of piping and valves employed with the vacuum brake apparatus to combine it with the sand box, and place the business of track sanding under the control of the engineer.

Like letters indicate like parts in all the figures.

A is the shell of a locomotive.

B is the sand box.

C is the sand pipe leading in front of the driving wheels.

E (Figs. 1 and 2) is an air reservoir.

e^2 is the pipe leading from that air reservoir to the pipe *e* which leads to the sand box. This pipe is controlled by a valve e^5. In case the engineer desires to apply sand when he does not wish to stop the train, it may be applied by opening the valve e^5.

G is the engineer's valve.

f is the pipe leading to the train line.

e^3 of Fig. 1 is a pipe into which the exhaust of the engineer's valve opens when that valve is opened. It connects by means of a T with the elbow pipe e^2 leading from the valve e^5, and in Fig. 1 by means of the elbow *e'* with the drip cup or water trap D from which water trap the pipe *e* is led, which branches and enters the sand box B, one branch on each side. The interior of this sand box is shown in section in Fig. 4, and the pipes *e* it will be seen, enter the sanding pipe C below the sand valve and form an exhaust current in the sand pipe.

H is the rod by which the segment gears, which open and close the sand valves, are operated from the engineer's cab.

F is the brake cylinder of the locomotive.

Most of the letters found upon Fig. 1 are also found upon Fig. 2; but in lieu of the piping necessary to be employed when the water trap D is employed, this water trap being omitted, causes an omission of the part lettered *e'* and the pipe e^3 is made continuous with the pipe *e*. In this Fig. 2 also the pipe *e* enters the sand box as a single pipe, as shown in the plan Fig. 5, and is branched to the right and left so as to come opposite a slot in the sand valve into which slot this pipe delivers its air. The air in this case is air derived from the exhaust of the train line, which exhaust is caused by the opening of the engineer's valve.

In Fig. 2, e^4 is a pipe leading to a pressure gage which would indicate the pressure in the reservoir E. The opening of the engineer's valve will cause the exhaust from that valve to travel along the pipes *e* and cause sand to be delivered in front of the driving wheels or sand can be applied by a blast de-

rived from the storage reservoir E, by turning the air valve e^5.

The arrangement of valves and the method of working them in this apparatus have already been described in the previous application for Patent, Serial No. 447,608, of October 3, 1892; and consequently, are not further described on this occasion.

In Fig. 3 A is the boiler; B is the sand box; C is the sand pipe; H is the rod leading to the sand valve lever; *e* is the pipe which conveys either a steam blast or a steam and air blast from the vacuum brake apparatus to the sand box. F′ is the diaphragm of the driver vacuum brake; *f* is the train line; and *f′* is the vacuum pipe leading to the driver brake diaphragm F′. L is the release lever used by the engineer to operate the brake apparatus, and e^5 is a valve which connects the steam jet with the sand blast pipe *e*. *m* is the exhaust pipe leading to the muffler, and M is the muffler on top of the cab. The cock e^5 is, as I have said, in a branch pipe leading to the steam pipe. e^7 is a pipe connecting the pipe *e* either with the exhaust which leads to the muffler pipe *m* in which case, it would be analogous to the pipe e^3 of Fig. 1 and Fig. 2 of this application, or it may connect the pipe *e* with the source of steam supply. In the first case, the eduction, and in the second case, the induction current would be delivered into the pipe *e*.

Fig. 6 shows in plan this system of piping and valves. S is the boiler connection. S′ is the steam pipe leading from the boiler connection to the T S^2. S^3 is the pipe leading from this T to the controlling valve T. This controlling valve T is geared to the lever L′ which is the steam valve lever of the vacuum brake apparatus, and sets in motion the ejector to form the vacuum. The opening of this controlling valve causes steam to enter the ejector O of Fig. 3, shown only in section in Fig. 6, and thereby to exhaust air from the pipes *f f′* of Fig. 3; a run around or by-pass extends from the T S^2 to another T which connects the pipe e^7 with the pipe *e* common to all the locomotive figures and leading either to the sand box or the sand pipes.

Where steam is employed in pipe *e*, whether mingled with air, as in the case of using the exhaust, or unmingled, it will be necessary to put the nozzle of the pipe *e* into the sand pipe C below the valve K of Fig. 4, but where simply the air exhaust is employed, that may be introduced above the bottom of the sand box, as in the former application already referred to.

An analysis of the apparatus shown in Figs. 4 and 5 shows that the sand pipes are covered at the top by a cap that beneath this cap is a passage from the cavity of the sand box to the opening of the sand pipe C, that around the opening of the sand pipe there is a slight bead and that underneath the cap which surmounts the sand pipe is the air pipe *e* either blowing into the sand pipe a short distance below the cap or in the slot under the cap and close to it. In the drawings, this cap and the beaded platform beneath it are mounted on a spindle and can be moved from side to side so as to completely open the sand pipe and the cavity of the sand box. The presence of the bead around the upper edge of the sand box is desirable to keep the sand from shaking down by gravity unless blown or sucked. It is not essential that this upper attachment to the sand box should be on a swing spindle or indeed that it should be movable at all. The essential features for feeding the sand by a blast being a sand box B, sand pipes C, a cover to the top of the sand pipe having a narrow passage beneath it from the cavity of the box to the sand pipe, an upwardly projecting bead around the upper edge of the sand pipe and a pipe *e* furnishing a blast of air beneath the cover of the sand pipe or a blast of steam and air or of steam alone or air alone into the interior of the sand pipe, being the essential part of this apparatus.

I claim as my invention and desire to secure by Letters Patent:

1. The combination of the steam supply pipe *e* leading to the sand box with the steam pipe S, controlling valve T, and the ejector O and controlling lever L′, substantially as and for the purpose described.

2. The combination of the steam pipe S with the controlling valve T, pipe e^7, by-pass controlled by the valve e^5, and the pipe *e* and sanding apparatus proper, substantially as and for the purpose described.

3. The combination of the sand box B of ordinary construction and attachments, but having the slotted valve K with the track sanding pipes C, blast pipes *e* therein, and an ejector vacuum apparatus and source of steam supply actuated simultaneously with the track sanding apparatus by the same lever, and a by-pass controlled by a hand valve from the same source of steam supply to the same ejector nozzles, all substantially as and for the purpose described.

4. In a track sanding apparatus the combination of the sand box B, the track sanding pipes C opening into the lower part of said sand box, covers to said track sanding pipes, the edges of which covers extend laterally to a considerable distance beyond the upper inner edge of the track sanding pipes, a passage beneath said covers from the interior of the sand box to the interior of the track sanding pipe, a bead around the upper edge of the track sanding pipe and a blast pipe *e* delivering air or steam or air and steam beneath said cover and into said track sanding pipe. The said pipe *e* when delivering steam or steam and air having its nozzle located within the track sanding pipe or when delivering air having its nozzle located either within the track sanding pipe or higher and nearer to said cover

than the cavity of the track sanding pipe, all in combination with each other substantially as described.

5. In combination with a sand box and the sand pipes C, a sand valve E, which forms a cover to said sand pipe and which is constructed open at its sides to the interior of said sand pipes as described, and pipes *e*, leading from the air or vacuum brake apparatus to the interior of said pipes C below said valve E, all actuated by the exhaust of an air or vacuum brake, substantially as and for the purposes described.

CHARLES W. SHERBURNE.

In presence of—
J. M. DOLAN,
F. F. RAYMOND, 2d.