

No. 650,052.

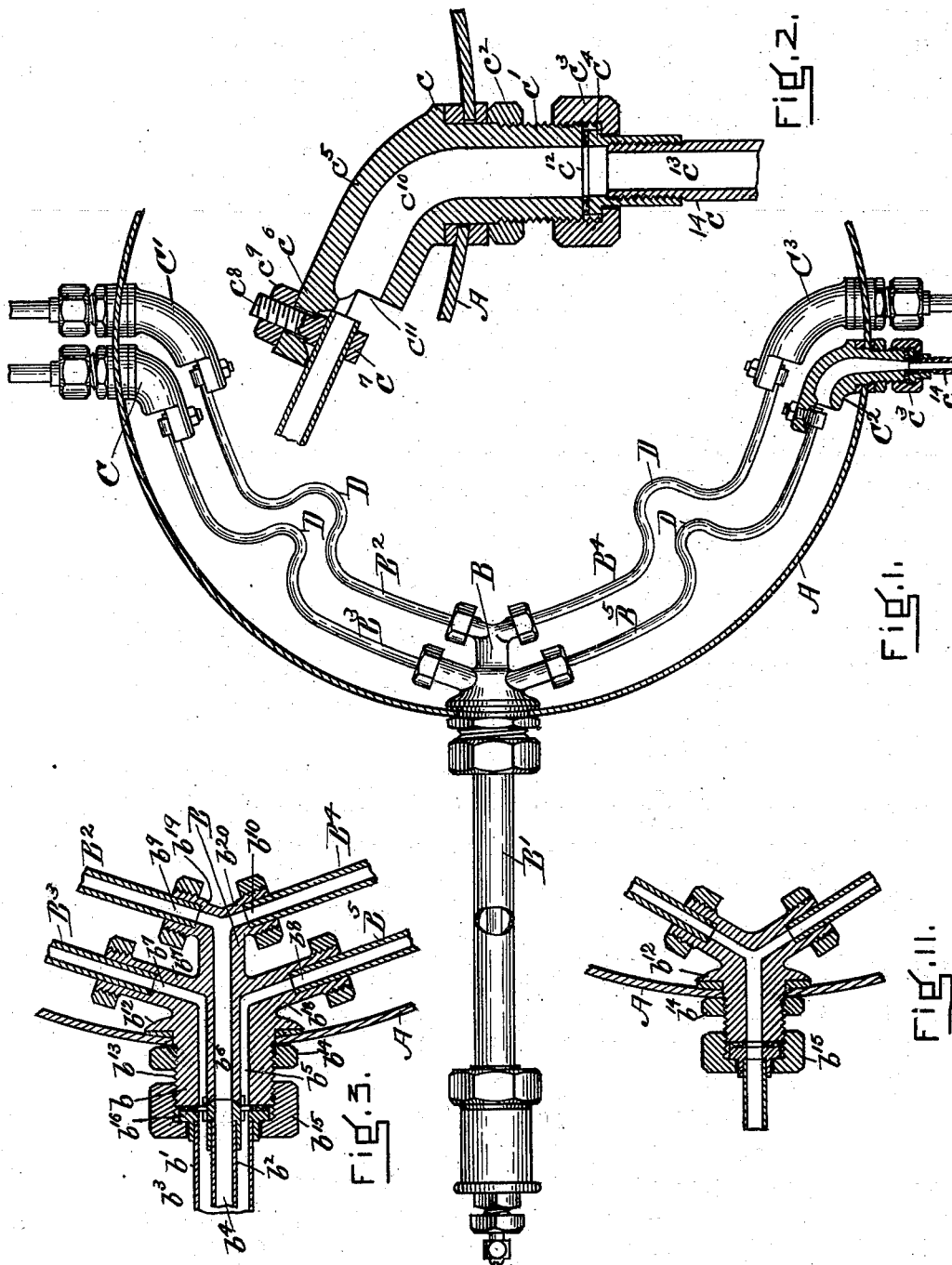
Patented May 22, 1900.

C. W. SHERBURNE.
TRACK SANDING APPARATUS.

(Application filed Dec. 30, 1899.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES

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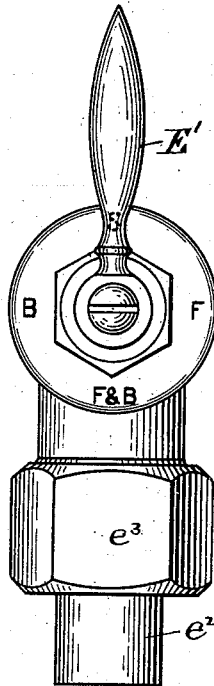


Fig. 4.

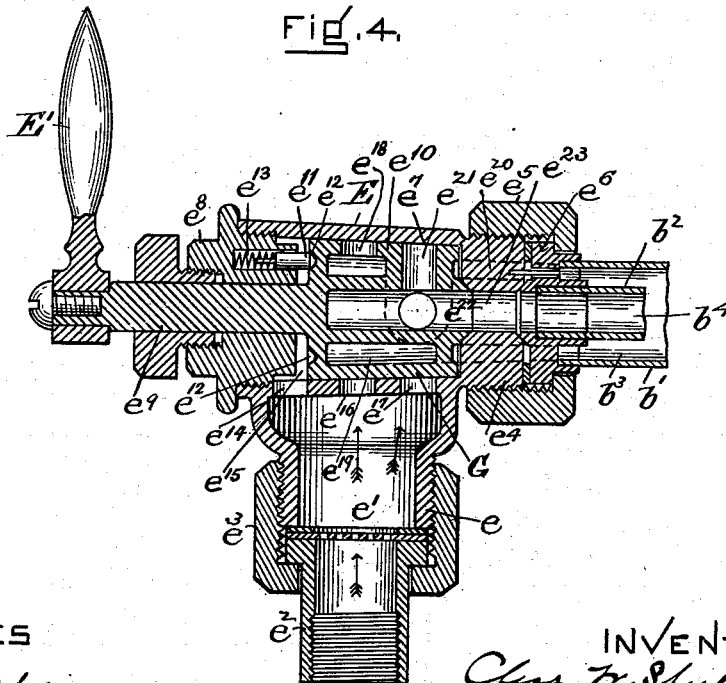


Fig. 5.

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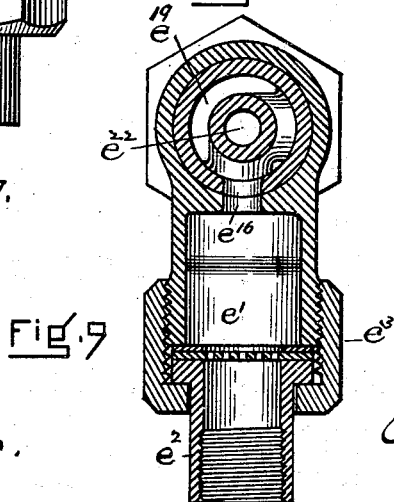
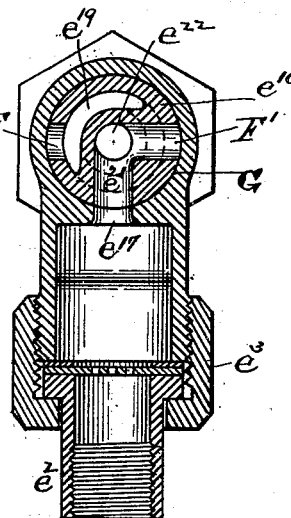
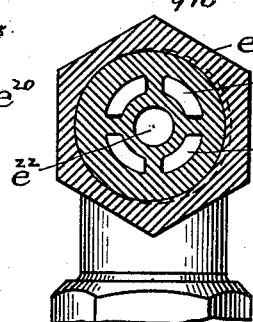
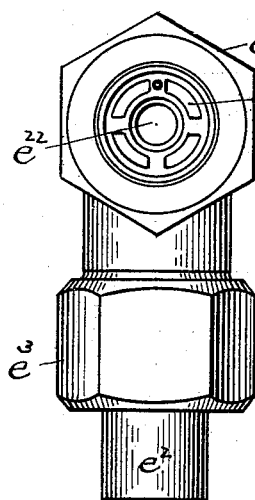
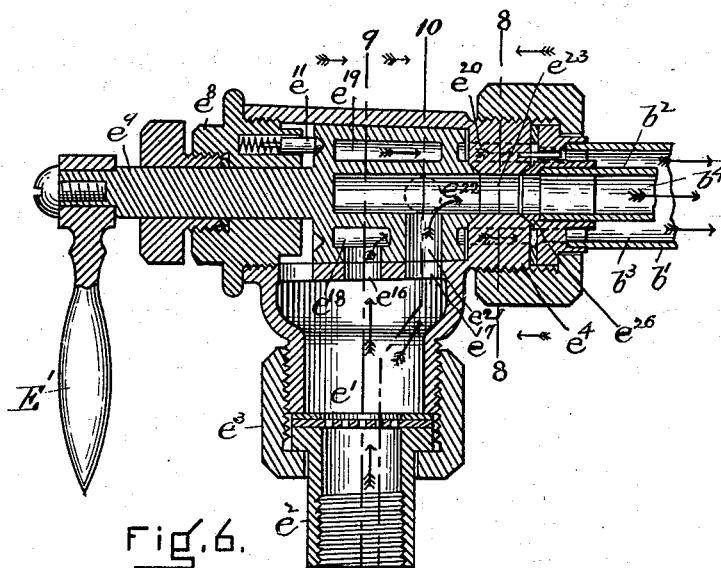
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3 Sheets—Sheet 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

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TRACK-SANDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 650,052, dated May 22, 1900.

Application filed December 30, 1899. Serial No. 742,120. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. SHERBURNE, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Track-Sanding Apparatus, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to the herein-described track-sanding apparatus.

It comprises a sand-box and air and sand ejectors at the sides of the box opposite each other, separated from each other by the width of the box, adapted to be attached singly or in groups to the sides of the box and connected upon the inside of the box by air-pipes with a coupling attached to the rear side of the sand-box and upon the outside of the sand-box with sand-distributing pipes.

The invention further comprises a valve in the system preferably located and operated in the cab of the engine.

It will be understood that this invention belongs to the class of track-sanding apparatus which employs, for forcing or conveying sand from the sand-box to the tracks, air drawn or taken from the air-supply of the air-brake system.

In the drawings, Figure 1 is a view in horizontal section of a portion of a locomotive sand-box and in plan of my improvement attached thereto. Fig. 2 is a view in horizontal section, enlarged, of one of the air and sand ejectors, representing its relation to the side of the sand-box and also its relation to the air-supply pipe and to the air and sand delivery or distributing pipe. Fig. 3 shows a form of coupling having branches connecting the main air-supply pipes with branch pipes and adapted to be secured to the back or rear side of the sand-box. Fig. 4 is a view in elevation of the controlling-valve, to which reference will hereinafter be made. Fig. 5 is a view in vertical central section thereof. Fig. 6 is also a view on the same section, representing the valve in a different position from that represented in Fig. 5. Fig. 7 is a view in rear elevation thereof. Fig. 8 is a view in vertical section upon the dotted line 88 of Fig. 6. Fig. 9 is a view in vertical section upon the dotted

line 99 of Fig. 6. Fig. 10 is a view in vertical section upon the dotted line 10 10 of Fig. 6. Fig. 11 is a view in horizontal section of a three-way coupling as distinguished from the six-way coupling of Fig. 3.

Referring to the drawings, A represents a portion of the wall of the sand-box of a locomotive. It has extending from its rear side and attached to it a coupling B, which connects the air-supply pipe or pipes B' outside the sand-box and extending from the train-brake supply through the cab to the sand-box with the air-distributing pipes B², B³, B⁴, and B⁵ inside the sand-box.

The coupling may be of the form shown in Fig. 3, which I term a "six-way" coupling, or it may be of the form represented in Fig. 11, which I call a "three-way" coupling. The six-way coupling is adapted to be coupled at its outer end b outside the wall of the sand-box to air-supply pipes B', consisting of the outer pipe b' and its inclosed pipe b², the outer and inner pipes providing the air-passages b³ and b⁴, respectively, the first of which connects with the air-passage b⁵ of the coupling and the second of which with the passage b⁶ of the coupling.

It will be seen that the passage b³ of the air-supply pipe surrounds the passage b⁴ and that the passage b⁵ of the coupling surrounds the passage b⁶. The passage b⁵ of the coupling extends through the sand-box and upon the inner side thereof is divided into the two branches b⁷ and b⁸, which in turn are connected with the passages in the pipes B³ B⁵. (See Fig. 1.) The passage b⁶ in the coupling extends through the wall of the sand-box and separates at its inner end into the branches b⁹ b¹⁰, which are connected in the sand-box, respectively, with the passages of the air-pipes B² B⁴.

The coupling B is shaped for attachment to the sand-box wall by having a shoulder b¹² to bear against the inner surface thereof and a threaded shank b¹³ to extend through the hole and receive the fastening-nut b¹⁴, whereby it is bolted to the wall of the box. It also has coupling-nut b¹⁵, which couples the collar b¹⁶, holding the ends of the air-pipes b' b² thereto. The coupling upon its inner side has outwardly-extending arms b¹⁷, b¹⁸, b¹⁹, and b²⁰, in which, respectively, are the branches b⁷, b⁸,

b^8 , and b^{10} of the air-passages. These arms are preferably constructed to receive and hold the ends of the air-pipes B^2 B^3 B^4 B^5 by having the passages through them enlarged sufficiently to receive and contain the ends of the pipes, which are secured in said arms by any suitable means, as by providing said arms with longitudinal slits and clamping-nuts. The air-supply pipes B^2 , B^3 , B^4 , and B^5 extend from the coupling at the rear of the sand-box to the sand-ejectors C C' C^2 C^3 at the sides of the sand-box, the ejectors C C' being arranged side by side and at one side of the sand-box and the ejectors C^2 C^3 being correspondingly arranged at the other side of the sand-box. The ejectors are alike in construction and operation and a description of one will answer for a description of all. The only difference between them is a difference in form, the ejectors C' C^3 being shaped to extend farther into the sand-box than the ejectors C C^2 in order that their inner ends may be conveniently located for receiving the ends of the air-supply pipes B^3 B^4 . Each ejector is distinct from all the others and is separately attached to the wall of the sand-box. Each has the shoulder c to bear against the inner wall of the box, the threaded shank c' , which passes through a hole in the wall of the box and receives upon its outer section the nut c^2 , which fastens it to the wall of the box, and the coupling-nut c^3 , which attaches the pipe-holder c^4 to the outer end of the threaded shank. The body c^5 of the ejector within the sand-box bears an obtuse angle to the shank, and it has at its inner end the extension c^6 at one side, to which the eye c^7 for receiving and holding the end of the air-supply pipe is attached by means of the threaded shank c^8 , passing through a hole in the extension, and a locking-nut c^9 . There extends through the ejector the passage c^{10} , which opens into the sand-box at c^{11} , extends through the body and shank, and opens at its outer end c^{12} into the passage c^{13} of the sand distributing or delivery pipe c^{14} . (See Fig. 2.) There is thus provided between the end of the air-supply pipe and the passage c^{10} a connection with the sand-box upon the side of the extension c^6 , which connection is open at the side and at the top and bottom to the box and by means of which sand in the box falls in front of the outlet of the air-supply pipe and is blown by the air through the passage c^{10} in the ejector to the passage c^{13} in the delivery-pipe outside the wall of the sand-box. The end of the air-pipe attached to the ejector by the eye c^7 is adjustable forward and back in the eye when the eye is released somewhat by the nut c^9 , and the end of the air-pipe is caused by tightening the nut to be rigidly clamped to the ejector. By this means the position of the outlet of the air-supply pipe with respect to the inlet c^{11} of the ejector may be varied. It will be observed that the extension c^6 is formed to provide a rest c^{15} for the end of the air-supply

pipe, which projects into the line of the passage c^{10} of the ejector and so that the end of the air-supply pipe held against it will have its passage centrally disposed with respect to the said passage c^{10} , the said rest also forming a wall which partially closes one side of the inlet c^{11} .

Each of the air-supply pipes B^2 , B^3 , B^4 , and B^5 is preferably of a light or ductile metal and is curved from a continuous arc or straight line at any point in its length sufficient to provide means for lengthening or shortening the actual distance between its ends, according as the distance between the coupling and the ejector may need to be increased or decreased. This result is most effectively obtained by means of a curve in the pipe of a bow shape, and this curve is lettered D in each of the pipes. It is really a make-up or compensating device whereby the position of its outlet may be changed at will.

Figs. 4 to 9, inclusive, represent the valve for controlling the feed of the air to the ejectors, and consequently the feed of the sand. It is represented as adapted to regulate the feed of the air to the four ejectors C C' at one side of the sand-box and C^2 C^3 at the other side of the box. It should be understood that it is desirable to simultaneously feed the sand either from the four ejectors or from either one of the two pairs made up of the ejectors C C^2 or C' C^3 , and the valve is organized to admit air to all the air-distributing pipes B^2 B^3 B^4 B^5 or to the air-distributing pipes B^3 B^5 or B^2 B^4 . It is also organized to shut off the supply from all the ejectors. The valve is preferably located in the engineer's cab.

E is the valve-case. It has extending at one side a threaded neck e , surrounding the air-inlet e' , and it is connected with any source of air-supply (preferably the train-brake supply) by means of a pipe e^2 , coupled by the coupling- e^3 to the neck. The case also has at one end the threaded neck e^4 , which is connected by a coupling-nut e^5 and a pipe-spacing holder e^6 with the ends of the pipes b' b^2 , which provide the air-passages b^3 b^4 , the latter being in the inner pipe b^2 and the former being in the outer pipe and surrounding the inner pipe, as above specified. The pipe-spacing holder e^6 is like the holder b^{16} , which holds and centers the other ends of the pipes with respect to the coupling B . It has shoulders against which the ends of the pipes rest and sleeves within which they extend and passages which are in extension of passages in the neck of the valve e^4 . The valve-chamber e^7 is conical in form, being largest at the handle end of the valve, and it is closed at said end by the screw-cap e^8 , which screws into the end of the valve-body and which supports the valve-spindle e^9 , extending through it, having at its inner end the conical valve e^{10} and at its outer end the operating-handle E' . The cap e^8 also has a spring-latch e^{11} , which engages notches e^{12} in the end of the conical valve and which serves to hold

the valve into any of its operative positions to which it may be moved by the handle E'. This latch is represented in the form of a plug having an outwardly-rounded or tapered outer end and as partially contained in the hole e^{12} in the cap, in which hole is also a coiled spring e^{13} , which bears against the inner end of the latch and serves to constantly bear against it to hold it against the end of the valve and move it into one of the latching-recesses e^{12} .

As above stated, the valve e^{10} is conical, and it is of a size to fit the conical side of the valve-chamber e^7 , its outer surface and said side forming the valve-seat. It is held seated by means of air-pressure obtained by introducing air from the air-supply passage e' through the port e^{14} into the chamber e^{15} between the end of the valve and the cap e^8 . The air under pressure is constantly contained in this chamber whatever the position of the valve may be and serves to maintain the valve seated. The wall of the valve-chamber has also the ports e^{16} and e^{17} , which connect the air-passage e' of the neck e with air-passages in the valve. The port e^{16} connects the air-passage e' with the port e^{18} of the conical valve, (see Fig. 6,) and this port e^{18} opens into the passage e^{19} in the conical valve, which in turn opens into the passage b^3 in the pipe b' through an intermediate connecting-passage e^{20} in the neck e^4 and in the collar e^{20} . This passage is shown by dotted lines in Figs. 5 and 6. The port e^{17} connects with the port e^{21} of the conical valve, and this port e^{21} opens into the central passage e^{22} in the conical valve, which in turn connects with the passage b^4 in the air-pipe b^2 through the intermediate passage e^{23} in the neck e^4 and in the collar e^{20} . (See Figs. 5 and 6.)

In addition to the ports e^{18} and e^{21} in the conical valve, which in Fig. 5 are represented to be in line with each other and which provide for the simultaneous flow of air from the air-passage e' through the passages of the conical valve to the air-passages b^3 b^4 , the conical valve has other ports F F'. The port F connects the air-supply passage e' with the passage in the conical valve connected with passage b^3 . The port F' connects the air-passage e' with the central passage e^{22} in the conical valve, which connects, as has already been stated, with the passage b^4 in the pipe b^2 . The conical valve also has the wall G, which serves to close both ports e^{16} and e^{17} from its passages and whereby the connections between the passage e' and the passages b^2 and b^4 are entirely shut off or closed when required.

From this description it will be seen that the conical valve is adapted to be moved to four positions with respect to the air-inlet e' ; that when its port F registers with the port e^{17} air will flow through the valve, the passage b^3 in the pipe b' , and the passages b^7 b^8 in the pipes B^3 B^5 and sand will be ejected by means of the ejectors C C'; that when the port F' of the valve registers with the port

e^{17} air will flow through the central passage of the valve, the passage b^4 in the pipe b^2 , and the passages b^9 b^{10} in the pipes B^2 B^4 and sand will be ejected by the ejectors C' C'; that when the ports e^{18} e^{21} of the valve register with the ports e^{16} e^{17} air will flow through the valve and through the two passages b^3 b^4 and the passages b^7 b^8 b^9 b^{10} of the pipes B^3 B^5 B^2 B^4 and sand will be ejected simultaneously by the two pairs of ejectors C C' and C' C', and when the valve is turned to bring the wall G against the inlet-ports e^{16} e^{17} the apparatus is at a state of rest, as no air can then reach the ejectors.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a track-sanding device a sand-ejector secured to the wall of the sand-box, having an inlet in the sand-box and an outlet outside the same and means for securing a sand-distributing pipe to its outer end, and its inner end having an extension e^6 beyond the sand-inlet and an air-distributing pipe, the end of which is secured to said extension with its outlet facing the sand-inlet.

2. In a track-sanding device a sand-ejector having a sand-inlet on the inside of the sand-box and a sand-outlet upon the outside of the sand-box and means outside the sand-box for attachment of a sand-distributing pipe thereto, the ejector having the extension e^6 beyond the sand-inlet, supporting an air-pipe holder or eye e^7 secured thereto by a threaded stem and nut and the air-supply pipe held by said eye or holder.

3. The combination in a track-sanding device of a sand-ejector, extending through the wall of the sand-box, having at one end a sand-inlet and at the other end a sand-outlet, the portion extending from the box being radially disposed with regard to it and the portion within the box bearing an obtuse angle thereto, and an air-feeding nozzle in proximity to the sand-inlet.

4. In a track-sanding device the combination of a sand-ejector, an air-pipe coupling and an interposed extensible air-supply pipe, as and for the purposes described.

5. In a track-sanding device the combination of a sand-ejector, a coupling, an interposed, air-supply pipe of a length greater than is necessary for the purpose of connecting the coupling with the ejector and which excess of length is in the form of an outward and return bend between two relatively straight or direct sections, as and for the purposes set forth.

6. The combination in a track-sanding device of two pairs of independent ejectors arranged opposite each other, each pair having a section inside the sand-box and a section outside the sand-box, a coupling having inside the sand-box two pairs of diverging passages and outside the sand-box two air-passages, one for each diverging pair of passages, and independent air-supply pipes connecting the two pairs of diverging passages with the

two pairs of ejectors, as and for the purposes set forth.

7. The combination in a track-sanding device of two pairs of sand-ejectors arranged opposite each other, each of which has a section within the sand-box and a section without the sand-box and each of which has its inner end curved to an obtuse angle; a coupling having two air-supply passages, each of which has two branches, and air-supply pipes connecting said branches with the sand-ejectors.

8. In a track-sanding device the combination of two pairs of independent ejectors, an air-coupling having two air-inlets and two branching passages and two outlets from each passage, air-supply pipes connecting the said outlets with the sand-ejectors, a valve-casing, two pipes connecting the valve-casing with the coupling, one contained within the other and providing two air-supply passages, the said valve-casing having an air-inlet, two air-outlets and a controlling-valve the casing of which has two stationary ports, and said valve having four movable ports and a cut-off, two of the movable ports being arranged to be brought simultaneously in line with the two stationary ports by the movement of the

valve and the third and fourth ports being arranged to be successively brought into register with the two stationary ports, two of said ports connecting with one of the air-outlets and two with the other of the air-outlets, as and for the purposes described.

9. In a track-sanding device a valve-casing provided with a conical cavity, an inlet having three entrances to the cavity and an outlet having two ways or passages connecting with the passages in the air-supply pipes, a conical valve contained in said conical cavity, a chamber at the outer end of said valve-casing connected with the air-inlet to receive air under pressure, the said valve having ports connected with its two passages in line with each other and ports connected with said passages out of line with each other and a cut-off whereby air may be simultaneously admitted to both passages, or independently admitted to either passage, or shut off from all the passages and all the sand-ejectors, simultaneously operated, or operated in individual pairs or held from operation.

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Witnesses:

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