

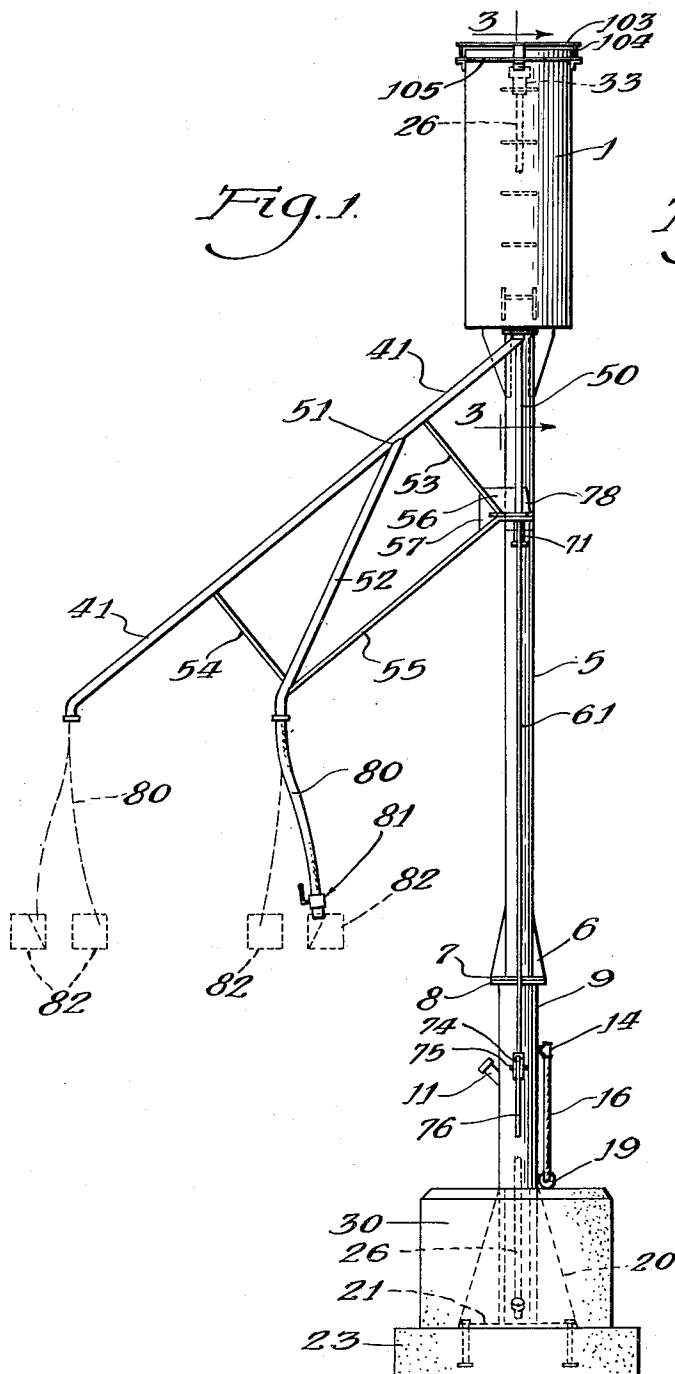
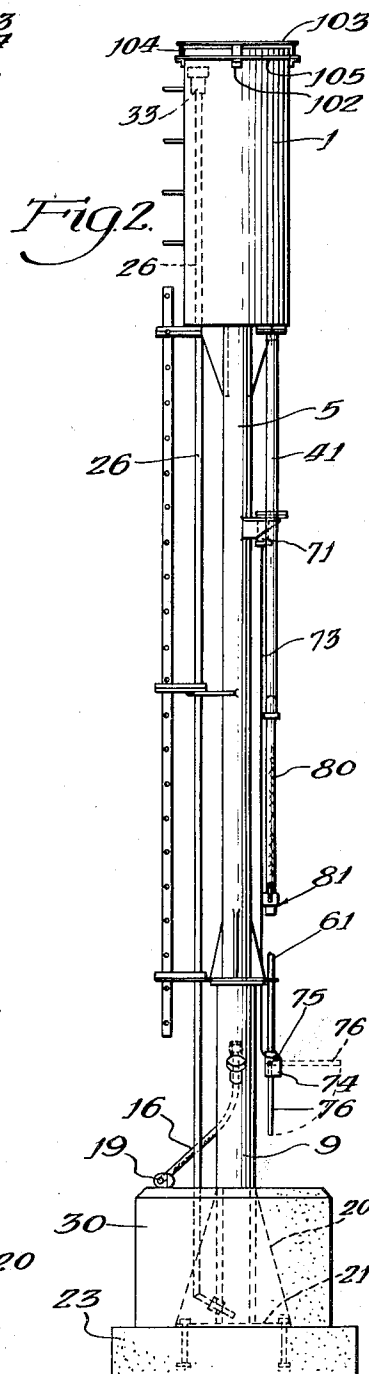
July 17, 1951

B. S. SNOW
SAND DISPENSER

2,561,148

Filed April 7, 1948

4 Sheets-Sheet 1



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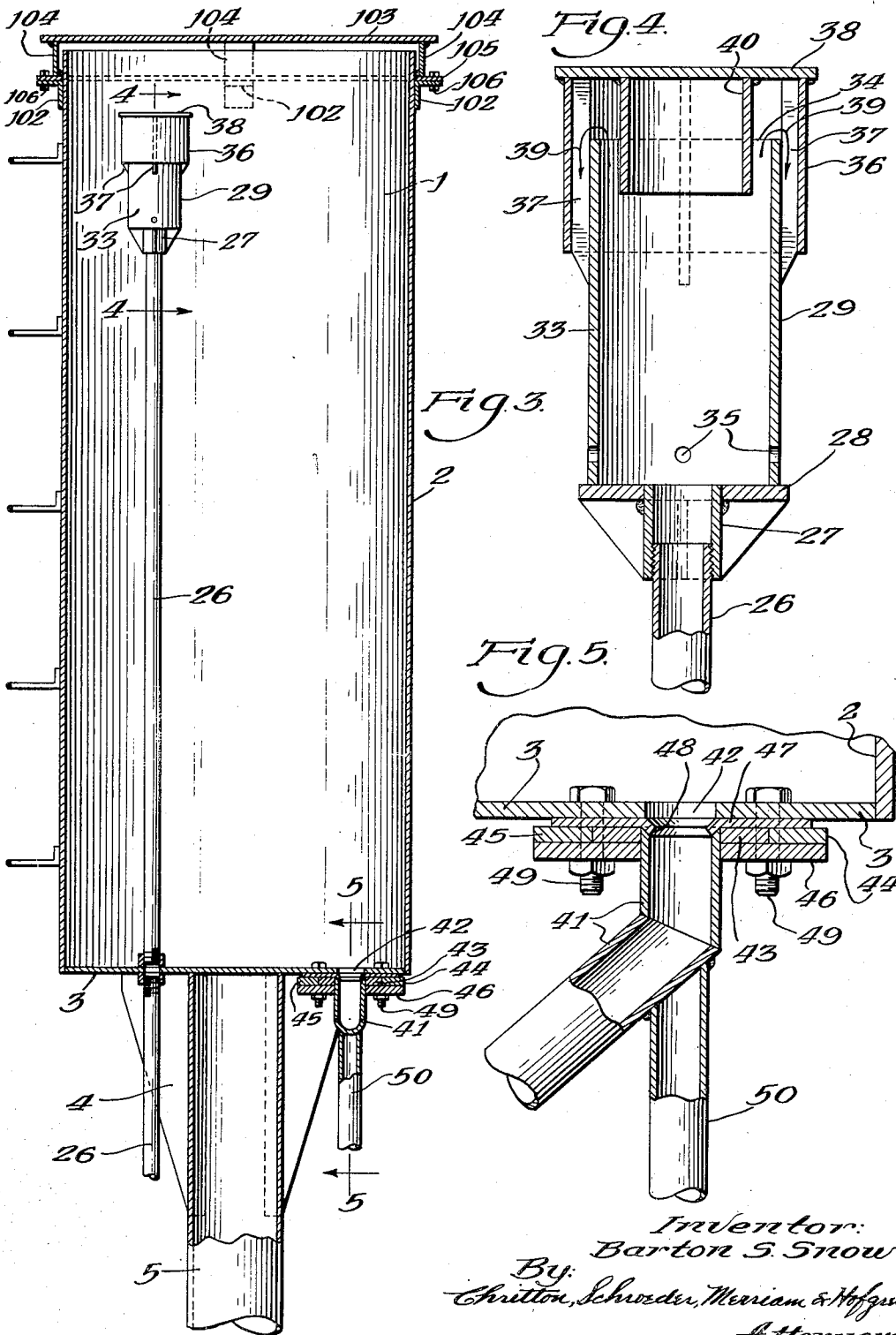
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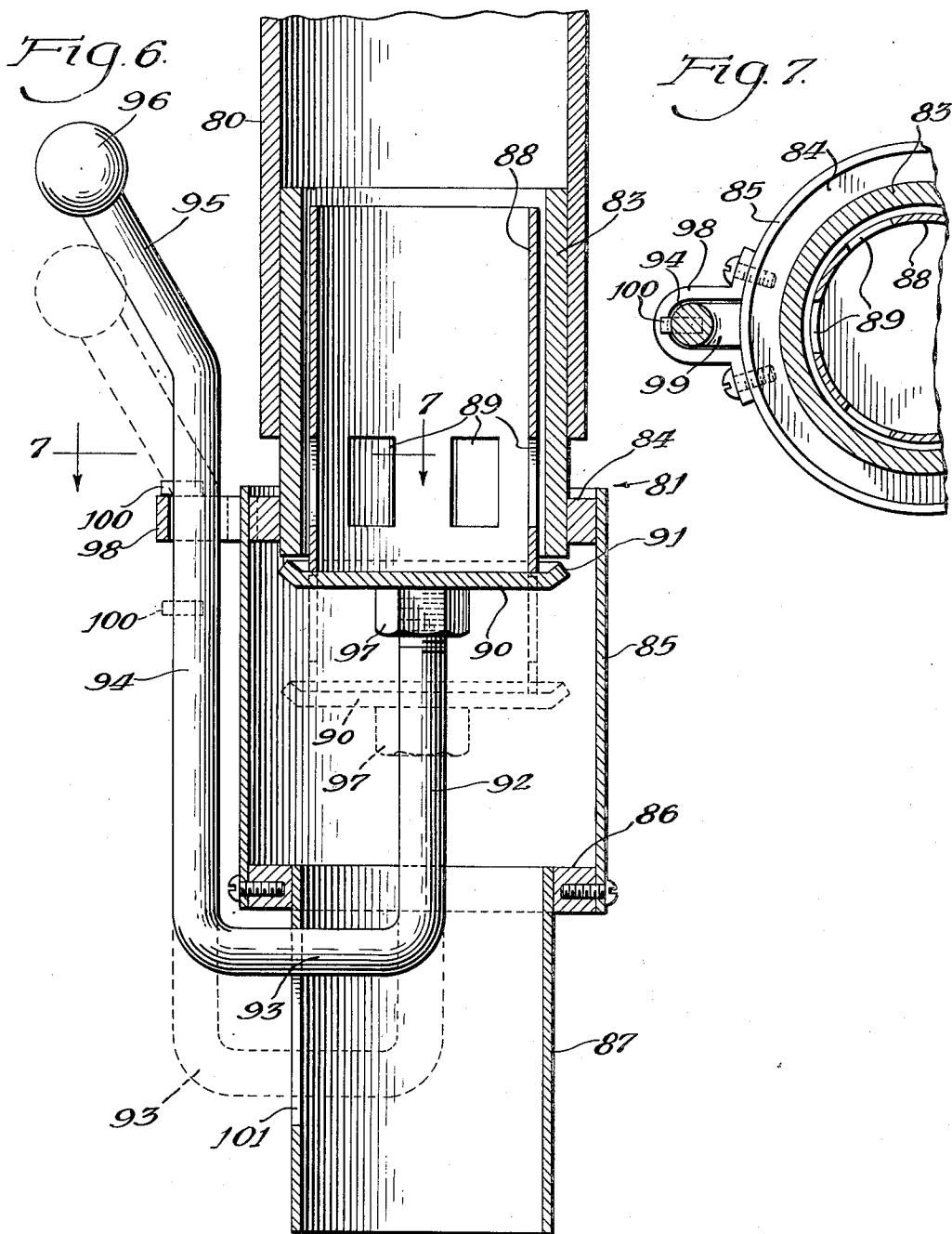
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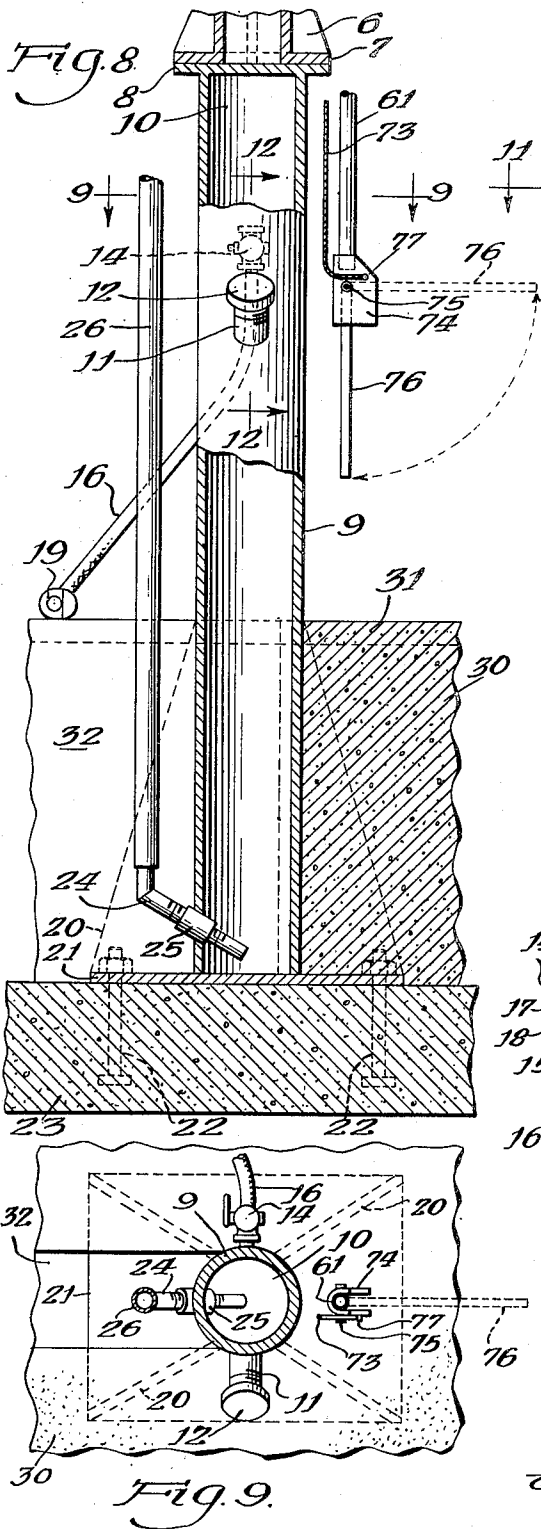
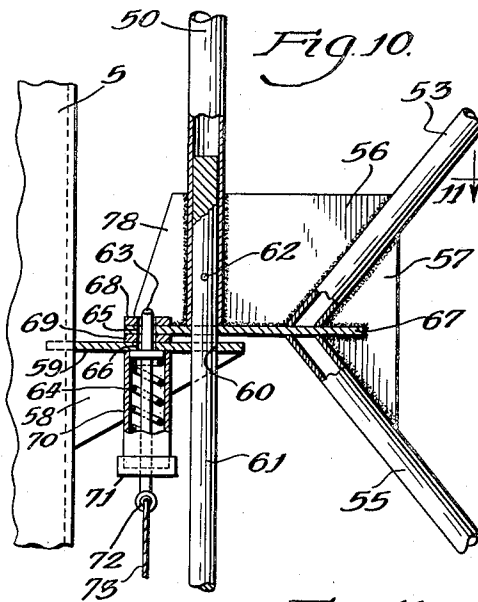
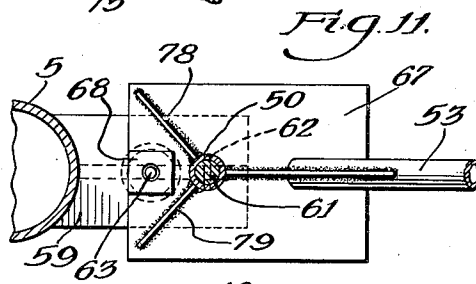
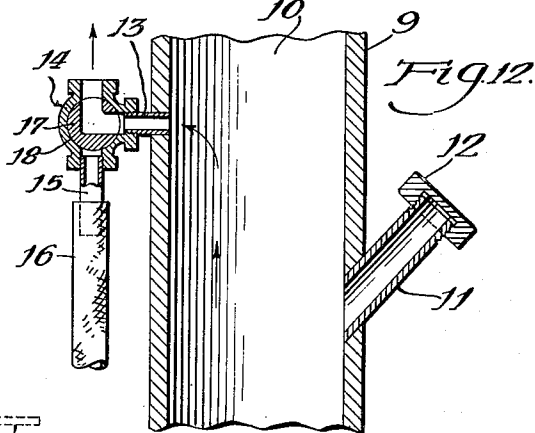
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UNITED STATES PATENT OFFICE

2,561,148

SAND DISPENSER

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2 Claims. (Cl. 222—185)

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This invention relates to sand dispensing apparatus, and while not limited thereto it is particularly adapted for filling the sand boxes on railway locomotives, particularly of the Diesel type.

The present invention is an improvement over that of my copending application Serial No. 552,229 filed September 1, 1944, now Patent No. 2,542,588 dated February 20, 1951.

Among the objects of my invention are: to provide a novel and improved sand dispensing apparatus; to provide sand dispensing apparatus having improved means for transferring sand into a storage tank and for dispensing the same to sand compartments in railway locomotives and other suitable locations; to provide sand dispensing apparatus having a plurality of dispensing spouts, and novel means for swingably mounting the same on sand tank supporting means, and novel means for manipulating said spouts during sand dispensing operations; to provide novel means for preventing erosion of the sand tank cover when introducing sand under pressure into the storage tank; to provide an improved valve whereby the flow of sand will be immediately stopped from flowing out of the discharge nozzle when the valve is closed; and such further objects, advantages and capabilities, inherently possessed by my invention, as will later more fully appear.

The invention is illustrated in a preferred embodiment in the accompanying drawings in which:

Fig. 1 is a side elevation of a sand dispensing apparatus embodying my invention and showing the sand dispensing spouts as swung horizontally into position for introducing sand into the sand compartments of a railway locomotive.

Fig. 2 is a side elevation looking toward the left hand side of Fig. 1.

Fig. 3 is an enlarged vertical longitudinal section on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged vertical longitudinal section on the line 4—4 of Fig. 3.

Fig. 5 is a fragmentary enlarged section on line 5—5 of Fig. 3.

Fig. 6 is an enlarged vertical longitudinal section through the sand dispensing valve.

Fig. 7 is a fragmentary transverse section on the line 7—7 of Fig. 6.

Fig. 8 is a fragmentary longitudinal section, partly in elevation, of the lower portion of the storage tank supporting column and the base footing therefor.

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Fig. 9 is a transverse section on the line 9—9 of Fig. 8.

Fig. 10 is a vertical section, partly in elevation, showing the means for rotatably supporting the spouts with relation to the supporting column.

Fig. 11 is a transverse section on the line 11—11 of Fig. 10.

Fig. 12 is an enlarged longitudinal section on the line 12—12 of Fig. 8.

In the embodiment illustrated in the drawings, a sand storage tank 1 having side walls 2 and a bottom wall 3, is mounted by means of angular brackets 4 to the upper end of a supporting column 5 of preferably tubular steel or the like.

Supporting column 5 is provided at its bottom end with reinforcing brackets 6 having an annular bottom flange 7, said brackets 6 being welded or otherwise fixed to the supporting column in any manner desired. Flange 7 is seated upon the top plate 8 forming the upper closed end of a bottom supporting column 9 having a hollow interior portion 10 for the initial reception of sand to be forced up into the tank 1 as later more fully explained.

As seen in Fig. 8 the bottom end of the tubular column 5 may be open, but such opening is closed by the top plate 8 which forms a sealed cover for the top of the chamber 10 within the bottom column 9. Bottom column 9, as seen in Figs. 8, 9 and 12 is provided with an upwardly and outwardly inclined tube 11 having threadably or otherwise secured at its outer end a closure 12. Sand may be introduced into chamber 10 through the tubular neck 11 and when filled to the desired degree cap 12 will be screwed thereon. Extending outwardly through the wall of bottom column 9 is a pipe 13 to which is secured a three-way valve 14 to one part of which is attached the tube 15 which in turn is secured to a hose 16. Rotatably mounted in valve 14 is a member 17 having an angular port 18 therein whereby when the rotatable member 17 is moved into the position shown in Fig. 12 air under pressure within the chamber 10 will be released to atmosphere to vent said chamber. When rotatable member 17 is rotated through an angle of 90° in a clockwise direction as viewed in Fig. 12 air under pressure will be passed from hose 16 through this valve and into chamber 10.

As seen in Figs. 1, 2 and 8 the free end of hose 16 is provided with a coupling 19 for connection to the air system of a railway locomotive having sand introduced into its sand compartments. The bottom column 9 is provided with strengthening brackets 20 welded or otherwise secured to

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this column and having at the bottom ends thereof a plate 21 forming and sealing the bottom of compartment 10. Plate 21 is firmly secured in position by bolts or other suitable projections 22 the lower ends of which are embedded in a concrete footing 23 initially poured in place below the frost line of the ground.

As seen in Fig. 8 a pipe 24 passes through a nipple 25 fixed in the wall of bottom column 9, the inner end of pipe 24 terminating near the vertical center of chamber 10 and slightly above the bottom plate 21. Outside of bottom column 9 the upper end of connection pipe 24 connects with a vertically extending pipe 26 which at its upper end passes through the bottom 3 of tank 1 and then extends upwardly through the open chamber within tank 1 to the nipple 27 welded or otherwise fixed to the bottom plate 28 of the blow head 29.

As soon as the concrete footing 23 has set a block of concrete 30 is poured in a suitable mold thereabove, the top surface 31 of concrete block 30 being approximately even with the top surface of the rails of the adjacent railroad track. In pouring concrete 30 an opening 32 is provided of approximately the outside diameter of the bottom column 9 to permit access to the bottom end of pipe 26 and the pipe connection 24 for renewal, repairs or the like.

Blow head 29 is formed with an upstanding tubular member 33 having an open upper end 34 and formed adjacent its bottom with a plurality of vent holes 35 to avoid the formation of a suction while sand is being blown upwardly through this blow head. Extending downwardly for a distance along the sides of the tubular member 33 is a cap 36 secured to this tubular member by a plurality of spacing members 37 spaced apart suitable distances circumferentially around the upper exterior portion of tubular member 33. Cap 36 has welded or otherwise fixed thereto a top plate 38 positioned a substantial distance above the top end 34 of tubular member 33. The spacing of the side walls of cap 36 from the side wall of tubular member 33 provides a plurality of passageways whereby sand when blown into the blow head will be forced over the top edge of the tubular member and downwardly through the spaces between these walls, the sand following the arrows 39 in Fig. 4.

In order to prevent the blast of sand from wearing a hole in the top plate 38 I have provided a downwardly extending sleeve member 40 welded or otherwise fixed at its top to the inner face of plate 38 and having its bottom end terminating a slight distance below the top edge of tubular member 33 and spaced radially inwardly therefrom to provide the space followed by arrows 39. As the sand enters this blow head it will fill the space within sleeve 40 after which the incoming sand will strike the sand deposited therein and be deflected sidewise and follow the path of arrows 39 into the space within the sand storage tank 1.

From the above it will be seen that sand may be initially poured into the bottom chamber 10 through the feed pipe 11 and after the cap 12 has been fastened in place air under pressure will be introduced above the sand in chamber 10 and the sand therein blown upwardly through pipe 26 and blow head 29 into the inner space of storage tank 1. As many charges of sand as desired may be thus introduced into the storage tank until the same is filled to the desired degree. Valve 14 will be manipulated as desired to either force air

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into chamber 10 or vent it from this chamber to the outside air as desired. Secured in circumferentially spaced relation to the outer surface of the upper end portion of sand storage tank 1 are a plurality of angle members 102. A cover plate 103 is provided having fixed to its under surface a plurality of circumferentially spaced downwardly extending legs 104 which at their bottom ends are welded or otherwise fixed to the flat annular plate 105. Annular plate 105 when the cover is in position on the tank will be bolted to angle members 102 by bolts 106 which may be removed when it is desired to remove the cover. As will be noted in Fig. 3 the inner surface of the cover plate 103 is elevated some distance above the top edge of the walls of tank 1, and the legs 104 being circumferentially spaced apart this provides an outlet and an inlet for air into the sand storage tank to permit it to breathe as the volume of sand therein may be increased or decreased. This cover also prevents entrance of the weather elements to the inside of the tank.

Rotatably mounted in the bottom 3 of storage tank 1 is a spout 41 the longitudinal opening therein alining with opening 42 in the tank bottom. At its upper end and just below opening 42, spout 41 has fixed thereto by welding or otherwise as desired, an annular flange 43 which is confined within a complemental opening in the pair of side plates 44 and 45. Side plates 44 and 45 and flange 43 are seated above the bottom plate 46 having an opening to receive the spout 41, and above flange 43 and plates 44 and 45 there is positioned a metallic gasket member 47 having an opening in longitudinal alinement with the opening in the spout and formed around the opening in this gasket with a downwardly inclined annular wall 48. The inclination of wall 48 is similar to that of the upper end of the spout 41 so that when these parts are clamped to the bottom 3 of the sand storage tank by a plurality of bolts 49 the spout may be rotated in a horizontal plane without any possibility of sand entering the space between metal gasket 47, flange 43, plates 44 and 45 and bottom plate 46. This enables rotation of the spout in a swinging direction without undue wear between the parts.

Fixed near the upper end of spout 41 with its longitudinal axis in alinement with the longitudinal axis of that portion of spout 41 which joins tank bottom 3, is a downwardly extending tube 50 welded or otherwise fixed to the spout as seen in Fig. 5. By having said openings in longitudinal alinement rotation of tube 50 will cause rotation of spout 41 in a horizontal swinging direction. Connected to spout 41 at 51 and extending downwardly divergently therefrom is a second spout 52, these two spouts being rigidly secured together by the bracing framework composed of the tubular end members 53 and 54 fixed to spout 41 at their upper ends. The end brace 54 at its bottom end is welded or otherwise fixed to the spout 52. Also fixed to spout 52 at its lower end is a lower tubular bracing member 55. Tubular bracing members 53 and 55 at their adjacent ends are welded or otherwise fixed as desired to a supporting plate 56 as shown in Fig. 10. As further bracing these ends of members 53 and 55 together an angular plate member 57 is welded thereto in the angle between the ends of these bracing members 53 and 55.

Welded or otherwise fixed to the outside of the upper supporting column 5 and adjacent the meeting ends of bracing members 53 and 55 is

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a metal bracket 58 having a flat upper plate 59. Plate 59 near its outer end is formed with an opening 60 within which rotates the downwardly extending arm 61 which arm extends at its upper end above plate 59 and into the tube 50 which as stated, is at its upper end fixed to spout 41. Arm 61 is fixed to tube 50 by any suitable means such as a pin 62 so that these parts will rotate together when depending arm or rod 61 is rotated. Tube 50, and brace members 53 and 55 being welded or otherwise fixed to plate 56 it will be seen that rotation of arm or rod 61 will cause the two spouts 41 and 52 to swing laterally in horizontal planes.

In Fig. 10 the detent pin 63 is yieldably pressed upwardly by means of a coil spring 64 through openings 65 and 66 in plates 67 and 59 respectively. As seen in Fig. 10 plate 57 is also welded or otherwise fixed to brace members 53 and 55, and to plate 67 so that these parts move together as a unit. A suitable reinforcing member 68 may be fastened above plate 67, and a similar reinforcing member 69 is fixed above plate 59, these reinforcing members having holes in alignment with holes 65 and 66 in plates 67 and 59. The detent pin 63 may be withdrawn downwardly to permit swinging movement and then released so that when the spouts return to their initial position the detent pin will again snap into the hole in each of plate 67 and member 68 to securely hold the spouts till needed for use again.

Coil spring 64 is mounted within the cylindrical casing 70 and detent pin 63 passes through the bottom cap 71 of such casing. At its lower end below the casing, pin 63 is formed with an eyelet 72 to which is attached a flexible pull member 73 so that when this pull member is pulled downwardly detent pin 63 may be removed from the holes above reinforcing member 69 to permit swinging of the spouts and bracing framework thereof. As seen in Figs. 1, 2 and 8 the arm or rod 61 at its bottom end is provided with a bracket 74 to which is fulcrumed at 75 a handle 76 so that said handle may hang straight down by gravity when out of use and when it is desired to swing the spouts the handle may be moved upwardly into the dotted line position shown in Figs. 2 and 8. The flexible pull member 73 may be secured to bracket 74 at 77, to be readily available to be puller by the operator when swinging of the spouts is desired. As seen in Fig. 11 diverging brace members 78 and 79 may be welded or otherwise fixed to the upper surface of plate 67 and along their vertical edges welded or otherwise fixed to the bottom end portion of tube 50 for bracing purposes.

Secured to the bottom end of each of spouts 41 and 52 is a flexible hose 80 to the bottom end of which is connected a sand valve 81 adapted to be respectively positioned for discharging sand into the sand boxes 82 located in the railway locomotive (not shown). The details of this sand valve will be understood in Figs. 6 and 7. This valve has a tubular member 83 adapted to be pushed with a frictional fit, or otherwise secured, in the lower end of the nozzle 80. Fixed to the lower end of tubular member 83 on the outside surface thereof is an annular collar 84 to which is fixed the upper end of a second tubular member 85. This second tubular member has fixed to the inner surface of its lower end a collar 86 to which is fixed a third tubular member 87. Slidably mounted in tubular member 83 is a sleeve 88 which adjacent its lower end is

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formed with a plurality of circumferentially spaced openings 89. Fixed to the bottom end of sleeve 88 as viewed in Fig. 6 is a bottom plate 90 having slightly upturned inclined marginal edges 91. The overall diameter of plate 90 is greater than the inner diameter of tubular member 83 so as to form a closure for the bottom end of tubular member 83. In Fig. 6 plate 90 is shown in its closed position, but it is pointed out that it is not necessary that the same actually contact the bottom edge of tubular member 83, but it is sufficient if it stand a slight distance away therefrom, as sand will not flow horizontally. The upper edge of the inclined marginal edge of plate 90 is however sufficiently close to the bottom end of tubular member 83 to prevent sand from flowing therethrough when the plate 90 is closed. From the above it will be seen that when closure plate 90 and sleeve 88 are lowered as a unit, sand within sleeve 88 and hose 80 will flow out through openings 89 down through the hollow interior of tubular member 85 and thence downwardly through the tubular member 87 which later serves as a nozzle for guiding the sand into its place of deposit. Also it is to be noted that when sleeve 88 and closure plate 90 are moved upwardly into closed position the flow of sand will immediately stop instead of requiring an interval of time to empty the hose when the valve is positioned at a higher level.

To provide for opening and closing manipulation of sleeve 88 and closure plate 90, which jointly constitute a piston, I have provided a handle means in the form of a U-shaped member having the inner upwardly extending leg 92, the lower laterally extending leg 93 and the outer upwardly extending leg 94 which latter at its upper end has an outwardly inclined handle portion 95 provided with a ball 96 for convenience in manipulation. The inner upwardly extending leg 92 is fixed to bottom plate 90 by being screwed into a nut 97 fixed to the bottom plate. Collar 84 adjacent the handle portion 95 has fixed thereto a laterally extending yoke 98 having a slot 99 of sufficient length to permit the outer upstanding leg 94 to have lateral movement therein when pressure is exerted inwardly against the ball 96. When such pressure is released leg 94 will return to its outer position with some pressure against the outer end of slot 99 due to the inherent resiliency of this U-shaped handle member. Fixed at a suitable vertical location to the outer edge of the upstanding leg 94 is a stop member 100 which when the leg 94 is released will rest on the upper edge of the outer end of yoke 98. At this time the bottom plate 90 is in closed position. When it is desired to open the valve the ball 96 is pushed inwardly to free stop member 100 from the adjacent edge of yoke 98 after which the U-shaped handle member and the piston within tubular member 83 will be lowered as shown in dotted lines in Fig. 6. This will permit sand to flow from hose 80 through the nozzle 87 into the place of deposit. To permit such vertical movement of the U-shaped handle member the tubular member 87 is formed with a vertical slot 101 within which the laterally extending leg 93 is vertically movable during manipulation of the valve. During use of the valve it may be closed by raising the U-shaped handle member to position stop member 100 above the yoke member 98 and then releasing the pressure thereon to again position stop member 100 above the yoke when

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the handle may be released and flow of sand through the valve will be instantly stopped. This prevents the flowing of more sand than is desired into the place of deposit, as would occur should the valve be positioned at the top end of the hose.

The foregoing detailed description is given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, for some modifications will be obvious to those skilled in the art.

Having described my invention, I claim:

1. In a railway sand dispenser for dispensing sand into the sand compartments of a railway engine, a sand storage tank, supporting means for supporting said tank in an elevated position, a spout rotatably connected to said tank for swinging movement in horizontal directions, a second spout connected to the first mentioned spout to extend divergently therefrom, a framework for bracing said spout and said divergent spout in fixed relation to each other, a bracket fixed to said supporting means, a plate rotatably connected to said bracket and fixed to the framework, a pivot member rotatable in the bracket and rigidly secured to said framework and to said first mentioned spout in axial alignment with the pivotal axis of the first mentioned spout with the tank, and a downwardly extending arm fixed to said pivot member to be available to an operator on a lower level, whereby said spouts may be swung as a unit across an engine for servicing.

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2. A sand dispenser as claimed in claim 1, in which said downwardly extending arm has a handle swingably mounted at its lower end for selectively hanging straight down to be out of the way and for moving to a position approximately at right angles to the arm to serve as a handle.

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