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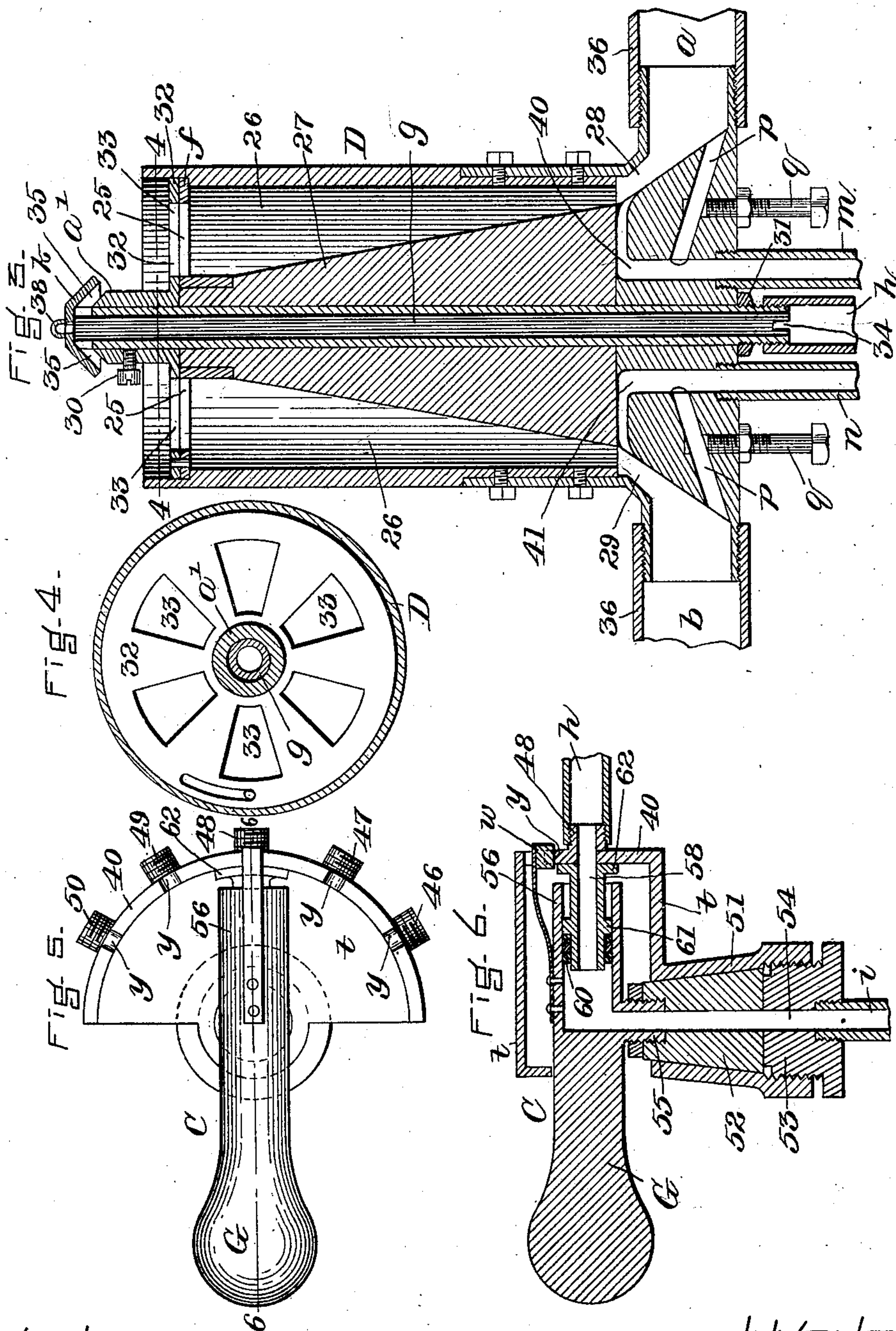
J. H. HANLON.

PNEUMATIC TRACK SANDING APPARATUS.

(Application filed July 10, 1899.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES.

A. D. Grover.  
Fred E. Dorr.

INVENTOR.

John Henry Hanlon.  
by *P. C. Schumacher*  
Att'y.



# UNITED STATES PATENT OFFICE.

JOHN HENRY HANLON, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO WILLIAM JAMES HANLON, OF FITCHBURG, MASSACHUSETTS.

## PNEUMATIC TRACK-SANDING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 633,194, dated September 19, 1899.

Application filed July 10, 1899. Serial No. 723,414. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN HENRY HANLON, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Pneumatic Track-Sanding Apparatus, of which the following is a specification.

My invention has for its object to improve the construction of pneumatic track-sanding apparatus for locomotive engines and cars, whereby the sand is caused to pass more evenly and uniformly and with absolute certainty from the sand-box to the distributing-pipes and all liability of the latter becoming obstructed by the packing of the sand therein entirely avoided.

To this end my invention consists in certain novel features and combinations of parts, as will be hereinafter described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a locomotive-engine having my improved pneumatic track-sanding apparatus applied thereto. Fig. 2 is a vertical section on the line 2 2 of Fig. 1. Fig. 3 is an enlarged vertical section of one of the casings which are connected with the bottom of the sand-box and through which the sand passes to the delivery or track-sanding pipes. Fig. 4 is a horizontal section on the line 4 4 of Fig. 3. Fig. 5 is a view of the valve which controls the admission of compressed air to the various air-pipes of the track-sanding apparatus, one side of the valve being removed to show the parts behind the same. Fig. 6 is a section on the line 6 6 of Fig. 5.

In the drawings, A represents the boiler of a locomotive-engine, and B the sand-box mounted as usual upon the top of the same and from which the sand passes through the front and rear sand-delivery pipes *a b* to the rails beneath, each sand-pipe being provided in the present instance with a tip or nozzle 10, with which is connected a pipe *c* or *c'*, communicating with the compressed-air reservoir of the engine and controlled by a five-way valve *c* in the engineer's cab, to be hereinafter described.

On each side of the sand-box B and con-

nected therewith at or near its bottom, as shown in Figs. 1 and 2, is a tubular casing D, the inner end of which is provided with a circular plate *f*, having openings 25, Fig. 3, for the passage of the sand to the annular space 26, formed between the interior of the casing and a hollow conical core 27, centrally arranged within said casing, the sand passing through this space 26 to the sand-delivery pipes *a b*, connected with the opposite sides of the casing, as shown in Fig. 3, and communicating with its interior through sand ports or passages 28 29.

*g* is a tube extending up through the center of the core 27 and fitted to turn axially therein, said tube, which is held in place by a set-screw 30 at the top and a nut 31 at the bottom, having secured to its upper end by a hub *a'* and the screw 30 a disk 32, provided with openings 33, corresponding to the openings 25 of the plate *f*, with which it lies in contact, as shown in Fig. 3, thus forming a register or shut-off valve for the sand. The openings of these plates normally register when the apparatus is in use, as shown in Fig. 3, but when repairs are to be made, and the parts at the base of the casing D required to be disconnected, the tube *g* is turned by a screw-driver or other implement placed within a notch 34 at its base, whereby the disk 32 is turned to close the openings 25 in the plate *f*, and thereby prevent the escape of sand from the sand-box. The tube *g* is connected with a pipe *h*, which in turn is connected through the medium of the valve C with a pipe *i*, Figs. 1 and 6, leading from the compressed-air reservoir *i'* of the engine. At the upper end of the tube *g*, which extends above the top of the casing D, is a cap or deflector *k*, by which the air-blast escaping through openings 35 at the top of the tube *g* is directed downward into the top of the casing D to blow the sand down through the openings 33 25 and thence through the space 26 and passages 28 29 into the horizontal portions 36 of the sand-delivery pipes *a b*. At the top of the pipe *g*, above the deflector *k*, is a nozzle 38, Figs. 2 and 3, curved to direct a blast of air horizontally across the interior of the sand-box B for the purpose of stirring



and loosening up the sand within the box, so that it will readily pass into the open ends of the two casings D D.

*m n* are two air-pipes connected with the base of the casing D and communicating through the medium of the five-way valve C with the common air-supply pipe *i*. These pipes *m n* communicate through passages 40 41 with the sand ports or passages 28 29, whereby the air-blasts are directed into and down said passages to the horizontal upper portions 36 of the delivery-pipes *a b*, thus blowing the sand down through said pipes and through the nozzles 10 onto the rails. The horizontal portions 36 of the delivery-pipes serve to hold the sand and prevent it from passing down to the rails when the air-blast is not in operation, the sand being normally free to pass down through the openings 33 and 25 of the disk 32 and plate *f* into and through the space 26 to said horizontal portions 36. *p p* are additional passages extending from the passages 40 41 to the sand-ports at the junction of the delivery-pipes *a b* therewith, two air-blast openings for each delivery-pipe being thus provided, so that should one become obstructed by scales or other substance the other will afford a sufficient escape for the air to force the sand into and through the delivery-pipe. Each of the passages *p p* is provided with a governor-screw *q*, which may be projected more or less into said passage to adjust or regulate the volume of air required to force the sand out of the delivery-pipe, which varies according to the length and size of the pipe used to deliver sand to the rails.

It will be observed that the mouths of the air-passages 40 41 and the passages *p p* are inclined downward at an angle to the line of gravity or the direction of the flow of sand through the sand-ports, whereby when the air-blast is shut off it will be impossible for the sand to enter said passages, which is a great advantage as it effectually prevents the accumulation of damp sand in said passages, which would be liable to clog or plug the same and render the apparatus inoperative.

Each of the air-pipes *h m n* is connected by a transverse pipe *r*, extending under the floor of the sand-box, as shown in Fig. 2, with a corresponding pipe entering the opposite casing D, whereby the air is supplied to both casings simultaneously to produce the delivery of the sand onto both rails at the same time. In like manner the air from the tubes *c c'* is supplied to the nozzle 10 on opposite sides of the engine by means of transverse pipes (not shown) extending across the track from one nozzle 10 to the corresponding one on the opposite side of the engine.

I will now describe the construction of the five-way valve C.

*t* is the hollow casing of the valve, a portion 40 of which is of semicircular form, as shown in Fig. 5, and is provided with five radially-arranged ports or openings 46 47 48 49 50 to the nipples of which are secured the

five air-pipes *c' c h m n*. Within the tapering portion 51 of the valve-casing is fitted a hollow plug 52, held in place by a screw-plug 53, having a central passage 54, into which is screwed the end of the pipe *i*, leading to the compressed air-reservoir *i'*. Into the smaller end of the hollow plug 52 is firmly screwed a nipple 55, projecting from a handle G, the front portion 56 of which is of tubular form and communicates through the nipple 55 and plugs 52 and 53 with the air-pipe *i*. Within the tubular portion 56 is fitted a hollow piston 58, open at both ends and sliding air-tight within the said portion 56 by means of packing-rings 60, placed behind the same against a collar or shoulder 61. The outer end of the piston 58 is provided with a flange 62, having its face curved to correspond to the curvature of the semicircular portion 40 of the valve-casing against which it is adapted to move with a ground or air-tight joint when the handle G is turned to bring the front open end of the piston 58 into line with any one of the ports 46, 47, 48, 49, or 50, with which it may be desired to bring the supply-pipe *i* into communication, the force of the air acting against the inner end of the piston and its packing, keeping the flange 62 tightly up against the corresponding concave face of the valve-casing, and in this manner the entrance of air to any one of the pipes *c', c, h, m, or n* may be independently controlled by a simple movement of the valve-handle G. The handle G is provided with a spring-catch *w*, which is adapted to engage a series of rounded notches *y* in the edge of the valve-casing, one for each port, thereby properly centering the piston 58 in line with the particular port and air-pipe to which it is desired to admit the air.

In operating my improved track-sanding apparatus, the engineer first turns the handle of the valve C to admit air successively to the pipes *c' c*, thereby clearing all of the sand-pipe tips 10 in front of and behind the driving-wheels. He then turns the valve to admit air to the central pipe *h*, whereby the sand within the sand-box is stirred up and loosened and blown down through the casings D D to the upper ends of the delivery-pipes *a b*. If the locomotive is going forward and he wishes to deliver the sand through the front pipes *a*, he turns the handle of the valve C into a position to admit air to the pipe *m*, thereby causing the air-blast to blow the sand down through the front delivery-pipes *a*, as required. If the locomotive is to be backed, he turns the valve to admit air to the pipe *n*, which causes the sand to be blown down through the rear delivery-pipes *b*, and in this manner the engineer can with the single valve C control independently of each other all of the air-pipes of the apparatus, which can thus be operated in a simple and expeditious manner.

The running position of the valve C is preferably with the outer end of the piston 58, between the ports 46 and 47, through which air is admitted to the tips or nozzles 10 of the de-



livery-pipes *a b*, and after the sand has been applied to the rails and has been shut off the said tips or nozzles 10 should be cleared of sand by an air-blast, ready for the next operation of the apparatus when required.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a track-sanding apparatus, the combination with the sand-box, of a casing entering the same at or near its bottom, and provided with a central core forming a space between the same and the interior of the casing for the passage of the sand, a track-sanding pipe or pipes communicating through sand-ports with the outer end of said casing, and leading therefrom to the rails, an air-supply pipe passing centrally through the casing, and provided above the inner end of the same and above the floor of the sand-box with means for directing the air-blast down through the casing to carry the sand through the sand port or ports, an air-pipe communicating through a passage or passages at the base of the casing with the sand-pipe at its junction with the casing, and means for controlling the admission of compressed air to the air-pipes, substantially as described.

2. In a track-sanding apparatus, the combination with the sand-box, of a casing connected therewith at or near its bottom, and provided with a central core forming a passage for the sand between the same and the interior of the casing, track-sanding pipes connected with the casing at its bottom, and communicating with the interior through sand ports or openings, air-passages having air-pipes connected therewith, and arranged to direct air-blasts into the upper end of the track-sanding pipes at their junctions with the said casing, an air-pipe extending centrally through the casing and beyond the upper end of the same, and provided with means for directing the air-blast down through the casing to carry the sand to the sand-pipes, a nozzle at the upper end of the central air-pipe arranged to direct a blast of air across the interior of the sand-box, and a valve for controlling the admission of compressed air to the several air-pipes, substantially as described.

3. In a track-sanding apparatus, the combination with the casing, its track-sanding

pipes, air-passages and central core, of an axially-movable air-pipe extending longitudinally through the said core, and provided at its top with means for directing the air-blast into the sand-box and down through the casing, a stationary disk located at the mouth or inner end of the casing, and provided with openings for the passage of the sand, and a movable disk overlying the stationary disk, and provided with openings adapted to register with the openings of said stationary disk, and forming a shut-off valve for the sand, said movable disk being secured to the axially-movable air-pipe, substantially as described.

4. In a track-sanding apparatus, the combination with a sand-box, of a casing having a central core and an air-pipe extending there-through, and provided with means for directing an air-blast downwardly through said casing, sand-ports through which the sand is delivered to the track-sanding pipes, the latter connected with the bottom of the casing, air-passages connected with air-pipes, and opening into the said sand-ports at their junctions with the sand-pipes, and governing-screws for regulating the volume of air passing through the air-passages, substantially as described.

5. In a track-sanding apparatus, the combination with the sand-box, its casing and the air-pipes connected therewith, of a governor-valve consisting of a casing having a face curved in the arc of a circle, and provided with openings, each having one of the air-pipes connected therewith, a plug having a passage communicating with a common air-supply pipe, a tubular handle connected with the valve-plug, and in communication with its air-passage, and a hollow piston open at both ends and sliding within said handle, and having its outer face curved to correspond to the curvature of the casing against which it is forced by the pressure of the air, and a suitable packing between the piston and the hollow handle, substantially as described.

Witness my hand this 6th day of July, A. D. 1899.

JOHN HENRY HANLON.

In presence of—

P. E. TESCHEMACHER,

M. B. WILSON.