O. JOHNSON.

TRACK SANDING APPARATUS.

APPLICATION FILED JULY 5, 1913.

**1,086,454.** Patented Feb. 10, 1914.

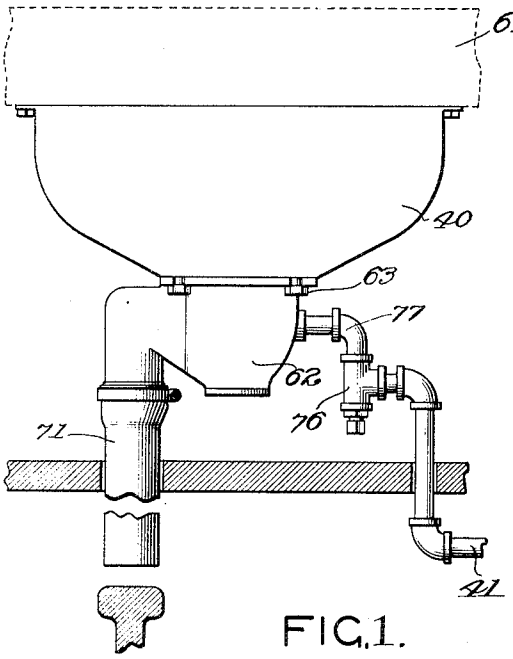



FIG. 1.

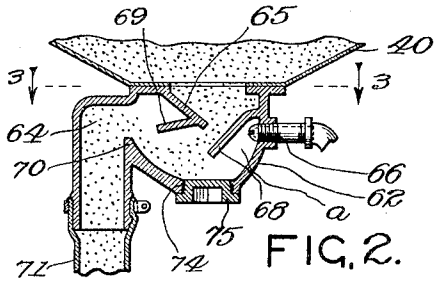



FIG. 2.

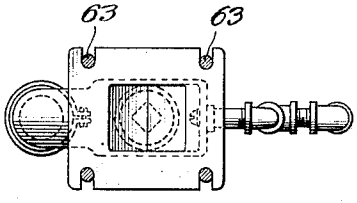



FIG. 3.

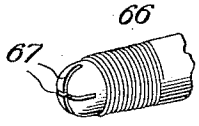



FIG. 4.

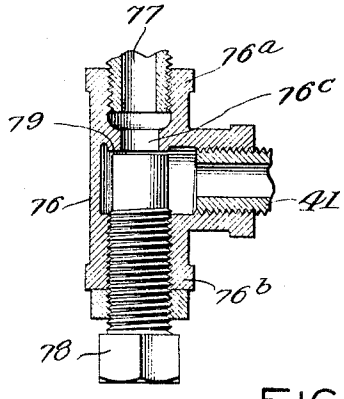



FIG. 5.

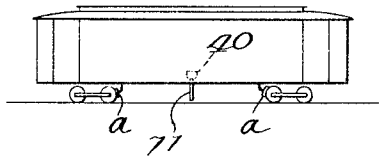



FIG. 6.

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# UNITED STATES PATENT OFFICE.

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## TRACK-SANDING APPARATUS.

1,086,454. Specification of Letters Patent. Patented Feb. 10, 1914.

Application filed July 5, 1913. Serial No. 777,382.

*To all whom it may concern:*

Be it known that I, OSCAR JOHNSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Track-Sanding Apparatus, of which the following is a specification.

This invention relates to track-sanding apparatus, and particularly to apparatus of the type used upon electrically propelled cars.

When an emergency application of the air brakes is made the wheels are likely to become locked and to slide on the rail, to obviate which it is necessary to increase the traction between the wheels and the rails by depositing sand on the latter. Heretofore, it has been customary to provide sand boxes beneath each platform, only those under the front platform being operated in making a stop. When a heavy application of air was made to the brakes, the wheels of the rear truck were likely to become locked before they reached the sanded portion of the track. When so locked, the wheels pushed before them sufficient scale and dirt to sweep the sand off the rails, thus nullifying the sanding operation so far as the wheels of the rear truck were concerned.

One of the objects of this invention is to arrange the track-sanding apparatus in such a way as to obviate the difficulty just mentioned.

Heretofore, the sand boxes and the trap have been located beneath the floor of the car, and thus the sand has been exposed to moisture and to freezing weather, in consequence of which sand in the trap has been liable to cake or freeze. When the sand is caked or frozen, the trap may fail to discharge the sand, or the air pressure may accumulate until the sand is discharged with such force as to scatter it over the right of way.

To avoid these disadvantages is one of the objects of this invention.

In previous forms of track-sanding apparatus, the nozzle that discharges air into the sand trap has been provided with a small substantially circular orifice, from which the air emerged in the form of a fine stream. When the sand is moist, such a fine stream is apt to bore a hole through the sand, without causing the discharge of an effective amount of sand.

A further object of the invention is to obviate the difficulty just mentioned.

Heretofore, it has been the practice to admit the compressed air directly to the nozzle, and the latter has become frequently clogged with sand, scale and particles of iron rust. When so clogged, it has been necessary to send the car to the barn, take apart the line of pipe containing the nozzle, clean the nozzle and replace the parts. It is impracticable to use a nozzle, the orifice of which may be readily adjusted or enlarged in case of clogging, because experience has shown that an adjustable nozzle is a temptation to the motorman to enlarge the opening for the purpose of obtaining a greater supply of sand. Such enlargement, however, leads to rapid exhaustion of sand and compressed air, the brakes being thereby rendered ineffective. Thus, when occasion arises for a quick application of the brakes to avoid an accident, the brakes fail to respond.

One of the objects of this invention is to provide an air inlet means for sand traps which can be readily cleaned and which is of such form and appearance as not to attract the attention of the motorman or permit of its convenient manipulation by unauthorized persons.

Further objects of the invention will be apparent from the following detailed description of one form of the invention.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is an elevation of a sand box, a sand trap and connected parts illustrating the arrangement thereof with reference to the car and the track. Fig. 2 is a vertical sectional view of the sand trap. Fig. 3 is a horizontal sectional view taken in the plane of dotted line 3 3 of Fig. 2. Fig. 4 is a perspective view of the nozzle. Fig. 5 is a sectional view of the adjustable air inlet. Fig. 6 is a diagrammatic view illustrating the relation of the sand discharge pipe to the car.

Certain features of the invention are applicable to sand traps and sand boxes located beneath the car platforms or in any other suitable or convenient places. In practice, sand boxes and traps would be arranged to discharge sand upon the rails beneath each platform. Such location of the sand boxes

and traps being old, I have not illustrated it herein, but have shown the invention as applied to a sand box and trap located within the car body.

In the drawings, 40 indicates a sand box and 62 a sand trap, both located within the car body, preferably beneath a transverse seat, as 61. The sand box may be of any suitable construction. The trap is detachably secured to the sand box by means of bolts and nuts 63. In the lower end of the trap body is a cleaning opening 74 which is normally closed by a screw plug 75. The sand outlet 64 is at one side of the trap body, and near the upper part thereof.

65 is a baffle to prevent sand from flowing directly from the sand box to the outlet.

At the side of the trap body, opposite to the outlet 64, is an air nozzle 66. In order to diffuse the air issuing from said nozzle, I form the orifice of two intersecting slits 67 or equivalent constructions affording a relative broad or diffused air discharge. In order further to insure effective action of the air upon the sand, I provide a baffle 68 inclined downwardly in front of the nozzle 66. Contact of the stream of air with the baffle 68 diffuses or breaks up said stream, said baffle also directing the air downwardly below the sand. The baffle 68 also keeps the sand away from the nozzle 66, thus preventing sand from caking upon or clogging the nozzle. A baffle 69 is provided to prevent the air from eddying or returning toward the baffle 68. It will be noted that the lower edges of the baffles 65 and 68 are in the same vertical plane, thus preventing the air pressure from holding back the sand and interfering with the flow of sand from the sand box.

The baffle 68 and the adjacent wall of the trap body form a chamber *a* into which the compressed air is admitted. The body of air in said chamber exerts its force against all the sand lying below the plane of the lower edge of the baffle 68. The pressure in said chamber increases until the pressure is sufficient to discharge the sand; and the pressure in said chamber may rise until it equals the pressure in the main reservoir. Thus if the trap contains a quantity of caked sand, high pressure is practically instantly available to force out the sand. When the sand is dry and granular, the air pressure simply causes the sand to overflow the barrier 70, the sand falling through the pipe 71 onto the rail under the action of gravity and without being blown through said pipe. In order to obtain a prompt and reliable discharge of the sand, the pipe 71 is made straight and is vertically disposed, as shown, thus obviating danger of choking at bends.

A sand box 40 and a sand trap 62 are preferably located midway of the length of the car, as indicated in Fig. 6, and at each side of the car, so that there is a pipe 71 above each rail. Thus when said traps and the sand traps beneath the front platform are operated, sand is supplied to the rails in front of each truck of the car.

In Fig. 6 *a* indicates the usual brake for each truck.

The means for supplying a proper amount of air to the nozzle 66 comprises a casing 76 having two alined internally screw-threaded ends $76^a$ and $76^b$. The upper end $76^a$ of the casing is connected to the nozzle by means of a pipe 77. The casing is connected at one side to the air supply pipe 41. In the lower end of the casing is a screw 78 extending longitudinally of the casing. The inner end of the screw 78 is preferably plane, and opposite such inner end is provided a plane surface 79 surrounding the opening $76^c$ through which air passes from the casing 76 to the pipe 77. In practice, the screw 78 is turned until its inner end is in contact with the surface 79. The screw is then unscrewed a suitable distance, say half a turn, to create a restricted opening establishing communication between the pipes 41 and 77. It will be seen that scale and other foreign matter will find lodgment in the lower portion of the casing without ordinarily obstructing the air inlet space formed between the screw 78 and the surface 79. If, however, it becomes necessary to clean out the air inlet casing 76, the screw 78 may be removed, and all foreign matter blown out through the lower end of the casing, it being unnecessary to disconnect any of the pipes. The end of the screw 78 that projects into the interior chamber of the casing 76 is made without screw-threads, in order that removal of the screw shall not be impeded or prevented by accumulation of foreign matter in the screw-thread.

It will be seen that the air inlet device just described does not have the appearance of a valve or an adjustable device, and moreover cannot be adjusted without the use of a wrench. Thus it is not likely to be tampered with by the motorman.

The devices herein described and claimed are substantially similar to those disclosed in my copending application Serial No. 744,304, filed Jan 27, 1913.

I claim as my invention:

1. In a track-sanding apparatus, a trap body having a compressed air inlet, a sand outlet, means for supporting a body of sand between said inlet and outlet, and an air expansion chamber between the air inlet and the body of sand.

2. In a sand-trap for track sanding apparatus, the combination of a trap body, an air nozzle attached to said body, a baffle in said body extending downwardly at an angle in front of said nozzle and adapted to dif-

fuse the stream of air that enters through the nozzle and direct said stream downwardly, and sand-discharging means for said trap body.

3. In combination, a trap body, sand-discharge means at one side of said trap body, air-inlet means at the opposite side of said body, a baffle in said body extending downwardly from the upper portion thereof toward the side at which the air-inlet means is located, and a baffle in said body extending downwardly and at an angle in front of and above said air-inlet means.

4. In combination, a trap body, sand-discharge means at one side of said trap body, air-inlet means at the opposite side of said body, a baffle in said body extending downwardly from the upper portion thereof toward the side at which the air-inlet means is located, and a baffle in said body extending downwardly and at an angle in front of said air-inlet means, the lower edges of said baffles being in approximately the same vertical plane.

5. In combination, a trap body, sand-discharge means at one side of said trap body, air-inlet means at the opposite side of said body, a baffle in said body extending downwardly from the upper portion thereof toward the side at which the air-inlet means is located, a baffle in said body extending downwardly and at an angle in front of said air inlet means, and a baffle in said body below the first mentioned baffle and adapted to prevent the return flow of air.

6. In a sand trap, a trap body having a sand outlet at one point; an air nozzle at another point, and a baffle forming with the trap body an air chamber into which the nozzle discharges, said air chamber being between the nozzle and the body of sand in the trap body.

7. In a track-sanding apparatus, the combination of a sand trap, an air pipe communicating with said trap, and an adjustable inlet for said pipe comprising a seat and a screw, the inner end of which is arranged close to said seat so as to form a restricted space for the passage of air.

8. In a track-sanding apparatus, in combination, a sand trap, a casing, a pipe connecting one end of said casing with said trap, a screw turned into the opposite end of said casing and providing between its inner end and a portion of said casing a restricted space for the passage of air, and an air supply pipe connected to said casing.

9. In a track-sanding apparatus, in combination, a sand trap, a casing, a pipe connecting the upper end of said casing with said trap, a screw turned into the lower end of said casing and providing between its upper end and a portion of said casing a restricted space for the passage of air, a space being provided in said casing below said restricted space for the lodgment of dirt, and an air supply connected to said casing.

10. In a track-sanding apparatus, a sand trap, a nozzle for said trap, said nozzle having an orifice adapted to discharge a diffused stream of air and a part arranged to keep the sand away from the orifice.

11. In a track-sanding apparatus, a sand trap, a nozzle for said trap, said nozzle having an orifice adapted to discharge a diffused stream of air and consisting of a narrow slit and a part arranged to keep the sand away from the orifice.

12. In a track-sanding apparatus, a trap body, an air inlet at one side of the trap body, a sand outlet at the opposite side of the trap body, said body being adapted to receive sand between said air inlet and sand outlet, and said body having means to keep the sand away from the air inlet and form an air expansion chamber between the air inlet and the sand.

In testimony whereof I hereto affix my signature in presence of two witnesses.

OSCAR JOHNSON.

Witnesses:
EARL C. CARLSON,
GEORGE L. CHINDAHL.