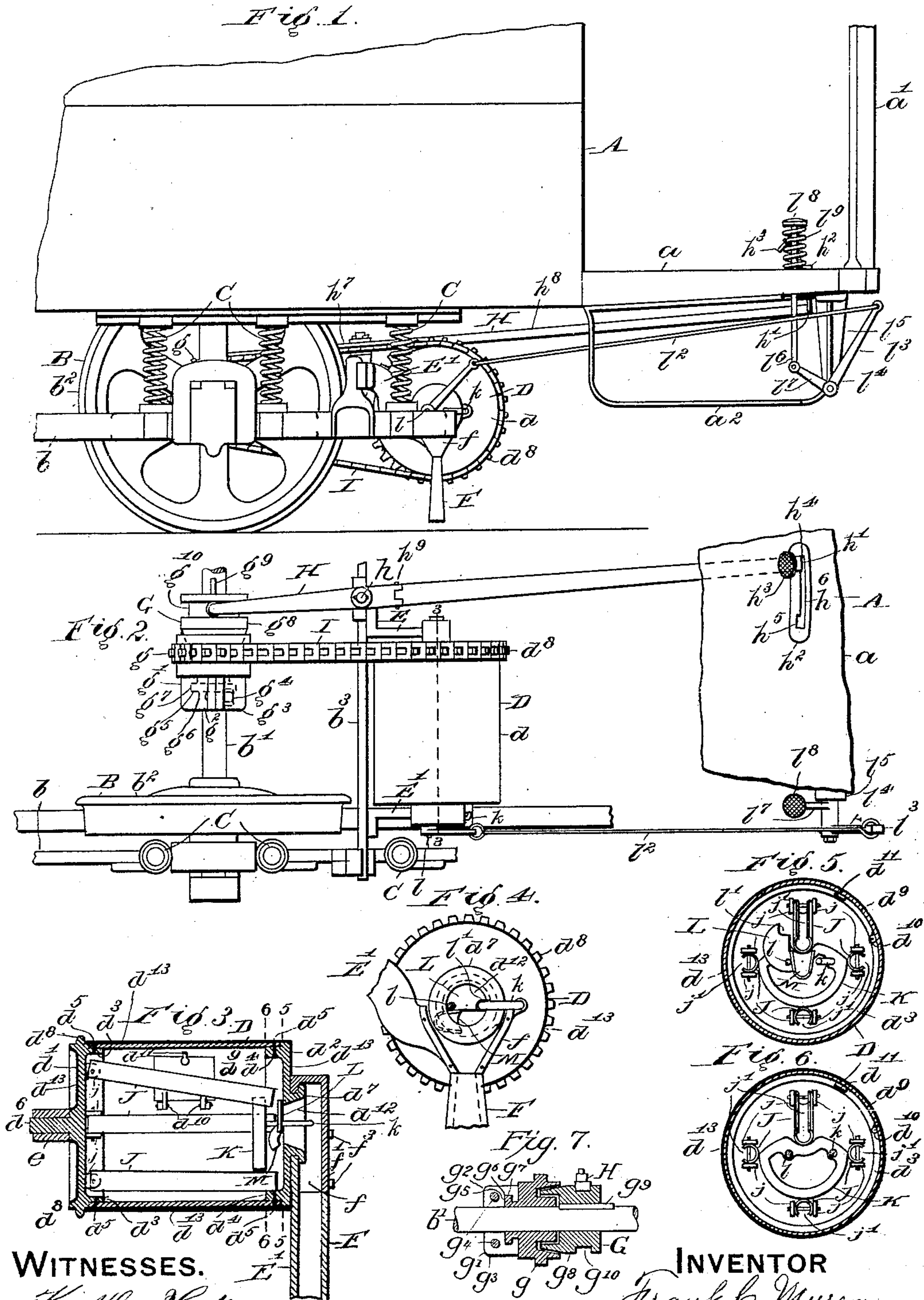


(No Model.)

F. C. MURRAY.
SAND BOX FOR STREET CARS.

No. 552,922.

Patented Jan. 14, 1896.



WITNESSES.

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SAND-BOX FOR STREET-CARS.

SPECIFICATION forming part of Letters Patent No. 552,922, dated January 14, 1896.

Application filed December 26, 1894. Serial No. 532,948. (No model.)

To all whom it may concern:

Be it known that I, FRANK C. MURRAY, a citizen of the United States, residing at Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Sand-Boxes for Street-Cars, of which the following is a specification.

My invention relates to sand-boxes for street-cars—as cars drawn by animals or driven by motors carried thereon—and is adapted to prevent the sand within the box from freezing by constant agitation of the sand within said box; to prevent the sand from being lodged or wedged in the delivery-tube, and to enable said tube to be cleared of any ice that may be formed therein; to deliver the sand from the box above the pile of sand in the box, thus allowing the box to be supported below the floor of the car without mutilation of the car-body, while securing a sufficient fall for the sand and enabling the valve of the sand-box to be placed above the sand, where it will not become clogged by the sand, allowing a waste of sand and rendering the box useless until the box is refilled; to prevent the lifting-tubes from being stopped by the sand, by making the slit through which the sand enters each of said tubes narrower than the discharge-ends of said tubes; and the said invention consists in the devices and combinations hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of an end portion of a car-body, including the platform and dasher, a part of the truck, and my improvement applied thereto; Fig. 2, a plan of a part of the truck, part of the platform, and my improvement; Fig. 3, a vertical central longitudinal section, transversely of the car, on the line 3 3 in Fig. 2, of the sand-box and delivery-tube; Fig. 4, an elevation of the outer end of the sand-box and of the delivery-tube, the upper part of the outer side of the tube being removed; Figs. 5 and 6, vertical transverse sections of the sand-box on the lines 5 5 and 6 6, respectively, in Fig. 3, the valve being drawn as closed in all the figures where said valve is shown, except in Fig. 5, where

said valve is represented as open, said valve not being shown in Fig. 6; Fig. 7, a vertical central longitudinal section of the sleeve and clutch and a front elevation of a part of the axle.

The car-body A, platform *a*, dasher *a'*, step *a''*, truck B, truck-frame *b*, axle *b'*, and wheels *b''* are all of the usual construction and operation, said car-body being elastically supported on said truck-frame by interposed springs C, in the usual manner.

The sand-box proper, D, is preferably supported by means of brackets E E' on the cross-girt *b''* of the truck-frame *b*, and consists of a hollow cylinder *d*, preferably of sheet metal, and two heads *d'* *d''*, preferably of cast-iron, provided on their inner surfaces with annular flanges *d'''* *d''''*, which enter the ends of the cylinder *d* and are secured therein by friction or other convenient means, as by rivets *d''''''*. The head *d'* has a central arbor *d''''''*, cast thereon or otherwise rigidly secured thereto, which turns in a journal-box *e*, with which the corresponding bracket E is provided, and the head *d''* is provided with a hollow cylindrical hub *d''''* which turns in a corresponding semicircular opening in the top of the bracket E', a portion of said bracket forming the back of the hopper-shaped upper portion *f* of the delivery-tube F, and the front, sides and top of said hopper being in a separate piece *f'*, cap or cover, secured, as by bolts or screws *f''*, to said bracket E', and the tube F, below said hopper, being represented as cast in one piece with said bracket E'.

The head *d'* has secured thereto, or preferably cast thereon, a sprocket-wheel *d'''*, and another sprocket-wheel *g* is loose on the adjacent car-axle *b'*, but is prevented from endwise movement thereon by a collar *g'*, formed in halves *g''* *g'''* secured to each other by bolts *g''''*, in such a manner as to clasp said axle firmly, said collar *g'* having a central internal enlargement *g''''* and an internal annular groove *g''''''* to receive the correspondingly flanged hub *g''''''* of the sprocket-wheel *g*, as shown in dotted lines in Fig. 2. The wheels *d'''* *g* are connected by a chain I.

The sprocket-wheel *g* forms one counterpart of a clutch G, (represented as a friction

or cone clutch,) the other counterpart g^8 of said clutch being a collar which slides on the axle b' and is prevented from turning thereon by a spline g^9 or key on said axle, in an obvious manner, said counterpart g^8 having an annular groove g^{10} to receive one end of a lever H, pivoted at h on the cross-girt b^3 and extending under the platform a , nearly to the end thereof. A leaf-spring h' is secured to the front end of said lever H and extends up through a slotted plate h^2 , secured in a hole in the platform, and terminates above said plate in a head h^3 which may be pressed by the foot of the motorman or driver to throw said spring out of either of the notches h^4 h^5 at the end of the slot h^6 of said plate h^2 , to allow the said lever H to be moved (by the foot) in such a manner as to couple or uncouple the clutch G. The clutch is represented as closed in Fig. 2. The lever H is formed in two parts h^7 h^8 , jointed to each other at h^9 in such a manner as to allow the part of said lever which carries said spring h' to rise and fall as the car-body rocks on the truck B without breaking said lever or lifting the other end of said lever out of engagement with the clutch counterpart g^8 .

The sand, gravel, salt or other material intended to be thrown on the rails is introduced into the sand-box or cylinder through the door d^9 which turns on hinges d^{10} and is fastened by a latch or button d^{11} in an obvious manner.

Within the cylinder D are arranged buckets J which, as said cylinder is revolved, raise the sand or other material above the center of said cylinder and drop said sand upon an inclined surface which causes the sand to be projected through the central opening d^{12} of the hub d^7 into the hopper or upper part f of the delivery-tube F, by which said sand or other material is directed upon the rail.

The buckets J are represented as tubes, each pivoted between ears j j , cast on or otherwise secured to the inner face of the head d' , and each slotted at j' from end to end, on the side of the tube next the curved wall of the cylinder D, so that, as said cylinder is revolved, the tubes are carried below the sand, where they are filled, and are then raised above the level of the sand in said receiver. The buckets being raised to a sufficient height by the rotation of the cylinder, their unsupported ends fall toward the center of the cylinder and strike upon a stationary cam K, arranged just within the end of said cylinder and supported upon an arm k , secured to the bracket d and curved around through the opening d^{12} , (see Figs. 3 to 6,) said cam being of such a shape that, as the cylinder continues to revolve, the tubes are successively crowded back toward their normal positions at the sides of said cylinder and passing below the cam are forced below the surface of the sand, keeping the sand constantly stirred up and thereby and by the slight heat generated by the friction of par-

ticles of sand on the tubes and on each other preventing the sand from freezing. When any tube falls upon the top of the cam, the inclination of the tube (see the upper tube in Fig. 3) and the shock causes the material contained in such tube to slide out of the lower free end of the tube, the slot j' of the tube being at this time at the top of said tube. When the tubes are below the sand-level, they are held out of actual contact with the body of the cylinder by the flange d^4 of the head d^2 , so that there is sufficient space for the sand between each tube and said body to admit the sand freely and, the slot being comparatively narrow, the wall of the tube at the sides of said slot acts as a scraper to loosen up the sand.

In fair weather, as in the summer, the clutch G will ordinarily be left open, but in slippery weather the clutch may remain closed. When the clutch is closed and the cylinder is rotating, the sand may be prevented from escaping by a valve L, of the shape shown in Figs. 3 to 5, pivoted at l on the cam K and having a notch l' to admit the arm k when said valve is closed, as shown in Fig. 4, and said valve being arranged just inside the head d^2 and between said head and said cam. When the valve is closed, as shown in Fig. 3, and the cylinder is rotating, the buckets or tubes merely serve as agitators, raising the sand and discharging it against the inner face of the valve, so that the sand from said buckets or tubes falls back into said cylinder. When the valve is open, some of the sand would fall from the ends of the tubes back into the cylinder were it not for a short trough-shaped incline or chute M, cast or otherwise secured on the lower edge of said valve, and when said valve is open or turned ninety degrees into the position shown in Fig. 5, arranged in the same vertical plane with the tube or bucket which at the time being is discharging but a little below said tube and extending from the front face of said valve back under the discharge end of said discharging tube or bucket, the momentum of the discharged sand being sufficient to carry it into said chute and from said chute into the flaring central opening d^{12} of the hub d^7 and thence into the hopper f . The pivot l of the valve is a crank connected by a rod l^2 to one arm l^3 of a bell-crank lever l^4 , fulcrumed on a stand l^5 secured to the under side of the platform a , and a vertical pedal-rod l^6 passes down through a hole in said platform and is jointed to the other arm l^7 of said lever l^4 , so that the motorman, by pressing with his foot upon the top or enlarged head l^8 of said pedal-rod, may open said valve. When the pressure is removed from said pedal-rod, said pedal-rod is raised by a spring l^9 , represented as a spiral spring surrounding said pedal-rod and compressed between said head l^8 and the platform a .

As a still further precaution against the freezing of the material in the cylinder, said

cylinder is covered with a material which is a poor conductor of heat, as paper, d^{13} , Fig. 3.

I claim as my invention—

1. The combination of a sand-receiver, adapted to be supported by a car and having a central opening in one end thereof, means for rotating the same, an incline, arranged to project sand placed thereon from said opening, and buckets, secured on the inside of said receiver and adapted to raise the sand in said receiver and to discharge the same upon said incline, as and for the purpose specified.

2. The combination of a sand-receiver, adapted to be supported by a car and having a central opening in one end thereof, means for rotating the same, an incline, arranged to project sand placed thereon from said opening, buckets, secured on the inside of said receiver and adapted to raise the sand in said receiver and to discharge the same upon said incline, and a discharge-tube, to receive sand from said incline and to deliver the same upon a rail of the track of said car, as and for the purpose specified.

3. The combination of a sand-receiver, adapted to be supported by a car and having a central opening in one end thereof, means for rotating the same, an incline, arranged to project sand placed thereon from said opening, and tubes, pivoted to the end of said cylinder farthest from said opening, and having longitudinal slots to receive sand contained within said receiver, and a stationary cam to support the free ends of said tubes while discharging and to restore the same to position to be again filled, as and for the purpose specified.

4. The combination of a sand-receiver or cylinder having an opening in one end thereof, a sprocket-wheel, fast thereon, a car-axle, another sprocket-wheel, carried by said axle, a chain, connecting said wheels, an incline, adapted to project sand placed thereon

through said opening, and buckets, arranged on the inside of said cylinder and rotating therewith and adapted to raise sand in said cylinder and to discharge the same upon said incline, as and for the purpose specified.

5. The combination of a sand-receiver or cylinder having an opening in one end thereof, a sprocket-wheel, fast thereon, a car-axle, another sprocket-wheel, loose on said axle and forming one counterpart of a clutch, another clutch-counterpart, a lever, engaging one of said counterparts, and adapted to be moved to close said clutch, a chain, connecting said wheels, an incline, adapted to project sand placed thereon through said opening, and buckets, arranged on the inside of said cylinder and rotating therewith and adapted to raise sand in said cylinder and to discharge the same upon said incline, as and for the purpose specified.

6. A sand-box, rotary on a horizontal axis and having a discharge opening in the end thereof and a valve, arranged to open and close said opening and turning in a vertical plane upon a stationary center, as and for the purpose specified.

7. The combination of a sand-receiver, adapted to be supported by a car and having a central opening in one end thereof, means for rotating the same, a valve, arranged to open and close said opening, a trough, secured to said valve and adapted to be brought into operative position by the opening of said valve, and buckets, secured on the inside of said receiver and adapted to raise the sand in said receiver and to discharge the same upon said trough, as and for the purpose specified.

In witness whereof I have signed this specification, in the presence of two attesting witnesses, this 20th day of December, A. D. 1894.

FRANK C. MURRAY.

Witnesses:

ALBERT M. MOORE,
KIRKLEY HYDE.