H. M. ESTABROOK.

CLOSURE FOR HOPPERS.

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1,105,639. Patented Aug. 4, 1914.

Fig 1.

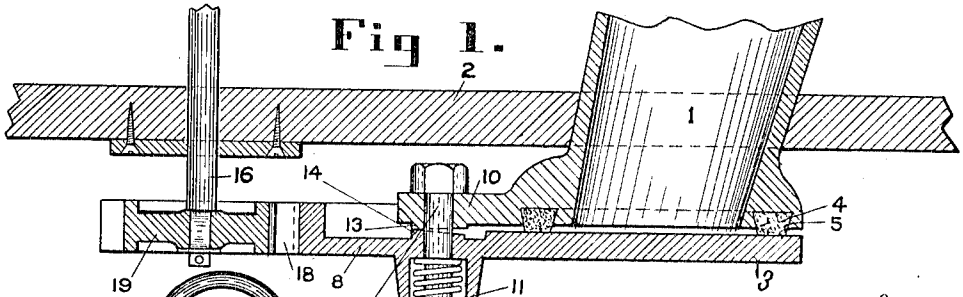


Fig 2.

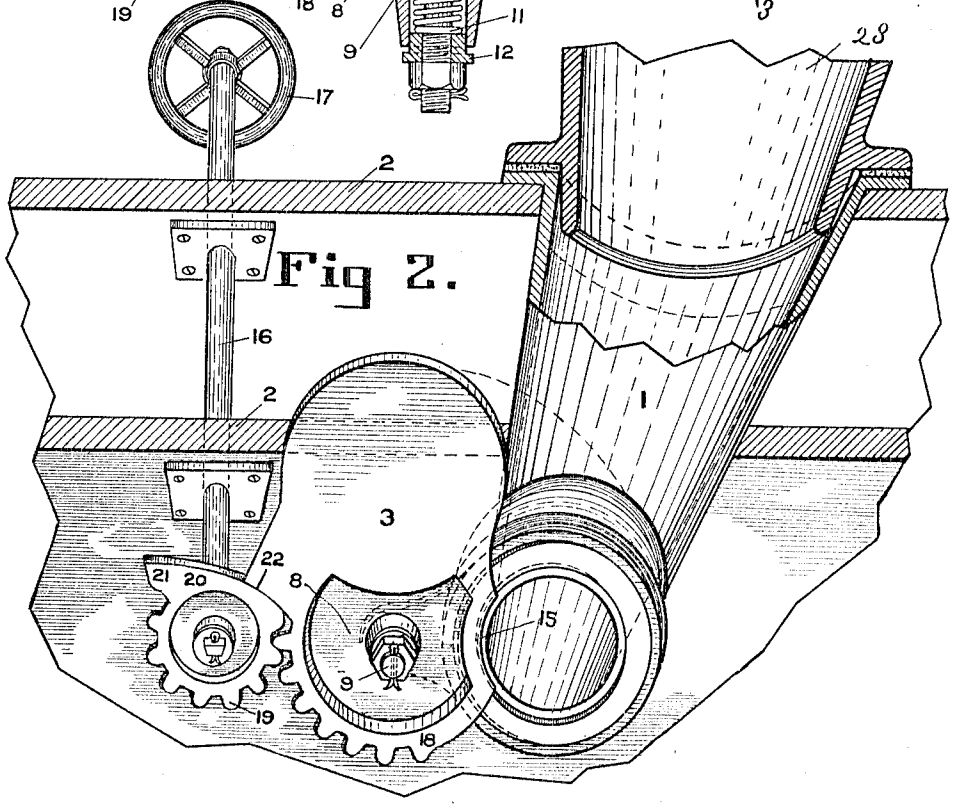
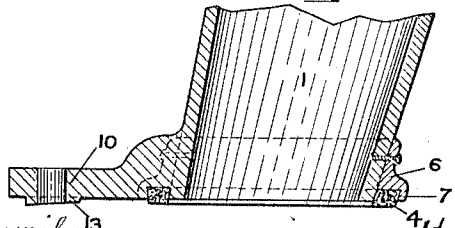


Fig. 3.



Attest.

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CLOSURE FOR HOPPERS.

1,105,639. Specification of Letters Patent. **Patented Aug. 4, 1914.**

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To all whom it may concern:

Be it known that I, HARRY M. ESTABROOK, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Closures for Hoppers, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to closures for hoppers and is designed more particularly for use in connection with the closets of railway cars.

As is well known it is common practice on both steam railroad and electric railroad cars to lock the doors of the saloons before the car enters a station and to keep them locked while the car is in the station and while it is passing through the streets of a city or town. This practice is not consistent with the best interests of the traveling public and is so objectionable that in some of the States laws have been enacted and in others orders have been issued by the State boards of health prohibiting the locking of the doors under these circumstances and making it compulsory to provide some means whereby the hoppers may be used at all times while the car is in service. Attempts have been made to accomplish this by providing the discharge end of the hopper with a closure or attaching thereto a receptacle having a closure. These devices have proved unsatisfactory because of the unclean and unsanitary conditions which follow their use, and further because the closures are of such a character that when in their open positions they are liable to be broken by contact with the truck or otherwise.

The object of the present invention is to provide a hopper closure which will be free from these objections, and, to this end, it is a further object to provide a closure which will be self cleansing; which, when in its closed position, will effectually seal the lower end of the receptacle which extends below the hopper proper and when in its open position will not be liable to injury; and further to provide means for controlling the position of the closure from the interior of the car.

In the accompanying drawings, Figure 1 is a sectional view, taken vertically through the lower floor of the car and the lower portion of the receptacle; Fig. 2 is a perspective view, partly broken away, of the hopper, the receptacle and the closure therefor; and Fig. 3 is a sectional view of the lower portion of a slightly modified form of hopper receptacle.

In these drawings I have illustrated one embodiment of my invention and have shown the same as applied to a hopper receptacle 1 of ordinary construction, the lower end of which extends through the floors 2 of the car and has its discharge opening arranged in a substantially horizontal plane. A closure 3 is supported adjacent to the lower end of the receptacle and is movable toward and away from the discharge opening of the same in a plane substantially parallel with the plane of that opening, thus causing the closure to have a sliding movement relatively to the receptacle. The relation of the closure to the receptacle is such that when the former is in its closed position the discharge opening will be effectually sealed, and, to this end, the receptacle is preferably provided with a gasket 4 extending entirely about the discharge opening thereof and adapted to engage the closure. In that form of the device shown in Figs. 1 and 2 this gasket is mounted in a dovetailed groove 5 formed in the enlarged lower end of the hopper. In Fig. 3 the gasket is held in position by means of a ring 6 extending about the lower portion of the hopper, rigidly secured thereto and having a depending flange 7 to engage the inclined outer wall of the gasket.

The closure may be supported in its operative relation to the receptacle in any suitable manner. In the present instance it is pivotally mounted on an axis extending at right angles to its line of movement, and, for this purpose, I have provided the closure with a lateral extension 8 which is connected by means of a pin 9 with an arm 10 carried by the receptacle and preferably formed integral therewith. Means may also be provided to press the closure constantly against the gasket when the former is in its closed position. To this end a spring 11 is coiled about the pin 9 below the lateral extension 8 of the closure and is confined between said extension and a suitable stop, such as a screw-threaded washer 12, mounted on the pin 9. The arm 10 and extension 8 are provided on their adjacent faces with bosses 13 and 14

respectively, the adjacent surfaces of the bosses being beveled to cause them to diverge toward the discharge opening of the receptacle and the closure, respectively. By reason of this construction the spring 11 causes the closure 3 to pivot on a horizontal axis and to press tightly against the gasket 4 and it will be apparent not only that the discharge opening is effectually closed but further that when the closure is moved toward its open position the gasket will remain in engagement with the inner face thereof and will scrape off any matter which may have accumulated thereon, the wiping action of the gasket serving to effectually cleanse the closure. Moreover, this construction serves to hold the outer edge of the closure, as well as the inner edge thereof, against the gasket, and as the closure is moved about its vertical axis the tension of the spring will be relieved without permitting the closure to drop away from the gasket. In this connection it will be noted that the fit of the bolt 9 and its coöperating parts is sufficiently loose, even when new, to permit of a slight movement of the closure about a horizontal axis and this looseness increases with use. Further, it will be apparent that inasmuch as the closure moves in a substantially horizontal plane it is supported above the trucks and in a position where it is not liable to injury. In the present form of construction the lateral extension 8 of the closure has a curved recess 15 in that side thereof which lies adjacent to the receptacle when the closure is in its open position. This recess, however, is merely incidental to the point of pivotal support for the present closure and is not an essential part of the device but may be wholly eliminated by a slight alteration of the size or shape of the extension or a slight change in the location of the pivotal support therefor.

Movement may be imparted to the closure in any suitable manner. Preferably, a suitable device is arranged above the floor of the car and is operatively connected with the closure. In the present form of the device I mount an operating rod 16 in the floor of the car and provide the same at its upper end with means, such as a wheel 17, for rotating it. The connection between the closure and the rod 16 is, in the present construction, a geared one and to this end of the lateral extension 8 of the closure is provided with a toothed segment 18, the teeth of which mesh with a corresponding segment 19 rigidly secured to the lower end of the rod 16. As here shown the segment 19 is carried by a plate 20 rigidly secured to the rod and provided with a projection 21 adapted to engage the extension 8 and limit the movement of the closure toward the receptacle, thereby causing it to register accurately with the discharge opening thereof. The closure is also provided with a cut-away portion forming a shoulder 22 which engages the plate 20 on the rod 16 and limits the movement of the closure away from the receptacle. The operating rod 16 may be located at any suitable point in the car, either within the saloon or outside of the same. This latter arrangement has the added advantage of enabling the closure to be manipulated while the saloon is occupied.

For the purpose of illustrating the connection of the receptacle with the hopper or bowl of an ordinary car water closet I have shown, in Fig. 2, a portion of the hopper mounted above the receptacle and designated by the numeral 23.

The operation of the device will be readily understood from the foregoing description and it will be apparent that I have provided a closure which, while very simple in construction, will effectually close the discharge opening of the hopper; will be automatically cleaned when moved into its open position; and is of such a character that it is not liable to injury.

While I have herein shown and described one embodiment of the invention and have shown the same as applied to a receptacle of ordinary construction I wish it to be understood that this form of the device is chosen for the purpose of illustration only and that it is applicable to receptacles of various kinds and sizes. For example, it would be a very simple matter to materially increase the size of the receptacle 1 by increasing its length, or diameter, or both, it being possible to carry the lower end of the receptacle down until it just clears the trucks or other parts beneath the body of the car. I, therefore, wish it to be understood that I do not desire to be limited to the details of construction shown and described, for obvious modifications will occur to a person skilled in the art.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. The combination, with a receptacle having a substantially vertical discharge opening, of a closure mounted on a substantially vertical axis and adapted to be moved into and out of alinement with said discharge opening, a spring arranged to move said closure about a horizontal axis toward said opening, and means to cause said spring to be compressed when said closure is moved about a vertical axis toward said opening.

2. The combination with a receptacle, of a closure for the receptacle, a pivot pin connecting the closure and receptacle, a stop carried by the pin on the side of the closure opposite the receptacle, a spring interposed between the closure and stop, and coöperat-

ing means respectively carried by the receptacle and closure to compress the spring when the closure is being moved to its operative position and to permit the spring to expand when the closure is being moved to its inoperative position.

3. The combination with a receptacle, of a closure for the receptacle, a pivot pin connecting the closure and receptacle, a stop carried by the pin on the side of the closure opposite the receptacle, a spring interposed between the closure and stop, and coöperating means respectively carried by the receptacle and closure to compress the spring when the closure is being moved to its operative position and to permit the spring to expand when the closure is being moved to its inoperative position, said stop being adjustably mounted on the pin to regulate the tension of the spring.

4. The combination with a receptacle, of a closure for said receptacle, a pivot pin connecting said closure to said receptacle, said closure and receptacle having coöperating bosses surrounding the pivot pin, the bosses having their surfaces beveled toward the receptacle and closure respectively, a spring coiled about the pivot pin and engaging the closure, and a stop carried by the pin and engaging the opposite end of the spring.

5. The combination, with a receptacle having a laterally extending arm, of a closure for the lower end of said receptacle having a lateral extension, a pivot pin connecting said extension to said arm, said arm and said extension having coöperating bosses surrounding said pivot pin, said bosses having their adjacent surfaces beveled toward said receptacle and said closure, respectively, a spring coiled about said pivot pin and engaging said extension, a stop carried by said pin and engaging the opposite end of said spring, and means to move said closure about said pivot pin.

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

HARRY M. ESTABROOK.

Witnesses:
HARRY B. MUST,
FRANK W. BAUER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."