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L. PRYCE.
APPARATUS FOR LOADING AND MEASURING.
APPLICATION FILED OCT. 7, 1907.

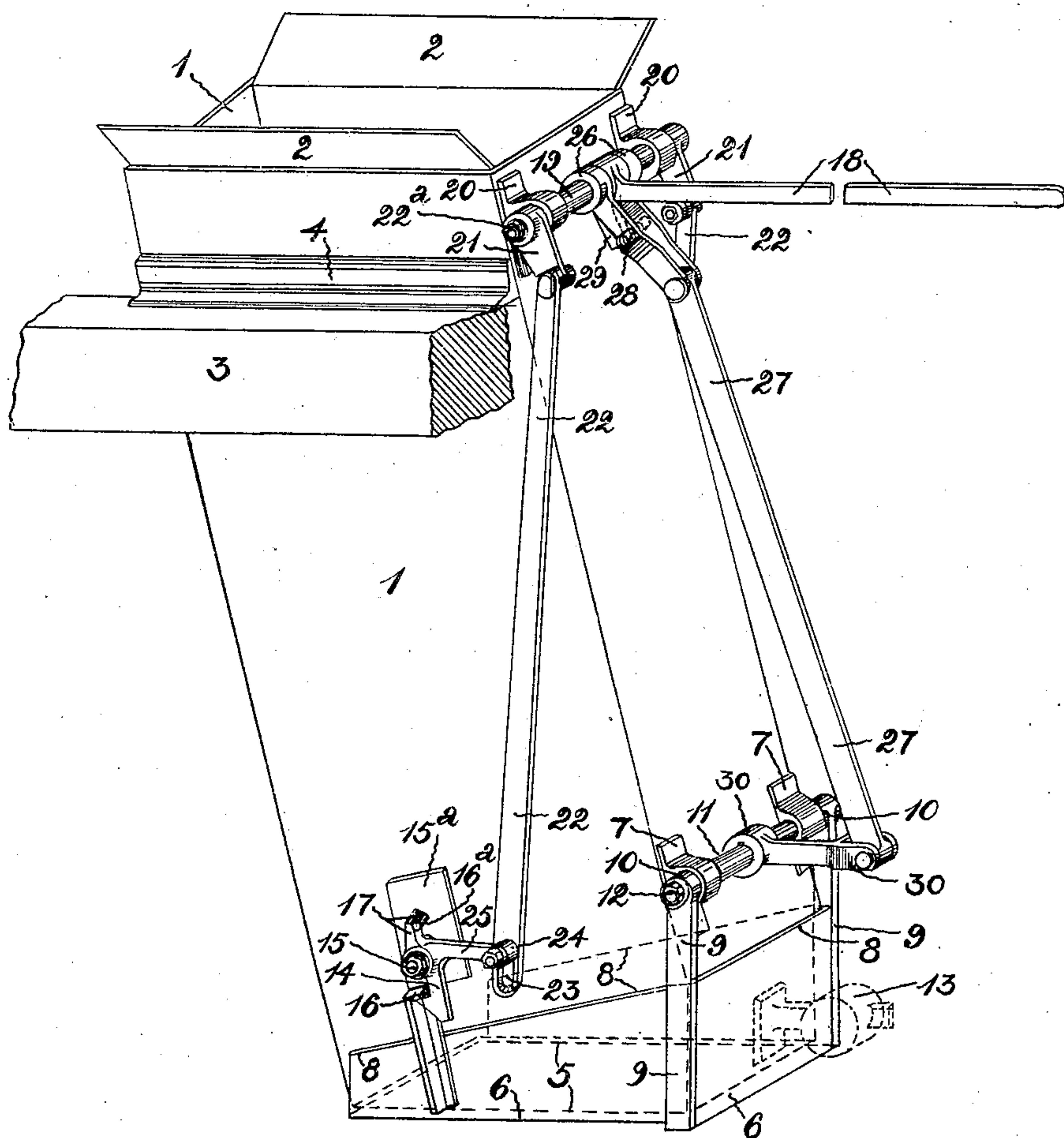


Fig. 1.

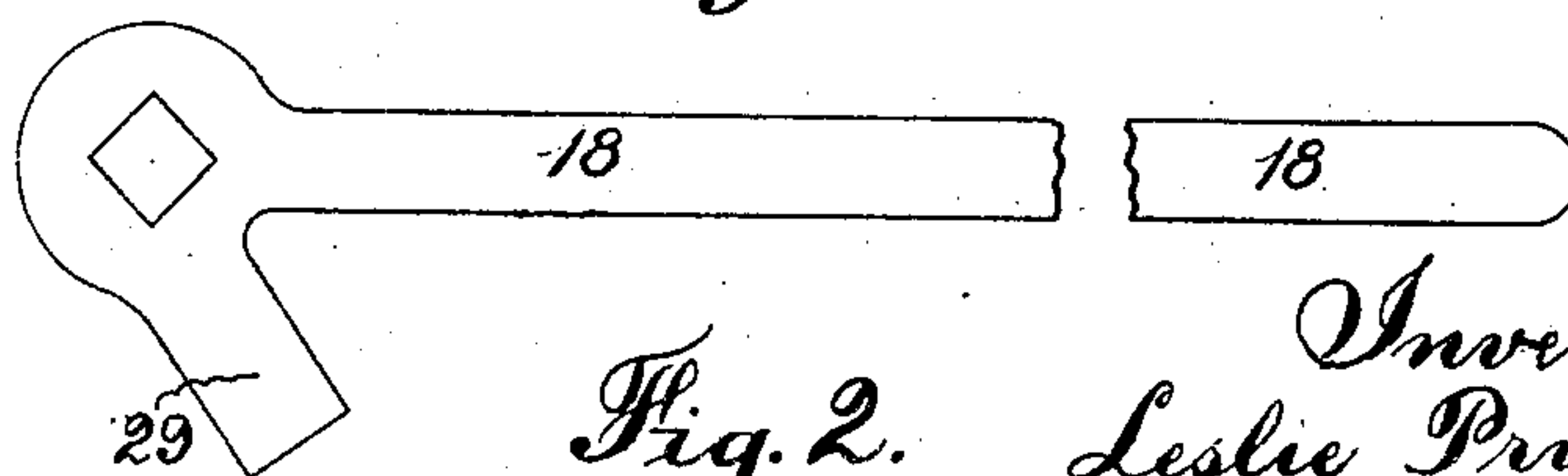


Fig. 2.

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APPARATUS FOR LOADING AND MEASURING.

No. 880,400.

Specification of Letters Patent.

Patented Feb. 25, 1908.

Application filed October 7, 1907. Serial No. 396,234.

To all whom it may concern:

Be it known that I, LESLIE PRYCE, a subject of the King of Great Britain, and resident of Germiston, Transvaal, have invented certain new and useful Improvements in Apparatus for Loading and Measuring, of which the following is a specification.

This invention has been primarily designed for use with and is especially applicable to the loading boxes customarily provided at the stations in the shafts of mines for receiving the broken ore from the main chutes or ore boxes and delivering it in successive and ordinarily measured or regulated quantities to the skips or other like vehicles in which it is transported to the surface. The invention may however be utilized in other types of apparatus designed for loading or delivering either constant or variable quantities of pulverulent, granular or fragmentary material. For this purpose it can be interposed between any source of supply of the material and the point of loading or delivery.

Loading boxes of the nature indicated ordinarily comprise a receptacle of equal capacity to the skip or other vehicle into which the material is discharged. The bottom of the receptacle constitutes the discharge aperture and is fitted with a door or cover which is closed during the filling of the receptacle, and opened to allow the contents to fall by gravity into the skip. For the satisfactory working of the apparatus it is requisite that the door or cover of the discharge aperture shall open fully and quickly to discharge the contents and that it shall be capable of being subsequently easily and quickly closed so that the receptacle can be again filled before the arrival of the next skip.

With the object of facilitating the operation of opening and closing the door it has been proposed to make the receptacle of inverted pyramidal shape which has reduced the area of the outlet aperture and consequently the door. Although this construction has facilitated the opening and closing of the door it has done so only at the cost of decreased rapidity of discharge and by incurring liability of the material to choke the outlet aperture.

My invention has reference to the construction and arrangement of the door and the mechanism for operating or controlling the same with the object of insuring rapid closing of the door regardless of its size and as a consequence permitting of the use of a

receptacle with parallel internal walls and a horizontal or substantially horizontal aperture the full area of the base, in order to facilitate the discharge of the contents. To accomplish this the door is hinged or pivoted at one side of the receptacle so that the aperture can be completely uncovered, and the door is so constructed and arranged that when released and thrust open by the weight of the superincumbent material, it acquires sufficient energy to cause it to re-close and be secured automatically by suitable latches after the material is discharged.

In the accompanying drawing I illustrate my invention, by way of example, applied to a skip loading box.

In the drawing Figure 1 is a perspective view of the apparatus, and Fig. 2 is an elevation of the operating lever 18, detached.

1 represents the receptacle which is open at its upper end and is adapted to receive the ore or other material from the main chutes or ore bins. It is shown equipped with inclined deflecting plates 2 at the top and supported by beams 3 and angle irons 4. The receptacle 1 may as shown be inclined, as for example to adapt it for use in a mine shaft, although it may be arranged with the sides vertical. It may be made of uniform transverse section from top to bottom, or if desired be slightly outwardly inclined in the direction of the base.

5 represents the discharge aperture comprising the whole of the base which provides an unrestricted and horizontal or substantially horizontal outlet.

6 is the door which serves for closing the aperture 5. This door is hinged or pivoted at one side of the receptacle. As shown the brackets 7 which are fixed to the side of the receptacle 1, are located some little distance above the bottom of the receptacle. The door 6 is shown constructed with vertical sides 8 and with pieces or bars 9 fixed thereto, in bosses 10 formed at the upper ends of which holes are provided for the bolt or hinge pin 11 revolvably supported by the brackets 7.

12 are nuts and washers on the ends or outer extremities of the hinge pin 11 for retaining it in position.

By hinging the door 6 to the receptacle 1 as shown and described, the sweep or path it describes is such that the aperture is fully uncovered when the door is released and the weight of the material swings the door outwards to such an extent beyond its stable

position that the momentum it acquires as it swings back is sufficient to return it to the closing position.

Instead of the construction described it will be obvious that the door might be counterbalanced, as for example by means of a weight 13 fixed to it at the back so that when the receptacle is empty the door when closed is in equilibrium, or any other suitable arrangement might be employed whereby the door will close automatically after the discharge of the contents of the receptacle, it being however necessary that the door when closed shall assume a substantially horizontal position and that it shall be pivoted at or towards one side.

In certain cases it may be preferred to use springs to assist or supersede the action of gravity in the arrangement above described.

14 represents a latch (a similar latch being in like manner provided at the opposite side of the receptacle) which is carried by a pin 15 fixed to the side plate of the receptacle by means of strengthening plate 15^a. Formed upon or fixed to the vertical side of the door 6 is a piece forming a lug or projection 16 adapted to be engaged by the latch 14 to secure the door in its closed position.

16^a is a pin which constitutes a stop to be engaged by a projection 17 on the latch to insure the retention of the latch in such a position that it will engage the lug or projection 16 on the door or to prevent it swinging too far forward.

The means illustrated for controlling the door 6 through the medium of the latches 14 are shown consisting of an operating lever 18, which through or in connection with means hereinafter described, serve for releasing the latches to open the door, to leave them free to engage the lugs 16, to close the door, or to lock them to secure the door, in consonance with the movement or position of said operating lever. This operating lever 18 is also arranged so that it may be utilized to actuate means for closing the door manually should it fail to close automatically from any cause. I preferably combine these latter means with the latch operating means so as to obviate accidental release of the catches during filling of the receptacle.

In the specific arrangement of mechanism shown for accomplishing the above purposes the mechanism intermediate the operating lever 18 and latches 14 comprises a rocking shaft or spindle 19 revolvably supported in brackets 20 fixed to the sides of the receptacle 1, at or in proximity to the top. The operating lever 18 is rigidly secured at one extremity to said rocking shaft 20. On each extremity of the shaft is suitably fixed an arm 21 (one for each latch 14) and 22^a are nuts and washers for retaining said arms on the ends of the shaft 19. To the outer extremity of each of the arms 21 is pivotally

attached a link or connecting rod 22 which at its other extremity is constructed with an elongated slot 23. A pin 24, carried by the tail piece 25 formed in one piece with the latch 14, engages in the slot 23. In Fig. 1 the latches 14 are shown in their closed position with the pin 24 engaging the upper end of the slot 23 and in this position said latches are locked through the medium of the link 22. It will now be apparent that by raising the lever 18 and through shaft 19 and arms 21, the links 22, into such a position that the pins 24 carried by the tail pieces 25 take up a position some distance from the top of the slots 23, the latches 14 are free or able to swing backwards and then forwards to engage the under side of the lugs 16 to automatically secure the door 6 when it swings forward after the discharge of the contents of the receptacle. Further, that by raising the lever 18 beyond the latter position the pins 24 will be engaged by the lower ends of the slots 23 and the latches 14 withdrawn and the door released.

26 are two arms or levers loosely mounted upon the rocking shaft 19 and located one at either side of the boss of the operating lever 18. Between the lower extremities of these two arms or levers 26 is pivotally attached a link or connecting rod 27. In a suitable position between the two arms or levers 26 is detachably positioned a pin 28, and formed on the extremity of the lever 18 or its boss, is a projection or toe 29 which is adapted to engage the pin 28. In place of the two arms 26 a lever bifurcated at both extremities could be employed, the bifurcation in the upper extremity being made sufficiently long to receive the pin 28 and to allow of the movement of the toe 29 into a position either above or below the pin 28. On the hinge pin 11 of the door 6 is keyed or otherwise suitably fixed an arm or lever 30 which at its outer extremity is bifurcated and in its bifurcation is pivotally attached the lower end of the link 27. This last described arrangement is shown in the position the parts are caused to assume to lock the operating lever 18, that is to say the detachable pin 28 is located above the toe 29, thereby preventing any accidental movement of the lever 18 and locking the latches 14 as previously stated. The toe 29 is placed below the pin 28 in order to lock the lever 18 during the filling of the receptacle. In order to discharge the receptacle 1 the detachable pin 28 is removed, which renders the movement of lever 30, link 27 and arms 26, independent of the operating lever 18, so that by raising the latter the latches 14 are withdrawn, leaving the door free to swing open and automatically reclose. Immediately after the door has been released the lever 18 is moved downwards sufficiently far to allow the latches 14 to assume their engaging positions, and when the door is automatically re-

closed the lever 18 is brought back into the position shown and the pin 28 re-inserted to engage the toe 29 to again lock the latches 14 during the re-filling of the receptacle 1.

Should the door 6 not automatically re-close owing to any obstruction presented in its path, then the pin 28 may be placed so that the opposite or underside of the toe 29 will engage it; the lowering of the lever 18 will then close the door through link 27 and arm or lever 30.

While I prefer to combine the means for closing the door by hand with the means for releasing and locking the latches 14, it will be obvious that the said releasing and locking means for the latches may be secured by any suitable independent means.

What I claim as my invention and desire to protect by Letters Patent is:—

1. In apparatus of the nature specified, a receptacle having a discharge aperture at the bottom, a cover for said aperture hinged towards one side of the receptacle in such manner that after being thrown open by the superincumbent material it swings back to its closed position, automatic latches for securing the door in its closed position, means for releasing the latches, a lever for operating said means, and means operated by the lever aforesaid for closing the door by hand, as set forth.

2. In apparatus of the nature specified, a receptacle having a discharge aperture at the bottom thereof, a cover for said aperture hinged towards one side of the receptacle in such manner that after being thrown open by the superincumbent material it swings back to its closed position, automatic latches for securing the door in its closed position, means for releasing the latches, said means comprising a shaft rotatably attached to the receptacle, a lever rigid with said shaft, arms on the extremities of said shaft and links connecting the aforesaid arms with the latches, as set forth.

3. In apparatus of the nature specified, a receptacle having a discharge aperture at the bottom thereof, a cover for said aperture hinged towards one side of the receptacle in such manner that after being thrown open by the superincumbent material it swings back to its closed position, automatic latches for securing the door in its closed position, means for releasing the latches, said means comprising a shaft rotatably attached to the receptacle, a lever rigid with said shaft, arms on the extremities of said shaft, links connected at one extremity to the aforesaid arms and constructed at the other extremity with elongated slots, the latches having tail pieces, and pins engaging the tail pieces and elongated slots, as and for the purpose set forth.

4. In apparatus of the nature specified, a receptacle constructed to provide a discharge

aperture at the bottom thereof, a cover for said aperture hinged towards one side of the receptacle in such manner that after being thrown open by the superincumbent material it swings back to its closed position, projections on the door and automatic latches secured to the receptacle and adapted to be engaged by said projections, means for releasing the latches, a lever for operating said means, means operated by the lever aforesaid for closing the door by hand, and means for locking the lever to prevent accidental movement thereof, as set forth.

5. In apparatus of the nature specified, a receptacle constructed to provide a discharge aperture in the bottom thereof, a cover for said aperture, hinged towards one side of the receptacle, latches for automatically securing the door in its closed position, means for releasing the latches, a lever for connecting said means, and means for closing the door by hand, said latter means being also adapted to lock the lever and latches in position when the door is closed, these means comprising an operating lever, a shaft therefor, arms loosely mounted on said shaft, a detachable pin carried between said arms, a toe or projection on the operating lever adapted to engage said detachable pin, an arm or lever fixed to the hinge pin of the door, and a link connecting the arms aforesaid with the lever fixed to the hinge pin, as set forth.

6. In apparatus of the nature specified a receptacle having a discharge aperture in the bottom thereof, a door for closing said aperture hinged towards one side of the receptacle, latches for automatically securing the door in its closed position, means for releasing said latches comprising a shaft rotatably attached to the receptacle, a lever rigid with said shaft, arms fixed to the extremities of said shaft, links connecting the aforesaid arms with the latches and constructed at said engaging extremities with elongated slots, pins attached to the latches and engaging said elongated slots, means for closing the door by the aforementioned lever, said means being also adapted to lock the lever and latches in position when the door is closed, said latter means comprising arms loosely mounted on the aforesaid shaft, a detachable pin carried between said arms, a toe or projection on the operating lever adapted to engage said detachable pin, an arm or lever fixed to the hinge pin of the door, and a link connecting the arms aforesaid with the lever fixed to the hinge pin, as set forth.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

LESLIE PRYCE.

Witnesses:

CHAS. OVENDALE,
R. OVENDALE.