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C. W. ROSS

DRAIN FOR RECEPTACLES OR HOPPERS

Filed March 17, 1923

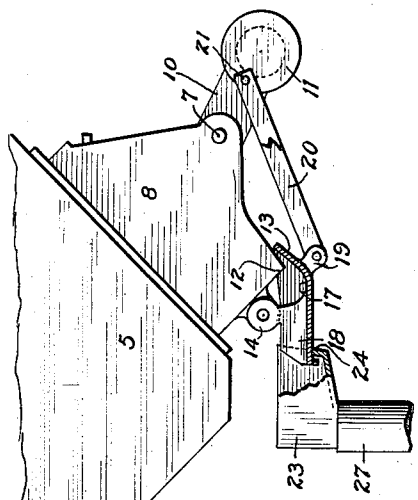


Fig. 2.

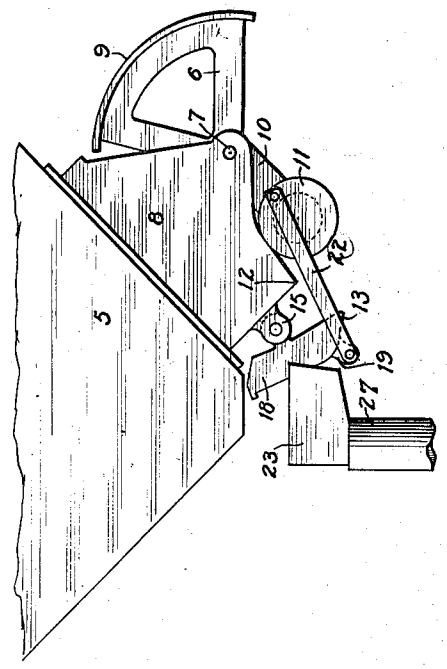


Fig. 3.

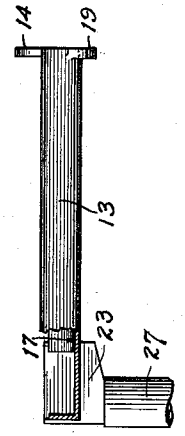


Fig. 4.

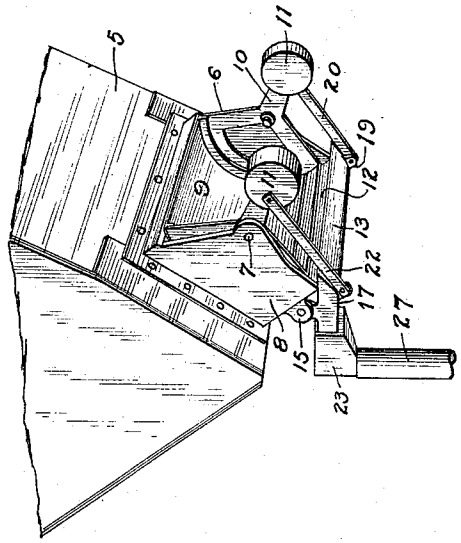


Fig. 1.

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UNITED STATES PATENT OFFICE.

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DRAIN FOR RECEPTACLES OR HOPPERS.

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To all whom it may concern:

Be it known that I, CHARLES WILSON ROSS, a citizen of the United States, and a resident of the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Drain for Receptacles or Hoppers, of which the following is a specification.

This invention relates to drains for receptacles or hoppers and more particularly to drain attachments for the gates of ash hoppers.

In boiler houses or similar plants where large quantities of furnace ashes are handled it is customary to quench the ashes with water after they have been deposited in the ash receptacle or hopper. The quenching water settles in the lower portion of the mass of ashes and either leaks out around the closed discharge gate to the floor of the ash pit or tunnel, or is discharged with the ashes when the gate is opened. This causes an untidy condition around the discharge gates and may render the floor beneath the hoppers slippery and dangerous. Moreover, where bottom discharge hoppers and certain other types of hoppers are used, the hot quenching water leaking from the hoppers or passing out with the ashes in liable to scald the workman attending to the hoppers.

For these reasons, it is desirable to have some means for effectively draining off the quenching water from the ashes while the discharge gate is closed, which will not interfere with the proper discharge of the ashes upon the opening of the gate.

An important object of the present invention is to provide such means for receiving the drainage from ashes or similar material contained in hoppers, bins or other receptacles and to so construct and arrange the drainage receptacle that it will be compact and will not interfere with the normal operation of the discharge gate or closure of the receptacle nor with the discharge of the ashes from the receptacle. While the invention is especially designed for use upon ash hoppers with side discharge gates, it may be applied to ash hoppers of the bottom discharge type, and is also applicable to hoppers or receptacles used in the handling of other materials similar to ashes, such as sand, gravel or the like.

The objects and advantages of the invention will appear in the following specification, reference being had to the accompanying drawing in which,

Figure 1 is a perspective view of an ash hopper of side discharge gate type showing my drain attachment associated therewith,

Figure 2 is a side elevational view, partly in cross section, showing the position of the drain attachment when the ash gate is closed,

Figure 3 is a side elevational view, showing the position of the drain attachment with the ash gate open, and,

Figure 4 is a front elevational view, partly in cross section, of the drain attachment showing the arrangement of the discharge spout thereon.

In the drawings, wherein similar reference numerals indicate like parts throughout the views, 5 indicates any usual ash hopper or receptacle such as may be used in boiler plants, usually below the boiler furnaces. The hopper shown is provided with a gate 6 pivoted on trunnions 7 extending outwardly from the sides of the mouth 8 of the hopper. The gate 6 has a curved valve or closure portion 9, as shown, which normally closes the mouth 8 of the hopper. Forwardly extending arms 10 at either end of the gate 6, carry counterweights 11 at their outer ends. A downwardly inclined lip or ledge 12 is fitted to the hopper 5 below the mouth 8 and gate 6 and is held in place by upstanding side members. This structure represents a well-known type of ash gate and is used merely for illustrative purposes in connection with my drain attachment, which may be applied to other types of hoppers, whether provided with pivoted or sliding gates.

The drain attachment includes a trough 13 located below and preferably extending across the width of the lip or ledge 12. This trough may be pivotally connected to the lip 12 by bolts passing through upstanding lugs 14 formed on the trough 13 and lugs 15 on the underside of the lip 12, but other suitable or convenient forms of pivotal connecting means may be used. As shown in Figure 2 of the drawings, the trough 13 is normally directly below the edge of the lip 12, so as to receive the water leaking out around the

gate and draining down the lip 12 from the mouth 8 of the hopper, when gate 6 is closed. The bottom 16 of the trough 13 slopes generally downwardly toward one end 17, at or near which point a spout 18 is formed.

Suitable means are provided for attachment of the trough to the discharge gate or its operating mechanism. By way of example, lugs 19 may be cast on the lower portion of the trough 13 at either end thereof. Links 20 or equivalent devices are pivotally connected to the outer ends of these bearings by bolts or the like. The outer ends of the links 20 are also pivotally connected to the counterweights 11 as shown at 21. The position and arrangement of the pivotal connection between the trough 13 and the lip 12 and of the pivotal connection between the trough and the counterweights are such that when the counterweights 11 are swung downwardly to move the valve or closure 9 of gate 6 away from mouth 8, the trough 13 will be swung back beneath and away from the lip 12, as shown in Figure 3 of the drawing. It is obvious that the specific form and arrangement of pivotal connections are merely illustrative as other constructions capable of producing substantially the same relative arrangement and movement of the parts may be substituted therefor. For carrying off the water from trough 13, a drain pipe 27 is provided, into which the water may flow from the spout 18. An enlarged head 23, having its front wall cut away as at 24, may be fitted on the upper end of the pipe 22, if so desired.

When the gate 6 of the ash hopper 5 is closed the position of the arms 10 carrying the counterweights 11 causes the trough 13 to be held up below the outer or lower edge of the lip 12, so that when the ashes in the hopper are quenched and the water seeps down and leaks out of the mouth 8, around the gate 6, it will drip into the trough 13 and flow from the spout 18 into the drain pipe 22. The quenching water being thus carried away, the ashes will be in a practically dry state and no water will flow out of the mouth when the gate is opened by the workman emptying the hopper. While the discharge gate is preferably so constructed and fitted as to permit water to leak out around it, it is usually sufficiently tight to prevent ashes from leaking out when the gate is closed. However, should some ashes pass out with the water and be deposited in the drain trough, they will not clog the drain device, but will be dumped into the ash car when the gate 6 is opened to remove the ashes from the hopper.

When it is desired to open the gate 6 to empty the ashes, a downward movement is imparted to the arms 10 or counterweights 11 either by hand or by power means. Through the action of the links 20 this movement will swing the trough 13 about its pivotal connection between lugs 14 and 15, so that the trough will be entirely out of the path of movement of the ashes, which will slide off of the lip 12 clear of the trough.

Upon the closing of the gate 6 the trough 13 will be restored to its operative position indicated in Fig. 2 and will catch any water that may leak from the hopper between mouth 8 and its gate 6.

I claim:

1. A receptacle for comminuted materials having a discharge outlet and a closure therefor, means for receiving the liquid draining from the receptacle when said outlet is closed and means connecting the closure and liquid receiving means for moving the liquid-receiving means out of the path of discharge of the comminuted material when the closure is opened.

2. A receptacle for comminuted materials having a discharge outlet and a closure therefor, means movable relative to said closure for receiving the liquid draining from the receptacle when said outlet is closed, and means operatively connecting the closure and the liquid-receiving means for moving the latter out of the path of discharge of the comminuted material when the closure is opened.

3. The combination with a receptacle having a discharge outlet and a pivoted closure therefor, of a drain pivoted to the receptacle and normally positioned below the discharge outlet, and means operatively connecting the drain and the closure whereby the former will be swung out of the path of the material discharged from the receptacle when the closure is moved to open position.

4. The combination with a receptacle having a discharge outlet, a lip extending therefrom and a pivoted closure for the outlet, of a drain attachment comprising a trough pivoted to the lip of the discharge outlet and normally positioned below the edge of the lip, and means operatively connecting the trough and the closure whereby the former will be swung back under the lip and out of the path of the material discharged from the outlet when the closure is moved to open position.

5. A receptacle for comminuted materials having a discharge outlet and a closure therefor, a drain for receiving liquid draining from the receptacle, means for supporting said drain, and means connecting the closure and drain for positioning the drain beneath the closure when the latter is closed and for moving the drain away from the closure when the latter is opened.

6. A receptacle for comminuted materials having a discharge outlet and a closure therefor, a drain for receiving liquid draining from the receptacle when the outlet is closed, said drain being pivotally mounted

and movable relative to the closure, and means connecting the closure and drain for moving the drain away from the closure and out of the path of discharge from the receptacle when the closure is opened.

7. The combination with a receptacle having a discharge outlet and a movable closure therefor, of a drain attachment normally positioned below the discharge outlet and movable with respect to the outlet and closure, and connections between the drain and closure whereby the former is moved out of the path of discharge from the receptacle when the closure is moved to open position.

8. The combination with a receptacle having a discharge outlet and a pivoted closure therefor, of a drain pivotally supported on the receptacle and normally positioned below said outlet, and pivotal connections between the drain and closure whereby the drain is moved to operative position beneath the closure by movement of the latter to closed position and is swung out of the path of discharge from the outlet by movement of the closure to open position.

9. The combination with a receptacle having a discharge outlet and a movable closure therefor, of a drain attachment comprising a fixed drain and an elongated movable drain member pivotally mounted on the receptacle and normally positioned below the discharge outlet and its closure, and pivotal connections between the movable drain and the closure for moving the drain to operative position beneath the closure and in communication with the fixed drain by movement of the closure to closed position and for swinging the movable drain out of the path of discharge from the outlet by opening movement of the closure.

CHARLES WILSON ROSS.