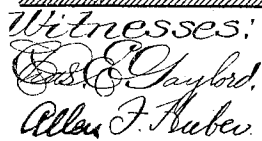


997,000.

3 SHEETS--SHEET 1.



Inventor:
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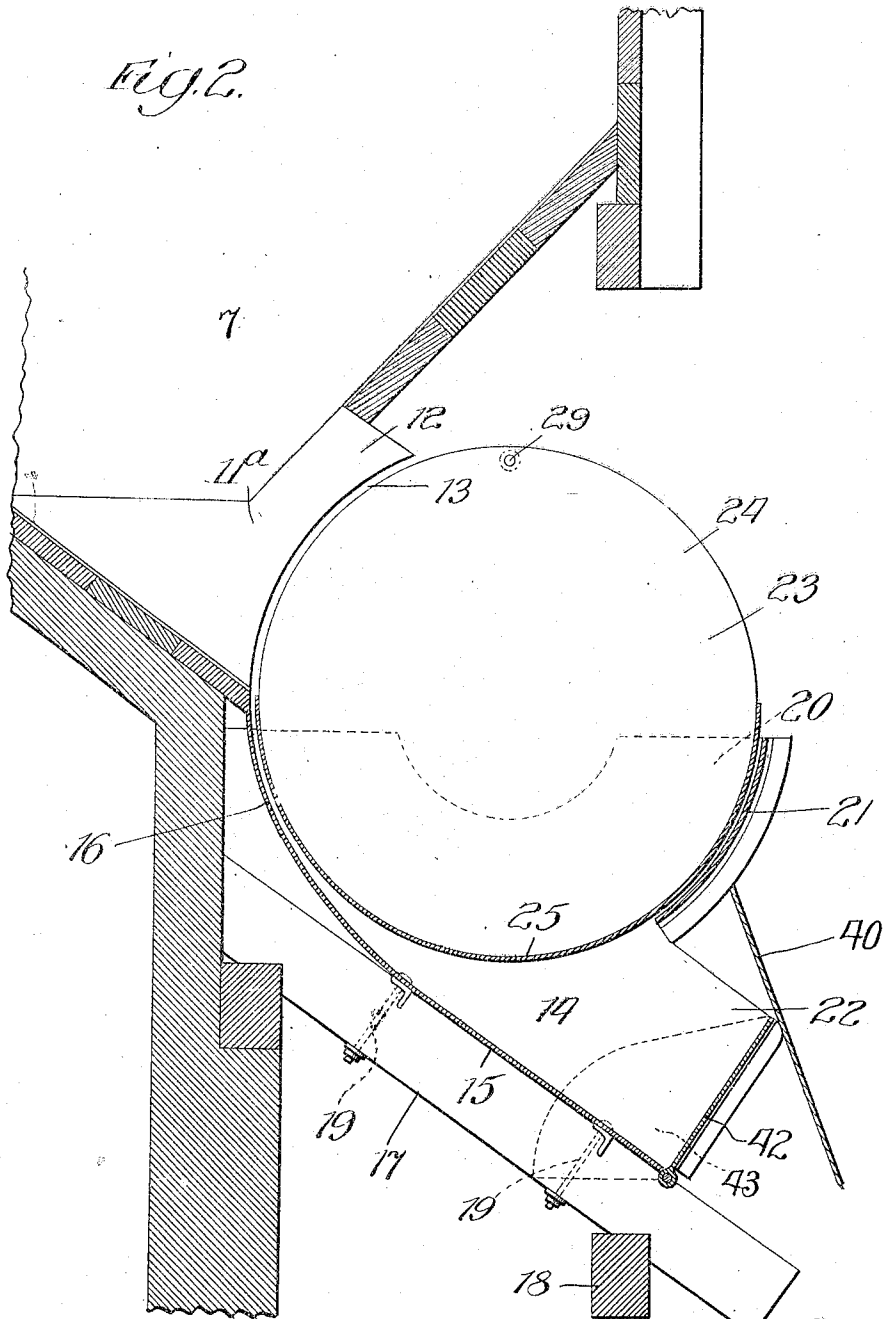
R. A. OGLE.
 APPARATUS FOR HANDLING LOOSE MATERIAL.
 APPLICATION FILED MAY 10, 1909.

997,000.

Patented July 4, 1911.

3 SHEETS-SHEET 2.

Fig. 2.



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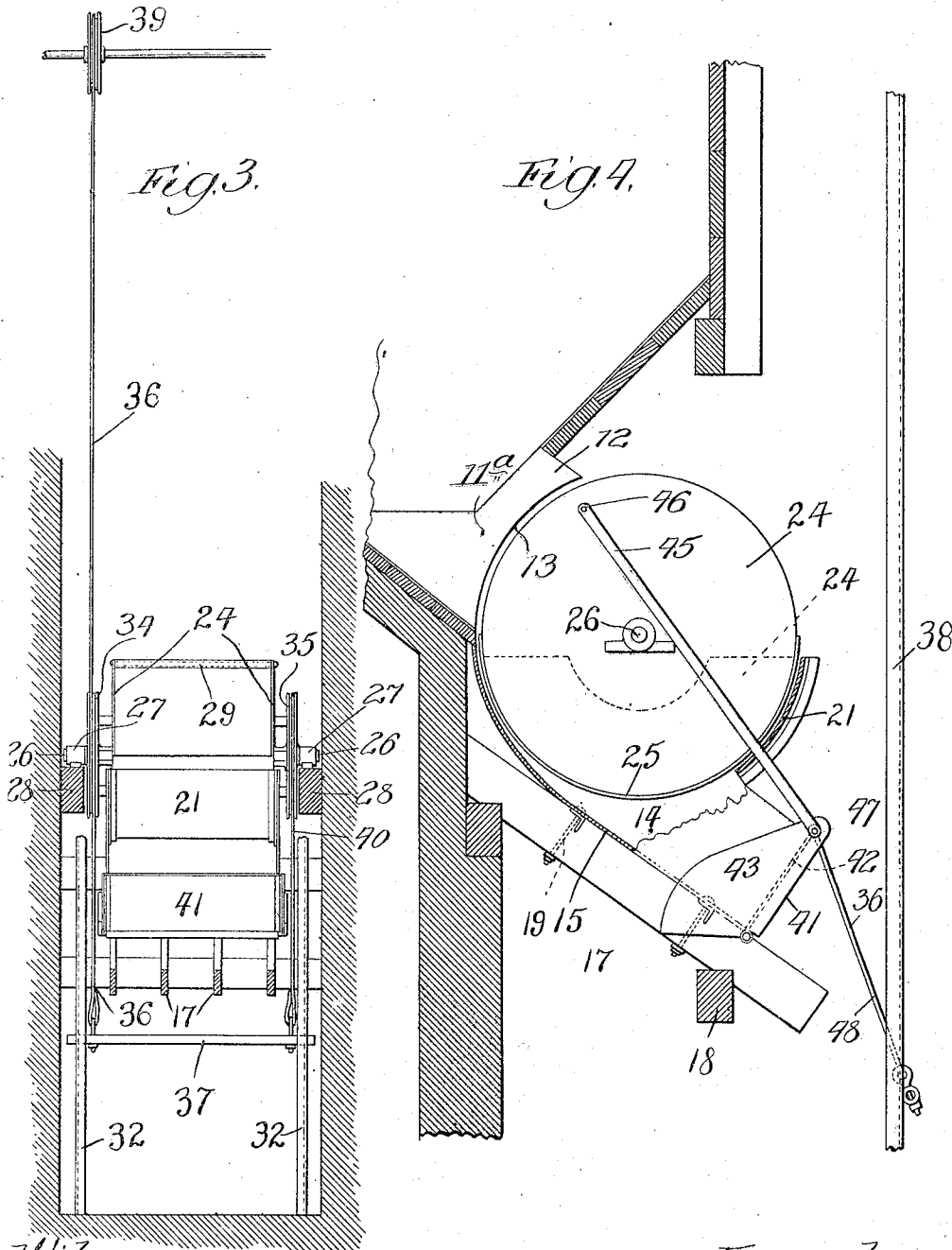
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

ROBERT A. OGLE, OF CHICAGO, ILLINOIS.

APPARATUS FOR HANDLING LOOSE MATERIAL.

997,000.

Specification of Letters Patent.

Patented July 4, 1911.

Application filed May 10, 1909. Serial No. 495,131.

To all whom it may concern:

Be it known that I, ROBERT A. OGLE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Apparatus for Handling Loose Material, of which the following is a specification.

My invention relates to improvement in apparatus for handling loose material and, more particularly, to apparatus intended for use in transferring coal, or the like, from a hopper at one level to a bin above the hopper; and my object is to provide an apparatus of the character referred to which shall be simple of construction, durable and positive in operation, and, in general, particularly adapted to perform the functions of apparatus of this character to the best advantage.

Referring to the accompanying drawings—Figure 1 is a view in elevation of apparatus constructed in accordance with invention, portions of the apparatus being shown in sectional elevation to better disclose details, the view being broken to better illustrate the apparatus. Fig. 2 is a vertical sectional elevation taken through the hopper and loader-mechanism proper at one side of the hopper. Fig. 3 is a view showing one of the two similar loading mechanisms in front elevation, the position of the loader being that represented of the one shown on the right-hand side of Fig. 1; and Fig. 4, a view similar to Fig. 1 showing a modification of the loader-mechanism and its operating means.

I have devised my invention for use, more particularly in elevating coal from a hopper into which it is discharged from cars on a track to bins above the track from which it may be removed periodically, or otherwise, as required, such as for instance to load tenders of locomotives, and in its preferred form it involves, generally stated, the use of two loader-mechanisms adapted to alternately discharge material received from the hoppers into hoisting-buckets operating in opposite directions to elevate the material in predetermined amounts to the bins, though it will be understood, as hereinafter set forth, that certain features of the in-

vention are not limited in their use to apparatus employing a plurality of buckets.

Referring particularly to Figs. 1 to 3, inclusive, a pair of pits usually employed in apparatus of this kind is represented at 5, these pits being located underground, and adjacent side walls thereof being illustrated at 6. Located above and between these pits is a hopper 7, which is usually placed underground and into which the cars (not shown) loaded with the material to be hoisted, discharge. The bottom of the pit 7 is formed of two downwardly converging sections 10 and two upwardly converging sections 11. The lower end-portions of the sections 10 are provided with openings 11^a which form discharge-openings at opposite sides of the hopper for the material periodically withdrawn therefrom in a manner hereinafter described, these discharge-openings preferably being flanked by plates 12 having curved outer edges as represented at 13. Located below each of the discharge-openings 11^a is an inclined chute 14 formed of a bottom-plate 15, having a curved section 16 at its upper end which is connected with the lower edge of the adjacent section 11 of the hopper 7, the bottom plate being supported upon a series of timbers 17 connected with the wall 6 at their upper ends and supported on timbers 18 toward their lower ends, this plate being preferably bolted to these timbers as indicated at 19; side-members 20 spaced apart a distance slightly greater than the width of the discharge openings 11^a and extending upwardly to within a short distance of the lower edge of the adjacent section 11; and a curved front-plate 21 carried by the walls 20 and spanning the space between them, the forward portions of the plates 20 terminating in extensions 22, which latter form, with the lower end-portion of the plate 15, the open discharge-end of the chute. Each of the open-topped chutes 14 thus provided at opposite sides of the hopper 7 below the outlets 11^a thereof, partially houses a measuring receptacle 23, which is cylindrical in form as represented, and formed of ends 24 of disk-shape and a shell, or wall, 25, the upper half of the shell being cut away, as clearly represented in Fig. 2. The receptacles thus provided are pivotally

mounted in the chutes 14 through the medium of stub-axes 26 which are connected with the outer faces of the heads 24, and are journaled in bearings 27 supported on timbers 28 suitably supported in the pit. For insuring the desired rigidity of the receptacles, I prefer to brace each pair of heads by a rod 29 connected at its opposite ends with its respective heads, as illustrated. In the operation of the apparatus, the receptacles 23 serve, at their open upper sides, to receive the material from the hopper 7, and at the proper time be rotated upon their journals to cause their open sides to be moved into registration with the outlet-ends of the chutes 14 for effecting the discharge of their contents into a receptacle herein-after described, the curved walls 25 of the receptacles, when thus operated, serving to be moved across the outlets 11^a, and thus prevent flow of material from the bin through these discharge-openings while the receptacles are discharging. A pair of hoisting buckets for periodically receiving material from the bin 7 through the medium of the receptacles 23, are represented at 30 and 31 as operating in guides 32 and 33, which extend upwardly from the bottoms of the pits 5. It will be understood that these guides rise sufficiently far to permit the buckets to be raised to a height enabling them to be discharged into a receptacle, or bin, (not shown), which may be located as far above the hopper 7 as is found desirable. In the construction illustrated, the buckets 30 and 31 are intended to be operated simultaneously, but in opposite directions, and, in accordance with an arrangement well known in the art, are so associated with hoisting mechanism (not shown) of any desired construction that when one of the buckets is at the bottom of the pit, the other is at the top of its respective guide. Fig. 1 is intended to represent the bucket 31 at the height of its upward travel, in which position, in practice it would be raised sufficiently far to permit it to be dumped into the bin. The receptacles 23 are designed to be automatically operated by the movements of the buckets, and to effect this, in the preferred construction, I fix on the stub-shafts 26 beyond the heads 24 of the receptacles 23, sheaves 34 and 35, about which sheaves 34 a cable 36 is wound, this cable being connected at its opposite ends to an end of each of two cross-bars 37 normally resting against pairs of upright guides 38 paralleling the guides 32 and 33 to extend into the path of downward movement of the buckets 31 and 32, this cable also extending over idler-pulleys 39 which may be located at any convenient point in the apparatus. The sheaves 35 have cables 40 partially wound upon them and fixedly secured thereto, the free

end of the cables 40 being connected with the ends of the rods 37 opposite to those at which the cable 36 connects. The cable 36 is initially wound upon the sheaves 34 in a position to cause the cross-bar 37 coöperating with the bucket 31 to be in raised position, while the cross-bar 37 coöperating with the bucket 30 is in its lowermost position, and the receptacle 23 coöperating with the bucket 31 to be in normal filling position, and the receptacle 23 coöperating with the bucket 30 to be in discharging position, all as represented in Fig. 1.

Assuming the parts of the apparatus to be in the relative positions illustrated in Fig. 1, operation of the hoisting-mechanism hereinbefore referred to for operating the buckets will cause the bucket 30 to ascend and the bucket 31 to descend. Lowering of the bucket 31 causes it to bear down against the bar 37 below it, with the result of drawing down the cable 36, thereby turning the receptacle 23, coöperating with the bucket 31, upon its journals, the movement of the bucket 31 downward while in engagement with its cross-bar 37 being sufficiently great to cause the receptacle 23 to be rotated through an arc of about 120 degrees, thereby causing its open side to register with the coöperating outlet 22 of the respective chute 14, and thus discharge its contents into the chute from which it escapes over an apron-device 41 hinged to the chute, into the bucket 31, it being understood, as hereinbefore described, that a portion of the curved wall of the receptacle 23 by reason of the foregoing operation is carried into registration with the outlet 11^a of the bin 7 for cutting off the discharge of material therethrough while the receptacle is discharging. The apron 41, which is formed of a bottom-plate 42 and side-plates 43 secured thereto and disposed beyond the chute sides 20, is counter-weighted as represented at 44, and in its normal position extends across the lower open end of the chute 14, as represented in Fig. 1, for maintaining the outlet 22 of the chute closed. As soon as coal begins to flow from the receptacle 23 into the portion 22 of the chute 14, the force of the coal exerted against the bottom 42 of the apron causes the latter to be turned on its hinge to the position illustrated of the one shown on the left-hand side of Fig. 1, it being understood that the parts of the apparatus are so arranged as illustrated as not to cause any coal to flow from the receptacle 23 against the chute 41 until the bucket, with which it coöperates, has traveled sufficiently far into the pit to extend below the outer end of the apron, and thus all the coal flowing from the chute 14 is discharged into the bucket coöperating therewith. Thus, when the receptacle 23 is turned to discharge po-

sition by lowering of the bucket 31 as described, the parts of the loading-mechanism and chute-device cooperating with the bucket 31 will assume the position represented in Fig. 1 or the corresponding apparatus operating in conjunction with the bucket 30. As soon as the bucket 31 is filled, the hoisting-mechanism is reversed and the bucket 31 rises in filled condition and the bucket 30 descends empty. As the bucket 31 rises, it causes the chute 41 cooperating therewith to be moved to the position illustrated in the right-hand side of Fig. 1, the receptacle 23 remaining in discharging position until the bucket 30 in its descent lowers the cross-bar 37 cooperating therewith and turns the receptacle 23 for discharging its contents into the bucket 30, during which movement the receptacle 23 cooperating with the bucket 31 is turned to filling position as illustrated in Fig. 1. It will thus be seen that the receptacles 23, under the action of the buckets 30 and 31 operating in opposite directions are caused to be automatically operated to receive coal from the bin 7 and discharge it through their cooperating chutes 14 into their respective buckets, and that the only operation performed by the buckets, in their rising movement, with respect to the loader-mechanisms, is that of throwing the aprons 41 to closed position. The manifest advantage of thus operating the apparatus is that of reducing the danger of injury to it as derangement or interlocking of the loader-mechanism is avoided.

By providing the hinged aprons 41, which operate as gates for the chutes 14, and the curved sections 16 of the plates 15, any dust or small particles of coal which unavoidably leak from the hopper 7 between the walls of its outlets and the curved walls 25 of the receptacles 23, when the latter are rocked upon their journals, is retained in the chutes 14 and is not discharged therefrom, excepting through the aprons 41 when the buckets are below them, and thus no dust or small particles of coal is discharged into the pit.

As certain features of my invention are applicable to apparatus in which but a single loading-mechanism is provided instead of two as illustrated of the preferred construction, I have shown such features of my invention illustrated in connection with a single loading-mechanism operating automatically by the rise and descent of a bucket cooperating therewith. This construction is in all particulars the same as that illustrated of the single loading mechanism and its operating means in Figs. 1 to 3, with the exception that in this modification the cables 36 and 40 and sheaves 34 and 35 are omitted and the receptacle 23 is connected with the apron 41 through the medium of links 45,

one only of which is shown, pivoted toward their upper ends to the heads 24 of the receptacle 23 as indicated at 46, and at their lower ends to the sides 43 of the chute 41 as indicated at 47, these links being connected with the cross-bars 37 by cables 48 and at all times inclining with relation to the vertical plane. By this arrangement the turning of the loader mechanism to discharging position is effected by the lowering of the cross-bar 37 under the action of the descending bucket cooperating therewith, and its movement to filling position is effected by the arranging of its cooperating chute to closed position when operated by the ascending bucket. It will also be understood that where a plurality of loading-mechanisms are employed, each may be equipped, if desired, with mechanism for turning the receptacles to normal filling position by the ascent of its cooperating bucket.

While I have illustrated and described the preferred form of my invention as embodied in an apparatus the hopper of which has discharge-openings in its opposed walls for drawing the coal from opposite sides of the hopper, it will be understood that the discharge-opening may be on the same side of the hopper and that the receptacle-mechanisms for discharging the coal into the buckets may be located side by side where such an arrangement is desired, without departing from the spirit of my invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. In apparatus of the character set forth, the combination of a hopper provided with a discharge-opening, a pivotally mounted single-chambered receptacle of general cylindrical form located adjacent to said discharge-opening and having a portion of its inclosing wall cut away, and a chute extending below the receptacle and having a front plate adjacent to the latter and operating to prevent premature discharge of the material from the receptacle, for the purpose set forth.

2. In apparatus of the character set forth, the combination of a hopper provided with a discharge-opening, a pivotally mounted single-chambered receptacle of general cylindrical form located adjacent to the discharge-opening of the hopper, and a chute extending below the receptacle and having a front plate adjacent to the latter and conforming in shape thereto with its side walls extending upwardly on opposite sides of the receptacle and operating to prevent premature discharge of the material from the receptacle, for the purpose set forth.

3. In apparatus of the character set forth, the combination of a hopper provided with a discharge-opening, a pivotally mounted re-

ceptacle located adjacent to the discharge-opening of the hopper, an inclined chute extending below the receptacle and having its bottom wall deflected and cooperating with the bottom of the hopper for directing dust and fine particles escaping from the hopper between it and said receptacle, and valve-mechanism for controlling the discharge-end of the chute, for the purpose set forth.

4. In apparatus of the character set forth, the combination of a hoisting-bucket, a hopper located adjacent to the bucket and provided with a discharge-opening, a pivotally mounted receptacle located adjacent to the discharge-opening of the hopper and intermediate the latter and the bucket, an inclined chute extending below the receptacle, and valve-mechanism for the discharge-end of the chute extending into the path of movement of the bucket and movable into closed position by engagement with the bucket in its upward movement, for the purpose set forth.

5. In apparatus of the character set forth, the combination of a hoisting-bucket, a hopper provided with a discharge-opening located adjacent to the bucket, a pivotally mounted receptacle adjacent to the discharge-opening of the hopper and located between the latter and the hoisting-bucket, an inclined chute extending below the receptacle, and an apron-device pivoted to the chute for controlling the flow of material from the chute, adapted to be swung to open position by the discharge of material into the chute from said receptacle and when in such position extending into the path of upward movement of the bucket, for the purpose set forth.

6. In apparatus of the character set forth, the combination with a hoisting-bucket, of a hopper provided with a discharge-opening, a pivotally mounted receptacle located adjacent to the discharge-opening of the hopper, a sheave on the receptacle, a cable connected with the sheave, a chute extending below the receptacle, and means secured to the cable and extending into the path of movement of the bucket for rotating the receptacle on its journals, for the purpose set forth.

7. In apparatus of the character set forth, the combination of a pair of measuring receptacles cooperating with a source of supply, hoisting-buckets cooperating with said receptacles and operating simultaneously but in opposite directions, cables engaging with said measuring receptacles and operatively connecting them together, and means connected with said cables and extending into the path of movement of the buckets for operating both the receptacles by either bucket in its operation.

8. In apparatus of the character set forth,

the combination of a pair of measuring receptacles cooperating with a source of supply, hoisting-buckets cooperating with said receptacles and operating alternately in opposite directions, and means connecting said receptacles together and extending into the path of movement of the buckets for simultaneously moving one of said receptacles to dumping position and the other of said receptacles to filling position, for the purpose set forth.

9. In apparatus of the character set forth, the combination of a hopper provided with discharge-openings, pivotally mounted measuring receptacles located adjacent to said discharge-openings, hoisting-buckets cooperating with said receptacles and operating alternately in opposite directions, chutes extending below said receptacles, sheaves on the receptacles, a cable extending about said sheaves, and separate means in the path of downward movement of the buckets constructed and arranged to simultaneously operate the receptacles, for the purpose set forth.

10. In apparatus of the character set forth, the combination of a hopper provided with discharge-openings, pivotally mounted measuring receptacles located adjacent to said discharge openings, hoisting-buckets cooperating with said receptacles and operating alternately in opposite directions, chutes extending below said receptacles, cables operatively connected with said receptacles, and cross-bars supported by said cables and extending into the path of downward movement of the buckets, said receptacles being operatively connected together for actuating them simultaneously during the downward movement of either of the buckets, for the purpose set forth.

11. In apparatus of the character set forth, the combination of a hopper provided with discharge-openings, pivotally mounted measuring receptacles located adjacent to said discharge-openings, chutes extending below said receptacles, hoisting-buckets beyond said receptacles operating alternately in opposite directions, sheaves carried by said receptacles, idler-pulleys above said receptacles, a cable extending about said sheaves and over said pulleys, and means connected with the opposite ends of said cable and extending into the path of downward movement of the buckets for operating said receptacles simultaneously.

12. In apparatus of the character described, the combination of a hoisting-bucket, a hopper located adjacent to the bucket and provided with a discharge-opening, a pivotally mounted receptacle located adjacent to the discharge-opening of the hopper and intermediate the latter and the bucket, an inclined chute extending below

the receptacle, valve-mechanism for controlling the flow of material from the chute adapted to be moved to open position by the discharge of material into the chute
5 from said receptacle and when in such position extending into path of the upward movement of the bucket, and means oper-

ated by the movement of the bucket for moving the receptacle from filling to dumping position.

ROBERT A. OGLE.

In presence of—

RALPH SCHAEFER,
JOHN WILSON.