J. M. SNEAD.

SORTING AND STORING DEVICE.

APPLICATION FILED JUNE 1, 1909.

1,016,971. Patented Feb. 13, 1912.

6 SHEETS—SHEET 1.

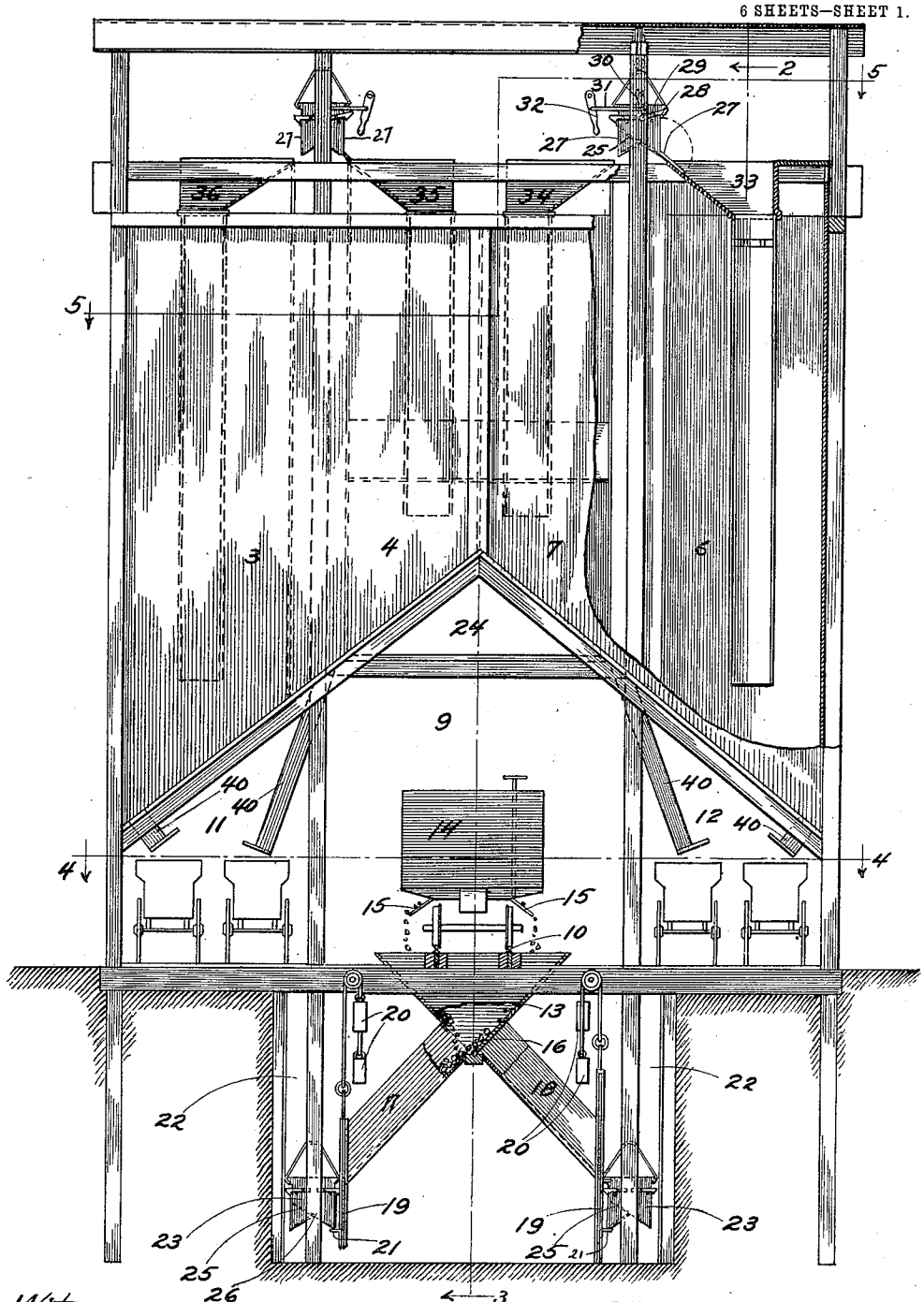

Fig. 1.

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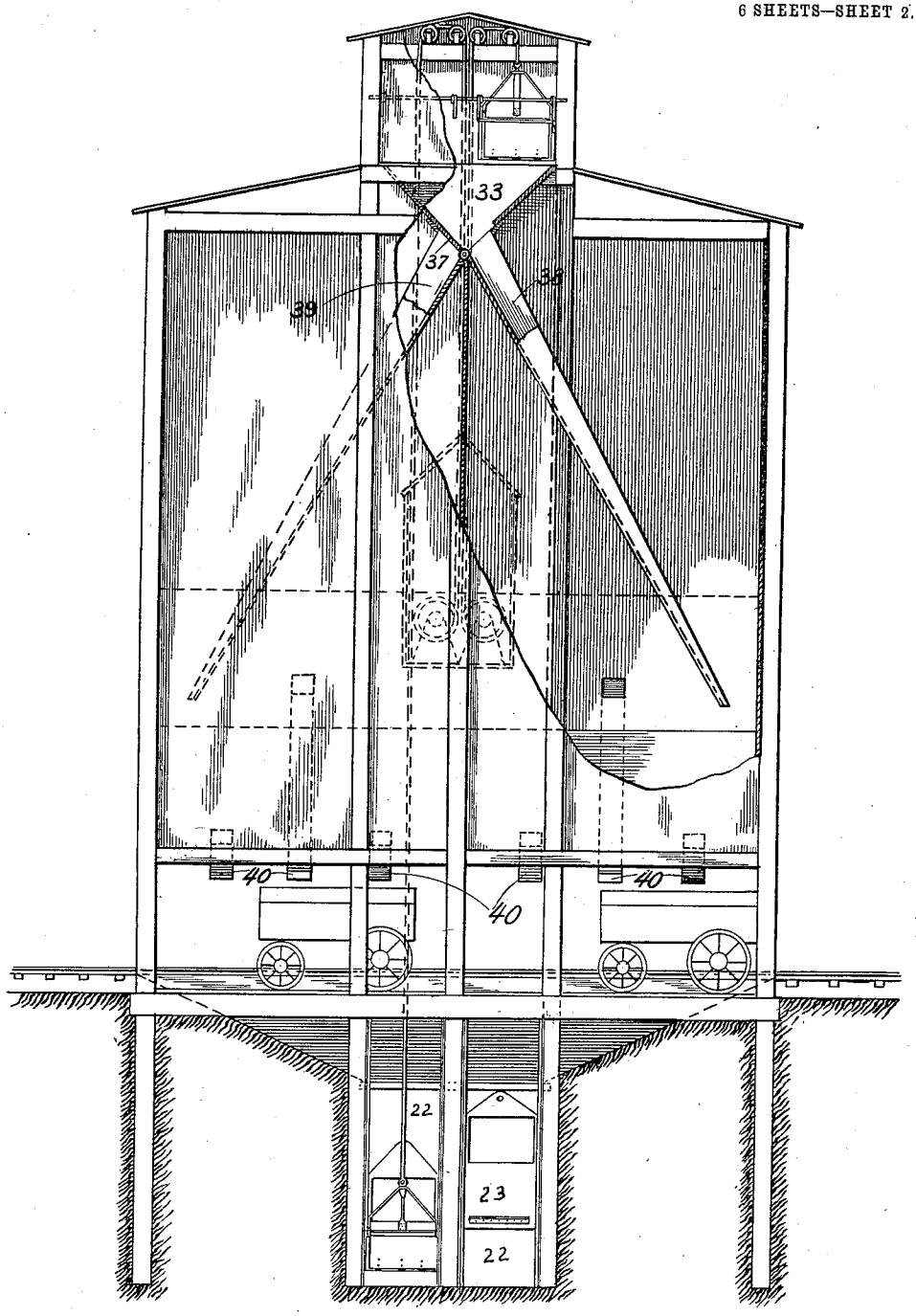

Fig. 2

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6 SHEETS—SHEET 3.

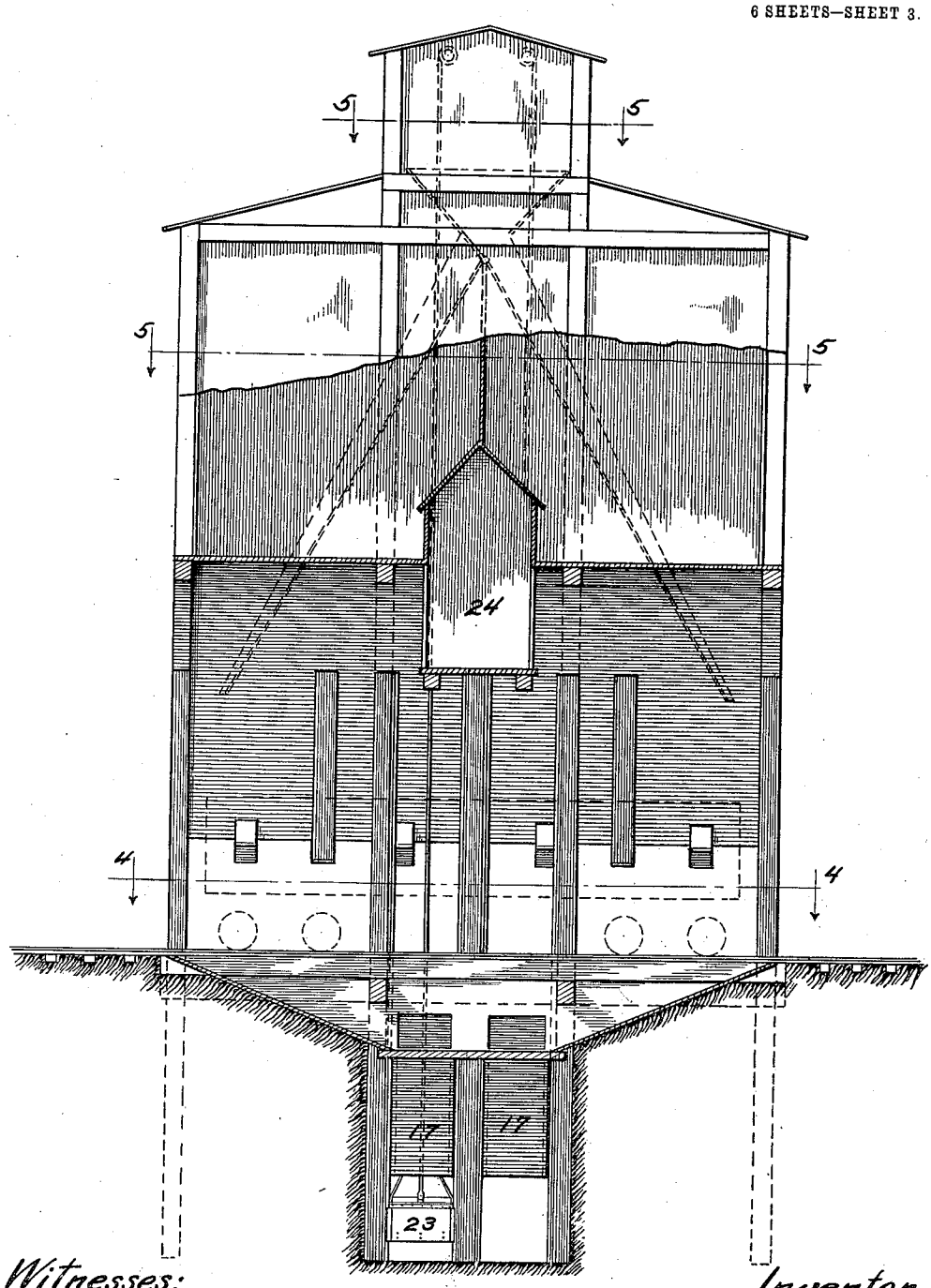

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Fig. 3

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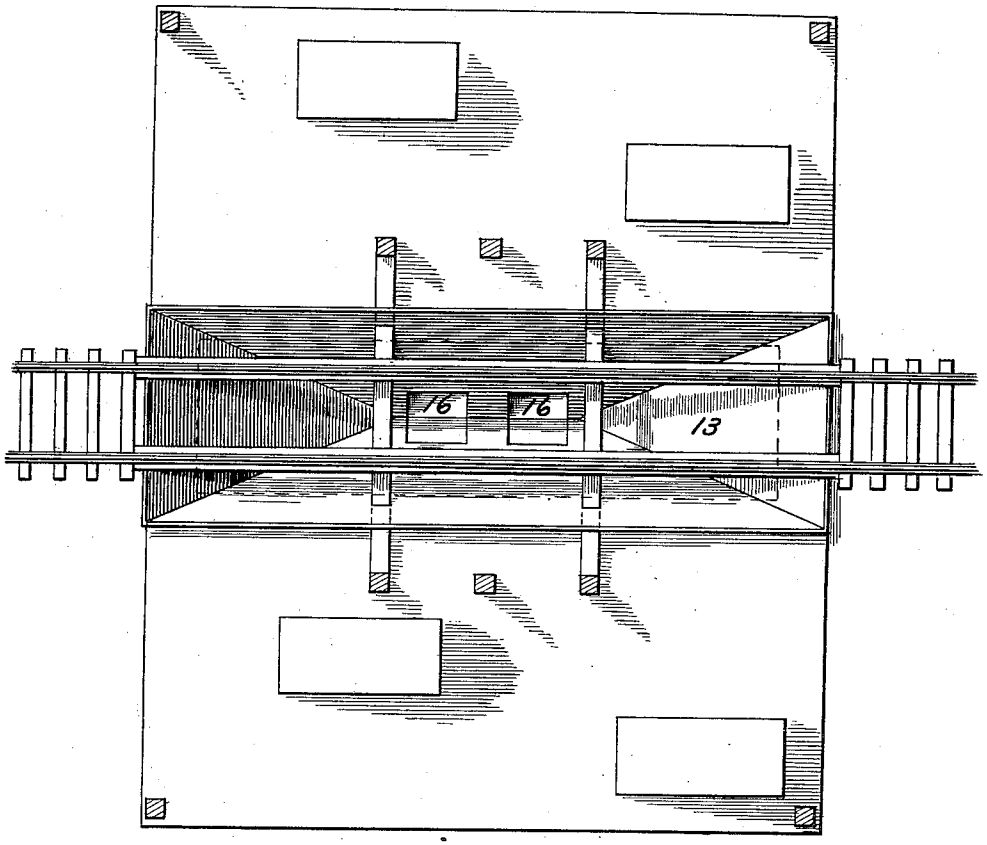
6 SHEETS—SHEET 4.

Fig. 4.



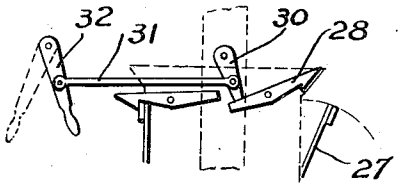


Fig. 8.

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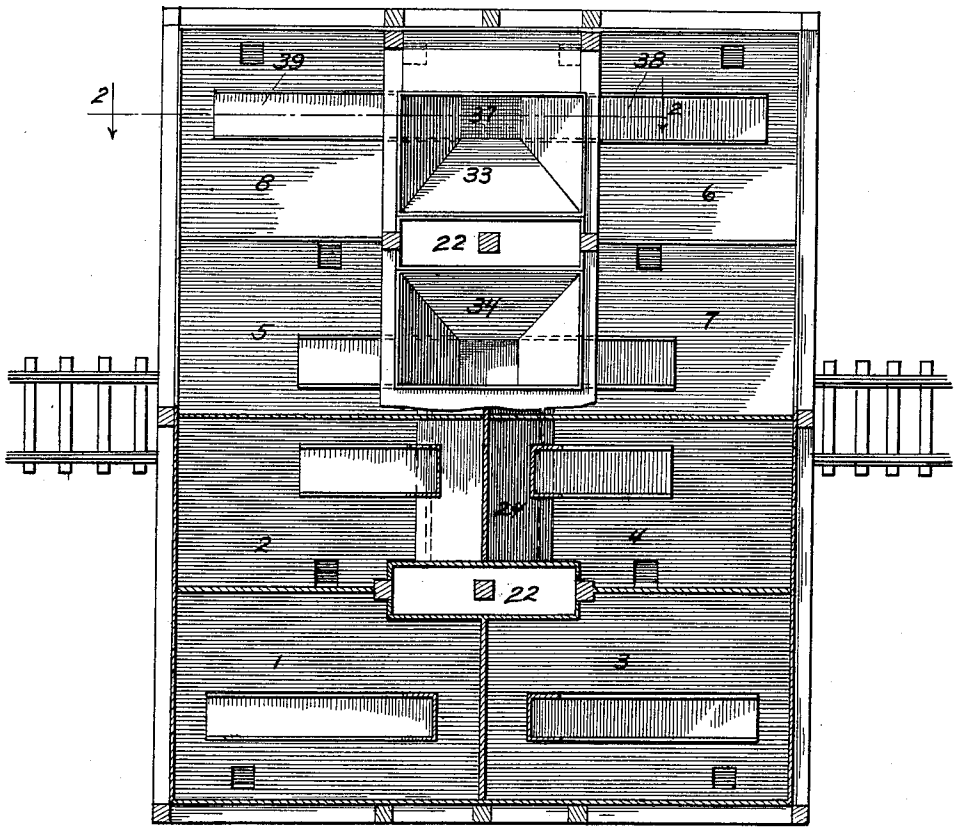
6 SHEETS—SHEET 5.

Fig. 5.



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6 SHEETS—SHEET 6.

Fig. 6

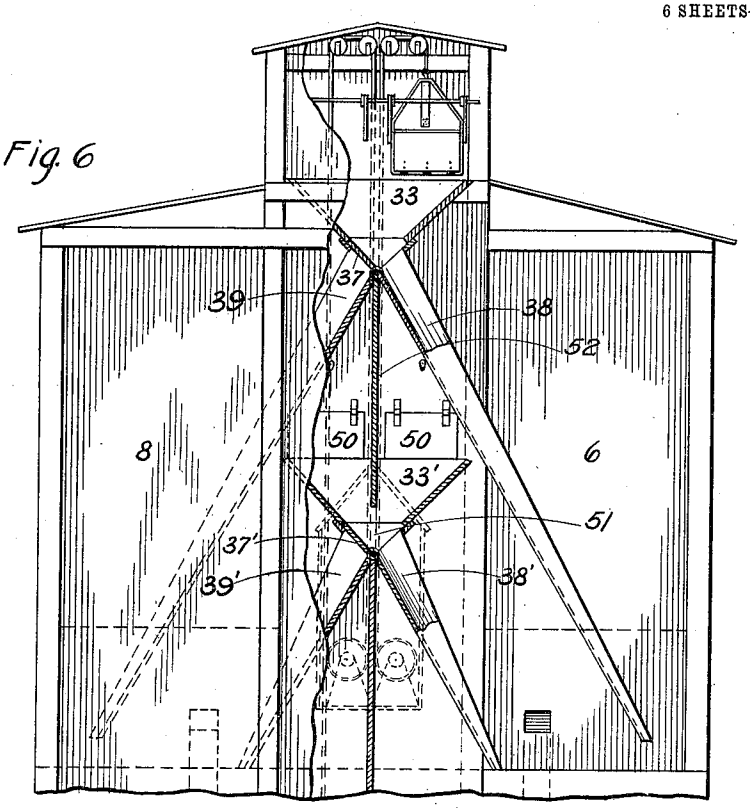
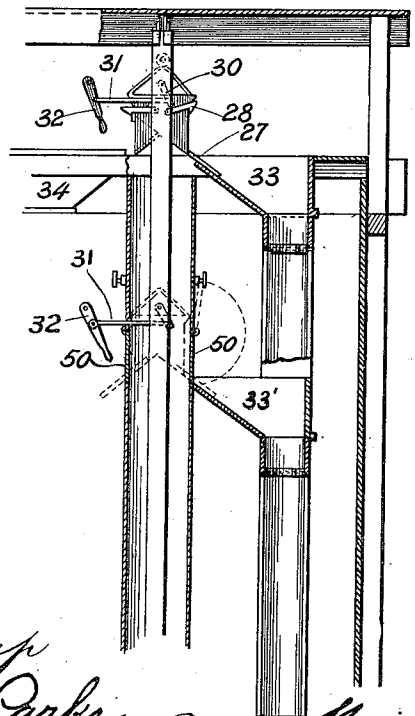


Fig. 7



Witnesses:

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UNITED STATES PATENT OFFICE.

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SORTING AND STORING DEVICE.

1,016,971. Specification of Letters Patent. Patented Feb. 13, 1912.

Application filed June 1, 1909. Serial No. 499,407.

To all whom it may concern:

Be it known that I, JOHN M. SNEAD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Sorting and Storing Devices, of which the following is a specification.

The object of my invention is to provide simple and efficient means for receiving coal, or other commodities, from railway cars or other vehicles, for distributing the same to any one of a plurality of bins, and for delivering the same therefrom as occasion may require.

Other and further objects of my invention will appear from the following description and claims, taken in connection with the accompanying drawings, in which—

Figure 1 is an end elevation, partially broken away, to show the interior structure. Fig. 2 is a side elevation, partially in section, as indicated by the line 2 of Fig. 5. Fig. 3 is a side elevation, all except the upper part being a central section. Fig. 4 is a horizontal section on the line 4 of Fig. 3. Fig. 5 is a horizontal section on the broken line 5 of Figs. 1 and 3. Fig. 6 is a fragmentary view, partly is section, similar to Fig. 2, showing two upper hoppers at different levels. Fig. 7 is a fragmentary view, partly in section, from the same point of view as Fig. 1, and illustrating the modification shown in Fig. 6. Fig. 8 is an enlarged view of the bucket gate trip and associated parts.

Generally speaking, my invention comprises a structure containing a plurality of bins or compartments beneath which extend a receiving passageway for the vehicle from which goods are received, and other passageways for the vehicles to which material from the bins is delivered. Beneath the receiving passageway, in which I have shown a railway track and car, is a hopper and chutes leading to elevators or conveyers, whereby the material is conveyed to the upper part of the structure and thence distributed by suitable mechanism to any one of the plurality of bins shown.

The storing part of the apparatus consists of eight bins—as indicated by the reference numerals 1 to 8 upon Fig. 5 of the drawings. These bins are supported upon a suitable structure of timber, or other material, at a sufficient height to leave a central passage 9, which will ordinarily be occupied by a railroad track 10, and side passages 11 and 12 for wagons or other vehicles. Beneath the track 10 is a hopper 13 which, preferably, is of sufficient length to receive the contents of a drop bottom car of the type illustrated in the drawings. The device, however, is equally well adapted for use with hopper bottom cars. The car 14 illustrated is one of a type in common use, in which the floor is provided with a series of dump doors 15 hinged at or near the center of the car and movable from horizontal position to the position illustrated. At its apex, the hopper 13 is provided with one or more gates 16, these gates being movable from the position shown in Fig. 1 to a position at the left, thereby acting as a two-way gate to discharge the contents of the hopper through either the right-hand or the left-hand opening. It is necessary to provide means for directing material dumped in the hopper 13 to any one of the eight bins above referred to. The first step in properly directing the material is accomplished by manipulation of the two-way gate 16, thus causing the material to flow down through the chute 17 or the chute 18, which chutes are inclined and lead from the opening in the bottom of the hopper 13.

At their discharge ends, the chutes 17 and 18 are provided with gates 19 which are normally held in elevated position—as shown at the right of Fig. 1—by means of counterweights 20. In their elevated position, the gates prevent the egress of material from the chutes 17 and 18. Adjacent its lower edge, each gate is provided with a projecting shoulder 21. This shoulder lies in the path of the downwardly moving bucket and is adapted to receive the pressure of said bucket and thereby cause the gate to open. In proximity to the discharge ends of the chutes 17 and 18, elevator shafts 22 lead to the upper part of the structure. Each elevator shaft is preferably equipped with two elevator buckets 23, each acting as a counterbalance for the other in the customary manner. In order to coöperate with the pair of buckets in each elevator shaft, the openings 16 in the bottom of the hopper 13 and the chutes 17 and 18 are also preferably arranged in duplicate, one chute registering with each bucket. The power

mechanism for operating the conveyers may be located in a compartment 24 just above the central passageway.

As shown in Fig. 1, the bottoms of the elevator buckets incline downwardly from the center toward the sides, and a false bottom section 25 hinged at the apex 26 of the V-shaped bottom may be thrown to either side for the purpose of providing a self-cleaning bucket capable of discharging its entire contents in either direction. The sides 27 of the buckets are hinged at their lower edges, and when opened to the position shown in the top bucket, at the top of Fig. 1, the hinged side or gate forms an apron which is continuous with the inclined bottom and carries the contents of the bucket into an adjoining hopper. In order to hold the hinged sides 27 closed, I provide hooks or latches 28 which coöperate with the upper edges of the doors or with lugs thereon. The latches 28 are pivoted to the sides of the bucket at 29 and extend inwardly beyond their pivotal connections. In order to automatically dump the buckets when they reach the top of the elevator shafts, I provide a trip 30 pivoted to the framework of the elevator shaft. The trip 30 is connected by a link 31 to the hand lever 32, and by means of the hand lever the trip can be moved to coöperate with either one of the latches 29. As shown at the right-hand of Fig. 1, the trip is set to actuate the right-hand latch 29, and the parts are shown in the position assumed just after the latch has been tripped and the right-hand door dropped. In its dropped position, the door overlaps the side of the adjacent hopper, thus preventing the contents of the bucket from discharging in the space between the bucket and the hopper.

The elevators may be operated by cables and any suitable hoisting mechanism. As the specific character of this mechanism forms no part of my invention, I have not illustrated the same in detail.

By means of the mechanism so far described, material dumped into the hopper 13 may be conducted to either the elevator shaft on the right or that on the left,—as shown in Fig. 1—this being accomplished by suitably setting the two-way gates 16. The material, upon being raised in the selected elevator shaft, may be discharged either to the right-hand or left-hand of the shaft when the buckets reach the top, this latter selection being accomplished by properly adjusting the trip 30. Upon reference to Figs. 1 and 5, it will be seen that hoppers 33, 34, 35 and 36 are arranged at the sides of the respective elevator shafts, each shaft cooperating with a pair of hoppers. Each hopper, at its apex, is provided with opposite openings, and a gate 37 serves to close either opening and to permit the contents to discharge through the opposite opening. Leading from the openings in the base of the hopper are chutes 38 and 39 which are extended downward nearly to the base of the bins into which they lead, in order to avoid the shock incident to dropping the material freely from the top to the bottom of the bins. The last step in the direction of the material to its appropriate bin is accomplished by means of the gates 37. These gates serve to direct material dumped into either of the upper hoppers toward one of the two bins over which such hopper is located.

In operation, if it is desired to conduct material dumped from the car 14 to bin No. 6, the gate 16 at the base of the hopper 13 will be thrown to the left, that is, to the position opposite to that illustrated in Fig. 1. The false bottoms 25 of the buckets in the right-hand elevator shaft—as viewed in Fig. 1—will be adjusted to the position illustrated in that view. The downward movement of the bucket will have previously caused it to engage the shoulder 21 on the gate 19 and to open said gate. The chute 18 is then free to discharge its contents into said bucket. The trip 30 at the top of the elevator shaft shown at the right in Fig. 1 will be set in the position illustrated in that view, and the gate 37 at the base of upper hopper 33 will be thrown to the left, as illustrated in Fig. 2. Material dumped from the car will then fall from the hopper 13 through the chute 18 to the elevators at the right-hand of Fig. 1, and will thereupon be conducted to the top of the structure, where the hinged sides or gates at the right—as viewed in Fig. 1—will be unfastened by the trip 30, permitting the contents to fall by gravity into the hopper 33. The gate at the base of this hopper being thrown to the left,—as shown in Fig. 2—the material will fall through the chute 38 into the bin 6.

In order to discharge material from the bins, chutes 40 lead from the base thereof and have their outlets above the side passages 11—12, thus affording means for conveniently discharging the contents into wagons or other vehicles. The chutes 40 may be provided at their lower ends with gates or closures of any convenient form.

In those cases where the bins are constructed of considerable height, it may be found desirable to provide means for discharging the contents of the conveyer buckets at a point or points below the upper end of the conveyer shaft, in order to avoid breaking the coal, or other material, into small pieces, by dropping it through a great distance. In Figs. 6 and 7, I have shown such an arrangement. Below the hopper 33 I provide a lower hopper 33′, half of which is located in the bin 6 and the other half in the bin 8. The two parts of the hopper communicate through an opening 51 in the wall

52 which separates the bins. Doors 50 in the sides of the conveyer shaft permit the contents of the conveyer bucket to be discharged into the bin 33′ or the corresponding bin upon the opposite side of the shaft, and trip mechanism similar to that used at the upper end of the shaft may be employed for releasing the latches 28 which normally hold the doors and sides of the buckets closed. At the lower end of the hopper 33′ is a gate 37′, through which communication may be established between the hopper and through the bin 6 or the bin 8. Chutes 38′ and 39′ similar to chutes 38 and 39 lead downwardly and outwardly from the hopper 33′.

When the filling of the selected bin is started, the door 50 leading to the hopper communicating therewith will be opened, and the gate 37′ properly adjusted. The trip mechanism for the lower hopper 33′ will also be adjusted to release the gate of the bucket opposite the selected hopper and the operation of filling the bin will be proceeded with. When the material in the bin reaches the level of the lower hopper, the door 50 may be closed and the lower trip, corresponding to the trip 30, set at inactive position to permit the buckets to pass the lower hopper without discharging their contents. The upper trip 30, however, will be set to operative position, for the purpose of releasing the bucket gate when the upper hopper is reached, and the filling operation will be completed through the upper hopper.

I would have it understood that I do not desire to limit myself to the precise construction and arrangement of parts shown in the drawings and herein described, as various modifications or alterations may be made without departing from my invention as defined in the appended claims.

I claim:

1. In a device of the class described, a plurality of bins arranged in two adjacent tiers, a hopper above each transverse pair of bins, gates in said hoppers communicating with the adjacent bins, a conveyer between adjacent hoppers, and automatic means for discharging said conveyer into either of the adjacent hoppers.

2. In a device of the class described, a plurality of bins arranged in two adjacent tiers, a hopper above each transverse pair of bins, gates in said hoppers communicating with the adjacent bins, conveyers between adjacent hoppers, automatic means for discharging each conveyer into either of the adjacent hoppers, a hopper at the receiving end of said conveyers, and means for discharging said last-named hopper into either of said conveyers.

3. In a device of the class described, a plurality of bins, hoppers above said bins, gates in said hoppers leading to a plurality of bins, a hopper beneath said bins, said hopper being provided with a plurality of outlets, conveyers extending from said outlets to a point above said upper hoppers, and automatic means for discharging said conveyers into selected hoppers.

4. In a device of the class described, a hopper, a two-way gate at the base of said hopper, chutes leading in different directions from said gate, conveyer shafts at the ends of said chutes, conveyer buckets operating in said shafts, gates in each bucket, hoppers upon opposite sides of said shaft above said chutes, a two-way gate in each of said hoppers, chutes leading in different directions from said gates, power mechanism for elevating said buckets in said shafts, and a compartment for said mechanism having a position above said first named hopper and between said conveyer shafts.

5. In a device of the class described, a hopper, chutes leading in different directions from said hopper, gates at the outlets of said chutes, a conveyer at the outlet of each chute, means upon the gates by which said conveyers may actuate said gates, a series of hoppers at the discharge point of said conveyers, a series of bins beneath said hoppers, means to discharge said conveyer into a selected hopper, and means to discharge said hoppers into selected bins.

6. A sorting and storing device provided with a receiving passage and delivery passages for vehicles, a plurality of bins above said passages, means for conveying material from said receiving passage to any one of said bins, and from said bins to said delivery passages, driving means for said conveying means, and a compartment for said driving means having a position directly above said receiving passage.

7. A sorting and storing device provided with a receiving passage and delivery passages for vehicles, a plurality of bins above said passages, a hopper beneath said receiving passage, hoppers above said bins, means for conveying material from said lower hopper to a selected one of said upper hoppers, and from said upper hoppers to selected bins, driving means for said conveying means, and a compartment for said driving means having a position above said lower hopper.

8. In a device of the class described, two hoppers, an elevator shaft between said hoppers, an elevator bucket operating in said shaft, a bottom in said bucket adjustable to incline toward either of said hoppers, gates in the sides of said bucket, and means adjustable by the operator for automatically unfastening either of said gates, said means being operable by the bucket in its movement.

9. In a device of the class described, two hoppers, an elevator shaft between said hoppers, an elevator bucket operating in said

shaft, a bottom in said bucket adjustable to incline toward either of said hoppers, gates in the sides of said bucket, fasteners to hold said gates closed, and trips adjustable by the operator acting to unfasten either of said gates when said bucket is in position to discharge into either of said hoppers.

10. In a device of the class described, an elevator shaft, hoppers at the sides thereof, an elevator bucket operating in said shaft, gates in the sides of said bucket, fasteners to hold said gates closed, and means to unfasten said gates when said bucket is in position to discharge into said hopper, said means being adjustable to operate either one of said gates.

11. In a device of the class described, a conveyer shaft, hoppers at the upper end thereof, hoppers at a point below the upper end of said shaft, a conveyer in said shaft, and automatic means for discharging material from said conveyer into either of the upper hoppers and means for discharging material into either of the lower hoppers.

12. In a device of the class described, a closed conveyer shaft, hoppers at each side of the upper end of said shaft, hoppers at each side of said shaft at a level below the top of said shaft, doors in said shaft communicating with said lower hoppers, a conveyer operating in said shaft, and means for discharging material from said conveyer into either of the upper or either of the lower hoppers.

13. In a device of the class described, a conveyer shaft, two bins separated by a wall abutting against said shaft, a hopper above said wall, said wall being provided with an opening at a level beneath said upper hopper, a lower hopper located partly in each bin, the parts of said lower hopper communicating through said opening, a conveyer operating in said shaft, and means for discharging material from said conveyer into either of said hoppers, and from either of said hoppers into either of said bins.

14. In a device of the class described, a conveyer shaft, a conveyer bucket operating therein, a gate in said bucket, a latch for holding said gate closed, and adjustable trips at each of a plurality of points in said shaft for releasing said latch and permitting said gate to open, a hopper adjacent each trip, and means for conducting material from each hopper to any one of a plurality of bins.

15. In a device of the class described, a plurality of bins arranged in two adjacent tiers, a hopper above each transverse pair of bins, gates in said hoppers communicating with the adjacent bins, a conveyer between adjacent hoppers, and automatic means for discharging said conveyer into either of the adjacent hoppers, said means being adjustable by the operator for either hopper.

16. In a device of the class described, a plurality of bins arranged in adjacent tiers, a hopper above each adjacent pair of bins adapted to discharge into either bin, a conveyer between adjacent hoppers adapted to discharge into either of said hoppers, hoisting means for driving said conveyers, and a compartment for said means having a position between said tiers of bins and below said hoppers.

17. In a device of the class described, a plurality of bins arranged in adjacent tiers, a hopper above each adjacent pair of bins adapted to discharge into either bin, a plurality of conveyers each having a position between adjacent hoppers and adapted to discharge into either of said adjacent hoppers, and driving means for said conveyers having a location between said tiers and between consecutive conveyers.

In testimony whereof, I have subscribed my name.

JOHN M. SNEAD.

Witnesses:
WALTER A. SCOTT,
HENRY A. PARKS.