

F. J. SCHRAEDER, JR.
CONVEYING SYSTEM.
APPLICATION FILED JUNE 3, 1909.

1,014,727.

Patented Jan. 16, 1912.

3 SHEETS—SHEET 1.

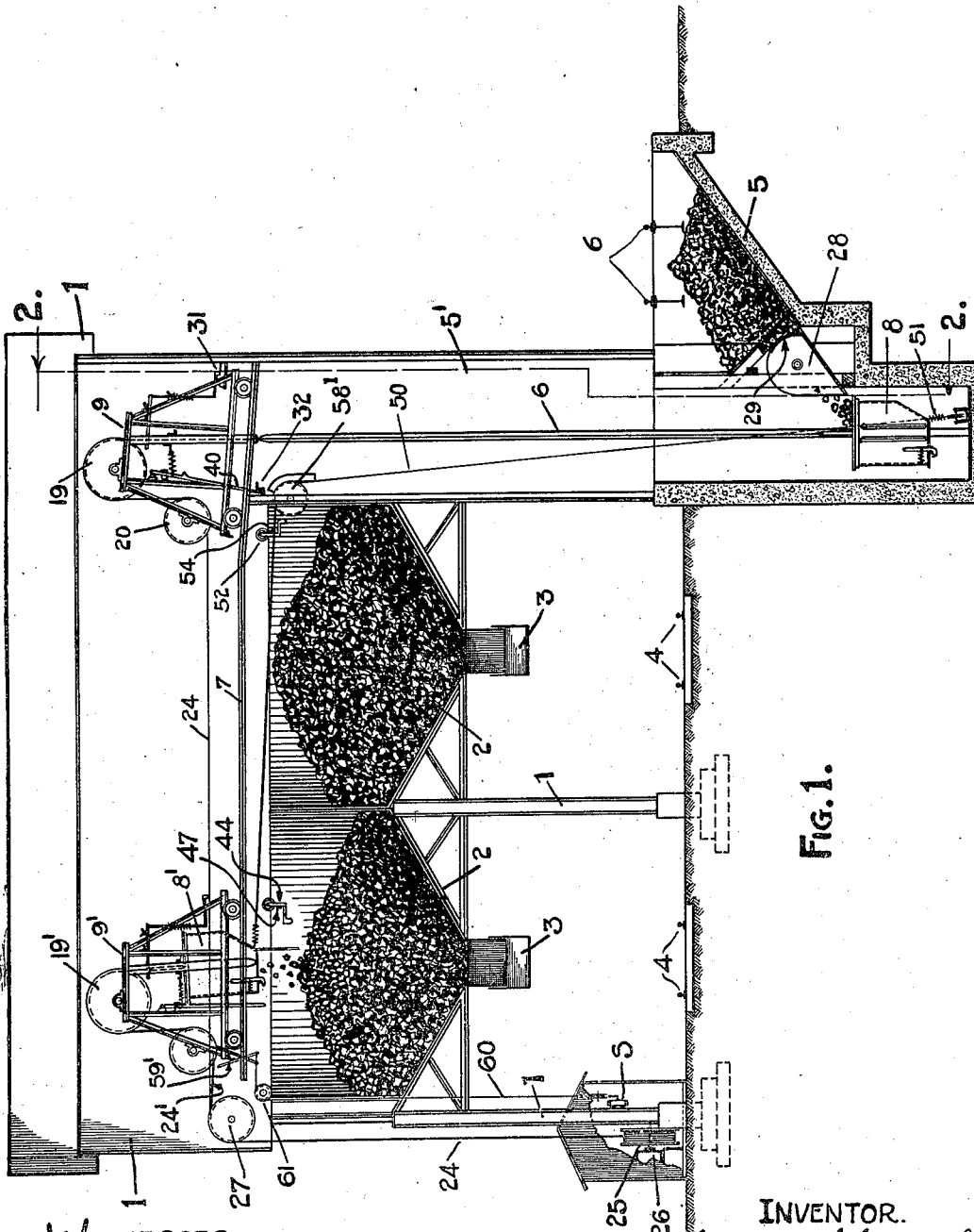


FIG. 1.

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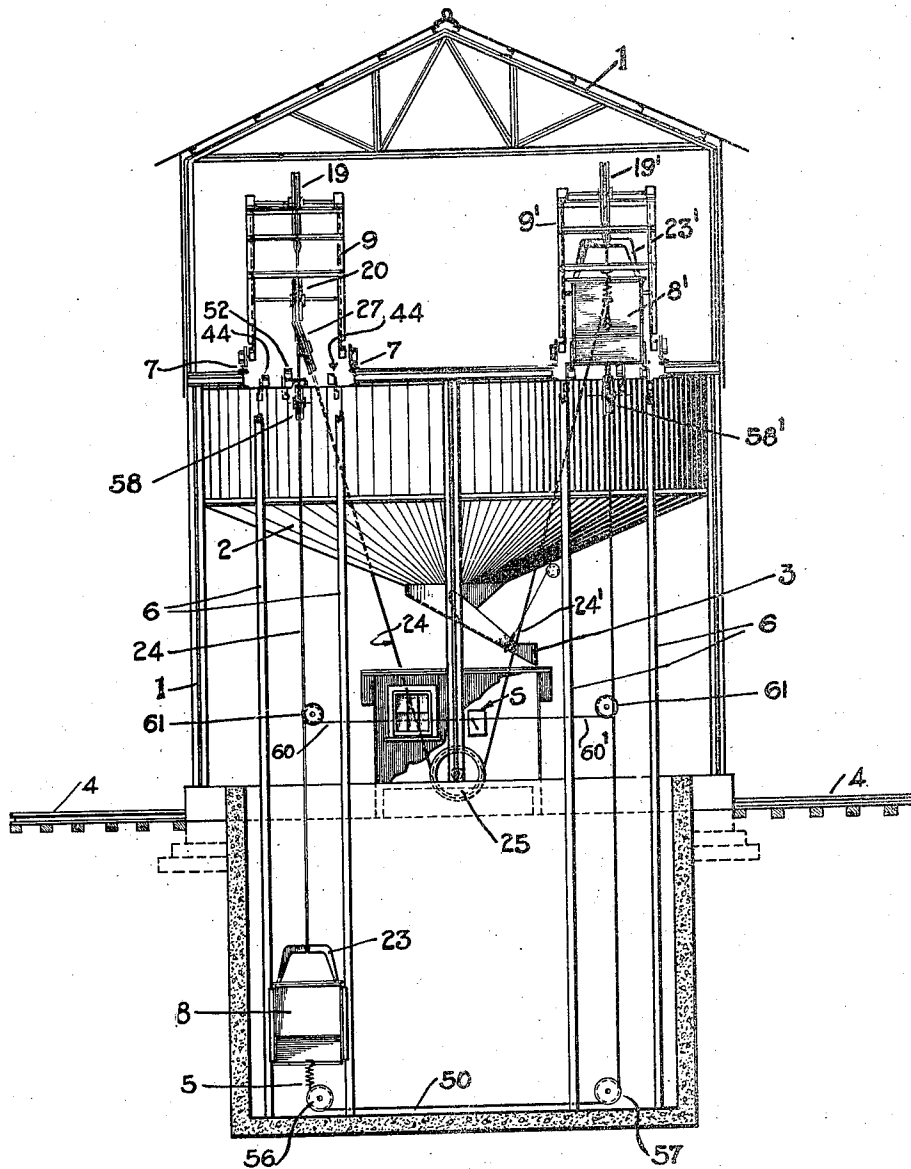


FIG. 2.

WITNESSES.

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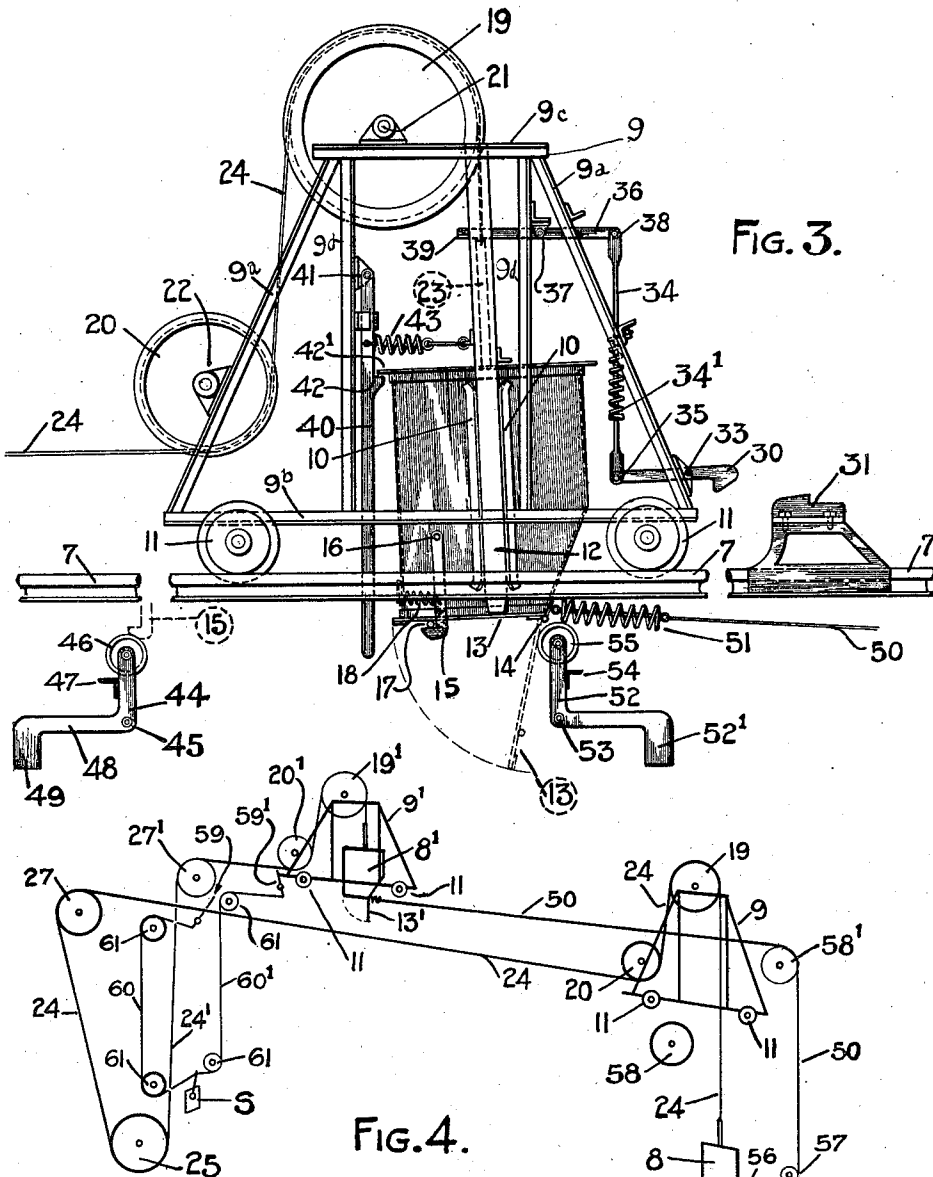
Frank J. Schraeder Jr.
By Hill & Hill
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3 SHEETS—SHEET 3.



WITNESSES.
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UNITED STATES PATENT OFFICE.

FRANK J. SCHRAEDER, JR., OF CHICAGO, ILLINOIS.

CONVEYING SYSTEM.

1,014,727.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed June 3, 1909. Serial No. 499,857.

To all whom it may concern:

Be it known that I, FRANK J. SCHRAEDER, Jr., 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 Conveying Systems or the Like, of which the following is a description.

My invention belongs to that general class of devices known as conveying apparatus and relates more particularly to a system or apparatus for receiving material and distributing the same where desired. It is particularly applicable for the handling of coal or the like in conveying and distributing the same to the storage bins from which it may be further distributed or conveyed by gravity or any other system or systems to where desired. However, the device is not limited to the materials or systems mentioned but may be used wherever found applicable and with all or parts of any other system or apparatus with which it may be suitably used. When applied to coal sheds the usual tower may be omitted and there being no intermediate transferring from the time the coal is loaded in the bucket until it is discharged in the storage bin the coal is not broken up as much nor is there as much dust.

To this end my invention consists in the novel construction, arrangement and combination of parts herein shown and described and more particularly pointed out in the claims.

Referring to the drawings in which like reference characters indicate like or corresponding parts, Figure 1 is a sectional view of the shed and receiving bins showing a side elevation of my preferred form of hoisting and distributing apparatus, Fig. 2 is a cross sectional view taken substantially on line 2—2 of Fig. 1, Fig. 3 is a side elevation of one of the buckets and the carrier therefor, and Fig. 4 is a diagrammatic view of a part of the system showing means for hoisting and moving the buckets.

Referring to the drawings in which my preferred construction and arrangement is shown as applied in the handling of coal or the like, 1 represents the usual shed and 2 suitable storage bins or receptacles of any suitable size and shape provided with discharge chutes 3 or any equivalent therefor. The application of the system or apparatus in the handling of coal is merely an illus-

tration of one of the uses of my preferred construction, and the same may be employed for other uses and with any construction of shed, bins, chutes, and the like. Tracks 4—4 or the equivalent may be arranged below the storage bins if desired so that the coal may be discharged directly into a car or locomotive tender below the bins. In the construction shown the apparatus is designed to carry the material from the auxiliary bins 5 to the storage bins 2, there being any number of auxiliary and storage bins, without any intermediate transferring or changing conveyers. The material may be brought to the auxiliary bins 5 in any suitable way, as for example, by dump cars carried by the track 6 arranged above the auxiliary bins. The preferred construction comprises one or more receptacles or buckets 8 provided with means for automatically lifting or hoisting the bucket up the elevator shaft 5, or from a lower to a higher level, and carrying the same laterally, in the higher level, to wherever desired and then discharging the same, the buckets being returned to the loading place after they have discharged their contents.

In the drawings two buckets are shown, the arrangement being such that when one bucket is in a position to receive the coal from the bins 5 the other bucket is at the limit of its lateral travel, Figs. 1 and 2 showing the buckets in these positions, that is, the buckets are alternately hoisted and laterally moved. Guides or ways 6 arranged in the shaft and suitable flanges or guides 10 on the buckets or their equivalents for the purpose, may be provided to guide the buckets during their vertical travel. To carry the buckets in their lateral movement I provide what may be termed carriers or carriages which are suspended or supported above the bins in any suitable way, supporting rails 7 being shown for the purpose. The carrier preferably comprises a frame made up of parts 9^a, 9^b, etc., and provided with suitable supporting wheels 11 or their equivalent. In order to hereafter more clearly explain the system, I have designated one frame or carriage as 9 and the other as 9', similarly for other similar parts. As shown the carriage is provided with guides 12 corresponding to the guides 6 of the shaft 5 and arranged so that they will register with the guides 6 when the carrier is over the shaft. Each frame also carries

a pulley 19 or its equivalent which supports the bucket during the hoisting.

The receptacles or buckets 8 may be of any suitable form or design and arranged to dump or discharge the material in any preferred way. As shown each bucket is provided with a bottom 13 pivotally secured to the same as at 14 and a latch or catch 15 pivotally secured to the bucket on each side at 16 and arranged to engage suitable pins 17 or their equivalent on the bottom, and normally retain the same closed. The latches 15 may be provided with resilient members 18 arranged to normally retain the same in operative position. In the preferred construction the bucket is hoisted to the top of the shaft or to the higher level by means of a cable 24 which also laterally draws the bucket and carriage when the bucket reaches the top of the shaft. The cable 24 is secured to the bail 23 of the bucket and to a drum 25 driven by a suitable motor or engine 26 or the equivalent, suitable pulleys 19 and 20 carried by the frame at points 21 and 22 and a pulley 27 carried by the structure being preferably provided to guide the same. The bucket may be returned to the bottom of the shaft by means of a cable 50 or its equivalent which may be secured directly to the drum 25 and controlled by the reversal of the drum or which may be arranged in a manner explained hereafter.

Any suitable means may be employed to control the discharge of material from the bin 5 to the bucket 8 a chute 28 provided with a shield 29 being shown for the purpose, the construction being such that when the bucket descends it pulls down the chute 28 discharging a bucketful into the bucket 40 the shield preventing more than a bucketful from being discharged from the bin. Hoisting the bucket raises the chute 28 to be again filled the same remaining closed until the bucket again descends. As the drum 25 is rotated drawing cable 24 the bucket is hoisted until it reaches the position substantially as shown in Fig. 3 (this figure showing the carriage having started on its lateral movement). While over the shaft and until the bucket is entirely hoisted the carriage is held against movement by a suitable locking member 30 engaging the notch of the cooperating locking part 31. Locking member 30 is pivotally secured to the frame as at 33 and is operated by a rod 34 pivotally secured thereto at 35, which rod is operated by the lever 36 provided with an extended end 39. The lever 36 is pivotally secured to the frame at 37 and to the rod 34 at 38. A resilient member 34¹ is also provided and arranged to resiliently retain the parts in operative position. When the bucket is raised until the bail 23 raises the end 39, the catch 30 will be disengaged from the notch of part 31 thereby releasing the

carrier so that continued drawing of the cable 24 draws the carriage along the tracks 7. Any equivalent arrangement for locking the carriage over the shaft when the bucket is down may be provided. The carrier is also provided with a suitable lever or lock 40 secured thereto as at 41 which is provided with a notch 42 adapted to engage the edge 42¹ of the bucket while carried laterally by the carriage the arm 40 being retained out of operative position by means of a stop 32 carried by the structure when the carrier is over the shaft.

To open the bucket at the desired time so that it will discharge its contents, I preferably provide what may be termed trips 44 carried by the structure and arranged to engage the latches on each side of the bucket so that they will release the bottom and permit the same to drop. As shown the trips are preferably secured to the structure as at 45 and provided with suitable stops 47. Normally the trip 44 is held against its stop by means of a weight 49 or its equivalent arranged on the extended arm 48, a roller 46 may also be arranged as shown if desired. As the carriage 9 moves over the shaft the trips 44 arranged where desired engage the hooks 15 substantially as shown by the dotted lines (Fig. 3) releasing the bucket bottom, the trip swinging about the center 45 on the return of the bucket permitting the hooks to pass. To close the bucket I preferably provide a member 52 arranged wherever desired, as shown substantially near the elevator shaft, which will force the bottom up in position where it will again be engaged by the hooks 15. As shown the member 52 is pivotally carried by the structure as at 53, the same being provided with a stop 54, and suitable means such as a weight 52¹ for drawing the same back into position. A wheel 55 may also be provided if desired. Any equivalent arrangement of bucket and controlling or operating mechanism for the bucket may be provided. Before the carrier or carriage 9 reaches the end of its travel toward the shaft, the lever or bucket lock 40 engages the stop 32 releasing the bucket so that the same is supported in the carriage by the cable 24. When the carriage reaches the end of its travel the bucket descends, the carriage being locked in position over the shaft. It might be noted that during the hoisting of the bucket as well as during its lateral movement the same is carried or supported by the carriage.

In the preferred construction I use two buckets and arrange the same so that as one bucket is hoisted the other will be retrieved to the loading point, that is they work alternately. Referring to the diagrammatic view, Fig. 4, 8 and 8¹ represent the two buckets and 9 and 9¹ the two frames. The

cable 24 secured to bucket 8 passes over the pulleys 19 and 20, over pulley 27 to the drum 25 where it may be given a number of turns around the drum and then extends over pulleys 27¹, 20¹ and 19¹ being secured to bucket 8¹. The two buckets are also connected by the cable 50 suitable pulleys 58 and 58¹ and 56 and 57 being provided where desired. As is obvious this construction forms substantially an endless cable made up of the cable 24 and cable 50. As the bucket 8 is drawn up by means of the cable 24 the bucket 8¹ and the carriage 9¹ are drawn toward the loading point. When the bucket 8 reaches the carriage 9 as before mentioned, the carriage is drawn along the tracks until the other bucket reaches the bottom of the shaft, the trips 44 for operating the bucket being of course arranged in the travel of the carriage at the point where it is desired to discharge the load. It might be noted that the tracks over the shaft are slightly inclined in the preferred construction. When the carriage reaches the inclination the tendency is for the weight of the car to always carry it to the end of its travel.

Any suitable arrangement may be employed to control the operation of the drum 25 or to reverse the same when a bucket reaches the bottom of the shaft, a simple arrangement being shown diagrammatically in Figs. 1, 2 and 4, in which the motor 26 driving the drum 25 is controlled by a suitable switch S operated by a plurality of levers 59 and 59¹ or their equivalent arranged in the path of the carriages. These levers are suitably connected by means of cables 60—60¹ or their equivalent to the switch S, suitable pulleys 61 being provided if required. Operating the switch changes the polarity of the motor thereby reversing the drum. Any equivalent arrangement may be provided. As mentioned the arrangement is such that the drum will be automatically reversed when a bucket reaches the bottom of the shaft and receives its load.

There may be any number of storage bins and of course it is obvious that the trips and bins may be so arranged that one bucket will be discharged in one bin while the other bucket may be discharged in any other bin.

Having thus described my invention it is obvious that various immaterial modifications may be made in the arrangement, construction and combination of parts shown and described or that the same may be used wherever it may be found applicable without departing from the spirit of my invention, hence I do not wish to be understood as limiting myself to the exact construction, arrangement and combination of parts shown or described or uses mentioned.

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

1. In a device of the kind described, and

in combination, a receptacle and carriage therefor; means for hoisting the receptacle to the carriage, and thereafter laterally moving the carriage and receptacle, means for controlling the discharge of material from said receptacle and means for positively returning the receptacle to the loading point.

2. In a device of the kind described and in combination, a plurality of material receptacles, means for vertically alternately lifting the receptacles from the loading point and laterally carrying the same to the discharging point, mechanism for automatically controlling the discharge of material from the receptacles, means for automatically resetting said discharging mechanism, and means coöperating with the filled receptacle for returning the empty receptacles to the loading point.

3. In a device of the kind described and in combination, a pair of material receptacles, means for alternately vertically lifting the receptacles from a loading point and thereafter laterally carrying the same to a discharging point, mechanism for automatically controlling the discharge of material from the receptacles and means for returning the empty receptacle to the loading point, comprising a cable connecting the receptacles, and guiding means for said cable.

4. In a device of the kind described and in combination, a pair of buckets arranged to alternately raise material from a lower to a higher level, an elevated track for each bucket, a carriage for each bucket mounted on said tracks, means for raising a filled bucket from the lower level to said carriage and thereafter drawing the carriage and bucket laterally in said higher level, and means connecting the buckets for simultaneously drawing the empty bucket to the lower level.

5. In a device of the kind described and in combination, an elevator shaft, a plurality of buckets, an elevated track for each bucket, a carriage for each bucket mounted on said tracks, means permanently connecting the buckets for alternately raising said buckets in the shaft and thereafter laterally moving the buckets and carriages therefor, and means connecting the buckets for returning the buckets to the bottom of the shaft.

6. In a conveying system and in combination, a plurality of elevator shafts, a pair of tracks for each shaft at the upper end thereof inclined upwardly and extending therefrom, a carriage mounted on each pair of tracks, a bucket for each shaft and carriage, means for alternately hoisting said buckets to their respective carriages and thereafter moving said carriages and buckets, means for positively returning the empty buckets to the bottom of the shaft, means for locking the buckets in their car-

riages when carried thereby, and means automatically controlled by the buckets for locking the carriages over their respective shafts when the buckets are in the shafts.

- 5 7. In a conveying system and in combination, a plurality of elevator shafts, a pair of tracks for each shaft at the upper end thereof inclined upwardly and extended therefrom, a carriage mounted on each pair
10 of tracks, a bucket for each shaft and carriage, means for automatically hoisting said buckets to their respective carriages and thereafter moving said carriages and buckets comprising a hoisting cable operatively
15 connecting said carriages and buckets, reversible operating means for said cable, and means automatically operated by said carriages for controlling said operating means, and means for automatically locking said
20 carriages over their respective shafts when the buckets are in the shafts.

8. In a system of the kind described, the combination of elevating and conveying apparatus comprising two receptacles, a material storage receptacle and a shaft, a track
25 for each bucket extending from said storage receptacle over the shaft, a carriage mounted on each track, a sheave carried by each carriage, means for hoisting and laterally moving the receptacles to the storage
30 receptacle, comprising an operating cable secured to said receptacles and extending over said sheaves, said receptacles associated so that one is at one end of its travel when
35 the other is at the opposite end of its travel, a power device for operating said cable, means for automatically controlling said power device, and means for returning said receptacles and carriage to the shaft, including a cable connecting said receptacles
40 and extending to the bottom of the shaft.

9. In a system of the kind described, the combination of elevating and conveying apparatus comprising a bucket, a material
45 storage receptacle and a shaft, a track extending from said storage receptacle to the shaft, a carriage mounted upon said track, a sheave carried by said carriage, means for hoisting said bucket to the carriage and lat-

erally moving the carriage and bucket from 50 the shaft to the storage receptacle, comprising a cable secured to the bucket and extended over said sheave, a power device for operating said cable, and means for controlling said power device, and means for
55 thereafter laterally moving the carriage and bucket from the storage receptacle to the shaft and drawing the bucket down the shaft, comprising a cable secured to the bucket and extending proximate the foot 60 of the shaft, and means for operating said cable.

10. In a conveying system, the combination with elevating apparatus, of a pair of buckets, and means for alternately hoisting 65 the buckets from a lower to a higher level, and thereafter laterally moving the same in the higher level, comprising a cable connected with said buckets and extending therefrom to the extreme end of their travel 70 in the higher level, a power device for operating said cable, and means for automatically controlling said power device, and means for alternately returning the buckets to the lower level including a cable connecting the buckets and extending to the end of
75 their travel in the lower level.

11. In a conveying system, the combination of a pair of buckets, and means for alternately hoisting said buckets from a lower 80 to a higher level and laterally moving the same in the higher level and thereafter returning the same to the lower level, comprising a pair of cables connecting the buckets, one cable extending from the buckets to the 85 extreme end of their travel in one direction, and the other cable extending to the extreme end of their travel in the opposite direction, a power device for operating one of said cables of the pair and means for controlling said power device. 90

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

FRANK J. SCHRAEDER, JR.

Witnesses:

ROY W. HILL,
CHARLES I. COBB.