No. 730,541. PATENTED JUNE 9, 1903.

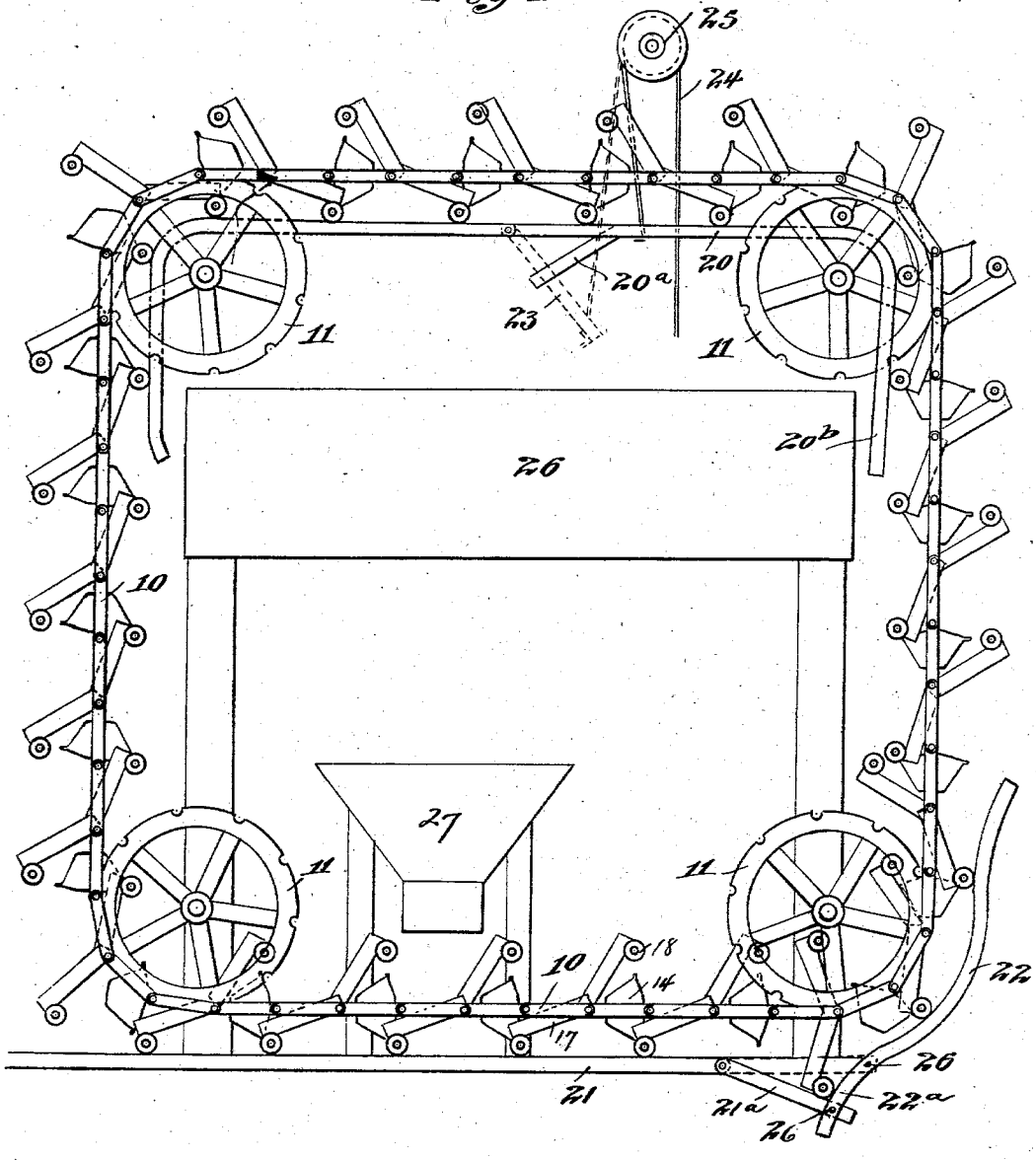
S. F. JOOR.

CONVEYER.

APPLICATION FILED JAN. 26, 1903.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



Witnesses,
D. Mann
S. N. Pond.

Inventor,
Samuel F. Joor,
By Offield, Towle & Linthicum
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.

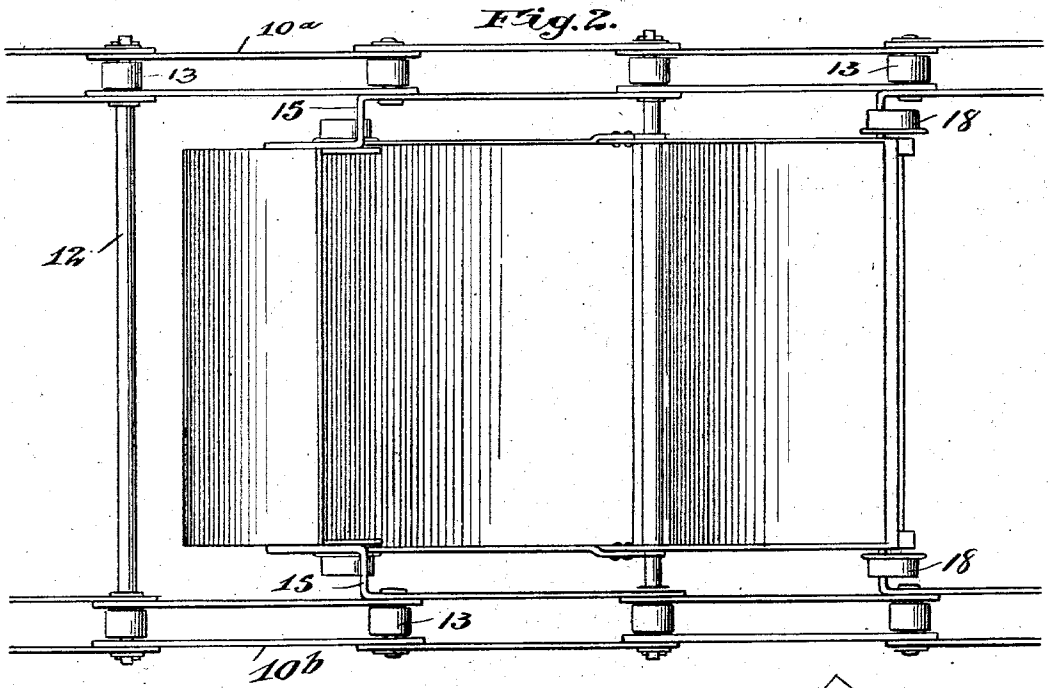
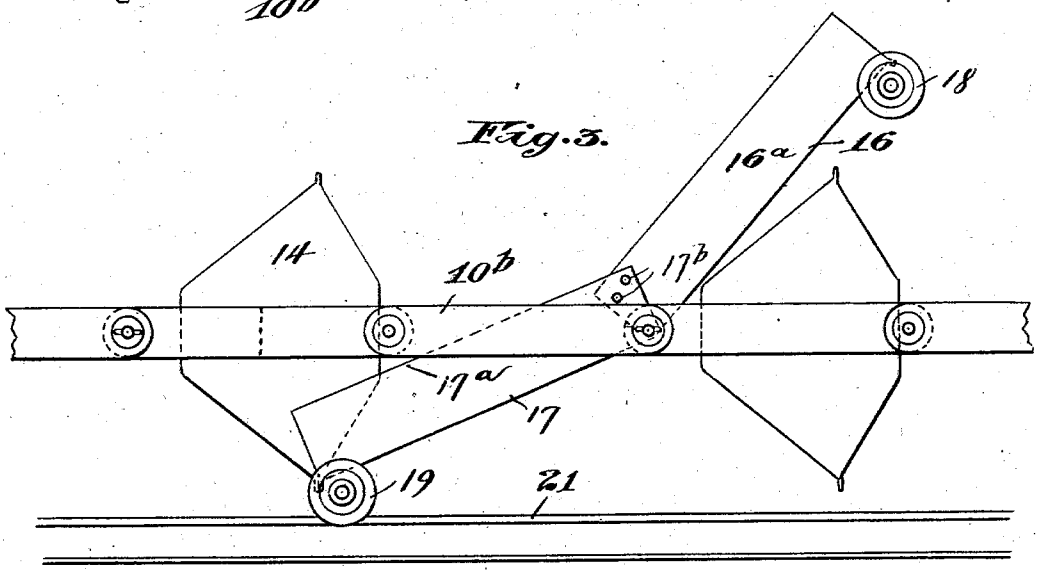


Fig. 3.



Witnesses,
S. D. Mann,
S. N. Pond.

Inventor,
Samuel F. Joor,
By Offield, Towle, Linthicum & Offield
Attys.

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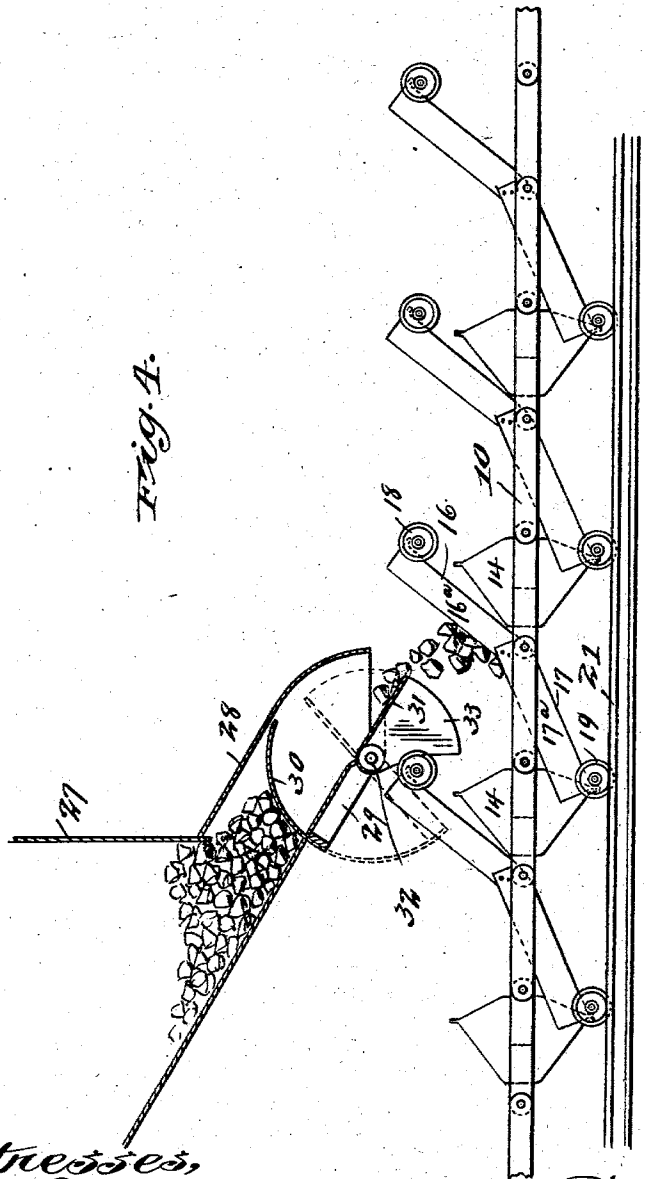
S. F. JOOR.

CONVEYER.

APPLICATION FILED JAN. 26, 1903.

NO MODEL. 3 SHEETS—SHEET 3.

Fig. 4.



Witnesses,
P. B. Mann,
S. N. Pond.

Inventor,
Samuel F. Joor,
By Offield, Towler & Linthicum
Att'ys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 730,541. Patented June 9, 1903.

UNITED STATES PATENT OFFICE.

SAMUEL F. JOOR, OF MORGAN PARK, ILLINOIS.

CONVEYER.

SPECIFICATION forming part of Letters Patent No. 730,541, dated June 9, 1903.

Application filed January 26, 1903. Serial No. 140,538. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL F. JOOR, a citizen of the United States, residing at Morgan Park, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Conveyers, of which the following is a specification.

My invention relates to conveyers, and has reference more particularly to conveyers of the endless type adapted to carry coal, grain, or other material and convey the same between points located at different elevations or between separated points on the same elevation.

Conveyers of the class to which my invention belongs are characterized by the provision of a series of endwise-connected buckets which are caused to pass in succession beneath a delivery-hopper and are charged therefrom, carrying their loads thence to a point of delivery, at which they are emptied by tilting or inverting the buckets, whence the buckets again return to the charging-hopper to repeat the operation.

The object of my invention is to provide a mechanism which shall be automatically actuated by the buckets to deliver a predetermined measured quantity of material thereto, and in the carrying out of this object I employ, in connection with the delivery-spout of the hopper containing the material, a delivery mechanism which is successively actuated by the buckets of the conveyer as they pass thereunder.

In the preferred embodiment of my invention I employ, in connection with and as constituting part of each bucket, a peculiar and novel form of hinged cover, which, operating in conjunction with a guide-track located beneath and parallel with the conveyer, constitutes the actuating device of the delivery mechanism, said cover also serving as a guide-chute for the material in the loading of the bucket. This hinged cover also possesses an additional function as constituting in part the load-carrying portion of the bucket, and where employed on endless conveyers having an upper and lower run, in traveling between which the bucket is inverted, said cover is capable of constituting in part the load-carrying portion of the bucket on both the lower and upper runs.

To this and other minor ends my invention consists in a conveyer mechanism characterized by a novel automatic delivery mechanism and a novel construction of bucket and hinged cover, substantially as hereinafter described and claimed.

Referring to the accompanying drawings, which illustrate a preferred form of my invention, Figure 1 is a side elevational view of a complete conveyer mechanism embodying my invention. Fig. 2 is a top plan view, enlarged, of a section of the conveyer-chain and a single bucket and its hinged cover carried thereby, more particularly illustrating the manner and means of supporting the bucket and cover on and between the parallel members of the conveyer-chain. Fig. 3 is a side elevational view of the parts shown in Fig. 2 drawn to the same scale; and Fig. 4 is a side elevational view of a section of the conveyer, illustrating in association therewith the details of the automatic feed device whereby measured quantities of material are delivered to the successive buckets.

Referring to Fig. 1, 10 designates as an entirety an endless conveyer-chain formed of a series of relatively short links pivoted together and trained over sprocket-wheels 11, mounted in a common vertical plane and presenting upper and lower runs between which the material may be carried. This chain, more specifically considered, is composed, as shown in Fig. 2, of a pair of relatively narrow sprocket-chains 10^a and 10^b, connected by transverse rods or bolts 12, passing through every other pivotal joint formed by the links of the chains. The pivot-pins of each sprocket-chain 10^a and 10^b are preferably provided with antifriction-rollers 13, which engage the peripheries of the sprockets 11, whereby the chain is driven through power applied to any one or more of the sprockets.

14 designates as an entirety each one of a series of buckets or bucket-bodies disposed in tandem order between the side members of the conveyer-chain, said bucket-bodies being rigidly connected to said side members of the conveyer-chain in any convenient way, as by means of the angle-brackets 15, shown as constituting integral offset extensions of the inner members of every other link of the chains 10^a and 10^b. These buckets are pref-

erably of the flaring and wide-mouthed formation shown, the entire wide advance end of the bucket being open and in the form of a flat V.

Coöperating with each bucket-body 14 is a double cover composed of a pair of flat cover-sections 16 and 17, provided, respectively, with side flanges or margins 16^a and 17^a. These cover-sections are rigidly united at their meeting ends, preferably by means of rivets 17^b, securing together the overlapping ends of their margins, and the cover-sections are thus united at a wide angle to each other, which in practice I have found should preferably be slightly less than one hundred and eighty degrees. The double cover thus formed is hinged centrally along the meeting-line of its two sections on one of the transverse rods 12 of the conveyer-chain, and the sections of the cover are of such a length as to extend from the hinge to the upper and lower margins, respectively, of the open end or mouth of the bucket-body 14.

Rotatably mounted on the cover-sections 16 and 17 at or near the outer end of each side thereof are rollers 18 and 19, respectively, these rollers being designed to ride over tracks 20 and 21, disposed beneath and parallel with the upper and lower runs of the conveyer-chain, respectively, and when said rollers are engaged with their respective tracks the respective sections of the hinged cover on which they are mounted are held thereby against the respective margins of the bucket-body with which they coöperate. For purposes of discharging the loads carried by the buckets the lower track 21 is provided with a drop-section 21^a and the track 20 with a corresponding drop-section 20^a. The drop-section 21^a is herein shown as a hinged section of the track, which coöperates with an oppositely-inclined depending section 22^a of a suitably-curved guide or track 22, located adjacent the lower right-hand sprocket 11, and the drop-section 20^a of the upper track may be a rigid section, which coöperates with a hinged trap 23, adapted to be raised and lowered by a cable 24, passed around a pulley 25 above the conveyer. The hinged drop-section 21^a of the lower track may be maintained in the level or the downwardly-inclined position, as desired, by any suitable means, as a pin 26, uniting the same at either of two points to the inclined extension 22^a, while the hinged section 23 of the upper track is maintained level or downwardly-inclined by the cable 24.

27 designates a hopper located directly above the lower section of the conveyer-chain and serving to supply the material to the buckets on the lower run. This hopper is provided with an inclined discharge trough or chute 28. Hinged in and transversely of the base of the trough 28 at its lower end is a measuring and feeding device consisting, as herein shown, of a frame 29, directly underlying the base of the trough and provided at one end with an arc-shaped blade 30, playing through a transverse slot in the base of the trough, and at its other end with a flat blade 31 of a size to swing freely into and out of the lower open end of the trough. On each overhanging end of the pivot-shaft 32 of the measuring device is secured a counterweight 33, preferably in the segmental form shown, one edge of which counterweight lies directly in the path of the roller 18 on the upper section of the hinged cover. The blades 30 and 31 are of a size substantially equal to the cross-sectional area of the trough, and thereby alternately serve as stops for the material sliding by gravity through the trough, said blades being so positioned relatively to their common center of oscillation that when one is within the trough and serving to stop the further flow of material the other is withdrawn.

In the operation of the device the buckets pass successively below the discharge-trough 28 of the hopper with their hinged covers occupying the position shown in Figs. 1 and 4, wherein the lower sections of the covers are held against the lower margins of the forward open ends of the bucket-bodies, thereby constituting, in effect, a part of the load-carrying portion of the bucket, while the upper sections of the covers are inclined at an angle suitable to receive the material as it drops from the trough and direct it into the bucket. The counterweight 33 normally maintains the curved stop 30 within the trough, as shown in full lines in Fig. 4. As the buckets successively pass along beneath the mouth of the trough the roller 18 impinges the adjacent edge of the counterweight 33, and by reason of the fact that the opposite end of the double cover is held between the lower margin of the bucket-body and the track the counterweight is swung upwardly, retracting the stop 30, but at the same time elevating the stop 31, whereupon the material slides by gravity, filling the trough up to and against the lower stop 31. As soon, however, as the roller 18 has passed out of engagement with the counterweight the latter drops, thereby quickly reversing the positions of the stops 30 and 31, and thus permitting a measured quantity of material to fall by gravity onto the cover of the underlying bucket, whence it slides down into the load-carrying section of the bucket constituted by the lower half of the bucket-body and the lower section of the hinged cover. No sooner has this operation been completed with one bucket than the cover of the next succeeding bucket engages the counterweight 33, and the operation is repeated. If it is desired to discharge the load on the lower run, the hinged section 21^a is moved to and secured in the lower inclined position, (shown in full lines in Fig. 1,) so that as soon as the load-carrying section of the cover reaches said hinged section of the track it immediately drops under the weight of the load and discharges the latter, the cover be-

ing returned to its former position immediately thereafter by reason of the engagement of the rollers 19 with the guide-track 22^a and 22. If, however, it is desired to carry the load up and discharge it on the upper run, the discharge-trap in the lower track is closed, whereupon the buckets and their covers, still occupying the same relative positions to each other as when the load is received, make the turn around the lower right-hand sprocket, during which travel the load is shifted entirely into the bucket-body, the cover-section being kept pressed thereagainst by the guide 22. As soon as the loaded bucket reaches the proximity of the upper right-hand sprocket 11 the wheels 18 on the opposite cover-section ride into engagement with a downward extension 20^b of the upper track, whereby said other section of the cover is moved toward and maintained in contact with the body of the bucket, while the load as the bucket rounds the sprocket-wheel is partially transferred from the bucket-body to said hinged cover-section, and thus conveyed to the discharge-trap formed by the drop-sections 20^a and 23 of the upper track, whereupon the load is automatically discharged in the manner already described into any suitable receiver, such as the storage-bin 26. After the load has been discharged the lower or load-carrying section of the cover is returned to closed position by riding up the hinged section 23 and is maintained therein during the continued travel of the bucket around and onto the descending leg of the conveyer. As soon, however, as the bucket reaches the bottom of the descending leg and rounds the lower left-hand sprocket 11 the rollers 19 again engage the lower track 21, thus automatically insuring the charging position of the cover as the bucket again passes beneath the load-delivering hopper and actuates the feed-delivery mechanism in the trough thereof.

It will thus be seen that the peculiar form of hinged cover which I have shown and described when coöperating with the underlying track, which serves the double function of maintaining the lower section of the cover against the bucket-body and maintaining the upper section of the cover sufficiently rigid to actuate the feed mechanism, not only possesses the advantage of permitting the delivery of the material from the bucket on either the lower or upper run of the conveyer, but it is also instrumental in connection with the measuring device described in effecting the automatic rapid successive operation of said measuring device in coöperation with the series of buckets passing beneath the discharge of the feed-hopper.

In a companion application filed of even date herewith, Serial No. 140,537, I have shown and claimed a bucket having a pair of covers and operating to deliver the load on either the lower or upper run, as desired; but in the aforesaid application the two covers are disconnected from each other and operate independently. The characteristic novel feature of the bucket of my present invention is the double-hinged cover, the two sections of which are rigidly united at their meeting ends, whereby in coöperation with the guide or track underlying the lower run of the conveyer the upper open end of the cover is rendered capable of positively actuating a feed mechanism for delivering given quantities of material to the successive buckets.

It is evident that the mechanism described and illustrated might be modified and varied considerably by the substitution of mechanically-equivalent forms and devices without departing from the spirit of my invention. I do not, therefore, limit the latter to the precise forms and relative arrangement of parts shown and described, except to the extent indicated in certain of the appended claims.

I claim—

1. In an apparatus of the type described, the combination with a conveyer comprising essentially a series of endwise-connected buckets, of hinged covers for said buckets, respectively, a guideway or track underlying said conveyer and overridden by the lower portions of said hinged covers, a delivery-receptacle for the material to be distributed having a discharge-trough disposed above the buckets, and means located in said trough for successively delivering measured quantities of material to the buckets, said means being actuated by the upper portions of said hinged covers, substantially as described.

2. In an apparatus of the type described, the combination with a conveyer comprising essentially a series of endwise-connected buckets, the advance end of each of said buckets being open, of hinged covers for said buckets, respectively, each of said covers comprising two sections rigidly united along their meeting edges and adapted alternately to close the upper and lower portions of the openings of said buckets, a guideway or track underlying said conveyer and overridden by the lower sections of said hinged covers, a delivery-receptacle for the material to be distributed having a discharge-trough overlying said buckets, a hinged frame mounted on said trough and carrying separated stop-blades adapted to be alternately entered and withdrawn from said trough by the oscillations of said hinged frame, and an actuating member on said hinged frame lying in the path of the upper sections of said hinged covers and actuated by the latter successively, substantially as described.

3. In an apparatus of the type described, the combination with a conveyer comprising essentially a series of endwise-connected buckets, the advance end of each of said buckets being open, of hinged covers for said buckets, respectively, each of said covers comprising two sections rigidly united along their meeting edges and adapted alternately to close the upper and lower portions of the openings of said buckets, rollers mounted on

the outer portions of said cover-sections, a guideway or track underlying said conveyer and engaged by the rollers on the lower sections of said covers, a delivery-receptacle for the material to be distributed having a discharge-trough overlying said buckets, a hinged frame mounted on said trough and carrying separated stop-blades adapted to be alternately entered and withdrawn from said trough by the oscillations of said hinged frame, and a weighted extension on said hinged frame disposed in the path of and adapted to be raised by the rollers on the upper hinged sections of the covers, substantially as described.

4. In an apparatus of the type described, the combination with an endless conveyer comprising essentially a series of endwise-connected open-ended buckets and having upper and lower runs, of guideways or tracks located below and parallel with said upper and lower runs, respectively, discharge-traps in said upper and lower tracks, hinged covers for said buckets, respectively, each of said covers comprising cover-sections rigidly united at their meeting edges and adapted to alternately close upper and lower portions of the open ends of said buckets, respectively, guide-rollers on the outer portions of said cover-sections adapted to override said lower and upper tracks, respectively, and maintain the lower portion of the bucket on each track closed, a delivery-receptacle for the material to be distributed having a discharge-trough located above the lower run, and a delivery mechanism mounted in said discharge-trough and actuated through contact therewith of the cover-rollers, substantially as described.

5. A conveyer-bucket of the type described, comprising a bucket-body having a V-shaped open forward end, and a hinged cover for the same, said cover comprising a pair of cover-sections rigidly united at their meeting edges coincident with their pivotal axis, and said cover-sections being disposed at a wider angle to each other than the angle formed by the planes of the open end of the bucket, substantially as described.

6. A conveyer-bucket of the type described, comprising a substantially diamond-shaped bucket-body having an open V-shaped forward end, and a hinged cover therefor comprising a pair of cover-sections rigidly united at their meeting edges coincident with the pivotal axis of the cover, said hinged sections being disposed at such an angle to each other as that when one section closes one plane of the opening of the bucket-body the other section constitutes an inclined chute to deliver material to the bucket-body through the other plane of the opening, substantially as described.

7. The combination with a conveyer constituted substantially by an endless line of buckets following one another in tandem, of a delivery trough or spout disposed above the line of the conveyer, and a pair of connected stop-gates operating alternately in said trough or spout, said stop-gates being operated through contact with a part of the conveyer mechanism traveling therebeneath to deliver a measured charge of material to each receptacle, substantially as described.

SAMUEL F. JOOR.

Witnesses:
SAMUEL N. POND,
FREDERICK C. GOODWIN.