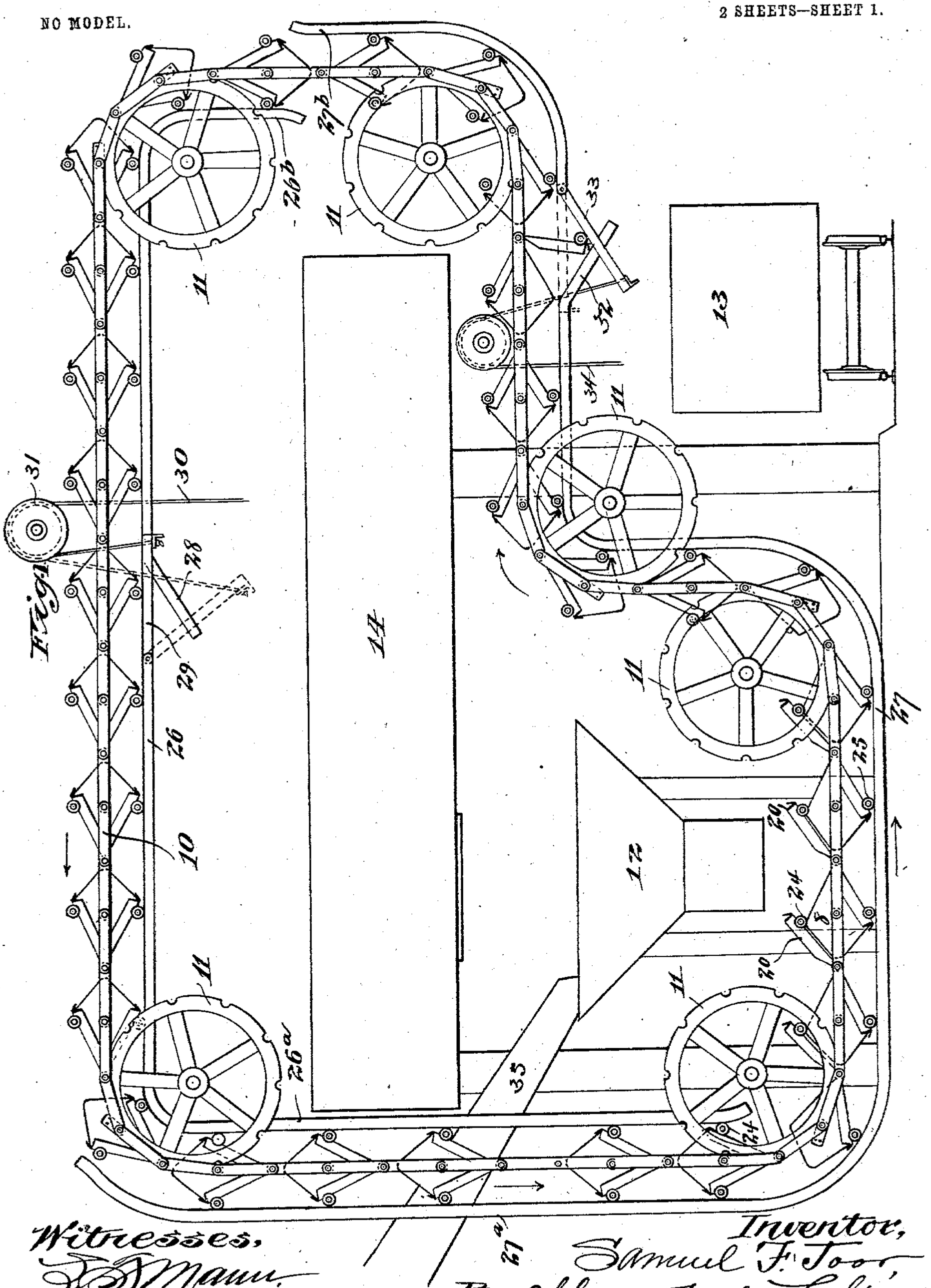
No. 730,540. PATENTED JUNE 9, 1903.

S. F. JOOR.

CONVEYER.

APPLICATION FILED JAN. 26, 1903.

NO MODEL. 2 SHEETS—SHEET 1.



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

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

No. 730,540. PATENTED JUNE 9, 1903.

S. F. JOOR.

CONVEYER.

APPLICATION FILED JAN. 26, 1903.

NO MODEL. 2 SHEETS—SHEET 2

Fig. 2.

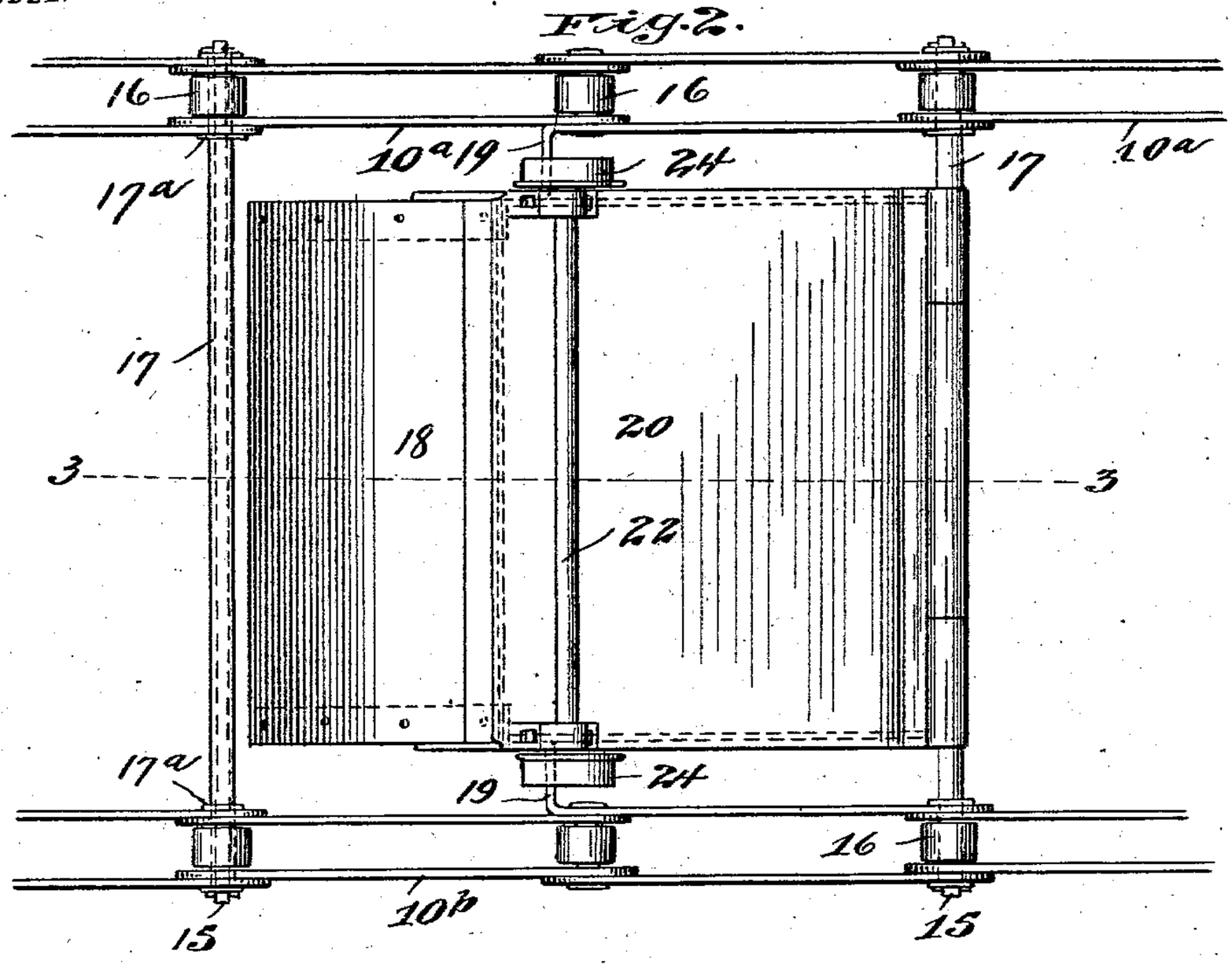
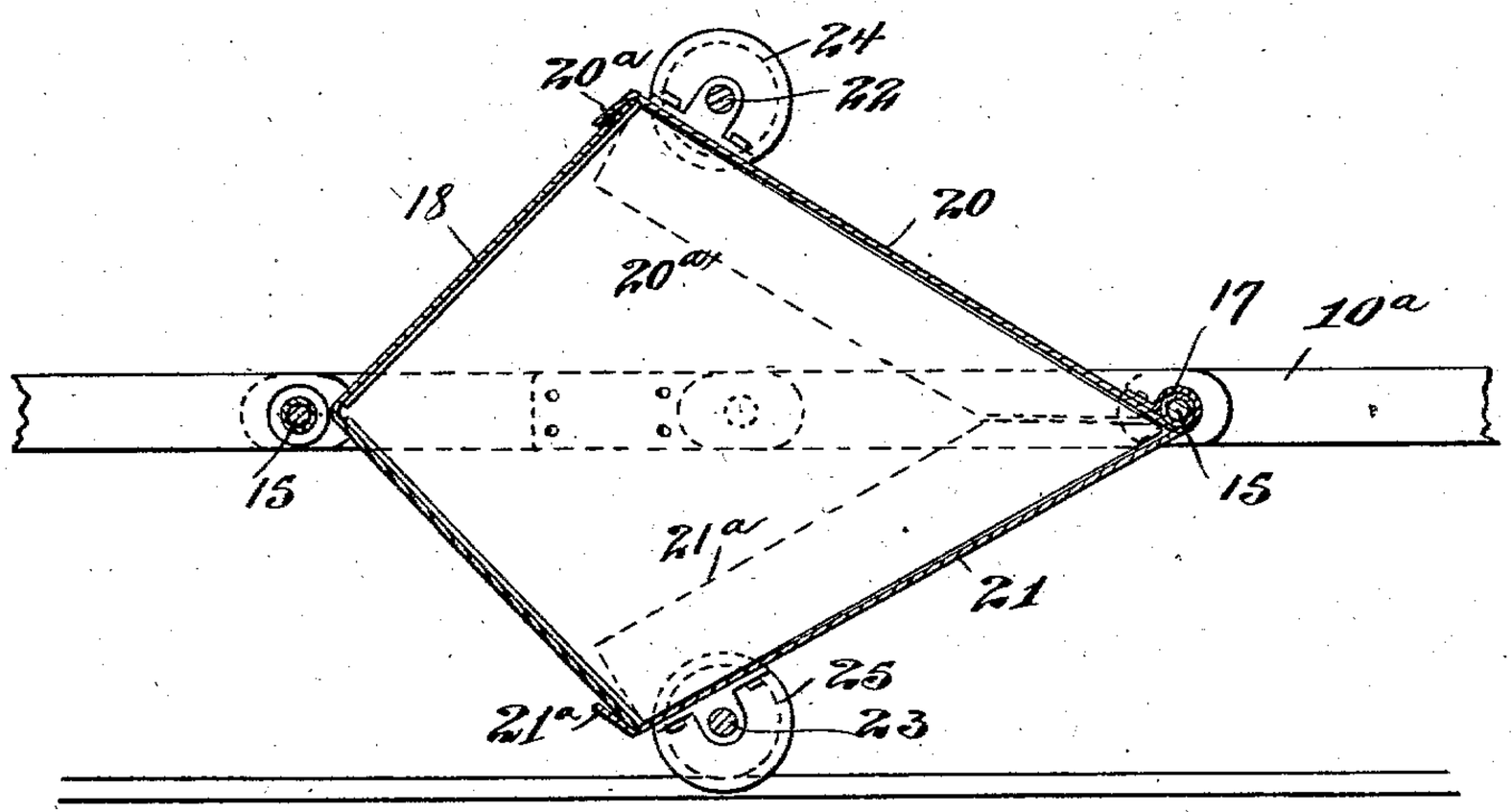


Fig. 3.



Witnesses,
F. S. Mann,
S. N. Powell,

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

No. 730,540. Patented June 9, 1903.

UNITED STATES PATENT OFFICE.

SAMUEL F. JOOR, OF MORGAN PARK, ILLINOIS.

CONVEYER.

SPECIFICATION forming part of Letters Patent No. 730,540, dated June 9, 1903.

Application filed January 26, 1903. Serial No. 140,537. (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 either between points located on the same run of the conveyer, whether on the same or different levels, or between points located on different runs of the conveyer and at different levels. Conveyers of this class to which my invention belongs are characterized by the provision of a series of endwise-connected buckets, usually carried between the side members of an endless chain trained over sprocket-wheels disposed in the same vertical plane. Of such conveyers some have heretofore been provided with buckets of a character to receive their loads on one run of the conveyer-chain and later deliver their contents at a distant point on the same run, while others have been adapted to deliver their contents at a point on the opposite run at a different level.

The leading object of my invention is to provide a conveyer which shall be capable of performing both of these functions—that is, receiving its load on one run and delivering it either on the same run or on the opposite run of the conveyer-chain whether on the same or different levels; and this object I carry out principally through the provision of a novel form of bucket having as its chief distinguishing characteristic a pair of hinged covers which during the travel of the buckets constitute load-carrying sections of the latter on the lower and upper runs, respectively, and are further adapted to permit the discharge of the load by an automatic opening under the weight of the latter on either the lower or upper run, as the case may be.

In the accompanying drawings, Figure 1 represents in side elevation one arrangement of an endless bucket conveyer having my improvements embodied therein. Fig. 2 is an enlarged top plan view of a short section of the conveyer-chain, showing a single bucket and its hinged covers carried thereby; and Fig. 3 is a longitudidal sectional view on the line 3 3 of Fig. 2.

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 to present upper and lower runs between which the material is to be carried. For convenience of illustrating the adaptability of my invention in the distribution of the material received by the conveyer-chain at different points and various levels on the horizontal runs of the latter I have shown the lower horizontal run of the chain as vertically offset at one end to enable the material received from a hopper 12 to be delivered to a railroad-car 13 on the level of the lower run or carried up and delivered to a bin or reservoir 14, as desired. The conveyer-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 pins or bolts 15. The pivot-pins of each sprocket-chain 10^a and 10^b are preferably provided with antifriction-rollers 16, which engage the peripheries of the sprockets 11, whereby the chain is driven through power applied to any one or more of the sprockets. 17 designates a pipe in the nature of a spacing-sleeve surrounding each one of the transverse rods 15 and terminating at its ends in collars 17^a, which bear against the inner faces of the side members of the chain.

18 designates each one of a series of buckets of substantially diamond form mounted between the side members of the conveyer-chain. A convenient means for attaching these buckets to the chain consists of angle-brackets 19, which constitute integral inwardly-offset extensions of the inner members of alternate links of the chains 10^a and 10^b, whereby the body of the bucket is maintained rigid relatively to the links of the chains to which it is attached. The entire forward end of the bucket both above and below the horizontal plane of the carrying-chain is open, but is designed to be served by a pair of closures in the nature of flat covering-plates 20 and 21, which are hinged at their adjacent margins on the sleeves 17, surrounding the transverse rods 15 of the chain, where-

by said covers are adapted to swing outwardly away from the body of the bucket in both the loading and discharging operations, as more fully hereinafter described. In order to provide an effective closure when the covers are seated, the latter are provided along their end and side margins with inwardly-extending flanges 20^a and 21^a, respectively. Journaled across the outer free ends of the covers 20 and 21 on the outer faces thereof are a pair of shafts 22 and 23, respectively, which carry on their outer ends and overhanging the side walls of the bucket-rollers 24 and 25, respectively, which engage tracks or ways lying parallel with the course or path of travel of the conveyer-chain, as next to be described.

Located beneath and parallel with the upper horizontal run of the conveyer-chain is a track or way 26, having on either end thereof depending extensions 26^a and 26^b, disposed alongside the vertical runs of the conveyer to a greater or less extent, as desired. Beneath the lower run of the conveyer is located a similar track or way 27, conforming to the character of said run, said track likewise terminating in upward extensions 27^a and 27^b, lying parallel with and extending throughout a greater or less part of the vertical runs of the conveyer. The track 26 is provided at a desired point of discharge to the bin 14 with overlapping rigid and hinged downwardly-inclined sections 28 and 29, respectively, to the free end of the latter of which is connected a cable 30, passed over a supporting-pulley 31 and extending down within convenient reach of an attendant. The lower track 27 is similarly provided with rigid and hinged overlapping downwardly-inclined sections 32 and 33, respectively, to the free end of which latter is connected an operating-cable 34, similar to the cable 30.

The operation is substantially as follows: Assuming the parts to be in the relative positions shown in Fig. 1 and the material to be distributed being supplied to the hopper 12, as through a trough 35, and the conveyer traveling in the direction indicated by the arrows, the buckets passing successively beneath the discharge-throat of the hopper receive their loads therefrom, the hinged covers 20 being thrown back to a position in which they serve as a guide-chute to direct material into the body of the bucket. At the same time the lower covers 21 are maintained in closed position through the engagement of their rollers 25 with the track 27, in which position it will be observed said covers constitute a portion of the load-carrying section of the bucket. Each bucket after having received its load passes on past the guide-sprockets supporting the offset portion of the lower run, and on reaching the discharge-trap formed by the drop-sections 32 33 of the track the cover 21 drops under the weight of the load, thus discharging the contents into the car 13. As the empty bucket proceeds, the open cover is again closed by riding up the incline 33 and is maintained closed throughout the remainder of the circuit either by gravity or by its contact with the guide-rails and their end extensions. As the bucket makes the turn around the lower left-hand sprocket the guide-rollers 24 ride off the end of the track 26^a and the cover 20 immediately falls by gravity into the open receiving position ready to again pass beneath the hopper 12 and receive another load. If it is desired to discharge the material into the bin 14 instead of to the car 13, the hinged section 33 of the track is drawn up to horizontal position by the cable 34, whereupon the buckets, with their loads, pass on up the vertical run onto the upper horizontal run, during which travel the loads are shifted with the inversion of the buckets, so that the covers 20 become load-carrying portions of the buckets, and as soon as the buckets reach the trap formed by the drop-sections 28 and 29 of the track the load is discharged automatically into the bin 14 in the manner already described.

It will be understood that the particular arrangement of conveyer-chain herein shown and described is not of the essence of my invention, but serves to illustrate the adaptability of my invention to serve points of delivery on either the lower or upper runs of the conveyer, or, in other words, to effect a discharge of the contents of each bucket in either position and horizontal direction of travel of the latter. To the securing of these results I regard the described construction of double-hinged cover as of primary importance, since said covers, being entirely independent of each other in their opening and closing movements and guarding opposite sides of the bucket, permit substantially duplicate operations of the bucket on the upper and lower runs, at the same time maintaining the bucket closed and guarded on the upwardly-moving run.

It is evident that various modifications of the detail features of my invention might be made without departing from the principle or spirit thereof. I do not, therefore, limit myself to the detail features of construction or arrangement 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 an endless conveyer comprising essentially a series of endwise-connected buckets traveling in tandem approximately in a vertical plane, and supporting and driving means therefor, of means associated with and forming constituent parts of said buckets adapting the latter to discharge their loads on any horizontal run of the conveyer, substantially as described.

2. In an apparatus of the type described, the combination with an endless conveyer-chain disposed to present horizontal runs at

different levels, of a series of buckets mounted tandem in said chain, each of said buckets being provided with a pair of hinged covers guarding respectively openings on opposite sides of said bucket and, when closed, constituting load-carrying sections of the bucket, substantially as described.

3. In an apparatus of the type described, the combination with an endless conveyer-chain disposed to present horizontal runs at different levels, of a series of buckets mounted tandem in said chain, each of said buckets being provided with a pair of independently-movable hinged covers guarding respectively openings on opposite sides of said bucket and, when closed, constituting load-carrying sections of the bucket, substantially as described.

4. In an apparatus of the type described, the combination with an endless conveyer comprising essentially a series of endwise-connected buckets having a plurality of horizontal runs, and supporting and driving means therefor, of a pair of hinged covers mounted to guard respectively openings on opposite sides of each bucket, and ways or guides disposed beneath and parallel with said horizontal runs and, through sliding contact with the lowermost of said covers, maintaining the latter in closed relation to their respective buckets, substantially as described.

5. In an apparatus of the type described, the combination with an endless conveyer-chain disposed to present horizontal runs at different levels, of a series of buckets mounted tandem in said chain, each of said buckets being provided with a pair of independently-movable hinged covers guarding respectively openings on opposite sides of said bucket, tracks disposed beneath and parallel with the horizontal runs of the conveyer-chain, and rollers mounted on said covers and engaging said tracks to maintain the covers in closed position, substantially as described.

6. In an apparatus of the type described, the combination with an endless conveyer-chain disposed to present horizontal runs at different levels, of a series of buckets mounted tandem in said chain, each of said buckets being provided with a pair of independently-movable hinged covers guarding respectively openings on opposite sides of said bucket, tracks disposed beneath and parallel with the horizonal runs of the conveyer-chain, rollers mounted on said covers and engaging said tracks to maintain the covers in closed position, and traps located in said tracks adapted to permit the opening of said covers by the weight of the load and the discharge of the latter, substantially as described.

7. A conveyer-bucket for the purpose described, comprising a bucket-body having openings on opposite sides of the horizontal plane of its longitudinal axis, and hinged covers guarding said openings, respectively, and constituting load-carrying sections of the bucket, substantially as described.

8. A conveyer-bucket for the purpose described, comprising a bucket-body having openings on opposite sides of the horizontal plane of its longitudinal axis, and independently-movable hinged covers guarding said openings, respectively, and constituting load-carrying sections of the bucket, substantially as described.

SAMUEL F. JOOR.

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