No. 730,539. PATENTED JUNE 9, 1903.

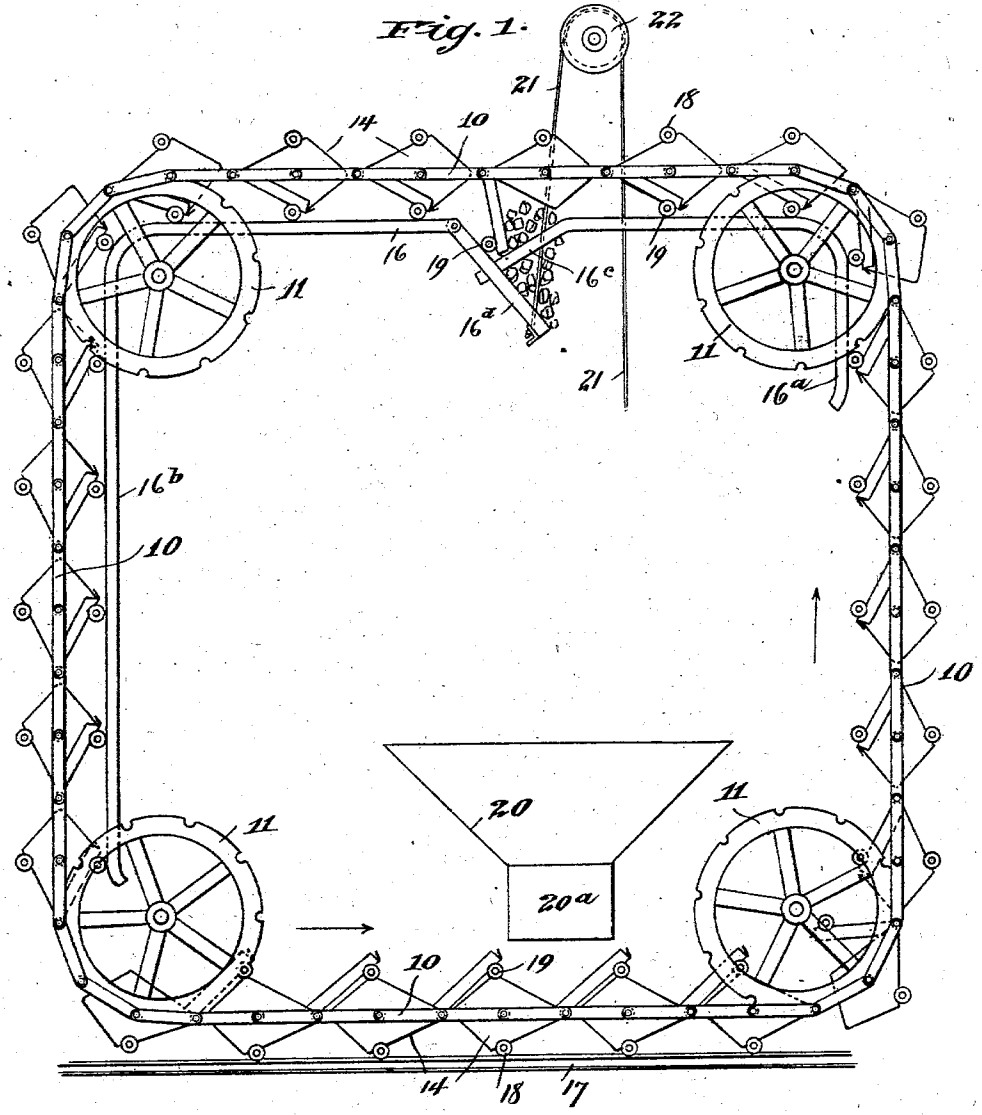
S. F. JOOR.

CONVEYER.

APPLICATION FILED DEC. 18, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



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

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NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.

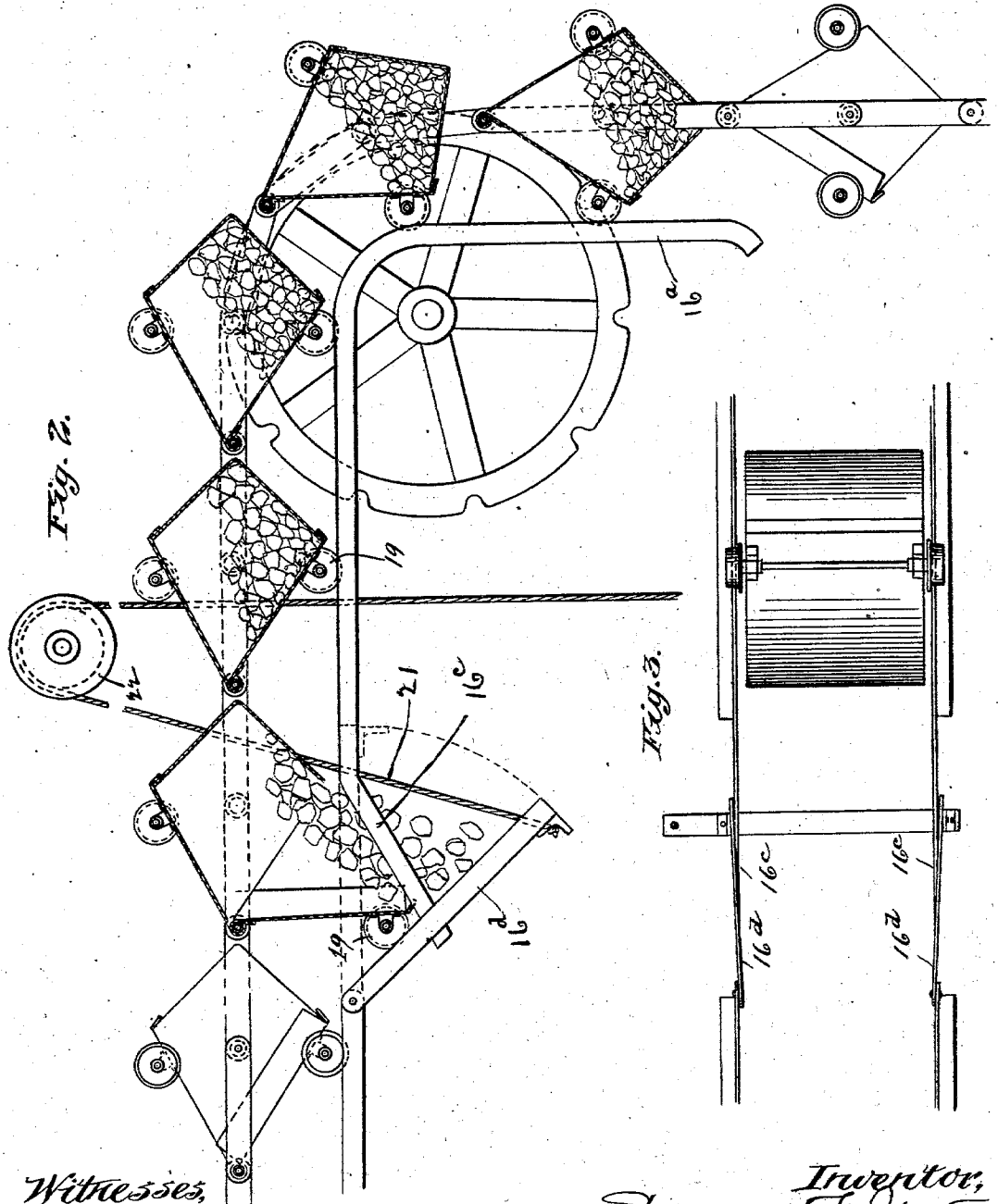


Fig. 3.

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NO MODEL. 3 SHEETS—SHEET 3.

Fig. 4.

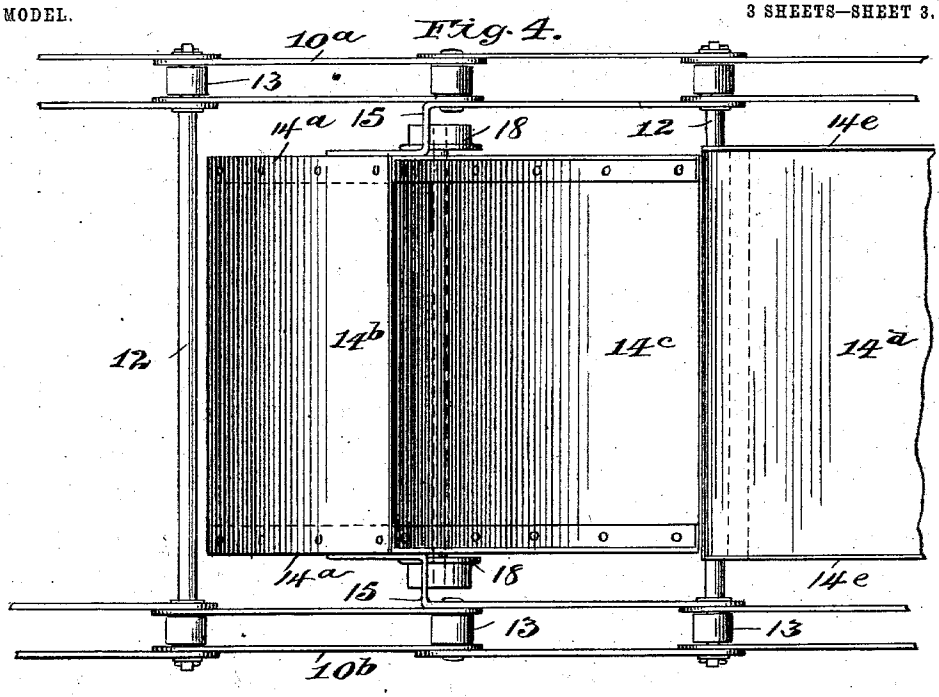
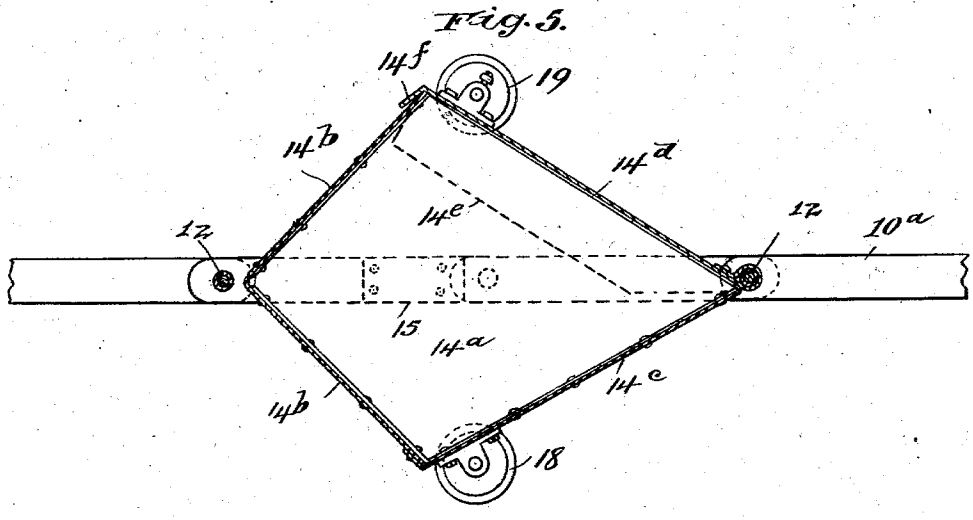


Fig. 5.



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

No. 730,539. Patented June 9, 1903.

UNITED STATES PATENT OFFICE.

SAMUEL F. JOOR, OF MORGAN PARK, ILLINOIS.

CONVEYER.

SPECIFICATION forming part of Letters Patent No. 730,539, dated June 9, 1903.

Application filed December 18, 1902. Serial No. 135,806. (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.

Conveyers of the class to which my invention belongs are characterized by the provision of an endless chain trained over sprocket-wheels disposed in the same vertical plane and having mounted between the side members of the chain a series of carriers in the form of buckets adapted to receive the material on the lower run and deliver it on the upper run of the conveyer.

My invention has for its primary object to improve conveyers of this type in the direction of rendering them more entirely automatic in their reception and discharge of their contents than heretofore; and to the carrying out of this object my present improvements relate principally to an improved construction of bucket having one side thereof made in the form of a hinged cover which in the loading of the bucket forms an inclined plane or chute to direct the material into the bucket and later constitutes a load-supporting section of the bucket.

A further improvement consists in a mechanism located on the upper run through which an automatic discharge of the successive buckets may be secured by permitting said hinged cover to drop.

Still another improvement consists in a conveyer-bucket having an opening for the reception and discharge of its contents and a closure for said opening, preferably in the form of a hinged cover.

My invention in the best mechanical embodiment thereof which I have as yet devised is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevational view of the complete device. Fig. 2 is an enlarged detail view of one corner of the conveyer in longitudinal section through the buckets. Fig. 3 is a top plan view of the immediately-overlying portion of Fig. 2, showing the discharging mechanism on the upper run. Fig. 4 is a detail in top plan view of a section of the conveyer-chain, illustrating the manner of mounting the buckets therein; and Fig. 5 is a longitudinal vertical section through one of the buckets, illustrating its detail construction.

In 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. This chain, more specifically considered, is composed, as shown in Fig. 4, of a pair of relatively narrow sprocket-chains 10^a and 10^b, connected by transverse pins or bolts 12. 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 disposed in tandem order between the side members of the conveyer-chain, said buckets being rigidly connected to said side members of the conveyer-chain in any convenient way, as by means of the angle-brackets 15. (Clearly shown in Fig. 4.) The buckets are all of similar conformation, each having, preferably, the substantially diamond form shown and having its longitudinal axis coincident or parallel with the longitudinal plane of the conveyer-chain. The bucket, as herein shown, has two fixed parallel side walls 14^a, two fixed angularly-disposed end walls 14^b, an inclined fixed bottom wall 14^c, and a movable top wall or cover 14^d, which is hinged on the transverse rod 12, lying adjacent and parallel with the lower margin-line of the opening of the bucket and which is adapted to swing from the closed position (shown in Fig. 5) back to the open position (shown in Fig. 4) and on the lower run of the conveyer in Fig. 1 to permit the reception of the load, as also to swing downwardly when the bucket is inverted to permit the discharge of the load, as shown on the upper run in Fig. 1. Preferably this cover is pro-

vided with side marginal flanges 14^e and with an end flange 14^f, adapting it to afford a complete closure for the contents, especially on the upper run of the conveyer, when the bucket is inverted and the hinged cover becomes a load-supporting element of the bucket.

Parallel with and below the upper and lower horizontal sections of the conveyer are fixed guide rails or tracks 16 and 17, respectively, the former of which has vertical extensions 16^a and 16^b, extending part way down inside of and along parallel with the two vertical sections of the conveyer. Each bucket has suitably journaled on the outer face of its fixed bottom 14^c a pair of supporting and guiding wheels or rollers 18 and at a corresponding point on the outer surface of the cover 14^b with a corresponding pair of guiding and supporting wheels or rollers 19. The wheels 18 are adapted to engage the track 17 and support the lower section of the conveyer on the lower horizontal run, while the wheels 19 on the hinged cover are adapted to similarly engage the upper track 16 and its vertical extensions 16^a and 16^b and guide and support the bucket on its vertical and upper horizontal runs.

At 20 is shown a suitably-positioned hopper adapted to discharge through its throat 20^a material into the successive buckets as they pass in opened condition therebeneath, in which operation it will be observed that the open inclined covers of the buckets not only constitute inclined planes serving to guide and direct the material discharged from the hopper directly into the buckets, but also prevent loss and waste of the material between successive buckets. On the upper track 16 there is provided means for effecting an automatic discharge of each bucket in turn. This track 16 is not formed integral, but is interrupted at or about the desired point of discharge of the material, and one of the opposed ends of the track is given a downward inclination, as shown at 16^c. Hinged to the other opposed end of the track is a drop-section 16^d, the free end of which has connected thereto a chain or cable 21, passing upwardly over and around a suitably-supported pulley 22 and extending thence downwardly to a point within convenient reach of the operator. The stationary and hinged inclined members 16^c and 16^d are of course duplicated in each rail of the track 16, as shown in Fig. 3, and together are of a width less than the width of the tread of the wheels or rollers 19, whereby the latter are adapted in the onward travel of the buckets to readily pass from one inclined section to the other without being derailed.

The operation of my improved conveyer has been to a considerable extent already described, but may be briefly set forth as follows: Assuming the parts to be in the relative positions indicated in Figure 1 and the conveyer to be moving in the direction indicated by the arrow, the coal or other material is continuously discharged from the hopper 20 into the successive buckets. As the buckets round the lower right-hand sprocket the longitudinal axis of the bucket obviously changes from a horizontal to a vertical position, which causes the load to settle down between the end walls 14^b, and simultaneously the hinged cover falls by gravity into its closed position. As the bucket approaches the upper right-hand sprocket and then rounds the same onto the upper horizontal run the wheels 19 on the cover first engage the track 16^a and subsequently the track 16, thereby holding the cover in closed position against the weight of the material, which is gradually shifted thereto. As the bucket continues along the track 16 the wheels of the cover run upon the downwardly-inclined sections 16^c, whereby the cover is allowed to drop and open under the weight of the load, thus discharging the contents. As the wheels of the cover ride over the inclined track-sections 16^c and onto the oppositely-inclined pivoted sections 16^d, the cover is automatically returned to and maintained in closed position as the bucket rounds the upper left-hand sprocket, the track extension 16^b serving to maintain said cover closed during the descent of the bucket until the latter rounds the lower left-hand sprocket, when the wheels 19 run off the end of the track and the cover falls open by gravity, remaining open throughout the run on the lower horizontal section for the reception of another load.

When for any reason it may be desired to vary the inclination of the track-sections 16^d or to close the track at this point entirely—as, for instance, where two or more separated points of discharge may be provided in the upper section—this may be done in an obvious manner through a proper manipulation of the cable 21.

From the foregoing it will be seen that my invention provides a conveyer of the endless-chain and bucket type which is entirely automatic in its action and in which the buckets are automatically opened to receive their contents and likewise automatically opened to discharge the same through a simple inversion of the position of the buckets and a shifting of the load from one side of the bucket to the other. It will also be observed as constituting an important feature of my invention that the hinged cover in its open position greatly facilitates the charging of the bucket by acting as an inclined plane or chute for the material received thereby, as well as a shield against the loss of material between successive buckets. I do not limit my invention to the precise form of the conveyer herein shown nor to the precise form and relative arrangement of its constituent parts, as it is evident that the same might be considerably varied in mechanical details by the substitution of well-known equivalents without departing from the spirit of my invention.

I claim—

1. In a conveyer of the type described, the combination with an endless chain disposed approximately in a vertical plane, and supporting a driving means therefor, of a series of buckets carried by said chain, each of said buckets being provided with a hinged cover adapted to automatically open on the lower run of the conveyer-chain, and when thus opened to serve as a chute for the charging of the bucket with its load, substantially as described.

2. In a conveyer of the type described, the combination with an endless chain and supporting and driving sprocket-wheels therefor, of a series of buckets carried by said chain each provided with a hinged cover movable wholly outside of the bucket to open and close the latter, a track constituting a support for the buckets on the lower run, and a similar track constituting a support for the inverted buckets on the upper run, said last-named track being provided with means for permitting the automatic opening of the hinged cover and the discharge of the load, substantially as described.

3. In a conveyer of the type described, the combination with a conveyer-chain, the links whereof are pivotally connected by bolts extending entirely across the chain, of a bucket secured by its sides to and between the side members of the links of the chain, and a cover hinged on one of said pivot-bolts and serving to open and close one side of the bucket, substantially as described.

4. In a conveyer of the type described, the combination with an endless chain, and supporting and driving means therefor, of a series of buckets carried by said chain, each of said buckets being provided with a hinged cover which, on the lower run of the conveyer-chain, serves as a chute for the reception of the load and on the upper run constitutes a portion of the bottom of the bucket, and means for maintaining said cover on its seat on the upper run, substantially as described.

5. In a conveyer of the type described, the combination with a series of buckets connected to form an endless conveyer, each of said buckets being provided with a hinged cover which, on the lower run of the conveyer, serves as a chute for the reception of the load and on the upper run constitutes a portion of the bottom of the bucket, of a fixed track or way engaging said cover on the upper run and normally holding it closed, said track or way being provided with a depressed portion adapted to permit the dropping of the cover and the discharge of the load, substantially as described.

6. In a conveyer of the type described, the combination with an endless chain and supporting and driving means therefor, of a series of buckets carried by said chain, each of said buckets being provided with a hinged cover, fixed tracks or ways located directly beneath the upper and lower sections of the conveyer, and antifriction devices mounted on the cover of each bucket and on the side thereof opposite the cover and engaging the upper and lower tracks or ways, respectively, substantially as described.

7. An endless conveyer of the type described, consisting essentially of a series of buckets connected in tandem, each of said buckets having an opening for receiving and discharging its load, and a closure for said opening movable wholly outside of the bucket into and out of closing position, substantially as described.

8. An endless conveyer of the type described, consisting essentially of a series of buckets connected in tandem, each of said buckets having an opening for receiving and discharging its load, and a hinged cover for said opening adapted to swing toward and from the latter wholly outside of the bucket, substantially as described.

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