No. 756,510. PATENTED APR. 5, 1904.

A. L. LE GRAND.

BUCKET CONVEYER.

APPLICATION FILED JULY 27, 1903.

NO MODEL.

Fig. 1.

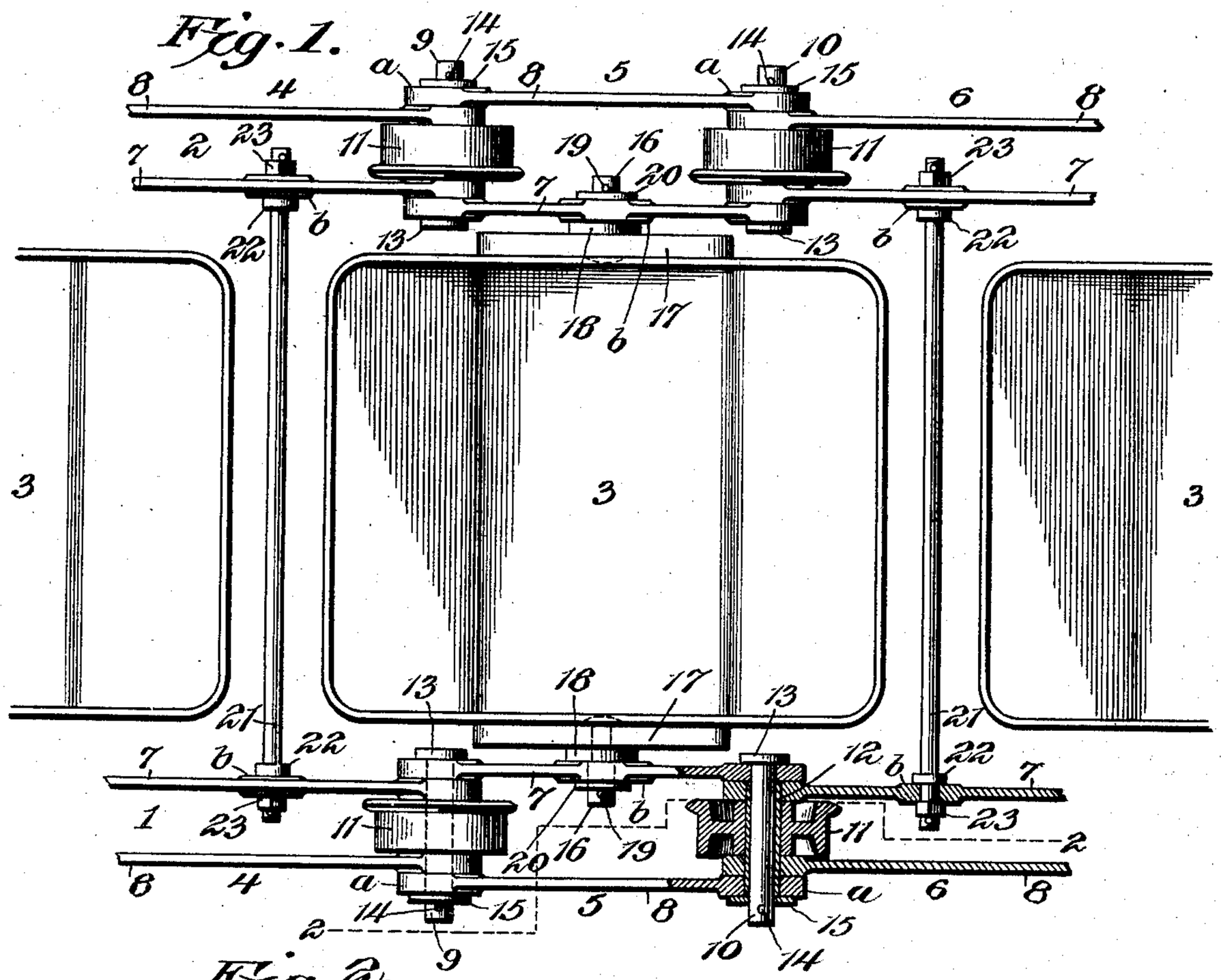
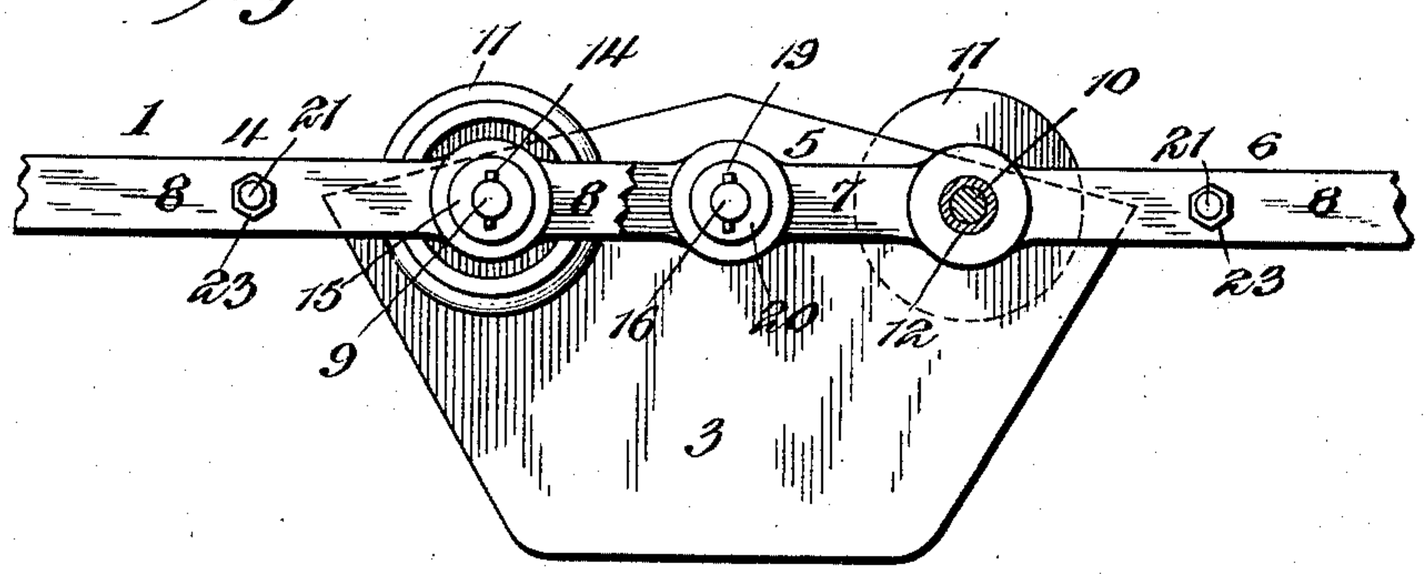


Fig. 2.



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No. 756,510. Patented April 5, 1904.

UNITED STATES PATENT OFFICE.

AUGUSTUS L. LE GRAND, OF WEST PITTSTON, PENNSYLVANIA.

BUCKET CONVEYER.

SPECIFICATION forming part of Letters Patent No. 756,510, dated April 5, 1904.

Application filed July 27, 1903. Serial No. 167,208. (No model.)

To all whom it may concern:

Be it known that I, AUGUSTUS L. LE GRAND, a citizen of the United States, residing at West Pittston, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Bucket Conveyer, of which the following is a specification.

My present invention relates to a novel bucket conveyer, the object being to simplify the construction, to increase the stability of the structure, and to render the same more durable.

To the accomplishment of this general object and others subordinate thereto, the invention in its preferred embodiment resides in that construction and arrangement of parts to be hereinafter described, illustrated in the accompanying drawings, and succinctly defined in the appended claims.

In said drawings, Figure 1 is a plan view of a portion of the conveyer, and Fig. 2 is a side elevation thereof with parts broken away on the line 2 2 of Fig. 1.

Like characters are employed to designate corresponding parts in both the views.

The bucket conveyer includes in its organization a pair of parallel side chains 1 and 2 and a series of intermediate buckets 3, supported by the chains in a manner to be described and designed to receive the material to be conveyed. Each chain is made up of a series of links 4 5 6, for instance, and each link consists of inner and outer link-plates 7 and 8. The adjacent ends of the links 4 and 6 are disposed between and are in lapping relation with the inner and outer plates of the link 5, and the connections between the links are effected by link connectors or pintles 9 and 10, passed transversely through the lapping ends of the link-plates of adjacent links, as shown. Each of these link connectors or pintles performs a triple function—that is to say, it serves as a connection between the adjacent ends of a pair of links, maintains the proper relation of the link-plates of the links connected by it, and also constitutes a shaft for a chain roller or traveler 11, disposed between the plates of a link, and thus located within the limits of the chain. These travelers may be mounted directly upon the pintles; but by preference each of the latter is surrounded by a sleeve or cylindrical bushing 12, having its inner end abutting against the inner link-plate of one link—as, for instance, the link 5—and extended through the outer plate of said link and through both plates of the connected link—as, for instance, the link 6, as shown in Fig. 1.

In order to insure the retention of the connectors or pintles 9 and 10, each is provided with a head 13, disposed against the inner face of the inner link-plate, and its opposite extremity is pierced by a key 14, which confines a washer 15 against the outer face of the outer link-plate and against the outer extremity of the bushing 12, which is flush therewith.

It will of course be understood that the conveyer may be of indefinite length; but the section shown in the drawings is representative of other similar sections, the buckets being suspended from alternate links and each of the side chains being provided with travelers mounted upon the link-connectors. The specific mounting of the buckets may be varied within wide limits; but by preference the inner plates 7 of the bucket-supporting links 5 are apertured for the reception of bucket-trunnions 16, extending laterally from the opposite sides of the buckets, intermediate of the ends thereof. To prevent lateral play of the conveyer-buckets, each is provided at its opposite sides with plates 17 of any desired contour secured to the bucket-walls and formed with projecting hubs 18, concentric with the trunnions 16 and designed to bear against the inner faces of the adjacent link-plates. Beyond the outer side of the inner link-plate, which is pierced by the trunnion, the latter is provided with a key 19, between which and the link-plate is interposed a washer 20, surrounding the trunnion, as shown. It should be understood, however, that while it is preferable to have the trunnions passed through the inner link-plates only they may be extended through both plates of the bucket-supporting links if such extension of the bucket-support is deemed necessary or desirable.

It will be noted by reference to Fig. 1 that

the links of the conveyer-chains are considerably shorter than those ordinarily employed, the buckets being of sufficient length to extend a considerable distance beyond the opposite ends of the bucket-supporting links. These relative proportions of the parts named constitute a feature of the present construction, since the shortening of the links and the mounting of the buckets upon alternate links increases the flexibility of the conveyer as a whole and tends to promote its stability.

The chains 1 and 2 of the conveyer are connected at points intermediate of the buckets by chain-connectors in the form of transverse rods 21, having their opposite ends passed through the inner plates of the chain-links which alternate with the supporting-links. These rods 21 are provided with enlargements 22, bearing against the inner faces of the connected link-plates and retained in such position by nuts 23, screwed upon the extremities of the rods and bearing against the outer sides of said plates.

It will now be noted that the inner plate of each link of each side chain is connected to the inner plate of the corresponding link of the other side chain, alternate connections being effected by means of buckets and rods, respectively. It will also be noted that since these connections extend between the middle portions of the opposite links the chain rollers or travelers will be located intermediate of such connections, since they are supported by the link-connectors at the ends of the links. The chain and link connectors may therefore be said to have an alternating arrangement, the links being connected at their extremities and the chains being connected at points midway of the ends of the links.

Another feature of the invention, and one which is of considerable practical importance, resides in the reinforcement of the link-plates at all points of wear. This reinforcement is preferably effected by thickening all of said plates at their ends, as indicated at *a* in Fig. 1, and by thickening the inner link-plates at the middle, as indicated at *b*, in addition. By forming the plates in this manner it will be evident that those portions of the links which move one upon the other or which are in contact with the travelers will be stiffened and that those portions of the inner link-plates which receive the bucket-trunnions and the ends of the rods will be likewise reinforced to resist wear, and thus prolong the life of the conveyer.

It is thought that from the foregoing the novel construction of my bucket conveyer will be clearly comprehended; but while the present embodiment of the invention is thought at this time to be preferable I reserve the right to effect such changes, modifications, and variations of the illustrated structure as may be fairly embraced within the scope of the protection prayed.

What I claim is—

1. In a bucket conveyer, the combination with side chains, of intermediate conveyer-buckets suspended from the middle portions of certain of the links, and chain-connectors extending between certain other links at points intermediate of the ends thereof.

2. In a bucket conveyer, the combination with side chains, of conveyer-buckets suspended from alternate links at points intermediate of the ends thereof, and chain-connectors extending between the middle portions of the other links of the chains.

3. In a bucket conveyer, the combination with side chains, comprising links and link-connectors connecting the ends of the links, of travelers carried by the link-connectors, buckets pivotally supported by alternate links, and chain-connectors located intermediate of the buckets.

4. In a bucket conveyer, the combination with side chains comprising links, of chain-connectors and link-connectors in alternating arrangement, each alternate chain-connector including a conveyer-bucket, and a traveler carried by each link-connector, the link-connectors being located at the ends of the links and the chain-connectors at points intermediate of the ends of said links.

5. In a bucket conveyer, the combination with side chains, of link-connectors located at the ends of the links, travelers mounted on the link-connectors, conveyer-buckets suspended from the middle portions of alternate links and constituting chain-connectors, and other chain-connectors in the form of rods extending between the middle portions of the other links of the chains and located intermediate of the buckets.

6. In a bucket conveyer, the combination with side chains having links made up of paired link-plates, of link-connectors connecting contiguous ends of the links, travelers mounted upon the connectors between the link-plates, conveyer-buckets pivotally supported from the inner plates of alternate links, and chain-connecting rods extending between the inner plates of the other links.

7. In a bucket conveyer, the combination with side chains having links composed of paired plates, link-connectors connecting the links at their contiguous ends, travelers mounted on the link-connectors, conveyer-buckets having trunnions extended through the inner link-plates only of alternate links, and chain-connecting rods connected to the inner plates only of the other links, all of the link-plates of the chains being reinforced at the wear-points.

8. In a bucket conveyer, the combination with side chains having links composed of paired plates, link-connectors connecting the links at their contiguous ends, travelers mounted on the link-connectors, conveyer-buckets having trunnions extended through the inner

link-plates only of alternate links, and chain-connecting rods connected to the inner plates only of the other links, all of the link-plates being reinforced or thickened at their ends and the inner plates being additionally reinforced or thickened at their middle portions.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

AUGUSTUS L. LE GRAND.

Witnesses:
GEO. DIETRICH,
M. THURMAN.