

Dec. 9, 1924.

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F. B. ANDRUS

BUCKET CONVEYER

Filed Aug. 17, 1922

3 Sheets-Sheet 1

Fig. 1.

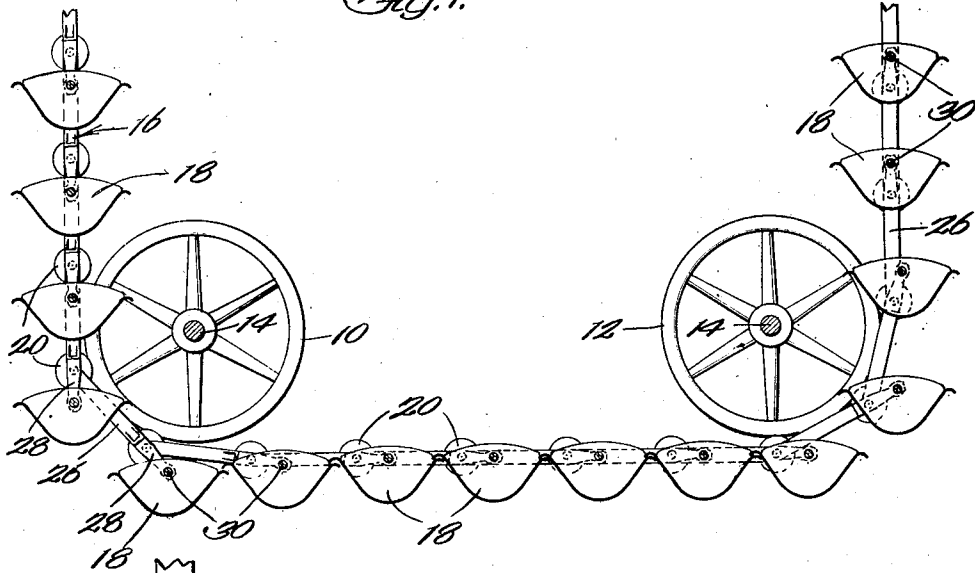
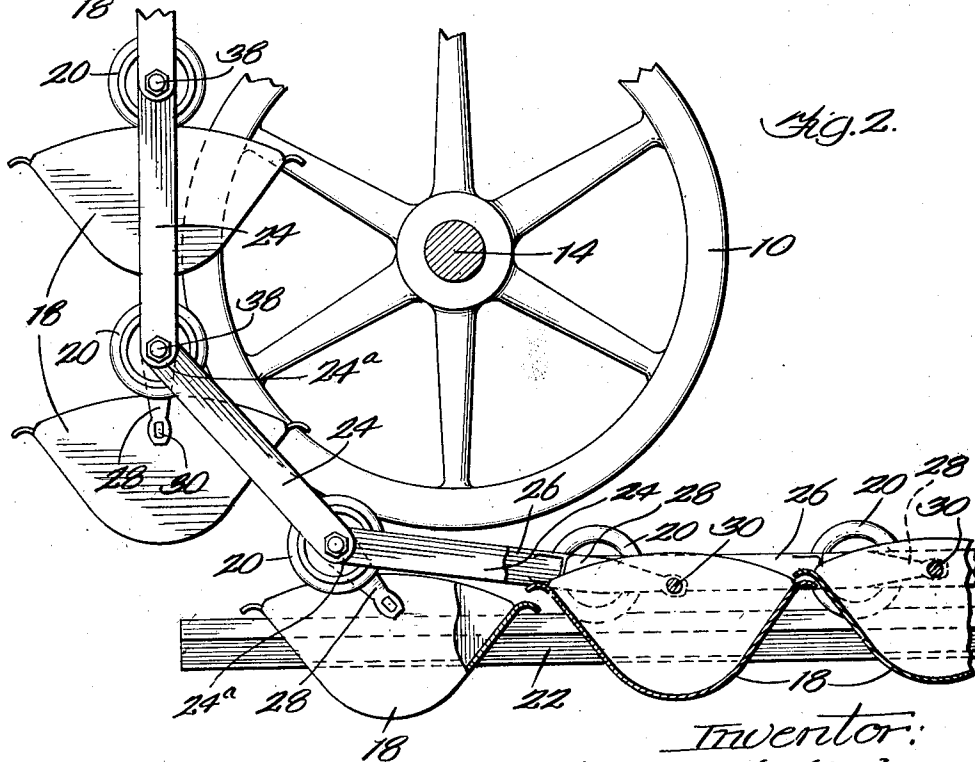


Fig. 2.



Inventor:
Franklin B. Andrus
By Cheever & Cox Attys.

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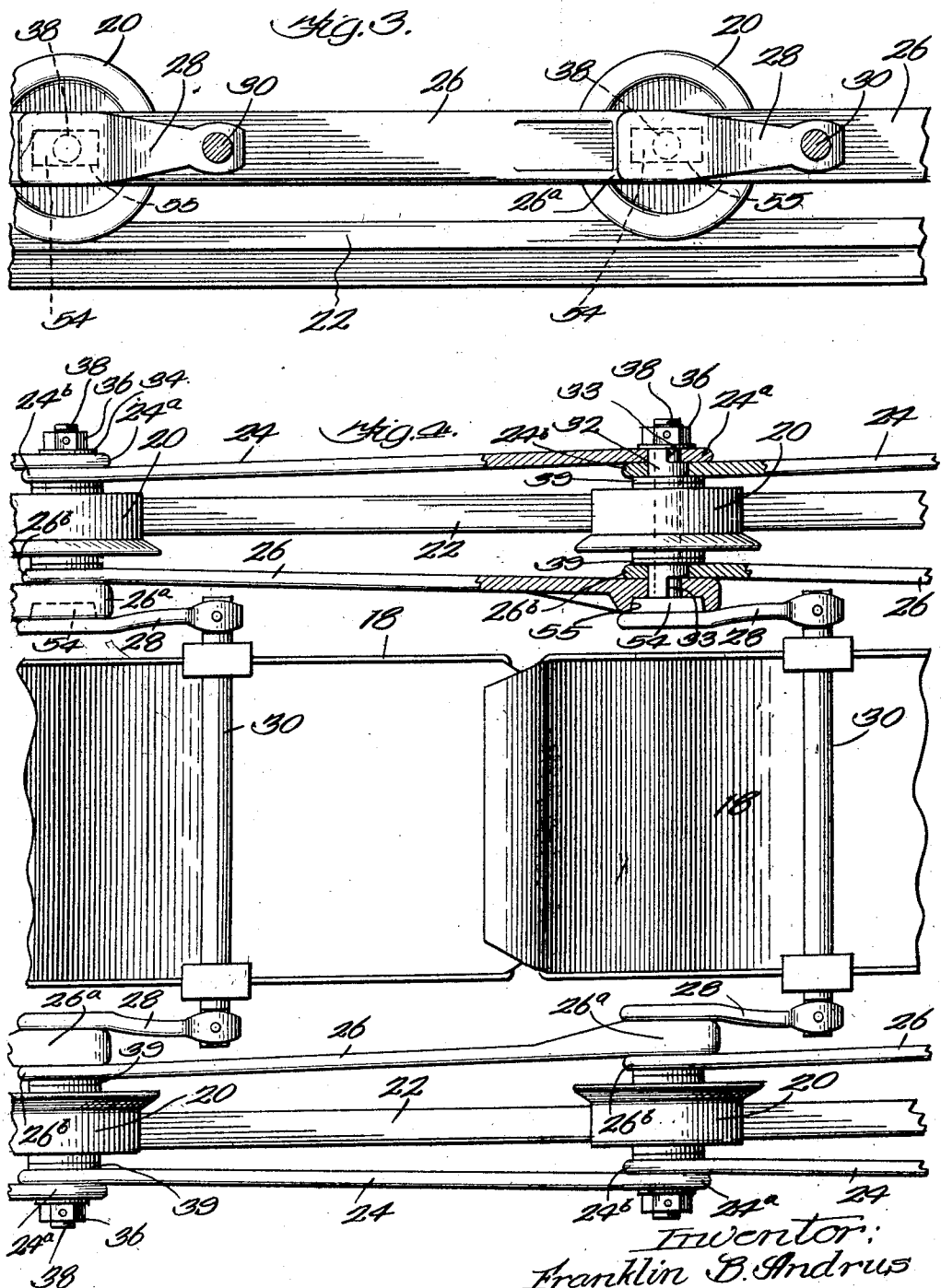
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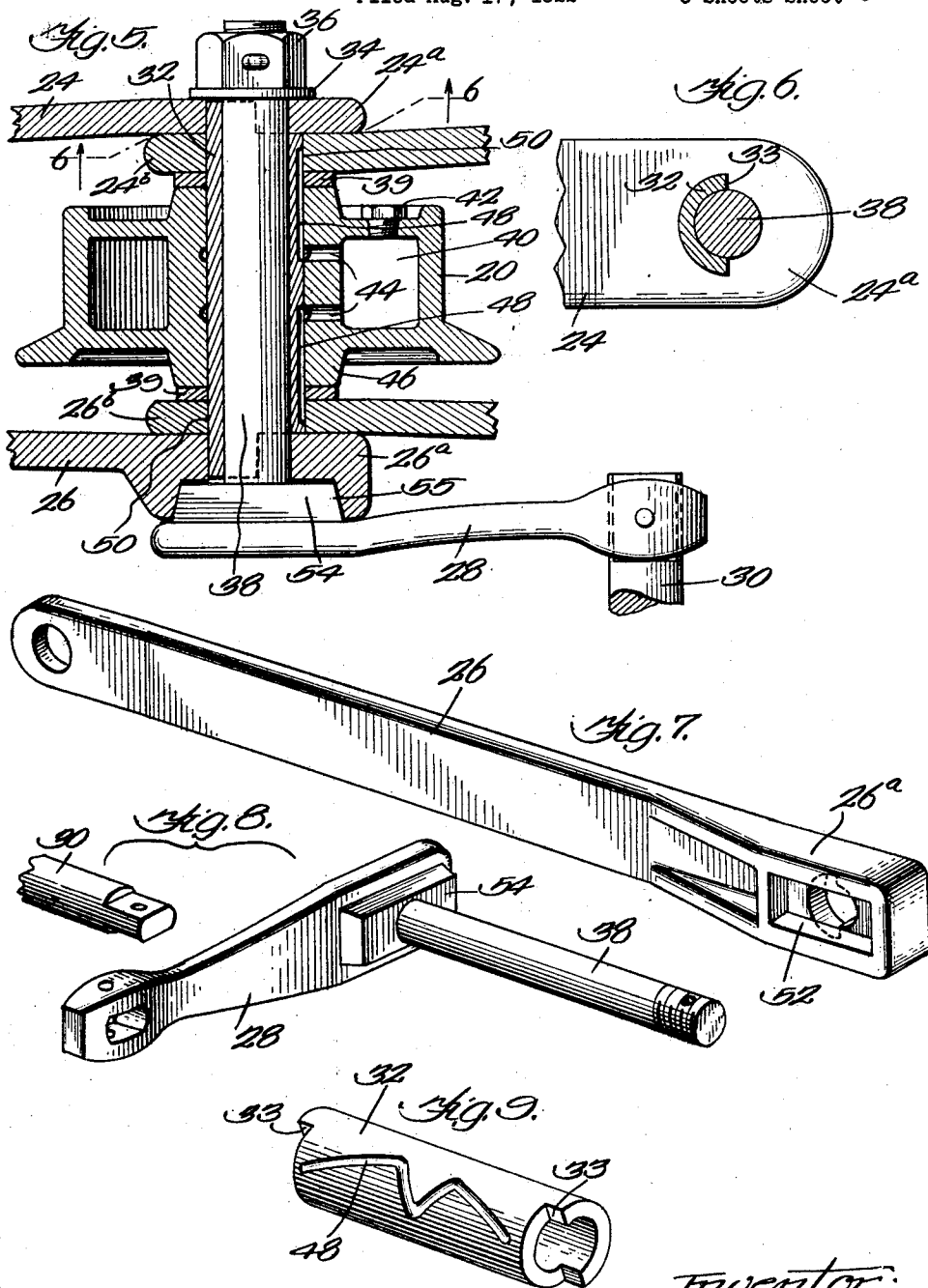
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Inventor:
Franklin B. Andrus
By Cheever & Cox Attys

UNITED STATES PATENT OFFICE.

FRANKLIN B. ANDRUS, OF CHICAGO, ILLINOIS.

BUCKET CONVEYER.

Application filed August 17, 1922. Serial No. 582,540.

To all whom it may concern:

Be it known that I, FRANKLIN B. ANDRUS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Bucket Conveyers, of which the following is a specification.

This invention relates to bucket conveyers, more particularly those in which the buckets are pivotally suspended upon a link belt and have overlapping lips for preventing the material from falling down between them. Conveyers of this type have been made in which the buckets are suspended from extensions of the inner links beyond the chain joints so that in passing around the corner wheels, they travel on a larger circle than the chains and are thus automatically separated at the turns so that the overlaps may be reversed and prevented from improperly tilting the buckets. In such previously known conveyers, however, the construction is such that if the extension link breaks at any point, the entire apparatus is crippled, and it is necessary to take the chain apart and then reassemble with a fresh link. One of the objects of the invention is to provide a construction such that if a bucket-supporting element breaks, a repair can be made by a series of very simple manipulations and the renewal of a small and simply constructed part. In the structure of this invention, if a bucket supporting element breaks, the chain will still maintain its assembly and the only thing that need be renewed is a small arm which carries the pin on which the bucket is supported. Another object is to provide a construction in which the links are pivotally connected by sleeves or bushings instead of pins, thus enabling the links to hold together when the link pins or shafts are withdrawn for making a repair, said sleeves also forming the axle on which the rollers rotate. Another object of the invention is to provide a simple interlocking connection between the bucket supporting arms and the links to which they are fastened. Another object is to provide simple and efficient means for tightening the link pins and co-operating parts without preventing free articulation between the links and associated elements. Still another object is to provide advantageous means for

greasing the contacting parts and keeping them greased for a long period of time without attention.

Referring to the accompanying drawings in which like numerals denote like parts throughout the several views:

Figure 1 is an assembly view showing a side elevation of the buckets, links and two of the corner wheels.

Figure 2 is a similar view on an enlarged scale, illustrating to better advantage the manner in which the extension arms operate to automatically reverse the overlapping lips of the buckets.

Figure 3 is a side elevation, showing the arrangement of the rollers on the tracks and the relation of the links and their extension arms.

Figure 4 is a plan section of a portion of a horizontal run showing the parts assembled in their natural relation.

Figure 5 is an axial section of a roller with a portion of the associated links and other elements, the link pin and extension arm being shown in full.

Figure 6 is a sectional view on the line 6-6 of Figure 5.

Figure 7 is a perspective view of one of the inner links which co-operates with the extension arm.

Figure 8 is a distributive detail view showing the preferred construction of the extension arm, link pin and bucket pin.

Figure 9 is a perspective view of the preferred form of bushing.

Figure 1 shows conventionally two chain carrying wheels 10 and 12, pivoted on widely separated shaftings 14 to, in conventional manner, take care of a chain mechanism 16 equipped with pivoted buckets 18 which must be kept in normal upright position during all conditions of movement of the chain, either vertically at the sides of the wheels 10 and 12, or horizontally between them, the chain mechanism being, during said horizontal movement, sustained from suitable rollers 20 engaging the conventional form of horizontal track 22, clearly shown in Figure 2. The chain proper is made up of parallel links 24 and 26, pivotally connected together on axes coincident with those of the rollers 20 and one link of each pair, in the particular case here illustrated, link 26, carries a projecting crank arm 28, whose crank

pin 30 pivotally supports one adjacent side of a bucket 18. A problem solved by this invention is to make this crank arm 28 detachable for repair purposes and to so pivotally mount adjacent pairs of links that the replacement of an arm 28 may take place without disconnecting the pivotal arrangement of the links. In accomplishing this purpose, a sleeve 32 is inserted through each end of the links to be pivotally connected. The sleeve is cut away at its opposite ends in notches 33 of substantially less depth with reference to the end of the sleeve than the thickness of the adjacent outside link ends 24^a and 26^a, which are to be secured together in spaced apart relation so that when a suitable washer 34 and clamping device such as a nut 36 is applied to the shaft 38 on crank arm 28, the outer link ends 24^a and 26^a will be clamped in the notches 33 on the ends of the sleeve 32 and spaced apart one from the other so that they cannot possibly bind upon the intermediate link ends 24^b and 26^b which are rotatably mounted on the sleeve 32. The spacing apart of the link ends 24^a and 26^a by the sleeve 32 is sufficient so that if the nut 36 is removed, thereby allowing the shaft 38 and crank arm 28 and attached parts, to be removed, the link ends 24^b and 26^b will still remain pivoted on the sleeve 32. In other words, the pivotal relationship of the link ends established by the sleeve remains the same, at least under conditions when a repair is taking place, whether the shaft 38 carrying the crank arm 28 is in place or not.

A wheel 20, heretofore referred to, is journaled on each sleeve 32 between the links described, being separated from the inner adjacent links by suitable washers 39. These wheels are preferably made hollow so as to provide a lubricant containing chamber 40 accessible through a removable screw cap 42. Lubricant in these chambers 40 is adapted to flow through passages 44 in the hubs 46 of the wheels to passages 48 on the circumferences of the sleeves 32 and extending longitudinally thereof under the bearing surfaces 50 of the link ends 24^b and 26^b, whereby lubricant in chamber 40 is automatically supplied to the bearings of the link ends to lubricate them as they rock on the sleeve.

As the load carried by the buckets 18 is substantial, it is desirable that the crank arms 28 be secured in non-rotatable relationship with the adjacent link ends 26^a. One desirable manner of doing this and that shown in the drawing consists in first

enlarging the link end 26^a, as clearly shown in Figure 7, and then providing it with a recess or depression 52 of non-circular form adapted to receive a non-circular block 54, provided at the juncture of crank arm 28 and shaft 38 (Figure 8). Obviously, when the parts are assembled with this block 54 in recess 52 and then the locking device 34-36 is applied to the end of the shaft 38, the crank arm 28 is secured just as rigidly in relationship to the link 26^a as though it were made integral therewith as in the prior art. In addition, my device has the distinct advantage that if anything happens to the crank pin 30, or the crank arm 28, the operator can at once release the locking device 34-36 and substitute new parts without pivotally disconnecting the chain and the supporting wheel 20 as is necessary in the prior art.

In order that the device may cause as little trouble as possible through friction, the links are made of sufficient size so that the sleeve or bushing 32 can be large enough to form ample bearing surfaces 50 for the link ends 24^b and 26^b and the link end 26^a is made of ample size to receive the block 54 having tapered edges 55 shown in the drawings, the same being of sufficient size to guard as far as possible against breakage at this point.

What I claim is:

1. In mechanism of the class described, two pairs of links having interfitted ends, a sleeve through said link ends affording pivotal connection between them, a roller journaled on the sleeve intermediate the links, means on the sleeve spacing one pair of links from the other pair of links and roller, a crank arm for supporting a bucket and means extending through the sleeve for detachably securing the arm in rigid position with reference to one link.

2. In mechanism of the class described, two pairs of links having interfitted ends, a sleeve through said link ends affording pivotal connection between them, a roller journaled on the sleeve intermediate the links, means on the sleeve spacing one pair of links from the other pair of links and roller, a crank arm for supporting a bucket, and means extending through the sleeve for detachably securing the arm in rigid position with reference to one link, said securing means including a non-circular block on the crank arm fitting into a recess for it in another part.

In witness whereof, I have hereunto subscribed my name.

FRANKLIN B. ANDRUS.