

No. 630,804.

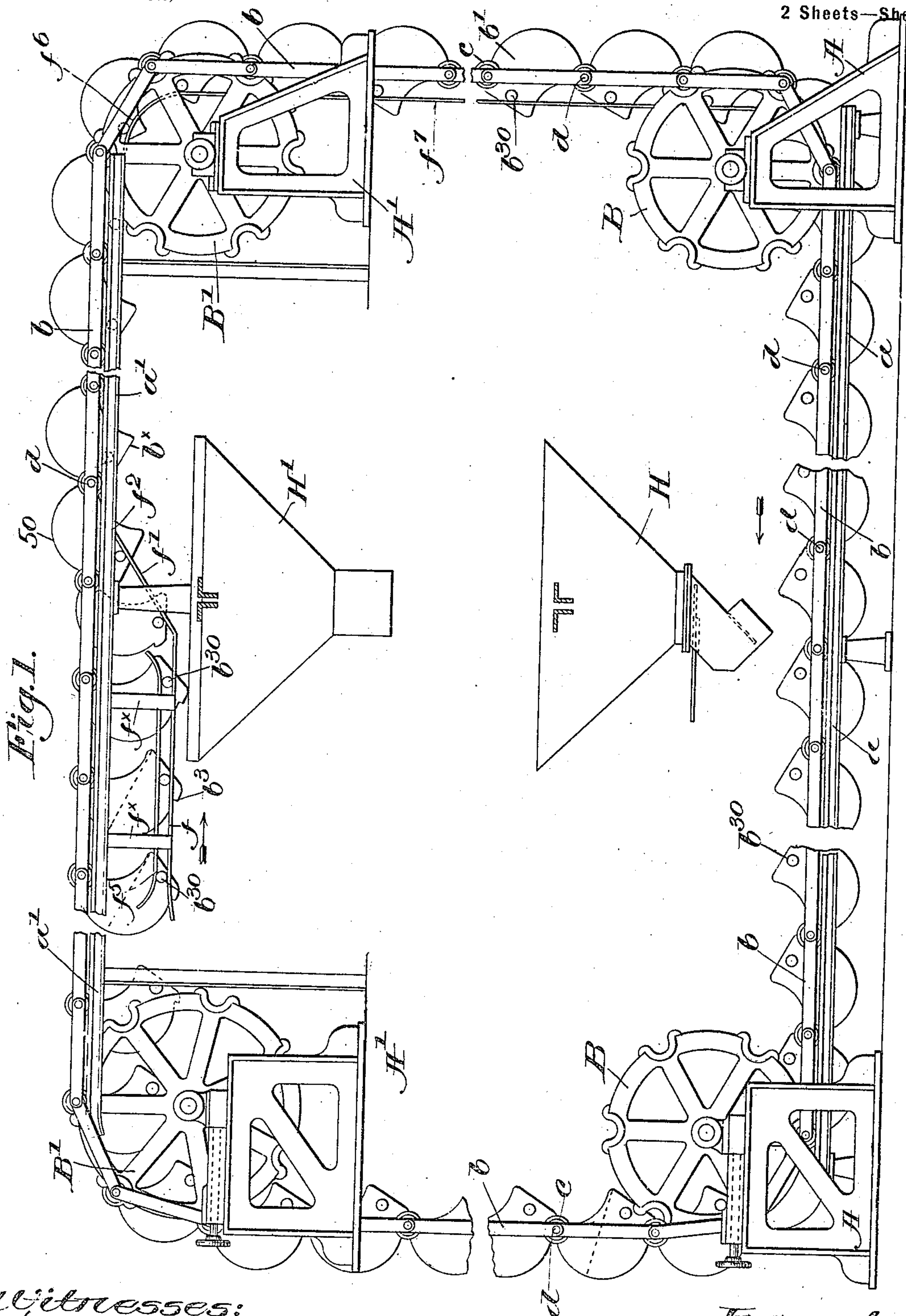
Patented Aug. 8, 1899.

E. S. DECKER.
CONVEYER.

(Application filed Dec. 21, 1896.)

No Model.)

2 Sheets—Sheet 1



Witnesses:

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2 Sheets—Sheet 2.

Fig. 2.

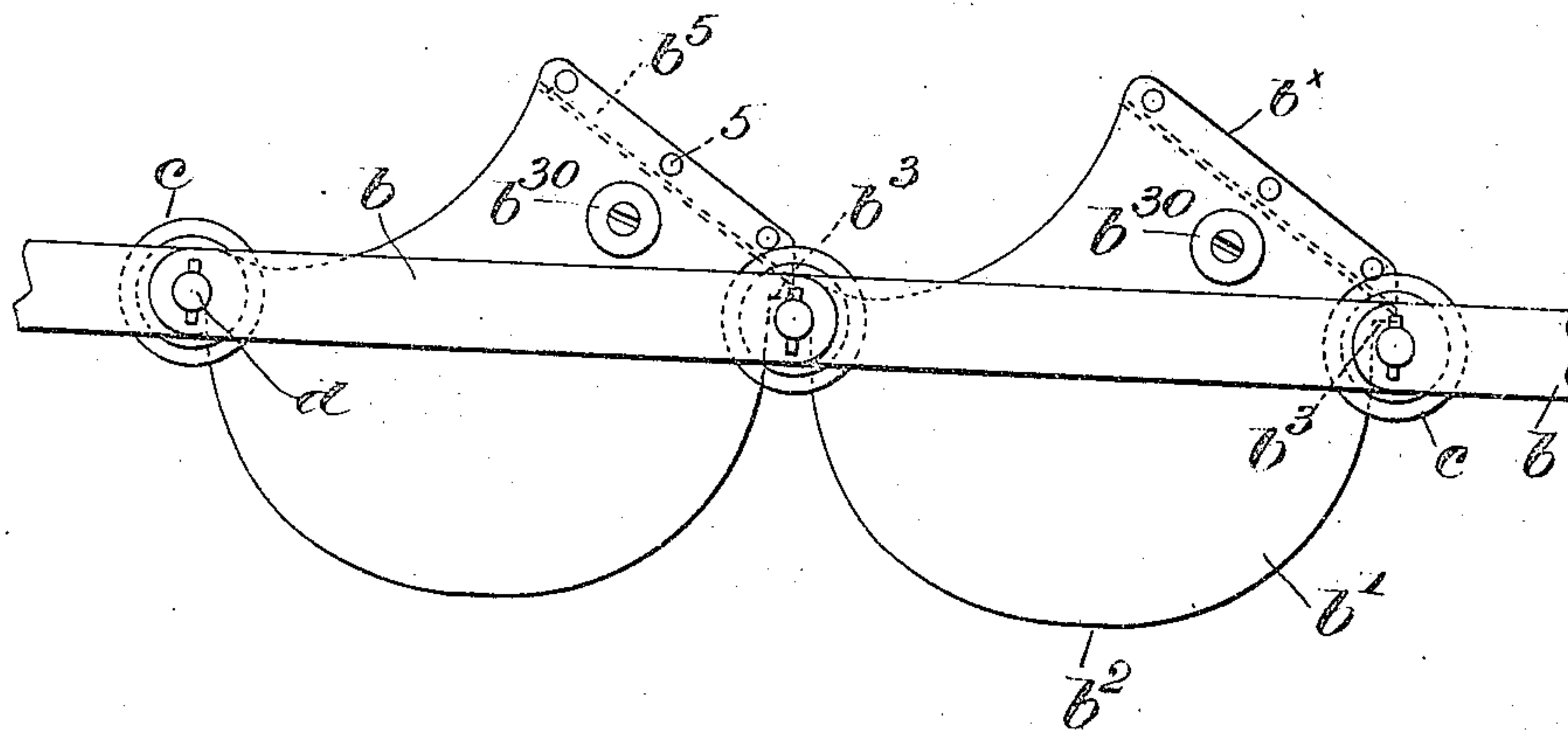


Fig. 3.

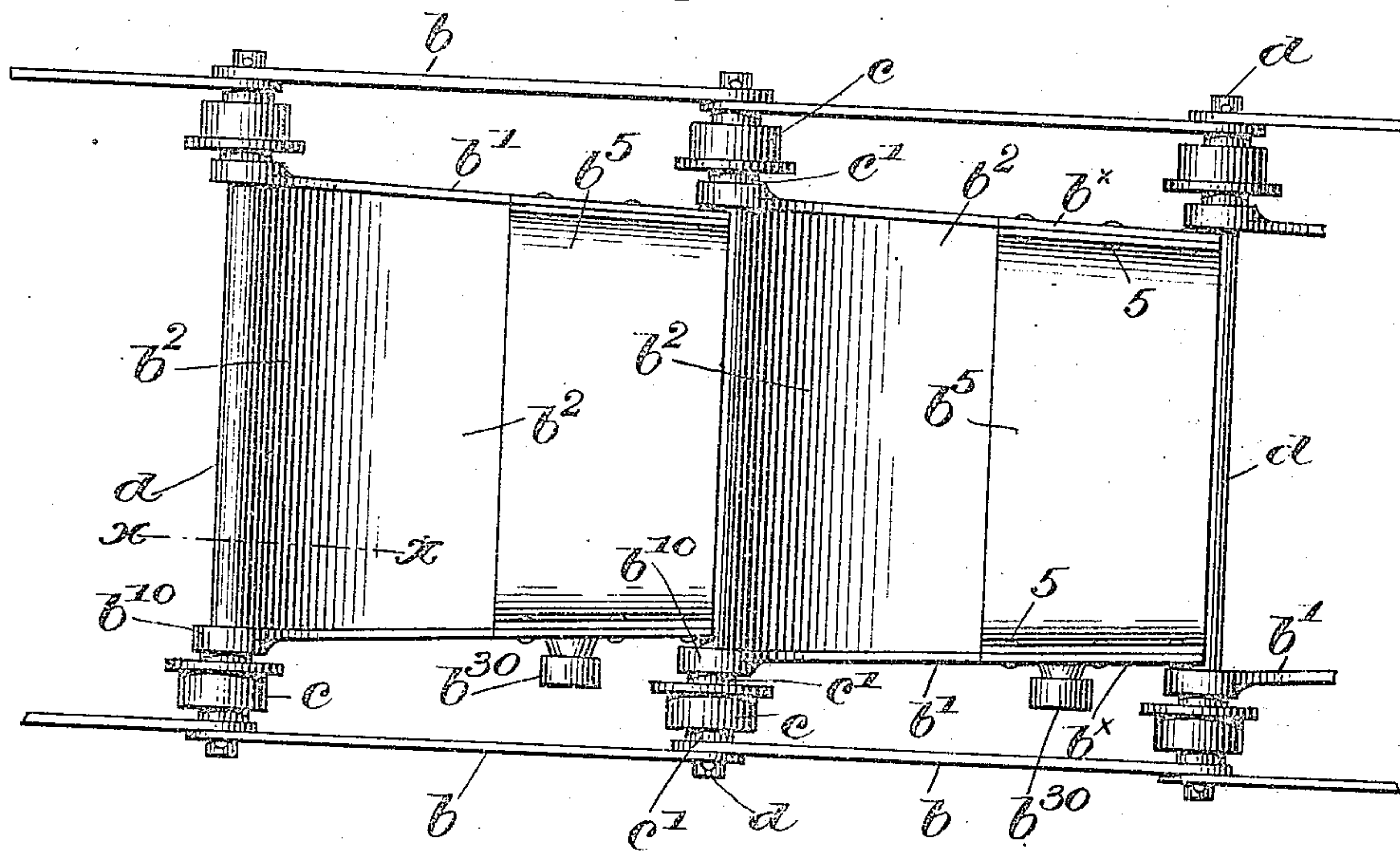
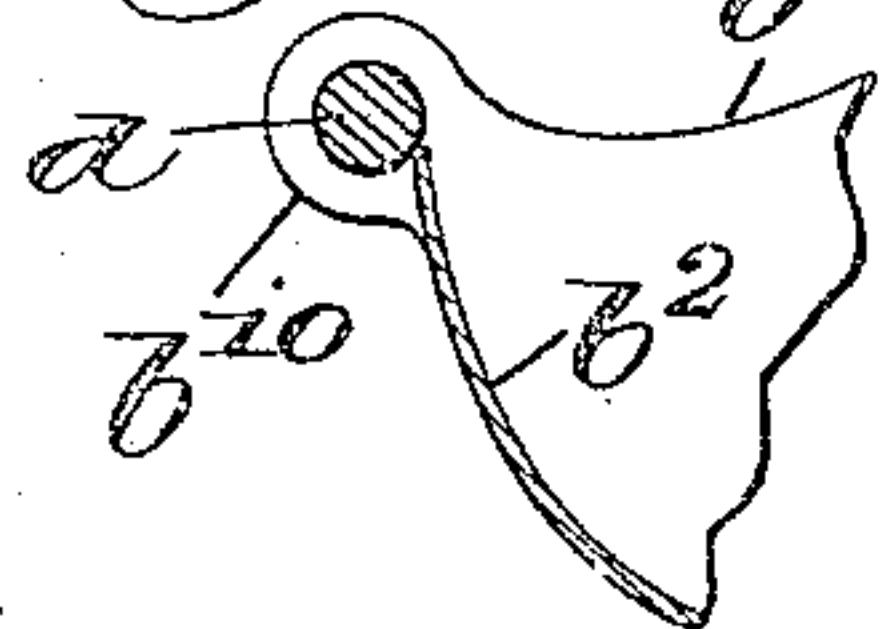


Fig. 4.



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UNITED STATES PATENT OFFICE.

EDWIN S. DECKER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE STEEL
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CONVEYER.

SPECIFICATION forming part of Letters Patent No. 630,804, dated August 8, 1899.

Application filed December 21, 1896. Serial No. 616,416. (No model.)

To all whom it may concern:

Be it known that I, EDWIN S. DECKER, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improve-
5 ment in Conveyers, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 The so-called "pan" conveyer is from its construction a comparatively cheap apparatus and can be used with great facility when it is desired to convey the material from the loading-point to the discharging-point with-
15 out materially changing the direction of the run; but inasmuch as the pans are connected at each end to the endless flexible connection, be the latter chains, cables, or pivoted links, a pan conveyer cannot be used when it is de-
20 sired to discharge the material on the "upper run," as it is termed. In the latter case a gravity-bucket conveyer is usually employed, a suitable tipping device being located at the discharging-point to turn the buckets
25 to empty their contents; but such conveyers are much more complicated in structure and more expensive to install.

My present invention has for its object the production of an endless conveyer combining
30 the cheapness and simplicity of the pan conveyer with the greater range of usefulness and adaptability of the gravity-bucket apparatus, the construction being such that at the loading-point and along the lower run the
35 buckets act as pans. On the upward connecting-run and along the upper horizontal run to the discharge-point the buckets act as gravity-buckets, means being provided for returning the buckets to normal position on the
40 downward flight preparatory to again approaching the loading-point.

The bucket is of peculiar construction, the loading and discharging opening being located at the leading end, at which end the
45 bucket is permanently and pivotally mounted on the flexible connections, while the rear closed end of the bucket is upwardly and forwardly inclined and overlaps the support of the next bucket on the lower run, so that
50 the material at the loading-point cannot pass between two adjacent buckets. A suitable

flexible connecting member is used, and if this be a chain the two series of connecting-links are provided at their joints with carrying-wheels, which run on suitable fixed tracks, 55 and the leading end of each bucket is pivotally mounted at the link-joint, so that the rear end of the bucket is perfectly free and disconnected from the links, while the distance between two adjacent link-joints or 60 points of support for the buckets on the flexible connecting member is less than the extreme length of a bucket. As a result when the buckets are traveling along the lower horizontal run the rear end of each bucket 65 rests upon and is supported on the support of the next following bucket, and as soon as the buckets change their direction of movement, traveling on the upward run, they hang or are suspended from their upper leading 70 ends as gravity-buckets.

Various features of my invention will be hereinafter fully described in the specification and particularly pointed out in the 75 claims.

Figure 1, in side elevation, broken out at the ends and top and bottom, represents an endless conveyer embodying my invention. Fig. 2 is a side elevation, on a larger scale, of two of the buckets shown in Fig. 1 in loading 80 position. Fig. 3 is a top or plan view of the buckets shown in Fig. 2; and Fig. 4 is a sectional detail taken on the line *x x*, Fig. 3.

In the embodiment of my invention illustrated herein upper and lower tracks or runs 85 *a' a* are suitably supported, and the lower run may be located on one story of a building, while the upper run *a'* is in a higher story. Each end support A of the lower run has rotatably mounted therein a carrying or 90 driving wheel B, shown as a sprocket-wheel, to receive the pivot bars or shafts *d*, which serve as joints connecting the links *b* of the chain carrying or connecting the series of buckets. Like wheels B' are mounted on the 95 end supports A' of the upper run *a'*, the buckets being supported between the chains and passing between the sides of the wheels.

Referring to Fig. 3, the pivot-bars *d* have mounted thereon, at each end inside the links 100 *b* of the chain, carrying-wheels *c*, flanged and adapted to travel upon the upper sides of the

tracks or runs a' , the elongated hubs c' of the wheels serving to position the buckets.

The buckets may be constructed in suitable manner, preferably of cast-iron for the sake of cheapness and convenience, the buckets each consisting in the instance selected for illustration of parallel sides b' , connected by a longitudinally-curved bottom b^2 . Along their lower edges the sides may be curved to correspond to the curvature of the bottom b^2 and the upper edges of the sides curved or inclined upwardly from the leading end of the bucket to the upwardly and forwardly inclined back edges b^x of the bucket sides. The sides are shown as extended rearwardly at b^3 to form short shoulders, which rest upon the pivot-bar d of the next-following bucket on the lower run, as clearly shown in dotted lines, Fig. 2, and full lines, Fig. 3, the bottom b^2 having its leading end upturned to rest against the bar d , as shown most clearly in Fig. 4, the bucket sides having bosses b^{10} thereon to surround the bar d and abut against the wheel-hubs c' , the bosses connecting the bucket to the bar. I have herein shown iron plates b^5 as bent or flanged at their edges and secured, as by rivets 5, to the sides b' of the buckets along their inclined rear edges b^x , thereby forming an end for each bucket. The loading and discharge opening of each bucket is thus located at its leading end between the portion b^2 and the back b^5 , and when the buckets are traveling on the lower run the bucket-openings will be upturned to receive the load from a suitable hopper H , Fig. 1.

As the buckets pass beneath the mouth of the hopper-chute H some of the material will impinge against the inclined back b^5 of the bucket next in front, the back being at such an angle that the material will be directed into the opening or mouth of the following bucket. The lower end of the back of one bucket projects over the supporting bar or shaft d of the next bucket, so that none of the material will be wasted and the loading can be carried on continuously.

The shape of the bucket is such that a large portion of its capacity may be utilized for the load without spilling during the transfer from loading to discharging point.

As the series of buckets pass around the sprocket-wheels at the end of the run a and begin the vertical ascent, as at the left, Fig. 1, the buckets will gradually assume a depending position, being pivotally supported from their leading ends on the joint-bars d . From the ascending run up to near the point of discharge the buckets are free to hang below the chains, as shown, the load gradually settling into about the position indicated by dotted lines.

It is supposed that the load of each bucket is to be discharged into a hopper H' , suitably supported below the upper run a' , and for this purpose the buckets must be swung rearwardly and upwardly to turn their mouths

downward and bring the backs b^5 to the proper discharge angle. To trip or turn the buckets, I provide a trip-rail f , supported on hangers f^x below the track a' and gradually inclined upward, as at f' , to the point f^2 . Each bucket has an exterior projection or roll b^{80} on the side thereof, near the rear edge b^x , and as a bucket approaches the discharging-point the roll first travels along the straight portion f of the trip-rail to steady the bucket and prevent it from oscillating, an auxiliary rail f^5 resting on the top of the roll. As the bucket moves along, the roll b^{80} rides up the inclined part f' , gradually lifting the rear end of the bucket into the position shown at 50, Fig. 1, with its mouth downturned, whereupon the contents will be discharged. From the point f^2 I carry the trip-rail as a guard or retaining rail f^6 to and around the wheel B' and thence downward along the descending run at f^7 , said guard-rail maintaining the buckets in the same relative position until they again enter the lower run in proper loading position.

Were it not for the guard the buckets would approach the lower run upside down and it would be difficult then to right them, and it will be obvious that along the lower run and while being loaded the apparatus will operate as a pan conveyer, while along the vertical ascending run and on the upper run nearly to the discharge-point the apparatus operates as a gravity-bucket conveyer.

My invention is not restricted to the precise construction and arrangement herein shown, for the same may be modified in various details without departing from the spirit and scope of my invention.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an apparatus of the class described, a series of connected buckets pivotally supported at their leading ends and free at their rear ends, the free rear end of each bucket resting directly upon the support of the next bucket along the lower run, substantially as described.

2. An apparatus of the class described, comprising a conveyer-run having its point of discharge at a higher level than its loading-point; an endless bucket support or traveler on said run; a series of buckets each mounted at its leading end upon a pivotal support on said traveler, and each without connection at its load-carrying end; said buckets being respectively longer than the respective intervals between their pivotal supports, and arranged to respectively rest at their free ends upon the pivotal supports of adjacent succeeding buckets when passing the loading-point, but to depend freely from their respective supporting-pivots when traversing the ascending and upper portions of the run as far as the point of discharge; and means to positively rotate the buckets about said pivotal supports to discharge their contents, and to insure their proper relative po-

sition at the loading-point, substantially as described.

2. In an apparatus of the class described, two parallel series of links, transverse bars 5 connecting the ends of the links and forming joints therefor, carrying-wheels on said bars, and a series of buckets pivotally mounted directly at their leading ends on said link-joints between the two series of links and free at 10 their rear ends, the free rear end of each bucket resting upon the support of the next bucket while being loaded, substantially as described.

4. In an apparatus of the class described, a 15 series of connected buckets pivotally supported at their leading ends, carrying-wheels, upper and lower tracks upon which said wheels travel, the rear end of each bucket resting on the transverse support of the next 20 bucket on the lower run, said buckets being freely suspended at their leading ends along the upward run and to near the discharge-point, substantially as described.

5. In an apparatus of the class described, a 25 series of connected buckets pivotally supported at their leading ends, upper and lower tracks, means to maintain the bucket-mouths upturned along the track adjacent the loading-point, to receive the load, said buckets 30 being freely suspended at their leading ends and depending from their respective points of suspension independently each of the others as they approach the discharge-point, and means to swing the rear ends of the buckets 35 up to invert their mouths at the discharge-point, substantially as described.

6. In an apparatus of the class described, a series of connected buckets pivotally supported at their leading ends and free to rotate about said supports, means to lift the rear 40 ends of the buckets to invert their mouths at the discharge-point, and a guard to thereafter

maintain the buckets in such relative position to the lower run, substantially as described.

7. In an apparatus of the class described, a 45 series of buckets pivotally supported at their leading ends, each bucket having a longitudinally-curved bottom and a forwardly and upwardly inclined rear end, and links connecting the leading ends of the buckets and 50 jointed thereat, the rear end of each bucket extending over throughout its breadth and resting upon the support of the next bucket when in position to be loaded, substantially 55 as described.

8. A conveyer-bucket having upright sides, a longitudinally-curved bottom, and an upwardly and forwardly inclined plane rear end, 60 to leave a loading and discharge opening between the leading edge of the bottom and the upper edge of the rear end substantially as described.

9. A conveyer-bucket having a longitudinally-curved bottom provided at its leading 65 edge with a transverse bearing, upright sides having straight rear edges inclined upwardly and forwardly from the rear edge of the bottom, and a correspondingly-inclined rear end between said edges of the sides, substantially 70 as described.

10. A conveyer-bucket having upright sides provided at their rear ends with extended 75 shoulders, a longitudinally-curved bottom, and an inclined plane rear end, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWIN S. DECKER.

Witnesses:

GEO. W. GREGORY,
JOHN C. EDWARDS.