

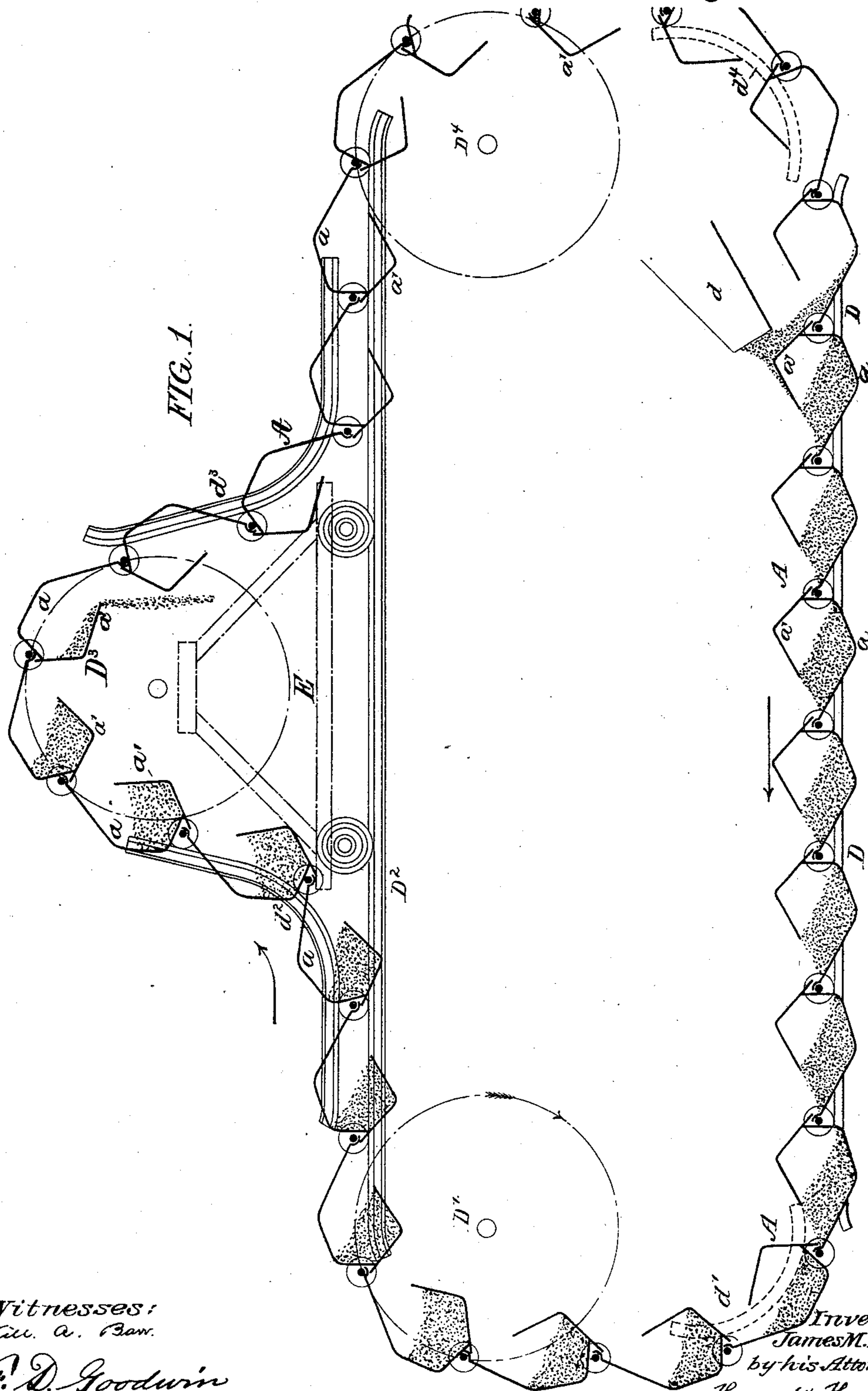
(No Model.)

4 Sheets—Sheet 1.

J. M. DODGE.
CONVEYER.

No. 565,334.

Patented Aug. 4, 1896.



Witnesses:
Wm. A. Barr.

C. D. Goodwin

Inventor,
James M. Dodge
by his Attorneys
Howson & Howson

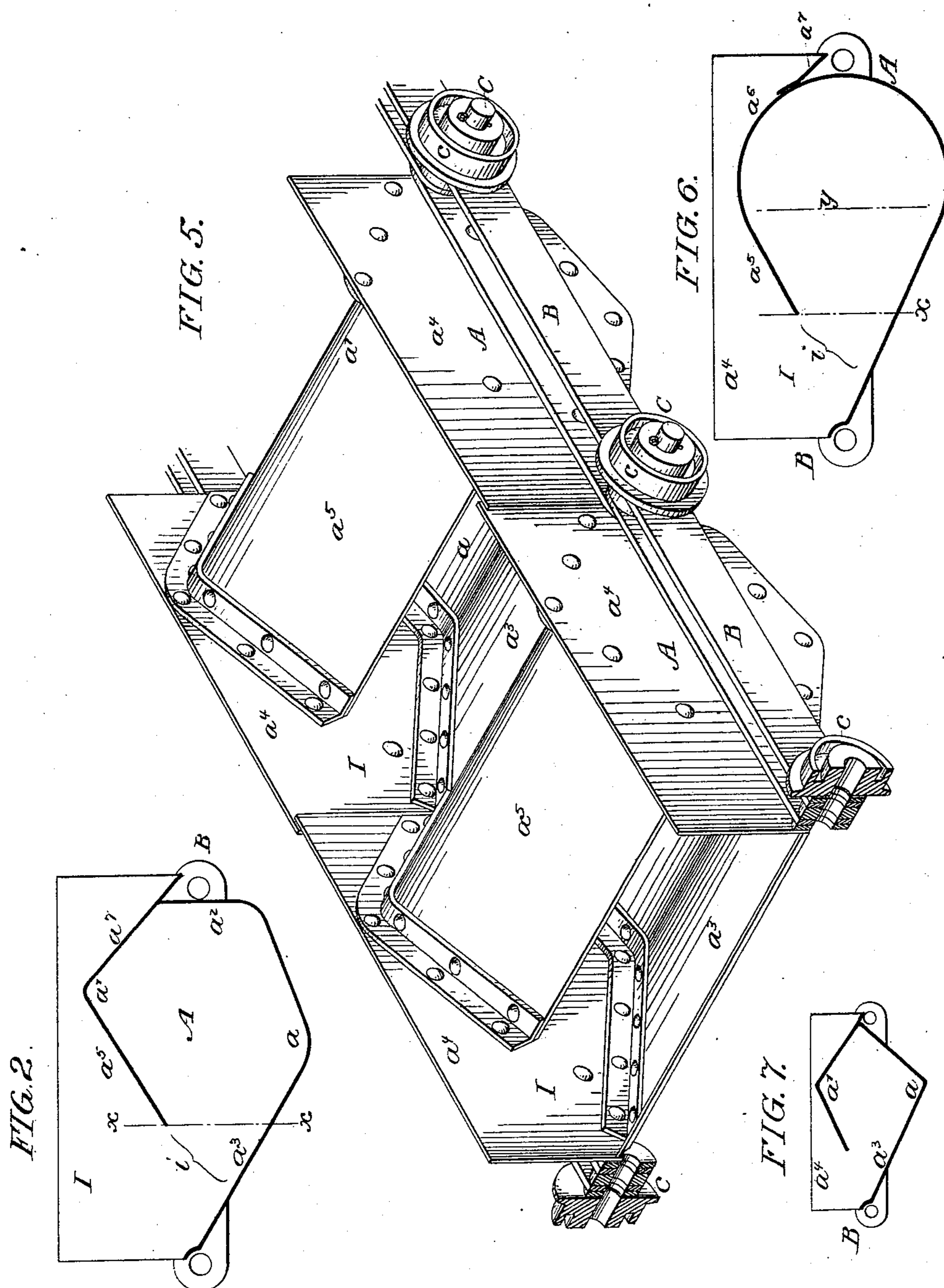
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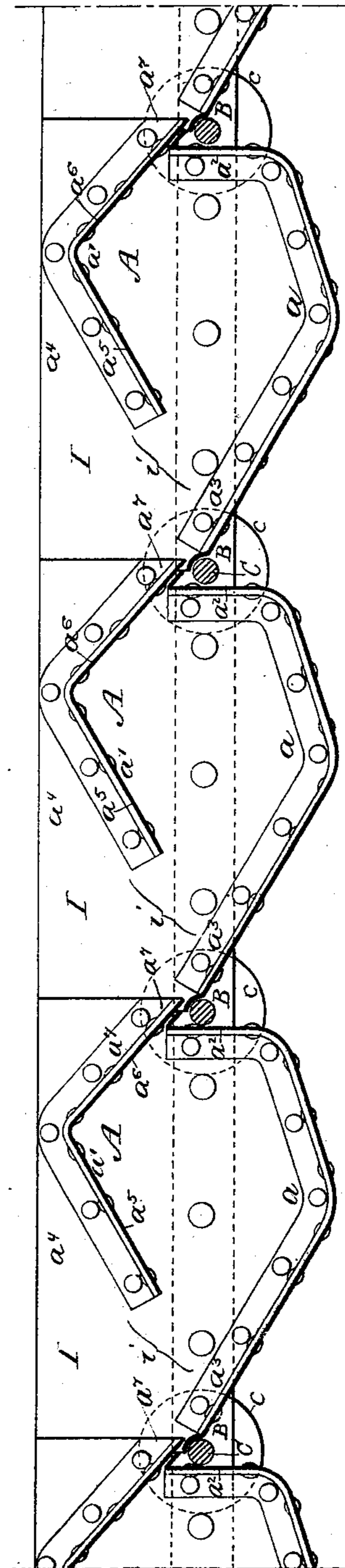
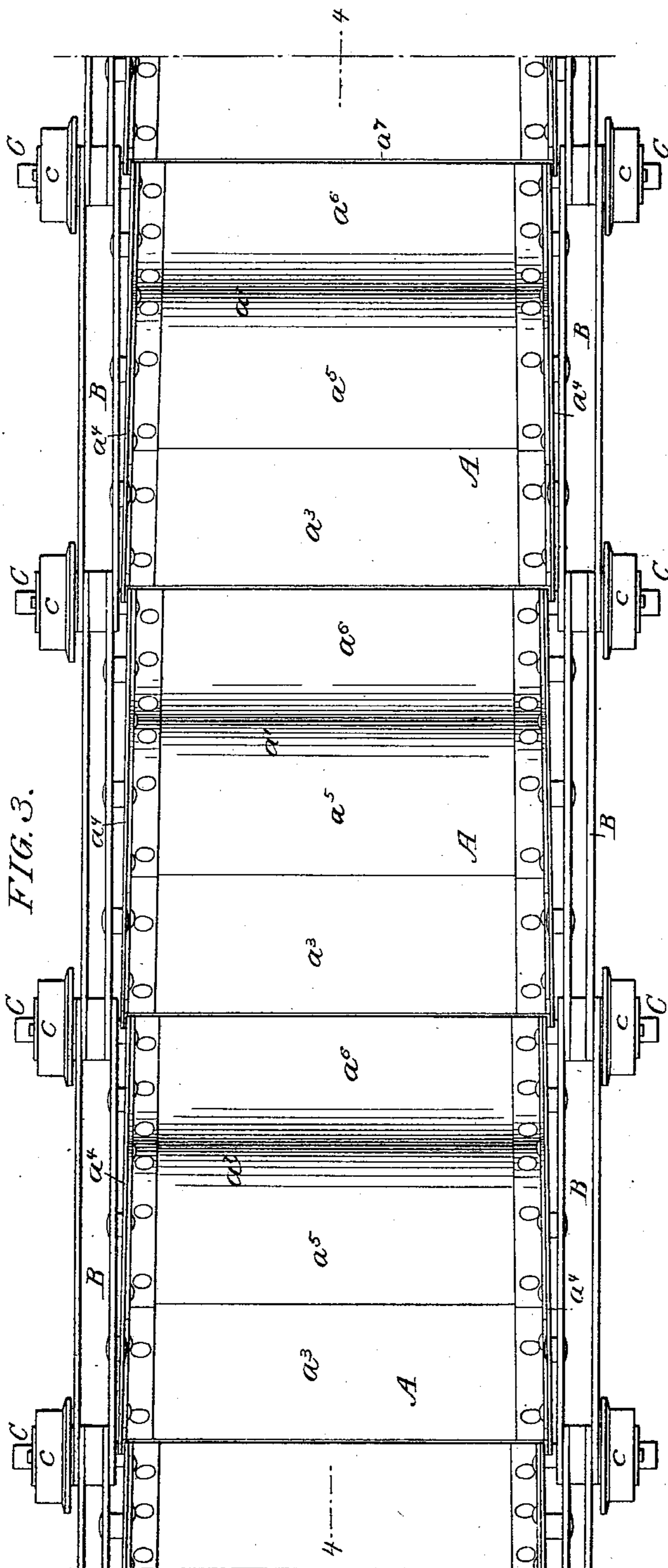
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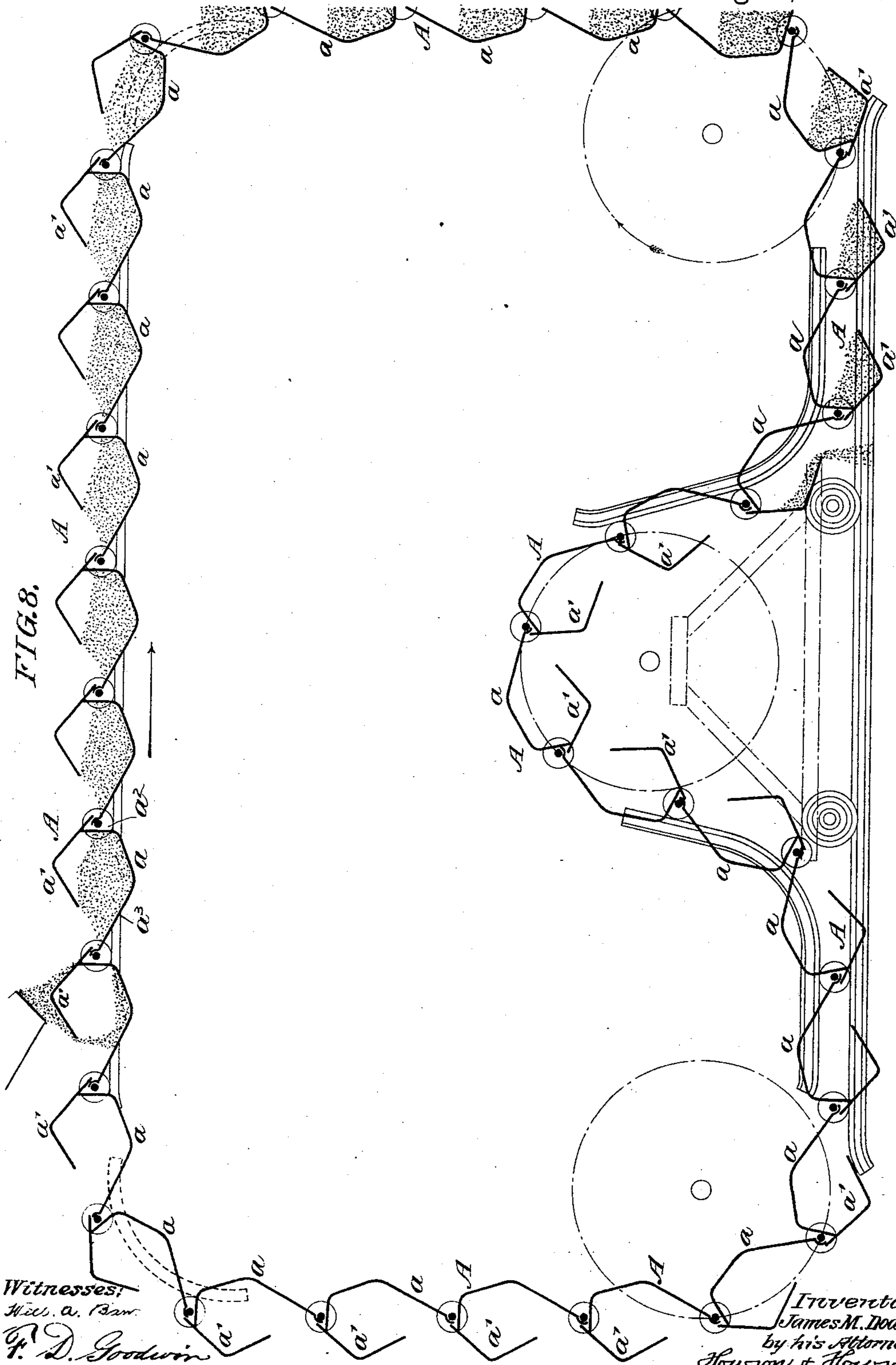
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4 Sheets—Sheet 4.

J. M. DODGE,
CONVEYER.

No. 565,334.

Patented Aug. 4, 1896.



UNITED STATES PATENT OFFICE.

JAMES M. DODGE, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
LINK-BELT ENGINEERING COMPANY, OF SAME PLACE.

CONVEYER.

SPECIFICATION forming part of Letters Patent No. 565,334, dated August 4, 1896.

Application filed June 23, 1896. Serial No. 596,616. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. DODGE, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain
5 Improvements in Conveyers, of which the following is a specification.

The object of my invention is to adapt endless-chain conveyers of that class in which the buckets are rigidly secured to the chain
10 to the carriage and elevation of materials in runs similar to those for which pivoted bucket conveyers have heretofore been commonly used, and I attain this object by forming and arranging the buckets substantially as hereinafter described, so that they may receive
15 the material to be conveyed upon the lower horizontal run of the chain to which they are attached, and may, without discharging their contents, be inverted, so as to traverse an upper horizontal run, and may yet be caused to
20 effect that discharge at any predetermined point upon the said upper run, or may receive material on an upper run and convey it to a discharge-point on a lower run, as described
25 hereinafter.

Heretofore, so far as I am aware, it has not been practicable to effect the work which my invention is mainly designed to accomplish, using conveyers of the fixed-bucket type, except by using separate conveyers for different
30 parts of the run and transferring the material from one such conveyer to another, or, where it has been sought to accomplish the result by the use of one such conveyer, by twisting the conveyer-chain in the ascending portion of the
35 run, so as to prevent inversion of the buckets during the "upper run."

By means of my present invention I am enabled to accomplish the result aimed at by
40 the use of one conveyer of the fixed-bucket type and without twisting the conveyer-chain in any part of its journey or employing any means to prevent "reversal" of the buckets.

My invention further relates to sundry improvements in details of construction hereinafter particularly described, whereby a conveyer of the fixed-bucket type having the capacity hereinabove set forth may be made
45 capable also of continuous operation and of being continuously fed without the employment of the customary valves and trips.

In the accompanying drawings, Figure 1 is a diagram illustrating a conveyer made in accordance with my invention, showing the buckets charged and carrying the loads from
55 the charging-point on the lower run to the discharging-point on the upper run. Fig. 2 is a sectional view of one of the buckets detached. Fig. 3 is a plan view of a series of the buckets coupled together. Fig. 4 is a sectional view on the line 4 4, Fig. 3. Fig. 5 is
60 a perspective view showing two of the buckets coupled together. Figs. 6 and 7 are views of modifications of the bucket. Fig. 8 is a diagram illustrating one form of conveying apparatus on which my improvement may be
65 used. In this instance the buckets are charged on the upper run and carry material to a discharge-point on the lower run.

Referring in the first instance to Figs. 1 to 7, inclusive, each bucket consists of what for
70 convenience of description I will call a "bottom" carrying-section a and an "upper" carrying-section a' , connected in the particular form of bucket shown in Fig. 2 by end section a^2 and side plates a^4 . The bottom section a of the bucket is that on which the material to be conveyed is received and carried
75 upon the "lower run," Fig. 1, the upper section a' becoming the bottom or carrying section when, upon the upper run, the buckets are inverted, this section a' being, as clearly shown in Fig. 1, of such length and shape
80 that the buckets can be so reversed without discharging the material being conveyed.

The links B of the conveyer-chain are attached to the side plates of the buckets, as shown in Figs. 3, 4, and 5, and are coupled together by pivot-rods C, which in the present instance extend entirely across the structure, between the buckets, and carry at their
85 outer ends wheels $c c$, adapted to the guide-rails of the conveyer system.

A portion a^3 of the bottom section a of each bucket extends forward, so as to overlap one
95 of the pivot-rods C, and this forward projection of each bucket is overlapped by a rearward projection a^7 of the upper plate a' of the bucket immediately in advance. By this construction leakage of material fed to the
100 buckets is prevented, and the apparatus becomes capable of being continuously oper-

ated and continuously fed, and the valves and trips necessary to accomplish this result in the ordinary pivoted bucket conveyer are dispensed with.

5 The side plates a^4 of the bucket extend some distance above the opening i thereof and form, with the inclined portion a^5 of the section a' of the bucket and the upper and forward end of the portion a^3 thereof, a hopper I. (See
10 Fig. 4.)

The part a^6 of the upper section a' of each bucket is inclined in a direction opposite to the inclination of the part a^5 of said section and acts as a portion of the hopper of the
15 next succeeding bucket, directing into the latter such portions of the continuously-fed material as, in the continuous travel of the apparatus, fall upon the said part a^6 . The upper and lower carrying sections are sub-
20 stantially V-shaped, so as to carry the load.

Fig. 6 illustrates a modified form of bucket in which the upper, bottom, and end sections are formed upon a curved line, a form which may be preferable in some instances, as al-
25 lowing the necessary shifting of the material from one position to another within the bucket, in its travel, to occur more easily and with less wear and tear upon bucket or material.

30 Fig. 7 illustrates a bucket in which the end section a^2 of the particular form of Fig. 2 is dispensed with.

The buckets may be made of sheet metal and the plates composing the same connected
35 by means of angle-plates, as shown in Fig. 5. It will also be noted that in the form of bucket shown in said figure, and also in Fig. 3, the side plates a^4 of one bucket overlap the side plates of the next adjoining bucket for the
40 prevention of leakage from the "hopper" portion of the buckets.

In the diagram Fig. 1 I have shown a system in which the buckets travel continuously along a track D of the lower run, in the di-
45 rection indicated by the arrow, receive material continuously from a chute d , and are guided by rails d' to a sprocket-wheel D' , driven in the direction of the arrow, from which wheel the buckets are received and
50 guided by the rails d^2 of the upper run.

It will be seen that as each bucket is thus carried and elevated it is gradually turned and the material therein gradually shifted, until on the upper run the bucket is com-
55 pletely inverted and the load shifted from the bottom section a to the upper section a' , which is of a length and shape to receive and retain the load when the bucket is in this position.

60 To discharge the load, the conveyer is guided by rails d^2 over wheels D^3 , and as each bucket commences to descend and be turned beyond the point of complete inversion, after passing over these wheels, the
65 material therein is at once discharged into any suitable receptacle. The conveyer and

buckets are then guided by rails d^3 downward onto the rail D^2 again, and from this rail pass around guide-wheels D^4 and around rails d^4 onto the rails D of the lower run. 70

The wheels D^3 are, in the present instance, carried by a truck E, which also carries the two sets of rails d^2 d^3 , and this truck travels on the rails D^2 , so that by merely shifting the position of the truck the buckets can be
75 caused to discharge at any desired point on the upper run.

When it is required to construct the apparatus to carry material from the upper run to a point on the lower run, I reverse the posi-
80 tion of the buckets, as shown in Fig. 8, so that the mouths of the buckets will be uppermost on the upper run, and the buckets can be charged with material on said upper run and will carry the material down to and
85 along the lower run without discharging until turned beyond the point of complete inversion, either by the mechanism shown in the drawings or at the end of the lower run as the buckets ascend. 90

It will be understood, of course, that the diagrams herein referred to are merely illustrative and that in practice apparatus embodying my invention will be capable of operation in "runs" varying greatly in extent and de-
95 tails.

I claim as my invention—

1. An elevator-bucket consisting of upper and lower carrying-sections connected at sides and rear, and having a loading and dis-
100 charge opening in front and adapted to carry the load until turned beyond the point of complete inversion, substantially as herein set forth.

2. As an improvement in endless-chain
105 conveyers, a conveyer-bucket having upper and lower carrying-sections, the lower section carrying the material on the lower run and the upper section carrying the material on the upper run of the conveyer, substantially
110 as described.

3. The combination with the chain of an endless-chain conveyer, of buckets rigidly attached thereto and having upper and lower
115 carrying-sections, said buckets adapted to receive and carry a load in the lower section on the lower run, and to retain and carry the load in the upper section when inverted, substantially as set forth.

4. An elevator-bucket consisting of upper
120 and lower carrying-sections connected at sides and rear, and having a loading and discharge opening in front, the upper carrying-section being so formed as to retain and carry the load when the bucket is turned in one
125 direction to the point of complete inversion, but to discharge said load when turned beyond said point, substantially as herein set forth.

5. The combination with the chain of an
130 endless-chain conveyer of buckets rigidly attached thereto, said buckets having upper

and lower carrying-sections, and adapted to be charged on the lower run of the chain, to retain and carry their load when inverted on an upper run, and means for turning the
5 buckets into discharging position at any predetermined point upon said upper run, all substantially as herein described.

6. A conveyer-bucket consisting of top and bottom sections, each substantially V-shaped
10 in cross-section, connected at their sides and rear ends and having between them, at their forward ends, an opening for the reception or discharge of a load, all substantially as herein described.

15 7. A conveyer-bucket having top and bottom carrying-sections, the bottom section having its forward end inclined and extending beyond the line of the forward end of the top section, and adapted to receive the material to be conveyed and direct it into the body
20 of the bucket, substantially as described.

8. A conveyer-bucket consisting of bottom and top carrying-sections connected together at the sides and rear end, and having an inclined forward portion adapted to receive material and direct it into the bucket, all substantially as herein described.

9. A conveyer-bucket consisting of bottom and top carrying-sections connected together
30 at their rear ends, the lower section carrying the material on the lower run and the upper section carrying the material on the upper run, said bucket having an opening at its forward end, and side plates connecting said
35 top and bottom sections, and extending above

said opening, all substantially as herein described.

10. A conveyer-bucket having a top carrying-section substantially V-shaped and adapted to carry material when the bucket is inverted, substantially as described. 40

11. In an endless-chain conveyer, the combination with a series of pivotally-connected links, of a series of buckets each rigidly secured to one pair of links and having inclined
45 upper sections, the upper section extending rearwardly so as to overlap the pivotal axis between its links and the links immediately in the rear thereof, substantially as set forth.

12. The combination in conveying and elevating apparatus, of a conveyer-chain, guides adapted to carry and direct the chain in two horizontal runs and in connecting runs, buckets rigidly secured to said chain, each bucket having a bottom section and a top
55 section, the bottom section extending in advance of the top section, the said bottom section carrying the load on the lower run, and the top section carrying the load on the upper run, when the buckets are reversed, and
60 means for turning the buckets into a discharging position, substantially as described.

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

JAMES M. DODGE.

Witnesses:

WILL. A. BARR,
JOS. H. KLEIN.