

No. 631,718.

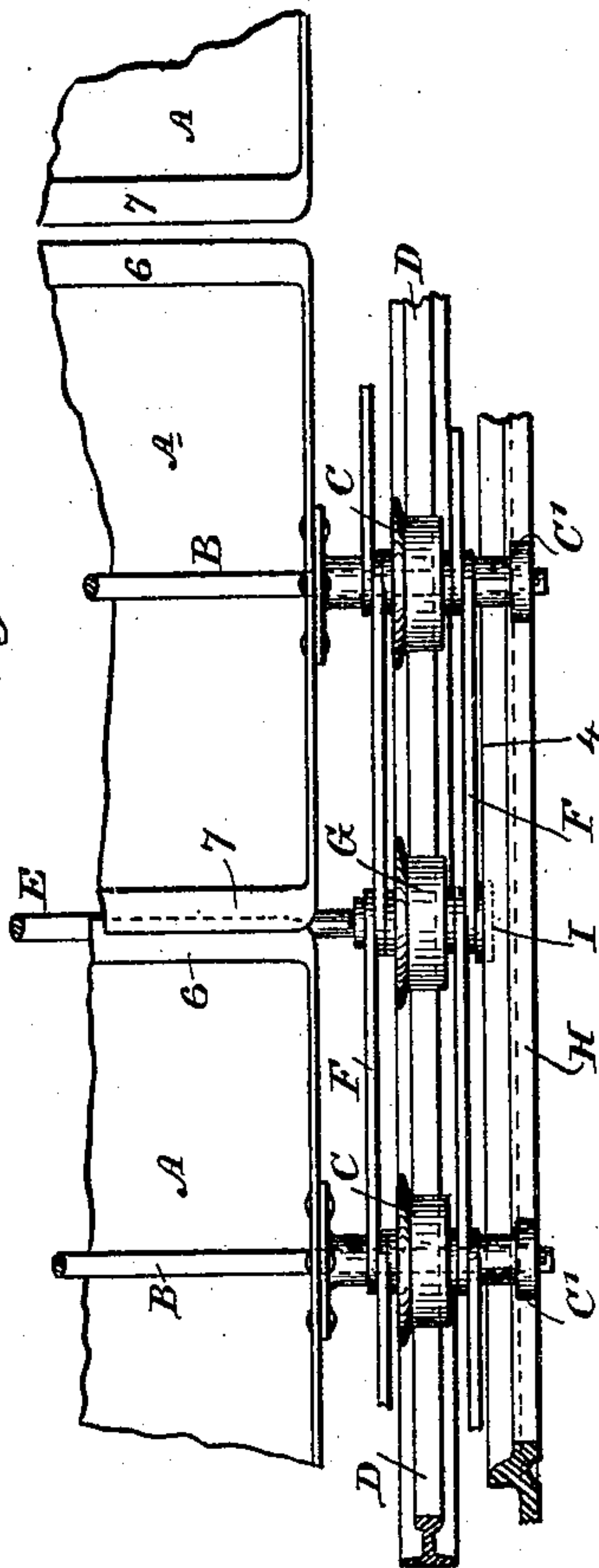
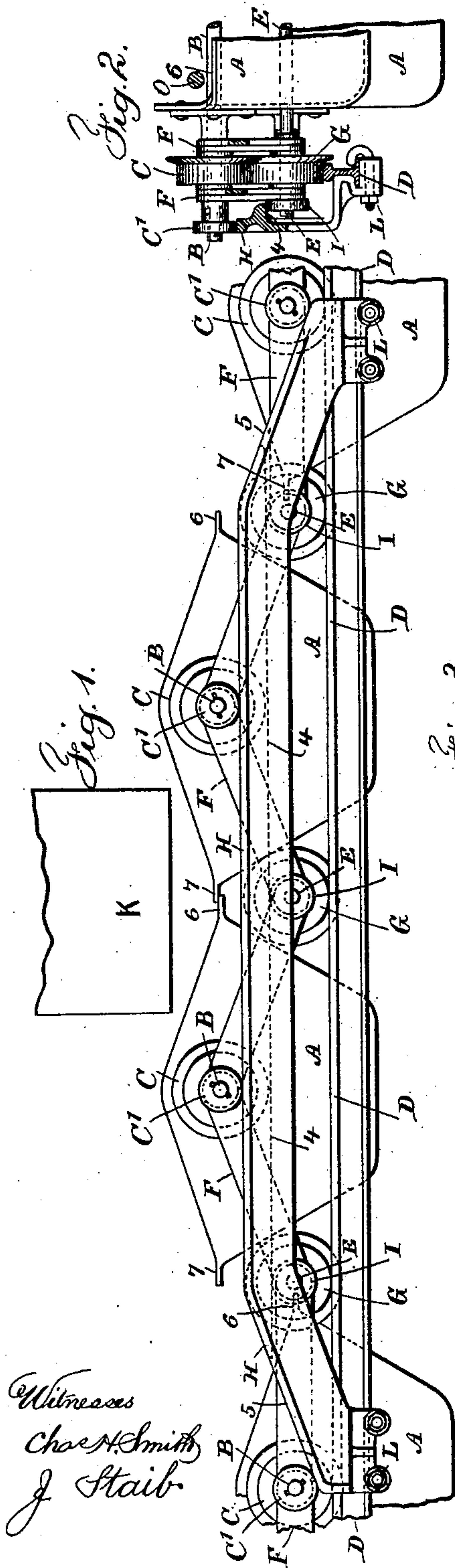
Patented Aug. 22, 1899.

C. W. HUNT & C. C. KING,
CONVEYER FOR COAL, ORE, &c.

(Application filed Apr. 17, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Inventors

Charles W. Hunt.

Charles C. King

for L. W. Lurwell & Son

attys

No. 631,718.

Patented Aug. 22, 1899.

C. W. HUNT & C. C. KING.
CONVEYER FOR COAL, ORE, &c.

(Application filed Apr. 17, 1899.)

(No Model.)

3 Sheets—Sheet 2.

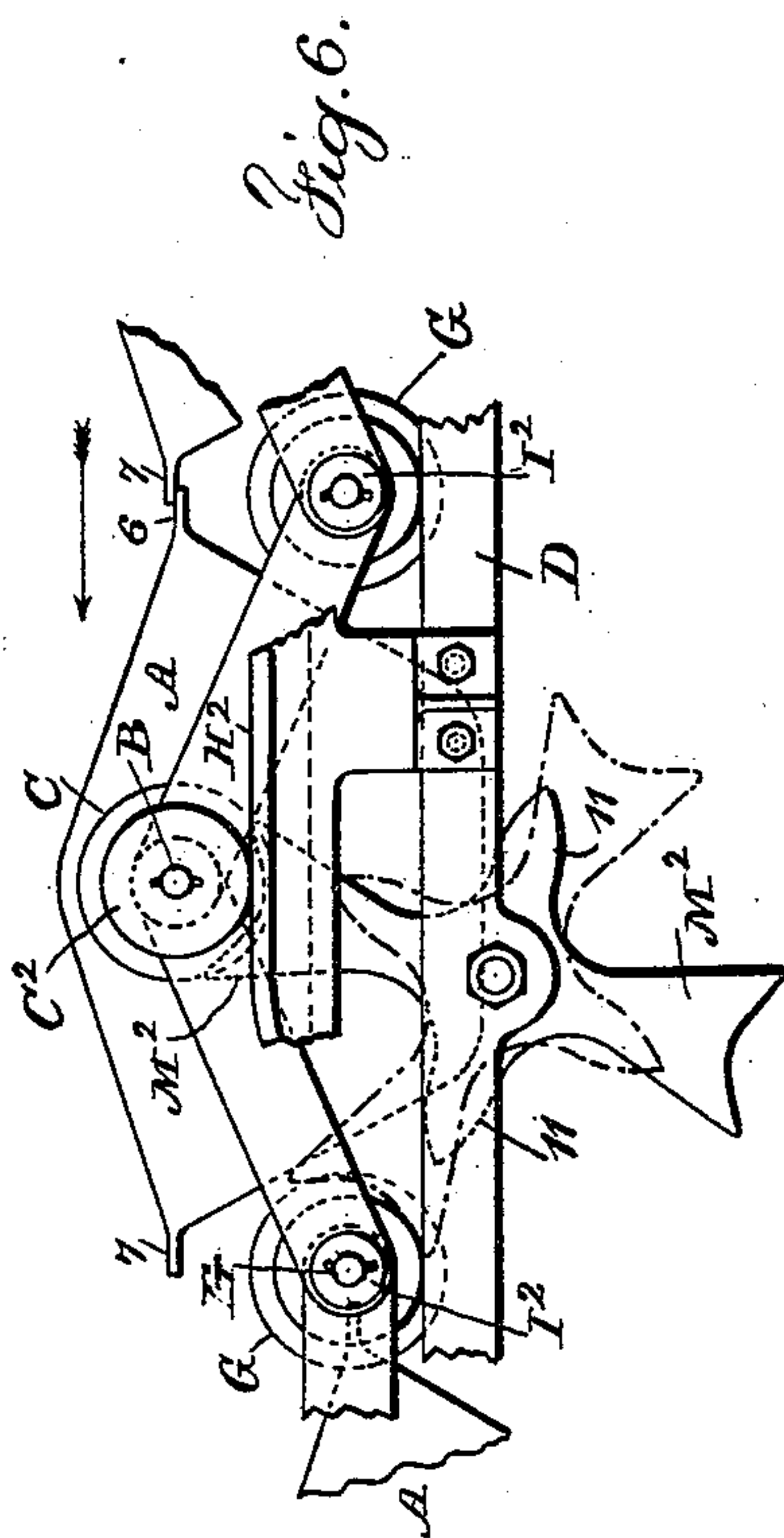


Fig. 5.

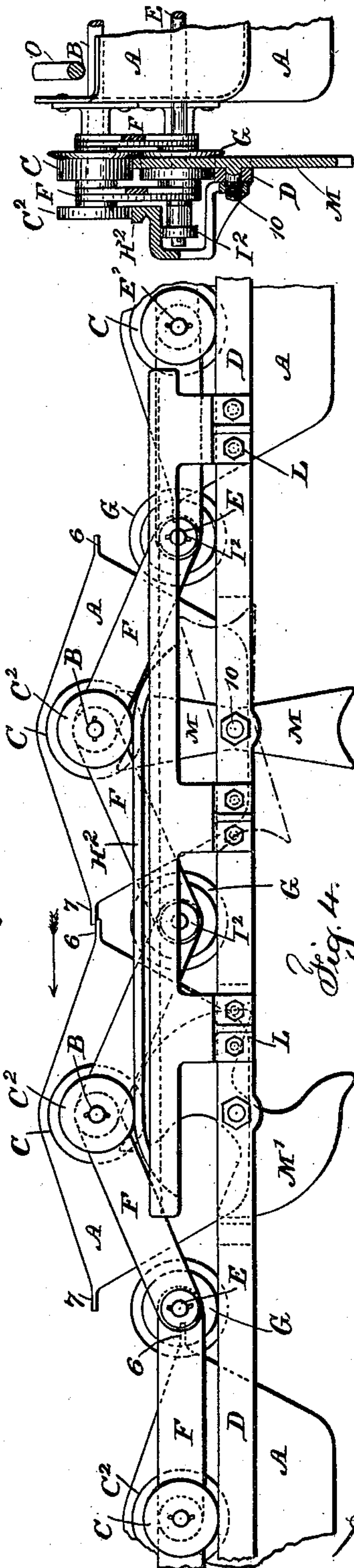


Fig. 4.

Witnesses
Chas. A. Smith
J. Staib

Inventors
Charles W. Hunt.
Charles C. King.
per L. W. Terrell & Son
attys

No. 631,718.

Patented Aug. 22, 1899.

C. W. HUNT & C. C. KING.
CONVEYER FOR COAL, ORE, &c.

(Application filed Apr. 17, 1899.)

(No Model.)

3 Sheets—Sheet 3.

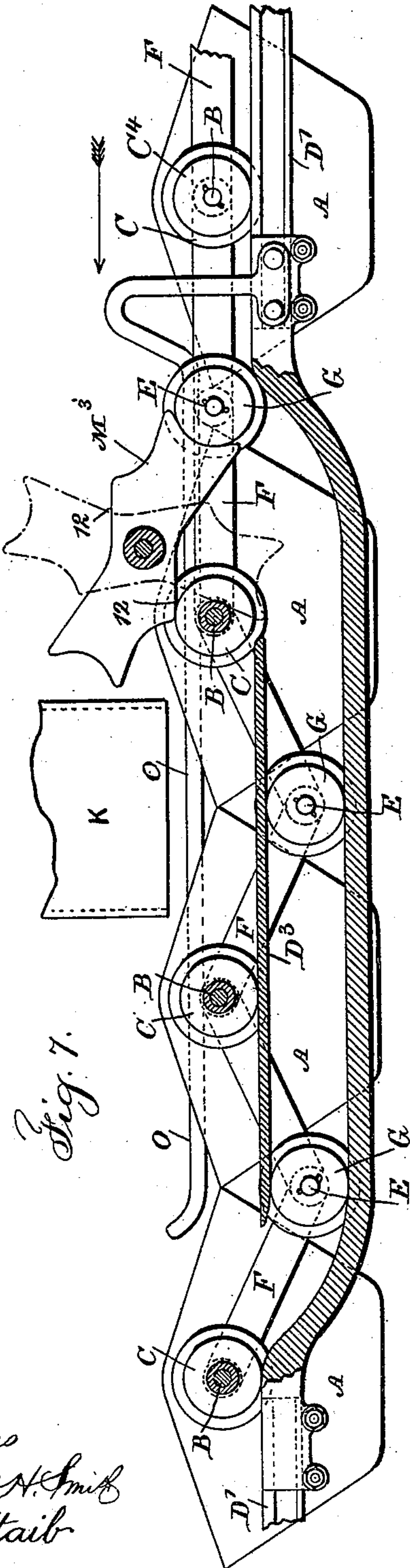


Fig. 7.

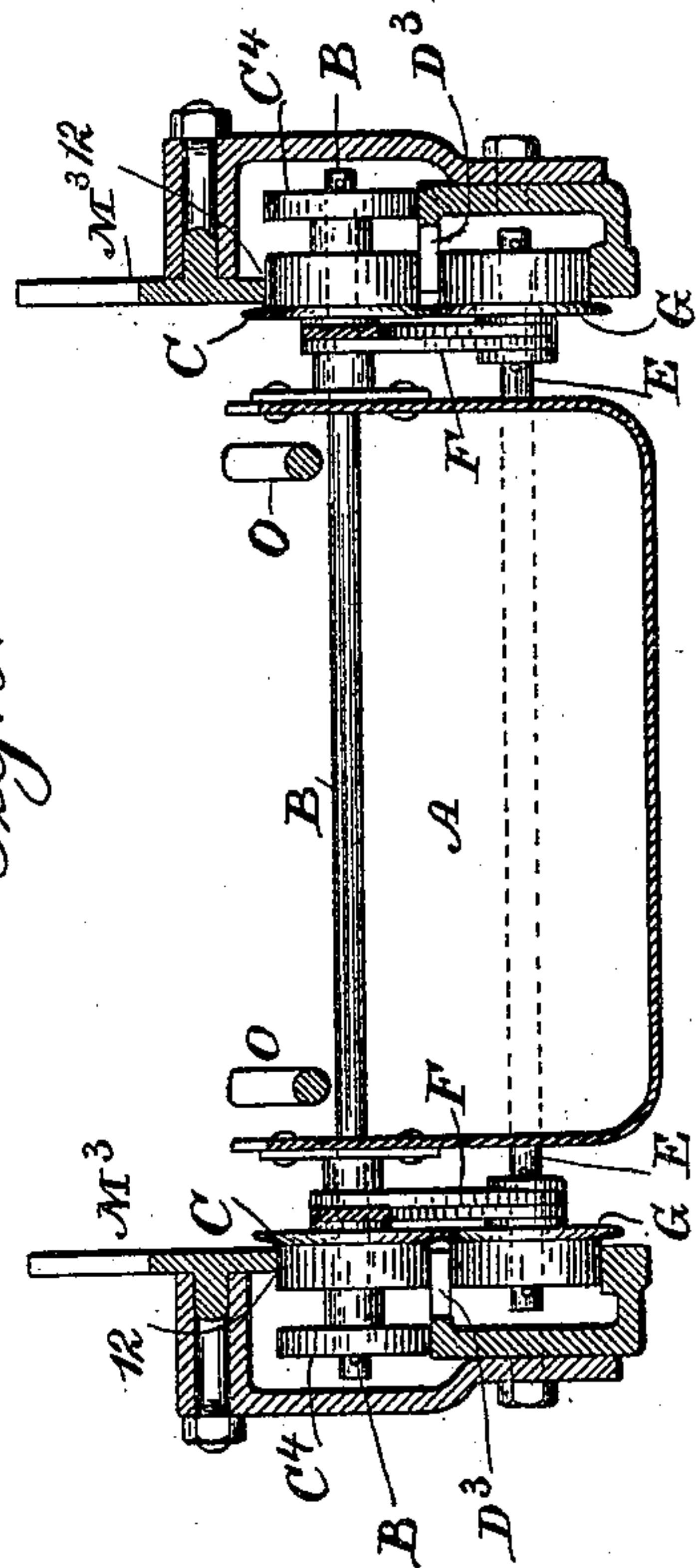


Fig. 8.

Witnesses
Chas. H. Smith
J. Staib

Inventors
Charles W. Hunt.
Charles C. King.
per L. W. Lurrell & Son

UNITED STATES PATENT OFFICE.

CHARLES W. HUNT AND CHARLES C. KING, OF NEW YORK, N. Y., ASSIGNORS
TO THE C. W. HUNT COMPANY, OF SAME PLACE.

CONVEYER FOR COAL, ORE, &c.

SPECIFICATION forming part of Letters Patent No. 631,718, dated August 22, 1899.

Application filed April 17, 1899. Serial No. 713,254. (No model.)

To all whom it may concern:

Be it known that we, CHARLES W. HUNT and CHARLES C. KING, citizens of the United States, residing at West New Brighton, borough of Richmond, city and State of New York, have invented an Improvement in Conveyers for Coal, Ore, and other Substances, of which the following is a specification.

Conveyers have been made of buckets hung upon pivots and connected by chains, links, or ropes at the respective sides, so as to form an endless series, there being rollers or wheels for supporting the buckets upon tracks, and such conveyers have been provided with wheels at the different places where the direction of movement has been changed, and in order to allow for the free movement of the buckets throughout their range of travel it has usually been necessary to allow the edge of one bucket to be at a short distance from the edge of the next, so that the buckets themselves may not collide. Where the coal, ore, or other material has been supplied to these buckets, a chute is usually employed, and the material is liable to fall down between one bucket and the next. To prevent this, the buckets have been provided with shields, lapping lips, or other devices to cover the space between one bucket and the next and prevent the material falling down between such buckets. It will be noticed that these lips are useless except at the places where the material is received.

The present improvement relates to means for bringing the edges of the buckets into close proximity where the ore, coal, or other material is received, so as to substantially close the space between one bucket and the next, and after passing the point where the material is received the buckets assume the usual position, with a space between one bucket and the next.

In carrying out this invention we cause the chain, rope, or other connecting device between one bucket-pivot and the next to assume an angular position sufficient to draw the adjacent edges of the buckets into reasonably close proximity, and thereby prevent the coal or other material falling down between one bucket and the next. It will be observed that in doing this the edge of one bucket is

drawn closely toward the other by the action of the connecting devices, the angular positions to which the parts of the connecting devices are moved performing the work of drawing one bucket toward the other. We employ tracks for supporting the buckets at one level and the intermediate connections at another level, and the approaches to these separate portions of the track are inclined in order that the chains or connecting devices of the conveyer may be automatically moved in the act of drawing the buckets along, so that the buckets may be at one level and the intervening connecting devices at another level, thereby making bends in the chains or connecting devices to draw the edges of the buckets toward each other by virtue of the bends in the chains forming triangles to the lines between one bucket-support and the next.

In the drawings, Figure 1 is a side view representing the improved conveyer. Fig. 2 is a cross-section of the same, representing the positions of the respective tracks and parts at one side. Fig. 3 is a plan view illustrating the buckets and tracks at one side. Fig. 4 is a side view, and Fig. 5 a cross-section at one side, showing a modification of the devices for zigzagging the chain; and Fig. 6 represents the device for lowering the filled bucket to the main track. Fig. 7 is a sectional side view, and Fig. 8 is a cross-section showing the devices for lowering the intermediate chain-pivots.

The buckets A A may be of any desired size, shape, or construction, and the pivots B for such buckets are at the ends and in such a position that the buckets hang by gravity, and at the pivots there are wheels or rollers C that run upon the tracks D. These parts are of any ordinary or desired construction, and the buckets are connected up in endless series by chains, wire ropes, or otherwise, and we have used herein the term "chain" as denoting any well-known or desired connection between the buckets in the endless series forming the conveyer.

It is usual to place a cross-bar E in the space between one bucket and the next, and these cross-bars form the pivotal connections between the links F of the chain; but where the links are sufficiently rigid it is not necessary

for the bars E to cross between one bucket and the next; but such bars under any circumstances become the axles or pivots for wheels or rollers G, which run upon the track; but for reasons hereinafter stated the wheels G are in a different vertical plane longitudinally of the conveyer from the wheels C', that are upon the pivots B and outside of the wheels C that support the buckets on the track D.

Wherever the buckets are to receive coal, ore, or other materials a device is applied upon the track to cause the buckets to approach closely, so that the edges of the buckets transversely of the conveyer come into contact, or nearly so, in order that the space between them may be reduced to a minimum and prevent the coal, ore, or other material falling between one bucket and the next.

In order to make a bend in the chain, and thereby draw one bucket toward the other, the wheels G upon the cross-bar E are moved into a position either above or below the wheels C that support the buckets. We have shown the wheels G as down below the wheels C and have represented a secondary track H for the wheels C', which secondary track H is in the same plane as such wheels C' and serves to carry the buckets bodily up higher than their normal positions, so that the wheels G on the cross-bars E can continue along upon the track D, and in order to keep the cross-bar E and wheels G from rising we provide a projection with or without a disk or small wheel I upon the outer end of each cross-bar E, and such disk runs beneath the flange or rail 4 upon the secondary track H. Devices of the same character are provided on each side of the bucket and upon the tracks and in line with each other transversely thereof, so that as the conveyer is moved along the cross-bars E and their wheels G continue upon the track D, and they are kept from rising by the disks or wheels I passing below the flanges 4, and the buckets A are lifted bodily by the wheels C' thereof running up the inclines 5 at the ends of the secondary tracks, and in this operation the chain is bent or brought into a zigzag position sufficient to shorten the distance between the pivots B B of the bucket and bring the edges 6 7 of the respective buckets either into contact or closely adjacent the one to the other, and the secondary track H is sufficiently long to hold two or more of the buckets with their edges thus closely adjacent, so that the material delivered from the spout or chute K, which is located at this place, will not fall between one bucket and the next.

It is advantageous to make the secondary track detachable from the main track and secured thereto by bolts or clips L, so that the secondary tracks can be attached to the main tracks at any desired places, according to where the chute or spout that discharges the material may be located, and it is usually advantageous to make the secondary track in the manner heretofore described, so that the

buckets can be carried up to bend the chains angularly and draw the edges of the buckets closely adjacent to each other, or, if desired, the cross-bars E can be carried downward to bend the chains, the buckets continuing to pass along upon the same level.

In Figs. 4 and 5 revolving lifters are represented, which serve to raise the buckets successively to the elevated positions, while the cross-bars E remain at the normal level. The rotary lifters M are pivoted upon the track at 10 and their ends are concave to act against the surfaces of the rolls or wheels C, and these lifters being in the form of bars with diverging ends are turned progressively, and, as represented in Figs. 4 and 5, the rotary lifter M has lifted the wheel C and brought the wheel C² to the elevated track H², and as the conveyer moves along progressively the roll C turns the lifter and then passes away from the end of such lifter, and the next wheel G as it comes along upon the track D presses against the rotary lifter and turns it around into the position illustrated by the dotted lines and passes away, leaving such lifter in position ready to engage the next wheel C as it comes along, and thereby lift the bucket. During these operations the wheels or rolls I² upon the cross-bars E have passed in below the flange of the track H², so that the cross-bars E are held down against any lifting action by the rotary lifter as the chain-links are turned into the angular positions shown in Fig. 4 to bring the edges of the buckets closely adjacent. As the wheels C² approach the end of the track H² the wheels C run upon the surface of the rotary lowerers M', and these lowerers are turned by contact with them of such wheels C as they pass down and rest upon the tracks D, it being understood that there are similar devices at each side of the buckets upon the tracks or rails. In place of the lowering device M' (shown in Fig. 4) the rotary lowering device M² (shown in Fig. 6) may be employed, there being two opposite arms concaved at the ends similar to the rotary lifters M; but with the addition of the cam projections 11, which are at right angles to the lowering devices M², and hence when the wheel C is taken by the concaved end of the lowering device M², as seen in Fig. 6, the parts will receive by the movement of the conveyer a quarter-revolution into the position illustrated by the dotted lines, and one of the cam projections 11 will be in position to be acted upon by the next wheel G as it rolls along upon the track D, and thereby the lowering device M² receives a quarter-revolution and is turned into the position shown by the full lines, Fig. 6, ready to receive the next wheel C upon the bucket-pivot.

In Figs. 7 and 8 the present improvement is illustrated with tracks D' and D³, adapted to receive the wheels C and C⁴ that support the buckets, so that the buckets and the wheels pass along on a substantially level track without the buckets being lifted; but

the cross-bars E and their wheels G are depressed, so as to cause the chain-links to assume a sufficiently angular position, one to the other, to draw the edges of the buckets into contact or nearly so. Any suitable means may be employed for carrying down the cross-bars E and the wheels or rolls G. We have, however, represented a rotary depressor M³, similar to the rotary lifter M, such depressor being placed above the track and having the concave ends of the arms adapted to act upon the wheels or rolls G as they come along and move them downward, so as to come beneath the track D³, there being an opening in such track to allow the rolls G to pass through, and the parts are so proportioned that the rolls G, running beneath the flange of the track D³, maintain the links of the chain in the proper angular position one to the other, and it is advantageous to employ the secondary rollers or wheels C⁴ at the ends of the pivot shafts or axles B to run upon the track D³ to prevent the wheels C dropping into the opening provided for the wheels G to pass through as they descend. As the wheel C upon the pivot of the next bucket passes along beneath the revolving depressing device M³ it acts against the rotary depressing device to give the same a quarter-revolution, and the surfaces 12 at that time occupy a horizontal position, as illustrated in Fig. 7, so that the end of the rotary depressing device M³ is brought to the proper position to take against the next roll G and carry the same down and swing the chain-links into the angular position necessary in bringing the buckets into close proximity. In Figs. 1, 3, 4, and 6 the buckets are represented as made with stationary or rigid lips projecting at their edges, so that one may lap above the other. In Fig. 7 the buckets are represented without lips, so that their edges may be brought into close proximity, as the lips are not necessary to this improvement. We remark that in conveyers of this character it is usual to provide stationary steady-bars O, suitably supported from the tracks, so that the buckets pass along beneath these stationary steady-bars, and hence are held in their proper normal positions as they are filled, so that the weight in the buckets may be equally distributed and cause the buckets to remain in a substantially level position as they are carried along by the conveyer, and in this manner the buckets are loaded with uniformity, and a greater weight at one side of the bucket than at the other, causing the bucket to hang at an inclination, is prevented. The lifters M and the depressors M³ should have frictional devices to prevent them turning too far by momentum.

We claim as our invention—

1. The combination with the buckets and

their connecting-chains, tracks and supporting-wheels in a conveyer, of mechanism for moving the links of the chains into angular positions between the pivots of the buckets and thereby drawing one bucket toward the other bucket and bringing the edges of the buckets sufficiently closely adjacent to prevent the coal or other material falling down between the buckets, substantially as set forth.

2. The combination with the tracks, buckets and connecting-chains, of cross-bars between the buckets, rolls at the ends of the cross-bars and a track with which such rolls come into contact and by which such rolls and the links with which they are connected are brought into angular positions between the pivots of the buckets for shortening the distance between such bucket-pivots to bring the edge of one bucket closely adjacent to the edge of the next bucket, substantially as set forth.

3. The combination with the tracks, buckets, connecting-chains and supporting-rolls for the buckets, of secondary tracks, one at each side of the buckets and means for connecting the same to the main track, and rolls or projections coming into contact with such secondary track for causing the parts of the chains to assume angular positions between one set of pivots and the next and thereby shorten the distance between such pivots and bring the adjacent edges of the buckets into close proximity, substantially as set forth.

4. The combination with the tracks, the buckets, the chains connecting the buckets in endless series, and the rolls supporting the weight of the buckets of a second set of rolls upon the chains between the pivotal connections and auxiliary tracks for causing the respective rolls to assume zigzag positions and the chains angular shapes to draw the buckets toward each other and cause the adjacent edges to be in close proximity, substantially as set forth.

5. The combination with the tracks, buckets, connecting-chains and supporting-rolls, of auxiliary tracks with inclined ends for raising the buckets, and rolls and pivots upon the chains in line or nearly so with the opening between one bucket and the next, and flanges upon the secondary tracks for holding such rolls down and causing the chains to assume angular positions, substantially as set forth.

Signed by us this 25th day of March, 1899.

CHAS. W. HUNT.
C. C. KING.

Witnesses:

JAMES P. J. MORRIS,
W. H. LEITCH.