

M. C. VOLK.
COAL ELEVATOR.
APPLICATION FILED AUG. 8, 1910.

983,584.

Patented Feb. 7, 1911.
3 SHEETS—SHEET 1.

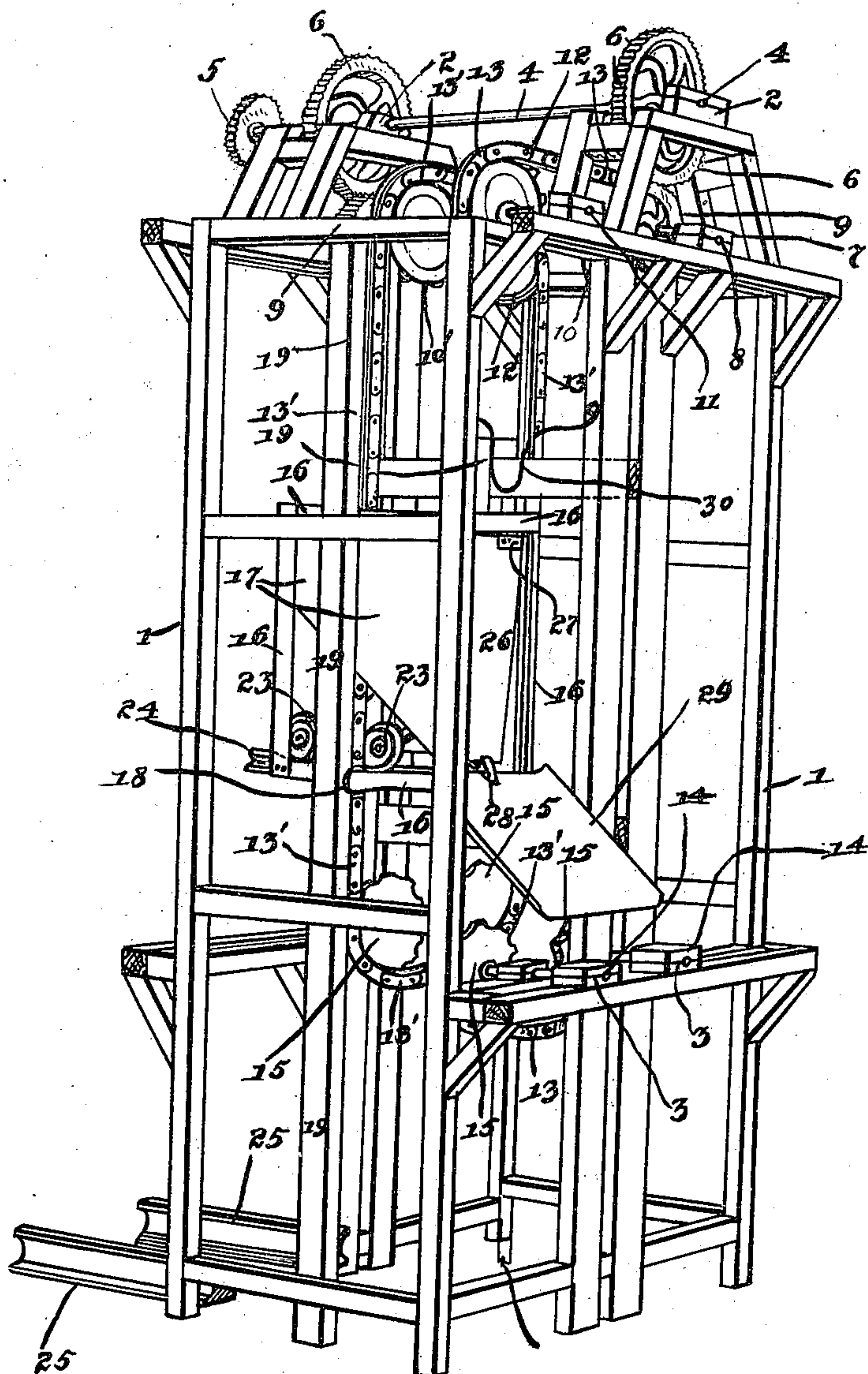


Fig. 1.

Witnesses;
W. C. Linton,
J. B. Austin

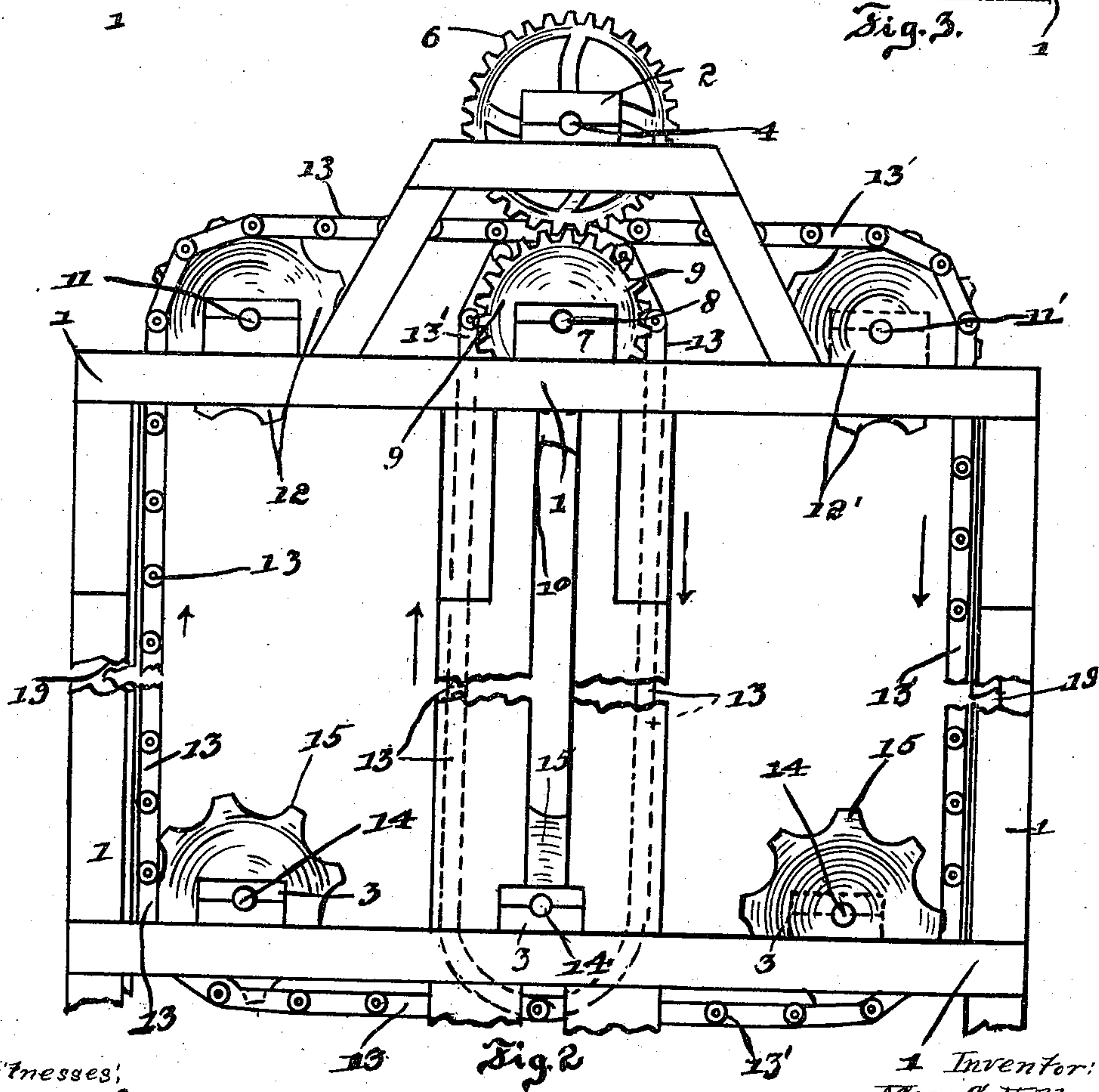
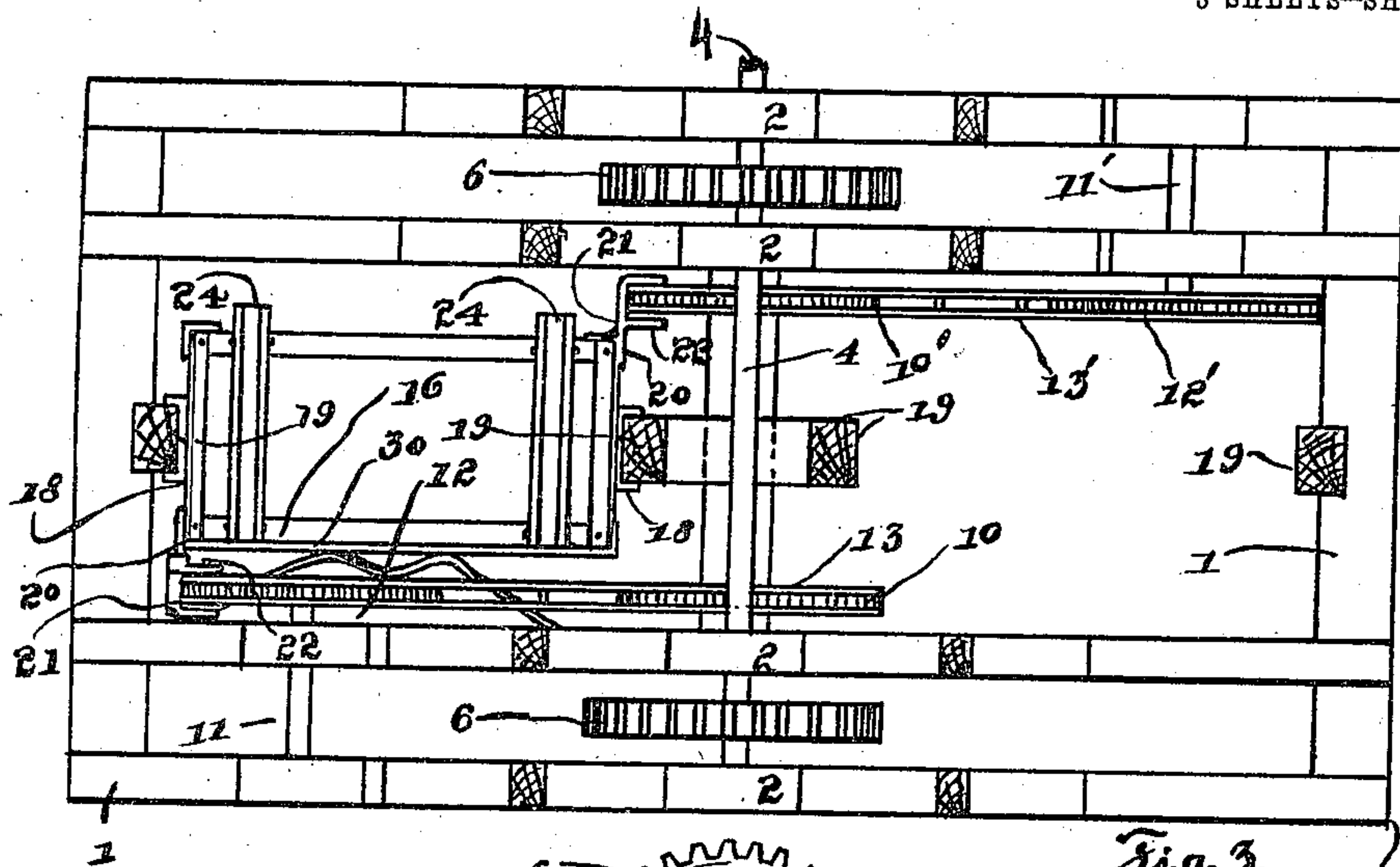
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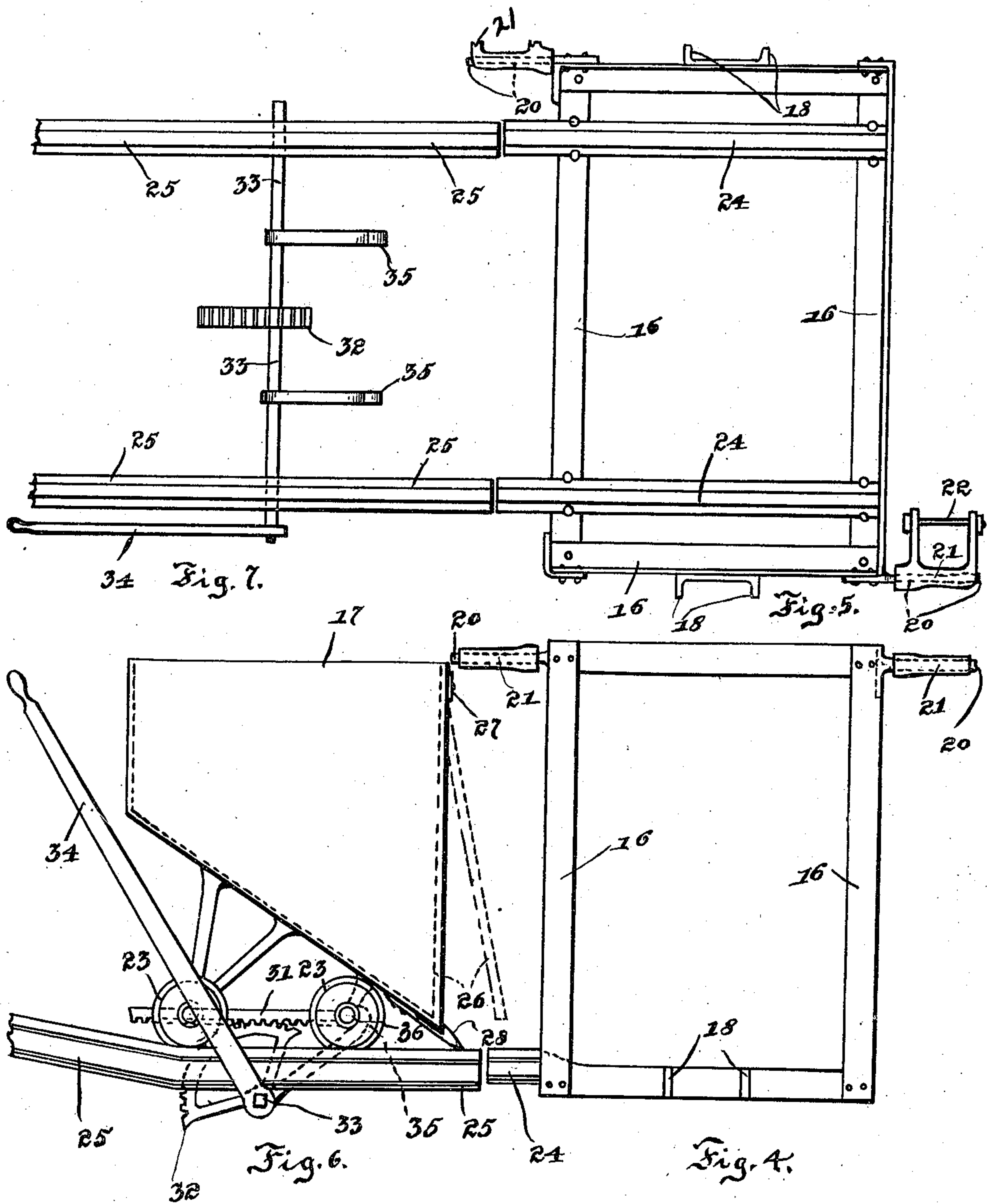
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Witnesses:

W. C. Eaton,

T. B. Austin

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UNITED STATES PATENT OFFICE.

MAX C. VOLK, OF CHICAGO, ILLINOIS.

COAL-ELEVATOR.

983,584.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed August 8, 1910. Serial No. 576,129.

To all whom it may concern:

Be it known that I, MAX C. VOLK, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Coal-Elevators, of which the following is a specification.

My invention relates to improvements in coal elevators and more particularly to elevators adapted for use in mine shafts, the object of the invention being the production of an elevator of this character which shall be so constructed as to discharge coal automatically when it reaches a predetermined level.

A further object of my invention is to provide an elevator which shall be strong and durable in construction and efficient in operation.

Other objects will appear hereinafter.

With these objects in view my invention consists in the novel construction and arrangement of parts which shall be hereinafter fully described and more particularly pointed out in the appended claims.

My invention will be more readily understood by reference to the accompanying drawings forming a part of this specification, and in which,

Figure 1 is a perspective view of my improved mine elevator in its preferred form, Fig. 2 is a front elevation showing the mechanism at the top and bottom of the elevator, the central and extreme bottom portions being broken away, Fig. 3 is a top plan view, Fig. 4 is a side elevation showing the coal car carrier, Fig. 5 is a top plan view of said carrier, Fig. 6 is a side elevation of the coal car and a bracket on which the same is adapted to travel, and Fig. 7 is a top plan view of said bracket.

The preferred form of my invention as illustrated in the accompanying drawings comprises a frame 1 having bearing blocks 2 and 3, the former being at the top of the frame and the latter adjacent the lower end thereof. In the bearings 2 a drive shaft 4 is journaled which extends from the front to the rear of the frame, the rear end of said shaft being provided with a driving sprocket 5 as shown in Fig. 1. Spur gears 6 are mounted on the shaft 4 and positioned between pairs of bearings 2, as shown in Fig. 3. Situated directly under the bearings 2 are bearings 7 in which are journaled short shafts 8 which carry driven spur gears 9

and chain sprockets 10 and 10'. The sprocket shaft 11 carries a sprocket 12 at its inner extremity as shown in Fig. 3, the chain 13 traveling over said sprocket and the sprocket 10 in the direction shown. The sprocket shaft 11' carries a sprocket 12' at its inner extremity, and traveling thereover and the sprocket 10' is a chain 13' which is sufficiently spaced from the chain 13 to allow the car carrier to pass therebetween. Shafts 14 are journaled in the bearings 3 and carry sprockets 15 at their inner extremities over which the chains 13 and 13' travel.

The car carrier 16 adapted to carry the coal car 17 always remains in the upright position and as many of these carriers may be provided as desired. Each car carrier is provided with U-shaped guide members 18 which slide on guides 19 provided in the main frame 1. Arranged diagonally opposite on each car carrier are downwardly extending rods 20 on which U-shaped chain grips 21 are pivotally mounted, the bolts serving to fasten said grips to the chains. The car 17 is provided with wheels 23 which are adapted to travel over tracks 24 and 25, the former being secured in the car carrier and the latter being in the mine and leading to the mine shaft.

The car 17 comprises a door 26 hinged by means of hinges 27 at its upper edge. A spring catch 28 is provided as shown in Fig. 6 to automatically lock the door in the closed position. In order to open the door 26 when in its upward movement it reaches the chute 29, the catch 28 is arranged to contact one edge of said chute as shown in Fig. 1. This forces the catch downward and allows the door to open by the presence of coal in the car. The coal when discharged may be deposited in any suitable conveyance which obviously must be adjacent the chute 29. After the car is dumped it passes upwardly past the door closer 30, as shown in Figs. 1 and 3. The door closer 30 is formed of wire and is so formed and positioned to press the door closed, when, as aforesaid, the catch 28 locks the door automatically.

The coal car 17 comprises a toothed rack 31 which is adapted to mesh with the segment gear 32 when the car has reached its limit of travel on the track 25. The segment gear 32 is mounted on a shaft 33 which is arranged transversely under the track 25, the lever 34 being provided to oscillate said

shaft and the segment gear 32 mounted thereon. Integral with the shaft 33 are hooks 35 which are formed to contact with an axle 36, and thus to stop the car before it reaches the elevator.

The operation is as follows: When it is desired to load a car on the car carrier of the elevator, the lever 34 is moved by the operator in the direction of the elevator which action causes the segment gear 32, which meshes with the toothed rack 31, to move the car along track 25 onto the track 24 of the car carrier. The lever 34 is then thrown back to the normal position in order that the hooks 35 may stop the next car traveling down the inclined portion of the track 25. The depth of the mine shaft determines the height of the elevator, it being clear that the distance between the upper and lower chain sprockets may be varied to suit given conditions. The cars in their upward travel are dumped automatically, as aforesaid, and thereafter descend on the other side of the elevator, as indicated by arrows in Fig. 2. When the cars reach the bottom of the elevator they are taken by the operator out through the opening indicated by the arrow in Fig. 1, and thence are carried away on tracks, not shown, to be again filled with coal, thus completing the cycle of operations. For very deep mine shafts a stairway, not shown, may be provided between the central guides 19, thus providing access to the mine in case of fire-damp explosions or other disasters.

While I have shown what I deem to be the preferable form of my improved coal elevator I do not wish to be limited thereto as there might be various changes made in the details of construction and arrangement of parts described without departing from the spirit of the invention comprehended within the scope of the appended claims.

Having described my invention what I claim as new and desire to secure by Letters Patent is:

1. In an elevator, a main frame, a car carrier, sprocket chains mounted in said frame and connected in said carrier to cause continuous upward and downward travel of said carrier in a horizontal position, means for driving said chains, a wheeled dump car adapted to ride on said carrier and having an inclined bottom, the side of said car at the lower end of said bottom being hinged at its top to swing outwardly, and automatic means for opening and closing said door, substantially as described.

2. A coal elevator comprising a frame, shaft bearings and shafts journaled therein and provided at the top and adjacent the bottom of the elevator, one of said shafts being a power shaft, driving spur gears mounted on said power shaft, driven spur gears mounted on shafts meshing with said

driving spur gears, driving sprockets mounted on the inner ends of the shafts on which said driven gears are mounted, chains traveling on said sprockets, a series of idler sprockets over which said chains travel, a substantially rectangular coal car carrier, chain grips pivoted to said carrier at diagonally opposite points thereof, the distance between said driving sprockets being sufficient to permit said carrier to pass therebetween, a coal car adapted to travel onto said carrier, a hinged door provided on said car, and automatic means for opening and closing said door, substantially as described.

3. In a coal mine elevator, the combination with a frame, of a series of horizontally disposed shafts journaled in said frame, one of said shafts being a power shaft, driving spur gears mounted on the latter shaft, driven spur gears meshing with said driving spur gears mounted on two of said first named shafts, driving sprockets mounted on the inner ends of said last named shafts, chains traveling over said sprockets, idler sprockets over which said chains travel, a car carrier and vertically disposed guides therefor in said frame, pivoted means provided at diagonally opposite points on said carrier for attaching the same to said chains, a track in said carrier, a track leading to the elevator registering with said carrier track, a wheeled coal car adapted to travel over said tracks onto said carrier, an automatically opened and closed door in said car, and means for moving said car onto said carrier, substantially as described.

4. In a coal mine elevator, the combination with a frame, of a series of horizontally disposed shafts journaled in said frame, one of said shafts being a power shaft, driving spur gears mounted on the latter shaft, driven spur gears meshing with said driving spur gears mounted on two of said first named shafts, driving sprockets mounted on the inner ends of said last named shafts, chains traveling over said sprockets, idler sprockets over which said chains travel, a car carrier and vertically disposed guides therefor in said frame, pivoted means provided at diagonally opposite points on said carrier for attaching the same to said chains, a track in said carrier, a track leading to the elevator registering with said carrier track, a wheeled coal car adapted to travel over said tracks onto said carrier, an automatically opened and closed door in said car, and means for moving said car onto said carrier comprising a shaft and a hand-operated lever mounted thereon, a segment gear mounted on said last named shaft, and a toothed rack provided on said car and adapted to mesh with said segment gear, substantially as described.

5. In a coal mine elevator, the combination with a frame, of a series of horizontally disposed shafts journaled in said frame, one

of said shafts being a power shaft, driving spur gears mounted on the latter shaft, driven spur gears meshing with said driving spur gears and mounted on two of said first 5 named shafts, driving sprockets mounted on the inner ends of said last named shafts, chains traveling over said sprockets, idler sprockets over which said chains travel, a car carrier and vertically disposed guides therefor in 10 said frame, pivoted means provided at diagonally opposite points on said carrier for attaching the same to said chains, a track in said carrier, a track leading to the elevator registering with said carrier track, a 15 wheeled coal car adapted to travel over said tracks onto said carrier, an automatically opened and closed door in said car, and means for moving said car onto said carrier comprising a hand-operated lever mounted 20 therein, a segment gear mounted on said last named shaft, a toothed rack provided on said car adapted to mesh with said segment gear and car stop hooks mounted on said last named shaft adapted to contact with an 25 axle or other portion of the car when said lever is in normal position, substantially as described.

6. In a coal mine elevator, the combination with a frame, of a series of horizontally dis- 30 posed shafts journaled in said frame, one of said shafts being a power shaft, driving spur gears mounted on the latter shaft, driven spur gears meshing with said driving spur gears and mounted on two of said first 35 named shafts, driving sprockets mounted on the inner ends of said last named shafts, chains traveling over said sprockets, idler sprockets over which said chains travel, a car carrier and vertically disposed guides 40 therefor in said frame, pivoted means provided at diagonally opposite points on said carrier for attaching the same to said chains, a track in said carrier, a track leading to the elevator registering with said carrier track, 45 a wheeled coal car adapted to travel over said tracks onto said carrier, an automatically opened and closed door in said car, and means for moving said car onto said carrier comprising a hand-operated lever mounted 50 therein, a segment gear mounted on said last named shaft, a toothed rack provided

on said car adapted to mesh with said segment gear and car stop hooks mounted on said last named shaft adapted to contact 55 with an axle or other portion of the car when said lever is in normal position, the means for opening said door comprising an inclined chute and a spring catch adapted to contact therewith and secured to said car, 60 substantially as described.

7. In a coal mine elevator, the combination with a frame, of a series of horizontally disposed shafts journaled in said frame, one of said shafts being a power shaft, driving 65 spur gears mounted on the latter shaft, driven spur gears meshing with said driving spur gears and mounted on two of said first named shafts, driving sprockets mounted on the inner ends of said last named shafts, chains traveling over said sprockets, 70 idler sprockets over which said chains travel, a car carrier and vertically disposed guides therefor in said frame, pivoted means provided at diagonally opposite points on said carrier for attaching the same to said chains, 75 a track in said carrier, a track leading to the elevator registering with said carrier track, a wheeled coal car adapted to travel over said tracks onto said carrier, an automati- 80 cally opened and closed door in said car, and means for moving said car onto said carrier comprising a hand-operated lever mounted therein, a segment gear mounted on said 85 last named shaft, a toothed rack provided on said car adapted to mesh with said segment gear and car stop hooks mounted on said last named shaft adapted to contact with an axle or other portion of the car when said lever is in normal position, the 90 means for closing said door comprising a flexible wire secured in said frame and arranged to contact with the face of said door and to close the same during the upward travel of said car, substantially as described.

In testimony whereof I have signed my 95 name to this specification in the presence of two subscribing witnesses.

MAX C. VOLK.

Witnesses:

ARTHUR A. OLSON,
JOSHUA R. H. POTTS.