

No. 731,371.

PATENTED JUNE 16, 1903.

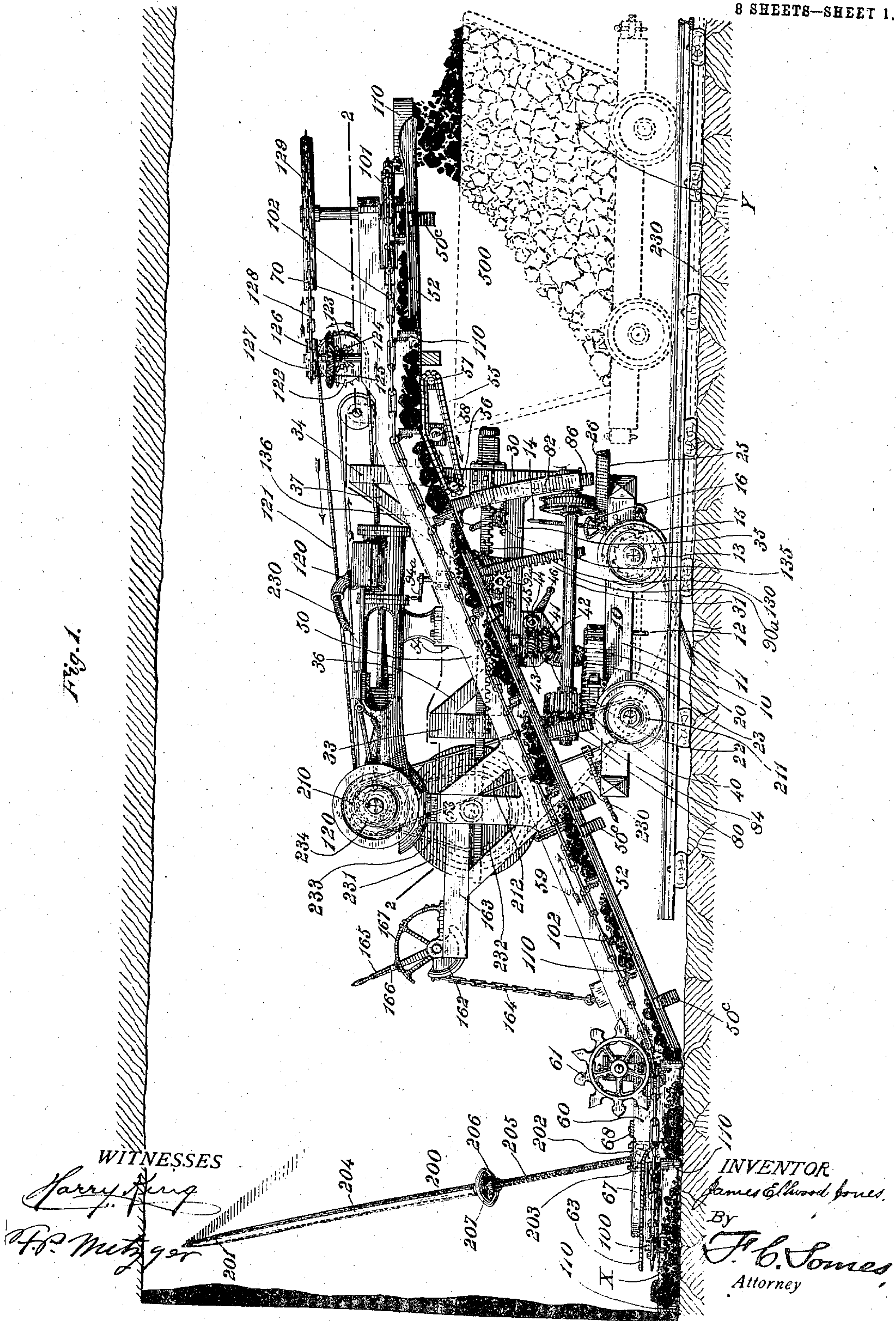
J. E. JONES.

LOADING MACHINE.

APPLICATION FILED SEPT. 11, 1902.

NO MODEL.

8 SHEETS—SHEET 1.



No. 731,371.

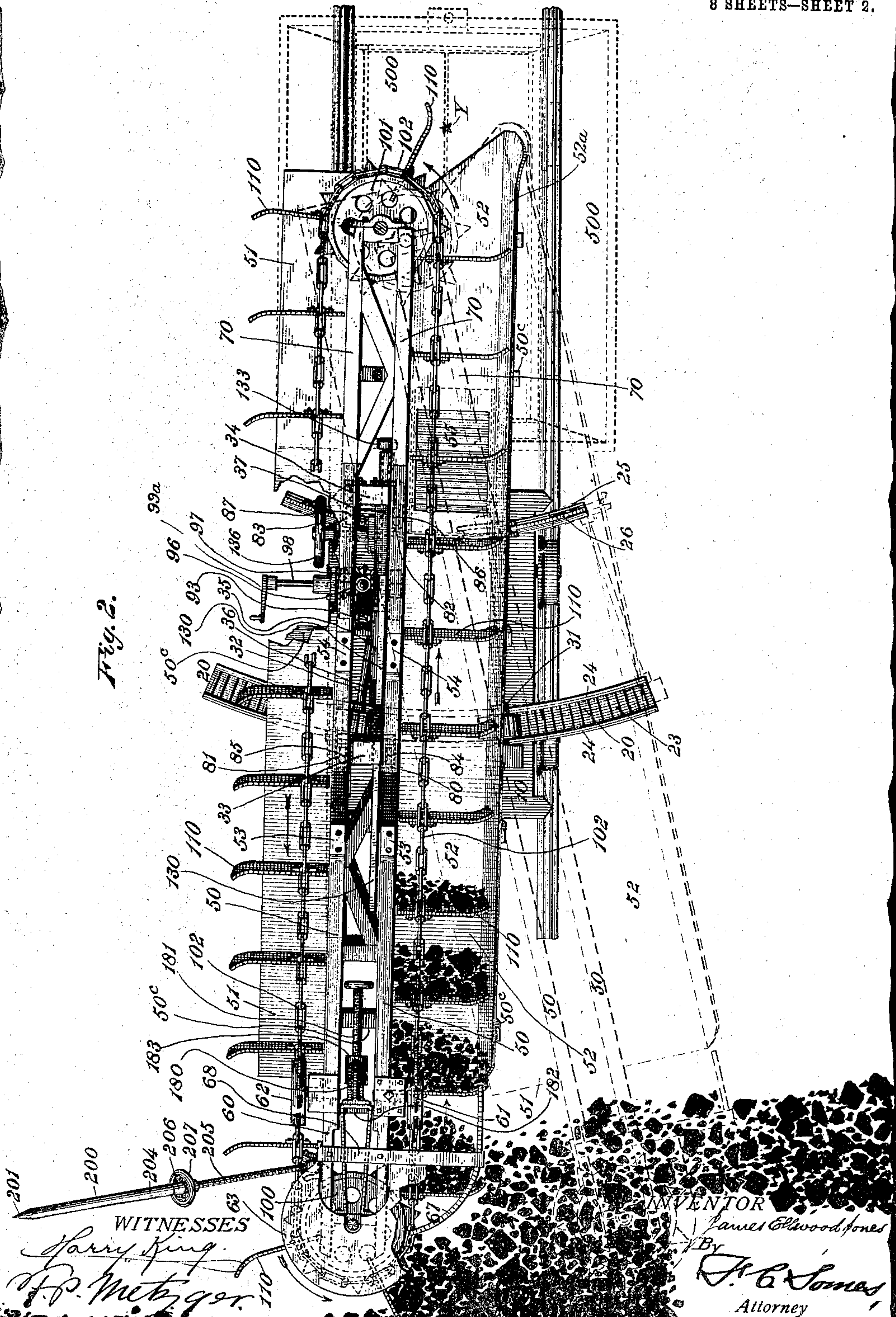
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8 SHEETS—SHEET 2.



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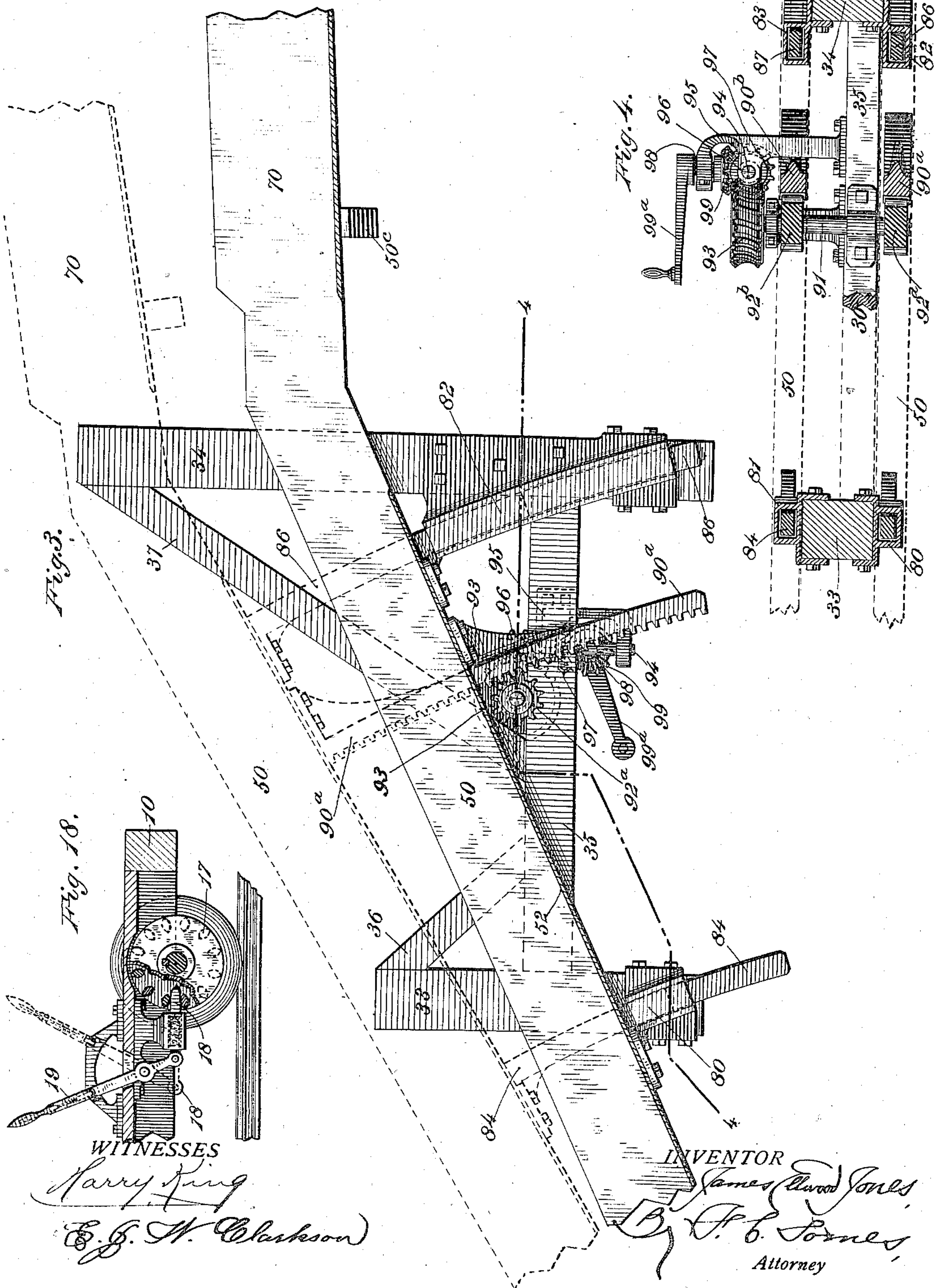
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8 SHEETS—SHEET 3.



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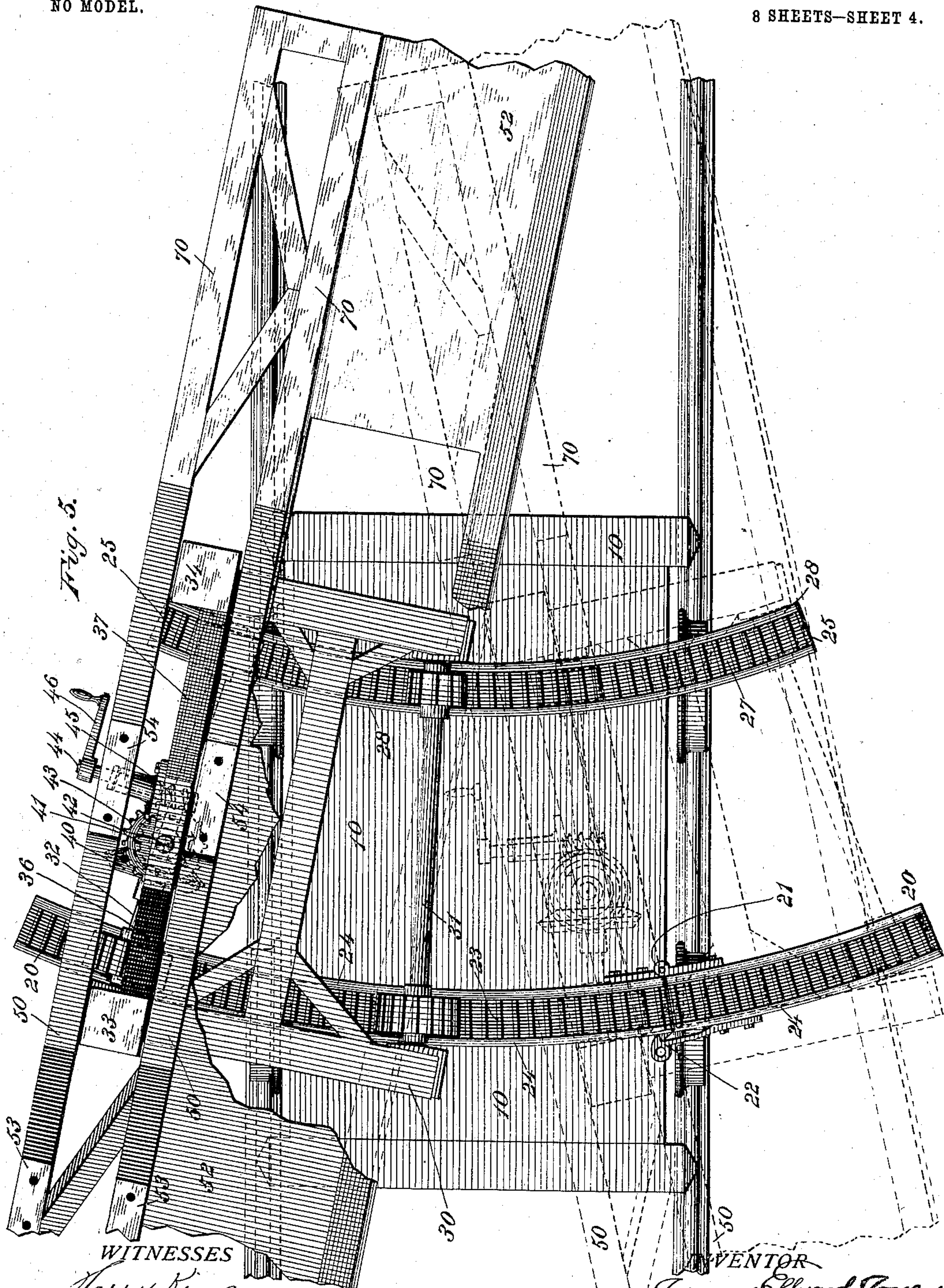
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8 SHEETS—SHEET 4.



WITNESSES

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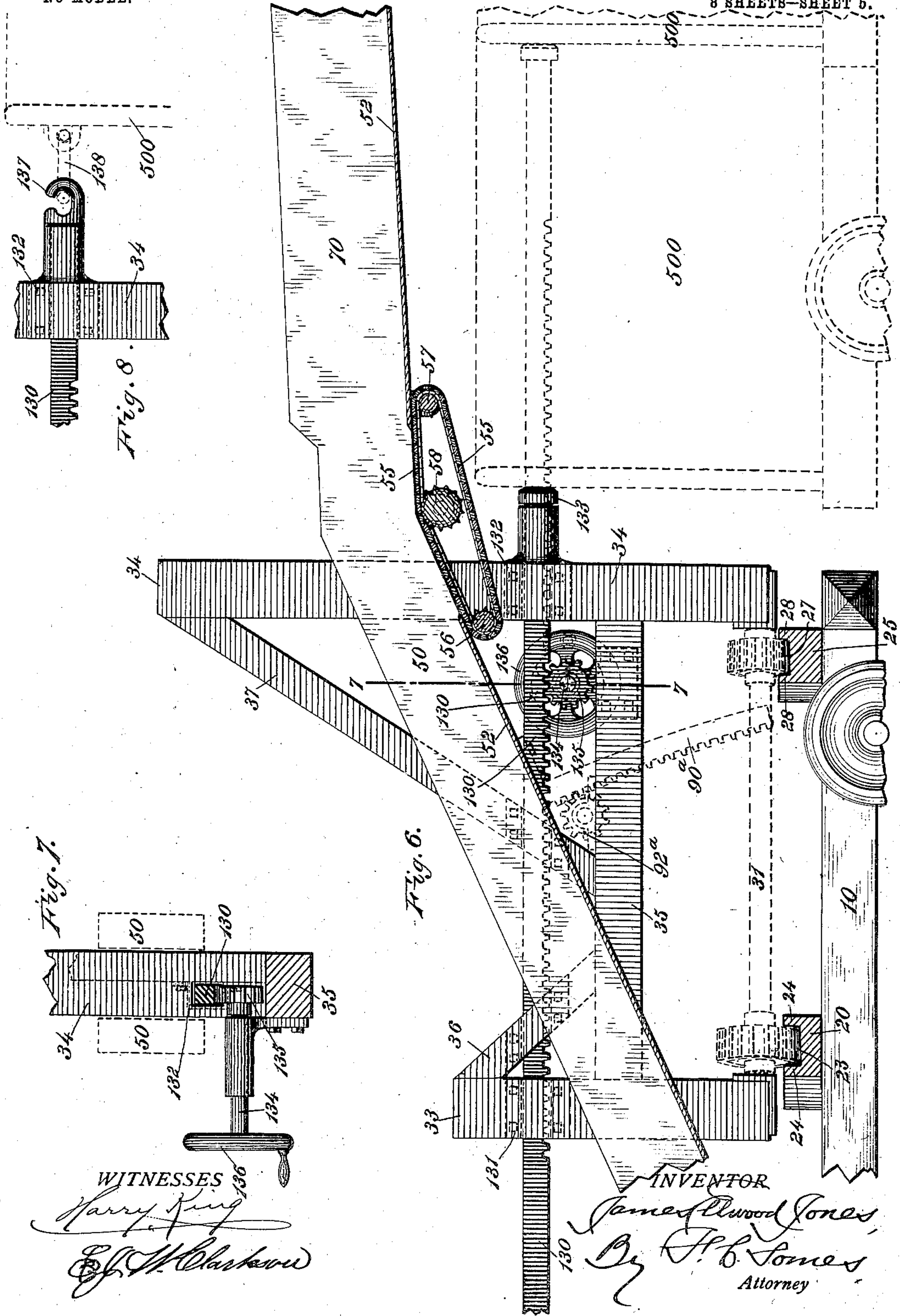
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8 SHEETS—SHEET 5.



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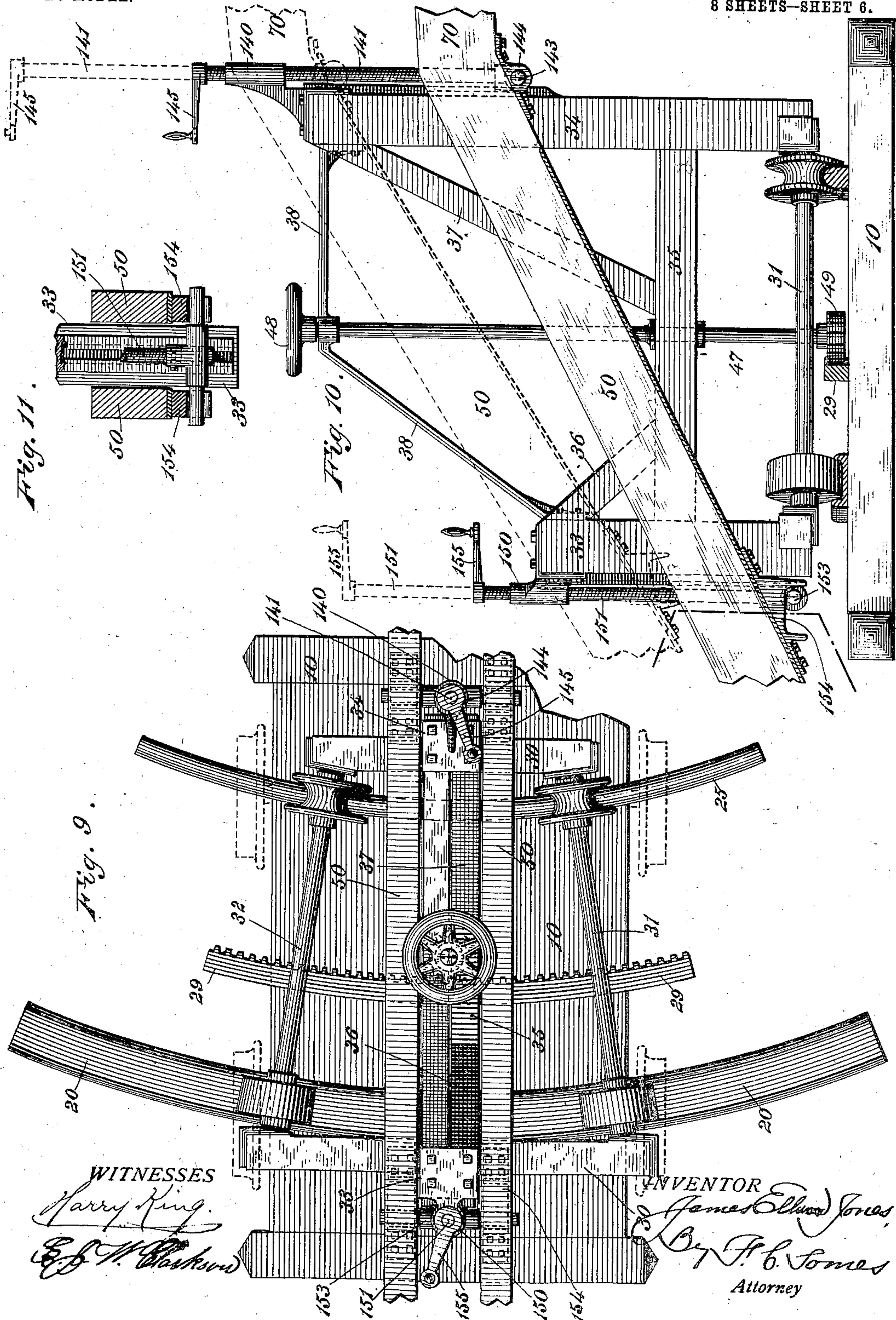
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APPLICATION FILED SEPT. 11, 1902.

NO MODEL.

8 SHEETS—SHEET 6.



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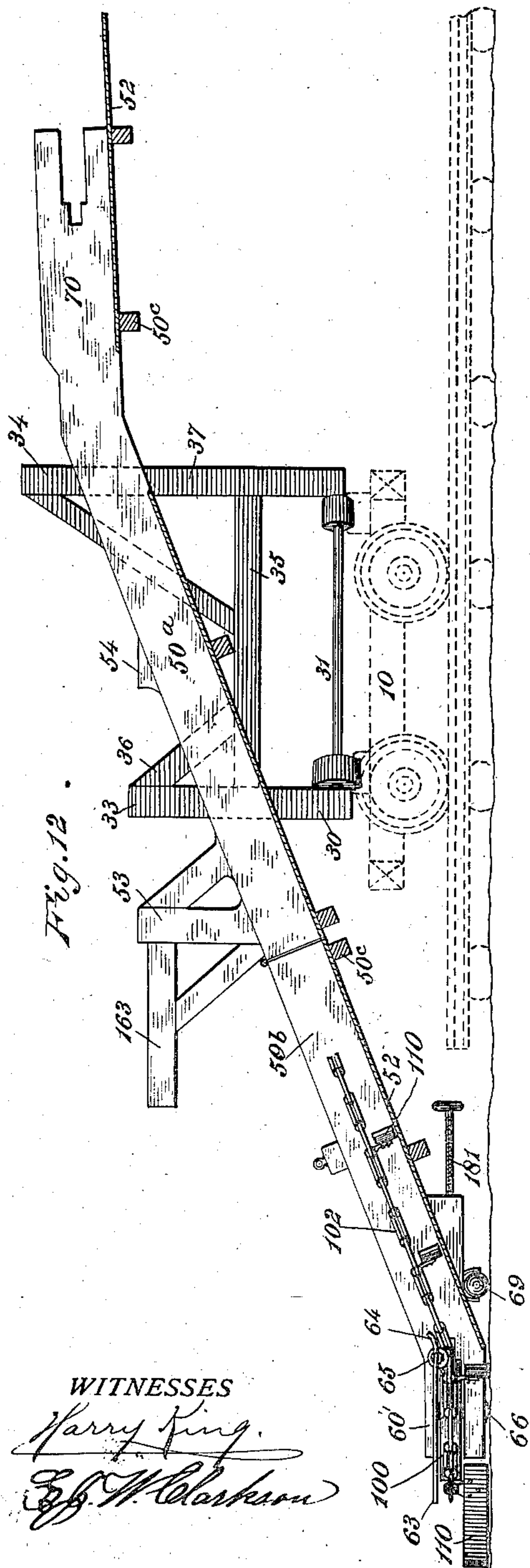
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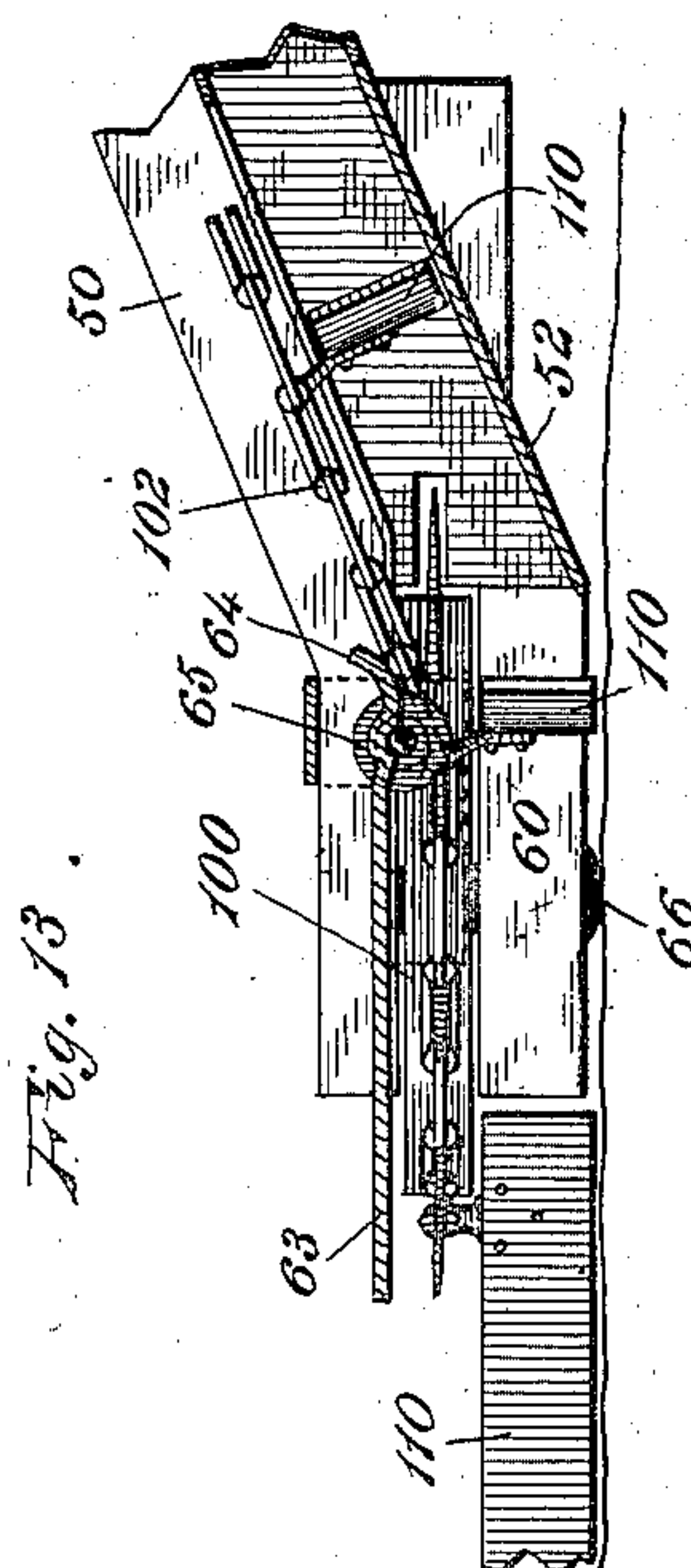
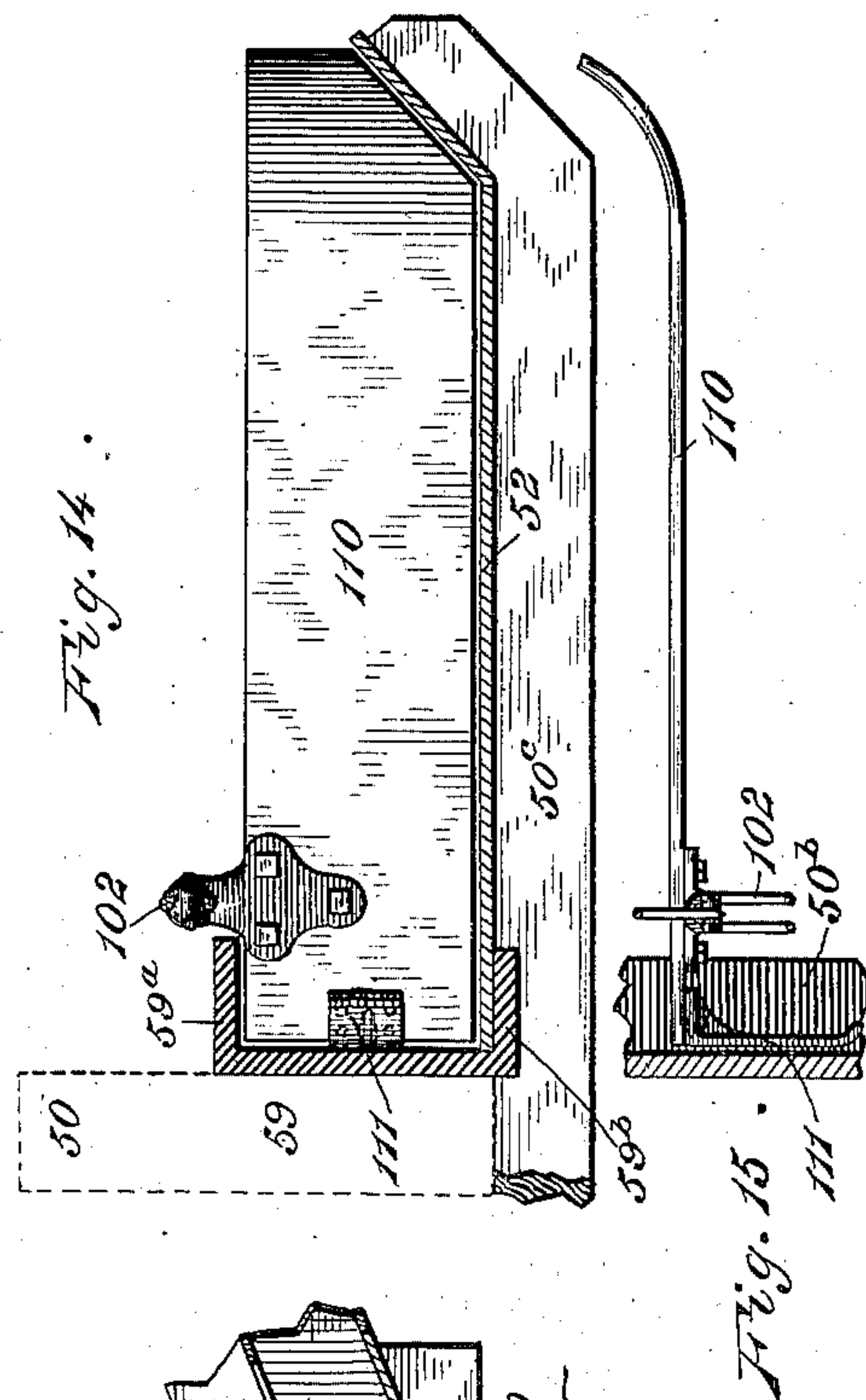
NO MODEL.

8 SHEETS—SHEET 7.



WITNESSES

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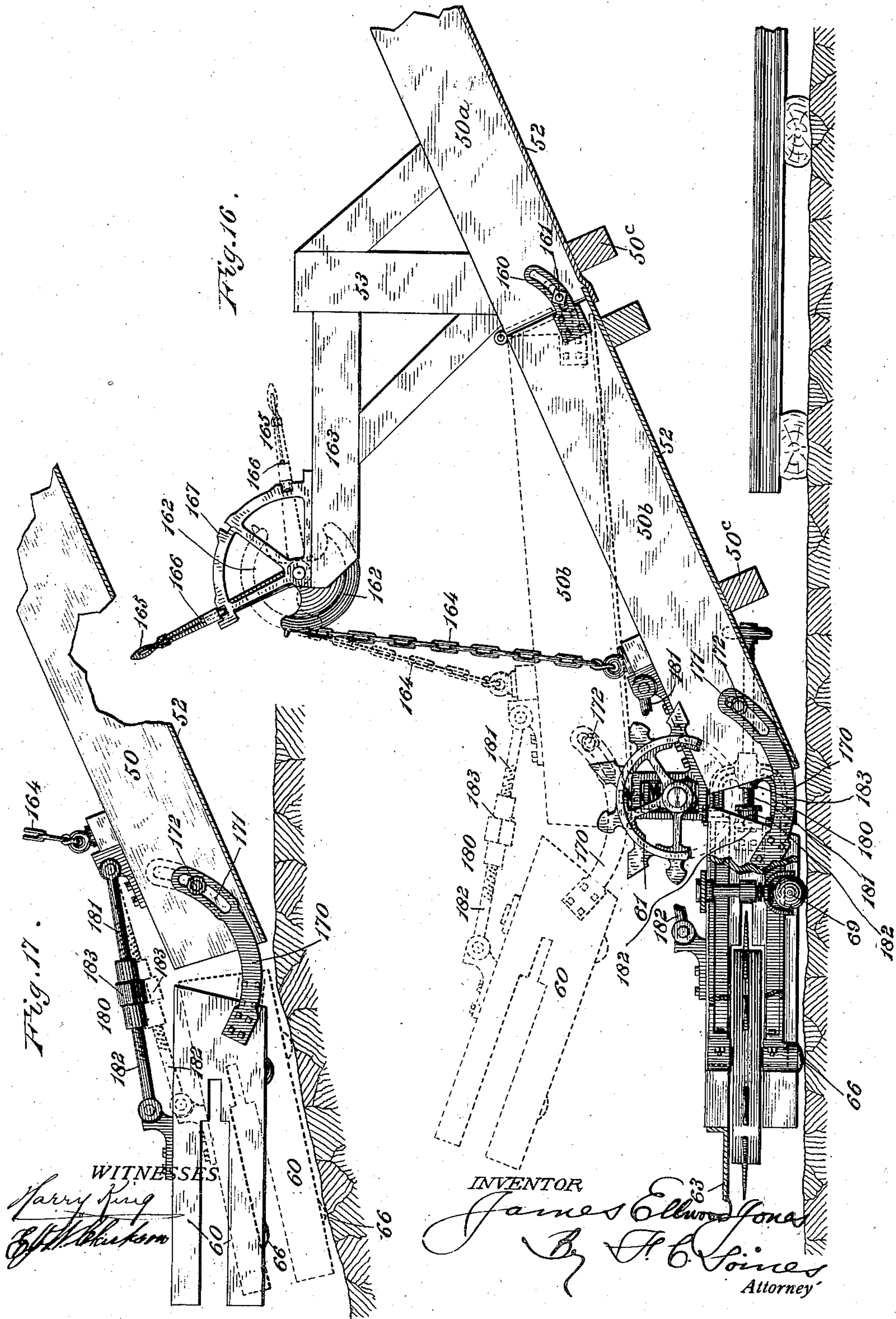
PATENTED JUNE 16, 1903.

J. E. JONES.
LOADING MACHINE.

APPLICATION FILED SEPT. 11, 1902.

NO MODEL.

8 SHEETS—SHEET 8.



UNITED STATES PATENT OFFICE.

JAMES ELLWOOD JONES, OF SWITCHBACK, WEST VIRGINIA.

LOADING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 731,371, dated June 16, 1903.

Application filed September 11, 1902. Serial No. 123,002. (No model.)

To all whom it may concern:

Be it known that I, JAMES ELLWOOD JONES, a citizen of the United States of America, residing at Switchback, in the county of McDowell, in the State of West Virginia, have invented certain new and useful Improvements in Loading-Machines, of which the following is a specification.

This invention relates to a machine for transferring material—such as coal, ore, ashes, or other substances—from one point to another; and it is especially designed for loading coal from the floor of a mine onto the mine-car for carrying it out of the mine.

The loading of coal in mines has heretofore been generally done by manual labor, as the conditions of the mines were thought to be such as to prevent the practical use of machines for this purpose, owing to low ceilings, narrow passages, and small rooms in which the work is to be done.

The principal object of this invention is to provide a loading-machine adapted to operate in the contracted space of a coal-mine for loading onto cars for conveying it out of the mine the coal shot down by the usual blasting operation, and in carrying out this object I have devised a simple mechanism, preferably located on a car traveling on a mine-track, adapted to pick up the coal from the mine-floor, elevate it to a point over the mine-car, and deliver it into said car.

Figure 1 of the accompanying drawings represents a vertical section of a mine-room from which the coal is mined and a side elevation of one form of this portable loading-machine disposed therein on the mine-track, the mine-car onto which the coal is loaded by the machine being indicated by dotted lines.

Fig. 2 represents a plan of a mine-room and a horizontal section of the loading-machine on line 2 2 of Fig. 1, parts being omitted or broken out. Fig. 3 represents, on an enlarged scale, one form of the mechanism for vertically adjusting the coal-conveyer on its supporting-carriage. Fig. 4 represents a horizontal section on line 4 4 of Fig. 3, also showing said mechanism. Fig. 5 represents an enlarged plan of the portable base of the loading-machine in the form of a platform-car, the carriage traveling thereon, means for moving the carriage on the car,

and a part of the conveyer-frame supported on said carriage. Fig. 6 represents, on an enlarged scale, a side elevation, partly in section, of the machine, showing an endless platform constituting a part of the conveyer-trough at an angle thereof and also showing a pusher-rod under control of the operator for pushing the receiving-car away from the loading-car to distribute the delivery throughout the receiving-car during the loading operation, the receiving or mine car being indicated in different positions by dotted lines. Fig. 7 represents, on an enlarged scale, a vertical section on line 7 7 of Fig. 6, showing actuating devices for said pusher-rod. Fig. 8 shows the end of the pusher-rod and means for coupling it to the receiving-car. Fig. 9 represents an enlarged plan of the base-car, the carriage movable thereon, and a portion of the frame of the conveyer mechanism, showing a separate actuating rack-rail for moving the carriage on the car and one means for pivotally supporting and adjusting the conveyer-frame on the carriage. Fig. 10 represents a side elevation of the parts shown in Fig. 9. Fig. 11 represents an enlarged view of the adjusting mechanism for the conveyer-frame shown in Figs. 9 and 10. Fig. 12 represents a side elevation of the conveyer-frame mounted on the carriage, the lower portion of the former being hinged to the upper portion thereof. Fig. 13 represents, on an enlarged scale, a fragment of the lower portion of the inclined conveyer-frame, the front extension thereof, a portion of the endless conveyer, and a section of the top guide-plate on said extension for the conveyer. Fig. 14 represents a transverse section through one-half of the conveyer-frame and conveyer, showing the elevator-trough provided with a flanged guide for holding the flights in contact with the trough and a rearwardly-extending shoe on the latter for engaging the guide to hold the flights at right angles to the trough. Fig. 15 represents a horizontal section and plan of the parts shown in Fig. 14. Fig. 16 represents, on an enlarged scale, a side elevation of the conveyer-frame and its horizontal front extension, the lower part of said frame being hinged to the upper part and provided with means for raising and lowering it and said extension being adjustable at different angles

to fit the floor of the mine. Fig. 17 represents, on an enlarged scale, a side elevation of the lower end of the inclined conveyer-frame and its horizontal front extension, showing means for adjusting said extension to adapt it to irregularities of the mine-floor and to keep taut the endless chain of the conveyer. Fig. 18 represents means for locking the loading-car on track.

The same reference-numbers indicate the same parts in the different figures.

A vehicle or car 10 preferably constitutes the portable base or platform of the machine and is adapted to travel on a track laid through the mine in the ordinary manner. This car is preferably provided with means for locking it in position on the track. Any suitable means may be employed for holding the car steady. The means shown in Fig. 1 comprises a bar 11, pivoted to the bottom of the car and adapted to engage the bottom of the room of the mine for holding the car against movement in one direction. A hook 12 underneath the car serves to support the free end of the bar when not in use. For holding the car against movement in the other direction one of the axles is provided in Fig. 1 with a ratchet-wheel 13, and an adjustable hand-lever 14, pivoted on the base 10, is provided with a tooth 15, adapted to engage said ratchet-wheel, and a rack 16 serves to hold said lever in adjusted position. Another means for the purpose is shown in Fig. 18, where a toothed wheel 17 on one of the axles is engaged by a spring-rod 18, actuated by a lever 19, for holding the car against movement in either direction. Any other suitable clutch mechanism may be employed for this purpose.

The car 10 is provided with an arc-shaped track disposed thereon in a transverse relation to the track on which the car travels. This track may extend beyond the sides of the car and form an arc of a circle of which the center is beyond and at the rear of the car, as indicated by the star Y in Figs. 1 and 2. The arc-shaped rails 20 and 25, composing the track, are concentrically disposed on the car one in front of the other, the front rail being longer than the rear rail. The side extensions of the front rail are adapted to fold inward toward the car to enable the car to travel through narrow passages, each lateral extension being connected with the central portion by a hinge 21 on one side, as shown in Fig. 5, and by a spring-catch 22 on the other side, which locks the rail in open position. These rails may be constructed in any suitable form. In Fig. 1 the rail 20 is shown in the form of a rack, being provided on its upper face with rack-teeth 23, and in Figs. 2, 5, and 6 it is also provided with rack-teeth and along its side with vertical flanges 24. In Figs. 1 and 2 the rear rail 25 is provided with a rib-shaped upper face 26 and in Figs. 5 and 6 with rack-teeth 27 and flanges 28. In Fig. 9 the rack-teeth are omitted from the

rails 20 and 25, and a supplemental arc-shaped actuating rack-rail 29 is disposed on the car 10 and provided with vertical rack-teeth on its inner face.

A carriage 30 is movable on the car 10, and the means for taking up, elevating, and delivering coal are mounted thereon. This carriage is preferably mounted on two radially-disposed axles 31 and 32, provided with wheels adapted to travel on the rails 20 and 25. It has on its front side a short post 33 and on its rear side a tall post 34. These posts may be connected by a cross-bar 35, brace-bars 36 and 37, and, as shown in Fig. 10, by a bent top bar 38. Suitable means are provided for causing the carriage 30 to travel to and fro on the track of the car 10. A means for this purpose is shown in Figs. 1 and 5 and omitted from Fig. 2. This means comprises a beveled wheel 40, fixed on the axle 32 and meshing with a crown-wheel 41 on a vertical shaft 42, carrying a worm-wheel 43. An actuating-shaft 44 is provided with a worm 45, which meshes with the worm-wheel 43 and with a crank 46 or other actuating device. The worm connection or other means holds the carriage in adjusted position on the arc-shaped track of the car 10. Another means for moving the carriage to and fro on the loading-car is shown in Figs. 9 and 10 and comprises a vertical rod 47, journaled in the cross-bar 35 and top bar 38 and provided at its upper end with a hand-wheel 48 and at its lower end with a pinion 44, which engages the arc-shaped rack-rail 29 on the car 10.

An elongated conveyer-frame is mounted on the carriage 30 and comprises in its preferable form an inclined frame 50, the front end of which extends downward below the carriage in front of the car 10, being provided at its lower end with a depressed front extension 60, adapted to move laterally with the movement of the carriage in a plane parallel, or approximately so, with the mine bottom or floor for taking up the coal or other material and being preferably provided at its upper end with an elevated rear extension 70, adapted to project beyond the traction-car and maintain its position over the top of an adjacent receiving or coal car, as 500, for delivering the coal to be loaded thereinto. This frame may be constructed in any suitable manner of angle-iron or other material. As shown in the drawings, it comprises two parallel bars trussed together and straddling the upright posts 33 and 34.

The inclined frame 50 is so supported or constructed that its lower front end may be raised above the mine-track or floor of the mine when the machine is moved from place to place and that its front extension 60 may be adjusted to the bottom or floor of the mine when the machine is in use. In Figs. 1 and 2 the means of support enable the frame to be raised and lowered in the arc of a circle whereof the center is in the front extension, as indicated at the point X in Fig. 1. This

means of support may comprise short arc-shaped guides 80 and 81, attached at opposite sides to the front post 33, and longer arc-shaped guides 82 and 83, attached to the opposite sides of the rear post 34 of the carriage 30. Dependent arc-shaped bars 84 and 85 are attached to the rails of the frame 50 and play in the guides of the front post, and longer arc-shaped bars 86 and 87 depend from the under side of said rails and play in the guides attached to the rear post.

The means for raising and lowering the conveyer-frame and holding it in adjusted position comprise when constructed as shown in Figs. 3 and 4 an arc-shaped rack 90^a, secured to and dependent from one side of said frame, and a like-shaped rack 90^b, secured to and dependent from the other side thereof. A horizontal shaft 91, journaled on the carriage 30, is provided with pinions 92^a and 92^b, which engage said racks, and at the front end with a worm-wheel 93. A vertical shaft 94, journaled in a bracket 95, also attached to the carriage, is provided at its upper end with a worm 96, which engages said worm-wheel, and at its lower end with a crown-wheel 97. A horizontal shaft 98, Fig. 2, also journaled in said bracket, is provided with a gear-wheel 99, which meshes with said crown-wheel, and with a crank 99^a or other means for actuating the shaft to raise and lower the conveyer-frame, and the crank is shown in convenient position to be turned by the operator. In Fig. 1 the actuating-crank 94^a is located directly on the vertical shaft 94.

The conveyer-frame is provided on one side with a conveyer-guide, which may consist of an outwardly-extending longitudinal guide-plate 51, and on its opposite side with a trough 52, which may extend from the lower end of the inclined portion of said frame to the upper end thereof and along the rear extension thereof. The trough may be in the form of a flat plate; but it is preferably provided with an upturned flange 52^a at its outer edge, as shown.

An endless conveyer is mounted on the conveyer-frame and adapted to operate in connection therewith. This conveyer when constructed as shown in Figs. 1 and 2 comprises horizontal sprocket-wheels 100 and 101, disposed at opposite ends of the front and rear extensions of said frame, an endless chain 102 of any suitable construction engaging said sprocket-wheels and adapted to travel up and down on opposite sides of said frame, flights 110, secured at proper intervals to said chain, and means for actuating one of said sprocket-wheels.

Any suitable means may be employed for operating the endless conveyer, such as a compressed-air, a steam, or an electric motor. Fig. 1 shows a compressed-air motor 120, mounted on posts 53 and 54, attached to the inclined frame. The driving belt or chain 121 from said motor engages a sprocket-wheel 122 on a horizontal shaft 123, journaled on

the conveyer-frame, and this shaft has a beveled wheel 124, which engages a crown-wheel 125 on a short vertical shaft 126, also journaled on said frame. The shaft 126 is provided with a small sprocket-wheel 127, and a sprocket-chain 128 passes over said small sprocket-wheel and over a large sprocket-wheel 129, fixed to the shaft of the upper sprocket-wheel 101 of the endless conveyer. The flights 110 swing around horizontally, or nearly so, with both runs in substantially the same plane at the lower front extension of the conveyer-frame and engage coal on the floor of the mine, push it up onto and along the trough 52, and discharge it at the upper end of the latter into a mine-car underneath, then swing around the upper sprocket-wheel 101 and pass down over the guides 51 on the opposite side of the conveyer-frame.

Means are provided at opposite sides of the conveyer-frame at the angle of the front extension with the inclined portion thereof for changing the travel of the chain from an inclined to a horizontal or approximately horizontal direction. The means shown for this purpose in Figs. 1 and 2 are two idler sprocket-wheels 61 and 62, journaled at opposite sides of the inclined frame, at the lower end thereof. These wheels may be dispensed with, if desired. The front extension of the inclined frame is provided with a top guard-plate 63, under which the flights travel. This guard-plate may serve at its opposite ends as a guide for the chain when the idlers are dispensed with.

In Figs. 12 and 13 the end of the guard-plate 63 on the trough side is provided with an upturned lip 64, having an antifriction-roller 65 to avoid friction of the chain on the guard-plate at the angle of the conveyer with its extension. The under side of the extension 60 may be provided with a shoe 66, adapted to rest and slide on the mine-floor. This shoe may consist of a rounded end of the journal-box supporting the sprocket 100.

To avoid friction of the flights at the upper angle between the inclined trough and the rear extension thereof, said trough is cut out for a desired distance in both directions from said angle, and an endless platform 55 is mounted underneath to take the place of the cut-out portion of the trough. This endless platform extends beyond the opening of the trough, so that the ends of the latter will overlap the platform. The platform travels over pulleys 56 and 57 at opposite ends of the loop and over an intermediate pulley 58 directly in the angle to prevent the sagging of the platform. The platform moves with the flights, avoiding friction and carrying the coal.

The rear extension 70 of the conveyer-frame preferably projects to a point over the rear portion of the adjacent receiving-car to be filled, and means are provided for separating the cars during the loading operation, so as to bring the delivery end of the loading de-

vice near the front portion of the receiving-car. For this purpose means are provided on the loading-car under the command of the operator for pushing the receiving-car away from the loading-car as the loading proceeds or at any time during the loading operation. Fig. 1 shows a means for this purpose consisting of a rack-bar 130, adapted to slide in guides 131 and 132, attached to the carriage 30. This bar may be provided with a buffer 133 at its rear end adapted to engage the receiving-car and push it away from the loading-car a desired distance to secure a proper delivery of the material in the front portion of the receiving-car. The means for actuating the rack-bar may consist of a horizontal shaft 134, journaled on the carriage and provided with a pinion 135, engaging said rack-bar, and a crank or hand-wheel 136 in convenient position for engagement by the operator. The rack-bar 130 may be provided with a hook 137 at its front end, as shown in Fig. 8, whereby it may be used as a coupling device for a link 138, attached to a receiving-car. In this case the cars may be separated at the beginning of the loading operation and gradually or intermittently pulled together during the progress thereof.

Another means for supporting and adjusting the conveyer-frame is illustrated in Figs. 10 and 11, in which said frame is adapted to swing in a vertical plane. In this case screw-threaded sleeves 140 and 150 are secured, respectively, to the upper ends of the posts 34 and 33 of the carriage 30, and vertical adjustable screw-rods 141 and 151 are supported in said sleeves. The rear screw-rod 141 is provided at its lower end with a transverse bar 143, which projects laterally and engages hinge-straps, as 144, attached to the opposite rails of the inclined frame, said bar serving as a pivot or pintle on which the frame swings. The upper end of this rod is provided with a crank 145 for operating it to raise and lower the inclined frame. The front vertical screw-rod 151 is also provided with a transverse bar 153, which projects laterally on opposite sides of the front post and engages recessed lugs 154, secured to the opposite rails of the inclined frame. This screw-rod is also provided with a crank 155 for raising and lowering it. The recessed lugs permit a play of the inclined frame on the transverse bar 153 of the front screw-rod, whereby the screw-rods may be raised or lowered independently of each other and the frame adjusted at different angles of inclination.

If desired, the inclined frame 50 may be formed in two sections, the upper section 50^a being rigidly secured to the carriage 30 and the lower section 50^b being hinged to the section 50^a, as shown in Figs. 12 and 16. A reinforcing and locking device is preferably employed at the joint of the sections to hold the hinged section 50^b in adjusted position. This reinforcing device may consist of a slot-

50^b adjacent to the joint and overlapping the main inclined part 50^a, and a clamping-bolt 161, secured to the main part and extending through the arc-shaped slot of said plate, as shown in Fig. 16.

Means are provided for raising and lowering the hinged section 50^b. These means may consist of a segment 162, pivoted on an arm 163, attached to the carrier-frame, a chain 164, connecting said segment with said hinged section, a hand-lever 165 on the shaft of said segment, a latch 166 on said hand-lever, and a toothed rack 167 for locking said hand-lever in different positions, as shown in Fig. 16.

The depressed front extension 60 of the carrier-frame may be connected with the inclined portion 50 thereof in such manner that it may be adjusted at an incline and still hold the endless chain taut. A means for securing this adjustable connection is shown in Figs. 16 and 17. These means comprise an elongated arc-shaped strap 170, connected to the extension 60 and provided with an arc-shaped slot 171, overlapping the side of the inclined frame 50, and a clamping-bolt 172, disposed in a hole in said frame 50 and serving to clamp said strap to the latter. A further connection shown is an extensible brace-rod 180, composed of a rod 181, hinged to the frame 50 and provided with a right-hand screw-thread at its outer end, a rod 182, hinged to the extension 160 and provided with a left-hand screw-thread at its outer end, and a sleeve 183, provided with right and left hand screw-threads at its opposite ends which take onto the screw-threaded ends of said rods. This sleeve is provided with an angular boss for the application of a wrench. The extension 60 may also be provided on the take-up side with a curved shield 67, disposed edgewise and extending from a point on a line with the axis of the front sprocket-wheel 100 back to the lower end of the trough 52. This guard-plate, which is shown in Fig. 1 and in section in Fig. 2, is supported by a lateral bar 68, secured to the frame of the extension 60. The lower end of this guard-plate is rounded.

In Figs. 12 and 13 the front take-up extension of the conveyer-frame is shown as integral with the hinged section 50^d of the inclined portion of said conveyer-frame, and it is there designated as 60'. The front portion of the conveyer-frame may be provided, as shown in Fig. 12, with antifriction-balls 69, disposed in sockets on the under side of said frame.

Means for adjusting the front sprocket-wheel 100 to render the conveyer-chain taut are shown in Figs. 2, 12, and 16. These means comprise a horizontal adjustable forked bracket 180, disposed in the front extension of the conveyer-frame and provided with bearings for the trunnions of the sprocket-wheel 100. The bracket is thrust forward or retracted to tighten or loosen the chain 102 by means of a screw-rod 181, which turns in a

cross-plate 182, fixed between the rails of the carrier-frame, and at its inner end engages a threaded sleeve 183, secured to said forked bracket 180.

5 The inclined frame 50 is preferably provided, especially on the trough side, with a flanged guideway 59, as shown in Figs. 14 and 15. The inner ends of the flights 110 of the
10 endless carrier engage this guideway and the flanges thereof to hold the flights in horizontal position. These flights are provided at their inner ends on their rear sides with rearwardly-extending shoes 111, which tend
15 to hold the flights in proper position at right angles to the frame when lifting coal along the trough 52. The two parts of the conveyer-frame are connected by transverse bars 50^c, as shown in Figs. 1, 2, 12, and 16, these bars extending outward and serving to
20 support the trough 52 and plate 51. The conveyer-frame is preferably composed of angle-iron beams disposed parallel to each other on opposite sides of the carriage-posts and suitably bolted together.

25 A brace-bar 200 may be used for holding or assisting to hold the front end of the conveyer-frame in position to take up the coal, being provided with a pointed end 201, adapted to engage the walls or top of the mine-
30 room, and preferably with a ball 202 at its lower end adapted to engage socket 203, fixed on the front side of the extension 60 of said conveyer. This brace-bar is preferably extensible, so that it may be elongated to
35 hold or push said extension toward the pile of coal to be taken up by the endless conveyer. For this purpose it may be composed of a tube 204, a screw-threaded rod 205, adapted to slide in said tube, and a screw-threaded
40 sleeve 206, engaging said screw-rod at the lower end of said tube and provided with a hand-wheel 207 for effecting the adjustment of the screw-rod relatively to the tube for elongating or shortening the brace-bar.

45 The loading-car is preferably a traction-car, containing in itself means for causing it to travel on the mine-track. Means are shown for this purpose in Fig. 1, in which the same motor for operating the loading mechanism may be used for moving the car. In
50 this case the driving-shaft of the compressed-air motor 120 is provided with a pulley 210 (indicated in dotted lines in said figure,) and one of the axles of the car is provided with a
55 pulley 211, also indicated in dotted lines, and a belt 212 connects said pulleys. This belt serves to transmit motion from the motor to the car-axle when the loading mechanism is out of operation or in normal inactive
60 position. When the carriage is shifted on the car or the conveyer-frame is adjusted on the carriage out of said position to carry on the loading operation, the belt 212 may be slipped off its pulley.

65 The compressed-air motor 120 may be supplied by a flexible supply-pipe 230, which may be connected with stationary air-con-

duits with which the mine is supplied in the usual manner. The traction-car may be provided with a winding-drum 231, adapted 70 to wind. This drum is shown in Fig. 1 as fixed to a shaft mounted on the conveyer-frame. A pulley 232 (shown in dotted lines in said figure) is mounted on the shaft of said drum, and a belt 233 connects it with a 75 pulley 234 on the driving-shaft of the motor, as indicated in dotted lines in said figure, whereby the drum may be rotated by the motor for winding and unwinding the pipe.

In the use of this machine for loading coal 80 in a mine the loading-car is run into the mine-room, where the coal has been shot down, and the conveyer-frame thereof adjusted so that the depressed extension 60 will rest on the bottom or floor. The mine-car is 85 placed adjacent to the loading-car under the rear extension of the conveyer, as indicated in Fig. 1. The conveyer is then started by steam, air, or other motive power employed, and the flights thereof move in a horizontal 90 or approximately horizontal or non-vertical plane around the front turn of said conveyer and, acting as a form of gathering device, scrape the coal from the mine-bottom onto the inclined trough 52, push it up said trough, and 95 deliver it over the rear extension thereof into the mine-car. The operator imparts a lateral movement to the carriage 30 as required and causes the extension 60 to sweep around the floor toward the receding pile of coal. The 100 operator also operates the separating mechanism to push the mine-car backward as desired to distribute the load. The brace-rod 200 serves to hold the depressed extension in contact with the pile of coal and may be used 105 as an auxiliary to the travel of the carriage to thrust said extension against the coal to be taken up. The mine-car is filled in very quick time by the stream of coal continuously delivered by the conveyer, and when 110 filled it is hauled away and replaced by an empty car.

I claim as my invention—

1. The combination of a wheeled vehicle and low conveying mechanism supported 115 thereon and comprising a depressed extension movable laterally and having gathering means adapted to travel in a non-vertical plane over a mine bottom or floor for picking up coal or other material deposited thereon, a delivery 120 disposed at a relatively high point of said conveying mechanism and means for conveying such material from the depressed extension to the delivery.

2. The combination of a wheeled vehicle 125 and low conveying mechanism mounted thereon and comprising a depressed extension movable laterally and projecting beyond said vehicle and having gathering means adapted to travel in a non-vertical plane over a mine 130 bottom or floor for picking up coal or other material deposited thereon, a delivery extension disposed at a relatively high point of said conveying mechanism also projecting

beyond said vehicle for delivery into an adjacent receptacle and means for conveying the material from the depressed extension to the delivery extension.

- 5 3. The combination of a wheeled vehicle and conveying mechanism mounted thereon, said mechanism comprising a depressed horizontal adjustable extension movable laterally and projecting in front of said vehicle and
10 having gathering means adapted to travel in a non-vertical plane over a mine bottom or floor for picking up coal or other material deposited thereon, an elevated delivery extension projecting rearward beyond said vehicle
15 and means for conveying the material from the depressed to the elevated extension.
4. The combination of a wheeled vehicle and conveying mechanism movable laterally thereon and comprising a depressed horizontal
20 extension movable laterally and projecting beyond said vehicle and having gathering means adapted to travel in a non-vertical plane over a mine bottom or floor for picking
25 up coal or other material deposited thereon, an elevated delivery also projected beyond said vehicle and means for conveying the material from the depressed extension to the delivery extension.
5. The combination of a wheeled vehicle
30 and conveying mechanism mounted thereon and comprising a depressed extension, an endless-band conveyer whereof both runs over said extension are substantially in the same non-vertical plane, said depressed extension
35 being adjustable to operate on a mine bottom or floor for picking up coal or other material deposited thereon, an elevated delivery extension, and means for conveying the material from the depressed extension to the delivery
40 extension.
6. The combination of a wheeled vehicle, a carriage movable thereon, an endless conveyer mounted on said carriage, means for causing said conveyer to travel in a horizontal
45 plane for taking up the material to be moved, and means for causing said conveyer to travel in an inclined plane for elevating said material to a point of discharge.
7. The combination of a wheeled vehicle, a
50 vertically-adjustable endless-band conveyer mounted thereon and having both its runs at its front turn substantially in the same plane, means for causing said turn to travel substantially in a horizontal plane for taking up the
55 material to be moved, and means for causing said conveyer to travel in an inclined plane for elevating said material to a point of discharge.
8. The combination of a wheeled vehicle, a
60 carriage movable thereon in an arc of a circle having its center beyond said vehicle and means mounted on said carriage and extended beyond said vehicle for picking up, elevating and discharging material, the delivery there-
65 of being substantially at the center of said circle.
9. The combination of a wheeled vehicle, a

vertically-adjustable frame movable thereon in the arc of a circle having its center beyond said wheeled vehicle, and conveying mechanism extending beyond the body of the vehicle
70 in two directions and comprising a depressed extension adapted to pick up material at about the plane of travel of said vehicle and an elevated delivery extension having its dis-
75 charging-point substantially at the center of said circle.

10. The combination of a wheeled vehicle, an endless-band conveyer mounted thereon and having both its runs at its front turn sub-
80 stantially in the same plane, means for causing said turn to travel substantially in a horizontal plane for picking up the material to be moved, means for causing said conveyer to travel in an inclined plane for elevating said
85 material to a point of discharge, and means for swinging said conveyer laterally.

11. The combination of a wheeled vehicle, a carriage movable thereon in an arc of a circle having its center beyond said wheeled
90 vehicle, and conveying mechanism extending in two directions beyond said vehicle and comprising a depressed extension adjustable to travel over a mine bottom or floor and pick
95 up coal or other material disposed thereon, an elevated delivery having its discharge-point substantially at the center of said circle and means for conveying such material from the depressed extension to the elevated
100 extension.

12. The combination of a wheeled vehicle, a carriage movable thereon in an arc of a circle having its center beyond said wheeled
105 vehicle and a continuous endless conveyer extending in two directions beyond said vehicle and comprising a depressed extension adjustable to travel over a mine bottom or floor and pick up coal or other material dis-
110 posed thereon, an elevated delivery having its discharge-point substantially at the center of said circle and means for conveying such material from the depressed extension to the elevated discharge.

13. The combination of a wheeled vehicle, a carriage movable thereon in an arc of a circle having its center beyond said vehicle,
115 means for moving said carriage laterally on said vehicle, conveying mechanism mounted on said carriage and extending beyond said vehicle, said conveying mechanism being pro-
120 vided at its front end with means adapted to travel over a mine bottom or floor for picking up material, and means for delivering such material substantially at the center of
125 said circle.

14. The combination of a wheeled vehicle, and conveying mechanism movable thereon in an arc of a circle having its center beyond
130 said vehicle and comprising a depressed extension projected beyond said vehicle and adapted to travel over a mine bottom or floor for picking up material and a delivery extension also projected beyond said vehicle
for discharging into an adjacent vehicle.

15. The combination of a wheeled vehicle, an inclined frame supported thereon and provided with an inclined trough and with a depressed extension in front of said vehicle, an endless-band conveyer traveling over said inclined trough and extension, means for adjusting said frame vertically and means for moving said frame laterally.

16. The combination of a wheeled vehicle, an inclined frame supported thereon and provided with an inclined trough and with a depressed extension in front of said vehicle, and an endless-band conveyer traveling over said inclined frame and having both its runs over said extension substantially in the same plane.

17. The combination of a wheeled vehicle, an inclined frame supported thereon and provided with an inclined trough and with a depressed extension in front of said vehicle, an endless-band conveyer traveling over said inclined frame and having both its runs over said extension substantially in the same plane, and means for moving said frame laterally.

18. The combination of a wheeled vehicle, a frame supported thereon and provided with a depressed front extension, an elevated rear extension and an inclined trough leading from said front extension to said rear extension, an endless-band conveyer mounted on said frame and having both its runs over said front extension substantially in the same plane, means for causing said conveyer to travel in a horizontal plane at said front extension for picking up material to be moved, and means for causing said conveyer to travel at an incline to the frame for elevating said material to a point of discharge.

19. The combination of a wheeled vehicle, a movable frame thereon, an inclined trough on said frame, an endless chain provided with flights or buckets, means for causing said chain to travel horizontally at its lower turn for taking up material, and means for causing said chain to travel in an inclined plane over said inclined trough for elevating said material to a point of discharge.

20. The combination of a wheeled vehicle, a movable frame thereon, an inclined trough provided with a horizontal extension, a horizontal sprocket-wheel journaled in said extension, a guide over said sprocket-wheel, another sprocket-wheel, an endless conveyer adapted to travel on said sprocket-wheels over said trough, and means for actuating said conveyer.

21. The combination of a vehicle, a movable frame thereon having an inclined trough, a horizontal extension at its lower front end and a delivery-plate at its upper rear end, sprocket-wheels on said frame, an endless chain adapted to travel on said sprocket-wheels, flights attached to said chain, an endless platform disposed at the angle of said trough to avoid friction of the flights in passing said angle, and means for actuating said chain.

22. The combination of a trough, a part of which is disposed at an angle to another part, an endless chain provided with flights adapted to travel over said trough, an endless platform disposed at the angle of said trough and adapted to be engaged by the flights to avoid friction, guides for supporting said chain, and actuating mechanism therefor.

23. The combination of a conveyer-frame provided with a trough and with a flanged guideway at the inner edge thereof, sprocket-wheels supported on said conveyer-frame, and an endless chain traveling over said sprocket-wheels and provided with flights the inner ends of which travel in said flanged guideway.

24. The combination of a conveyer-frame provided with a trough and with a flanged guideway at the inner edge thereof, sprocket-wheels supported on said conveyer-frame, an endless chain traveling over said sprocket-wheels and provided with flights the inner ends of which travel in said flanged guideway and with shoes adapted to engage said guideway for holding the flights in normal position.

25. The combination of a wheeled vehicle, a carriage movable thereon, a frame supported on said carriage and provided with a depressed extension having a shoe adapted to slide on a mine-floor, an endless conveyer supported on said frame and extension, means for actuating said conveyer and means for swinging said conveyer-frame laterally.

26. The combination of a wheeled vehicle, a carriage movable thereon, a vertical sleeve secured to the frame of said carriage, an adjustable screw-rod supported in said sleeve and provided with lateral bars, a conveyer-frame supported on said bars, an endless conveyer supported on said frame and means for adjusting said screw-rod.

27. The combination of a wheeled vehicle, a carriage movable thereon, screw-threaded sleeves disposed vertically on said carriage, screw-rods adjustable in said sleeves and provided with transverse bars, a conveyer-frame pivoted to one of said bars and provided with recessed lugs engaging the other bar, and an endless conveyer supported on said frame.

28. The combination of a wheeled vehicle, a carriage movable thereon, a conveyer-frame supported on said carriage and comprising a divided inclined frame, the lower portion thereof being hinged to the upper portion thereof, a front extension at the lower end of said hinged portion, a slotted plate and bolt for connecting said extension with said hinged portion and an endless conveyer on said frame.

29. The combination of a wheeled vehicle, a carriage movable thereon, a conveyer-frame adjustable on said carriage and comprising an inclined frame having a trough on one side and a conveyer-guide on the other, the lower end of said inclined frame extending downward in front of said vehicle, an adjustable extension at the lower end of said inclined frame, and an extension at the upper

- rear end thereof, an endless conveyer supported on said frame, and means for actuating said conveyer.
30. The combination of a wheeled vehicle, a carriage movable thereon, a conveyer-frame supported on said carriage and comprising an inclined frame having an extension at its opposite ends at angles to said inclined frame, horizontal sprocket-wheels supported on said extensions, vertical sprocket-wheels at the angles of said inclined frame with said extensions, and an endless chain provided with flights traveling over said horizontal sprocket-wheels and in contact with said vertical sprocket-wheels, and means for actuating said chain.
31. The combination of a wheeled vehicle, a carriage movable thereon, a conveyer-frame supported on said carriage and having its front end extending downward below said carriage and provided with an extension having a horizontal guard-plate, and an endless conveyer traveling over said frame and under said guard-plate.
32. A car provided with a track having an adjustable lateral extension.
33. A car provided with a track having a lateral extension and means for locking the extension in extended position.
34. A car provided with a track having a folding lateral extension.
35. A car provided with a track having a folding lateral extension and means for locking said extension in folded and extended positions respectively.
36. A car provided with a track composed of arc-shaped rails, one of said rails having a lateral extension projecting beyond the side of the car.
37. A car provided with a track composed of arc-shaped rails, one of said rails having folding lateral extensions projecting beyond the side of the car.
38. A car provided with an arc-shaped track whereof one rail has an adjustable lateral extension and the other rail a rack.
39. The combination of a car provided with a track whereof one rail is provided with lateral extensions and the other with a rack and a carriage adapted to travel on said track and having means for engaging said rack.
40. The combination of a loading-car, a receiving-car disposed in endwise relation to said loading-car, and means on one of said cars for engaging the other and varying the distance between them during the loading operation to distribute the material in the receiving-car.
41. The combination of a loading-car, a receiving-car disposed in endwise relation to said loading-car and mechanism on said loading-car adapted to engage said receiving-car for varying the distance between them during the loading operation to distribute the material being loaded in the receiving-car.
42. The combination of a loading-car, a receiving-car, pushing mechanism disposed on one of said cars and adapted to engage the other for varying the distance between said cars during the loading operation and means for locking one of said cars in stationary position.
43. The combination of a loading-car, a receiving-car, means on the loading-car for pushing said cars apart during the loading operation, and means on the loading-car for locking it in stationary position.
44. A loading-car provided with means for picking up, elevating and delivering material, a longitudinal rack-bar adapted to project at one end thereof for pushing an adjacent receiving-car away from said loading-car, and with mechanism for actuating said rack-bar.
45. The combination of a loading-car, a longitudinal rack-bar projecting at one end thereof, means for actuating said rack-bar for moving an adjacent receiving-car relatively thereto during the loading operation, and a coupling device for connecting said rack-bar with said receiving-car.
46. The combination of a loading-car, a receiving-car, means for pushing said cars apart during the loading operation, a conveying mechanism provided with a front extension adapted to pick up material in front of said loading-car and with a rear extension adapted to extend over the top of an adjacent receiving-car, and means for operating said conveying mechanism to pick up, elevate and deliver material into said receiving-car.
47. The combination of a wheeled vehicle, a carriage movable thereon, conveying mechanism supported on said carriage and provided with a depressed extension adapted to travel over a mine bottom or floor, and an extensible brace-rod adapted to engage said extension at one end and a fixed support at the other.
48. The combination of a wheeled vehicle, a carriage movable thereon, conveying mechanism supported on said carriage and provided with a depressed extension adapted to travel over a mine bottom or floor, and an extensible brace-rod having a ball-and-socket connection at one end with said extension and adapted to engage a fixed support at the other end.
49. The combination of a wheeled vehicle, a carriage movable thereon, an inclined carrier-frame supported on said carriage, the lower portion of said frame being adjustably hinged to the upper portion thereof and extending downward below the carriage and provided with a horizontal extension, and an endless carrier supported on said frame.
50. The combination of a car, a carriage movable thereon, a carrier-frame vertically adjustable on said carriage and comprising an inclined frame extended downward in front of said car and having a trough on one side and an adjustable extension at the front end of said inclined frame, and an endless carrier supported on said carrier-frame.
51. The combination of a portable base or

car, a carriage movable thereon, an adjustable carrier-frame mounted on said carriage and comprising an inclined frame the lower portion of which extends below the plane of said carriage in front of said car, an adjustable extension at the lower front end of said inclined frame, a horizontal extension at the upper rear end of said inclined frame and a trough along one side of said frame, an endless carrier supported on said frame, and means for actuating said carrier.

52. The combination of a portable base, a carriage movable thereon, a carrier-frame adjustable on said carriage and comprising an inclined frame having a trough on one side, the lower end of said inclined frame extending downward in front of said base, an adjustable extension at the lower front end of said inclined frame, and an extension at the upper rear end thereof, an endless carrier supported on said frame, and means for actuating said carrier.

53. The combination of a wheeled vehicle, a carriage movable thereon, a conveyer-frame adjustable on said carriage and comprising an inclined frame having a trough on one side, the lower end of said inclined frame extending downward in front of said car, an extension at the lower front end of said inclined frame and an extension at the upper rear end thereof, an endless conveyer supported on said frame, and means for actuating said conveyer.

54. The combination of a wheeled vehicle, a carriage movable thereon, a conveyer-frame mounted on said carriage and an inclined frame having extensions at its opposite ends at angles to the said inclined frame, an endless conveyer supported on said conveyer-frame and means for actuating said conveyer.

55. The combination of a wheeled vehicle, a carriage movable thereon and provided with posts disposed laterally thereon, a conveyer-frame comprising an inclined frame straddling said posts and provided on one side with a trough and at its lower front end with an extension adapted to travel on a plane below said carriage, an endless conveyer mounted on said conveyer-frame and means for actuating said conveyer.

56. The combination of a wheeled vehicle, a carriage movable thereon and provided with posts disposed laterally thereon, a conveyer-frame comprising an inclined frame straddling said posts and provided on one side with a trough and at its lower front end with an extension adapted to travel on a plane below said carriage, an endless conveyer mounted on said conveyer-frame and means for actuating said conveyer.

57. The combination of a wheeled vehicle, a carriage movable thereon and provided with posts disposed laterally thereon and provided with guides, a conveyer-frame comprising an inclined frame provided on one side with a trough and at its lower front end with an extension adapted to travel on a plane below

said carriage, said inclined frame being provided with dependent arc-shaped bars adapted to slide in said guides, an endless carrier mounted on said carrier-frame, means for actuating said carrier, and means for raising and lowering said inclined frame.

58. The combination of a wheeled vehicle, a carriage movable thereon and provided with laterally-disposed posts having arc-shaped guides, a conveyer-frame comprising an inclined frame provided on one side with a trough and at its lower front end with an extension adapted to travel on a plane below said carriage, said inclined frame being provided with dependent arc-shaped bars adapted to slide in said arc-shaped guides, an endless conveyer mounted on said conveyer-frame, means for actuating said carriage and means for raising and lowering said inclined frame, consisting of a dependent arc-shaped rack attached to said conveyer, a shaft on said carriage provided with a pinion engaging said conveyer and means for operating said shaft.

59. The combination of a wheeled vehicle, a carriage movable thereon and provided with posts disposed laterally and having arc-shaped guides, a conveyer-frame comprising an inclined frame provided on one side with a trough and at its lower front end with an extension adapted to travel on a plane below said carriage, said inclined frame being provided with dependent arc-shaped bars adapted to slide in said arc-shaped guides, an endless conveyer mounted on said conveyer-frame, means for actuating said conveyer, means for raising and lowering said inclined frame, and means for holding said frame in adjusted position.

60. The combination of a wheeled vehicle and low conveying mechanism supported thereon and comprising a depressed horizontal extension adapted to travel laterally over a mine bottom or floor and pick up coal or other material disposed thereon, an elevator for the material picked up and a delivery extension on a level with the top of the elevator.

61. The combination of a wheeled vehicle and low conveying mechanism mounted thereon and comprising a depressed horizontal extension projecting beyond said vehicle and adapted to travel laterally over a mine bottom or floor and pick up coal or other material therefrom, an elevator for the material picked up and a delivery extension disposed on a level with the top of the elevator and also projecting beyond said vehicle for delivering into an adjacent receptacle.

62. The combination of a wheeled vehicle and a conveying mechanism mounted thereon, said mechanism comprising an elevator member and pick-up and delivery members integral with the elevator member, the pick-up member being in the form of a depressed horizontal extension adapted to travel laterally over a mine bottom or floor for picking up coal or other material disposed thereon.

63. The combination of a wheeled vehicle, and low conveying mechanism supported thereon comprising an elevator member and pick-up and delivery members integral therewith, the pick-up member being in the form of a depressed horizontal extension adapted to travel laterally over a mine bottom or floor for picking up coal or other material disposed thereon, and the delivery member being also in the form of a horizontal extension projecting from the upper end of the elevator member.

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Witnesses:

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