No. 842,532. PATENTED JAN. 29, 1907

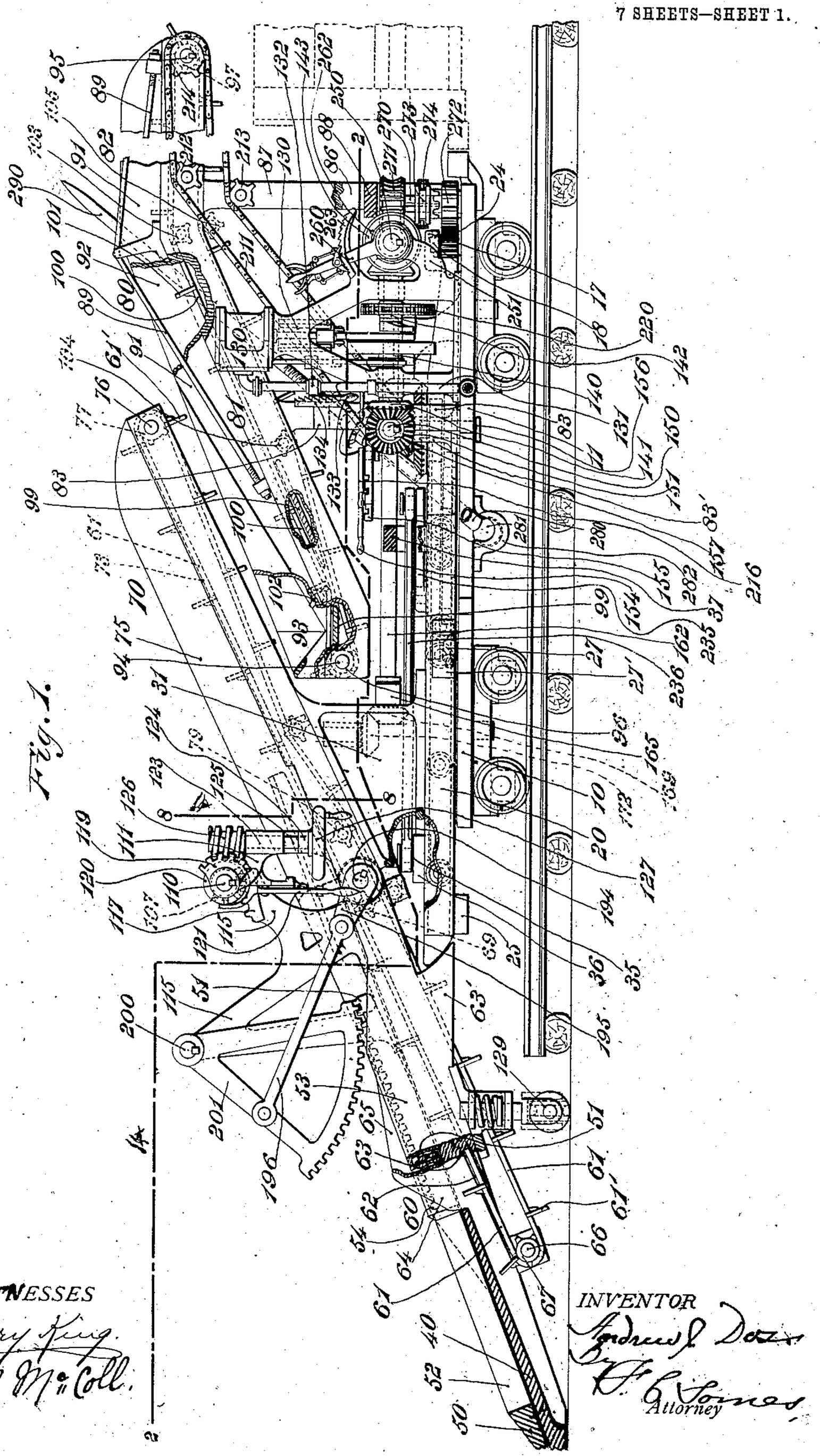
A. J. DOSS.

LOADING MACHINE.

APPLICATION FILED MAY 25, 1904.

7 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

Harry King.

S M McColl.

INVENTOR

Andrew J. Doss

By F. C. Jones

Attorney

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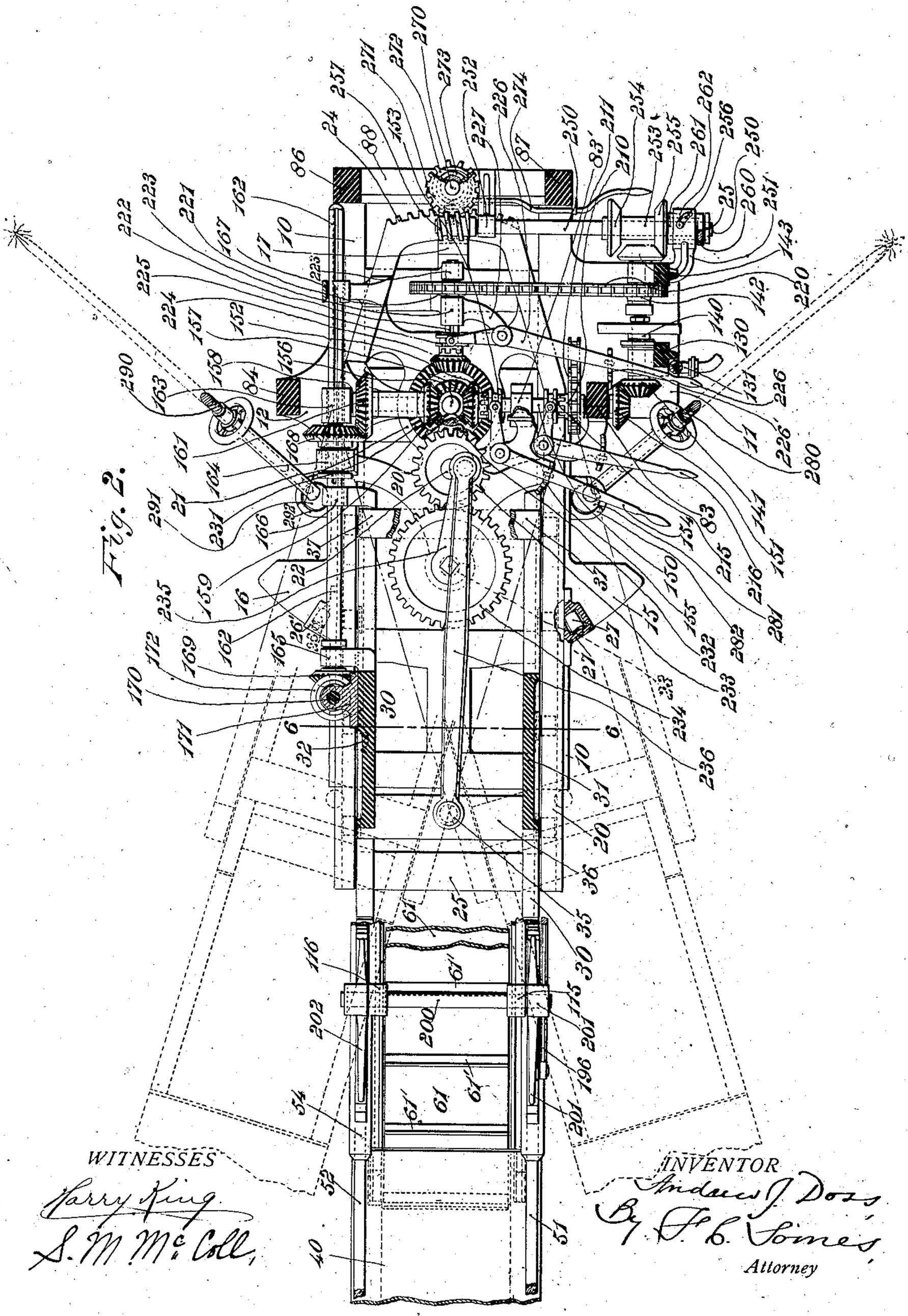
7 SHEETS—SHEET 2.

Fig. 2.



WITNESSES

Harry King.

S. M. McColl,

INVENTOR

Andrew J. Doss.

By F. B. Symes.

Attorney

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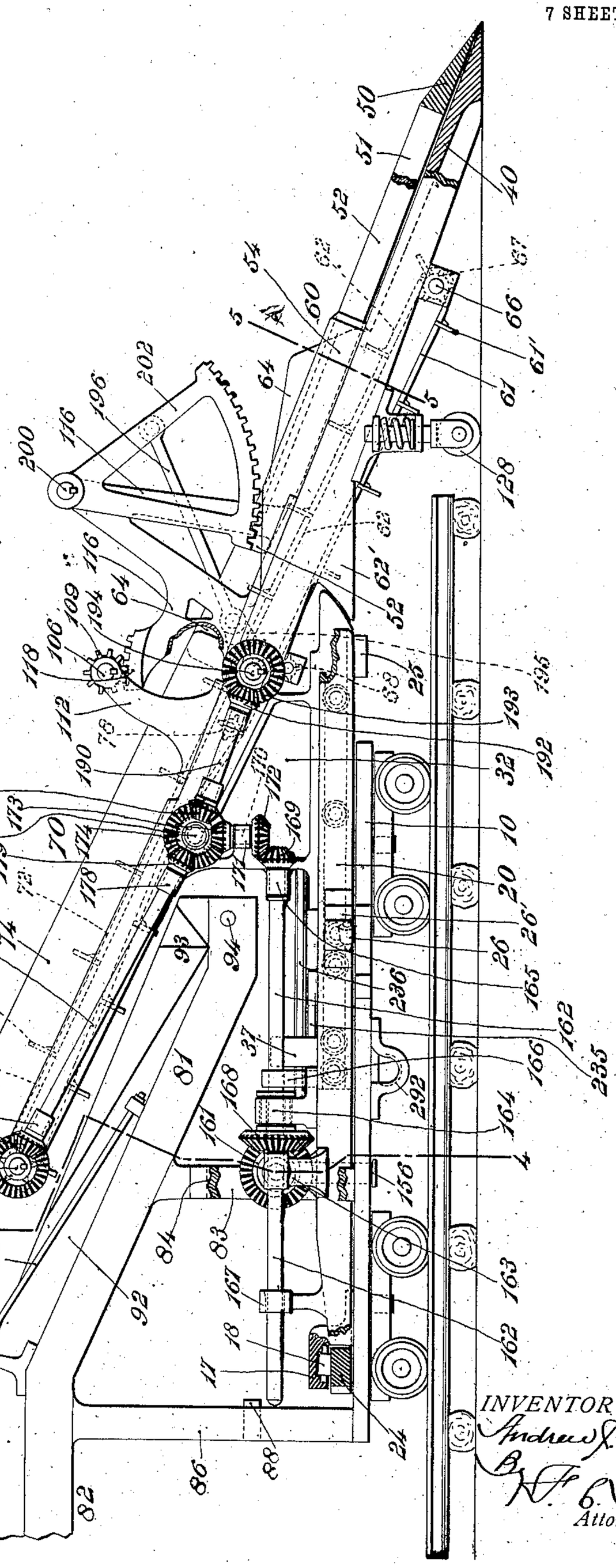
7 SHEETS—SHEET 3.

Fig. 3.



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7 SHEETS—SHEET 4.

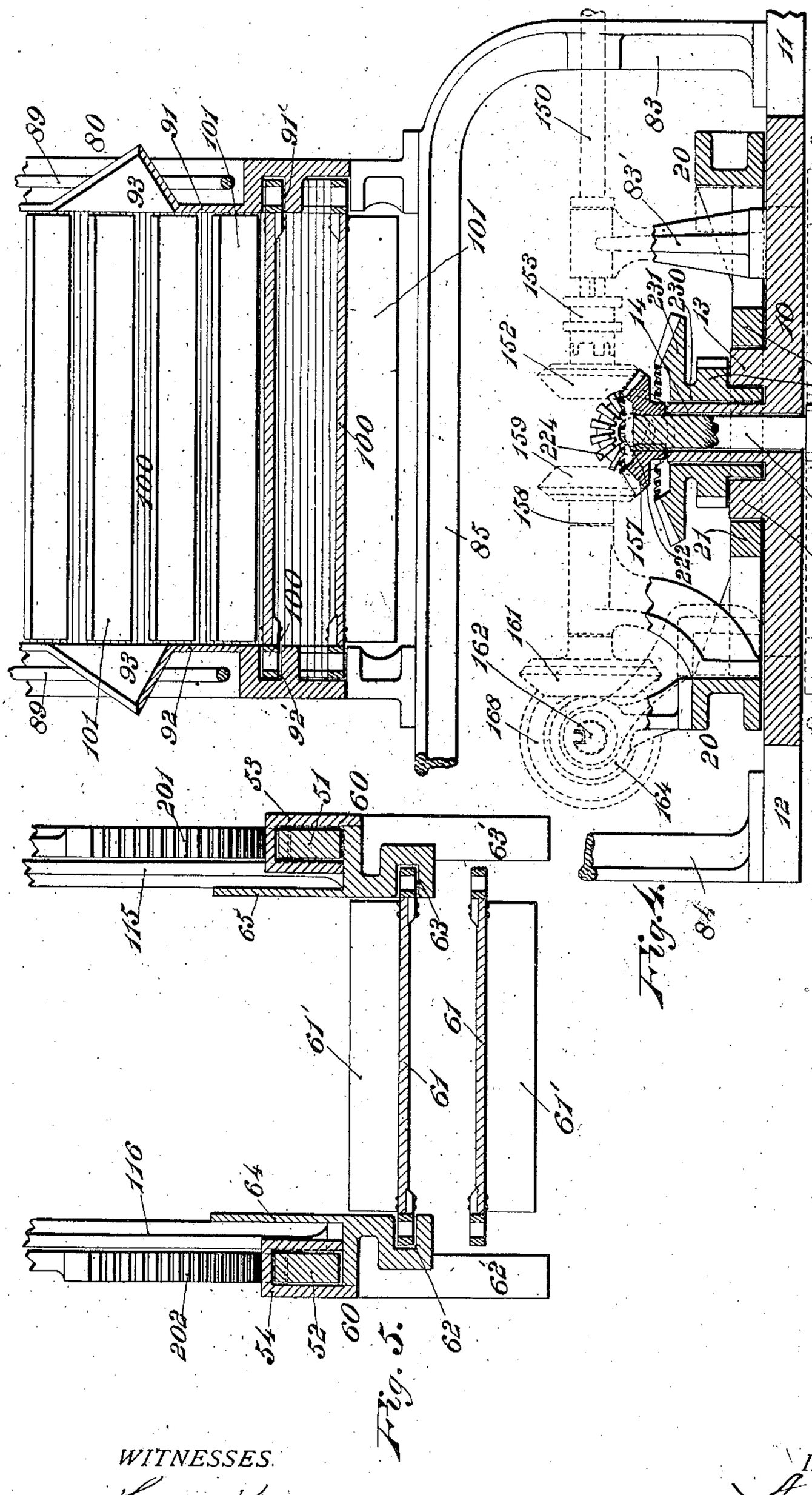
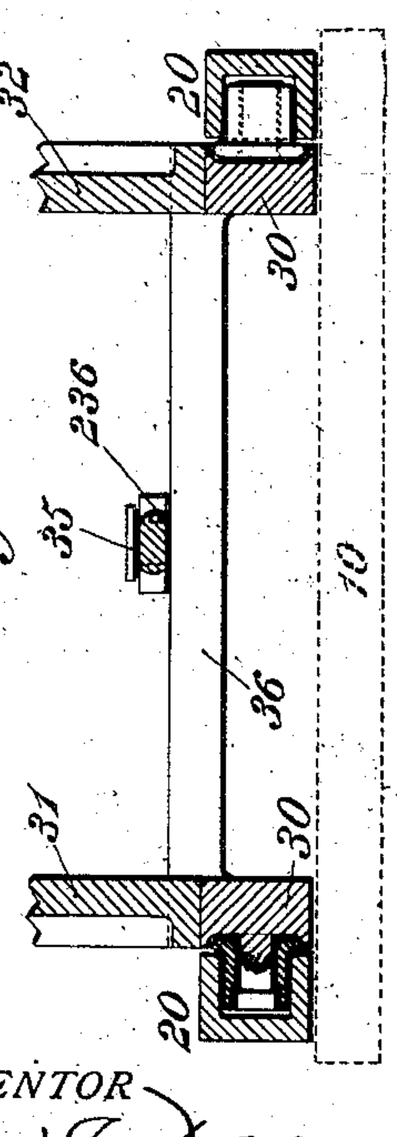


Fig. 5.

Fig. 6.



WITNESSES.

Harry King

S. M. McColl

INVENTOR

Andrew J. Doss

By F. L. Jones

Attorney

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7 SHEETS—SHEET 5.

Fig. 8.

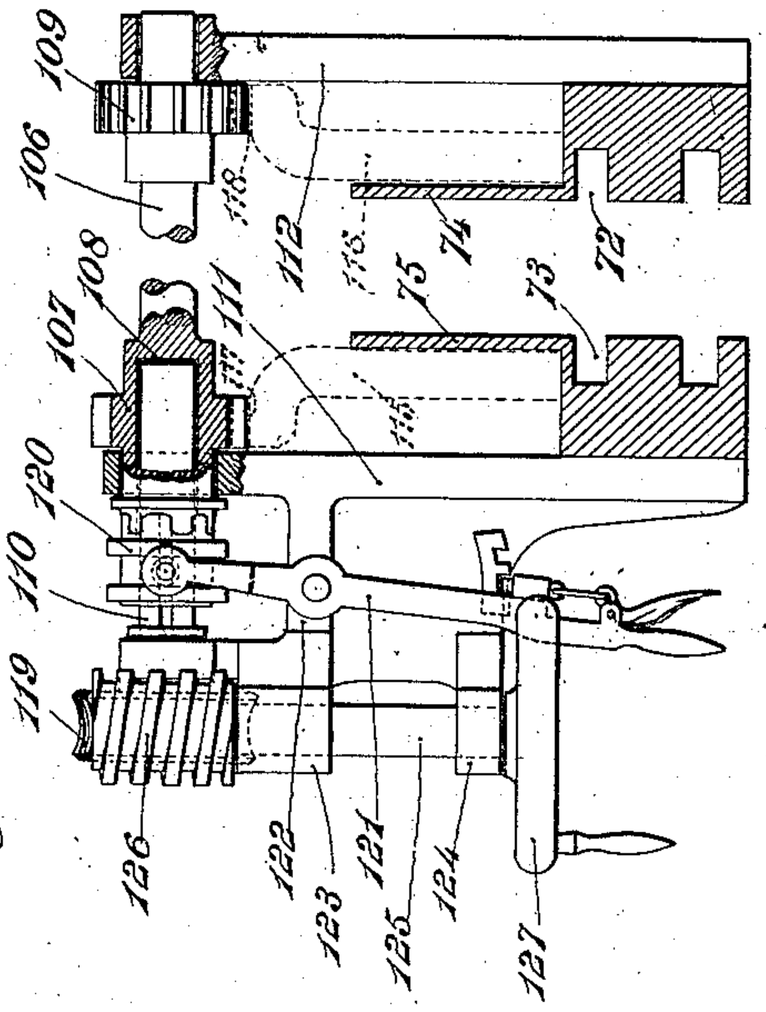
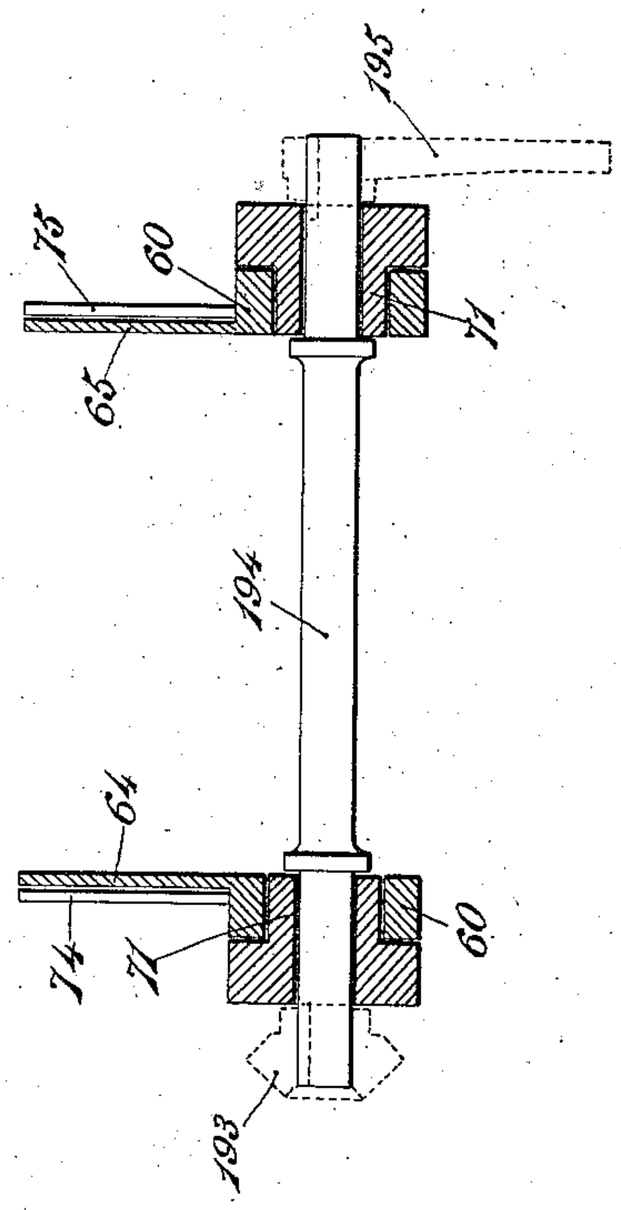


Fig. 7.



WITNESSES

Harry King.

S. M. McColl

INVENTOR

Andrew J. Doss

By F. B. Jones

Attorney

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7 SHEETS—SHEET 6.

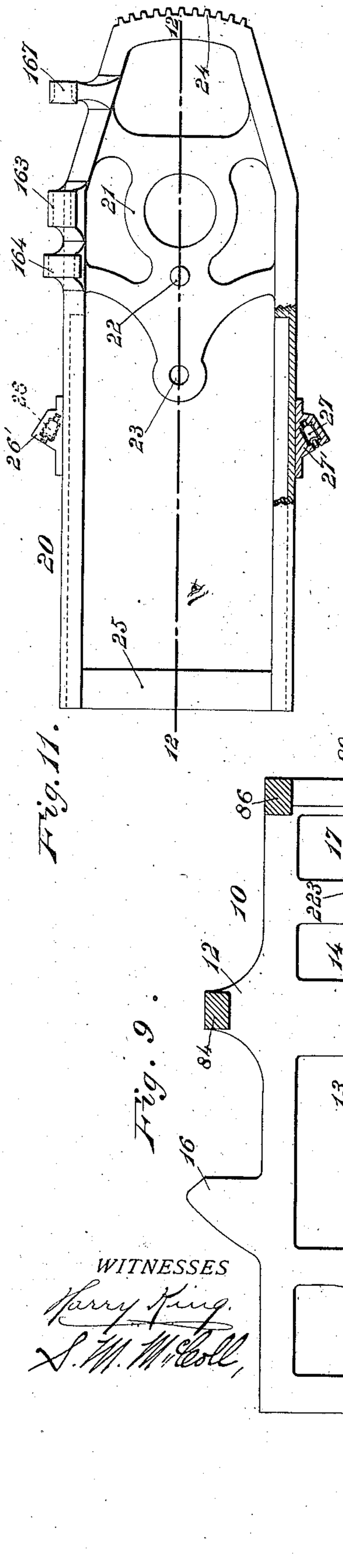

Fig. 11.

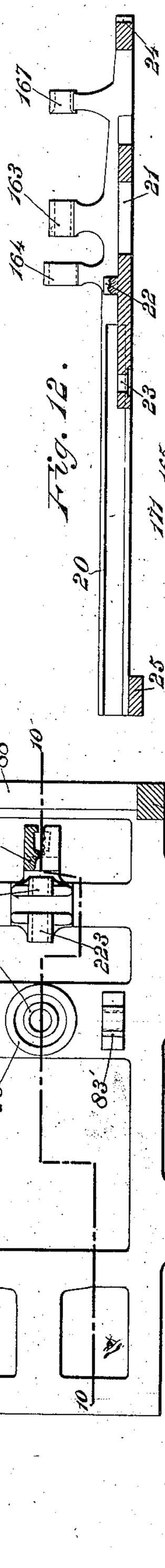

Fig. 12.

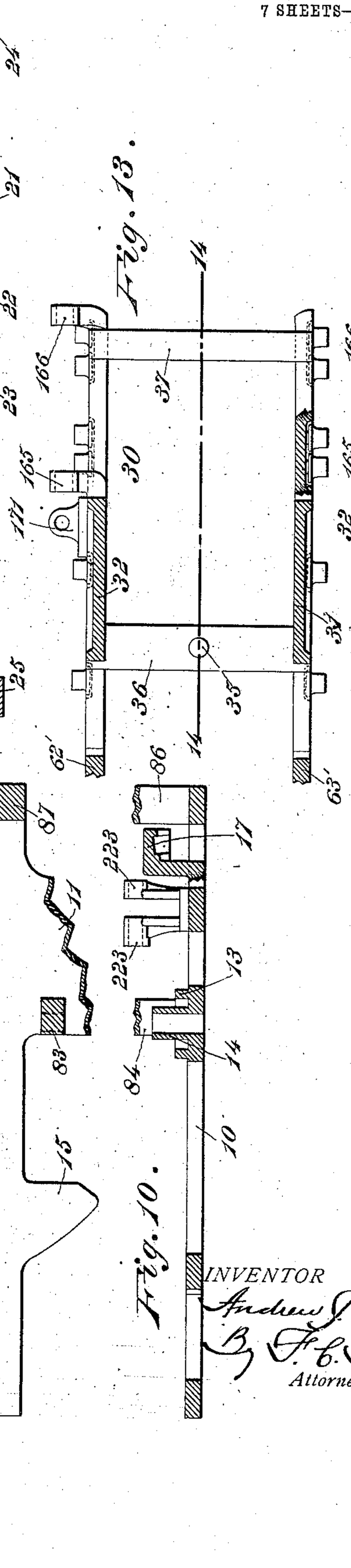

Fig. 13.

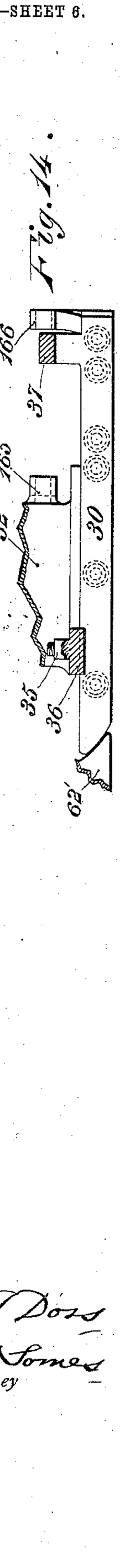

Fig. 14.

Fig. 9.

Fig. 10.

WITNESSES

Harry King.

S. W. McCall,

INVENTOR

Andrew J. Doss

By F. C. Somes

Attorney

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LOADING MACHINE.

APPLICATION FILED MAY 25, 1904.

7 SHEETS—SHEET 7.

Fig. 16.

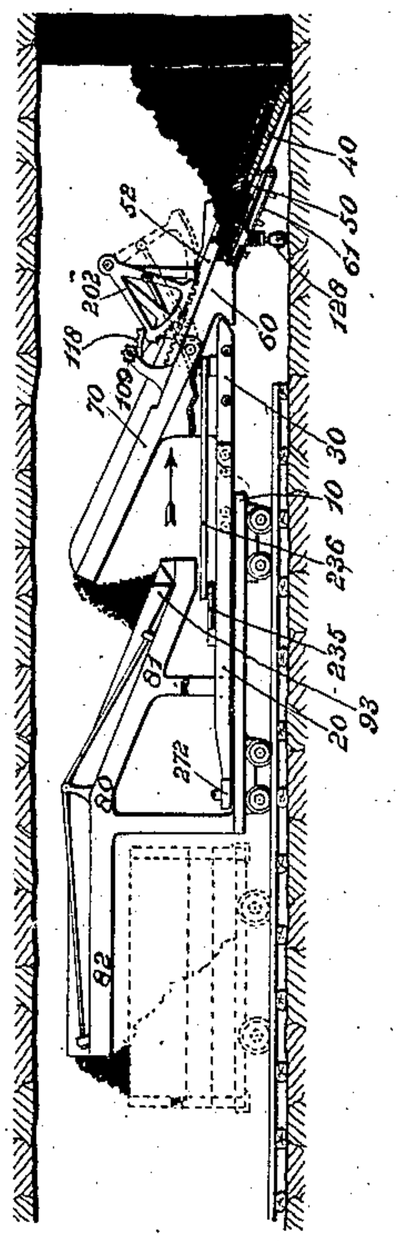


Fig. 17.

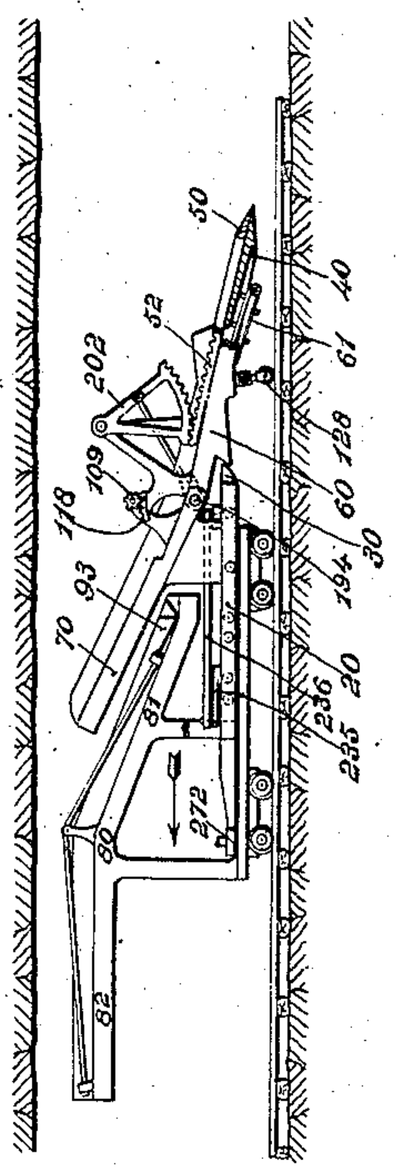
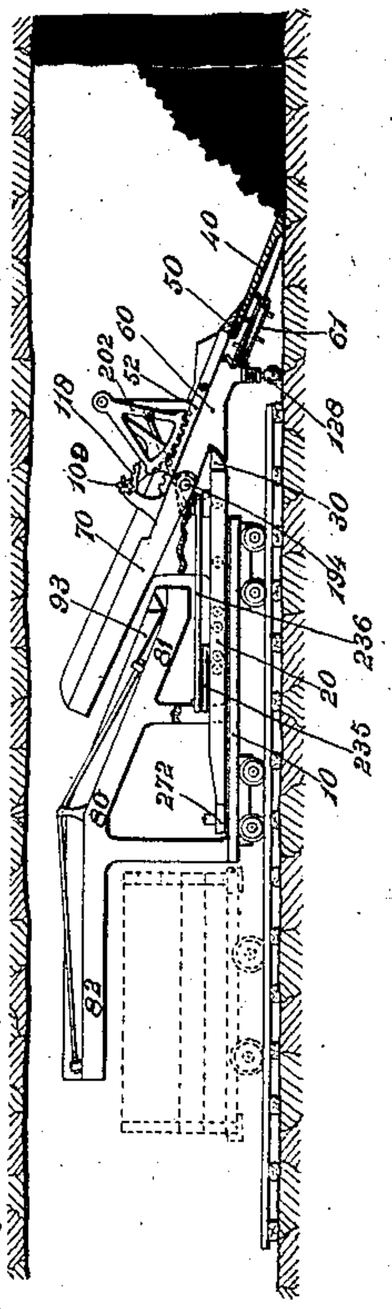


Fig. 15.



WITNESSES

Harry King

S. W. McCall

INVENTOR

Andrew J. Doss,

By F. G. Jones

Attorney

UNITED STATES PATENT OFFICE.

ANDREW JACKSON DOSS, OF SWITCHBACK, WEST VIRGINIA.

LOADING-MACHINE.

No. 842,532. Specification of Letters Patent. Patented Jan. 29, 1907.

Application filed May 25, 1904. Serial No. 209,706.

To all whom it may concern:

Be it known that I, ANDREW JACKSON DOSS, a citizen of the United States of America, and a resident of 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 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 the 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 side elevation of one embodiment of this machine, parts being broken out to facilitate the illustration. Fig. 2 represents a view, partly in plan and partly in horizontal section, on line 2 2 of Fig. 1 looking downward. Fig. 3 represents a side elevation of the reverse side of the machine, parts being broken out. Fig. 4 represents a transverse section on line 4 4 of Fig. 3. Fig. 5 represents a transverse section on line 5 5 of Fig. 3. Fig. 6 represents a transverse section of a portion of the machine on line 6 6 of Fig. 2. Fig. 7 represents a transverse section, on an enlarged scale, of the shoveling conveyer-frame on the axis of the pivoted or swinging lower portion thereof. Fig. 8 represents a transverse section, also on an enlarged scale, of the swinging conveyer-frame on line 8 8 of Fig. 1. Fig. 9 represents a plan, also on an enlarged scale, of the platform or body of the machine-car on which the loading mechanism is mounted, parts being broken out. Fig. 10 represents a longitudinal section thereof on line 10 10 of Fig. 9, also on an enlarged scale. Fig. 11 represents, on an enlarged scale, a plan of the swiveling base, parts being broken out. Fig. 12 represents a longitudinal section of the swiveling base on line 12 12 of Fig. 11. Fig. 13 represents on an enlarged scale, a plan, partly in section, of the reciprocating carriage carrying the shoveling-conveyer. Fig. 14 represents a section thereof on line 14 14 of Fig. 13. Fig. 15 represents, on a reduced scale, a side elevation of the machine in position for loading action, the reciprocating carriage being in its rearward position. Fig. 16 represents, on a reduced scale, a side elevation of the machine in action, showing the said carriage in forward position. Fig. 17 represents, on a reduced scale, a side elevation of the machine in position for traveling from point to point preparatory to the loading action.

The same reference-numerals indicate corresponding parts in all the figures.

The platform 10 of the machine-car is preferably constructed of metal in skeleton form, as shown separately in detail in Figs. 9 and 10. This platform is provided on its front side with a lateral extension 11, which serves as a support for the motor, and on its rear side with a lateral projection 12, which supports a frame-post. The platform is also provided on its upper side with an annular boss 13, which serves as a bearing for a swiveling base, hereinafter described, and with a tubular bearing 14 inside said boss and concentric therewith for supporting interior and exterior transmitting-shafts. The platform is also provided on its opposite sides in front of said bearings with lateral projections 15 and 16, which with the body of the platform form an arc-shaped track on which the front portion of the swiveling base is supported. A keeper 17, preferably provided with an antifriction-roller 18, is attached to the platform near the rear end thereof and engages the rear end of the swiveling base.

A swiveling base 20 is adapted to swing horizontally on the platform 10, being preferably pivoted to said platform by means of a hub 21, which turns on the annular boss 13. This base consists, preferably, of a metallic skeleton frame composed of doubly-flanged side rails connected by suitable end and intermediate cross-bars, as shown in Figs. 11 and 12. The inner flanged faces of these rails constitute a track, as shown in Fig. 6, on which a carriage reciprocates, as hereinafter described. A vertical stud 22, disposed in front of the hub 21, serves as a bearing for an idle wheel, hereinafter described, and a vertical bearing 23, disposed in front of said stud, supports a vertical shaft, hereinafter described. The base is provided,

preferably at its rear end, with an arc-shaped rack 24, which is engaged by the swiveling mechanism for swinging the base toward the right or left. The front cross-bar 25 is depressed below the plane of the side rails to permit the carriage to move over it. The base is preferably provided on opposite sides with brackets 26′ and 27′, carrying antifriction-rollers 26 and 27, which ride in an arc-shaped path on the platform 10 and the lateral projections 15 and 16 thereof. These supports, in connection with the bridge 17, serve to avoid strain and binding at the pivot.

A carriage 30 reciprocates on the base 20 and when constructed as herein shown comprises two side rails connected by cross-bars 36 and 37, the side rails being rounded at their front ends, as shown in Figs. 1, 3, and 14. This carriage is provided with wheels which travel in the ways or track formed by the flanges of the side rails of the swiveling base, as shown in Figs. 6 and 12. The rear portion of the carriage has a greater number of these wheels to give a reinforced support therefor when the front portion is projected beyond the supporting-rails of the base, as shown in Fig. 16. Standard-plates 31 and 32, having inclined upper edges, are mounted on opposite sides of the carriage and serve to support the loading mechanism hereinafter described. A stud 35, mounted midway of the cross-bar 36, serves as a bearing for a pitman for reciprocating the carriage, as hereinafter described.

A loading mechanism is mounted on the carriage 30 and comprises an elevating shoveling conveyer provided at its lower front end with a wedge-like feeder 40, which is thrust under the coal or other material by the forward movement of the carriage and operates on such thrust by a wedge-like action to cause such material to ride up over the feeder and drop from the higher rear edge thereof onto the traveling mechanism of the elevating shoveling conveyer. A supplemental feeder 50 may be used in connection with the feeder 40. The conveyer-frame is preferably divided into two parts—an inclined lower front frame 60, carrying the feeder and preferably pivoted to swing vertically to adjust the latter to the plane of operation, and an upper inclined rear frame 70, supported on the standard-plates 31 and 32 of the carriage and forming a continuation of the lower frame 60. The side rails of the frame 70 are provided near their lower ends with hollow bosses, as 71, (shown in Fig. 7,) which constitute the pivots for the swinging frame 60 and serve as bearings for the opposite ends of a transverse shaft, hereinafter described. The side rails of the frames 60 and 70 are provided on their inner faces with longitudinal guideways, as 62 and 63 and 72 and 73, respectively, which serve as intermediate supports for the upper run of the endless flight-apron of the conveyer. The lower frame 60 is provided with downward lugs 62′ and 63′, having curved surfaces at their rear ends concentric with the pivot of said frame and adapted to bear against the curved front ends of the side rails of the frame of the carriage 30, which are also concentric with said pivot. The frame 60 is provided with side boards 64 and 65 and the frame 70 with side boards 74 and 75, which form the sides of a continuous trough for the upward passage of the coal or other material. The trough sides of the lower frame 60 preferably terminate inside the trough sides of the upper frame 70. A transverse shaft 66 is supported in bearings near the front end of the front frame 60, and a transverse shaft 76 is supported in bearings near the rear end of the rear frame 70, and an endless conveyer-apron 61, preferably provided with flights 61′, passes over sprocket-wheels, as 67 and 77, disposed on said shafts, and is further supported in the intermediate guideways 62 and 63 and 72 and 73. The forward part of this conveyer-apron preferably extends underneath the rear edge of the feeder 40, as shown in Fig. 1, so as to readily catch the material dropping off said feeder. Intermediate idle sprocket-pinions, as 68 and 69 on the front frame 60 and as 78 and 79 on the rear frame 70, serve to guide the conveyer-apron and permit the front frame to swing upward. The wedge-like feeder 40 constitutes an inclined front extension of the inclined conveyer and may be rigidly connected with the frame thereof.

The supplemental feeder 50, preferably employed in connection with the feeder 40 to feed the material from the pile to the traveling mechanism of the elevating-conveyer, may consist of a reciprocating wedge-like structure which moves up and down over the inclined upper face of the feeder 40, being connected at its opposite ends to the lower ends of slide bars or shanks 51 and 52, having rack-teeth at their upper ends and sliding in boxes 53 and 54, mounted on opposite sides of the frame 60. This supplemental feeder has a beveled upper face to permit it to readily slide on its downstroke under the material over the face of the feeder 40 and an abrupt rear face to engage and push up said material over the top of the feeder 40 on its upstroke. The means for reciprocating this supplemental feeder at the desired speed will be hereinafter described.

A supplementary elevating and delivery conveyer 80 for receiving the material from the primary conveyer and delivering it into the car or other receptacle or place for receiving it is preferably supported in fixed position on the car 10 and comprises an inclined forward portion 81, underlapping the upper rear portion of the primary conveyer, and an elevated horizontal rear extension 82, adapted to extend over the receiving-car and de-

liver coal or other material thereinto from end to end thereof. This conveyer is mounted on any suitable support on said car. The support shown comprises two short forward posts 83 and 84, disposed, respectively, on the lateral extension 11 and lateral projection 12 of the platform of the car 10 and connected by a bridge-beam 85 and two taller rear posts 86 and 87, disposed on opposite sides at the rear of said platform. The posts 83 and 84 are a sufficient distance apart to permit the base 20 to oscillate between them. The rear posts are connected near their lower end by a cross-bar 88. The horizontal rear extension 82 is braced to the inclined portion 81 by means of bridge-braces, as 89. The side rails of this secondary supplemental conveyer are provided with side plates 91 and 92, which form a trough for the conveyer, and these side plates are flared outward at the lower end of the conveyer, and a hopper 93 is there formed to receive the material delivered from the primary conveyer 60–70 when the latter is swung at a lateral angle to the car 10. A shaft 94 is journaled in the forward end of the conveyer 80, and a shaft 95 is journaled at the rear end thereof. The shaft 94 carries idler sprocket-pinions, as 96, and the shaft 95 carries driving sprocket-pinions, as 97. An endless apron 100, preferably provided with flights 101, passes over these sprocket-pinions. Idler sprocket-pinions, as 102 and 103, duplicated at opposite sides of the conveyer-frame, guide the upper run of the endless apron, and sprocket-pinions, as 104 and 105, duplicated on opposite sides of the conveyer-frame, guide the lower run of said endless apron. Transverse bars, as 99, are disposed underneath the hopper to prevent injury to the apron by any large lumps of coal which might drop thereonto.

Mechanical means are provided under the control of the operator for swinging the front frame 60 upward when the machine is moved from place to place and for adjusting and locking said frame at the angle best suited for gathering up material from a mine or other place. Such means may be thrown out of gear, whereby the pivoted shoveling-conveyer frame 60 may be unlocked and adapted to swing freely on the shoveling stroke of the carriage to suit any inequalities of the floor. The means shown for this purpose comprise a transverse shaft 106, supported on standards 111 and 112, mounted on the opposite side rails of the fixed conveyer-frame 70. This shaft is provided at its near end with a pinion 107 and a socket 108 and at its off end with a pinion 109. Brackets 115 and 116 are attached to the opposite side rails of the swinging frame 60 and provided with arc-shaped racks 117 and 118, which are engaged by said pinions to swing said frame upward or downward on the turning of the shaft 106 in one direction or the other. A horizontal stub-shaft 110 is journaled in the socket 108 and in an upright arm of bracket 122 and provided at its near end with a fixed worm-wheel 119 and with a clutch 120. This clutch is shifted into and out of engagement with the pinion 107 by a lever 121, mounted on a bracket 122, attached to the standard 111, as shown in Figs. 1 and 8. This bracket is provided with vertical bearings 123 and 124, in which a vertical shaft 125 is supported. This shaft is provided at its upper end with a worm 126, which engages the worm-wheel 119, and at its lower end with a hand-wheel 127 in position to be grasped by the operator. When the clutch 120 is out of gear, the frame 60 is adapted to swing freely to suit the inequalities of the mine-floor, and by shifting the clutch into engagement with the shaft 106 and turning the hand-wheel 127 the operator can raise or lower said frame, and the worm serves as an automatic lock to hold it in the adjusted position.

The swinging frame 60 is preferably provided with supports adapted to engage either the track on which the machine travels or the mine-floor in front thereof. These supports may be in the form of swiveling spring-casters, as 128 and 129, attached to opposite sides of the frame.

A motor 130 for operating the loading mechanism is mounted on the lateral extension 11 of the platform 10. Any suitable motor may be used, preferably a motor operated by compressed air, steam, or electricity. A compressed-air motor is shown which is disposed vertically, and a pipe 131 serves as the supply-pipe for the motive fluid. This pipe is provided with a regulating and stop cock 132, and a controlling-lever 133 operates said cock. An arc-shaped rack 134 serves as a lever-lock for holding the controlling-lever in a variety of adjusted positions to vary the fluid-supply. The supply-pipe may be connected at any desired point with the fluid-main within the mine. A driving-shaft 140 is provided at its forward end with a bevel-pinion 141, through which motion is transmitted by intermediate connecting mechanism to the endless aprons of the primary and supplemental conveyers. A short shaft 150 is mounted in bearings of the post 83 and standard 83′ and is provided at its outer end with a beveled pinion 151, which meshes with the beveled pinion 141 of the driving-shaft 140, and at its inner end with a beveled pinion 152 and with a clutch 153, which operates to lock said pinion to said shaft, said clutch being operated by a clutch-lever 154, retained in open or closed position by a lever-lock 155. A vertical shaft 156 is supported in the tubular bearing 14 of the base 10 and provided at its upper end with a beveled pinion 157, which meshes with the beveled pinion 152 of the shaft 150

and receives motion therefrom. A short transverse shaft 158, supported in bearings on the swiveling base 30, is provided at its inner end with a beveled pinion 159, which meshes with and receives motion from the beveled pinion 157 on the vertical shaft 156, and at its outer end with a beveled pinion 161 for transmitting said motion. A longitudinal shaft 162 is supported at its rear end in brackets 163 and 164 on the swiveling frame 20 and at its front end on brackets 165 and 166 on the reciprocating carriage 30. A supplemental guide-bracket 167, mounted on the swiveling frame 20, operates to support the extreme rear end of this shaft. This shaft 162 is adapted to slide longitudinally in its bearings of the swiveling base, being carried forward and backward in unison with the movement of the reciprocatory carriage. A beveled pinion 168 is feathered on the shaft 162 between the brackets 163 and 164 and meshes with the pinion 161 of the shaft 158, receiving rotary motion therefrom. This shaft 162 is provided at its front end with a pinion 169 for delivering its motion. A short vertical shaft 170 is journaled in a bracket 171, attached to the standard 32 on the off side of the carriage 30. This shaft 170 is provided at its lower end with a pinion 172, which meshes with and receives motion from the pinion 169 on the shaft 162, and at its upper end with a pinion 173, which meshes with a beveled wheel 174, which turns on a stud 175, attached to the off-side rail of the conveyer 70. A longitudinal shaft 176 is journaled in bearings 177 and 178, also attached to the off side of the conveyer 70. This shaft is provided at its lower end with a pinion 179, which meshes with and receives motion from said beveled wheel 174, and with a beveled pinion 181, which meshes with and delivers motion to a beveled wheel 182, mounted on the shaft 76 at the upper end of the frame 70. By these or equivalent means motion is transmitted from the engine to the primary conveyer.

Any suitable mechanism may be employed for imparting reciprocatory motion to the supplemental feeder 50. The mechanism herein shown for this purpose comprises a longitudinal shaft 190, mounted in bearings on the off side of the frame 70 and provided at its rear end with a pinion 191, meshing with and receiving motion from the gear 174, and at its front end with a pinion 192, meshing with and delivering motion to a beveled gear 193 on a transverse shaft 194, journaled in the hollow bosses 71. This shaft is provided at its opposite or near end with a crank 195. A transverse shaft 200 is supported at its opposite ends in extensions of the brackets 115 and 116 and provided outside said brackets with toothed sectors 201 and 202, which mesh with the racks on the shanks 51 and 52 of the supplemental feeder. A pitman 196 connects the crank 195 with the near sector 201. By this or equivalent means a reciprocatory motion is imparted to the supplemental feeder 50, dragging up coal and pushing it over the rear end of the primary feeder onto the traveling apron of the primary conveyer. The means for operating the traveling apron of the supplemental conveyer 80 may comprise a pulley 210, loose on the shaft 150, and a belt 211, which passes over said pulley, over idlers, as 212 and 213, and over a pulley 214 on the shaft 95 at the rear end of the conveyer 80. A clutch 215 is disposed on the shaft 150 adjacent to the pulley 210, and a lever 216 is adapted to move said clutch into and out of engagement with said pulley, the usual means being provided for holding said lever in adjusted position. By this or other mechanism the supplemental conveyer may be made to operate in unison with the primary conveyer and deliver the material received therefrom into the car or other place or receptacle intended to receive it.

The mechanism for reciprocating the carriage 30 to thrust the shoveling-conveyer under the material to be loaded will now be described.

A pulley 142 is mounted on the driving-shaft 140, and a belt 220 passes over said pulley and over a pulley 221 on a short shaft 222, supported on a split standard 223, mounted on the platform 10, this gearing being preferably in sprocket form. The shaft 222 is provided with a loose beveled pinion 224 and with a clutch 225, adapted to engage said pinion to lock it to the shaft, said clutch being actuated by a lever 226, provided with a locking device 226′ and pivoted in a bracket 227, attached to the standard 223. The pinion 224 meshes with a beveled gear 231 on a hollow shaft 230, which surrounds the tubular bearing 14 of the platform 10. This hollow shaft is provided below its bevel gear-wheel with a gear 232, which meshes with an idle gear 233 on the stud 22 of the oscillating base 20, said idle gear being adapted to travel around the gear 232 and remain in mesh therewith as such base swings from right to left. A horizontal gear-wheel 234 is mounted on a vertical shaft disposed in the vertical bearing 23 of the oscillating frame 20 and meshes with the idle gear-wheel 233. The shaft or hub of the gear-wheel 233 is provided with a crank 235, and a pitman 236 connects the wrist-pin of said crank with a stud 35 on the reciprocating carriage 30, whereby reciprocating motion is imparted to said carriage by the revolution of said crank. Any other suitable means may be adopted for this purpose.

Any suitable mechanism for swinging the swiveling base 20 to the right or left may be employed. The mechanism shown for this purpose comprises a beveled friction-pulley 143, disposed on the driving-shaft 140. A

transverse shaft 250 is supported in brackets 251 and 252, attached to the platform 10, and carries at its outer end a reversing friction-gear, which may consist of a splined sleeve 253, having friction-pulleys 254 and 255. This sleeve is shifted to bring either of its friction-pulleys into or both of said pulleys out of engagement with the friction-pulley 143 of the driving-shaft by means of a reversing-lever 260, which has a collar 261 encircling the outer end of the sleeve 253. This collar is provided with a pin 262, which engages an inclined slot 256 in the bracket-bearing 251. The shaft 250 is provided at its inner end with a worm 257, which meshes with a worm-wheel 271 on a short vertical shaft 270, supported on the platform 10. The shaft 270 is provided at its lower end with a loose pinion 272 and also with a clutch 273, splined on said shaft. A lever 274, having the usual lever-lock, engages said clutch to clutch said pinion with said shaft or unclutch it therefrom. This pinion meshes with the arc-shaped rack 24 on the swinging base 20. A swing of the lever 260 in one direction shifts the sleeve 253 inward and brings the pulley 255 in engagement with the driving-pulley 143, and the base 20 is swung toward one side, and a swing of the lever 260 in the opposite direction disengages the friction-pulley 255 and engages the friction-pulley 256 with the driving-pulley 143, and said swiveling base is swung toward the other side. A half-swing of the lever to intermediate position disconnects both pulleys 254 and 255 from the driving-pulley 143, and the swiveling base 20 remains stationary. A double lever-lock 263 holds the lever 260 in any adjusted position. The worm connection operates as an automatic lock to hold the swiveling base in adjusted position. When the pinion 272 is unclutched from the vertical shaft by the lever 274, the oscillating base is free to swing in either direction as necessary in turning curves in the travel of the machine within the mine.

Means are provided for firmly locking and bracing the machine in stationary position during the loading operation. The means shown for this purpose comprise two extensible brace-rods 280 and 290, provided with balls 281 and 291 at their lower ends, adapted to engage sockets 282 and 292, firmly attached to the platform 10 at opposite sides thereof. The upper ends of these brace-rods are preferably pointed somewhat sharply to engage the ceiling or walls of the mine. Each of these brace-rods is preferably composed of a tube, in which the extension-rod slides telescopically, the extension having a screw-thread which is engaged by a screw-threaded hub of a hand-wheel mounted on said tube, as described in patent of the United States No. 731,371, dated June 16, 1903.

The operation: In the use of this machine for loading coal in a mine the machine is run into the mine-room, by means of the mine-locomotive or otherwise, where the coal has been shot down, the conveyer 60 being swung upward, so that its casters ride on the mine-track during this movement, as shown in Fig. 17. The machine-car is driven forward until the casters run off the end of the track, and the frame 60 is then lowered to bring the feeder 40 on a plane just above the mine-floor in front of the pile of coal, as shown in Fig. 15. Then the car 10 is fastened in stationary position by the anchoring means shown in Fig. 2 or other suitable means. The motor is connected with compressed-air main within the mine and the motive fluid turned on through the controlling-lever 133. The lever 216 is shifted to bring the elevating mechanism of the supplemental conveyer 80 into operation, and the lever 154 is also shifted to bring the elevating mechanism of the primary conveyer 60 70 into operation. Then the lever 226 is operated to connect the carriage-reciprocating means with the driving mechanism, whereby the carriage 30 is thrust forward toward the pile of coal into the position shown in Fig. 16, and then said mechanisms are disconnected by the back-shifting of said lever. In this forward movement of the carriage the feeder 40 slides under the coal and causes the latter to ride up over the inclined face of the feeder and drop over the rear edge thereof onto the endless apron 61 of the primary conveyer, whereby it is elevated and delivered from the upper end of said primary conveyer onto the supplemental conveyer 80, which elevates and delivers it into the car or other receptacle or place of deposit.

In case the supplemental feeder 50 be employed the coal rides over the forward wedge-shaped end thereof and falls onto the feeder 40 on the forward movement of the carriage. After the carriage 30 is moved forward a full stroke and the material has ceased to fall automatically over the rear end of the feeder 40 the coal disposed over the face of said feeder may be drawn up and delivered onto the carrier mechanism of the conveyer 60 70 by the supplemental feeder 50, which reciprocates over the face of the primary feeder 40. The auxiliary feeder 50 will on its upstroke or instroke draw up the mass of coal over the face of the inclined feeder 40 and push it over the upper edge thereof onto the elevating mechanism. On the outstroke or downstroke this supplemental feeder slides under the pile of coal and again pulls up a load on the subsequent upstroke. The supplemental feeder continues to work until the mass of coal overlying the feeder 40 has been drawn up and delivered onto the elevating mechanism of the conveyer. Then the lever 226 is operated to again shift the carriage recipro-

cating mechanism into operation, and the carriage is drawn back ready for another thrust. Then the lever 260 is shifted and the swiveling base turned to swing the feeder 40 slightly to one side or the other to give it a new position in front of the pile of coal. The carriage is then again thrust forward and the operation repeated. The base is swiveled as far to one side, then to the other, as may be necessary to clean up coal within the circle of the swing of the feeder. Then the anchors are removed from the car 10, and said car is moved forward the proper distance to make another sweep of the coal. As a coal-car is loaded it is hauled away and another put in place thereof. The coal-car may be shifted rearward to secure the delivery of the coal throughout the length thereof, or the shifting of the car 10 forward toward the pile may answer somewhat this purpose.

I claim as my invention—

1. The combination of a car, a swiveling base, a reciprocating carriage, and a loading mechanism, comprising a shoveling-conveyer having a wedge-like feeder and an elevating conveying mechanism in conjunction therewith.

2. The combination of a reciprocating inclined conveyer, a wedge-like feeder at the front thereof, and means for reciprocating said conveyer to drive the feeder in its forward movement under material to be loaded.

3. The combination of a reciprocating inclined conveyer, a wedge-like feeder at the front thereof, means for reciprocating said conveyer to drive the feeder in its forward movement under material to be loaded, and means for swinging said conveyer laterally.

4. The combination of a reciprocating carriage, a conveyer mounted thereon, a wedge-like feeder for said conveyer adapted to slide under the material to be loaded, means for shoving said carriage forward to thrust said wedge-like feeder under material to be loaded, and means for laterally swinging said carriage.

5. The combination of a reciprocating carriage, a traveling support therefor, means for swiveling said carriage, an inclined conveyer mounted on said carriage, a wedge-like feeder for said conveyer disposed in front thereof, and means for reciprocating said carriage to thrust said feeder under material to be loaded and deliver it onto said inclined conveyer.

6. The combination of a reciprocating inclined conveyer, a wedge-like feeder at the front thereof, means for reciprocating said conveyer to drive the feeder in its forward movement under material to be loaded, and a supplemental feeder for raking material up said wedge-like feeder.

7. The combination of a reciprocating inclined conveyer, a wedge-like feeder at the front thereof, means for reciprocating said conveyer to drive the feeder in its forward movement under material to be loaded, and a reciprocating supplemental feeder for raking material up said wedge-like feeder.

8. The combination of a reciprocating inclined conveyer, a primary wedge-like feeder at the front thereof, means for reciprocating said conveyer to drive the feeder in its forward movement under material to be loaded, and a wedge-like reciprocating supplemental feeder for raking material up said primary wedge-like feeder.

9. The combination of a reciprocating carriage, an inclined conveyer mounted on said carriage and pivoted to swing in a vertical plane, and a wedge-like feeder at the front of said conveyer adapted to lift material onto said conveyer on a forward movement of the carriage.

10. The combination of a reciprocating carriage, an inclined conveyer mounted on said carriage and pivoted to swing in a vertical plane, a wedge-like feeder at the front of said conveyer adapted to lift material onto said conveyer on a forward movement of the carriage, and a supplemental feeder for pulling up material over the wedge-like feeder.

11. The combination of a reciprocating carriage, an inclined conveyer mounted on said carriage and pivoted to swing in a vertical plane, a wedge-like feeder at the front of said conveyer adapted to lift material onto said conveyer on a forward movement of the carriage, and a supplemental reciprocating feeder for pulling material up the inclined face of said wedge-like feeder.

12. The combination of a traveling car, a reciprocating carriage, an inclined conveyer mounted thereon and comprising a fixed rear portion and a pivoted front portion, and a wedge-like feeder at the front of said conveyer adapted to slide under material to be loaded and deliver it onto the traveling mechanism of the conveyer on the forward thrust of the carriage.

13. The combination of a traveling car, a swiveling reciprocating carriage mounted on said car, an inclined conveyer mounted on said carriage, and a wedge-like feeder at the front of said conveyer adapted to slide under material to be loaded and deliver it onto the traveling mechanism of said conveyer on the forward thrust of said carriage.

14. The combination of a traveling car, a swiveling reciprocating carriage mounted on said car, an inclined conveyer mounted on said carriage, a wedge-like feeder at the front of said conveyer, adapted to slide under material to be loaded and deliver it onto the traveling mechanism of said conveyer on the forward thrust of said carriage, and a supplemental conveyer disposed on said car and adapted to receive material from the conveyer on said carriage.

15. The combination of a traveling car, a

swiveling reciprocating carriage mounted on said car, an inclined conveyer mounted on said carriage, a wedge-like feeder at the front of said conveyer adapted to slide under material to be loaded and deliver it onto the traveling mechanism of said conveyer on the forward thrust of said carriage, and a supplemental conveyer also mounted on said car and provided with a flaring hopper adapted to receive material from the conveyer on said arriage.

16. The combination of a traveling ca a reciprocating carriage supported thereby. means for swinging said carriage to the righ or left, an inclined conveyer mounted on said carriage, a wedge-like feeder at the front of said conveyer, and a supplemental conveyer on said car comprising an inclined front portion adapted to receive material from the conveyer on said carriage and a rearward extension adapted to overhang a car or other point of delivery.

17. The combination of a reciprocating carriage, an inclined conveyer mounted on said carriage and pivoted to swing in a vertical plane and provided at its front end with a wedge-like feeder adapted to lift material by a forward thrust onto said conveyer, and means for adjusting the inclination of said inclined conveyer.

18. The combination of a reciprocating carriage, an inclined conveyer mounted on said carriage and pivoted to swing in a vertical plane and provided at its front end with a wedge-like feeder adapted to lift material by a forward thrust onto said conveyer, means for adjusting the inclination of said inclined conveyer, and means for locking said pivoted conveyer in adjusted position.

19. A low loading-machine comprising a traveling car, a base swiveled thereon, a shoveling-conveyer supported on said swiveling base and having an elevating conveying mechanism and a wedge-like feeder at its front end, means on said car for thrusting said wedge-like feeder under the mass of material to be loaded, means for operating said conveying mechanism, the frame of said traveling conveyer comprising a stationary rear portion, and a front portion pivoted to swing in a vertical plane.

20. The combination of an inclined conveyer, a traveling support therefor, a wedge-like feeder at the front of said conveyer adapted by a wedge-like action on a forward thrust to slide under, lift and deliver material onto the traveling carrier of said conveyer, means for moving said conveyer forward to slide said feeder under the material to be loaded, and a supplemental wedge-like feeder reciprocating over said wedge-like feeder for raking material over it.

21. The combination of an inclined conveyer, a wedge-like feeder at the front thereof, a supplemental feeder, and means for reciprocating said supplemental feeder over the wedge-like feeder comprising two sectors engaging racks on said supplemental feeder, a crank-shaft, pitmen connecting the cranks of the crank-shafts with said sectors, and means for operating said crank-shafts.

22. The combination of an inclined conveyer, a wedge-like feeder at the front thereof, a supplemental feeder provided with slide-bars having rack-teeth, guides on the frame of the conveyer for said slide-bars, two sectors pivoted to swing on said conveyer and engaging said rack-teeth, and means for reciprocating said sectors.

23. The combination of a traveling car, a swiveling base supported thereon, a reciprocating carriage guided in ways of said base and carrying a shoveling-conveyer, a crank-shaft journaled in said base and provided with a crank, and a pitman connecting said crank with said reciprocating carriage to impart motion thereto.

24. The combination of an inclined conveyer, a traveling support therefor, a wedge-like feeder at the front of said conveyer adapted by a wedge-like action on a forward thrust to slide under, lift and deliver material onto the traveling carrier of said conveyer, means for moving said conveyer forward to slide said feeder under the material to be loaded, and means for holding said traveling support in fixed position.

25. The combination of a traveling car, a swiveling base supported thereon, a swiveling mechanism therefor, a reciprocating carriage guided in ways of said base, a reciprocating mechanism therefor, a shoveling-conveyer mounted on said carriage, a supplemental reciprocatory feeder for raking material onto said conveying mechanism of the shoveling-conveyer, a reciprocating mechanism for said supplemental feeder, a driving-shaft, and clutches connecting said mechanisms with said driving-shaft.

26. The combination of a conveyer, a primary wedge-like feeder at the front thereof, means for moving said conveyer forward to thrust said primary wedge-like feeder under material to be loaded, and a wedge-like supplemental feeder arranged to reciprocate over the inclined face of said primary wedge-like feeder for raking material up the inclined face thereof.

27. In a loading-machine, the combination of a conveyer, a shoveling-conveyer pivoted to the lower end of said conveyer, a transverse shaft supported in bearings attached to said conveyer and provided with pinions, toothed segments attached to said pivoted conveyer and engaged by said pinions, a stub-shaft journaled in alinement with said transverse shaft and provided with a worm-wheel, a worm-shaft provided with a

worm engaging said worm-wheel, a clutch for connecting and disconnecting said transverse shaft with said stub-shaft, the frame of said traveling conveyer comprising a fixed rear portion having curved front ends and a front portion pivoted to swing in a vertical plane and provided with curved lugs bearing on said curved front ends.

28. The combination of a traveling support, a conveyer supported thereon and pivoted to swing in a vertical plane, a wedge-like feeder for said conveyer disposed at the front thereof, mechanism for raising and lowering said pivoted conveyer, and a clutch for connecting and disconnecting said mechanism and said conveyer whereby the conveyer may be rendered automatically adjustable.

29. The combination of a traveling car, a swiveling base supported thereon, a swiveling mechanism therefor, a reciprocating carriage guided in ways of said base, a reciprocating mechanism therefor, a shoveling-conveyer mounted on said carriage, a driving-shaft, and clutches connecting said driving-shaft with the swiveling mechanism, and the reciprocating mechanism.

ANDREW JACKSON DOSS.

Witnesses:
J. H. RILEY,
J. WALTER GRAYBEAL