G. MANIERRE.

LOADING MACHINE.

APPLICATION FILED JUNE 28, 1916.

1,321,531.

Patented Nov. 11, 1919.

6 SHEETS—SHEET 1.

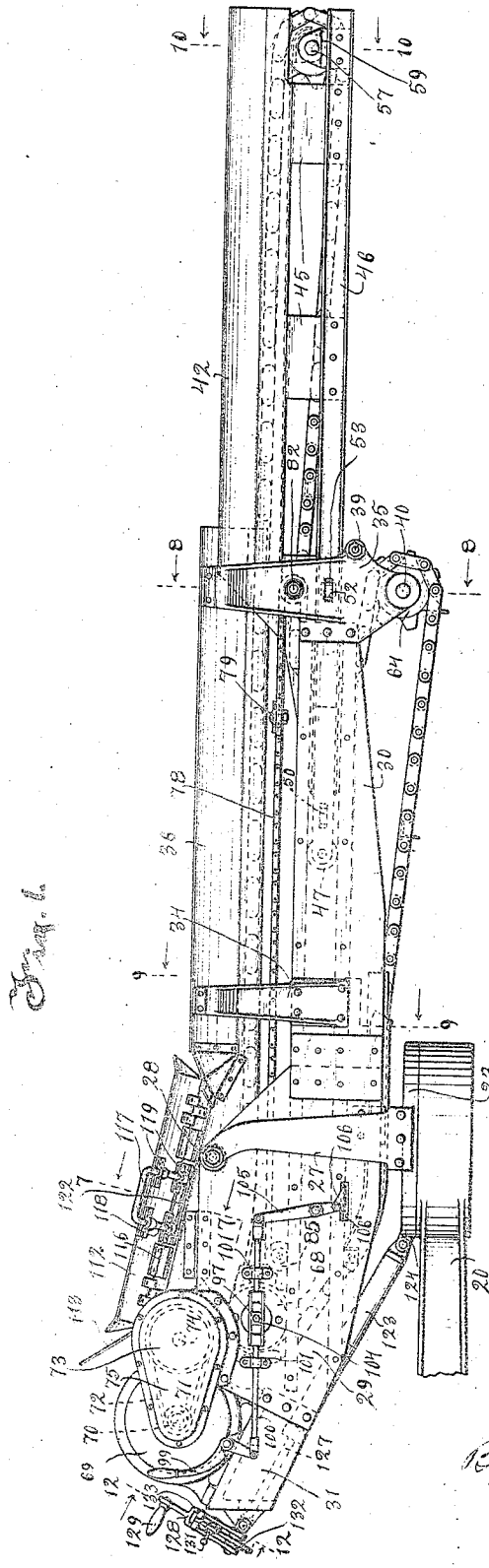


Fig. 1.

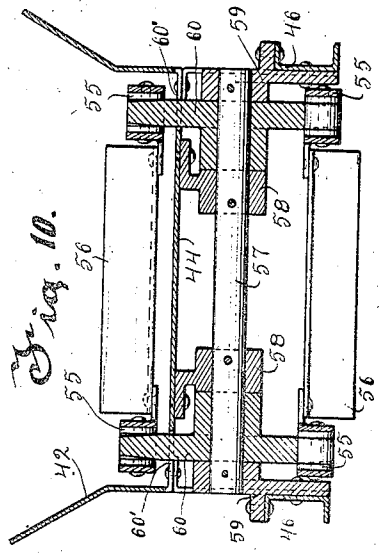


Fig. 10.

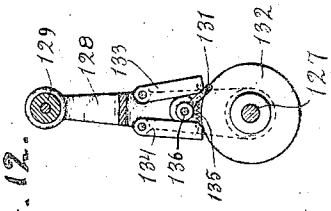


Fig. 12.

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6 SHEETS—SHEET 2.

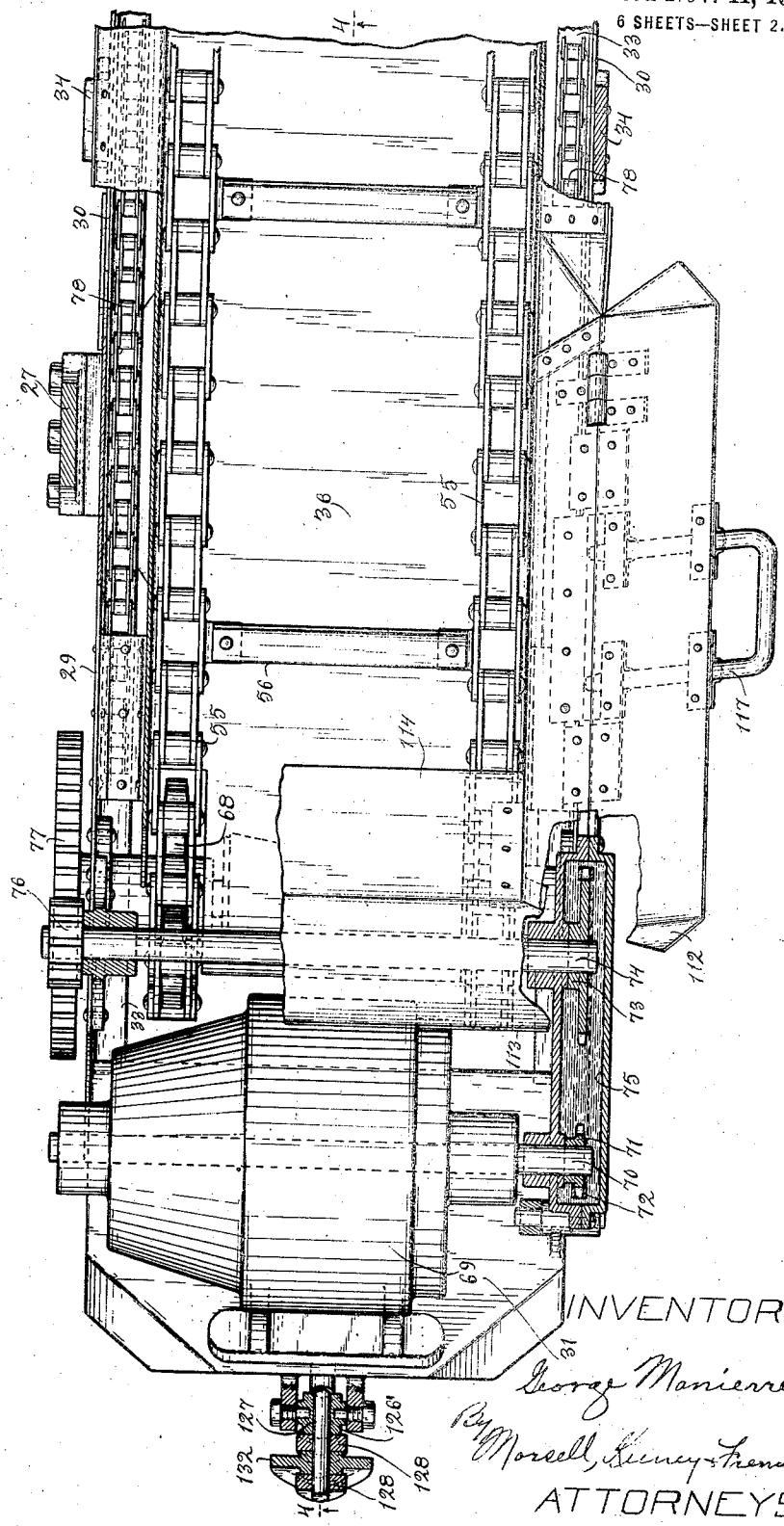


Fig. 2.

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6 SHEETS—SHEET 3.

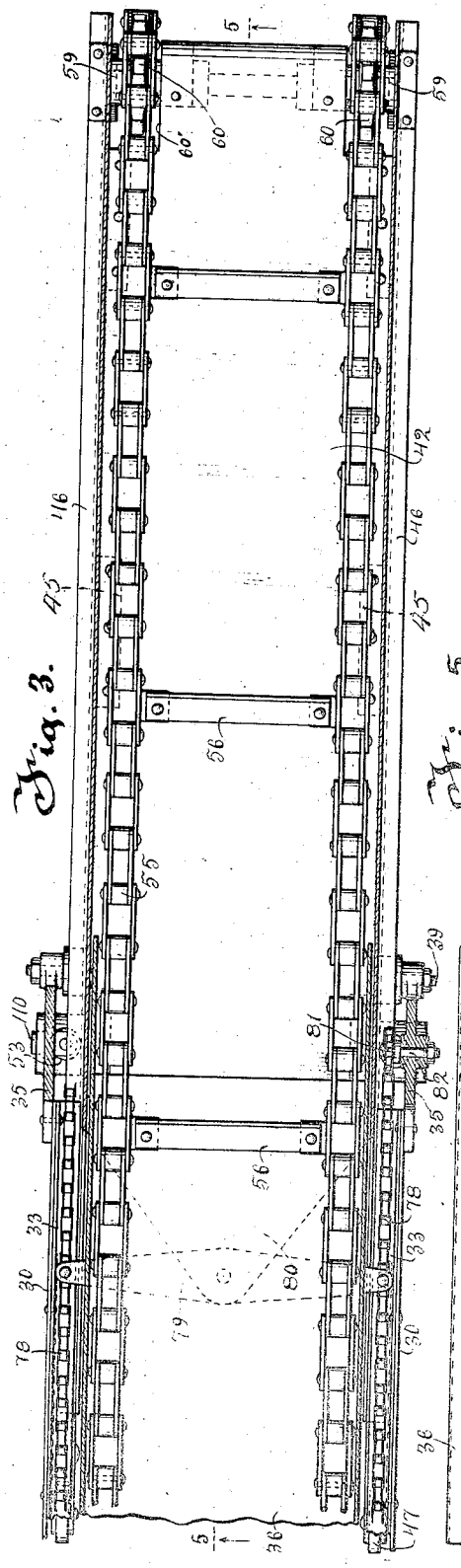


Fig. 3.

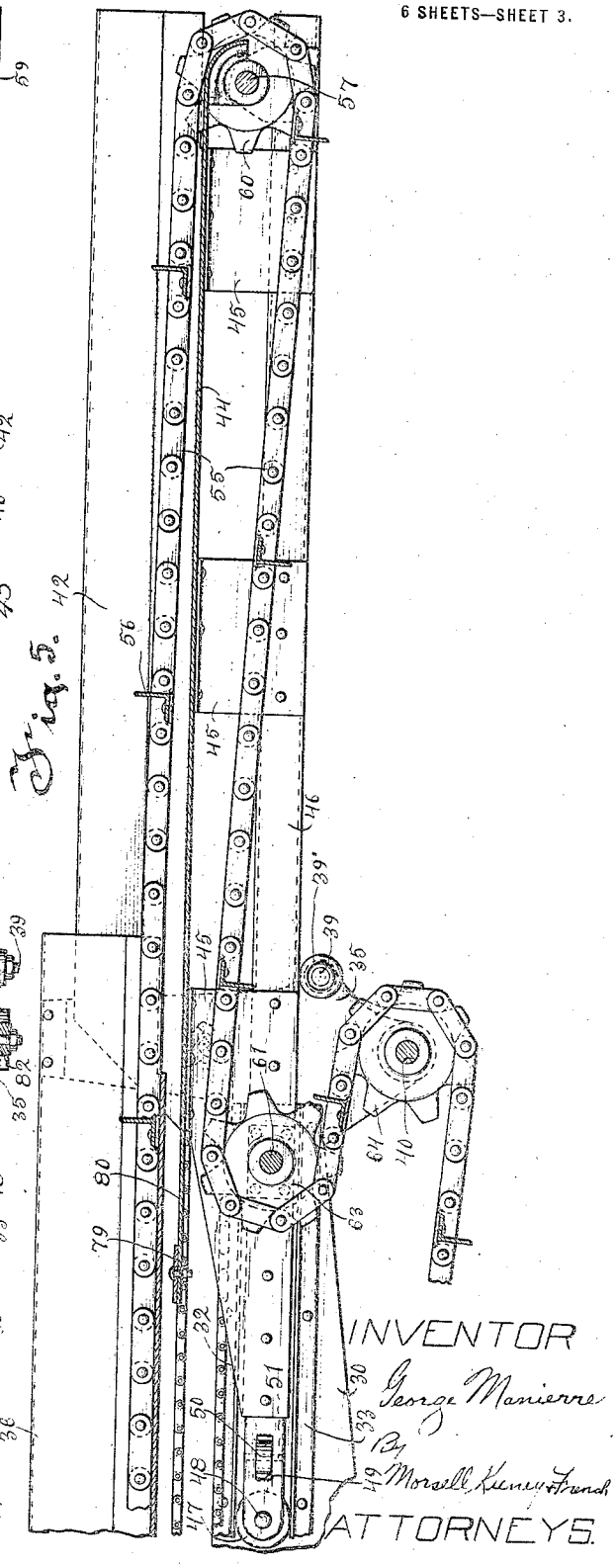


Fig. 5.

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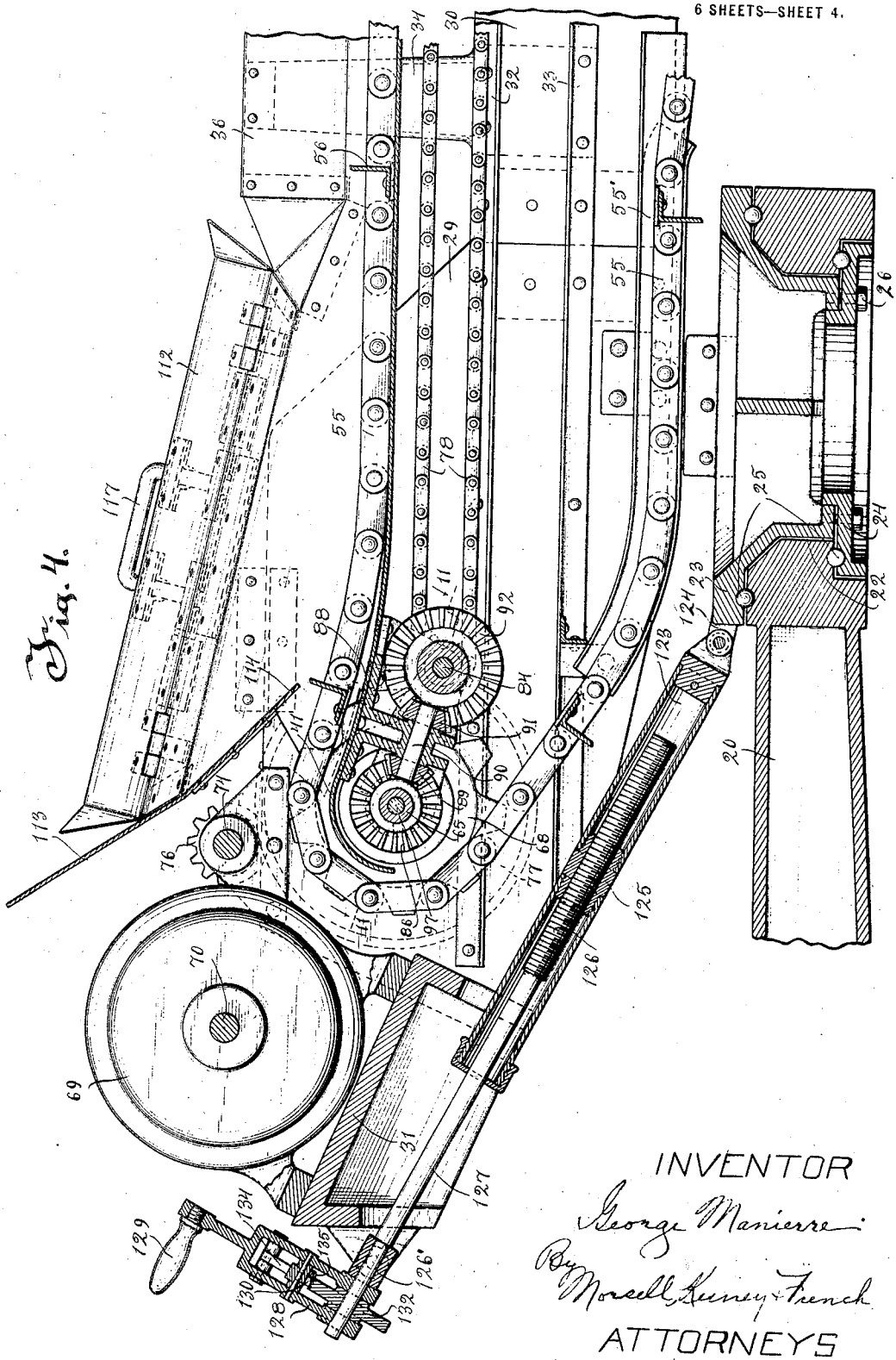
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6 SHEETS—SHEET 4.

Fig. 4.



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6 SHEETS—SHEET 5.

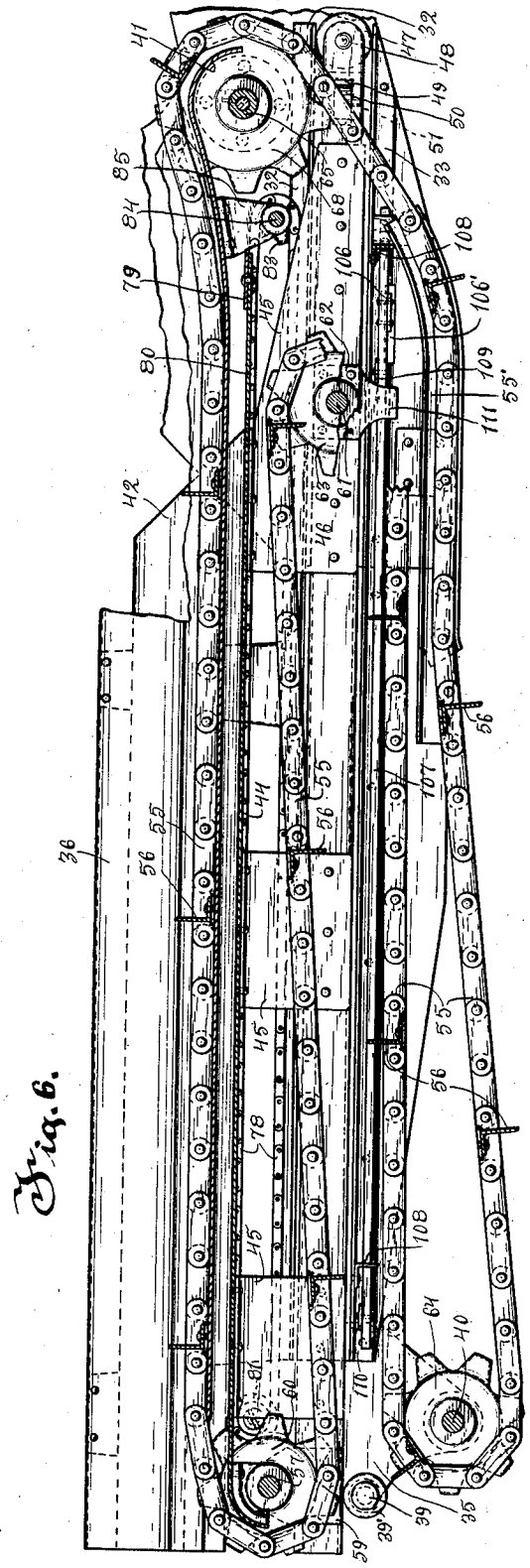


Fig. 6.

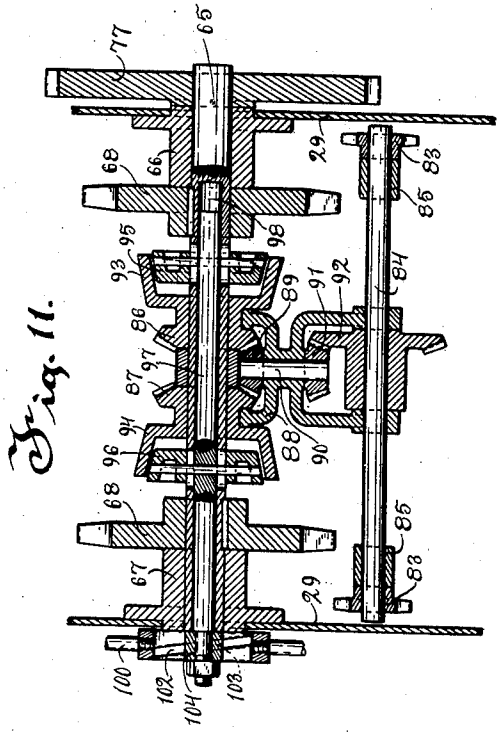


Fig. 11.

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6 SHEETS—SHEET 6.

Fig. 7

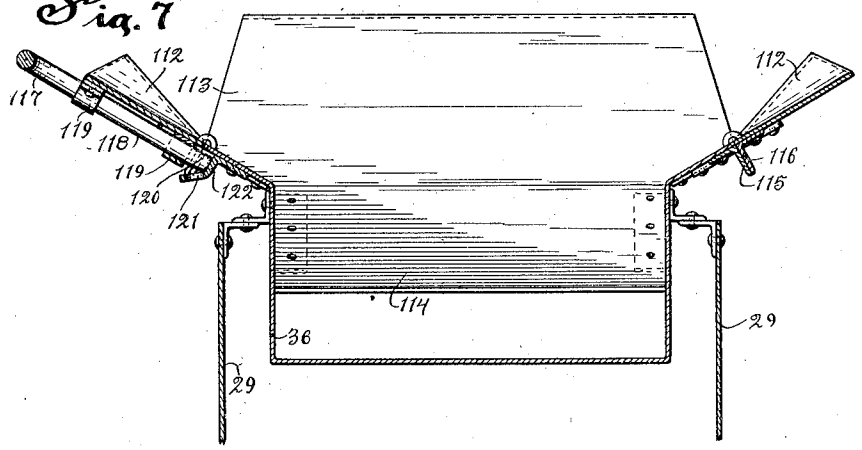


Fig. 8.

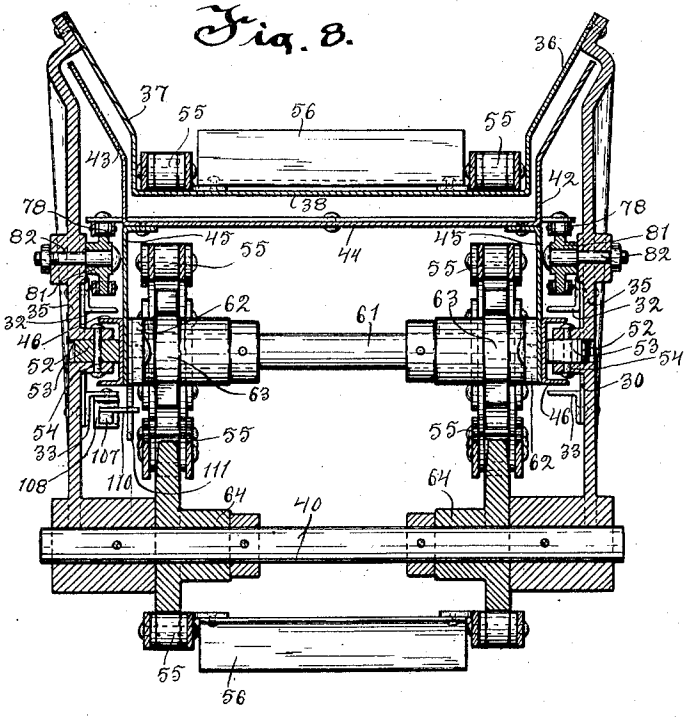
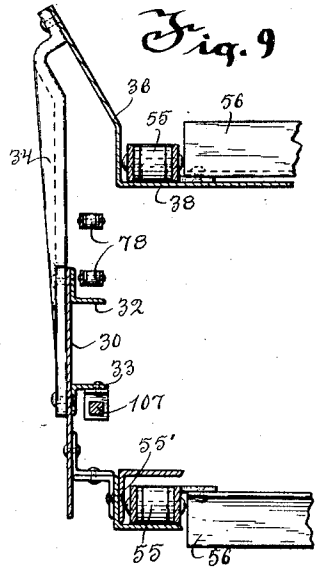


Fig. 9



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UNITED STATES PATENT OFFICE.

GEORGE MANIERRE, OF MILWAUKEE, WISCONSIN.

LOADING-MACHINE.

1,321,531. Specification of Letters Patent. Patented Nov. 11, 1919.

Application filed June 28, 1916. Serial No. 106,305.

To all whom it may concern:

Be it known that I, GEORGE MANIERRE, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented new and useful Improvements in Loading-Machines, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

The invention relates to box car loaders.

The invention is designed more particularly to provide a machine for loading coal, coke or other bulk material into the box car or other compartment not readily accessible.

The art of box-car loaders found its first exposition in mechanical shovelers and rotary or paddle wheel expellers. These sought to imitate the operation of hand shoveling but similiar to it, broke the coal, which breakage at the present time would amount to considerable loss per ton of coal loaded. It is one of the objects of the present invention to produce a loader which will transmit the material into the box car with minimum breakage loss.

A further object of this invention is to provide an extensible loader which in unextended position may be successfully projected through the door of a box-car and turned lengthwise thereof and which when so positioned within the car may be extended to bring the forward end of the conveyer at or near the end of the box-car to deliver the coal with a minimum amount of handling and breakage.

A further object of this invention is to provide means, operated by the driving means, for extending and shortening the working length of the conveyer.

A further object of this invention is to provide a loader having a fixed chute and an extensible chute, and an extensible conveyer for conveying the material along said chutes. With these and other objects in view, the invention consists in the several features hereinafter set forth and is more particularly defined by claims at the conclusion hereof.

In the drawings:

Figure 1 is an elevation of the device embodying the invention;

Fig. 2 is a plan view of a portion of the device, parts being broken away and parts being shown in section;

Fig. 3 is a plan view on a smaller scale than Fig. 2 of the other portion of the device, showing it in extended position, parts being broken away and parts being shown in section;

Fig. 4 is a section taken on the line 4—4 of Fig. 2;

Fig. 5 is a section taken on the line 5—5 of Fig. 3, parts being broken away;

Fig. 6 is a section similar to Fig. 5 showing the device in unextended position;

Fig. 7 is a section taken on the line 7—7 of Fig. 1;

Fig. 8 is a section taken on the line 8—8 of Fig. 1;

Fig. 9 is a detail section taken on the line 9—9 of Fig. 1;

Fig. 10 is a section taken on the line 10—10 of Fig. 1;

Fig. 11 is a section taken on the line 11—11 of Fig. 4; and

Fig. 12 is a section taken on the line 12—12 of Fig. 1.

The device comprises supporting means, a loader frame carried thereby, an endless conveyer mounted on said frame, means for driving said conveyer, means for varying the effective working length of the conveyer, means for feeding material to the conveyer, and means for raising and lowering said frame and conveyer.

The supporting means consists of a movable arm 20 which is adapted to be swung into and out of the car, a turn-table carried by said arm and a yoke mounted upon said turn-table. The turn-table consists of a support revolubly mounted in an enlarged apertured end 22 of the arm 20, Fig. 4. This support comprises base members 23 and 24 which have a ball bearing connection through the bearings 25 with the end 22 of the arm and which members have portions rotatably mounted in and upon said arm 20. Bolts 26 secure the member 24 to member 23. The yoke consists of two upright members 27 which are suitably secured at their lower ends to the base member 23 and carry pins 28 upon which the loader frame is swingingly mounted. This loader frame may be swung through its pivotal support upon the uprights in a vertical plane and be rotated in a horizontal plane through the turn-table connection with the end of the arm 20. This mounting of the loader frame in the manner above described enables it to be projected through the door of a box car and turned lengthwise thereof and permits it to be

raised and lowered within the car during the loading operation.

The loader frame comprises a main frame and an extensible frame slidably connected to the main frame.

The main frame consists of a pair of plates 29 pivotally mounted on the pins 28 and to the front portion of which longitudinally extending parallel side plates 30 are riveted and to the rear portion of which a supporting platform 31 is riveted, Fig. 1. The inner sides of the plates 29 and 30 are provided with upper and lower angled guide strips 32 and 33 which are riveted to said plates. Riveted to each side plate 30 adjacent the rear end thereof are upright brackets 34, Figs. 1 and 9. Riveted to the forward end of each side plate 30 are upright brackets 35, Figs. 1 and 3. Secured to the upper ends of the brackets 34 and 35 and disposed between each pair of brackets is a main delivery chute 36 having inclined sides 37 and a bottom portion 38. The chute 36 extends rearwardly and is secured to the side plates 29, the bottom portion 38 extending beyond the sides and being curved upwardly and then downwardly at its end 41, Figs. 4 and 7. The forward brackets 35 are braced apart by a transversely extending brace rod 39 carrying a roller 39′ and also by a transversely extending shaft 40.

The extensible or auxiliary frame comprises a chute 42 having inclined sides 43 and a bottom portion 44, said chute being secured to a plurality of upright angled side plates 45 to the outer sides of which are riveted lower channel guide members or strips 46. The ends of the strips 46 have their flanges cut away to receive vertically disposed guide rollers 47 revolubly mounted on pins 48 in said ends and are slotted at 49 to receive horizontally disposed guide rollers 50 rotatably mounted on pins 51 in said ends, Fig. 5. The upright brackets 35 on the main frame are slotted as at 52 to receive horizontally disposed rollers 53 journaled on pins 54 mounted on said brackets, said rollers 53 adapted to contact with the web of the channel guides 46, Fig. 8. The vertical rollers 47 of the extensible frame run on the horizontally extending flange portions of the angled guides 32 and 32 of the main frame and the horizontally disposed rollers 50 on said extensible frame and the horizontally disposed rollers 53 on the main frame coöperate to properly guide the extensible frame with respect to the main frame, said extensible frame being adapted to be telescoped within the main frame as shown in Figs. 5, 6 and 8, the chute 42 on the extensible frame being disposed below the chute 36 of the main frame and running between said chute and the brackets 34 and 35.

The endless conveyer comprises a pair of parallel disposed spaced apart endless chains 55 which are provided along their length with spaced apart transversely extending angled pusher blades 56, said chains running for a portion of their length along the bottom of said chutes near the sides thereof and supported for varying the extensible working length in a manner now to be described. The extensible frame is provided with a transversely extending shaft 57 fixedly mounted in depending brackets 58 secured to the front portion of the bottom of the chute 42 and also to brackets 59 mounted on the front portion of the channel strips 46. Journaled on the shaft 57 are a pair of spaced apart sprockets 60 which project up through slots 60′ in the bottom of the chute 42 and which are adapted to receive the chains 55, Fig. 10. Said extensible frame is also provided with a transversely extending shaft 61 journaled in bearing brackets 62 near the rear end of said frame and carrying sprockets 63 for receiving the chains 55, Figs. 6 and 8. As previously stated the shaft 40 is mounted in the brackets 35 of the main frame and said shaft has sprockets 64 journaled thereon to receive the chains 55, Fig. 6. A shaft 65 is journaled in members 66 and 67 secured to the side plates 29 of the main frame, said shaft carrying sprockets 68 for receiving the chain 55, Fig. 11. Thus the chains 55 pass from the sprockets 68 forwardly over the bottom of the chute 36 and over the bottom of the chute 42, when said chute is extended, over the sprockets 60, then backwardly and over the sprockets 63 and thence over the sprockets 64 and thence backwardly to the sprockets 68, Figs. 4, 5 and 6. The lower run of the chain 55 runs in channel guides 55′ secured to the main frame. With this construction the upper portion of the conveyer between the sprockets 68 and 59 forms the effective working length of the conveyer and this length is varied by moving the extensible frame inwardly or outwardly with respect to the main frame which results in a decrease or increase of the effective working length of the conveyer, which decrease or increase is taken care of by the sprockets 60, 63 and 64, the sprockets 63 being so disposed as to form a loop in the conveyer, the position of which loop may be varied by the movement of the extensible frame with respect to the main frame and the consequent movement of the sprockets 63 with respect to the sprockets 64. Thus when the auxiliary or extensible frame is telescoped within the main frame, as shown in Fig. 6 the machine may be swung into position within the car, and as the auxiliary frame is extended the portions of the chains between the sprockets 63 and 64 shorten thereby permitting the upper working portion

of the conveyer to be corresponding lengthened, Figs. 1, 5 and 6.

The means for driving the conveyer comprises a variable speed motor 69 mounted upon the supporting platform 31 of the loader frame and whose shaft 70 carries a sprocket 71 which is connected through an endless chain 72 with a sprocket 73 mounted on a shaft 74 journaled in bearings on the plate 29, said sprockets 71 and 73 and chain 72 running in an oil bath in the gear case 75, Figs. 1 and 2. The shaft 74 carries a gear 76 which meshes with a gear 77 on the shaft 65, Figs. 2 and 11. Resultantly, the rotation of the shaft 65 through the motor and gearing just described causes the conveyer to move over the sprockets and chutes previously described, and the speed of the belt may be varied by varying the speed of the motor which is under the control of the operator. In this machine the weight of the motor and its end of the loader frame counterbalances the weight of the other end of the loader frame when said extensible frame is in telescoped position. The means of varying the effective working length of the conveyer comprises the extensible frame with the sprockets mounted thereon and operating as described and means for moving said frame outwardly or inwardly.

This means for moving the auxiliary frame comprises endless chains 78 on both sides of the machine which are secured to a draft link 79 secured to an extension 80 of the bottom portion 44 of the chute 42 Figs. 3 and 5. Each of these chains are mounted on sprockets 81 pivotally secured on stud pins 82 in the brackets 35 and on sprockets 83 mounted on a shaft 84 journaled in brackets 85 secured to the bottom of the chute 36, Figs. 4, 6, 8 and 11. Resultantly movement of the chains 78 upon the sprockets 81 and 83 will cause the extensible frame to travel inwardly or outwardly depending upon the direction of movement of said chains.

The chains 77 are driven from the motor 69 through a reversible driving connection between the shaft 65 and the shaft 84. This connection comprises oppositely disposed bevel gears 86 and 87 loosely mounted on the shaft 65 and journaled in a bracket 88 secured to the bottom of the chute 36, which gears are in mesh with a bevel gear 89 mounted on a shaft 90 journaled in said bracket 88 and carrying a gear 91 in mesh with a gear 92 in the shaft 84. The direction of drive is reversed by locking either one of the gears 86 and 87 to the shaft 65, Fig. 11. This is accomplished by providing the gears 86 and 87 with friction drums 93 and 94 and friction disks 95 and 96 upon a shaft 97 slidably but non-rotatably mounted in the bore 98 of the shaft 65 so that said shaft 97 may be moved with respect to the shaft 65 to bring the desired disk into engagement with its drum to rotate the shaft 64 through the gearing just described in the desired direction. The shaft 97 is adapted to be moved with respect to the shaft 65 by means of a hand lever 99 pivotally mounted on the platform 31 and pivotally connected to an apertured rod 100 slidably mounted in brackets 101 at the side of the loader frame, which rod is provided with a cam 102 in the aperture thereof which engages in a groove 103 in a block 104 secured to the shaft 84. A rearward movement of the lever 99 moves the rod 100 forwardly, the shaft 97 outwardly and the disk 95 into engagement with the drum 93 for the gear 86 which through the gearing connection previously described drives the chain to move the extensible frame outwardly and on a forward movement of the lever 99 moves the rod 100 forwardly, the shaft 97 inwardly and the disk 96 into engagement with the drum 94 for the gear 36 which through the gearing connection drives the chain to move the extensible frame inwardly. In midposition of the lever both gears 86 and 87 are loose on the shaft 65.

In order that the extensible frame cannot be moved beyond predetermined extreme positions means for automatically stopping the rotation of the shaft 84 are provided. This means comprises a connection between the rod 100 and the extensible conveyer to throw the rod 100 to midposition when the conveyer reaches either of its extreme positions, Figs. 1 and 6. This means consists of a lever 105 pivotally mounted intermediate its ends to the side of the loader frame, pivotally connected at one end to front end of the rod 100 and pivotally connected at its other end to a plate 106 projecting through a hole 106′ in the plate 29 and secured to a rod 107 slidably supported in brackets 108 in the main frame and provided with fingers or lugs 109 and 110 near its ends, which lugs are adapted to be respectively engaged by a lug 111 carried near the rear end of the extensible frame. When the lug 111 strikes the lug 109 when the extensible frame has reached its innermost position it moves the rod 107 rearwardly and through the plate 106, lever 105, rod 100, and block 104 moves the shaft 84 to midposition and when said lug 111 strikes the lug 110 when the extensible frame has reached its extended position the shaft 86 is likewise moved to midposition to stop the drive. It will be noted that the means for moving the extensible frame is driven by the motor through the shaft for driving the conveyer so that the conveyer is driven as the extensible frame moves outwardly or inwardly in the loader frame.

The means for feeding the material to the

conveyer comprises an open ended hopper Figs. 4 and 7. This hopper consists of side plates 112 hingedly secured to the rear portion of the sides 37 of the chute 36, means for securing said plates 112 in different positions of adjustment and a back plate 113 riveted to the sides of the chute 36 and having its lower portion 114 extending down to a position in front of the sprockets 68 and above the upper run of the chains 55, Fig. 4. The means for adjusting the position of the plates 112 with respect to the sides of the chute 36 comprise angled plates 115 secured to outer sides of the chute 36 and adapted to abut against angle plates 116 secured to the outer sides of the plates 112 so that said plates 112 will form a continuation of the sides of the chute in one position of adjustment, as shown in Fig. 7 and the plates 112 are also adapted to be disposed at an angle to the sides of the chute 36 by securing them in upright position through handle members 117, the sides 118 of which are slidably mounted in clips 119 on the back of the plates 112 and are provided with tapered end portions 120 which are adapted to be inserted into openings 121 in angled members 122 on the sides of the chute, Fig. 7.

The means for raising and lowering the loader frame comprises a cylindrical arm 123 pivotally connected at one end to lugs 124 on the base member 23 and provided with a threaded member 125 through which runs the threaded end 126 of a shaft 127 Figs. 2 and 4, journaled in a block 126′ pivotally connected to the supporting platform 31. By varying the position of the member 125 on the arm 123 with respect to the shaft 127 the loader frame may be raised or lowered as desired and this is accomplished by means for rotating the shaft 127 in either direction. This means consists of a crank 128 loosely mounted on the shaft 127 and provided with a handle 129 and means for locking said crank to turn with said shaft in either direction. This means consists of frictional clutch fingers 133 and 134 pivotally mounted at opposite sides of the crank, said fingers being connected together by a spring 135, and means for permitting either one of said fingers to engage with a disk 132 on the shaft 127. This means consists of a cam 135 journaled in a pin 136 carried by the crank 128 and provided with an operating handle 130. The cam 138 lifts one of the clutch fingers away from the disk while the other is in engagement with it and each clutch finger permits the disk and therefore the shaft 127 to be turned in one direction only. Thus when the finger 134 engages the disk, the shaft 127 may be turned to the left to lower the front end of the loader frame and when the finger 133 engages the disk the shaft 127 may be turned to the right to raise the front end of the loader frame and when neither clutch finger is in the shaft 127 cannot be turned.

It will be noted that the clutch fingers 134 and 133 also coöperate with the disk 132 to form a pawl and ratchet mechanism whereby the crank 128 may be oscillated to turn the shaft 127. I provide this pawl and ratchet connection for the reason that when the rear of the loader frame is down it sometimes happens that the operator cannot turn the crank 128 all the way around to turn the shaft 127 and consequently the ratchet fingers 134 and 133 permit rotating the shaft 127 by a movement of the crank 128 in a confined space.

The operation of the machine in brief is as follows: The machine with the extensible frame telescoped therein, is swung in the car door by means of the arm 20 and is turned on the turn table so as to be disposed lengthwise of the car and so that the delivery chute (not shown), which may be brought into the car from either side connects with the hopper and the operator then adjusts the conveyer to the proper horizontal position by either lowering or raising it through the turning of the shaft 127 from the crank handle 129. Then he may start the motor 69 and drive the conveyer to fill up to some extent the middle of the car after which by the manipulation of the lever 99 he may extend the working length of the conveyer its full length through the movement of the auxiliary frame to extreme position and then load the end of the car and gradually decrease the working length of the conveyer by moving the auxiliary frame inwardly as the car becomes filled.

The invention thus exemplifies a car loader which may be swung into position within a box-car or other compartment and whose working length may be increased so as to convey the material to the ends of the car and whose working length may be gradually decreased as the car is loaded.

What I claim as my invention is:

1. In a box car loader, the combination, with a support, of a loader frame mounted thereon comprising a main frame and an extensible frame, an endless conveyer carried by said loader frame, a motor mounted on the loader frame for driving the conveyer, means driven by the motor for moving said extensible frame inwardly and outwardly, controlling means for said frame moving means, and means for automatically stopping said extensible frame moving means when said extensible frame has moved to either of its extreme positions.

2. In a box car loader, the combination, with a movable support, of a loader frame swingingly mounted thereon comprising a main frame and extensible frame slidably

mounted on the main frame, an extensible endless conveyer carried by said frames, a motor mounted on the loader frame for driving the conveyer, means for moving the extensible frame inwardly or outwardly, a driving connection between said extensible frame moving means and said motor, a clutch for said driving connection, and means for automatically operating said clutch when the extensible frame reaches its extreme inward or outward position.

3. In a box car loader, the combination, with a movable support, of a main loader frame swingingly mounted thereon and provided with longitudinally extending trackways, an extensible loader frame including channel side members, horizontally disposed rollers on the main frame engaging the sides of the channel members, a vertically disposed roller on the main frame engaging the bottom of the channel members, vertically disposed rollers on said channel members movable on said trackways, and horizontally disposed rollers on said channel members engaging the sides of the main frame, conveyer carrying supports mounted on said frames, an extensible endless conveyer carried by said supports, means for driving the conveyer, and means for moving the extensible frame.

4. In a box-car loader, the combination, with a movable support, of a loader frame mounted thereon comprising a main frame and an extensible frame slidably mounted on the main frame, conveyer shafts mounted on said frames, an extensible endless conveyer mounted on said shafts, a motor mounted on the main frame, a driving connection between said motor and one of said shafts, said motor driven shaft having a hollow bore therein, a clutch shaft slidably mounted within the bore, means for moving the extensible frame, a reversible driving connection between said extensible frame-moving-means and said motor-driven shaft controlled by said clutch shaft, and a sliding shaft and a cam for operating said clutch shaft.

5. A box car loader of the class described including a main frame, an extensible frame carried thereby, an endless conveyer carried by said main and extensible frames, a motor mounted on the main frame, a shaft driven by said motor and having a bore therein, means connected with said shaft for operating the conveyer, a shaft slidably but non-rotatably mounted in the bore of said other shaft, a clutch member freely journaled on said other shaft, a second clutch member mounted on said other shaft and connected with said slidably-mounted shaft, means connecting said extensible frame with said freely-journaled clutch member, and means for sliding said slidably-mounted shaft to engage and disengage the clutch member, whereby the extending of the extensible frame is controlled.

In testimony whereof, I affix my signature.

GEORGE MANIERRE.