

No. 738,114.

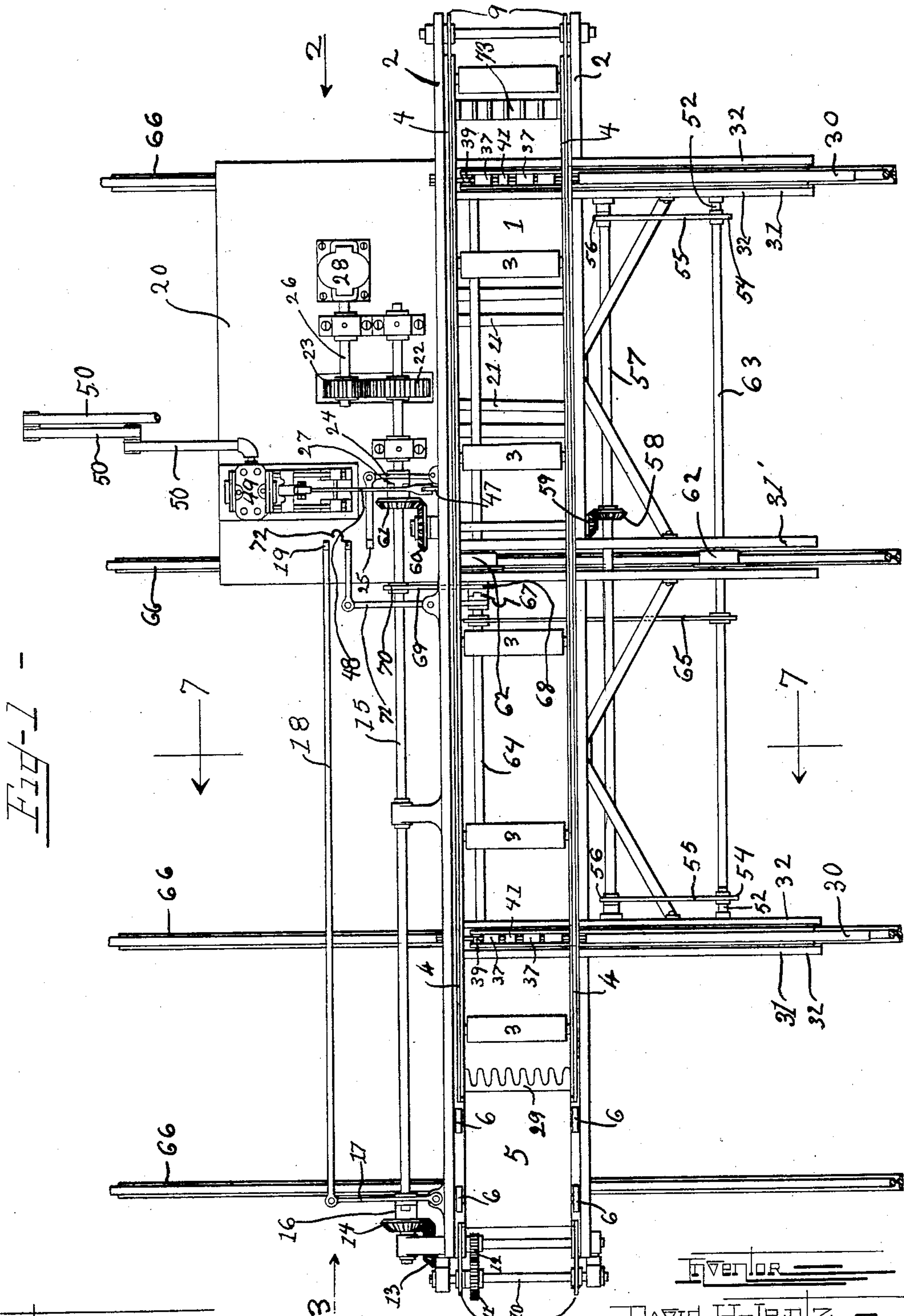
PATENTED SEPT. 1, 1903.

D. H. LENTZ.  
CHARGING MACHINE.

APPLICATION FILED FEB. 20, 1901. RENEWED AUG. 8, 1903.

NO MODEL.

5 SHEETS—SHEET 1.



Witnesses  
Milton M. Alexander.  
Herbert F. Oberfell.

INVENTOR  
DAVID H. LENTZ  
BY Charles A. Brown & Cragg  
ATTORNEYS

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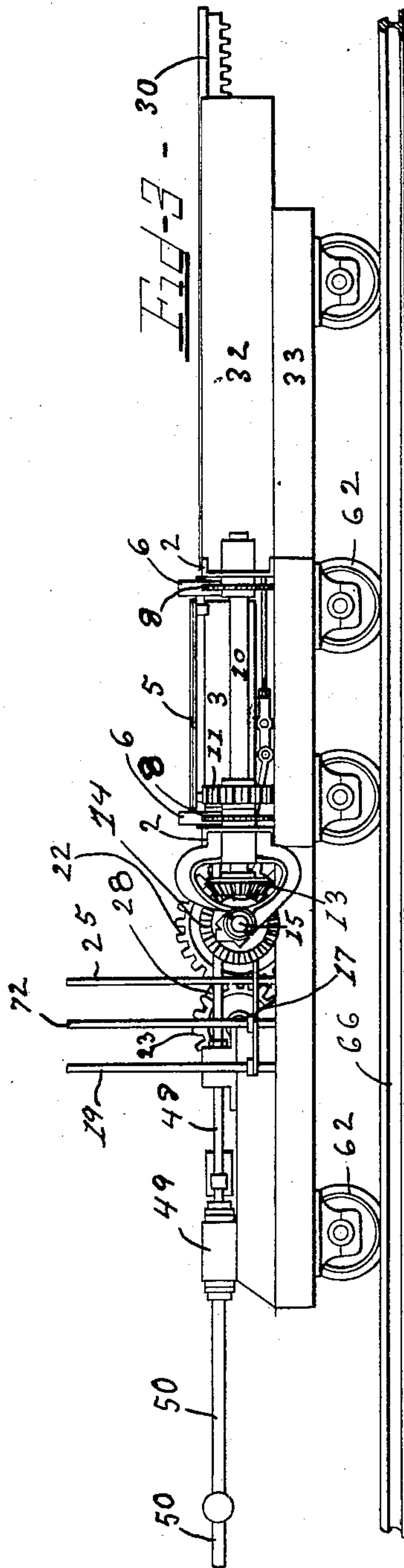
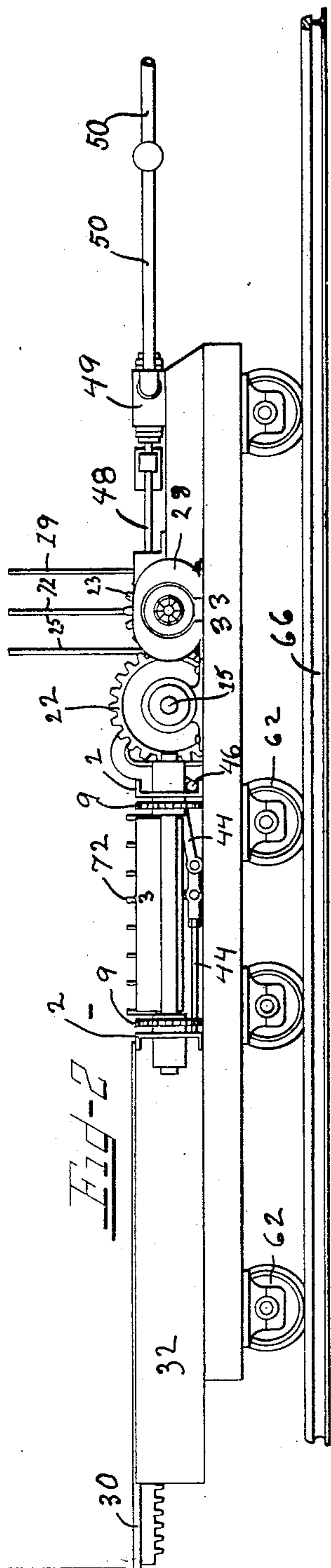
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5 SHEETS—SHEET 2.



Witnesses  
Milton M. Alexander  
May W. Label.

INVENTOR  
DAVID H. LENTZ  
BY Charles A. Brown & Cragg  
ATTORNEYS.

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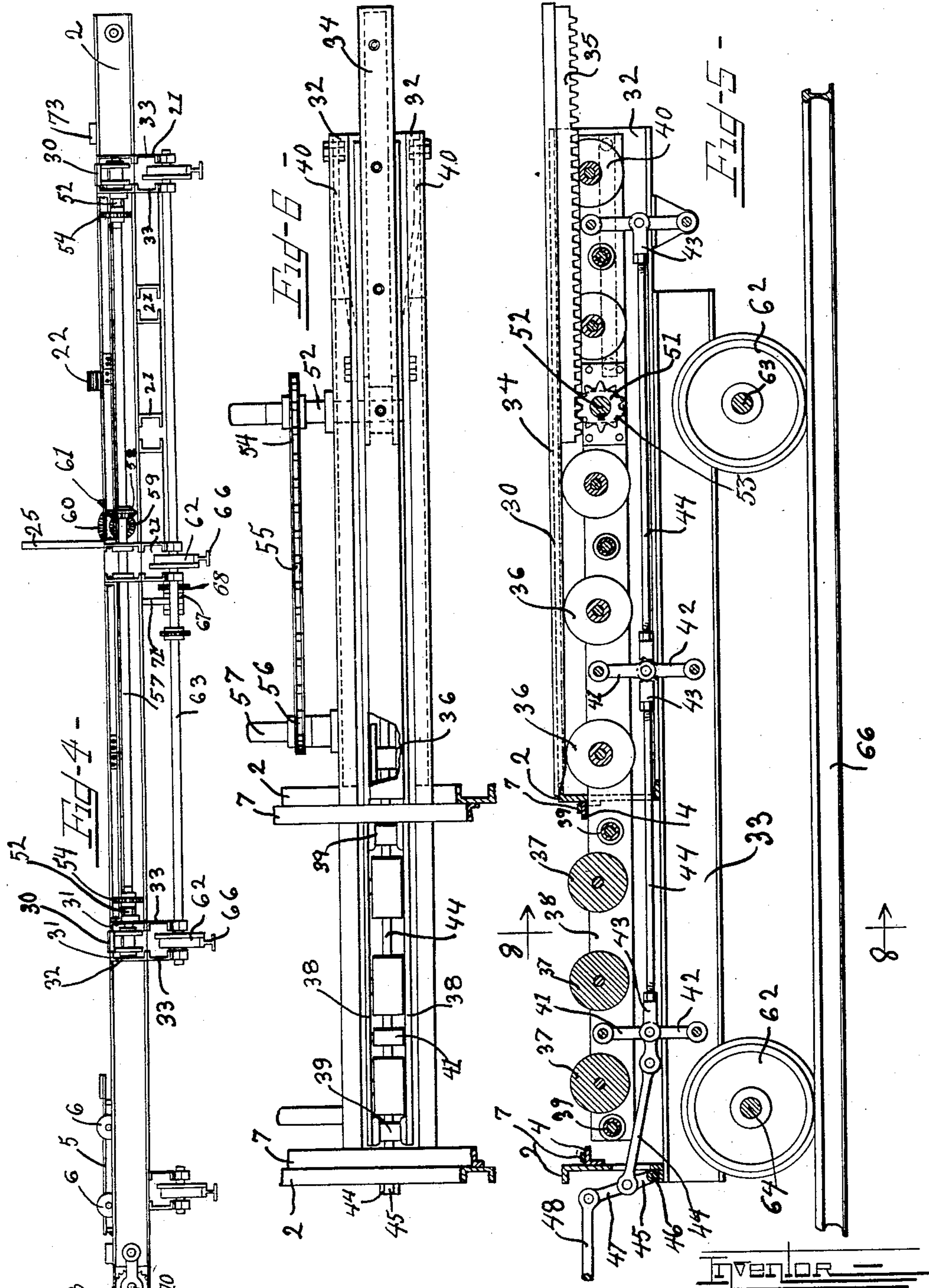
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5 SHEETS—SHEET 3.



WITNESSES -  
Milton M. Alexander.  
Max W. Label.

BY *Charles A. Brown & Cragg*  
ATTORNEYS



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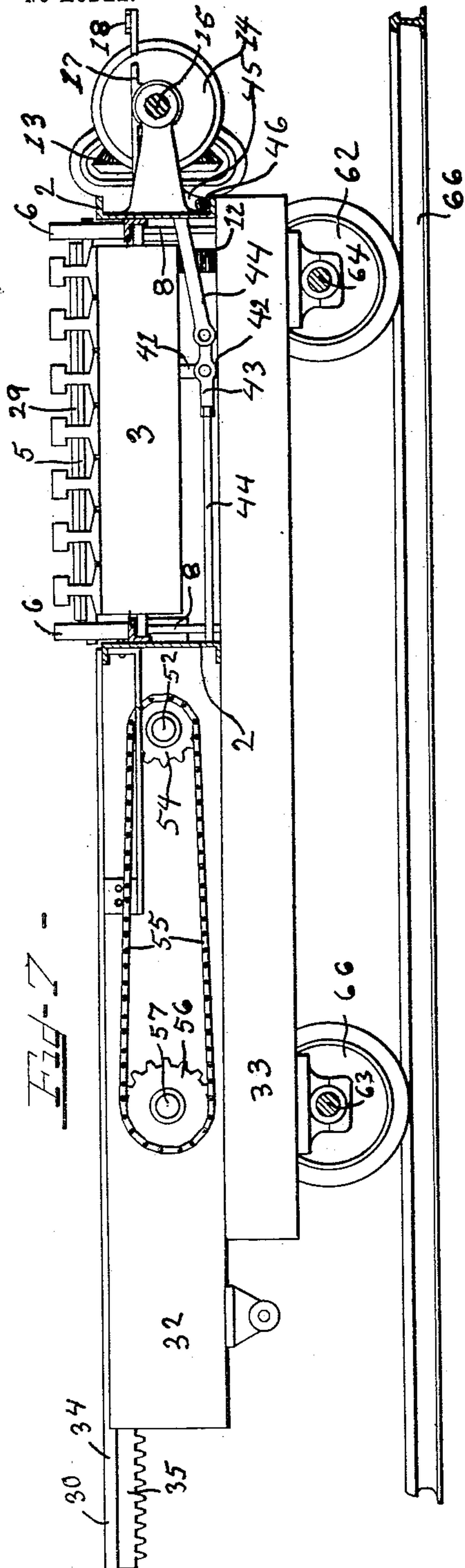
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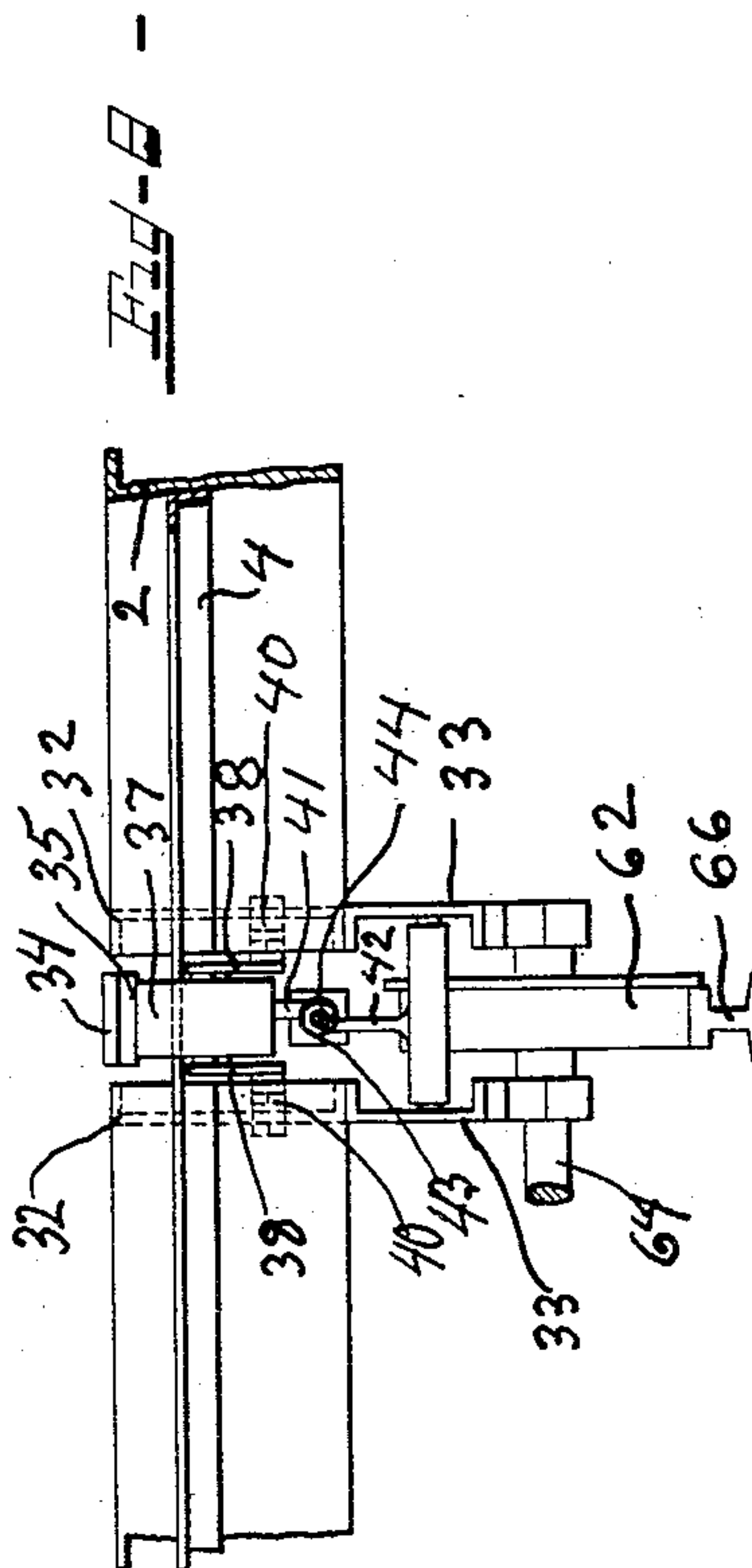
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5 SHEETS—SHEET 4.

NO MODEL.



WITNESSES -  
Milton M. Alexander.  
May H. Label.



INVENTOR  
DAVID H. LENTZ  
BY Charles A. Brown & Cragg  
ATTORNEYS

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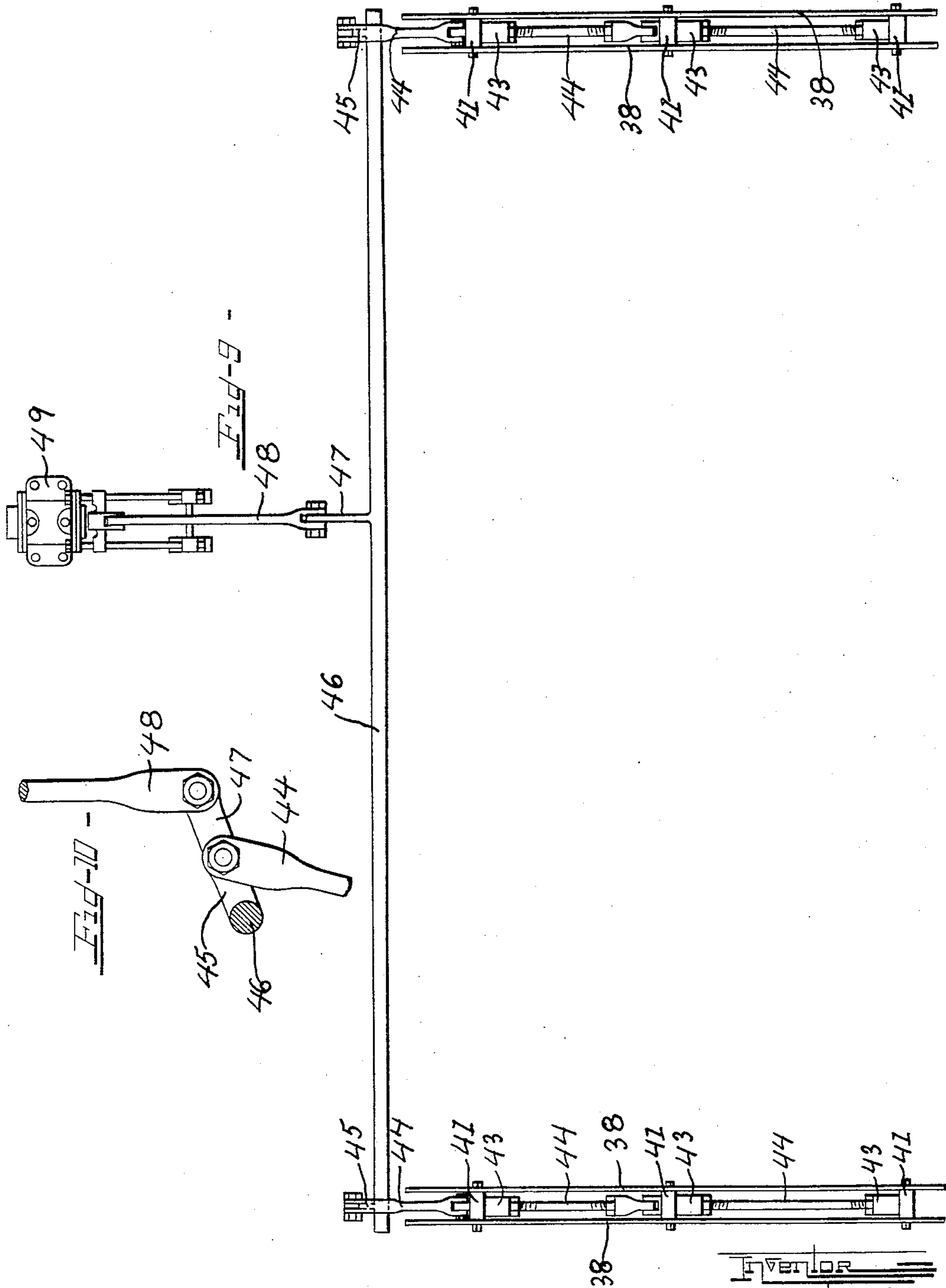
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NO MODEL.

5 SHEETS—SHEET 5.



Witnesses —

Milton M. Alexander.  
Max W. Zabel.

By Charles A. Brown & Cragg  
Attorneys.



# UNITED STATES PATENT OFFICE.

DAVID H. LENTZ, OF JOLIET, ILLINOIS, ASSIGNOR, BY MESNE ASSIGNMENTS,  
TO AMERICAN MCKENNA PROCESS COMPANY, OF MILWAUKEE, WISCONSIN,  
A CORPORATION OF WISCONSIN.

## CHARGING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 738,114, dated September 1, 1903.

Application filed February 20, 1901. Renewed August 8, 1903. Serial No. 168,763. (No model.)

*To all whom it may concern:*

Be it known that I, DAVID H. LENTZ, a citizen of the United States, residing at Joliet, in the county of Will and State of Illinois, have invented a certain new and useful Improvement in Charging-Machines, (Case No. 10,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to charging-machines, and has for its object the provision of an improved machine for the manipulation of steel rails or other manufactures, whereby the same may be charged into a furnace.

Primarily the invention relates to that class of machines which are adapted to charge worn or otherwise impaired steel rails into a furnace prior to heating such rails, after which said rails may be passed through roll-trains to restore them to their desired cross-section.

My invention is of course applicable for use in connection with bars or rods of iron of cross-sections other than those of a steel rail, and I do not limit my invention for use solely with steel rails.

Generally speaking, my invention consists in the provision of a plurality of parallelly-movable transfer-tables which are adapted to receive steel rails or other bars of iron and support the same throughout their length. The steel rails upon the transfer-tables are conveyed by means of said tables over a plurality of preferably horizontally-mounted idlers. When in position over the idlers, the transfer-tables are simultaneously lowered, thus depositing the steel rails upon said idler-rollers, after which the transfer-tables again recede to their former position, the steel rails remaining upon said idlers. Means are then employed to charge the rails deposited upon said idlers over said idlers and into a furnace placed at one end of the row of idlers. The means for propelling the steel rails is then returned to its original position, and a new supply of rails is again laid upon the idlers by means of said transfer-tables. The second consignment may then also be

charged into the furnace. In this manner a continuous operation of the charging-machine is effected. The transfer-tables and idler-rollers are preferably movably mounted in one integral structure, the transfer-tables preferably moving transversely to the roller-bed. The whole structure is mounted upon suitable wheels and is adapted to operate upon suitable tracks provided for said wheels, so that the driving-machine is movable bodily in front of a row of furnaces into which rails are to be charged.

It is the further object of my invention to facilitate the rapid working of the machine and to automatically perform operations which had previously to be performed by hand. To this end I provide an operating-table, preferably integrally united with the frame of the machine, upon which all levers and operating mechanism are placed, so that one attendant may cause the operation and actuation of any part of the charging-machine, thereby saving the expense of additional attendants. I prefer to employ a cat-ract-engine to effect the raising and lowering of the transfer-tables.

Further objects and advantages of my invention will be apparent from the construction which I will now describe in detail in connection with the accompanying drawings, illustrating the preferred embodiment thereof, in which—

Figure 1 is a plan view of a charging-machine constructed in accordance with my invention. Fig. 2 is an end view of the machine looking in the direction of arrow 2 of Fig. 1. Fig. 3 is an end view of the same machine looking in the direction of arrow 3 of Fig. 1. Fig. 4 is a side view of the apparatus illustrated in Fig. 1. Fig. 5 is a cross-sectional view through one of the transfer-table-supporting mechanisms, illustrating the method of raising and lowering said transfer-table. Fig. 6 is a top view of the transfer-table illustrated in Fig. 5, parts thereof being broken away to more clearly reveal features of construction. Fig. 7 is a cross-sectional view on line 7 7 of Fig. 1. Fig. 8 is a cross-sectional view on line 8 8 of Fig. 5. Fig. 9 is a detail



view of the transfer-table-operating mechanism. Fig. 10 is a detail view of the shaft and levers for effecting the operation of the toggle-joints.

5 Like characters of reference indicate like parts throughout the different views.

The machine of my invention consists, in its preferred embodiment, of framework 1, comprising two parallel channels 2 2 of suitable length to accommodate rails or other material adapted to be charged into a furnace. 10 Rollers 3 3, preferably all in a horizontal plane, are disposed throughout the length of the frame 1, the said rollers being in this instance idlers, and adapted to support the material to be charged into a furnace or other chamber. Angles 4 4 are attached to the inner surface of the channels 2 2, the length of 15 said angles being sufficient to provide a track or carrying-surface for a car or pusher 5. The car is provided with four wheels 6 6, adapted to engage the angles 4 4, and is drawn over said angles by means of chains 7 7, each fastened at their two ends to the opposite extremities of the car 5. The chains 7 each 25 pass about sprocket-wheels, provided at the opposite extremities of the frame 1. The sprocket-wheels 8 8 are preferably fixedly secured to the shaft 10, which shaft is also provided with a gear-wheel 11, engaging a second gear-wheel 12, rotatable on the same shaft with a bevel-gear 13. The bevel-gear 13 has toothed engagement with a second bevel-gear 14, driven through the agency of 35 a shaft 15. A clutch 16 is interposed between the shaft 15 and gear 14 and is thrown into and out of engagement by means of a lever 17. The operation of the lever 17 is effected by a connecting-bar 18, united to a hand-lever 19, which hand-lever is mounted 40 upon an attendant's table 20, placed at one side of the frame 1 and supported by means of four channels 21, said channels being continuous under the frame 1. Shaft 15 is driven by means of a gear 22, having toothed engagement with a second gear 23, mounted 45 upon shaft 26 and driven by means of a motor 28. Power is also supplied by said shaft 15 through the agency of a clutch mechanism 27, said clutch mechanism being thrown into and out of engagement by means of a lever 24, controlled by hand-lever 25, preferably placed adjacent to the hand-lever 19, so that the levers are within easy reach of an attendant. It will thus be seen that in order to operate the car 5 clutch 16 must be thrown into engagement, which is effected by means of the lever 19. In order to reverse the direction of travel of the car, the motor 28 may be 60 reversed, or clutch mechanism, which is not herein shown, may be employed which will effect such reversal, thereby returning the car 5 to its starting-point.

65 Rails or other material adapted to be charged into a chamber may when deposited upon the rollers 3 3 be moved forwardly by

the car 5, which engages the web of the rails when the machine is being used to charge rails, as most clearly shown in Fig. 7. To increase the effectiveness with which the car 70 may engage the ends of the rails and to more perfectly retain rails in alinement, I provide upon said car 5 a recessed plate 29, the recesses of said plate corresponding in number to the number of rails to be moved at one time. 75

In order to convey and deposit rails upon the rollers 3 3, I employ transfer-tables 30 30, movable transversely with respect to the frame 1. The transfer-tables 30 are movable longitudinally within and are supported 80 by a framework 31, comprising two parallelly-mounted channels 32 32, displaced sufficiently to permit the inclusion between the same of the operating mechanism for said transfer-tables. The channels 32 are supported by 85 channels 33 33, which latter channels project through and under the frame 1, being secured thereto in any suitable manner. A third framework 31' is employed, but has not associated therewith an operating-table 30, the 90 purpose of said framework being more clearly set forth hereinafter. The operating-tables 30 are adapted simultaneously to move transversely of the frame 1 and convey rails to the idlers 3, the construction of the transfer-tables being such that the same may be elevated 95 when in a retracted position with rails placed thereon, the said tables being then moved transversely toward the frame 1 until the rails are over the idlers 3. The transfer-tables are 100 then depressed, depositing the rails upon the idlers 3, and are then retracted to their original position. The car 5 is then adapted to charge the rails into the furnace or other chamber adapted to receive them. 105

The construction of the transfer-table and the controlling mechanism therefor will be more clearly understood by referring particularly to Figs. 5 and 6. The transfer-table 30 consists, preferably, of a flat rectangular plate 110 34, provided along a portion of its under surface with a rack 35, which is of less width than the width of the plate 34. The table 30 is movable over grooved idlers 36 36 and solid idlers 37 37. The grooved rollers enable the 115 rack 35 to pass between the outside flanges thereof, so that the same does not interfere with the movement of the table 30 over said rollers 36. The rack does not move forward a sufficient distance to come into close proximity 120 to the idlers 37, and for this purpose I construct them of solid material. The idlers 36 and 37 are mounted within a framework comprising two horizontal and parallelly-mounted plates 38 38, which plates are preferably 125 secured in alinement by means of distance-pieces 39 39. The frame comprising the plates 38 is bodily movable vertically, thus vertically moving the idlers 36 37, together with the transfer-table 30. In order to prevent a 130 sidewise and likewise a transverse movement with respect to the frame 1 of said frame com-



prising the plates 38, I provide pivotally-mounted connecting-bars 40 40, each pivotally secured to a channel 32 and a plate 38. The plates 38 are supported by means of preferably three toggle-joints, each comprising two levers 41 42, the said levers being hinged together and respectively secured to the plates 38 and the channels 33. It will thus be seen that the vertical position of the plates 38, and consequently of the transfer-table 30, is governed by the angle between the two levers 41 and 42—that is, when the two levers are both in a vertical position said movable framework is at its highest position, whereas if the said levers are displaced from their vertical position toward an inclined position the said movable frame is lowered, depending upon the amount of inclination of said levers. In order to effect this inclination of the levers, I employ a connecting-bar 43, pivotally secured to each one of said levers, which is movable transversely to the frame 1 and which is connected by means of a rod 44 and a crank 45 to a shaft 46. The shaft 46 runs, preferably, lengthwise of the machine and is connected by means of a crank 47 to the connecting-rod 48 with a cataract-engine 49. The said cataract-engine is mounted upon the attendant's table 20 and supplied with steam by means of a flexible joint comprising pipes 50 50. The length of stroke of the engine is preferably so chosen that a movement of the piston through its complete stroke effects the required elevation of the transfer-table 30, and a movement of the piston its full length in the reverse direction effects the required lowering of said table. The engine is preferably placed close to the levers 19 and 25, so that one attendant may attend to the control of said engine and effect the operation of said levers. The operation of the cataract-engine is such that when the table 30 is in its retracted position the same is raised by means of said engine, then moved forwardly, and when in its forward position lowered by means of said engine and then retracted to its original position, when it is again raised to its former elevated position by means of said cataract-engine 49. The forward movement of the table 30 is effected through the agency of the before-mentioned rack 35 and a pinion 51, mounted upon a driving-shaft 52. The driving-shaft 52 is secured to the plates 38 and passes through a recess 53, provided in one of the channel members 32, the recess permitting the shaft to move vertically therein when the plates 38 are raised and lowered. The shaft 52 is provided with a sprocket-wheel 54, which engages a chain 55. The two chains 55 are driven by sprocket-wheels 56 56, fixedly secured to a shaft 57, said shaft being provided with a bevel-gear 58. The rotation of the shaft 57 is effected by means of a second bevel-gear 59 and a second pair of bevel-gears 60 and 61, bevel-gear 60 being fixedly secured with respect to

gear 59, and bevel-gear 61 is brought into engagement with the shaft 15 by means of a clutch mechanism 27. In order thus to effect a forward and backward movement of the transfer-tables 30, clutch mechanism 27 must be operated by means of the hand-lever 25 to throw the bevel-gear 61 into engagement with shaft 15, whereby the shaft 57 is operated to effect a rotation of the chains 55 55. It will be apparent that as chains are employed to transmit the power from the shaft 57 to the shafts 52 a forward movement of said shafts 52 is permissible without disarranging the driving mechanism. Driving-wheels 62 are mounted below the frames 31 31 and the frame 31' and are fixedly secured to a shaft 63. Additional driving-wheels 62 62 are mounted below the frame 1 and fixedly secured to a shaft 64. The shafts 64 and 63 are preferably connected by means of a chain 65. In order now to remove the whole frame bodily in front of a furnace, I provide rails 66 66, upon which said driving-wheels 62 are adapted to operate. The whole framework of the machine upon which all the operating parts are mounted is thus movable, and to control the movement thereof I provide a clutch mechanism 67 and a sprocket-wheel 68 upon said shaft 64, said clutch mechanism serving to connect the sprocket 68 with said shaft. The sprocket-wheel 68 is driven by means of a chain 69 engaging a sprocket-wheel 70, fixedly secured to the shaft 15. The actuation of the clutch mechanism 67 is effected by means of a lever 71, pivotally secured to a hand-lever 72. A guide-frame 73 is mounted at the forward end of the frame 1 to preserve the alinement of rails to be charged.

The operation of the machine will now be apparent. Rails are placed upon the transfer-tables 30 when the said transfer-tables are in their retracted position. In this position the tables 30 are elevated to their highest point, which is slightly above the upper surface of the idlers 3. In order to transfer the rails onto the idlers 3, the transfer-tables 30 are moved forwardly upon actuation of the hand-lever 25 until the rails to be charged are over the idlers 3. It will be seen that seven rails may be charged at one time by use of the construction illustrated in the drawings, but that the transfer-tables 30 are adapted to receive a greater number of rails at one time. In order now to deposit the rails upon the idlers 3, the cataract-engine 49 is operated to effect the depression of the transfer-tables 30 through the operation of the toggle-joints employed in connection therewith. Some of the rails upon the transfer-tables 30 are deposited upon the idlers 3, the remaining rails being deposited upon the upper edges of the channels 32 in a position adjacent to the frame 1. The transfer-tables remain depressed until they are moved backward to their former horizontal position, where they are raised to the position shown



in Fig. 5, and in thus rising they pick up the rails which had previously been deposited on the tops of the channels 32 adjacent to the frame 1. More rails may now be laid upon the transfer-tables at their outermost extremities. After a supply of rails has been deposited upon the idlers 3 car 5 is propelled forward by means of the chains 7 7 upon actuation of the hand-lever 19 to charge the rails into the furnace or other chamber adapted to receive them. The car 5 is then returned to its initial position, and more rails may be deposited upon the idlers 3 by the transfer-tables 30. The whole charging-machine may then be moved bodily, if desired, to charge the second consignment of rails at a different place in the furnace, and to effect this movement of the charging-machine lever 72 may be actuated, as previously described.

I have herein shown and particularly described one embodiment of my invention; but it will be apparent that many embodiments may be constructed without departing from the spirit of my said invention. I do not, therefore, wish to limit myself to the precise construction and arrangement as herein shown; but,

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a machine for charging rails or other material, the combination with a transfer-table adapted to receive rails, of a guideway adjacent to said transfer-table, adapted to receive rails from said transfer-table, means for raising said transfer-table to elevate the same above said guideway, means for moving said transfer-table to place the rails within said guideway, means for depressing said transfer-table, thereby lowering the rails into said guideway, means for causing a reverse movement of said transfer-table, and a car for propelling said rails along said guideway and into a receiving-chamber, substantially as described.

2. In a machine for charging rails or other material, the combination with a transfer-table adapted to receive rails, of a guideway adjacent to said transfer-table, adapted to receive rails from said transfer-table, means for raising said transfer-table to elevate the same above said guideway, means for moving said transfer-table to place the rails within said guideway, means for depressing said transfer-table, thereby lowering the rails into said guideway, means for causing a reverse movement of said transfer-table, a car for propelling said rails along said guideway and into a receiving-chamber, a supporting-frame within which said guideway and said transfer-table are mounted, rails over which said frame is adapted to operate, and means for causing a movement of said supporting-frame over said rails, substantially as described.

3. In a machine for charging rails or other material, the combination with a transfer-

table adapted to receive rails, of a guideway adjacent to said transfer-table, adapted to receive rails from said transfer-table, a bed of rollers provided in said guideway, means for raising said transfer-table to elevate the same above said rollers, means for moving said transfer-table to place the rails within said guideway, means for depressing said transfer-table, thereby lowering the rails onto said rollers, means for causing a reverse movement of said transfer-table, and a car for propelling said rails along said guideway and into a receiving-chamber, substantially as described.

4. In a machine for charging rails or other material, the combination with a transfer-table adapted to receive rails, of a guideway adjacent to said transfer-table, adapted to receive rails from said transfer-table, a bed of rollers provided in said guideway, means for raising said transfer-table to elevate the same above said rollers, means for moving said transfer-table to place the rails within said guideway, means for depressing said transfer-table, thereby lowering the rails onto said rollers, means for causing a reverse movement of said transfer-table, a car for propelling said rails along said guideway and into a receiving-chamber, and a supporting-frame within which said transfer-table and said guideway are mounted, substantially as described.

5. In a charging-machine, the combination with a transfer-table, of a guideway arranged transversely to said transfer-table, said transfer-table being adapted to deposit rails or other material on said guideway preparatory to charging into a furnace, means for moving said transfer-table toward and away from said guideway, toggle-joints to effect a raising and lowering of said transfer-table, relative to said guideway, and means for causing an actuation of said toggle-joints, substantially as described.

6. In a charging-machine, the combination with a transfer-table, of a guideway arranged transversely to said transfer-table, said transfer-table being adapted to deposit rails or other material on said guideway preparatory to charging into a furnace, means for moving said transfer-table toward and away from said guideway, toggle-joints to effect a raising and lowering of said transfer-table, relative to said guideway, means for causing an actuation of said toggle-joints, and a catalyst-engine for operating said toggle-joints, substantially as described.

7. In a charging-machine, the combination with a transfer-table, of a guideway arranged transversely to said transfer-table, said transfer-table being adapted to deposit rails or other material on said guideway preparatory to charging into a furnace, means for charging said rails from said guideway into a furnace, means for moving said transfer-table toward and away from said guideway, toggle-



5 joints to effect a raising and lowering of said transfer-table, relative to said guideway, means for causing an actuation of said toggle-joints, and a cataract-engine for operating

raising and lowering said frame to effect a raising and lowering of said supporting-plate, 50 and means for operating said toggle-joints, substantially as described.

8. In a charging-machine, the combination with a transfer-table, of a guideway arranged transversely to said transfer-table, said transfer-table being adapted to deposit rails or 10 other material on said guideway preparatory to charging into a furnace, means for charging said rails from said guideway into a furnace, means for moving said transfer-table toward and away from said guideway, toggle-joints to effect a raising and lowering of 15 said transfer-table, relative to said guideway, means for causing an actuation of said toggle-joints, a cataract-engine for operating said toggle-joints, and a frame for said guideway and said transfer-table, substantially as 20 described.

9. In a charging-machine, the combination with a guideway, of means for charging rails or other material from said guideway into a 25 furnace or other receiving-chamber, transfer-tables adapted to deposit rails within said guideway, means for moving said transfer-table toward or away from said guideway, toggle-joints for effecting a raising or lowering of said transfer-table, a framework for 30 said guideway and said transfer-table, a cataract-engine mounted upon said frame and adapted to operate said toggle-joints, and means for moving said framework bodily in front of a furnace, substantially as described. 35

10. In a transfer-table, the combination with a supporting-plate, of means for effecting a longitudinal movement of said plate, toggle-joints for raising and lowering said plate, 40 means for operating said toggle-joints, and a framework to which said toggle-joints are fixedly secured, substantially as described.

11. In a transfer-table, the combination with a supporting-plate, of rollers upon which 45 said supporting-plate is adapted to be operated, a rack, a pinion, gear mechanism for operating said plate, a frame within which said rollers are mounted, toggle-joints for

12. In a transfer-table, the combination with a supporting-plate, of rollers upon which said supporting-plate is adapted to be operated, a rack, a pinion, gear mechanism for 55 operating said plate, a frame within which said rollers are mounted, toggle-joints for raising and lowering said frame to effect a raising and lowering of said supporting-plate, 60 and a cataract-engine for operating said toggle-joints, substantially as described.

13. In a machine of the class described, the combination with a chute, of a transfer-table movable transversely of said chute for de- 65 positing rails or other material therein, lever mechanism for raising and lowering said transfer-tables, whereby the same are adapted to convey said material toward and into said chute, an engine for causing the raising and 70 lowering of said transfer-table, and propelling mechanism movable longitudinally of said chute, for discharging the said material therefrom, substantially as described.

14. A charging-machine, comprising a 75 framework, motor mechanism for causing a movement of said charging-machine, a chute provided in said charging-machine, a transfer-table mounted upon said charging-machine for receiving material to be charged and 80 periodically depositing the same within the chute, motor mechanism for operating the said transfer-table, lever mechanism for raising and lowering the said transfer-table, and propelling means moving longitudinally of 85 said chute to discharge the material deposited therein by the transfer-table, substantially as described.

In witness whereof I hereunto subscribe my name this 11th day of February, A. D. 90 1901.

DAVID H. LENTZ.

Witnesses:

HARVEY L. HANSON,  
HERBERT F. OBERGFELL.