

J. H. BLOOM.
FERTILIZER DISTRIBUTER.
APPLICATION FILED MAR. 3, 1908.

935,579.

Patented Sept. 28, 1909.

5 SHEETS—SHEET 1.

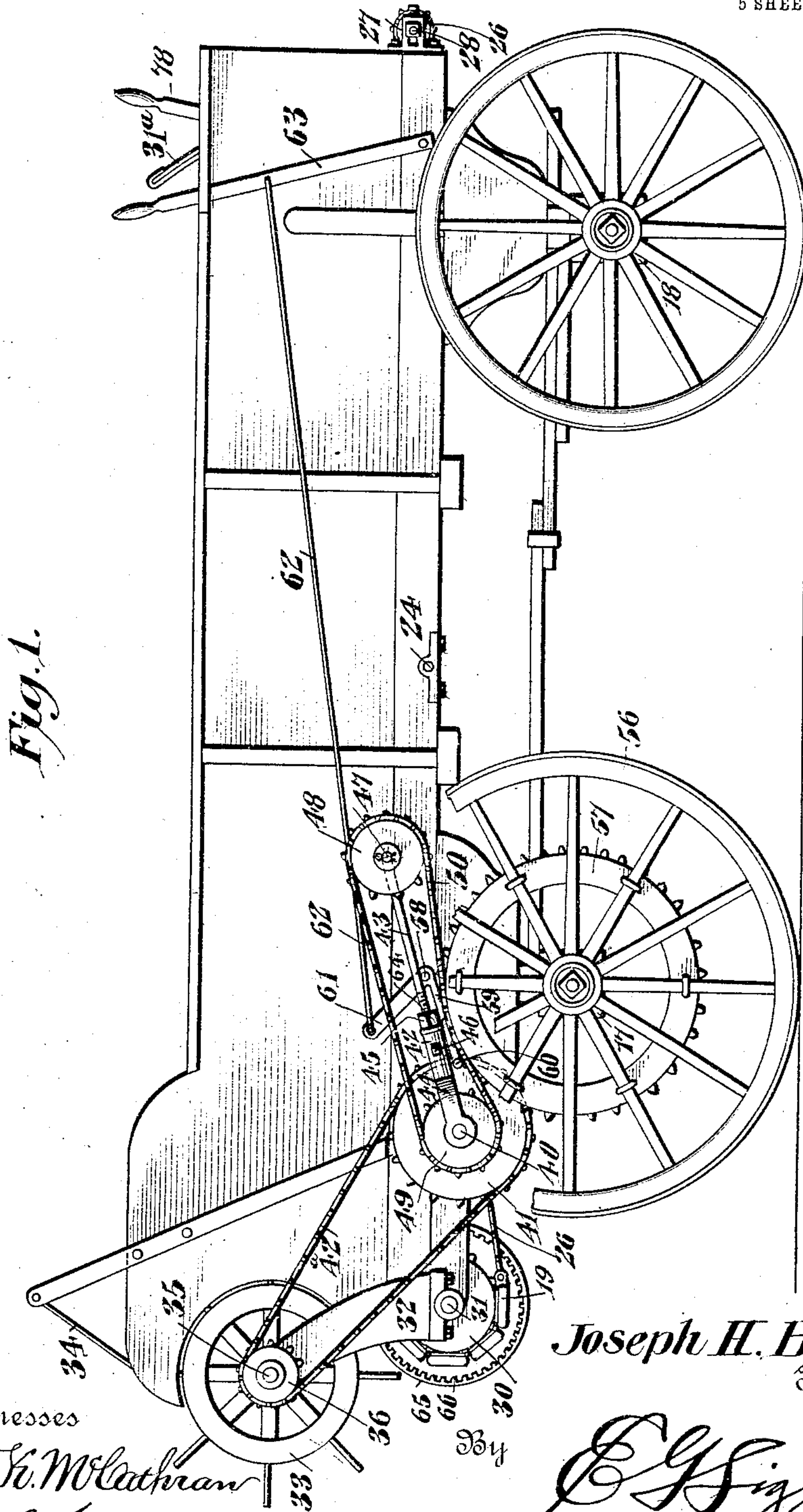


Fig. 1.

Witnesses
Jas. E. McLaughlin
B. L. Felt

Joseph H. Bloom,
Inventor

E. G. Siggers
Attorney

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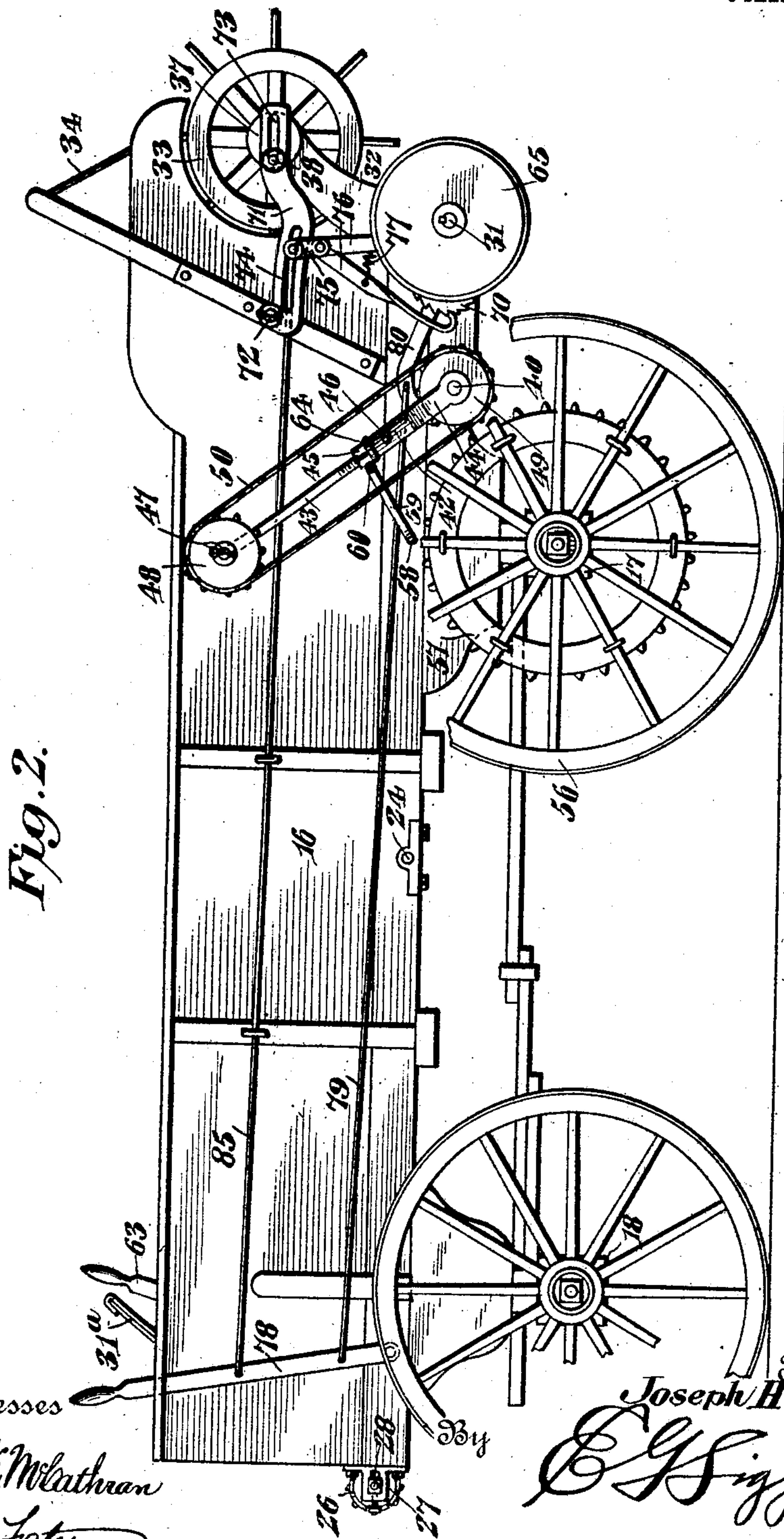


Fig. 2.



Fig. 16.



Fig. 15.

Witnesses
Jas. K. McElathran
B. L. Fetter

Inventor
Joseph H. Bloom,
E. G. Siggers
Attorney

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5 SHEETS—SHEET 3.

Fig. 3.

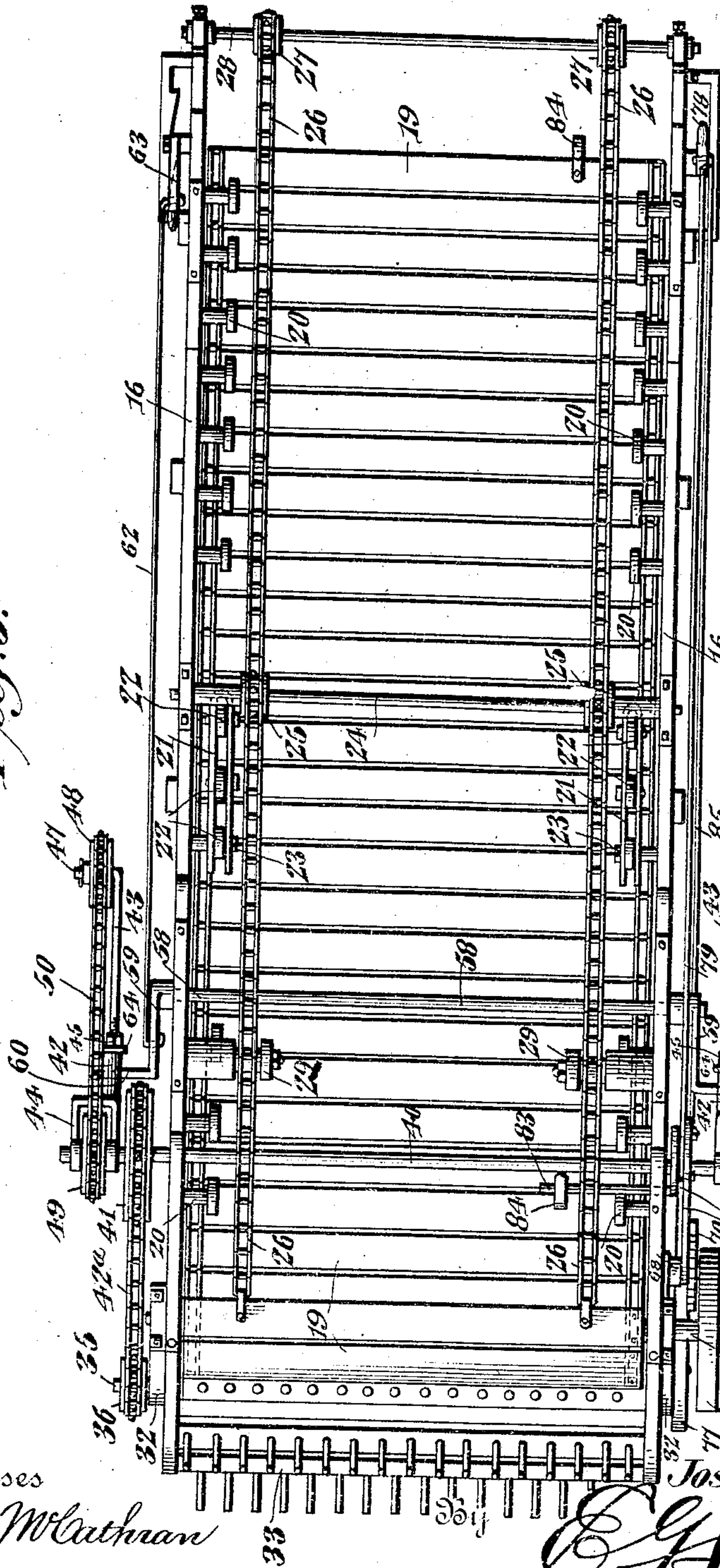


Fig. 13.

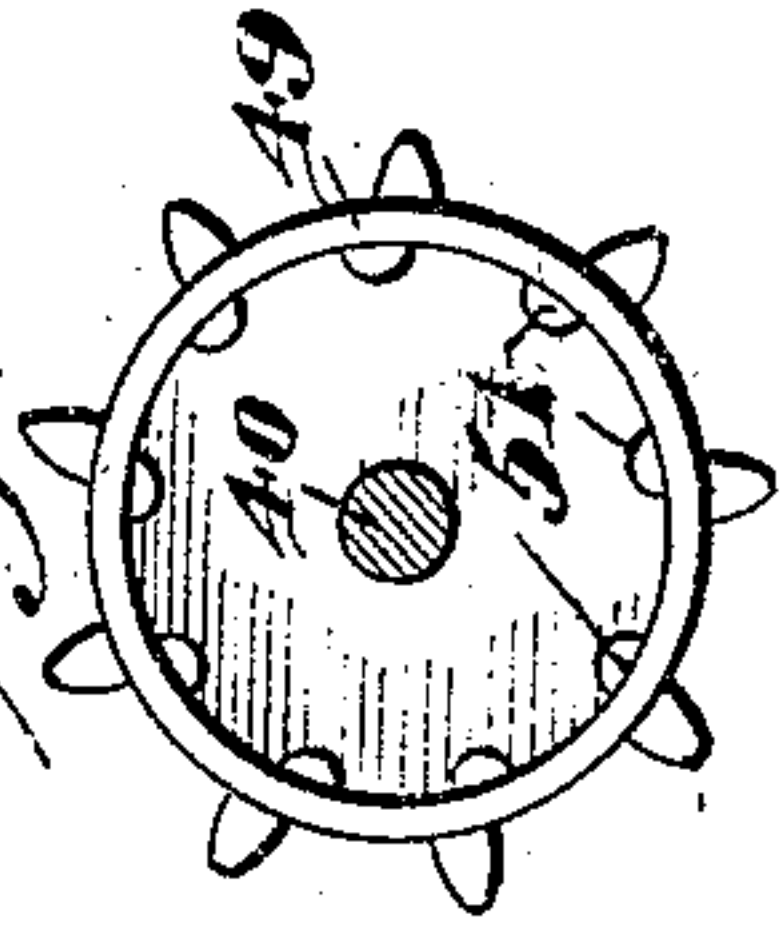


Fig. 14.

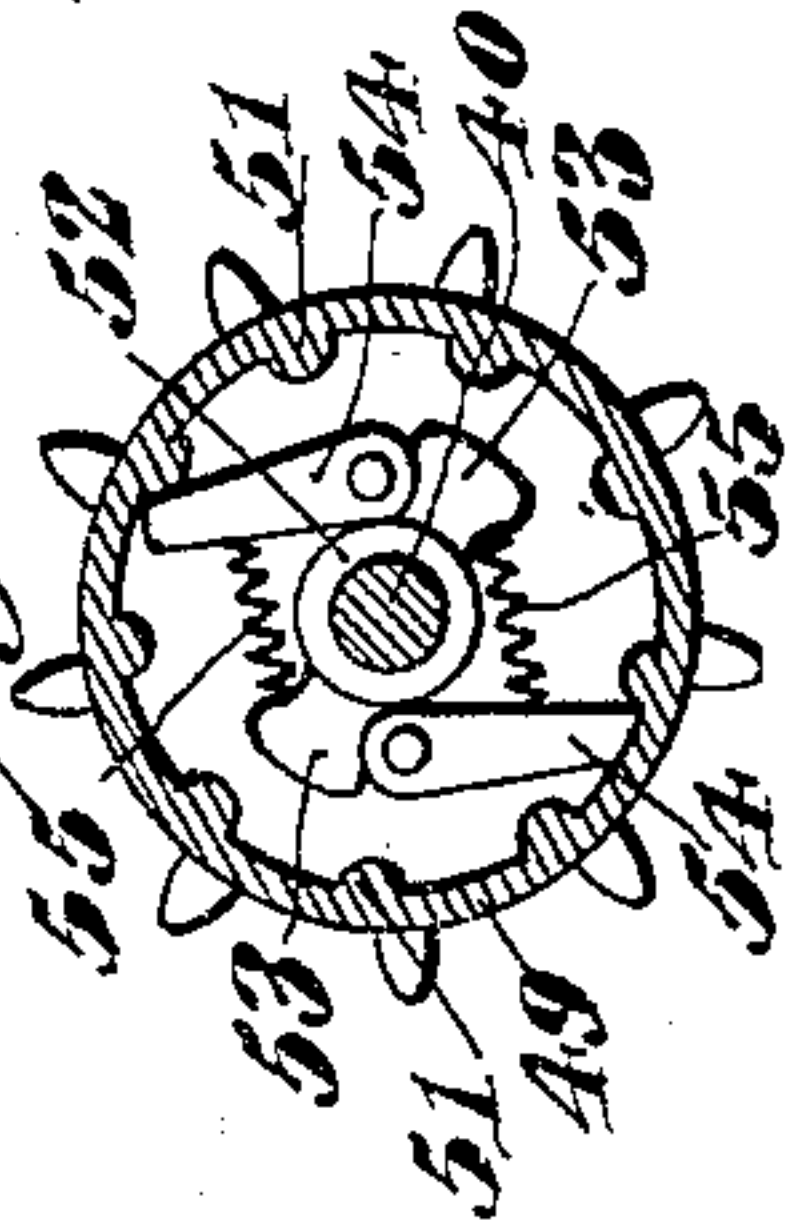
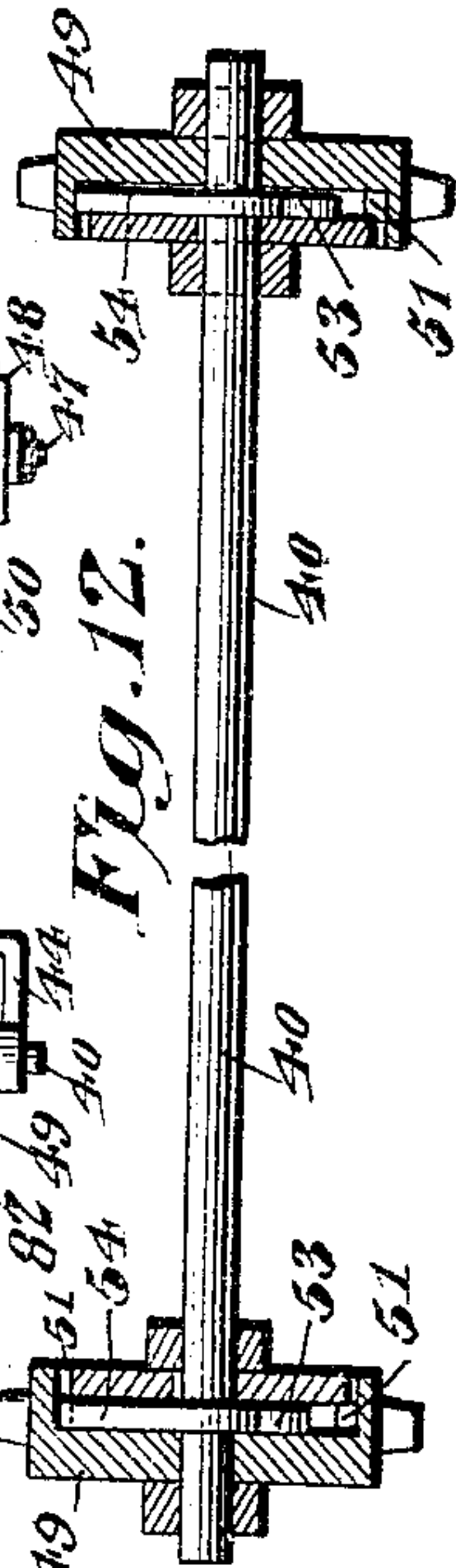


Fig. 12.



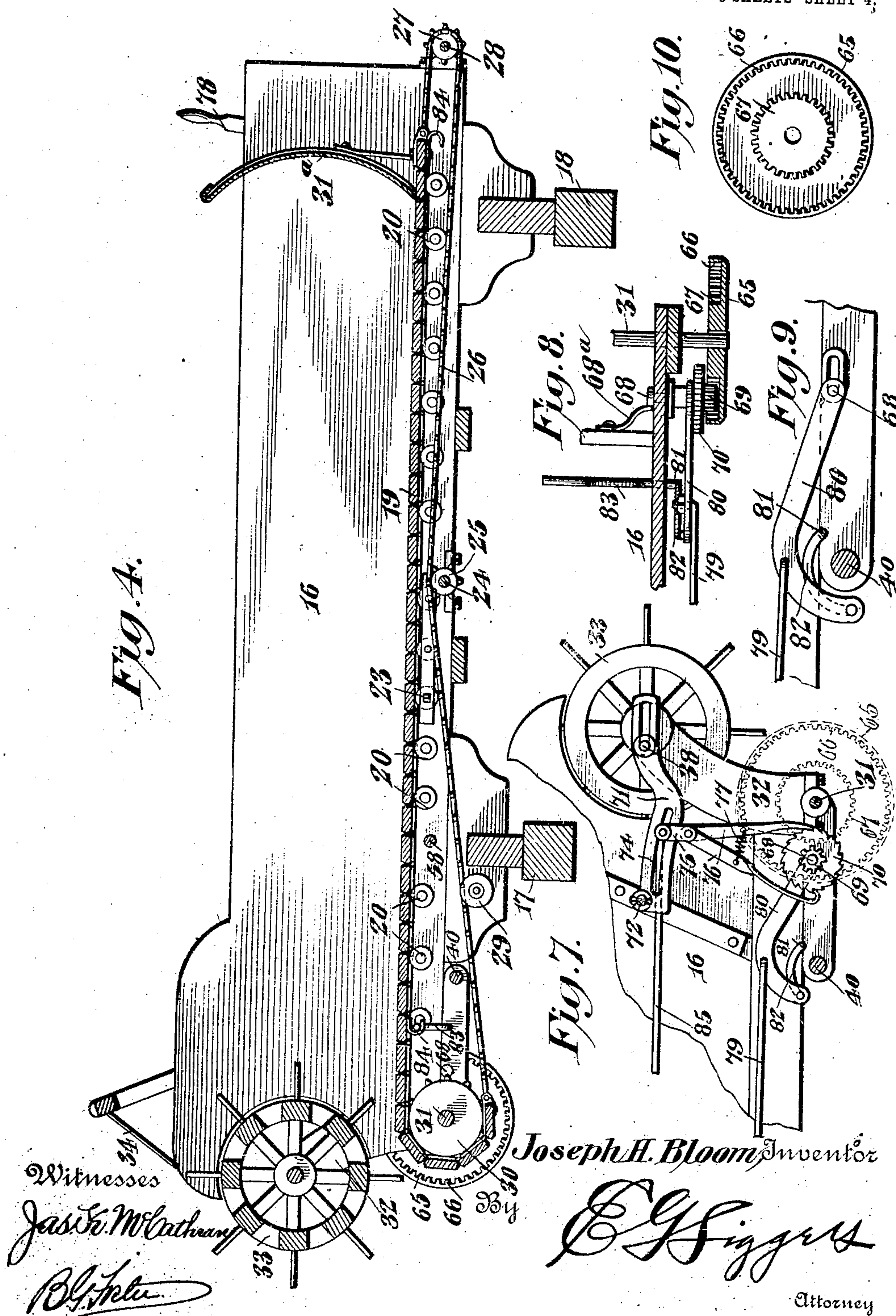
Witnesses
Jas. E. McLaughlin
Bl. Int.

Inventor
Joseph H. Bloom,
C. G. Figger
Attorney

935,579.

Patented Sept. 28, 1909.

5 SHEETS—SHEET 4.



Witnesses

James M. McArthur

Bl. H. H. H.

Joseph H. Bloom, Inventor

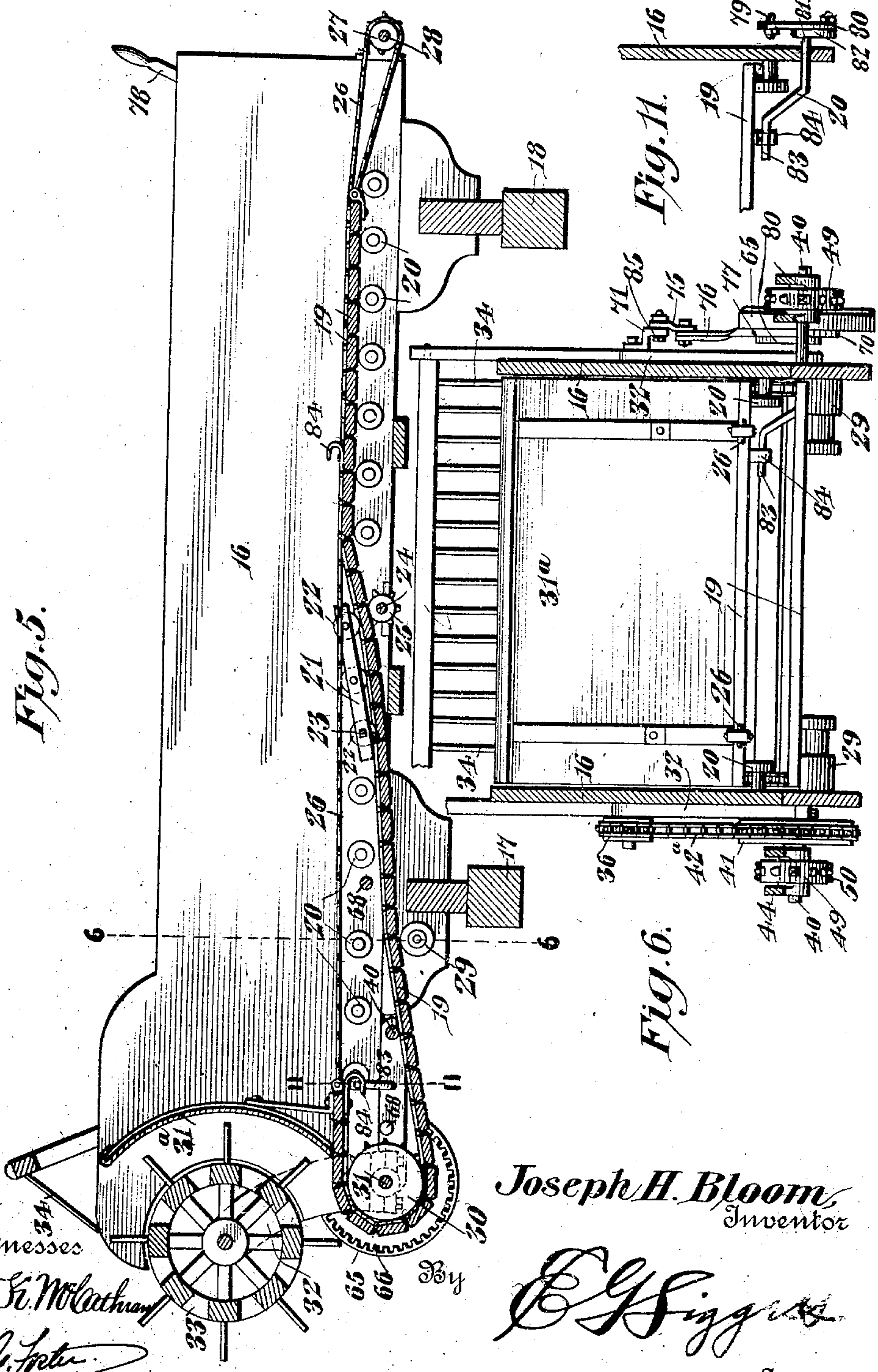
E. G. Figgers

Attorney

935,579.

Patented Sept. 28, 1909.

5 SHEETS-SHEET 5.



Witnesses
Jas. E. McLaughlin
R. L. Foster

Joseph H. Bloom
Inventor
E. G. Figg
Attorney

UNITED STATES PATENT OFFICE.

JOSEPH H. BLOOM, OF FREEPORT, ILLINOIS.

FERTILIZER-DISTRIBUTER.

935,579.

Specification of Letters Patent.

Patented Sept. 28, 1909.

Application filed March 3, 1908. Serial No. 419,016.

To all whom it may concern:

Be it known that I, JOSEPH H. BLOOM, a citizen of the United States, residing at Freeport, in the county of Stephenson and State of Illinois, have invented a new and useful Fertilizer-Distributor, of which the following is a specification.

One of the primary objects of this invention is to provide novel, simple and effective mechanism for operating the conveyer and distributing drum.

More particularly, one of the features of the invention resides in novel means for carrying the conveyer out of the way of the under frame of the vehicle so that the front wheels can cut under the body without interference.

Another feature resides in certain improvements in the operating means for the conveyer and drum and the provision of novel mechanism for automatically increasing the speed of the conveyer during its return movement.

The preferred form of construction is illustrated in the accompanying drawings, wherein:—

Figure 1 is a view in elevation of one side of the distributor. Fig. 2 is a view in elevation of the opposite side. Fig. 3 is a bottom plan view, with the running gear of the vehicle removed. Fig. 4 is a longitudinal sectional view through the mechanism. Fig. 5 is a similar view but showing the position of the conveyer when the body has been emptied. Fig. 6 is a cross sectional view on the line 6—6 of Fig. 5. Fig. 7 is a side elevation of the conveyer operating mechanism with the driven gear wheels removed. Fig. 8 is a horizontal sectional view therethrough. Fig. 9 is a view showing the mechanism for shifting the driving gear. Fig. 10 is a detail view of the driven gears. Fig. 11 is a detail cross sectional view substantially on the line 11—11 of Fig. 5. Fig. 12 is a detail view of the driving shaft showing the sprocket wheels and clutches in section. Fig. 13 is a face view of one of the sprocket wheels. Fig. 14 is a sectional view through one of the clutches. Fig. 15 is a detail sectional view through one of the supporting arms. Fig. 16 is a detail perspective view of the rock shaft and its crank arms that control the reversing movement.

Similar reference numerals designate cor-

responding parts in all the figures of the drawings.

In the embodiment illustrated, a body is employed, comprising side walls 16 mounted on an under frame which includes a rear axle 17 and a front axle 18, the latter being pivoted in any suitable manner. The bottom of the vehicle is in the form of a conveyer of hingedly connected slats 19, said conveyer being movably mounted on front and rear sets of rollers 20 journaled upon the opposite inner sides of the side walls 16. These front and rear sets thus constitute in effect a sectional support for the conveyer. Between the front and rear sets of rollers are located upwardly swinging gates 21 having rollers 22 journaled thereon, the gates being pivoted by suitable devices 23 at their rear ends and having their front ends normally resting on a cross shaft 24 provided with sprocket wheels 25. Connecting the ends of the conveyer are sprocket chains 26 that operate on the sprocket wheels 25 and pass around other sprocket wheels 27 mounted on a shaft 28 at the front end of the body, this shaft being transversely adjustable as shown in Fig. 2 in order that the slack in the chains may be taken up. Idler rollers 29 are located just in rear of the rear axle 17 and slightly above the same, these rollers constituting guides for carrying the conveyer over the top of the axle and bolster, as will be evident by reference to Fig. 5. The conveyer at its rear end operates around sprocket wheels 30 secured to a shaft 31 journaled transversely of and at the rear end of the wagon body. The front end of the conveyer carries the usual upstanding wall or apron 31^a.

With this construction, it will be evident by reference to Fig. 4 that when the apron 31^a is in the front end of the body, the conveyer will be located longitudinally in said body, but upon its rearward movement, the rear portion of said conveyer will move from the rear set of supporting rollers around the shaft 31, beneath said rear set of rollers, and striking the gates 21, will raise the same. By this time, the front portion of the conveyer will have passed from the front set of rollers and the rear portion of said conveyer moving past the gates, will move over said front set of rollers, as shown in Fig. 5.

Upon the rear end of the body are located

brackets 32 in which is journaled a suitable distributor drum 33, and cooperating with this drum is a comb 34. One end of the drum shaft 35 carries a sprocket wheel 36, while a crank disk 37, fastened to the opposite end, has a crank pin 38. A shaft 40, journaled upon the under side of the body, carries a sprocket wheel 41 and a sprocket chain 42^a, passing around the wheel 41, also passes around the sprocket wheel 36, thus forming a driving connection between the shaft 40 and the drum. Supporting arms are located on opposite sides of the vehicle body, and each arm comprises slidably telescoped sections 42 and 43, the sections 42 being provided with yokes 44 journaled on the projecting end of the shaft 40, and the sections 43 being slidably mounted in said sections 42. Adjusting nuts 45, threaded on the sections 43, bear against the ends of the sections 42, and serve as adjusting devices for lengthening or shortening the arms. Set screws 46, threaded through the sections 42, engage the sections 43 to normally prevent their rotation.

The outer or free end of each arm section 43 is offset as shown at 47, to form a pin on which is journaled an idler sprocket wheel 48, and another sprocket wheel 49 is loosely journaled on the shaft 40 within the yoke of each arm. These two sprocket wheels are connected by a sprocket chain 50. As illustrated, particularly in Figs. 12, 13 and 14, the sprocket wheel 49 is recessed, and is provided with an internal set of teeth 51. Secured to the shaft within the recess, is a hub 52 having projections 53 on which are pivoted dogs 54 that cooperate with the teeth 51. These dogs are urged toward the teeth by springs 55.

The usual ground wheels 56 are mounted on the rear axle 17 and clipped or otherwise secured to said wheels are driving sprocket wheels 57, the chains 50 being movable into and out of engagement with the wheels 57 accordingly as the supporting arms are raised or lowered. This will be evident by a comparison of Figs. 1 and 2. To effect the raising and lowering of the supporting arms a rock shaft 58 is employed that extends transversely of the body, and has secured to its ends crank arms 59 provided with offset terminals 60 that operate against the under sides of the arms. Another angularly disposed arm 61 is secured to one end of the rock shaft, and has a link connection 62 with a lever 63 arranged at the front end of the body. By operating this lever therefore, it will be evident that the rock shaft will be turned, and consequently the arms 59 swung to raise or lower the supporting arm. When raised, the offset ends 60 preferably engage behind ribs 64 on the arm sections 42 and thus maintain the arms in elevated positions.

The shaft 31 around which the conveyer

operates, has secured to one end a disk 65, which carries external and internal gear wheels 66 and 67, and a reciprocatory support 68 mounted on the adjacent portion of the vehicle body has journaled thereon, a driving gear wheel 69 located between the driven gears 66 and 67, being shiftable into mesh with either or to an intermediate position out of mesh with both. A spring 68^a mounted adjacent to the inner end of the support 68 forces said support rearwardly and normally urges the gear wheel 69 into engagement with the gear 67. Fastened to the driving gear 69 is a ratchet wheel 70, located on the inner side of the disk 65. A lever 71, is fulcrumed at one end, and as shown at 72 upon the vehicle body, and has a slot 73 in its other end in which the crank pin 38 of the distributing drum operates. This lever 71 furthermore has a longitudinal slot 74 and slidably mounted therein is a carrier bracket 75. A pair of dogs 76 is pivotally hung from the carrier 75, the dogs being connected by a spring 77, the lower ends of these dogs operating upon the ratchet wheel 70. Thus when the drum is in operation, the lever 71 will be swung back and forth, operating the dogs, which in turn, will operate the driving gear 69. If the driving gear is in mesh with the larger or internal gear 66, the conveyer will be moved rearwardly at one speed, but if said driving gear 69 is in mesh with the smaller gear, the return movement of the conveyer will take place at a higher rate of speed than the feeding movement. Again when the driving gear is out of mesh with both the internal and external gears, then the conveyer will be at a standstill.

In order to effect the above described shifting operations of the driving gear, the following mechanism is preferably employed. A lever 78 is fulcrumed on the side of the vehicle body, preferably the opposite side to that which carries the lever 63, and a rod 79, pivoted on the lever, is pivoted to a link 80, which is connected to the reciprocating support 68. Thus upon the operation of the lever, the gear will be shifted. Means are also provided for effecting the automatic shifting movement of the gear. To this end, a rock shaft 81 is journaled on the lower portion of the body, and has an outer crank arm 82 connected to the front end of the link 80 which end is preferably downturned, as shown in Fig. 9. The inner end of this rock shaft has another crank arm 83, which is bent upwardly from the journal shaft 81 and inwardly, and has a part located below the conveyer, as shown in Figs. 4 and 5, said conveyer being provided with oppositely extending hooks 84, arranged to engage the crank arm 83. The mechanism is so arranged that upon the rearward movement of the conveyer, when the front hook

84 strikes the upwardly bent part of crank arm 83, the part 83 will be rocked rearwardly, thereby rocking the part 82 outside of the wagon body upwardly and rearwardly and through its connection with 80 the latter will be automatically shifted a sufficient distance to carry the driving gear 69 from the internal driven gear 66, whereupon the spring 68^a will carry the gear 69 into mesh with the external driven gear 67 so that the movement of the conveyer is automatically reversed. On the other hand, when the conveyer has completely returned and the rear hook strikes the crank arm 83, the driving gear 69 will be carried out of mesh with the driven gear 67 to an intermediate position out of mesh with both gears so that the travel of the conveyer will be automatically stopped. Means are also provided for automatically increasing the speed of the driving gear 69 during the return movement of the conveyer and for this purpose, a rod 85 connects the lever 78 and the carrier 75 for the dog 76. It will thus be evident that when the driving gear 69 is shifted out of mesh with the driven gear 66 and into mesh with the driven gear 67, the lever 78 being moved, will cause the carrier 75 to shift away to a position farther away from the fulcrum 72 of the lever 71. The dogs 76 therefore will have a greater amount of movement. On the other hand, on the reverse shifting action of the driving gear 69, said carrier 75 will be moved toward the fulcrum, and thus the amount of movement of the dogs will be less, with a corresponding amount of movement of the driving gear.

There are a number of advantages for this structure as shown. In the first place, the mechanism is comparatively simple, and yet sufficient driving power is secured for operating the conveyer and the drum, regardless of the weight of the load. This driving mechanism is connected with both of the rear wheels, but because of the clutches, the said wheels are permitted to run at different rates of speed in making turns and the like. The mechanism may be stopped whenever desired, but when thrown into operation, it will automatically operate to completely discharge the load, and return the conveyer without further attention. The said conveyer is so arranged that the rear portion is carried above the under frame at the front portion of the body, so that the front axle and wheels can turn and cut under the body without interference.

From the foregoing, it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art, without further description, and it will be understood that various changes in the size, shape, proportion, and minor details of construc-

tion, may be resorted to without departing 65 from the spirit or sacrificing any of the advantages of the invention.

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

1. In a vehicle fertilizer distributor, the combination of a vehicle body, wheels supporting the same, a rotary distributing drum mounted on the body, a shaft on the body, a driving connection between the shaft and drum, driving sprockets on the wheels, loose sprockets on the ends of the shaft, clutches for connecting the said sprockets with the shaft, swinging supporting arms pivoted on the shaft, sprockets on the free ends of the arms, sprocket chains passing around the last-mentioned sprockets and the said loose sprockets and arranged to mesh with the driving sprockets carried by the said wheels whereby the shaft will be driven simultaneously by the wheels during forward travel or by the faster rotating wheel during turning of the vehicle, and means for swinging the arms to engage or disengage the sprocket chains with or from the driving sprockets. 70 75 80 85 90

2. In mechanism of the character described, the combination with a rotary distributing drum, of a shaft geared thereto, swinging supporting arms journaled on and carried by the shaft, sprocket wheels having clutch connections with the opposite ends of the shaft, other sprocket wheels carried by the arms, sprocket chains mounted on the wheels, driving sprocket wheels, and means for swinging the arms to carry the chains into and out of engagement with the driving sprocket wheels. 95 100

3. In mechanism of the character set forth, the combination with a conveyer operable in opposite directions, of a driving device, means interposed between the driving device and conveyer for operating the same from the former at different rates of speed in opposite directions, and means for also altering the speed of the driving device when the direction of movement of the conveyer is reversed. 105 110

4. In mechanism of the character set forth, the combination with a conveyer operable in opposite directions, of a driving device, means interposed between the driving device and conveyer for transmitting motion from the former to the latter and causing the return movement of the conveyer at a greater rate of speed than the delivery movement, and means for also increasing the speed of the driving device when the direction of movement of the conveyer is reversed to cause the return movement of said conveyer. 115 120 125

5. In mechanism of the character set forth, the combination with a conveyer operable in opposite directions, of a plu-

ality of driven devices connected to the conveyer, a driving device shiftable from one driven device to the other; and means for automatically varying the speed of the driving device when it is shifted.

6. In mechanism of the character set forth, the combination with a conveyer operable in opposite directions, of a plurality of driven devices connected to the conveyer, a driving device shiftable from one driven device to the other, means for automatically varying the speed of the driving device when it is shifted, and common means effecting the shifting of the driving device and the change of speed of the same.

7. In mechanism of the character set forth, the combination with a conveyer operable in opposite directions of a plurality of driven gears connected to the conveyer, a driving gear shiftable from one to the other of the driven gears, means for operating the driving gear, and means for simultaneously shifting said driving gear and varying its speed during the shifting operation.

8. In mechanism of the character set forth, the combination with a conveyer operable in opposite directions, of a plurality of driven gears connected to the conveyer, a driving gear shiftable from one to the other of the gears, means for operating the driving gear, a lever, and means operated by said lever for shifting the driving gear and varying its speed.

9. In mechanism of the character set forth, the combination with a conveyer operable in opposite directions, of a plurality of driven gears connected to the conveyer, a driving gear shiftable from one to the other of the driven gears, a ratchet wheel connected to the driving gear, dogs movable in opposite directions and operating on the ratchet wheel, and common means for shifting the driving gear and varying the throw of the dogs.

10. In mechanism of the character set forth, the combination with a conveyer operable in opposite directions, of internal and external driven gears connected to the conveyer, a driving gear shiftable from one to the other of the driven gears, a ratchet wheel connected to the driving gear, a lever, means for swinging the lever, a carrier shiftable toward and from the fulcrum of the lever, dogs pivoted on the carrier and operating on the ratchet wheel, a lever, and connections between the lever, the driving gear and the carrier for simultaneously effecting the movement of the carrier and of the driving gear.

11. In mechanism of the character set forth, the combination with a conveyer operable in opposite directions, of driven gears connected therewith, a driving gear shiftable from one driven gear to the other, a controller, a connection between the controller and

shiftable gear, a variable speed device for rotating the driving gear, a connection between the device and controller, and means for automatically shifting the gear independently of the controller and by the conveyer when the latter reaches the end of its movement in one direction and operating through said connections and controller for changing the variable speed device to increase the speed of rotation of the driving gear.

12. In mechanism of the character set forth, the combination with a conveyer operable in opposite directions, of driven gears connected therewith, a driving gear shiftable from one driven gear to the other, a controller, a connection between the controller and shiftable gear, a variable speed device for rotating the driving gear, a connection between the device and controller, means for automatically shifting the gear independently of the controller and by the conveyer when the latter reaches the end of its movement in one direction and operating through the connections and controller for changing the variable speed device to increase the speed of rotation of the driving gear, and means for throwing the driving gear to a position out of engagement with either of the driven gears when the conveyer reaches the end of its return movement.

13. In mechanism of the character set forth, the combination with a conveyer operable in opposite directions, of driven gears connected to the conveyer, a shiftable driving gear movable into engagement with either of the driven gears, means for rotating the driving gear, a reciprocatory support on which the driving gear is journaled, a rock shaft having spaced crank arms, a link connected to one of the crank arms and to the support, the other arm being located in the path of movement of the conveyer and operated thereby in opposite directions, and a lever connected to the link for manually shifting the driving gear.

14. In mechanism of the character set forth, the combination with a vehicle body, of a conveyer movable in opposite directions therein, means for operating the conveyer in opposite directions, a support for the conveyer, and means for directing one portion of the conveyer on to the portion of the support normally occupied by another portion of the conveyer and in an opposite direction when said other portion moves therefrom in one direction.

15. In mechanism of the character set forth, the combination with a vehicle body, of a conveyer movable in opposite directions therein, means for operating the conveyer in opposite directions, a support for the conveyer arranged longitudinally within the body, and means for directing the rear portion of the conveyer in its forward direction

on to the front portion of the support when the front portion of the conveyer moves rearwardly therefrom.

16. In mechanism of the character described, the combination with a vehicle body, of a support extending longitudinally therein, and comprising front and rear sections, a conveyer operating upon the support, the rear portion of said conveyer being movable from the rear section of the support, beneath the same and forwardly to a position upon the front section, the front portion of the conveyer moving rearwardly to a position upon the rear section of the support, and means for moving the conveyer.

17. In mechanism of the character described, the combination with a vehicle body, of a support extending longitudinally therein and comprising sections, a conveyer operating upon the support, one portion of the conveyer being movable from one of the sections of the support beneath the same and to a position upon the other section, a gate located between the sections and permitting the movement of the conveyer therebetween, and means for moving the conveyer.

18. In mechanism of the character set forth, the combination with a vehicle body, of a support extending longitudinally therein and comprising front and rear sections, a conveyer operating upon the support, the rear portion of the conveyer being movable from the rear section, beneath the same and to a position upon the front section, the front portion of the conveyer moving to a position upon the rear section of the support, a swinging gate located between the adjacent sections and swinging upwardly to permit the movement of the rear portion of the conveyer on to the front section of the support, and means for operating the conveyer.

19. In mechanism of the character set forth, the combination with a vehicle body,

of a conveyer movable in opposite directions therein, means for operating the conveyer in opposite directions, a support for the conveyer comprising a series of rollers arranged within the body, means for directing one portion of the conveyer beneath a portion of the support and forwardly on to and along another portion of the support, when another portion of the conveyer leaves said latter portion of the support, and means for operating the conveyer in opposite directions.

20. In mechanism of the character set forth, the combination with a vehicle body, of front and rear sets of rollers located therein, upwardly swinging gates pivoted to the body between the front and rear sets of rollers and having rollers journaled thereon, a conveyer operating upon the upper sides of the rollers, the rear portion of said conveyer moving beneath the rear set of rollers past the gates and on to the front set of rollers when the front portion of the conveyer moves on to the rear set of rollers, and means for moving the conveyer in opposite directions.

21. In mechanism of the character set forth, the combination with a vehicle body, of a support extending longitudinally therein and comprising front and rear sections, a conveyer operating on the support, the rear portion of the conveyer moving from the rear section beneath the same, between the sections and forwardly upon the front section, and means for operating the conveyer to cause its said movement.

In testimony, that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

JOSEPH H. BLOOM.

Witnesses:

ROBERT BICKENBACH,
E. TOELLE.