

No. 817,704.

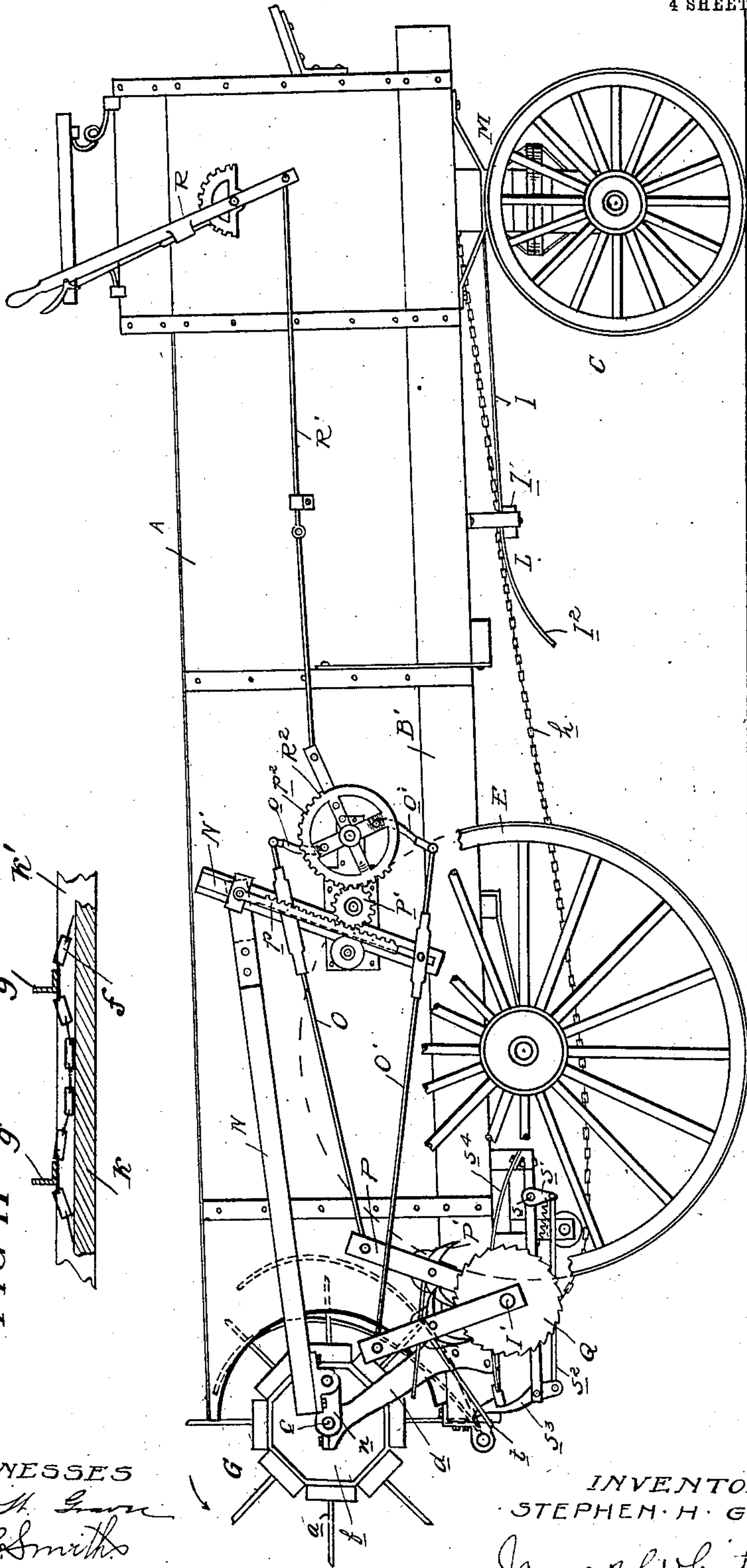
PATENTED APR. 10, 1906.

S. H. GARST.
MANURE DISTRIBUTER.
APPLICATION FILED JAN. 19, 1905.

4 SHEETS—SHEET 1.

FIG. 1.

FIG. 11. g



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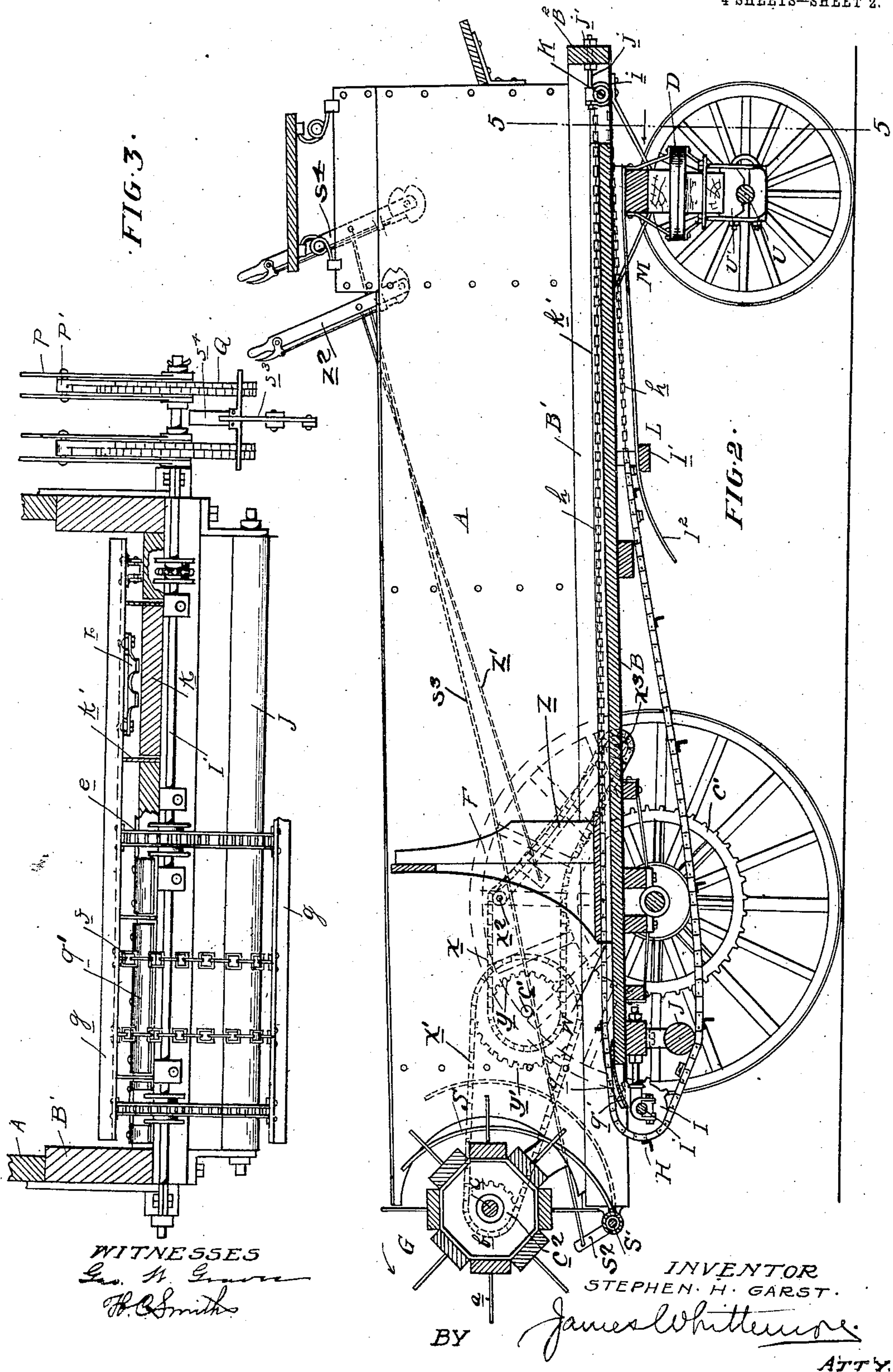
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4 SHEETS—SHEET 2.



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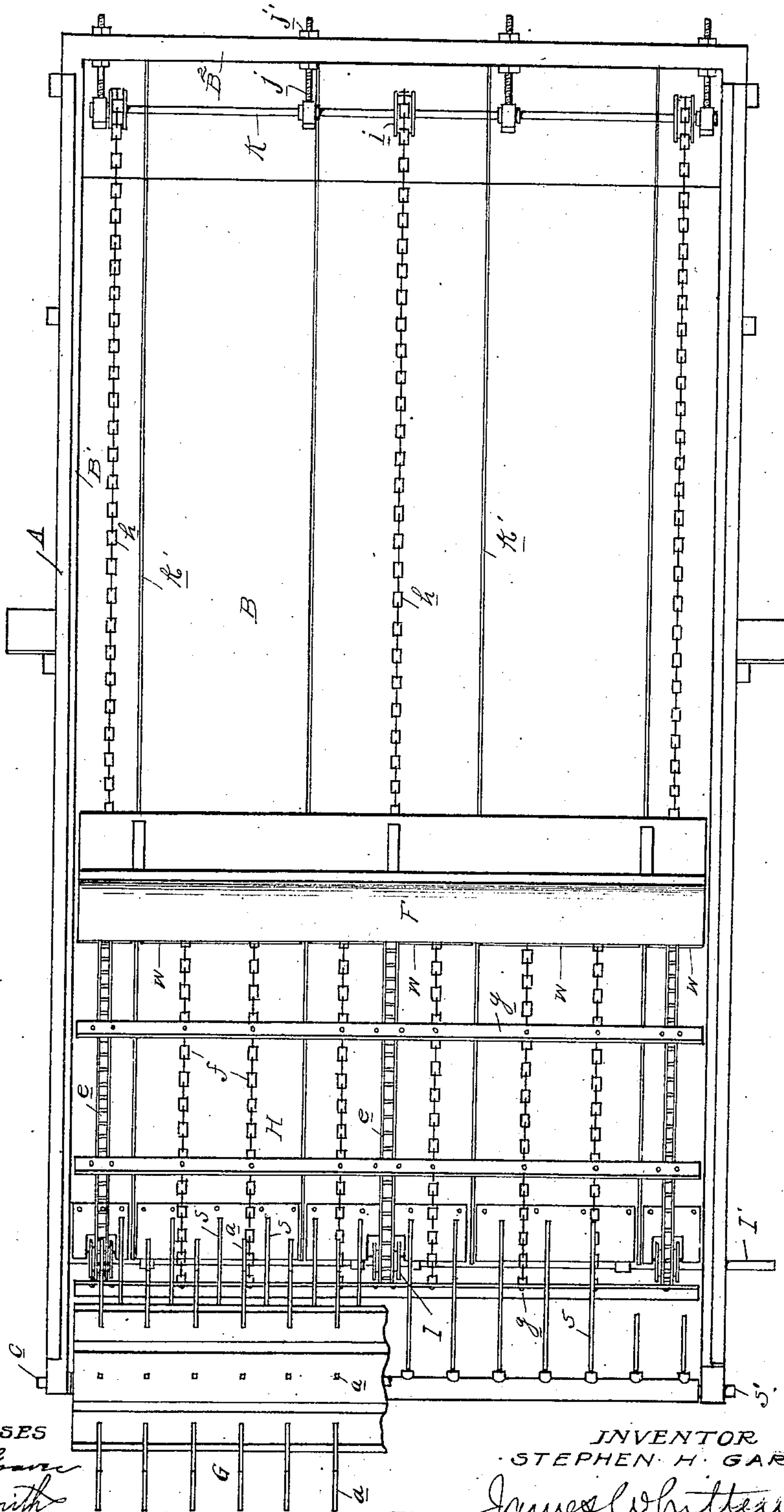
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4 SHEETS—SHEET 3.

FIG. 4.



WITNESSES

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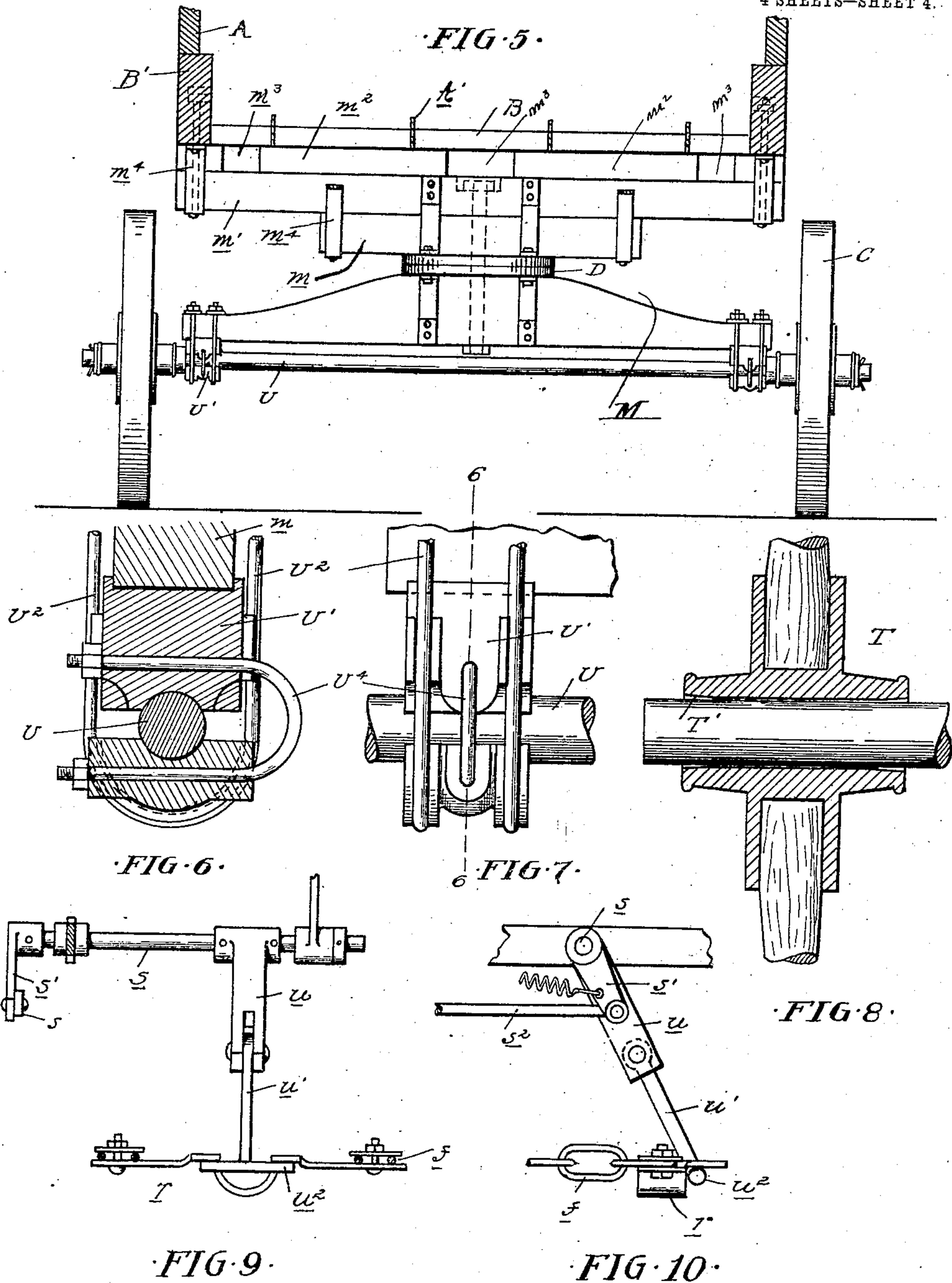
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

STEPHEN H. GARST, OF DETROIT, MICHIGAN, ASSIGNOR TO AMERICAN HARROW COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

MANURE-DISTRIBUTER.

No. 817,704.

Specification of Letters Patent.

Patented April 10, 1906.

Application filed January 19, 1905. Serial No. 241,827.

To all whom it may concern:

Be it known that I, STEPHEN H. GARST, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Manure - Distributers, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to distributing-wagons, being more particularly designed for use in the distribution of manure; and the invention consists in the construction as hereinafter set forth.

In the drawings, Figure 1 is a side elevation of the machine. Fig. 2 is a central longitudinal section thereof. Fig. 3 is an end elevation, partially broken away to more clearly show the parts. Fig. 4 is a plan view. Fig. 5 is a cross-section on line 5 5 of Fig. 2. Fig. 6 is a cross-section through the clip for securing the axle to the bolster, the section being on line 6 6 of Fig. 7. Fig. 7 is an elevation of Fig. 6. Fig. 8 is a section through the hub of one of the ground-wheels. Fig. 9 is a front elevation of the trip mechanism. Fig. 10 is a side elevation thereof. Fig. 11 is a longitudinal section illustrating the normal position of the false bottom in relation to the bottom of the wagon-box.

The distributor comprises a wagon-body of any suitable proportions, preferably provided with sides A and a bottom B. This body is mounted upon a forward truck C, provided with the usual fifth-wheel or turn-table D, and at the rear upon a truck E, one or both of the wheels of which are the drivers for the mechanism. The end board for the forward end of the wagon is formed by a traveling follower F, and at the rear end of the body is a revoluble distributing-wheel G, to which the material is fed by the movement of the follower. This wheel is composed of a series of rotating rakes or tined bars *a*, which are mounted upon heads *b*, secured to a shaft *c*, the latter being journaled in brackets *d*, secured to and projecting upward on the side sills B'. These side sills are arranged upon opposite sides of the bottom B and are cross-connected at their forward end by an end sill B², as shown in Figs. 2 and 4.

Arranged above the bottom B of the body is a false bottom H, upon which the load is

supported and which is adapted to travel with the follower F to feed the material to the distributing-wheel G. This false bottom H is preferably formed of a series of parallel chains or flexible connections and a series of cross-bars secured to said chains. All or a portion of these chains *e* are drivers and adapted to engage with sprockets I, which are mounted upon a shaft I', journaled in bearings at the rear end of the wagon-bottom.

In the construction shown only three chains are drivers, and intermediate these sprocket-chains are a sufficient number of supporting-chains *f* to sustain the material within the wagon-body and lift the same from contact with the bottom B, as will be hereinafter described. At the forward end of the chains *e* and *f* they are connected to the follower F, and when the latter is in its normal position at the front of the wagon-body these chains extend rearward the full length of the bottom B and are cross-connected at short intervals by the bars *g*, preferably angle-bars. The sprocket-chains also extend about the sprockets I and are then connected to return-chains *h*, which extend beneath the guide-roller J, beneath the rear axle, thence forward and about the sheaves *i* on the shaft K, near the forward end of the sills B'. This shaft K is adjustable in position, so as to take up the slack in the chains, and to this end is secured to threaded rods or bolts *j*, which pass through the front sill B² and are provided with clamping-nuts *j'*. The bottom B falls short of the full length of the sills B', so as to leave a space between its forward end and the cross-sill B² in which the shaft K may be adjusted.

With the construction above described it will be understood that the rotation of the shaft I' and sprockets I will cause the false bottom H to travel over the bottom B, carrying the follower F with it, while that portion of said false bottom which is fed about the sprockets is returned beneath the bottom B to the forward end of the wagon. To relieve the friction caused by the sliding of the false bottom over the bottom B, I preferably form the latter of a series of longitudinally-extending boards *k*, between which are secured thin metallic bars *k'*, projecting upward above the face of the boards *k*. These metallic bars *k'* form tracks upon which the

cross-bars *g* of the false bottom rest and over which they are adapted to travel. When the false bottom is in its normal position and at rest, there will be sufficient slack in the chains *e* and *f* to permit them to loop downward between the cross-bars *g*, as illustrated in Fig. 11, the center of the loops resting upon the bottom *B*. When, however, the false bottom is in movement, the tension placed upon the chains will straighten them out, so that they will lift the material deposited thereon clear of the bottom *B* and maintain this clearance during the feeding movement. The bars *K'* preferably bridge the space between the bottom *B* and end sill *B²* to brace the latter. The false bottom when returned beneath the bottom *B* is suspended by the chains *e* and *f*; but near the forward end of the wagon a rack *L* is arranged to support the chains and cross-bars, so as to clear the wheels of the forward truck in the turning of the wagon. This rack *L* extends only a sufficient distance rearward to hold the false bottom from contact with the truck-wheels and is formed by a series of bars *l*, extending from a front bolster *M* to a cross-bar *l'*, which bar is provided with curved portions or skids *l²* for guiding the false bottom thereon.

The front bolster *M* is apertured for the passage of the chains *h* and is preferably formed of a series of superposed bars, as illustrated in Fig. 5. The lower bar *m* extends for only a portion of the distance between the sides of the body and is connected with a top plate of the circle *D*. The bar *m'* extends completely across beneath the bottom *B*, and above this are a series of bars *m²*, which are spaced to form therebetween the recesses *m³*, through which the chains pass. The bolsters are securely attached to the bottom *B* and sills *B'* by metallic brace-bars *m⁴*.

For imparting movement to the distributing-wheel *G* and the false bottom *H* and follower *F* a drive mechanism is provided, which receives its motion from sprocket-wheel *C'*, secured to one of the ground-wheels of the rear truck. This sprocket is connected to sprocket *c²* on the shaft *c* by means of chain *x*, stub-shaft *c'*, bearing-sprockets *y* and *y'*; and chain *x'*. The distributing-wheel *G* is mounted on the shaft *c*, and rotary movement is thus imparted to said wheel in the direction indicated by the arrow. The chain *x* passes over an idler *x²* and sprocket *x³*, mounted in a pivoted rod *z*, connected by a rod *z'* to a sector-lever *z²*, whereby the rod *z* may be adjusted from the seat to raise the chain *x* out of engagement with the sprocket *C'* when the distributing-wheel is not desired to be rotated. This is clearly shown in Fig. 2 and will not be further described, as it is not intended to be claimed in this application. From this shaft *c* motion is also communicated to the false bottom and follower by mechanism of the following construction:

n is a crank at one end of the shaft *c*. *N* is a pitman-rod, which is connected to said crank at one end and at its opposite end pivotally connected to a rock-lever *N'*. *O* and *O'* are reciprocatory rods, which are pivotally connected to a lever *N'* on opposite sides of the fulcrum thereof, and at their opposite ends are attached to rock-arms *P*, carrying double pawls *P'* for engaging ratchet-wheels *Q* on the shaft *I'*. Thus the rotation of the shaft *c* will cause the crank *n* to reciprocate the pitman *N*, rocking the lever *N'* and oppositely reciprocating the rods *O* and *O'*, so as to cause them to alternately actuate the shaft *I'* through the medium of the rock-arms *P*, pawls *P'*, and ratchet-wheels *Q*.

To change the feed or speed of travel imparted to the false bottom *H*, the pivotal connections between the rods *N*, *O*, and *O'* and the rock-lever *N'* are adjusted. This adjustment is preferably effected by a lever *R*, fulcrumed upon the wagon-body adjacent to the driver's seat, said lever being connected from a rod *R'* with a crank *R²*, adjacent to the lever *N'*. To this crank *R²* the rods *O* and *O'* are attached through the medium of links *o* and *o'*. These links support said rods and determine the position of the pivotal connection between said rods and the lever *N'*, which connection is slidable along said lever. The pivotal connection to the pitman *N* is also slidable upon the lever *N'*, and it is adjusted through the medium of a rack *p*, engaging a pinion *p'*, which is in mesh with a gear-segment *p²*, attached to the crank *R²*. The arrangement is such that by the adjustment of the lever *R* the crank *R²* is turned so as either to adjust the pivotal connections for the rods *O* and *O'* toward the center or fulcrum of the lever *N'* or to adjust them away from said fulcrum. The same movement will cause the gear-segment *p²* transmitting its movement through the pinion *p'* to the rack *p* to slide the pivotal connection to the rod *N* upon the lever *N'*, this movement being in the opposite direction in relation to the fulcrum of the lever from the movement simultaneously imparted to the pivots of the rods *O* and *O'*.

It will be understood from the description above given that by suitably adjusting the lever *R* any desired change of speed may be imparted to the shaft *I'*, which drives the false bottom, and it will be further observed that in this adjustment the opposite movement imparted to the pivots for the pitman and for the rods *O* and *O'* will cause a quick adjustment and through a large range.

In the feeding of the false bottom the cross-bars *g* will pass successively off from the bars *k'* and around the sprockets *I*. In the reverse movement—i. e., where the false bottom is returned to normal position—these cross-bars must mount upon the bars *k'*, and to avoid catching the end portions *g* of the bars *k'* are inclined downward, as illustrated

in Fig. 2. To prevent the slack in the chains above the sprockets from catching thereon, inclined guides are arranged for these chains to travel over, which, as shown, are formed by the curved metallic plates q' . These plates are secured to the end of the wagon-bottom and extend adjacent to the sprockets, so as to prevent sagging of chains.

The forward and return movements of the false bottom are both effected through the same mechanism by simply reversing the double pawls P' . For the feeding movement—i. e., where the false bottom and follower are moving rearward to fit the material to the distributing-wheel—the pawls P' are properly adjusted by hand; but the reversal of these pawls is automatically accomplished upon the completion of the rearward movement of the follower F through the following mechanism: r is a catch or projection from the chains f and preferably of bifurcated form. s is a rock-shaft which is connected by a rock-arm s' and rod s^2 with a hook s^3 . This hook normally engages a spring-bar s^4 , but is released therefrom by the rocking of the shaft s , so as to permit said spring-bar to strike against projecting arms t on the pawls P' , thereby rocking the pawls and changing the direction of their feed. The rock-shaft s has secured thereto a depending rock-arm u , which has a pivotal extension u' , which is provided with a T-shaped head u^2 , extending into the path of the bifurcated catch r . Thus when said catch comes into engagement with the head u^2 it will rock the arm u and shaft s and cause a reversal of the pawls, as above described. In the opposite movement of the chain the pivotal extension u' will permit the head u^2 to ride over the cross-bars without catching thereon.

When the wagon is being loaded and during its travel at all times, excepting when the load is being distributed, it is desirable to hold the material from contact with the distributing-wheel G . In the construction shown this is accomplished by a curved fork or tined gate S . The tines of this gate are secured to a rock-shaft S' , which is secured in bearings at the end of the sills B' . The gate may be adjusted into either position of adjustment illustrated, respectively, in full and dotted lines of Fig. 2. In the latter position the tines are arranged to clear the ends of the tines a on the distributing-wheel G , thereby holding the material within the wagon-body from contact with said wheel. When adjusted into the position shown in full lines, the tines S are arranged between the tines a of the distributing-wheel, permitting the latter to engage with the material and throw it over the wheel. The amount of material distributed by the wheel can, however, be varied by adjusting the curved tines S , so as to limit the length of the exposed portion of the tines a . The shaft S' and gate S are adjusted

by any suitable mechanism, preferably controlled by the driver while on his seat, such as the crank S^2 , secured to the shaft S' and connected by a rod S^3 to a sector-lever S^4 , as clearly shown in Fig. 2.

When the wagon is under full load, considerable weight is brought to bear upon the axle with the tendency to slightly bow the same. It has been found in practice that this deflection of the axle is sufficient to cause an unequal pressure in the bearings in the hubs of the ground-wheels, with the effect that the edges of said hubs are frequently chipped, and the consequent vibrations thereof cause the hubs to be broken out. To avoid this, I have constructed a hub T on the ground-wheels, as illustrated in Fig. 8, in which end portions of the hub are slightly chamfered at T' , so as to relieve the pressure at the extreme end. This construction prevents the chipping of the edge of the hub, as the chamfered portion, which is not subjected to pressure, reinforces the bearing portion.

The front axle is preferably formed as illustrated in Figs. 5, 6, and 7, in which the shaft or axle proper, U , is secured in bearings U' , which are fastened by clips U^2 to the bolster or truss portion m of the axle. The bearings U' are also connected by U-shaped clips U^4 , which extend transversely through the bearings and project forward to form an eye for the engagement of the tongue connection.

To clear the bottom from material falling through the false bottom between the chains, scrapers W are attached to the follower between the tracks K' , as shown in Fig. 2.

What I claim as my invention is—

1. In a distributing-wagon, the combination with the box, provided with a bottom, of a traveling false bottom and means whereby portions of said bottom are permitted to rest upon the wagon-bottom when stationary and are lifted to clear the same during the feeding movement.

2. In a distributing-wagon, the combination with the box, provided with a bottom, of a false bottom comprising closely-arranged flexible longitudinal members and spaced angle-iron cross-bars and means for feeding said false bottom during the distribution of the load.

3. In a distributing-wagon, the combination with the box provided with a bottom, of a false bottom comprising closely-arranged longitudinal chains or flexible connections and spaced angle-iron cross-bars and separated bars projecting upward from said bottom forming supporting-tracks for said false bottom, with which the cross-bars thereof engage and hold the chains clear of said bottom.

4. In a distributing-wagon, the combination with the box, provided with a bottom, of separated bars arranged on edge and projecting above said bottom extending longitudinally thereof and a false bottom comprising

longitudinal chains and connecting cross-bars, said cross-bars resting upon said tracks and said chains looping between said cross-bars when said false bottom is stationary and being straightened to clear said bottom during the feeding movement of said false bottom.

5. In a distributing-wagon, the combination with the wagon-box and a timed distributing-wheel at the end thereof, of a gate comprising a rock-shaft secured to said box and curved tines projecting over said shaft adapted to be swung alternatively between the tines of said wheel and into a position clearing the ends thereof, the latter position holding the material within said box out of contact with said wheel.

6. In a distributing-wagon, the combination with a frame comprising side sills and a forward end sill, a bottom extending between said side sills, terminating to leave a space between the same and said end sill, a false bottom arranged to travel over said bottom, chains for actuating said false bottom, idler-wheels around which said chains pass at the forward end of said frame, a shaft on which said idler-wheels are mounted arranged in the space between said bottom and end sill, and supporting-rods for said shaft, adjustably engaging said end sill and forming the means for taking up the slack in said chains.

7. In a distributing-wagon, the combination with a body and a movable bottom therefor, of a truck, a bolster for supporting said body upon said truck, comprising the cross-bars m , m' , the separated bars m^2 upon the bar m' , leaving the spaces m^3 therebetween, for the purpose described.

8. In a distributing-wagon, the combination with the body having a stationary bottom, of a false bottom adapted to travel over said stationary bottom, comprising cross-bars and the longitudinal chains, a sprocket for actuating said false bottom, a reversible drive connection for said sprocket, and a trip for reversing said drive connection, comprising the rock-arm u , the pivotal extension u'

thereof, having the T-head u^2 and the fork r on the false bottom, for the purpose set forth.

9. In a distributing-wagon, the combination with the box, provided with a bottom, of a false bottom comprising a number of closely-arranged longitudinally-extending chains and cross-bars, of a drive-shaft at the rear end of said box, sprocket thereon for engaging said chains, to feed rearward and to return said false bottom, and guides for said chains preventing the sagging thereof, adjacent to said sprocket in the return feed movement.

10. In a distributing-wagon, the combination with the wagon-box comprising sides and bottom, said bottom being composed of a plurality of longitudinally-extending boards, and track-bars arranged between said boards and projecting upward above the same, of a false bottom formed principally of flexible members bearing widely-spaced angle-iron cross-bars.

11. In a distributing-wagon, the combination with a frame comprising side sills and a forward end sill, a bottom extending between said side sills, terminating to leave a space between the same and said end sill, a false bottom arranged to travel over said bottom, chains for actuating said false bottom, idler-wheels around which said chains pass at the forward end of said frame, a shaft on which said idler-wheels are mounted, arranged in the space between said bottom and end sill, supporting-rods for said shaft adjustably engaging said end sill and forming the means for taking up the slack in said chains, and tracks over which said false bottom travels secured to said bottom and bridging the space between the same and said end sill to brace the latter.

In testimony whereof I affix my signature in presence of two witnesses.

STEPHEN H. GARST.

Witnesses:

C. L. READ,
J. F. SHEEN.