(No Model.) 4 Sheets—Sheet 1.

C. O. MOORE & T. J. FITZSIMMONS.

TRANSPLANTING MACHINE.

No. 526,406. Patented Sept. 25, 1894.

FIG. 1.

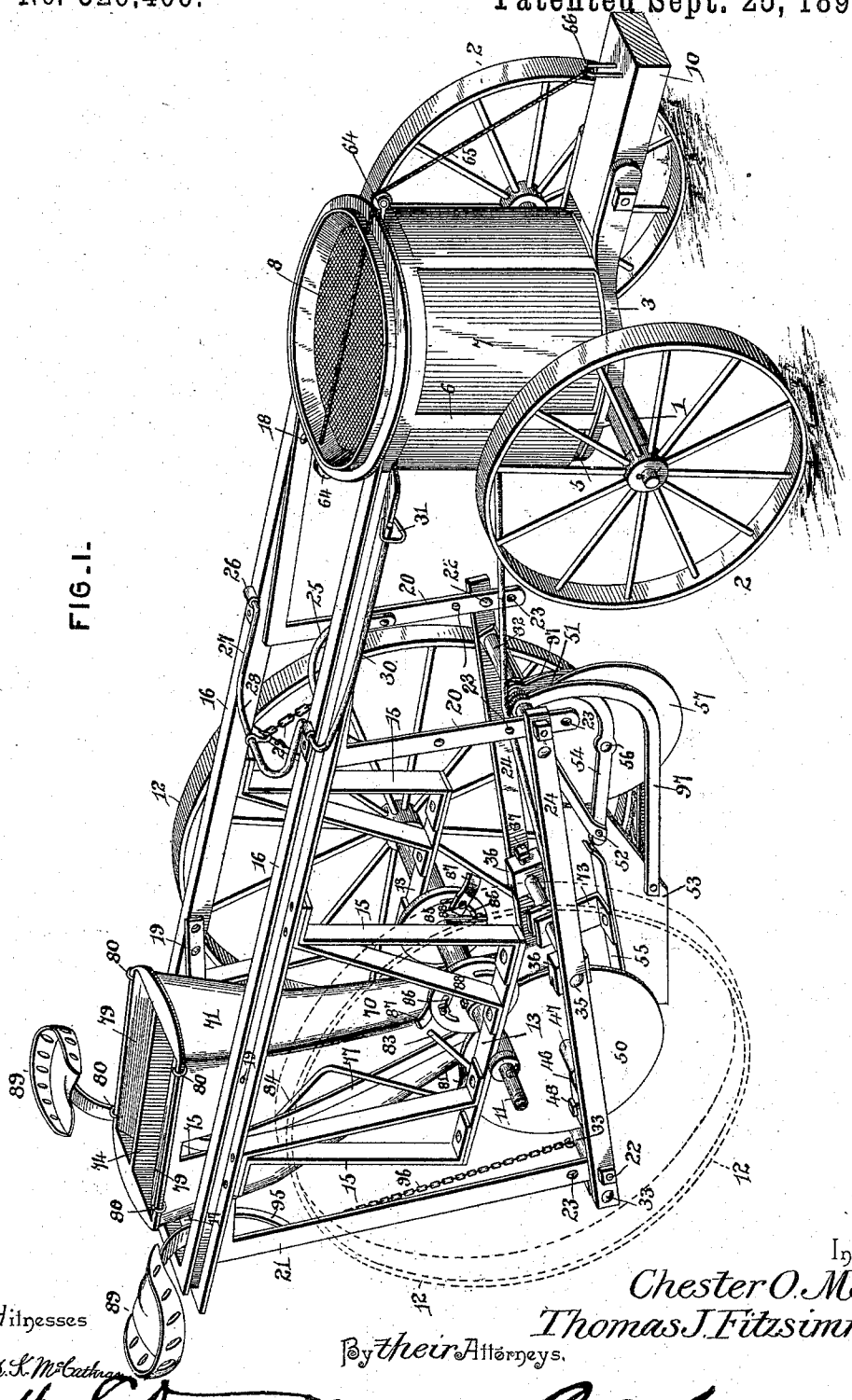

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FIG. 2.

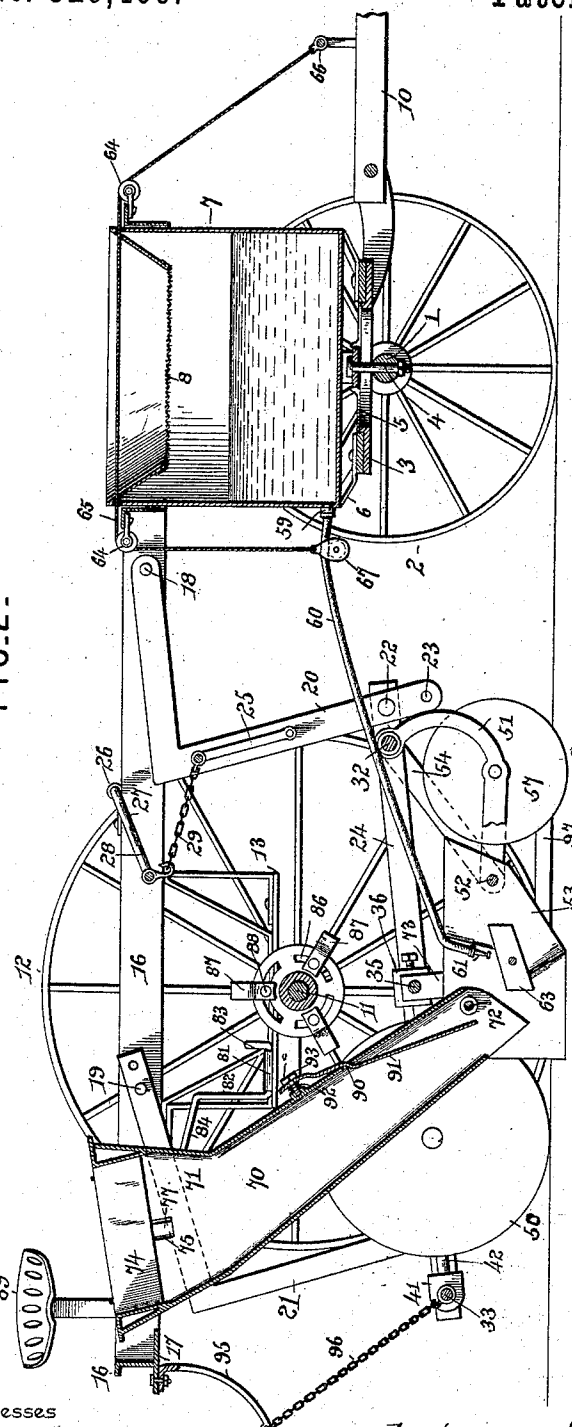
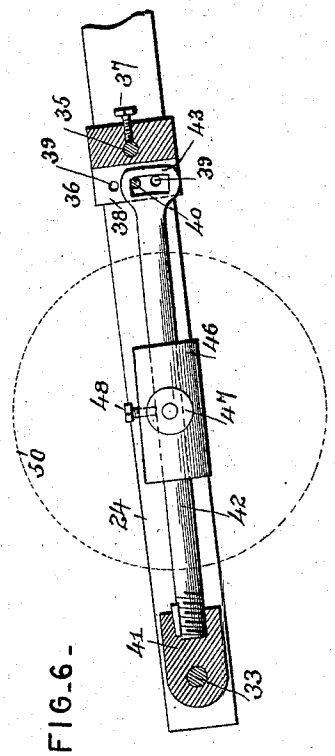


FIG. 6.



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(No Model.) 4 Sheets—Sheet 3.

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TRANSPLANTING MACHINE.

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FIG. 7.

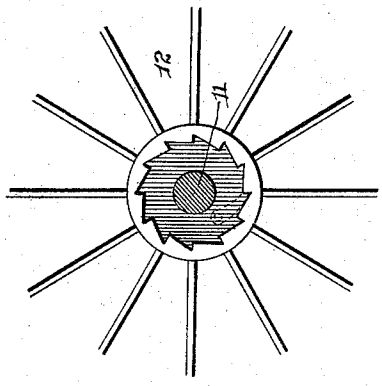
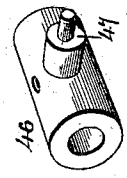


FIG. 8.



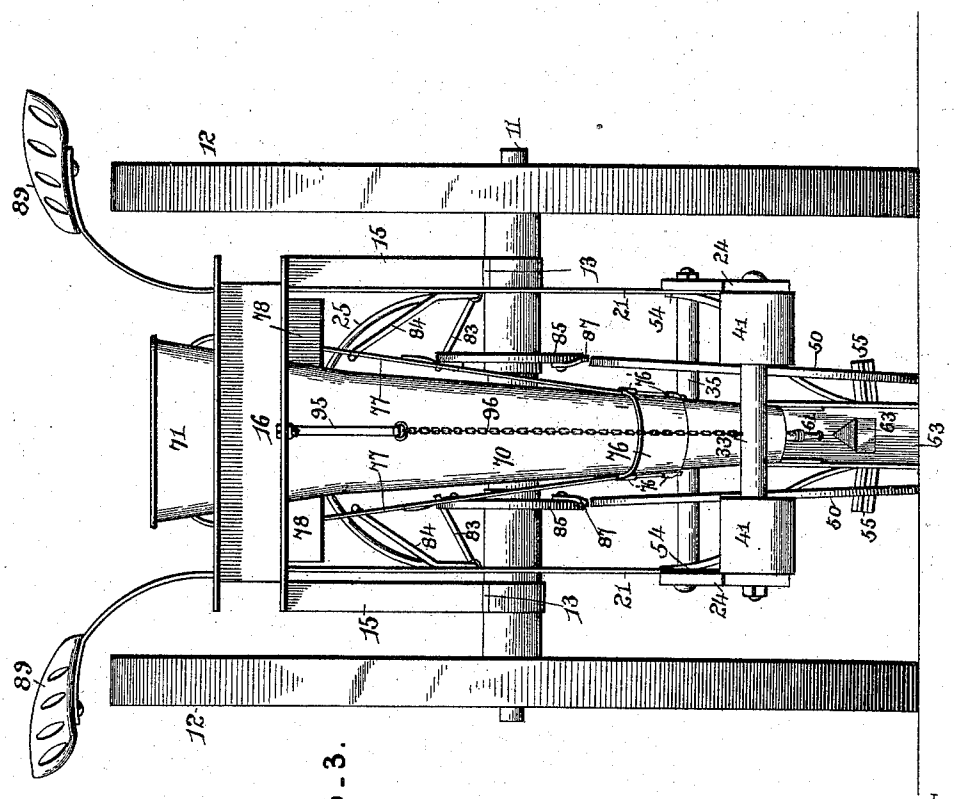


FIG. 3.

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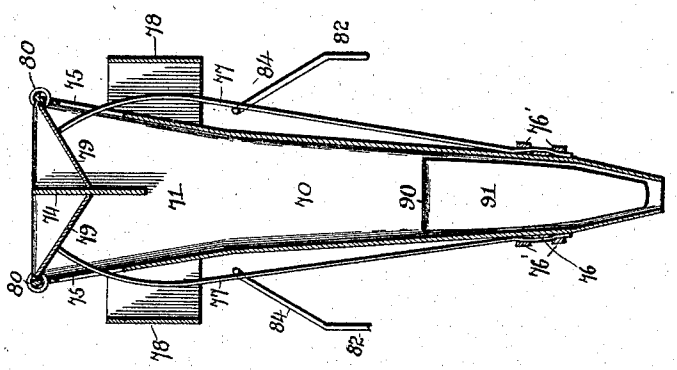
TRANSPLANTING MACHINE.

No. 526,406. **Patented Sept. 25, 1894.**

FIG. 5.



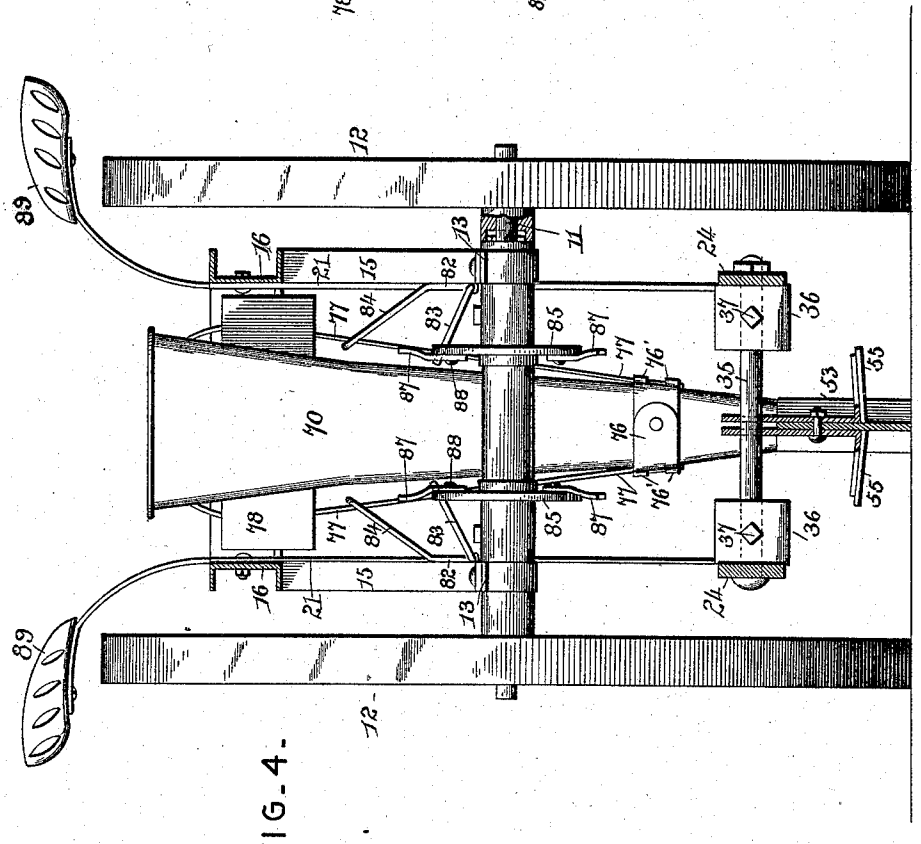


FIG. 4.

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UNITED STATES PATENT OFFICE.

CHESTER O. MOORE AND THOMAS JOSEPH FITZSIMMONS, OF FRUITLAND, IOWA.

TRANSPLANTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 526,406, dated September 25, 1894.

Application filed December 8, 1893. Serial No. 493,111. (No model.)

To all whom it may concern:

Be it known that we, CHESTER O. MOORE and THOMAS JOSEPH FITZSIMMONS, citizens of the United States, residing at Fruitland, in the county of Muscatine and State of Iowa, have invented a new and useful Transplanting-Machine, of which the following is a specification.

Our invention relates to improvements in transplanting-machines, the objects in view being to produce a machine of cheap and simple construction, consisting of comparatively few parts, and which is adapted to form the furrow and at regular intervals set therein plants, and to subsequently cover the plants; and also to provide for a convenient adjustment of the parts under the control of the operator.

Various other objects and advantages of the invention will appear in the following description and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings:—Figure 1 is a perspective view of a machine embodying our invention. Fig. 2 is a vertical longitudinal sectional view of the machine. Fig. 3 is a rear elevation. Fig. 4 is a transverse vertical sectional view in front of the discharge-spout. Fig. 5 is a vertical transverse sectional view through the discharge-spout. Fig. 6 is a longitudinal sectional view through the supporting blocks of the short longitudinal covering-wheel supporting shafts. Fig. 7 is an inner elevation of the central portion of one of the ground-wheels. Fig. 8 is a detail perspective view of one of the covering-wheel journals.

Like numerals of reference indicate like parts in all the figures of the drawings.

In practicing our invention we employ a front axle 1, upon which are located ground-wheels 2, the said axle being secured to the under side of a fifth-wheel 3, and pivoted by a king-bolt 4, to a bolster 5. This bolster 5 supports a frame 6 in which there is mounted in this instance a cylindrical water-tank 7 in whose upper end a strainer 8 is located. To the hounds the draft-pole 10 is secured in the usual manner. A rear axle 11 is also employed, and upon the same is loosely mounted ground-wheels 12, the same being connected with the axle by a pawl and ratchet-mechanism of the usual construction, whereby when the ground-wheels move forward the axle is turned and when moving backward the axle remains stationary.

Supporting-plates 13 are arranged upon the axle and are provided upon their under sides with bearing-boxes for the accommodation of said axle. These supporting-plates are surmounted by standards 15, and a pair of longitudinal sills 16 are arranged thereon, and at their front ends are bolted to the frame that supports the water-tank. The rear ends of the sills are connected by a transverse sill 17.

Pivotally connected at 18 and 19 to the sills 16 are respectively front and rear inverted L-shaped hangers 20 and 21, whose lower ends are pivoted thereto in an adjustable manner by means of bolts 22 passed through any one of a pair of perforations 23 formed in the hangers 20.

A bail 25 is pivotally connected to the front pair of hangers 20 and journaled above the same in transversely opposite bearings 26 is a crank-shaft 27, the same having its crank-portion 28 connected by a chain 29 to the aforesaid bail. One end of the shaft projects beyond the bearing 26 and is bent to form a lever 30 which may be depressed toward the front end of the machine and engaged by the locking-pin 31, whereby it will be obvious the hangers are elevated as is also the mechanism supported thereby. On the other hand, by disengaging the link with the free-end of the lever, the hangers, together with the mechanism carried thereby and hereinafter described, are lowered to an operative position.

The side-bars 24 are connected at their front and rear ends by tie-bolts 32 and 33 respectively, and between their ends by a transverse tie-bolt 35. The latter bolt has mounted thereon a pair of boxes 36 which are adjustable upon the bolt by means of binding-bolts 37 passed therethrough and bearing against the aforesaid bolt 35. The blocks 36 are further provided at their rear sides with vertical slots 38, the opposite sides of which are provided with a series of perforations 39, in any pair of which a transverse pin 40, may be

arranged. Bearing-boxes 41, are located upon the rear tie-bolt 33, and into these boxes are threaded the rear ends of a pair of short longitudinal shafts 42, the same being keyed therein so as to be rigid. The front ends of these short shafts 42 terminate in vertically slotted clevises 43, which pass into the slots 38 of the boxes 36 and are loosely engaged by means of the pins. When in such engagement it will be seen that the shafts 42 are also capable of a slight vertical oscillation.

Sleeves 46 are mounted upon the shafts 42, and at their inner sides are provided with stub-axles 47. Each sleeve is adjustable upon its shaft both in a longitudinal and rotatable manner by means of a binding-screw 48, whose inner ends impinge upon the shaft 42 and by this construction covering wheels 50 are transversely pivotally adjusted. Each of these stub-axles 47 carries a covering-wheel 50 which is adapted to loosely rotate thereon. These covering wheels are capable of swinging inward and outward transversely to effect the desired adjustment.

To the front bolt 32 there is loosely connected the upper ends of a pair of braces 51, which at their rear ends are, by means of a bolt 52, secured to the opposite sides of a pair of diverging branches of a shoe 53. Inclined braces 54 are also secured at their upper ends to the bolt 32 and at their lower ends to the bolt 52. The branches of the shoe are provided upon their exterior sides with inclined deflecting-wings 55, which limit the depth of penetration of the shoe and also serve to level off the furrow produced thereby. A transverse axle 56 is located between the curved braces in advance of the shoe, and the same supports a colter-wheel 57, adapted to travel in front of the shoe and clear away the trash that may lie in its path.

A faucet 59, is located at the rear end of the water-tank and connected to the faucet is a flexible hose 60, which extends rearward to a point over the shoe and terminates in a nozzle 61 let into the shoe at the upper end thereof and located above an inclined wedge-shaped spreading plate 63. A pair of pulleys 64, are located upon the front and rear sides and at the upper edge of the water-tank, and over these passes a light rope 65, the front end of which is connected at 66 to the draft-pole, and the rear end of which has attached thereto a sheave or pulley 67, through which the flexible hose runs. It will be obvious that from this construction when the front wheels are turned at an angle, as when turning the machine, the light rope will be drawn outward by the draft tongue and consequently the flexible hose arched or elevated to a point above the front ground-wheels, and hence cannot be injured by contacting therewith.

Located in the rear end of the machine is an inclined gradually tapered or conical spout 70, which at its upper end is flared to form a hopper 71. The lower end of the hopper takes between the branches of the shoe and is pivoted thereto by a transverse bolt 72. A pair of straps 73 are likewise bolted to the shoe, and at their upper ends are perforated for the passage therethrough of the transverse intermediate tie-bolt 35. The hopper is subdivided longitudinally by a partition 74, and at its opposite sides its wall is slotted at 75. A band 76 encircles the discharge-spout above the shoe and is provided with sockets 76′ in which are fitted the lower ends of a pair of opposite curved springs 77, whose upper ends pass through keepers 78 located at opposite sides of the hopper and extend into the latter through the openings before mentioned. The free ends of these springs bear against the under sides of and support a pair of hinged cut-offs 79 whose outer edges are hinged at 80 to the outer upper edges of the hopper.

Bearings 81, are located upon the supporting-plates of the rear axle, and in each is journaled a rock-shaft 82, the front ends of which are inwardly and upwardly bent as at 83 and the rear ends of which are upwardly and rearwardly bent as at 84 and take between the springs and the sides of the hopper. The rear axle is provided at each side of its center with a disk 85, and each disk is provided with one or more curved slots 86. Tappets 87, to any number required, are removably and adjustably secured to the inner faces of the disks by means of bolts 88 and are designed to alternately strike the rock-shafts and press them outward so as to cause them to force the springs away from the hopper and from their supporting positions with relation to the cut-offs, and thus release the latter, whereby they may drop by gravity.

Seats 89 are located at the opposite sides of the hopper for the accommodation of the feeders or attendants.

The front wall of the discharge spout above the shoe is provided with a transverse slot 90 and extending from the outside into and below the slot is a tension-plate 91.

The tension plate is disposed longitudinally of the discharge spout at a slight angle thereto, and it gradually contracts and diminishes the size of the same. The outer end of the plate extends upward in front of the discharge spout and has interposed therebetween a coiled-spring 92 whose tension is regulated by means of an adjusting-screw 93, passing through a perforation in the plate and the spout.

A spring 95 depends from the bar 17 and is connected to rod 33 by chain 96. The spring 95 is curved, and extends rearward, and the chain 96 inclines downward and forward therefrom, its upper end being connected to the lower end of the spring.

This completes the construction of the machine and the operation thereof is as follows:—It will be seen that in order to throw the machine into operative position the crank-shaft is first lowered, the lever of said shaft being

disengaged from said locking-link in the manner before mentioned. This operation brings the colter in contact with the ground and as the machine moves along the colter cuts through the trash and forms a path or kerf, which facilitates the formation of the furrow by the shoe that follows thereafter. In a manner hereinafter described the plants are dropped at intervals into the shoe and deposited into the furrow thus formed, their dropping being immediately followed by the planting-wheels which tend to throw up the earth and produce a drill or row. It will also be seen that at the time that the furrow is formed a spray of water will be deposited in the bottom thereof so as to freshen the roots of the plant deposited in the furrow. The depth of the furrow will be regulated in a great measure by the flanges or wings at the sides of the shovel, which also tend to smooth off the same.

It will be obvious that by reason of the manner of mounting the covering-wheels, that is upon shafts that are permitted to have a slight vertical play, the said wheels will bear conveniently at each side of the furrow and are capable of passing over undulations therein.

The attendants are mounted upon the seats at the opposite sides of the hopper, and as fast as necessary place the plants root down upon the cut-offs, which as shown, are, at intervals alternately permitted to drop the plants, sliding down the discharge-spout and being deposited by the shoes in the bottom of the furrow as the same is formed and being immediately followed by the covering-wheels which secure them in position. It will be obvious that the tappets on the tappet-wheels may be adjusted with relation to each other, so that they will alternately operate the rock-shafts; and furthermore, that their number may be increased or diminished.

From the foregoing description in connection with the accompanying drawings it will be seen that we have provided a very simple, economical, and durable machine, which is designed to accurately and rapidly at predetermined distances apart deposit plants in furrows, producing the furrows, and covering the same, all in one continuous, unbroken operation.

We do not limit our invention to the precise details of construction herein shown and described, but hold that we may vary the same to any degree and extent within the knowledge of the skilled mechanic. Curved guards 97 may depend from the bolt 32 and be bolted at their rear ends to the sides of the shoe 53, for the purpose of depressing down all trash from the path of the shoe while being cut by the colter.

Having described our invention, what we claim is—

1. In a machine of the class described, the combination with the front and rear axles, the former being pivoted, of a framework supported by the axles, a tank supported by the front axle, a transplanting mechanism, a flexible hose extending from the tank to the transplanting mechanism, a tongue secured to the front axle, and devices operated by the tongue for elevating the hose to prevent contact with the front wheels when the front axle is turned, substantially as specified.

2. In a machine of the class described, the combination with the front and rear axles, the former being pivoted, of a framework supported by the axles, a tank supported by the front axle, a transplanting mechanism, a flexible hose extending from the tank to the transplanting mechanism, a tongue secured to the front axle, pulleys arranged upon the tank, a rope passing through the pulleys and connected to the tongue, and a sheave connected to the rear end of the rope and loosely receiving the hose, substantially as specified.

3. In a machine of the class described, the combination with the front axle, the fifth wheel surmounting the same, the bolster surmounting the fifth wheel, the circular framework surmounting the bolster, and a tank arranged in the framework, of a rear axle, the framework surmounting the same, the transplanting mechanism arranged therein, and a hose leading from the tank to the transplanting mechanism, substantially as specified.

4. In a machine of the class described, the combination with the depending inverted L-shaped hangers arranged in pairs, the frame at the lower end of the same, and the transplanting mechanism carried by the frame, of the transversely opposite bearings, the cranked shaft arranged in the bearings and having a handle at one end, means for locking the handle in a depressed position, a bail connected to the front hangers and a chain between the bail and the cranked portion of the shaft, substantially as specified.

5. In a machine of the class described, the combination with the framework, and furrow-forming and plant-dropping devices, of a pair of longitudinally-disposed shafts pivoted at their rear ends and having their front ends loosely mounted and capable of a limited swinging movement, sleeves mounted on the shafts and provided with transversely-disposed stub-shafts and capable of rotary adjustment on the longitudinal shafts to arrange the stub-shafts in the desired position, and a pair of covering wheels journaled on the stub-shafts, substantially as described.

6. In a machine of the class described, the combination with the framework, and the furrow-forming and plant dropping mechanism, of a pair of slotted blocks arranged at the sides of said mechanism, a pair of rear pivoted blocks, shafts secured to the rear blocks and engaging the slots of the front blocks, means for adjustably securing the shafts in the front blocks, sleeves arranged on the shafts and provided at their sides with

stub-shafts, binding-screws for the sleeves, and covering-wheels for the stub-shafts, substantially as specified.

7. In a machine of the class described, the combination with the front and rear axles, the framework supported thereby, the depending hangers, the opposite side-bars connecting the hangers, and the tie-bolts connecting the cross-rods, of the furrow-forming and plant-dropping mechanisms between the side-bars, the vertically slotted blocks arranged on one of the tie-bolts, a pair of loose blocks upon the rear tie-bolt, the front blocks being provided with vertical slots having a series of perforations, and removable locking-pins passing through the perforations, short longitudinal shafts having their rear ends rigidly secured in the rear blocks, and their front ends terminating in vertically slotted clevises engaged loosely by the pins, substantially as specified.

8. In a machine of the class described, the combination with the front and rear axles, the superimposed sills, the pivoted hangers having perforations in their lower ends, means for raising and lowering the hangers, the opposite side-bars, adjusting-bolts connecting the same with the perforations in the hangers, tie-bolts for the side-bars, a furrow-forming shoe secured to the intermediate tie-bolt, braces between the front tie-bolt, and the furrow-forming shoe, a colter located between the braces, opposite covering-wheels in rear of the shoe, and a discharge-spout leading from the upper end of the machine to a point between the blades of the shoe, substantially as specified.

9. In a machine of the class described, the combination with the superimposed side-sills, the front and rear axles, their ground-wheels, depending hangers, the opposite connecting side-bars, and the front, rear, and intermediate tie-bolts, of a shoe located below the intermediate tie-bolt, straps connecting the same with said tie-bolt, inclined and curved braces leading from the front tie-bolt to the front end of the machine and bolted thereto, a colter located between the curved braces, a plant setting-device arranged above the shoe, and covering-devices in rear of the shoe, substantially as specified.

10. In a machine of the class described, the combination with a framework, and furrow-forming and plant-dropping devices, of longitudinally-disposed sleeves provided with stub-shafts and capable of longitudinal and rotary adjustment to arrange the stub-shafts in the desired position, and a pair of covering wheels arranged on the stub-shafts, substantially as described.

11. In a machine of the class described, the combination with the framework, and planting devices, of a discharge spout, subdivided at the top, a pair of inclined downwardly swinging cutoffs arranged within the discharge spout at the top thereof, springs supporting the cutoffs, tappet wheels, and rock-shafts actuated by the tappet wheels and arranged to engage the said springs, whereby the supports are withdrawn from the cutoffs, substantially as and for the purpose described.

12. In a machine of the class described, the combination with the framework, and the planting mechanism, of a discharge spout having a transverse slot between its ends, a tension plate passed through the slot and at its upper outer end extending above the same, the inner lower portion of the tension plate being disposed longitudinally of the discharge chute and arranged at an angle thereto and gradually contracting the same a spring introduced between the upper end of the plate and the discharge spout, and an adjusting-bolt passed through the spring and plate, substantially as specified.

13. In a machine of the class described, the combination with the framework, supporting axles and wheels, the furrow-forming shoe, and covering wheels, of the superimposed discharge spout terminating at its upper end in a hopper, and longitudinally subdivided, the hinged cut-offs at the upper end of the spout, a band encircling the spout, the springs fixed in sockets in the band and extending through slots in the hopper and taking under the cut-offs and normally supporting the same, tappet-wheels arranged on the axle, and rock-shafts arranged in the path of the tappet-wheels and having their rear ends engaging the inner sides of the springs, substantially as specified.

In testimony that we claim the foregoing as our own we have hereto affixed our signature in the presence of two witnesses.

CHESTER O. MOORE.
THOMAS JOSEPH FITZSIMMONS.

Witnesses:
J. CHENOWETH,
J. S. MCKEE.