

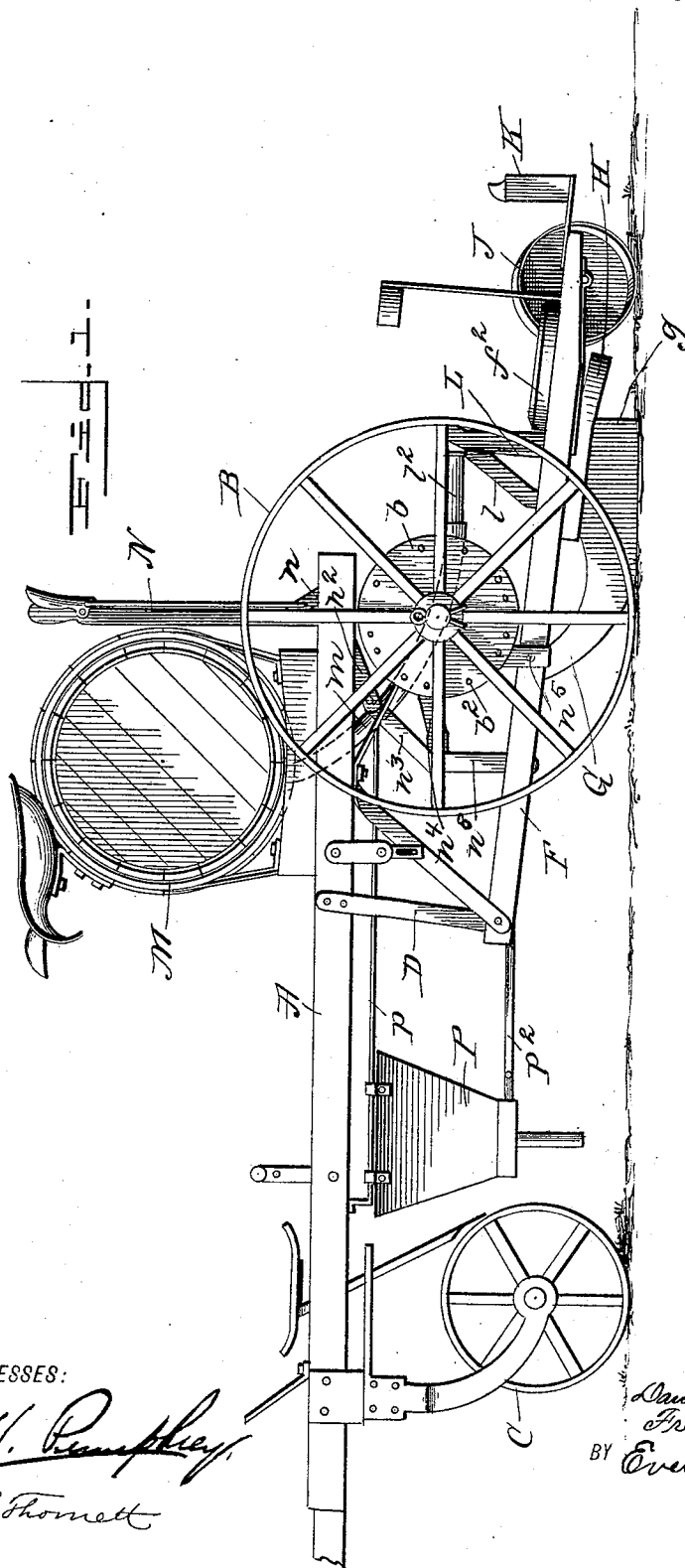
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6 Sheets—Sheet 1.

D. D. & F. H. BEMIS.
TRANSPLANTER.

No. 520,477.

Patented May 29, 1894.



WITNESSES:

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B. F. Thorne

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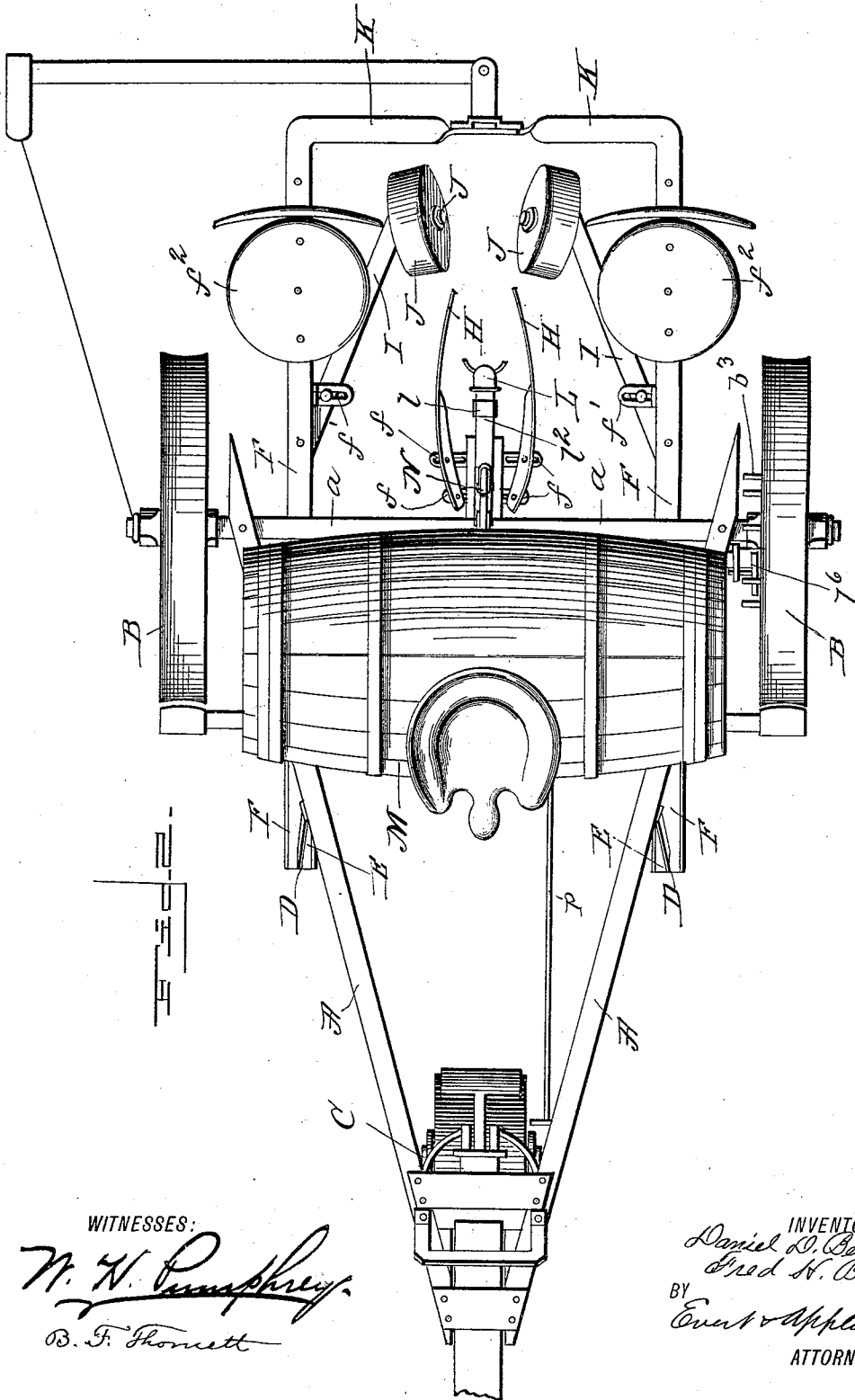
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6 Sheets—Sheet 2.

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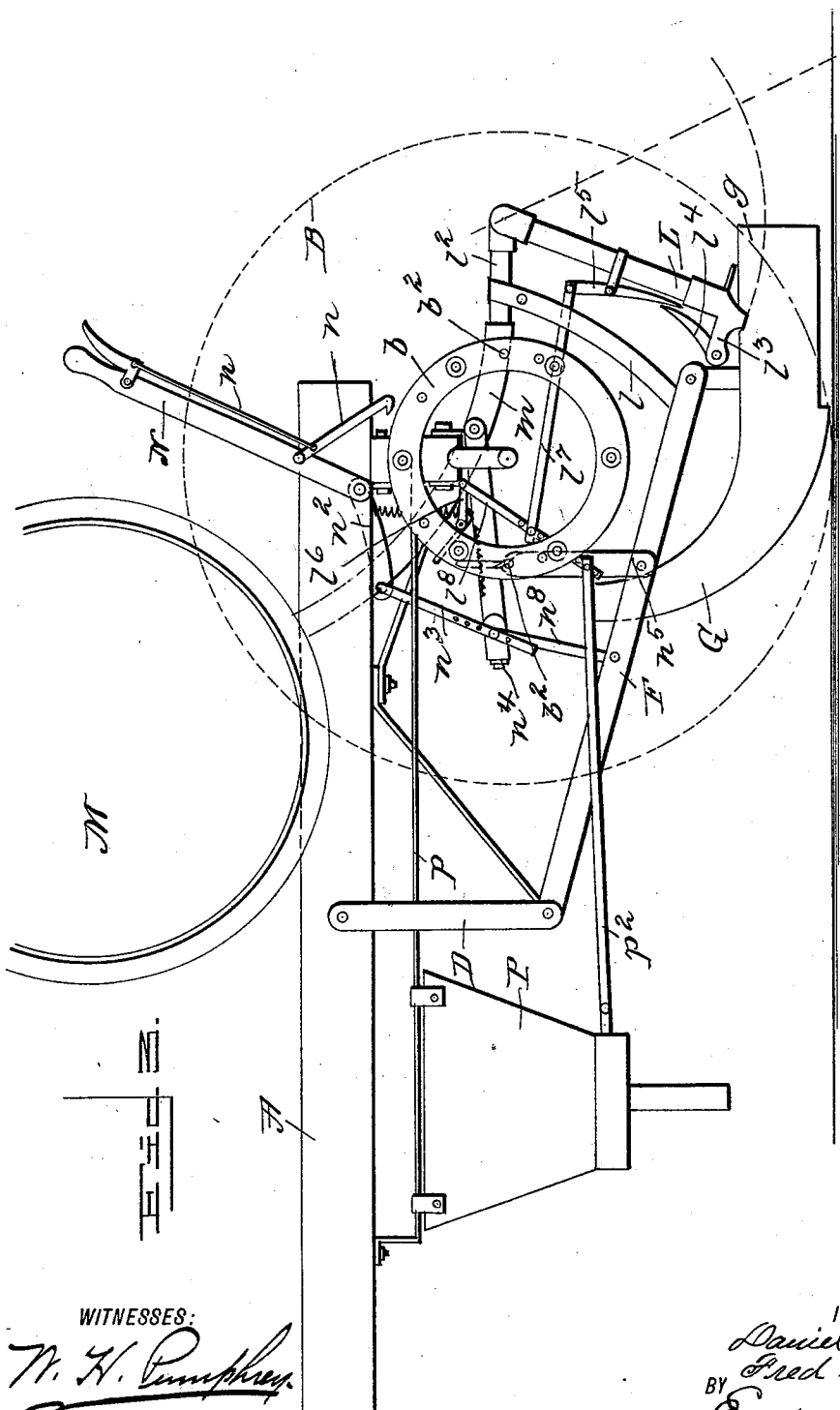
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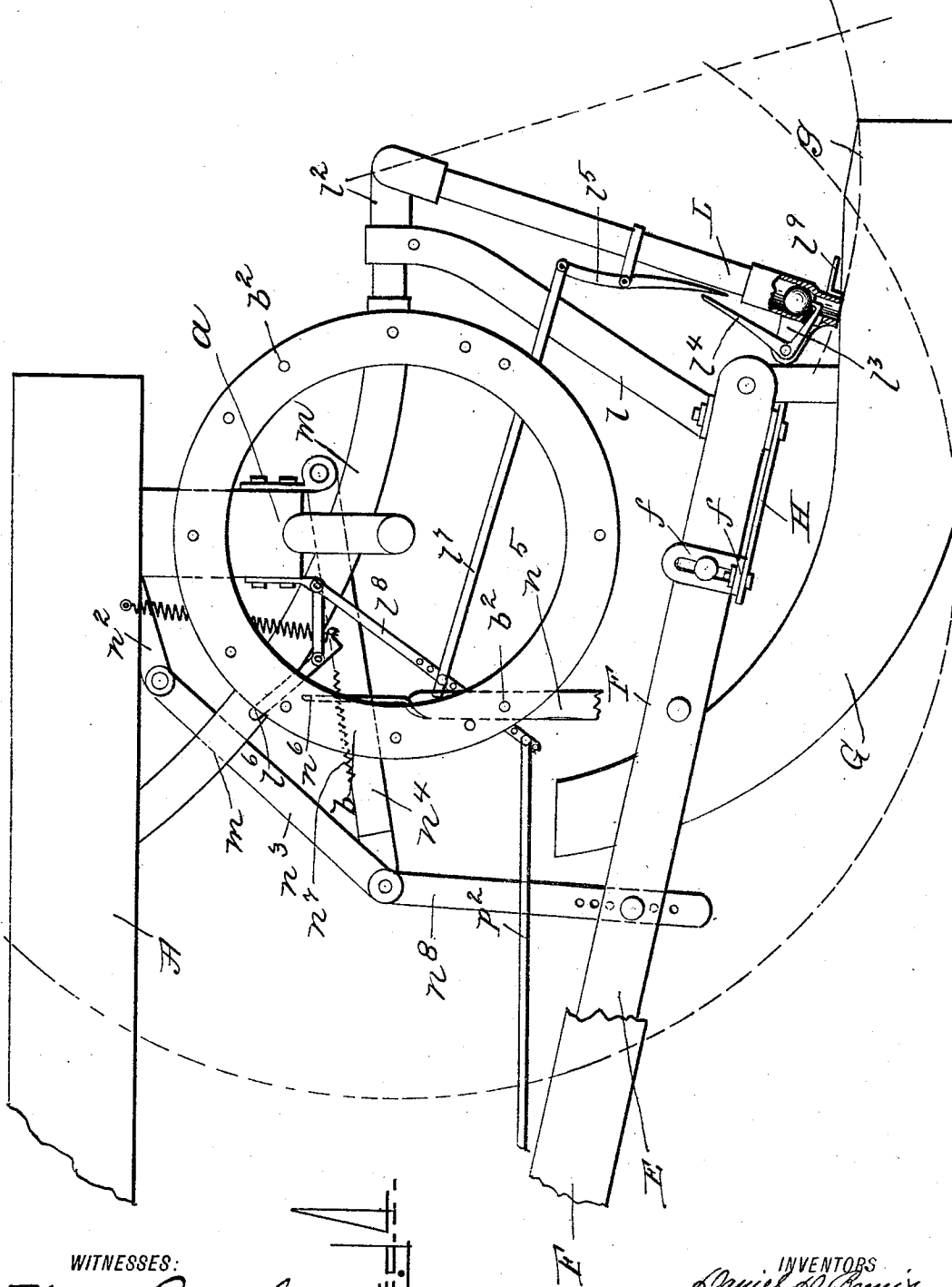
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D. D. & F. H. BEMIS.
TRANSPLANTER.

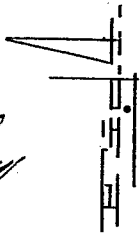
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(No Model.)

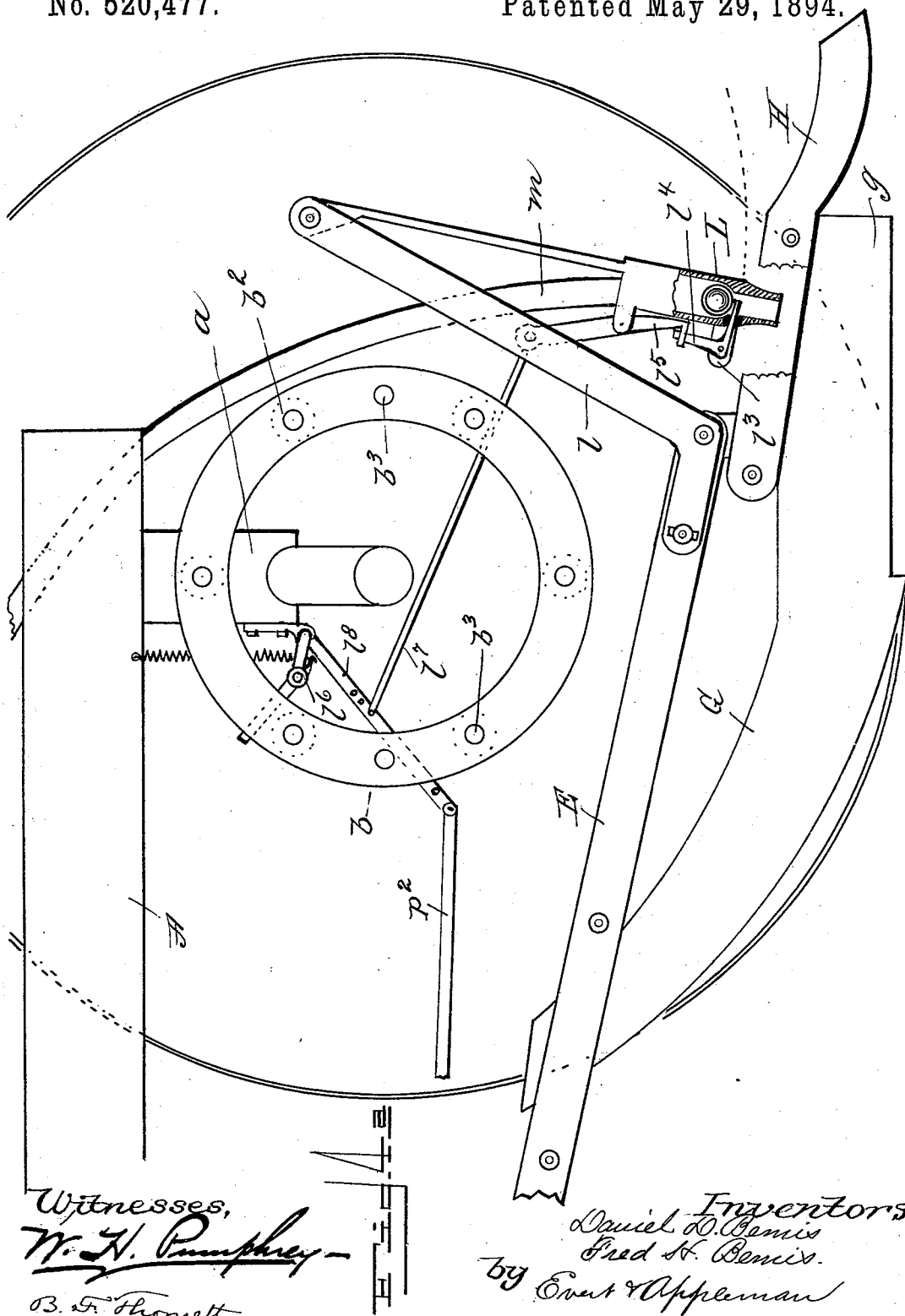
6 Sheets—Sheet 6.

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UNITED STATES PATENT OFFICE.

DANIEL D. BEMIS, OF EASTONVILLE, COLORADO, AND FRED H. BEMIS, OF FOOTVILLE, WISCONSIN; SAID DANIEL D. BEMIS ASSIGNOR TO SAID FRED H. BEMIS.

TRANSPLANTER.

SPECIFICATION forming part of Letters Patent No. 520,477, dated May 29, 1894.

Application filed March 5, 1892. Serial No. 423,952. (No model.)

To all whom it may concern:

Be it known that we, DANIEL D. BEMIS, residing at Eastonville, El Paso county, Colorado, and FRED H. BEMIS, residing at Footville, Rock county, Wisconsin, citizens of the United States, have jointly invented certain new and useful Improvements in Transplanters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

Our invention relates to machines for transplanting plants, such as tobacco, cabbage, tomato and the like and it has for its object the provision of a machine that shall be simple, inexpensive and thoroughly efficient in use.

The novelty of our invention will be hereinafter set forth and specifically pointed out in the claims.

In the accompanying drawings:—Figure 1, Sheet 1, is a side elevation of a machine embodying our invention. Fig. 2, Sheet 2, is a plan view of the same with the fertilizer hopper removed. Fig. 2^a, Sheet 3, is a partial plan view with the water tank and valve mechanism removed. Fig. 3, Sheet 4, is an enlarged sectional side elevation of the machine. Fig. 4, Sheet 5, is a still further enlarged sectional side elevation to illustrate the operation of the water supply mechanism. Fig. 4^a, Sheet 6, is a corresponding view showing a modification in the construction of the water supply mechanism.

The same letters of reference indicate identical parts in all the figures.

A, Fig. 1, is the main frame of the machine composed of two forwardly converging beams secured at their rear ends to a transverse beam *a* having stub spindles on which are journaled the supporting wheels B. At the forward converging end of the frame is a caster wheel C provided with any suitable locking device to hold it rigid when the machine is moving straight forward.

Extending downwardly from the frame, Figs. 1, 2 and 3, are two rigid bars or supports D to which are pivotally secured the diverging forward ends of the two part draw bar E and the seat bars F. Secured between the two parts of the draw bar is the furrow

opening runner G having diverging plates or mold boards *g*, Fig. 2^a, which serve to open the furrow, and adjustably secured to said runner are rearwardly extending curved scrapers H for closing the furrow and covering in the roots of the plant.

The seat bars F carry seats *f*² for the plant-setters and have pivotally secured to their under sides and adjustably held as at *f'* *f'* rearwardly converging spring arms I with inclined spindles on which are journaled inclined presser wheels J. The rear ends of the seat bars F are connected by adjustable brackets K K to aid the arms I in adjusting the distance between the wheels J.

Secured to the rear end of the draw bar F is a standard *l* carrying at its upper end a water pipe *l*² communicating at its forward end, by a tube *m*, with a water tank or barrel M carried on the main frame. Hinged with a water tight joint to the rear end of the pipe *l*² is a backwardly and forwardly movable pipe L having any suitable valve at its lower end. As seen in Fig. 4, this valve is a ball which is held down to its seat by the weight of water above it and which is raised to permit the flow of water, by a bell crank lever *l*⁴ pivoted to a projecting lug *l*³ on the pipe L and having a bent up projection entering an opening in the valve casing and engaging the under side of the ball. Pivoted to a clip or other projection on the pipe L is a lever *l*⁵ whose lower end is adapted to operate the bell crank *l*⁴ and whose upper end is pivotally connected by a forwardly extending rod or link *l*⁷ to a downwardly extending crank arm *l*⁸ on a shaft journaled in brackets on the lower forward side of the beam *a*. The outer end of said shaft also has upon it a crank arm to which is pivoted with a knuckle joint a dog *l*⁶ in the path of rollers or projecting trips on a ring disk *b* secured to the adjacent wheel B and concentric therewith. The rollers are carried on studs *b*³ secured in openings *b*² in the disk *b*, of which openings a series is provided so that the rollers may be adjusted as desired. The crank arm *l*⁸ is provided with a series of perforations by which the link *l*⁷ may be adjusted as desired to obtain greater or less throw of the pipe L. Any suitable spring is employed to hold down the dog and hold

up the crank arm to which the dog is pivoted together with the parts carried thereby. In this instance I have shown it as a coiled spring l^9 whose upper end is secured to the main frame and whose lower end is secured to a rearward and lateral extension of the dog, which extension forms the knuckle.

Pivoted to the rear lower side of the beam a just over the seat bars F , are two forwardly extending arms n^4 serrated on their upper edges as at n^7 and connected by a transverse bar in front, the whole forming a yoke which is held up by a link n^8 adjustably pivoted at its lower end to the draw bar E and pivoted at its upper end to a central projection on the yoke. A second link is likewise pivoted at its lower end to said projection and at its upper end to the short arm n^2 of a bell crank hand lever N pivoted on the beam a and having a hand operated hook latch n . Links n^5 pivoted at their lower ends to the seat bars extend up and have their upper ends formed into hooks n^6 which engage in the serrations n^7 of the yoke.

As seen in Figs. 1 and 3, P is a fertilizer hopper adjustably supported on longitudinally disposed rods p secured to the under side of the main frame and having a downwardly directed discharge spout in line with the runner G . Any suitable valve is provided to open and close an opening in the bottom of the hopper and this valve is connected by a link or rod p^2 with the lower end of the crank arm l^8 . When not desired for use, the hopper P and link p^2 may be disconnected from the machine.

The operation of the machine thus described is as follows: The plant-setters sit on the seats f^2 with the plants in their laps and their weight is transmitted through the hooked links n^3 , yoke n^4 and link n^8 to the draw bar and runner causing the latter to properly enter the ground to open the furrow. Before the machine is started the pipe L is in the position of the solid lines of Fig. 4 with its lower end carrying the valve between the mold boards g at their rear ends, as seen in Fig. 2^a. One of the plant-setters then takes a plant in his fingers and rests his hand against the lower end of the valve casing and the machine is started and the furrow opened. Still holding his hand against the pipe L he lowers the roots of the plant into the furrow and as the roller on the disk b comes in contact with the dog l^6 the same is pressed down, thereby pressing evenly backward the crank arm l^8 and link l^7 . The first backward movement of the link l^7 through the medium of lever l^5 and bell crank l^4 opens the valve to permit the flow of water from the pipe L directly into the furrow around the roots of the plant. Almost instantly after the valve is thus opened, the upper end of the lever l^5 comes in contact with the pipe L and swings it backward, say as far as the dotted line in Fig. 4, the valve in the mean time continuing open to permit the discharge of water. Now while the pipe L is

swinging backward the machine is going forward at the same rate so that the lower end of the pipe is discharging at one fixed spot in the furrow and around the roots of the plant. Just at the moment the scrapers H begin to pull the earth into the furrow to cover the roots, the roller will have pressed and released the dog, and the spring l^9 which had been put under tension, draws the crank arm up to which the dog l^6 is pivoted and through the medium of the crank arm l^8 , link l^7 and lever l^5 , first closes the valve and then quickly, almost instantaneously, draws forward the pipe L to its former position between the mold boards g . The other plant-setter, in the mean time, having gotten his plant ready now places it in the furrow and holds it there against the pipe until the next roller on the disk b engages the dog, and the above operation is repeated, continuously, each plant-setter setting a plant, alternately, behind the pipe L which serves as a guide for the proper and equidistant setting of the plants. The inclined wheels J , following the scrapers H , hill up and firm the earth over the roots of the plants thereby insuring their speedy and healthy growth.

By changing the distance apart of the rollers on the disks b and the throw of the pipe L , the distance apart of the plants can be regulated as desired.

In transporting the machine from place to place, when not in action, the lever N is drawn back and down, thereby lifting the draw-bar, runner and connected parts, and, through the medium of the yoke and links n^3 , the seat beams and wheels J , until the hook on the latch n comes under and is engaged by the beam a to hold these parts suspended from the ground.

The hopper P is so located on the frame that the deposits of fertilizer, will come at the points where the plants are inserted, and, by placing the fertilizer hopper in front of the runner, the fertilizer is carried down into the furrow where its efficiency is increased.

In the modification shown in Fig. 4^a, the pipe L is shortened and is pivoted by an extension s to the upright l and the tube m is brought from the tank M directly down into the top of the pipe L but the operation remains the same, as will be readily understood.

While we have shown and prefer the use of a valve in the water conduit, it is obvious that a large part of the advantage of our invention would be obtained if the valve were dispensed with, for the pipe L returns so quickly to its forward position that very little water would escape into the furrow between the plants, and if it did no harm would result.

Having thus fully described our invention, we claim—

1. In a transplanter, the combination of a furrow opener, a water tank, a movable conduit and hand guide extending from said tank to the furrow in rear of the furrow opener,

automatic means for carrying said conduit back and then forward, and one or more plant-setter's seats in rear of said furrow opener, whereby the discharge end of said conduit
5 forms a guide and support for the hand in setting the plants, substantially as described.

2. In a transplanter, the combination of a furrow opener, a water tank, a movable conduit and hand guide extending from said tank
10 to the furrow in rear of the furrow opener, a valve in the conduit, means for opening said valve and carrying back said conduit so that its discharging end delivers the water on one spot as the machine advances and then closes
15 said valve and resets the discharging end of the conduit, and one or more plant-setter's seats in rear of said furrow opener, whereby the discharge end of said conduit forms a guide and support for the hand in setting the
20 plants, substantially as described.

3. In a transplanter, the combination of a furrow opener, a water tank, a movable conduit and hand guide extending from said tank to the furrow in rear of the furrow opener, a
25 valve in the conduit, means for opening said valve and carrying back said conduit so that its discharging end delivers the water on one spot as the machine advances and then closes said valve and resets the discharging end of
30 the conduit, one or more plant-setter's seats in rear of said furrow opener, and scrapers for filling in the earth on the roots of the plants in the furrow, substantially as described.

35 4. In a transplanter, the combination of a furrow opener, a water tank, a movable conduit and hand guide extending from said tank to the furrow in rear of the furrow opener, a valve in the conduit, means for opening said
40 valve and carrying back said conduit so that its discharging end delivers the water on one spot as the machine advances and then closes said valve and resets the discharging end of the conduit, one or more plant-setter's seats

in rear of said furrow opener, scrapers for
45 filling in the earth on the roots of the plants in the furrow, and presser wheels following said scrapers to firm the ground, substantially as described.

5. In a transplanter, the combination of a
50 furrow opener, a water tank, a movable conduit and hand guide extending from said tank to the furrow in rear of the furrow opener, a valve in the conduit, mechanism operated by the revolution of one of the wheels of the machine as it advances for opening said valve
55 and carrying back said conduit so that its discharging end delivers the water on one spot as the machine advances and then closes said valve and resets the discharging end of
60 the conduit, and one or more plant-setter's seats in rear of said furrow opener, substantially as described.

6. In a transplanter, the combination of a furrow opener, a water tank, a movable conduit extending from said valve to the furrow
65 in rear of the furrow opener, a valve in said conduit, means for opening said valve and carrying back said conduit, and a fertilizer hopper in advance of the furrow opener and
70 provided with a valve controlled by the afore-said means for swinging the water conduit, substantially as described.

7. In a transplanter, having a combined vibrating water conduit and hand guide with
75 a valve therein, the combination with said valve of means for first opening the valve, then swinging back the conduit, then closing the valve and finally swinging forward said conduit, substantially as described. 8c

In testimony that we claim the foregoing as our own we hereunto affix our signatures in presence of two witnesses.

D. D. BEMIS.
FRED H. BEMIS.

Witnesses:

G. D. SILVERTHORN,
GRACIA D. SIMONS.