(No Model.)

3 Sheets—Sheet 1.

G. S. GUNDERSEN.

TRANSPLANTING MACHINE.

No. 532,740. Patented Jan. 15, 1895.

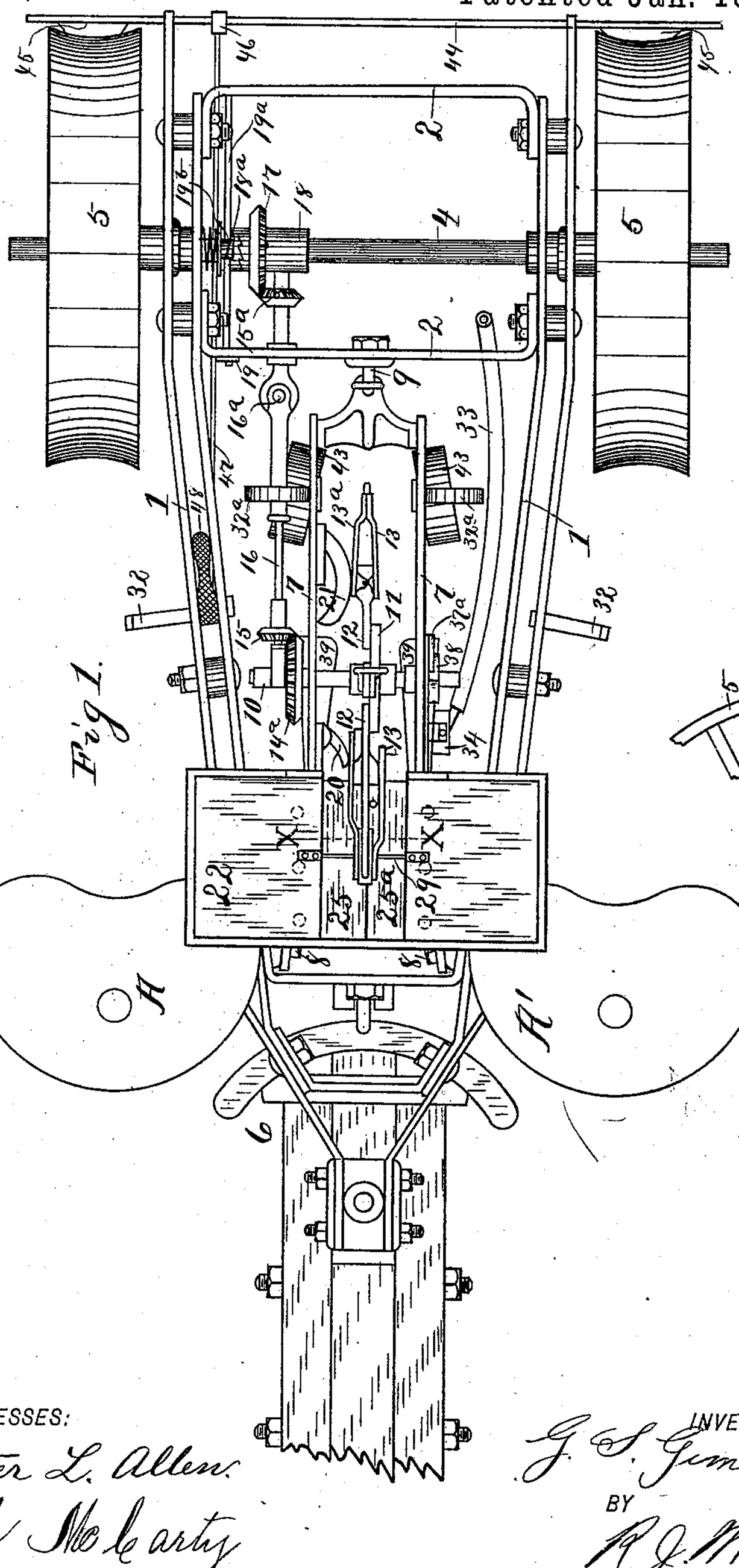


Fig 1.

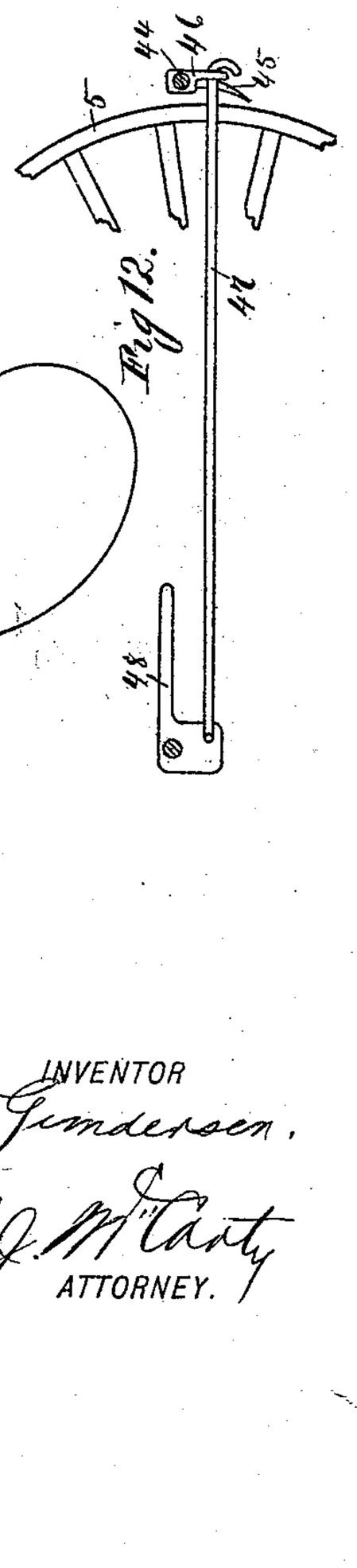


Fig 12.

WITNESSES:

Lester L. Allen.

Belle McCarty

INVENTOR

G. S. Gundersen.

BY

R. J. McCarty

ATTORNEY.

(No Model.)

3 Sheets—Sheet 2.

G. S. GUNDERSEN.

TRANSPLANTING MACHINE.

No. 532,740. Patented Jan. 15, 1895.

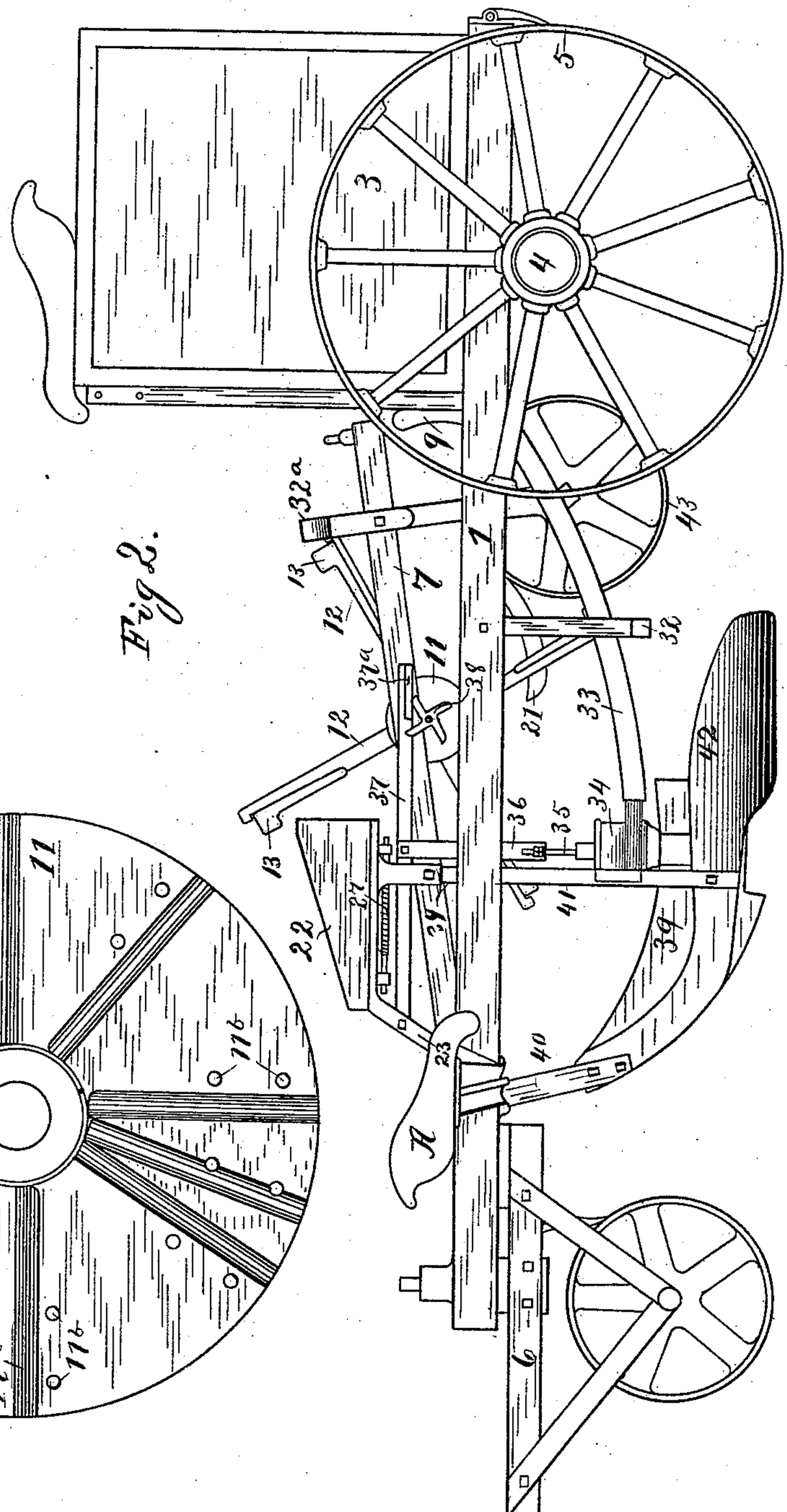


Fig 2.

Fig 3.

WITNESSES:

Lester L. Allen.

Belle McCarty

INVENTOR

G. S. Gundersen.

BY

R. J. McCarty.

ATTORNEY.

(No Model.) 3 Sheets—Sheet 3.

G. S. GUNDERSEN.

TRANSPLANTING MACHINE.

No. 532,740. Patented Jan. 15, 1895.

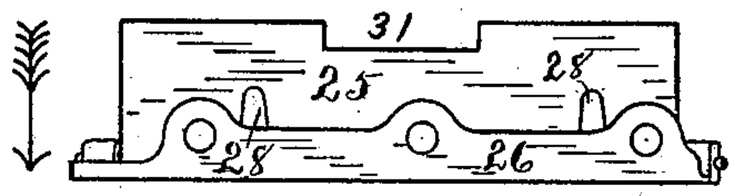


Fig 4.

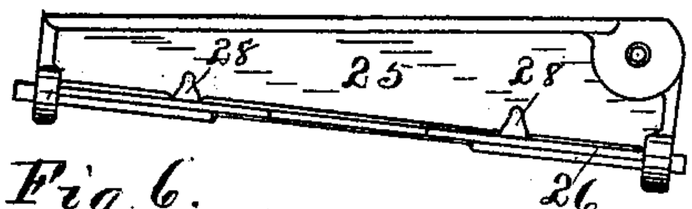


Fig 6.

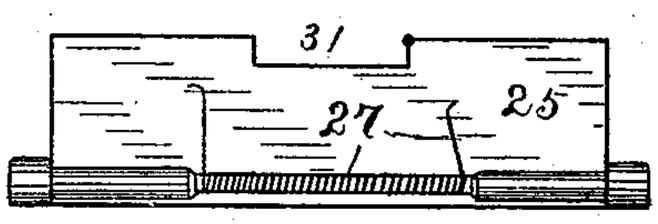


Fig 5.

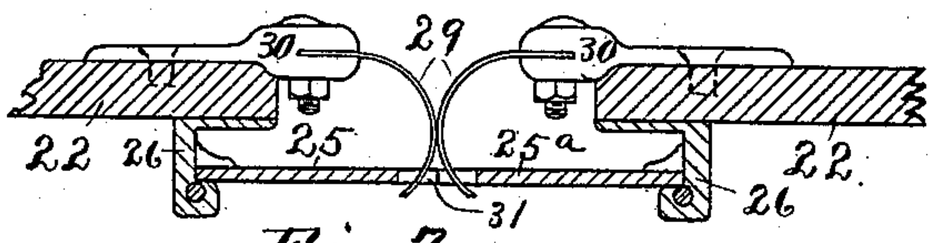


Fig 7.

Fig 8.

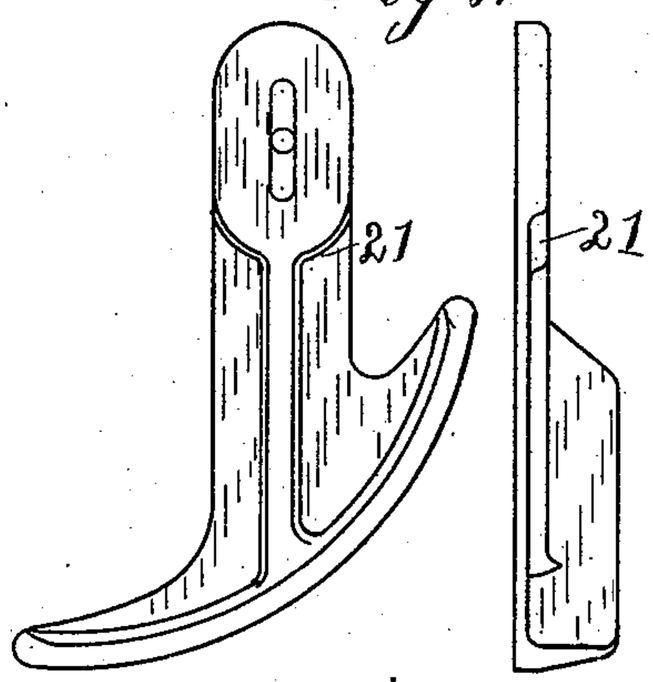


Fig 9.

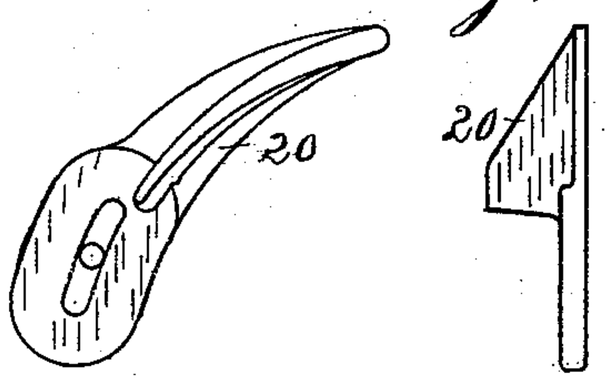


Fig 10.

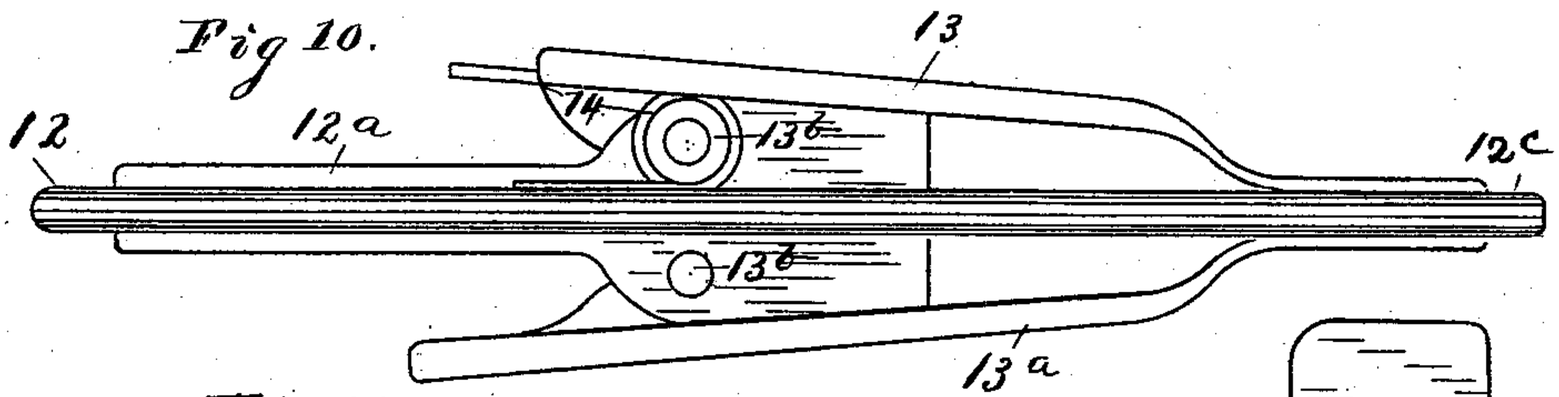


Fig 11.

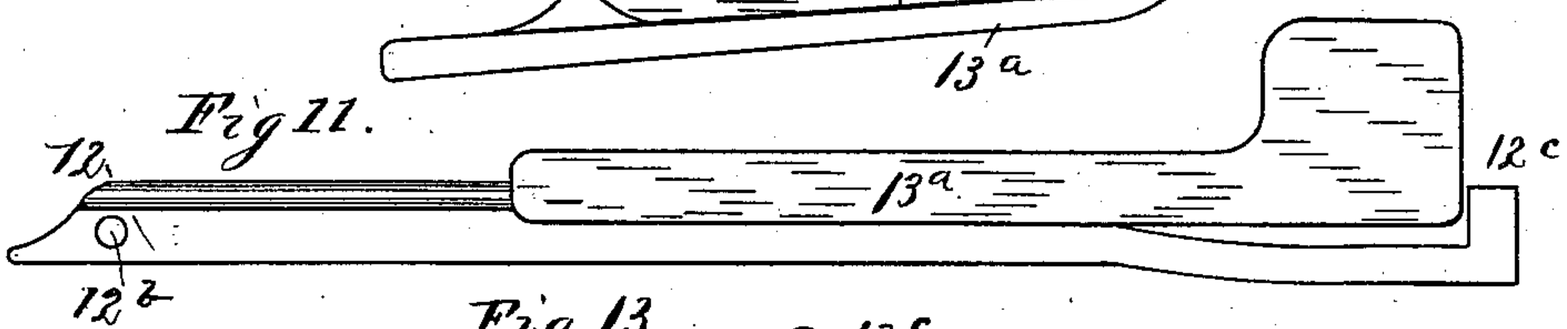
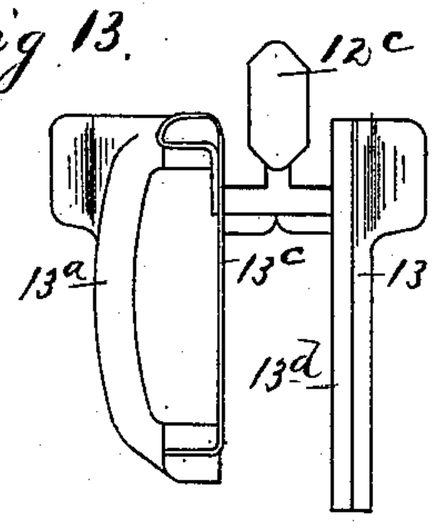


Fig 13.



WITNESSES:
Lester L. Allen.
Belle McCarty

G. S. GUNDERSEN. INVENTOR
BY R. J. McCarty.
ATTORNEY.

UNITED STATES PATENT OFFICE.

GILBERT S. GUNDERSEN, OF MIDDLETOWN, OHIO, ASSIGNOR TO THE McSHERRY MANUFACTURING COMPANY, OF SAME PLACE.

TRANSPLANTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 532,740, dated January 15, 1895.

Application filed July 2, 1894. Serial No. 516,340. (No model.)

To all whom it may concern:

Be it known that I, GILBERT S. GUNDERSEN, of Middletown, county of Butler, State of Ohio, have invented a new and useful Improvement in Transplanting-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to new and useful improvements in transplanting machines.

The object of the invention is to further improve the transplanting machine invented by myself, and covered by a reissued patent, dated August 16, 1892, No. 11,262. To this end the improvements have reference to mechanism for automatically setting and watering the plant, and to other points that will be described in the specification and set out in the claims.

In the accompanying drawings forming a part of the specification, Figure 1, is a plan view of the transplanter; Fig. 2, an elevation of that side upon which the watering mechanism is located; Fig. 3, an enlarged elevation of the rotating disk upon which the arms and plant clamps are carried, said parts being detached; Fig. 4, a detached detail view of one of the brackets and plates attachable to the plant table; Fig. 5, a view of the opposite side of Fig. 4; Fig. 6, a view looking in the direction of the arrow, Fig. 4; Fig. 7, a detail sectional view of the plant table, brackets and plates, on the line (*x*—*x*) Fig. 1, the plant clamp shown in said figure not appearing in this sectional view; Fig. 8, detached, detail front and edge views of the plant releasing cam; Fig. 9, similar views of the plant engaging cams; Figs. 10 and 11, bottom and side views, enlarged, of the arms and plant clamps, detached from the disk; Fig. 12, detached detail view of the scraper; Fig. 13, an enlarged end view of one of the arms and plant clamps.

In the detailed description, similar figures of reference will indicate corresponding parts in the different views.

The outer or carrying frame is indicated by 1. 2 is a rectangular frame bolted thereto, upon which the water tank (3) is securely mounted. 4 designates the shaft upon which said frame is mounted, and 5—5 the traction wheels.

6 indicates the truck to which the front end of the carrying frame is attached.

7 indicates an inner or auxiliary frame having its front end pivoted to the outer frame as at 8.

9 designates a guide rigidly attached to the frame (2) and projecting into a slot in the front of said frame to prevent it from vibrating laterally. 10 designates a shaft journaled in the sides of said frame or in boxes attached thereto. 11 designates a disk rigidly mounted on said shaft in which there is a series of radial slots (11^a) and concentric perforations (11^b). 12 designates a series of arms adapted to an attachment to said disk, the flange (12^a) thereon extending into the slot (11^a), and said arm is further made secure to the disk by bolts or screws entering the openings (11^b) and (12^b). These arms, it will be observed, may be attached to the disk as desired, with reference to their number and distances apart. The plant clamps which consist of two members, (13) and (13^a), are pivoted to said arms at (13^b), and are maintained normally closed under the tension of a coil spring (14). The ends (12^c) of the arms (12) are enlarged as shown in Fig. 10, and project beyond the ends of the plant clamps. Said ends will be again hereinafter referred to.

The ends of the plant clamps in which the plants are carried, are provided with flexible material forming cushions (13^c) and (13^d) as shown in Fig. 13, to prevent said plants from being crushed.

The shaft (10) is driven by a bevel gear wheel (14^a) keyed on an end thereof with which a bevel pinion (15) meshes. The pinion (15) is rigid on an end of shaft (16) which is loosely supported in the front portion of the rectangular frame (2), and to the rear end of which shaft there is a second gear pinion (15^a) rigid thereon, that meshes with a bevel gear (17) fast on a sleeve (18) loosely mounted on the shaft (4). The shaft (16) is provided with a knuckle joint (16^a) to allow the planting mech-

anism to rise or fall in conforming to the unevenness of the soil, and to allow the auxiliary frame (7) to be raised when turning around or in transporting the machine from the field. The outer end of the sleeve (18) is provided with teeth that are adapted to be brought in and out of engagement with similar teeth on a similar sleeve (18ª) placed adjacent thereto on the shaft, and said parts thus forming a clutch by means of which the wheels are brought in or out of gear. A movement of the sleeve (18ª) is effected by throwing the upright lever (19) which extends to within reach of the driver, to the right or left as the case may be. This upright lever is connected with a horizontal lever (19ª) which is movably supported in the rectangular frame (2) and to which there is attached a tongs (19ᵇ) or analogous device that engages with the sleeve (18ª). See Fig. 1.

20 and 21 designate, respectively, adjusting cams, attached to the auxiliary frame (7), the functions of which are to open the plant clamps at the proper time to receive and deliver the plants. These clamps are provided with oblong slots by means of which they may be adjusted to any desirable extent with reference to their contact with the clamps.

22 designates a plant table supported on uprights 23 and 24 rigidly attached to the auxiliary frame (7). The center of this table is provided with a slot or opening, see Fig. 7, beneath which are placed vibrating metallic plates (25) and (25ª), hinged to brackets (26) rigidly attached to the under side of said table. These plates are normally maintained in the horizontal position shown in Fig. 7, by a coil spring (27) placed there-beneath, and stops (28) projecting from the brackets and over said plates.

29 designates curved metallic springs rigidly secured to brackets (30) which are likewise secured to the table and project over the slot therein; the lower ends of said springs projecting into the opening (31) in the plates (25) and 25ª).

The springs (29) and plates (25) and (25ª) constitute the plant holder; the plants being placed thereon by the occupants of the seats A and A′ who alternately pick said plants up from the table (22) place them with the root end on the springs (29) and the other end resting on the plates (25) and (25ª) from which position the clamps take and deposit them in the ground which has previously been prepared by the furrow-opener. As said clamps pass downwardly bearing the plants, the follower or end (12ᶜ) of the arms spreads the springs (29) thereby permitting the end of the plant resting thereon to freely pass through said springs, while the clamps, coming against the plates (25) and (25ª) deflect them downwardly until said clamps pass clear thereof, when the plates resume the horizontal position shown in Fig. 7.

(32) designates foot rests for the occupants of seats A and A′, and (32ª) designates foot rests attached to the frame 7 for the feet of the driver and upon which, pressure is put to maintain the frame 7 in proper contact with the ground, or if it is desired, spring pressure may be employed instead of foot pressure.

(33) designates a flexible hose through which water is fed to the soil; one end connecting with the water tank (3), and the other to a water valve (34), the piston rod (35) of which is connected to a bar (36), which is in turn pivoted to a horizontal bar (37) one end of which is pivoted to the upright (23). On the rearward end of this bar (37), there is a laterally projecting flange (37ª) with which the arms of a star wheel (38) come in contact to raise the bar (37) and thereby open the water-valve to permit the discharge of water. The wheel (38) is keyed to shaft (10). Therefore, it rotates in unison with the planting wheel. It will further be noted the number of arms on the wheel (38) and the relative positions with reference to the arms (12) on the disk (11) (which I term the planting wheel) are the same. Therefore, the plant is simultaneously set and watered.

39 designates the furrow opener which is attached to the auxiliary frame (7) by bars (40) and (41). The soil gatherers (42) attached to the bars (40) and (41) collect the soil around the plant after which the presser wheels (43), mounted on the frame (7), pack the soil so collected, leaving the plant in a firm and upright position in the ground. The soil collected by the gatherers (42), covers that which has been moistened by the watering device, so that the soil is prevented from drying out sooner than is desirable.

A scraper to relieve the ground wheels of the accumulation of dirt is provided, consisting of a rod (44) journaled in the frame (1) in the rear of said wheels, upon which scrapers (45), and a bracket (46) is rigidly placed. 47 is a rod linked to said bracket, and to a tread (48) upon which the driver's foot may press to rock the rod (44) and thereby bring the scrapers in contact with the peripheries of the wheels.

Having described my invention, I claim—

1. In a transplanting machine, the combination of the plant table (22) provided with an opening in its center; spring-controlled plates (25) and (25ª) also provided with openings, and hinged below the opening in the table, and adapted to open and close, as described; springs (29) mounted on the table and projecting downwardly in a vertical plane through the opening therein, and through the opening in the plates; and a planting wheel carrying clamps to grip the plants and to open said plates, substantially as described.

2. The combination of the disk provided with a series of irregularly arranged radial slots; a series of arms mounted in said slots and adapted to be varied as to number and position, as described; plant clamps carried by said arms; adjustable cams (20) and (21)

for opening said clamps; vertical springs (29), and vibrating plates (25) and (25ª) upon which the plants are placed, and from which said plants are taken by the clamps, as described.

3. A stationary planting table (22) provided with an opening in its center; vibrating plates (25)—(25ª) hinged to said table below the opening; springs (29) mounted on the table to project downwardly through the opening therein, upon which and the plates (25) and (25ª) the plants are placed; a planting wheel carrying plant clamps to take the plants from said spring and plates, and whereby said spring and plates are opened to permit said plant clamp to pass to deposit the plant in the ground, as described.

In testimony whereof I have hereunto set my hand this 27th day of June, 1894.

GILBERT S. GUNDERSEN.

Witnesses:

E. C. BOYER,

CHAS. B. OGLESBY.