

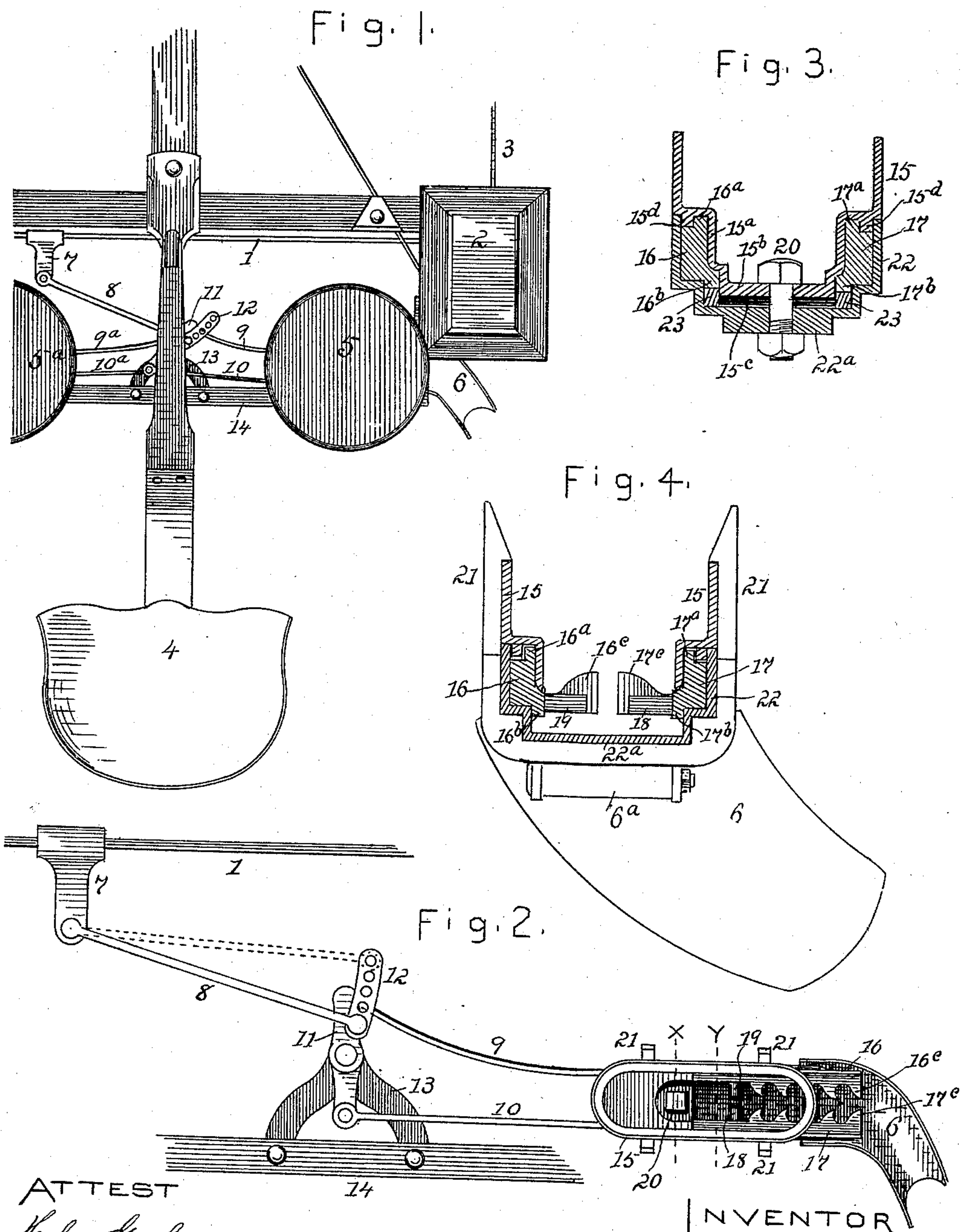
(No Model.)

2 Sheets—Sheet 1.

G. D. HAWORTH.
FERTILIZER DISTRIBUTER.

No. 474,635.

Patented May 10, 1892.



ATTEST

Helen Graham

William Graham

INVENTOR
GEO. D. HAWORTH
by his attorney
L. P. Graham

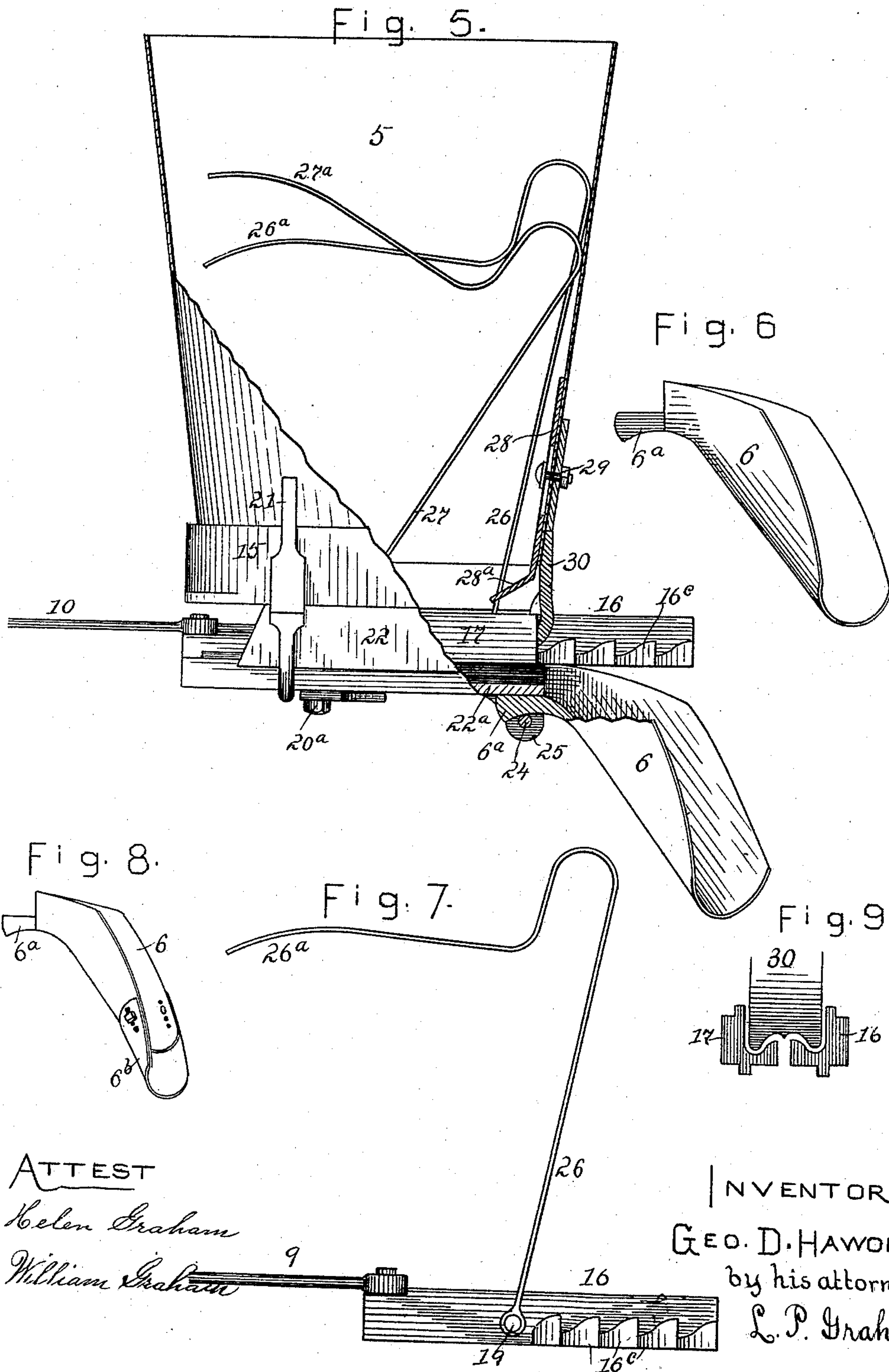
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UNITED STATES PATENT OFFICE.

GEORGE D. HAWORTH, OF CHICAGO, ILLINOIS.

FERTILIZER-DISTRIBUTER.

SPECIFICATION forming part of Letters Patent No. 474,635, dated May 10, 1892.

Application filed May 28, 1891. Serial No. 394,374. (No model.)

To all whom it may concern:

Be it known that I, GEORGE D. HAWORTH, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Fertilizer-Distributers, of which the following is a specification.

This invention relates to fertilizer-distributer attachments for planters; and it consists in the details of construction and combinations of parts hereinafter set forth and claimed.

In the drawings accompanying and forming a part of this specification, Figure 1 is a plan of a sufficient number of the essential details of a corn-planter to show the relation of my device thereto. Fig. 2 is a plan of the fertilizer-distributer with such parts omitted as would interfere with a clear showing of the most essential features. Fig. 3 is an enlarged cross-section on dotted line X in Fig. 2. Fig. 4 is a similar representation on dotted line Y, same figure. Fig. 5 is an elevation of a distributing-hopper with parts broken away to show the internal arrangement. Fig. 6 is a representation of a discharging-spout. Fig. 7 shows a single drop-bar with a stirring-rod attached. Fig. 8 shows how the discharge-spout may be made extensible. Fig. 9 is an end elevation of the drop-bars, showing the relation of the principal retarding-plate thereto.

The shake-bar 1 of the corn-planter actuates the seed-dropping mechanism of boxes 2. The seat 4 is placed in approximately the position shown and is supported in any desirable manner. The fertilizer-hoppers 5 and 5^a are placed one at the inner rear corner of each seed-box 2. One of the runners is shown at 3. Each fertilizer-hopper has a spout 6, which is preferably connected with the hopper in a manner to be hereinafter explained, and which inclines outward, downward, and backward in a manner to protect the discharging fertilizer from currents of air that would otherwise tend to scatter and to afford such protection without interfering with the natural falling motion of the fertilizer. The fertilizer-hoppers have each a bottom formed of two parts bolted together and constructed to form bearings for and partly incase the reciprocating and alternately-acting drop bars.

In the drawings, and more particularly in Figs. 3 and 4 thereof, the upper part of the

hopper-bottom is seen at 15 and is oblong in plan outline. It is of cast metal, is adapted to receive the lower end of the sheet-metal hopper, and has lateral and upwardly-extending strengthening-ribs 21, adapted to sustain the sides of the hopper and to overlap the edges of the lower portion of the bottom. On dotted line X in Fig. 2, as shown in Fig. 3, the upper part of the bottom extends downward and inward in a number of abrupt turns on both sides, and also extends from side to side across the bottom or lower portion, as seen at 15^b, and fits closely against the surface of the lower portion at 15^c. It has the downwardly-extending ledges 15^d and vertical inner walls 15^a, both of which act as guides for the drop-bars, while incasing the same. The side walls 22 of the lower portion of the bottom of the hopper extend downward and inward in rectangular lines, and, connecting horizontally, form the continuous lower surface and real bottom 22^a. The drop-bars 16 and 17 have upwardly-extending ledges 16^a and 17^a, respectively, and they have each a downwardly-extending ledge, as 16^b and 17^b, teeth, as 16^c and 17^c, and a pivot-pin, as 18 and 19, for stirrer-bars, as 26. The ledges of the drop-bars conform to recesses between the walls of the two parts of the bottom, and the inner walls of the upper part leave only the teeth of the drop-bars exposed. The bolt 20 binds parts 15 and 22 together, and in front of such bolt the horizontal surface of the upper part is cut away or omitted to permit the pulverized material to come in contact with the drop-bars. Lugs 25 on the lower surface and forward end of part 22 provide bearings for bolt 24, and spout 6 has extension 6^a, enlarged at its end, which fits between the bolt and plate 22^a and holds the spout in rigid connection with the hopper and in position to receive the discharge thereof. Each drop-bar has a stirrer-rod, as 26 and 27, which extends upward to a side of the hopper and runs thence rearwardly in curves more or less irregular and in a general direction at approximate right angles to the upward extension, as seen at 26^a and 27^a. Plate 28 (seen only in Fig. 5) is held against the hopper, above the discharge-vent thereof, by means of bolt 29 or other obvious contrivance. It has the backwardly and downwardly inclined part

28^a at its lower end, and it is slotted, as shown, or otherwise made vertically adjustable, in order that the fertilizing material may be supplied more or less freely to the drop-bars, with a view to regulating their discharge. Plate 30 is secured to the hopper. It may be vertically adjustable with relation thereto, and its lower end conforms to the drop-bars, as seen in Fig. 9. Bar 14 extends from one fertilizer-hopper to the other and carries at its center the forwardly-projecting bracket 13, which provides a pivot for lever 11. Rods 9 and 10 connect pivotally with opposite ends of lever 11 and extend the one to drop-bar 16 and the other to drop-bar 17. Arm 12 is formed integral with or rigidly secured to lever 11. It has a set of holes, which preferably correspond in number to the teeth of a drop-bar, and such holes describe an arc of a circle drawn with the pivot of block 7 as a center when the shake-bar is at the middle of its stroke. The block 7 is rigidly secured to the shake-bar, and is connected with arm 12 by rod 8. The blocks 23 (seen only in Fig. 3) coact with lip 15^c to prevent the fertilizer from entering the space between plates 15^b and 22^a.

In operation the shake-bar is moved back and forth, and it actuates the seed-plates at each motion in either direction. The motion of the shake-bar 1 is imparted to lever 11 through rod 8 and from lever 11, through rods 9 and 10, to the drop-bars 16 and 17 of the fertilizer-hopper, and such is the arrangement of parts and obvious distribution of force that one drop-bar is thrown forward actively, while the other is withdrawn inactively, at each motion of the shake-bar, the fertilizer being discharged by both drop-bars in regular alternation. The extent of the throw of the drop-bars may be increased or diminished by connecting bar 8 to arm 12 nearer to or farther from the pivot of lever 11, and such adjustment may be made without causing any irregularity in the operation of the drop-bars, because of the shape of arm 12, which always carries lever 11 at right angles to bar 14 at the middle of each stroke of the shake-bar, whether the drop-bars be adjusted to make a long or a short throw. The fertilizer falls on or along spout 6, the curvature of which is so proportioned to the throw of the drop-bars and the forward motion of the planter as to offer but little resistance to the fall of the fertilizer, while protecting it against currents of air and holding each discharge in a compact mass until it nears the ground.

The operation of the stirrers is apparent from Fig. 5 of the drawings. They are designed for use with fertilizers having a tendency to pack, and they have reciprocating motion forward and back and up and down. With loose granular fertilizers the stirrers are not needed, but plate 28 may be advantageously employed to regulate the supply of fertilizer to the drop-bars. The discharge-spouts ride readily over obstructions, owing to their backward inclination, and they are able to

compensate for variations in the speed of teams and deposit the fertilizer uniformly with relation to the seed. The last-named result is effected as follows: When the speed of the team is increased, the planting mechanism has its motion comparatively quickened, and the drop-bars of the fertilizer-hoppers are similarly affected. This gives the discharging fertilizer greater momentum, and it is thrown out of contact with the surface of the spout and falls unobstructedly and with a corresponding increased degree of speed. When, on the other hand, the speed of the team is decreased, the momentum given to the fertilizer by the drop-bars is also lessened and the material is to some little extent affected by friction against the spout. When planting during high winds, it is desirable to protect the fertilizer throughout its entire descent, and this may be done by means of the auxiliary and extensibly adjustable spout 6^b. (Shown in Fig. 8 of the drawings.)

The relative positions of the seat, the seed-boxes, and the fertilizer-hoppers are of utility in permitting the driver to observe the fall of the seed.

I claim—

1. A fertilizer-distributor attachment consisting in the combination of a hopper having a lateral discharge-vent and a drop-bar adapted to move longitudinally back and forth in the discharge-vent and having a set of teeth extending laterally along the bottom of the hopper, as set forth.

2. A fertilizer-distributor attachment consisting in the combination of a hopper having a lateral discharge-vent and two drop-bars adapted to move longitudinally and alternately back and forth in the discharge-vent and having on their inner or opposing edges sets of teeth extending along the bottom of the hopper, as set forth.

3. A fertilizer-distributor consisting in the combination of a hopper having a lateral discharge-vent, reciprocating drop-bars adapted to force the fertilizer through the opening, and stir-rods pivotally connected with the drop-bars and extended upward into the hopper, as set forth.

4. A fertilizer-distributor consisting in the combination of a hopper having a lateral discharge-vent, reciprocating drop-bars adapted to force the fertilizer through the opening, and stir-rods pivotally connected with the drop-bars, extended upward into the hopper, and having at their upper ends lateral bends or extensions traversing the hopper, as set forth.

5. In fertilizer-distributors, the combination of the hopper having lugs 25, bolt 24, extending through the lugs, and spout 6, having extension 6^a, adapted to be held by the bolt and the bottom of the hopper, as set forth.

6. In fertilizer-distributors, the combination of a two-part hopper-bottom bolted or otherwise secured together and drop-bars

incased between the walls of the parts and having teeth projecting inwardly beyond the same, as set forth.

5 7. In fertilizer-distributer attachments for planters, the combination of the fertilizer-boxes having dropping mechanism extended through one end of said boxes, a shake-bar, an arm 7 thereon, and a rod connecting the arm of the shake-bar with a pivoted lever
10 having a series of holes, two drop-bars having teeth on their sides, connecting-rods uniting the drop-bars to the pivoted lever, and a connecting-rod 8, having one end attached to the arm 7 and the other end adjustably to the
15 perforated lever, substantially as described.

8. In fertilizer-distributers for planters, the combination of hoppers 5 5^a, having drop-bars, centrally-pivoted lever 11, rods 9 and 10, connecting the ends of the lever with the
20 drop-bars of the hoppers, shake-bar 1 of the

planter, rod 8, pivotally connected with the shake-bar, and arm 12 on the lever, having a set of holes describing an arc of a circle drawn by rod 8 when the shake-bar is at the middle of its stroke, as set forth.

25 9. In a fertilizer attachment for planters, the combination of seed-boxes and furrow-openers, a driver's seat in the rear of the seed-boxes, fertilizer-boxes having a discharge-vent in their ends and located at the rear in
30 ner corners of the seed-boxes, and spouts extended from the end of the fertilizer-boxes outwardly, downwardly, and rearwardly, substantially as shown and described.

In testimony whereof I sign my name in the
35 presence of two subscribing witnesses.

GEO. D. HAWORTH.

Attest:

THEODORE COLEMAN,
GEO. S. SIMPSON.