

L. S. BORTREE, DEC'D.
A. B. ANDREWS, ADMINISTRATRIX.
SEED PLANTER.
APPLICATION FILED JAN. 30, 1904.

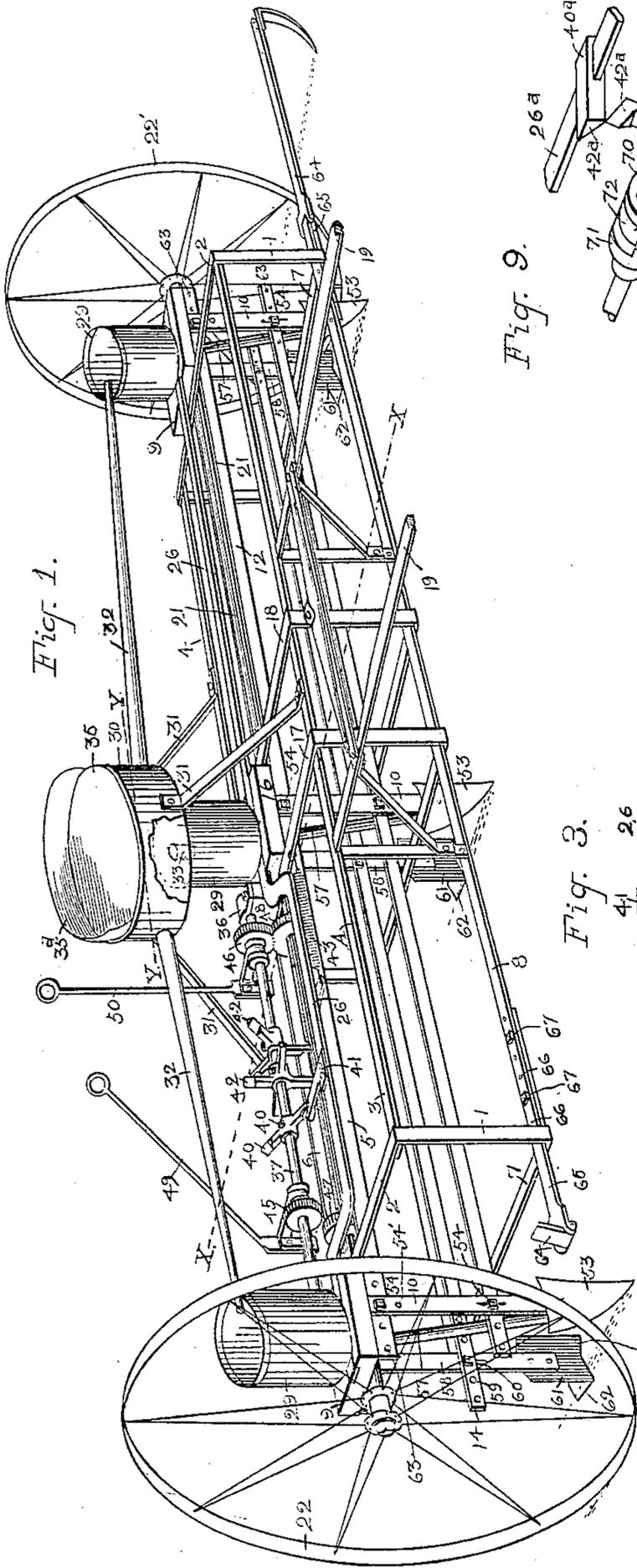


Fig. 1.

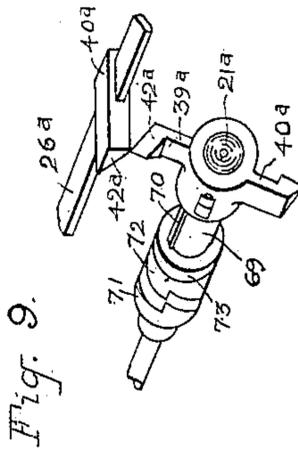


Fig. 9.

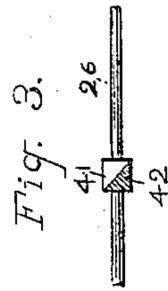


Fig. 3.

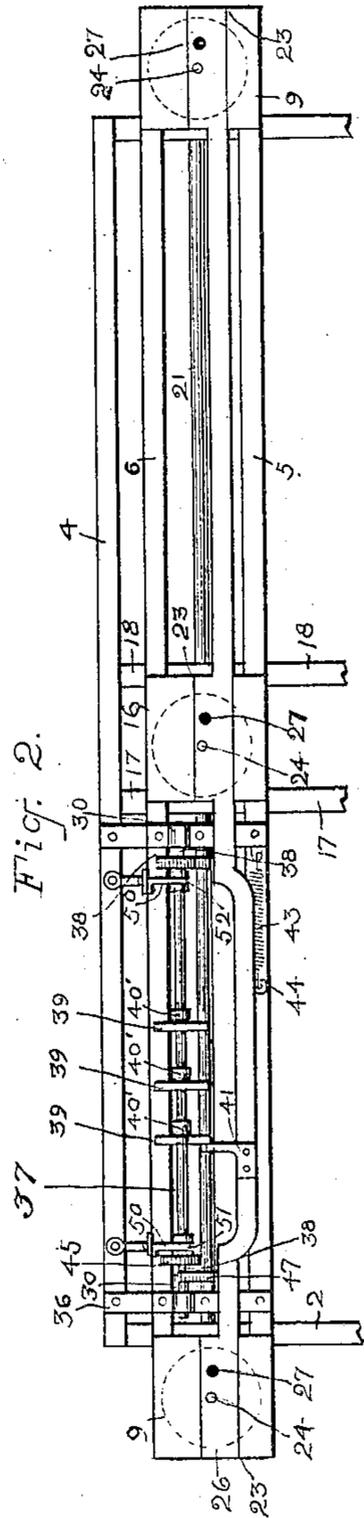


Fig. 2.

Witnesses.
R. D. Watson
C. A. Boare

Inventor.
Louis S. Bortree
By Wilson & Marten
his attorneys

L. S. BORTREE, DEC'D.
A. B. ANDREWS, ADMINISTRATRIX.
SEED PLANTER.
APPLICATION FILED JAN. 30, 1904.

Fig. 4

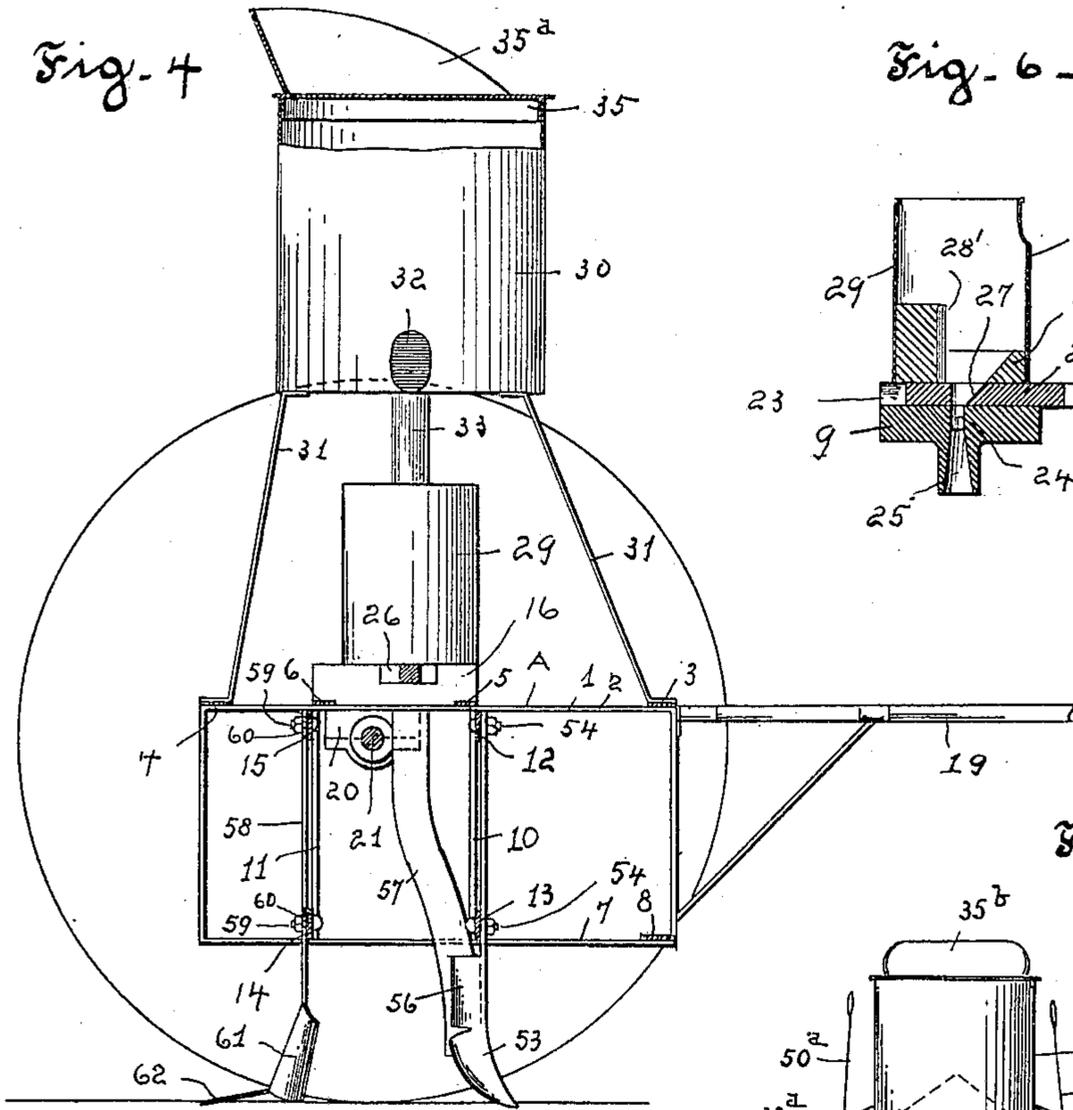


Fig. 6

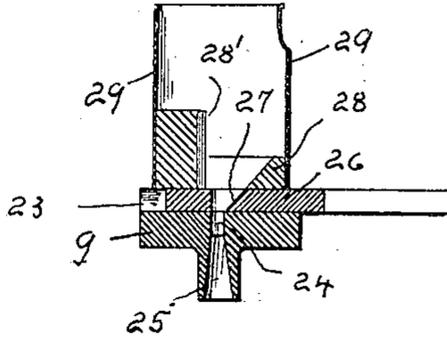


Fig. 8

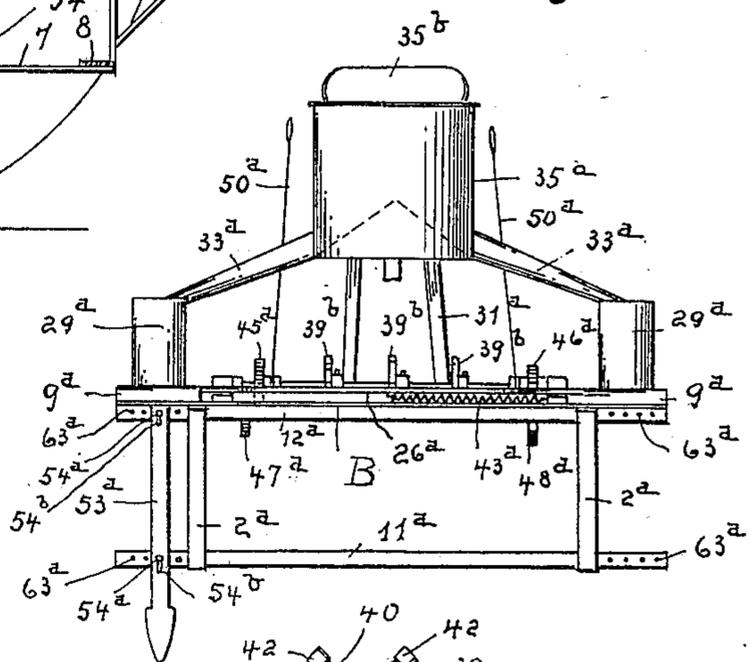


Fig. 5

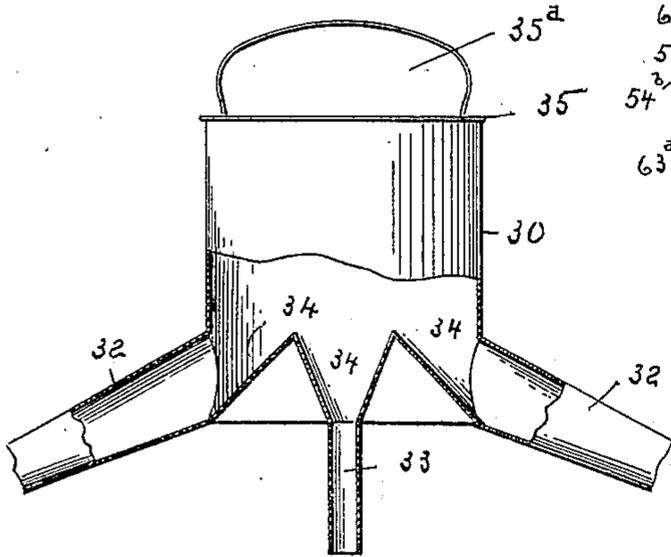
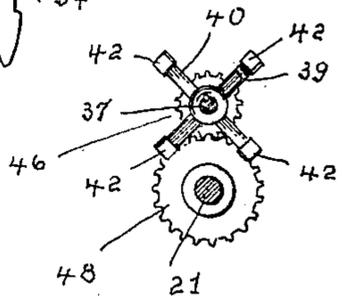


Fig. 7



witnesses—

Grace Lowdrick
C. W. Klausner

Inventor—

Louis S. Bortree
By Wilson & Martin
Attorneys

UNITED STATES PATENT OFFICE.

LOUIS S. BORTREE, OF TOLEDO, OHIO; ALTA B. ANDREWS ADMINISTRATRIX OF SAID BORTREE, DECEASED.

SEED-PLANTER.

No. 825,376.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed January 30, 1904. Serial No. 191,245.

To all whom it may concern:

Be it known that I, LOUIS S. BORTREE, a citizen of the United States, residing at No. 442 Hicks street, Toledo, Lucas county, Ohio, have invented a new and useful Improvement in a Seed-Planter, of which the following is a specification.

My invention relates to a seed-planter, and has for its object to provide a simple and light-draft machine by means of which seed can be planted in rows at regular intervals of optional width and that is adapted to form cross-rows at regular intervals of optional width.

The objects of my invention are accomplished as hereinafter described, and illustrated in the drawings, in which—

Figure 1 is an isometric view of a seed-planter constructed in accordance with my invention with parts of the frame broken away for greater clearness of view of the working parts. Fig. 2 is a top plan view of the dropper-plate and its operating mechanism. Fig. 3 shows an end elevation of the beveled arm, which is secured to and projects from the dropper-plate in the path of the spider-arms, which are each provided with a complementary bevel that engages with the bevel of the dropper-plate arm, as illustrated in the figure, and forces it to one side, thereby actuating the dropper-plate, a spider-arm being shown in the figure in cross-section. Fig. 4 is a longitudinal section through the planter on line X X of Fig. 1. Fig. 5 is a view of the main seed-hopper on line Y Y of Fig. 1. Fig. 6 is a vertical section through one of the auxiliary hoppers. Fig. 7 shows in sectional elevation the four-armed wiper for moving the dropper-plate. Fig. 8 is a front elevation of a two-row planter, and Fig. 9 is an isometric view showing a method of mounting the tap-pet-wheels on the axle.

A strong and light frame A for my planter may be built of bars of suitable cross-section and weight. In the design for the frame illustrated in the drawings rectangular side frames 1 are employed, to the top members 2 of which are secured the respective ends of the cross-bar 3, the rear cross-bar 4, and the intermediate cross-bars 5 and 6, and to the bottom members 7 of the side frames is secured front and rear cross-bars 8, as

more fully shown in Fig. 4. The intermediate top cross-bars 5 and 6 are disposed toward the rear of the side frames 1 and are of a length to have each of their ends overlap a suitable distance, the side frames 1 to form bracket-supports for the side bed-plates 9, which outwardly overhang the side frames 1. Each side frame 1 is also provided with vertical struts 10 and 11, which are secured to the top and bottom members of each side frame, respectively in line with the front and the rear sides of the bed-plates 9, as shown in Fig. 4.

In front of the struts 10 there are secured thereto cross-bars 12 and 13, which are of a length equal to the cross-bars 5 and 6 and of which the bar 12 is arranged under the top member 2 and the cross-bar 13 upon the bottom member 7 of the side frames, and like bars 14 and 15 are secured to the top and bottom at the rear side to the struts 11.

In alinement with the side bed-plates there is mounted on top of the frame a centrally-disposed bed-plate 16, which is suitably secured to the bars 17 and 18. The latter bars are secured to the intermediate cross-bars 5 and 6, and at the front of the frame shafts 19 are rigidly attached thereto. From the under side along the rear portion of each bed-plate depends a bearing 20 for journaling an axle 21, which is provided with a journaled traction-wheel 22 and a fixed traction-wheel 22' and upon which the frame A is mounted.

In the top of each bed-plate there is formed a cross-slot 23 of suitable width and depth and in line with each other forward of the axle-bearings. Centrally of the area of the slots the bed-plates are each provided with an aperture 24, which extends through the body of each plate and through a nipple 25, depending from each bed-plate forward and free of the axle, and in the nipples the apertures 24 are suitably flared, as shown in Fig. 6. Within the slots 23 there is mounted a drop-plate 26, which extends through all of the slots and flush with the top of the bed-plates.

The drop-plate is provided with the beveled apertures 27, one over each bed-plate, as shown in Fig. 6, which are, respectively, so located with reference to the aperture 24 of the respective bed-plates that at the limit of

the movement of the drop-plate in one direction the apertures 27 are each brought into register with an aperture 24 of a bed-plate and forms therewith a port for the hopper. The drop-plate is movably confined within the slots of the bed-plates by means of annular plates 28, one for each bed-plate, which are mounted on the bed-plates above the drop-bar concentric to the apertures 24.

These annular plates are of a diameter to fit into the lower ends of the seed-hoppers 29, which are mounted on the bed-plates. The seed-hoppers 29 are auxiliary to the main seed-hopper 30, which is supported by means of legs 31 over the central hopper 29 at such elevation that the end seed-hoppers may be readily supplied from the main hopper through the inclined side spouts 32, leading therefrom to the end hoppers. The central hopper 29 is also supplied from the main hopper by the spout 33.

To supply the auxiliary hoppers at an equal rate of feed, the central spout 33 is reduced in size and the bottom of the main hopper is divided into funnels 34, of which the funnel leading to the side spouts exceed in size the middle funnel leading to the central spout. The closure-cap 35 for the main hopper is adapted as a seat for the driver by attaching thereto a low back 35^d.

To the top of the cross-bars 5 and 6 and adjacent to the central bed-plate and one of the side bed-plates 9 are mounted bearings 36 to journal a shaft 37 counter to the axle 21. This shaft is held in position by set-collars 38, mounted on the shaft at the inner side of each bearing. Between the set-collars the shaft 37 is preferably splined to rotatively engage an armed tappet or spider wheel 39 and other wheels of the like description having more or less arms 40, which are mounted upon the shaft and are lockable against movement along the shaft by means of set-screws 40'.

Between the counter-shaft bearings the drop-plate is curved away from the counter-shaft to permit the rotation of the tappet-wheels, and in a position centrally of the curved portion the drop-plate is provided with a shoulder 41, which projects a suitable distance within the path described by the revolving arms of the spider-wheels.

The shoulder 41 and the tips of the arms of the tappet-wheels are beveled to form co-incident inclined planes 42, whereby when one of the tappet-wheels is fixed to the counter-shaft in line with the shoulder and rotated the arms of the wheel will move the drop-plate a suitable distance to one side and bring the drop-plate apertures 27 into register with the apertures 24 in the bed-plates, the bevels on both the arms and the shoulder being made to extend crosswise of the same a distance slightly more than the diameter of the apertures 24.

The drop-plate after being moved by an arm 40 is suddenly returned to its normal position by means of a spring 43, which is coupled to a hook 44 at the under side of the drop-plate and to the bearing adjacent to the middle bed-plate, and it is in the direction of this spring-actuated return movement that the apertures 27 are beveled. The inner rim of each socket-ring is also beveled in the same direction, and opposite the beveled portion each ring is provided with a yielding cushion or cut-off 28', the bottom of which is in contact with the top of the drop-plate.

The counter-shaft receives motion from the axle either by means of a gear 45 or of gear 46, which are so mounted upon the splined counter-shaft as to adapt them to be respectively shifted into and out of mesh with their respective companion gears 47 and 48, fixed on the axle. The gears 45 and 47 are of equal diameters and are adapted to rotate the counter-shaft at the same speed as the axle, and the gears 46 and 48 are of complementary differential diameters adapted to increase the speed of the counter-shaft over that of the axle. The gear 45 is moved into and out of mesh with its companion gear 47 by means of a lever 49, and in like manner the gear 46 is engaged with or disengaged from the gear 48 by means of a lever 50. The levers for both of the gears are suitably pivoted to the frame and extend within convenient reach from the operator's seat. Each lever is provided with a yoke 51, which engages the hub of the gear-wheel it shifts within a groove 52, formed in the hub. The axle and counter-shaft may be provided with additional complementary pairs of differential gears similarly shifted, whereby the speed of the counter-shaft may be increased or diminished relative to the speed of the axle, as desired.

To open a furrow for the seed the planter is provided with shares 53, which are secured, by means of the bolts 54, to the face of the cross-bars 11 and 12 in front of each auxiliary seed-hopper, and to permit each share to be raised or lowered to adjust the depth of the furrow the bolt-holes 54' are vertically elongated. Under the cross-bar 12 the sides of each share are curved backward and inward to form a clip 56, and below the clip the point of each share is curved forward and the sides backward to throw the earth to opposite sides of the point of the share to produce a furrow.

To deliver seed dropped through the bed-plates by the movement of the drop-plate, there is connected to each nipple a flexible spout 57, and from the nipple connection each spout is flexed to permit the bottom end to be loosely inserted within the share-clip to drop seed into the furrow directly behind each share. The apertures 27 in the drop-plate are made of a capacity to permit the de-

sired number of grains to drop through each when in coincidence with the apertures 24.

To cover the seed in the furrow, the planter is provided with plates or standards 58, which trail over the furrows in line with the shares. The plates 58 are secured, by means of bolts 59, to the backs of the cross-bars 14 and 15. The bolt-holes 60 in the standard portion of each cover-plate 58 are elongated, whereby the plates may be raised or lowered to adjust the pressure at which earth is bedded in the furrows.

Below the cross-bar 14 each plate or standard 58 is for a distance slightly pitched backward and provided with forward flared sides to form a scoop or scraper 61, adapted to crowd into the furrow earth thrown aside by the preceding share, and to press this earth upon the seed and smooth the furrow each scoop is provided with a spade-like extension 62, trailing from the back of the scoop in contact with the earth in the furrow.

The ends of the bars 11 and 12 and the bars 13 and 14, which overlap the respective sides of the side frame 1, are each provided with a series of orifices 63, spaced lengthwise of the extending ends of the bars and in such vertical alinement that the side shares and the side presser-plates may be also adjusted lengthwise of the ends to optionally increase or decrease the width between rows, the flexibility of the down-spouts 57 being adapted to permit such adjustment.

In order to mark the field for a new bout, the planter is provided with markers 64, one of which is located at each side at the front of the frame. The markers are pivoted to the ends of bars 65, which are respectively connected to opposite end portions of the bottom front cross-bar in positions to extend the markers sidewise from the frame A. Each bar 65 is also provided with a series of bolt-apertures 66, equally spaced at the apertures in the ends of the cross-bars 11 and 12 and the cross-bars 13 and 14, whereby the markers may be adjusted to make a trace-line distant from the respective side shares equal to the established width between the furrows and to be locked in the desired position by means of the bolts 67, extending through the apertures 66 in the body of the cross-bar suitably located for such adjustment.

Thus constructed, when the planter is drawn forward the shares form parallel furrows at regular intervals into which seed is dropped from the hoppers at regular intervals by the drop-plate as actuated by the axle through the intermediary mechanism of the gear-wheels, counter-shaft, and tappet-wheels, adjusted to effect the movement of the drop-plate at fixed distances of travel of the driving-wheel, and the cover-plates following the shares refill the furrows, covering the seed and packing and smoothing the soil thereon, and at the same time one of the

markers forms a trace or groove at a regular interval which is to be followed on the next bout.

When the planter is turned for a new bout across the field, the trace or groove of the marker is followed by the side share that is on the same side of the frame as the marker that made the trace, that marker being then raised against the frame A and the opposite marker being lowered in position to make a new trace for the next bout. In turning the planter at the sides of the field both markers are raised, and the counter-shaft is thrown out of gear with the axle.

The planter illustrated in Fig. 1 is adapted to plant three rows of corn at one time, the intervals between the rows being established by adjusting the side shares at equal intervals from the center share, and these intervals may be increased or diminished within certain limits by moving the side shares and cover-plates outward or inward one or more holes 63, and the desired depth of furrow is obtained by vertical adjustment of the shares by means of the elongated bolt-holes 54'. The depth of planting and the density of packing the soil over the seed may also be regulated in like manner by adjusting the cover-plates vertically.

The intervals at which the seed is dropped into the furrows is established by adjusting the speed of the counter-shaft relative to the speed of the axle and then fixing on the counter-shaft in operative relation to the shoulder of the drop-plate a tappet-wheel having the number of arms that will operate the drop-plate in succession at desired regular intervals of the travel of the driving-wheel, it being apparent that when the speed of the counter-shaft is greater or less than that of the axle the same spider-wheel will operate the drop-bar at shorter or longer intervals of the travel of the driving-wheel than when the speed of the counter-shaft and the axle is the same. It is therefore apparent that by providing gears on the counter-shaft of both equal and differential diameters to the gears on the axle, which may be severally shifted into mesh, a greater range of adjustability as to the intervals is obtained with the same tappet-wheels. However, I do not limit myself to the use of a counter-shaft, as it is apparent that tappet-wheels may be mounted on the axle, as shown in Fig. 9, in which a tappet 39^a is mounted upon a tubular shaft 69, through which the axle 21^a is inserted. The tubular shaft is suitably prevented from lengthwise movement on the axle and is provided with a spline 70 to rotatively engage the tappet-wheels. At one end of the tubular shaft there is fixed to the axle a clutch member 71, with which the companion clutch member 72 may be coupled. The clutch member 72 is slidably mounted upon the splined tubular shaft 69 and is provided

with an annular groove 73, into which a suitable lever may be inserted to move the clutch member 72 into mesh with the fixed clutch member on the axle to rotatively couple the tubular shaft to the axle, whereby the shaft will be rotated with the axle. When the clutch is disengaged from the axle, the shaft being loosely mounted on the axle will be prevented from turning with it by a tappet engaging the shoulder of the drop-bar. It is also apparent that by mounting a number of tappet-wheels 39^a upon the tubular shaft, respectively adapted to move the drop-bar at different regular fractional intervals of the travel of the driving-wheel in one complete revolution, the planter may be adapted to plant seed at intervals equal to the whole, half, third, fourth, fifth, sixth, or seventh, &c., parts of the distance traveled by the driving-wheel in one revolution by selecting and securing in position to engage the shoulder of the drop-bar a tappet-wheel having the required number of arms; but intervals between the whole and one-half or one-half and one-third of a complete revolution of the driving-wheel cannot be produced without the use of a counter-shaft, by reason whereof the use of the counter-shaft is preferred.

To plant in cross-rows at regular intervals, base furrows at right angles to each other are first run at one side and one end of the field, and then using the end furrow as a trace and the side furrow as the first cross-row the planter, adjusted to drop the seed at a desired cross-row interval, is brought into position and condition to first operate the drop-plate at the side furrow. Upon reaching the opposite side of the field the last cross-row established by the machine establishes the line for a side furrow for that side of the field which is then run at a right angle to the end furrow and parallel with the opposite side furrow. If, however, the field has such undulations of surface as will make a parallel side furrow impossible, measurements are made of equal distances from the first side furrow at suitable points throughout the length of the field, and the second side furrow is then run through such points. Should the side furrow thus established leave room for one or more cross-rows of less than the full length of the field, additional side furrows parallel with the second and at the proper cross intervals are made until a starting cross-furrow is established for each side and at every point of the length of the field. The side furrows and one end furrow being thus established and care being taken to start the operation of the machine at the first side furrow at each side of the field and to follow the last trace made by the marker, the machine may be moved to and fro across the field until the whole field is planted in direct and cross rows of regular intervals established for each. Should the ends of the

field not be at right angles to the sides and should the initial end furrow or the last full-length row planted at the opposite end of the field leave a triangular strip of ground, such triangular strip may be planted to continue the cross-rows across such strip by planting in one direction only, starting from the side furrow, forming the base of such triangular strip and using a marker as a guide to follow the last planted row, (the counter-shaft being uncoupled for the return.)

The planter may be adapted to plant different kinds of seeds by substituting for the drop-plate shown in the drawings a drop-plate having apertures 27, adapted to the kind of seed that is to be planted.

In Fig. 8 is shown a two-row planter, in which a frame B of reduced length, but otherwise similar in construction to frame A of the three-row planter and having similar operating mechanism adjusted to said frame B, is provided, but in which the middle share, cover-plate, auxiliary hopper, bed-plate and its supporting-bars, and dropping mechanism are omitted. In this form of planter the range of adjustment of the width between the direct rows is obviously doubled, since the same distance of lateral adjustment of each of the side shares as in the three-row planter adds to or diminishes the same interval.

What I claim to be new is—

1. A seed-planter, comprising a frame, an axle journaled in the frame, a fixed and a loose traction-wheel mounted on opposite ends of the axle, a plurality of seed-hoppers mounted at intervals on the frame, shares secured to the frame, one forward of each hopper, cover-plates secured to the frame, one rearward of each share, flexible spouts for the hoppers between the shares and the cover-plates, a reciprocating drop-plate, extending parallel with the axle over the bottom of the hoppers, a seed-aperture through the drop-plate within each hopper, adapted to register with the opening of the flexible spout of the hopper, a spring adapted to yieldingly hold the drop-plate in position with the seed-apertures normally out of register with the openings of the flexible spouts, and means adapted to operatively connect the drop-plate with the axle and to communicate motion from the axle to actuate the drop-plate in opposition to the spring to register the seed-apertures with the opening of the flexible spouts at regular intervals and distances of the forward travel of the driving-wheel and then release it, substantially as set forth.

2. In a seed-planter, the combination with a traction-wheel, of a fixed axle for the wheel, adapted to be revolved thereby, a shaft journaled parallel with the axle and detachably geared thereto, to revolve with equal speed therewith, tappet-arms fixed radial to the

shaft at equal radial intervals, a drop-plate movable endwise parallel with the shaft adapted to be successively engaged by the tappets as the shaft revolves, and moved
5 endwise thereby in one direction, and a spring engaging the drop-plate and adapted to return the plate when released by the tappets, substantially as set forth.

3. In a seed-planter, the combination with
10 a traction-wheel, of a fixed axle for the wheel adapted to be revolved thereby, a shaft journaled parallel with the axle and detachably geared thereto to revolve at a differential speed, tappet-arms fixed radial to the shaft
15 at equal radial intervals, a drop-plate movable endwise parallel with the shaft, adapted to be successively engaged by the tappets as the shaft revolves, and moved endwise there-
20 by in one direction, and a spring engaging the drop-plate, adapted to return the plate when released by the tappets substantially as set forth.

4. A seed-planter, comprising a frame, an axle journaled in the frame, a fixed and a
25 loose traction-wheel mounted on opposite ends of the axle, a plurality of seed-hoppers mounted at intervals on the frame, laterally and vertically adjustable shares secured to the frame, one forward of each hopper,
30 trailing cover-plates secured to the frame, one rearward of each share, flexible spouts for the hoppers between shares and the cover-plates, a movable drop-plate extend-
35 ing parallel with the axle over the bottoms of the hoppers and normally closing the

openings of the flexible spouts, seed-aper-
tures through the drop-plates within the hop-
pers, adapted to be simultaneously brought
into register with respective openings of the
flexible spouts by an endwise movement of
40 the drop-plate in one direction, a spring en-
gaging the drop-plate, adapted to yieldingly
hold the drop-plate in position closing the
flexible spouts, a counter-shaft journaled par-
45 allel with the axle, a plurality of pairs of ad-
justable and interchangeable gears of like
and differential diameters arranged on the
axle and counter-shaft, the pairs being re-
spectively adapted to rotate the counter-
50 shaft, one at the same and others at different
differential speed with that of the axle, means
to shift the respective pairs into or out of
mesh, a plurality of tappet-wheels loosely
mounted on the counter-shaft and adapted to
55 be interchangeably located and tightened on
the shaft in position to operate the drop-plate,
each tappet-wheel being provided with a dif-
ferent number of radial arms at regular inter-
vals, each having an inclined shoulder adapted
60 to engage the drop-plate and move it endwise
in opposition to the spring, until the seed-aper-
tures are in register with the flexible spouts,
and then release it, substantially as set forth.

In testimony whereof I have hereunto set
my hand, in presence of two witnesses, this
65 26th day of January, 1904.

LOUIS S. BORTREE.

In presence of—

A. HARRINGTON,
D. F. McNERNY.