(No Model.) 6 Sheets—Sheet 1.

J. W. SPANGLER.

CORN PLANTER.

No. 418,823. Patented Jan. 7, 1890.

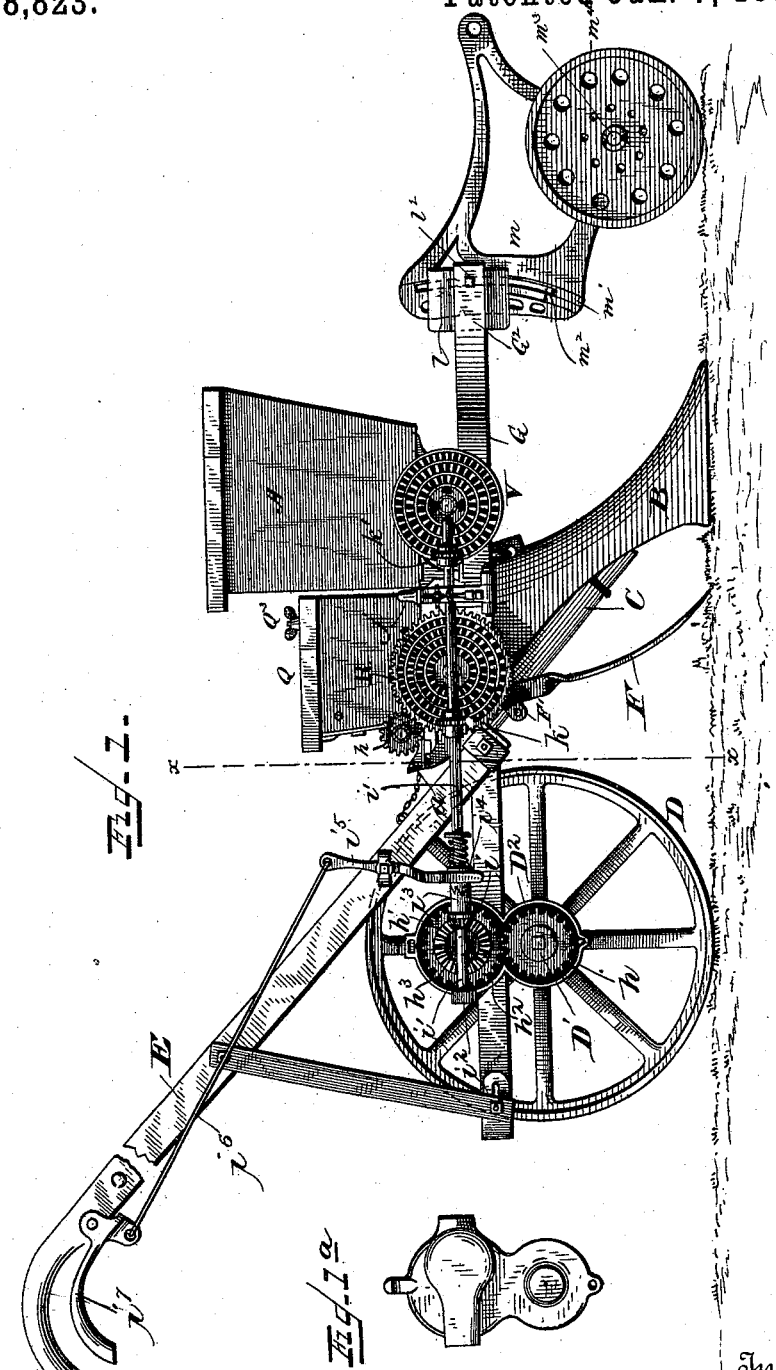


Fig. 7.

Fig. 7a.

Witnesses
F. L. Ourand.
Edwin A. Finckel.

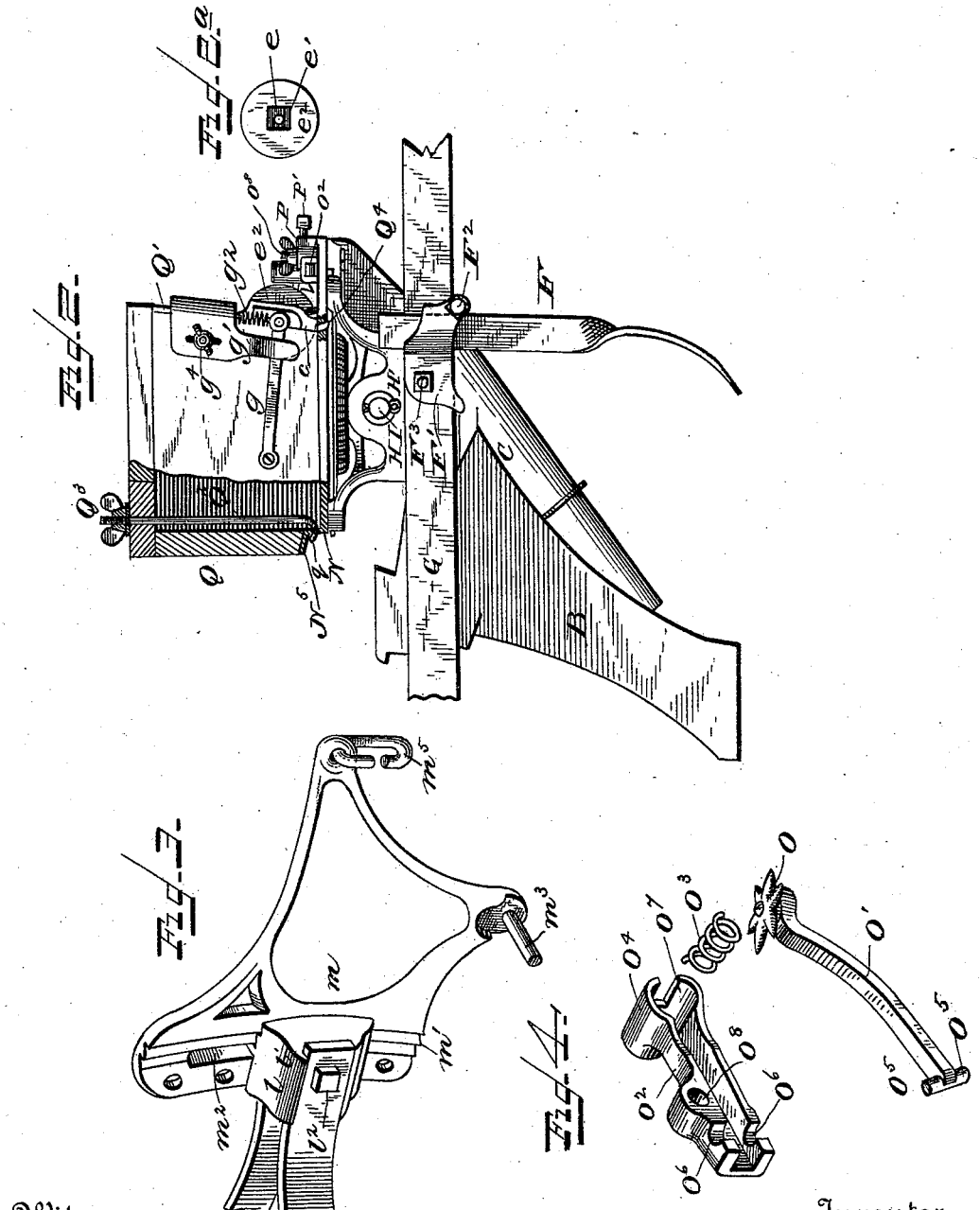
Inventor
Jacob W. Spangler
by Wm. W. Finckel
his Atty.

(No Model.) 6 Sheets—Sheet 2.

J. W. SPANGLER.

CORN PLANTER.

No. 418,823. Patented Jan. 7, 1890.



Witnesses
F. L. Ourand
Edwin A. Finckel

Inventor
Jacob W. Spangler
by Wm. N. Finckel
his atty.

(No Model.) 6 Sheets—Sheet 3.

J. W. SPANGLER.

CORN PLANTER.

No. 418,823. Patented Jan. 7, 1890.

Fig. 5

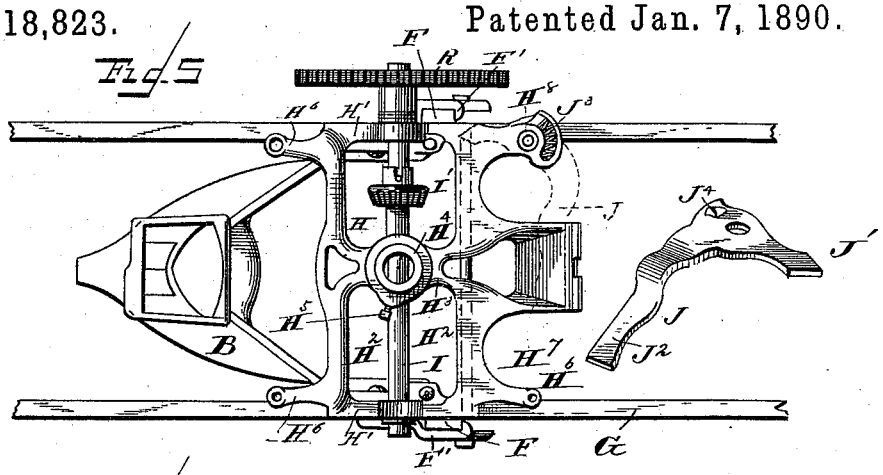


Fig. 6.

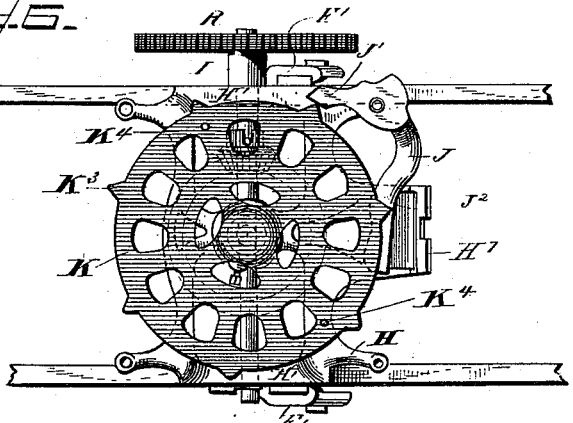
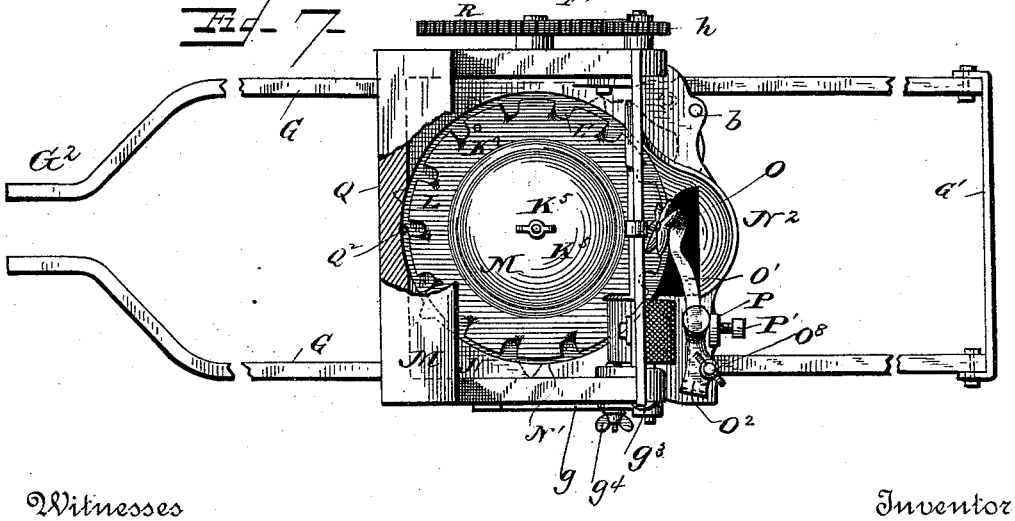


Fig. 7.



Witnesses
F. L. Ourand.
Edwin A. Finckel.

Inventor
Jacob W. Spangler
by Wm. N. Finckel.
his Atty.

(No Model.) 6 Sheets—Sheet 4.

J. W. SPANGLER.

CORN PLANTER.

No. 418,823. Patented Jan. 7, 1890.

Fig. 8

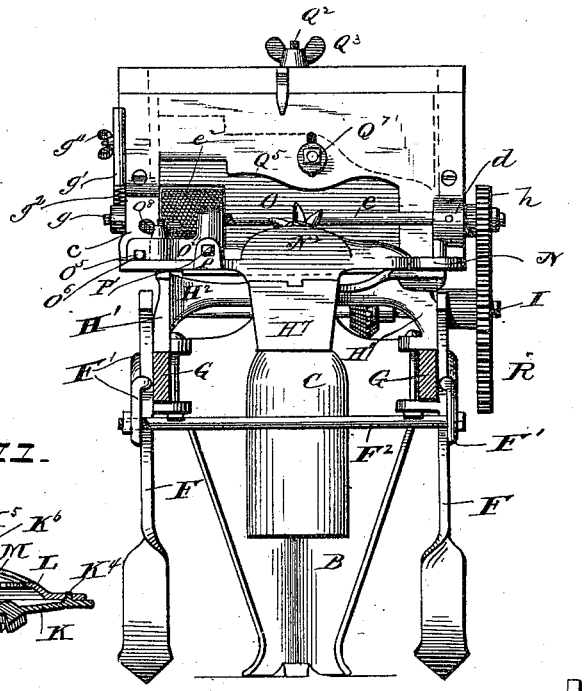


Fig. 11.

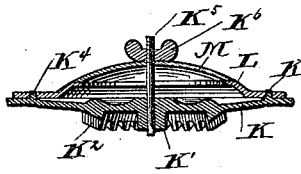


Fig. 9.

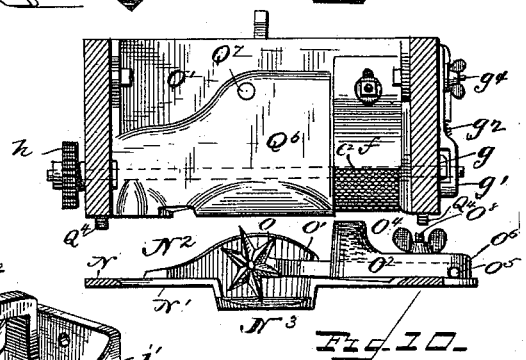


Fig. 12.

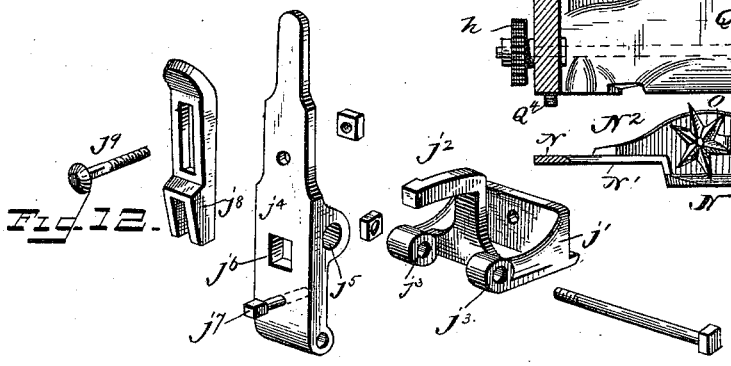


Fig. 10.

Witnesses
F. L. Ourand.
Edwin A. Finckel.

Inventor
Jacob W. Spangler
by Wm. A. Finckel
his atty.

(No Model.) 6 Sheets—Sheet 5.

J. W. SPANGLER.

CORN PLANTER.

No. 418,823. Patented Jan. 7, 1890.

Fig. 13.

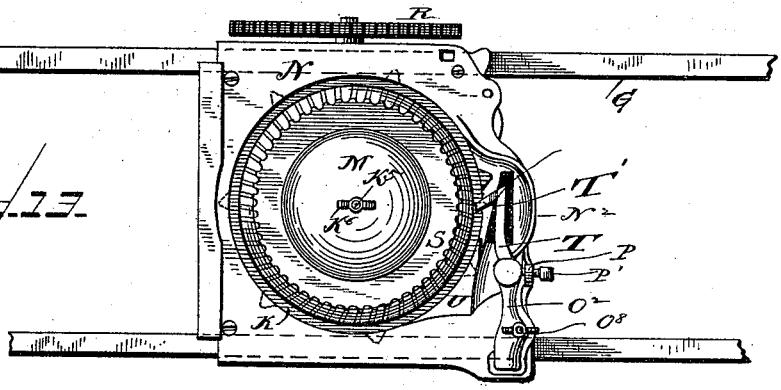


Fig. 14.

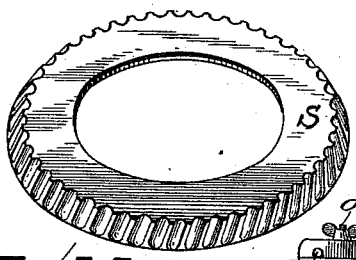


Fig. 15.

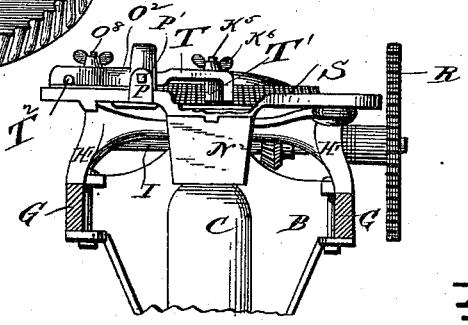


Fig. 16.

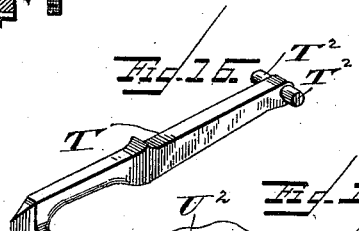


Fig. 18.

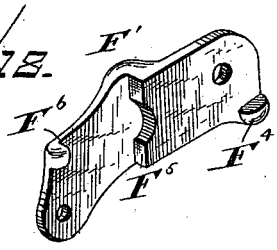
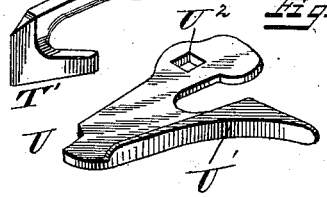


Fig. 17.



WITNESSES

F. L. Ourand.

Edwin A. Finckel.

INVENTOR

Jacob W. Spangler

by Wm. N. Finney

his Attorney

(No Model.)

6 Sheets—Sheet 6.

J. W. SPANGLER.

CORN PLANTER.

No. 418,823.

Patented Jan. 7, 1890.

Fig. 19.

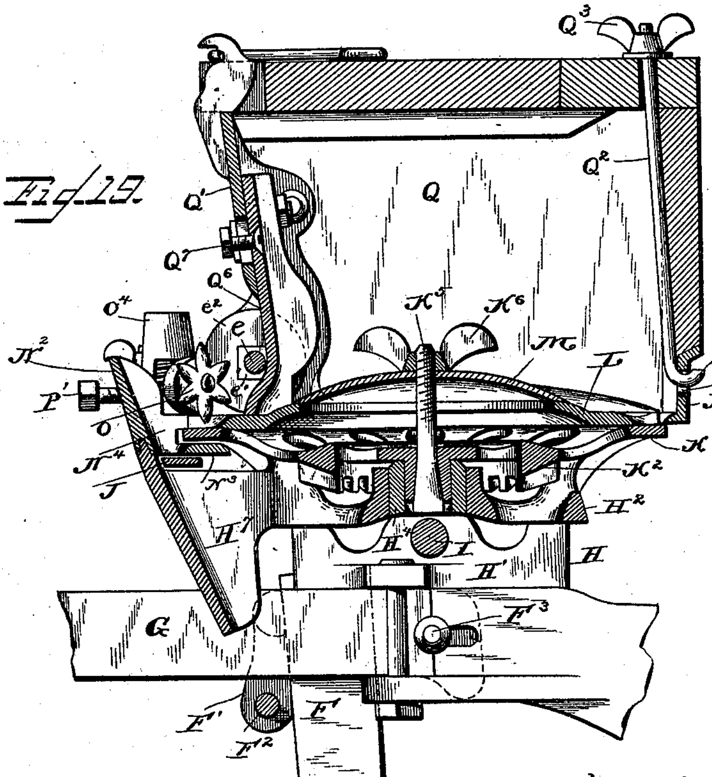
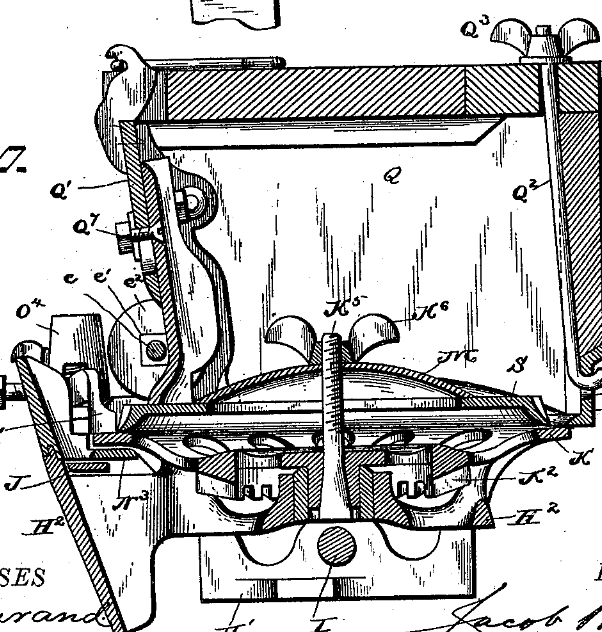


Fig. 20.



WITNESSES

F. L. Ourand.

Edwin A. Finckel.

INVENTOR

Jacob W. Spangler

by Wm. H. Finckel

his Attorney.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JACOB W. SPANGLER, OF YORK, PENNSYLVANIA.

CORN-PLANTER.

SPECIFICATION forming part of Letters Patent No. 418,823, dated January 7, 1890.

Application filed March 26, 1888. Renewed June 10, 1889. Serial No. 313,718. (No model.)

To all whom it may concern:

Be it known that I, JACOB W. SPANGLER, a citizen of the United States, residing at York, in the county of York and State of Pennsylvania, have invented a certain new and useful Improvement in Corn-Planters, of which the following is a full, clear, and exact description.

The invention relates to a machine for planting corn, beans, and peas in hills or broadcast.

One object of the invention is to provide an efficient seed or kernel "feed" for such machines, and another object is to provide interchangeable parts for adapting the machine for planting peas, beans, and the like. Still other objects are to provide a driving mechanism for the feed, also a clamp for the coverers, and also a draft-regulator for the machine.

With this statement of the objects of the invention, taken in connection with the following detailed description of the machine and the claims, it is deemed superfluous to make a formal statement of what the invention consists in.

In the accompanying drawings, in the several figures of which like parts are similarly designated, Figure 1 is a side elevation of a combined corn-planter and fertilizer-distributer with the casing-cap of the transmitting-gears removed, said cap being shown in detail at Fig. 1ª. Fig. 2 is a side elevation, partly in section, of the grain or kernel feed and adjacent parts with the "brush," shown in end view at Fig. 2ª. Fig. 3 is a perspective view of the draft-regulator clevis; Fig. 4, details in perspective of the ejector. Fig. 5 is a plan view of the spider and adjacent parts, showing, in enlarged perspective at the right, the gate or cut off detached. Fig. 6 is a plan view of the spider, feed-carrier, and gate or cut-off in position. Fig. 7 is a plan view of the corn-feed complete, part of the box being broken away, and the frame being shown broken in front and rear of the box to come within the drawing-sight. Fig. 8 is a rear elevation taken in the plane of line x x, Fig. 1. Fig. 9 is a cross-section of the detached box, looking rearwardly. Fig. 10 is a similar sectional view of the bottom plate. Fig. 11 is a cross-section of the feed-carrier, feed-plate or ring, and cap therefor connected. Fig. 12 shows in perspective details of driving-shaft hanger. Fig. 13 is a plan view of the bean or peas feed; and Fig. 14 a rear view thereof, and Fig. 15 a perspective of the feed-ring detached. Figs. 16 and 17 are perspective views of details of ejector used with the peas-feed. Fig. 18 is a perspective view of the coverer-clamp or clip-plate; and Figs. 19 and 20 vertical cross-sections, on a larger scale, of the two kinds of feeding devices complete.

The fertilizer-distributer A, plow B, boot C, drive-wheels D, handles E, and coverers F may be of any approved style; hence the details of their construction are not illustrated, and will not, as they need not, be described.

One main feature of my invention is the corn-planter proper, and of this the parts are shown in detail and now will be described.

In the example of my invention herein shown the metal frame G, hereinafter more fully described in proper place, supports the spider H, (see Figs. 2, 5, 6, 8, 19, and 20,) which comprises the side pieces H′ H′, resting on and secured to the frame and having bearings for the driving-shaft I, the stretchers H^2 connecting these side pieces, and cross-piece H^3 connecting the stretchers about midway of their length, and containing an adjustable bushing or bearing H^4, fixed in adjusted position by the set-screw H^5 to receive and sustain the superposed rotating members of the feed. Further, the spider has the feet H^6— one at each corner—and in addition is cast with the throat H^7, leading to the boot or delivery-spout. One of the feet H^6 is spread out flat, and made with boss H^8 to form the bearing and axis for a vibratory lever-gate or cut-off J.

The gate J is of the general outline of an L or bell-crank lever having one of its ends J′ made as a toe or tappet, and the other J^2 extending over the throat and serving as the gate or cut-off proper. The gate is held in position normally to close the throat, as by means of a spring (here shown as a coiled spring J^3) set in a pocket in the foot H^6 and engaged by a lug J^4 on the bottom of the gate. (See the detached gate at the right of Fig. 5.) The spring also serves to return the

gate to the closed position after having been forcibly opened.

The feed-carrier K (see Figs. 6, 7, and 11) is made as a skeleton circular plate or disk, and is provided with a hub or journal K′, whereby it is fitted to rotate in the bearing H^4 in the spider, and it is also provided with teeth K^2, with which the pinion I′ on the shaft I engages to rotate said carrier. The rim or edge of this carrier is provided with cams or wipers K^3, which act upon the toe of the gate J periodically to open the gate. I have shown one wiper for each two grain-cells in the corn-planter ring; but this proportion may be varied. By making the carrier in skeleton form the cost and weight of the casting is decreased and said carrier will not accumulate dirt. The face of the carrier is provided with registering pins K^4, and these aid in securing the planter-ring in position thereon. A screw bolt or pin K^5 rises from the center of the carrier.

The planter-ring L is provided with holes to engage the pins K^4, so as to center it upon the carrier. This ring is elevated centrally and combined with a dome-shaped cap M, which with the ring is secured to the carrier by a nut K^6, applied on top the cap to the bolt K^5. Provision is thus made for the lateral distribution of the seed in the box. The edge of the ring is divided into a suitable number of cells or pockets L′, which are chamfered or sloped out in their inner leading corners to admit of effective work of the ejector (presently mentioned) in throwing out the seed from these pockets into the throat and onto the gate.

When it is desired not to plant in hills, as for ensilage or fodder, the gate is held in the open position of Fig. 7 by a pin *a*, Fig. 1, inserted in a hole *b*, Fig. 7, in the bottom plate next described.

A plate N, herein designated the bottom plate because it serves as a bottom to the hopper or box, although not fixed to such box, is secured by bolts (stove-bolts) to the four feet H^6 of the spider and rests upon such spider, one of these bolts passing through the boss or pivot H^8 of the gate and serving in conjunction with the plate to hold in place the said gate. The bottom plate may be provided with any suitable device—such as lugs—to insure its proper register with the spider. The center of this plate is cut out circularly to make an opening N′ to surround the feed-ring L, said ring lying within the said opening, while the wipers K^3, and, if desired, a portion of the rim of the carrier abut against the under side of the said plate.

As shown in Fig. 10, the edges of the opening in the bottom plate are beveled, and by this means a close fitting of such edges and the feed-ring is not necessary to prevent cracking of the seeds. This construction thus attains a very important result in an operative and economical structural view, and is a valuable and important feature of my invention.

The bottom plate is provided with a lip N^2, projecting above its plane and to align with the throat to form a guard therefor, and it is also provided with a lip N^3 to project beneath the carrier, with a mouth N^4 between the lips, which mouth forms the true throat or discharge-opening for the feed, the gate traveling across this mouth and underneath the lips. The other end of the bottom plate is provided with an elevated shelf N^5, which forms a seat for one end of the box or hopper.

The ejector (shown in detail in Fig. 4) consists of a star-wheel O, journaled to an arm O′, which is pivoted in a cap O^2, the latter having a spring O^3 arranged in a socked O^1 to bear upon the arm O′, and thus hold the star-wheel in forcible but yielding contact with the feed-ring. The arm O′ has trunnions or lateral journals O^5, which are engaged by bearing-cavities O^6 in the cap O^2 to form a pivotal connection of said arm with the said cap. The socket O^1 is open in front at O^7 to straddle the arm O′ and admit of its vertical play. The cap is provided with a bolt-hole O^8 to receive a bolt passed up through and held from turning in the bottom plate, whereby said cap is itself pivotally held to the said bottom plate. A lug P stands up from the bottom plate near the inner end of the cap O^2, and a set-screw P′ is arranged in this lug to bear against said cap to throw it, and hence the star-wheel, into closer relation to the feed-ring, or let it, as it naturally would do, fall away from such ring. The said star-wheel is thrown in toward the feed-wheel in order that its points may begin their entry into the pockets or cells at the most distant leading point in the chamfered portions thereof, so as to get in front of the seed in such pockets or cells and so eject such seeds without injury. The adjustment, then, of this star-wheel (ejector) will be governed largely by the shape and size of the seeds, and because of this capability of getting in well in front of or underneath the seeds my feed is adapted to kernels, however well ill or shaped, of various sizes.

Of course, as will be understood, the star-wheel receives a rotary motion from its engagement with the feed-ring and its pivotal connection with the cap, the spring in said cap allowing a rising movement of the said wheel, but at the same time normally depressing it into forcible engagement with the feed-ring.

The box or hopper Q has no attached bottom, but comprises simply a partly-removable top, two side pieces, a front piece, and a metal back plate Q′. By means of a rod Q^2, having a hook *g* at one end to engage a hole 9 in the shelf N^5 of the bottom plate a clamping-nut Q^3 and hooks Q^4 (see Figs. 2 and 9) at the rear engaging holes in the bottom plate, the said box is bodily detachable from the feed

fixtures just described for gaining access to the latter, and in this connection it is noted that the feed-ring is removable also without detaching the bottom plate from the frame.

The metal back plate Q′ is cut out at Q^5 (see Fig. 8) and a patch-plate Q^6 inserted inside over it and made adjustable by a slot and stove-bolt Q^7, so as to adapt the box to feed-rings of different height. The plate Q′ also has at its sides housings *c d* for a horizontal shaft *e*, which has a squared portion *e′* to receive a removable elastic or yielding cylinder or cut-off e^3, arranged upon such shaft so as to come in contact with the feed-ring as it is about leaving the box, it being understood that my feed is a "sight-feed"—that is to say, one in which the seed is carried out of the hopper by the feeding device and held in sight of the operator before it is discharged into the throat. Now this cylinder or roller, moving in reverse direction to the feed-ring by positive gearing with the driving mechanism, as presently explained, comes in such close contact with the feed-ring as to clear off surplus seed from such ring, thus insuring the proper filling of the pockets or cells. The cylinder thus subserves the function of the brush commonly used. A shield or striker *f* is placed in an adjustable manner, as by a slot and stove-bolt or set-screw, over the cylinder inside the box to prevent the seeds from choking the said cylinder. When the cylinder is worn out, it may be removed from the square on the shaft and replaced by a fresh one.

That end of shaft *e* nearer the cylinder is supported in an automatically-yielding and independently-adjustable bearing composed, as shown in Fig. 2, of a bar *g*, pivoted to the box and having vertical play in a hanger *g′*, between which bar and hanger a spring g^2 is disposed, said spring normally depressing the bar and permitting the automatic movement or conformability of the cylinder. The hanger is fitted by a groove g^3 (see Fig. 7) to a projecting edge of the plate Q′, and is adjustable vertically on the box by a slot and bolt g^4, whereby the bar, and, in consequence, the cylinder are raised and lowered to suit feed-rings of different height. In order to correspondingly adjust the other end of the shaft *e*, the housing *d* may be provided with any usual and suitable adjusting mechanism. Indeed, that just described may be duplicated at this end of the said shaft.

The shaft I is provided with a gear-wheel R, driven as hereinafter described, and the shaft *e* is provided with a change-gear *h*, which is driven from said wheel R, and thereby imparts to the cylinder e^2 the positive rotation before referred to.

Some of the parts just described are interchangeable with peas or beans planting devices, the details of which latter are shown in Figs. 13 and 17. To adapt the feed for this purpose the box is removed, (by unhooking the rod Q^2,) and then the cap M and feed-ring L are detached, and in place of the feed-ring is arranged the feed-ring S, (shown in Figs. 13 and 15,) which is clamped down and covered by the same cap M. The feed-ring S is higher on its rim than the corn-feed ring, and the said rim is beveled and has the cells or pockets arranged thereon slantwise. In order to adapt the box to this feed-ring, its patch-plate Q^6 is adjusted vertically, and the shaft *e* is also elevated, as by the means already described.

The star-wheel is replaced by a vibratory but non-rotating ejector T, (see Fig. 16,) the effective end T′ of which is reversely inclined and adapted to hug the rim of the feed-ring and direct or throw the seed from the pocketed feed-ring into the throat. This ejector is provided with the lateral journals T^2 T^2, to be engaged by the bearings O^6 of the cap O^2, as in the case of the corn-ejector hereinbefore described, that cap serving to hold this ejector T in the manner it holds the corn-ejector and permitting the same play to it. In order, however, to wall up the space between this ejector and the box, whence otherwise the seed would escape, I employ beneath the cap the plate U, which has an elevated curved face U′, described in an arc of a circle concentric with the feed-wheel and arranged as shown in Fig. 13. This plate is provided with a squared hole U^2, through which is passed the non-rotating bolt O^8, used to secure the ejector-cap to the bottom plate.

It is to be observed that I employ with this bean-feed ring the same feed-carrier and the gate used with the corn-feeder; hence the same methods of discharging or planting the beans or peas may be followed as in the first instance.

By employing my feed-carrier and feed-ring any desired number of beans to a hill may be planted by employing a feed-ring having the appropriate number of cells to feed any number of seeds before the feed-carrier wiper acts upon the gate to open the throat and thus discharge the accumulated seeds.

Elevating the ejector T above its effective end T′ affords a passage-way for the peas or beans, and thereby admits of planting them in a continuous stream.

The quantity fed both of the fertilizer and of the seed and the distance for hilling are regulated by the speed of the machine, and this is governed by change-gears, as I will now specify. Referring to Fig. 1, the axle or shaft D′ of the driving-wheels D is provided with a pinion *h*, arranged in a case or hood D^2. This case is extended above said pinion, and is provided with a stud *h′*, on which rotates the idler-pinion h^2, meshing with pinion *h*, and on the face of this idler-pinion is a bevel-tooth rim h^3, which in turn drives a bevel-gear *i*, loose on a horizontal shaft *i′*. One end of shaft *i′* has a bearing in a lug i^2 of the case D^2, and its other end is supported in an adjustable bearing *j*, presently described. The bevel-gear *i* has a

clutch member i^3, which is engaged by the other half of this clutch i^4, which is feathered to and capable of sliding on the shaft i', a spring being employed to keep the part i^4 in engagement with part i^3 and permit slipping on reversal, as usual. This clutch member i^4 may be operated by a forked lever i^5, pivoted to the handles E, and connected by a rod i^6 with a hand-lever i^7 at the grips of the handles.

The wheels R and V for driving the seed and fertilizer feeds, respectively, have their faces formed with a series of concentric circles of indented teeth, which constitute so many toothed wheels or change-gears. These wheels R and V are engaged and driven by sprocket or cog wheels k and k', which are loose on the shaft i', so as to be shifted or slipped longitudinally along said shaft from one circle of cogs to another of the wheels R and V to change the speed of the feeds as circumstances may require. In order to admit of this adjustment, and at the same time hold the wheels k and k' in engagement with wheels R and V, the bearing j is employed. (For details of this bearing see Fig. 12.) A bracket j' is bolted to frame G, and this bracket has a rigid notched tongue j^2 and also eyes j^3. A lever j^4 is pivoted at its lower end (as by a bolt and nut, as shown) between the eyes of the bracket j', and has a box j^5 for the shaft i' and a passage j^6 for the tongue j^2, and a set-screw j^7 abutting against the bracket and serving as a back-stop for the lever. The lever j^4 is locked to the tongue j^2 of the bracket by a forked wedge j^8, which is also slotted and adjustably secured to the said lever by a bolt j^9, the forked end of the wedge engaging the notched end of the tongue. By releasing the wedge j^8 from its engagement with this notched tongue the lever j^4 may be swung outwardly away from the machine, carrying with it the shaft i', disengaging the wheels k and k' from the wheels R and V, and permitting the wheels k and k' to be shifted from one set of teeth to the other of the wheels R and V, which being done the lever is moved back and the wedge again engaged with the forked tongue.

The coverers are adjustably bound or clamped to the frame G by the clamps F′ and clamp-binding bolt F^2. The clamps F′ are pivoted at F^3 to the frame G, and are held from displacement by a lug F^4, which engages the frame. Offsets F^5 and F^6 in the clamps provide for the reception of the coverers and admit of their ready adjustment vertically. The coverers, when thus arranged in the clamps F′, are securely held by the bolt F^2, which passes crosswise of the machine from one clamp to the other, and is provided, of course, with the usual nut, which may be turned up to get the proper strain or tension on the clamps to hold the coverers.

The frame G (see Figs. 1 and 7 particularly) for lightness and strength is composed of parallel bars of metal connected by a cross-piece G′ at the rear and having their forward ends convergent to form a beam G^2, between which the draft-regulator clevis is secured. (See details, Fig. 3.) The clevis comprises a block l, having a ribbed face l', and secured between the bars of the frame by a bolt l^2. The clevis proper m has a flanged base describing an arc of a circle and provided with ribs to match the ribbed face l' of the block l, the object of these interlocking ribs being to afford extended bearing or holding surfaces for the clevis to hold it rigidly and admit of its vertical adjustment. The bolt l^2 passes through a longitudinal slot m^2 in the flanged base of the clevis, and thus serves to bind it, with the block, within the ends of the frame G. The clevis is provided with a laterally-projecting stud m^3 to receive the gage-wheel m^4, and is also provided with a draft-link m^5. By adjusting the flanged base of this clevis not only is the line of draft changed, but the elevation of the gage-wheel is correspondingly changed.

I have shown the plow and spider as bolted together to the frame; but they may be otherwise mounted thereon. So, also, many other details of construction are shown in the drawings, but are not described, as they are simply copied from the working-machine from which said drawings were made, and do not of necessity enter into the composition of this invention and may be modified at pleasure.

It is obvious that either of the wheels k and k' may be wholly disengaged from their respective wheels R and V by moving them along the shaft out of mesh with such wheels, and hence either the feed of the seed or fertilizer may be stopped.

Special attention is called to the capacity of the machine in the use of the cellular feed-ring and the gate combined. With this combination corn may be hilled one or two grains to the hill. As shown, with the gate in operation two grains to a hill are dropped at a given distance. Now, if the gate be rendered inoperative one grain will be dropped at just half that distance. Thus I make the one ring do work ordinarily requiring two rings or feeders.

In those of my claims where I am silent as to the kind of feed-ring or location of the cells I wish to be understood as claiming, broadly, a cellular or pocketed feed-ring irrespective of size, arrangement, or location of cells or pockets.

What I claim is—

1. A fixed spider, a feed-carrier rotatably borne thereby, and interchangeable feed-rings adapted to said carrier for feeding corn, beans, and peas in hills or in a stream, as may be desired, and a gate or cut-off pivoted in the discharge-throat and provided with a tappet acted upon by wipers on the feed-carrier to open the throat periodically for planting in hills and returned by a spring, and adapted to be held open by extraneous means.

for sowing, all combined and arranged substantially as described.

2. A fixed spider, a feed-carrier revolubly borne thereby and provided with peripheral wipers, a gate or cut-off for the discharge-throat having a toe or tappet and operated periodically by said wipers, and a feed-ring secured to the feed-carrier, substantially as described.

3. A feeding device composed of a ring having pockets or cells in its rim, the inner leading corners of which pockets are sloped out, substantially as described.

4. A stationary spider having corner feet, a bottom plate secured to the said feet and on top the spider, and having a mouth-piece for the discharge-throat and a pivoted gate arranged in such mouth-piece to open and close the mouth, combined with a feed-carrier, and a feed-ring on said carrier arranged in an opening in said bottom plate, substantially as described.

5. The feed-ring having peripheral pockets or cells, combined with an ejector having lateral journals at one end, a rigid cap having cavities to receive the journals of the ejector, whereby said ejector is pivoted in the cap, and a spring interposed within the cap between itself and the ejector to render the ejector vertically yielding to adapt it to cooperate with the cellular feed-ring to positively discharge the seed therefrom, substantially as described.

6. The feed-ring, combined with an ejector having an effective end in engagement with the feed-ring and pivoted in a spring-cap, and a set-screw for regulating the proximity of the ejector and feed-ring, substantially as described.

7. The feed-ring having pockets or cells arranged in its rim, which pockets or cells are sloped out in the inner corners of their leading ends, combined with a star-wheel ejector adapted to enter such pockets or cells through their sloped-out portions, and thus get beneath the seed and eject it without injury, substantially as described.

8. The bottom plate fixed to the spider and united with the feeding devices, combined with the box, and a hooked bolt detachably connecting the box to the bottom plate, substantially as described.

9. The box provided with a rear plate cut away and combined with an adjustable patch-plate, substantially as described.

10. The box provided with an adjustable patch-plate and a roller arranged in adjustable bearings, substantially as described.

11. The shaft-hanger described, comprising a stationary bracket, a lever pivoted to said bracket and bearing the shaft, a stationary notched tongue projecting from the bracket into engagement with the lever, and a wedge for connecting and disconnecting the lever and tongue, substantially as described.

12. The coverers, combined with clamping-plates secured to the frame at one end and united at their other ends by a tension or straining bolt, whereby said coverers are firmly but adjustably secured to the frame, substantially as described.

13. The clevis having an arc-like slotted and ribbed base-flange, combined with a ribbed block, the frame, and a connecting-bolt, substantially as described.

14. The clevis having an arc-like slotted and ribbed base-flange, a ribbed block, the frame, and a connecting-bolt, combined with a gage-wheel carried by the said clevis, substantially as described.

15. The bottom plate N, having a central opening N′ provided with a beveled edge to obviate the necessity of milling a seat or rabbet for the feeder, combined with the feeder arranged in said opening, substantially as described.

16. The spider provided with a foot H^6, having a cavity and spring J^3 therein, and a pivot or post H^8 thereon, combined with a gate J, secured to said pivot or post and having a lug J^4 engaged by said spring, substantially as described.

In testimony whereof I have hereunto set my hand this 17th day of March, A. D. 1888.

JACOB W. SPANGLER.

Witnesses:
N. M. WANNER,
W. H. SITLER.

Corrections in Letters Patent No. 418,823.

It is hereby certified that in Letters Patent No. 418,823, granted January 7, 1890, upon the application of Jacob W. Spangler, of York, Pennsylvania, for an improvement in "Corn-Planters," errors appear in the printed specification requiring the following corrections, viz: In lines 114–115, page 2, the clause "however well ill or shaped" should read *however well or ill shaped*, and in line 128 of same page the reference letter "g" should read *q*, and the reference figure "9" should read *q'*; and that the Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 21st day of January, A. D. 1890.

[SEAL.]

CYRUS BUSSEY,
Assistant Secretary of the Interior.

Countersigned:

C. E. MITCHELL,
Commissioner of Patents.