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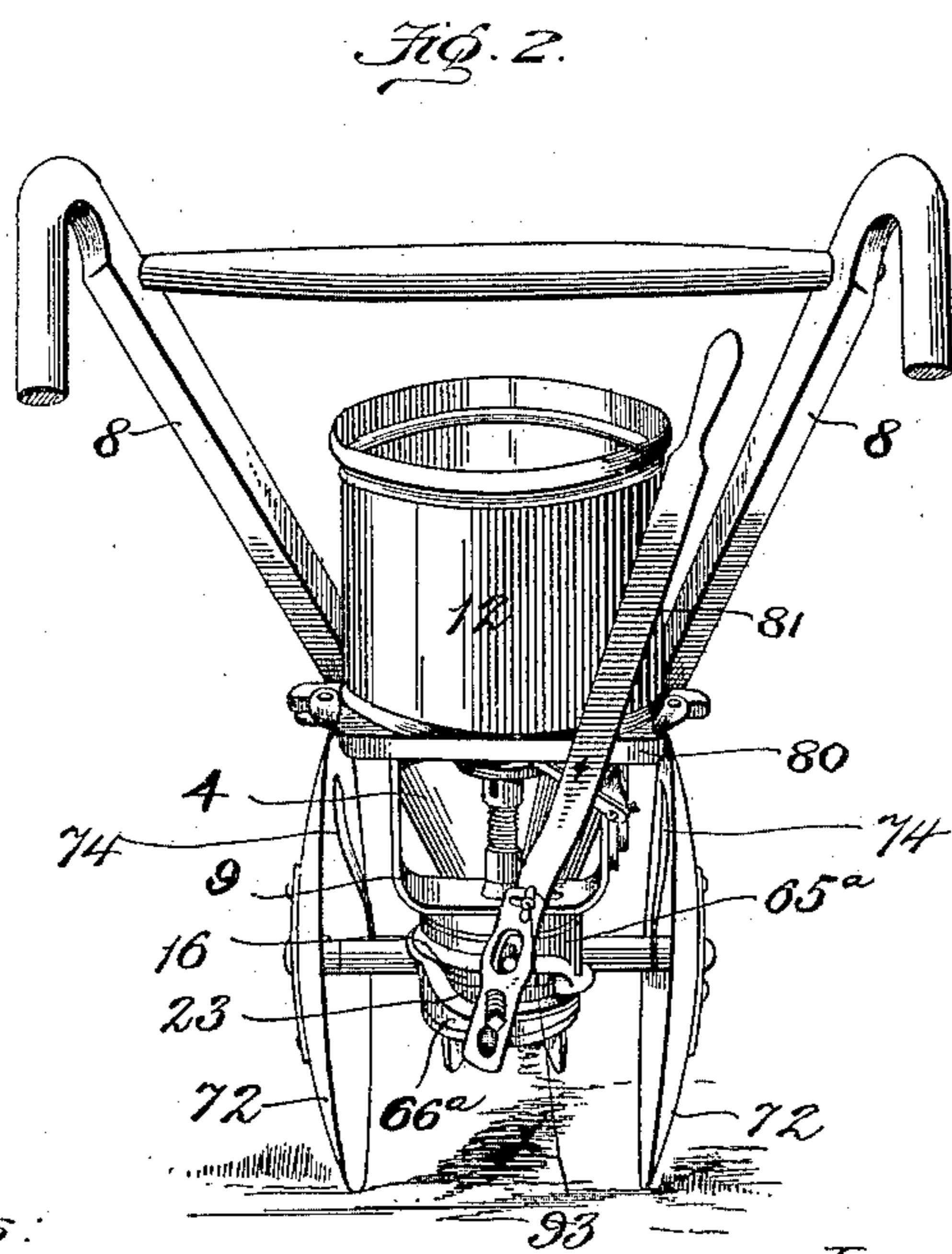
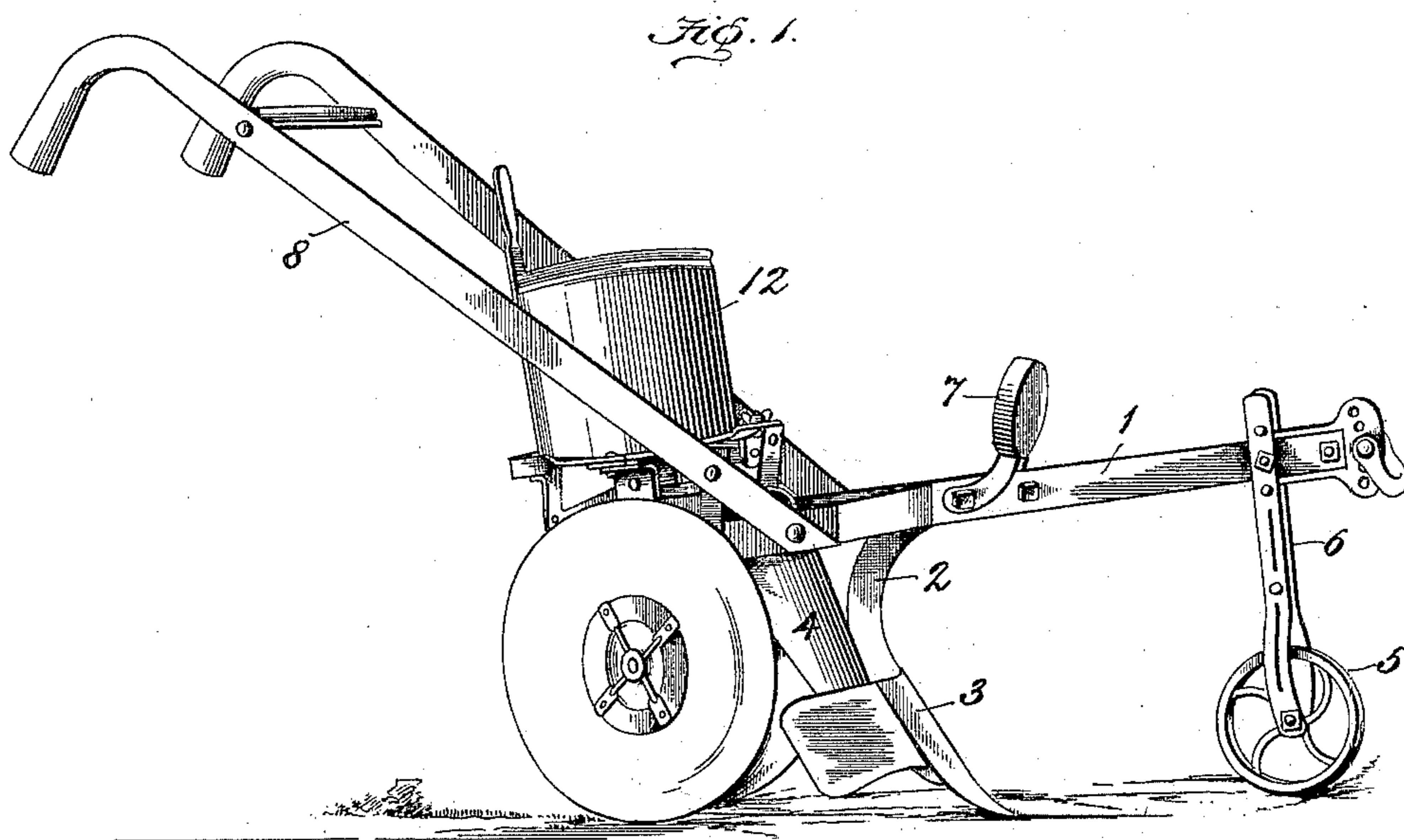
Patented Sept. 13, 1898.

J. D. SCHOFIELD.
PLANTER.

(Application filed Sept. 4, 1897.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses:

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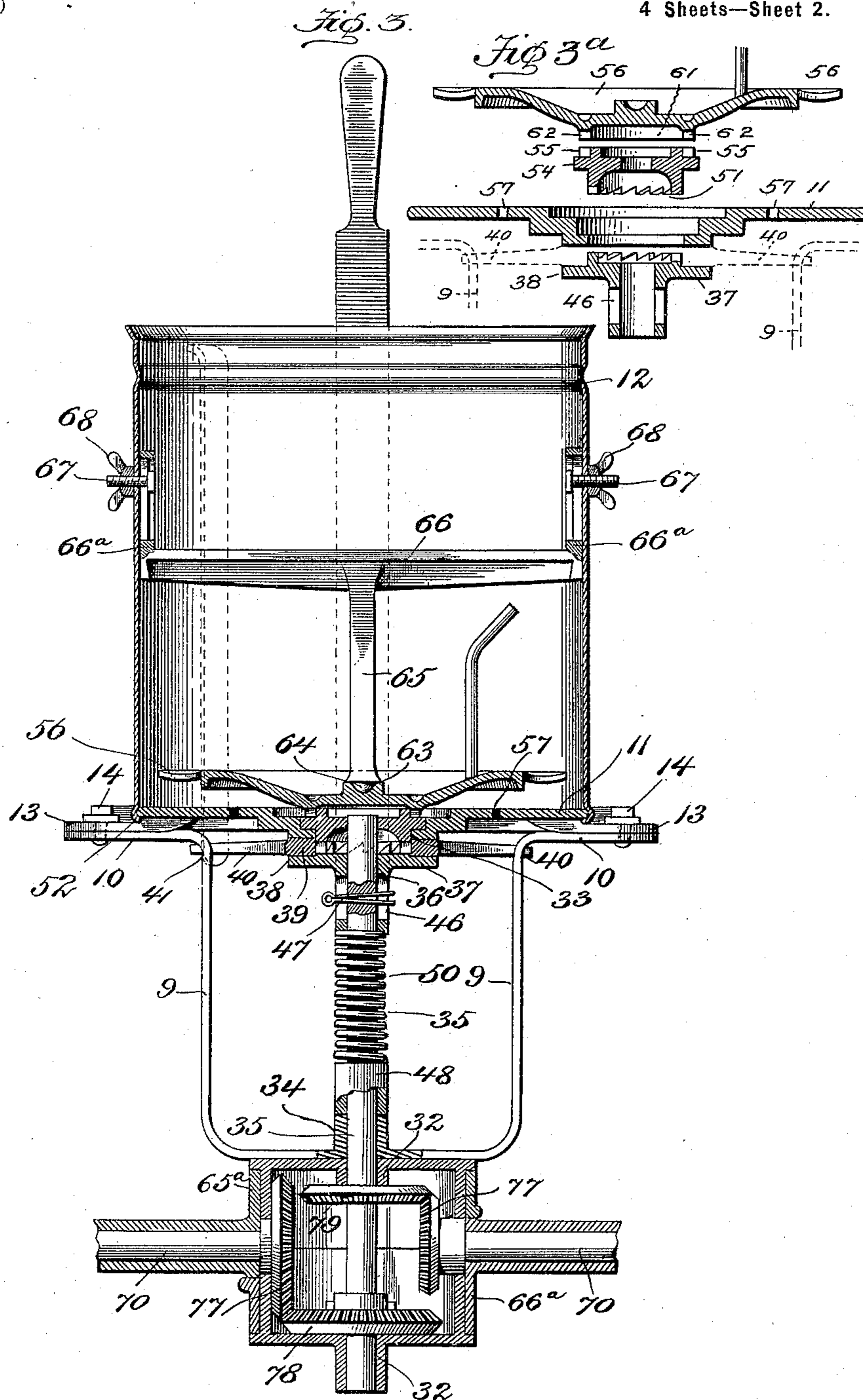
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4 Sheets—Sheet 2.



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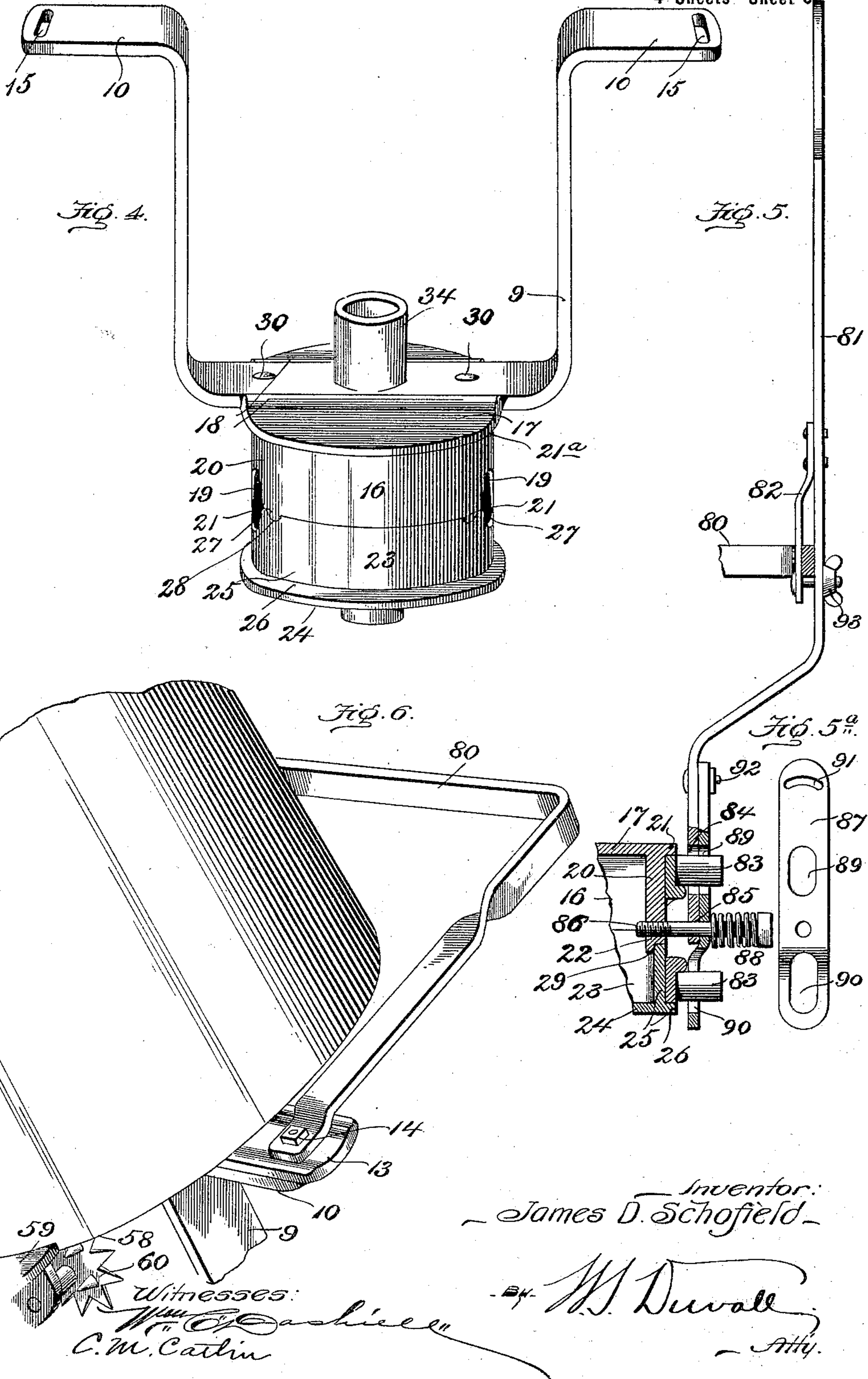
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4 Sheets—Sheet 3



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4 Sheets—Sheet 4.

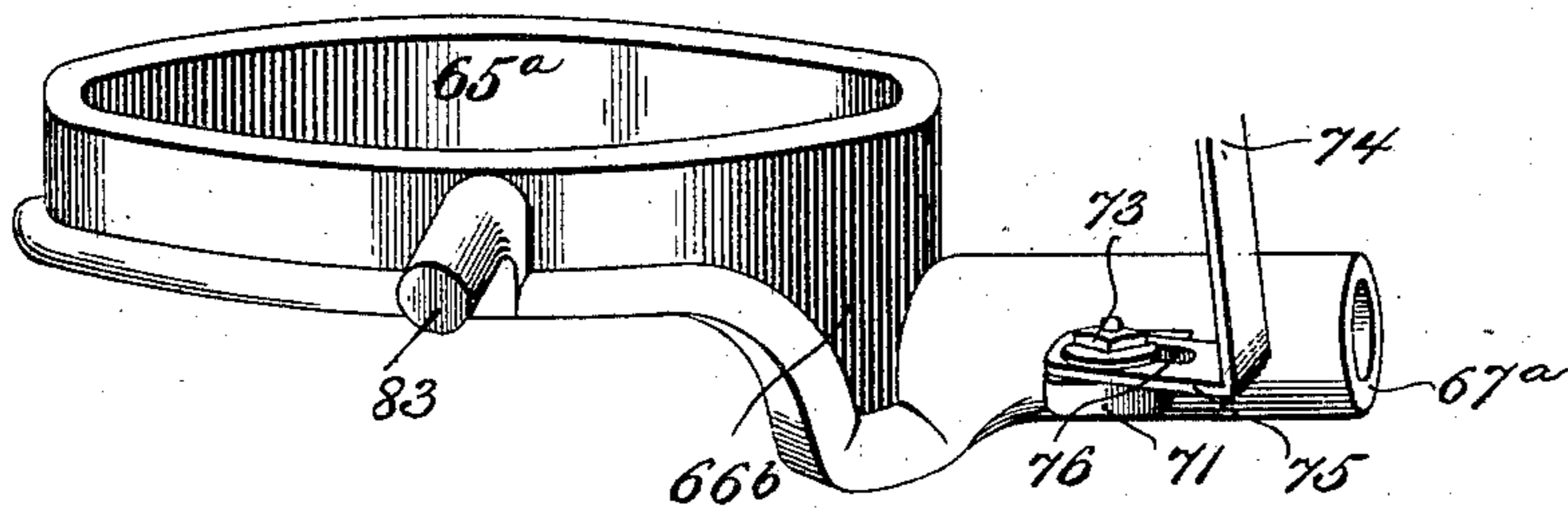


Fig. 7.

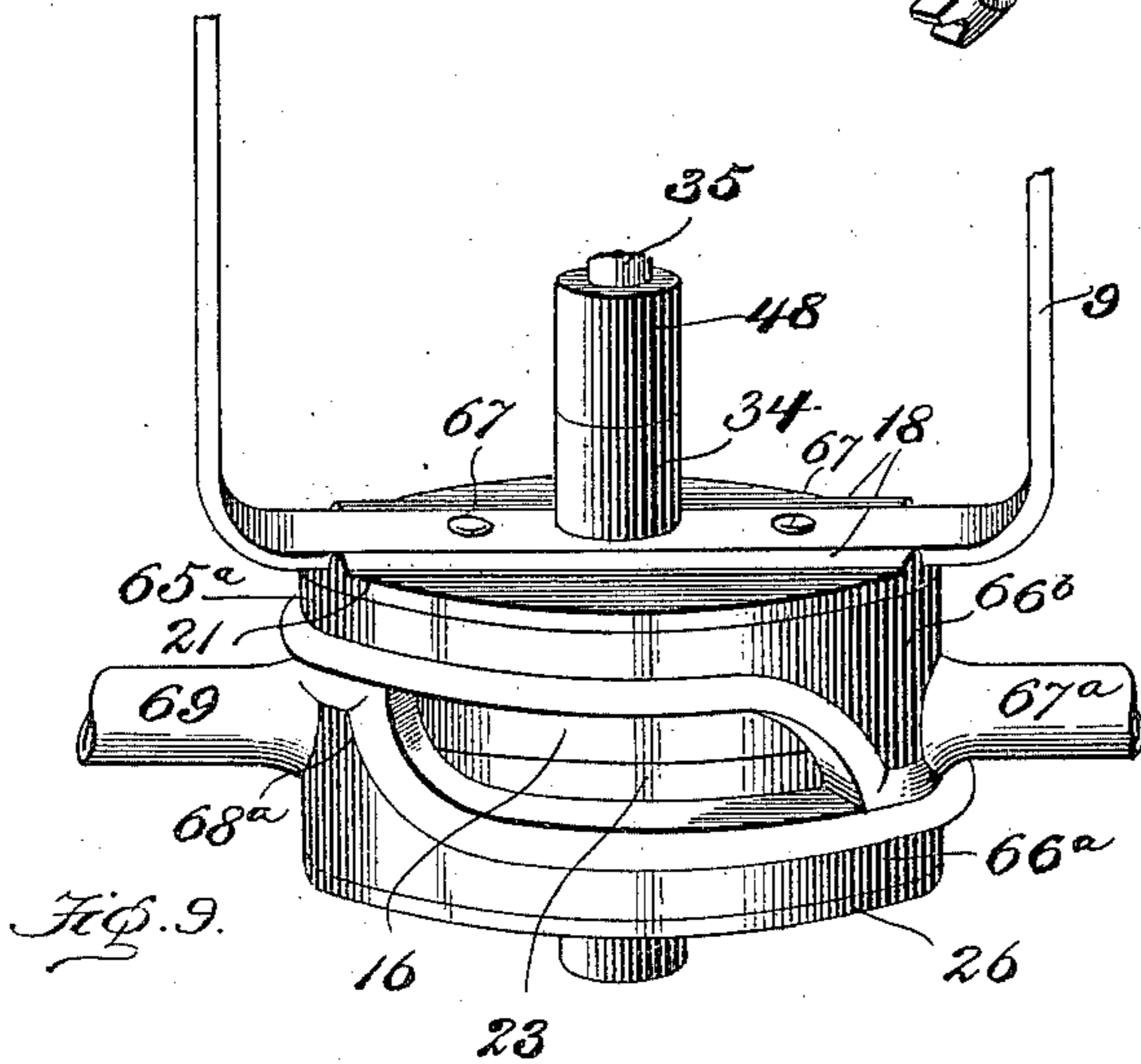
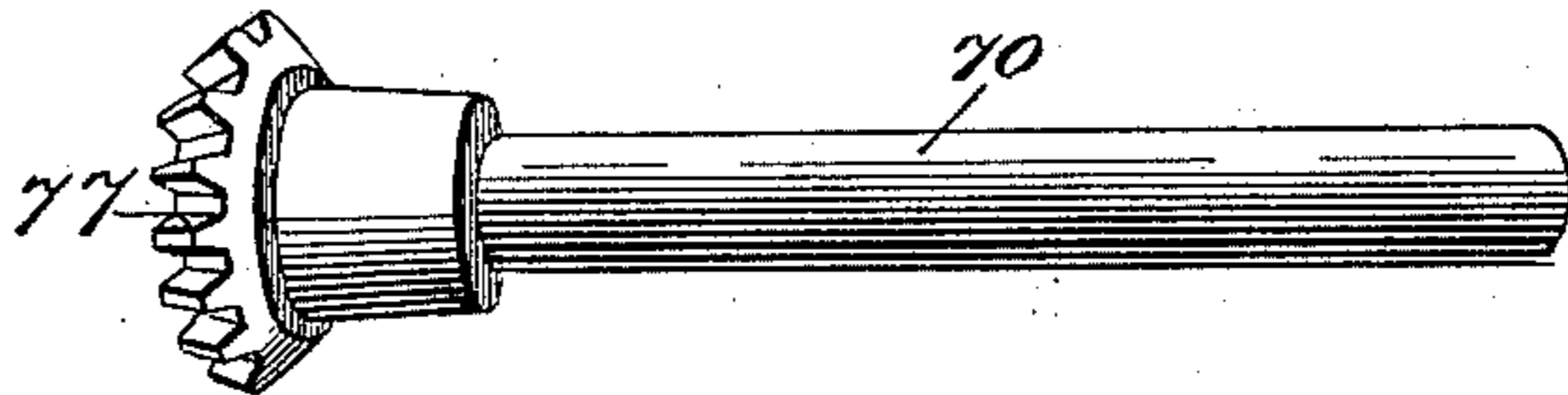


Fig. 9.

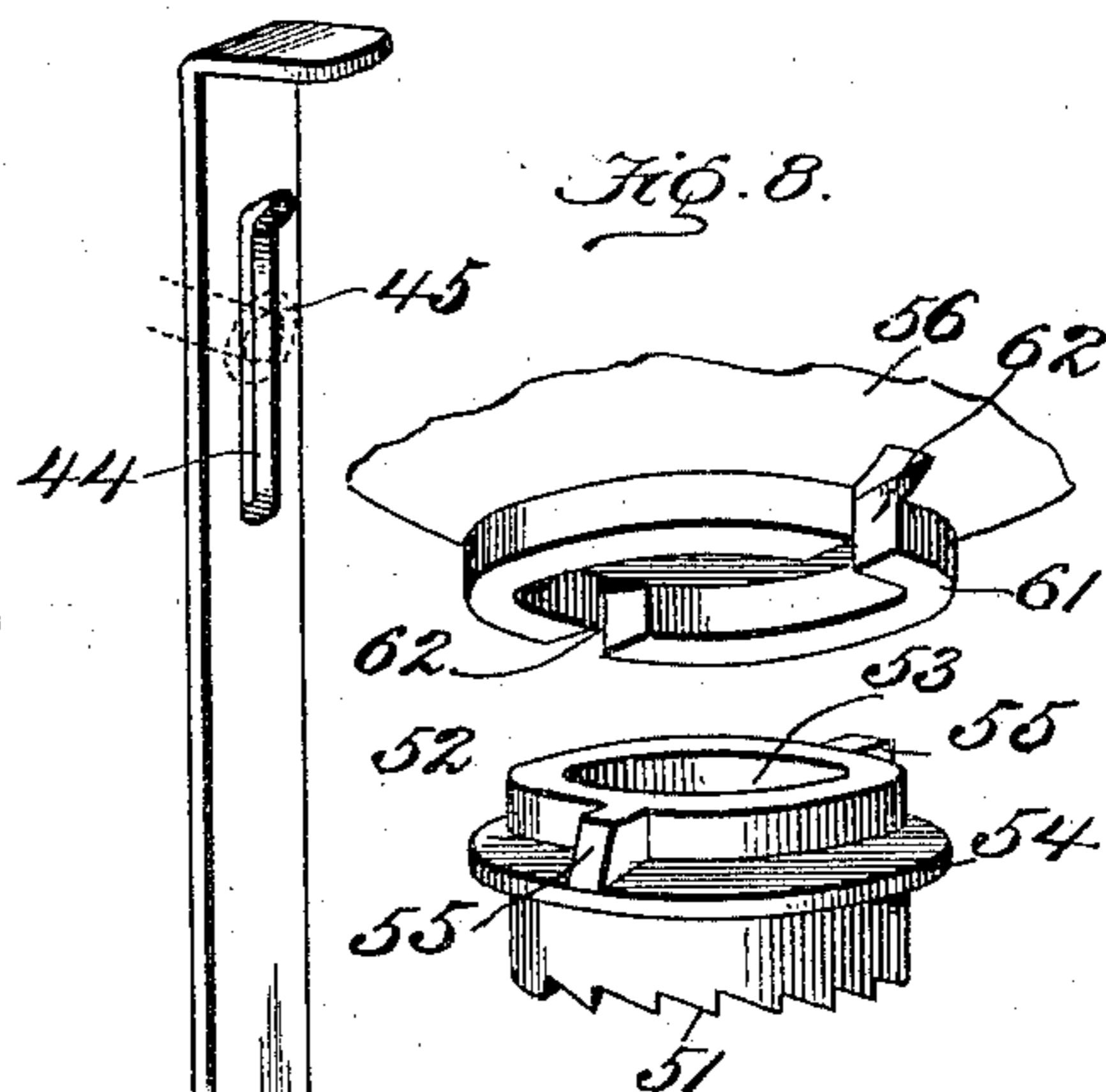


Fig. 8.

Fig. 10.

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UNITED STATES PATENT OFFICE.

JAMES DROMMOND SCHOFIELD, OF DALLAS, TEXAS.

PLANTER.

SPECIFICATION forming part of Letters Patent No. 610,771, dated September 13, 1898.

Application filed September 4, 1897. Serial No. 650,660. (No model.)

To all whom it may concern:

Be it known that I, JAMES DROMMOND SCHOFIELD, a citizen of the United States, residing at Dallas, in the county of Dallas and State of Texas, have invented certain new and useful Improvements in Planters; and I do hereby 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.

This invention relates to improvements in planters, the same having special reference to that class of planters employed for automatically planting cotton-seed, corn, &c., and wherein the feed is operated by a driving mechanism set in motion by the planter-supporting ground-wheels or, as herein shown and as preferred, the covering-disks.

The main objects of my present invention are to devise a convenient and simple means for converting and transmitting motion in a positive manner from the planter-supporting covering-disks or the ground-wheels, whichever are employed, to the driving mechanism; to provide for a thorough protection of the necessary gearing against the admission of dust and grit, as well as a convenient means of access to the same; to provide a conveniently-operated adjustment for the covering-disks when employed, whereby their relative angular location may be changed at will and instantly, so that the planter is thereby adapted and caused to cover and plant at the depth desired; to provide means whereby the covering-disks may be independently adjusted irrespective of the joint adjusting means before mentioned, so that they may be subsequently jointly adjusted with relation to each other and also with relation to the line of draft, and thus the machine be forced to travel in a straight line and obviate all tendency to travel sidewise, and, finally, to provide a novel means for shifting or throwing the driving mechanism into and out of operative connection with the feed devices and for retaining the corn, cotton, or other seed disk in position for light running and adapted for easy removal, whereby the one may be readily substituted for the other without an absolute removal of the retaining devices employed.

Various other though minor objects of my

invention will appear in the following description, and the novel features claimed for my invention will be embodied in the appended claims.

Referring to the drawings, Figure 1 is a perspective view of my improved planter. Fig. 2 is a rear perspective of the same. Fig. 3 is a vertical transverse sectional view of the hopper and the feed and operating mechanisms. Fig. 4 is a detail in perspective of the supporting-yoke and gear-case. Fig. 5 is a side elevation and partial section of the disk-adjusting lever and its connections. Fig. 5^a is a detail of the adjusting-link of said lever. Fig. 6 is a perspective view of a portion of the hopper. Fig. 7 is a detail of the upper swiveled ring and its axle. Fig. 8 is a detail of the under side of a corn or cotton disk and also of the feed wheel or disk upon which it is mounted. Fig. 9 is a detail of the gear-case and the parts carried thereby. Fig. 10 is a detail of the shifting yoke and its operating-rod. Fig. 10^a is a sectional view of hopper bottom with parts separated.

Similar numerals of reference indicate similar parts in all the figures of the drawings.

My improved planter mechanism may be supported in position upon any suitable cultivator-frame, the one illustrated being preferred and comprising, briefly stated, the beam 1, bifurcated or divided at its rear end in the usual manner and at its front end provided with the usual clevis or other draft appliance or connection. The standard 2 of an ordinary plow or cultivator 3 is bolted to the beam 1 at the point of divergence, and immediately in rear is located the seed spout or discharge 4. A gage-wheel 5 may be adjustably connected by a standard 6 to the front end of the beam 1. I may also employ a reflecting-mirror 7, mounting the same upon the beam in such manner as to be readily adjusted to reflect the working of the seeder to the eyes of the operator, so that he can at all times readily see that the machine is performing its proper function in a satisfactory manner and therefore does not have to leave his position to ascertain this fact. Of course handle-bars 8 may be employed, the same being bolted to the bifurcations of the beam and to any other suitable points. Such, however, would be omitted or removed when the planter

is supported upon a riding-cultivator for planting one or a plurality of rows simultaneously.

I preferably bolt to the rear bifurcated ends of the beam 1 a substantially U-shaped main yoke or frame 9, and the same may have its upper ends or terminals bent outwardly in a horizontal manner to form opposite rests 10, upon which the bottom 11 of the hopper 12 may be mounted. The hopper-bottom may have formed at diametrically opposite points lateral extensions or lugs 13, through which vertical bolts 14 may be passed, said bolts also passing upwardly through openings 15, formed in the rests 10, which openings are preferably in the form of elongated slots, so that the hopper as a whole is capable of a slight adjustment with relation to the yoke 9.

16 designates a cast-metal cap comprising an upper disk 17, on the upper side of which is formed a pair of transverse parallel superficial ribs 18, cast thereon, and between which and seated on the cap is the lower transverse portion of the yoke 9. This cap may further comprise a depending annular flange 20, the same being of less diameter than the disk 17, from which it is extended and of which it is formed a part, whereby there is produced at the upper end of the cap an annular bead 21^a, which in reality is the projecting or overlying edge of the disk 17. The lower edge of the flange 20 of the cap is cut away or recessed at nearly diametrically opposite points, as at 19, and at one side between these points has its edge provided with small lugs 21 and at the opposite side provided with a half-round depending perforated threaded lug 22. An oppositely-disposed lower cast-metal cap 23 may also be employed, the same comprising the lower disk 24, annular flange 25, and lower annularly-disposed radially-projecting bead 26. The upper edge of the flange 25 of this cap is also cut away, as at 27, at nearly diametrically opposite points, so that when the annular flanges of the two caps meet these cut-away or recessed portions combine to produce side openings in what constitutes an annular sectional gear-case. The flange of the lower cap is provided with nicks or shallow recesses 28, which receive the depending lugs 21 of the upper cap, and is also formed with a half-round recess 29 for the reception of the perforated and threaded lug 22. These two caps are oppositely disposed and may be held in removable position by means of a pair of vertical binding-bolts 30, which depend through corresponding pairs of vertically-alining perforations, with which the disks of the two caps are provided, close up to the interior surfaces of their annular meeting flanges. The disks of the two caps are provided with central vertically-alining perforations 32, that of the upper cap having its perforations flanged on its under side. These holes or perforations 32 are in direct vertical alinement with similarly-flanged holes 34, formed at the center of the U-shaped

main yoke 9, and also with the usual though larger opening 33, formed in the bottom 11 of the cylindrical hopper 12. Extending through these four openings and journaled in the lower three is the vertical operating-shaft 35, which is also passed through the bored hub 36 of the ratchet-wheel 37, located below the hopper-bottom. This ratchet-wheel, which is in reality the lower member of a clutch, is surrounded by an annular flange 38, upon which loosely rests a curved clutch-yoke 39, having three angularly-disposed trunnions 40, two of which are journaled in openings in the sides of the main or U-shaped yoke-frame 9, as indicated at 41, Fig. 3, and the other of which is engaged by a perforation 42 or otherwise loosely connected to the lower end of a vertically-movable rod 43, located at one side of the hopper-body 12. The rod 43 is slotted near its upper end, as at 44, and is engaged and guided by a headed stud or screw 45. The slot 44 is preferably of inverted-L shape, so that the rod may be depressed and moved laterally, so as to become locked against upward movement by reason of the neck of the stud entering the lateral branch of the said slot.

The ratchet-wheel 37, before mentioned, is loosely mounted on the upper end of the operating-shaft 35, and its hub is longitudinally slotted, as at 46, through which slot projects a pin 47, which projects laterally from said shaft. By this means it will be seen that the ratchet-wheel will have a vertical movement independent of the operating-shaft 35, but must rotate with the same. A loose bearing-collar 48 may be mounted on the operating-shaft immediately above the bottom of the yoke 9, and between this collar and the lower end of the hub of the ratchet-wheel is located a spring 50, the same being coiled upon the operating-shaft and adapted to normally elevate the aforesaid ratchet-wheel until its teeth engages operatively with similar teeth 51, formed on the underside of the feed-disk 52.

The feed-disk 52, Fig. 8, is located in the depressed central portion of the hopper-bottom, the ratchet-hub on the under side thereof projecting through the central opening in said bottom. The disk is provided with a central opening 53, through which the upper end of the operating-shaft projects, and with an external intermediate track-flange 54. The upper side of the flange 54 has formed thereon diametrically opposite lugs 55. A corn-disk or, as herein illustrated, a cotton-disk 56 may surmount the feed-disk 52. The corn or cotton disk may be formed in any usual manner for dropping corn through the openings 57, with which the bottom 11 of the hopper is provided, or for feeding cotton-seed horizontally or otherwise through the opening 58, Fig. 6, also formed in said bottom 11. The latter opening may be provided with the usual gage or cut-off 59 and dropping-wheel 60. Whatever be the shape or configuration of the corn or cotton-seed disks, each has its bottom pro-

vided with a depending annular hub 61 of such size and shape as will adapt it to take over and fit the upper end of the feed-disk 52, and the said hub 61 is recessed or notched at diametrically opposite points, as at 62, so as to engage the lugs 55, with which said feed-disk is provided. It will thus be apparent that motion will be conveyed from the feed-disk to the corn or cotton disk and that by operating the ratchet-wheel 39 the motion may be arrested and the feed stopped, such arresting and stoppage of the feed being accomplished while the planter is in motion by simply operating the clutch-rod 43, heretofore described, which will, through the medium of the clutch-yoke, depress the lower clutch member or ratchet-wheel until it is out of engagement with its companion in the hopper.

The upper side of the corn or cotton-seed disk may be provided with a central concaved bearing-lug 63, and in the lug is stepped the lower cone-shaped end 64 of a vertical post 65, which depends from and may be formed as a part of a transverse bridge-bar 66. This bridge-bar is located across the upper end of the hopper and is formed with slotted angular ends 66^a, which rest against the inner side of the hopper-wall, a pair of bolts 67 being passed through the slots mentioned and through corresponding circular bolt-holes in the hopper-wall and provided at their outer ends with winged nuts 68. By running these nuts backward so as to slightly loosen the bolts it is obvious that the bridge-piece may be raised until the lower cone end of its post is out of engagement with the cavity of the lug 63 of the corn or cotton disk, and hence, for instance, the cotton-disk may be removed and a corn-disk substituted, and thus the planter easily and quickly converted from a cotton to a corn planter, or vice versa.

Now to return to the motion-producing mechanism. Between the annular parallel beads formed on the upper and lower caps or sections 16 and 23 composing the gear-case is located an upper and a lower ring 65^a and 66^a, respectively designed to revolve or oscillate horizontally in contact with each other and about the gear-case, these rings being confined in position by means of the aforesaid beads with which the gear-case is provided. The upper ring is provided with a depending extension 66^b, which bears on the lower ring and from which radiates an outwardly-disposed bored stud 67^a, and the lower ring is provided with an upward extension 68^a, which bears against the upper ring and from which radiates outwardly a similar bored stud 69, the said studs being opposite the two side openings in the gear-case. In each of these studs is journaled a short radial axle 70, said axles being somewhat longer than the studs in which they are mounted. On the outer ends of the axles are mounted in any rigid manner ordinary covering-disks 72. Perforated lugs 71 may be formed on the studs 67^a and 69, and supported in an adjustable man-

ner thereon, by means of set-bolts 73, is a pair of scraper-blades 74. The blades are bent at their lower ends at 75, which bent portions are slotted, as at 76, whereby the blades may be adjusted with relation to the covering-disks. It will also be seen that radial movements of the covering-disks will cause similar movements upon the part of the scraper-blades, so that the relative adjustments between the blades and covering-disks are maintained.

At the inner ends of the radial axles (which occur within the gear-case) are located and fixed small bevel-gears 77, which, as will be apparent, are in the same horizontal plane, but the axles differing slightly in length the gears are not in the same annular plane or radius. The gears are also of different size. The larger one meshes with and drives a similar bevel-gear 78, located on the operating-shaft within the lower half of the gear-case, and the smaller of these bevel-gears 77 meshes with and drives a larger opposing gear 79, located in the upper half of the gear-case on the operating-shaft and slightly smaller than its companion 78. As a result of this system and proportioning of gearing the two covering-disks through their axles transmit motion at the same relative speed and in the same direction to the operating-shaft, so that the latter is driven positively and the strain is equally divided by the two sets of drivers.

An angular horizontal frame 80 is located in rear of the hopper, the forwardly-projecting terminals of the frame resting on the horizontal lugs projecting from the hopper-bottom and may be secured in position by means of the same bolts that serve to secure the hopper-bottom to the main U-shaped yoke-frame 9. A hand-lever 81 convenient to the operator is loosely clipped, as at 82, to the rear transverse portion of the frame and has its lower end inwardly bent or offset, so as to be in juxtaposition to the gear-case and the rings carried thereby. Each of these rings is provided with a bearing-pin 83, the upper one passing loosely through and beyond an elongated slot 84, formed in the hand-lever. At its lower end the hand-lever is provided with an opening 85, through which passes a bolt 86, which projects radially from the opening or perforation formed in the depending half-round lug 22, that extends from the annular flange of the upper half or cap of the gear-case. A link 87 is perforated between its ends, so as to be fulcrumed on said bolt, and between the head of the bolt and the link there is coiled on the former a tension-spring 88. This link is provided with upper and lower elongated slots 89 and 90, respectively, the upper slot receiving the upper bearing-pin 83 or that of the upper ring, and the lower slot receiving the lower bearing-pin 83 or that of the lower ring. At its extreme upper end the link is provided with a transverse slot 91, curved concentrically with

relation to the fulcrum-bolt 86 of the gear-box. An adjusting-bolt 92 passes through this slot and a coincident bolt-hole in the hand-lever.

5 It will be evident that by oscillating the lever, the bolt 86 as the fulcrum, the two rings on the gear-case will be caused to oscillate or partially rotate in opposite directions, this by reason of the intermediate fulcruming of
10 the hand-lever on the bolt 86. This opposite rotary movement upon the part of the rings causes the covering-disks to gather or angle or separate, so that their angles are increased or diminished, and thus the machine will be
15 caused to plant the desired depth. The covering-disks may be locked in any of their adjusted positions by means of an adjusting-screw 93, passed through the lever and the clip 82, said screw serving to clamp the clip
20 upon the frame 80. Other means may readily be devised for accomplishing this locking of the parts. In fact slight modifications in regard to the various details of the invention will readily suggest themselves, and for this
25 reason I would have it understood at the outset that I do not contemplate confining my invention to the details herein shown and described, but maintain that I may vary the same to any extent and degree desired and
30 which may be within the knowledge of the skilled mechanic without departing from the spirit of my invention or sacrificing any of its numerous advantages.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a planter, the combination with a hopper having a lower feed-opening at one side of its center, of a seed-disk rotatably supported in the bottom of the hopper and provided with a central upwardly-disposed stud, a transverse bridge-piece located in the hopper, a post depending from the said bridge-piece and having a bearing at its lower end
45 for engaging the said stud of the seed-disk, and means for adjustably securing the bridge-piece to the wall of the hopper.

2. In a planter, the combination with a hopper having a lower feed-opening at one side of its center, of a seed-disk rotatably supported in the hopper-bottom and provided on its upper side with a bearing-cavity, a transverse bridge-piece located in the hopper and having a depending post immovably connected with the bridge-piece and terminating in a reduced bearing end entering said bearing-cavity of the seed-plate, and means for vertically adjusting the bridge-piece in the wall of the hopper.

3. In a planter, the combination with a hopper having a lower feed-opening at one side of its center, of a seed-disk rotatably supported in the hopper-bottom and provided on its upper side with a bearing-cavity, a transverse bridge-piece located in the hopper and having the terminals at its ends bent at right angles and slotted, adjusting-bolts passed through

the slotted angular ends of the bridge-piece and the walls of the hopper, and a post depending from the bridge-piece and having a reduced bearing end conforming to the bearing-cavity of the said disk.

4. In a planter, the combination with a hopper having a lower feed-opening and a central opening in its bottom, of an operating-shaft extending through the latter, means for rotating the shaft, a feed-disk carried by the shaft and located in the bottom of the hopper and provided with an annular encircling flange and lugs, a seed-disk having its under side provided with an annular hub adapted to receive the flange of the feed-disk and provided with notches for engaging the lugs thereof, and means for removably retaining the seed-disk in position upon the feed-disk.

5. In a planter, the combination with a hopper having a central opening formed in its bottom, a vertical operating-shaft extending therethrough, and means for rotating the said shaft, of a feed-disk supported in the bottom of the hopper and having its under side provided with a toothed hub, a flanged ratchet-wheel mounted for vertical movement upon and adapted to rotate with the shaft, a spring for normally elevating the same into engagement with the toothed hub of the feed-disk, a shifting yoke loosely engaging the ratchet-wheel and provided with a radial arm, a yoke-operating rod located at the side of the hopper and provided with a slot having a lateral offset and at its lower end loosely engaging the said arm, and a headed stud projecting from the hopper-wall and through the said slot of the rod.

6. In a planter, the combination with the U-shaped frame or main yoke, a hopper supported thereby and having its bottom provided with a central opening and with a lower feed-opening, of an operating-shaft extending through the bottom, means for rotating the operating-shaft, a ratchet-wheel carried by the shaft below the hopper-bottom and free to move vertically on the operating-shaft and adapted to rotate therewith, a feed-disk located in the hopper-bottom upon the operating-shaft and having its under side provided with a toothed hub to engage the ratchet-wheel when the same is operated in one direction, a curved operating-yoke connected loosely to the ratchet-wheel and provided with opposite trunnions bearing in the terminals of the yoke-frame and with a lateral arm, an operating-rod loosely connected to the outer end of the arm and provided with a slot having an offset, a headed stud extending from the hopper-wall and engaging the slot of the rod, and a spring arranged on the operating-shaft for normally elevating the ratchet-wheel into engagement with the teeth of the hub of the feed-disk.

7. In a planter, the combination with a hopper and its supporting-frame, of a cylindrical gear-case supporting the frame, upper and lower rings swiveled on the gear-case and pro-

vided with lateral bearings, opposite axles journaled in the bearings and extending beyond the opposite ends of the same, bevel-gears at the inner ends of the axles (one of which is smaller than the other), covering-disks at the outer ends of the axles, a central operating-shaft journaled in the gear-case, large and small bevel-gears carried thereby, which respectively mesh with and are adapted to be driven by the large and small bevel-gears of the axles, a stud extending radially from the gear-case, a stud extending radially from each ring, a lever fulcrumed between its ends on the stud of and loosely connected to the studs of the rings at each side of the fulcrum-stud and feed devices connected to and operated by the operating-shaft.

8. In a planter, the combination with a cylindrical gear-case and a hopper supported thereabove, of upper and lower rings swiveled on the gear-case, each ring being provided with a radial bearing, opposite axles located in and extending beyond these bearings, covering-disks carried by the outer ends of the axles, a vertical operating-shaft journaled in the gear-case, a bevel-gear carried thereby, a similar gear carried by the inner end of one of the axles and meshing and driving the gear of the operating-shaft, studs extending from the gear-case and from the rings, a lever fulcrumed on the stud of the gear-case and at opposite sides thereof loosely engaging the studs of the rings, and feed devices operated by the rotations of the operating-shaft.

9. In a planter, the combination with a cylindrical gear-case, a superimposed hopper carrying a feed mechanism, an upper and a lower ring swiveled on the gear-case, each of said rings having a radial bearing, axles mounted in the bearings, covering-disks located at the outer ends of the axles, means for partially rotating the rings in opposite directions, a vertical operating-shaft, feed mechanism operated thereby, and means for conveying motion from one of the axles to said operating-shaft.

10. In a planter, the combination with a gear-case, a superimposed hopper carrying a feed mechanism, of axles projecting radially from the gear-case, means for connecting them movably with the gear-case, covering-disks located on the outer ends of the axles, a vertical feed-shaft journaled in the gear-case and adapted to operate the feed mechanism, means for conveying motion from one of the axles to the feed-shaft, and means for securing said axles at a point of their radial adjustment.

11. In a planter, the combination with a gear-case, of an operating-shaft journaled therein, a superimposed hopper carrying feed mechanism operated by the operating-shaft, of covering-disks located at opposite sides of the gear-case, means for simultaneously angling or adjusting the same, and means for independently adjusting them with relation

to each other, a gearing located in the gear-case for conveying motion from the covering-disks to the operating-shaft.

12. In a planter, the combination with a cylindrical gear-case upper and lower rings swiveled thereon and provided with studs, independent axles radiating from and journaled in said rings and carrying at their outer ends covering-disks, a stud projecting from the gear-case between the rings, an operating-shaft journaled in the gear-case, a superimposed hopper carrying feed mechanism operated by the operating-shaft, and gears within the gear-case for conveying motion from the axles to the operating-shaft, of a hand-lever fulcrumed on the stud of the gear-case and loosely connected at opposite sides thereof to the studs of the upper and lower rings, and means for securing the lever at any point of its adjustment.

13. In a planter, the combination with a cylindrical gear-case an operating-shaft journaled therein, a superimposed hopper carrying a feed mechanism operated by the operating-shaft, upper and lower rings swiveled on the gear-case and having bored radial bearings arranged out of the same horizontal plane with each other, axles located in the bearings, covering-disks secured to the outer ends of the axles, bevel-gears at the inner ends of the axles within the gear-case, bevel and oppositely-disposed gears on the operating-shaft each meshing with one of the gears of the axles, of studs radiating from the rings and from the gear-case, a hand-lever fulcrumed on the stud of the gear-case and connected loosely to the studs of the rings at each side of said fulcrum-point, a spring mounted on the fulcrum-stud of the case and bearing on the lever, an upper transverse guide bar or frame, a clip connecting the lever slidably to the frame, and means for securing the lever at any point of its adjustment.

14. In a planter, the combination with a cylindrical gear-case having a radial fulcrum-stud, a superimposed hopper carrying a feed mechanism, an operating-shaft journaled in the casing and adapted to operate the feed mechanism, opposite axles carrying covering-disks, rings swiveled on the casing and supporting the axles and studs extending from the rings, of a hand-lever fulcrumed on the stud of the gear-case and above the same provided with an opening for engaging the stud of the upper ring, a link loosely mounted on the stud of the gear-case at one side of the hand-lever and at opposite sides of its fulcrum-point slotted to loosely engage the studs of the upper and lower rings, and above the upper stud concentrically slotted with relation to said fulcrum-point, and a set-bolt passed through the aforesaid concentric slot and through an opening in the hand-lever.

15. In a planter, the combination with a cylindrical gear-case having a radial fulcrum-stud, a superimposed hopper carrying a

feed mechanism, an operating-shaft journaled in the casing and adapted to operate the feed mechanism, opposite axles carrying covering-disks, rings swiveled on the casing and supporting the axles and studs extending from the rings, of a hand-lever fulcrumed on the stud of the gear-case and above the same provided with an opening for engaging the stud of the upper ring, a link loosely mounted on the stud of the gear-case at one side of the hand-lever and at opposite sides of its fulcrum-point loosely slotted to engage the studs of the upper and lower rings, and means for adjustably securing the link to the hand-lever.

16. In a planter, the combination with the divided cylindrical gear-case, comprising the opposing cylindrical caps provided with annular beads at their opposite ends, the yoke-frame secured on the upper cap, the bolts passing through and connecting the caps and frame, said caps having their meeting edges provided with openings or recesses combining to form side slots, the upper cap having a depending threaded extension, a threaded bolt carrying a spring mounted adjustably therein, opposite rings for encircling the caps and swiveled between the beads thereof, each ring being provided with an inward extension carrying a radial bored stud and short studs, the bearing-studs being out of the same horizontal plane, axles mounted in the bored studs, covering-disks located on the outer ends of the axles and bevel-gears at the inner ends of the axles within the gear-case, of a vertical operating-shaft journaled in the gear-case, a superimposed hopper carrying feed mechanism operated by the operating-shaft, opposing bevel-gears carried by the operating-shaft and meshing each with one of the bevel-gears of the axles, a lever fulcrumed on the stud of the gear-case, and loosely connected at each side thereof with the studs of the rings, and means for securing said lever at the desired point of adjustment.

17. In a planter, the combination with a pair of radially-movable axles carrying covering-disks, of means for radially adjusting the disks with relation to each other, and scraper-

blades supported at the sides of the disks and adapted to move therewith.

18. In a planter, the combination with a cylindrical gear-case upper and lower rings encircling the same and adapted to revolve thereabout, each of said rings being provided with a radial bored arm forming a bearing, opposite axles journaled in the arms and at their outer ends carrying covering-disks, and scraper-blades supported by the bored arms and adjustable thereon with relation to the disks, of a vertical operating-shaft, a superimposed hopper carrying feed mechanism, and means for conveying motion from one of the said axles to the said operating-shaft, and for adjusting the aforesaid axles with relation to each other.

19. In a planter, the combination with a hopper having lateral extensions at its bottom, and a subjacent U-shaped yoke-frame having its terminals laterally bent to agree with the extensions, and bolts connecting the extensions with the bent terminals of the frame, of a cylindrical gear-case located below the yoke-frame and secured thereto, a pair of axles supporting covering-disks at their outer ends located at opposite sides of the gear-case, means for rotatably supporting the axles on the gear-case, a lever for simultaneously moving the axles, and a guide-frame for the lever having its ends secured to the extensions of the hopper and the bent terminals of the yoke-frame.

20. In a planter, the combination with a hopper, a feed mechanism carried thereby, and means for operating the latter, of a pair of opposite covering-disks, means for simultaneously angling or adjusting the same with relation to each other and for angling one more than the other, or less, as the travel of the planter may require.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES DROMMOND SCHOFIELD.

Witnesses:

J. C. HAMBERLIN,
E. J. GANNON.