

No. 676,925.

Patented June 25, 1901.

I. D. STEVENS & C. GRAY.

SEEDING MACHINE.

(Application filed May 29, 1899.)

(No Model.)

3 Sheets—Sheet 1.

FIG. 1

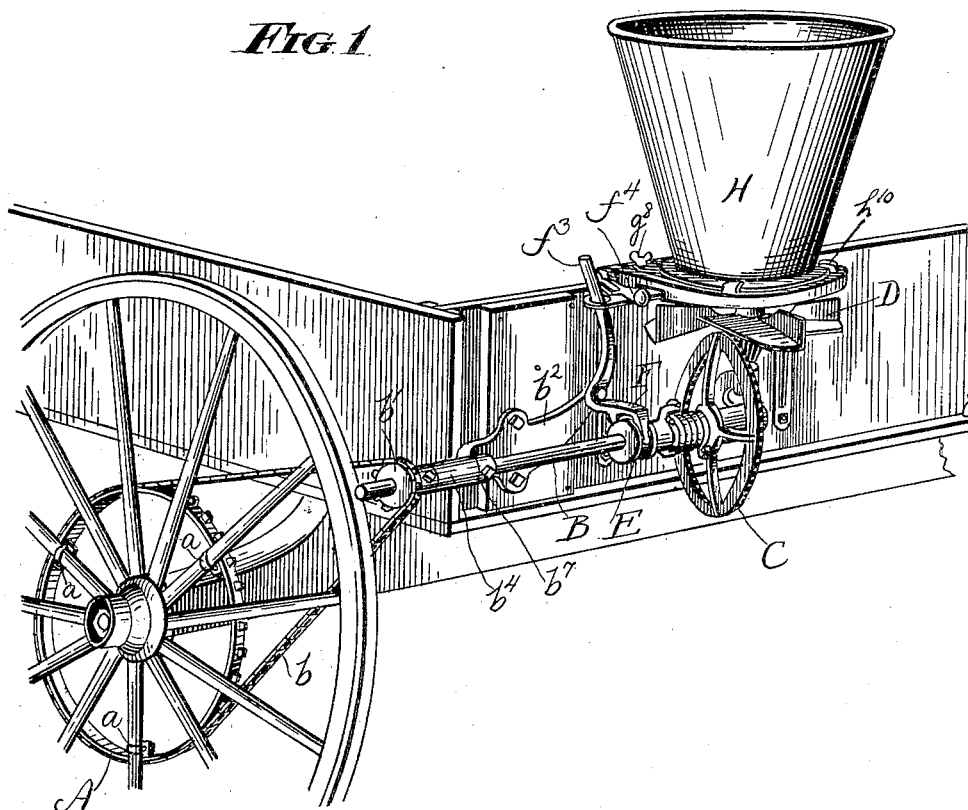
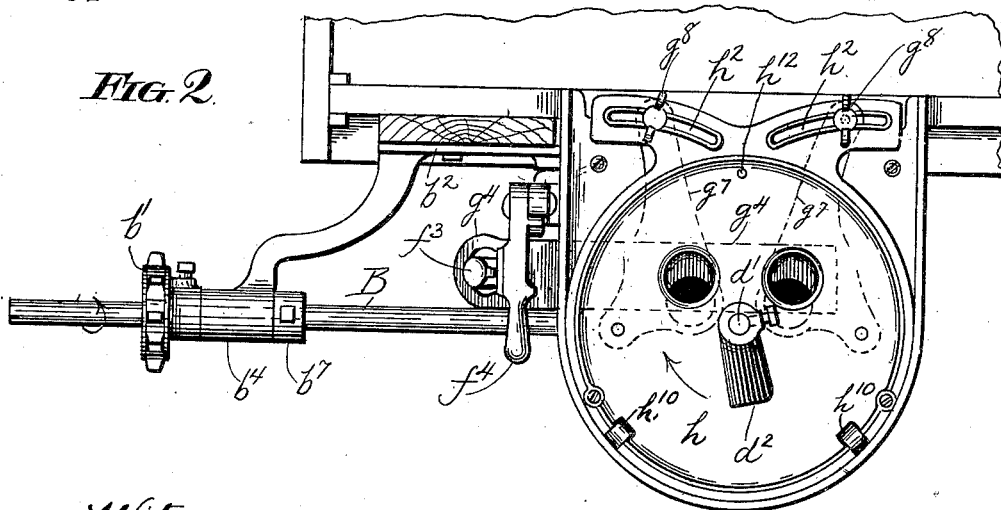
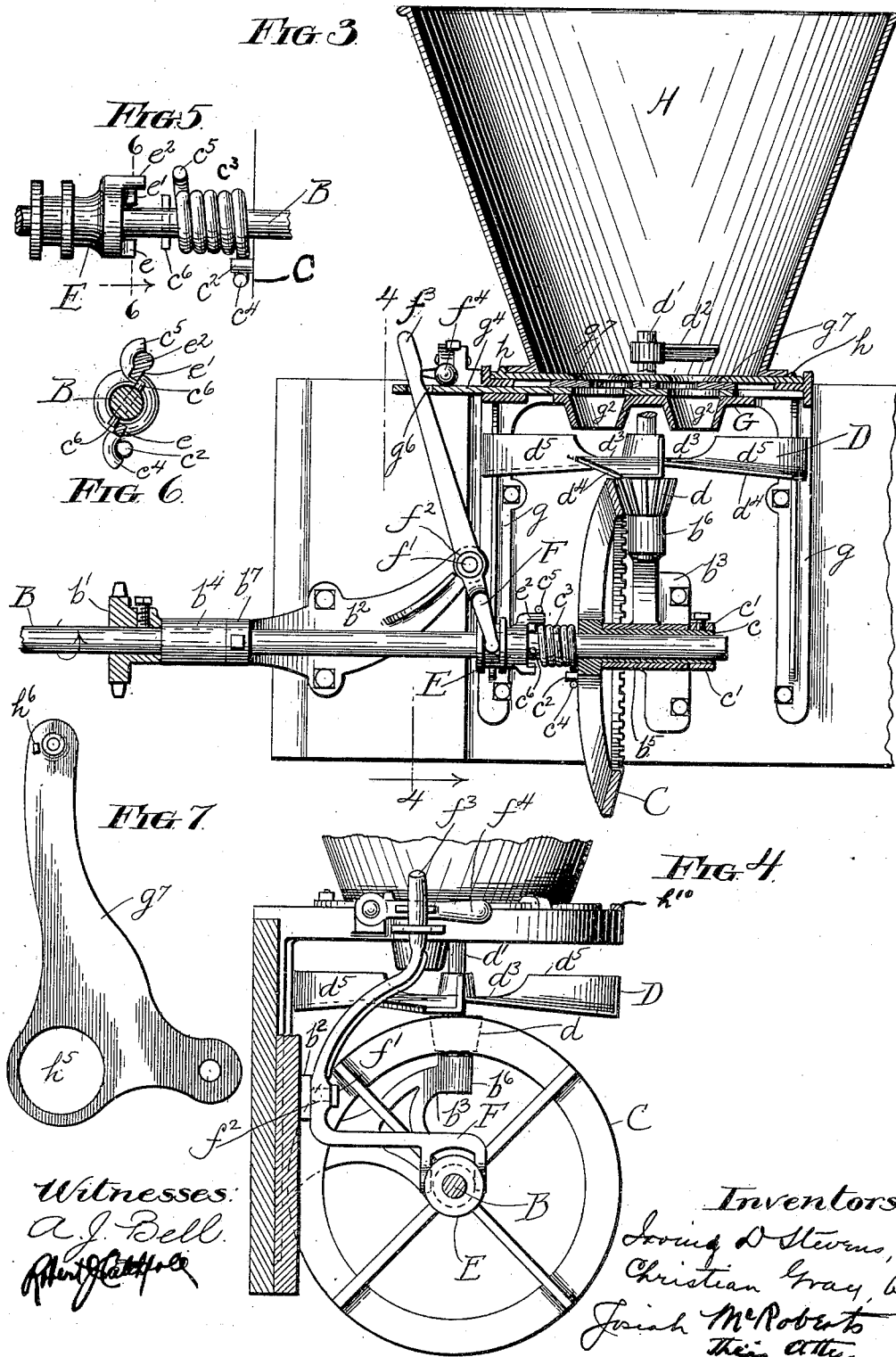


FIG. 2



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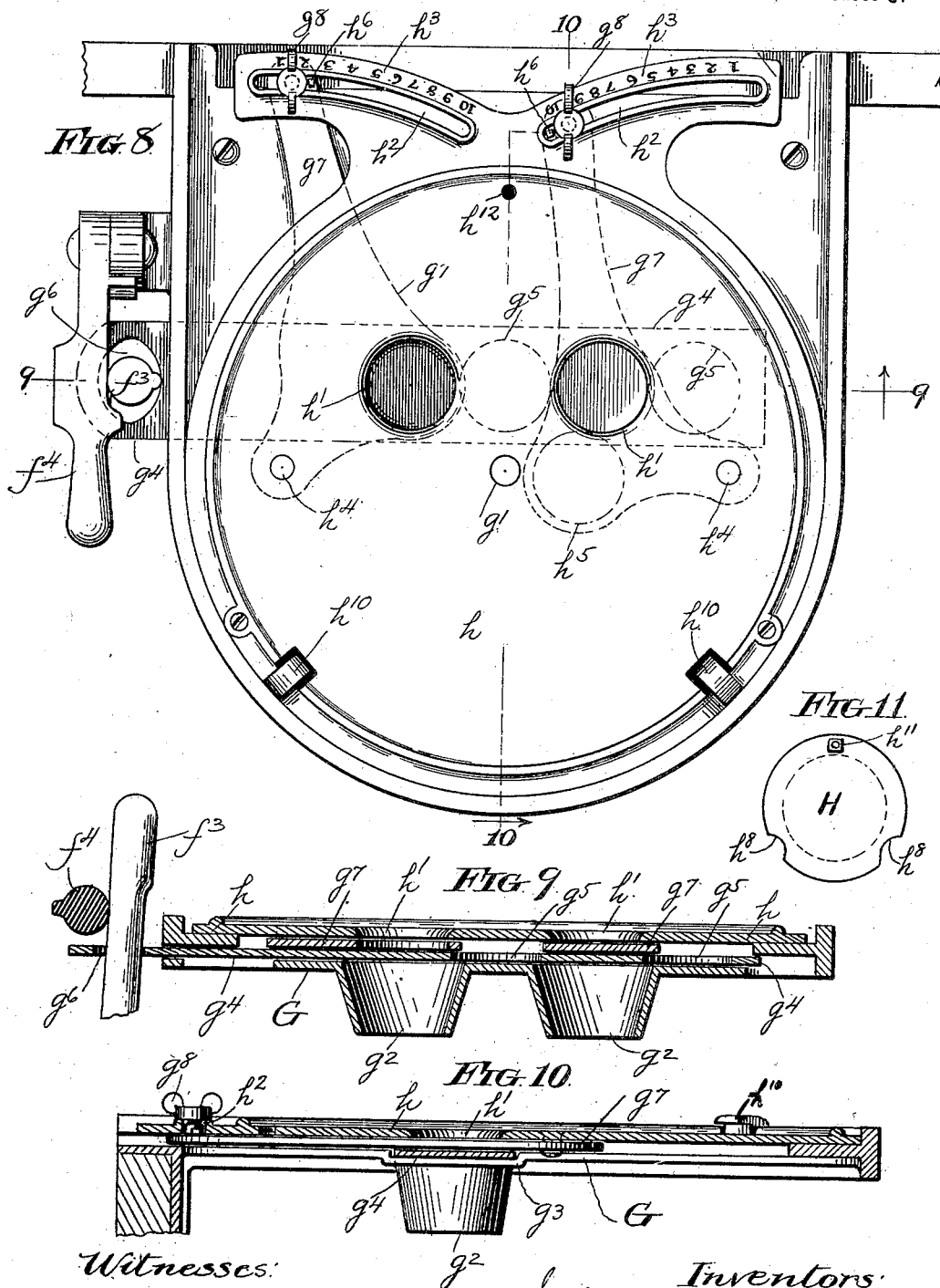
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

IRVING D. STEVENS AND CHRISTIAN GRAY, OF JOLIET, ILLINOIS; SAID
GRAY ASSIGNOR TO SAID STEVENS.

SEEDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 676,925, dated June 25, 1901.

Application filed May 29, 1899. Serial No. 718,666. (No model.)

To all whom it may concern:

Be it known that we, IRVING D. STEVENS and CHRISTIAN GRAY, citizens of the United States, residing at Joliet, in the county of

Will and State of Illinois, have invented certain new and useful Improvements in Seeding-Machines; and we hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it apper-

tains to make and use the same.

This invention relates to seeding-machines, and especially to that class denominated "end-gate seeders," which are adapted to be mounted upon the end-gates of wagons. In machines of this character power is transmitted to the driving-shaft of the seeder by a chain running from a sprocket attached by clips to the wagon-wheel over a smaller sprocket mounted on a driving-shaft and thence by beveled gears to the operating mechanism of the seeder, a clutch mechanism being employed to connect and disconnect the seeder mechanism and the driving-shaft. In machines as heretofore constructed it is customary to mount the movable member of the clutch mechanism fast upon the driving-shaft or to have this member constitute the small sprocket, so that in either case the sprocket is shifted laterally as the clutch is thrust for engagement and disengagement. These arrangements are objectionable, as the shifting of the parts causes the sprocket-wheels to move out of alinement, thereby causing unnecessary wear upon the chain.

One of the objects of our invention is to obviate this objection, which we do by providing a construction in which the alinement of the sprockets is maintained in either position of the clutch mechanism.

Another object of our invention is to provide a seeder having an automatic feed cut-off, so that when the machine is out of gear no cast can be made, thereby insuring that no seed shall be wasted.

A further object of our invention is to provide a machine of this general character in which the size of the seed holes or ports may be reduced from the outside toward the center, so that the area of the openings shall approximate more nearly to the center of the

distributor as they are reduced in order to make a more uniform and even cast of smaller seeds.

Another object of our invention is to provide a device of this kind in which the hopper may be readily attached and detached.

Other and further objects of our invention will appear from the disclosure hereinafter made.

In order to accomplish the objects for which the machine is designed, our invention consists in the constructions, arrangements, and combinations of parts hereinafter fully set forth in the specification and specifically pointed out in the claims.

In the drawings forming a part of this specification, Figure 1 is a perspective view of the seeder mounted on the end-gate of a wagon with the clutch mechanism engaged to operate the seeder mechanism. Fig. 2 is a top plan of the same with the hopper removed. Fig. 3 is a vertical cross-sectional view with the clutch engaged. Fig. 4 is a side elevation with the hopper in section. Fig. 5 is a detail view of the clutch mechanism disengaged. Fig. 6 is a detail sectional view on the line 6 6 of Fig. 5. Fig. 7 is a detail plan view of one of the valves. Fig. 8 is a plan view with the hopper removed, showing the arrangement of parts when the clutch is disengaged. Fig. 9 is a central transverse sectional view on the line 9 9 of Fig. 8. Fig. 10 is a longitudinal plan view on the line 10 10 of Fig. 8, and Fig. 11 is a plan of the feed-hopper.

The same reference-letters indicate the same parts throughout the specification.

In the drawings the letter A indicates the large sprocket, which is attached to the wheel of the wagon on which the seeder is mounted by means of clips *a*. As shown, three of these clips are used, and they secure the sprocket by passing around three of the spokes of the wheel. Passing over this sprocket is the gear-chain *b*, by which power is transmitted to the small sprocket *b'*, which is keyed on the driving-shaft B. This shaft is supported in suitable brackets *b² b³*, which are attached to the end-gate of the wagon by bolts. The end bracket *b²* has an arm that projects laterally and rearwardly, terminating in the bearing

b^4 , in which one end of the shaft B is journaled, the other end being journaled in the bracket b^3 . This bracket projects rearwardly from the end-gate a distance sufficient to bring its horizontal bearing b^5 in line with the bearing b^4 of the bracket b^3 , so that the shaft B is held in such relation to the end-gate as to give room for the rotation of the gear-wheel C, which is sleeved on the shaft, as will be hereinafter fully pointed out. The bracket b^3 is provided with a vertical bearing b^6 , in which the vertical shaft d' of the distributing wheel or fan D is stepped, as will be more fully described. The shaft B is held against lateral movement by the small sprocket b' , which is keyed to it at one side of the bearing b^4 , and by the ring b^7 , which is keyed to it at the opposite side of this bearing, as clearly shown in Fig. 2.

The gear-wheel C is cast with an integral hollow sleeve c , which surrounds the shaft B and is journaled in the bearing b^5 , as clearly shown in Fig. 3. This sleeve is held in place and prevented from moving laterally by means of the ring c' , which is keyed to the sleeve c in such manner as to bring the bearing b^5 between the ring and the hub of the gear-wheel.

When the shaft B is rotated through the agency of the sprockets and chain, the gear-wheel C may or may not revolve with it, according as the clutch, by which it may be locked to the shaft, is shifted into or out of engagement. The mechanism for this purpose is clearly shown in Figs. 3, 5, and 6. The gear-wheel is provided on its front face opposite the sleeve c with a laterally-projecting lug c^2 . A spring c^3 is coiled loosely about the shaft, being held in position between the face of the gear-wheel and the pin c^6 , which passes through the shaft B. The ends of the spring are carried out tangentially to the shaft and formed into oppositely-disposed hooks c^4 and c^5 , as shown in Fig. 6. The hook c^4 is in the path of the lug c^2 , and the hook c^5 is in the path of the travel of the flange e^2 of the clutch E when the latter is thrust into engaged position for purposes hereinafter pointed out. The arrangement of parts is clearly shown in Figs. 5 and 6.

The clutch E is sleeved loosely on the shaft B and is shifted lengthwise of the same by means of the lever F, which straddles the clutch in a well-known manner, whereby the latter may freely rotate with the shaft, but be controlled in its movements along the shaft by the lever. This lever is pivoted upon the bracket b^3 by means of the rearwardly-projecting pin f' , which is cast integral with the bracket and receives the sleeve f^2 of the lever. The lever is carried forwardly near its upper end and terminates in an upwardly-projecting handle f^3 , arranged in proximity to the hopper for a purpose hereinafter set forth. The clutch is provided on its face with two oppositely-arranged projecting studs ee' , which extend across the face of the clutch,

so as to come close to the shaft. The periphery of the clutch is somewhat enlarged at the point of attachment of the stud e' , so that the latter projects a distance beyond the path of the travel of the stud e . The stud e' is provided with a flange e^2 , projecting from the face of the clutch at the point of its greatest diameter. By this construction and arrangement of parts when the lever F is operated to thrust the clutch into engagement the studs ee' are carried into the path of the travel of the pin c^6 , which revolves with the shaft, to which power is applied by the sprocket-and-chain connection. As the shaft revolves from rear to front, as indicated by the arrow in Fig. 2, the pin c^6 engages the studs ee' of the clutch E and causes this member to revolve with the shaft. The flange e^2 of the stud e' projects beyond the pin c^6 by reason of the enlarged periphery of the clutch at this point and extends into the path of the hook c^5 of the spring c^3 , as shown in Fig. 5, so that the latter is caused to revolve with the clutch and shaft, and by reason of the engagement of the hook c^4 and the lug c^2 of the gear-wheel the latter is in turn rotated to transmit motion to the operating mechanism of the seeder with which it is geared. When the clutch is in turn thrown out of engagement, the parts become disconnected by the disengagement of the pin c^6 from the studs ee' and the flange e^2 from the hook c^5 , so that the rotation of the shaft does not affect the seeder mechanism.

The gear-wheel C transmits motion to the operating mechanism of the seeder by means of a beveled gear d , which is fixed on a shaft d' , stepped into vertical bearing b^6 of the bracket b^3 and projecting upwardly through the base G of the seeder. This shaft d' supports the distributing fan or wheel D and the stirrer or force-feed d^2 , located within the hopper.

The seed wheel or distributor D is cast with a hub and has a bevel-wheel d . Surrounding the hub is a central platform d^3 , which revolves immediately beneath the feed-ports of the seeder. Extending outwardly from this platform are the tangential wings d^4 , each wing being provided with a division-plate d^5 on its rear edge. The division-plates do not extend to the center of the wheel, but are cut away or terminate at the outer part of the center platform. It is apparent that any suitable form of distributors may be used in connection with the other parts.

The base G of the seeder, which forms the support for the hopper, is preferably in skeleton form and is supported upon the end-gate by two angular brackets g , which are secured by bolts. Near the center of the base it provides a bearing g' for the shaft d' , and upon either side of this bearing, but a little to the rear thereof, are the tubular feed spouts or ports g^2 . At this point the base is provided with a suitable transverse guideway or run g^3 , in which a cut-off g^4 is mounted for sliding movement, as shown in Figs. 3 and 10. This

cut-off is provided with feed-openings g^5 , which are adapted to register with the feed-ports g^2 when the cut-off is drawn outwardly. The cut-off projects laterally beyond the edge 5 of the base and is provided with an opening g^6 , through which the handle f^3 of the clutch-operating lever F passes, the relation of the parts being such that the feed-openings g^5 of the cut-off register with the feed-ports of the base when the handle is thrown away from 10 the device and into position to throw the clutch into engagement. The feed-passages are thereby opened when the clutch is thrust to revolve the distributor and are closed when 15 the distributor is disconnected from the driving-shaft. This arrangement for automatically operating the cut-off to open or close the feed-passages, according as the clutch is in or out of gear, is of a special advantage, as it 20 prevents all waste of seed. The moment the seeder is out of gear the feed of material is automatically checked.

The base-plate h of the hopper is secured to the base G, preferably by the same bolts 25 that secure this base to its brackets g . The base-plate is provided with an opening registering with the bearing g' in the base and with feed-openings h' , registering with the feed-ports in the base. The base-plate is sub- 30 stantially circular in form, but is provided at its front edge with two segmental portions, each of which is provided with a slot h^2 and a dial h^3 .

Feed-regulating valves g^7 are pivoted at h^4 35 to the upper face of the base-plate and are arranged to work between the cut-off and the base-plate. As shown in Fig. 7, these valves are in the form of substantially triangular plates, and each is provided with a circular 40 feed-opening h^5 in its apex and with a guide-pointer h^6 , running in one of the slots h^2 , which is struck on the circumference of a circle having its pivot h^4 as a center. These valves move independently toward and away 45 from each other and as they are brought toward the center of the base or hopper reduce the size of the feed-openings. The valves are set to regulate the size of the openings by the set-screws g^8 according to the character of 50 the seed to be cast, the several positions at which they are to be set for this purpose being indicated by the dials. When adjusted for smaller seeds, to reduce the size of the openings the arrangement is such, by reason 55 of the inward movement of the valves toward each other, that the area of the openings is brought toward the center of the fan or distributor, thereby insuring an even cast. This is a matter of importance, as it is found in 60 practical use that the adjustment produces an even and uniform cast of all sizes of seeds.

The hopper H is attached to the base-plate by means that admit of its ready removal 65 when the seeder is not in use. The base-plate is provided with overhanging lugs h^{10} , which bear upon the flange of the hopper to hold it in place. The hopper is centered

upon the base-plate by adjusting the ears or shoulders h^8 of its flange beneath the over- 70 hanging lugs, this positioning of parts bringing the bolt h^{11} in place to pass through the opening h^{12} in the base-plate, whereby the hopper is securely attached. By using these lugs and shoulders the hopper may be secured 75 in place by the use of but a single bolt, thereby greatly facilitating its application to and removal from the base-plate. Within the hopper the stirrer or force-feed wheel d^2 is attached to the shaft d' and rotates with it. 80 This stirrer is in the form of a wing or vane and is set at a slight angle to the shaft, so that the seed is carried down into the openings by the inclination of its face, it being understood, of course, that the wing inclines 85 toward the base-plate at its rear. A latch f^4 is pivoted in the bracket on the side of the base in proximity to the handle f^3 and may be thrown down upon either side of the handle to lock same in its two positions. Thus 90 when the handle is thrust outwardly from the base to open the ports and throw the clutch to operate the distributor the latch may be dropped behind it to hold the parts in operative position, as in Figs. 3 and 4, or 95 when the handle is thrust inwardly to close the ports and disconnect the clutch the latch may be dropped in front of it to hold the parts in inoperative position, as in Figs. 8 and 9.

It will be observed that the clutch E is cast 100 in a single piece and is capable of movement lengthwise of the driving-shaft, thereby permitting the clutch to be operated to throw the machine into and out of gear without in any way disturbing the driving-shaft. This 105 provides for the maintenance of the alignment of the sprockets A and b' , whereby the wear and stretching of the chain b and its frequent running off of the sprockets, which occurs when the small sprocket is shifted 110 by the throwing in and out of the gear, are avoided. The capacity of the machine to always keep the sprockets in line is of very great advantage.

The coil-spring c^3 is loosely mounted on the 115 drive-shaft and is not permanently fastened to any part of the machine, being engaged by the lug c^2 and the flange e^2 only when the machine is in gear. By this arrangement the spring when released from engagement with 120 these parts by the disconnection of the clutch has nothing to carry back with it in resuming its normal position.

Seeders constructed in accordance with our invention are simple in construction, being 125 composed of comparatively few parts, and are adapted to make uniform and even casts of all kinds of seeds.

Various modifications may be made without in any manner departing from the spirit 130 of our invention. For example, the special form of clutch mechanism may be varied within the limits of such devices as will permit the connection and disconnection of the

shaft and gear-wheel without altering the alinement of the sprockets. Other suitable forms of distributors or of dampers or of valves may be used. Other arrangements for the automatic operation of the damper when the clutch is operated may also be employed, and in general such changes may be made as will suggest themselves to any one skilled in the art to which this invention appertains.

10 Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a seeding-machine, the combination with a driving-shaft having a sprocket-wheel fast thereon, and a gear-wheel loosely mounted thereon, of a clutch mechanism for locking the gear-wheel to the shaft, the movable member whereof moves lengthwise of the shaft, substantially as described.

2. In a seeding-machine, the combination with a pair of alined sprockets, and a driving-shaft to which one of them is secured, of a gear-wheel for operating the distributor, and a clutch mechanism adapted to lock the gear-wheel and shaft together without disturbing the alinement of the sprockets, substantially as described.

3. In a seeding-machine, the combination with a driving-shaft carrying a sprocket and means to prevent lengthwise movement thereof, of a gear-wheel loosely mounted on the shaft and means to connect and disconnect the shaft and gear-wheel, substantially as described.

4. In a seeding-machine, a driving-shaft held against lengthwise movement and a sprocket secured thereon, a gear-wheel having a sleeve loosely mounted on the shaft, and a clutch mechanism for connecting said wheel to the shaft, substantially as described.

5. In a seeding-machine, a driving-shaft, a gear-wheel having a sleeve encircling the shaft and journaled in a suitable support, a lug on the wheel, and a clutch member movable lengthwise of the shaft to engage the lug, substantially as described.

6. In a seeding-machine, a driving-shaft held against lengthwise movement, a gear-wheel loosely mounted thereon and having a lug, a pin in the shaft, a coil-spring between the pin and wheel and having oppositely-disposed hooks, a clutch loose upon the shaft having studs upon its face and a flange in the path of travel of one of the hooks of the spring, and means to thrust the clutch lengthwise of the shaft, substantially as described.

7. In a seeding-machine, the combination with a base-plate having inwardly-projecting lugs, of a hopper having a flange provided with ears to engage the lugs, and a single bolt passing through the base-plate, substantially as described.

8. In a seeding-machine, a base-plate having overhanging lugs, a hopper having a flange to fit beneath said lugs and a bolt to secure the hopper in position upon the base-plate, substantially as described.

9. In a seeding-machine, a base-plate, a hopper, means for centering said hopper upon the plate, and a single bolt to secure the same in place, substantially as described.

10. In a seeding-machine, the combination with a base-plate provided with overhanging lugs and an opening, as h^{12} , of a hopper having a flange provided with ears and with a bolt, the relation and arrangement of parts being such that when the ears engage beneath the lugs the bolt registers with the opening, whereby the hopper is accurately centered and detachably connected upon the base-plate.

11. In a seeding-machine, the combination with a hopper having suitable feed-ports, and a slide adapted to control said ports, of a distributor, a gear-wheel mounted on the driving-shaft, means for engaging said shaft and wheel, and means for simultaneously operating said slide and engaging means, substantially as described.

12. In a seeding-machine, the combination with a driving-shaft, of a distributor adapted to be coupled and uncoupled therewith, a cut-off, and means to operate the cut-off when the shaft and distributor are coupled and uncoupled.

13. The combination in a seeding-machine of a driving-shaft, a gear-wheel loose upon the shaft, a clutch mechanism to connect the wheel and shaft together, a second shaft carrying a distributor and a gear-wheel which meshes with the first-named gear, a cut-off, and an operating means common to the cut-off and clutch mechanism.

14. In a seeding-machine, the combination of a driving-shaft, a distributor, a gear-wheel mounted on the shaft, and a clutch mechanism for coupling and uncoupling the shaft and gear, with a cut-off and means for operating the same when the clutch mechanism is shifted, substantially as described.

15. In a seeding-machine, a driving-shaft held against lengthwise movement, a gear-wheel mounted on the shaft and adapted to control the operating mechanism of the seeder, a clutch mechanism having one of its members shifted along the shaft, and a cut-off slide automatically operated by the thrust of the shiftable member of the clutch, substantially as described.

16. In a seeding-machine, a base having feed-ports and a shiftable cut-off, a driving-shaft, a gear-wheel on the shaft geared to the distributor, a clutch movable lengthwise of the shaft to control the gear-wheel, and a handle common to the clutch and cut-off, substantially as described.

17. In a seeding-machine, the combination with a driving-shaft held against lengthwise movement and having a pin, a gear-wheel sleeved upon the shaft and having a lug, of a clutch member sliding on the shaft and a coiled spring upon the shaft, substantially as described.

18. In a seeder, the combination with a hopper and a base having feed-ports, of a pivoted

valve adapted to control the opening of each port, substantially as described.

19. In a seeder, the combination with a hopper having feed-ports, of independent valves, one for each port, said valves being adapted to reduce the area of said ports toward the center of the hopper, substantially as described.

20. In a seeder, the combination with a hopper, a base-plate having feed-openings and slots provided with dials upon one edge, of feed-valves adapted to be moved toward the center of the hopper to reduce said openings, pointers and set-screws, one of each on each dial, substantially as described.

21. In a seeder, the combination with a hopper having feed-ports, pivoted valves movable to and from the center of the hopper to control the size of the openings through said ports, of a damper to open and close said ports, substantially as described.

22. In a seeder, the combination with a hopper having feed-ports, valves movable toward the center of said hopper to reduce the size of the openings through said ports, of a slide to open and close said ports, substantially as described.

23. In a seeding-machine, the combination with a hopper having feed-ports, valves controlling the same, and a cut-off sliding across the ports, of a distributor and means to move the cut-off and control the distributor, substantially as described.

24. In a seeding-machine, the combination with a hopper having feed-ports and a bearing for a shaft in the base, a force-feed device on the shaft in the hopper, of a cut-off and means to simultaneously control the cut-off and shaft, substantially as described.

25. In a seeding-machine the combination with a hopper and a base-plate having feed-openings and a transverse guideway, of a cut-off mounted for sliding movement in the guideway to simultaneously control both feed-openings, and a separate valve for regulating the area of each opening.

In testimony whereof we affix our signatures in presence of two witnesses.

IRVING D. STEVENS.
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Witnesses:

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