

No. 632,645.

Patented Sept. 5, 1899.

S. J. COYIM.
SEEDER.

[Application filed Jan. 13, 1899.]

(No Model.)

10 Sheets—Sheet 1.

Fig. 1.

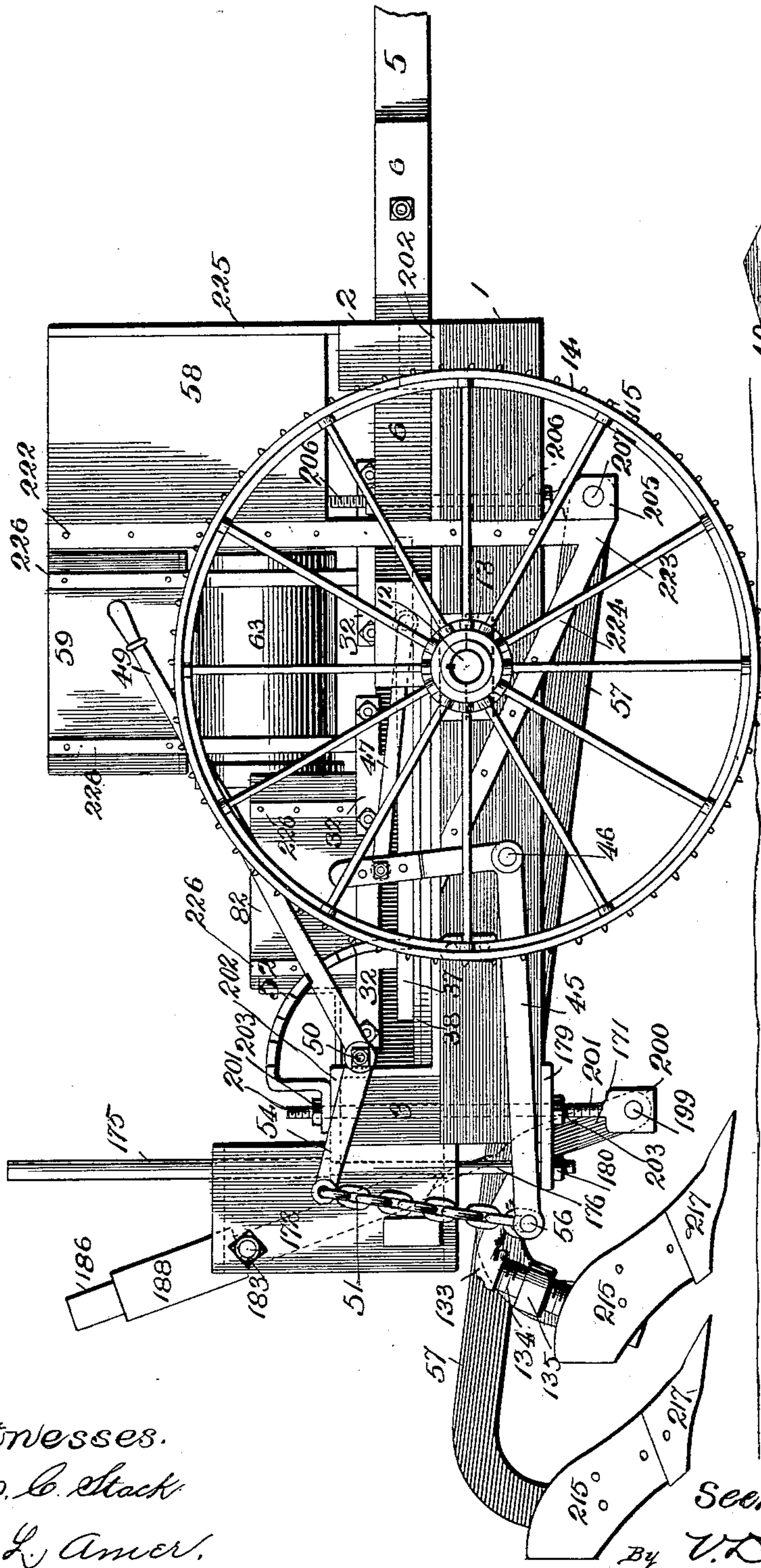
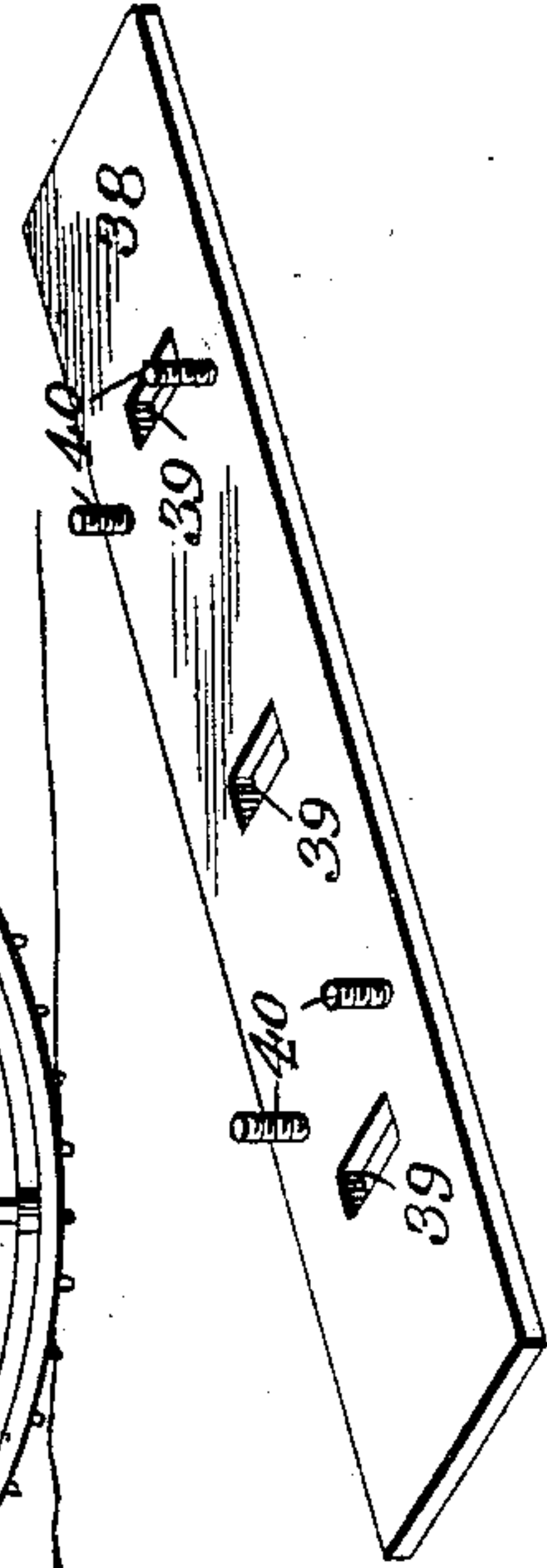


Fig. 8.



Witnesses.
Jos. C. Slack
H. L. Amer.

Inventor.
Seeho J. Coyim.
By V. D. Stockbridge,
his Att'y.

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Fig. 2.

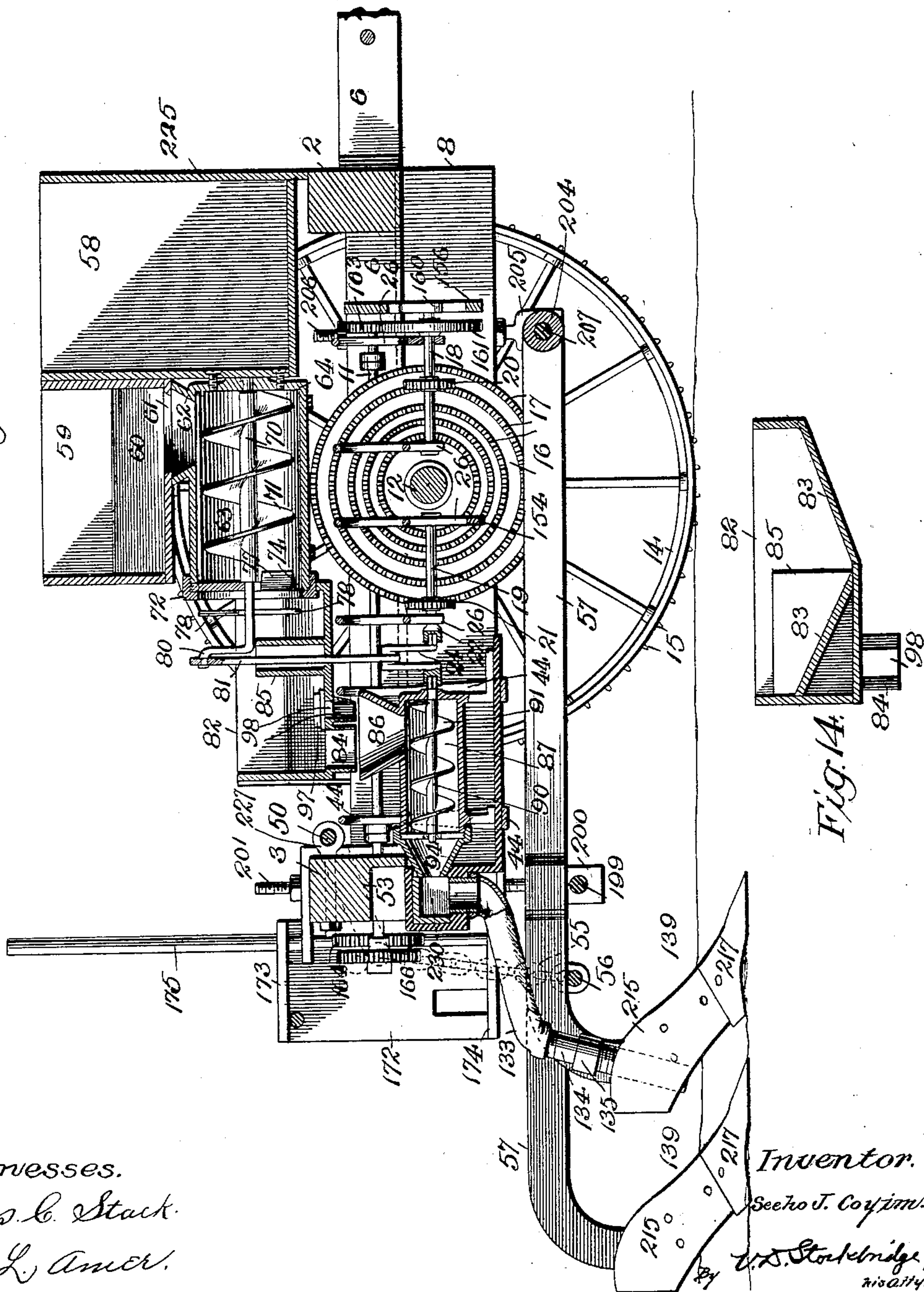


Fig. 14.

Witnesses.

Jos. C. Stack.

H. L. Amer.

Inventor.

See also J. Coyim.

W. S. Stockbridge,
att'y.

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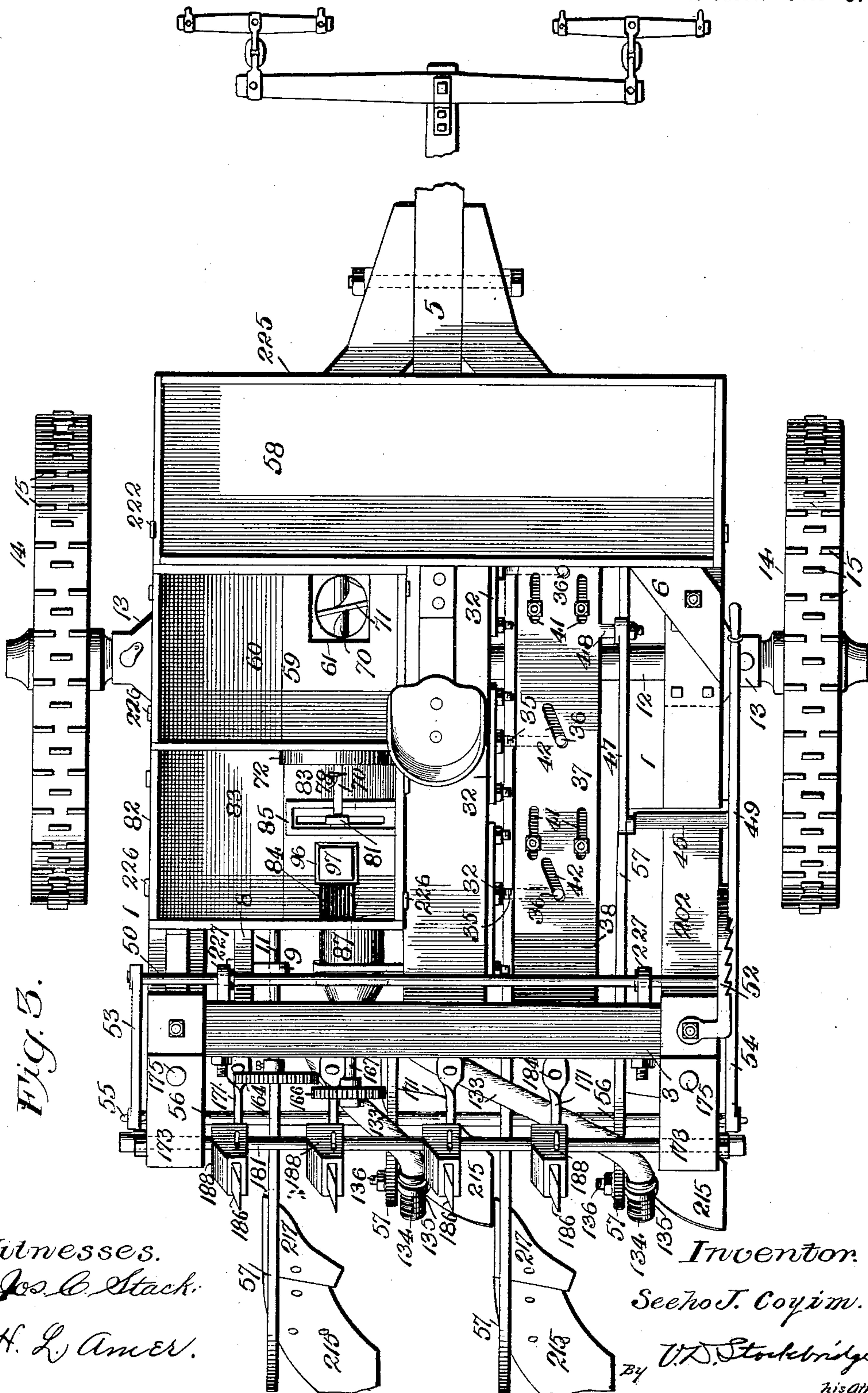


Fig. 5.

Witnesses.
Jos. C. Stack.
H. L. Amer.

Inventor.
Seeho J. Coyim.
By V. D. Stodbridge,
his atty.

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Fig. 4.

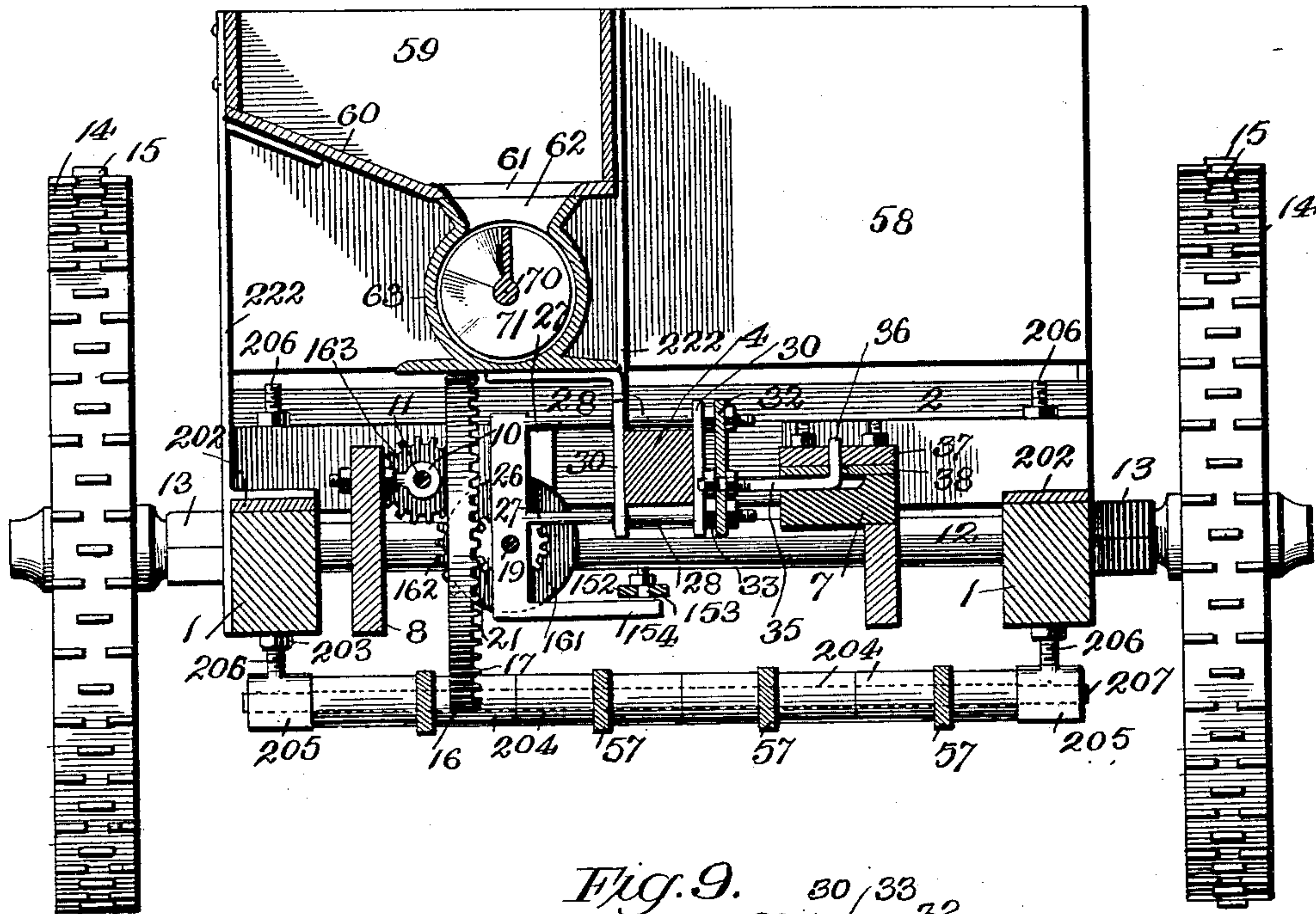


Fig. 9.

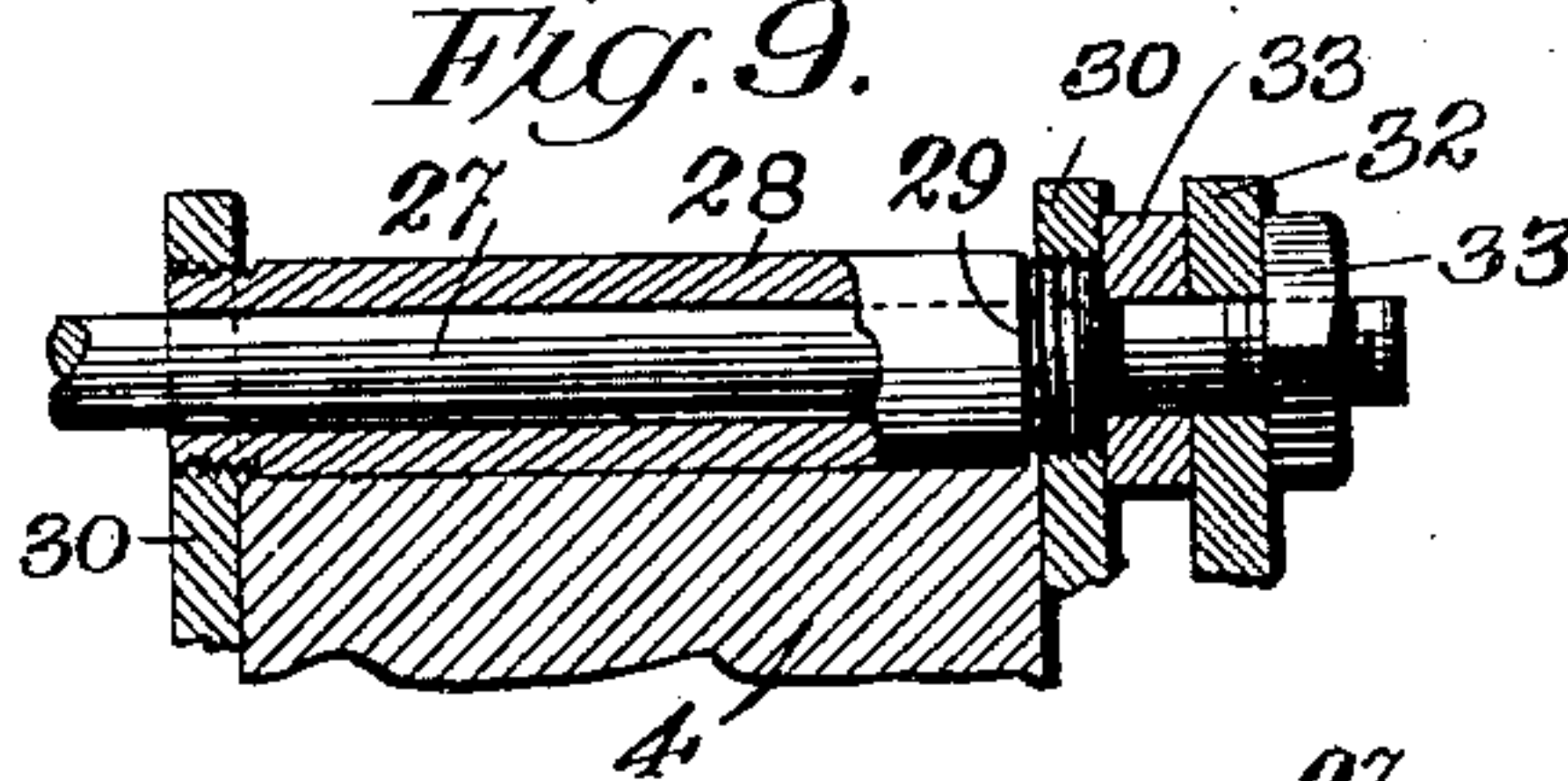


Fig. 10.

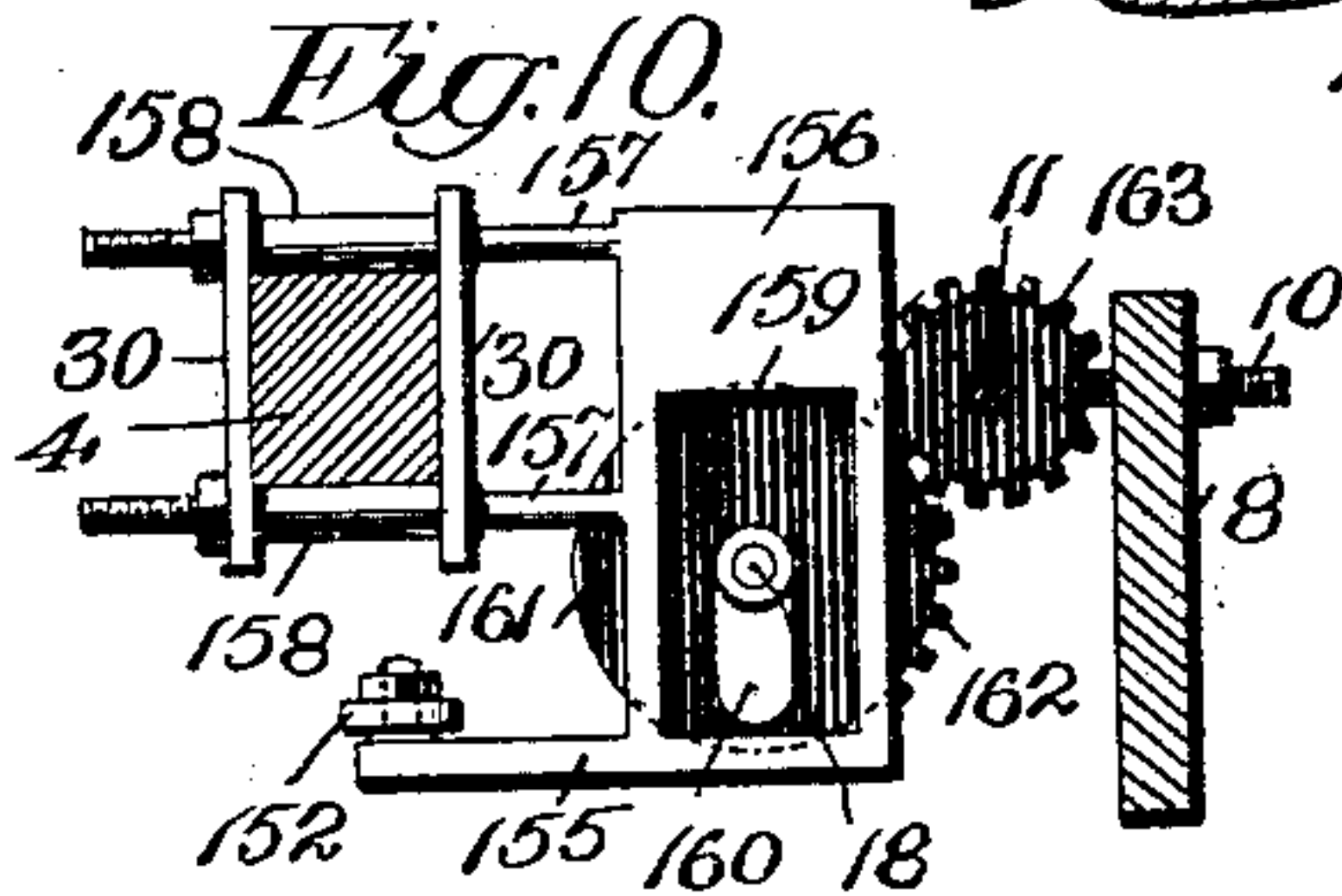


Fig. 11.

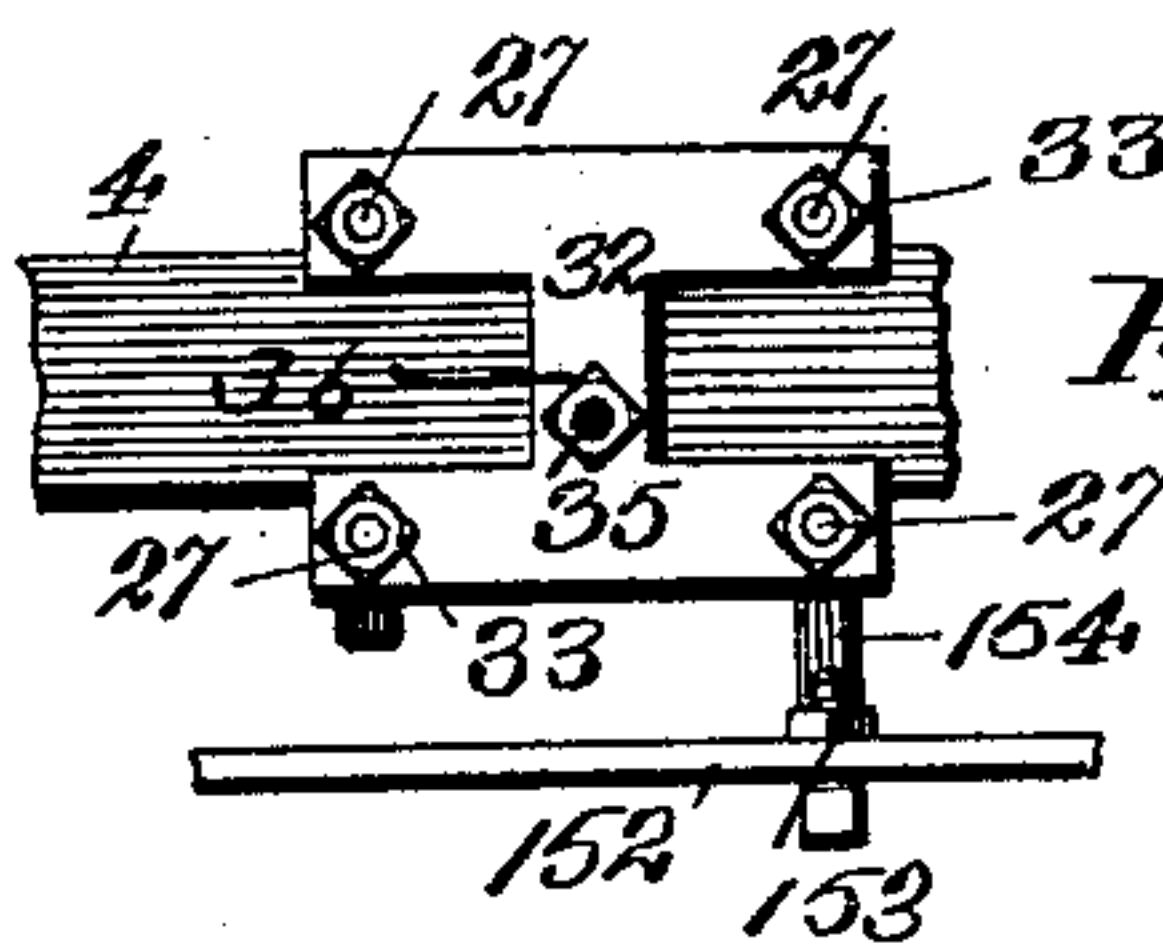


Fig. 12.

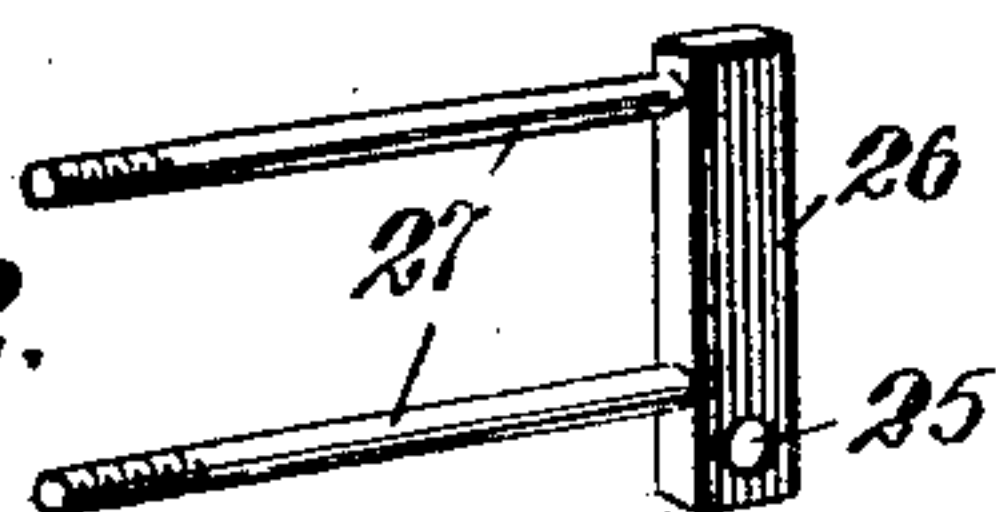
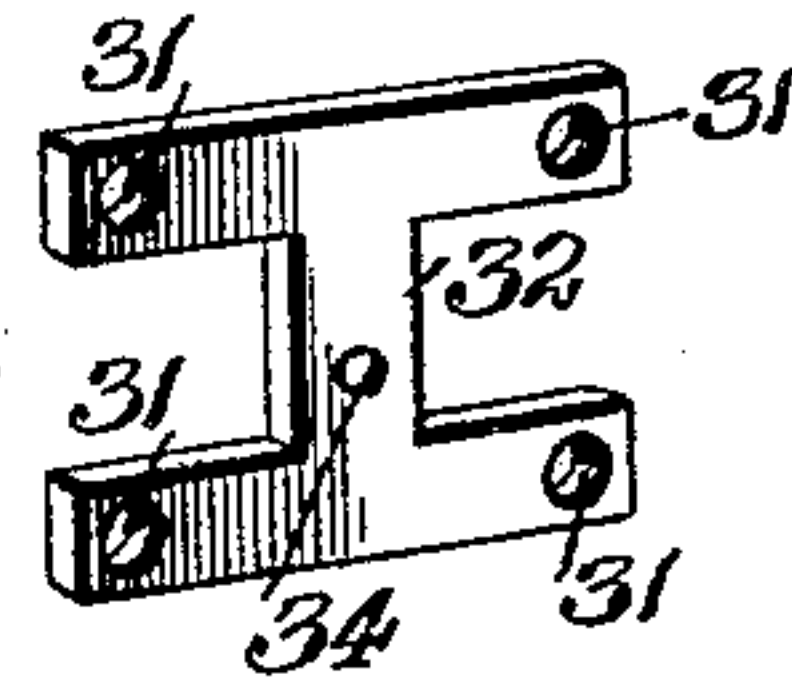


Fig. 13.



Witnesses.
Jos. C. Stack
H. L. Amer.

Inventor.
Seeho J. Coyim.
By V. W. Stockbridge,
his atty.

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Fig. 5.

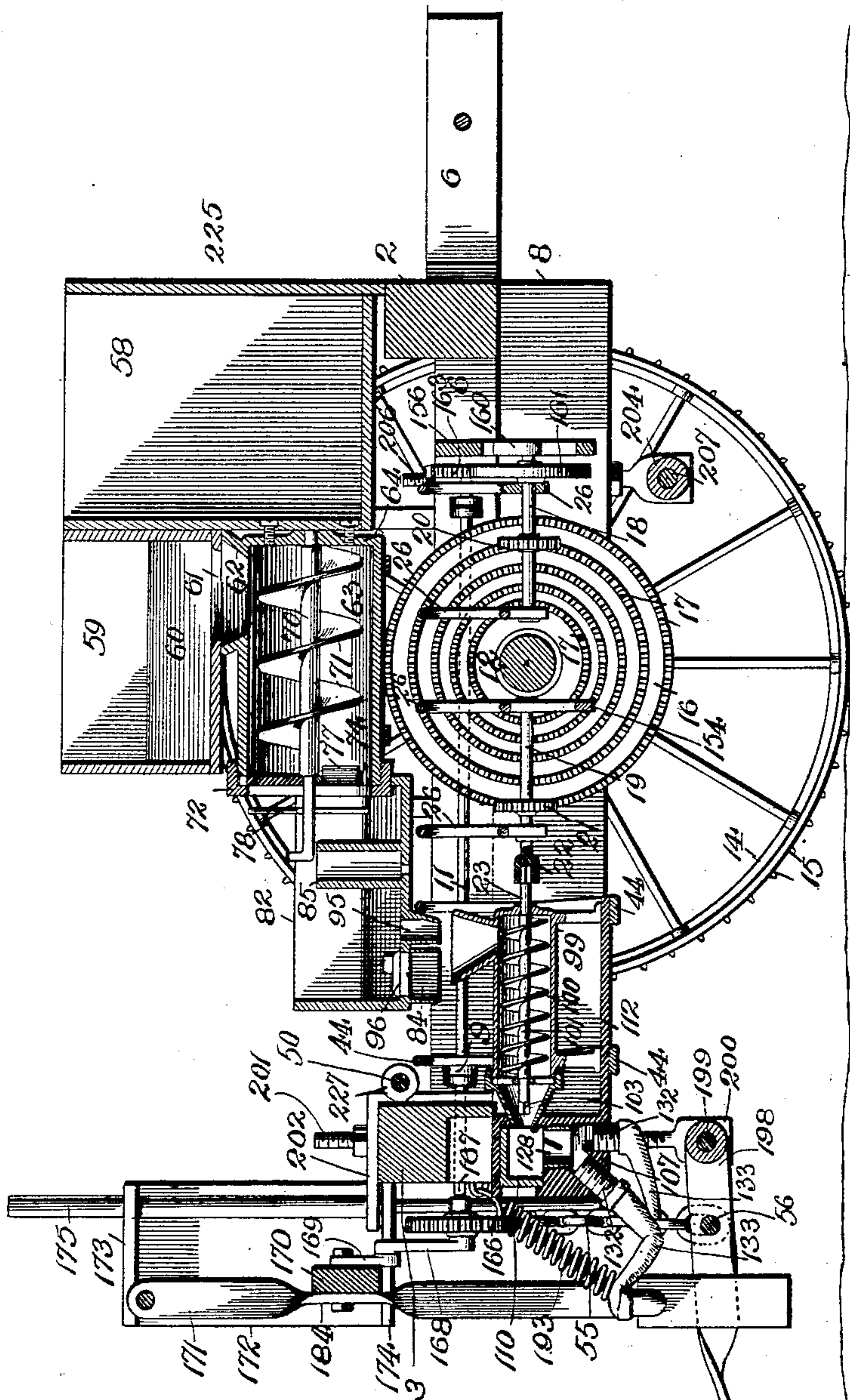


Fig. 16.

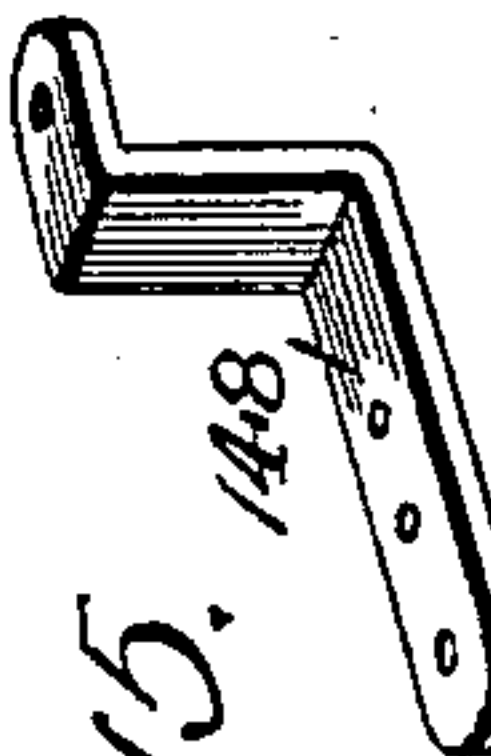
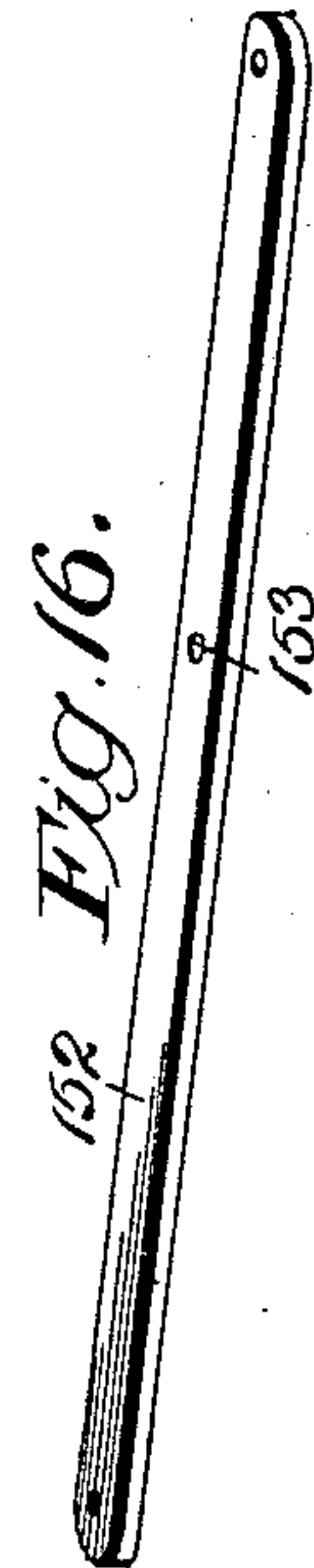


Fig. 15.

Witnesses.
Jos. C. Stack.
H. L. Amer.

Inventor.
See J. Coyim.
By U. D. Stockbridge.
his atty.

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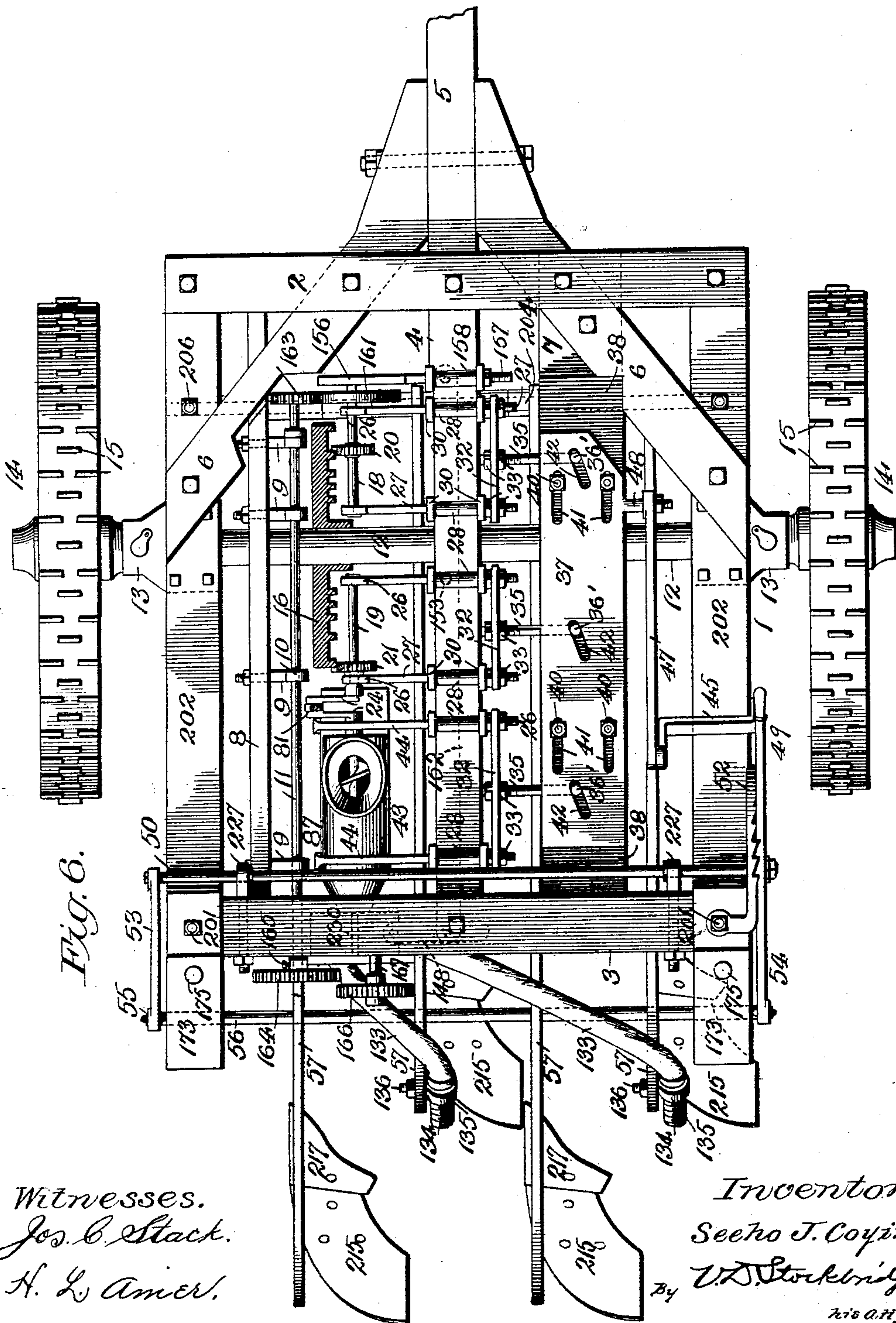
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SEEDER.

(Application filed Jan. 13, 1899.)

(No Model.)

10 Sheets—Sheet 6.



Witnesses.
Jos. C. Stack.
H. L. Amer.

Inventor:
Seeko J. Coyim.
V.D. Stockbridge,
his atty.

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S. J. COYIM.

SEEDER.

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Fig. 7.

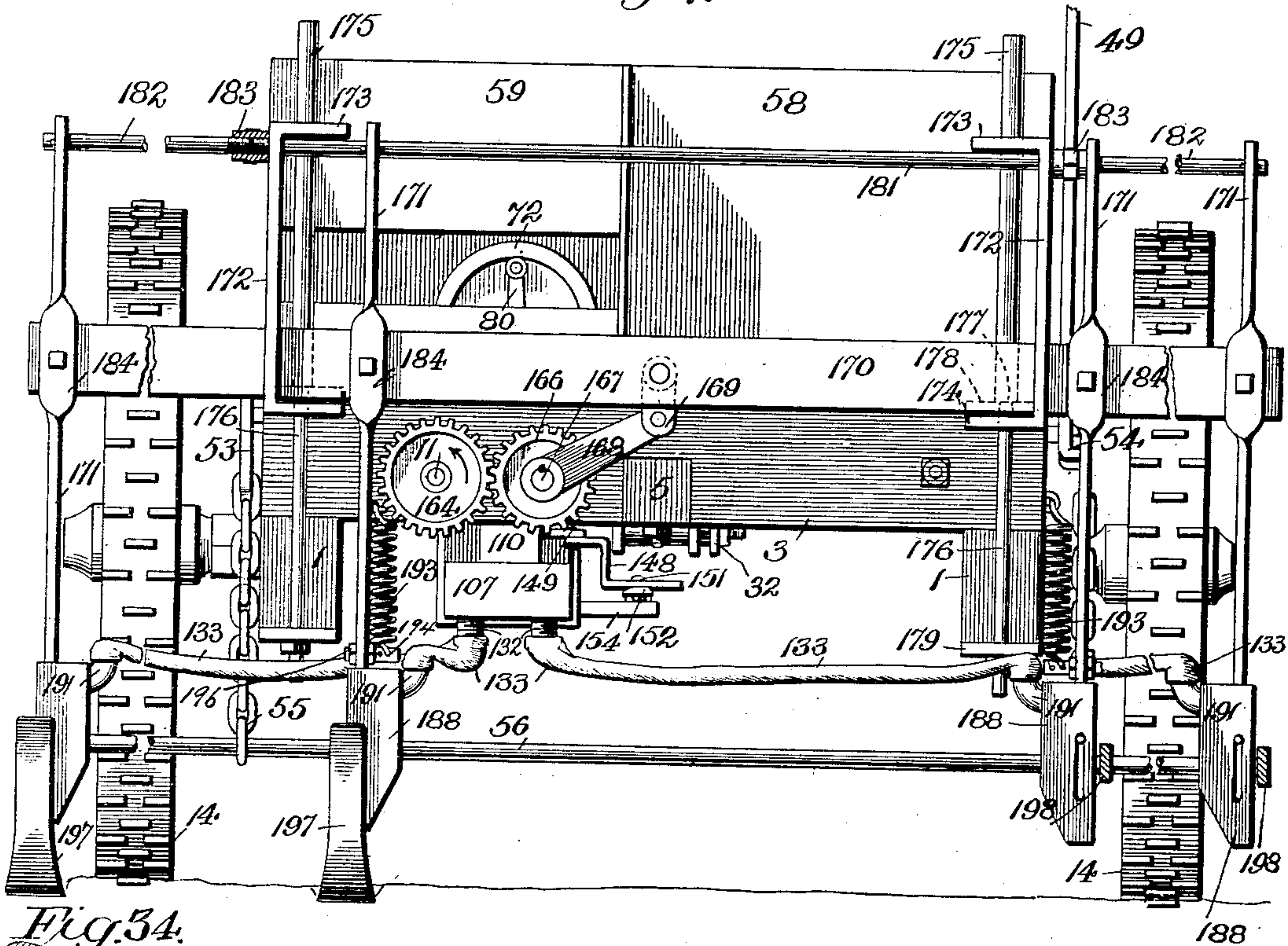


Fig. 34.

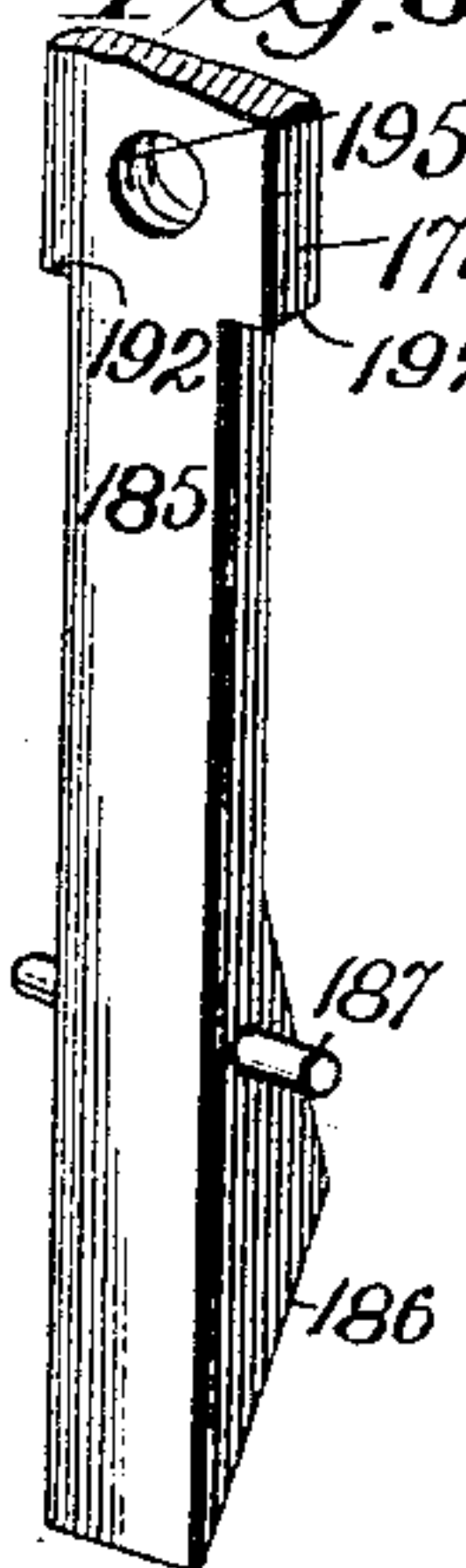


Fig. 36.

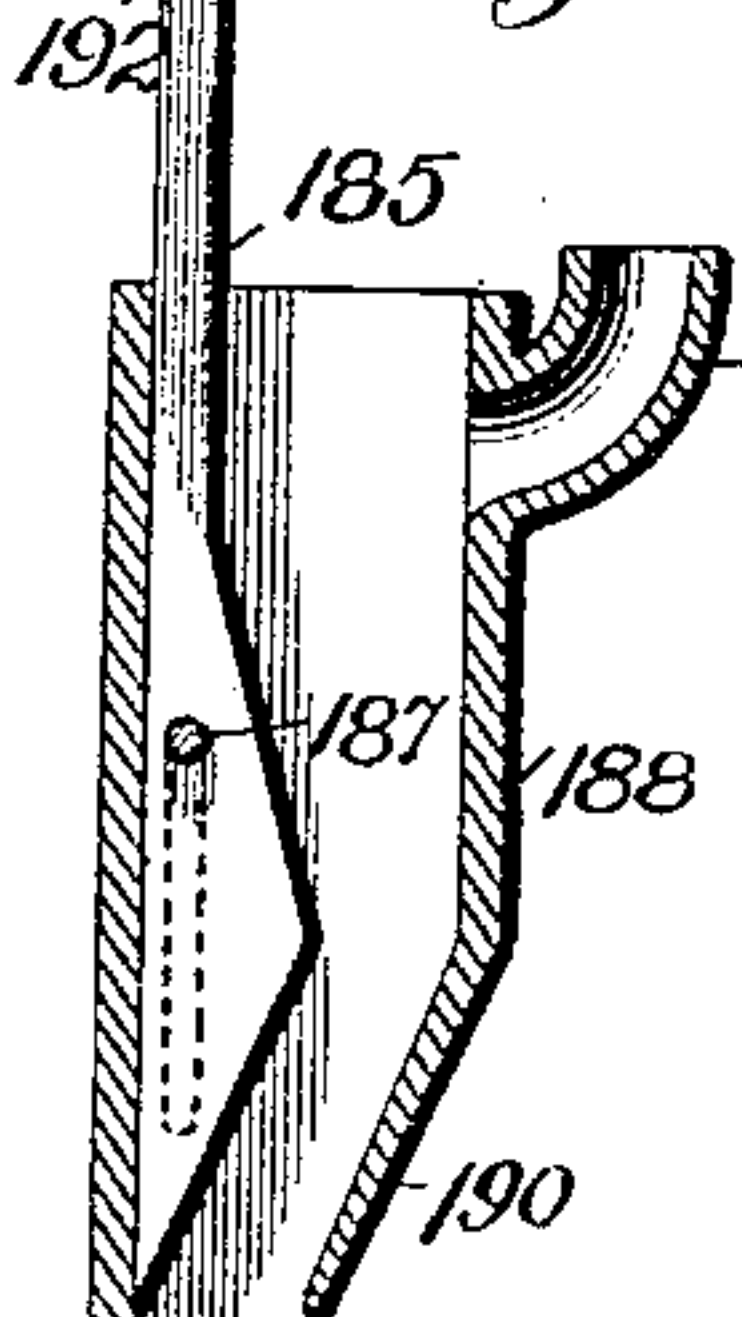


Fig. 37.

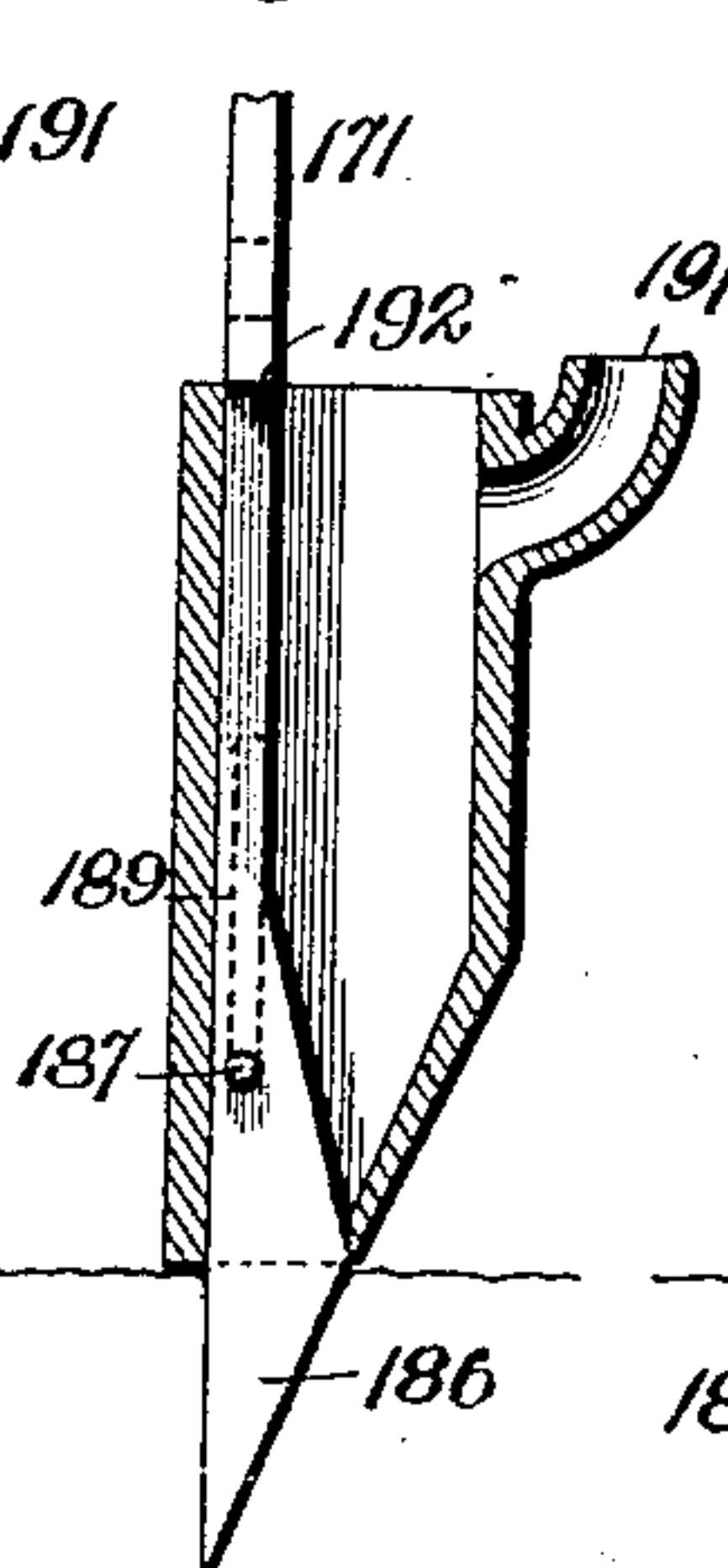


Fig. 38.

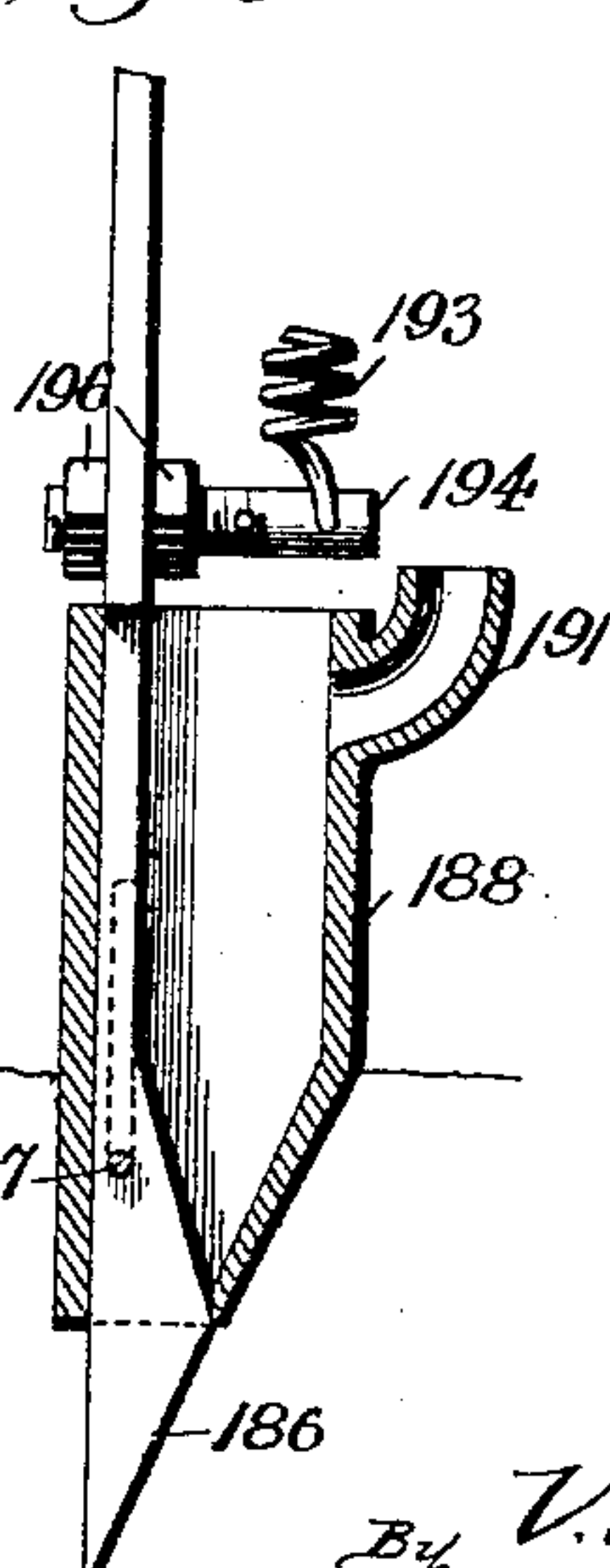
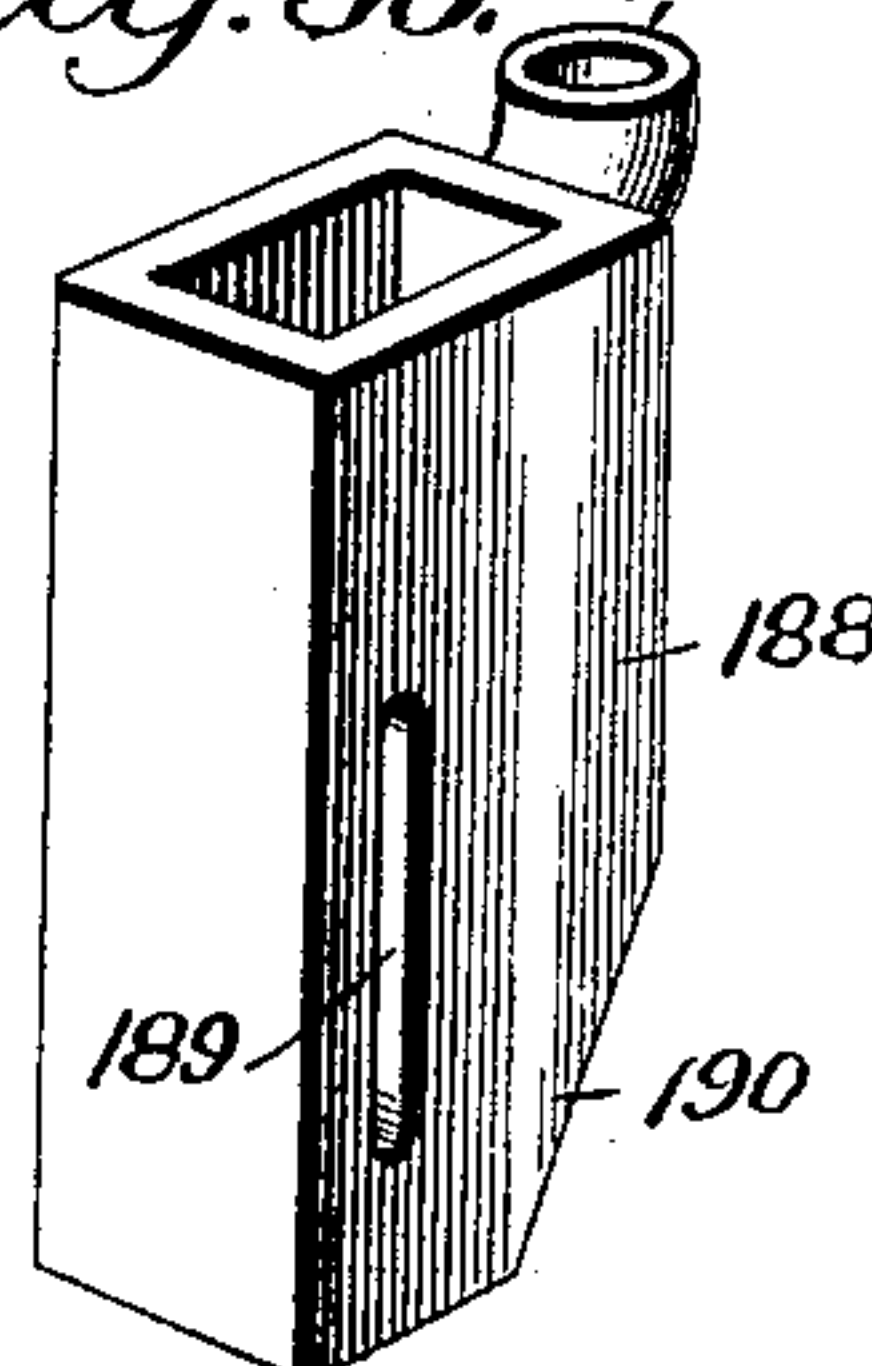


Fig. 35.



Witnesses.

Jos. C. Stack.

H. L. Amer.

Inventor.

See No. J. Coyim.

By V. D. Stockbridge,

his atty.

No. 632,645.

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Fig. 17.

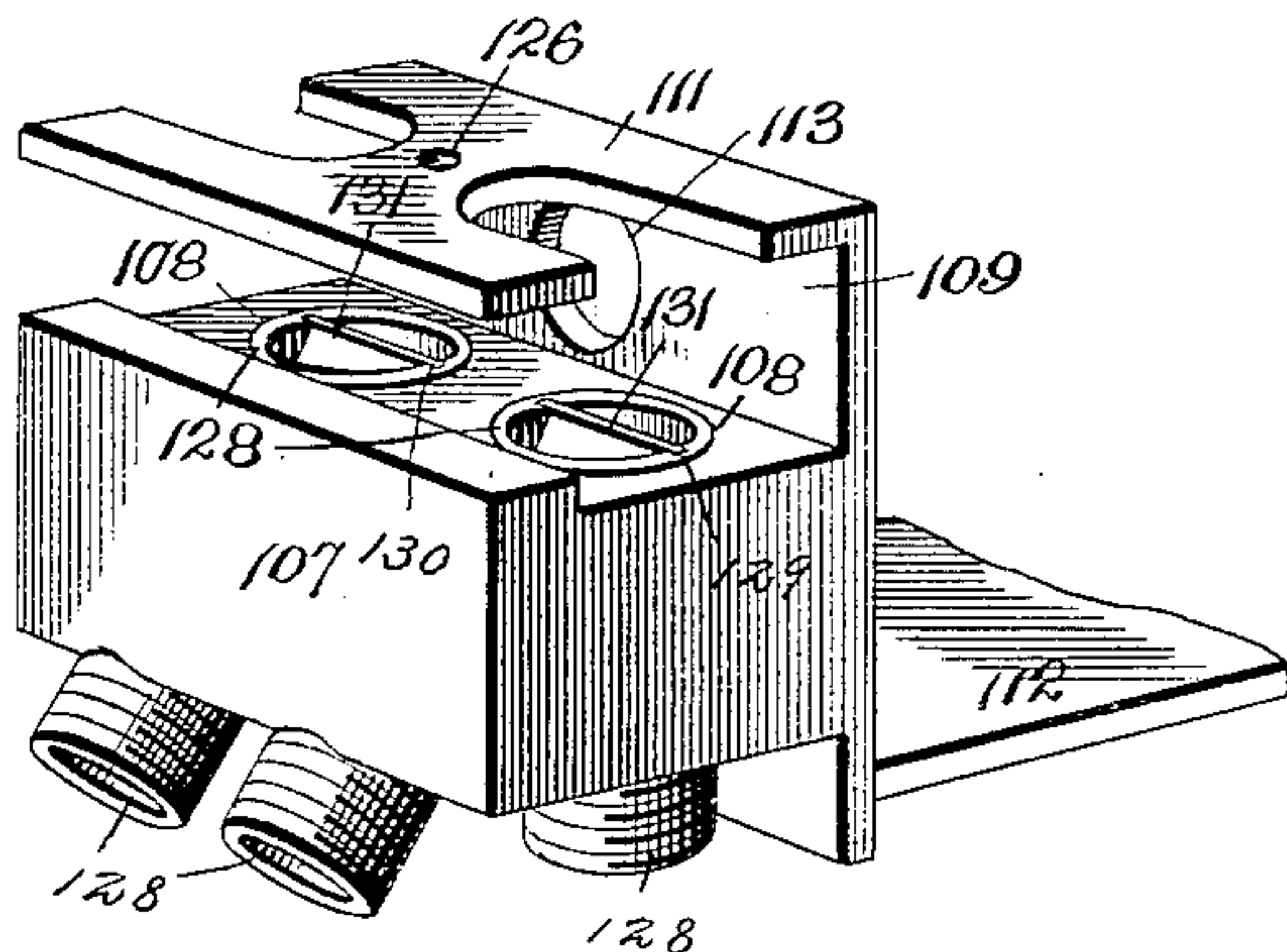


Fig. 19.

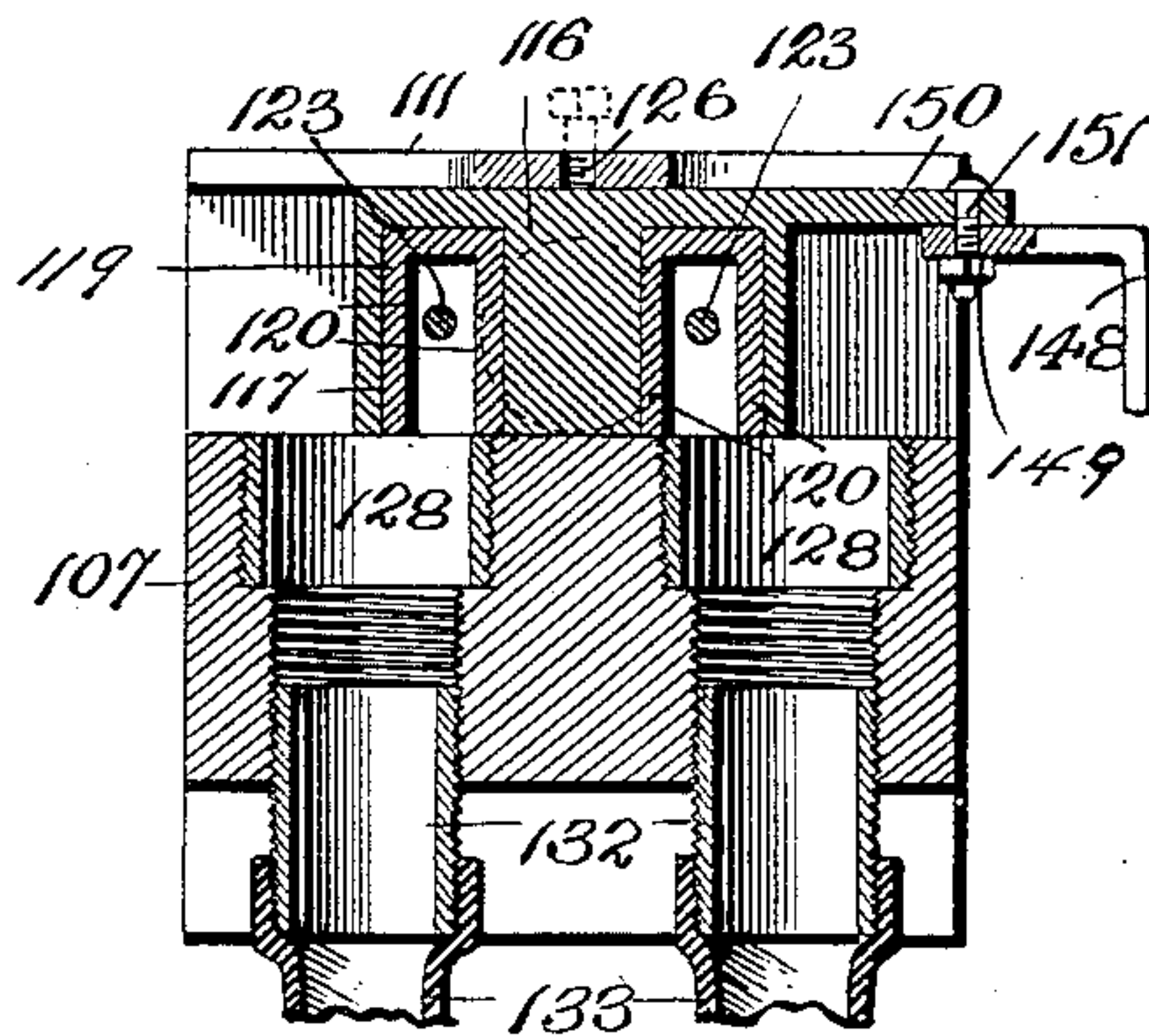


Fig. 18.

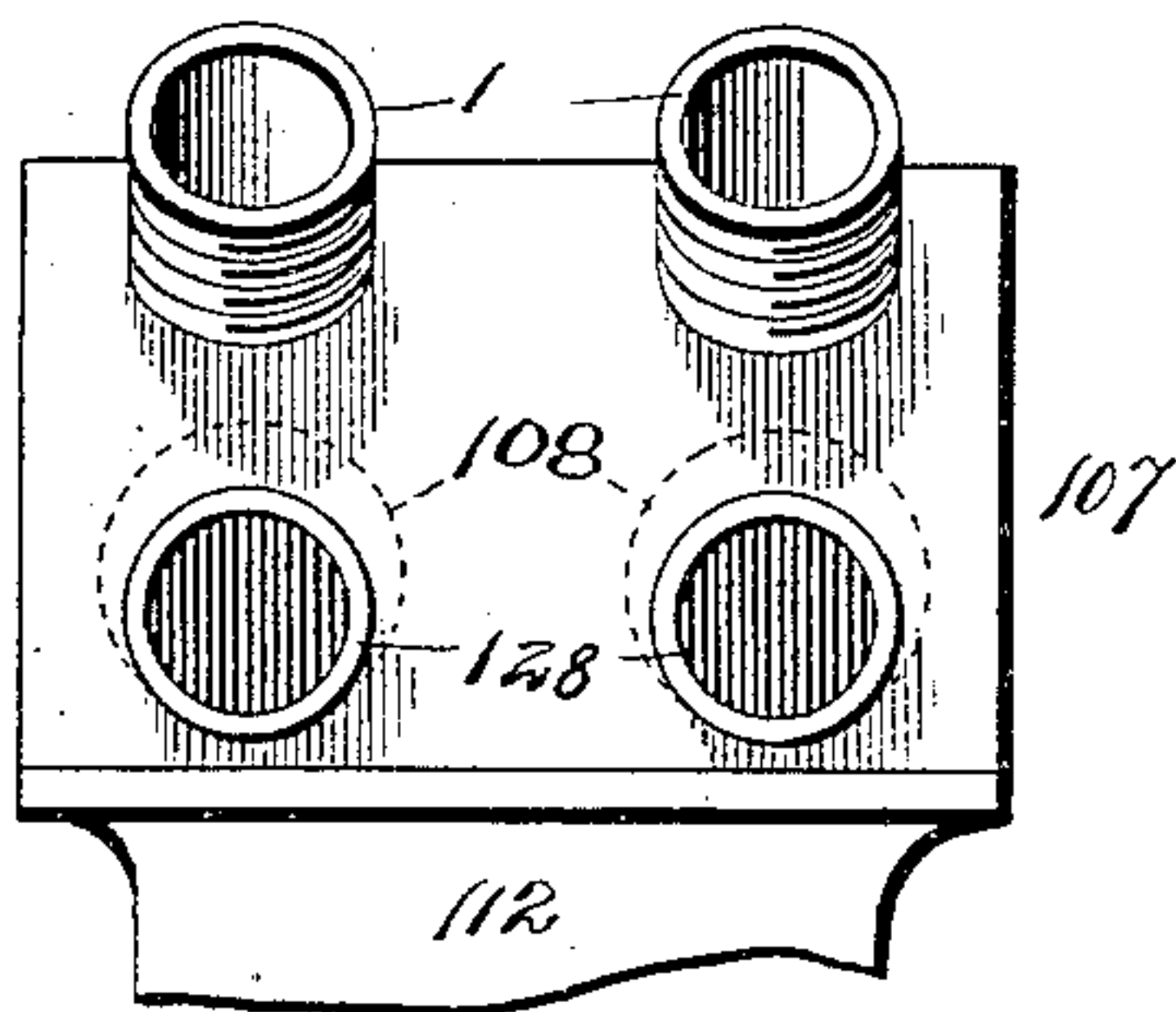


Fig. 20.

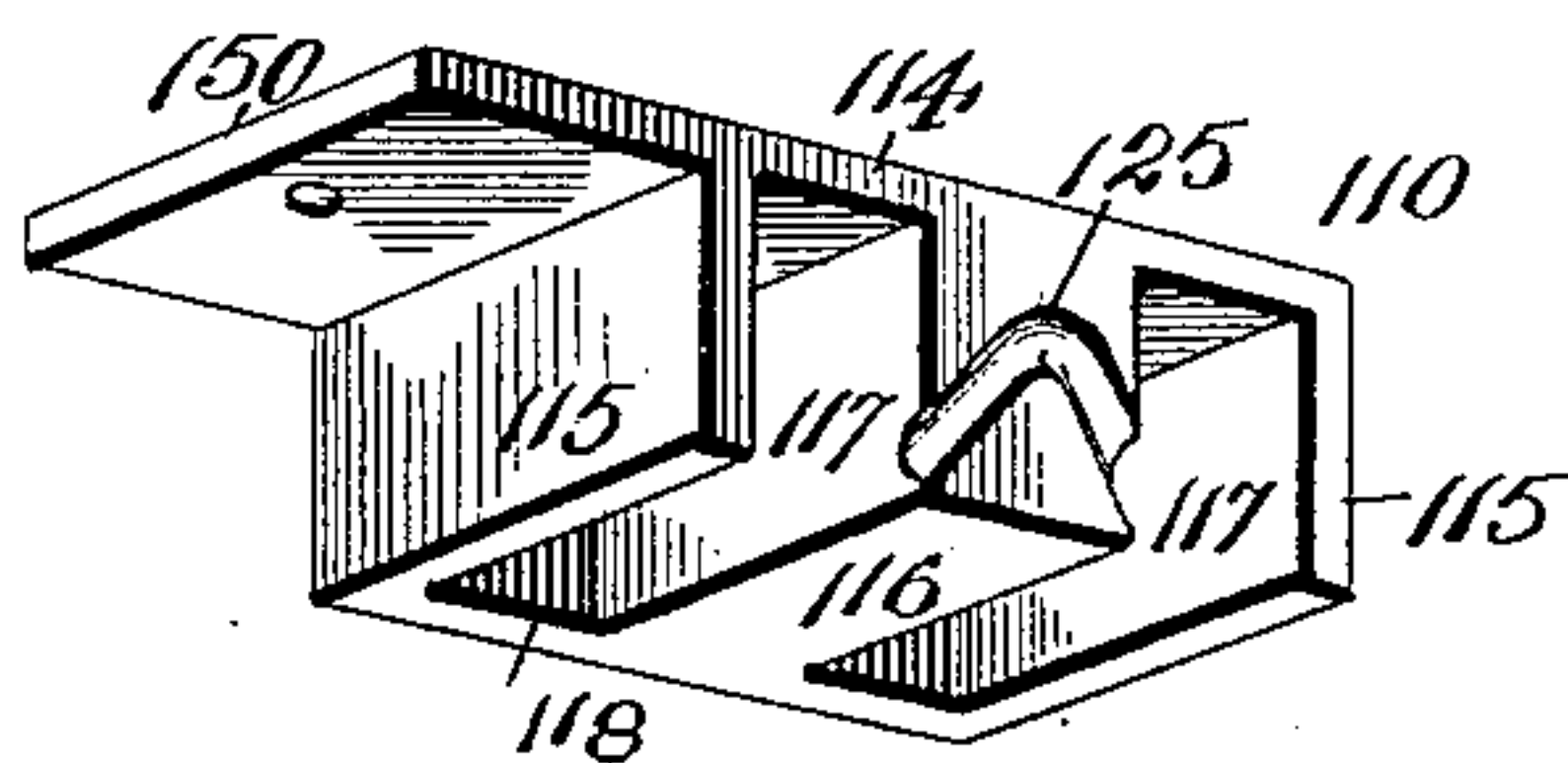


Fig. 21.

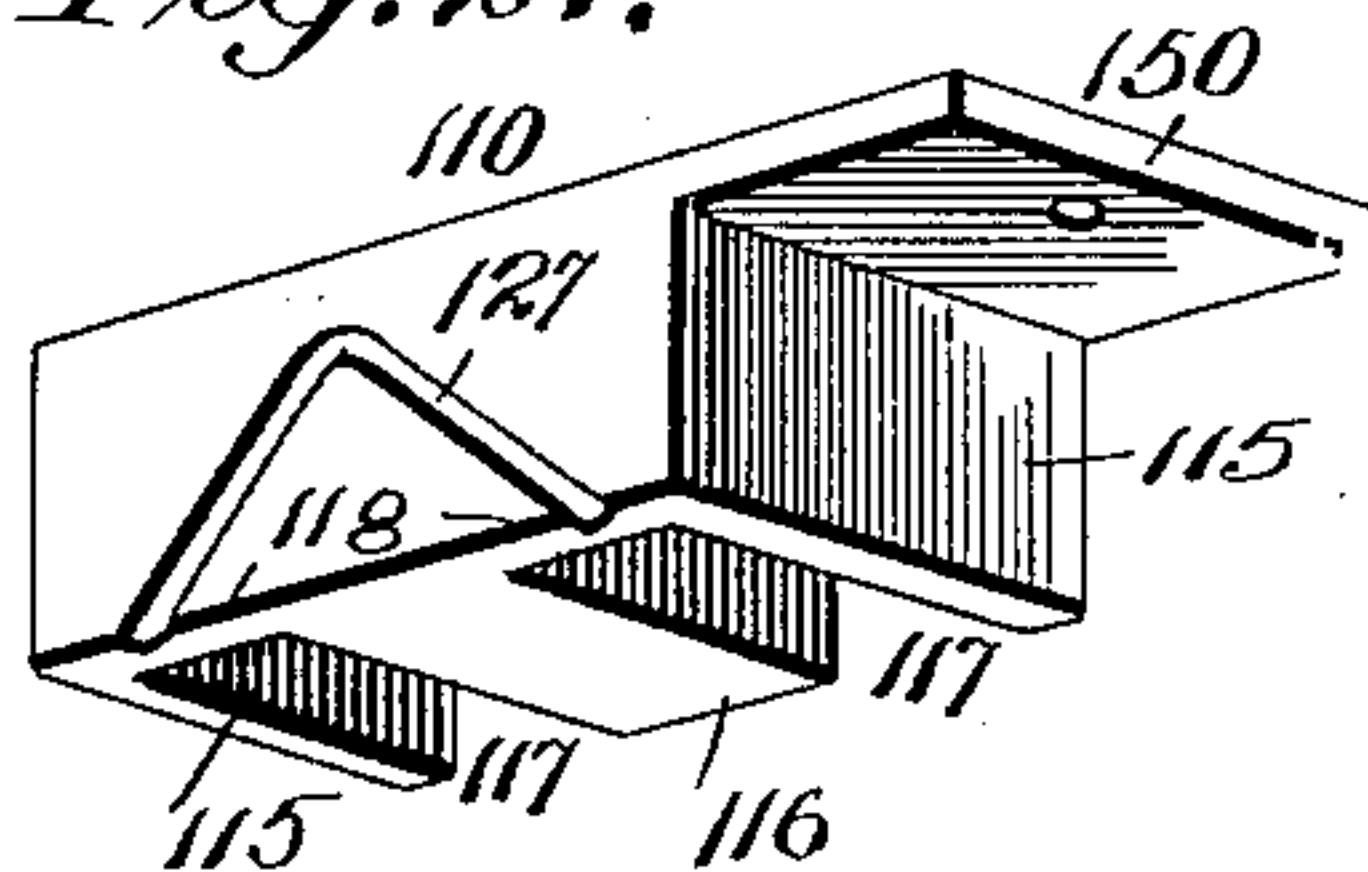


Fig. 23.

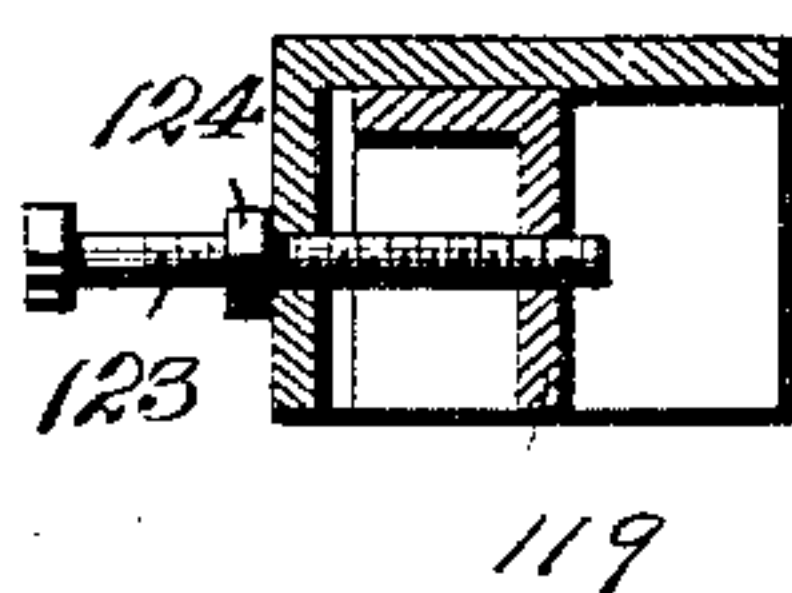
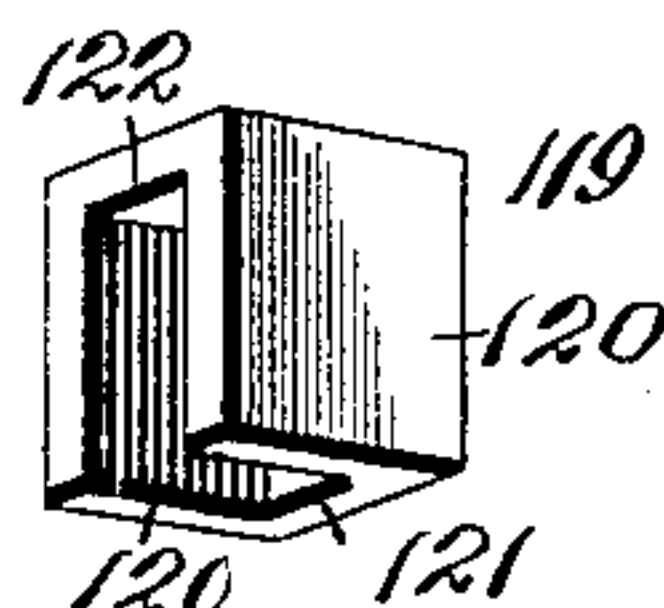


Fig. 22.



Witnesses.
Jos. C. Stack
H. L. Amer.

Inventor.
Seeho J. Coyim.
By V. D. Stockbridge,
his atty.

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Fig. 24.

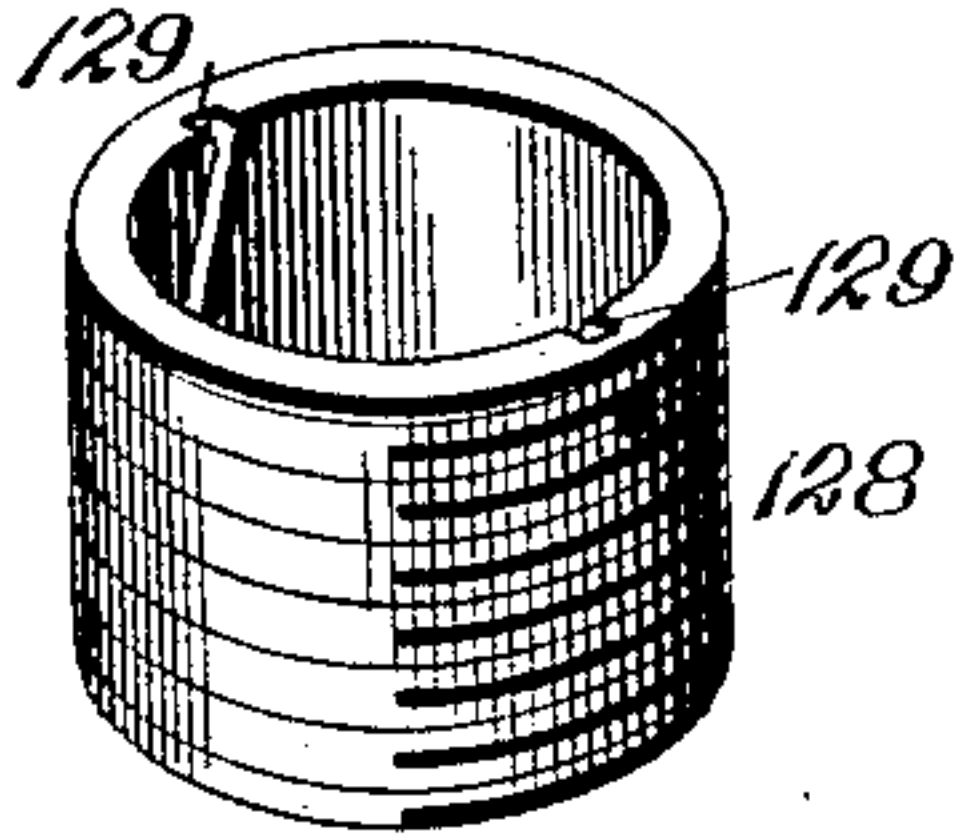


Fig. 25.

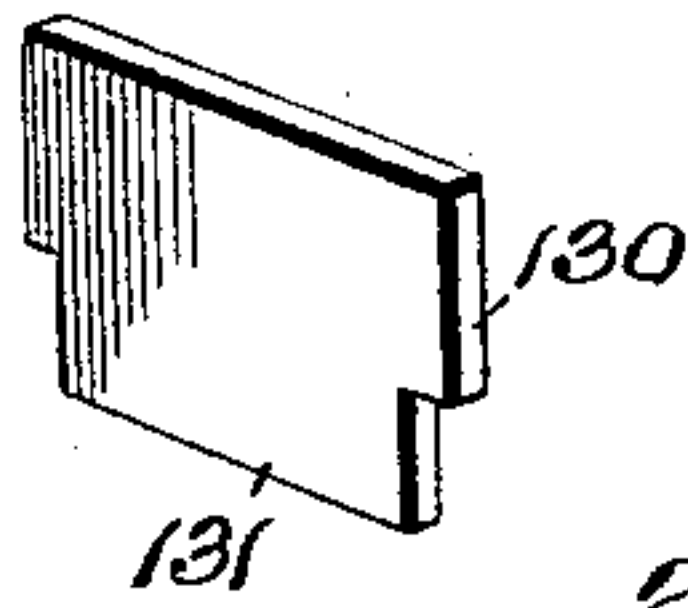


Fig. 26.

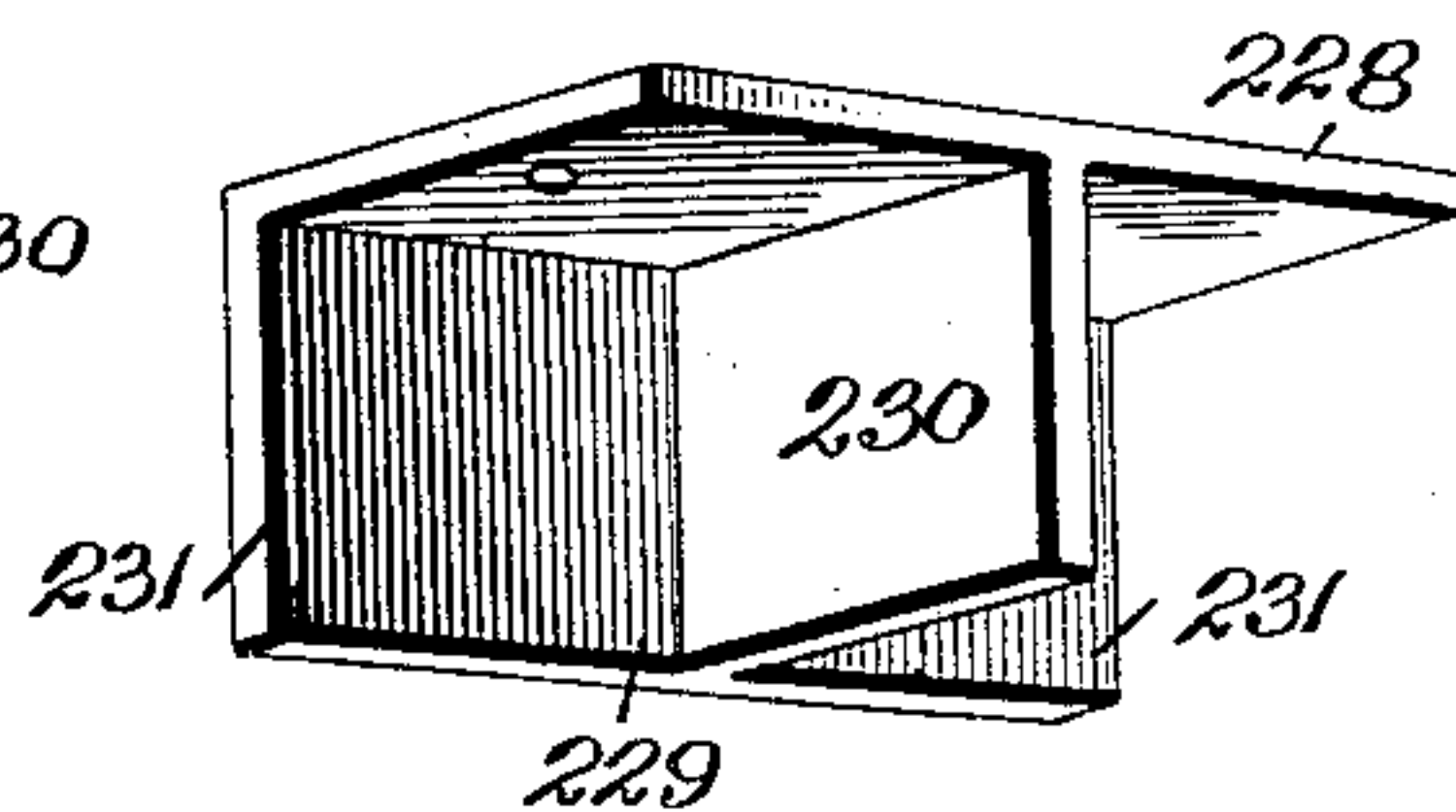


Fig. 27.

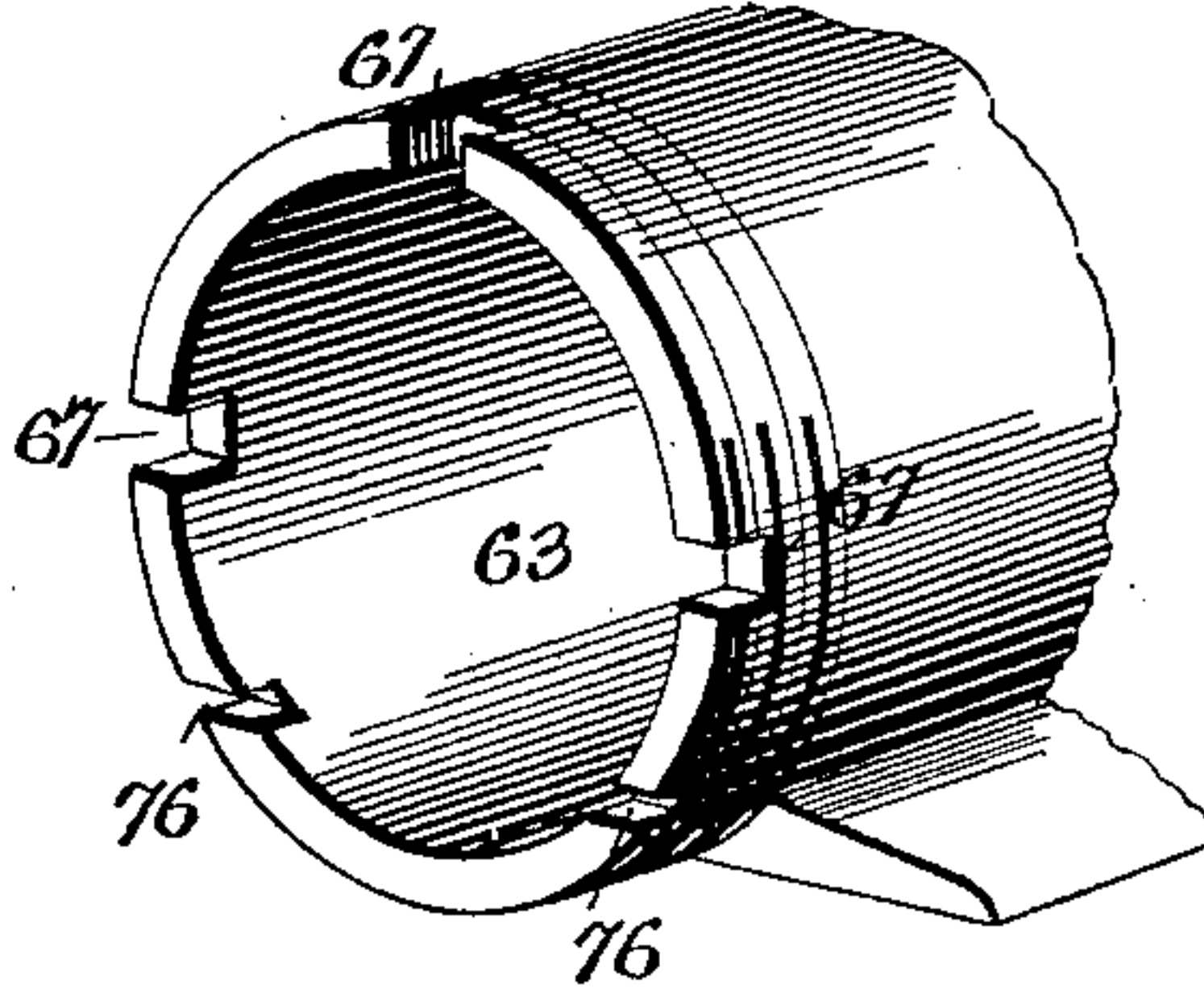


Fig. 31.

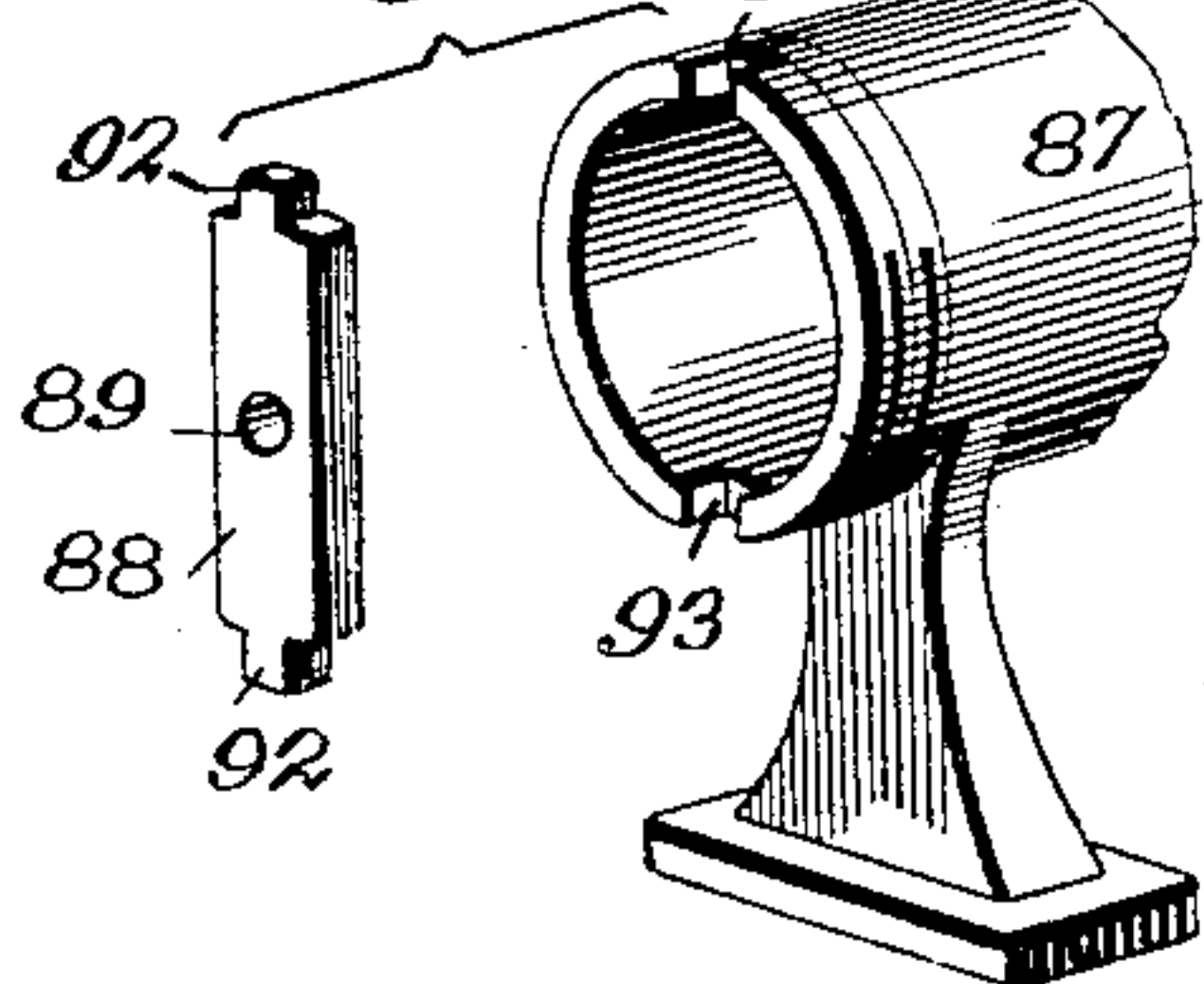


Fig. 28.

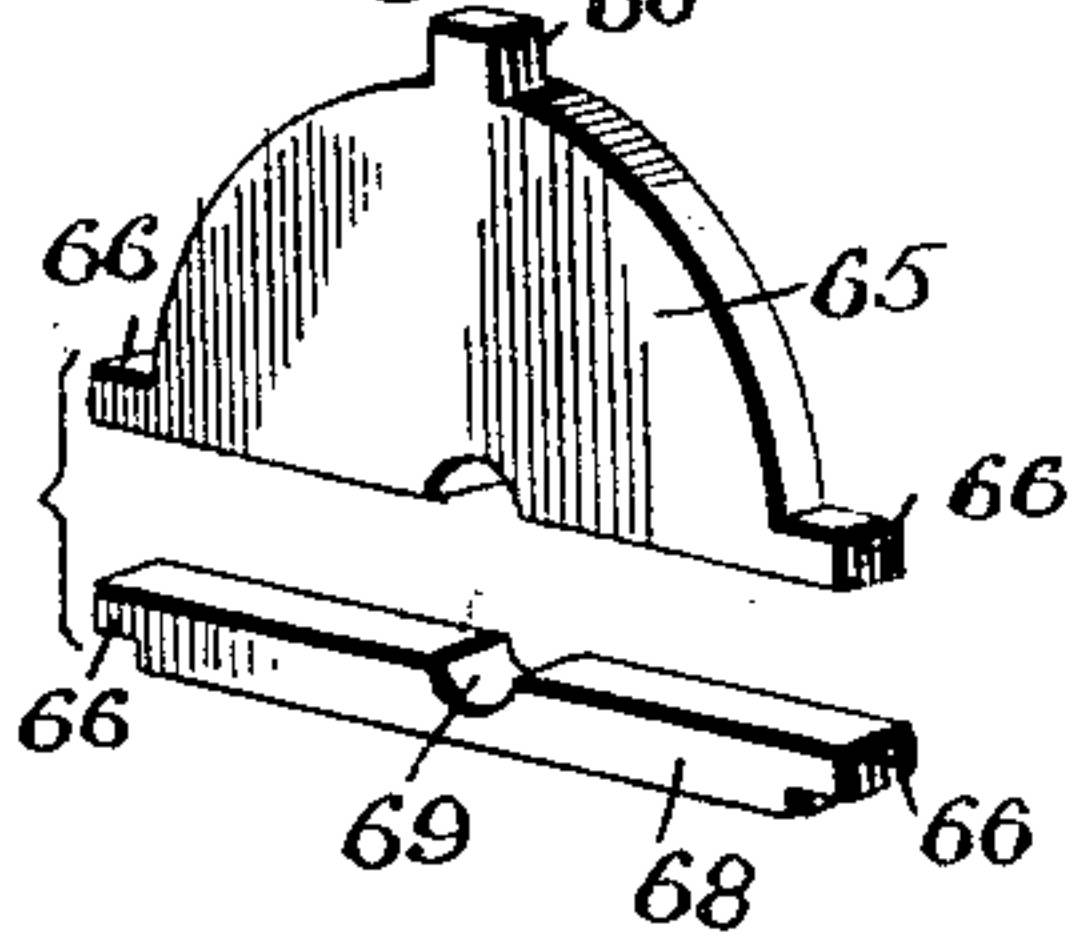


Fig. 29.

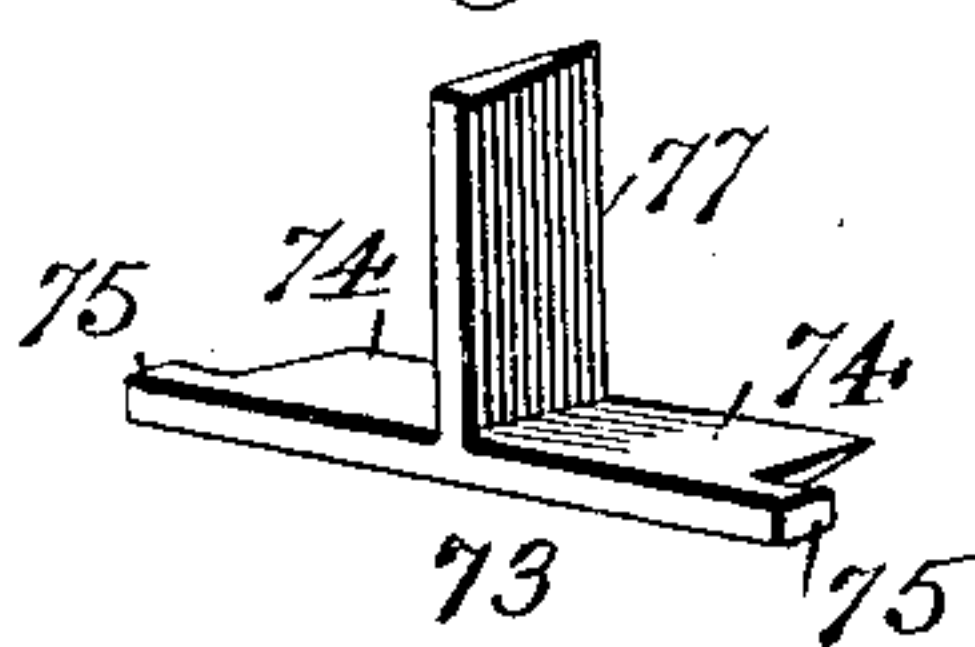


Fig. 30.



Fig. 33.

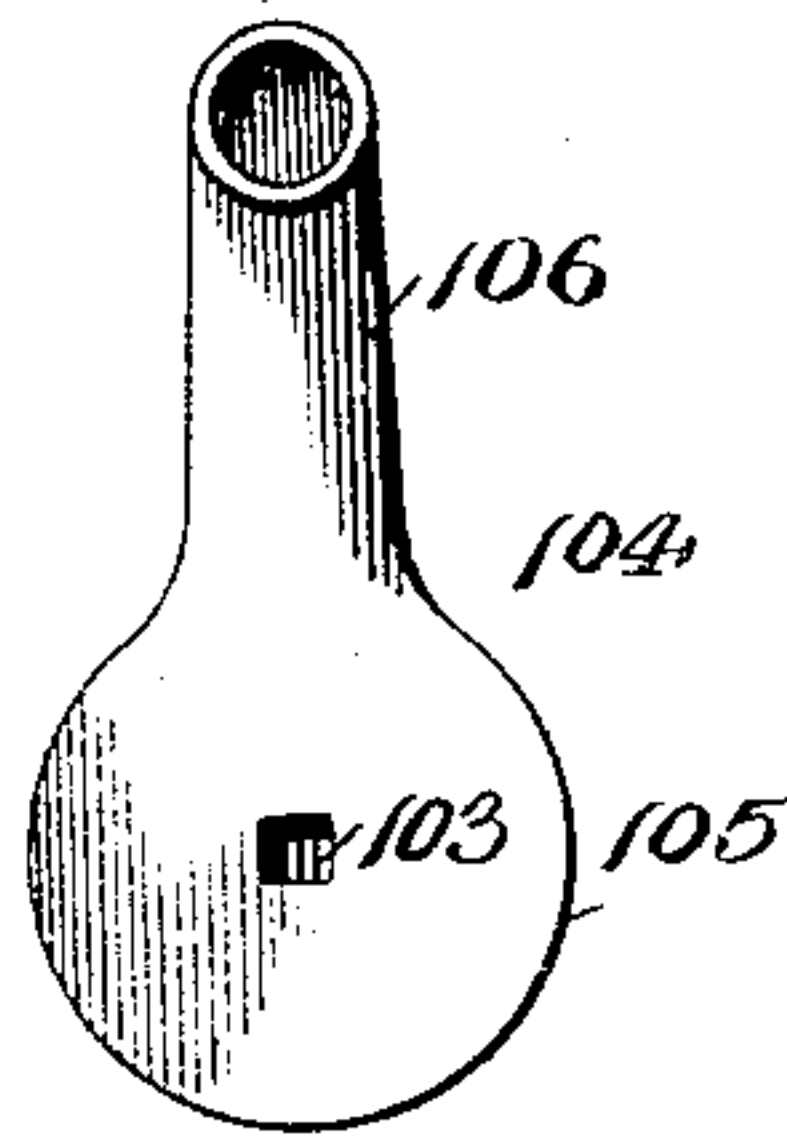
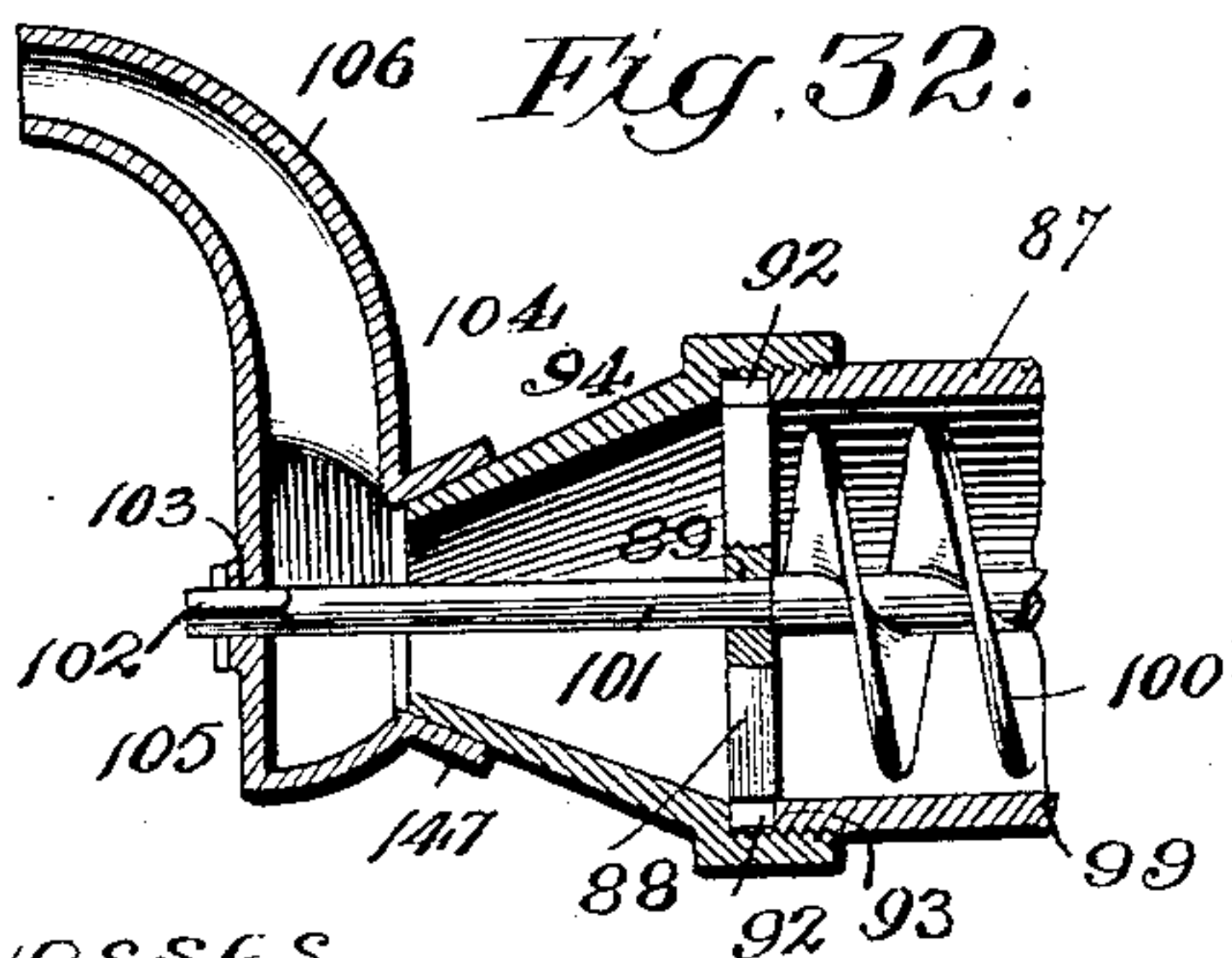


Fig. 32.



Witnesses.

Jos. C. Stack.

H. L. Amer.

Inventor.

Seeho J. Coyim.

By V. D. Stockbridge,
his atty.

No. 632,645.

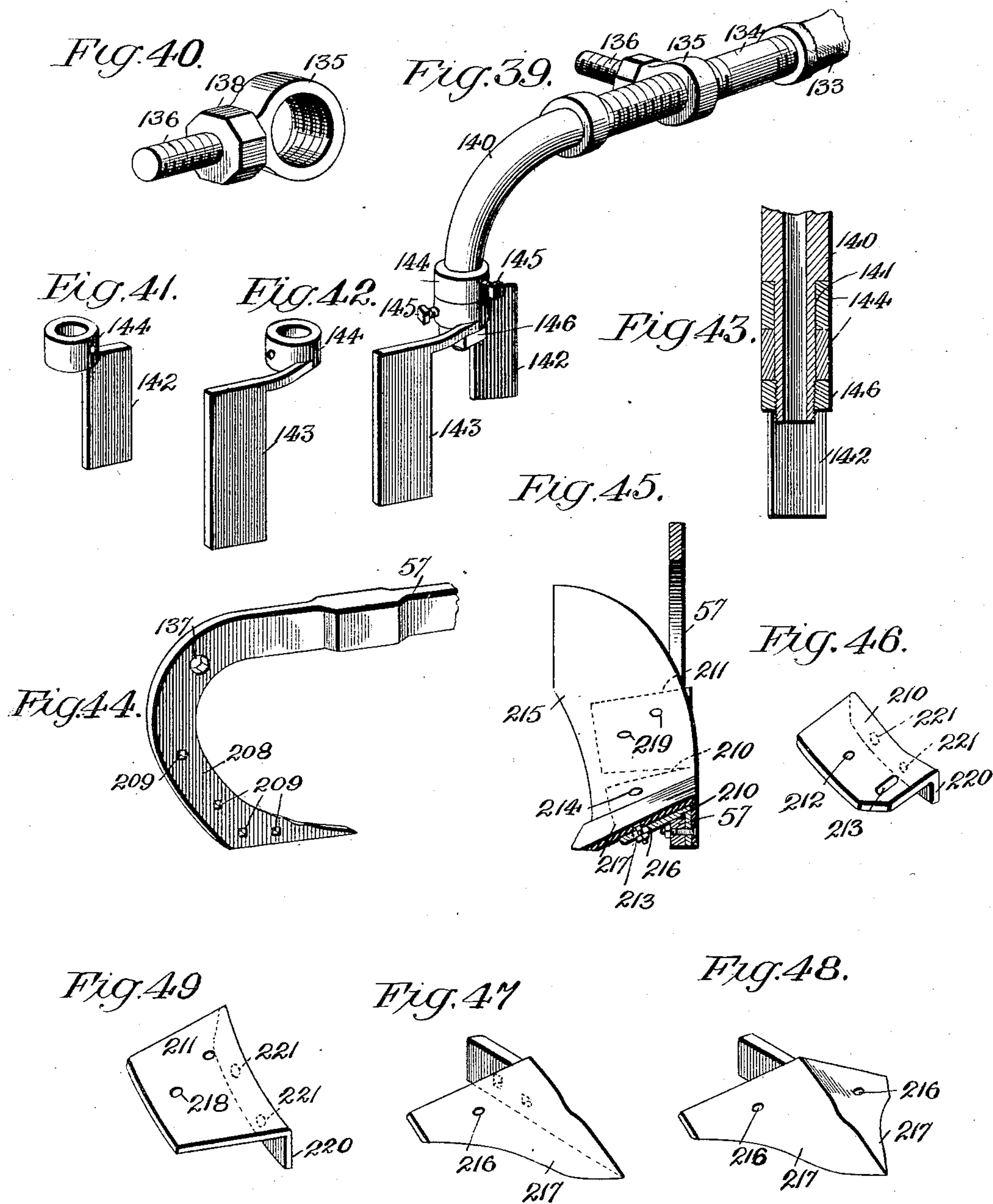
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S. J. COYIM.
SEEDER.

(Application filed Jan. 13, 1899.)

(No Model.)

10 Sheets—Sheet 10.



Witnesses

Jos. C. Stack

H. L. Amer.

Inventor

Seeho J. Coyim.

By U. A. Stockbridge,

his atty.

UNITED STATES PATENT OFFICE.

SEEHO J. COYIM, OF CHIHUAHUA, MEXICO.

SEEDER.

SPECIFICATION forming part of Letters Patent No. 632,645, dated September 5, 1899.

Application filed January 13, 1899. Serial No. 702,079. (No model.)

To all whom it may concern:

Be it known that I, SEEHO J. COYIM, a citizen of Mexico, residing at Chihuahua, Mexico, have invented certain new and useful Improvements in Seeders; 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.

10 This invention relates to seeders, being designed for the purpose of planting potatoes or corn or smaller seed and grain, such as wheat, rye, turnip-seed, &c.

15 The principal object of the invention is to provide a machine which may be readily changed or converted from a potato-planter to a corn-planter or grain drill or seeder, according to requirements. The machine is designed to be drawn by draft-animals across the field, and the carrying-wheels, which are also traction-wheels, are so geared to the operative parts of the machine that the operation of the machine as a whole will be automatic, requiring no attention on the part of the operator, except the placing of the seed or grain in the proper hopper. The machine also comprises means whereby the plows and seeding or dropping devices may be elevated clear of the ground for the purpose of transportation.

30 The detailed objects and advantages of the invention will be clearly pointed out in the course of the ensuing description.

35 The invention consists in a seeder or planter embodying certain novel features and details of construction and arrangement of parts, as hereinafter fully described, illustrated in the drawings, and incorporated in the claims.

40 In the accompanying drawings, Figure 1 is a side elevation of a machine constructed in accordance with the present invention, the machine being shown in its adaptation as a potato-planter and the plows and seeding devices being shown elevated for transportation. Fig. 2 is a vertical longitudinal section through the machine, showing the plows lowered or in their operative positions. Fig. 3 is a plan view of the same. Fig. 4 is a vertical cross-section through the frame. Fig. 5 is a vertical longitudinal section through the machine. Fig. 6 is a plan view of the machine,

partly in section. Fig. 7 is a rear elevation of the same. Fig. 8 is a detail perspective view of the slotted plate which underlies the cam-plate for shifting the seed-shaft into and out of gear. Fig. 9 is an enlarged detail cross-section through the intermediate longitudinal beam of the machine, showing the manner of mounting the sliding hangers and brackets. Fig. 10 is also a detail cross-section showing the sliding bracket and operating means therefor. Fig. 11 is a detail side elevation showing the yoke which assists in the operation of the sliding hangers. Fig. 12 is a detail perspective view of one of the hangers. Fig. 13 is a similar view of one of the yokes. Fig. 14 is a detail cross-section through one of the hoppers. Fig. 15 is a detail perspective view of the link which connects the longitudinal lever with the reciprocating divider. Fig. 16 is a similar view of the longitudinal lever. Fig. 17 is a perspective view of the divider-box. Fig. 18 is a bottom plan view thereof. Fig. 19 is a vertical cross-section through the divider-box and the divider. Fig. 20 is a detail perspective view of the divider. Fig. 21 is a similar view of the divider, showing the opposite side thereof. Fig. 22 is a detail perspective view of the filling-block. Fig. 23 is a sectional view of the divider, showing also the filling-block and adjusting means therefor. Fig. 24 is a detail perspective view of one of the discharge-nipples. Fig. 25 is a similar view of one of the division-pieces thereof. Fig. 26 is a similar view of another form of reciprocating divider. Fig. 27 is a fragmentary perspective view of the discharge end of the potato-bowl. Fig. 28 is a detail perspective view of the removable end bearing and wall for the potato-bowl. Fig. 29 is a similar view of the stationary detachable potato-knife. Fig. 30 is a similar view of one of the rotary potato-knives. Fig. 31 is a detail perspective view of the seed-bowl, showing the bearing at the discharge end thereof detached. Fig. 32 is a longitudinal section through one end of the seed-bowl and wheat scatterer or distributor. Fig. 33 is a rear elevation of the wheat-scatterer. Fig. 34 is a detail perspective view of the shank of one of the drill-teeth. Fig. 35 is a similar view of the sleeve of one of the drill-teeth. Fig. 36 is a vertical sectional view of one of said

drill-teeth, showing the parts in their elevated position. Fig. 37 is a similar view showing the parts depressed with the sleeve resting on the ground. Fig. 38 is a similar view showing the parts in the lower limit of their movements and just before being elevated. Fig. 39 is a detail perspective view showing the seed-conduit with its attached leveler and covering blades. Fig. 40 is a similar view of the supporting-eye for the seed pipe or conduit. Fig. 41 is a similar view of the leveler-blade. Fig. 42 is a similar view of the covering-blade. Fig. 43 is a vertical section through the discharge end of said pipe or tube, showing the manner of attaching the leveling and covering blades. Fig. 44 is a detail perspective view of one of the plow-standards. Fig. 45 is a vertical section through one of the plow standards and beams, showing the plow-point and its attaching frame-plate in section and showing also the moldboard. Fig. 46 is a detail perspective view of the plow-point attaching-frame. Fig. 47 is a detail perspective view of the plow-point. Fig. 48 is a similar view of the double plow-point. Fig. 49 is a similar view of the frame-plate for attaching the moldboard to the standard.

Similar numerals of reference designate corresponding parts in all the figures of the drawings.

Referring to the drawings, and particularly to Fig. 6, the main frame of the seeder is composed of the longitudinal side bars 1, the forward end or cross bar 2, the rear end or cross bar 3, and the central longitudinal beam 4, which is extended in advance of the bar 2 to form a tongue or tongue-support 5, the latter being connected to the bars 1 and 2 by means of the oblique hounds 6, which are preferably let into mortises or recesses in the bars 1 and 2, thus giving rigidity to the frame. The frame is further composed of the longitudinal beam 7 for supporting the cam-plate, &c., and another longitudinal bar 8, connecting the front and rear end or cross bars and provided with laterally and inwardly projecting brackets 9, having bearings 10 for the longitudinal operating-shaft 11, which communicates motion from the master-wheel to the drill-teeth.

The axle 12 is journaled in divided bearings 13, let into recesses in the side bars 1, and has mounted fast upon its opposite ends carrying traction-wheels 14, provided on the outer surfaces of their rims with short transverse ribs 15, arranged in three separate rows, the ribs bearing a staggered relation to each other, as best illustrated in the plan views and cross-sections, thus insuring a firm hold upon and engagement with the ground. Arranged within the frame and mounted fast upon the axle 12 is a master gear-wheel 16, having upon its active face five circular series, more or less, of beveled gear-teeth 17. Arranged in front of the active face of the master gear-wheel 16 is a divided longitudinal shaft com-

prising a forward section 18 and a rear section 19. The forward section is provided with a pinion 20, adapted to mesh with and be driven by one of the rows of teeth 17. The rear section 19 is provided with a similar pinion 21, adapted to mesh with another row of teeth 17, but upon the opposite side of the axle 12. The rear section 19 of the divided shaft is provided with a coupling-head 22 at its rear end, having a square socket to receive the squared end of the seed-feeding shaft 23 or one arm of a double crank 24, the purpose of which will hereinafter appear. The section 18 of the divided shaft is journaled in openings 25 (see Fig. 12) in a pair of sliding hangers 26, each provided with a pair of parallel horizontal rods 27, which pass slidingly through a pair of sleeves 28, located above and below the central longitudinal beam 4 and bearing, respectively, against the upper and lower sides thereof. Each of the sleeves 28 is slightly longer than the transverse thickness of the beam 4 and has its extremities screw-threaded, as indicated at 29, to screw into coupling-plates 30, which extend vertically and bear against the side faces of the beam 4, as best illustrated in detail Fig. 9. As before stated, the rods 27 are adapted to slide through the sleeves 28, and at their ends they pass through openings 31 (see Fig. 13) in the yoke 32 substantially in the form of the letter H, the ends of the rods 27 being secured in fixed relation to the yoke by means of nuts 33, located upon the inner and outer surfaces of the yoke, thus providing for adjustment of the distance between the yoke and the bearings 25. (See Fig. 12.) The central or connecting portion of the yoke 32 is provided with an opening 34, in which is adjustably received the threaded end of the operating-rod 35, the end of said rod being secured to the yoke by means of nuts arranged similarly to the nuts 33.

The rods 35 are provided at their opposite or outer ends with upturned extremities 36', (see Fig. 6,) forming pins which cooperate with the slots in the cam-plate 37. The cam-plate 37 slides longitudinally of the machine-frame upon a stationary slotted plate 38. (Best illustrated in Fig. 8.) The plate 38 is fixedly supported upon the longitudinal beam 7 of the machine-frame and is provided with a series of transverse slots 39, through which the pins 36 project and work. The slotted plate 38 is also provided with a series of upwardly-projecting threaded studs 40, which pass upward through longitudinal slots 41 in the cam-plate 37, thereby steadying the cam-plate in its sliding movements. The cam-plate, which is actuated by means hereinafter described, is also provided with a series of oblique slots 42, which receive the pins 36, and it will now be seen that as the plate 37 is reciprocated longitudinally the pins 36 are moved laterally or transversely of the machine, thereby correspondingly actuating and moving the yokes 32 and the sliding hangers

26 connected thereto. In this manner the forward section 18 of the divided shaft is moved so as to force its pinion 20 into and out of engagement with the master-wheel 16.

5 The rear section 19 of the divided shaft is mounted in a manner exactly similar to the forward section 18, and its pinion 21 is moved into and out of engagement with the wheel 16 in precisely the same manner and by similar means located in rear of the axle 12.

10 The seed-bowl 43 is supported upon sliding hangers or brackets 44, which are located in rear of the hangers for the section 19 of the divided shaft, and which operate through sleeves, and which are attached to the yoke and operated by a rod controlled by the movements of the cam-plate in a manner exactly similar to the devices last hereinabove described.

20 From the foregoing description it will be seen that as the cam-plate 37 is moved forward the sections 18 and 19 of the divided shaft will be moved away from the master-wheel 16, and a corresponding movement will be given to the seed-bowl 43, which is driven by the rear section 19. In the reverse or rearward movement of the cam-plate 37 the sections 18 and 19 will be moved toward the master-wheel and the seed-bowl 43 moved back to its operative position. It will of course be understood that when the pinions 20 and 21 are moved away from the master-wheel 16 the seed-feeding devices will be thrown out of operation. The cam-plate 37 is operated by means of a bell-crank lever 45, fulcrumed at 46 at one side of the machine and connected by means of a rod or link 47 with a laterally-projecting stud 48 on the cam-plate 37, as best illustrated in Figs. 1 and 6.

40 The bell-crank lever 45 is in turn operated by means of a hand-lever 49, fulcrumed at 50 upon one side of the machine-frame and connected by means of a chain 51 or equivalent device to the rear end of the bell-crank lever 45. The hand-lever 49 is engaged and held at any desired point by means of a segmental rack 52. The fulcrum 50 of the hand-lever 49 consists of a transverse rod or shaft which extends across the rear part of the machine and is provided at its opposite end with an arm 53, similar to the rear portion 54 of the hand-lever 49 and connected by means of a chain 55 to a transverse supporting-rod 56, the opposite end of which is mounted in the rear end of the bell-crank lever 45. The rod 56 extends beneath the plow-beams 57 and forms a means whereby all of the plow-beams may be simultaneously elevated, so as to carry all of the plows out of engagement with the ground. From the foregoing description it will be seen that both ends of the rod 56 are supported and moved up and down by means of the chains 51 and 55, attached to the arms 53 and 54 on the shaft 50 and controlled by means of the hand-lever 49.

I will now proceed with the description of

the seed-feeding devices, and especially those which are used for potatoes.

58 designates a large receptacle for potatoes or other seed, arranged near the front of the machine and extending transversely across the same. This receptacle is a mere box open only at the top and has no discharge-opening. Just in rear of the receptacle 58 is a potato-hopper 59, having an inclined bottom 60, leading to a discharge-opening 61, which communicates with the upper flaring mouth 62 of the cylindrical potato-bowl 63, as shown in Figs. 2, 3, 4, and 5. The forward end of the cylindrical potato-bowl 63 is closed by an end wall 64, while the rear end is partially closed by means of a removable segment 65 in the form of a half-disk, provided with radial projections 66, which enter notches or recesses 67 in the rear end of the bowl 63, as best illustrated in Figs. 27 and 28. The removable segment 65 is made in two sections, comprising a lower separable piece 63, which is also provided with projections 66, similar to those of the part 65, and also adapted to enter the notches 67 in the potato-bowl. The parts 65 and 68 are provided in their meeting surfaces with notches or opposing recesses 69 to receive the shaft 70 of a spiral conveyer or feeding device 71, which operates within the bowl 63. This construction enables the feeding device to be removed whenever required, the parts 65 and 68 being held against displacement by means of a flanged sleeve 72, which screws upon the rear end of the bowl, as shown, for example, in Figs. 2 and 5. Mounted in the same end of the bowl is a T-shaped knife or cutter 73, comprising a horizontal blade 74, which extends across the bowl and is provided with lugs 75, which enter notches or recesses 76 in the bowl. (See Figs. 27 and 29.) The cutter 73 also comprises a short vertical blade 77, which extends upward to the bar 68. Thus as the potatoes are forced out of the rear end of the bowl they are divided by means of the blades 74 and 77 into longitudinal strips or sections. After the sections of the potatoes pass out of the rear end of the bowl they are divided transversely by means of a pair of rotary cutters 78, arranged on opposite sides of and connected rigidly to the shaft 70, each of the cutters 78 having a screw-threaded shank 79, designed to enter a threaded socket in the shaft, thus enabling the cutters 78 to be detached from the shaft for facilitating the removal of the parts 65, 68, 72, and 73, hereinabove described. The shaft 70 is provided at its rear end with a crank 80, and to said crank is pivotally attached a connecting-rod 81, which extends downward and connects to the crank 24 at the rear end of the rear section 19 of the divided shaft, hereinabove described. (See Fig. 2.) In this manner motion is imparted to the feeding device 71 and rotary cutters 78. The potato-bowl discharges into a hopper 82, having a double inclined bottom 83, by which the pota-

toes are caused to gravitate through the discharge-opening 84 into the bottom thereof. The hopper 82 is provided with a well 85, through which the connecting-rod 81 passes, said well extending sufficiently high to prevent the potatoes from falling therethrough and the inclined bottoms 83 of the hopper being so disposed that the potatoes will find their way around the well 85 to the discharge-opening 84. The said discharge-opening is located immediately above the upper flaring mouth 86 of a second bowl 87, smaller than the bowl 63 and located in a lower plane. This second bowl is illustrated in detail in Fig. 31, where it is seen to comprise a movable end bar 88, having a bearing 89 for the shaft 90 of a feeding device 91 and also provided with lugs 92, which are received in notches or recesses 93 in the bowl, the part 88 being held in place by a conical discharge-nozzle 94, (shown best in Fig. 32,) the said nozzle screwing upon the rear end of the bowl 87. The potatoes discharged from the bowl 87 are deposited in the divider-box, herein- after described, wherein they are separated or divided into equal halves and delivered into the tubes which lead to the points of final discharge into the furrows formed by the plows. The hopper 82 is provided with a second or smaller discharge-opening 95 for use where corn and other grain or smaller seed are used, and in connection with the discharge-openings 84 and 95 I employ a double plug 96, (see Fig. 3,) one side 97 of which is employed to stop the opening 84 and the other side 98 to stop the smaller opening 95. The plug 96 is thus interchangeable, its two positions being shown in Figs. 2 and 5. The flaring mouth 86 of the lower bowl 87 is sufficiently large to take in or underlie both of the discharge-openings of the hopper 82. Where very small seed or grain is used, a third bowl 99 (see Figs. 5 and 32) is substituted for the bowl 87, the bowl 99 being similar in all respects—location, &c.—to the bowl 87, with the exception that the spiral feeding device 100 has less pitch and the shaft 101 is extended beyond the end bearing - bar, where it is squared, as indicated at 102, to enter a square opening 103 in the wheat-scatterer 104. (Best illustrated in Figs. 32 and 33.) This wheat-thrower comprises a cylindrical body portion 105, from which a spout 106 extends, the discharge end of the spout inclining and pointing rearward. Thus the rotation of the shaft 101 not only drives the feeding device 100, but also imparts rotary motion to the wheat-scatterer 104, thus delivering the wheat or other small grain in an annular spray.

The divider-box, indicated at 107, (see Fig. 18,) comprises two openings 108, leading downward therethrough, both of said openings communicating at their upper ends with a recess or channel 109, extending transversely of the machine and in which reciprocates a divider 110. (See Fig. 20.) The recess 109 is comprised between the box proper, 107, and

an overhanging part or plate 111, forming the top of the box. The box is supported by means of a horizontal plate or bracket 112, which is secured to the machine-frame, and the front wall of the box is provided with an opening 113, in which is received the contracted end of the discharge-nozzle 94 of the bowl 87. The divider 110 consists of a top plate 114 and pendent walls 115, forming the ends of the divider, and also a central division-piece 116, which separates the divider into two compartments 117. These compartments are closed at the rear by means of a wall 118. As the divider 110 is reciprocated over the openings 108 the division-piece 116 passes the opening 113, thus enabling the compartments 117 to alternately receive a charge of the potatoes or other seed. Also in the reciprocation of the divider the potatoes so received are directed into and deposited in nipples seated in the openings 108. In this manner the potatoes or seed are divided, a portion passing through one of the openings 108 and another portion through the remaining opening. The means for reciprocating the divider will be hereinafter described. Where smaller seed are being planted, use is made of a filling-block 119, comprising side walls 120, a front wall 121, and a top 122. The filling-block 119 is moved back and forth in its compartment 117 in the divider by means of a feed-screw 123, which may be held by a jam-nut 124, as shown in Fig. 23. By means of the filling-block 119 the size of the compartment 117 may be regulated at will to hold more or less seed, as desired. Where still smaller seed are being planted, use is made of an inverted-V-shaped groove 125 in the forward edge of the division-piece 116. In this case the divider 110 (see Fig. 20) is preferably held stationary by means of a set-screw passing through the opening 126 in the top 111 of the divider-box and entering a threaded socket in the top of the divider. The divider is provided in its rear side with a smaller inverted-V-shaped groove 127, which may be used when very fine seed are being planted, in which case the divider 110 is removed and turned end for end, so as to bring its rear side forward and place the groove 127 in communication with the opening 113.

Exteriorly-threaded nipples 128 are placed in the openings 108 of the divider-box, (see Figs. 17, 18, 19, and 20,) and each of said nipples is provided with oppositely-disposed inclined grooves 129 for the reception of the oppositely-projecting flanges 130 of the division piece or plate 131. The upper edge of the plate 131 when in position extends diametrically across the upper receiving end of the nipple 128, and said plate is for the purpose of dividing the seed into two separate portions, one portion of the seed passing in advance of the plate 131 and out of the discharge end of the nipple 128, the other portion of the seed passing in rear of said division-plate and into a branch nipple 132, ex-

tending obliquely away from the nipple 128 and toward the rear of the machine. Connected to the lower extremities of the nipples 128 and 132 are flexible tubes 133, which are
 5 attached at their opposite ends to exteriorly-threaded pipes or metal tubes 134. (See Figs. 39 and 40.) The tubes 134 are adjustably mounted in interiorly-threaded eyes or brackets 135, having threaded shanks 136, which
 10 pass through openings 137 (see Fig. 44) in the plow-standards and are secured by means of nuts placed upon the shanks 136. Each of the eyes 135 is provided with a polygonal base 138, which enters the opening 137 in the stand-
 15 ard, said opening being of a shape corresponding to that of the base 138, thereby preventing the eye 135 from turning. In Fig. 2 the tube 134 is shown as extending in an approximately vertical direction, the discharge end
 20 of the tube being arranged just in rear of the plow 139, so as to discharge the seed into the furrow formed thereby. In Fig. 39 the tube 134 is shown as disposed nearly horizontally and provided at its rear end with a tubular
 25 elbow 140, the lower end of which is reduced, as shown at 141, (see Fig. 43,) to receive the sleeves 144 of a pair of blades 142 and 143. The blade 142 is for leveling the soil thrown upward by the plow and is shorter than the
 30 blade 143, which travels in rear of the blade 142 and on the opposite side of the furrow for the purpose of covering over the seed after they are dropped into the furrow. Each of the blades 142 and 143 is provided at its upper
 35 end with a laterally-extending collar or sleeve 144, designed to surround the reduced end 141 of the tubular elbow, each of the sleeves or collars being held by means of binding-screws 145 and both of the collars 144 being
 40 further held on the tubular elbow by means of a nut 146, placed upon the lower threaded end of said elbow, as shown in Figs. 39 and 43. The length of the flexible tube 133 is such that when the plows are lowered to their op-
 45 erative positions, as shown in Fig. 2, a gradual inclination will be given to said tubes sufficient to enable the potatoes or other seed to gravitate therethrough and enter the discharge-tubes 134. When the plows are ele-
 50 vated, as shown in Fig. 1, the tubes 133 will be crimped or bent, thus preventing the passage of the seed therethrough and checking the discharge of the seed. Where the wheat-scatterer 104 is employed, the divider-box, &c., (see Fig. 17,) are removed and the wheat-scatterer placed directly upon the rear end
 55 of the discharge-spout of the bowl 99, the wheat-scatterer being provided with a forwardly-flaring annular flange 147, which surrounds the discharge-nozzle and forms a bearing for the scatterer thereon.

The divider (see Sheet 8) is reciprocated in the divider-box by means of a bent link 148, which is connected pivotally at 149 (see Sheet
 65 8) to an ear 150 on the divider, the opposite end of said link being pivotally connected at 151 (see Fig. 7) to the rear end of a longitu-

dinal lever 152, which is fulcrumed at 153, (see Fig. 4,) intermediate its ends, on a bracket 154 on one of the hangers 26, hereinabove de-
 70 scribed. The forward end of the lever 152 is connected pivotally to the horizontally-extending arm 155 (see Fig. 10) of a transversely-movable bracket 156, provided with parallel
 75 rods 157, working slidingly through sleeves 158 above and below the beam 4, the construction and operation being similar to that described in connection with the hangers 26. The sliding bracket 156, however, is provided
 80 with an oblong aperture 159, (see Figs. 5 and 10,) in which operates a wiper-cam 160, which is mounted fast on the forward section 18 of the divided longitudinal shaft. As the shaft
 85 18 is driven the cam 160 revolves and actuates the bracket 156 in a direction transversely of the machine-frame, thereby vibrating the forward end of the longitudinal lever 152. This causes a corresponding motion of
 90 the rear end of said lever and through the medium of the link 148 (see Figs. 7 and 15) imparts a reciprocating movement to the divider.

Mounted fast upon the shaft is a mutilated gear-wheel 161, (see Figs. 5 and 10,) the teeth
 95 162 of which are designed to mesh with the teeth of and actuate the pinion 163, (see Figs. 6 and 10,) mounted fast on the longitudinal drill-operating shaft 11, hereinabove referred
 100 to. The shaft 11 is provided at its rear end with a spur gear-wheel 164, which is normally fast on said shaft and which may be shifted longitudinally thereon by means of a set-screw
 105 165. The object in shifting the wheel 164 is to throw it into and out of gear with a second spur gear-wheel 166, mounted on a stud-shaft 167 at the rear end of the machine and pro-
 110 vided with a crank-arm 168. (See Fig. 5.) This crank-arm is connected, by means of a link 169, with a transverse beam 170, which is movable bodily in an up-and-down direc-
 115 tion, and it carries the drill-teeth 171. The beam 170 passes through a pair of yokes 172, (see Figs. 5 and 7,) each of which is provided at its upper end with a horizontal extension 173 and at its lower end with another hori-
 120 zontal extension 174, the said extensions projecting inwardly. 175 designates a pair of vertical guide-posts upon which the yokes 172 are mounted to slide. Each post 175 has its
 125 lower portion reduced, as indicated at 176, (see Figs. 1 and 7,) thereby forming a shoulder at the point 177 to limit the upward movement of its respective yoke 172. Each post 175 passes through an upper metal strap or
 130 holding-bracket 178, and its lower end passes through a lower bracket or strap 179, secured to one of the longitudinal timbers 1 of the machine-frame, the post being held by means of a nut 180. (See Fig. 1.) Arranged above the beam 170 and parallel thereto is a rod 181,
 135 which passes through openings in the yokes 172 and also through openings in the upper ends of the drills 171. The rod 181 is provided with end extensions 182, which are de-

tachably connected to the rod 181 by means of unions or couplings 183 in the form of interiorly-threaded sleeves, which engage the threaded contiguous ends of the rod 181 and its extensions. The shanks of the teeth 171 are given a quarter-twist, as shown at 184, and bolted or otherwise secured to the elevating and depressing beam 170. Each tooth is also provided at its lower end with a reduced shank 185, and the extremity of the shank is thickened to form a double wedge-shaped end or grain cut-off 186, the shank being also provided with oppositely-projecting pins 187, the purpose of which will appear. Surrounding the shank 185 is a sleeve 188, which is substantially square in cross-section and adapted to slide up and down on the shank 185. The sleeve 188 is provided in its opposite walls with vertical slots 189 to receive the pins 187, thereby limiting the upward and downward movements of the sleeve on the shank. The sleeve 188 is provided with an inclined wall 190, which extends in a plane substantially parallel to the lower inclined face of the grain cut-off, and the sleeve is provided near its upper end with a nozzle or spout 191, to which one of the flexible tubes 133 hereinabove described is attached, as shown, for example, in Figs. 5 and 7. The upward movement of the sleeve 188 is further limited by the shoulders 192, formed by reducing the shank 185. The teeth are normally upheld and are retracted after having been depressed by means of spiral springs 193, said springs being secured at their lower ends to studs 194, each having a screw-threaded connection with one of the teeth 171, the tooth for that purpose having a threaded opening 195 to receive the stud 194 and the latter being held when adjusted by means of nuts 196, arranged to bear against opposite sides of the tooth-shank. Each spring 193 is secured at its upper end to the rear cross-bar 3 of the machine-frame or any other suitable part of the machine. The operating mechanism in depressing the teeth overcomes the tension of the springs 193; but when the operating mechanism is automatically thrown out of gear the springs 193 retract or draw upward the teeth. The operation of the teeth is clearly illustrated in Figs. 36, 37, and 38. In Fig. 36 the drill-shank and its sleeve are shown in their upward or operative positions. In Fig. 37 the tooth has been forced downward through a part of its movement until the sleeve 188 comes in contact with the ground. In this position the cut-off 186 fills the discharge end of the sleeve and prevents the grain from escaping. In the further downward movement of the tooth the point of the tooth and also the lower inclined end of the sleeve 188 are forced into the ground, thus forming an opening for the seed. In this position the flexible tube 133 is straightened out and the seed permitted to pass therethrough into the spout 191 and into the sleeve 188 until they rest against the tooth-point or cut-

off 186. As soon as the tooth starts upward, the discharge end of the sleeve 188 is opened by the removal of the cut-off 186 and the seed deposited in the ground. As soon as the pins 187 reach the upper ends of the slots 189 the sleeve 188 is also elevated until it comes in contact with the shoulders 192. During this upward movement of the sleeve the flexible connection 133 has been crimped or bent, so as to cut off the flow of the seed. By referring now to Fig. 10 it will be seen that as the shaft 18 revolves the teeth 162 will impart approximately a half-revolution to the pinion 163. This actuates the shaft 11 and through the mechanism hereinabove described forces downward the beam 170 with its attached teeth. As soon as the teeth 162 pass the pinion 163 the pinion is released, together with the shaft 11, and the springs 193 now act to suddenly elevate the teeth and other parts connected thereto.

In connection with the teeth hereinabove described I employ a series of coverers or shovels 197, said shovels or coverers having beams 198, which are pivotally mounted at their forward ends on a transverse shaft 199, (see Figs. 2 and 5,) mounted in hangers 200, having shanks 201, which extend through the lower straps or brackets 179, above referred to, and also through upper straps 202 to receive nuts 203. By this means the brackets 200 and the rod or shaft 199 may be adjusted to any desired height for regulating the depth of penetration of the plows or shovels or coverers, as the case may be. The beams 198 (see Fig. 7) are spaced apart by means of spacing sleeves or thimbles 204, (see Fig. 4,) which surround the rod 199, thus enabling the coverers or shovels or plows to be set at any desired distance apart. Where the long plow-beams 57 are employed, as shown in Figs. 1 and 2, forward hangers 205 are employed, said hangers having vertically-adjustable shanks 206, similar to those 201 previously described and adjusted in the same manner, the said forward hangers carrying a forward beam-holding shaft 207, equipped with spacing sleeves or thimbles similar to those 204 of the rod or shaft 199. When the teeth 171 are not in use, they are detached by withdrawing the rods 181 and 199 therefrom, after which they are inverted or turned with the points upward, as shown in Fig. 3, the rods 181 and 199 being reinserted through the openings made therefor in the drill-shanks, as will be readily understood from Figs. 1 and 3.

The plow-standard 208 (see Fig. 44) is provided with a series of openings 209 for the attachment of frame-plates 210 and 211, the plate 210 being bolted to the plow-foot and provided with an opening 212 and a transverse slot 213 to receive bolts passing through openings 214 in the moldboard 215 and openings 216 in the plow-foot 217. The frame-plate 211 is provided with openings 218 to receive bolts which pass through openings 219

in the moldboard 215. The frame-plates 210 and 211 are each provided with a depending right-angular flange 220, which extends down upon the landside of the plow-foot and which has openings 221 for bolts, which pass also through the plow-foot. In Fig. 47 I have shown a single plow-point, while in Fig. 48 I have illustrated a double plow-point, and in both instances the angle or cutting edge of the plow-point is depressed or constructed on a wave-line to give a better cutting or shearing effect. The construction just above described provides a convenient means for attaching and detaching plow-points and moldboards to their standards and enables various forms of plow-points and moldboards to be used on the same machine and in connection with the same standard and adapts the machine as a whole to varied conditions of the soil and the requirements of the particular seed to be sown.

To sum up the details of construction hereinabove described, it may be stated that one plow may be used for forming the furrow, in which case it is arranged, of course, slightly in advance of the seed-dropper and another plow used for covering in the furrow, in which case it will of course be arranged slightly in rear of the drill, as the case may be, and a little to one side of the path in which the forward plow travels. In the machine hereinabove described four plow-beams are provided for, and in dropping potatoes but two chutes or tubes are employed. Therefore all of the plows or shovels may be used in connection with the dropper, as shown, for example, in Fig. 1. When the drill-teeth are employed, the plow-beams 57 are removed and the short beams 198 substituted, in which case, there being four grain-drills, no plows are needed to form furrows, and simply four shovels or coverers are necessary, one being arranged in rear of the drill. The several parts of the machine may be mounted in any manner found to be most convenient. For instance, the main potato box or receptacle 58 is supported by means of the vertically-extending portions 222 of a pair of acute-angled elbow-brackets 223, the other arms 224 of which are connected to the side timbers 1 of the machine-frame, as shown in Fig. 1. The rear edge of the box 58 may be supported by other straps or standards 225, connected at their lower ends to the front cross-bar 2 of the machine-frame. The hoppers 59 and 82 are also supported by vertical standards or metal straps 226, connected to the frame-bars of the machine. The transverse shaft 50 is preferably journaled in bearing-eyes 227, extending rearward from and passing through the rear transverse cross-bar 3 of the machine-frame. When the drill-teeth are not in use, the gear-wheel 164 is shifted on the shaft 11 until it no longer meshes with the gear-wheel 166. At the same time that the hand-lever 49 is depressed and the plows and seeding devices elevated above the ground the pinions 20 and

21 are moved out of gear with the master-wheel 16, thus throwing the machine out of operation. A simple form of reciprocating divider may be employed, as shown in Fig. 26, which consists simply of an upper horizontal wall 228, a vertical rear wall 229, and a central division-piece 230, which separates the divider into two compartments 231. Where such a divider is used as that last described, it may in some instances be necessary to close or partially close the ends of the recess 109, in which the divider reciprocates.

From the foregoing description it will be seen that I have provided a machine which may be with equal advantage used for planting large seed, such as potatoes, smaller seed, such as corn, and very small seed, such as wheat, turnip-seed, &c. The changes adapting the machine to its several operations may be expeditiously made, and the machine in each of its adaptations is perfectly designed for the particular use to which it is to be put. By means of the several sets of teeth on the master-wheel the relative speeds of the several parts of the machine may be governed, thereby enabling the seed to be planted at any suitable distance apart. The machine is automatic in operation, requiring very little attention on the part of the operator, and may be readily thrown out of gear when required. The lifting of the plows, &c., from the ground also effects the throwing of the seed-dropping mechanism out of operation and by bending the tubes places the parts of the machine in proper condition for transportation.

It will of course be understood that the machine hereinabove described is susceptible of changes in the form, proportions, and minor details of construction, which may accordingly be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a seed-planter, the combination with the hopper and devices for feeding the seed, of a flexible seed-tube, and means for bending said tube so as to obstruct the passage of the seed, substantially as described.

2. In a seeding-machine, the combination with a hopper, and a feeding device, of a flexible seed-tube, and means for simultaneously obstructing the passage of seed through the tube by bending the latter and throwing the feeding device out of operation, substantially as described.

3. In a seed-planter, the combination with a hopper, of a plow-standard, a seed-discharge tube adjustably mounted thereon, and a flexible seed-tube communicating therewith, and means for bending said tube to obstruct the passage of the seed through it, substantially as described.

4. In a seed-planter, in combination, a hopper, a plow-standard, an eye connected thereto, a metal seed-tube adjustably mounted in

said eye, and a flexible seed-tube communicating therewith, and means for bending said tube to obstruct the passage of the seed through it, substantially as described.

5 5. In a seed-planter, the combination with a hopper, of a divider-box, a divider mounted therein, a feeding device between the hopper and divider, and means for automatically operating the divider, substantially as de-
10 scribed.

6. In a seed-planter, the combination with a hopper and a divider, of a feed device located between the hopper and the divider, traction-wheels, and operative connections
15 whereby the feeding device and divider are automatically actuated, substantially as described.

7. In a seed-planter, the combination with a hopper, of a bowl underlying the hopper, a
20 spiral feeder operating in said bowl, and cutters arranged at the discharge end of the bowl, substantially as described.

8. In a seed-planter, the combination with the hopper, of an underlying bowl, a force-
25 feed device operating therein, stationary cutters at the discharge end of the bowl, and rotary cutters arranged near the discharge end of the bowl.

9. In a seed-planter, the combination with
30 a hopper, of a bowl arranged beneath the same, a spiral force-feed device revolving therein, a stationary cutter at the discharge end of the bowl, and revolving cutters mounted on the shaft of the feed device and actu-
35 ated thereby.

10. In a seed-planter, the combination with a hopper, of a cylindrical bowl, a rotating spiral feed device mounted therein, a station-
40 ary cutter removably connected to the discharge end of the bowl, and rotary cutters removably connected to the shaft of the feed device.

11. In a seed-planter, the combination with a hopper, of a force-feed device comprising a
45 cylindrical bowl having notches or recesses at its discharge end, a spiral conveyer journaled in said bowl, a stationary cutter having lugs removably fitted in the notches in the bowl, and a collar for holding said cutters in place,
50 substantially as described.

12. In a seed-planter, the combination with a hopper, of a force-feed device comprising a cylindrical bowl, a spiral conveyer mounted therein, a segmental end wall removably fitted
55 in the discharge end of the bowl, and a cutter detachably mounted in the discharge end of the bowl.

13. In a seed-planter, the combination with a hopper, of a force-feed device consisting of
60 a cylindrical bowl, a spiral conveyer rotatably mounted therein, and a bearing for the shaft of said conveyer, said bearing being removably fitted in the discharge end of the bowl, substantially as described.

65 14. In a seed-planter, the combination with a hopper, of a force-feed device comprising a cylindrical bowl, a spiral conveyer rotata-

bly mounted therein, a sectional end wall in the discharge end of the bowl, and a T-shaped cutter removably fitted in the discharge-open- 70
ing of the bowl, substantially as described.

15. In a seed-planter, a force-feed device comprising a cylindrical bowl, a spiral con- 75
veyer rotatably mounted therein, and a cutter comprising knives or blades set at an angle to each other and having end lugs or brackets which fit in notches or recesses in the dis-
charge end of the bowl.

16. In a seed-planter, a force-feed device comprising a cylindrical bowl, a spiral con- 80
veyer mounted therein, a cutter comprising knives set at an angle to each other and having end lugs or projections removably fitted in notches in the discharge end of the bowl, and a flanged collar threaded upon the end of 85
the bowl for holding the cutter in place, substantially as described.

17. In a seed-planter, a force-feed device comprising a bowl, a spiral conveyer mount- 90
ed therein and having its shaft extended outside of the bowl, stationary cutting-blades mounted in the discharge end of the bowl, and other cutting-blades having threaded shanks by which they are detachably connect- 95
ed to said shaft, the last-named cutters being carried around by the shaft, substantially as described.

18. In a seed-planter, a force-feed device comprising a cylindrical bowl, a spiral con- 100
veyer mounted therein, a removable bearing-bar fitted in notches in the discharge end of the bowl, and a conical discharge-nozzle having an interiorly-threaded collar or flange which screws upon the discharge end of the bowl and holds the bearing-bar in place. 105

19. In a seed-planter, the combination with a hopper, of a force-feed device underlying said hopper, a second force-feed device lo- 110
cated in a lower plane, a second hopper intervening between the two feed devices, means for operating the shaft of one feed device, and a connection between the shafts of the two feed devices whereby both are simulta-
neously actuated.

20. In a seed-planter, two force-feed devices 115
arranged at a distance from each other and in different horizontal planes, in combination with an intervening hopper whereby the material is conducted from one feed device to the other, a well arranged within said hop- 120
per, and an operative connection between the two feed devices extending through said well, substantially as described.

21. In a seed-planter, the combination with the two force-feed devices, of an interposed 125
hopper having a well located therein, an operative connection between the shafts of the two feed devices extending through said well, and a partially-inclined bottom to said hopper upon which to direct the potatoes around the 130
well to the discharge-opening of the hopper, substantially as described.

22. In a seed-planter, a hopper having two independent discharge-openings of different

sizes, in combination with an interchangeable plug having projections of varying sizes corresponding to the discharge-openings, substantially as described.

23. In a seed-planter, a divider-box comprising a single entrance-opening and two or more discharge-openings, in combination with a movable divider containing two seed-receiving compartments separated by a division-wall, and means for actuating said divider, substantially as described.

24. In a seed-planter, a divider-box having a discharge-opening, in combination with a nipple fitted therein, and an obliquely-disposed branch nipple communicating therewith, substantially as described.

25. In a seed-planter, the combination with a divider-box, of a discharge-nipple fitted therein, and an inclined or oblique division-piece fitted in the receiving end of said nipple, substantially as described.

26. In a seed-planter, the combination with a divider-box, of a discharge-nipple fitted therein and provided with diametrically-opposed grooves, and a division-piece removably fitted in said grooves, substantially as described.

27. In a seed-planter, the combination with a divider-box having one inlet and two discharge openings, of a divider operating between the inlet and discharge openings, and comprising a seed-containing compartment and a filling-block adjustably mounted in said compartment, substantially as described.

28. In a seed-planter, the combination with a divider-box, of a divider located between the inlet and discharge openings of the box and provided with a V-shaped groove communicating with all of the openings, substantially as described.

29. In a seed-planter, the combination with a divider-box, of a reciprocating divider mounted therein and operating in a direction transverse to the path of movement of the machine, a lever fulcrumed on the machine-frame, a connecting-link between said lever and divider, and means for automatically vibrating said lever.

30. In a seed-planter, the combination with a divider-box having inlet and discharge openings, of a divider adapted to reciprocate across said openings, and a set-screw passing through the divider-box and adapted to engage the divider for holding the latter stationary, substantially as described.

31. In a seed-planter, the combination with a driven axle, and a master gear-wheel thereon, of a force-feed device, a shaft for operating the same, a pinion on said shaft meshing with the master-wheel, a sliding cam-plate, connections between said plate and the shaft which operates the force-feed device, and means for shifting said cam-plate.

32. In a seed-planter, the combination with a driven axle and a master gear-wheel thereon having several series of gear-teeth, of a force-feed device, an actuating-shaft therefor ex-

tending across the face of the master gear-wheel, a pinion on said shaft meshing with the master gear-wheel, sliding hangers in which the shaft is journaled, and a sliding cam-plate for actuating said hangers, substantially as described.

33. In a seed-planter, a driven axle, and a master gear-wheel thereon, in combination with a divided longitudinal shaft, pinions on the sections of said shaft meshing with the master-wheel, sliding hangers in which the sections of said shaft are mounted, and a cam-plate for shifting said hangers, substantially as and for the purpose specified.

34. In a seed-planter, the combination with a master gear-wheel, of a shaft extending across the face of said wheel, a pinion on said shaft meshing with the master-wheel, hangers for said shaft comprising parallel rods, sleeves on the frame through which said rods slide, a yoke connecting said rods, and actuating means for said yoke.

35. In a seed-planter, the combination with a master gear-wheel, of a shaft extending across the face of said wheel, a pinion on said shaft meshing with the wheel, hangers for said shaft having parallel rods connected thereto, sleeves on the frame through which said rods slide, a yoke connecting said rods, a cam-plate, and rods connecting said cam-plate and yoke, substantially as and for the purpose described.

36. In a seed-planter, the combination with a driven axle, and a master gear-wheel thereon, of a shaft extending across the face of said wheel, a pinion on said shaft meshing with said wheel, sliding hangers for said shaft, a cam-plate adapted to slide in a direction at right angles to said hangers, oblique slots in said plate, rods connected to said hangers, and having pins which work in the slots of the cam-plate, and means for shifting said cam-plate.

37. In a seed-planter, in combination, a driven axle, a master gear-wheel, a shaft extending across the face of said wheel, a pinion on said shaft meshing with the wheel, sliding hangers for said shaft, a slotted plate mounted on the machine-frame, a cam-plate sliding on said slotted plate, and a rod interposed between the cam-plate and the sliding hangers and having a pin which coacts with the cam-plate.

38. In a seed-planter, the combination with the machine-frame and carrying-wheels, of a series of pivotally-supported plow-beams, a supporting-rod for raising and lowering said beams, seed-dropping devices, shifting mechanism for throwing said seed-dropping mechanism into and out of operation, means for elevating the bar which supports the plow-beams, and connections between said supporting-bar and the shifting mechanism whereby the seed-dropping devices are thrown out of action simultaneously with the elevation of the plow-beams, substantially as described.

39. In a seed-planter, the combination with the seed-dropping devices and a sliding cam-plate for throwing the same into and out of operation, of a series of pivotally-supported plow-beams, and a bell-crank lever interposed between and connected to said cam-plate and the beam-elevating device, whereby the plows and dropping devices are simultaneously thrown into and out of operation.
40. In a seed-planter, the combination with a driven axle, and a master gear-wheel thereon, of a force-feed device and the shaft carrying said feed device, a shaft extending across the face of the master-wheel and geared thereto and arranged in alinement with the shaft of the force-feed device, and a crank detachably connected to the adjacent ends of said shafts, substantially as described.
41. In a seed-planter, the combination with a driven axle, and a master gear-wheel thereon, of a shaft extending across the face of said wheel and geared thereto, a mutilated gear-wheel on said shaft, and a drill-operating shaft provided with a pinion in mesh with said mutilated gear-wheel, substantially as described.
42. In a seed-planter, the combination with an intermittently-rotated shaft, of a vertically-movable horizontal bar, a connection between said bar and shaft for depressing the bar; a series of drill-teeth carried by said bar, and a spring or springs for elevating said bar and teeth.
43. In a seed-planter, the combination with a pair of vertical guide-posts, of a horizontal bar movable up and down thereon, means for raising and lowering said bar, and a series of drill-teeth carried by said bar, substantially as described.
44. In a seed-planter, the combination with a pair of vertical guide-posts, of yokes sliding up and down thereon, a horizontal bar connected to said yokes and moving therewith, means for raising and depressing said bar, and a series of drill-teeth carried by said bar, substantially as described.
45. In a seed-planter, the combination with an intermittently-rotated shaft, of a gear-wheel thereon, a second gear-wheel meshing therewith, a crank-arm operated by said second gear-wheel, a horizontal bar movable up and down and having a linked connection with said crank-arm, and a series of drill-teeth carried by said bar, substantially as described.
46. In a seed-planter, the combination with the machine-frame, of a series of drill-teeth detachable from the frame and capable of being adapted to be inverted or turned end for end, substantially as described.
47. In a seed-planter, the combination with the machine-frame, and brackets thereon, of a pair of vertical guide-posts having reduced lower ends passing through said brackets, yokes sliding up and down on said guide-posts, a horizontal bar connecting said yokes, drill-teeth carried by said bar, and means for raising and depressing said bar, substantially as described.
48. In a seed-planter, the combination with a vertically-movable horizontal bar, of a series of drill-teeth carried thereby and provided with openings in transverse alinement with each other, a rod passing through said openings; and extensions at the ends of said rod, detachably connected thereto by unions or couplings, substantially as described.
49. In a seed-planter, a drill-tooth shank having its lower end reduced to form shoulders, in combination with a sleeve slidingly mounted on the reduced portion of the shank and limited in its movement by said shoulders, substantially as described.
50. In a seed-planter, a drill-tooth shank provided with oppositely-projecting pins, in combination with a sleeve slidingly mounted thereon and having slots in which the pins work, substantially as described.
51. In a seed-planter, the combination with a drill-tooth shank having a wedge-shaped cut-off at or near its extremity, of a sleeve slidingly mounted thereon and having a contracted lower end designed to be filled by said cut-off, and means for limiting the relative movement of said shank and sleeve, substantially as described.
52. In a seed-planter, the combination with a drill-tooth shank having a double wedge-shaped extremity forming a cut-off, of a sleeve slidingly mounted thereon and limited in its up and down movements and also provided with a downwardly-projecting contracted lower end and provided near its upper end with a seed-spout, substantially as described.
53. In a seed-planter, the combination with a drill-tooth shank, of depressing means therefor, a spring for elevating the drill-teeth, a threaded stud passing through a threaded opening in the shank and having a spring attached thereto, and means for securing said stud when adjusted in relation to the shank, substantially as described.
54. In a seed-planter, the combination with a seed-discharge tube, of an elbow connected thereto, and a covering-blade connected to said elbow and arranged to operate in rear of the discharge end thereof.
55. In a seed-planter, a seed-discharge tube having its discharge end reduced, in combination with a blade provided with a collar detachably mounted upon said reduced end, substantially as described.
56. In a seed-planter, the combination with a seed-discharge tube, of a pair of blades of different lengths detachably mounted thereon, substantially as described.
57. In a seed-planter, the combination with a seed-discharge tube, of leveling and covering blades mounted thereon, one moving in advance and the other in rear of the point of discharge, substantially as described.
58. In a seed-planter, the combination with a divider-box, and a movable divider mounted therein, of a longitudinal lever connecting

said divider at one end and fulcrumed at a point intermediate its ends, a sliding bracket connected to the opposite end of said lever, a continuously-driven shaft, and a cam on said shaft for shifting said bracket, substantially as described.

59. In a seed-planter, the combination with a divider-box and movable divider, of a lever operatively connected to said divider, a sliding bracket connected to said lever for operating it and provided with an oblong aperture, and a driven shaft provided with a wiper-cam operating in said aperture, all combined and arranged as described.

60. In a seed-planter, the combination with a driven axle, and a master gear-wheel thereon, of a shaft extending across the face of said wheel and geared thereto, sliding hangers for said shaft, rods connected to said hangers, sleeves mounted on opposite sides of one of the frame-timbers of the machine and having their ends threaded, coupling-plates having threaded openings to receive said sleeves and arranged on opposite sides of the beam, and a yoke adjustably connected

to the ends of said rods and adapted to receive an operative connection by means of which the hangers are actuated, substantially as described.

61. In a seed-planter, the combination with a divider-box and divider, of a lever connected to said divider for operating it, means for operating said lever, and a sliding bracket carrying a fulcrum for said lever, substantially as described.

62. In a seed-planter, the combination with an intermittently-rotated shaft, of a spur gear-wheel on said shaft, a second spur gear-wheel meshing therewith, operative connections between said second gear-wheel and the drill-teeth for actuating the latter, and means for shifting one of said gear-wheels for the purpose of throwing it out of mesh with the other gear-wheel, substantially as described.

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

SEEHO J. COYIM.

Witnesses:

C. HEDANA,
JESUS J. ROJAS.