

No. 845,078.

A. J. GRITTON.
STRAW STACKER.
APPLICATION FILED SEPT. 22, 1906.

PATENTED FEB. 26, 1907.

4 SHEETS—SHEET 1.

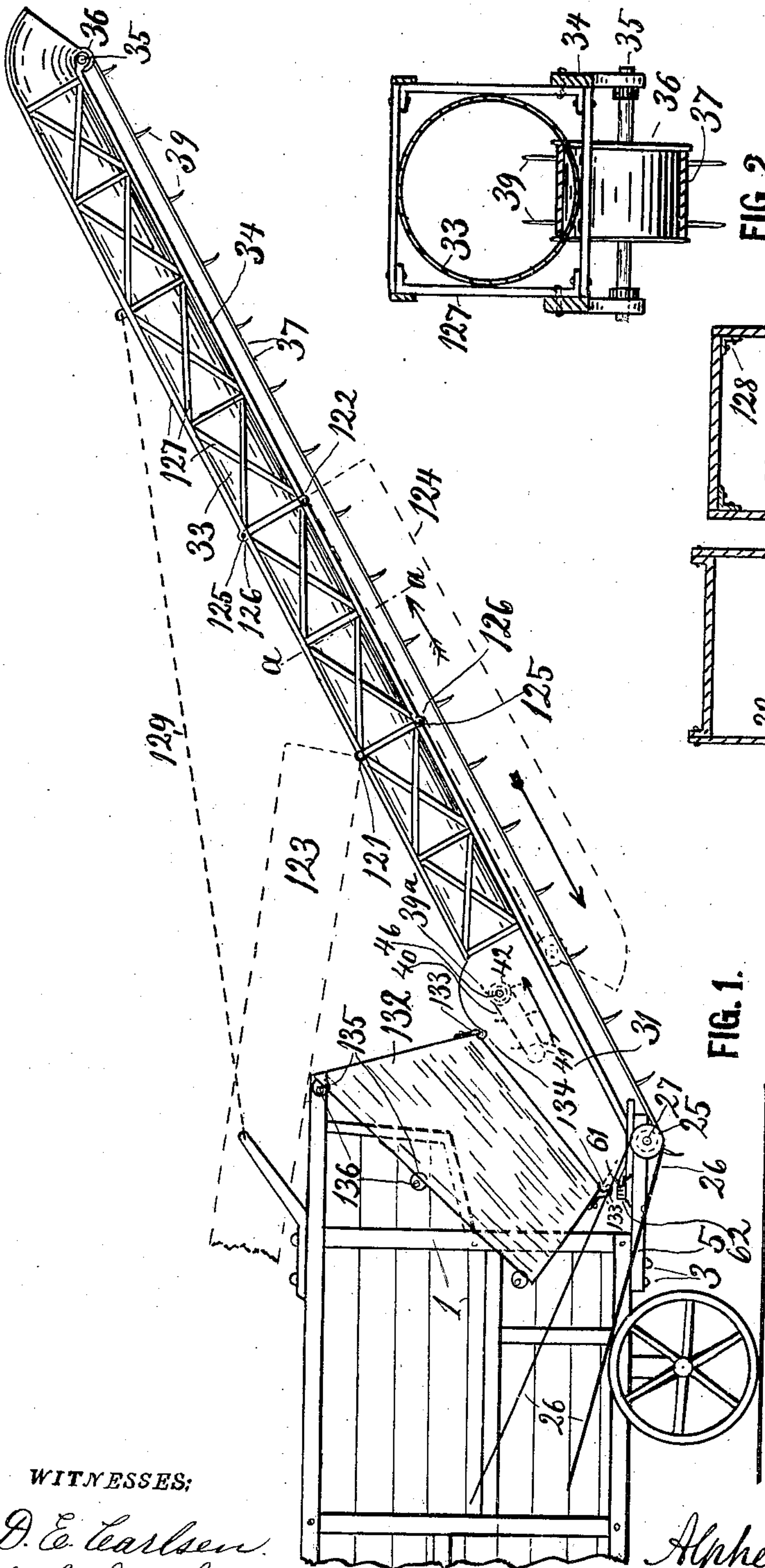


FIG. 1.

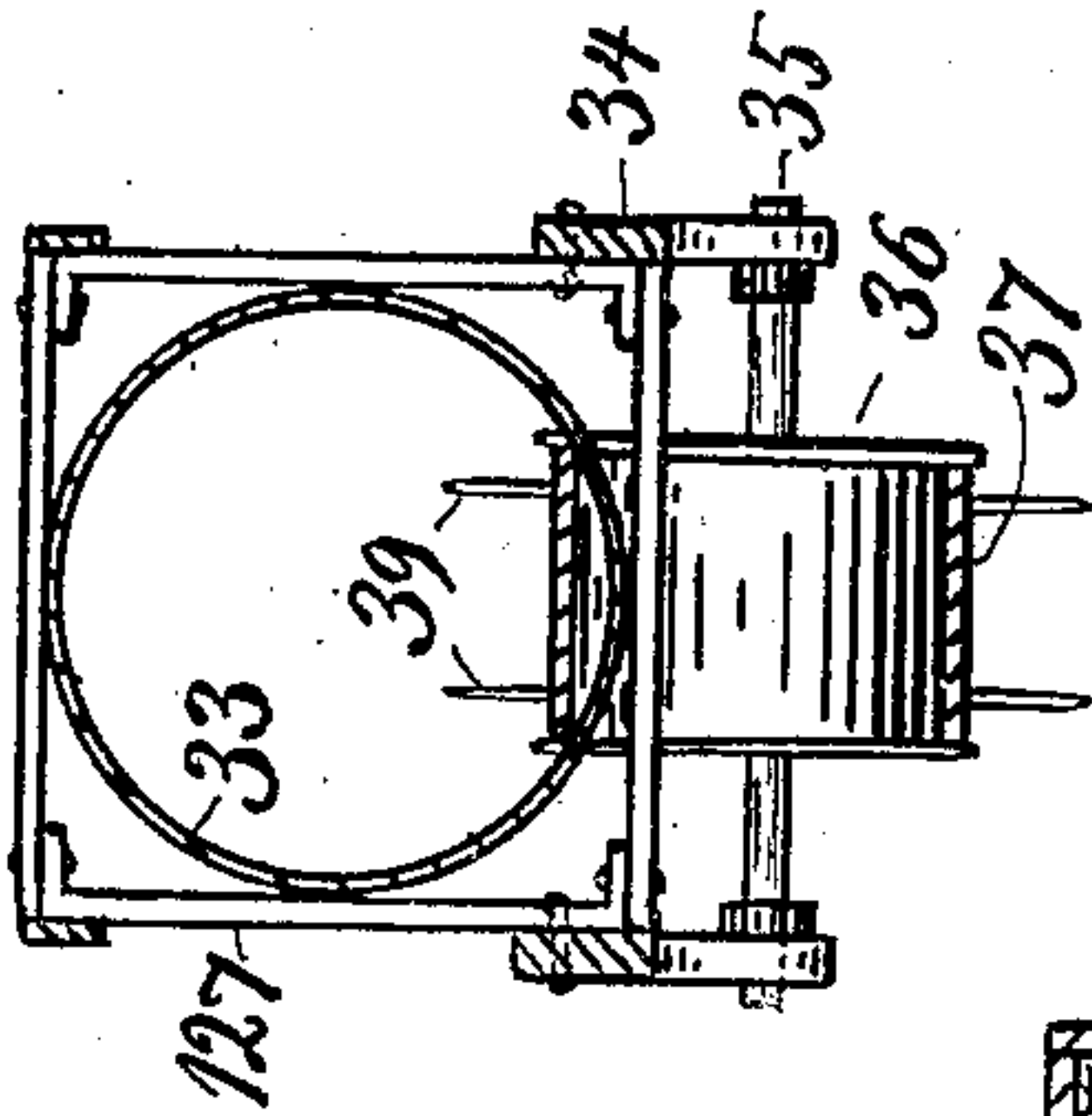


FIG. 2.

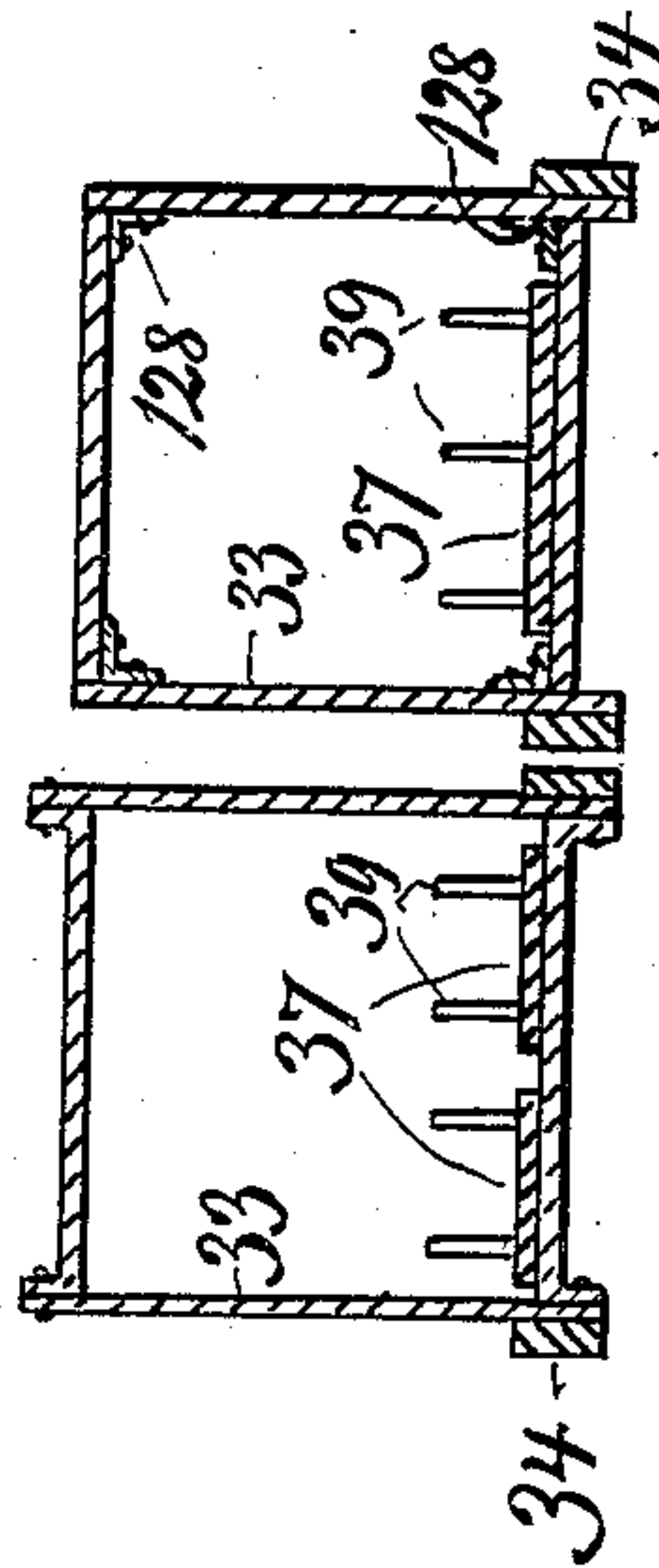


FIG. 3.

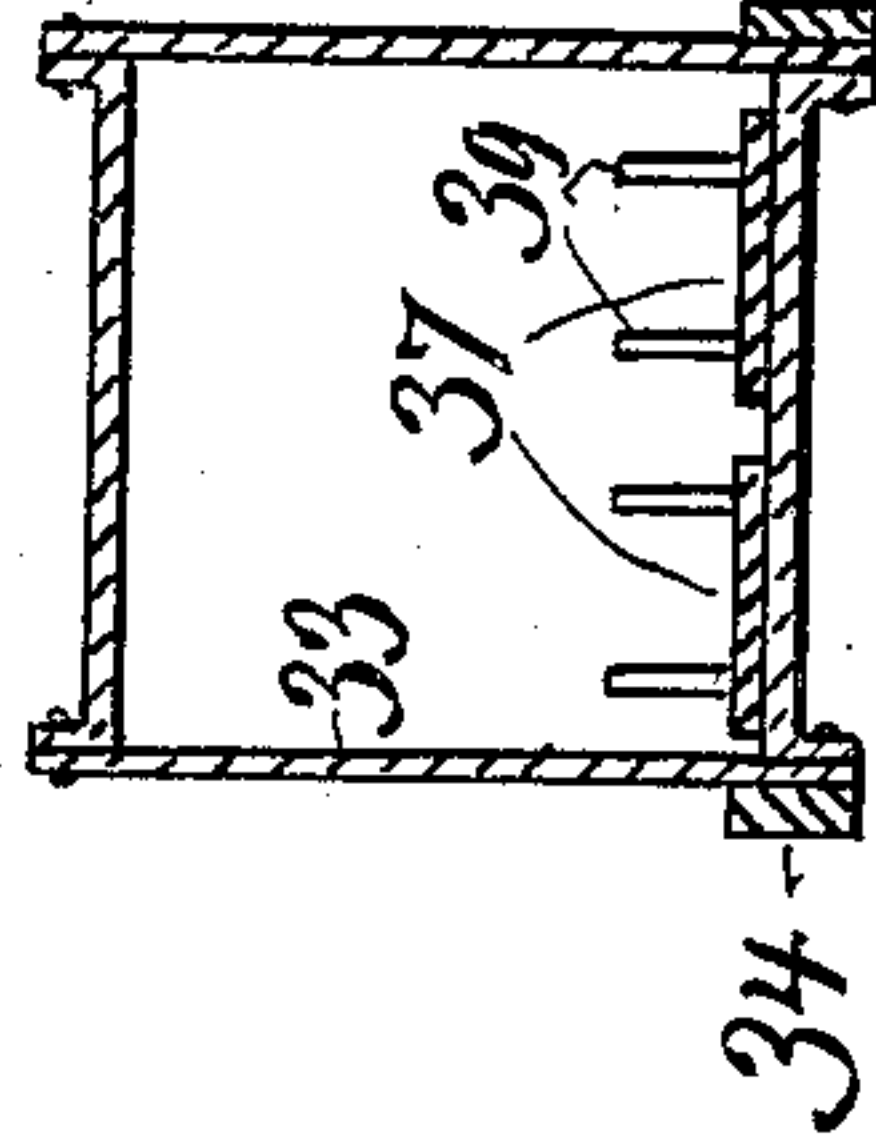


FIG. 4.

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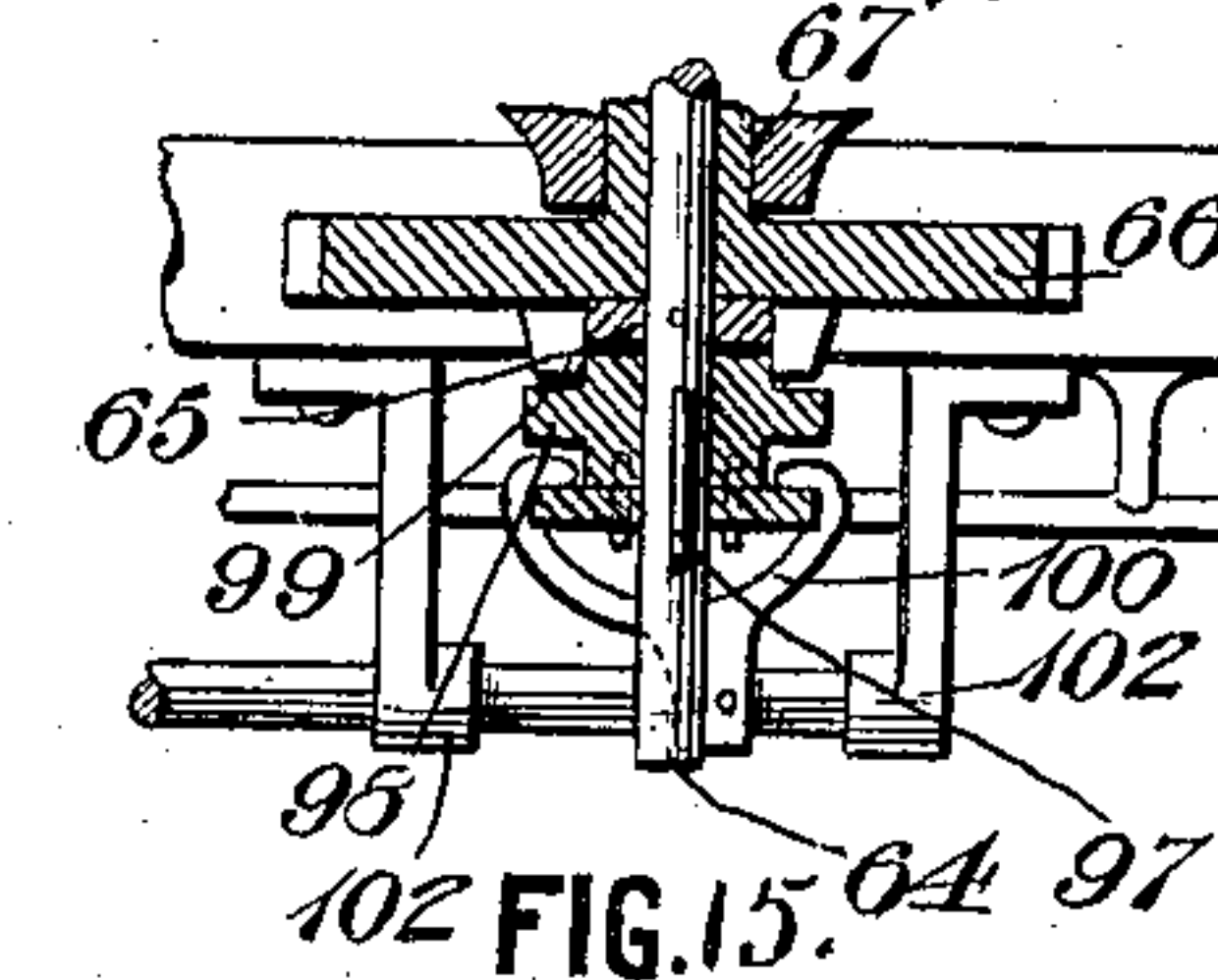
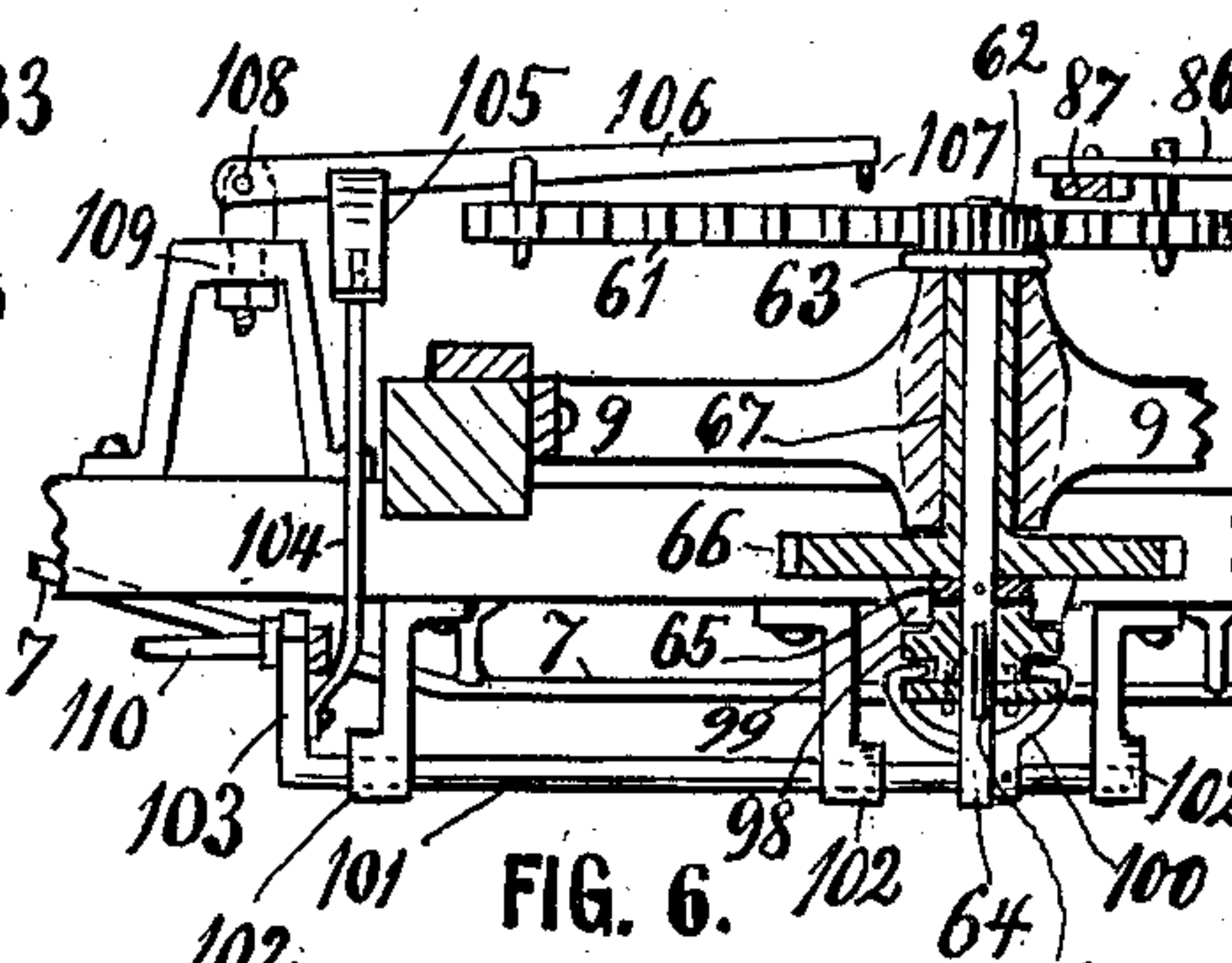
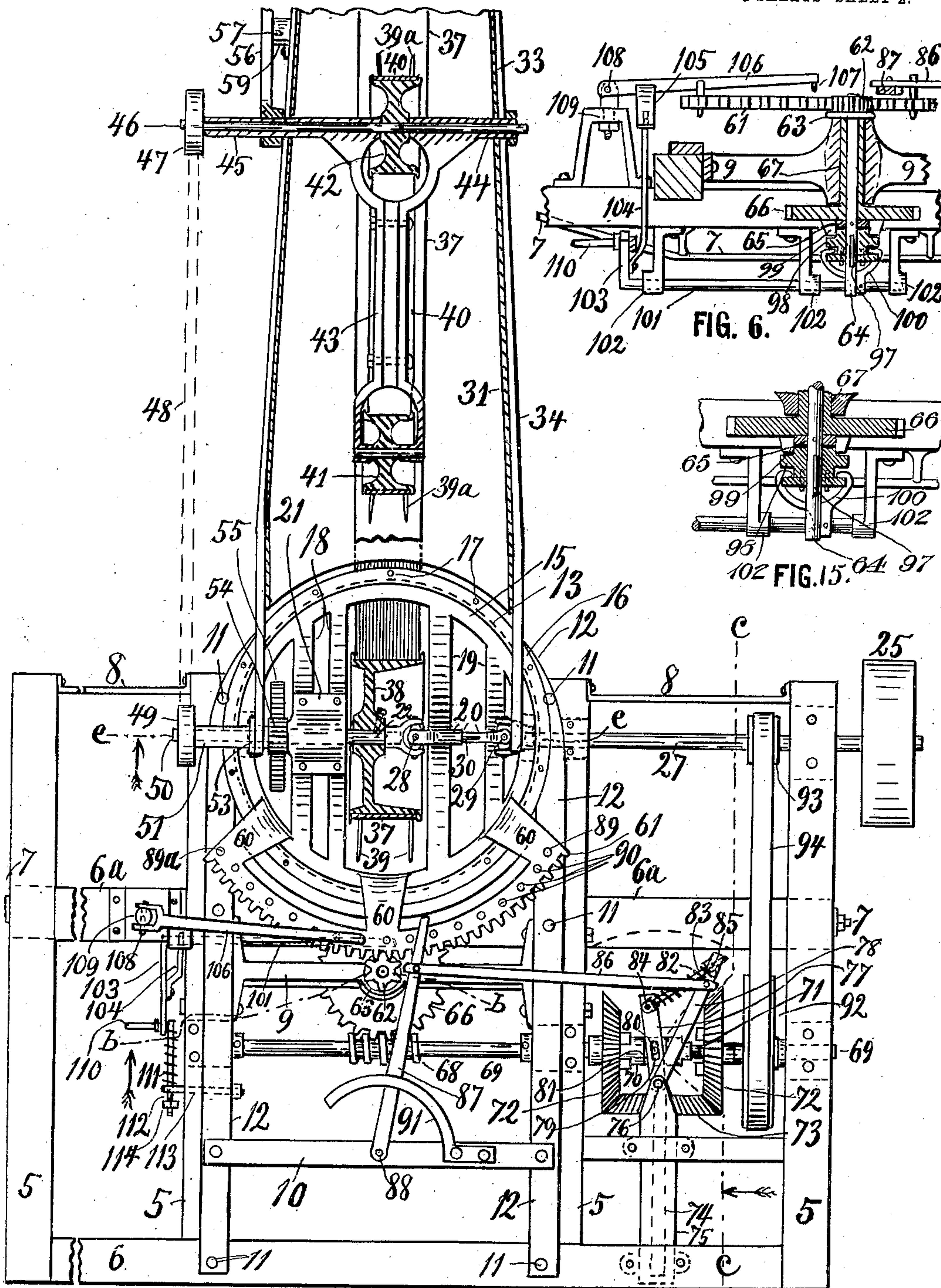


FIG. 5.

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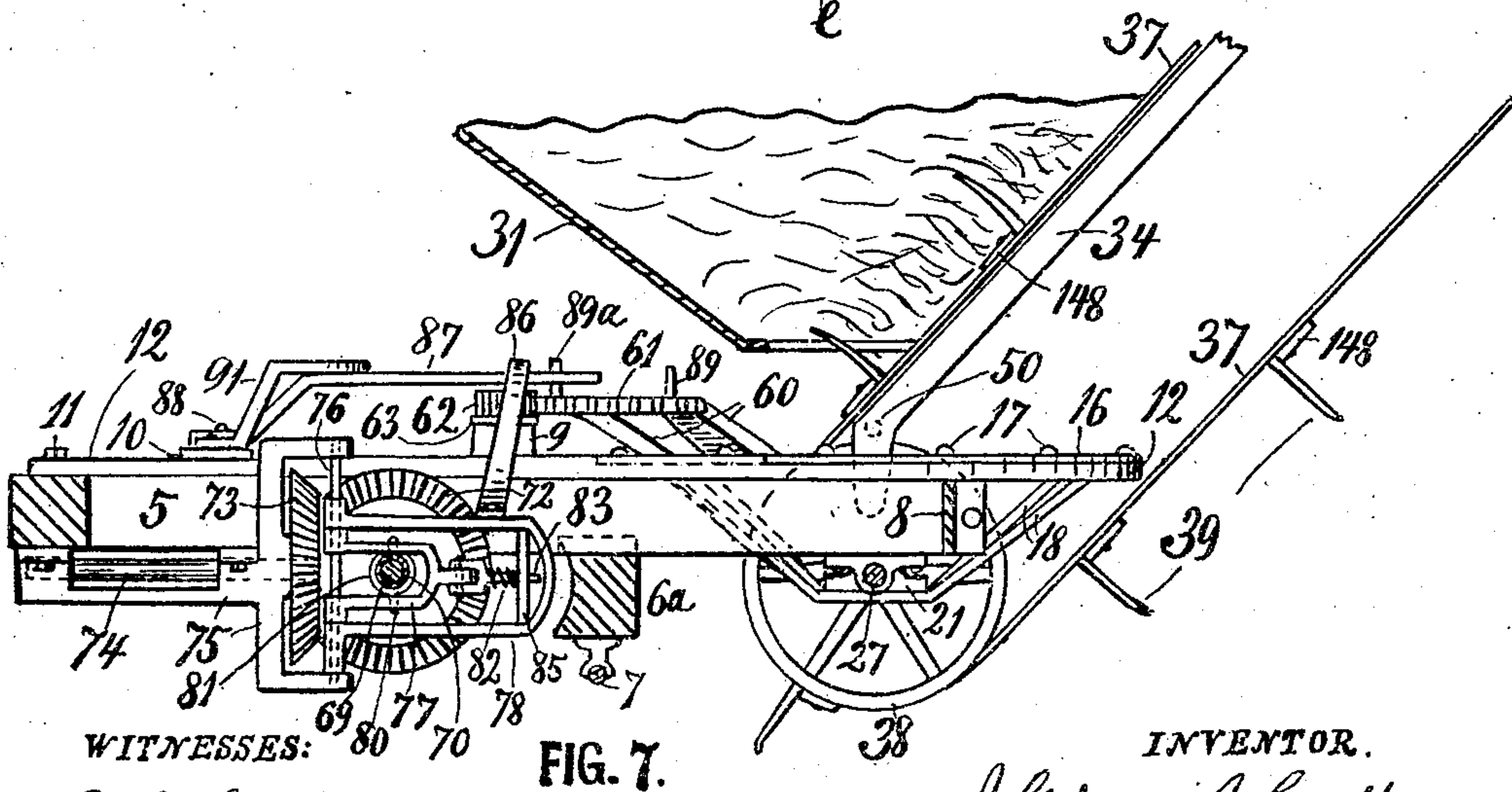
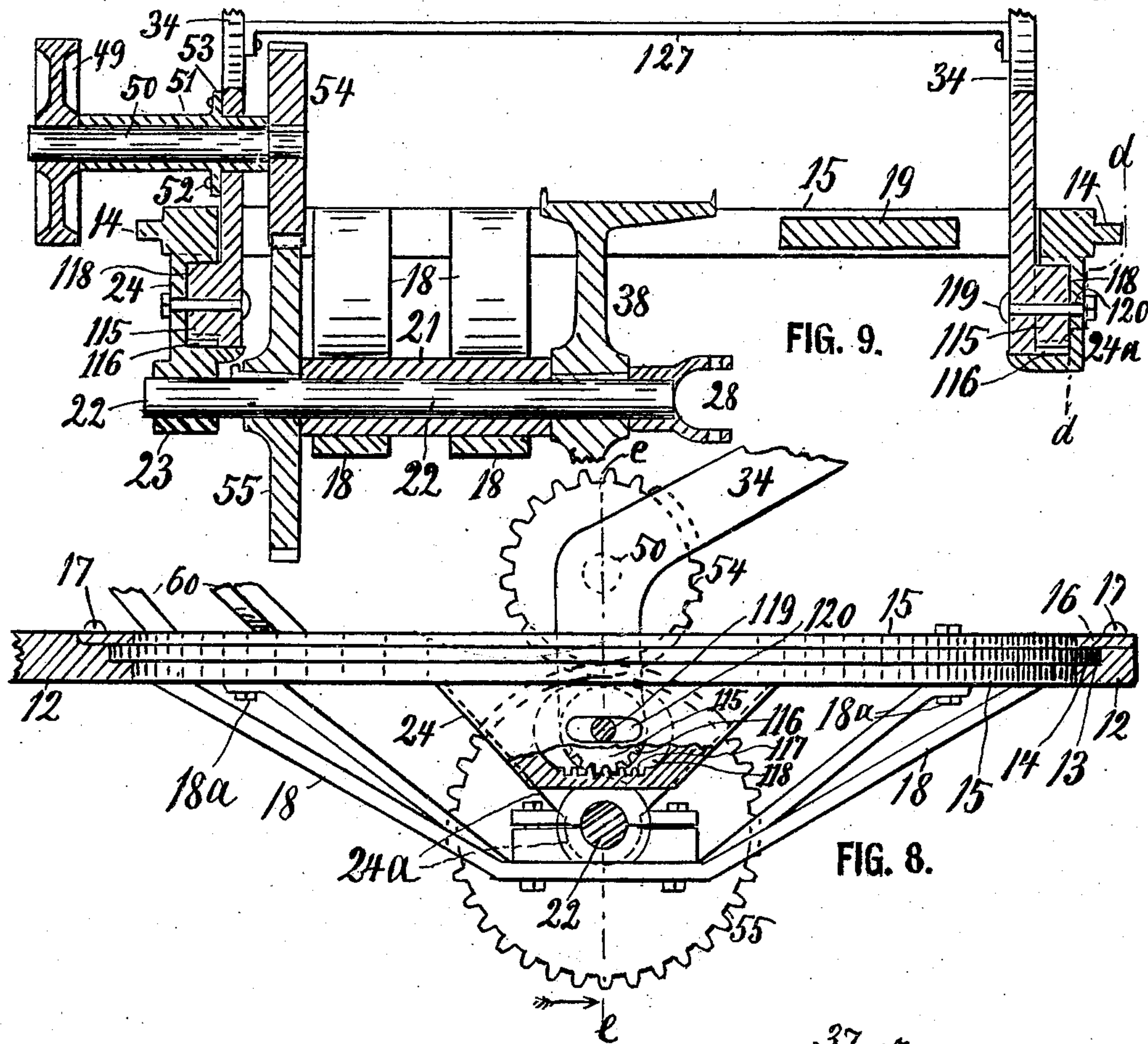
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4 SHEETS—SHEET 3.



WITNESSES:
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FIG. 7.

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4 SHEETS—SHEET 4.

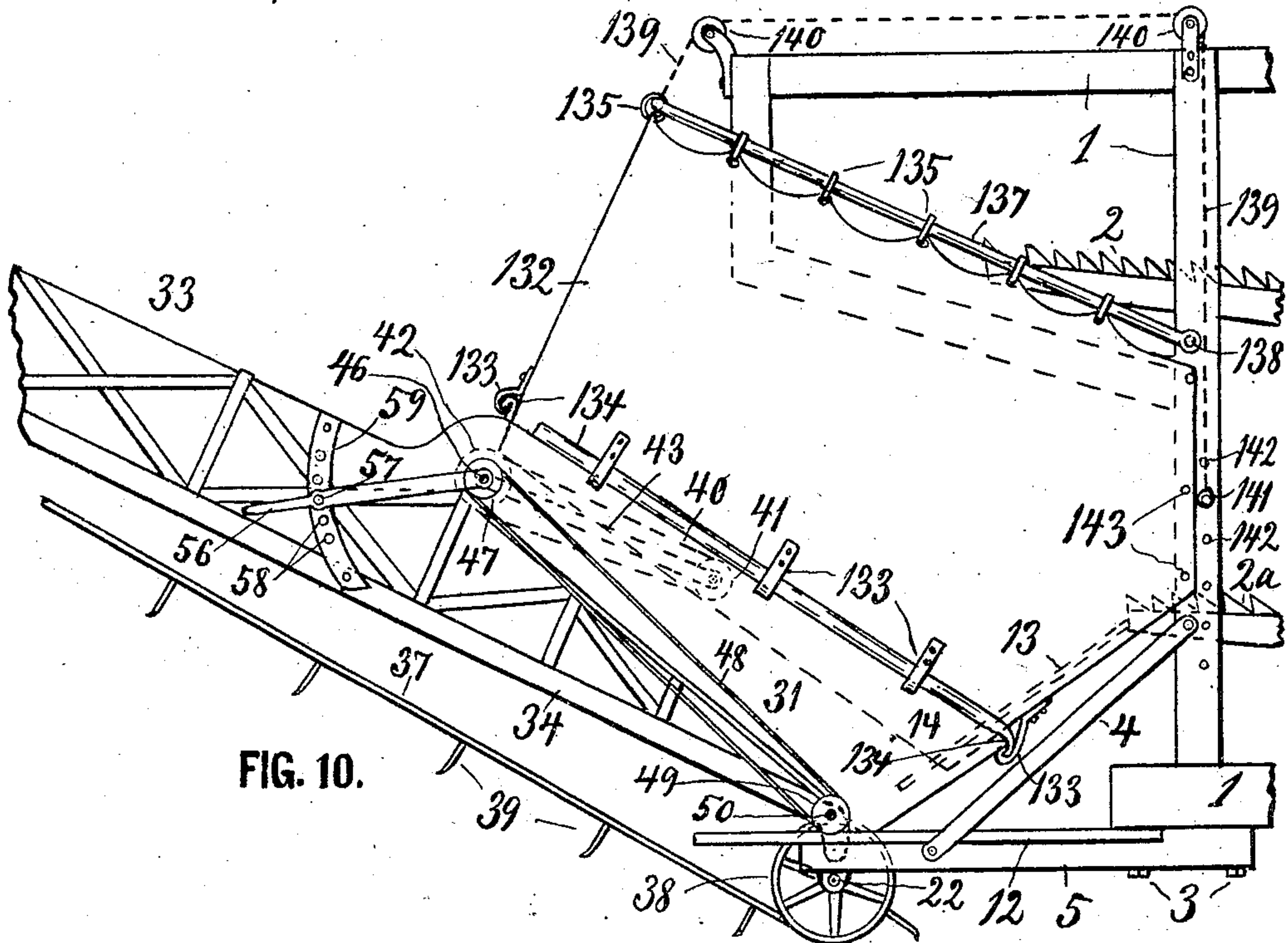


FIG. 10.

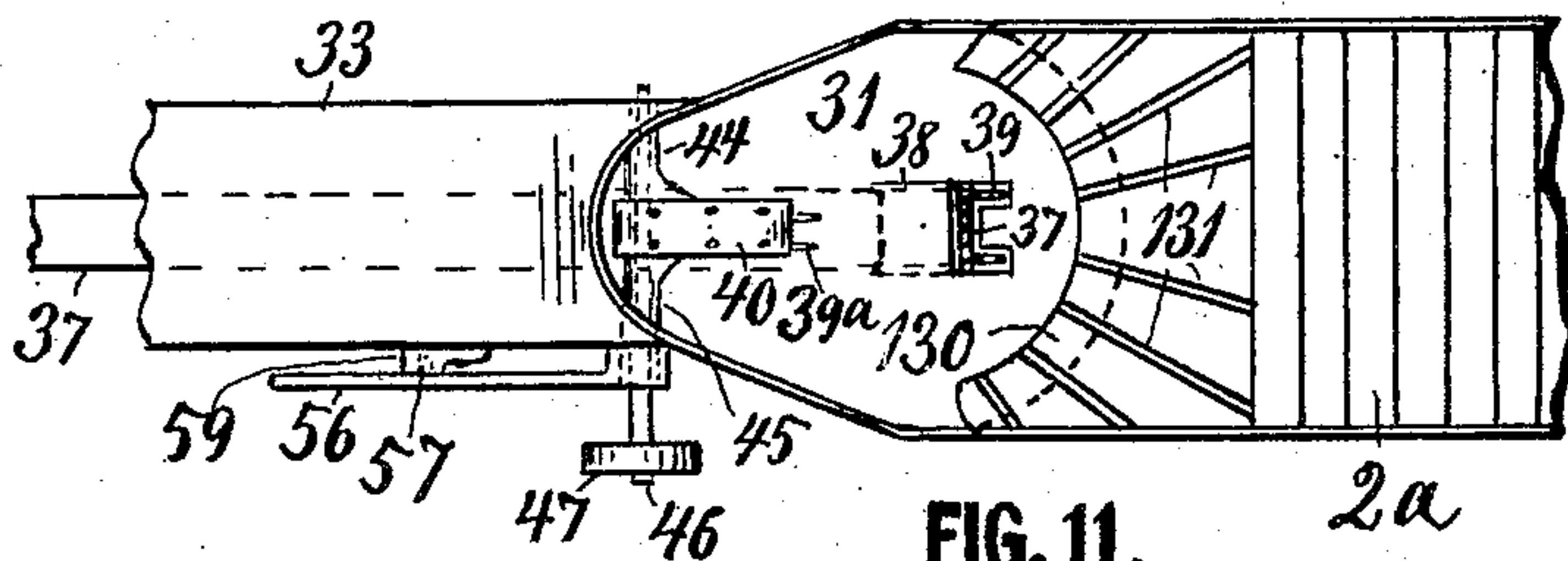


FIG. 11.

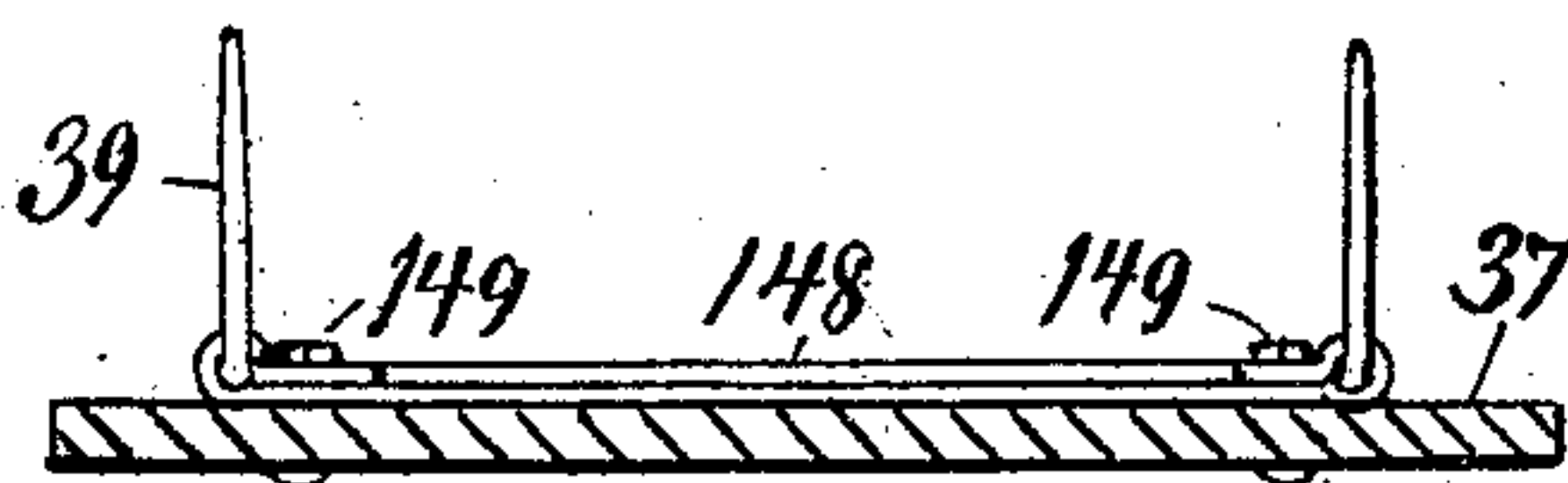


FIG. 12.

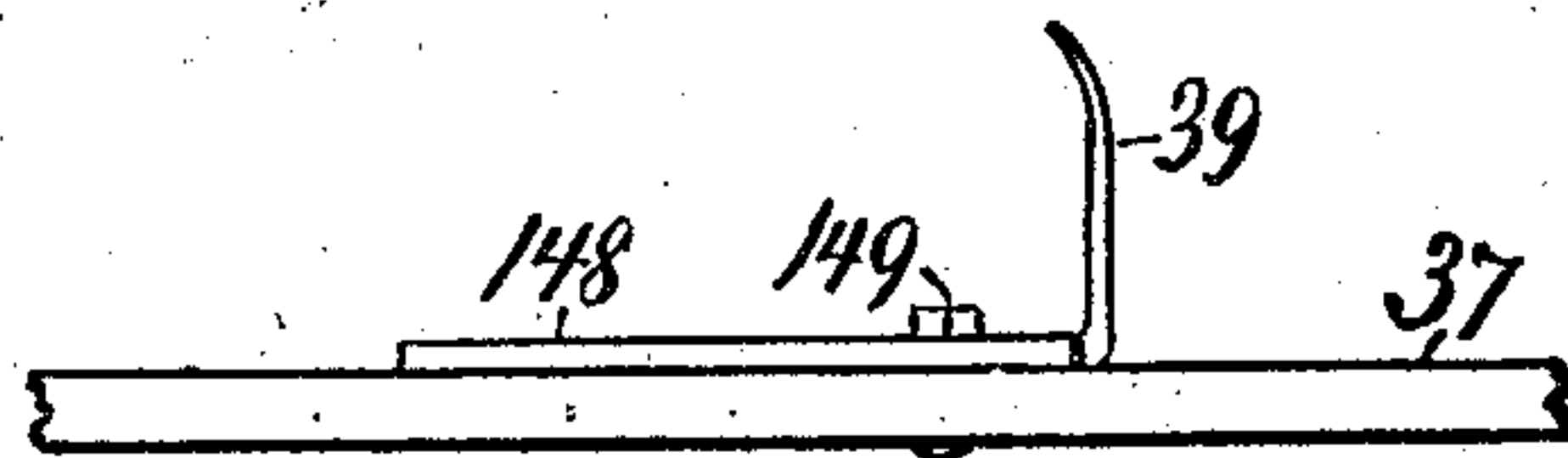


FIG. 13.

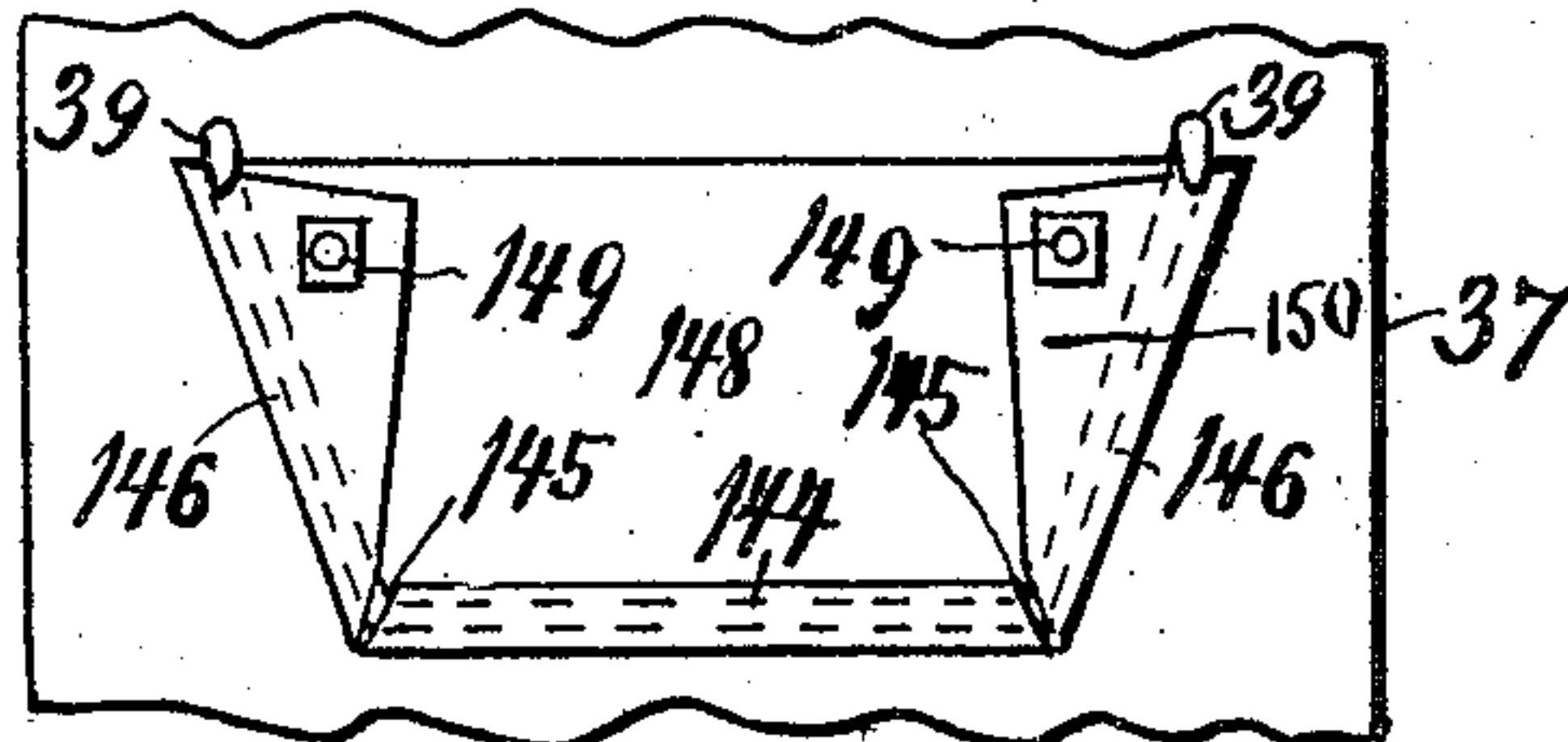


FIG. 14.

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UNITED STATES PATENT OFFICE.

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STRAW-STACKER.

No. 845,078.

Specification of Letters Patent.

Patented Feb. 26, 1907.

Application filed September 22, 1906. Serial No. 335,772.

To all whom it may concern:

Be it known that I, ALPHEUS J. GRITTON, a citizen of the United States, residing at Heron Lake, in the county of Jackson and State of Minnesota, have invented certain new and useful Improvements in Straw-Stackers; and I do 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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to straw-stackers of the endless-belt-conveyer type; and the main object is to provide a straw-stacker with a conveyer which may be set to a steeper pitch than the conveyers heretofore used and may also be exposed to strong winds in any direction and still move the straw steadily along and not allow it to roll back or be blown nor thrown away from the belt conveying it.

Another object is to provide improved means for oscillating the conveyer from side to side for purpose of enlarging horizontally the straw-stacks.

Furthermore, the general object is to improve various parts and features in general, and thereby increase the efficiency of said class of straw-stackers.

These objects I attain by the novel construction and arrangement of parts illustrated in the accompanying drawings, in which—

Figure 1 is right-hand side elevation of my improved straw-stacker connected with the part of a threshing-machine known as the "separator." Fig. 2 is an enlarged cross-section on the line *a a* of Fig. 1 looking in the direction of the arrow. Figs. 3 and 4 are cross-sections of the conveyer tube and belt with different modifications. Fig. 5 is a partly-sectional top or plan view of the stacker with hopper removed and conveyer tube, pulleys, and belts therein in section. Fig. 6 is a vertical section on the line *b b* in Fig. 5. Fig. 7 is a vertical section on line *c c* in Fig. 5 and a portion of the hopper in section. Fig. 8 is a right-hand side elevation of the oscillating table supporting the conveyer-tube and some of the parts mounted thereon, the shaft 22 in Fig. 5 being intersected at the left of pulley 38. The iron frame 12, in which

the table oscillates, is shown in longitudinal central section, and one of the lugs depending from the table is intersected on the line *d d* in Fig. 9. Fig. 9 is a transverse vertical section on the line *e e* in Figs. 5 and 8, showing only the oscillating table and parts supported by it. Fig. 10 is a left-hand side elevation of the stacker secured to the framework of a separator from which it is to carry the straw away. Fig. 11 is a top view looking downward into the hopper and upon the part of the separator delivering straw into said hopper of the stacker, also a portion of the conveyer-tube and its mechanism is shown. Fig. 12 is an enlarged cross-section of the conveyer-belt and a pair of conveyer hooks or fingers secured thereon. Fig. 13 is a side view, and Fig. 14 is a top view, of Fig. 12. Fig. 15 is an enlarged view of the clutch mechanism shown in Fig. 6.

Referring to the drawings by reference-numerals, 1 is the framework, and 2 and 2^a are the shoes, of the separator. To the lower part of the rear end of the separator-frame I secure by bolts 3 and braces 4 (see Fig. 10) a wooden frame, which is the main supporting-frame of the stacker and consists in the present instance of four longitudinal timbers 5, two transverse timbers 6 and 6^a, the latter with a truss-rod 7 to help stiffen the middle of the frame. Also the iron braces 8 and transverse bars 9 and 10 belong to the frame.

Upon the wooden frame is secured by bolts 11 an iron bed or frame 12, which in a circular recess 13 (see Fig. 8) supports the circular flange 14 of the turn-table 15, which is held in said recess by a ring 16, secured upon the frame by screws or bolts 17. The bridge-bars 18 19 may be cast integral with the table or secured thereto by bolts, as at 18^a in Fig. 8.

In the following description the terms "front" and "rear" are used to indicate the inlet and discharge ends of the machine, respectively, the same as threshermen use said terms about the threshers.

As best shown in Figs. 5 and 8, the table 15 is a ring with several parallel downwardly-bulged bridge-bars 18 and 19, of which 19 may be straight and single bars, as indicated in Figs. 7, 8, and 9, but are preferably bulged downward, so as to give more free access to the tumbler-shaft 20, crossing them, while the bars 18, which may also be a single bar,

support the bearing 21, in which the shaft 22 is journaled, and has its outer end (see Fig. 9) journaled in a bearing 23, formed at the lower end of the depending lug or bracket 24, which may be cast integral with or bolted to the table. To the right in Fig. 9 is best shown a similar bracket 24^a, only it is without the journal-bearing 23. The shaft 22 is rotated by the main drive-pulley 25, which is driven by a belt 26 from the thresher or separator, and the shaft 27 journaled to the main frame and turning the tumbler-shaft 20, whose knuckled joints 28 and 29 and sliding joint 30 allow the table to oscillate. The hopper 31 and conveyer-tube 33, extending therefrom, are carried by two frame-arms 34, supported by the table, as will presently be fully described. In the upper ends of said arms is mounted to revolve on or with a shaft 35 a pulley 36, over which is taken the endless conveyer-belt 37, driven by the pulley 38, fixed on the shaft 22. Said belt is provided with claws or fingers 39, by which to carry the straw up the tube and discharge it to the rear thereof. Above the main conveyer-belt is an auxiliary short conveyer-belt 40 with fingers 39^a. This belt is arranged in the rear part of the hopper 31, where it is stretched over two pulleys 41 42, mounted to revolve in an elongated frame 43, whose rear end is provided with two sleeves 44 45, journaled in the sides of the conveyer-tube 33 or hopper part thereof and forming the journals for the shaft 46, which drives the pulley 42 and is driven by a pulley 47, belt 48, and a pulley 49. The latter pulley is secured on a shaft 50, journaled in a sleeve 51, which extends through the left side frame-arm 34 (see Fig. 9) and is secured to the arm by screws 52 through its collar 53. On the inner end of said shaft 50 is fixed a gear-wheel 54, driven by a larger gear-wheel 55, secured on the shaft 22. The front end of the frame 43 is thus adapted to be swung to and from the main conveyer-belt, and thus assist in gathering and starting the straw in such light or heavy charges or stream as it may come. The height of the pulley 41 from the main conveyer-belt is controlled by an arm 56, fixed on the sleeve 45 and having a pin 57 adapted to be let into any of the holes 58 in a sector 59, fixed upon one side of the hopper or adjacent part of the tube. The table 12 is formed with arms 60, carrying a toothed sector 61, engaged by a pinion 62, which oscillates the section, and thereby the table and the conveyer-tube, so as to spread the stack. How said pinion is operated and oscillated will now be described.

As best shown in Figs. 5 and 6, the pinion 62 is formed with a wearing-collar 63, resting upon the frame-bar 9, while the shaft 64, driving the pinion, is journaled in said frame-bar and below the latter has affixed to it a

collar 65, supporting a worm-gear 66, having a sleeve 67 to steady it on the shaft. Said worm-gear is oscillated by a worm-screw 68 on a shaft 69, journaled in the main frame and carrying a coupling member 70, sliding on a feather-key 71 and adapted to engage alternately with clutch-teeth of either one of the two miter-gears 72, which revolve on the shaft and are given reverse direction of motion by means of an intermediate idler-wheel 73, mounted on a stump-shaft 74 in a bracket 75.

As best shown in Figs. 6 and 7, the bracket 75 supports pivotally on a pintle 76 two U-shaped levers 77 and 78, of which 77 is provided with slots 79 for the trunnions 80 of a collar 81, engaging in an annular recess in the coupling member 70, so as to move the latter when the lever 77 is thrown in either direction by the expanding coil-spring 82, which encircles the guiding-rod 83, pivoted at 84 to the short lever 77 and sliding in a hole in a rod 85, rocking in the larger lever 78. The latter lever is pivotally connected by a rod 86 to a horizontally-swinging arm 87, pivoted at 88 to the frame and having its rearward end thrown from side to side by two pins 89 and 89^a, which are movable into any of the holes 90 in the sector 61, so that by moving the pins closer together the oscillating motion of the stacker may be reduced. 91 is a guide to prevent accidental rising of the arm 87 and rod 86. This explains the automatic oscillation of the table and conveyer-tube when power is transmitted to the shaft 69 by the pulleys 92 93, belt 94, and shaft 27.

For the purpose of stopping the oscillation of the stacker when so desired I provide the following means, (best shown in Fig. 6:) On the shaft 64 slides, on a feather-key 97, a clutch member 98, adapted to engage clutch-teeth 99 of the worm-wheel 66. The clutch member is thrown into and out of such engagement by a fork 100, which is fixed on a rock-shaft 101, journaled in bearings 102 and provided with a rocker-arm 103, from which extends upwardly a push-piece 104, engaging a wing 105 of a hook-rod 106, whose hook 107 may engage any of the holes 90 in the sector 61, so as to hold the table still when the fork 100 holds the clutch member 98 downward into idle position, and when the clutch is in active or engaged position the push-rod 104 will automatically disengage the hook 107 from the sector 61, so that the latter may oscillate without breaking the hook. The hook-bar 106 is pivoted at 108 to swing vertically and at 109 to swing horizontally into a direction away from the sector. The rocker-arm 103 is provided with a handle 110, by which it is swung either into an upwardly or downwardly inclined position, whereby it holds the clutch member 98 either fully engaged or fully disengaged. In either of said

positions the arm is held by an expanding coil-spring 111, encircling a rod 112, pivoted to the rocker-arm and sliding in a rocking eyebolt 113, which guides the rod, resists the spring, and by meeting a nut 114 on the rod prevents the fork 100 from pushing too hard upward the clutch member, and thereby cause undue wear on the fork or on a ring (not shown) which may be used between the fork and the clutch member, on the principle of ring 81 in the clutch, by which the oscillation is produced.

Turning now again to the stacker or conveyer-tube, it will be seen in Figs. 8 and 9 that its supporting-frame arms 34 have their lower ends provided each with a cylindrical lateral projection 115, having at its lower side cogs 116, engaging cogs 117 of a horizontal rack formed in the lower side of a horizontally-elongated recess 118, one in the bracket 24 and the other in bracket 24^a. The upper side of said recess holds the projection or pinion 115 always in gear with the rack, and a bolt 119, moving in a slot 120, helps to hold the pinion in the recess. For the advantage of this construction see the last clause of the specification.

The conveyer-tube is provided with two joints 121 and 122, (see Fig. 1,) whereby it may be folded into either the position 123 or 124, as may be desired. Said joints are held in normal position by locking-rods 125, inserted in overlapping eye-lugs 126. When the tube is made of very light sheet metal, it is supported in a skeleton frame 127, on which the joints and the lugs 126 are then formed. In Figs. 1 and 2 the tube is shown as being of cylindrical form; but it is obvious that I may also make it of any other form—as, for instance, in the modification Fig. 3, where the tube is of four-cornered section and the belt has three rows of fingers 39 and the sides of the tube may be secured together by angle-irons 128, or in Fig. 4, where the sides are riveted together in the manner shown and the belt is in two strands with two rows of fingers in each or, what is the same, two belts are used. In said views Figs 3 and 4 the tube is heavy enough to be without the frame 127, and said frame may also be dispensed with if a cylindrical tube is made of sufficiently thick sheet metal to not need the frame. In Fig. 1, 129 represents any suitable means for holding the stacker-tube at any desired incline.

In Fig. 11 is shown a heavy canvas 130, stiffened by light cleats 131 and extending from the lower shoe 2^a, from which it conveys chaff and short straw into the hopper. This canvas may be an independent piece or an integral part of the main canvas 132, which extends about the hopper and guides the straw into the latter from the separator. Said canvas has near its lower edge hooks

133, engaging the downwardly-curved edges 134 of the hopper, and the upper edge of the canvas may be secured to the separator by rings 135, dropped upon headed pegs 136, as in Fig. 1, or preferably, as in Fig. 10, the rings may be placed on a bail 137, pivoted, as at 138, to both sides of the separator, and then the bail is held at different elevations, according to the elevation of the conveyer-tube, by a cord or chain 139, passing over sheaves 140 and adjustably secured by having a ring 141, movable to any of the several pegs 142 on the separator. The front edge of the canvas if not integral with the canvas 130 may be secured thereto or to the separator-frame by eyelets placed on buttons or studs 143.

In Figs. 12, 13, and 14 is shown my preferred way of securing hooks or fingers to the conveyer-belts. In said views it will be seen that a piece of wire 144 is bent at obtuse angles 145 to form two arms 146, lying in the same plane with each other and with the wire bar 144, thus forming together a bow adapted to be secured upon the belt, while the ends of the two arms are bent at about right angles away from the belt to form two fingers 39, whose free ends are slightly curved away from the straw moved by them, so as to drop the straw so much easier when it leaves the conveyer. 148 is a sheet-metal plate bent at three edges to fold inwardly over the parts 144 and 146 of the wire. After the wire is thus secured in the plate the latter is secured to the belt by bolts 149, passed through the belt, the plate, and the flaps 150 of the latter, whereby the fingers are held very firmly to the belt.

To insure a full understanding of the use of the construction 115 to 120 in Figs. 8 and 9, it may be further stated that the rack and pinion preferably form the supporting-joint of the arms 34 above and not on the shaft 22, and this higher position of the joint would cause the gear 54 to press against the gear 55 when the arms swing back or forth beyond a vertical position above gear 55. Hence the straight form of the rack is used to compensate for such falling of gear 54, and thus avoid pressure of said gear upon the lower one 55.

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

1. A straw-stacker comprising a conveyer-belt running with one part upwardly at an incline, a thin tube encircling said part of the belt, and a skeleton frame extending along the tube to stiffen and support it, said tube and frame having one or more transverse joints for folding up the tube during transportation.

2. In a straw-stacker, the combination with a conveying-tube adapted to be adjusted to different inclines, of a pulley at

each end thereof, an endless conveyer-belt stretched over said pulleys and passing upward inside the tube and downward outside the tube, and a shaft in the lower pulley for driving it and the belt; said belt having hooks or fingers adapted to convey the straw; an elongated frame pivoted to swing to and from the lower part of the main conveyer-belt, two pulleys mounted in said swinging frame, an auxiliary comparatively short conveyer-belt passed over said pulleys and provided with fingers, means for tilting and holding the said frame at different inclines to the main conveyer-belt, and means for operating the auxiliary belt from the shaft driving the main conveyer-belt.

3. A straw-stacker having a conveyer-belt with fingers thereon for moving the straw, said fingers being formed in pairs one finger at each end of a single piece of wire, the middle of the wire being bent to a U-shaped bow standing at about right angles to the fingers, a metallic plate between said bow and the belt and having three of its edges bent inward so as to embrace the loop and both arms of the U, and project inside of it, and bolts passed through the belt and said plate for securing it to the belt.

4. In a straw - stacker, the combination with a frame adapted to be fixed to the separator, an oscillatory table mounted therein, an inclined straw-conveying elevator mounted on the table and having an endless conveyer-belt, a toothed sector secured on the table, a vertical shaft journaled in the frame, a pinion fixed on the shaft and engaging the sector, a worm-wheel loose on the shaft, a clutch by which to couple the worm-wheel to the shaft when so desired, a worm-screw engaging the worm-gear, a shaft journaled to the table and a pulley thereon driving the endless belt, a main shaft journaled in the fixed frame, a pulley fixed thereon and adapted to be driven by a belt from the separator, a flexible or knuckle-joint shaft connecting the main shaft with the shaft in the table, whereby the table is permitted to oscillate, a drive-pulley on the main shaft and a driven pulley on the worm-screw or its shaft, a belt connecting said two pulleys, a clutch mechanism on the shaft of the worm-screw for reversing alternately the rotatory motion of the screw, movable pins in the sector, a lever mechanism operated by said pins, whereby the clutch mechanism is reversed automatically and the elevator thereby oscillated to the extent regulated by the position of the pins in the sector.

5. In a straw-stacker, the combination of a frame securable to the separator of a threshing-machine, a horizontally-oscillating table mounted therein, a straw-conveyer mounted on the table and a shaft operating

the same, a toothed sector provided on the table, a gear mechanism engaging the sector to oscillate the table, said sector having a series of holes, a hook pivoted to the frame and adapted to engage either of the holes to hold the table and conveyer in certain positions, a clutch adapted to establish operative connection between the gear driving the sector and the shaft driving the conveyer-belt, a handle throwing said clutch and a spring holding the handle when the clutch is in idle and inoperative position, and means extending from the handle whereby the hook is disengaged from the holes in the sector when the clutch is in a position to cause oscillation of the sector.

6. A straw-stacker having a horizontally-oscillating table with openings through it and adjacent the openings downwardly-projecting lugs with lateral horizontally-elongated recesses having cogs in their lower sides, a conveyer-tube mounted on said table by having arms extending through the table and provided with lateral pinions inserted in the recesses and engaging the cogs therein, and means for holding the tube more or less inclined.

7. A straw-stacker having a horizontally-oscillating table with openings through it and adjacent the openings downwardly-projecting lugs with lateral horizontally-elongated cavities or recesses having cogs in their lower sides, a conveyer-tube mounted on said table by having arms extending through the table and provided with lateral pinions inserted in the recesses and engaging the cogs therein, and means for holding the tube more or less inclined; said cavities having in their bottoms horizontal slots, bolts through said slots, and through the centers of the pinions, for the purpose set forth.

8. The combination with a grain-separator, of a straw-stacker arranged in position to convey the straw from the separator, a hopper and conveyer-belt in the stacker, a canvas stiffened with cleats and extending from the lower shoe of the separator and forming a guide for the chaff and short straw to the hopper.

9. A straw-stacker comprising a base-frame, a conveyer-tube having at its lower end frame-arms pivotally mounted in the frame to admit changing of the incline of the tube, a main and an auxiliary conveyer-belt working in the tube, a horizontal main shaft journaled in the frame, a gear-wheel fixed thereon and also a pulley engaging and driving the main conveyer-belt, a short shaft journaled in one of the frame-arms of the tube, a gear-wheel fixed thereon and meshing with the gear on the main shaft, also a pulley on the short shaft for transmitting power to the auxiliary conveyer-

belt; said frame having above the main shaft
two horizontally - elongated recesses with
rack-bars in their lower sides, and the frame-
arms of the tube having partly-toothed pin-
5 ions inserted in the recesses and meshing
with the racks therein, whereby the pivot-
joints between the tube and the frame is
formed in a manner allowing the said two

gears to mesh properly also when the incline
of the tube is changed. 10

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

ALPHEUS J. GRITTON.

Witnesses:

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C. PETERSON.