

No. 641,532.

Patented Jan. 16, 1900.

J. A. MUSSETTER.
STRAW STACKER.

(Application filed June 30, 1898.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.

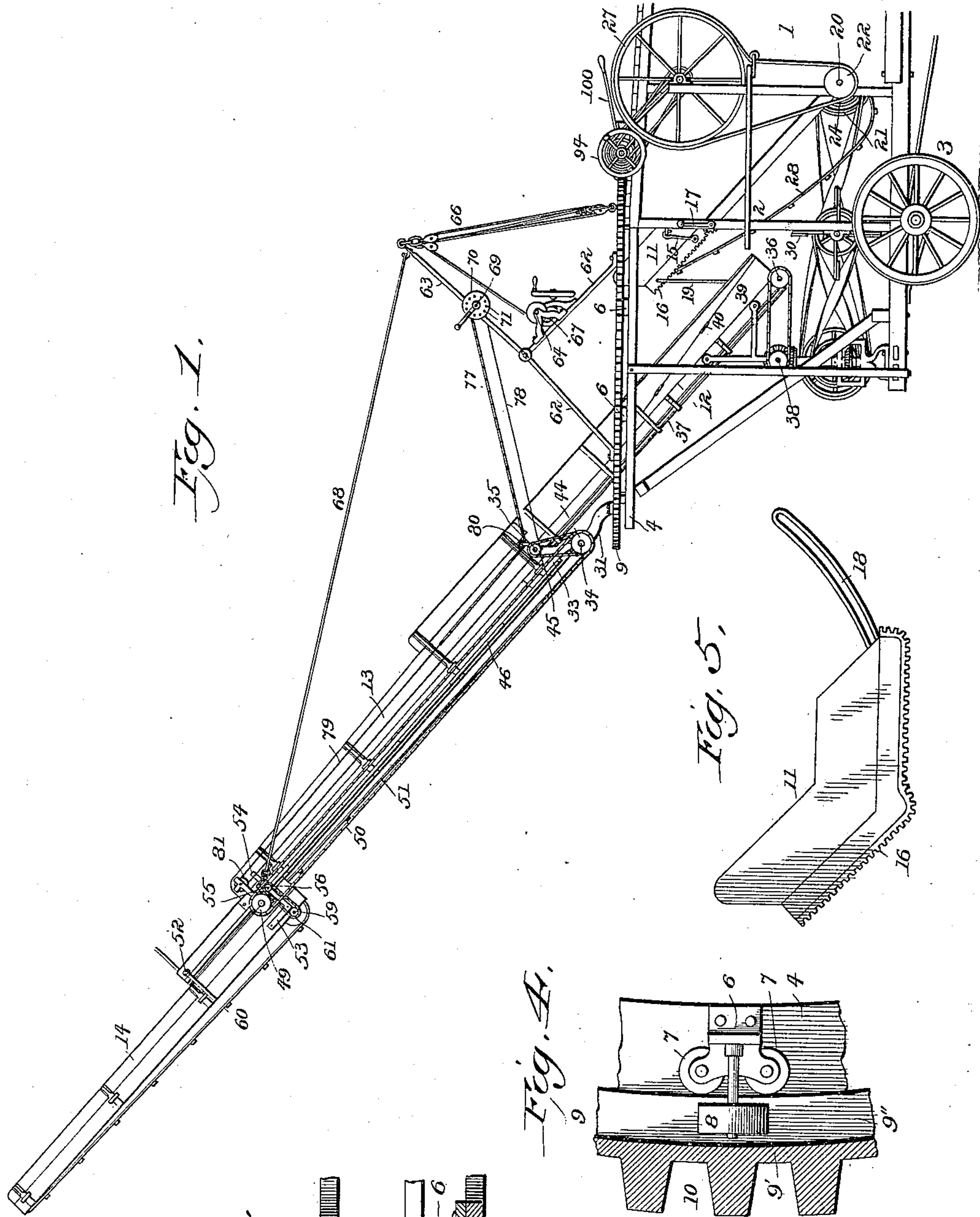


Fig. 5.

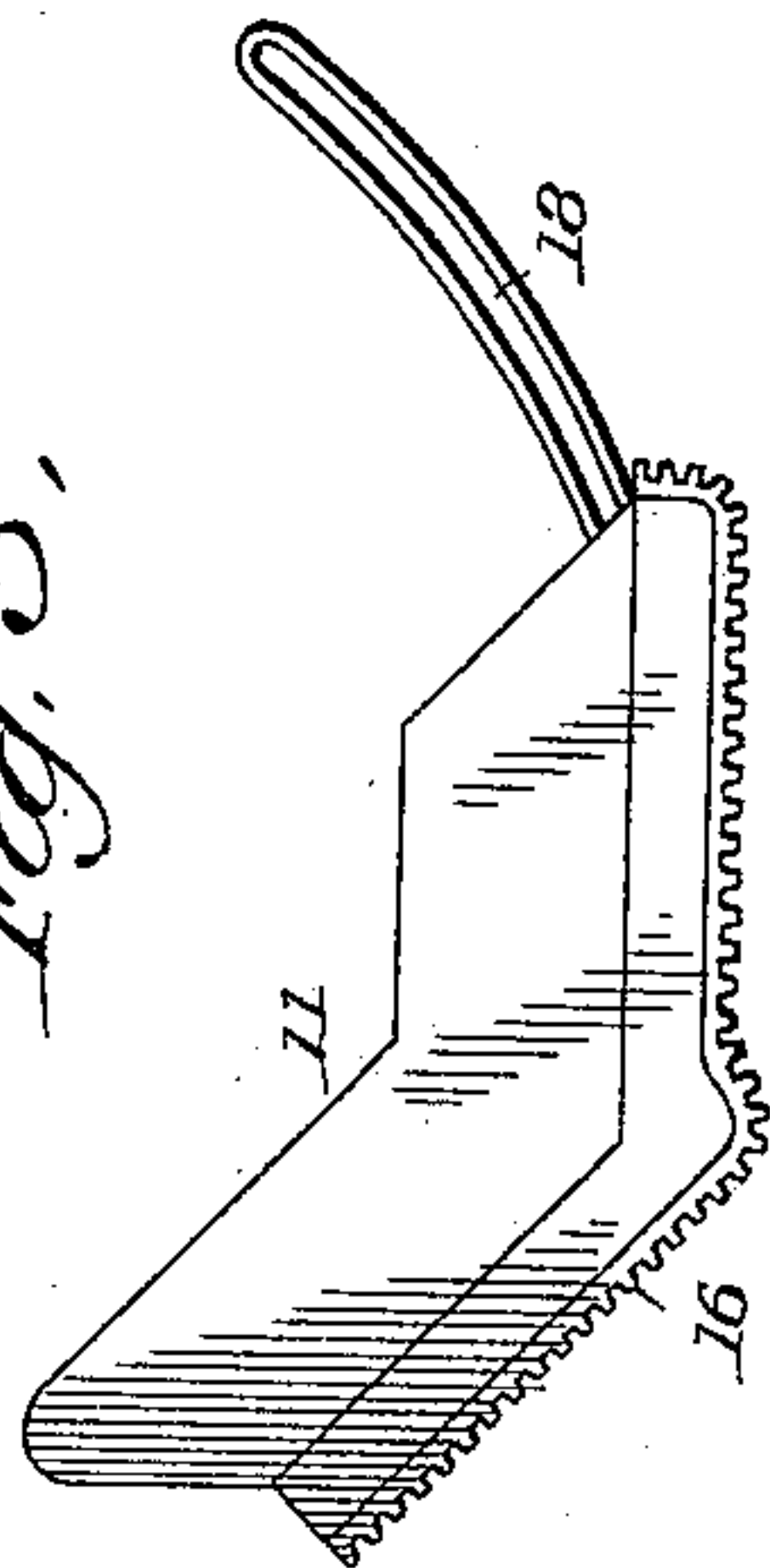


Fig. 4.

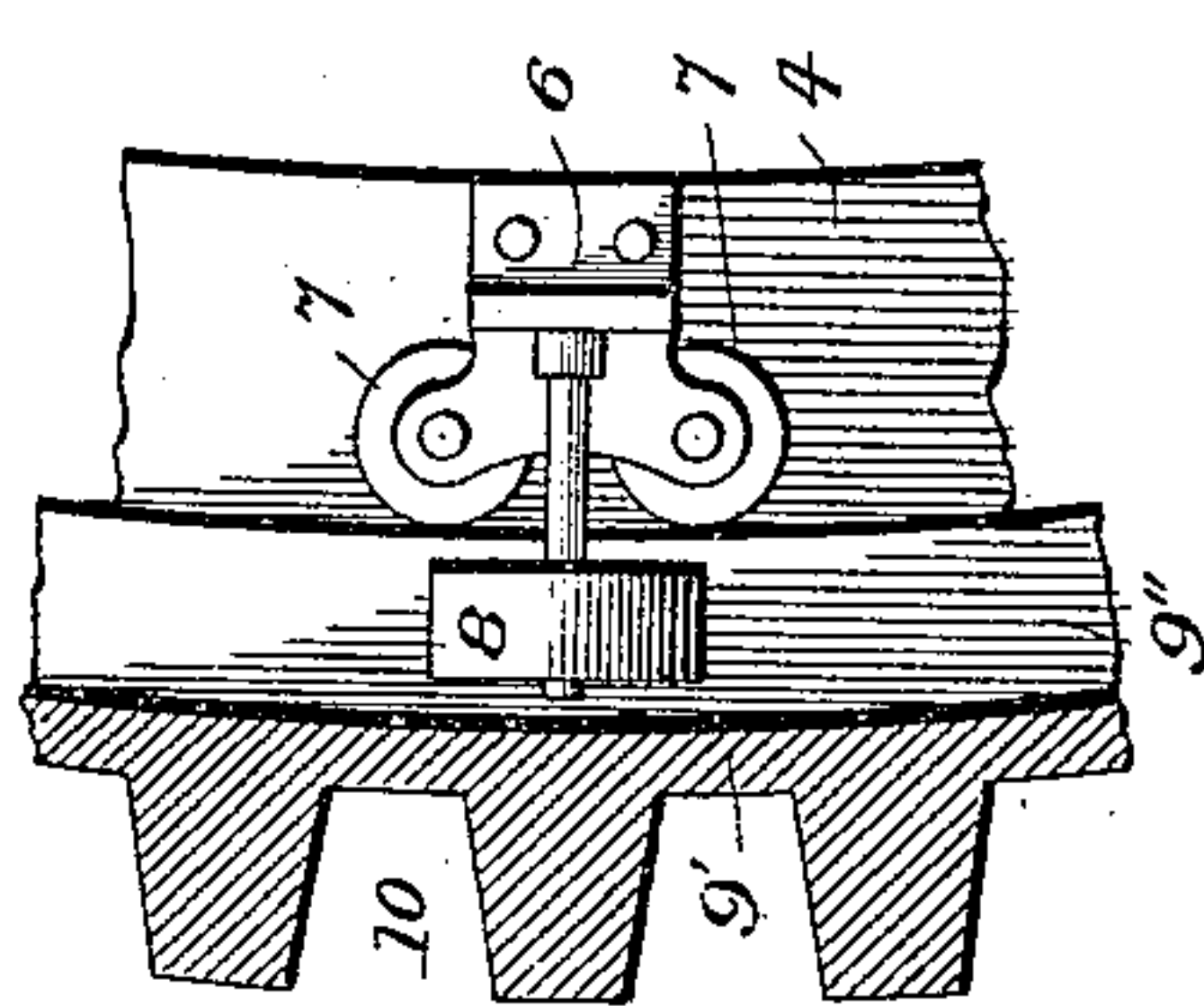
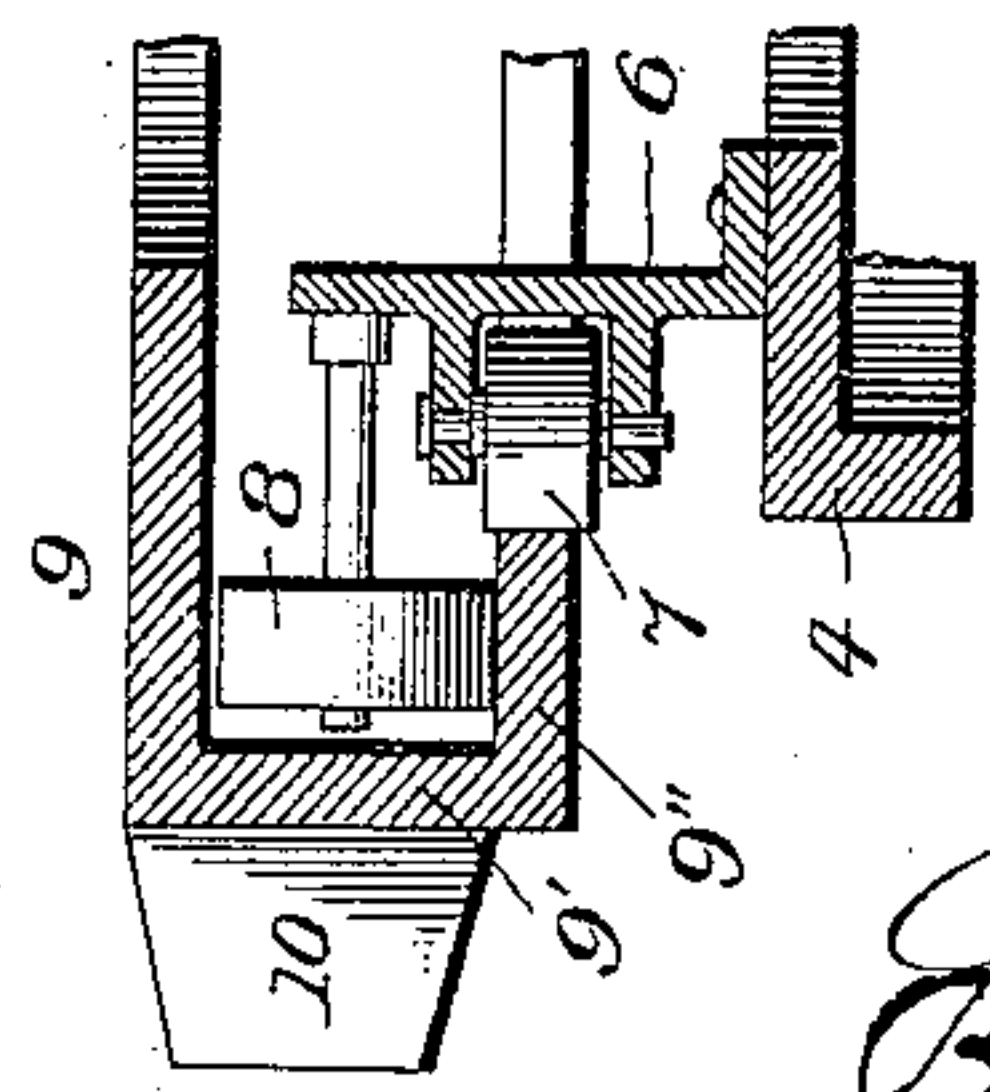


Fig. 3.



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4 Sheets—Sheet 2.

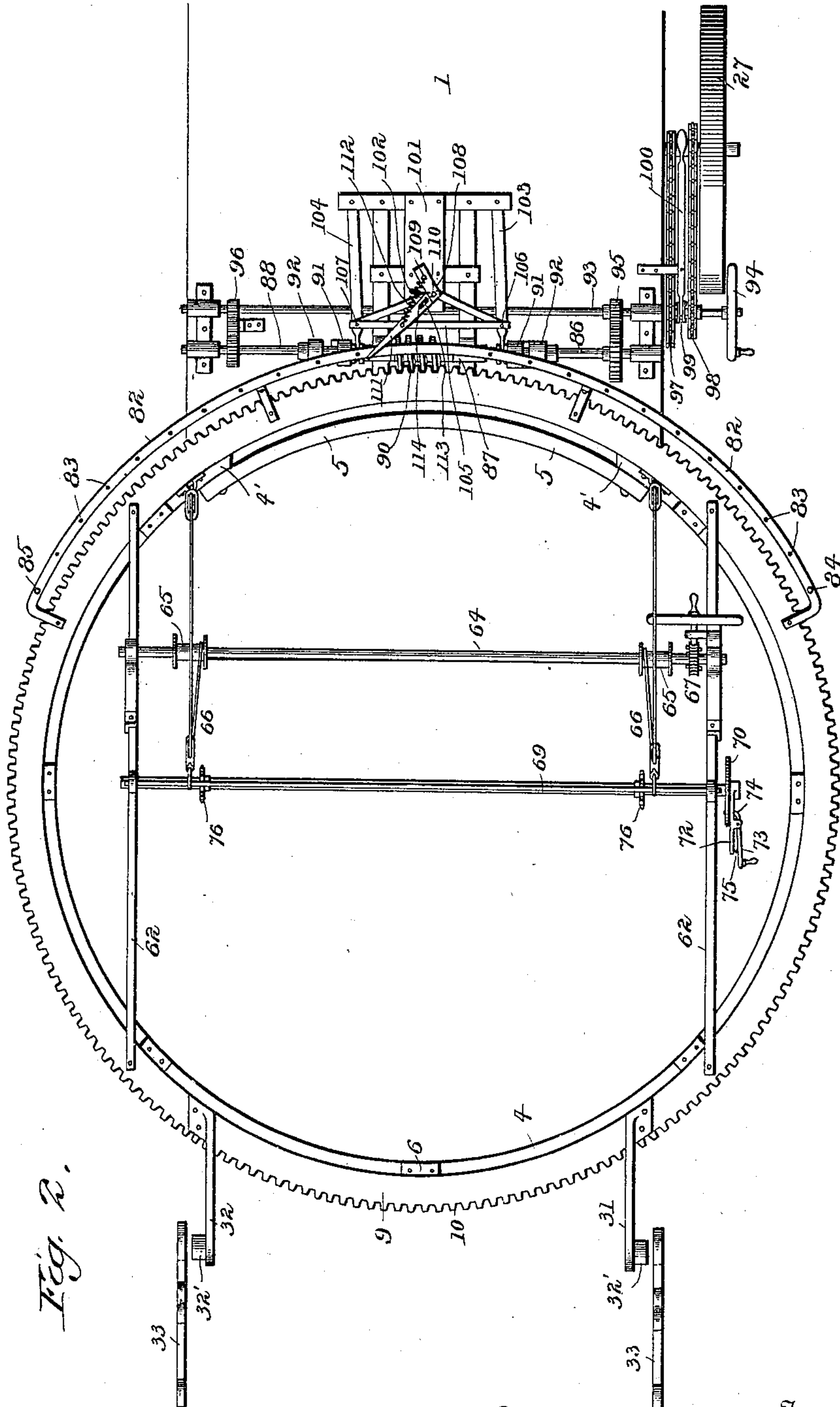


Fig. 2.

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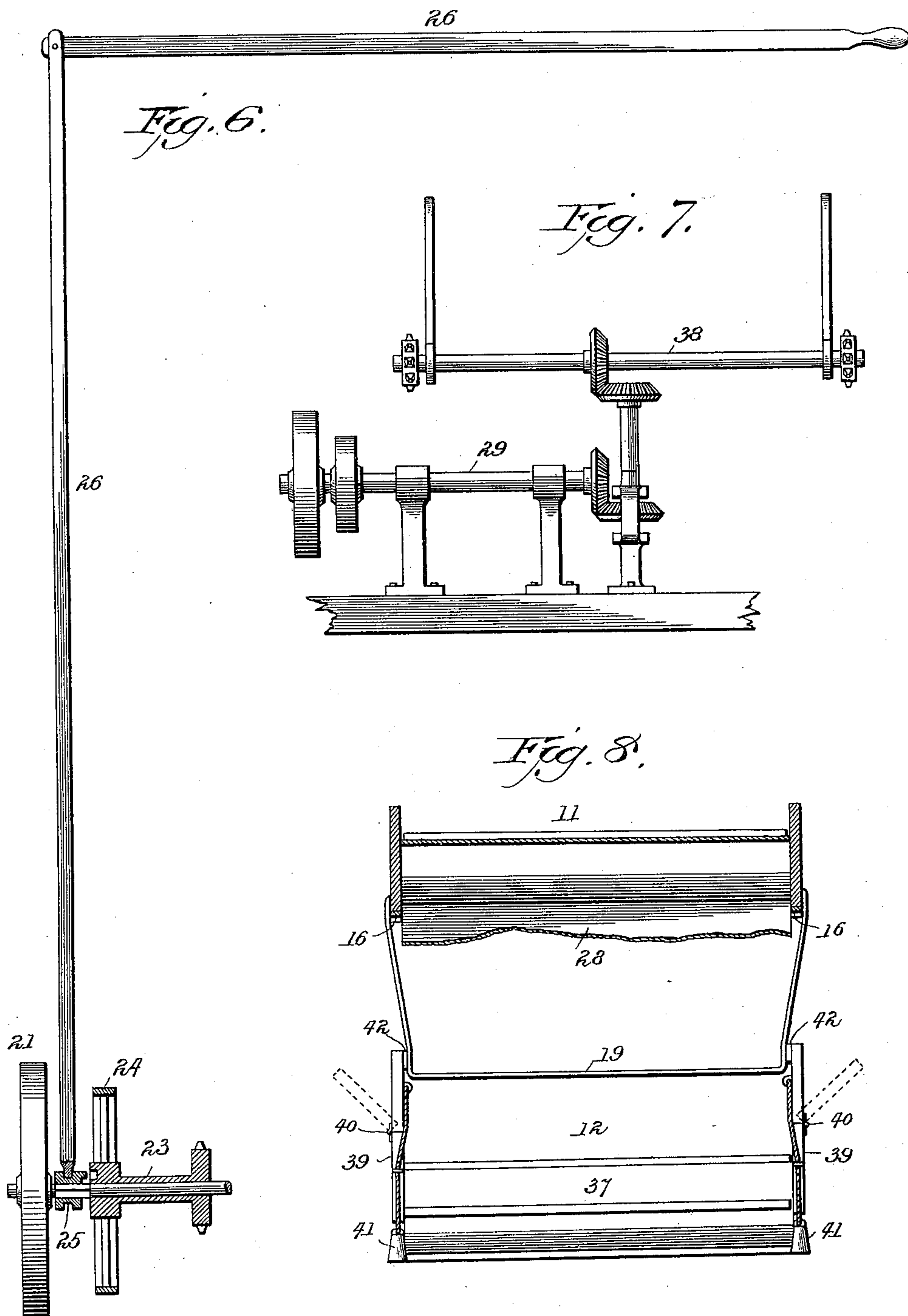
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(Application filed June 30, 1898.)

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4 Sheets—Sheet 3.



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4 Sheets—Sheet 4.

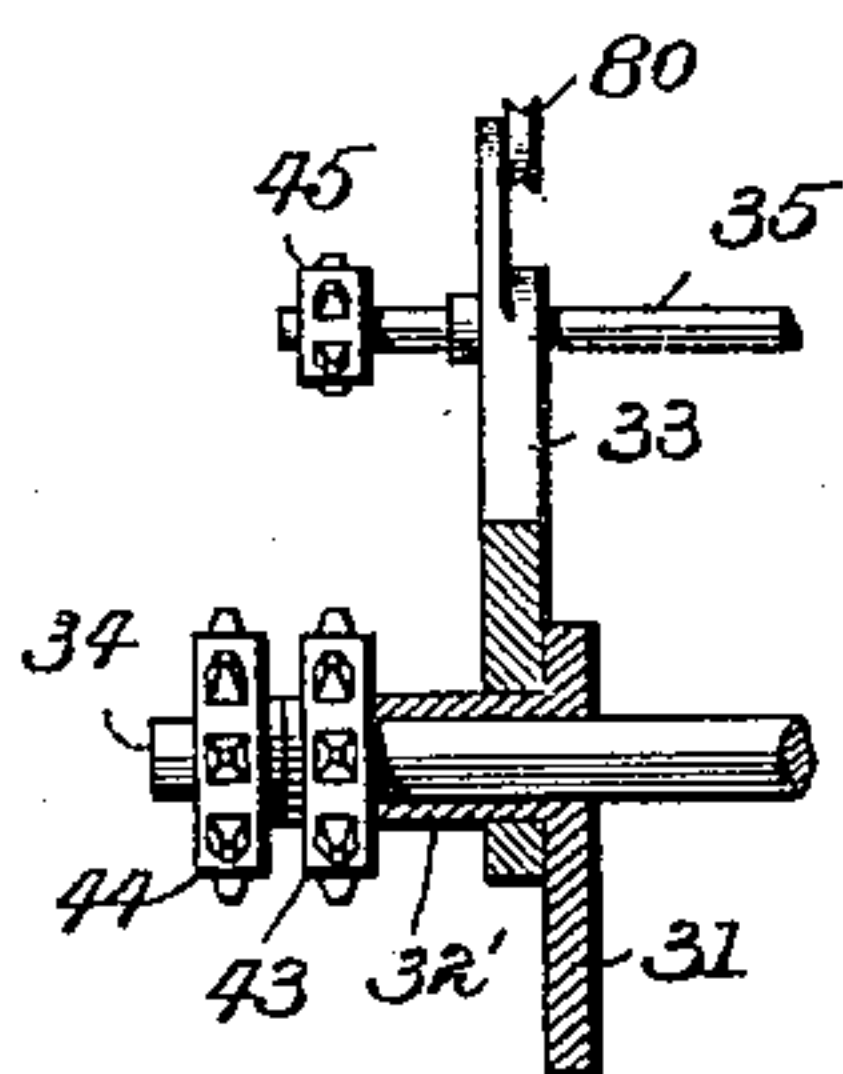


Fig. 9.

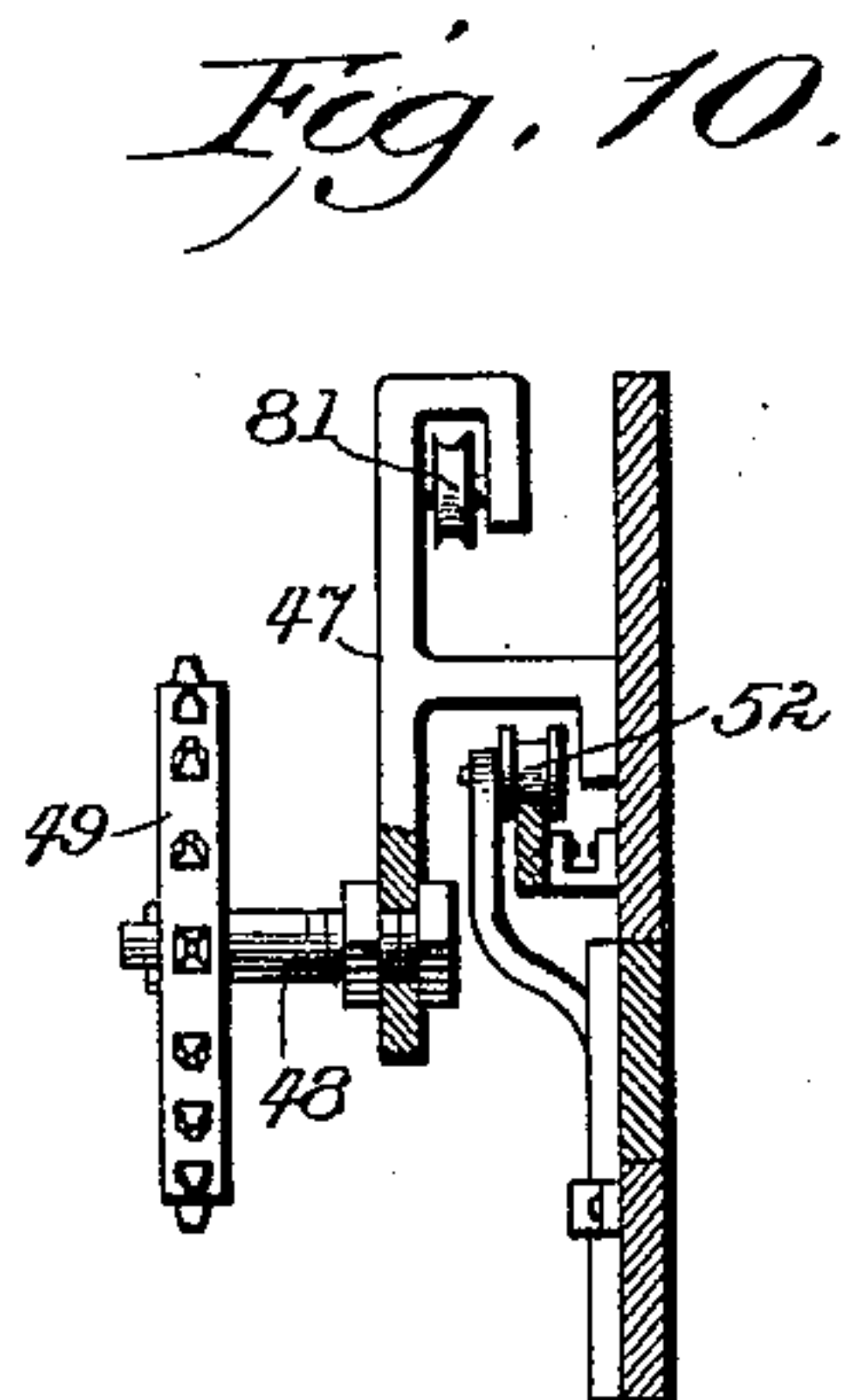


Fig. 10.

Fig. 11.

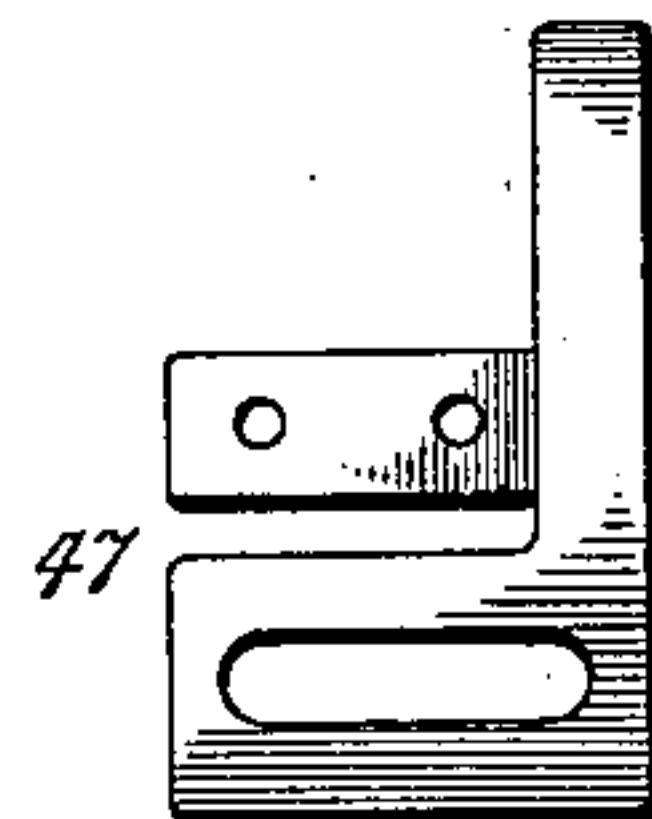


Fig. 12.

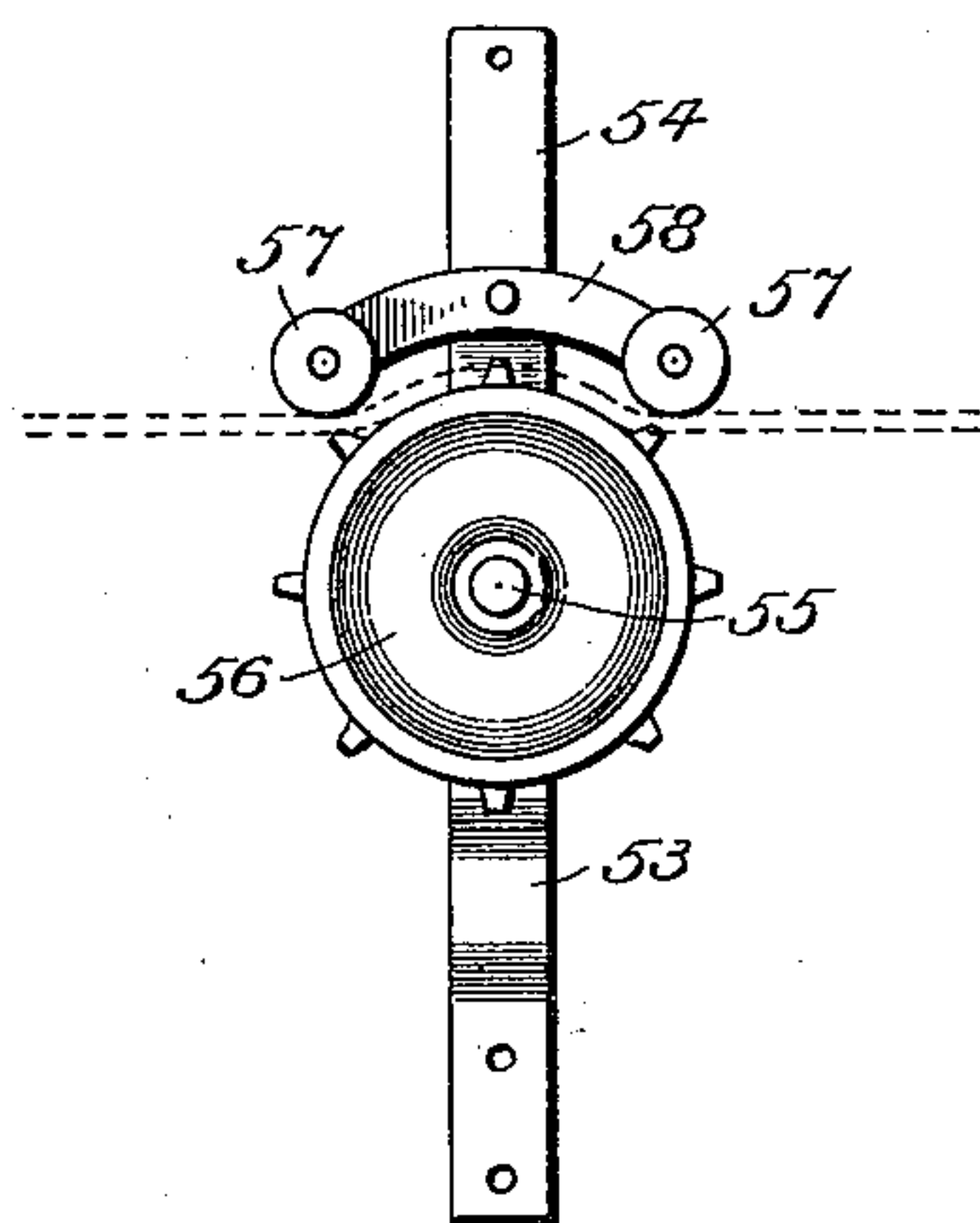


Fig. 13.

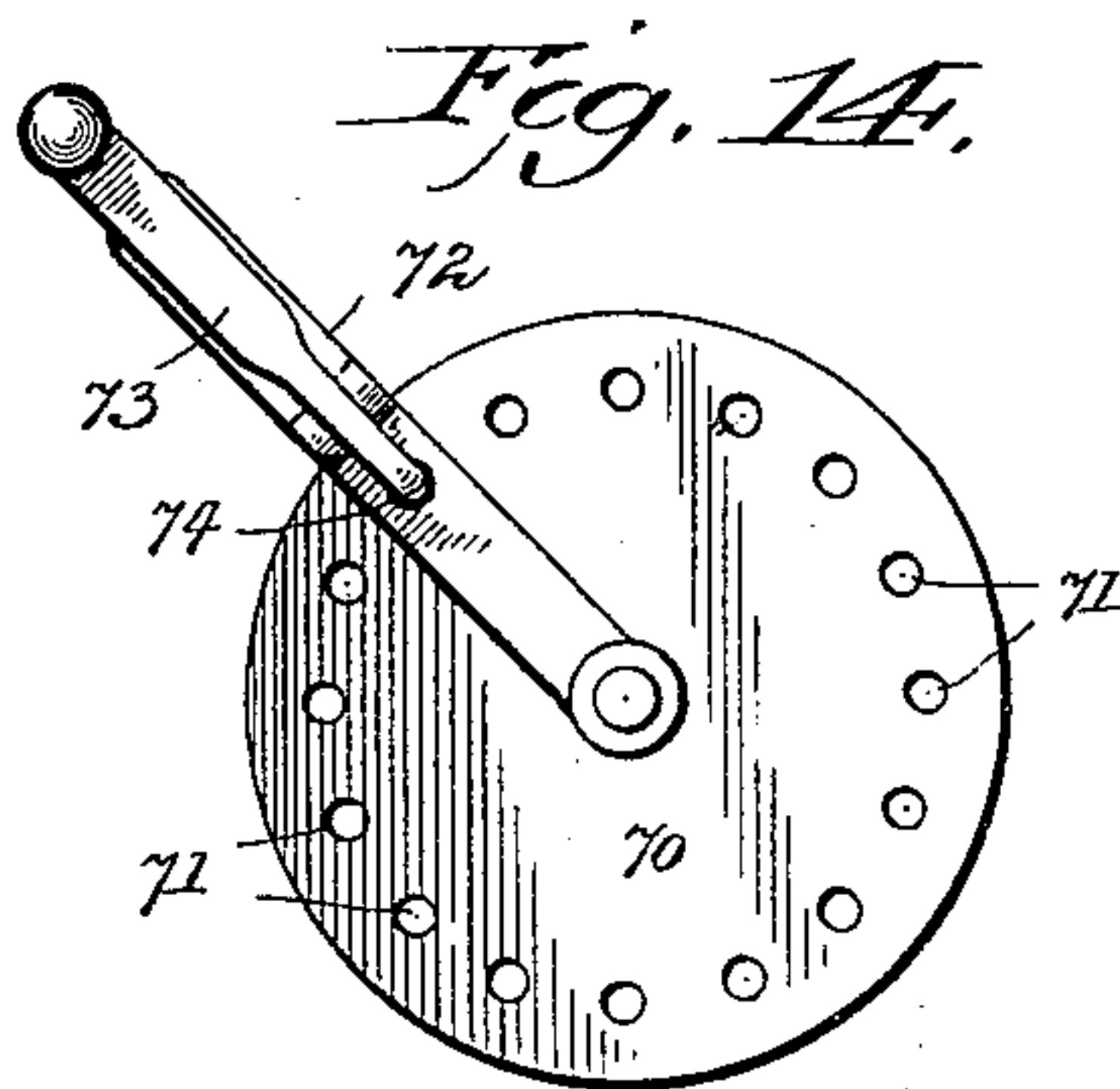
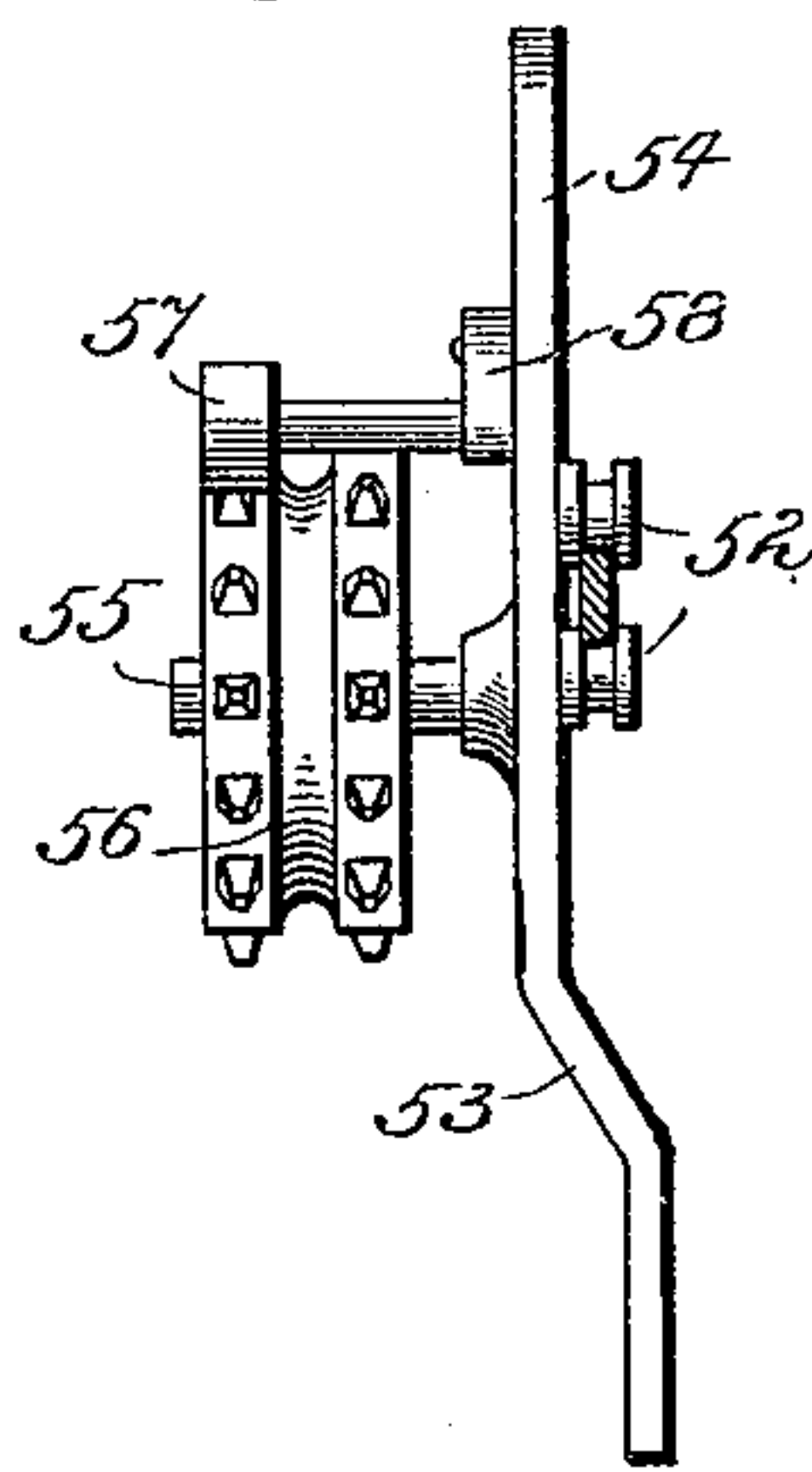
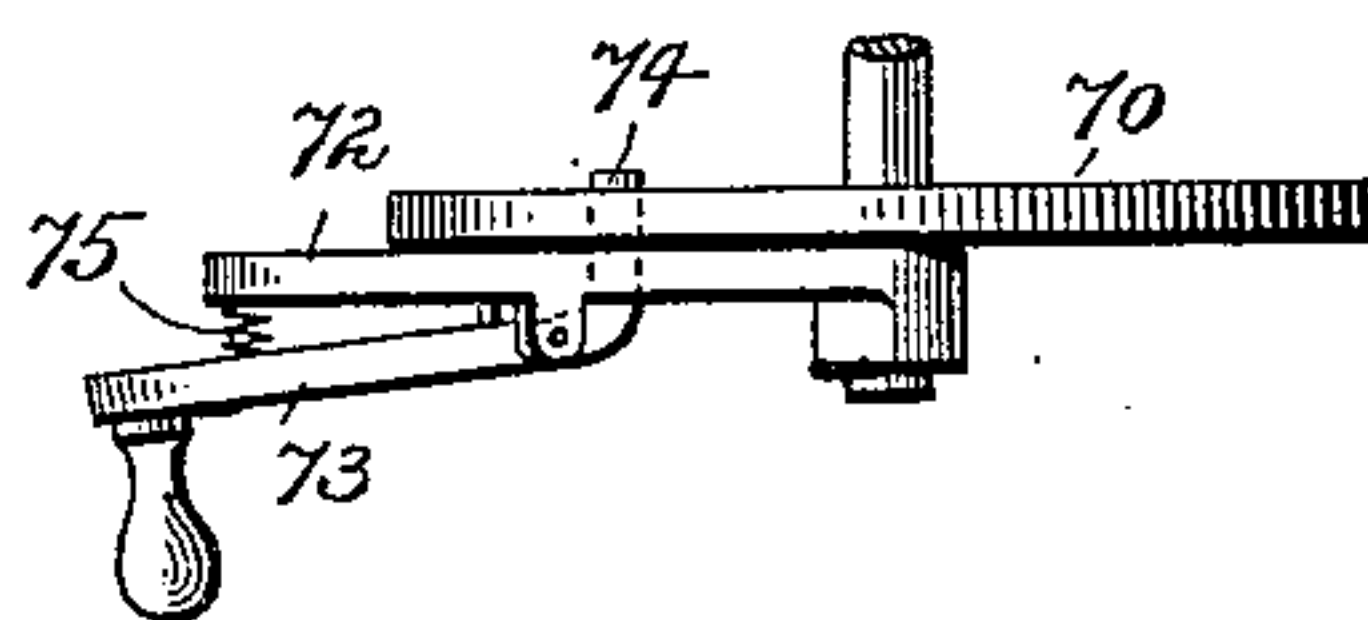


Fig. 14.

Fig. 15.



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UNITED STATES PATENT OFFICE.

JOSEPH A. MUSSETTER, OF PAINTERSVILLE, OHIO.

STRAW-STACKER.

SPECIFICATION forming part of Letters Patent No. 641,532, dated January 16, 1900.

Application filed June 30, 1898. Serial No. 684,892. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. MUSSETTER, a citizen of the United States, residing at Paintersville, in the county of Greene and State of Ohio, 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 figures of reference marked thereon, which form a part of this specification.

The present invention relates to straw-stackers of the type employing a turn-table and a straw-elevator carried thereby.

One object is the provision, in a straw-stackers, of an improved straw-elevator capable of rapid and easy elevation and depression and extension to different lengths, whereby the stack can be made of any desired height.

A further object is to provide, in a straw-stackers, an improved straw-elevator and novel mechanism for automatically oscillating the straw-elevator to any desired extent, to evenly distribute the straw on the stack and build the latter the required length.

Other objects are to provide improved means for supporting and operating the turn-table and the straw-stackers and manipulating the various other parts of the invention.

Having the foregoing objects in view, the invention consists of certain improvements in the various constructions comprising the invention, more fully set forth in the following description and recited in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of the invention applied to a threshing-machine and in position for use; Fig. 2, an enlarged plan view of a portion of the straw-stackers. Figs. 3 and 4 are enlarged details in vertical and horizontal section, respectively, of a portion of the turn-table with the rollers for guiding and supporting it. Fig. 5 is an enlarged detail of a portion of the lower section 11, showing the teeth 16 thereon and one of the guides 18. Fig. 6 is a view showing the clutch 25 and levers for shifting it. Fig. 7 is an enlarged detail showing the shafts 29 and 38 and connected gearing. Fig. 8 is a vertical sectional view show-

ing two of the sections in their relative positions, and Figs. 9, 10, 11, 12, 13, 14, and 15 are detached views of various parts of the operating mechanism.

My improvements are located at the rear of the threshing-machine, a portion of the separator-frame of which is shown at 1. The numeral 2 indicates a frame supported by the rear wheels 3, which are set back from the machine-body a proper distance to sustain the additional weight.

A metal ring 4, preferably made of a single piece, is secured to the top of the frame 2. A filler-piece 5 completes the circle of ring 4 and has its ends lapping on and secured to portions 4' of the ring. Turn-table supports 6 are secured to ring 4 at different points. Each support has two antifriction-rollers 7, whose axes are disposed in parallel relation vertically, and a third roller 8, having a horizontal axis. A horizontal turn-table is shown at 9, being preferably composed of several sections secured together and having gear-teeth 10 on its periphery, and this turn-table is provided with a depending band 9', terminating in a horizontal inwardly-turned track 9'', disposed parallel to the upper portion of the turn-table. The rollers 7 bear against the inner edge of track 9'', and the rollers 8 are located between the track and the upper portion of the turn-table, the diameters of the rollers 8 being somewhat less than the distance between said track and top. Assuming that the straw-elevator is in discharging position, the rollers 8 at the rear of the turn-table receive the pressure caused by its weight from above, while those at the front of the turn-table receive the upward pressure of the track from below, and the weight of the parts is thus evenly distributed on the various rollers. The rollers 7 are for the purpose of centering and preventing horizontal displacement of the turn-table.

The straw-elevator is composed of four sections, (shown at 11, 12, 13, and 14, respectively.) Section 11, which is adapted to receive the straw and chaff from the separator, is hung from the frame 2 by hooks 15, and in order to permit the straw-elevator to be turned around and lowered on the machine without checking or stopping the engine said section is capable of movement back onto the turn-table,

this being made possible in the following manner: Section 11 has on its lower surface racks 16, one of which is shown in detail in Fig. 5, and a crank-shaft 17 and is journaled to the frame and equipped with pinions in mesh with the racks. The section is controlled in its movements by guides 18 and is equipped with a depending loop 19 at its upper end, adapted to cooperate with the side boards of section 12, as will appear presently.

Journaled in the frame 2 is a shaft 20, which carries a main pulley 21 on one end and a small pulley 22 on its other end. The pulley 21 constitutes a drive-pulley for all the power-driven mechanism of the stacker. This shaft passes through a hollow shaft 23, which carries a pulley 24 next pulley 21. A sliding clutch 25, carried by the shaft 20, is adapted to lock with the hollow shaft to cause it to run with the central shaft. This clutch is shifted by a system of levers 26, which extend up over the separator to the other side of the machine. The pulley 22 is belted to the large pulley 27, that operates the turn-table. The carrier 28 of section 11 of the straw-elevator is operated by the hollow shaft 23, and hence when this shaft is unclutched this carrier-section, as well as those of the other sections of the straw-elevator, ceases to operate, so that the separator can be operated independently of the stacker when desirable.

There is a counter-shaft 29, which is belted to pulley 24 and, through suitable intervening gears, drives the carriers of the remaining sections of the straw-elevator. A fan 30 is located between shafts 20 and 29, being belted to the latter, for the purpose of blowing the chaff as it falls, with the straw that is lost in passing from section 11 to section 12, out of the way.

Two standards 31 and 32 are secured to the turn-table for the purpose of supporting sections 12, 13, and 14 of the straw-elevator. The lower ends of the side rails of section 13 are provided with arms 33, which pivotally receive hollow hubs 32' on the standards. A shaft 34 is journaled in the hubs of the standards. These have upper extensions which serve as journal-boxes for a shaft 35, over which and a drive-shaft 36, at the lower end of the section 12, runs a carrier 37 of ordinary construction. This drive-shaft 36 is connected by sprocket-chains to a counter-shaft 38, which is geared to counter-shaft 29. The side boards of section 12 are constructed in two longitudinal parts from their centers to their lower ends, the lower parts 39 being stationary and the upper parts hinged to them at 40, so as to be adapted to swing down, weights 41 serving to keep the hinged parts normally closed in upright position. The upper parts are provided with ears 42, against one of which the loop 19 is adapted to wipe when the straw-elevator has oscillated sufficiently far, whereupon the hinged part is lowered to allow a further oscillation of the elevator and at the same time insure the re-

ception in section 12 of all the straw delivered to it by section 11. When the reverse movement takes place, the hinged side is gradually released, and the hinged part on the other side of the section is afterward engaged in the same manner.

The mechanism now to be described is duplicated on opposite sides of the straw-elevator.

Shaft 34 has inner and outer sprockets 43 and 44. Shaft 35 carries a sprocket 45, and a chain connects this sprocket with inner sprocket 43. A track 46 is connected to the side of the section 13 by suitable brackets. A bracket 47 is fastened to the upper end of the track, being provided with a slot extending longitudinally thereof. A stub-shaft 48 is received in the slot and adjustably held in position by a nut thereon. A sprocket 49 is rotatably mounted on this stub-shaft, and a long sprocket-chain 50 runs over it and sprocket 44. The adjustable connection between the stub-shaft and the bracket affords means for tightening the chain as found necessary. The carrier 51 for section 13 is operated from shaft 34. Section 14 has a hanger equipped with a grooved roller 52, which runs on track 46 and assists in holding said section in position. At the extreme end of this section is another hanger 53, having two rollers, similar to roller 52, which bear against the top and bottom of the track, and also an upwardly-extending arm 54, which is connected to the mechanism hereinafter to be described for shifting the section. A stub-shaft 55 projects from the hanger, a double sprocket-wheel 56 being mounted thereon. The outer wheel of this double sprocket is held constantly in mesh with chain 50 by rollers 57, mounted in a bracket 58, secured to hanger 53 and bearing on the upper part of the chain. At the end of section 14 is a shaft 59, which operates the carrier 60 of said section, and this shaft is connected by a sprocket-chain 61 to the inner wheel of the double sprocket 56. With the foregoing constructions section 14 can be shifted as desirable without interfering in any way with the operation of its carrier or the operation of the stacker.

The derrick employed for raising, lowering, and operating the straw-elevator consists of a base-frame composed of legs 62, connected to and rising from opposite sides of the turn-table, and an adjusting-frame 63, hinged to the base-frame. A winding-shaft 64, having spools 65, is journaled in suitable bearings connected to one set of the legs of the base-frame. Block and tackle 66 connect these spools with the upper end of the adjusting-frame and turn-table in the manner shown, so that rotation of the winding-shaft, accomplished by the operation of hand-operated worms and worm-wheel gearing 67 on the base-frame, will cause a movement of the adjusting-frame. The upper end of the adjusting-frame is connected to the upper end of section 13 by rods 68, which support this

section and section 14, and they, together with the derrick, constitute the means for elevating and depressing the straw-elevator to any desired extent, the standards 31 and 32, the arms 33, and shaft 34 affording the hinge connection between the straw-elevator and the turn-table.

The numeral 69 designates a shaft journaled in bearings on the adjusting-frame for shifting section 14 of the straw-elevator. A locking-plate 70, provided with a circular row of holes 71, is secured to the adjusting-frame with the holes concentric to the shaft. A crank 72, secured to the shaft, carries a pivoted locking-handle 73, having a dog 74, which is adapted for reception in any one of the holes 71 and is normally kept in locking position by a spring 75, interposed between the crank and handle. This construction renders the shaft self-locking at all times. The shaft carries sprockets 76, over which run chains 77, which pass under idlers 80, secured to standards 31 and 32. These chains are connected at one end to wire ropes 78, which are fastened to the arms 54, and at the other end are fastened to wire ropes 79, which pass around pulleys 81 on the upper end of section 13 and are connected to the arms 54. Rotation of shaft 69 imparts movement through the sprockets it carries to the chain and wire ropes and shifts section 14 either way, according to the direction of rotation.

An arc-shaped track 82 is secured to the top of the turn-table, being provided with regularly-spaced pin-holes 83, adapted to receive trip-pins 84 and 85, which determine the length of oscillation of the turn-table, and hence the straw-elevator. A shaft composed of three sections 86, 87, and 88 is journaled on top of the separator adjacent to the edge of the turn-table. The center section 89 carries a worm 90, which meshes with the gear-teeth of the turn-table and carries sliding clutches 91 on its ends. The end sections are provided with fixed clutches 92, adapted to engage the respective clutches aforesaid.

The numeral 93 designates a shaft provided with a crank-wheel 94 on its end and operatively connected with shaft-section 86 by multiplying-gearing 95, and it is also connected with shaft-section 88 by gearing 96, which rotates said section in an opposite direction to that in which section 86 turns. Two sprocket-wheels 97 and 98 of different sizes are loosely mounted on shaft 93 near its end, they being turned by chains running over sprockets of different sizes on the shaft that carries pulley 27. There is a clutch 99, which slides on a key on shaft 93 and is adapted to engage with either of the sprockets 97 and 98 or can be disposed between them without engagement with either, its movements being brought about by the manipulation of a shifting lever 100. The slow-speed gearing thus provided is for use in the ordinary oscillation of the straw-elevator and the high-speed gearing for

use in running it around rapidly to proper position. When the shaft-section 86 is clutched to worm-shaft 87, the turn-table will rotate in one direction, and when clutched to shaft-section 88 it will rotate in the opposite direction. The clutching and unclutching of the end sections is automatically accomplished by the mechanism now to be described.

A bed 101, consisting of crossed metal plates connected together, is fastened to the top of the separator, and the center plate of this bed has a curved slot 102. There are two parallel shifting levers 103 and 104, which are pivoted at one end to the bed and have forks at their other ends which straddle the respective sliding clutches 91 in a well-known manner, being connected together by a cross-bar 105, which is pivoted to them at 106 and 107. The numeral 108 represents a link, which is pivoted at 109 to the bed and has its other end free for movement. A bolt 110 is secured to the free end of this link and is adapted to travel in slot 102. There are two connecting-bars which are pivoted at one end on the pivots 106 and 107 and are pivoted at their other ends to the bolt 110. A trip-lever 111 is also pivoted on bolt 110, its other end being free and overlapping the track 82, so as to lie in the path of movement of the trip-pins. A close coil-spring 112 connects the central part of this lever with the link 108 and keeps these parts normally at an angle to each other, they constituting a pair of toggle-levers. A bolt 113, which is secured to the center plate, works in a slot 114 in trip-lever 111 and guides the lever in its movements. This mechanism operates as follows: The turn-table having rotated until one of the trip-pins strikes the trip-lever, the latter is pushed thereby, gradually straightening the knee of the toggle-levers and drawing the engaged clutches apart until the knees of the toggle-levers have been first straightened and then bent in an opposite direction to that it previously assumed, whereupon the spring, having been stretched, throws the trip-lever completely over and the other set of clutches are made to engage, and the direction of rotation of the worm having been reversed the turn-table rotates back again until the other trip-pin strikes the trip-lever and throws the mechanism back. The oscillation of the turn-table, and hence the straw-elevator, is thus continued automatically and the straw delivered evenly along the stack, being governed by the distance the trip-pins are set apart.

It is sometimes desirable to oscillate the device by hand instead of power, and for this reason the crank-wheel on shaft 93 is provided.

Described generally, the operation of the machine is as follows: The straw and chaff are delivered from the separator to the first section of the straw-elevator, from which it falls onto the carrier of the second section of the elevator, the fan meanwhile blowing the

chaff that is lost in making connections between sections 11 and 12 back and out of the way. The second section carries the straw up and delivers it to the carrier of the third section, which in turn delivers the straw to the carrier of the fourth section, from the upper end of which it falls and forms the stack. While the straw is being delivered to the stack, the whole elevator is being oscillated by the coaction of the worm and turn-table and the automatic reversing mechanism, so that the straw is distributed evenly along the stack. As the stack increases in height and size the adjusting-frame can be drawn down from time to time by the block and tackle and operating means therefor, thereby elevating the upper end of the straw-carrier. The shifting mechanism for the uppermost section of the straw-elevator can also be brought into action to extend said section. All these adjustments can be carried on while the machine is in operation without interfering with its action in any manner. The oscillating mechanism can be thrown out of operation at any time, so that the movement of the straw-elevator will cease, or the entire machine may be stopped at will, so that the separator can operate independently thereof.

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

1. In a straw-stacker, the combination with a straw-elevator having sections adjustably connected together and independent carriers for the sections, of means for driving the carrier of one of the sections, a sprocket-chain actuated by the movement of the driven carrier aforesaid, a sprocket-wheel operatively connected with the carrier of the other section of the straw-elevator, and means straddling the sprocket-wheel for keeping the sprocket-wheel constantly in mesh with the sprocket-chain.

2. In a straw-stacker, the combination with a straw-elevator having sections adjustably connected together and independent carriers for the sections, of means for driving the carrier of one of the sections, a sprocket-chain actuated by the movement of the driven carrier aforesaid, a sprocket-wheel operatively connected with the carrier of the other section and meshing with the sprocket-chain, and a hanger carried by the last-named section, having antifriction-rollers bearing against a single lead of the sprocket-chain on opposite sides of the sprocket-wheel and preventing the disengagement of the sprocket-chain and sprocket-wheel.

3. In a straw-stacker, the combination with a frame, tracks supported by the frame and carrying turn-table supports 6 and antifriction-rollers 7 and 8, carried by the supports at right angles to each other, of a turn-table having peripheral teeth and provided with an inwardly-projecting track 9 the rollers on the supports operating between the turn-table and track and upon the inner edge of the track

respectively, and means for engaging the teeth of the turn-table for turning the latter.

4. In a straw-stacker, the combination with a straw-elevator composed of sections, one of which is adjustably connected to the other so as to be capable of extension and contraction in relation thereto, of pulleys on the other section, a winding-shaft provided with a sprocket-wheel, a sprocket-chain running over the sprocket-wheel and one of the pulleys, a flexible connection between one end of the chain and the movable section and a second flexible connection between the other end of the chain and the said section, said second connection passing around the pulley and extending to the section from an opposite direction to the first-named flexible connection whereby rotation of the winding-shaft in one direction shifts the movable section one way and rotation in the other direction shifts it in an opposite direction.

5. In a straw-stacker, the combination with a turn-table having gear-teeth, of a shaft carrying a worm meshing with the gear-teeth, slidable clutches on said shaft, independent shafts driven in opposite directions and equipped with fixed clutches adapted to engage the slidable clutches and shifting mechanism operated by the movement of the turn-table for moving the slidable clutches to alternately couple the worm-shaft to the respective driving-shafts.

6. In a straw-stacker, a table-reversing mechanism comprising a shifting member, a pivoted link, a connection between the link and lever, a trip-lever pivoted to the link and a spring connecting the trip-lever and link and keeping their joint or knee normally bowed.

7. In a straw-stacker, a table-reversing mechanism comprising a pivoted shifting lever, a pivoted link, a bar pivoted to the free end of the link and to the lever, a trip-lever pivoted at one end to the link where the bar is pivoted thereto, and a spring connecting the trip-lever and link and keeping their joint or knee normally bowed.

8. In a straw-stacker, a table-reversing mechanism comprising a bed having a slot, a movable shifting member, a link pivoted to the bed, a bar connected to the shifting member, and to the link by a member which is adapted to move in the slot, a trip-lever pivoted to the link and a spring connecting the link and trip-lever and keeping their knee or joint normally bowed.

9. In a straw-stacker, a table-reversing mechanism comprising parallel pivoted shifting levers, a bar pivotally connecting them together, a pivoted link, bars pivoted to the shifting levers and to the link, and a spring connecting the trip-lever and link and keeping their joint or knee normally bowed.

10. In a straw-stacker, the combination with a turn-table having a depending band provided with an inwardly-extending track, of turn-table supports located inside the track

and provided with antifriction-rollers which bear against the edge of the same and also having a roller on which the table rests.

11. In a straw-stacker, the combination with
5 a turn-table having a depending band provided with a track, of turn-table supports and rollers journaled on the supports and located between the top of the table and the track and
10 of less diameter than the distance between the top and the track and adapted to bear against either of them.

12. In a straw-stacker, the combination with
15 a turn-table having a depending band and an inwardly-extending track, of turn-table supports, rollers journaled to the supports and bearing against the edge of the track and a roller journaled to each support and located between the top of the table and the track,
20 and of less diameter than the distance between the top and the track and adapted to bear against either of them.

13. In a straw-stacker, the combination with a straw-elevator section mounted for horizon-

tal oscillation and having movable sides and means for keeping them retracted, of a second
25 straw-elevator section for delivering the straw to the first-named section and means for engaging and spreading the movable sides alternately when the first-named section oscillates.

14. In a straw-stacker, the combination with
30 a straw-elevator section mounted for horizontal movement and having longitudinally-hinged sides adapted to spread laterally and means for keeping said sides normally closed, of a second straw-elevator section adapted to
35 deliver the straw to the first-named section, and a loop depending from the second section and located between the hinged sides, being adapted to alternately engage and spread said sides as the first-named section oscillates.
40

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

JOSEPH A. MUSSETTER.

Witnesses:

WM. MUSSETTER,
JOHN SWOPE.