

No. 670,406.

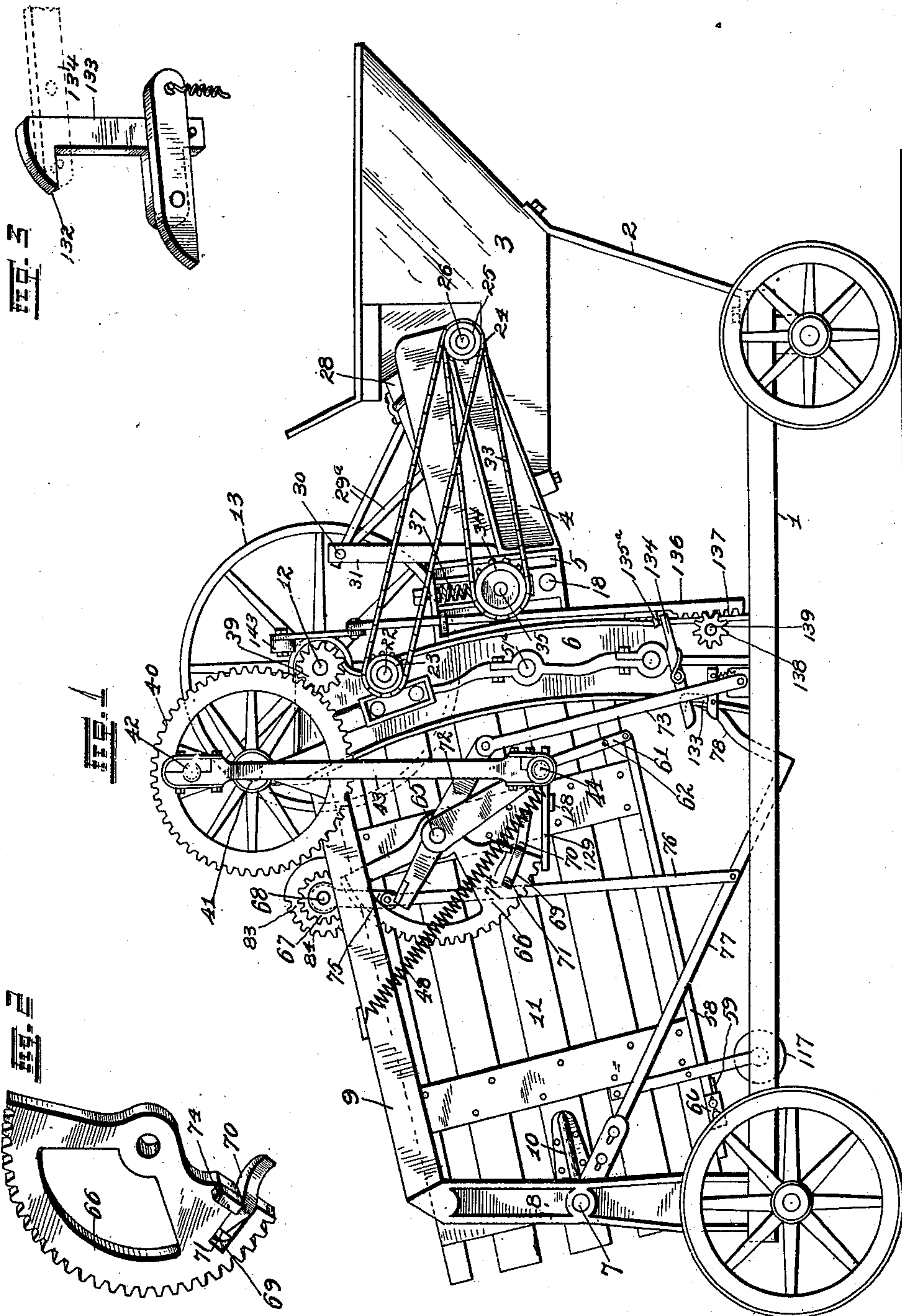
Patented Mar. 19, 1901.

T. KIRSHMAN & L. M. MEDLIN.  
BALING MACHINE.

(Application filed Feb. 23, 1900.)

(No Model.)

8 Sheets—Sheet 1.



Witnesses:

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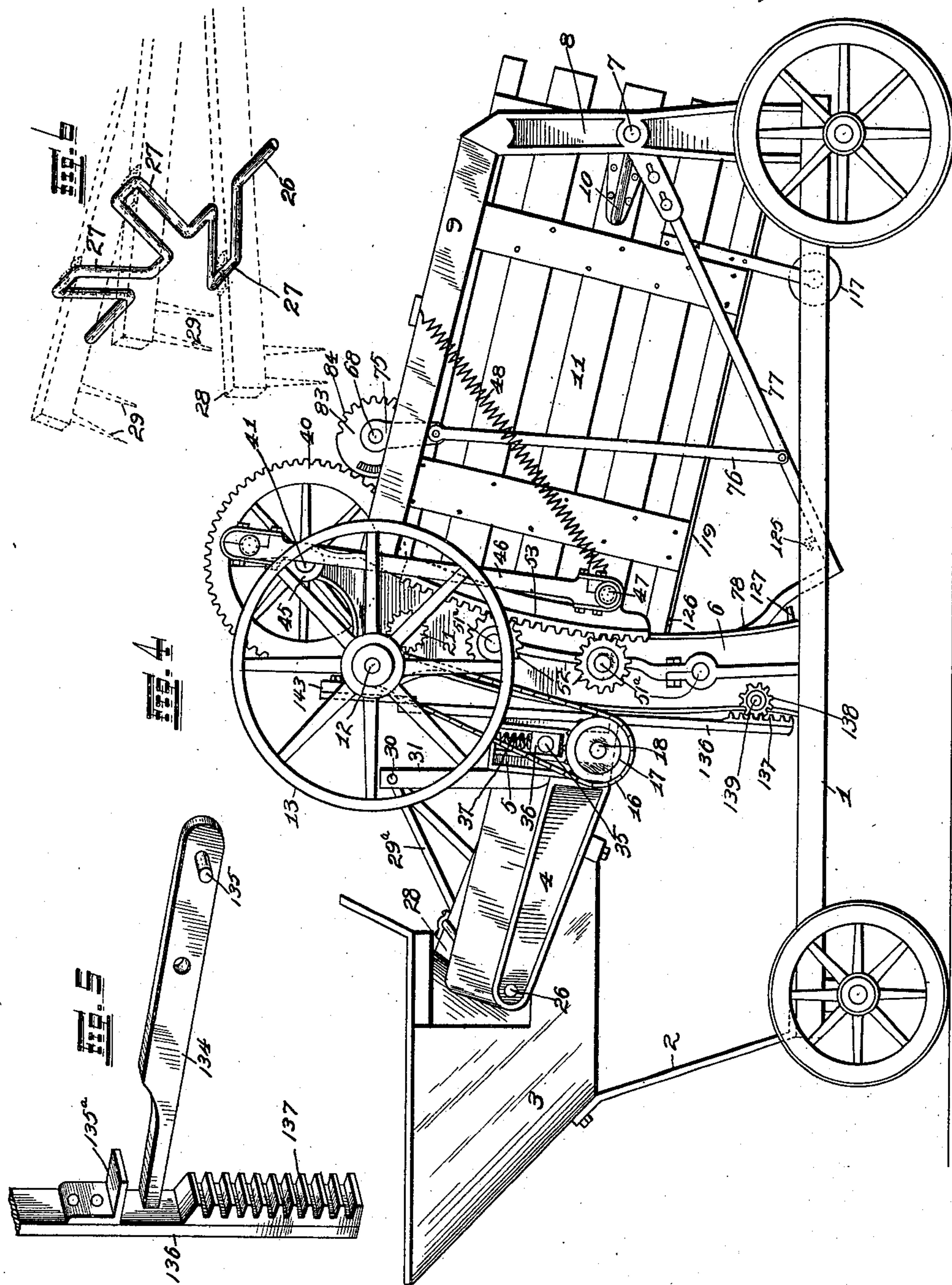
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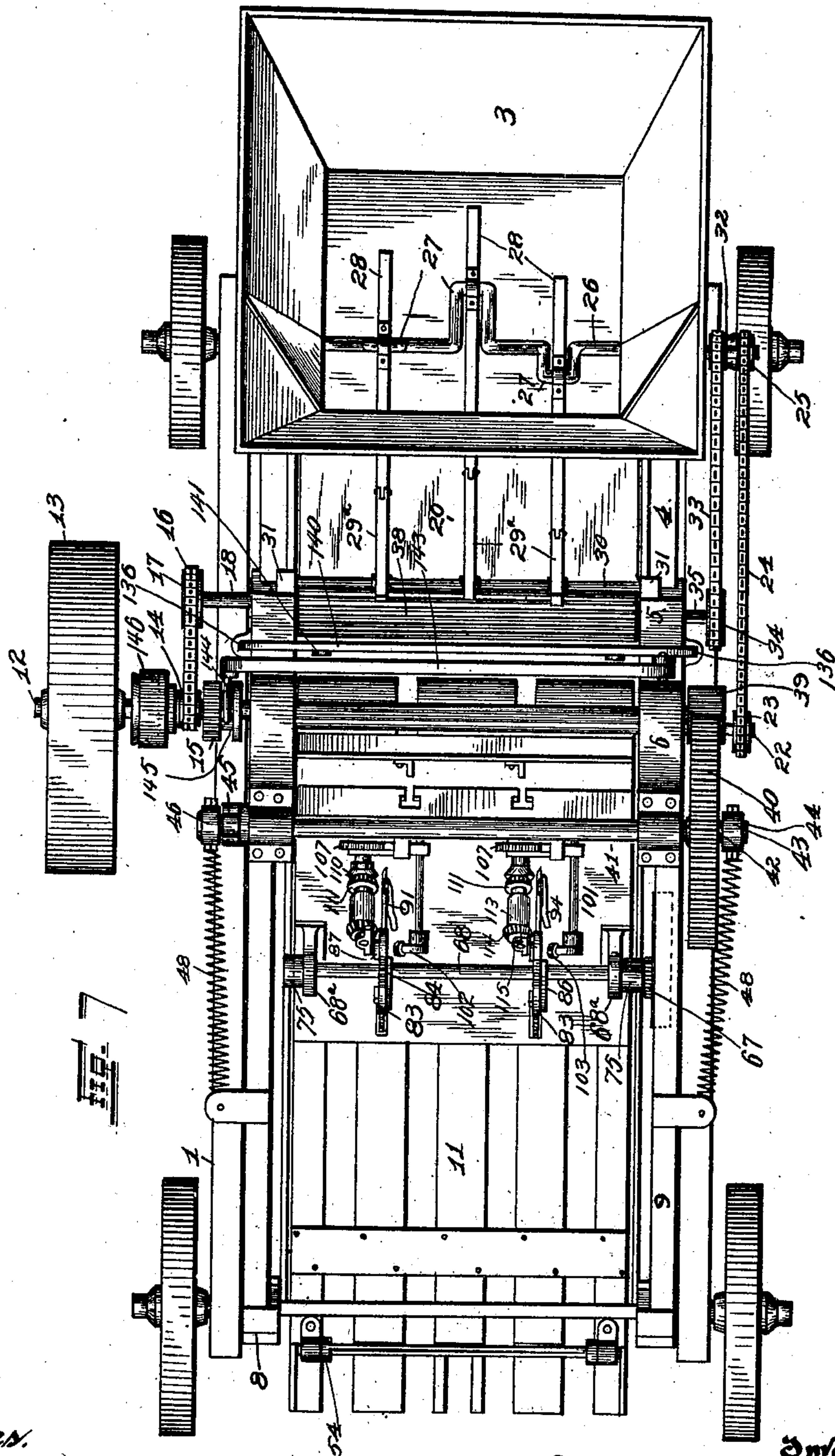
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8 Sheets—Sheet 3.



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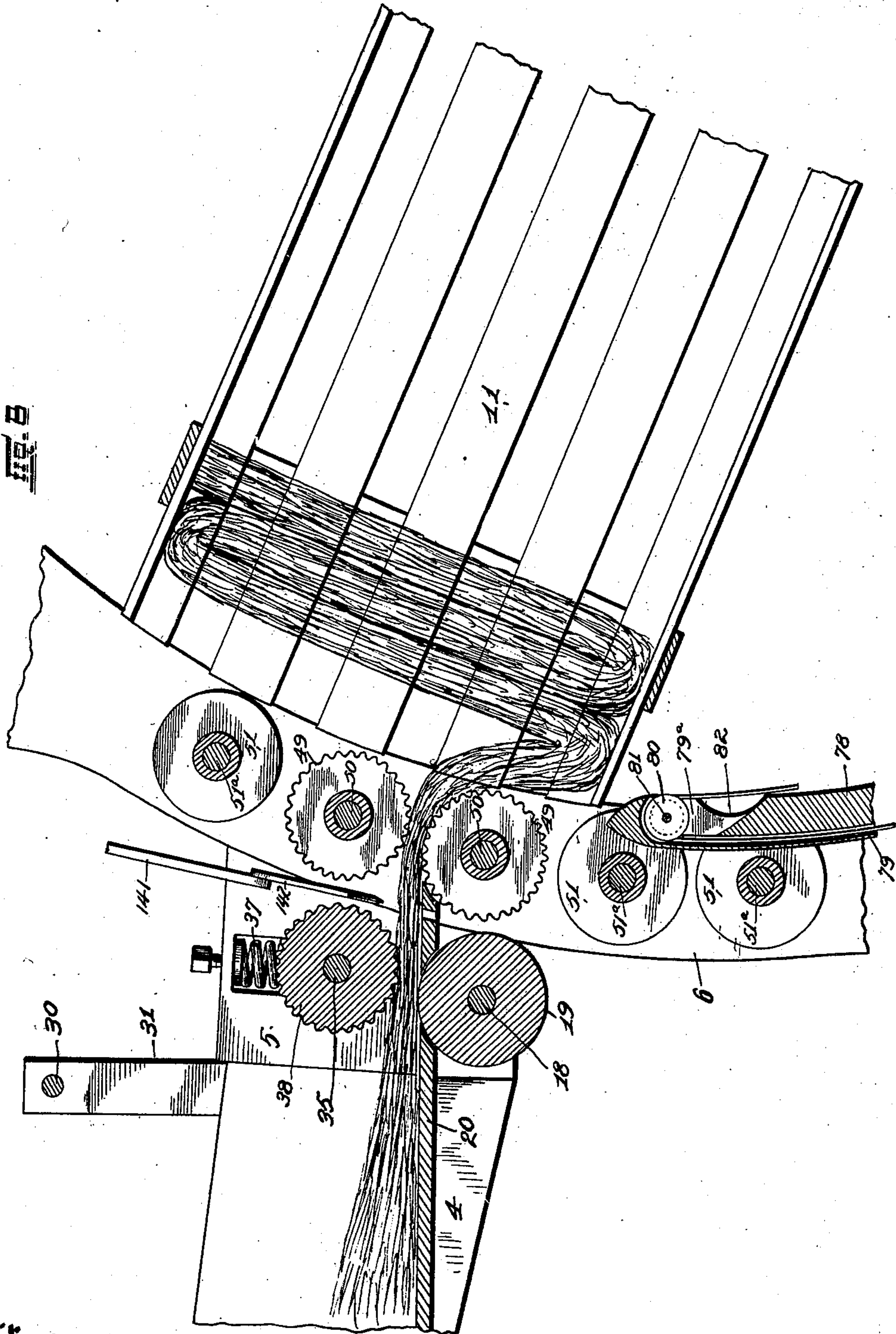
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8 Sheets—Sheet 4.



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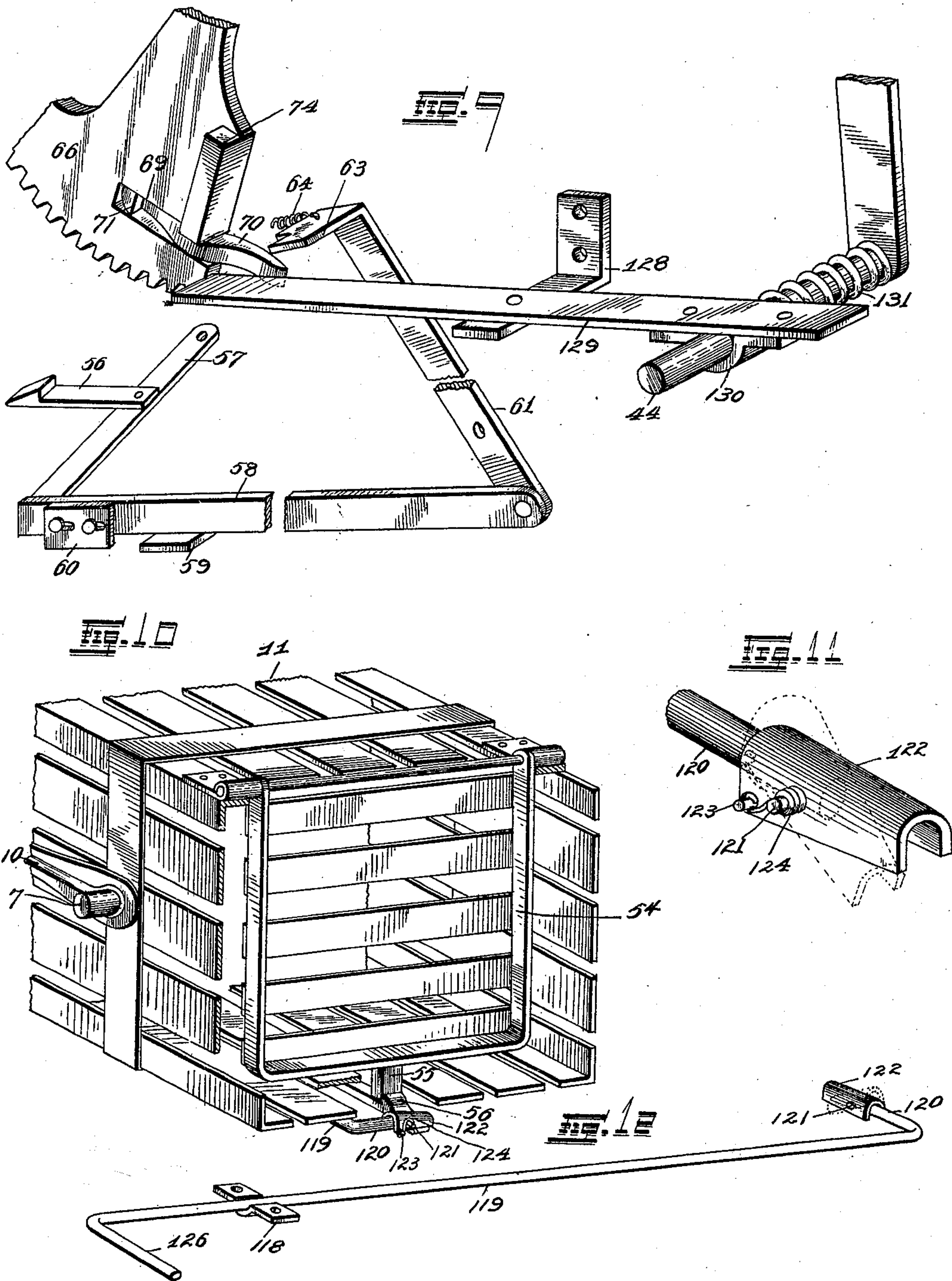
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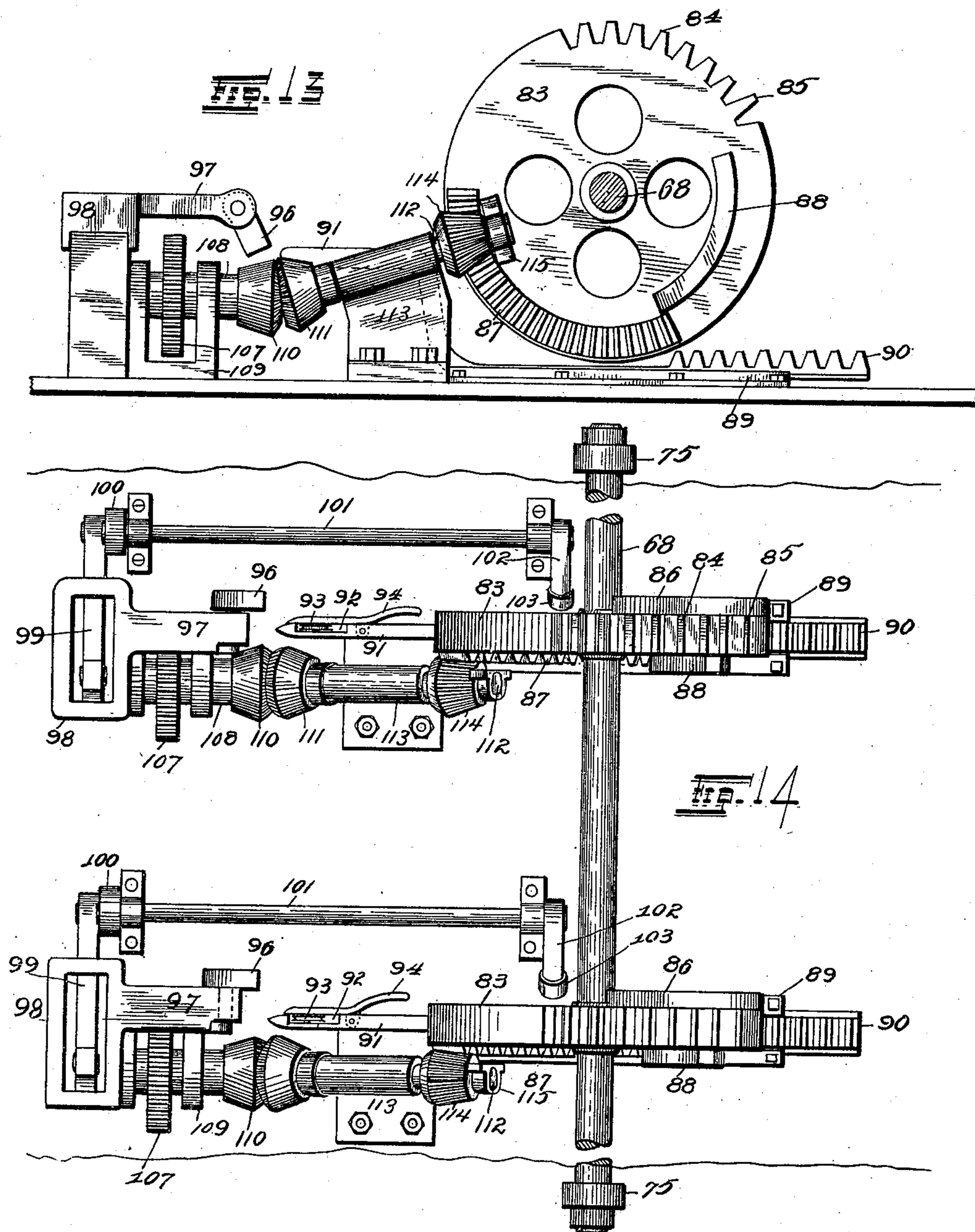
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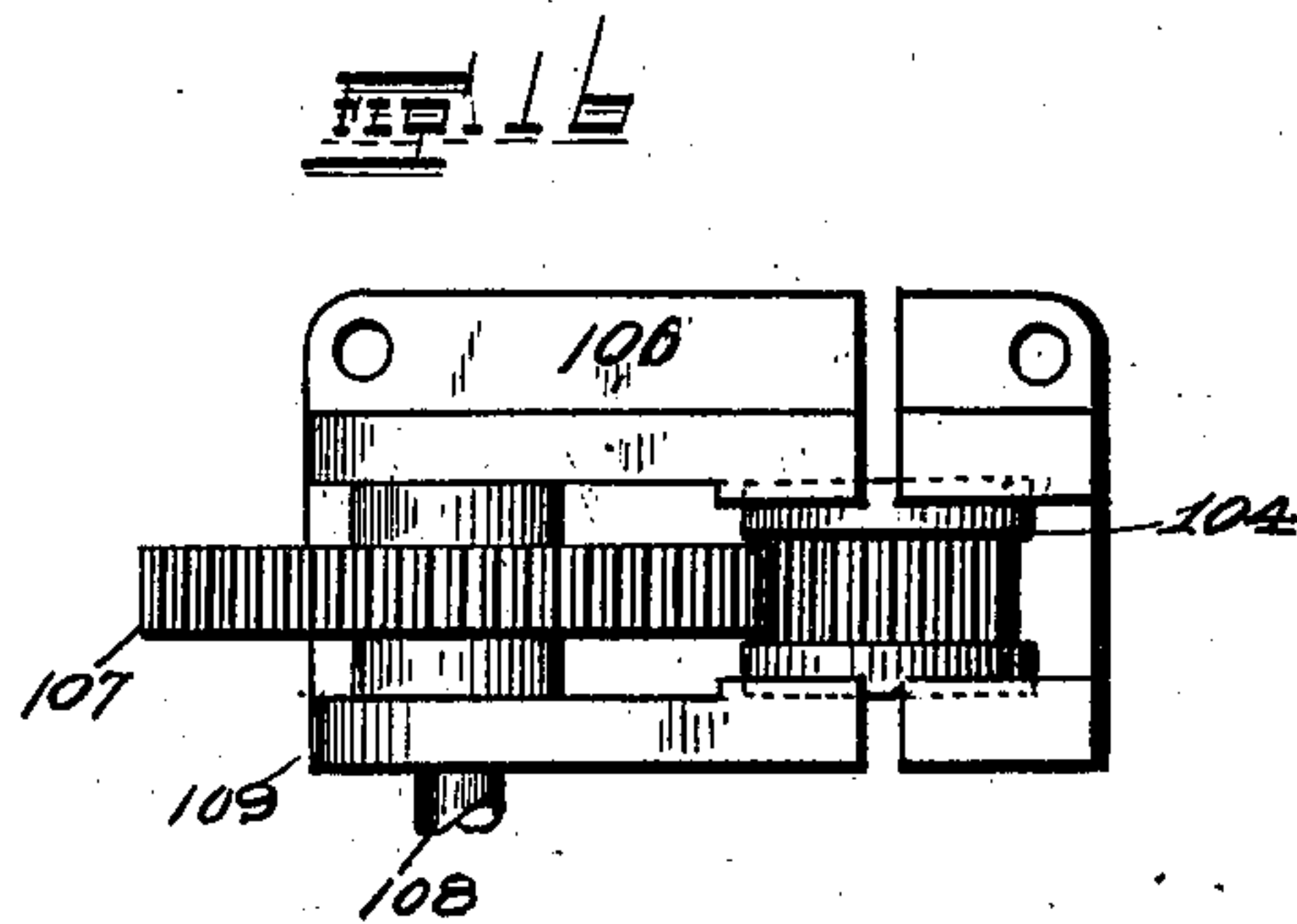
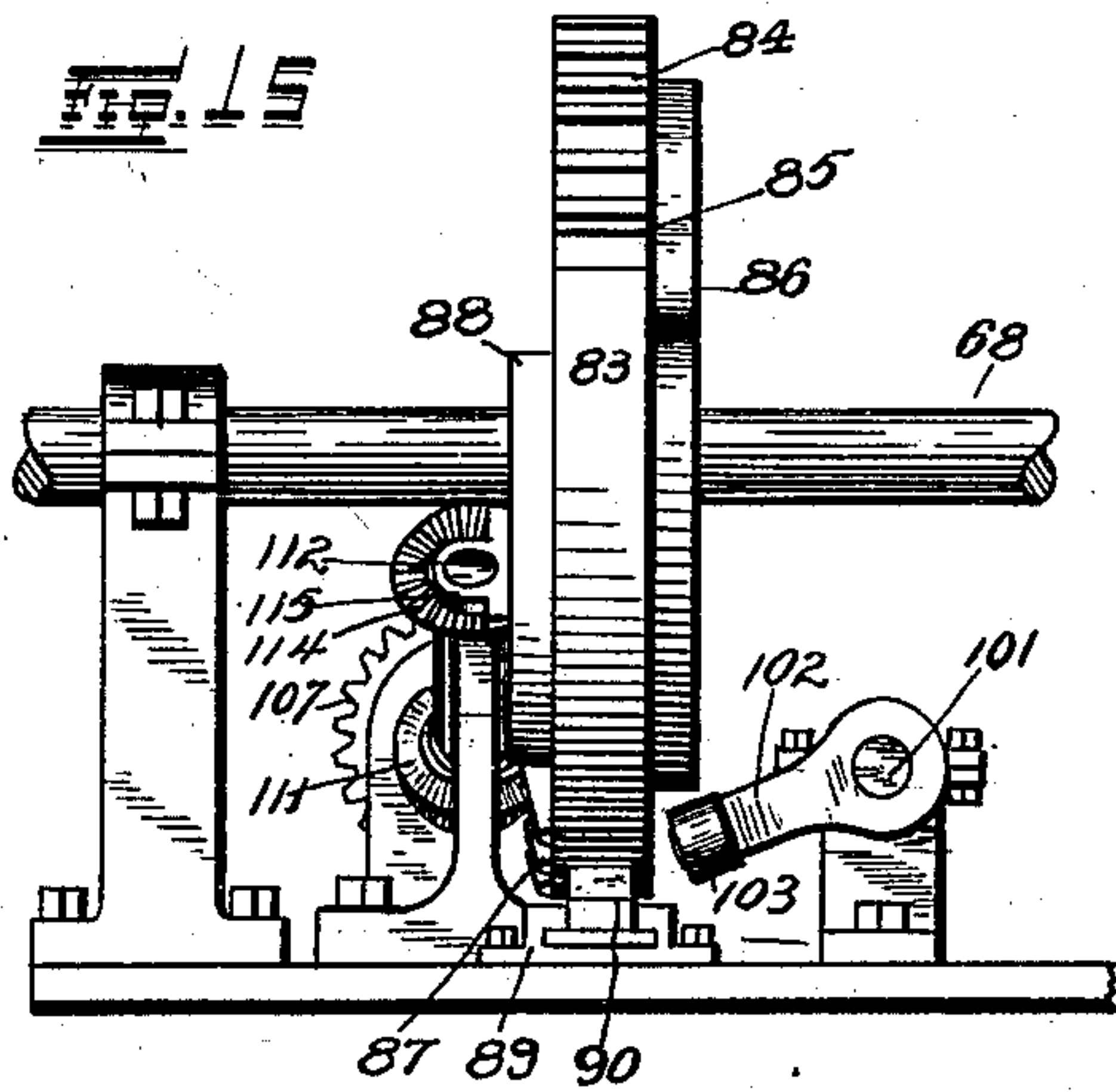
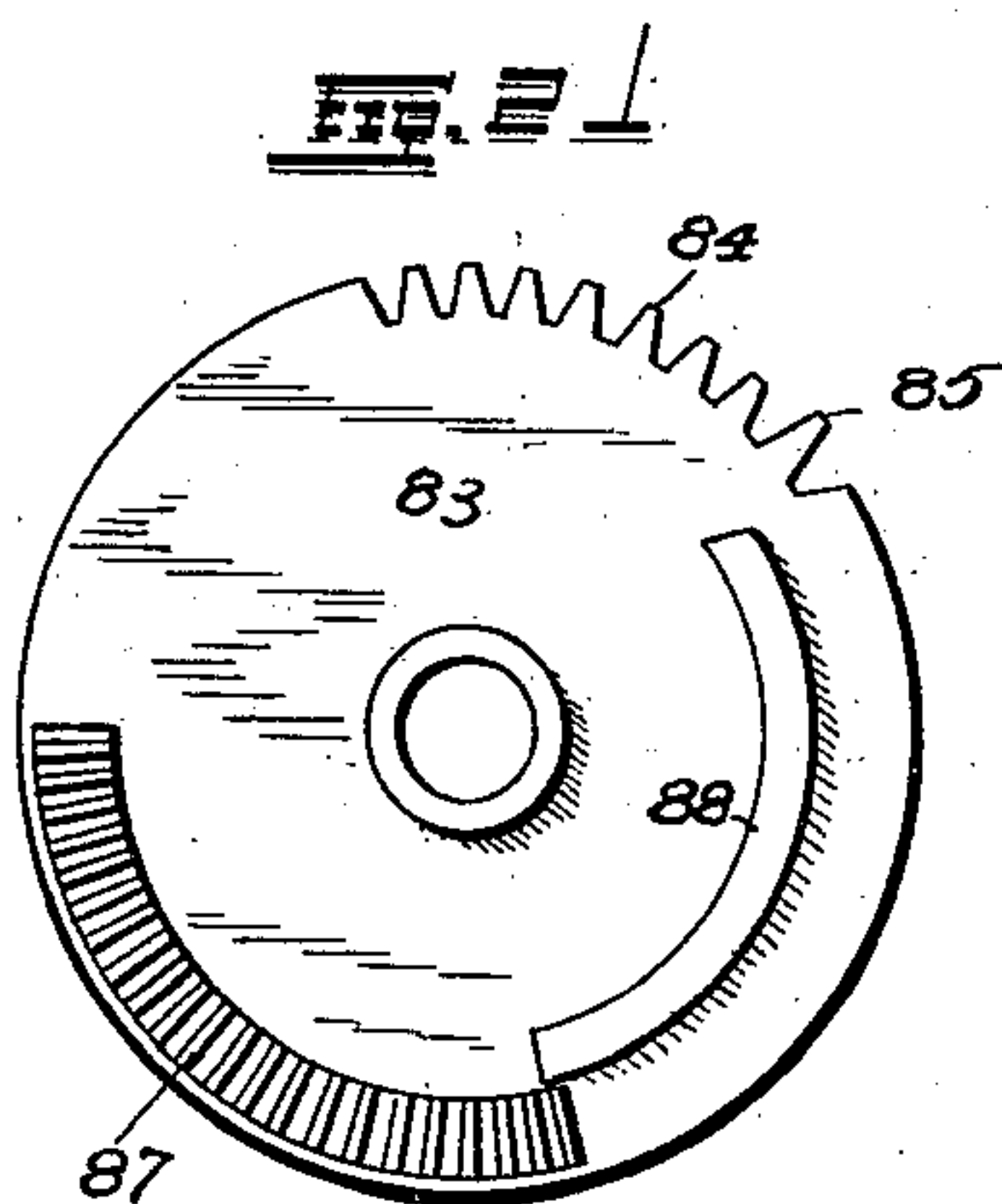
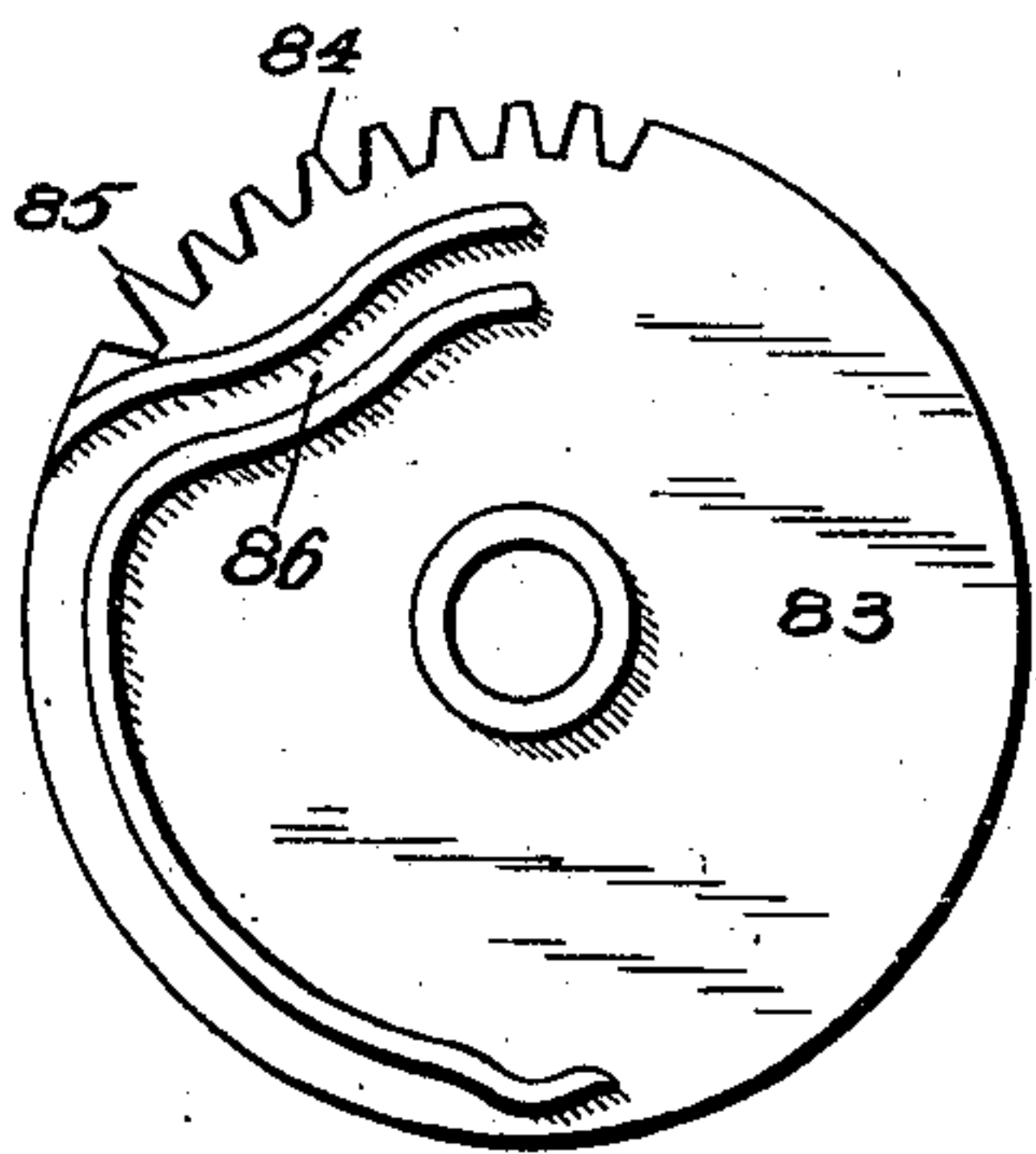
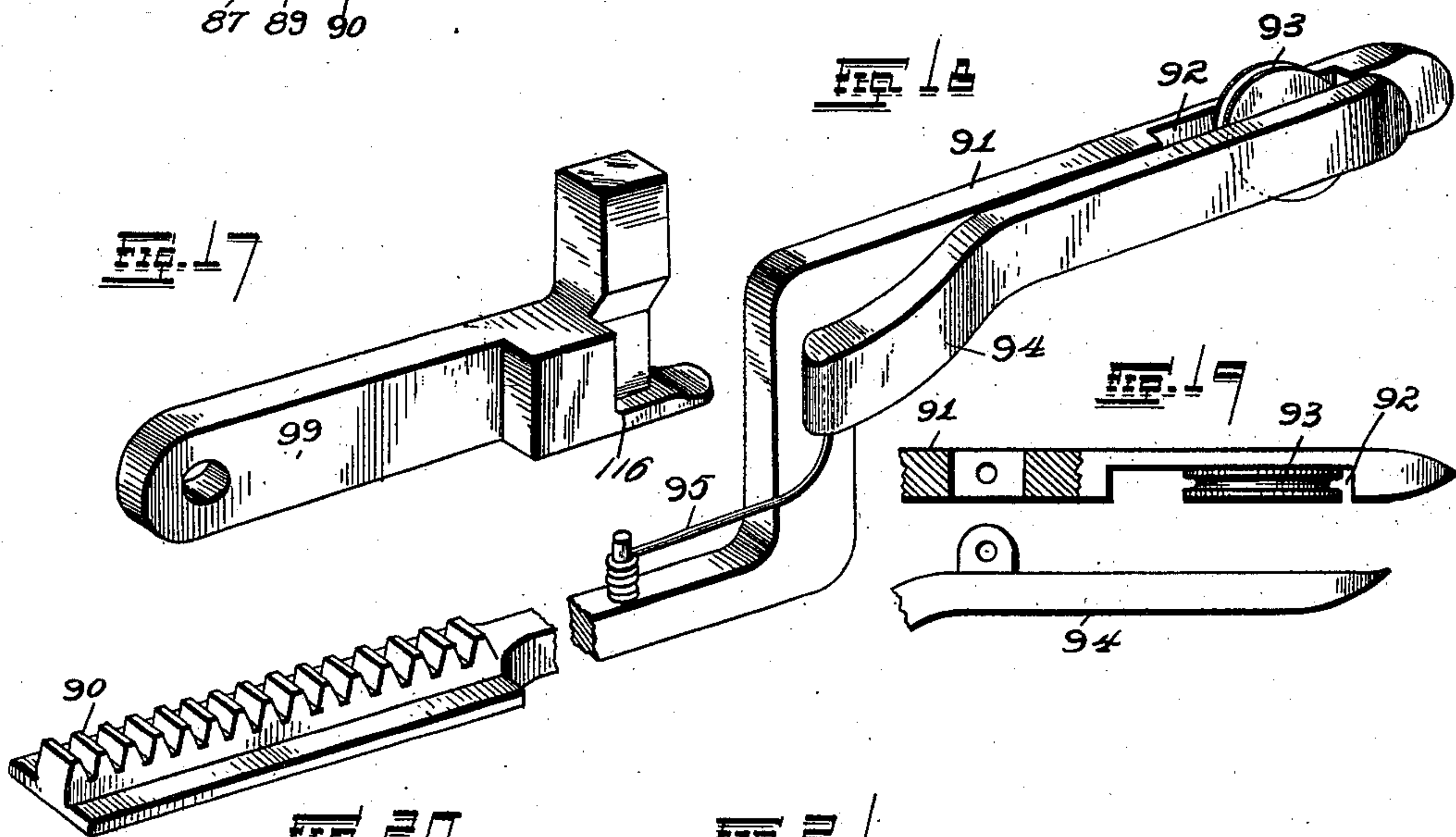


FIG. 17



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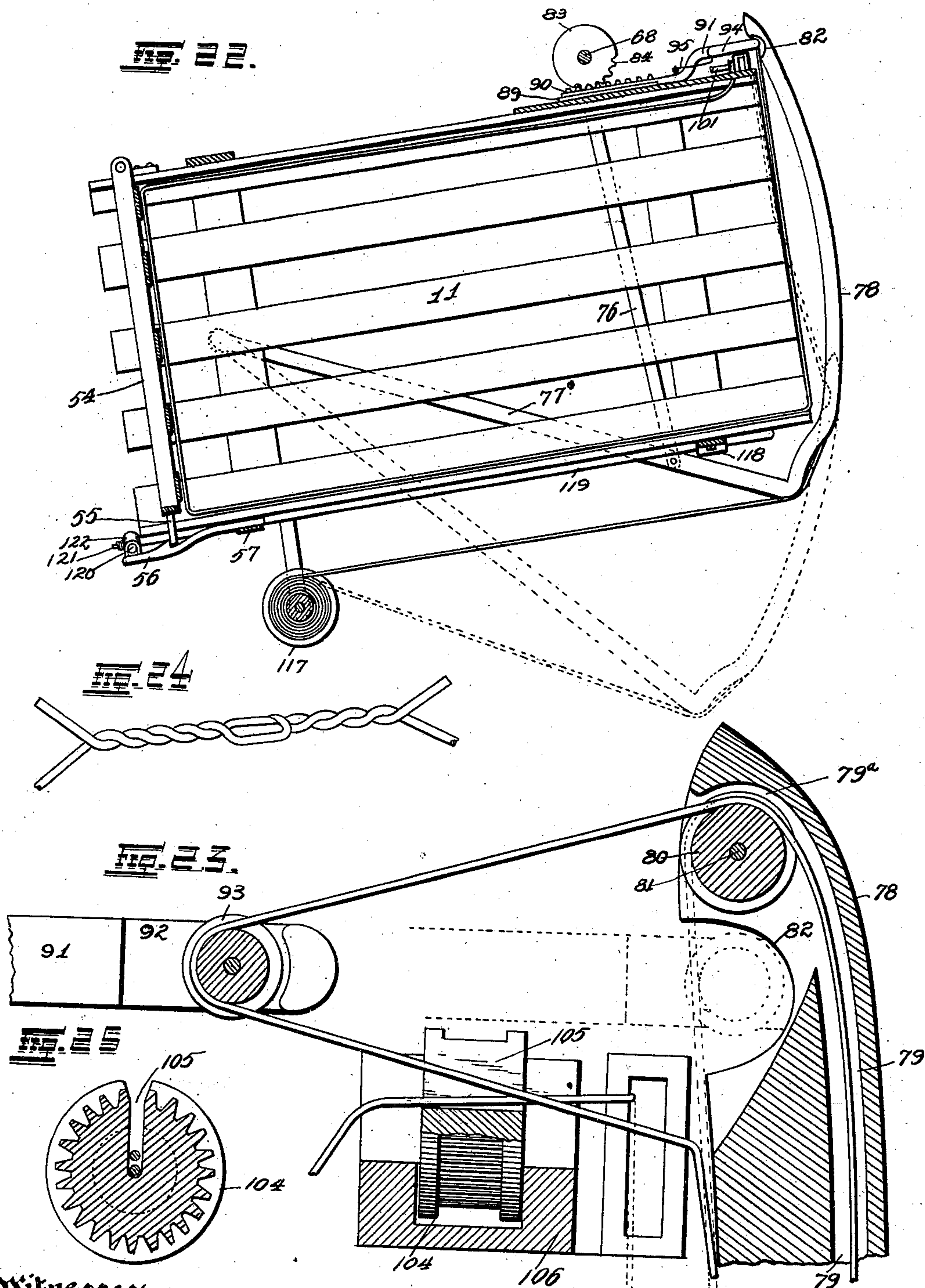
Patented Mar. 19, 1901.

T. KIRSHMAN & L. M. MEDLIN.  
BALING MACHINE.

(No Model.)

(Application filed Feb. 23, 1900.)

8 Sheets—Sheet 8.



Witnesses

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# UNITED STATES PATENT OFFICE.

THOMAS KIRSHMAN, OF CALIFORNIA, AND LOGAN M. MEDLIN, OF LATHAM, MISSOURI, ASSIGNORS OF ONE-HALF TO H. W. LATHAM, OF LATHAM, AND HENRY HERFURTH, JAMES L. BUCHANAN, AND H. E. BLAKEMAN, OF CALIFORNIA, MISSOURI.

## BALING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 670,406, dated March 19, 1901.

Application filed February 23, 1900. Serial No. 6,221. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS KIRSHMAN, of the city of California, and LOGAN M. MEDLIN, of the city of Latham, Moniteau county, State of Missouri, have invented certain new and useful Improvements in Baling-Presses, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

This invention relates to baling-presses; and it consists of the novel construction, combination, and arrangement of parts hereinafter shown, described, and claimed.

This invention relates specifically to improvements in the baling-press for which an application for Letters Patent was filed by us September 28, 1897, Serial No. 653,412, allowed January 13, 1898, (not issued,) and in the improved baling-press for which an application for Letters Patent was filed by Logan M. Medlin January 30, 1899, Serial No. 703,928, allowed December 29, 1899.

In the drawings, Figure 1 is a side elevation of our complete invention. Fig. 2 is a view in perspective of a segment made use of in carrying out our invention. Fig. 3 is a perspective view of a latch which is made to stop the feeding mechanism at suitable intervals and also operates the knife which cuts the web of material passing into the baling-box. Fig. 4 is a side elevation of the complete baling-press, showing the side opposite from that shown in Fig. 1. Fig. 5 is a view in perspective of a part of the knife-operating mechanism. Fig. 6 shows the shaft operating the feeding-claws. Fig. 7 is a top plan view of the machine. Fig. 8 is a sectional view of the feeding-rollers and of a part of the baling-box. Fig. 9 is a perspective view showing in detail the relative position of the levers carried by the side of the baling-box and the function of which is to operate the knotter. Fig. 10 is a view in perspective of the rear end of the baling-box. Figs. 11 and 12 are detail perspective views showing the rod which we employ to operate the latch at the rear end of the baling-box. Figs. 13 and 14 are side and top plan views, respectively, of the knotting mechanism. Fig. 15 is a front view of the same. Fig. 16 is a top plan view of the knotter. Fig. 17 is a per-

spective view of the knife which cuts the wire after the same has been bound around the bale. Fig. 18 is a view in perspective of the device made use of to draw the wire into the knotter. Fig. 19 is a detail plan view of a part of the same. Figs. 20 and 21 are views showing the different sides of the wheels made use of to operate the knotter. Fig. 22 is a sectional view of the baling box or receptacle, showing the position of the wire-carrying needles after the wire has been carried around the bale. Fig. 23 is a detail sectional view of the knotter and of a part of the wire-carrying needle. Fig. 24 shows the form of knot tied by our improved knotter. Fig. 25 is a sectional view of the knotting-wheel.

Referring by numerals to the accompanying drawings, 1 indicates a supporting-frame of any suitable construction and which may when desired be mounted on wheels, and thereby be easily and quickly moved from one locality to another. Supported above the forward end of the said frame by means of braces 2 is a hopper 3, into which the material to be baled is placed and from which it is passed into the baling-box. The rear end of the hopper is supported by suitable side strips 4, rigidly secured to or integral with the bearing-boxes 5, the same being secured in any suitable manner to the upright frame 6. The frames 6 are curved in side elevation, all points on their rear sides being equidistant from the trunnions 7, rotatably journaled in bearings in the frames 8, the same being rigidly supported on the rear end of the frame 1 and forming pivots for the baling-chamber. The purpose of curving the frames 6 is to support the compression-rollers, hereinafter described, in close proximity to the forward end of the baling-box at all points in its oscillatory movement. The said frames 8 are provided with integral members 9 at their upper ends, which members project forwardly and are secured to the frames 6, thereby securing both the said frames more rigidly in their upright position. The trunnions 7, one of which is provided for each of the frames 8, are integral with the bearing-plates 10, the same being rigidly secured to the sides of the baling-box 11. By this means the rear end of the baling-box is pivotally supported, while the



forward end is supported and oscillated in a manner hereinafter set forth.

Rotatably carried by the upper end of the frames 6 is a driving-shaft 12, keyed upon one end of which is a belt-pulley 13, inwardly from which is a sprocket-wheel 14, and inwardly from the said sprocket-wheel is a gear-wheel 15. A sprocket-chain 16 is passed around the sprocket-wheel 14 and also around another sprocket-wheel 17, keyed upon the end of the shaft 18, upon which shaft, between the side strips 4, is carried one of the feed-rollers 19, the same operating through the bottom 20 of the hopper 3. The gear 15 meshes with a like gear 21, keyed upon the shaft 22, upon the opposite end of which is a sprocket-wheel 23, around which is passed a chain 24, the same being carried forwardly and passed around a similar sprocket-wheel 25, carried by the shaft 26. The said shaft 26 projects through the hopper 3 and is provided with a plurality of integral cranks 27 within the said hopper, the said cranks projecting in relatively different directions from the shaft, but being similar in all other respects, Fig. 6. Each of the said cranks is made to operate an arm 28, upon the forward ends of which are carried a plurality of downwardly-pending teeth 29, the object of which is to draw the material to be baled rearwardly and pass the same to the feed-rollers. As may be seen by referring to the drawings, these claws engage in the material at different times, which arrangement prevents the web passing into the baling-box from becoming stationary at any time. The rear end of each of the arms 28 is pivotally secured to another arm 29<sup>a</sup>, which are pivoted upon a shaft 30, the same being rotatably carried by supports 31, secured in any suitable manner to the bearing-boxes 5. By this means the arms 28 are allowed to operate forwardly and rearwardly, the elbow formed at the connection of the arms 28 and 29<sup>a</sup> allowing such operation to take place.

Inwardly from the sprocket-wheel 25 upon the shaft 26 is another sprocket-wheel 32, a chain 33 being passed around the same and carried around another sprocket 34, keyed upon the shaft 35. The said shaft is journaled in vertically-moving bearings 36, which operate in the bearing-boxes 5. Above each of the bearing-blocks is a coil-spring 37, the same pressing at all times against the said bearings and against the upper part of the bearing-boxes 5. A corrugated feed-roller 38 is carried by the shaft 35 in vertical alinement with the feed-roller 19 and may be pressed upwardly and allow a greater amount of material to pass between the said rollers, the spring 37 allowing such separation to occur.

A small gear 39, keyed upon the shaft 12 on the end opposite from the pulley 13, is made to mesh with a large gear 40, keyed upon the shaft 41, rotatably supported in bearings in the upper ends of the frames 6. Rigidly secured to the side of the gear 40 at

a suitable distance from the center is a wrist-pin 42, pivotally secured to which is a rod 43, the lower end being secured to a pin 44, secured in any suitable manner to the forward end of the baling-box. Upon the end of the shaft 41 opposite from the gear 40 is a crank 45, corresponding in every respect to the crank formed by the gear 40 and the pin 42, and to the said crank is pivoted a rod 46, the lower end thereof being connected to a pin 47, secured to the side of the baling-box in horizontal alinement with the pin 44. By this means, as is readily apparent, the baling-box is oscillated as the shaft 41 is rotated, the short trunnions 7 being the pivots which permit this operation. The lower end of a retractile coil-spring 48 is secured to each of the pins 44 and 47, and their upper ends are secured to the horizontal members 9. The object of these springs is to aid in drawing the baling-box up again after each downward stroke.

In horizontal alinement with each of the feed-rollers 19 38 is a corrugated guide-roller 49, the same being carried on shafts 50, rotatably supported in bearings in the frame 6, Fig. 8. The object of the rollers 49 is to receive the material after it has been passed rearwardly by the rollers 19 and 38 and to pass it on into the oscillating baling-box and to serve as compression-rollers to press the material into the baling-box as the said box is oscillated. The rollers 49 are in sections, the different sections being held a suitable distance apart by any well-known means to allow the wire-carrying needles to pass upwardly and carry the wire to the tying mechanism hereinafter described. Above and below the rollers 49 are arranged suitable sectional compression-rollers 51, the same corresponding in size to the rollers 49. The object of these rollers is to keep the material pressed closely into the baling-box and to obviate friction as the said box oscillates. Any number of these rollers may be made use of corresponding to the sweep of the baling-box in its oscillating movement. The said rollers are carried on shafts 51<sup>a</sup>, supported in bearings in the frame 6, each of which is provided with a gear 52. A segmental rack 53 is secured to the forward end, at one side of the baling-box, and is of the same curvature as the forward end of the baling-chamber and meshes with the gears 52, thereby operating them in the proper direction as the baling-box moves up or down.

After a sufficient amount of material has been passed into the baling-box the wire carrying and tying mechanism is automatically set in motion. At the rear end of the baling-box is a door 54, the upper side of which is pivotally secured to the baling-box. To the lower edge of the said door is secured a projecting pin 55, which is adapted to engage with a latch-spring 56, provided for that purpose. The said latch-spring is rigidly secured to an arm 57, the same being pivotally se-



cured at one end to the under side of the baling-box and at the other end to a rod 58, Fig. 9. The said rod projects forwardly over a suitable guide 59, in the rear of which is a set-collar 60, carried by the rod 58, by means of which the movement of the said rod may be regulated, and is pivotally connected at its forward end to another rod 61. The set-collar 60 may be of any known construction and may be moved on the rod to contact with the guide 59, and thereby limit the forward movement of the said rod. One form of set-collar or stop is shown in Fig. 9; but it is clear that other forms may be used, the only requirement being that they contact with the guide 59 to stop the rod 58. Above the point of connection with the rod 58 the rod 61 is pivotally secured to the baling-box by means of a pin 62. (See Fig. 1.) The upper end of the rod 61 is provided with an integral outwardly-projecting member 63. A coil-spring 64 connects the projection 63 to the side of the baling-box. (See Fig. 9.)

Rotatably carried on a pin 65, secured in any suitable manner to the side of the baling-box, is a gear-segment 66, the same meshing with a small gear-wheel 67, keyed on the shaft 68, the said shaft being rotatably journaled in bearings 68<sup>a</sup> on the upper surface of the baling-box, Fig. 7. The lower front edge of the segment 66 is provided with an elongated slot 69, in which is pivotally secured a pawl 70, integral with the rear end of which is a lug 71. The rear end of the said pawl is pressed outwardly by any well-known means, as by a spring, and the front end is normally engaged against the outer end of the projection 63, thereby holding the lug 71 within the slot 69. Pivotally mounted on the pin 65 is a lever 72, to the forward end of which is pivotally secured a rod 73, the same being connected at its lower end to the frame 1. The rear end of the lever 72 is provided with an ordinary tooth or lug on its inner side, and as the baling-box oscillates the said lug operates at all times in close proximity to the outer side of the segment 66. When the bale within the baling-box presses against the door 54, this presses the latch 56 rearwardly, which operation draws the rod 58 and the lower end of the rod 61 rearwardly, thereby drawing the member 63 forwardly out of contact with the pawl 70. By adjusting the set-collar 60 forwardly or rearwardly on the rod 58 the projection 63 may be allowed a greater or less sweep and the movement required to remove it out of contact with the pawl 70 may be regulated. When a greater movement is required, a greater amount of material will enter the baling-box before the knotting mechanism is set in operation, and vice versa. When this is done, the rear end of the said pawl 70 is pressed outwardly, as hereinbefore set forth, and the lug 71 projects beyond the face of the segment 66, and at the next downward movement of the baling-box the said lug will be engaged by the end of the lever 72, and as the baling-

box moves upwardly again the segment 66 will be rotated partly around by the lever 72, and the shaft 68 will be operated through the meshing of the gears 67 with the segment 66. Integral with the lower edge of the segment 66 is a projection 74, which contacts with the lever 72 and prevents the said segment from turning beyond the required distance and also causes the lever to bring the segment back to its former position at the next downward stroke of the baling-box. The operation above set forth sets in motion the wire carrying and knotting mechanism, which will now be described.

Keyed upon each end of the shaft 68 is a crank 75, which when the knotter is not in operation occupy a vertical position, as shown in Figs. 1 and 4. To the free end of each of the cranks is pivotally secured a rod 76, which rods are secured at their lower ends to arms 77, the same extending rearwardly and being pivoted at their rear ends upon the trunnions 7. The forward ends of the arms 77 are bent inwardly under the forward end of the baling-frame and are provided with the integral upwardly-projecting needles 78. Each of the needles is provided with an aperture 79, extending longitudinally therethrough from the rear or head end to the point. At the point of each of the needles is a large recess 79<sup>a</sup>, in each of which is mounted a small pulley 80, the same being rotatably carried on the pins 81. Below the recesses 79<sup>a</sup> in each of the needles is another recess 82. Keyed upon the shaft 68, near each side of the baling-box, is a wheel 83, each provided on a part of its periphery with a plurality of teeth 84, which normally occupy a position as shown in Figs. 1 and 4. The lowest one, 85, of the teeth on each of these wheels is made to project a slight distance beyond the others for a purpose hereinafter set forth. On one face of each of the wheels is a cam 86, and on the other side, diametrically opposite from the teeth 84, are a plurality of gear-teeth 87, and a raised surface 88 extends from the last of the said teeth to a point even with the tooth 85 on each of the wheels.

Operating in guides 89 under each of the wheels 83 is a rack 90, integral with the forward end of each of which is an upwardly and forwardly projecting finger 91, the end of each of which is wedge-shaped. Slightly to the rear of the point in each of the fingers is a groove 92, in each of which is rotatably mounted a small pulley 93. To the rear of the groove 92 in each of the fingers is pivotally secured a metallic strip 94, the forward end of which is normally held against the side of the pulley 93 by means of a suitable spring 95. The racks 90 are advanced forwardly by the wheels 83 when the shaft 68 is rotated by the segment 66. The operation takes place by the long tooth 85 on each of the said wheels coming in contact with the foremost tooth on the rack 90, and thereby causing the remaining teeth to mesh and ad-



vance forwardly a suitable distance. When the shaft 68 is turned backward, the racks 90 will again be forced into their former positions, and the short teeth 84 being the last to come out of mesh with the racks 90 the said racks are in such positions that the long teeth 85 will again engage them when the shaft 68 is rotated forwardly. When the racks 90 are advanced forwardly, the rear ends of the strips 94 are pressed inwardly by the fingers 96, the same projecting downwardly from the frames 97, supported on the forward end of the baling-box. The forward ends 98 of the said frames are rectangular in plan view, Fig. 14, and within the rectangular portion of each operates a knife 99, each of which is pivotally secured to a crank 100, keyed upon the forward end of a shaft 101. The shafts 101 are provided on their rear ends with cranks 102, upon the free ends of each of which is a small roller 103. As the wheels 83 are rotated the cams 86 contact with the rollers 103 and rotate the shafts 101, and thereby operate the knives 99 within the frames 98. In alinement with each of the fingers 91, near the forward end of the baling-box, is a small knotter-gear 104, each having an elongated slot 105, the said slots being parallel with the axis of the wheels. The said gears are supported in the bearings 106 of two parts in order that the wire being pressed rearwardly by the web of material to be baled may enter the slot 105 in the knotter-gear 104 and be tied. The knotter-gears 104 mesh with other gears 107, keyed upon shafts 108, the same being rotatably journaled in bearings 109, secured to the top of the baling-box. Upon the rear end of each of the shafts 108 is a beveled gear 110, which mesh with like gears 111, keyed upon the shafts 112. The shafts 112 are supported in bearings 113 and are provided with gears 114 on their rear ends, which mesh with the gears 87 on the sides of the wheels 83. Upon the end of each of the shafts 112 is a cam 115, which slide upon the raised surfaces 88 after the gears 114 have been passed out of mesh with the gears 87, which operation stops the rotation of the shafts 112 and also stops the operation of the knotter-gear 104.

Each of the knives 99 is provided with an integral lug 116, which operates directly against the side of the frames 98 and which hold the free ends of the wires rigidly after the same have been cut by the said knives.

In order to bind a bale of material, coils of wire are placed on spools 117, secured to the under side of the baling-box. The free end of said wire is passed through the elongated aperture 79 in each of the needles 78, and the said wire is drawn upwardly and attached firmly between the lugs 116 and the sides of the frames 98. The web of material is then fed into the baling-box, and as the box fills the wire is forced rearwardly, which operation unwinds the windings on the spools 117. When a sufficient amount of material has

entered the baling-box, as hereinbefore set forth, the shaft 68 is rotated, which operation draws the wire-carrying needles upwardly and draws the wire up over the forward end of the bale. When the needles reach the position shown in Fig. 22, the fingers 91 have been advanced until they project into the slots 82 of the needle, and the metallic strips 94 being pressed away from the fingers 91 the wire is engaged behind the pulleys 93. By this time the baling-frame has again passed on a downward stroke and the pawl 70 engages against the projection 63, which releases the lever 72 and allows the segment 66 to turn backward to its former position. This rotates the shaft 68, and through it the rack 90 and the finger 91 are drawn rearwardly, which because of the ratio of the gearing draws the wire held by the pulley 93 into the slots 105, of the wire-twisters 104. The slots 105 are of such width that the strands of wire placed therein must necessarily occupy a position one upon the other, as shown in Fig. 25. The free end of the wire by the pressure of the bale has already been pressed into the slots, and as the other ends are drawn in the knotters 104 are rapidly rotated, which twists the wire in the form shown in Fig. 24. The wire at the same time is cut again by the knives 99 pressing against the frames 98, and the free ends are engaged again by the lugs 116 and the frames 98, and the friction has been found sufficient to hold the wire under ordinary circumstances. The needles 78 are lowered again by the shaft 68 and will again be drawn up when a sufficient amount of material has entered the baling-box, the operation at all times being the same.

Mounted in bearings 118, secured to the under side of the baling-box, is a rod 119, its ends being bent horizontally in opposite directions. Secured to the rear end 120, by means of a pin 121, is a semitubular plate 122, rigidly secured to the rear end of which is a pin 123. A spring 124 is secured upon the pin 121, is connected at its other end to the pin 123, and normally holds the plate in a plane parallel with the end 120 of the rod. The said rod is arranged so that its ends will pass the side of the latch-spring 56; but the plate 122 is made to engage against the said spring. When the machine is set in motion, the plate 122 is below the latch-spring 56, and as the needles 78 pass down after the tying operation has taken place the hook 125, integral with one of the said needles, Fig. 4, contacts with the forward end 126 of the said rod, presses it downwardly, which will throw the end 120 and the plate 122 upwardly, the pin 121 allowing the operation to take place. The end 120 and plate 122 are raised until they rest upon the flat spring 56, Fig. 10, and at the next downward movement of the baling-frame the forward end 126 of the rod is forced against a lug 127, secured in any suitable manner to the framework, the purpose of the said lug being to operate the latch-rod 119,



as described. (See Fig. 4.) When this operation occurs, the rod is rotated again, the latch-spring 56 is drawn down until the latch is freed, and the bale is allowed to pass out.

5 The rod is rotated a sufficient distance by the operation to allow the plate 122 to pass beyond the end of the latch-spring 56 and assume its normal position below the said spring. After being freed from the operating-rod the spring 56 resumes its former position and after the door is closed locks the same, as before. The end 126 of the rod 119 contacts with the lug 127 at each downward stroke of the baling-box; but as the rear end 15 plate 122 is only placed upon the spring 56 by the operation of the wire-carrying needles the said latch-spring will not be operated except at the desired time.

Rigidly secured to the side of the baling-box, in alinement with the lower edge of the segment 66, is an angled support 128, pivotally secured upon which is a rod 129, the rear end of which engages against the forward edge of the said segment when the same is in its normal position, Fig. 9. When in this position, the pawl 70 engages against the rear end of the said rod and actuates the same outwardly, which position is maintained until the tying mechanism is set in motion. The forward end of the said rod is provided with a bearing 130 and operates upon the pin 44. A coil-spring 131 is mounted around the said pin between the rod 129 and the side of the baling-box, and the tendency of the said spring is to press the forward end of the rod outwardly, which it does when the tying mechanism is set in motion, and the pawl 70 is removed from the rear end of the said rod. When this occurs, the forward end of the rod 40 129 at the next downward stroke of the baling-box contacts with the hook 132 of a latch 133, pivotally secured to the lower end of one of the frames 6, and pushes the said latch forwardly.

An arm or lever 134 is pivotally secured to the frame 6 slightly above the latch 133 and is provided on its rear end with a pin 135, which is normally engaged under the hook 132, thereby holding the said lever normally in an approximately horizontal position, Fig. 1. The forward end of the said lever 134 is engaged under a suitable finger or lug 135<sup>a</sup>, rigidly secured to the rear side of a rod 136, one of which is provided for each side of the machine and each of which is provided on its lower end with a plurality of teeth 137, the same meshing with small gears 138, keyed upon the ends of the shaft 139. By this means it is readily seen that the rods 136 are normally held upward by the said lever 134. Any well-known means is made use of to actuate the shaft 139, such as a spring, &c., and when the lever 134 is removed from the hook 132 the said means actuates the shaft, rotates the same, and draws the rods 136 downwardly. 65 The upper ends of the rods 136 are connected by a transverse rod 140, to which is secured a pair of downwardly-pending arms 141, to

the lower ends of which is secured a knife or sickle 142, which when the rods 136 are drawn downwardly cuts the web of material between 70 the feed and guide rollers, Fig. 8. One end of the transverse rod 140 is pivotally secured to a rod 143, the opposite end of which is provided with a bifurcated lever 144, which fits over a sleeve 145, mounted upon the driving-shaft 12. As the knife is drawn downwardly the lever 144 is drawn inwardly, which operation draws inwardly the gear 15 and the sprocket-wheel 14, together with one member of the friction-clutch 146, this operation al- 80 lowing the said sprocket and gear to turn free on the shaft 12, the belt-pulley 13 being still driven by the motive power. When this operation takes place, the feeding mechanism is stopped until the next downward stroke of 85 the baling-box, when the rod 129 contacts with the rear end of the lever 134 and forces it downwardly again and engages the pin 135 under the hook 132. This again draws the knife to its former position, adjusts the friction-clutch 146, and sets in motion the feed- 90 ing mechanism.

The operation is as follows: When it is desired to use the machine, the motive power is applied to the driving-shaft by any well-known connections, and the material to be 95 baled is fed into the hopper 3 at the forward end of the machine. The material as it is fed into the hopper is engaged by the feeding-claws and passed rearwardly to the feeding-rollers, whence it is passed between the corrugated guide-rollers 49 and into the oscillating baling-box. The oscillation of the baling-box causes the web as it enters to arrange itself in layers or folds, in the manner shown 100 in Fig. 8. This allows the material to be compressed equally tight in all parts of the baling-box. The material after it has passed into the baling-box presses the wire rearwardly, unwinding the spools all the time, until the material reaches the rear end of the baling-box, when the knotting mechanism is set in motion. When the material presses 105 against the door 54, it forces the latch-spring 51 rearwardly, which through its connections draws the projection 63 out of contact with the pawl 70 and allows the lug 71, integral with said pawl, to be engaged by the lever 72. This necessarily occurs while the forward end of the baling-box is at its lowest point and as 120 it raises the lever 72 draws the segment 66 around, thereby rotating the shaft 68 and causing the racks 90 to be pushed forwardly, as hereinbefore set forth. At the same time the wire-carrying needles 78 are drawn up- 125 wardly, and the wire carried by the said needles is engaged behind the small pulleys 93 in the manner hereinbefore described and is drawn rearwardly and into the slots 105 in the knotters 104, the ends of the wire lying 130 one over the other in the said slots, in the manner shown in Fig. 25. When the wire has been placed in the slots and the shaft 68 turns backwardly, the knotter-wheels 104,



because of their connections to the said shaft, are necessarily rotated, which operation twists the ends of the wire tightly together in the form shown in Fig. 24. After the parts assume their former position, as shown in Figs. 1 and 4, the knotting-wheels 104 are stopped from rotating because the shaft 68 has been stopped, which shaft operates the knotters. When the wheels 104 have stopped, the slots 105 are turned downwardly because of the ratio of the gearing, and as the bale is drawn rearwardly out of the baling-box the wire will be drawn out of the said slots, allowing the wire of the next bale to enter therein.

Our improved baling-machine may be mounted upon traction-wheels, if desired, and can be readily moved from place to place and is applicable for baling hay, straw, and all like products.

We claim—

1. In a baling-machine, a framework, a baling-box supported by said framework, means for conveying the material to be baled into the said baling-box and for folding it back and forth upon itself, means for compressing the material within the said baling-box, means for stopping the feeding mechanism after the baling-box has been filled, and means for binding wire around the bale, substantially as specified.

2. In a baling-machine, an oscillating baling-box, the said baling-box being adapted to move within the segment of a circle, means for conveying the material to be baled in the said baling-box, means for passing the material rearwardly in the baling-box and for compressing the same therein, means for stopping the feed mechanism after the baling-box has been filled, means for placing wire around the bale, and means for tying the wire after it has been passed around the bale, substantially as specified.

3. In a baling-machine, a baling-box, a door pivoted to said baling-box, means for locking said door in a closed position, means for conveying the material to be baled into the said baling-box, means for stopping the feed mechanism after the baling-box has been filled, and means for unlocking the said door by the pressure of the bale, substantially as specified.

4. In a baling-machine, a baling-box, a door pivotally secured to said baling-box, a latch for holding said door in a closed position, means for operating the said latch and for releasing the door therefrom, means for actuating the said latch-operating mechanism by the pressure of the bale, and means for regulating the amount of pressure required to operate the said latch-operating mechanism, substantially as specified.

5. In a baling-machine, a baling-box, a door pivotally secured to said baling-box, a latch for said door, means for releasing the door from the said latch, means for adjusting the latch-operating mechanism, means for connecting said latch-operating mechanism to

said latch, and means whereby it is removed from said latch after each operation, substantially as specified.

6. In a baling-machine, an oscillating baling-box, means for conveying the material to be baled into said box, wire-carrying needles for carrying wire partly around the bale, means for actuating said wire-carrying needles by the pressure of the bale, and means for regulating the amount of pressure required to actuate said wire-carrying needles, substantially as specified.

7. In a baling-machine, an oscillating baling-box, a door secured to said baling-box, a latch for said door, means for conveying the material to be baled into said baling-box, wire-carrying needles for carrying wire partly around the bale, means for actuating said wire-carrying needles by the pressure of the bale, means whereby the said latch is operated by the said wire-carrying needles, and means for regulating the amount of pressure required to actuate said wire-carrying needles, substantially as specified.

8. In a baling-machine, an oscillating baling-box, means for conveying the material to be baled into said baling-box, means for placing wire partly around the bale by the pressure of said bale within the baling-box, wire-carrying needles for carrying wire around the remaining portion of the bale, means for actuating said wire-carrying needles by the pressure of the bale, means for regulating the amount of pressure required to actuate said wire-carrying needles, and means for tying the wire after it has been placed around the bale, substantially as specified.

9. In a baling-machine, a baling-box, means for conveying the material to be baled into said box in the form of a web, wire-carrying needles for carrying wire partly around the bale, means for actuating the wire-carrying needles by the pressure of the bale, and means whereby the web of material entering the baling-box is cut simultaneously with the movement of the wire-carrying needles, substantially as specified.

10. In a baling-machine, an oscillating baling-box, feed-rollers for conveying the material into said baling-box, compression-rollers for compressing the material into said baling-box, means for rotating said compression-rollers as the baling-box oscillates, a knot-tying mechanism for tying a wire around the bale, and means for stopping the feed-rollers while the knot-tying mechanism is in operation, substantially as specified.

11. In a baling-machine, a baling-box, means for oscillating said baling-box, means for conveying the material to be baled into said baling-box, a knot-tying mechanism, means whereby said knot-tying mechanism is actuated by the pressure of the bale, and means whereby the amount of pressure required to actuate the said knot-tying mechanism may be regulated, substantially as specified.



12. In a baling-machine, a baling-box, means for oscillating said baling-box, a knot-tying mechanism, means for conveying the material to be baled into the said baling-box, means for placing wire around the bale, means for presenting the wire to the knot-tying mechanism, means for actuating the knot-tying mechanism by the pressure of the bale, means for regulating the amount of pressure required to operate the knot-tying mechanism, means for cutting the wire after it has been tied and means for holding the free end of said wire after it has been cut, substantially as specified.

13. In a baling-machine, an oscillating baling-box, means for conveying the material to be baled into the baling-box in the form of a web, means for placing wire around the bale, a knot-tying mechanism, means for presenting the wire to said knot-tying mechanism, means whereby the knot-tying mechanism is actuated by the pressure of the bale, and means whereby the web of material entering the baling-box is stopped during the operation of the knot-tying mechanism, substantially as specified.

14. In a baling-machine, a baling-box, means for oscillating said box, a knot-tying mechanism carried by said baling-box, means for actuating said knot-tying mechanism by the pressure of the bale, means for conveying the material to be baled into the baling-box, means for placing wire around the bale, means for drawing the wire into the knot-tying mechanism, means for cutting the wire after it has been tied, means for holding the free end of the wire after it has been cut, and means for regulating the amount of material that is allowed to enter the baling-box before the knot-tying mechanism is operated, substantially as specified.

15. In a baling-press, an oscillating baling-box for receiving the material to be baled, a knot-tying mechanism comprising a wheel having a slot, means for placing one end of the wire in said slot by the pressure of the bale, a separate means for drawing the other end of the wire into the said slot, means for rotating the said wheel to twist the wire, and means for regulating the amount of material which enters the baling-box before the said parts mentioned will be operated.

16. In a baling-press, a baling-box having a door, a latch for said door, a knot-tying mechanism, means for operating the knot-tying mechanism, means for actuating said operating device by the pressure of the bale, means for regulating the amount of material which enters the baling-box before the operating device will be actuated, connections between the said latch and the operating device, and means whereby the operating device will be set in motion whenever the said latch is operated.

17. In a baling-machine, a baling-box, means for oscillating said baling-box, a knot-tying mechanism carried by said baling-box,

a gear-segment pivotally secured to the said baling-box, means for holding said segment in a fixed position, and means for releasing said segment from its fixed position by the pressure of the bale, substantially as specified.

18. In a baling-machine, a baling-box, means for oscillating said baling-box, a knot-tying mechanism carried by said baling-box, a gear-segment pivotally secured to the said baling-box, means for holding said segment in a fixed position, means for rotating said segment, and means whereby the knot-tying mechanism is operated when the said segment is rotated, substantially as specified.

19. In a baling-machine, a baling-box, means for oscillating said baling-box, a knot-tying mechanism carried by said baling-box, a gear-segment pivotally carried by said baling-box, means for holding said segment in a fixed position, means for releasing said segment by the pressure of the bale, means for rotating said segment, means for operating the tying mechanism when the said segment is rotated, and means for bringing said segment to its former position, substantially as specified.

20. In a baling-machine, an oscillating baling-box, a knot-tying mechanism, wire-carrying needles, a gear-segment carried by said baling-box, means for rotating said segment by the pressure of the bale, means for operating said wire-carrying needles when the segment is rotated, a separate means for drawing the wire into the knot-tying mechanism, and means for operating the knot-tying mechanism, substantially as specified.

21. In a baling-machine, an oscillating baling-box, a gear-segment pivoted to said baling-box, a pawl secured within a groove in said segment, means for locking said segment, a lever, means whereby said lever is allowed to engage the pawl at suitable intervals and to move the said segment, a knot-tying mechanism, means whereby the knot-tying mechanism is operated whenever the said segment is moved, and means whereby said lever is removed out of engagement with said pawl after each operation of the knot-tying mechanism, substantially as specified.

22. In a baling-machine, an oscillating baling-box, a door at one end of said baling-box, a latch for said door, an operating-rod for said latch, wire-carrying needles, means for placing said rod in operative position by the movement of the needles, means for operating said rod by the movement of the baling-box, a knot-tying mechanism, means for operating said knot-tying mechanism, and means for starting the said operating device whenever the said latch is operated, substantially as specified.

23. In a baling-machine, an oscillating baling-box having a door and a latch for said door, means for operating the latch to release the door, slotted gear-wheels carried by said baling-box, means for drawing one end of the



wire into said slots by the pressure of the bale, means for presenting the other end of said wire, a rack for each of said gear-wheels, means for operating said racks, means where-  
5 by the said wheels and rack are set in motion whenever the said latch is operated, and means whereby said racks are made to draw the presented end of said wire into the said slots, substantially as specified.

10 24. In a baling-machine, an oscillating baling-box, a knotting mechanism carried by said baling-box, means for operating said knotting mechanism, suitable feed-rollers, means for operating said feed-rollers, means for passing  
15 the material to be baled between said feed-rollers, a knife supported to the rear of said feed-rollers, and means for operating said knife to cut the web of material, each time the knotting mechanism is operated, substantially as specified.  
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25. In a baling-machine, an oscillating baling-box, feed-rollers for conveying the mate-

rial to be baled into said baling-box, a knotting mechanism, means for operating said knotting mechanism, means for stopping the  
25 said feed-rollers when said knotting mechanism is operated, and means for cutting the web of material to the rear of said feed-rollers, substantially as specified.

26. In a baling-press, a baling-box, means  
30 for oscillating it, a shaft, a knotter connected to it, wire-carrying needles connected to said shaft for presenting the wire to the knotter, means for feeding the material into the baling-box, and means for releasing the said shaft  
35 by the pressure of the bale to operate both the knotter and needles.

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

THOMAS KIRSHMAN.  
LOGAN M. MEDLIN.

Witnesses:

JOHN C. HIGDON,  
JOHN D. RIPPEY.