

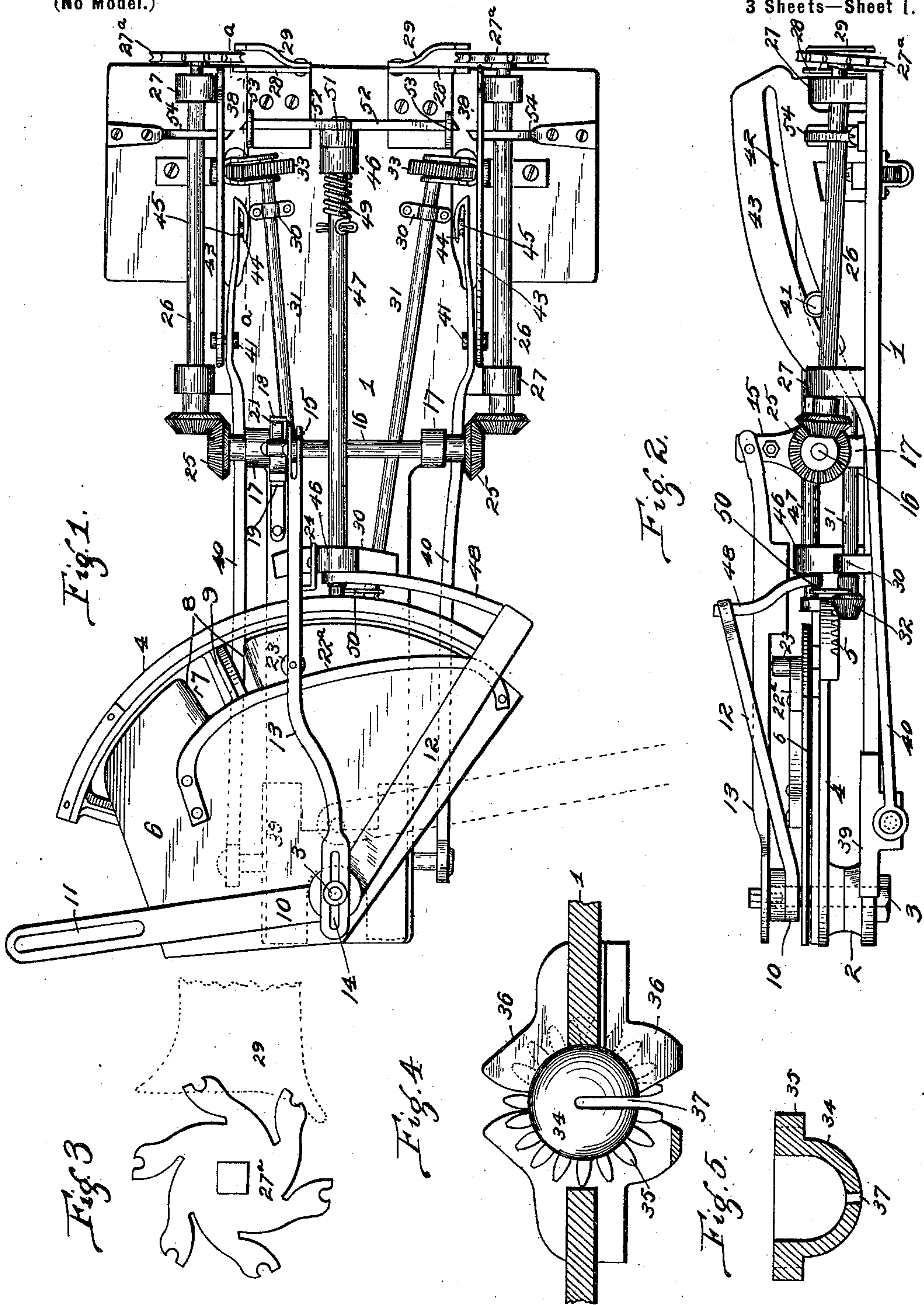
No. 670,407.

Patented Mar. 19, 1901.

T. KIRSHMAN.
KNOTTER FOR BALING PRESSES.

(Application filed Apr. 2, 1900.)

(No Model.)



Witnesses:

Alfred Eicher

J. W. Rippey

Inventor:

Thomas Kirshman

By Higdon & Longan Attys.

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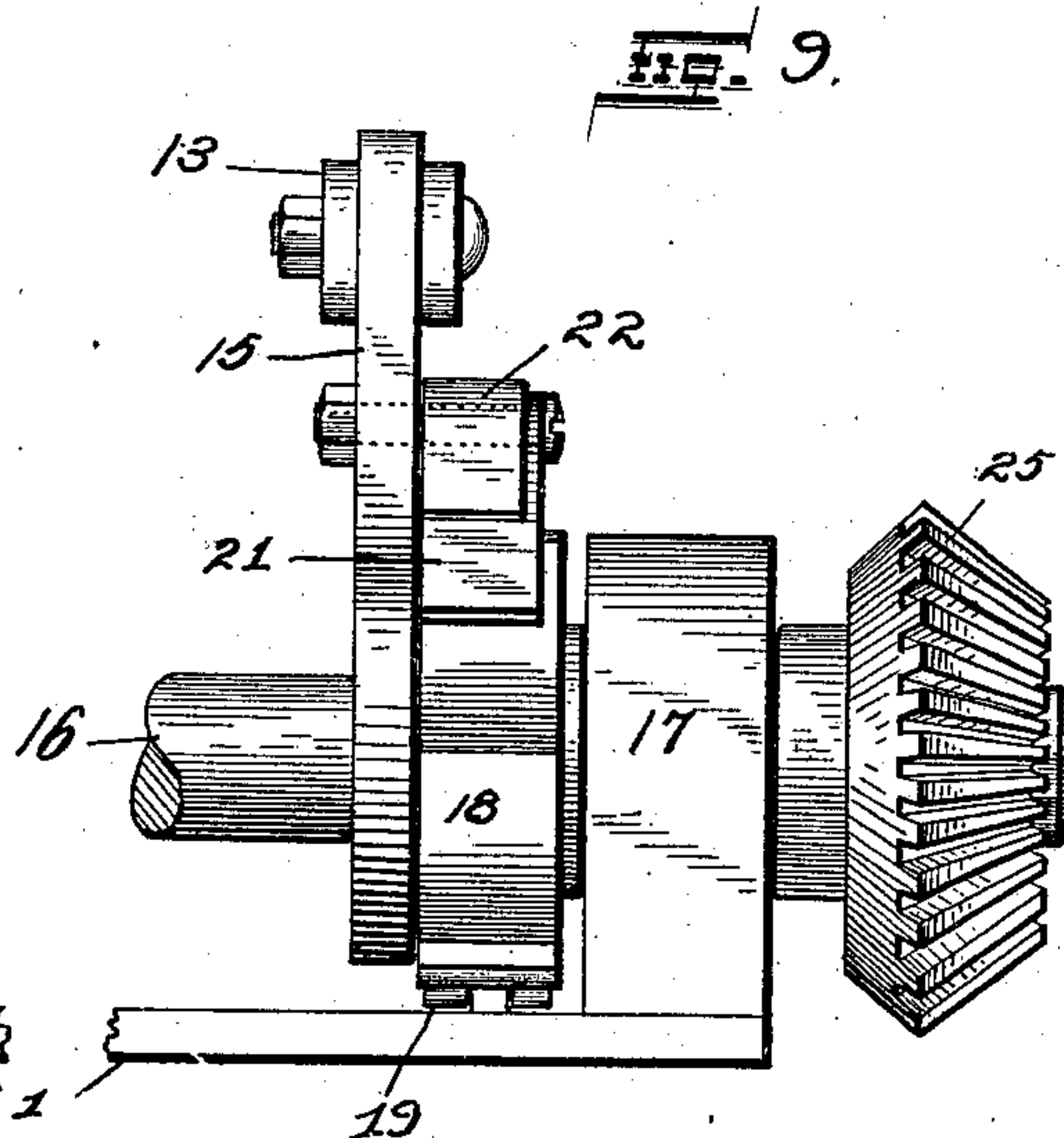
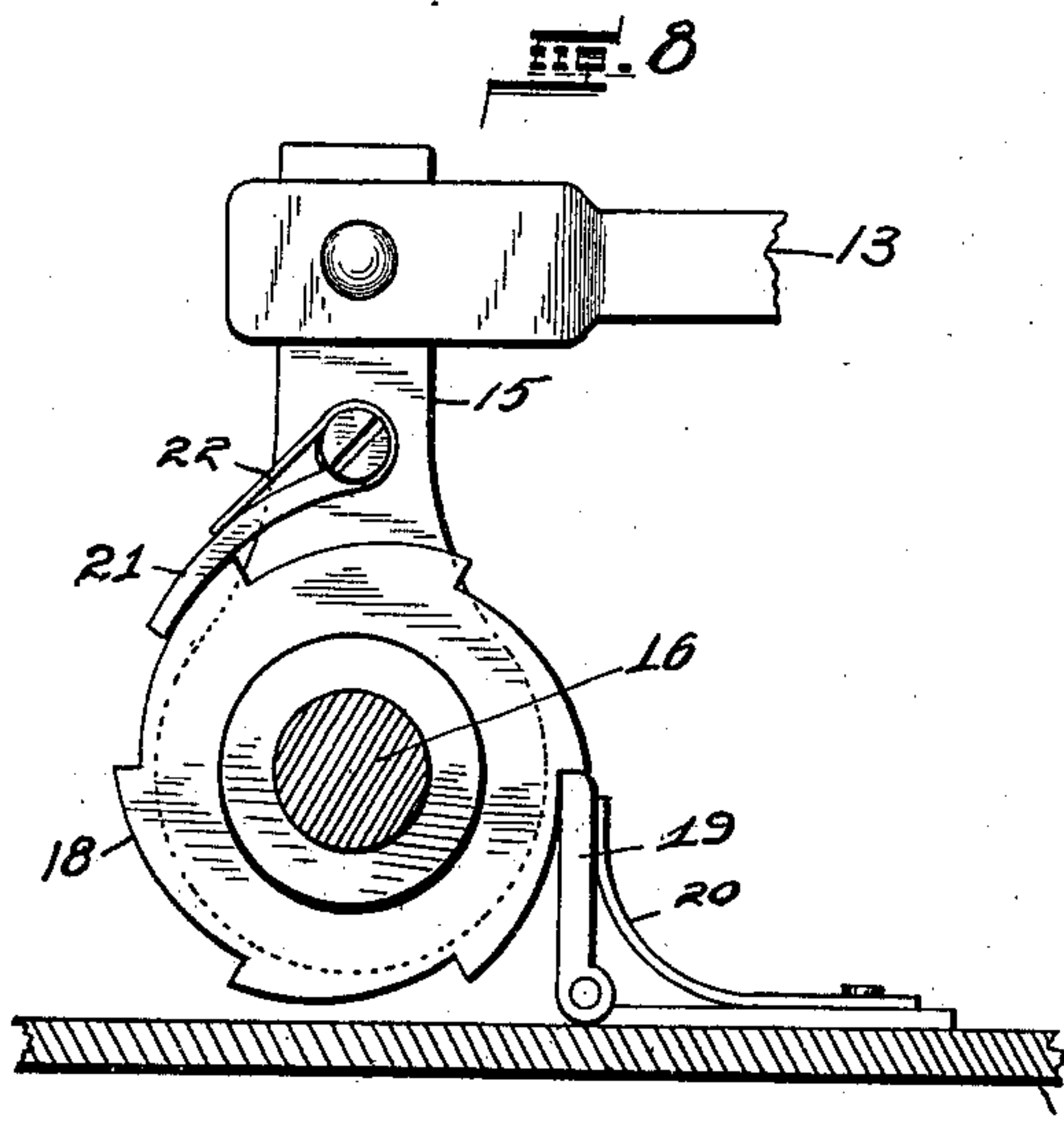
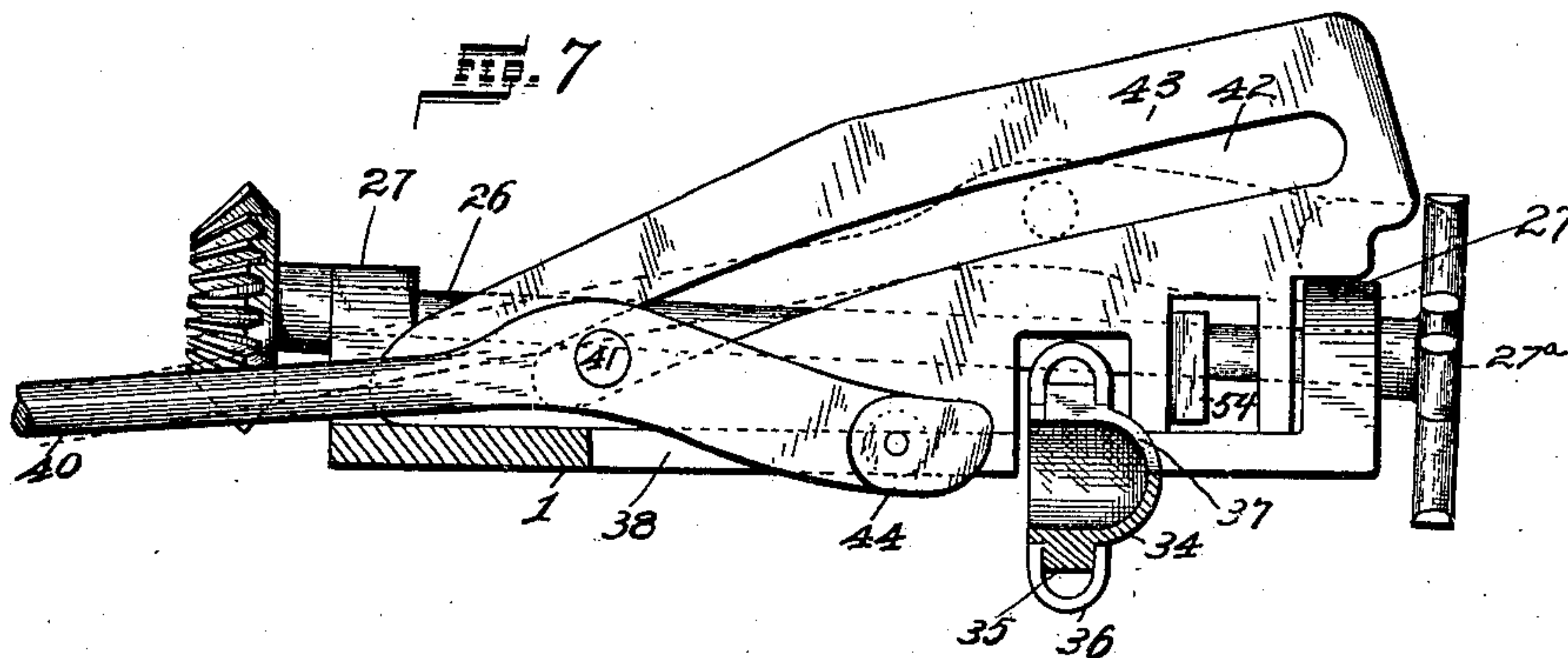
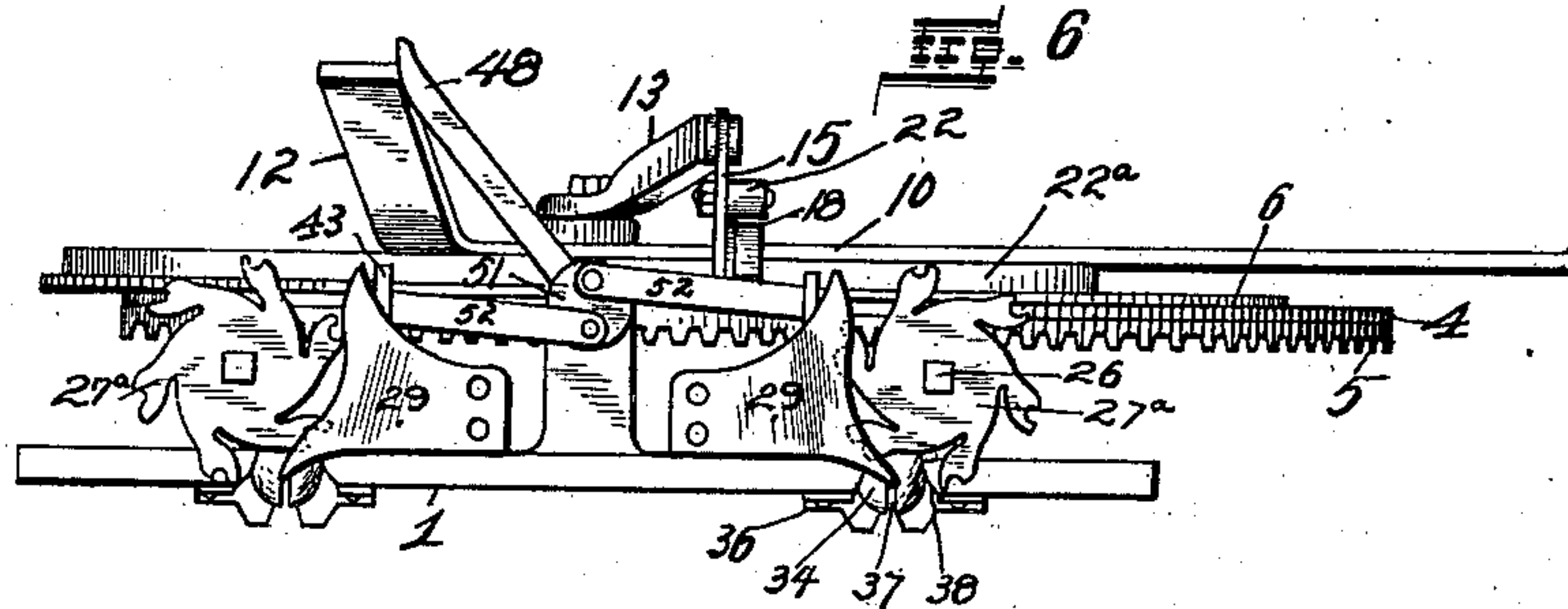
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3 Sheets—Sheet 2.



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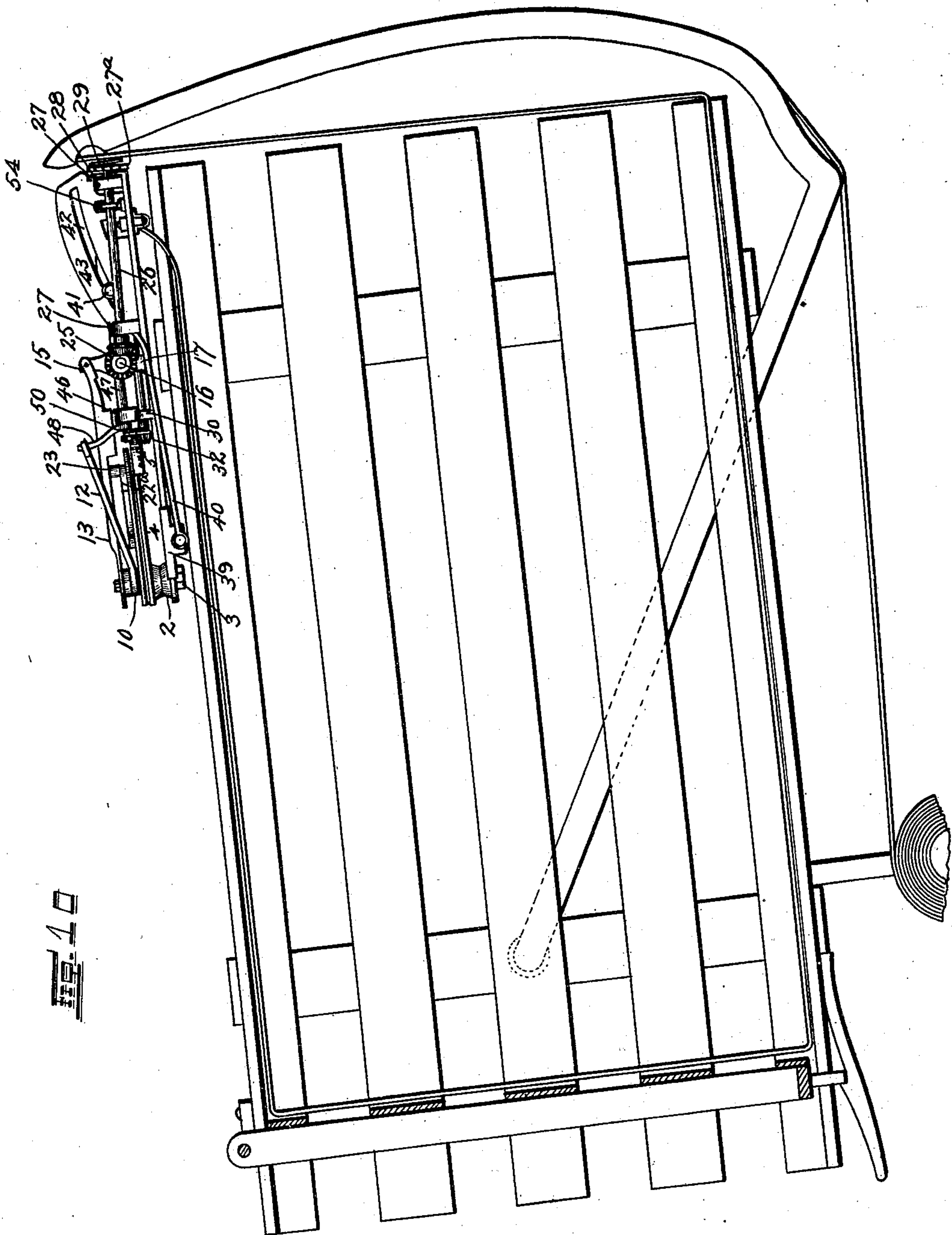
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Alfred A. Eicher

J. D. Rippey

Inventor

Thomas Kirshman

By Higdon & Longan, Attys.

UNITED STATES PATENT OFFICE.

THOMAS KIRSHMAN, OF CALIFORNIA, MISSOURI, ASSIGNOR OF ONE-HALF TO HENRY HERFURTH, JAMES L. BUCHANAN, AND H. E. BLAKEMAN, OF SAME PLACE, AND H. W. LATHAM, OF LATHAM, MISSOURI.

KNOTTER FOR BALING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 670,407, dated March 19, 1901.

Application filed April 2, 1900. Serial No. 11,087. (No model.)

To all whom it may concern:

Be it known that I, THOMAS KIRSHMAN, of the city of California, Moniteau county, State of Missouri, have invented certain new and useful Improvements in Knotters for 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 knotters for baling-machines; and it consists of the novel construction, combination, and arrangement of parts hereinafter shown, described, and claimed.

Figure 1 is a top plan view showing the normal position of my improved knot-tying mechanism. Fig. 2 is a side elevation. Fig. 3 is a front view of the guiding and clamping disk. Fig. 4 is a view of the knotting-wheel. Fig. 5 is a sectional view of the same. Fig. 6 is a front view of the complete knotter. Fig. 7 is a sectional view taken on the line *a a* of Fig. 1. Fig. 8 is a view showing a ratchet-disk which I make use of in carrying out my invention. Fig. 9 is a front view of the same. Fig. 10 is a view showing the knotter in position on the baling-box, and, as shown, is to be located at the feed end of the baling-box.

In carrying out this invention I provide a base-plate 1 of sufficient size to support the entire knotting mechanism, the said plate being provided on its rear end with a bearing 2, rotatably carried upon which, by means of the bolt 3, is a segment 4, the same occupying a horizontal position and being provided on its under side with gear-teeth 5. Supported upon the segment 4 is a segmental plate 6, the said plate being pivotally held by the bolt 3 and having in its outer edge a slot 7, and integral with the said plate on each side of the said slot is a downwardly-pending flange 8, one of which is on each side of the central spoke 9, the same being integral with the segment 4 and being located under the middle of the plate 6. As shown, the slot 7 is wider than the spoke 9, which necessitates one of the flanges 8 being removed from the said spoke when the other is in contact therewith. By this means the plate 6 is allowed to rotate a short distance

free to gain momentum; but one of the flanges 8 will then contact with the spoke 9, and thereby rotate the segment 4.

Engaged by the bolt 3 is an angled lever 10, one arm of which is provided with an elongated slot 11, which is for the purpose of receiving an operating-arm carried by the baling-box, the other arm 12 being bent upwardly for a purpose hereinafter set forth, Fig. 6. The said lever is rigidly secured to the plate 6 and when operated will rotate the said plate and also the segment 4, the flanges 8 contacting with the spoke 9, thereby carrying the said segment around.

A rod 13 is provided at its rear end with a slot 14, through which the bolt 3 operates, and is pivotally secured at its front end to a crank 15, the same being rotatably carried upon a shaft 16, the said shaft being journaled in bearings 17, carried upon the plate 1. A ratchet-wheel 18 is keyed upon the shaft 16 beside the crank 15 and is prevented from turning backward by a pawl 19, the said pawl being held against the ratchet at all times by means of a spring 20. A pawl 21 is carried by the crank 15 and is retained upon the ratchet 18 by a spring 22, and as the said crank is operated the ratchet 18 and the shaft 16 will be rotated a slight distance forwardly, in which position they will be held by the pawl 19 until rotated again by the same operation. A cam 22^a is secured upon the upper surface of the plate 6, and as the said plate is rotated to the left the said cam contacts with a small roller 23, carried on the lower side of the rod 13, and pushes the said rod forwardly, thereby rotating the shaft 16. When the plate is turned backward to its former position, the rod 13 is actuated rearwardly by means of a spring 24, secured in any suitable manner to the plate 1.

Keyed upon each end of the shaft 16 is a beveled gear-wheel 25, each of which meshes with a like gear carried on the rear ends of the shafts 26, the same being journaled in bearings 27, rigidly secured to each side of the plate 1. To the forward end of each of the shafts 26 is secured an armed disk 27^a, the function of which is to engage the free end of the wire after it has been tied and cut and to hold it until the knotter is again set

in operation. As shown in Fig. 3, each of the disks 27^a is constructed with a central body portion, integral with the edge of which is a plurality of arms or projections, which project tangentially therefrom and which are provided in their outer ends with circular recesses for receiving the wire. Inwardly from each of the disks 27^a is a support 28, rigidly secured to each of which is a strip 29, the function of the said members 28 29 being to deflect the wire so that it will be securely retained until released by the rotation of the disks 27^a. After the wire has been received within the circular recesses in the outer ends of the arms carried by the disks 27^a the said disks are rotated until the arms supporting the wire are between the strips 28 and 29 by which the wire is deflected and frictionally held between the arms and the said strips. The relative positions of the disks 27^a and the strips 28 and 29 are clearly shown in Fig. 1 of the drawings, and the manner in which the arms project behind the strips 29 may be seen by referring to Fig. 6.

Journalled in suitable bearings 30, near each side of the plate 1, is a shaft 31, each provided on its rear end with a beveled gear-wheel 32, the said gears meshing with the teeth 5 on the under side of the segment 4. The forward end of each of the shafts 31 is provided with a gear-wheel 33, and the function of said gears is to operate the knoter-wheels, the said knoter-wheels being carried between the gear-wheels 33 and the sides of the baling-box. The knoter-wheels comprise the hollow hemispherical castings 34, having near their edges a plurality of gear-teeth 35, the said gear-teeth meshing with the gear-wheels 33. Each of the said castings is journaled in bearings 36 of two parts spaced a suitable distance apart in order to allow the wire to enter the knoter-wheel from below and from above, as the case may be. In each of the wheels is a slot 37, the said slots extending inwardly to the center and being of such width that the wires placed therein must lie one upon the other. The castings are supported in elongated slots 38 in the plate 1 in order that the wire may be drawn into the knoter from below by the pressure of the material to be baled being forced into the baling-box.

Mounted to slide on the plate 1, beneath the segment 4, is a frame 39, the said frame being adapted to be operated forwardly and rearwardly on the plate 1 in any desirable manner, and pivotally secured to each end thereof is a rod 40, the said rods being bent upwardly at their forward ends. Each of the rods is provided near its forward end with a pin 41, which operate in slots 42 in the guides 43, the said guides being rigidly carried by the plate 1, near the forward end thereof. By this means when the rods 40 are advanced they are also raised to a height sufficient to allow them to pass over the knotting mechanism. Integral with each of the said rods at its forward end is a rearwardly-projecting

ear 44, rotatably supported between which and the rod proper is a small pulley 45.

Rotatably journaled in bearings 46, supported by the plate 1, between the shafts 31, is a knife-operating shaft 47, keyed upon the rear end of which is an arm 48, the same being adapted to contact with the arm 12 of the lever 10 when the said lever is operated. By this operation the said arm 48 is pressed upwardly, which rotates the shaft 47, the said shaft being drawn back to its normal position when released from the arm 12 by means of a coil-spring 49, one end of the said spring being secured to one of the bearings 46 and the other end to the shaft 47, Fig. 1. When drawn backward to its former position, it is retained there by a pin 50, the same being carried by the shaft 47, the lower end contacting with one of the shafts 31. Rigidly secured upon the forward end of the shaft 47 is a disk 51, and pivotally secured to each the upper and lower side thereof is a knife 52, which when the shaft is rotated are pressed outwardly, the outer ends operating in guides 53, which are for the purpose of holding the knives 52 in the desired adjustment. Other knives 54 are provided between the knives 52 and the sides of the baling-box, one for each of the knives 52, and when the said knives 52 are operated outwardly they contact with the forward side of the knives 54, thereby cutting the wire which has been drawn rearwardly into the knotting-wheels.

The operation is as follows: The free end of the wire is engaged in the armed disks 27^a, and as the material to be baled is fed into the baling-box it presses the wire rearwardly, the said wire being guided in the elongated slots 38, in which are held the knotting-wheels 34, the slots 37 thereof being turned downward, as shown in Fig. 6. As the wire is pressed rearwardly it passes between the two parts of each of the bearings 36 and upwardly in the slots 37. When a sufficient amount of material has been passed into the baling-box, the lever 10 is operated clockwise, which rotates the shafts 31, the said shafts rotating the knoter-wheels 34 a sufficient distance to bring the slots 37 to their upper sides, and then while the lever remains at rest the frame 39 and rods 40 are advanced forwardly by any suitable means until the wire which has been carried over the front side of the bale by the needle or any other well-known means is engaged behind the small pulleys 45, when the said frame and rods are drawn rearwardly, which operation draws the wire into the slot 37 in the knoter-gear 34. The lever 10 is then operated again, which rotates the knotters rapidly and twists together the ends of the wire. The wire at the same time is cut by the knives 52 and 54, and the free end is engaged by one of the arms integral with the disks 27^a and is slightly twisted by the rotation of the said disks, which fastens the wire securely until the knoter is again set in operation. The lever 10 is now operated in the

opposite direction from the former operation, which releases the wire from the knotter and restores the parts to their former position.

I claim—

5 1. In a knotter, a wheel having a slot, means for holding one end of the wire adjacent to said slot the said wire being forced into said slot by the pressure of the bale, a separate means for drawing the other end of
10 the wire into said slot, means for rotating said wheel thereby twisting the wire, means for cutting the wire after it has been twisted, the free end of the wire after it has been cut, being held adjacent to said slot by the said
15 wire-holding means, substantially as specified.

2. In a knotter, a segment, means for operating said segment, shafts carrying disks on their forward ends, arms integral with
20 said disks, means for operating said disks when the said segment is operated, wheels having slots extending from their edges to their centers, means for holding one end of the wire adjacent to said slots, means for
25 guiding the said wire into said slots by the pressure of the bale, a separate means for drawing the opposite end of the wire into said slots, means for rotating said wheels thereby twisting the wire, and means for cut-
30 ting the wire after it has been twisted, substantially as specified.

3. A knotter, comprising a segment, a segmental plate carried above said segment, means for operating said plate, means for op-
35 erating said segment when the said plate is moved, wheels having slots extending inwardly from their edges, means for holding one end of the wire adjacent to said slots, means for guiding the said wire into said slots
40 by the pressure of the bale, means for drawing the other end of the wire into said slots, and means whereby the said wheels are rotated whenever the said plate and segment are operated, substantially as specified.

45 4. A knot-tying mechanism, comprising a segment, a segmental plate carried adjacent to said segment, means for operating said plate and segment, knotter-wheels having slots, means for holding one end of the wire
50 adjacent to said slots, means for guiding the

wire into said slots when pressed by the bale, means for drawing the opposite end of the wire into said slots, means for rotating said knotter-wheels when the said plate and seg-
ment are operated, means for cutting the wire 55 after it has been tied, and means for engaging the end of the wire with the said wire-holder after it has been cut, substantially as specified.

5. In a knotter, a wheel having a slot, a wire-holder carried adjacent to said wheel, 60 means for engaging the wire with said wire-holder, means for guiding the retained end of the wire into said slot by the pressure of the bale, means for drawing the opposite end of the wire into said slot, means for rotating 65 the wheel to twist the wire, and means for cutting the wire after it has been twisted, the end of the wire being engaged by the wire-holding device after it has been cut, substantially as specified. 70

6. A knotter, comprising a wheel having a slot, a wire-holding device carried adjacent to said wheel, a knife operating adjacent to said wheel, means for guiding one end of the wire into said slot, by the pressure of the bale, 75 means for drawing the opposite end of the wire into said slot, means for rotating said wheel, and means for operating the knife after the wire has been tied, the end of the wire being engaged by the said wire-holding de- 80 vice, after it has been cut, substantially as specified.

7. A knotter, comprising a movable lever, a wheel having a slot, a wire-holding device adjacent to said wheel, means for engaging 85 the wire with said wire-holder, means for guiding the retained end of the wire into said slot by the pressure of the bale, means for drawing the opposite end of the wire into said slot, a knife adjacent to said wheel, and means 90 whereby the said parts mentioned are operated whenever the said lever is moved, substantially as specified.

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

THOMAS KIRSHMAN.

Witnesses:

EDWARD E. LONGAN,
JOHN D. RIPPEY.