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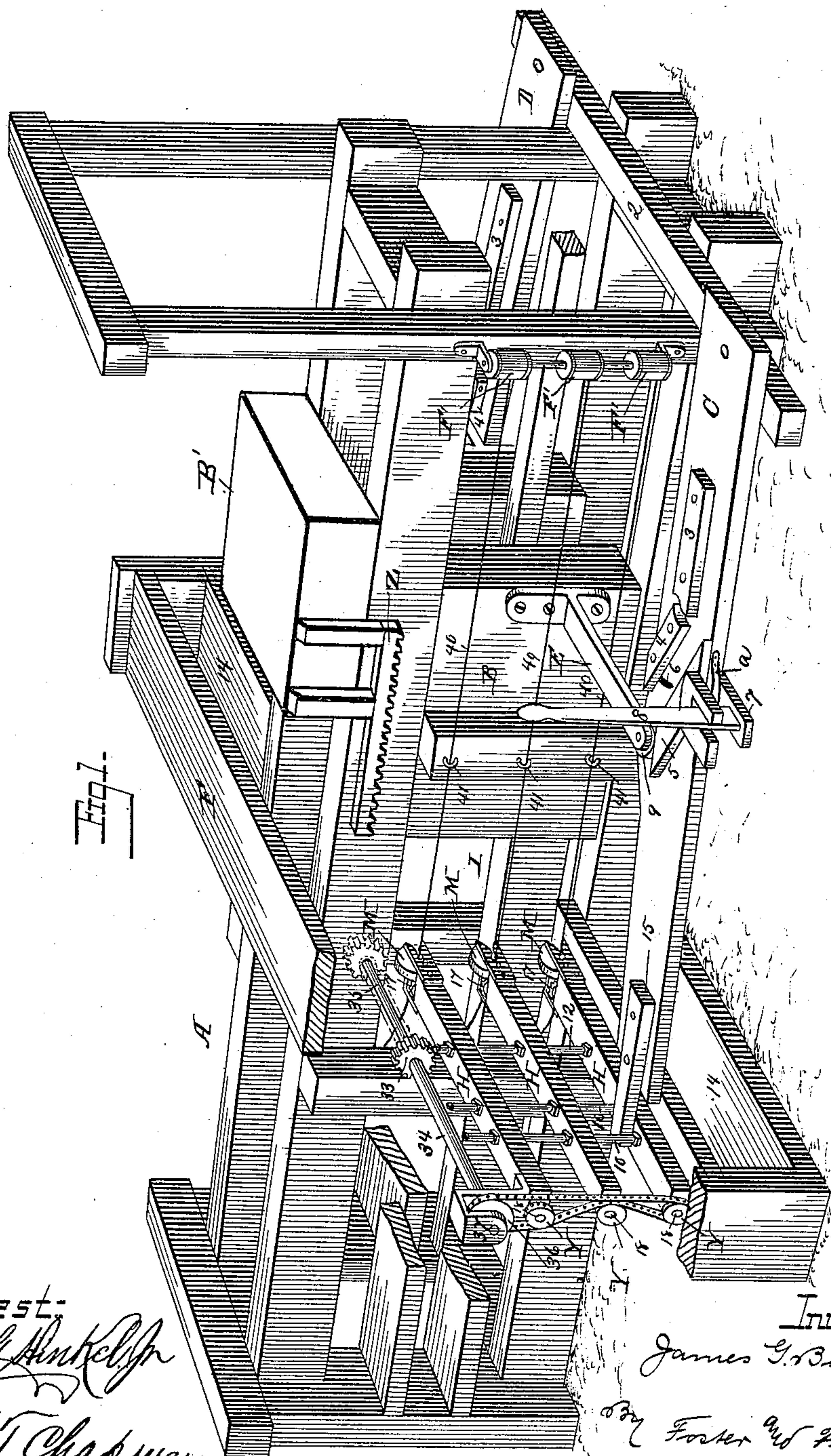
4 Sheets—Sheet 1.

J. G. BUCHANAN.

BALING PRESS.

No. 370,374.

Patented Sept. 27, 1887.



Attest:

Prof. Hinkel
H. T. Chapman

Inventor:

James G. Buchanan,

by Foster & Freeman,
attys.

(No Model.)

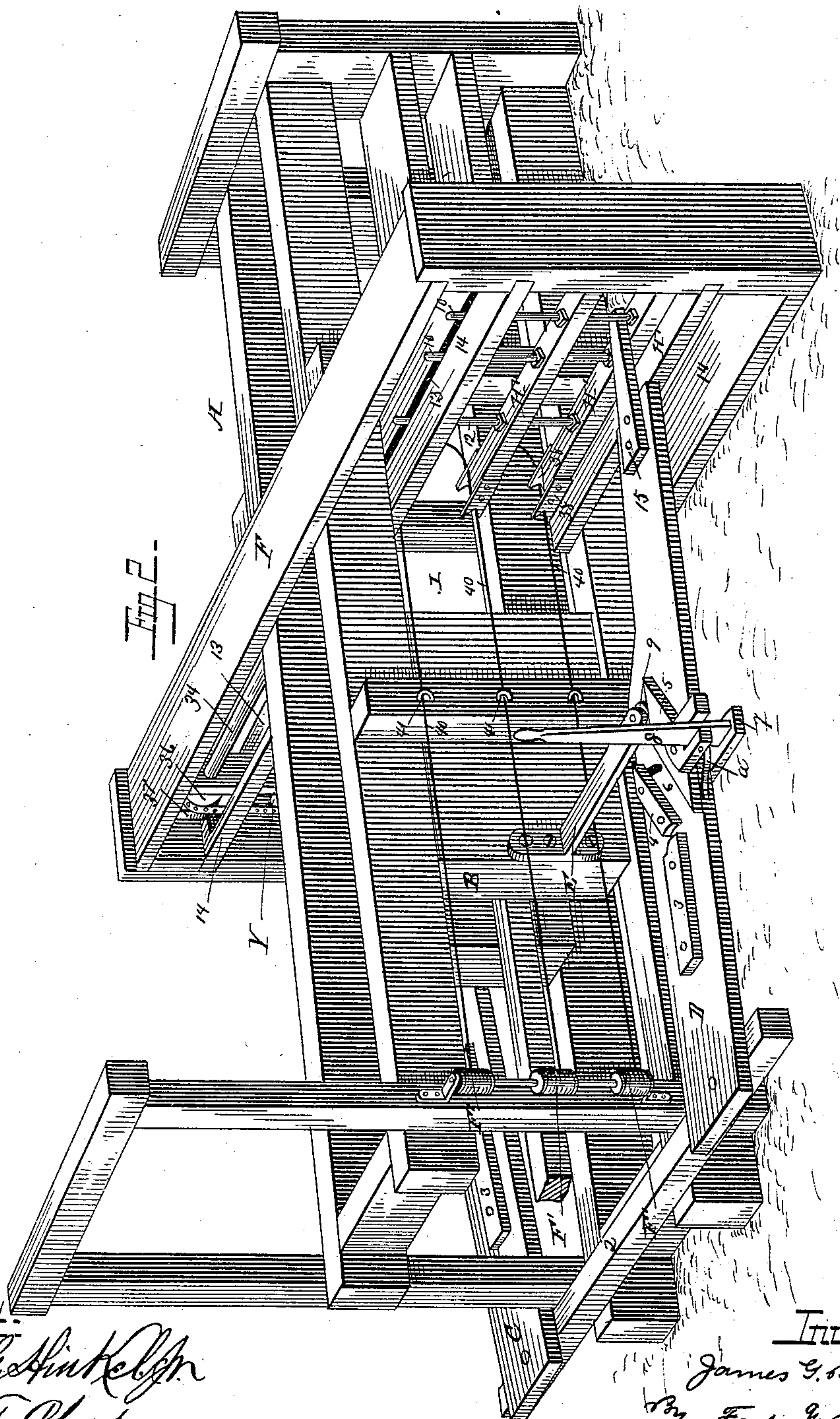
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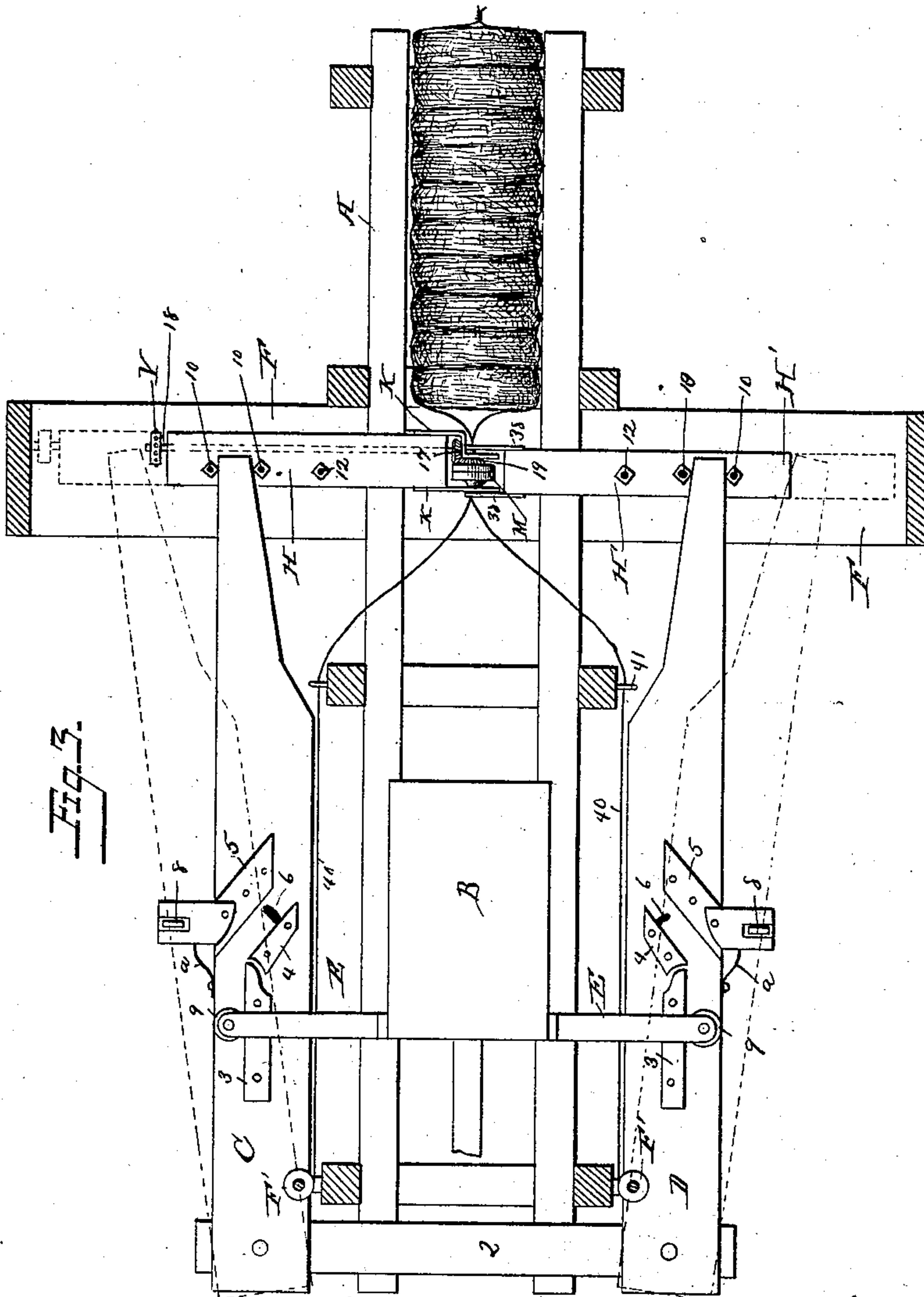
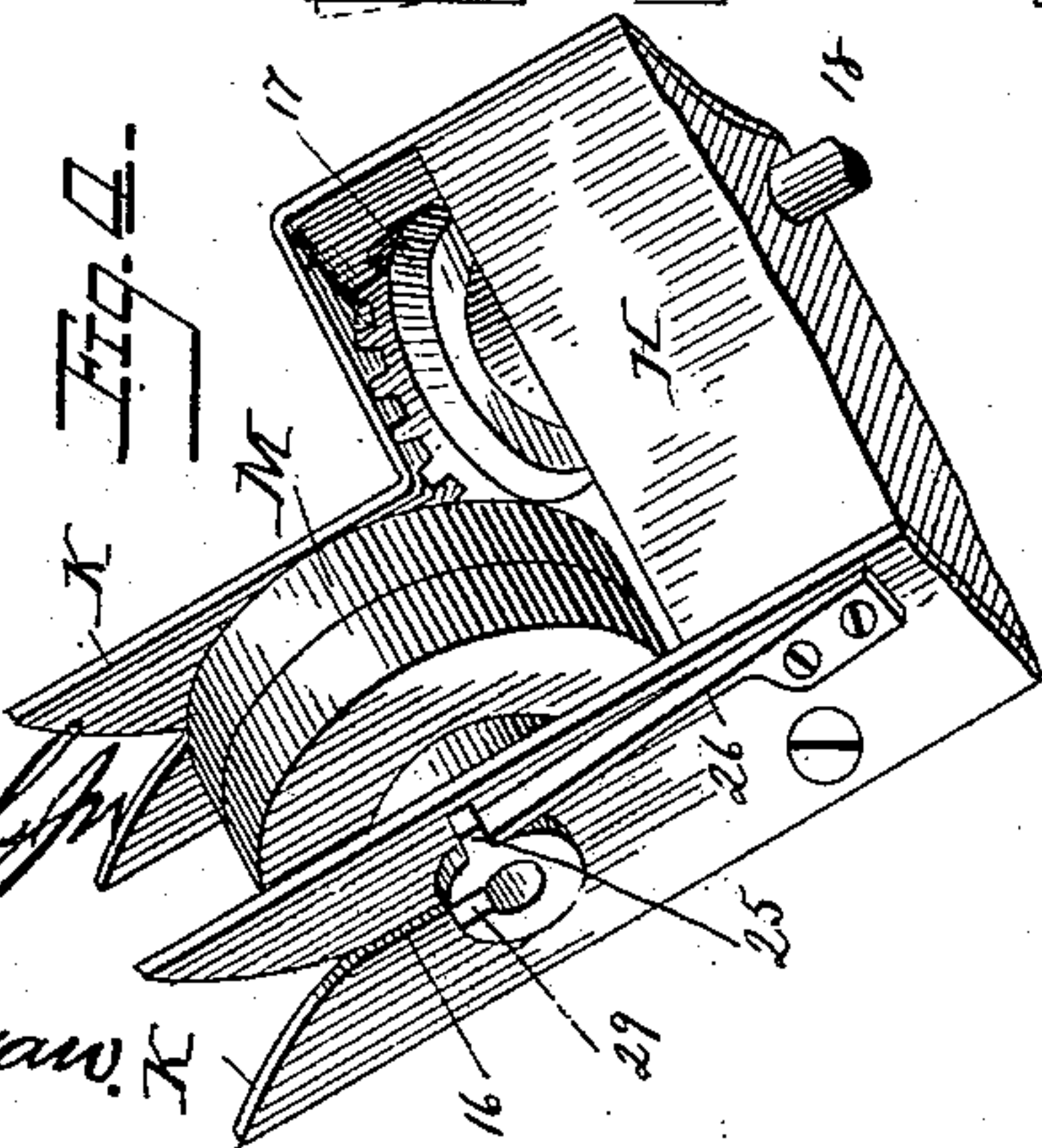


Fig. 3.

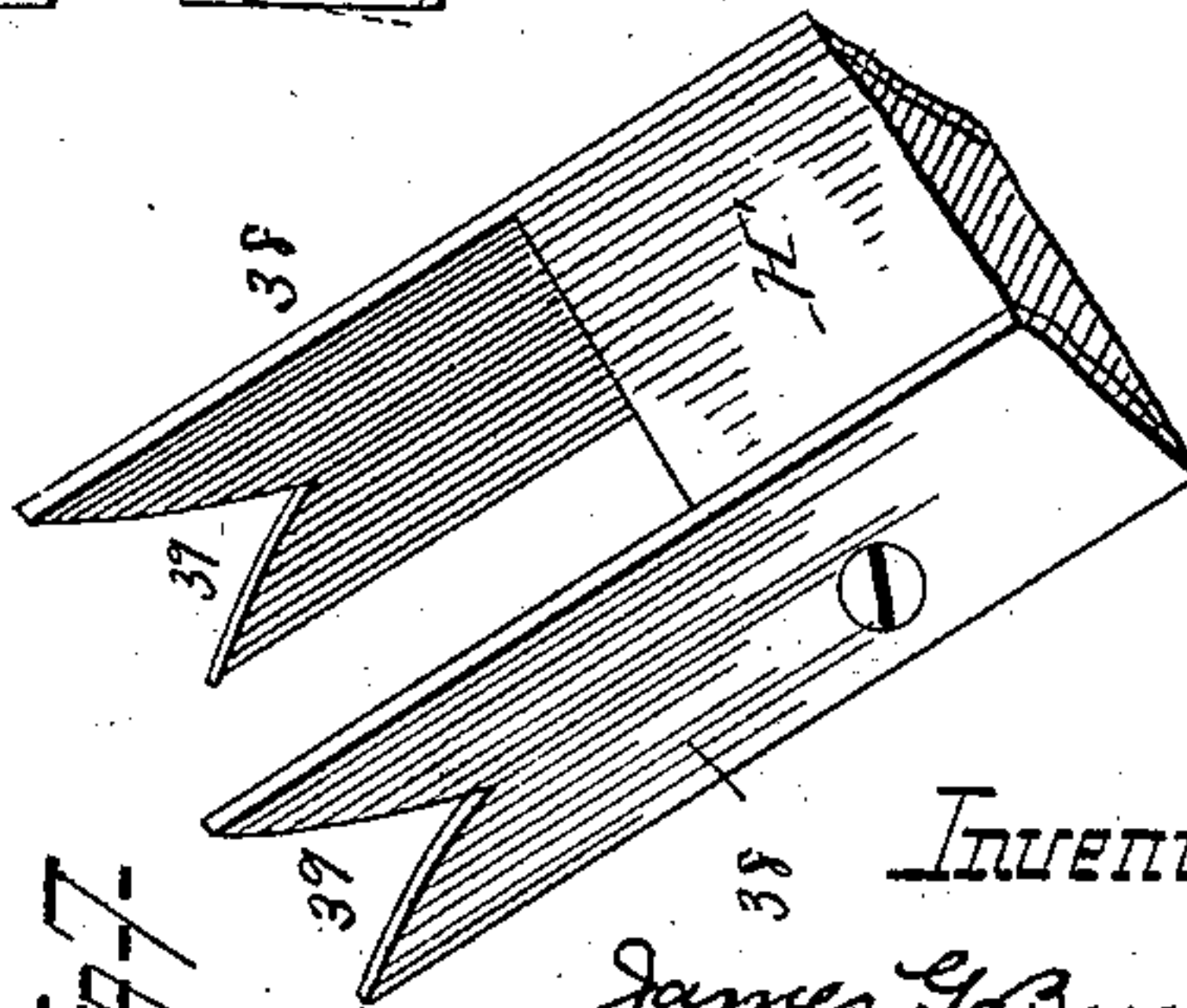
Fig. 4.



Witness:

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Fig. 5.



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(No Model.)

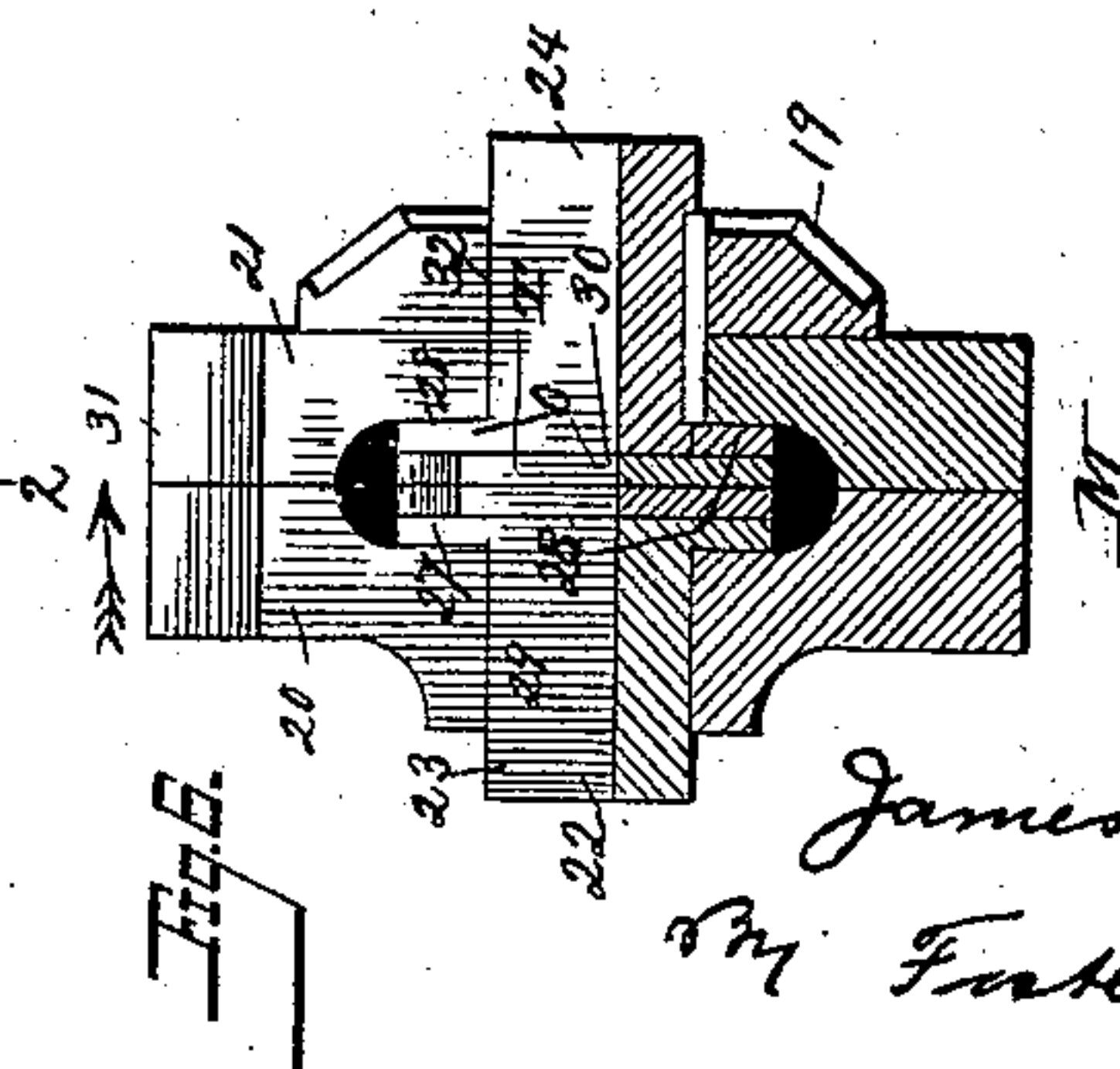
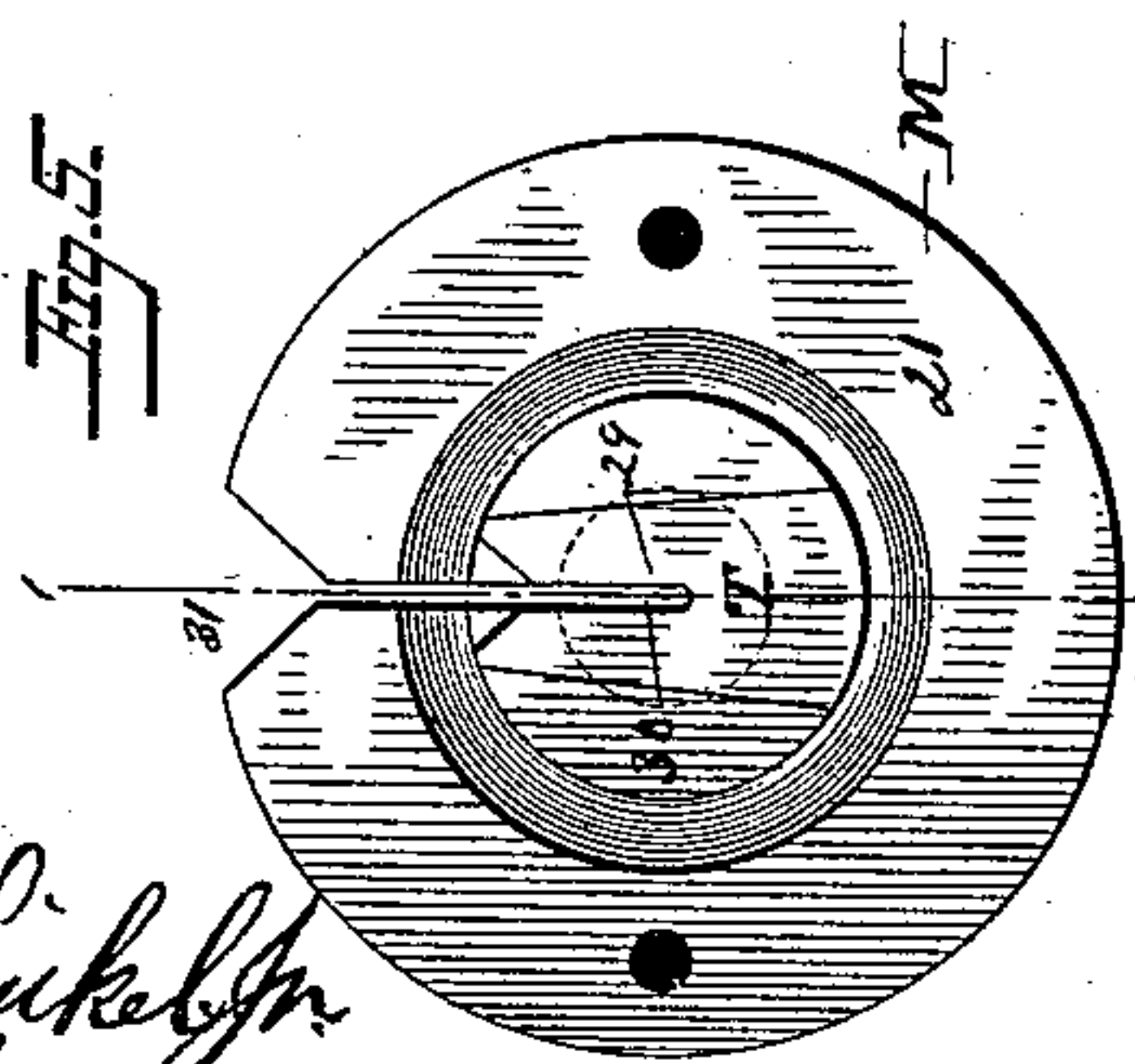
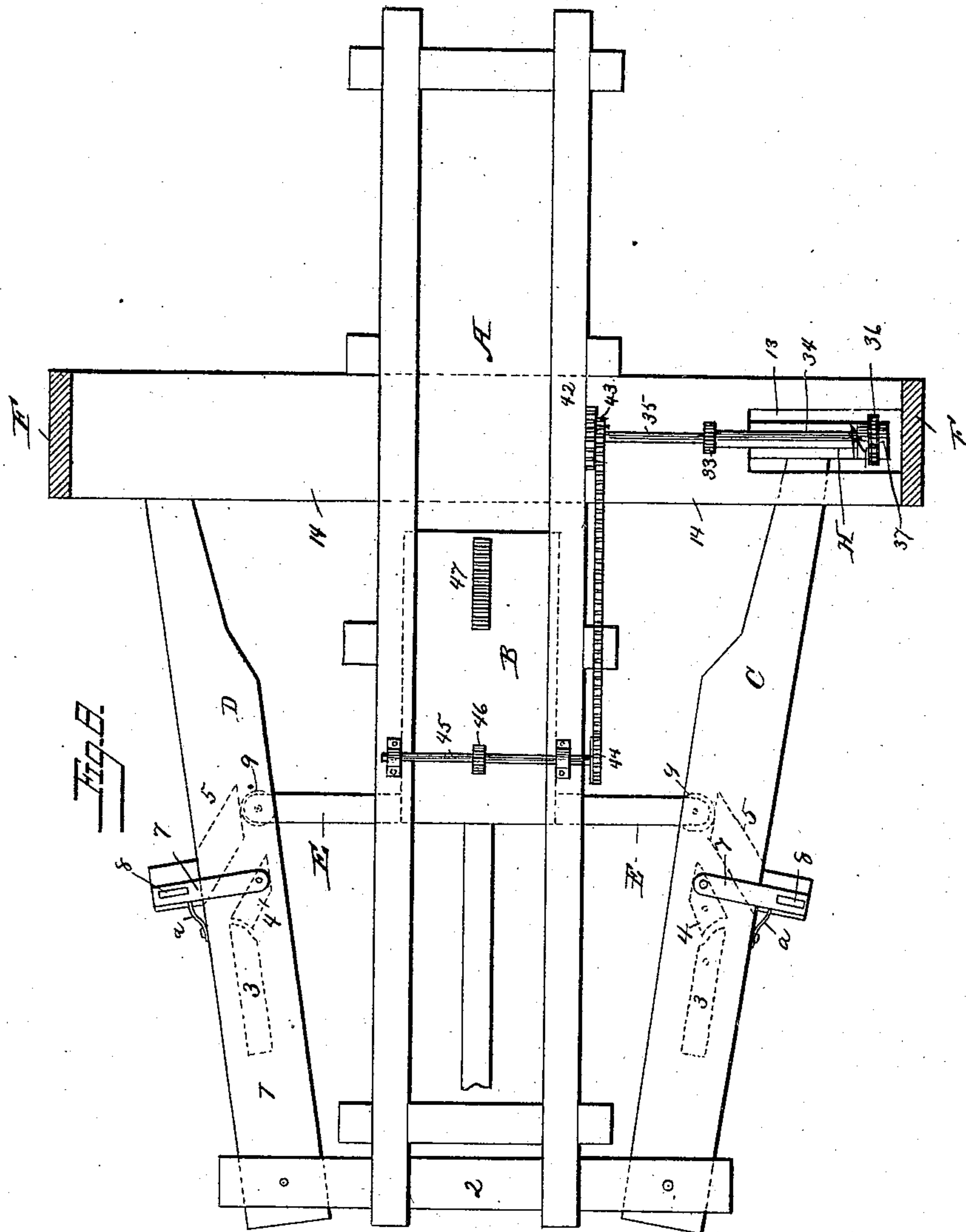
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Attest:

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UNITED STATES PATENT OFFICE.

JAMES G. BUCHANAN, OF NEOGA, ILLINOIS, ASSIGNOR OF TWO-THIRDS TO
JOHN W. PETERS AND FRANKLIN D. VORIS, BOTH OF SAME PLACE.

BALING-PRESS.

SPECIFICATION forming part of Letters Patent No. 370,374, dated September 27, 1887.

Application filed August 18, 1886. Serial No. 211,212. (No model.)

To all whom it may concern:

Be it known that I, JAMES G. BUCHANAN, a citizen of the United States, and a resident of Neoga, county of Cumberland, and State of Illinois, have invented certain new and useful Improvements in Baling-Presses, of which the following is a specification.

This invention relates to that class of baling-presses in which the operation of tying the bale is automatically performed; and it consists, essentially, in an arrangement of twisting devices supported at one side of the press and fingers supported at the other side of the press, and suitable means for carrying both the twisting-heads and the fingers, together with the wires for binding the bales into said press, and means for operating said twisting devices to twist the wires together after being passed around the bale.

The invention further consists in the construction of the twisting devices, whereby they are adapted to twist the wires and then sever the twisted portion.

The invention also consists in the constructions and combinations of parts, as hereinafter set forth.

In the drawings, Figure 1 represents a perspective view of one side of a portion of a baling-press with the improvements applied; Fig. 2, a perspective view of the side of the press opposite to that shown in Fig. 1; Fig. 3, a sectional plan view of the press; Fig. 4, a detail perspective view of one of the twisting-heads and adjacent parts; Fig. 5, a cross-section of one of the heads; Fig. 6, a section taken on line 1 2, Fig. 5, looking in the direction of the arrow; Fig. 7, a detail perspective view of the end of one of the arms and the notched fingers thereon carried by the lever shown in Fig. 2; Fig. 8, a bottom plan view, partly in section, of a portion of the press, showing a modification of the mechanism for operating the twisting devices.

As the press is of known construction in the class of continuous presses, no description of the parts thereof is deemed necessary further than to designate the frame A of the press, the traverser B, and the feeder-slide B'.

On opposite sides of the press are levers C and D, each pivoted at one end to a projecting timber, 2, of the frame A. Each lever has

secured on the upper side a longitudinal strip, 3, at one end of which is a switch-piece, 4, pivoted to the lever. On each lever, near the free end of the switch-piece, is a diagonal piece, 5, and each lever is provided between the pivot-point of the said switch-piece and the piece 5 with a slot, 6, through which extends a pin connecting the switch-piece with a slide, 7, operated by a hand-lever, 8, a spring, *a*, acting upon the slide 7 to normally retain the switch-piece in line with the strip 3.

To opposite sides of the traverser B, preferably near one end, are secured arms E, projecting laterally through the sides of the press, each arm carrying at the outer end a wheel or roller, 9, adapted to engage with either side of the strip 3, as hereinafter set forth.

Surrounding the press coincident with the pressing-chamber thereof, is a frame, F, secured to the frame A, and projecting laterally from each side of the latter. Supported and guided within said frame are two series of bars, H and H', one series on one side of the press and the other series on the other side of the press, and adapted to be moved laterally into the pressing-chamber through suitable slots or openings, I, in the sides of the press-frame, as hereinafter set forth. The bars of each series are connected, preferably, by rods 10 10, so as to move simultaneously, and they may be maintained at a suitable distance apart by interposed space-blocks; but preferably, and as shown, the bars are held apart by screw-rods 12, provided with suitable adjusting-nuts placed on opposite sides of the bars to retain them in position, and, if desired, the rods 10 may also be screw-rods and be provided with nuts for a like purpose. The top and bottom bars of each series are provided with suitable guide-blocks or projections—such, for instance, as extensions of the rods 10 12—which project into or through slots 13 in the timbers 14, forming part of the frame F, and extending from the outer part of the latter to the press-frame A. The free end of each lever C and D, or an extension, 15, thereof, projects between the rods 10 10. Each bar H enters the press-chamber through the slot I in the wall of the press, and carries at the inner end parallel fingers K K, which form bearings for the journals of the twisting-head M, the said fingers

having slots 16 leading from said bearings to the outer ends, where the slots are expanded, as shown. One of the fingers K is straight and the other is bent, so that a portion thereof is parallel to the end of the bar, and between the said portion and the end of the bar turns a bevel-pinion, 17, on the end of a shaft, 18, extending through the bar H, said pinion gearing with another pinion, 19, at the side of the twisting-head M.

Each twisting-head consists, as shown, of two recessed disks, 20 21, bolted together and inclosing a chamber. The shaft or axle 22 of the head consists of two parts, 23 24, the latter secured to the disk 21 and the former revolving independently of disk 20, and provided exterior to said disk with a lug, 25. Each bar H has secured thereto a spring-stop, 26, which will engage the lug 25 and prevent reverse rotation of the part 23. A hub, O, is formed by two contiguous heads, 27 28, on the parts 23 24 of the shaft. Each part of the shaft has a longitudinal slot, 29, and at the inner face of the head there is a plate, T, with a slot, 30, from one end to a point coincident with the axis of the twisting-head. Each disk also has a slot, 31, extending radially in line with slot 30 from the center to the periphery, at which latter point it is expanded. The pinion 19 at the side of the twisting-head M also has a slot, 32, extending from its center to the periphery in line with the slots 30 and 31. The slots in the fingers K and in the disks and plates T are of just sufficient width to receive a wire of the gage used in baling.

Instead of using plates T, I may form a slot in each head 27 28 of a width just sufficient to receive the wire.

I secure the rotation of each twisting-head in any suitable manner, but prefer to drive it from the adjacent shaft 18, the other end of which carries a sprocket-wheel, Y, connected with the wheels of the other shafts 18 by a suitable belt or chain, to turn all the shafts and the twisting-heads simultaneously.

Different means may be used to impart motion to the sprocket-wheels Y, and through them to the heads; and one means I have illustrated consists of a rack, Z, connected to the feeder-slide B', which advances as the traverser is drawn back, and when the bars H are moved in the said rack Z is carried forward by the feeder-slide and meshes with a pinion, 33, on a hollow shaft, 34, turning and moving longitudinally on a rod, 35, fixed above the upper timber 14 of the frame F, the outer end of said shaft carrying a sprocket-wheel, 36, connected with the wheels Y. Ears 37 project upward from the top bar H through the slot 13 in the timber 14, and extend on each side of the sprocket-wheel 36.

In Fig. 8 I have shown another form of mechanism for rotating the twisting-heads. I fix the rod 35 on the bottom timber 14 and place the shaft 34, with the pinion 33 and the sprocket-wheel 36, thereon, and extend the ears 37 from the bottom bar H through the slot 13 in

the said timber 14. A sprocket-wheel, 43, carrying a pinion, 42, has its bearings in the frame F, below the rod 35, and is connected by a sprocket-chain to a sprocket-wheel, 44, on the outer end of a shaft, 45, extending under the press, and there carrying a pinion, 46. On the bottom of the traverser is secured a rack, 47.

Each bar H' carries parallel fingers 38, projecting beyond the end thereof, each finger having a notch or recess, 39, at the extremity.

On each side of the body of the press, at any convenient point, are bearings for the spools F' for the wires 40, which latter are led through eyes 41 and through the openings I to the pressing-chamber. The ends of the several wires from the spools are in the first instance joined together, and the material to be baled is deposited in the chamber in front of the traverser, which is then forced against the said material. The body of material is pushed back against the connected wires, so that as it moves back the wires are folded around the end and laid along the sides until the material is in the bale-chamber. The traverser is then drawn back, more material inserted, and the traverser again advanced, and the operation continued until a bale of the desired size is formed in the bale-chamber. When the last charge of material has been inserted and the traverser advanced to compress the same, each lever 8 is manipulated to carry the switch-piece 4 away from the diagonal piece 5 and at an angle to the piece 3. Then, as the traverser is drawn back, the roller 9 on each arm E engaging with the respective switch-piece 4, the levers C and D will be moved on their pivots toward the press, thereby carrying ends of the bars H H' into the press-chamber to the rear of the bale. The fingers K on the end of each bar H engage one of the wires at one side of the press and guide it directly into the twisting-head and carry the wire to the center of the pressing-chamber. The fingers 38 on each bar H' engage a wire on the other side of the press and carry it into the pressing-chamber and through the slots in the fingers K of the opposite twisting-head into the slot 31 of the said head. The wires from the opposite sides of the press having been thus properly laid in the twisting-heads, and the pinion 33 on the shaft 34 engaging the rack Z, the latter is moved by the feeder-slide then moving toward the feed-opening of the press, and causes the several twisting-heads to turn on their axes and twist the wires together. As the traverser moves forward to compress the material inserted behind the portions of wire being twisted during the retraction of the said traverser, the direction of the travel of the rack is reversed by the reversing of the movement of the feeder-slide, and the twisting-heads are caused to rotate in a direction opposite to that by which the wire was twisted. In Fig. 8 the heads are rotated as the traverser is drawn back and after the bars H and H' have been carried into the press, the rack 47 engaging the pinion 46 and rotating the shaft 45, thereby rotating, by means of

the sprocket-connections, the pinion 43, which latter meshes with the pinion 33 when the bars H are moved into the press. The reverse rotation of the heads is caused by the forward movement of the traverser. As the reverse rotation of each head takes place, the lug 25 on the part 23 of the shaft engages with the end of the stop 26, thus holding the said part 23 in a relatively fixed position while the part 24 revolves, and the slotted plate in the head 28 will move over the face of the plate T in the head 27, and one will shear against the other and sever the twisted wires, thus disconnecting the wires surrounding the bale from those leading from the spools. The shearing action takes place at the center of the twisted parts of the wires, so that the ends of the wires within the pressing-chamber remain connected.

The bars H H' are carried outward from the press-chamber after the formed bale is bound by the rollers 9 9 on the arms E E, engaging with the diagonal pieces 5 5, the new body of material to form the succeeding bale being forced against the connected ends of the wires to carry the same with it into the bale-chamber, as before. As soon as the rollers 9 9 pass the switch-pieces, the latter are carried against the diagonal pieces by the springs a, thus closing the switches. When the said succeeding bale is of the desired size, the switch is opened by means of the hand-lever 8, the levers C D are again moved to carry the arms into the press, and the operation of carrying the wires into the press and twisting and severing them is repeated.

It will be evident that the twisting-heads may be carried by arms or bars moved by different devices from those described, that other means may be employed for rotating them, and that the levers C D may be vibrated positively from different moving parts of the machine.

It will also be evident that a separate independently-operated cutter or severing device may be used in connection with each cutter-head.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. The combination, with the frame of a baling-press inclosing a baling-chamber, and with a traverser, of guides for binding-wires, and laterally-reciprocating supports carrying twisting-heads, whereby the wires wrapped around the bale in the chamber from opposite sides are twisted together, substantially as set forth.

2. The combination, with the baling-press provided with a baling-chamber and with guides for binding-wires, of twisting-heads, laterally-reciprocating supports by which the heads are brought in contact with the wires to twist the same together at the end of the bale, and cutters whereby the twisted portions of the wires are severed transversely, so that the ends thereof at the end of the bale and also the ends of the portions extending into the

chamber shall be connected together, substantially as set forth.

3. The combination, with the baling-press, of guides for wires, twisting-heads, and reciprocating supports therefor, whereby the heads are brought against the wires and brought centrally to the chamber, and carrier-bars at the opposite sides of the press, whereby the opposite wires are brought into connection with the twisting-heads, substantially as set forth.

4. The combination, in a press, of a lever at one side of the press and bars carrying wire-twisting heads, a lever at the opposite side, and bars carrying wire-guiding fingers, arranged and operating to carry wires from opposite sides of the press, from the sides to the center of the bale at the end, and bring them together in the twisting-heads, and means for operating the twisting-heads, substantially as set forth.

5. The combination, with a baling-press, of a vibrating lever at one side, bars carrying twisting-heads and connected to be operated by said lever, and guides for conducting binding-wires in the paths of said heads, and a lever and bars at the opposite side of the press, and guides for conducting other binding-wires in the paths of said bars, substantially as set forth.

6. The combination, with a baling-press, of a lever at one side and a series of bars each provided with a wire-twisting head and cutter, and a lever at the opposite side and a series of guide-bars provided with fingers arranged to carry the wires from that side to the twisting-heads, substantially as set forth.

7. The combination, with a baling-press, of levers at opposite sides, bars carrying wire-twisting heads and guides, a reciprocating traverser, and projections or strips upon the levers arranged to be struck by bars on the traverser as it is withdrawn from the bale, substantially as set forth.

8. A baling-press provided with openings at the side of the baling-chamber, levers at the opposite sides of the press, bars extending into said openings, twisting-heads carried by the bars on one side of the press, guide-fingers carried by the bars on the other side of the press, and wire-guides arranged to conduct the wires to one side in the paths of the twisting-heads and at the other side in the paths of the guiding-fingers, substantially as set forth.

9. The combination, with the lever C, pivoted to the side of the baling-press, of bars carrying twisting-heads adapted to receive the binding-wires, and devices for revolving the twisting-heads, and cutters arranged to sever the twisted wires within the twisting-heads, substantially as set forth.

10. The combination, with the lever C, of twisting-heads and guide-fingers on said twisting-heads, arranged to conduct the wire to the twisting-heads, substantially as set forth.

11. The combination of the lever C, bars reciprocated by said lever, twisting-heads car-

ried by the said bars, driving-shafts 18, connections between the latter and the twisting-heads, feeder-slide, and connections whereby the reciprocation of the feeder-slide rotates the shafts 18, substantially as set forth.

12. The combination of the reciprocating bars H, series of twisting-heads, and driving-shafts 18, carried by the bars, gears connecting the driving-shafts, and a reciprocating rack driving said gears, substantially as set forth.

13. The combination of the series of bars, each carrying a twisting-head, and adjusting means for varying the distance between the bars, substantially as set forth.

14. The combination, in a rotatable twisting-head, of two slotted disks, each carrying a shearing-plate with a radial slot extending from the center, and devices, substantially as described, for moving one of the disks independently of the other to shear the wires crossing the said plates, substantially as set forth.

15. The combination, with the lever C, of twisting-heads, driving devices for revolving the heads in one direction to twist the wires, and cutters carried by the heads arranged to sever the wires when the revolution of the head is reversed, substantially as set forth.

16. The combination, with a cutter-head, of two slotted disks, 20 21, a cutter-plate carried by the disk 21, a driving-shaft geared with the disk 21, a cutter-plate carried by a head, 27, in contact with the opposite cutter-plate, and means, substantially as described, for arresting the revolution of the head 27 when the cutter-head is revolved in one direction, substantially as set forth.

17. The combination, with a cutter-head pro-

vided with a cutter-plate, of a driving-shaft, whereby the head is revolved first in one direction and then in the other, a second cutter-plate carried by a head revolving with the cutter-head in one direction, and a stop for arresting the rotation of the head carrying the cutter-plate when the motion of the cutter-head is reversed, substantially as set forth.

18. The combination of the revolving cutter-head carrying a cutter-plate, head 27, carrying another cutter-plate, shaft 22, supporting the head 27, and provided with a lug, 25, and spring 26, arranged to make contact with the pin 25, substantially as set forth.

19. The combination of a cutter-head provided with a transverse slot, a slotted cutter-plate, and a head, 27, within a recess of the cutter-head, carrying a second cutter-plate and connected to a shaft extending through the cutter-head, and a stop arranged to arrest the rotation of the said shaft when the cutter-head is revolved in one direction, substantially as set forth.

20. The combination, with a traverser carrying laterally-projecting arms, of levers, each provided with a longitudinal and a diagonal strip or piece, and a pivoted switch-piece between the longitudinal strip and the diagonal strip, arranged to be engaged by the arms on the traverser, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES G. BUCHANAN.

Witnesses:

JOHN W. PETERS,
W. W. WHITNEY.