

No. 684,087.

Patented Oct. 8, 1901.

L. A. MCCARTHY.
LEADER FORMING MACHINE.

(Application filed Feb. 14, 1901.)

(No Model.)

4 Sheets—Sheet 1.

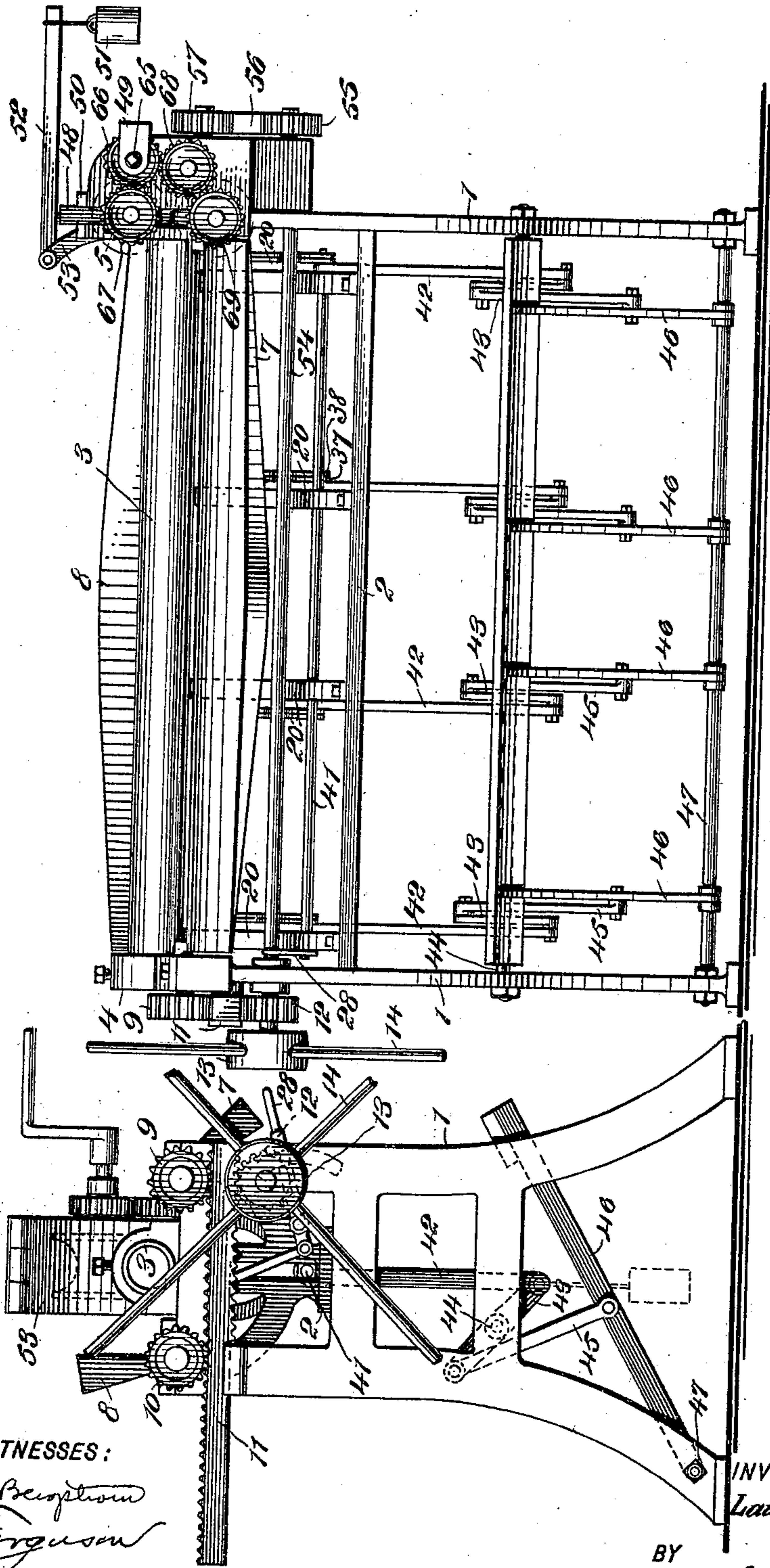


Fig. 1

Fig. 2

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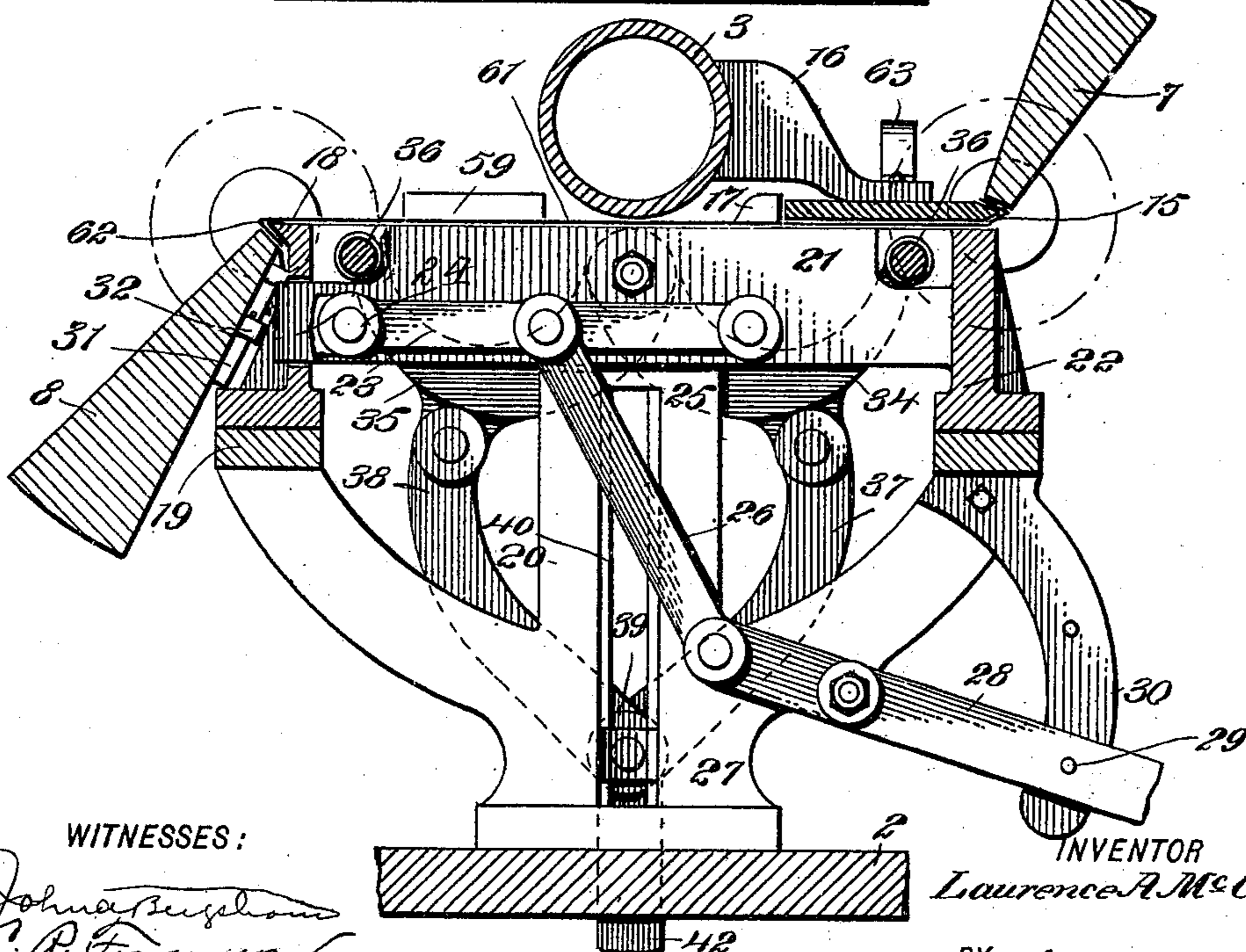
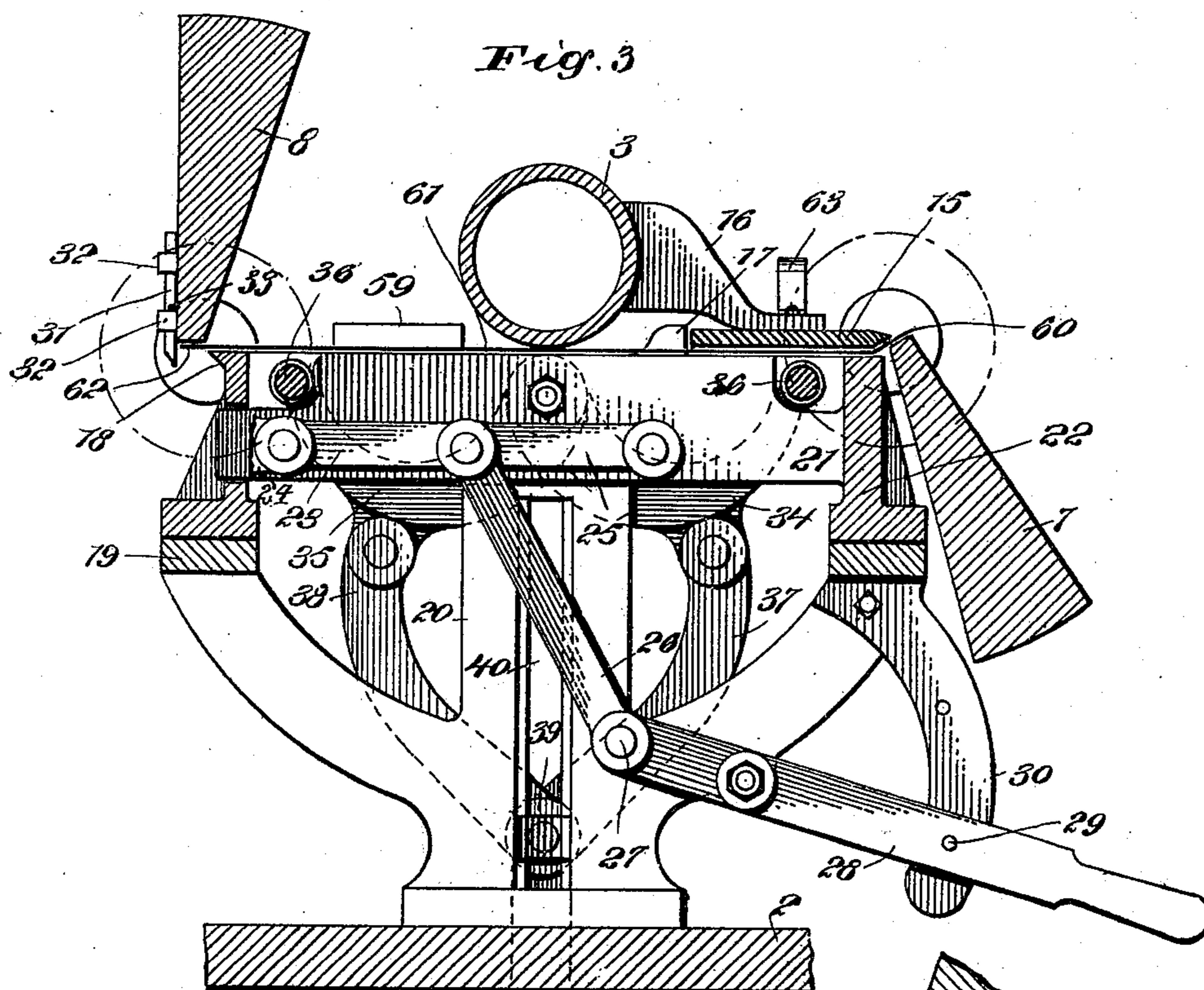
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4 Sheets—Sheet 2.



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Fig. 4

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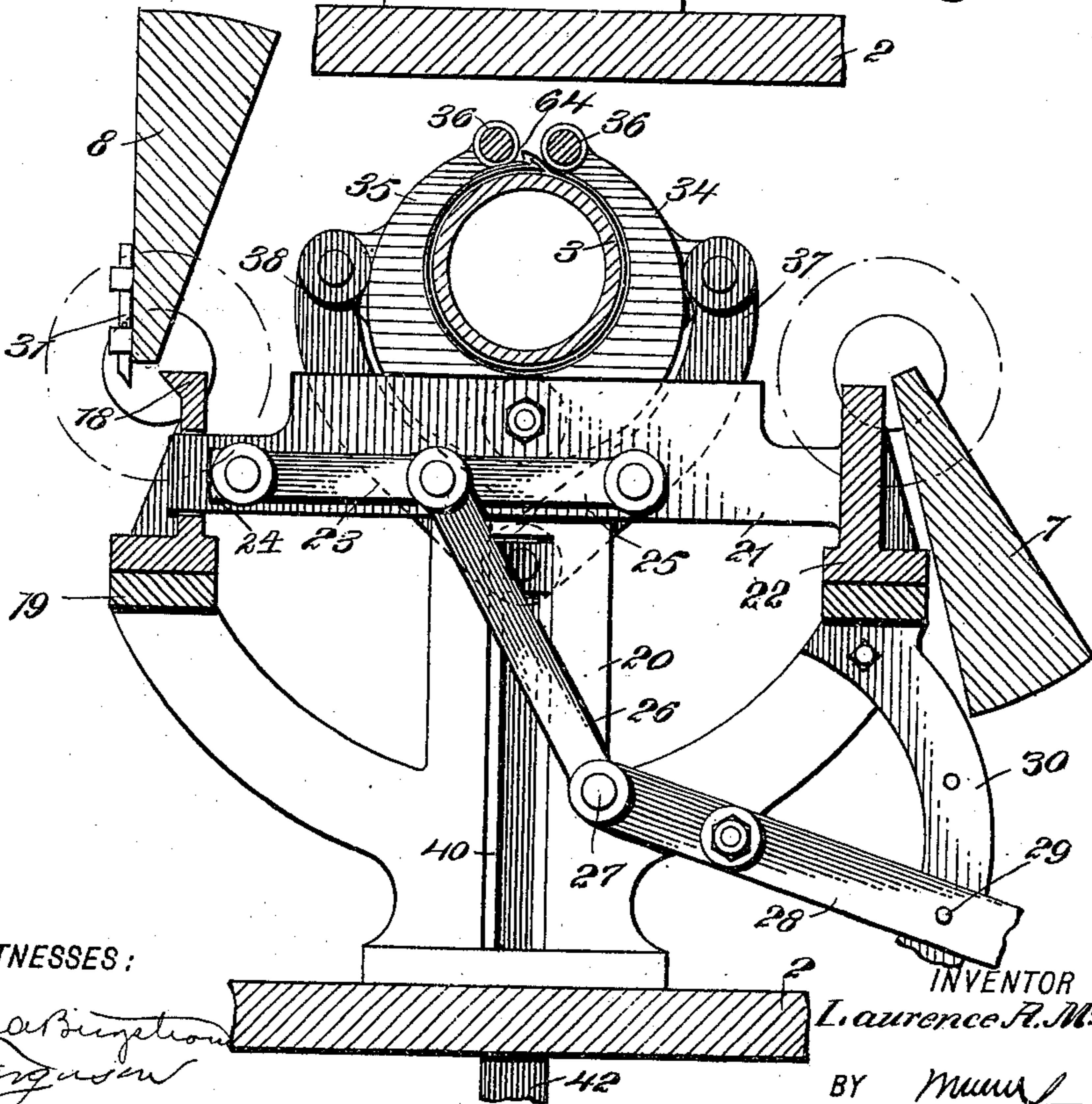
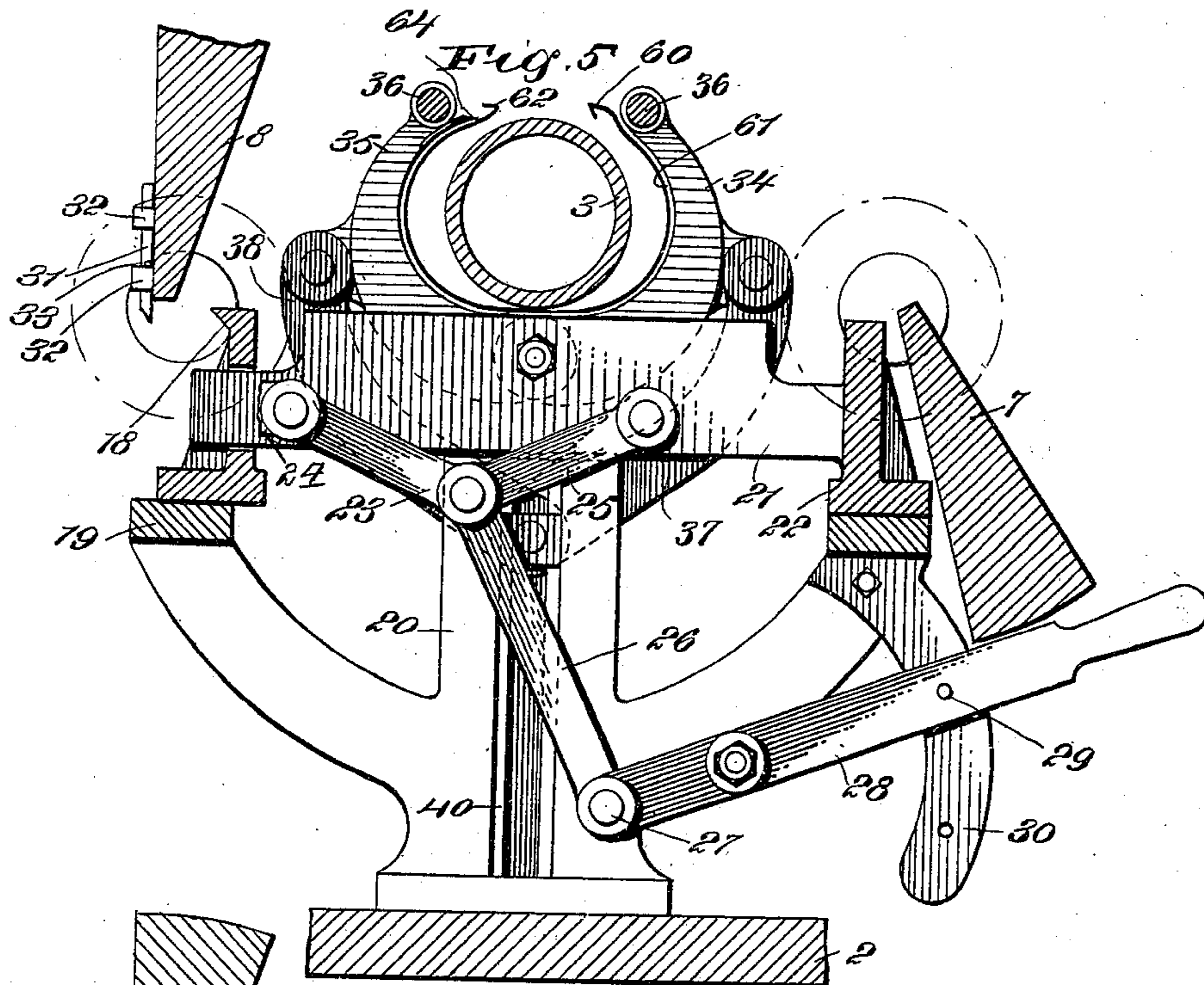
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Fig. 6

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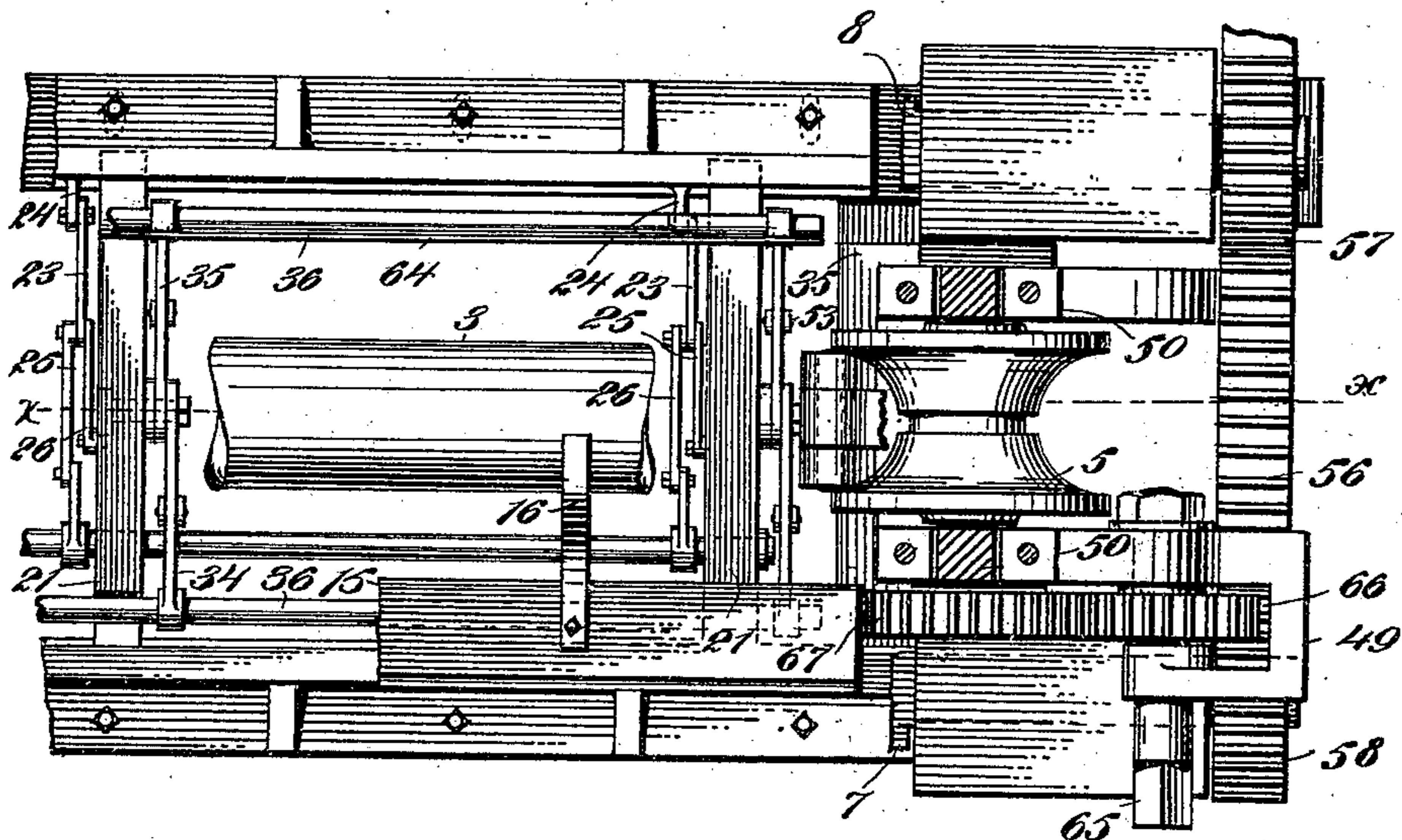


Fig. 7

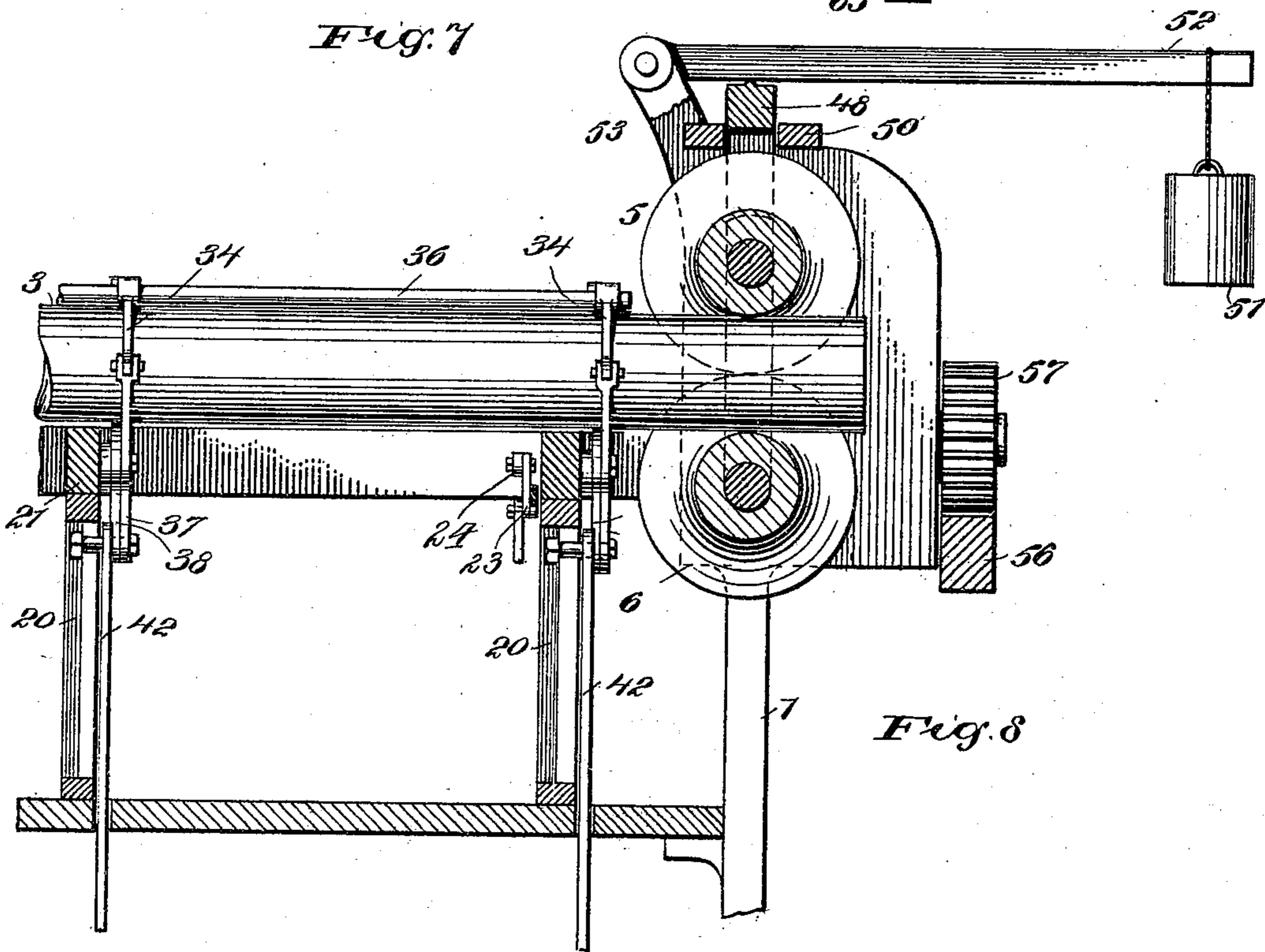


Fig. 8


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Fig. 9

UNITED STATES PATENT OFFICE.

LAURENCE ANTHONY MCCARTHY, OF SAVANNAH, GEORGIA.

LEADER-FORMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 684,087, dated October 8, 1901.

Application filed February 14, 1901. Serial No. 47,245. (No model.)

To all whom it may concern:

Be it known that I, LAURENCE ANTHONY MCCARTHY, a citizen of the United States, and a resident of Savannah, in the county of Chatham and State of Georgia, have invented a new and Improved Leader-Forming Machine, of which the following is a full, clear, and exact description.

This invention relates to improvements in machines for forming leader-pipes; and the object is to provide a machine of this character by means of which the leaders may be rapidly formed from a flat sheet of tin or other metal up to the point of soldering the lap or joint.

I will describe a leader-forming machine embodying my invention and then point out the novel features in the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is an end view. Fig. 3 is a cross-section showing the position of parts prior to turning the joint-laps. Fig. 4 is a similar section showing the position of parts after turning the laps. Figs. 5 and 6 are cross-sections showing different stages in the turning or bending of the pipe. Fig. 7 is a broken plan view at the outlet end of the machine. Fig. 8 is a section on the line *xx* of Fig. 7, and Fig. 9 is an edge view of a portion of a die-plate employed.

The frame of the machine comprises end standards or legs 1, between which is supported near the top a platform 2. A mandrel 3 is connected at one end to one of the standards 1 by means of a strap 4, while the other end extends between joint-pressing rollers 5 and 6, to be hereinafter described.

Mounted to swing on one side of the machine is an outer lap-forming die 7, and mounted to swing on the opposite side of the machine is an inner lap-forming die 8. These lap-forming dies are of plate-like construction and somewhat thicker at the outer edges than at the inner edges, giving them a sufficient weight to effectually bend or form the laps. At one end said lap-forming dies have trunnion-bearings in the upper portion of a standard 1, and at the opposite end the trun-

nions extend through the opposite standard or leg 1, and on these projected trunnions pinions 9 and 10 are secured. These pinions engage with a rack formed on the upper side of a horizontally-movable rack-bar 11, while a rack on the lower side of said bar engages with a pinion 12, from the hub of which arms 14 extend outward.

Coacting with the outer lap-forming die 7 is a removable die-plate 15. This die-plate is designed to be placed upon the metal sheet, and connected to the die-plate are abutment-arms 16, designed to engage against the mandrel 3, and stops 17 are also placed at the ends of the machine-frame, against which the inner edge of said die-plate 15 may abut. On its outer edge the die-plate 15 is beveled outward on its upper and lower sides, as clearly shown in Fig. 3.

Coacting with the inner lap-forming die 8 is an inner lap-die 18, which is mounted to slide inward and outward on a bar 19, connected to standards 20, supported on the platform 2. It may be here stated that at suitable intervals cross-bars 21 are extended from a side rail 22, supported on the standards 20, to the opposite side of the machine.

The die 18 is moved inward and outward by a toggle mechanism consisting of links 23, pivoted at one end to lugs 24 on the said die, the opposite ends of said links being pivotally connected to links 25, which at their opposite ends are pivoted to the cross-bars 21. From the pivotal point of the links 23 and 25 connecting-bars 26 extend downward to a shaft 27, which at one end is connected to a hand-lever 28, pivoted to the machine-frame. By moving the outer end of this lever downward the toggle-links will be operated to move the die 18 outward, and a movement in the opposite direction of said hand-lever will of course operate the toggle-links to move said die inward, and the lever may be held in its adjusted position by means of a pin 29, passing through said lever into either one of the holes formed in an arm 30, attached to the machine-frame.

On the outer side of the forming-die 8 is a stop with which the edge of the plate to be bent is designed to engage, the said stop consisting of a bolt 31, mounted to slide in guides 32, attached to said die. A pin 33 on the

bolt by engaging with either one of the lugs will limit the movements of said bolt.

The bending-dies consist of a series of pairs of curved arms 34 and 35, the arms of a pair being pivoted to the cross-bars 21, and supported by the outer ends of the arms of a side are rollers 36, designed to engage closely against the metal to press it around the mandrel. Pivottally connected to the central portions of the arms 34 and 35 are links 37 and 38, which at their lower meeting portions are pivoted to a block 39, mounted to move in guides 40, formed in the central portion of the standards 20. The several blocks 39 are connected together by means of a rod 41, from which bars 42 extend downward to pivotal connections with levers 43, connected to a rock-shaft 44. These levers 43 have members extended in opposite directions from the shaft 44, and at the ends opposite those connecting with the rods 42 links 45 are pivoted, the lower ends of said links being connected to foot-lever bars 46, connecting with a shaft 47.

The seam or joint pressing rollers 5 and 6 are arranged one above another and are each longitudinally concaved, as clearly shown in the drawings, to correspond to the circumference of the leader. The shaft of the lower roller 6 has a fixed bearing, while the shaft of the upper roller 5 has its bearing in a frame 48, movable vertically in guides 50, extended upward from the forward end standard 1. The upper roller 5 is held yieldingly against its work by means of a weight 51, suspended from a lever 52, pivoted to a fixed bracket 53 and bearing upon the upper end of the frame 48.

It will be seen that from the pinion 12 a shaft 54 extends through the machine, and on its opposite end is a pinion 55, which engages with the lower rack on a rack-bar 56, the upper rack on said rack-bar engaging with pinions 57 and 58 on the extended trunnions of the lap-forming dies.

In operation when the parts are in the position indicated in Fig. 3 the flat sheet of tin or other metal is to be placed in position and the plate 15 is placed thereon, as shown in said figure, and the ends of this sheet by engaging with the stops or guides 17 and 59 will hold said sheet straight or square across the machine, and it will be limited from moving too far through the machine by the stop-bolt 31. By turning the shaft 54 by means of the handles or arms 14 the rack-bars 11 and 56 will be operated to cause a swinging movement of the forming-dies 7 and 8, the said forming-dies swinging in opposite directions—that is, the die 7 will swing upward and its inner edge by engaging with the projected outer lap edge 60 of the plate 61 will turn said edge over the edge of the die-plate 15, and at the same time the die 8 in moving downward will turn the opposite or inner lap edge 62 of the plate 61 over the die 18. The parts will then be in the position indicated in Fig.

4, and during this swinging movement of the die 8 the stop-bolt 31 will drop by gravity to move its end out of contact with the edge of the plate 61. The plate 15 is now to be removed, and for convenience in removing it I have provided it with handles 63. Then by operating the hand-lever 28 the die 18 will be moved inward, releasing it from the lap edge 62, the inward position of this die 18 being indicated in Fig. 5. When the dies are in the position indicated in Fig. 5, the foot-lever is to be forced downward, which by drawing upon the levers 43 will move the links 37 and 38 upward, consequently moving the jaws 34 and 35 upward, so that the rollers 36, engaging with the outer side of the metal, will force the same around the mandrel 3. As the jaws 34 and 35 reach the limit of their movement a tucker-blade 64, carried by the jaws 35 and projected beyond the roller carried by said jaws, will engage with the lap 62 and force it underneath the lap 60, so that when the pressure of the jaws is released the said laps will lock together. After releasing the jaw-pressure the leader or pipe is to be moved forward on the mandrel until its end engages between the rollers 5 and 6. Then by rotating said rollers by means of a crank applied to a shaft 65, which has a bearing in a frame 49, the pipe will be carried through and the seam or joint pressed firmly down. On a shaft 65, journaled at one end of the machine, is a gear-wheel 66, which meshes with a gear-wheel 67 on the shaft of the upper roller 5, and said gear-wheel 66 also meshes with a gear-wheel 68, which meshes with a gear 69 on the shaft of the lower roller 6. Therefore these two rollers are positively driven together.

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

1. In a leader-forming machine, a mandrel, swinging dies on the machine for forming the opposite lap edges of the leader, means for swinging said dies in opposite directions, and devices for turning the leader-forming metal or sheet around the mandrel, substantially as specified.

2. In a leader-forming machine, a mandrel, edge-turning dies at opposite sides of the mandrel, means for operating said dies, a series of curved pivoted jaws, rollers connecting with said jaws, and means for moving opposite jaws toward each other for bending the sheet of metal around the mandrel, substantially as specified.

3. In a leader-forming machine, a mandrel, devices for turning the lap edges of the sheet of material to be formed into the leader, a series of curved pivoted arms, a tucking-blade carried by the arms at one side, and means for swinging the arms of opposite sides toward each other to bend the sheet of material around the mandrel after turning the lap edges, substantially as specified.

4. In a leader-forming machine, a frame, a lap-forming die mounted to swing at one side of the said frame, a mandrel, a lap-die plate removably connected to the frame, stop-arms
5 on said plate adapted to engage with the mandrel, and means for turning the leader-forming plate around the mandrel, substantially as specified.

5. In a machine for forming leaders, a frame,
10 a mandrel mounted thereon, a lap-forming die mounted to swing at one side of the frame, a lap-forming die coacting with the first-named die, the said lap-forming die being movable inward and outward on the frame,
15 means for causing said movements, and means for turning the leader-forming sheet of material around the mandrel, substantially as specified.

6. In a machine for forming leaders, a frame,
20 a mandrel, devices for forming the lap edges of the leader material, means for turning said leader material around the mandrel, and a pressing-roller for pressing the lap edges together, the said rollers also operating to draw
25 the leader from the mandrel, substantially as specified.

7. In a machine for forming leaders, a frame, a mandrel supported on said frame, joint or seam pressing rollers arranged at one end of
30 the frame and between which one end of said mandrel engages, means for forming the lap edges of the leader-sheet while in flat position, means for turning said sheet around the mandrel, and means for causing the locking
35 of the lap edges, substantially as specified.

8. In a leader-forming machine, a frame, a mandrel mounted on the frame, outer lap-forming dies at one side of the frame for forming the outer lap of the leader-joint, inner
40 lap-forming dies at the opposite side of the machine, one of said inner lap-forming dies being mounted to swing while the other is movable inward and outward in the frame, toggle-links connecting with said other inner
45 lap-forming die, and a lever for operating said toggle-links, substantially as specified.

9. In a leader-forming machine, a frame, a mandrel mounted on said frame, an outer lap-forming die mounted to swing at one side of
50 the frame, a removable die-plate for coacting

with said swinging die, an inner lap-forming die mounted to swing on the opposite side of the machine, an inner lap-forming die mounted to move transversely of the frame, means
55 for simultaneously swinging the swinging dies in opposite directions, and means for turning the leader-forming sheet around the mandrel, substantially as specified.

10. In a leader-forming machine, a frame, a mandrel mounted on said frame, means for
60 turning a sheet of material around said mandrel, means for locking the edges of said sheet of material, presser-rollers arranged at the outlet end of the machine and operating
65 to draw the leader from the mandrel, and a yielding support or bearing for one of said presser-rollers, substantially as specified.

11. In a leader-forming machine, a frame, a mandrel supported thereon, means for forming
70 the lap edges of a sheet of material while in flat position, means for turning said sheet of material around the mandrel, concaved presser-rollers at the outlet end of the machine, a vertically-movable or yielding bearing
75 for the upper of said presser-rollers, and means for imparting rotary motion to said presser-rollers simultaneously, substantially as specified.

12. In a machine for forming leaders, a mandrel, a series of pairs of forming-jaws,
80 the jaws of a pair being pivotally connected together, connections between the several jaws at the opposite sides of the mandrel, links or arms pivotally connected to the jaws and extended downward therefrom, blocks
85 to which the links of a pair are pivoted, a rock-shaft, levers on said rock-shaft and having oppositely-extended portions, rods extended downward from the pivotal connections of said links to connections with said
90 levers, and a treadle having connection with the opposite ends of said levers, substantially as specified.

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

LAURENCE ANTHONY MCCARTHY.

Witnesses:

JAMES L. MURPHY,

W. G. WOODFINE.