

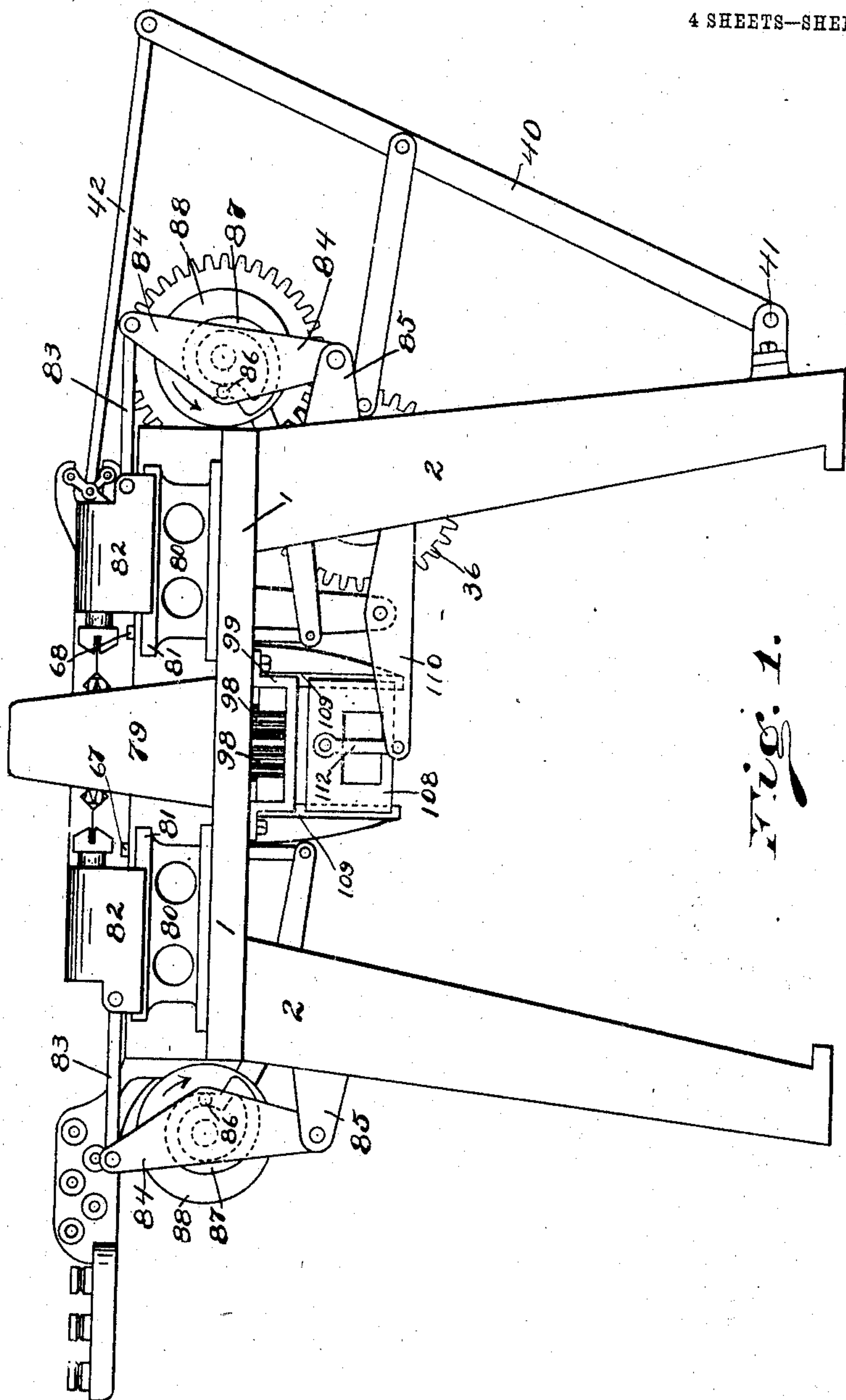
No. 846,589.

PATENTED MAR. 12, 1907.

W. P. MARSH.  
BAILING MACHINE.

APPLICATION FILED APR. 28, 1905.

4 SHEETS--SHEET 1.



Witnesses  
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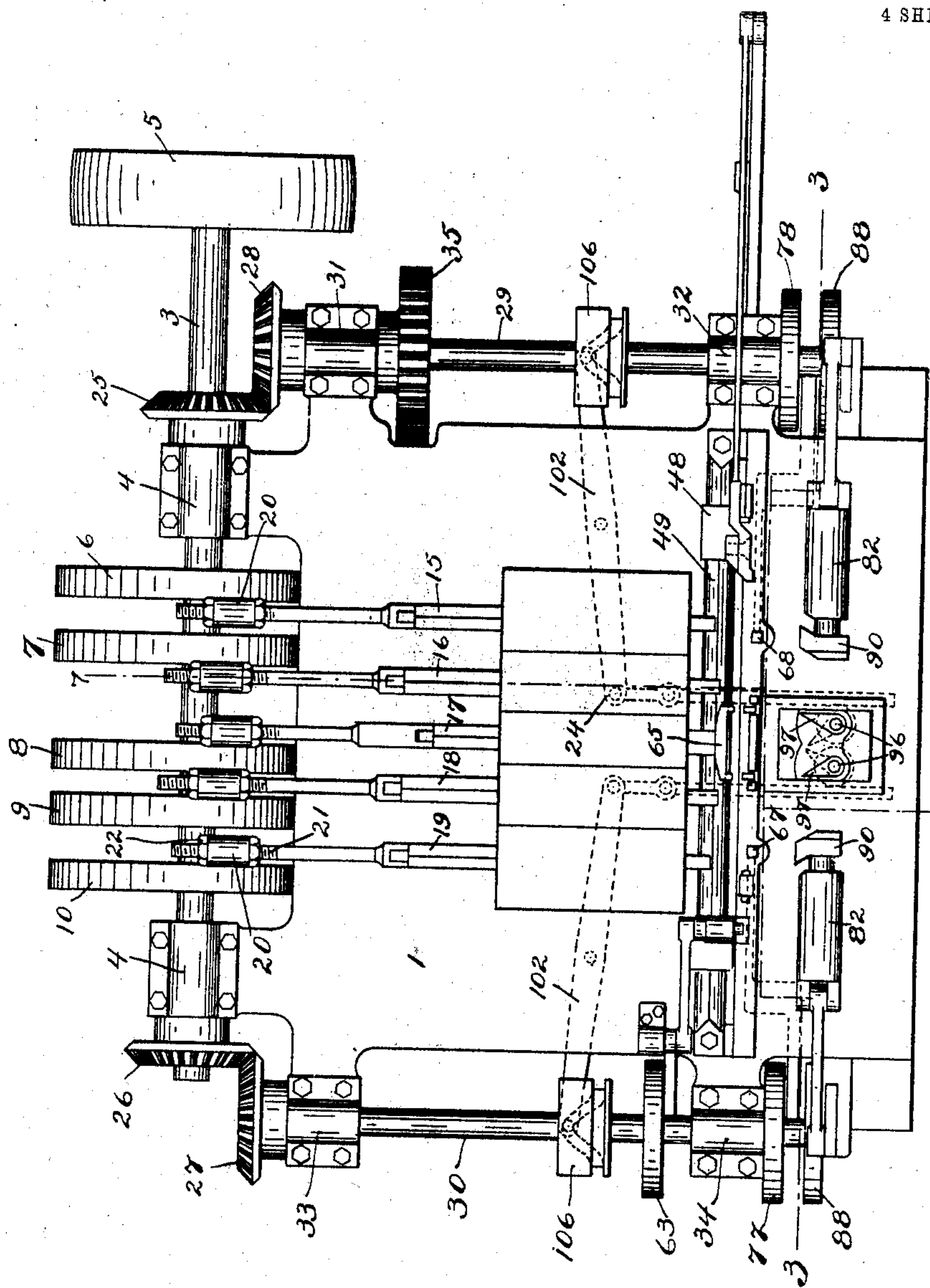


Fig. 2.

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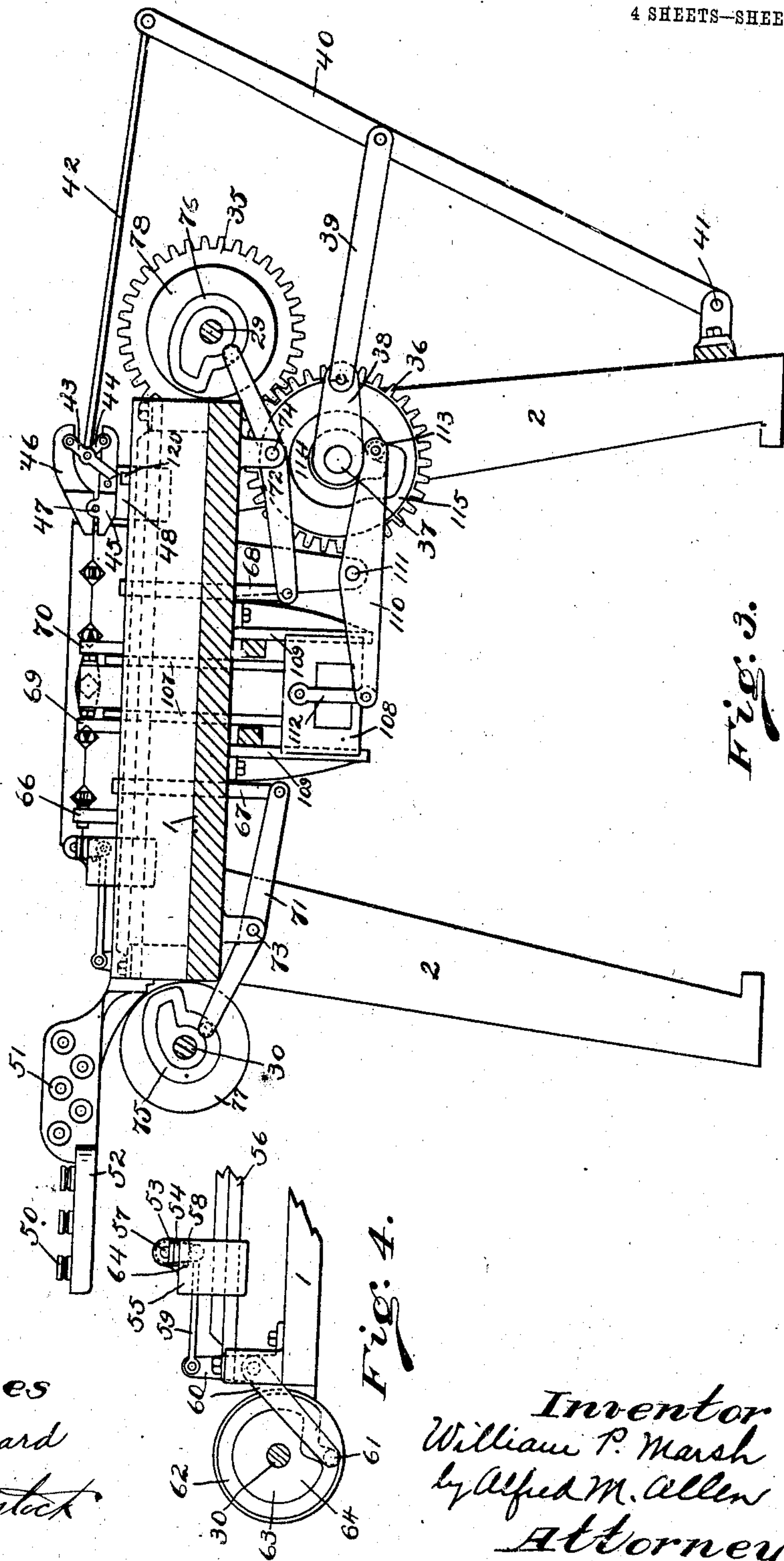


Fig. 3.

Fig. 4.

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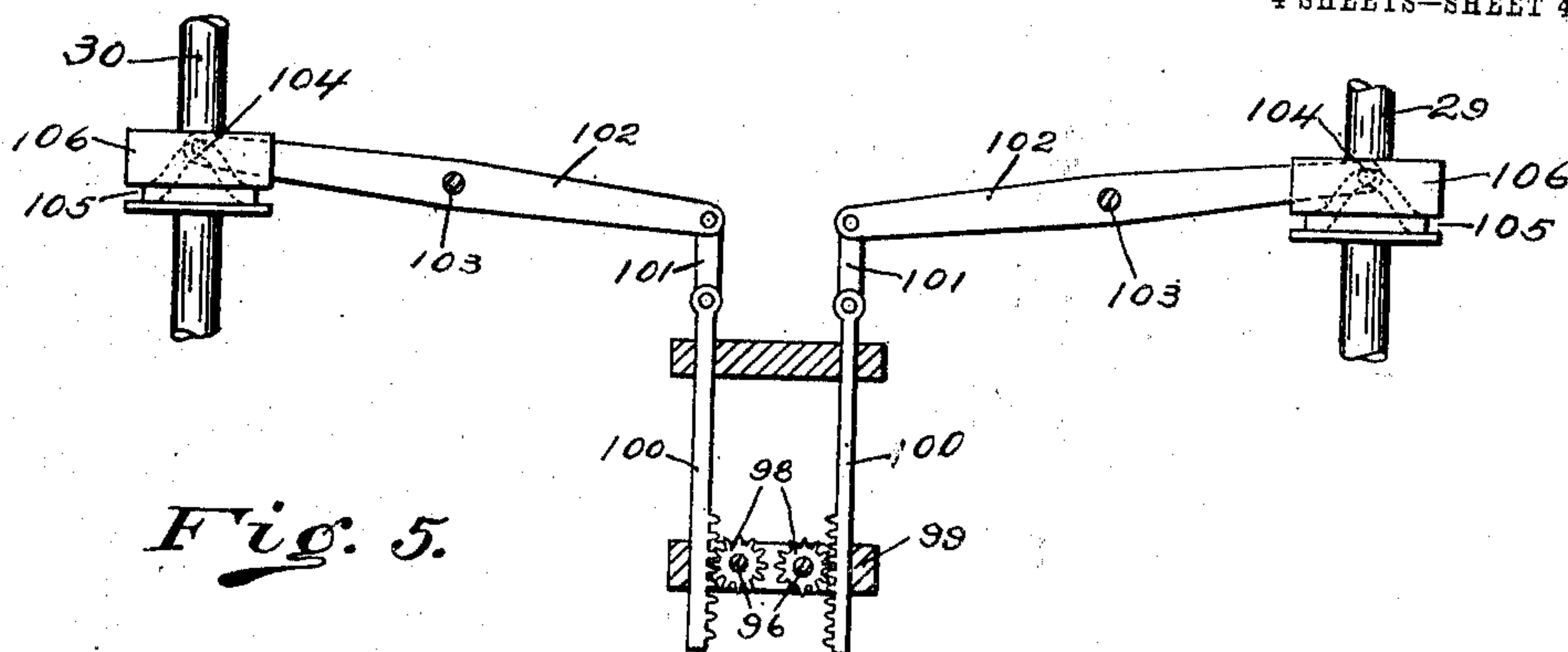


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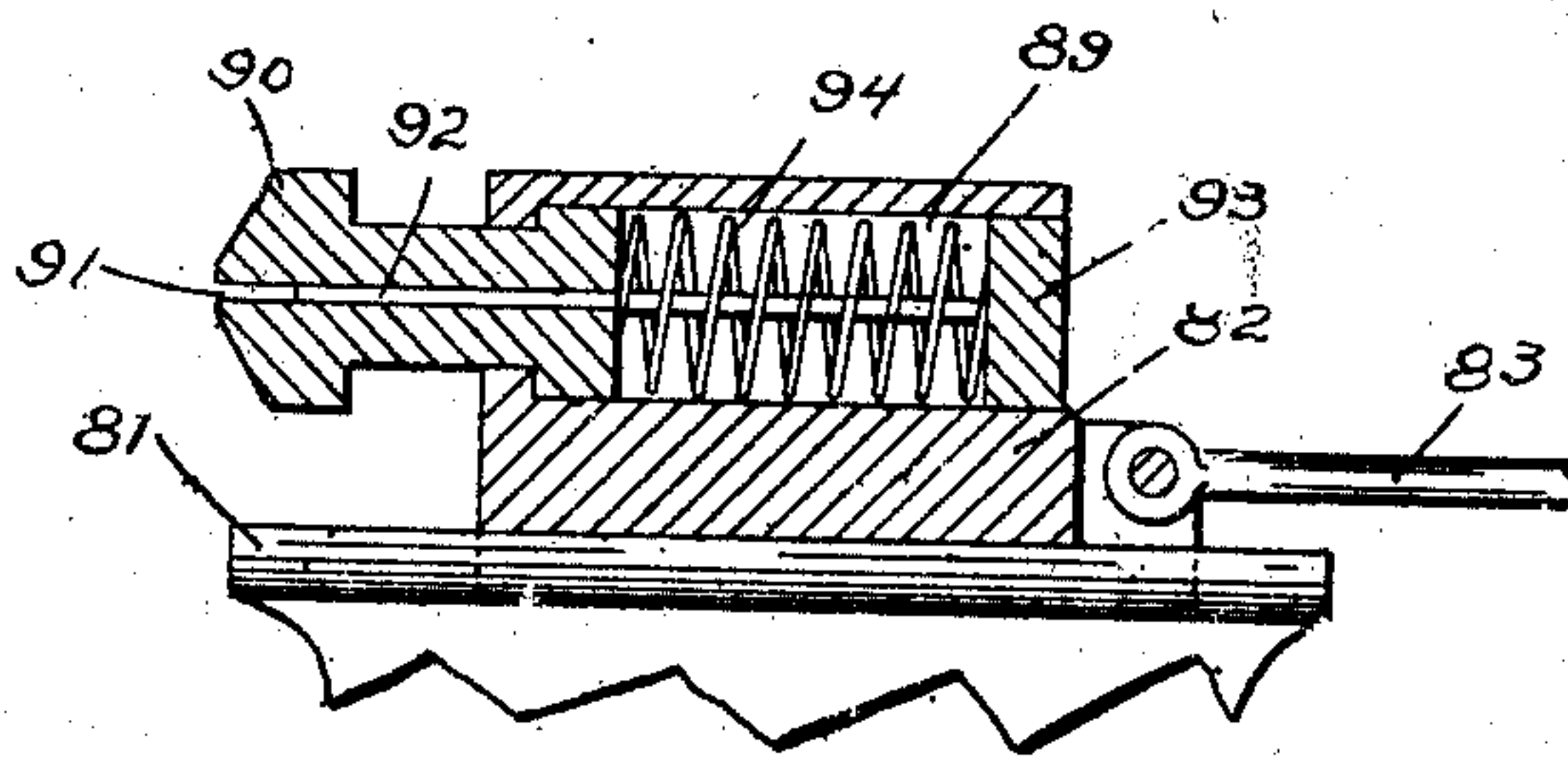
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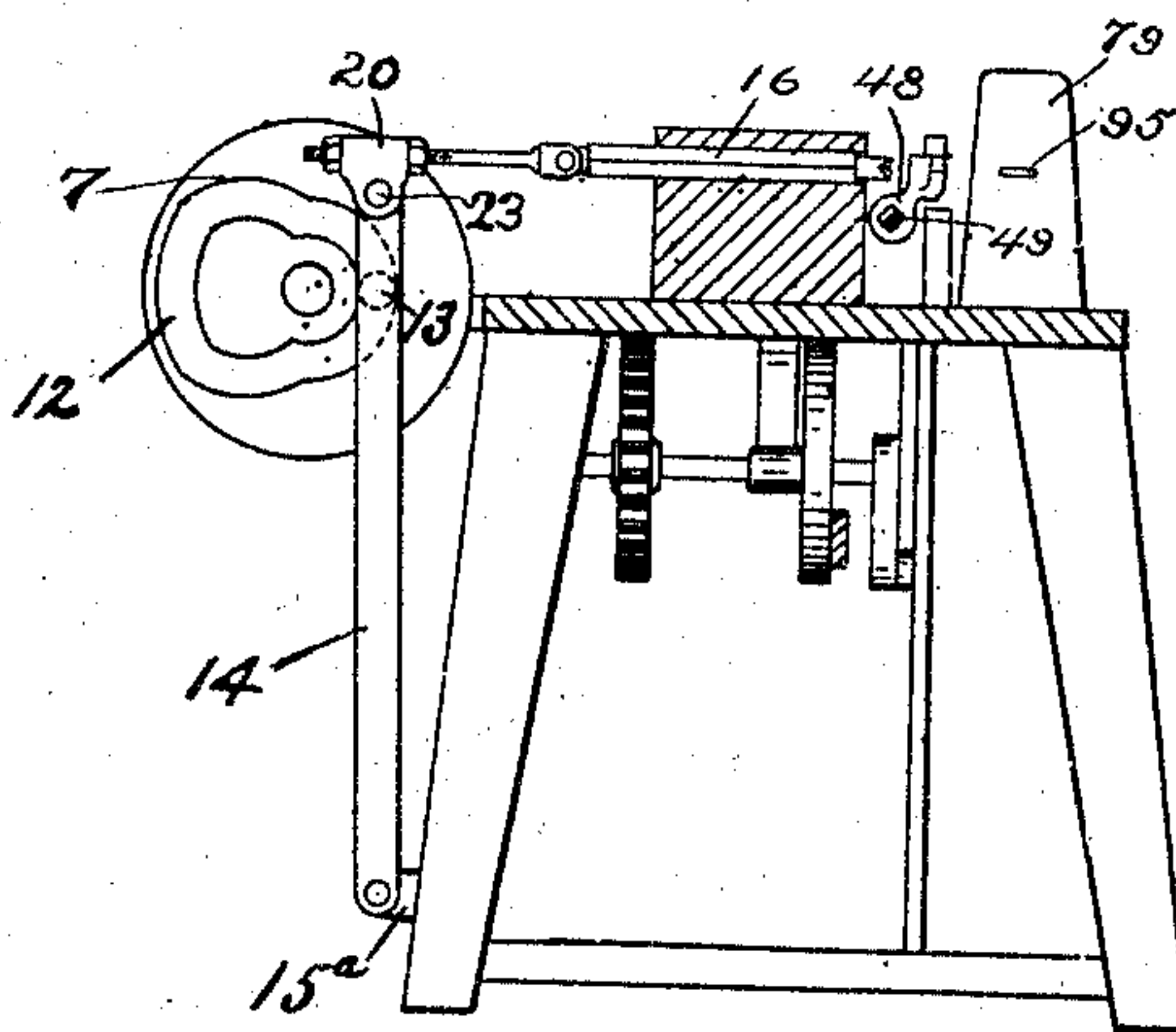
4 SHEETS—SHEET 4.



*Fig. 5.*



*Fig. 6.*



*Fig. 7.*

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# UNITED STATES PATENT OFFICE.

WILLIAM P. MARSH, OF DAYTON, OHIO, ASSIG. OR TO WILL M. KINNARD, OF DAYTON, OHIO.

## BAILING-MACHINE.

No. 846,589.

Specification of Letters Patent

Patented March 12, 1907.

Application filed April 28, 1905. Serial No. 257,930.

*To all whom it may concern:*

Be it known that I, WILLIAM P. MARSH, residing in Dayton, county of Montgomery, State of Ohio, have invented certain new and useful Improvements in Bailing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My improvements relate to machines for securing the wire bails to paper buckets and the like; and the improvements consist of that certain novel construction and arrangement of parts to be hereinafter particularly pointed out and claimed.

In the drawings, Figure 1 is a front elevation of my improved machine. Fig. 2 is a plan view of same. Fig. 3 is a vertical cross-section taken on the lines 3 3 of Fig. 2. Fig. 4 is a detail side elevation of the wire-feed mechanism. Figs. 5 and 6 are details of the staple-driving mechanism. Fig. 7 is a vertical longitudinal section on the lines 7 7 of Fig. 2.

1 is a table provided with four legs 2 2 to form a solid and substantial framework for the operating parts.

3 is the driving-shaft, journaled in suitable bearings 4 4 at the rear of the frame and driven by pulley 5 from suitable power. Mounted on the medial portion of this shaft 3 are a series of five cam-wheels 6, 7, 8, 9, and 10, each provided with a cam-groove 12 and each engaged by a roller 13 on a lever 14, one for each cam-wheel, and each pivoted in suitable supports 15<sup>a</sup> on the rear of the frame. The upper end of each of these levers 14 is coupled with a horizontal plunger 15, 16, 17, 18, and 19, respectively, by a collar 20, loosely mounted on the end of each plunger-rod and adjusted by nuts 21 22, so that the throw of each plunger can be properly adjusted, each collar being provided with a loose joint 23 to pivot same to its respective lever 14. These plungers are square in cross-section at their outer portion, with one edge uppermost, and each reciprocates through a guide-box 24, through which they pass to prevent them from turning.

The driving-shaft 3 is provided with beveled gears 25 26 at either end, which mesh with corresponding gears 27 28 on the shafts 29 30, mounted at right angles to shaft 3 in

suitable bearings 31 32 and 33 34 on the side of the frame. The shaft 29 carries the gear 35, which meshes with the gear 36 on shaft 37, journaled in suitable bearings in the frame underneath the table. On the end of the shaft 37 is keyed a crank-arm 38, coupled by a link 39 to the lever 40, pivoted at 41 near the bottom of the frame. The upper end of this lever 40 is connected by the connecting-rod 42 with the knuckle-joint of the toggle-levers 43 44, which operate the clamp by means of which the wire to be formed into the bail is drawn from the roll. This clamp consists of a relatively fixed jaw 45 and a pivoted jaw 46, pivoted at 47 to the fixed jaw. The fixed jaw is mounted on a block 48, which slides on the rod 49.

The wire for forming the bails is fed to the machine from a roll and passes first through the two sets of grooved rollers 50 51, mounted on a side extension of the table 52, one set of grooved rollers being vertically disposed and the other set arranged horizontally, so as to straighten the wire as it passes between the rollers. The wire then passes into the feeding device, which consists of the loose clamp-plate 53, Fig. 4, and the relatively fixed plate 54, mounted on the block 55, which slides on the bar 56. The clamp-plate 53 is actuated to clamp the wire, which passes between the plates 53 and 54, by the pin 57, which is flattened on one side and is mounted to oscillate in suitable bearings on the block 55. This pin 57 carries the depending arm 58, coupled by the link 59 with the bell-crank lever 60, the longer arm of which carries the roller 61 on its outer end, which engages within the cam-groove 62 on the side or face of the cam-wheel 63, mounted on the shaft 30. As the bell-crank lever 60 is oscillated by the cam-wheel 63 the arm 58 on the pin 57 in the block 55 will cause the pin to rock and bring the edge of the flat face of the pin to bear on the plate 53 to tightly clamp the wire between the plates. The further movement of the bell-crank lever will slide forward the block 55 on the rod 56, and thus feed the wire a short distance. Upon the return movement of the bell-crank lever the arm 58 oscillates the pin 57 to release the clamp-plate 53, and then the arm 58 contacts with the pin 64 on the block 55 and the block is returned to its normal position to again,



with the next operation of the machine, clamp the wire and feed it forward a short distance. This short forward feed of the wire is necessary to permit the clamping-jaws 45 46 to grasp the wire when by the action of the crank 38 on the shaft 37 and connecting mechanism the clamp is brought into the position to grasp the wire. Inasmuch as the clamp 45 46 is actuated by the connecting-rod 42 acting on the toggles while the clamp is being pushed in a position to grasp the wire, the jaws will be open. The moment the pull on the rod 42 comes in the opposite direction the pull on the toggles will close the clamp on the wire and the wire will be drawn across the machine in front of the five plungers 15, 16, 17, 18, and 19. The plunger 17 carries on its outer end a fork 65, grooved horizontally to receive the wire, and the outer ends or contact-faces of the plungers 15, 16, 18, and 19 are also grooved horizontally to receive the wire. The outer edge of the plunger 19 is also formed with a sharp vertical face, and the wire is cut off by the advance of this plunger against the wire-holder 66, through which the wire passes, and which wire-holder is fixed to the frame. 67 and 68 are vertical posts movable vertically, and which posts normally stand at the height of the fixed posts 69 and 70. A vertical oscillation is given these posts 67 and 68 by the levers 71 72, Fig. 3, pivoted at about their middle point in suitable bearings 73 74 on the lower edge of the table. These levers 71 72 are coupled at their inner ends to the posts 67 68, respectively, and the outer ends of these levers carry rollers which engage, respectively, the cam-slots 75 and 76 in the cam-wheels 77 78, mounted on their respective side shafts 30 and 29.

The operation of the various cam-wheels, heretofore described, is so timed that when the clamp-jaws 45 46 have drawn the wire across the machine and the wire is released by these clamps, which open by reason of the contact of the depending toggle-arm 43 with the lug 120, located at the proper position in the frame, the plunger 19 will advance to cut off the wire against the holder 66 and bend over at right angles a short half-inch section around the post 67 at the same time that the holding-fork 65 advances to catch the wire, and the plunger 15 advances to bend a short half-inch section of the other end of the wire at right angles around the post 68. As the plungers 16 and 18 advance to further bend the wire around the fixed post 69 70 the post 67 68 are withdrawn by the levers 71 72, actuated by the cam-wheels 77 78. The advance of the plungers 16 and 18 carries the section of wire, with the short right-angle bends at the ends, into the driving and clenching mechanism.

79 is the form-block, mounted on the table,

of the proper size and shape to receive in inverted position the paper vessel to be fitted with the bail.

80 80 are guide-blocks mounted on the table at each side of the form-block 79, each provided with a rail 81 81, upon which is mounted to slide laterally and horizontally the blocks 82 82. The outer ends of these blocks are coupled by the connecting-rods 83 83 to the levers 84 84, pivoted, respectively, on each side of the frame in suitable supports 85 85. These levers each carry a roller 86, which engages in a cam-slot 87 87 in the cam-wheels 88 88, mounted, respectively, on the side shafts 29 and 30. Mounted in a recess 89 as shown in Fig. 6, in each of these blocks 82 is a sliding head 90, provided with a slot 91 to receive the ends of the wire advanced to it by the plungers 16 and 18. The slot 91 is carried through the head 90 for the reception of a plate 92, which rests against the rear wall 93 of the recess 89 in the block 82. 94 is a spiral spring which bears between this wall 93 and the head 90 to keep the head normally extended.

A recess is provided within the form-block 79, and a slot 95 is formed into this recess on each side to allow the ends of the wire bail to enter the recess. Mounted horizontally within this recess in the block 79 upon the shafts or rods 96 96 are the clencher-plates 97 97. 98 98 are pinions mounted on these rods 96 96, Fig. 5, held in position by bracket 99 underneath the edge of the table and actuated by the rack-bars 100 100, which are coupled by the links 101 101 to the levers 102 102, which levers are pivoted at about their middle points 103 103 to the frame and are oscillated by the studs 104 104 on the outer ends thereof, engaging grooves 105 105 in the cam-wheels 106 106, mounted, respectively, on the side shafts 29 30. The operation of these cams is so timed that as the section of wire to form the bail is driven in to pierce the side of the pail by the driving-heads 90 and the plates 92 these clenching-plates 97 97 will be oscillated in a position shown in Fig. 2, so as to bend over and clench the bail on the inside of the paper vessel. During this driving and clenching operation the fork 65 on the end of the plunger 17 has held the outer loop of the wire bail tightly against the forming-block. In order to remove the wire bail from this position after the bail has been clenched in place, two vertical rods 107 107 are provided, the ends of which rods are located in a position to contact with and push up the outer loop of the bail. These rods 107 107 are mounted on the cross-head 108, which slides vertically in the guides 109 109 and is actuated by the lever 110, pivoted at its middle point 111 in a suitable support in the frame. One end of this lever 110 is coupled by the link 112 to the cross-head 108, while the



other end of this lever carries a roller 113, which engages the cam-groove 114 in the cam-wheel 115, mounted on the shaft 37.

The operation of the machine as a whole will be evident from the foregoing description, the various cams on the various shafts being timed to actuate their respective mechanisms, which in turn operate on the wire to draw it from the roll, cut it off, bend it into the proper shape, clench it through the walls of the paper vessel, and release the completed bail for the succeeding operations, and prior to which operation the wire being fed forward a short distance to permit the drawing-clamps to take hold.

In the operation of the machine the operator first places the paper bucket to be bailed on the form-block 79, the slots in the form-block being located at the proper position to receive the bail through the sides of the bucket. The wire is then fed from the roll between the straightening-rollers 50 51, through the feeding clamp-plates 53 54, and through the wire-holder 66 and extending slightly beyond the wire-holder. The machine is then set in operation, and the drawing-clamp 45 46 oscillates by its cam-wheel to advance across the machine and grasp the wire. The clamp then recedes, and just as the end of the toggle-lever 43 of the clamp strikes the lug 120 on the frame the cam-wheels 6, 8, and 10 advance the plungers 15, 17, and 19. 19 cuts the wire off, and 15 and 19 make the short bend around the posts 67 and 68 at the same time that the fork 65 advances to hold the middle portion of the wire against the form-block 79. The plungers 16 and 18 are then advanced to bend the wire at right angles around the fixed posts 69 and 70 at the same time that the driving-heads 90 are advanced by their respective cams and connecting mechanism to drive the end of the staple through the paper vessel and into the recess in the form-block against the clenchers to bend the staple back tightly against the inside of the pail. In this last operation the plates 92 92 form the backing on the outside for clenching the ends of the bail. Before the final bend is given to the bail by the plungers 16 and 18 the posts 67 68 are withdrawn by their respective cams and connecting mechanism. As soon as the wire bail has been clenched in place the rods 107 107 are raised to throw the bail up, so that the paper bucket and its bail may be easily removed. During this operation the cam-wheel 63 operates the feeding device to advance the wire through the wire-holder 66 a sufficient extent to permit the drawing-clamps to take hold at the commencement of the next operation of the machine.

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

1. In a bailing-machine, a series of plungers

each independent of the other for cutting, holding, and bending the wire, a shaft with cam-wheels one for each plunger and connecting mechanism for operating said plungers, a block for holding the vessel to be bailed, with driving and clenching mechanism to secure said bail when formed to the paper vessel.

2. In a bailing-machine, a series of plungers each independent of the others for cutting, holding, and bending the wire, a shaft with cam-wheels one for each plunger and connecting mechanism for operating said plungers, a block for holding the vessel to be bailed, a pair of driving devices with shafts, cam-wheels and connecting mechanism for operating same to drive the ends of the wire through the vessel, with a pair of clenchers with cams and connecting mechanism to operate same to clench the ends of the bail in place.

3. In a bailing-machine, a series of plungers each independent of the others for cutting, holding, and bending the wire, a shaft with cam-wheels one for each plunger and connecting mechanism for operating said plungers, a block for holding the vessel to be bailed, a pair of driving devices with shafts, cam-wheels and connecting mechanism for operating same to drive the ends of the wire through the vessel, a pair of driving devices, with shafts at right angles to and geared to said plunger-shaft, cam-wheels thereon, and connecting mechanism for operating the driving devices to drive the ends of the wire through the vessel, with a pair of clenchers within the block with cams on the shafts of the driving devices, and connecting mechanism to operate the clenchers to secure the ends of the bail in place.

4. In a bailing-machine, a reciprocating clamp to draw the wire across the machine, a series of plungers with means for actuating them to hold, cut off, and bend the wire at both ends simultaneously, and driving mechanisms for driving the bent ends of the wire through the vessel.

5. In a bailing-machine, the combination with a guide-frame and five reciprocating plungers horizontally disposed therein, of a driving-shaft, with cam-wheels thereon connected with said plungers, the middle plunger carrying a fork to hold the wire to be acted upon, and the other two pairs of plungers bending the wire, with posts upon which the wire is bent, and means for withdrawing the outermost posts to permit bending around the innermost posts.

6. In a bailing-machine, a driving mechanism, consisting of a sliding block, a slotted head mounted to slide in said block to receive the wire to be driven, with a longitudinal recess in said head, a driving-plate mounted in said recess, with a spring to keep said slotted head extended to receive the



wire, and to permit the head to be withdrawn to bring the said driving-plate into action.

7. In a bailing-machine, feeding mechanism for the wire, consisting of a sliding block  
5 carrying a relatively fixed and a loose plate between which plates the wire is passed, a flattened shaft mounted to rotate in said block, bearing on said loose plate, with means

for shifting said sliding block and connection therefor to said flattened shaft, whereby the shifting of the sliding block will tighten and release said clamping-plates.

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