

No. 898,167.

PATENTED SEPT. 8, 1908.

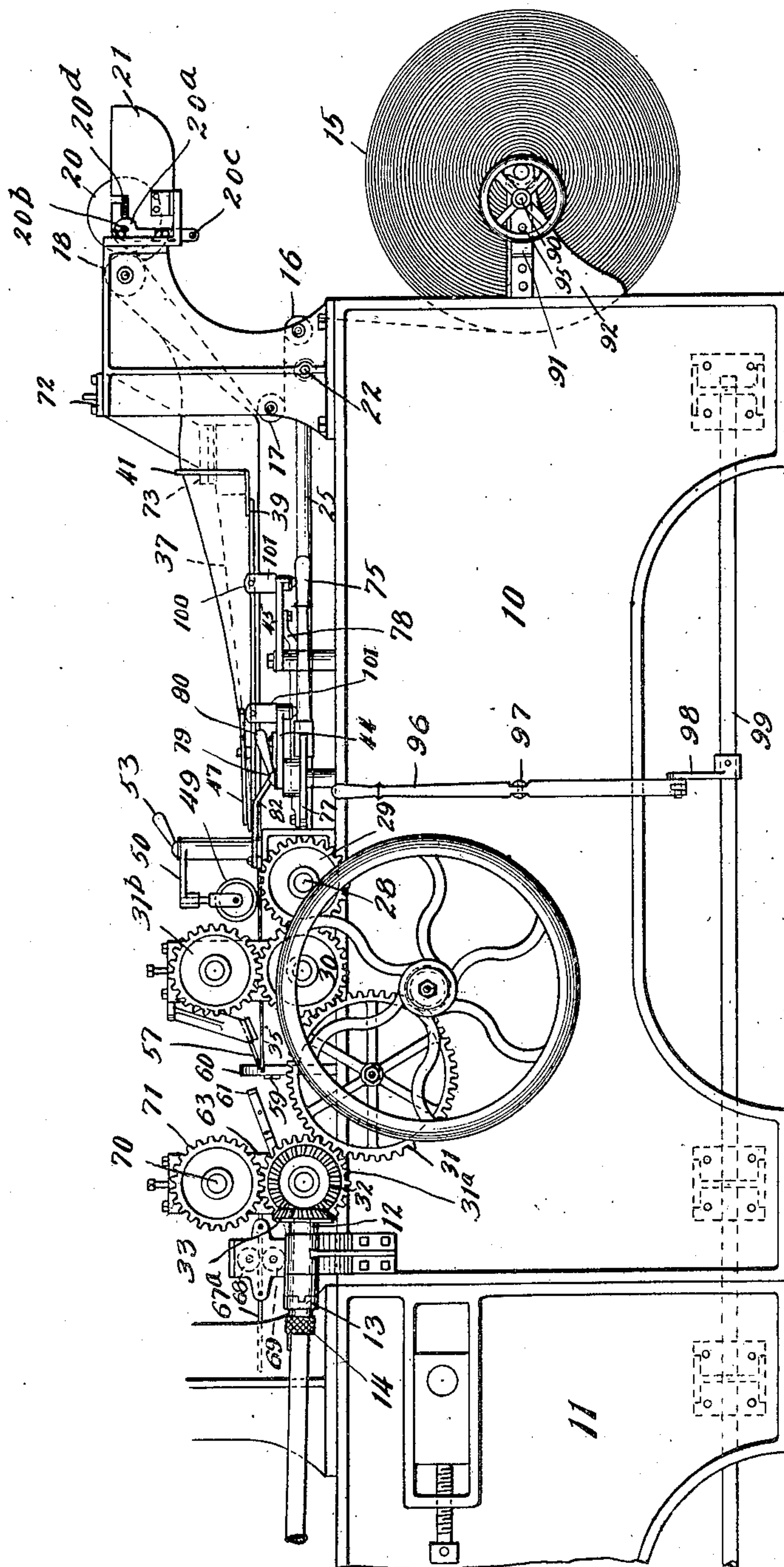
T. M. AVERY.

BODY FORMING MECHANISM OF BAG MACHINES.

APPLICATION FILED APR. 17, 1907.

6 SHEETS—SHEET 1.

Fig. 1



Witnesses:

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5 SHEETS—SHEET 2.

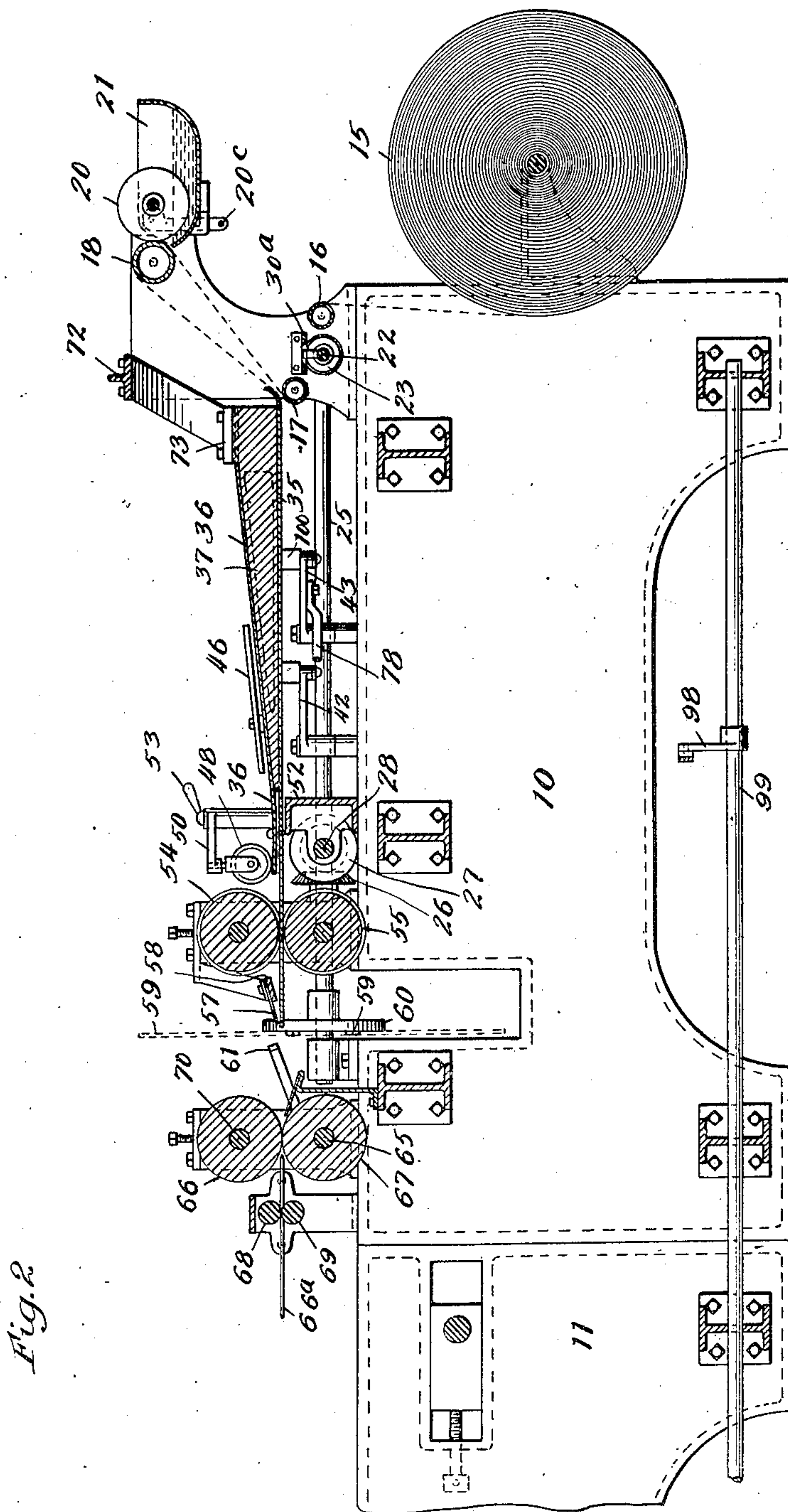


Fig. 2

*Witnesses*

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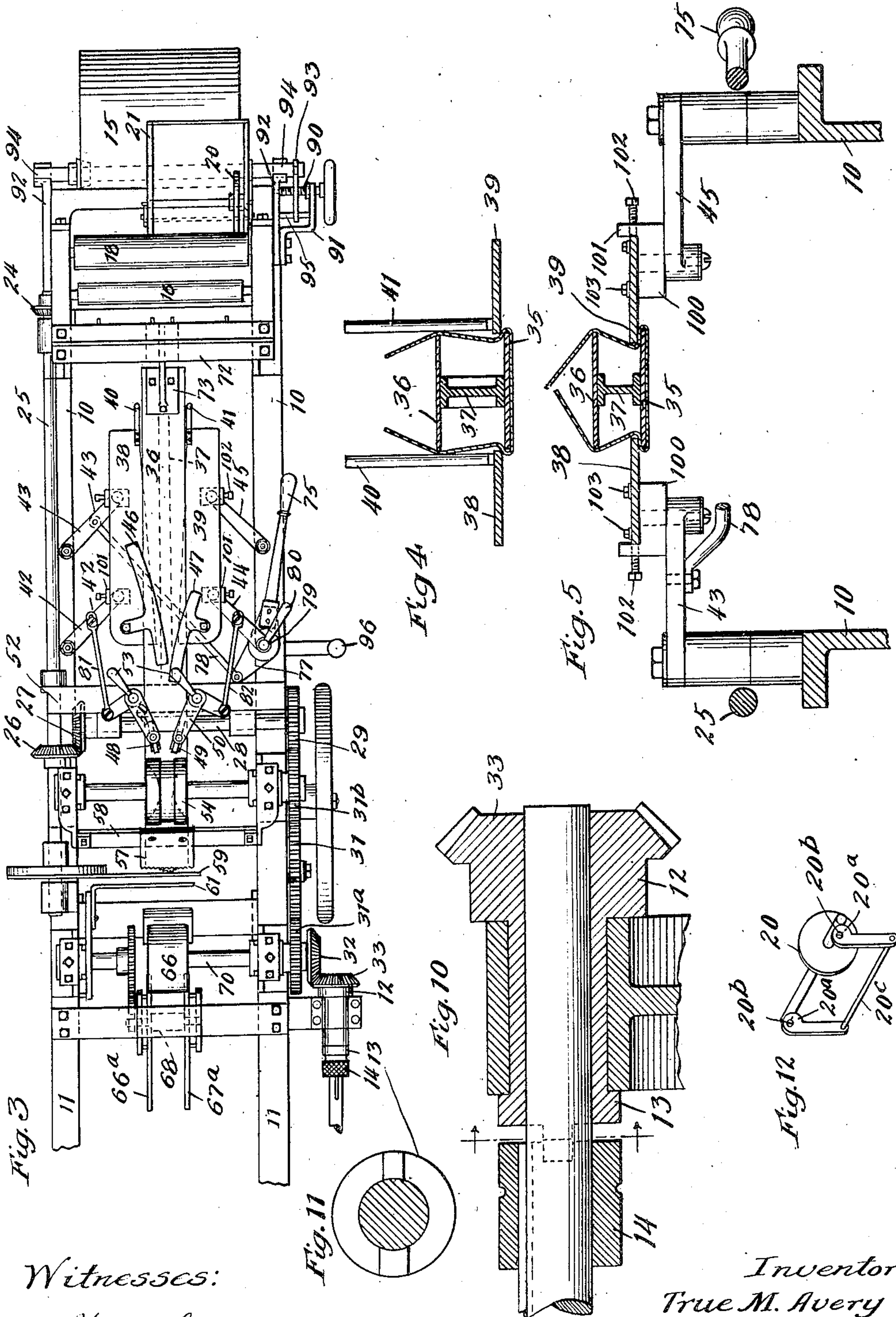
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5 SHEETS—SHEET 3.



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5 SHEETS—SHEET 4.

Fig. 6

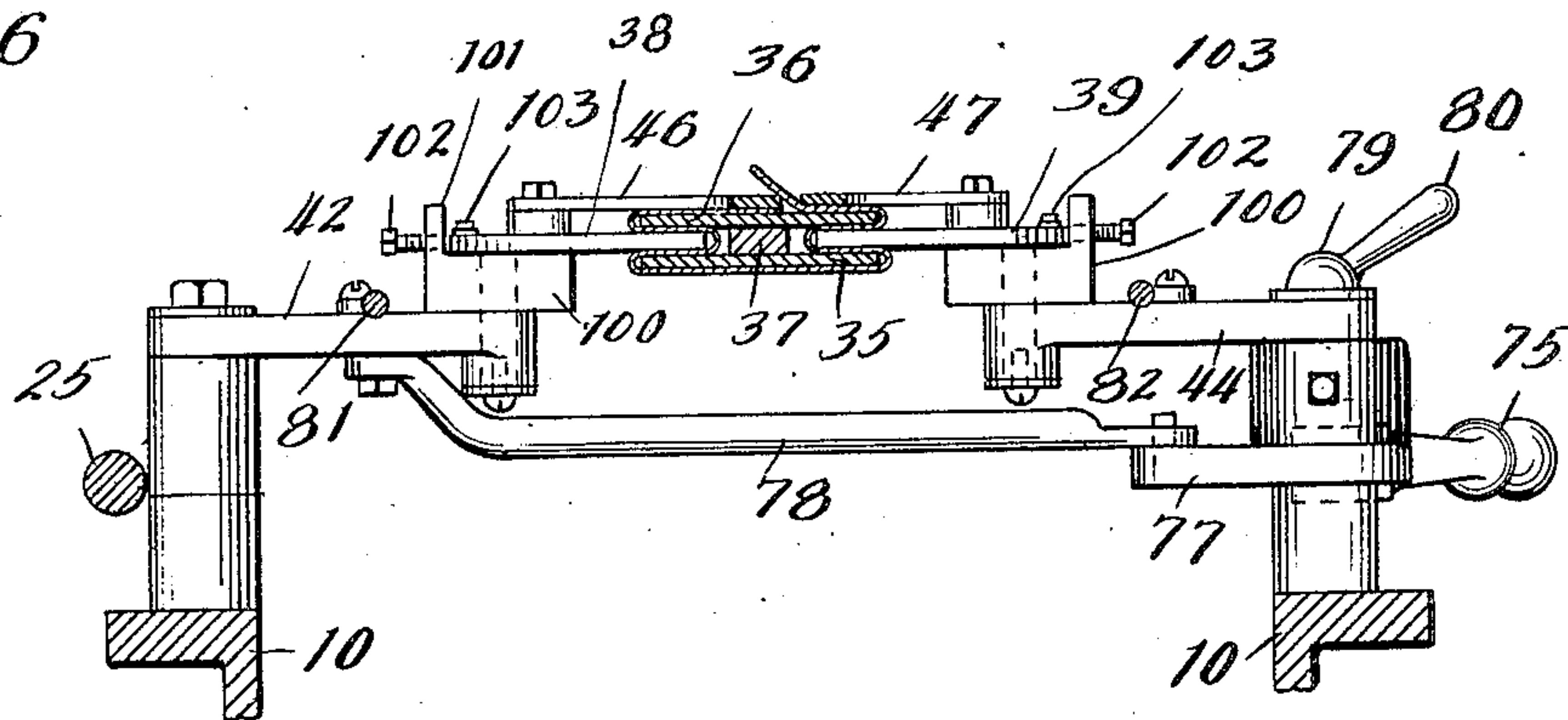


Fig. 7

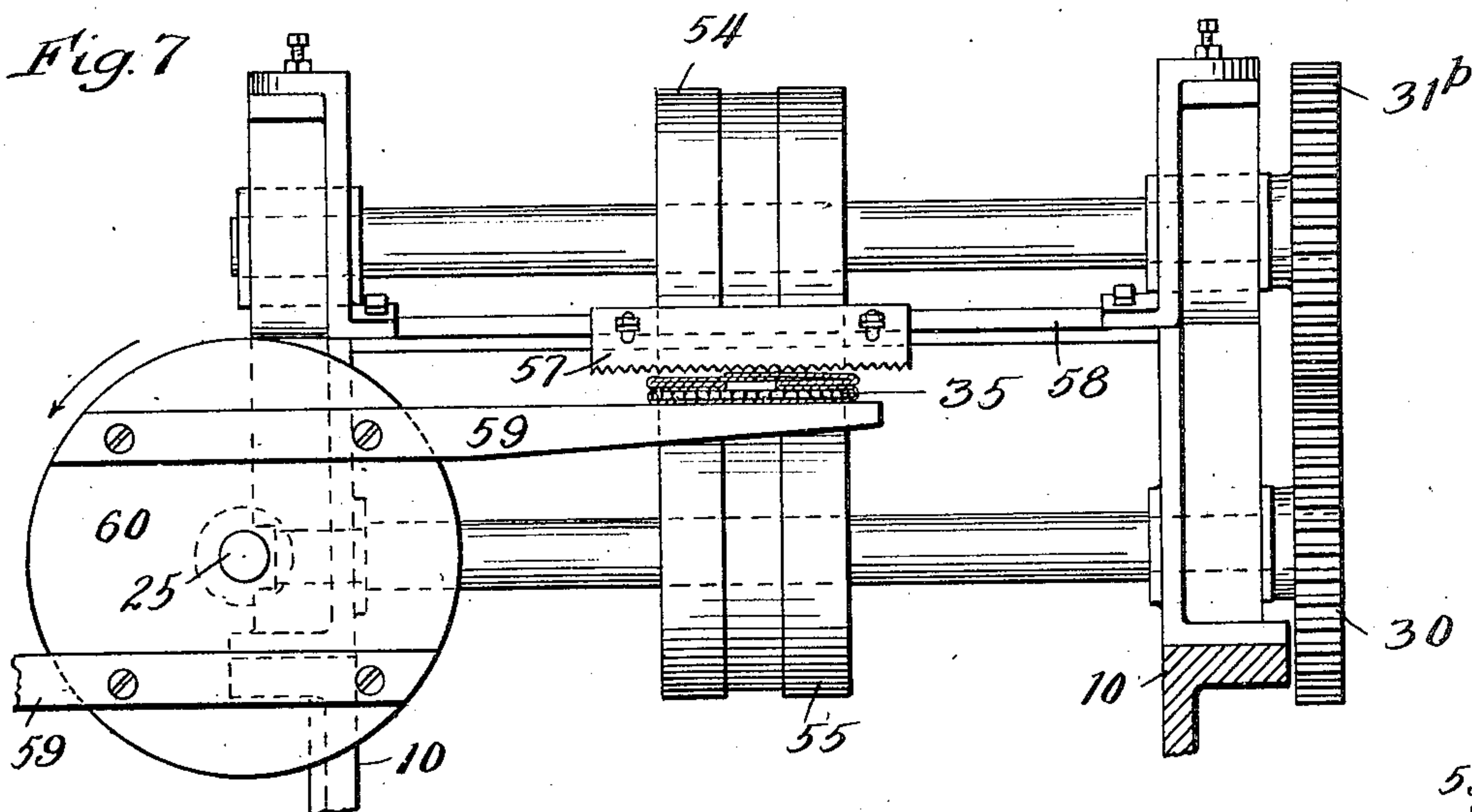
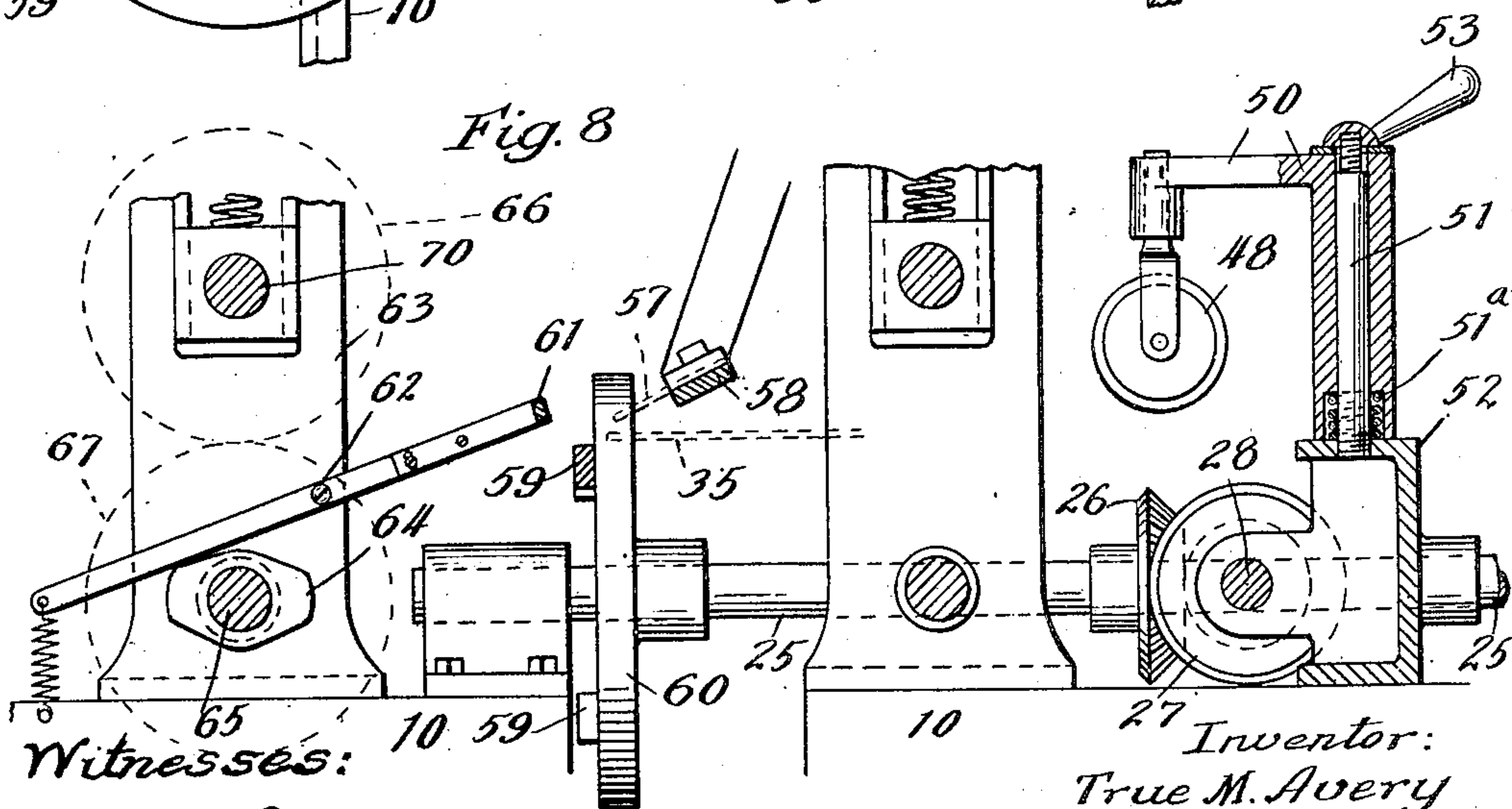


Fig. 8



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5 SHEETS—SHEET 5.

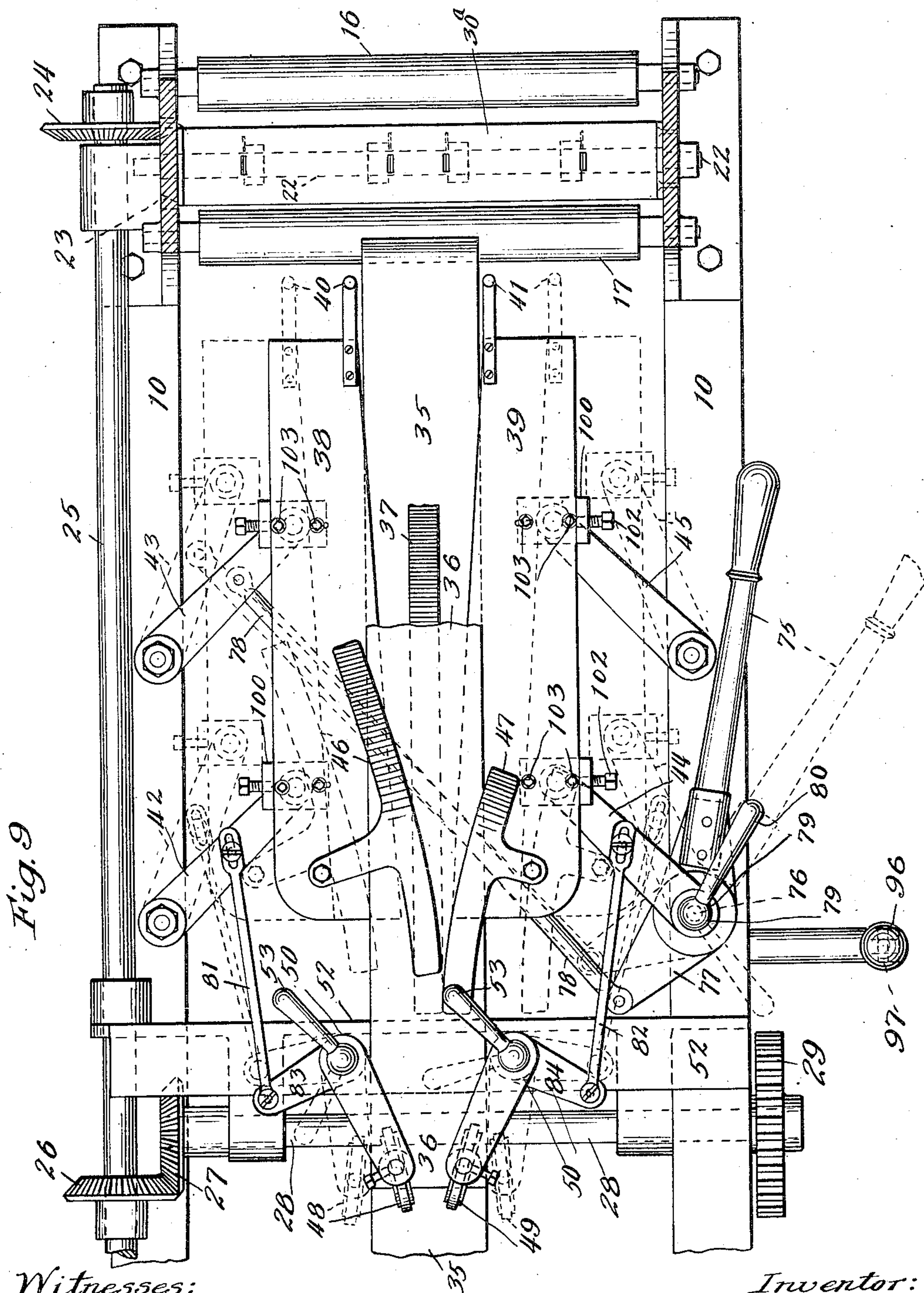


Fig. 9

Witnesses:

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# UNITED STATES PATENT OFFICE.

TRUE M. AVERY, OF OTTUMWA, IOWA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNION PAPER BAG MACHINE COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

## BODY-FORMING MECHANISM OF BAG-MACHINES.

No. 898,167.

Specification of Letters Patent.

Patented Sept. 8, 1908.

Application filed April 17, 1907. Serial No. 388,630.

*To all whom it may concern:*

Be it known that I, TRUE M. AVERY, a citizen of the United States, residing in Ottumwa, in the county of Wapello and State of Iowa, have invented a new and useful Improvement in Body-Forming Mechanism of Bag-Machines, of which the following is a specification.

This invention relates to paper bag machines, and more especially to that part of such machines in which the paper is first formed into long tubes and then flattened or plaited and cut off into proper lengths for the bags being manufactured.

The nature of my improvements, as well as the details of construction employed therein, are fully set forth below, and illustrated in the accompanying drawings, in which latter—

Figure 1 is a side elevation of my improvement. Fig. 2 is a longitudinal vertical section. Fig. 3 is a plan. Figs. 4, 5 and 6 are cross sectional views of the plaiting devices, showing different stages of the operation. Fig. 7 is a like view showing the mechanism for severing the plaited blanks. Fig. 8 is a cross sectional view showing mechanism for creating slack in the tube preparatory to cutting off the blanks. Fig. 9 is a partial plan, enlarged. Figs. 10 and 11 are sectional views of the clutch connecting this machine with the bottom forming machine. Fig. 12 shows the adjustment of the paste disk.

In said drawing, 10 represents a suitable frame for that part of a complete bag machine embraced in my present machine, and 11 may represent the frame of that part of the machine in which the end of the bag is formed, and upon which is mounted the mechanism shown in my application No. 357,846, filed February 18th, 1907. The two frames are usually arranged in close contact, and the mechanisms of both may be driven from a single source of power. In this instance, I show at Fig. 1 a shaft upon frame 11, driven from the source of power of the folding mechanism and connected to the initial shaft 12 of the mechanism of the present invention by a clutch 13. This clutch is readily opened and closed by operating the hand nut 14 which controls the movable member of the clutch, and its construction will be understood from Fig. 10; and when

closed, the mechanism will be operated by it at a speed agreeing with that of the folding mechanism and also in proper timing therewith. The clutch is adapted to insure the reconnecting of the two mechanisms in the same relative positions occupied by them when the connection was broken.

The paper from which the bags are to be formed is supplied to the machine from the roll 15 and is passed first over a roll 16, thence under a roll 17, thence around a roll 18, and thence to the forming devices to be described later on, whereby it is bent into U form, as seen at Fig. 4. As it passes around roll 18, one edge of the paper is supplied with paste by the paste wheel 20 rotating in the paste box 21. The rolls 16, 17 and 18 and the paste wheel are not driven, but receive their power from the web of paper, but between rolls 16 and 17 is a driven slitting roll 22 adapted to form the short slits in the paper rendered necessary or desirable in the formation of the box bottom, such slits being made adjacent to the line where the blank is subsequently severed from the web. The slitting roll shown is adapted to make four such slits, and it is driven by bevel gears 23 and 24 from shaft 25, drawn by the bevel gears 26, 27, from cross shaft 28 receiving power from spur gear 29. A plate 30<sup>a</sup> having slots through which the knives of the roll are given access to the paper is placed over the roll 22 as shown at Figs. 2 and 9. The gear 29 is actuated by spur gears 30, 31, 31<sup>a</sup> and bevel gears 32 and 33, the latter on shaft 12.

After leaving the roll 18, the paper encounters the forming devices by which it is gradually reduced to tubular form. The first of these is a stationary shaping device over which the paper is drawn and composed of a flat bottom plait 35 and flat top plate 36, and an intermediate spacing member 37 to which both plates are attached. The plates are arranged horizontally as shown, and taper from the receiving to the discharging end, as indicated in dotted lines, and the member 37 diminishes in height from the receiving to the discharging end so that at the discharging end the shaper permits the tube to be brought to the condition shown at Fig. 6. At each side of this shaper are plates 38 and 39 acting as plait formers, and provided at



the receiving end with upright guards 40 and 41; and adapted to carry the sides of the web against the side edges of plates 35 and 36, as shown at Fig. 4. The guards 40 and 41 project longitudinally so that they encounter the paper in advance of the plaiters and bring the web into U form for the action of the plaiters. The plaiters are supported on parallel levers, pivoted in the side frames of the machine, those of plaiter 38 being shown at 42 and 43, and those of plaiter 39 at 44 and 45. The acting edges of the plaiters incline toward each other, so that they are able to force the paper inward from the position given at Fig. 4 to that of Fig. 6, thus completing the plaits therein before the paper passes off the shaper.

The free edges of the web which project above the top plate 36 are gradually guided down to horizontal position by the folders 46 and 47, secured each to one of the plaiters as plainly indicated. They are arranged in angling positions so that as the paper encounters them its edges will be bent over upon the plate 36, the paste coated edge after the other edge. After being thus acted upon by the folders, the side portions of the web are further drawn together by two idler wheels 48 and 49, which are arranged in positions at each side of the longitudinal center of the paper and in angling positions relative to said line, so that they are adapted to push their respective sides of the paper toward each other. The wheels 48 and 49 are supported by bell cranks 50 mounted on cross bar 52. The bell cranks are adjustable on the bar and secured thereto by pivot bolts 51 having handle nuts 53 whereby they may be made rigid with the bar. By loosening the nuts the bell cranks may be turned so as to carry the wheels onto or away from the paper, and at such times the springs 51<sup>a</sup> surrounding the bolts 51 will lift the bell cranks so as to permit the wheels to move freely over the paper. Beyond the wheels, the web of paper which has now been brought to the condition indicated at Fig. 6 leaves the shaper with the exception of the blade 35, and passes between the feeding or drawing rolls 54 and 55, driven by gears 30, 31 and 31<sup>b</sup>. Each of these feeding rolls has a depressed center zone (Fig. 3) to give room to the blade 35, which is extended forward to the point of cutting. That portion of the blade lying between the rolls is narrowed in width to agree with the width of said depressed zone of the rolls, but it is widened at the delivery end to the width of the flattened tube as seen at Fig. 7. The widened end is serrated at its edge as seen at Fig. 3, where it coacts with the serrated edge knife 57, supported in a downwardly inclined position by the cross bar 58 above the paper in severing the paper, which is lifted against said edges in effecting the serration by one

or the other of the arms 59 upon the wheel 60 mounted on shaft 25 as already described.

In order to facilitate the severing of the bag blank from the tube, I create slack in the tube at the point of severation by means of a right angled lever 61, pivoted at 62 to an upright 63 and oscillated at proper intervals by a cam 64 on the cross shaft 65 carrying gears 32 and 31<sup>a</sup>, so as to bring the horizontal member of said lever down upon that portion of the tube lying between the knives and the delivery rolls 66 and 67 located beyond the knives, and in the bite of which the advance end of the bag blank will have been entered by the time the slack creating device operates. The rolls 66 and 67 press the bag blank closely, and effectually crease the paper so that the plaits formed therein will be permanent, and also finish the pasted joint, and after so doing feed the blank to guide rolls 68 and 69, by which it is fed into the mechanism for forming the bottom which is mounted on frame 11. The shaft 65 supports the roll 67, and shaft 70 the roll 66, and the latter is driven by gears 31<sup>a</sup> and 71.

As the blank leaves the rolls 66 and 67, stationary guides 66<sup>a</sup> and 67<sup>a</sup>, one at each side and shaped to adapt them to enter the side plaits in the blank, find their way into the plaits and prepare the blank for the bottom folding mechanism. The rolls 68 and 69 are made short to avoid interference with these guides. See Fig. 3.

The shaper is supported at its initial end by a cross bar 72 having a strap or hanger 73 to which the vertical member of the shaper is bolted. The plait-forming plates 38 and 39, the folders 46 and 47, and the idler wheels 48 and 49 are all made movable and connected by levers so that they can be simultaneously and quickly moved out of their acting positions whenever necessary, as, for instance, when starting operation on a fresh roll of paper, or when the paper tears, or stoppages from any cause occur or become desirable. To this end I provide a hand lever 75 at the side of the machine, and mount it on the pivot 76 by which the lever 42 is secured to the frame of the machine. This hand lever is made rigid with lever 44, and it is also rigid with an arm 77 which is connected by a link 78 with the lever 43 at the opposite side of the machine. As the levers 42 and 43 are parallel and joined to the same plaiter, and as the levers 44 and 45 are also parallel and joined to the plaiter on the same side with them, it results from this construction that any movement imparted to lever 44 by the hand lever will cause the plaiters to move in or out as the case may be, in unison and to the same extent, carrying the top folders with them. When adjusted for action, the plaiters are locked by tightening the nut 79 on the top of pivot 76, and this



is done by turning the handle 80 attached to the nut.

The angling wheels are also preferably moved out of action with the plaiters, and are connected to the levers 42 and 44 for that purpose. The connections consist of links 81 and 82, the first of these joined at one end to said lever 42 and at the other to an arm 83 rigid with the bell crank from which one of the wheels swings, and the other link joined at one end to lever 44 and at the other end to an arm 84 rigid with the bell crank from which the other wheel swings. It will be noted that the links 81 and 82 have elongated slots for the bolts by which they are attached to the levers 42 and 44, thereby allowing some freedom of adjustment to the wheels without disturbing the plaiters. Also that each wheel has a tightening handle 53 whereby it may be locked in position, and these handles should be released before operating the main lever 75.

The paste disk 20 is adjustable to and from the work by means of the duplicated eccentrics 20<sup>a</sup> pivoted at 20<sup>b</sup> and having their operating arms joined by a cross rod 20<sup>c</sup>. The eccentrics bear against the ends of the journal of the paste disk and push it away from the work when paste is not desired, while the springs 20<sup>d</sup> act upon the journal in the opposite direction and hold it in contact with the paper from which it receives motion.

The paper roll sometimes requires adjustment so the paper may enter the machine in its proper path, and I therefore provide means whereby it may be moved longitudinally on its supporting shaft. These means consist of a screw 90 supported in a bracket 91 and having an operating wheel at its outer end, and bearing at its inner end against another bracket 92. The screw has no longitudinal movement, but an arm 93, which is loosely secured on the roll shaft 94 with freedom to turn thereon, but without freedom to slide or otherwise change its position, is threaded on the screw, so that when the screw is turned movement will be given the shaft. A guide 95 passes through the arm and is supported by said brackets.

A lever 96 is shown at Figs. 1 and 3. It is pivoted at 97 and joined at its lower end to a crank 98 on a rock shaft 99. This rock shaft extends to a belt shifter not shown, whereby the driving power of the mechanism shown herein, as well as the bottom forming mechanism used therewith, is controlled.

The plaiters are united to their supporting and adjusting levers by means of blocks 100 pivotally united to the levers. These blocks have projecting ledges 101, and through these ledges extend horizontal screws 102 adapted to adjust the plaiters upon the blocks and thus to regulate their action upon

the paper. The screws 103 secure the plaiters upon the blocks in their adjusted positions.

I claim:—

1. The machine for forming the bodies of paper bags, wherein are combined means for feeding the paper, means for forming the paper into tubular form, the plait forming plates, the parallel levers supporting the plates, the folders mounted on said plates, the idler wheels mounted on stationarily pivoted arms and connected to said parallel levers, said pivoted arms, and means whereby said plates and said wheels can be simultaneously moved out of acting position.

2. The machine for forming the bodies of paper bags, wherein are combined means for feeding the paper, a shaper or forming device around which the paper is bent having open sides into which the paper may be forced to form the plaits, plait forming plates at opposite sides of said shaper and mounted on pivoted and connected parallel levers, said pivoted levers, and a hand lever and connections whereby all said levers may be simultaneously actuated.

3. The machine for forming the bodies of paper bags, wherein are combined means for feeding the paper, a shaper or forming device around which the paper is bent and having open sides to receive the plaits, devices for forcing the paper into the shaper, folders and idler wheels 48 and 49 mounted upon swinging arms having stationary pivots, said swinging arms and a hand actuated lever whereby the folders and wheels may be moved into and out of action.

4. The machine for forming the bodies of paper bags, wherein are combined means for feeding the paper, a shaper or forming device around which the paper is bent, and consisting of flat plates at top and bottom and an intermediate vertical spacing device, plaiters for forcing the sides of the paper into said shaper, lever mechanism controlling the plaiters, converging idler wheels acting to fold the free edges of the paper, and swinging arms carrying said wheels, said arms being joined to the lever mechanism of the plaiters.

5. The combination with a shaper around which the paper is bent, of plaiters acting to form the plaits and located one at each side of the shaper, and parallel bars or levers pivoted to the machine frame, upon which the plaiters are mounted, the levers of one plaiter being mechanically connected to the levers of the other plaiter so that both move together.

6. The combination with a shaper around which the paper is bent, of plaiters acting to form the plaits and located one at each side of the shaper, parallel bars or levers pivoted to the machine frame, upon which the plait-



ers are mounted, the levers of one plaiter being mechanically connected to the levers of the other plaiter so that both move together, and folding devices adapted to fold the free  
5 edges of the paper together, said edge folding devices being supported from the plaiters.

7. The combination with a shaper around which the paper is bent, of plaiters, one at each side of the shaper and acting to form  
10 the plaits, parallel bars or levers pivoted to the machine frame and carrying said plaiters, and connections between said plaiters so that the adjustment of one will cause a like adjustment of the other.

15 8. In a machine for forming the bodies of paper bags, the combination of the angling idler wheels 48 and 49 with adjustable side

plaiters, parallel levers supporting the plaiters, the pivoted arms carrying the wheels, and the connections between the levers and  
20 said arms.

9. The machine for forming the bodies of paper bags, wherein are combined plaiters, folders, and adjusting devices connecting  
25 the plaiters and folders together for simultaneous adjustment, a hand lever jointed to said adjusting devices, and a screw for locking said hand lever and through it the adjusting devices.

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Witnesses:

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