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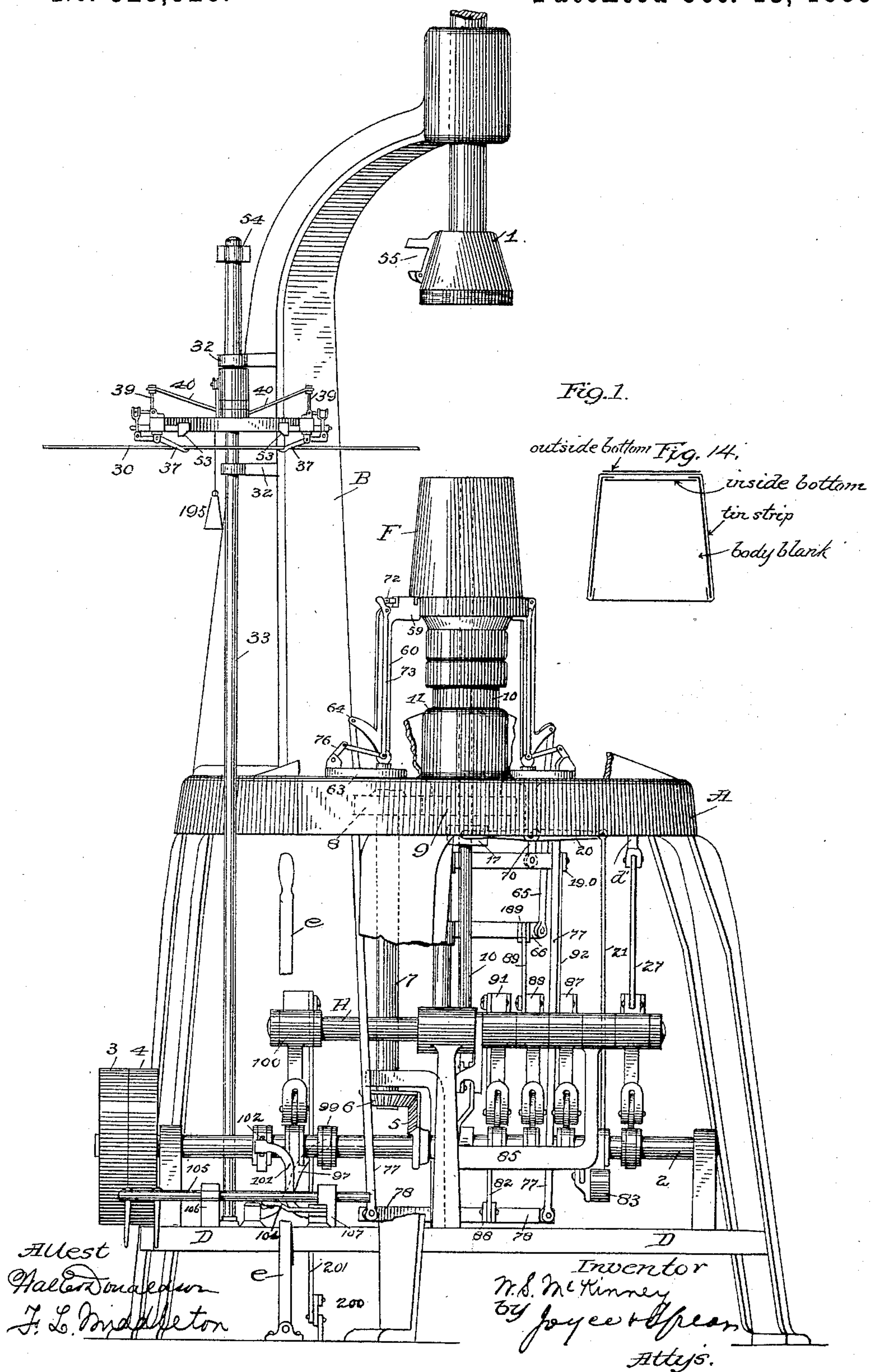
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W. S. McKINNEY.

MACHINE FOR MAKING PAPER PAILS, &c.

No. 328,328.

Patented Oct. 13, 1885.



(No Model.)

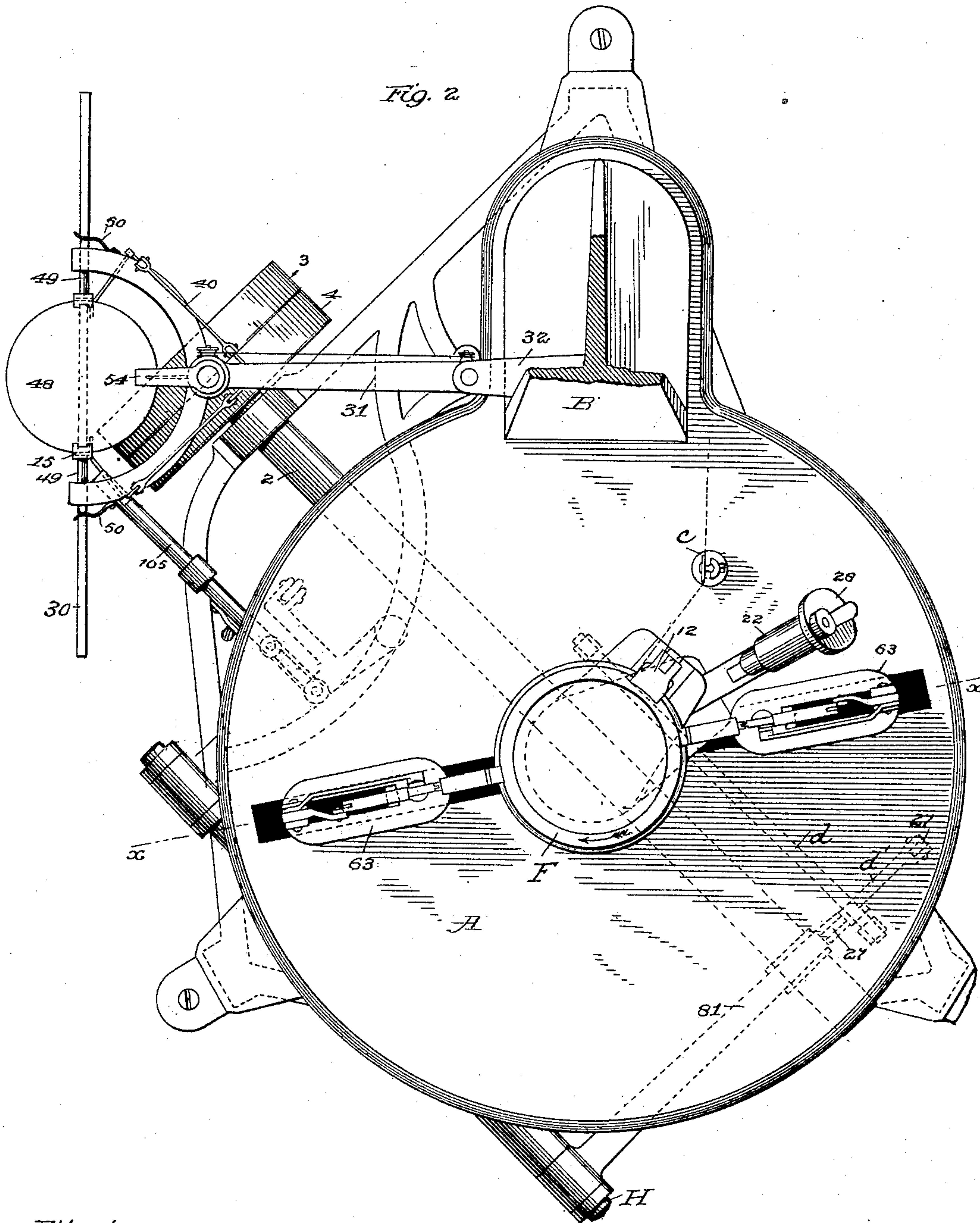
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F. L. Middleton.

Inventor

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by Joyce Spear

Atty's.

(No Model.)

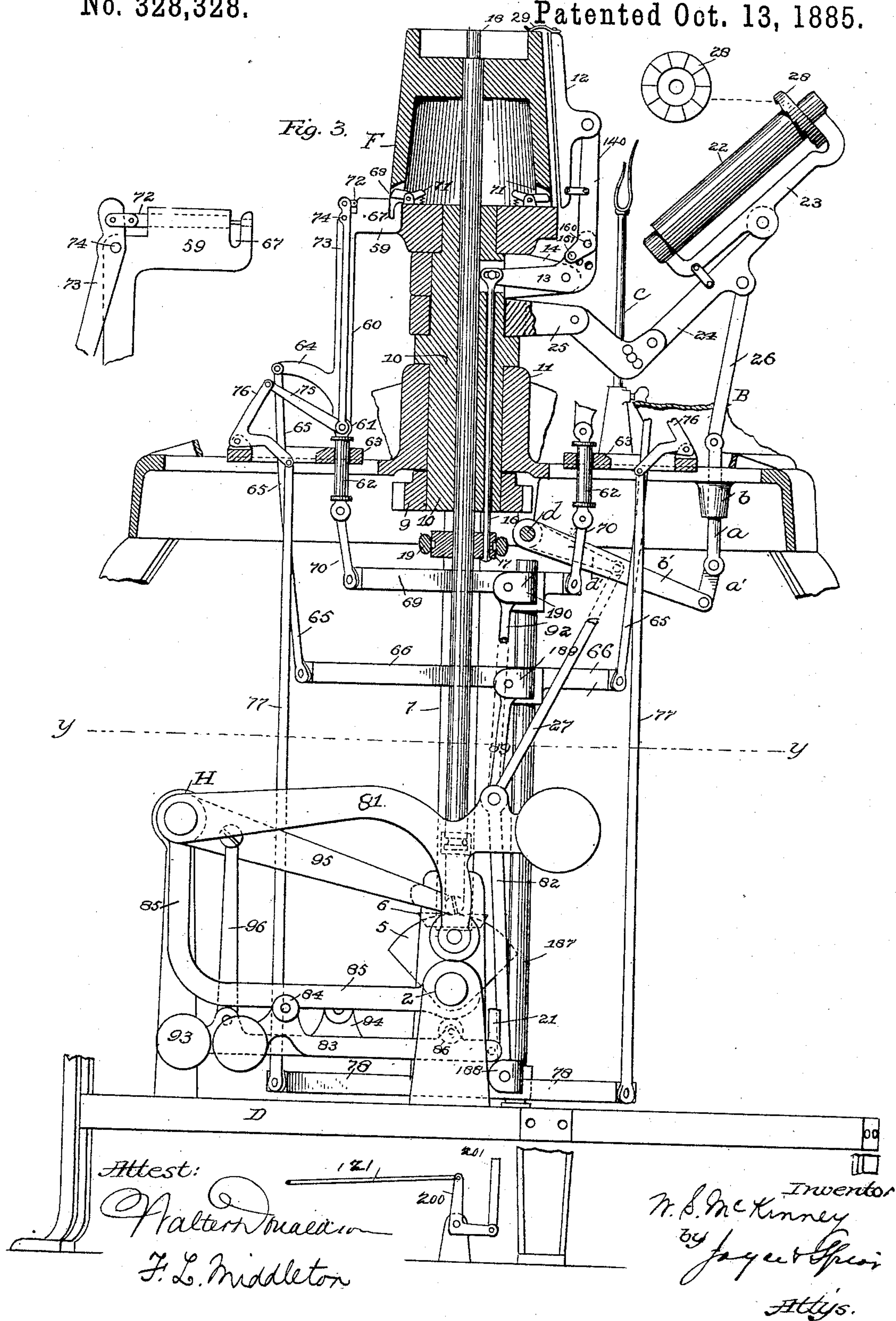
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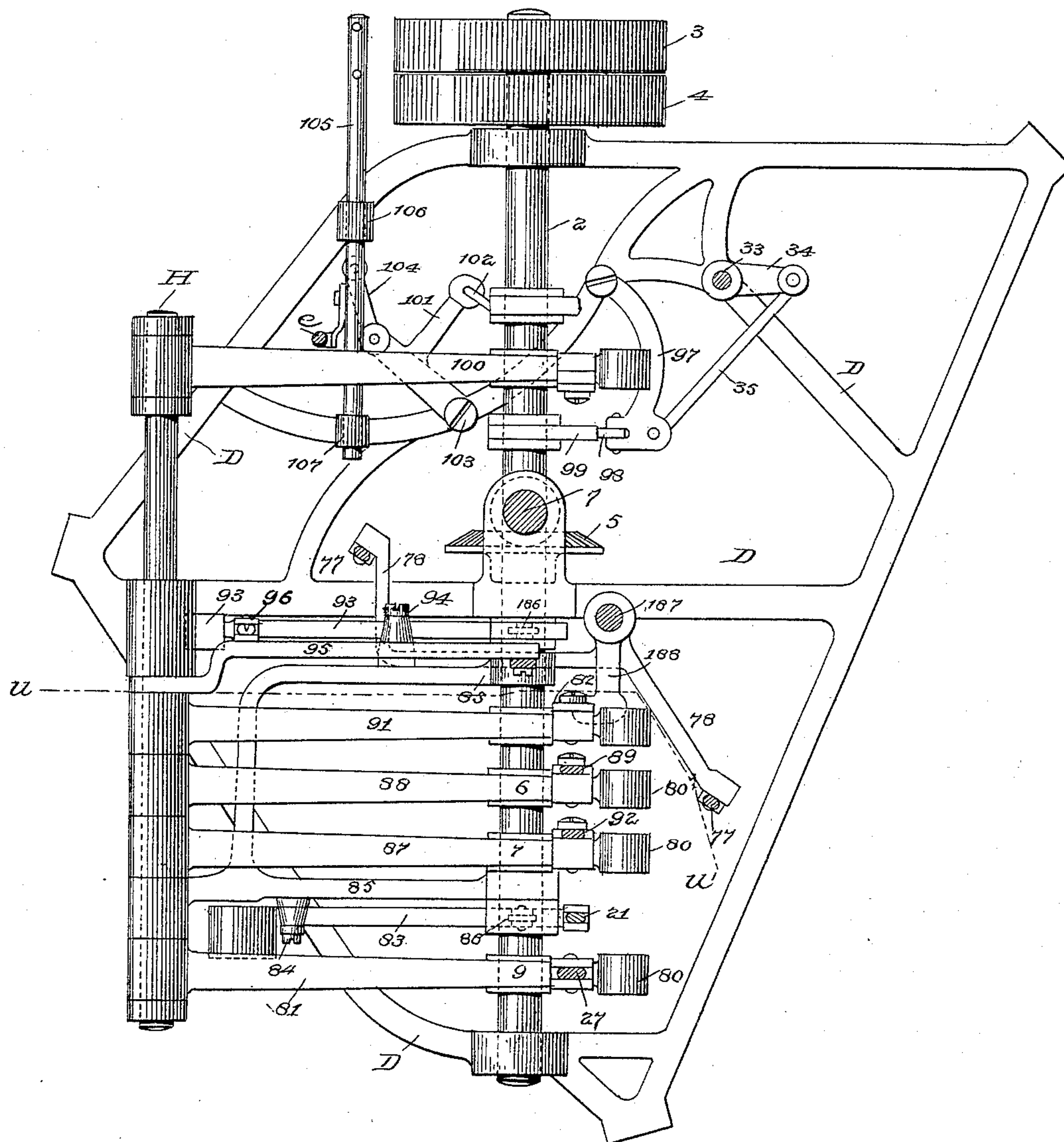
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Fig. 4.



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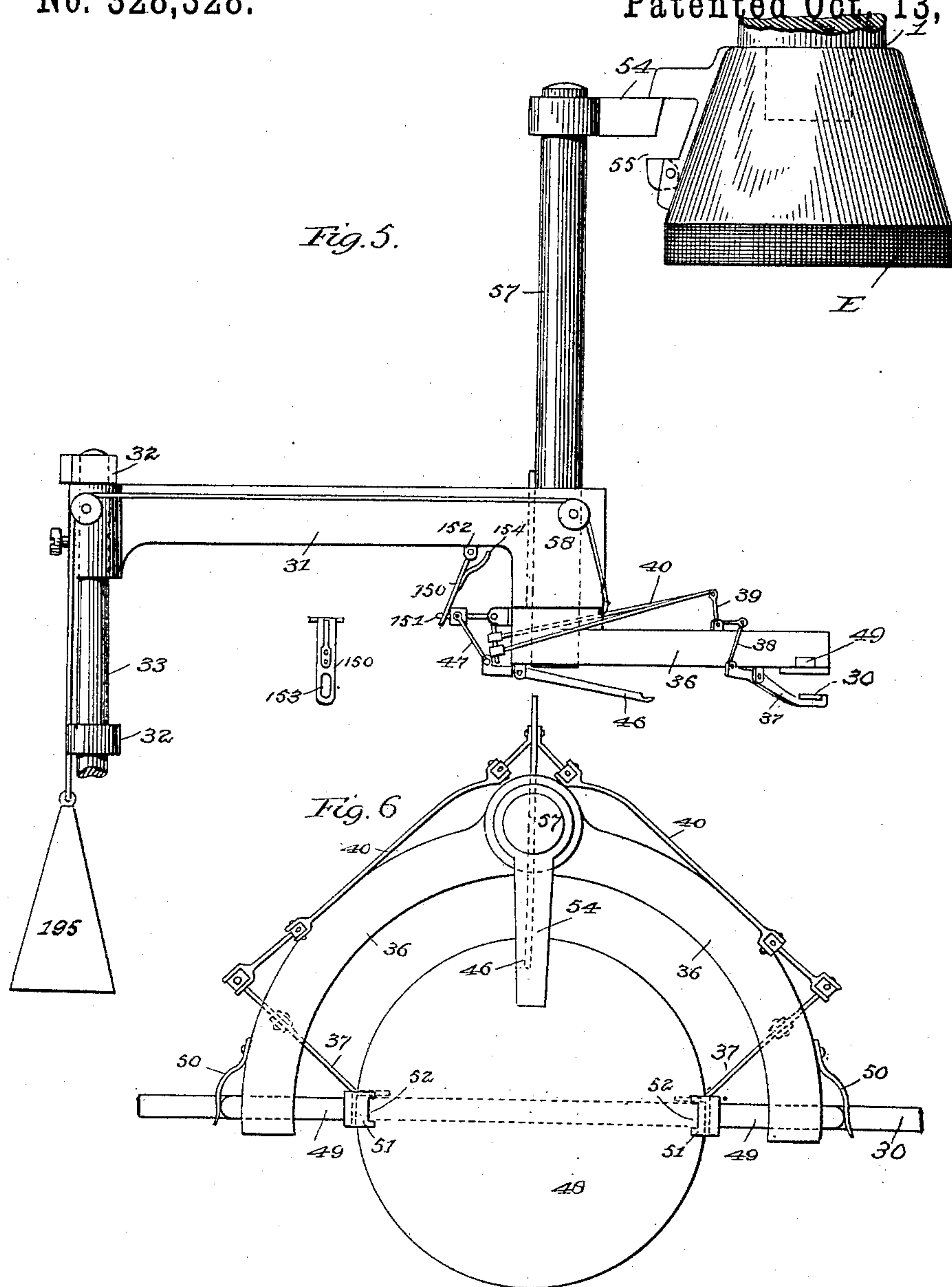
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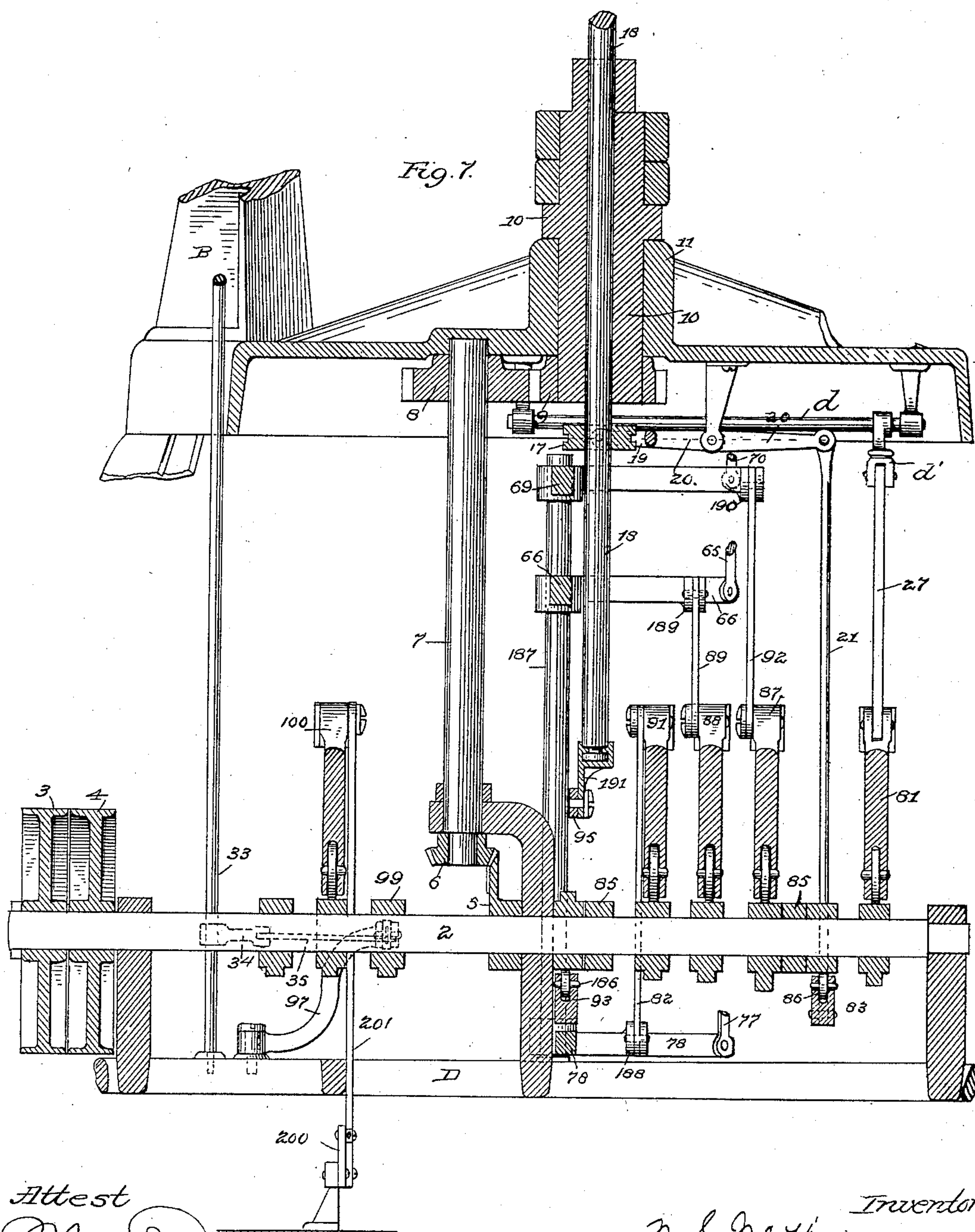
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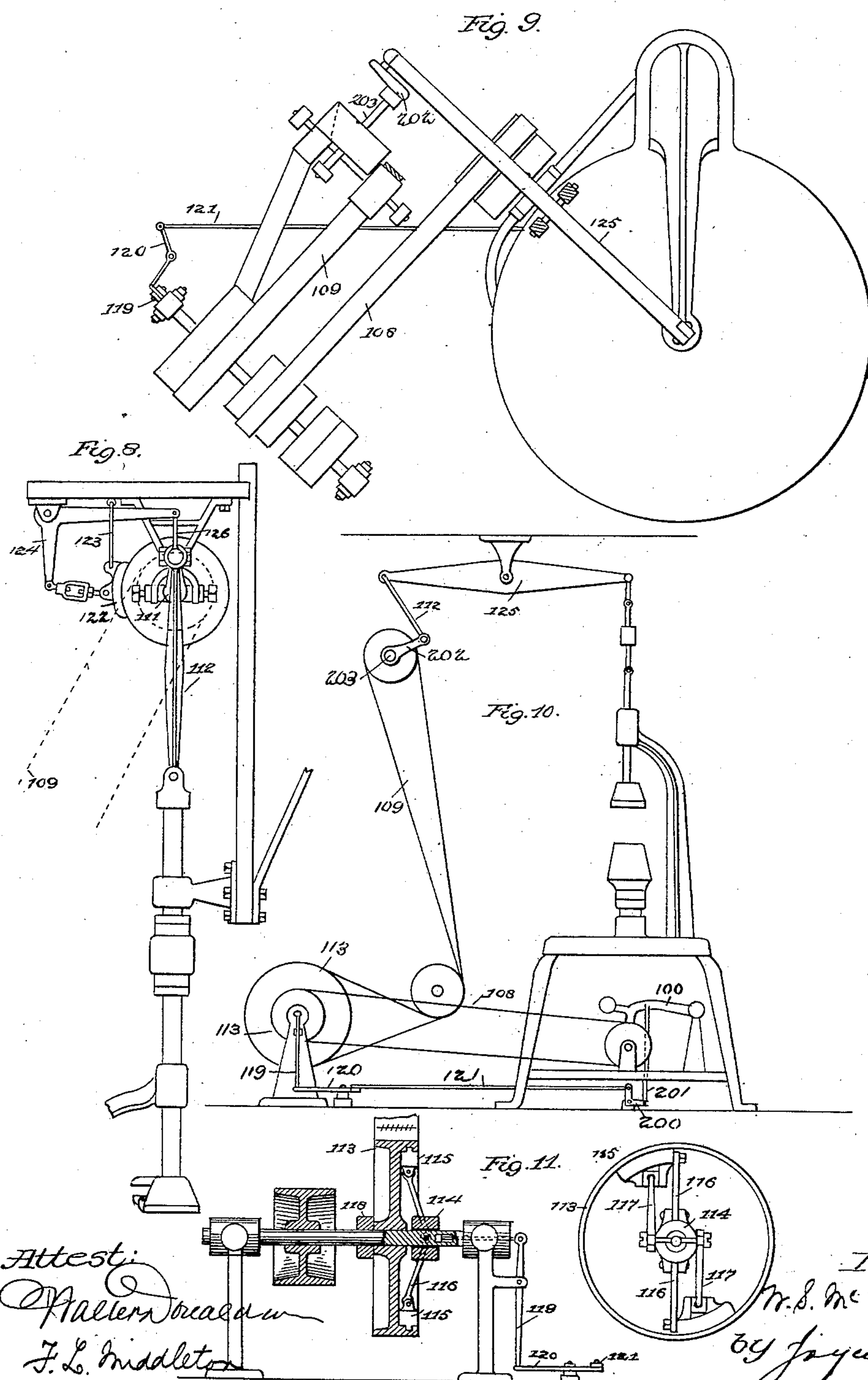
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(No Model.)

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MACHINE FOR MAKING PAPER PAILS, &c.

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Fig. 12.

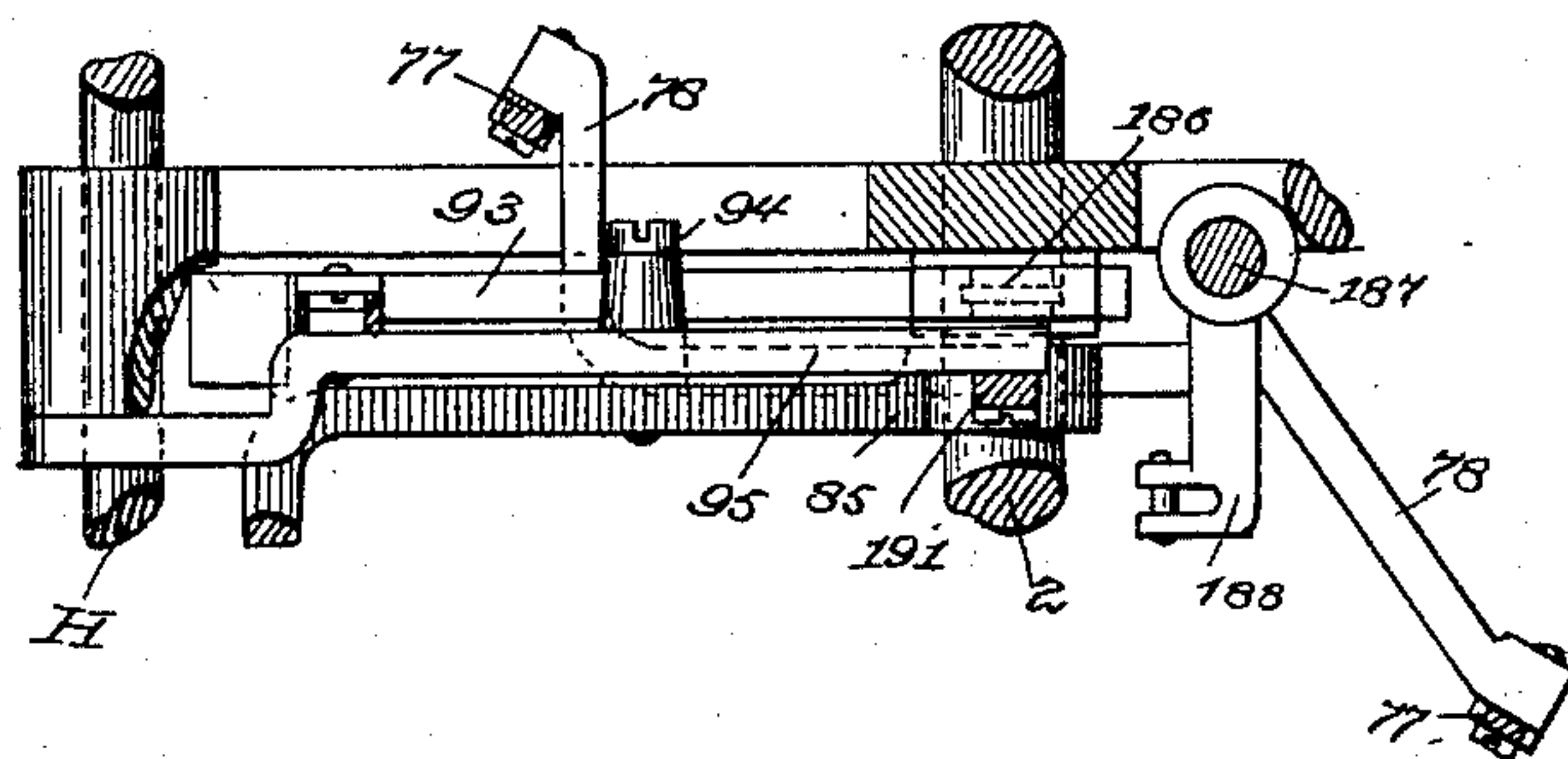
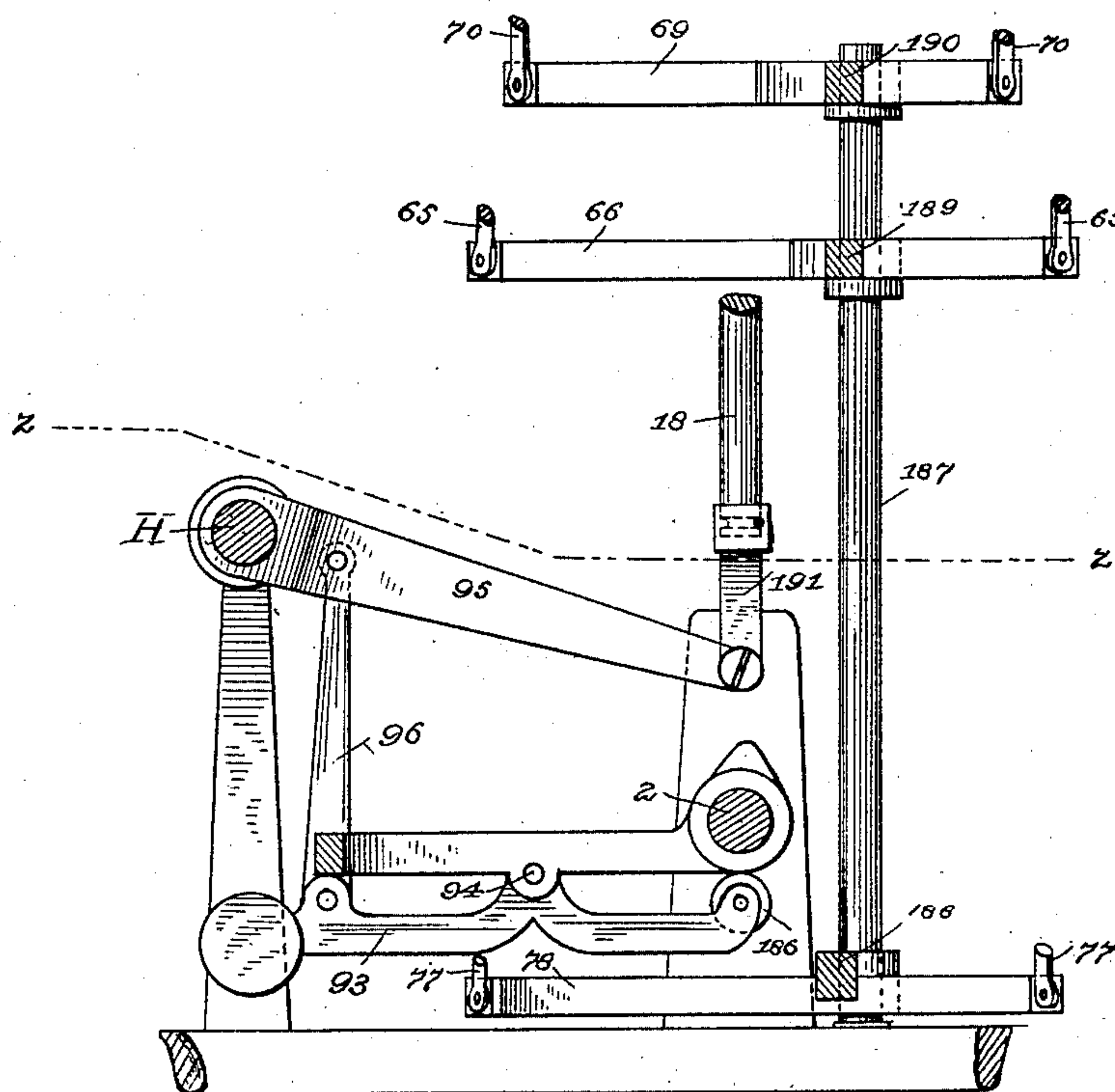


Fig. 13.



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UNITED STATES PATENT OFFICE.

WALTER S. McKINNEY, OF BINGHAMTON, NEW YORK.

MACHINE FOR MAKING PAPER PAILS, &c.

SPECIFICATION forming part of Letters Patent No. 328,328, dated October 13, 1885.

Application filed March 3, 1884. Serial No. 122,849. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. McKINNEY, of Binghamton, in the county of Broome and State of New York, have invented a new and
5 useful Improvement in Paper Pail, Box, &c., Making Machine; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention relates to the manufacture of
10 pails, buckets, and like receptacles out of paper, pasteboard, or like material. These receptacles are designed to be made cheaply and for temporary use. They consist, when completed, of a body formed in one piece with
15 lapped, glued, or pasted edges, with a bottom piece or pieces pasted or glued to the body.

This machine is shown in the accompanying drawings, in which Figure 1 is a side elevation of the entire apparatus, with the exception of
20 the mechanism which operates the plunger, the device carrying the bottom of the pail being shown in front elevation—that is, thrown inward from the position shown in Fig. 2. Fig. 2 is a plan view of the table with the
25 plunger and its supporting bracket removed. Fig. 3 is a vertical section through the table on line *xx* of Fig. 2, the cam and lever shafts being represented in end view, and for convenience of illustration the clamping mechanism is also shown in this figure, its position
30 being changed from that shown in said Fig. 2 for this purpose. Fig. 4 is a plan view of a section on line *yy* of Fig. 3. Figs. 5 and 6 are detail views of the device which carries
35 the pail-bottom. Fig. 7 is a vertical section along the cam-shaft, showing the cams, cam-levers, and their connection with the different parts of the apparatus. Fig. 8 is a side elevation of the press-plunger and brake for the
40 same. Fig. 9 is a diagram in plan of a modified form of mechanism for communicating motion to the press-plunger. Fig. 10 is a diagram in elevation of the same mechanism shown in Fig. 9 on a smaller scale, and with
45 the parts distorted and differently placed in order to bring them into view in this figure. Fig. 11 shows the construction of the locking mechanism for connecting the driving-pulley of the press-plunger to its shaft. Fig. 12 is
50 a plan view of a section on line *zz* of Fig. 13. Fig. 13 is a view of a section across the cam and lever shafts on line *uu* of Fig. 4. Fig. 14

represents in section the product of the machine.

The general form of the supporting parts of
55 the machine is shown in Fig. 1, in which A is a suitable table, and B a standard supporting a guide for plunger 1. The frame-work D, fixed to legs, supports the working parts underneath the table. The main driving-shaft
60 2, with suitable fast and loose pulleys, 3 and 4, is mounted in suitable bearings on frame-work D, and gives motion to the main parts of the mechanism. About midway of the shaft is
65 fixed a segmental beveled gear, 5, which meshes into a beveled pinion, 6, on a vertical shaft, 7, which carries on its upper end a pinion, 8, meshing into a pinion, 9, upon the lower
70 end of the shaft 10, which carries the forming-block F. This train of gearing gives intermittent motion to the block for a purpose hereinafter explained. The shaft 10 is
75 supported in a bearing, 11, on the table, a collar upon the shaft resting on the top of the bearings. The blank which is to form the body of the bucket or other receptacle is
80 wrapped round the block by the rotation thereof, and the block is provided with suitable means for holding the blank and for clamping it thereon. This clamp for holding the
85 body-blank to the block is shown at 12, Fig. 3, the face of which is preferably covered with rubber. It is pivoted to a bell-crank lever, 13, which bell-crank lever is pivoted on arm
90 14, set upon a ring on the block-shaft. The arm 140 of the bell-crank lever 13 is pivoted on pin 160, and is adjustable by means of a
95 pin, 161, placed in the different holes provided for that purpose, so that the clamp 12 may be set in or out to adjust it to the size of
100 the block. The inner end of the bell-crank lever is connected by a rod, 16, to the collar 17 on the plunger-shaft 18. This collar is held in the forks 19 of a lever, 20, Fig. 1, the outer
end of which lever is connected to a rod, 21. This rod 21 is connected to a cam mechanism,
hereinafter described, which mechanism is adapted to hold the clamp 12 against the block
after the paper has been introduced and before the block starts, and continues its pressure
during the entire revolution of the block. By this the body-blank is carried around and
caused to wrap itself upon the block.

An adjustable post or guide, *c*, Figs. 1 and

2, is provided at a suitable distance from the clamp, for the purpose of holding up the free end of the blank, in order that it may start straight upon the form.

5 In order to press the blank upon the block a pressure-roller, 22, is mounted in bearings in the frame 23, which frame is pivoted on the upper end of a bent arm, 24, pivoted upon a stud, 25, projecting from a collar on the block-shaft. This bent arm has a joint near its angle for adjustment to or from the block, where-
10 by the roller may be adjusted, in the manner described above in connection with the clamp, and for the same purpose.

15 The link 26 connects this bent arm to a short vertical bar, *a*, which passes through a guide, *b*, and is connected through link *a'* and arm *b'* to rock-shaft *d*, journaled in hangers underneath the table. Upon the opposite end of
20 the shaft from arm *b'* is an arm, *d'*, connected by rod 27 to cam-lever 81, as shown in Figs. 3 and 7. This mechanism gives proper and timely movement to the roller. The face of the roller is preferably covered with rubber,
25 and it has slight friction in its bearings for holding it back, in order to give a slight rubbing action upon the paper as the block turns under the roller. On the upper end of the roller is a flange, 28, the lower face of which is
30 formed with serrations, and when the roller is pressed against the block the serrated flange projects from the top of the block and crimps down the edge of the body-blank upon the top of the block to form the bottom flange for the
35 pail. This edge of the paper is first bent over and held down by means of an elastic finger, 29, on the upper end of the clamp. The clamp and the roller are held in place in proper position by means of small links at their lower
40 ends connected to the supporting-arm.

It will be understood that the blank is cut of proper length, so that when it is quite folded upon the block the ends overlap, and suitable paste or glue being applied to one of the lap-
45 ping edges, when these edges are pressed upon by the roller 22, they are caused to adhere to each other. It will be observed that the clamp is connected to the shaft of the block and travels with it; but the rollers remain
50 stationary, and the clamp moves away from it as the block turns, and it makes a complete revolution, so as to bring the seam under the roller.

Before the body-blank is thus wound upon
55 the block a disk of paper of the diameter of the top of the block is placed on said top, with glue or paste upon its upper edge, and the edge of the body-blank is crimped down upon this and caused to adhere to it. This makes the
60 inside bottom of the pail, which is re-enforced by the outside disk, hereinafter described.

After the body and the inside disk have thus been placed, the other disk and a metallic strip is added before the pail is removed from
65 its place. The strip consists, preferably, of a narrow strip of tin, (shown at 30, Fig. 1.) It is long enough to extend across the central part

of the bottom of the pail, down the sides, and to be turned up around the edges. This forms a support for the bottom, stiffens the sides, and
70 furnishes a bail-support. The mechanism for applying this strip and outside bottom is shown in Figs. 1, 5, and 6. This apparatus is carried upon an arm, 31, fixed to a shaft, 33,
75 by means of a set-screw, and adjustable thereon for different sizes of forms. The upper end of this shaft or standard turns in the bracket 32, fixed to the main standard B. The lower end of the shaft 33 is stepped in the frame, as shown in Fig. 4, and has an arm, 34,
80 connected by a link, 35, to mechanism, hereinafter described, for swinging the arm 31, and the mechanism which it carries into line with and exactly over the top of the block.

The arm 31 has a hub upon its outer end, 85 forming a guide for a rod, 57, which is permitted movement vertically through the hub by means of a groove and feather, as shown in Fig. 5.

This rod carries on its upper end an arm, 90 54, and secured to its lower end are arms 36, (shown in a side elevation and in plan in Figs. 5 and 6, respectively, Fig. 6 being a top view.) On the ends of these arms, underneath, are pivoted levers 37, which are connected by
95 rods 38 to bell-crank lever 39, and thence by rods 40 to a bell-crank lever, 151, pivoted on a small stud on the hub of the arms 36.

At the center of the arms 36, or in line with the center of the rod 57, is another lever, 46, 100 also pivoted underneath on a small stud and connected by link 47 to the bell-crank 151.

The ends of the levers 37 are formed to receive the metal strip 30, which lies across them in the position shown in Fig. 6. The end 105 of the lever 46 receives the edge of the disk 48, which forms the outer bottom of the pail, this disk being laid on, as shown in Fig. 6, over the strip. These levers, which are all attached to the bell-crank lever 151, are held up in position for receiving and carrying the disk 48 and
110 strip 30 by a catch, 150. This catch consists of a small plate pivoted on the arm 31 at 152, as shown in Fig. 5, and having an elongated hole, 153, in its lower end to receive the end of
115 the bell-crank lever 151.

It will be readily seen from this arrangement of the mechanism that downward movement of the rod 57, which takes place just after the disk and metal strip have been swung into
120 position exactly over the top of the block, will cause the levers 46 and 37 to be tripped, thus depositing the strip and disk in exact position on the top of the block, the levers falling by their own weight out of the way of the
125 block. The catch 150 is retained in proper position by a stop-arm, 154, secured thereto so that on the rise of the rod 57 the end of the bell-crank lever 151 will enter the elongated hole 153 in the catch, thereby returning and
130 holding the levers to the position shown in Fig. 5.

Just above the ends of the levers 37, which carry the strip and disk, are arms 49, set hori-

zontally in mortises in the arm 36, projecting inward with their rear ends resting against stiff springs 50. The heads 51 of these arms are formed with notches 52 adapted to receive the strip, and with lower inclined faces, 53, as shown in Fig. 1.

As before described, the rod 57 passes through the hub of arm 31, and carries on its lower end the arms 36, and on its upper end the arm 54.

The shaft 33 is adapted to be rotated so as to swing the disk 48 as it lies on its supporting-levers, in position shown in Fig. 6, exactly over the upper surface of the block F.

This brings the arm 54 into a notch, 55, of the plunger E. The plunger E is brought down at the proper moment by mechanism hereinafter referred to. When this plunger comes down, as it does after the arm 54 has swung into the notch 55, it carries the rod 57 and arms 36 with it, the first effect of which is to lay the strip 30 across the block with the bottom 48 above it, and this movement takes place after the body-blank has been wrapped around the block with the inner disk of the bottom in place. The return of the rod 57 and its connections to its elevated position is effected by means of a weight, 195, suspended by a cord or strap which passes over pulleys or sheaves on the arm 31, and is attached to the hub of the arms 36, as shown in Fig. 5.

The laying of the strip and the disk upon the block occurs in the early part of the downward movement of the plunger E. Its further movement causes the heads 51 of the arms 49 to bend down this strip and by pressure of the springs 50 to rub snugly against the strip and fold it down on both sides close against the outside of the body. The strips are long enough to project down below the edge of the body of the pail and below the edge of the block which supports it. These projecting ends, as heretofore explained, are bent up and inward so as to fold over the edge of the body of the pail. This is done by mechanism shown more clearly in Fig. 3. After the strips have been bent down, as heretofore explained, hammers 59 are swung directly against these strips on opposite sides of the block, bend them in, and force them up around the edge of the body-blank. These hammers are set on arms 60, pivoted at 61 upon bolts 62, which have limited vertical movement in a block, 63.

The arms 60 have branches 64 connected by rods 65 to a bar, 66. An upward movement of this bar on post 187 swings the hammers in to strike upon and bend in the ends of the strip. It will be observed, by referring to Fig. 3, that the hammers 59 are provided with notches 67, cut across from the upper side near the end. When these hammers strike to bend in the ends of the strip, they are in a position shown in Fig. 3—that is, with their upper surfaces below the edge of the block. When they have reached their limit of inward movement, they have carried the ends of the strips in at right angles to that

part of the strip which lies on the side, and the notch of each hammer is in line with the part of the strip lying upon the side, or, rather, more accurately, with the edge 68, over which the strip is to be bent.

The hammers from this position receive an upward movement by means of the bar 69, which is given vertical movement on the post 187 through mechanism hereinafter described. This bar is connected to the bolts 62 by links 70, and this upward movement bends the extreme ends inward, so as to cause the ends to lap over the edge of the pail. The block F is hollow, and the edge is cut away, as shown in Fig. 3, to allow the end of the strip to be bent back against the paper. This makes it necessary to provide an anvil on each side to hold the strip and afford a support over which the hammers may bend the strips. These anvils are shown at 71. They are pivoted on little studs, and extend inwardly from the studs, the inner ends bearing upon the springs, which hold the outer ends downward in place while the hammers are striking. When the hammers are pushed upward to bend the ends upward, the anvils yield and give place to the small tongues outside the slots in the hammers.

In addition to this, I have made provision for punching holes in the doubled ends of these strips. The hammers are bored to receive punches 72, which, when forced inward across the notches 67, perforate the doubled ends of the strips. They are forced in by means of a lever, 73, pivoted at 74, with their lower ends connected by links 75 to bell-crank levers 76. These bell-crank levers are connected by rods 77 to a cross-bar, 78, to which proper and timely movement is given by mechanism hereinafter described.

The cams which operate the mechanism heretofore described, are on a shaft, 2, and are arranged as shown in Figs. 4 and 7. The connecting-rods are brought down and attached to levers, most of which are pivoted upon a rod, H, and these levers are provided with counter-weights 80, and are lifted by cams on the shaft 2. The lever 81 is connected, as before explained, by a rod, 27, and arm d' to rock-shaft, which, through arm b' and links a' a and 26, operates the roller 22 and holds it against the paper upon the block during the revolution of the block. The cam is of such shape and location that it brings the roller into place directly after the clamp 12 is operated, and holds it in place until the completion of the revolution of the block.

Lever 83, Figs. 3 and 4, is pivoted at 84 upon a part of the frame 85, and is operated by a cam which bears upon a friction-roller, 86, on the inner end of the lever. This lever 83 is connected by means of the rod 21 to the lever 20, through which the clamp 12 is applied, as heretofore explained. The lever 91 (shown in plan view in Fig. 4) is the same in side elevation as lever 81. It is connected by the rod 82 to an arm, 188, of the cross-bar 78,

and through the cross-bar and rods 77 transmits motion to the punching mechanism, as heretofore explained. Lever 88 (shown in plan in Fig. 4) is the same in side elevation as lever 81, and it is connected by means of rod 89 to arm 189 of cross-bar 66, and through the cross-bar and rods 65 serves to swing the hammers 59 into place, as heretofore explained. Lever 87 (shown in plan in Fig. 4) is the same in side elevation as lever 81, and is connected by means of rod 92 to arm 190 of the cross-bar 69, which cross-bar, like those heretofore described, slides on rods 187, and serves through links 70, in the manner above described, to raise the hammers in order to bend the ends of the strip round the edge of the pail. The lever 93 is pivoted at 94, and operated by a cam acting upon the friction-roller 186. (Shown in Figs. 12, 13, and 7.) This lever is connected to lever 95 by rod 96, lever 95 being pivoted upon the shaft H, and connected at its inner end to the discharge-plunger 18 by a swivel, 191, to allow the plunger 18 to turn with the form. A lever, 97, (shown in Fig. 4,) having a friction-roller, 98, bearing upon the cam 99, is connected by a rod, 35, to the arm 34 of the shaft 33, (shown in Figs. 4 and 7,) which serves to swing the arm 31, which carries the bottom and a strip, into line with the plunger, as heretofore explained.

Another cam on the shaft 2 operates lever 100, which is connected to a friction-clutch for the plunger, hereinafter explained. The last cam on the shaft 2 operates a bell-crank lever, 101, the friction-roller of which, 102, bears on the face of the cam. This lever is pivoted at 103, and connected by a link, 104, to the rod 105, which shifts the belt on the fast and loose pulleys 3 and 4. This rod 105 moves horizontally in bearings 106 and 107 on the main frame. The belt which drives the cam-shaft is shown at 108, Figs. 9 and 10, and runs continuously. The belt 109, Fig. 8, which drives the press-plunger shaft, is required to run intermittently, and is connected to a pulley on the same shaft on which is the crank 111, which is connected by a pitman, 112, to the shaft of the press-plunger.

A handle, *e*, is provided, as shown in Figs. 1 and 4, which is connected to the rod 105, and the belt 108 may thus be shifted by hand. Mechanism for regulating the intermittent motion of the belt 109 is shown in Fig. 11. The pulley 113 is provided with a brake mechanism sliding upon a shaft on which the pulley runs loose, and is adapted to release or hold the pulley on the shaft. This mechanism includes a sleeve, 114, splined on the shaft, and brake-blocks 115, which are held upon arms 116 by bolts passing through slots in the ends of the arms, the arms being pivoted in the sleeve on pivots transverse to the shaft. Toggle-arms 117 connect the sleeve to the brake-blocks. These blocks are provided with ribs that fit into a groove in the under side of the flange of the pulley. When the sleeve 114 is pushed toward the hub of the pulley, it forces

out the blocks and locks the pulley to the shaft. The pulley is held against lateral movement by collar 118. The sleeve is connected by a rod to a lever, 119. This, by a bent lever 120 and rod 121, is connected to the cam mechanism 100, as shown in Figs. 9 and 10, by bell-crank 200 and rod 201.

Fig. 9 shows the general arrangement of the driving-belts. Belt 108, running continuously, is shifted automatically by the belt-shifting mechanism heretofore described, which is set in motion by the cam arranged and timed to move the belt to the loose pulley when the shaft has completed its revolution and the pail has been formed on the block. Belt 109 runs intermittently, and the clutch mechanism of its driving-pulley is set so as to operate the plunger at the proper moment after the bottom and strip have been placed on the block.

In the operation of the machine it is necessary that the press-plunger should be arrested at its points of highest elevation a short time in order to allow the mechanism which carries the tin strip and outside bottom piece to swing into place between the plunger and the forming-block. This is accomplished by means of the clutch-connection heretofore described, and a brake, 122, Fig. 8. This brake is supported by link 123, and is applied by a bell-crank lever, 124. The bell-crank lever is connected to the wrist-pin 126 of the shaft, so that when the pin is down the brake is relieved; but when the pin is up, as shown in Fig. 8, the brake is applied. As the cam mechanism 100 is so constructed and timed that it releases the locking mechanism of pulley 113 at the instant when the wrist-pin of crank 111 reaches its highest elevation, the release of the pulley and the application of the brake arrest the mechanism and hold the press-plunger in an elevated position; but when the cam 100 is turned sufficiently to lock pulley 113 to its shaft, which runs constantly, the force is sufficient to overcome the pressure of the brake and turn the shaft to carry down the plunger. This occurs immediately after the strip and bottom have been swung into place, as heretofore explained.

In Figs. 9 and 10 I have shown a modified form of mechanism for communicating motion to the press-plunger. This consists of a walking-beam, 125, to which the pitman 112 is connected, the press-plunger rod being connected to the other end of the walking-beam. A weight may be used to counter-balance the plunger and its connections, so as to relieve the friction-clutch and its mechanism from strain when starting the machine.

The various motions may be recapitulated as follows: The body-blank and the interior bottom being in position, motion of the shaft 2 causes the cam, properly set for the purpose, to operate the clamps which hold the blanks to the block. Immediately thereafter, by means of its proper cam, the roller is applied to the blank, and the block is turned by the segment 5. Upon completion of the revolution of the block the further revolution of the

shaft brings the cam 99 into position to turn the shaft 33 and swing the arms carrying the bottom and strip into position over the forming-block. The clutch mechanism of the belt 109 is then operated and the press-plunger is brought down, pressing on the bottom, paste having been previously applied either on this crimped edge or on the inner surface of the bottom. The heads 51 carry down the strip and lay it against the sides of the pail. The cam upon lever 88 acts immediately and swings in the hammers 59, thus bending in the ends of the strips. Thereupon cam under lever 87 acts on said lever and lifts the hammers to double the ends of the strips. Next thereafter the cam under lever 91 operates said lever, and rods 77 move the punchers, the cams which operate the hammers being shaped so as to hold the hammers in place until the punchers have operated. Then the bar 78 is allowed to drop by reason of the shape of its cam-face, and the other bars return by their own weight, removing the hammers. It will also be understood that the cams which operate the clamps and rollers are constructed and arranged to hold these parts to the blocks until the blank has been formed thereon, when they are released and fall back to their original position. The pail is then completed.

I claim—

1. In a machine for making pails, a revolving block or former holding a fixed longitudinal relation to the table of the machine, a clamp for holding the body-edge of the blank, and a roller for pressing the blank to the block as the latter revolves, the said roller being arranged, substantially as described, so as to be movable to and from the former, substantially as described.

2. In a machine for making pails, a revolving block, a clamp for holding the edge of the body-blank, a roller for pressing the body of the blank, mechanism, substantially as described, for delivering and placing the bottom, and the press-plunger for pressing the bottom on the pail-body, all substantially as described.

3. In a machine for making pails, a revolving block, and devices, substantially as described, for holding and pressing the body-blank upon the block, combined with the mechanism, substantially as described, for placing the bottom, and the strip mechanism, substantially as described, for binding the strip down upon the sides of the pails, and hammers 59, to bend the ends of said strip around the edge of the pail, and mechanism, substantially as described, for operating said hammers, all substantially as described.

4. In combination with the revolving block, the hammers 59, and the described mechanism for operating these devices, the press-plunger, and mechanism for imparting to it the proper and timely movement, the shaft 33, having an arm, 31, and arms 36, set upon a shaft, 57, sliding vertically in the arm 31, de-

vices attached to the arm 36 for supporting the strip and the bottom, means, substantially as described, whereby the press-plunger bears upon the arms 36, after they have been swung into place over the block, and devices on the arms 36 for bending down the strip, substantially as described.

5. In combination with the arm 31 of the shaft 33, the rod 57, sliding in the end of the arm 31, and having arm 54 fitted into notch 55 of the plunger, the arms 36 fixed to said rod having the described levers for supporting a strip and bottom, and a counter-weight for returning the arms 36, substantially as described.

6. In combination with the mechanism for forming body-blanks upon a block, F, and for bending and punching the strip, the cams upon the shaft 2, and the mechanism between said cams, and the devices for forming body-blanks upon the block, and bending and punching the strip, fast and loose pulleys 3 and 4 on the shaft 2, and the described mechanism for automatically shifting the belt, all substantially as described.

7. The block F, mechanism for driving it, and for holding and placing the blank upon it, the hammers 59, and the described mechanism driven from the shaft 2 for operating the clamp, rollers, and hammers, fast and loose pulleys 3 and 4, belts 108 and 109, and the clutch mechanism adapted to hold and release its driving-pulley mechanism, operated by the cam on the shaft 2 for working such clutch, and mechanism, driven by belt 109, for operating the plunger, all these parts being constructed and combined, substantially as described.

8. In combination with the revolving block and its shaft fixed against longitudinal movement, the vertically-operating discharge-plunger 18, having the swivel-connection 191 to its operating mechanism, arranged substantially as described, and for the purpose set forth.

9. In combination with the revolving former and its shaft, the clamp 12, revolving therewith, and its operating mechanism consisting of bell crank lever 13, grooved collar 17, and connecting-rod 16, the forked lever 20, embracing the collar, the rod 21, cam-lever 83, and cam on shaft 2, all substantially as described.

10. In the described machine, and in combination with the clamp, the bell-crank lever 13, having arm 140, pivoted as shown, and pin 161, fitted to suitable holes, as described, whereby the clamp may be adjusted, for the purpose set forth.

11. In a pail-machine, a roller adapted to press the blank upon the former, and having a flange upon its end, said flange being provided with a serrated face for the purpose specified.

12. In combination with the revolving former F and its shaft, the roller 22, journaled in a frame connected to a bent arm, 24, which is piv-

oted on a loose collar on the shaft 10, as described.

13. In the described machine and in combination with the intermittently-revolving former, the roller and its supporting-frame, the operating mechanism consisting of links 26 *a* *a'*, arm *b'*, on the rock-shaft *d*, arm *d'*, connecting-rod 27, cam-lever 81, and cam, all arranged substantially as described, and for the purpose set forth.

14. In the described machine, the combination of the arm 31, adapted, substantially as described, to be swung into position over the forming-block, the rod 57, having arm 54 at one end, the press-plunger, having notch 55, the arms 36, carrying the pail-bottom, and strip-supporting levers, marked, respectively, 46 and 37, which are pivoted thereto, the bell-crank 151, suitable rod and bell-crank connections, 47, 40, and 39, and the retaining-catch 150, all substantially as described, and for the purpose set forth.

15. In the described apparatus, the swinging arm 31, carrying the pail-bottom and strip-supporting devices, said arm being adjustably secured to the shaft 33, for the purpose set forth.

16. In combination with the arm 31 and shaft 33, the means for operating the same, consisting of arm 34 on the shaft 33, rod 35, pivoted arm 97, provided with roller 98, cam 99, all arranged for swinging the arm 31 into position over the forming-block, all as described, and for the purpose set forth.

17. In combination with the hammers upon the pivoted arms 60, having branch arms 64, the rods 65, sliding cross-head 66, rod 89, connected to the cam-lever, and the cam, substantially as described, and for the purpose set forth.

18. In combination with the hammers 59, having notches 67, the hollow forming-block F, having edges 68, yielding anvils 71, pivoted within the block, and mechanism, substantially as described, for giving upward movement to the hammers, for the purpose set forth.

19. In combination with the notched hammers

59, and means, substantially as described, for giving upward movement to the same, the punches 72, and suitable operating mechanism, all substantially as described, and for the purpose specified.

20. The means for operating the punching mechanism, consisting of levers 73, pivoted as shown, links 75, bell-crank levers 76, connecting-rods 77, cross-head 78, rod 82, cam-lever and cam, all substantially as described.

21. The means for giving the hammers an upward movement for the purpose described, consisting of arm 60, sliding bolt 62, link 70, cross-head 69, connecting-rod 92, cam-lever 87, operated by cam, substantially as described.

22. In a pail-machine, and in combination, a forming-block, segmental beveled gear, and intermediate driving mechanism, substantially as described, a press-plunger, with clutch and brake device, for the purpose described, a bending and punching mechanism operated from main driving-shaft, fast and loose pulleys, and a belt-shifting device, all substantially as described, and for the purpose set forth.

23. In combination with the forming-block F and intermediate driving mechanism, the main driving-shaft 2, fast and loose pulleys 3 4, the punching and bending devices, the belt-shifting device, consisting of bell-crank lever 101, operated from cam on shaft 2, the link 104 and rod 105, all substantially as described.

24. In combination with the former F and its operating mechanism, the press-plunger and mechanism for operating the same, consisting of cam-lever 100, connecting-rod 201, bell-crank 200, rod 121, bent arm 120, lever 119, connected to clutch device of pulley 113, substantially as described.

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

WALTER S. MCKINNEY.

Witnesses:

T. A. HARROUN,
W. H. HECOX.