

J. T. CARROLL, JR.
 BUTTON MAKING MACHINERY.
 APPLICATION FILED JULY 24, 1909.

998,072.

Patented July 18, 1911.

8 SHEETS—SHEET 1.

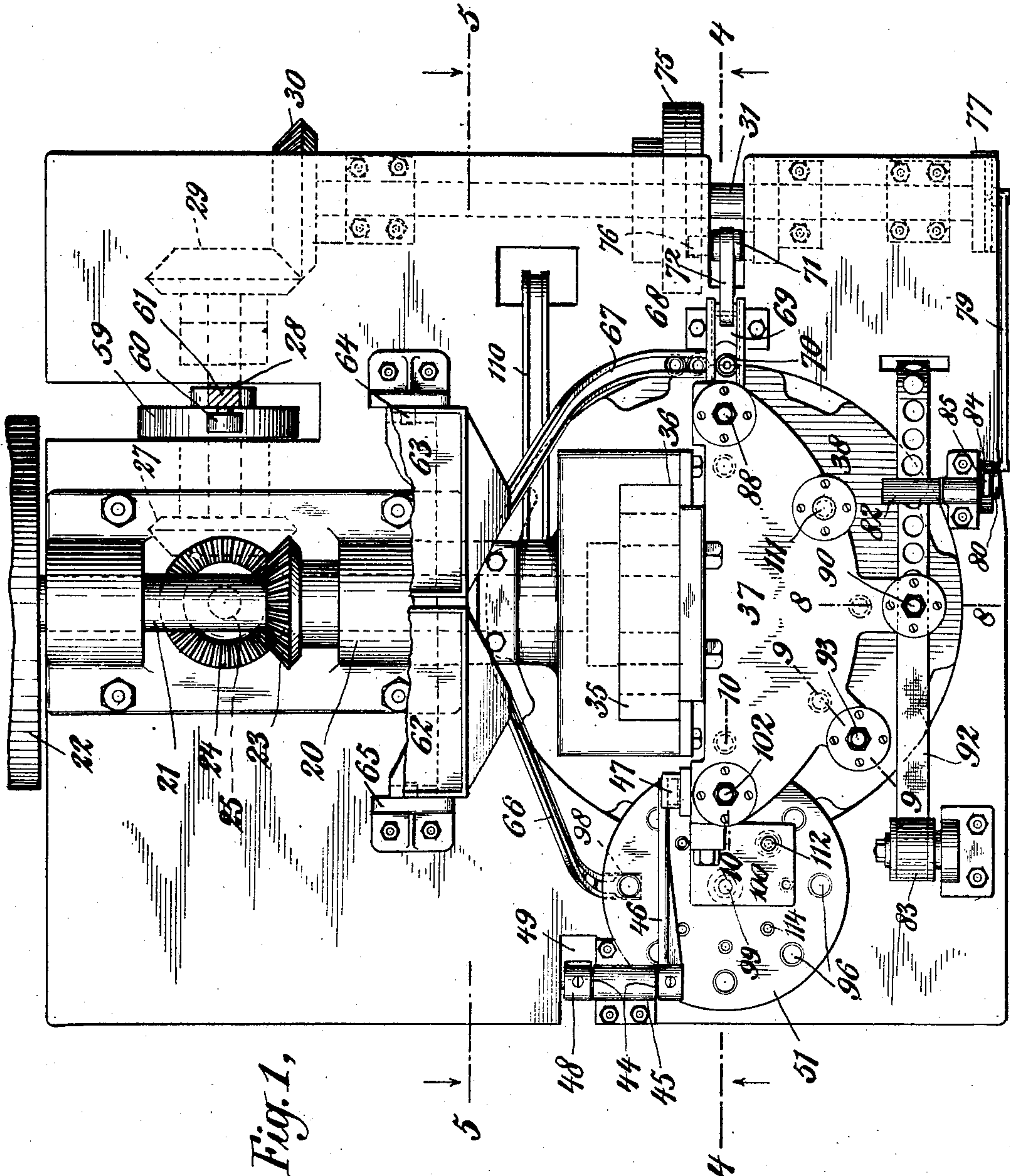


Fig. 1,

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& Sandreivog Jr.

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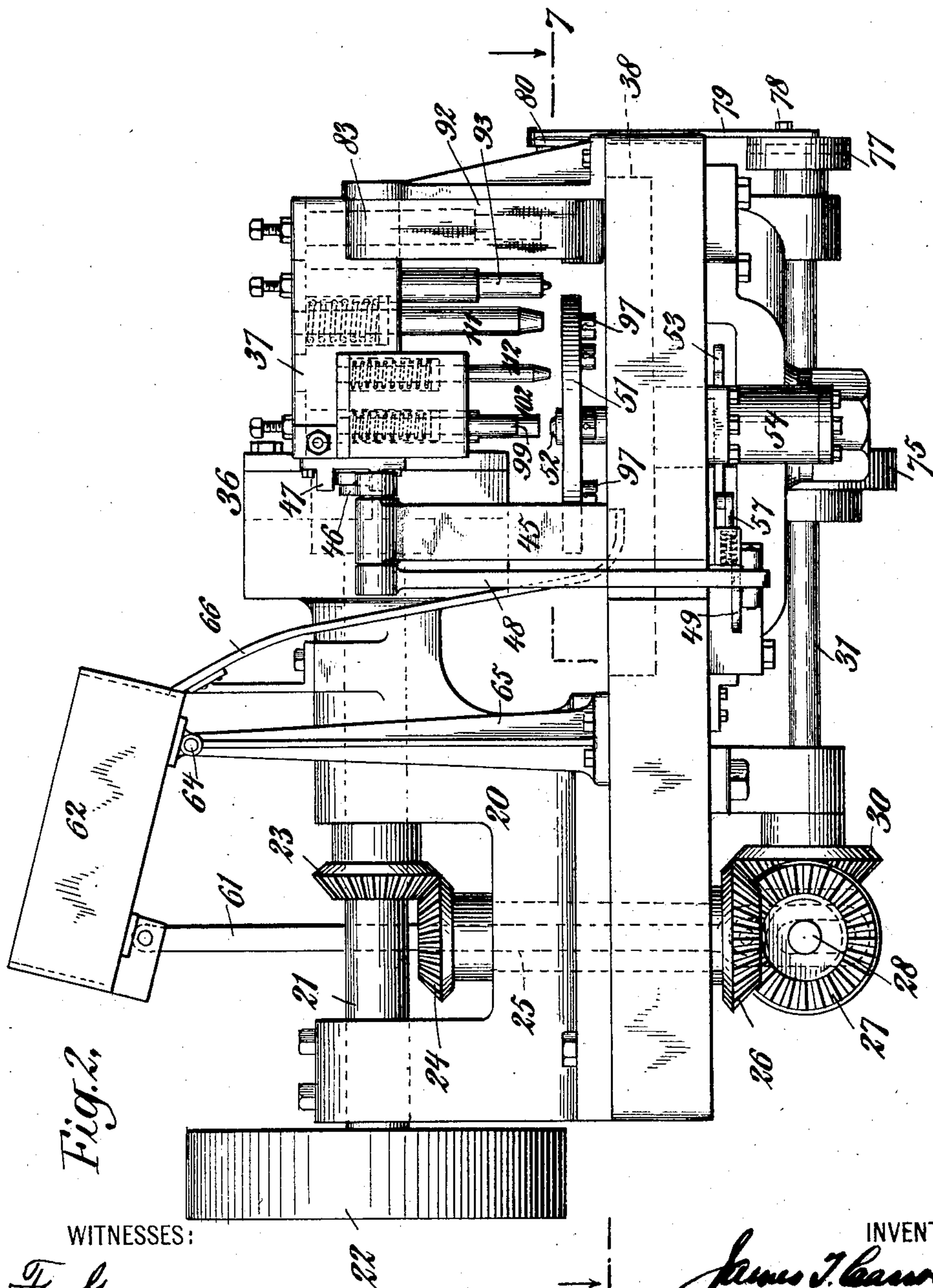


Fig. 2.

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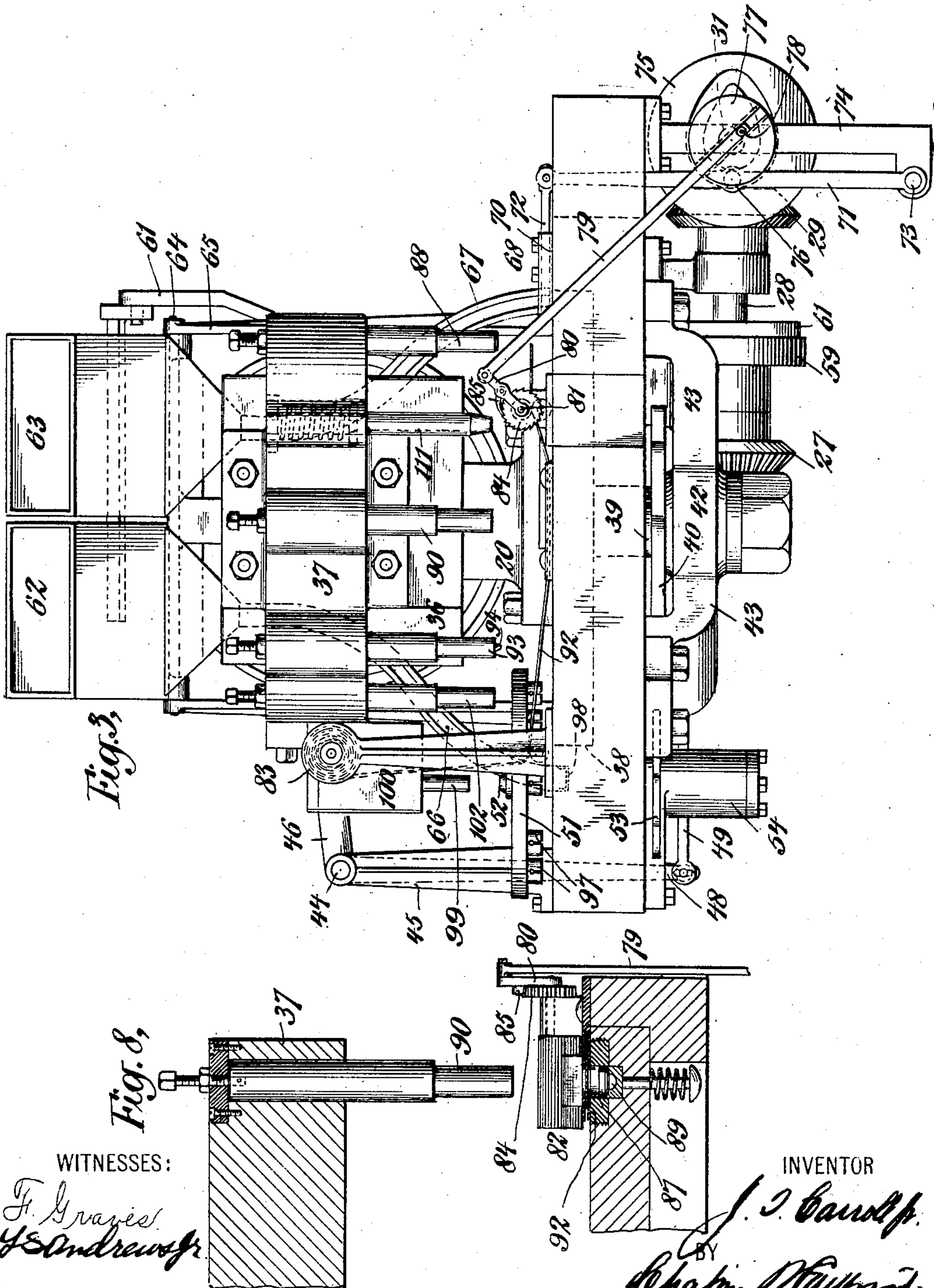
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8 SHEETS—SHEET 3.



WITNESSES:
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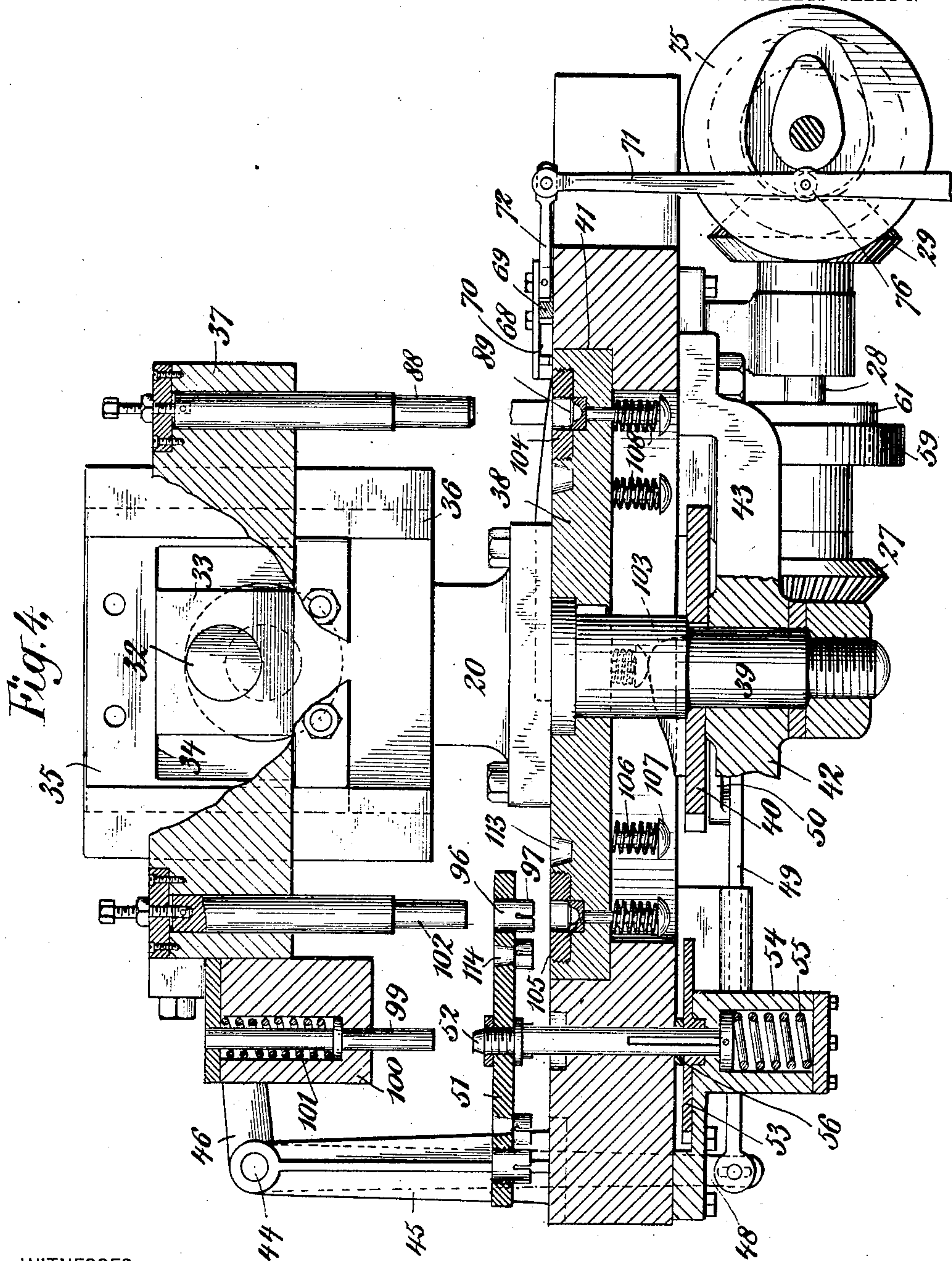
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8 SHEETS—SHEET 4.



WITNESSES:

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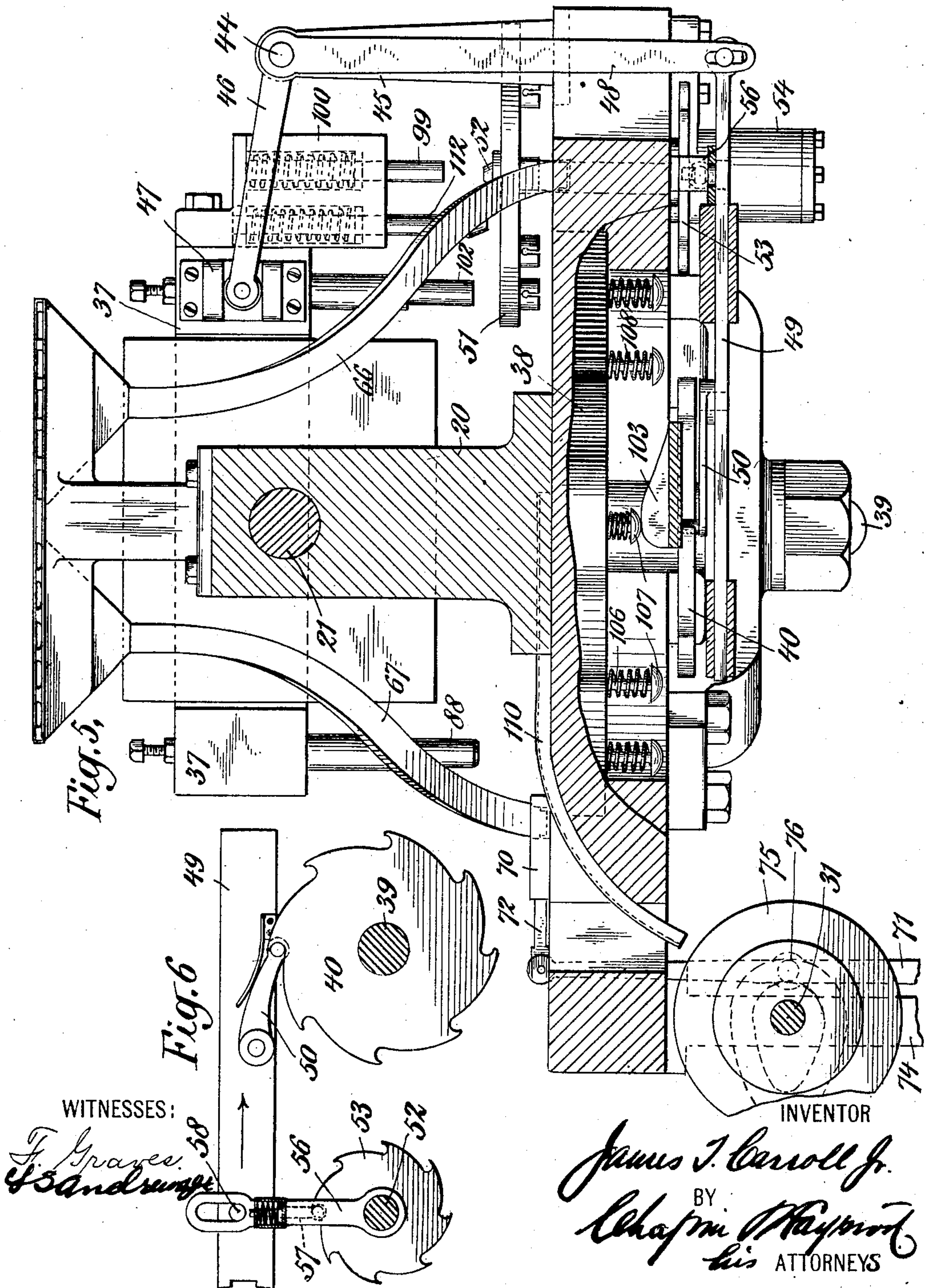
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8 SHEETS—SHEET 5.



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8 SHEETS—SHEET 6.

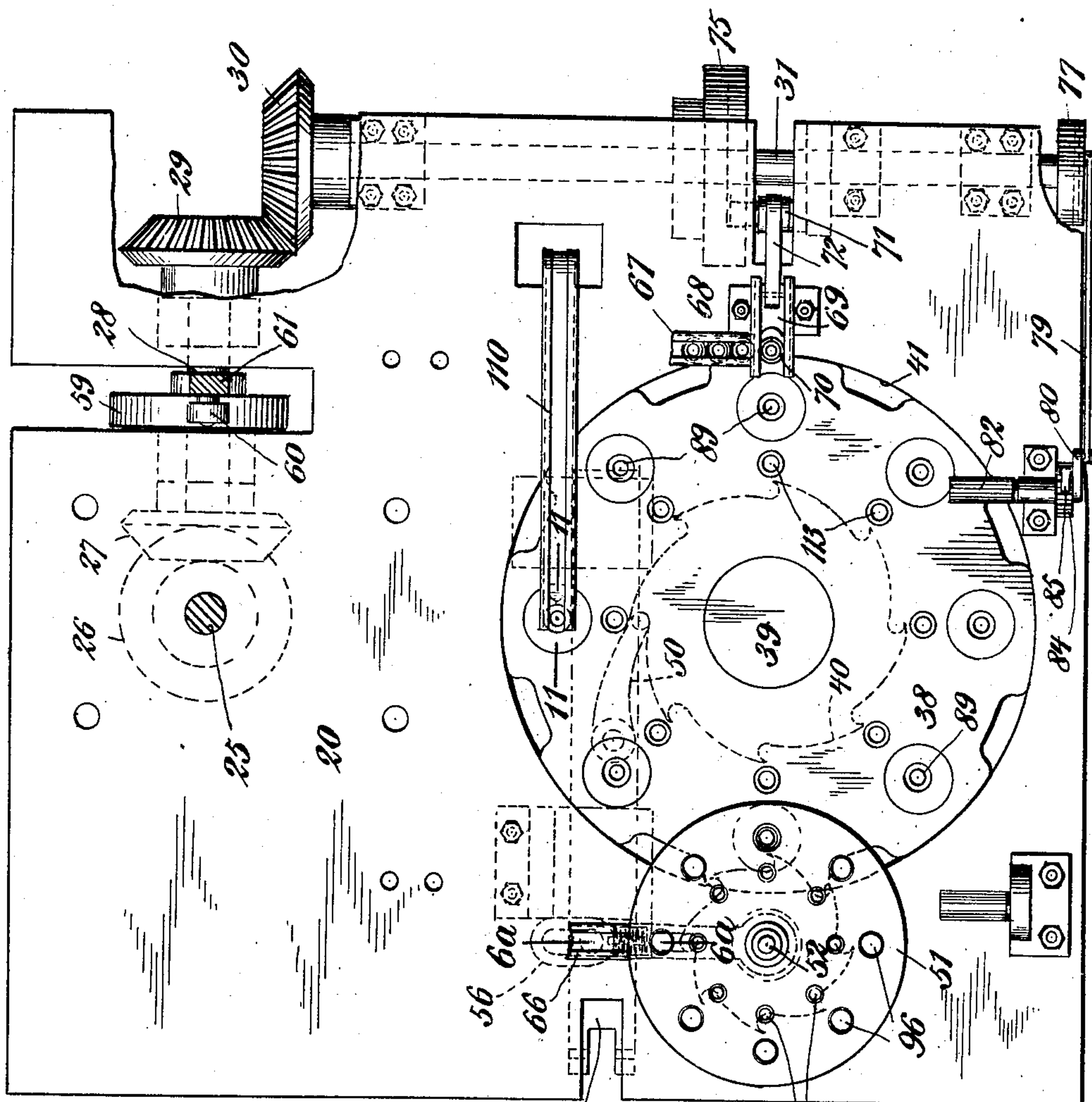
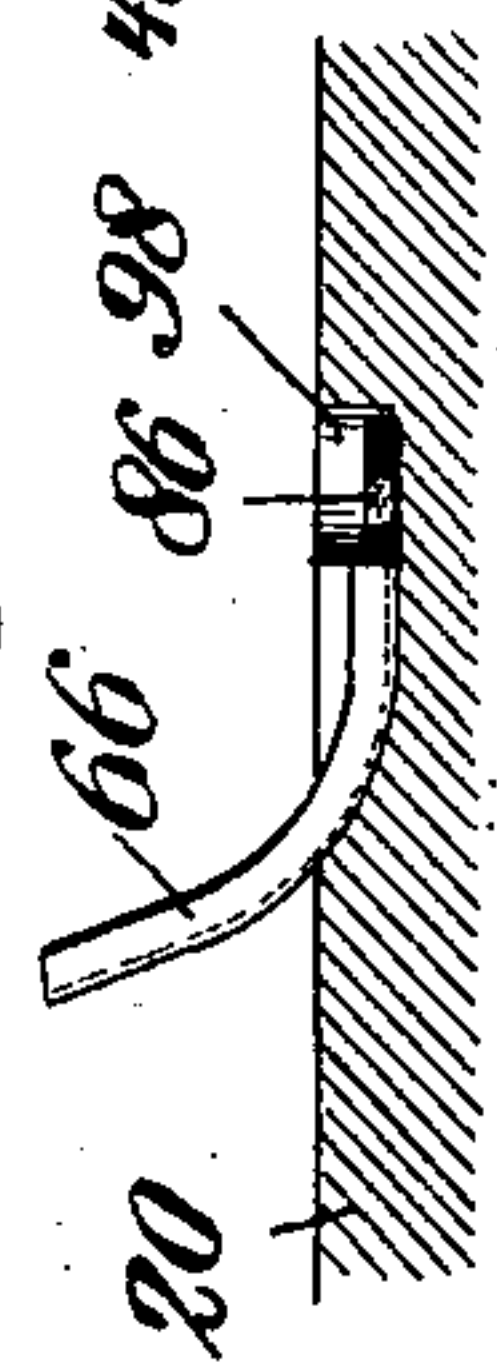


Fig. 7,

Fig. 7a,



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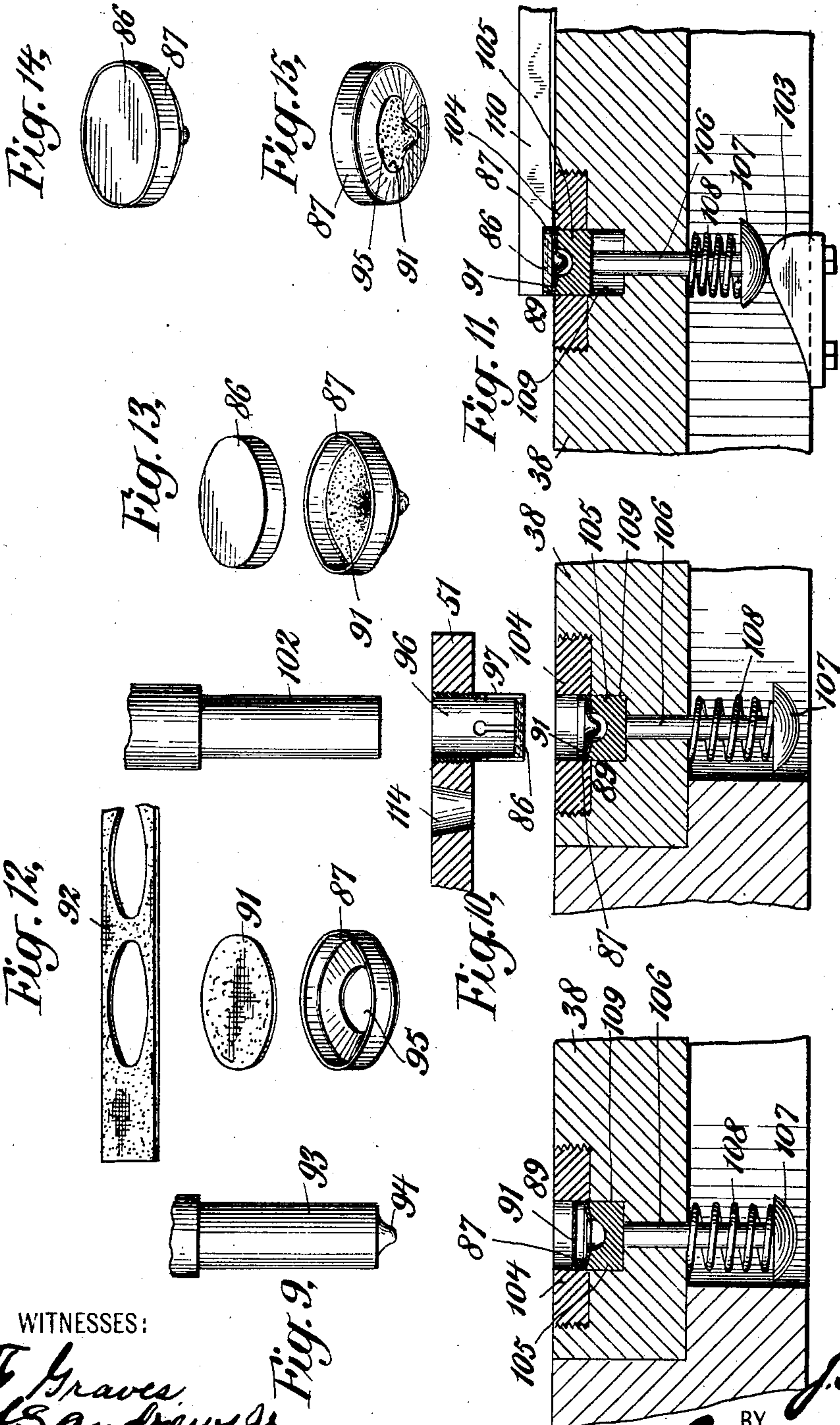
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8 SHEETS—SHEET 7.



WITNESSES:
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Fig. 9.

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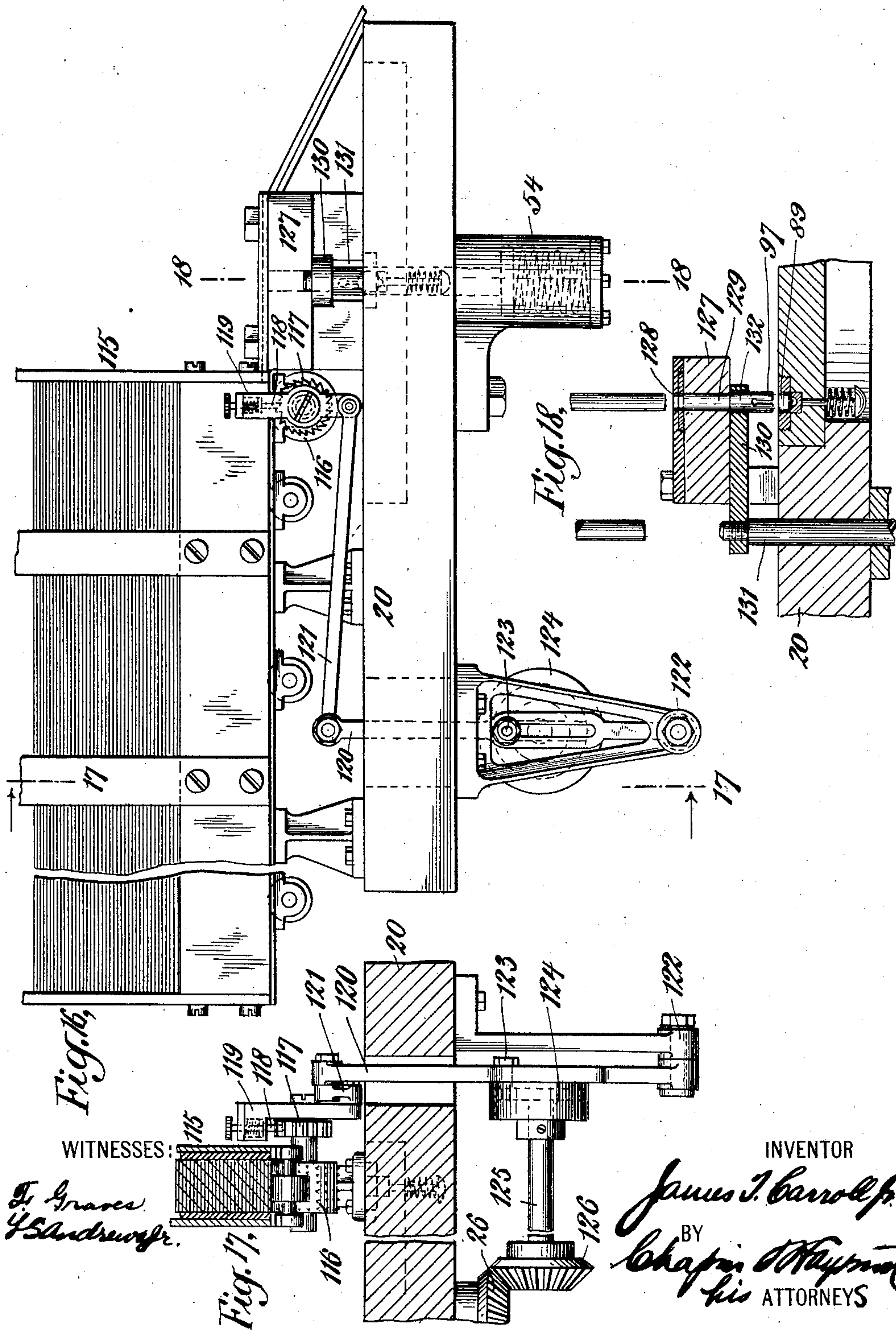
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Patented July 18, 1911.

8 SHEETS—SHEET 8.



UNITED STATES PATENT OFFICE.

JAMES T. CARROLL, JR., OF LONG ISLAND CITY, NEW YORK.

BUTTON-MAKING MACHINERY.

998,072.

Specification of Letters Patent. Patented July 18, 1911.

Application filed July 24, 1909. Serial No. 509,344.

To all whom it may concern:

Be it known that I, JAMES T. CARROLL, Jr., a citizen of the United States of America, and a resident of Long Island City, county of Queens, and State of New York, have invented certain new and useful Improvements in Button-Making Machinery, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to improvements in button making machinery, and particularly to machines for producing button backs for cloth faced buttons.

The approved form of cloth faced button of the present day has a back comprising a perforated cup shaped metallic portion known as a collet, a washer of fabric which is inserted in the collet, the central portion thereof being caused to protrude through the perforation in the collet, and a follower disk of card board or similar material which is pressed into the collet upon the washer and which serves to hold the cloth washer in place. The portion of the cloth washer which projects through the central opening in the collet is employed for the purpose of attaching the button to a garment in use. A crowned facing piece of metal covered with the desired kind and quality of cloth is placed upon the back when the button is being prepared for use, but my present invention relates to the production of the button backs only and not to the crowned facing pieces or shells.

In carrying out my invention I preferably employ previously manufactured collets for the reception of which I conveniently provide a reservoir or hopper. Fabric is fed into the machine in strips and disks or washers of such fabric are punched therefrom in the operation of the machine. The disks of card board or other material are either received in a hopper or reservoir or are stamped out directly in the present machine. In the operations of feeding the various parts, the assembling thereof, and the discharging of the finished button backs, the machine is completely automatic. The machine is particularly designed for turning out a large amount of work; the various moving parts are light so that their inertia or momentum will not be a serious factor and the various movements are made easy, the cams having

gradual inclines, etc. so that there is nothing to prevent the machine operating at exceedingly high speeds.

In order that my invention may be fully understood, I will now proceed to describe an embodiment thereof, having reference to the accompanying drawings illustrating the same, and will then point out the novel features in claims.

In the drawings: Figure 1 is a top view of the machine with certain parts broken away to show other parts beneath them. Fig. 2 is a view in side elevation of the machine. Fig. 3 is a front view thereof. Fig. 4 is a view in vertical transverse section through the machine, the plane of section being taken substantially upon the line 4—4 of Fig. 1. Fig. 5 is a transverse sectional view of the machine substantially upon the plane of the line 5—5 of Fig. 1. Fig. 6 is a detail top view of certain parts of the step by step feeding mechanism for the turn tables. Fig. 7 is a view of the machine in horizontal section upon the plane of the line 7—7 of Fig. 2. Fig. 7^a is a detail view in transverse vertical section upon the plane of the line 6^a—6^a of Fig. 7. Fig. 8 is a detail sectional view through the cloth cutting mechanism, the plane of section being taken substantially upon the line 8—8 of Fig. 1. Fig. 9 is a detail sectional view upon the line 9—9 of Fig. 1, showing the parts in condition for the cloth washer to be pressed into the collet. Fig. 10 is a detail sectional view upon the plane of the line 10—10 of Fig. 1 showing a follower disk as held in position over a collet, and a plunger in position above the same. Fig. 11 is a detail sectional view upon the plane of the line 11—11 of Fig. 6 showing the completed button back as it appears when being ejected. Fig. 12 is a detail view in perspective showing a section of the cloth strip, a cloth washer removed therefrom, and a collet beneath the same. Fig. 13 is a view in perspective showing the cloth washer as having been received within the collet, and showing a follower disk in a position above the same ready to be received within the collet. Fig. 14 is a view in perspective looking upon the finished button back from above. Fig. 15 is a view in perspective of the finished-button back looking from below. Fig. 16 is a detail view in side elevation of a modified form of the apparatus in which the follower

disks are stamped out of strip material instead of being supplied from a hopper. Fig. 17 is a sectional view upon the plane of the line 17—17 of Fig. 16. Fig. 18 is a sectional view upon the plane of the line 18—18 of Fig. 16.

Referring first to the machine illustrated in Figs. 1 to 11 inclusive, 20 designates a frame work, the upper portion of which supports a drive shaft 21. The drive shaft is provided with a suitable belt wheel 22 with which it may be driven, and with a miter gear wheel 23, the teeth of which are in mesh with the teeth of a complementary miter gear wheel 24 mounted fast upon a vertical shaft 25. At its lower end, the vertical shaft 25 is provided with another miter gear 26, the teeth of which are in mesh with the teeth of a miter gear 27 disposed upon a shaft 28, the axis of which is arranged at right angles to the axis of the drive shaft 21. The said shaft 28 is provided at its opposite end with another miter gear wheel 29, the teeth of which are engaged in mesh with the teeth of a complementary gear 30 secured fast to a horizontal shaft 31, the axis of which is arranged at right angles to the axis of the shaft 28 and parallel with the axis of the shaft 21. The three shafts 21, 28 and 31 together with the connecting shaft 25 constitute the means by which the various parts of the machine are driven. The forward end of the main shaft 21 is provided with a crank pin or eccentric 32, the same being mounted in a bearing block 33 which is in turn mounted and arranged to slide in a guideway 34 in a plate 35, the latter being arranged to reciprocate vertically in a suitable guideway 36 secured to or formed as a part of the frame of the machine. Secured fast to the plate 35 is a head 37 in which are mounted a plurality of plungers. Rotation of the drive shaft 21 transmits a vertical reciprocating movement through the crank pin or eccentric 32 and the bearing block 33 to the plate 35 and hence to the head 37 and the plungers carried thereby. Mounted immediately beneath the head 37 and the plungers carried thereby is a turn table 38. The said turn table is mounted fast upon a central shaft 39 (see particularly Figs. 4 and 6) to which shaft is also secured a ratchet wheel 40. The turn table 38 rests in a rabbeted portion 41 of the bed plate of the machine frame, the face of the turn table being preferably substantially flush with the face of the said bed plate. The shaft of the said turn table is rotatably mounted in a hub 42 which is secured to the frame work by means of arms 43, or is formed as a part thereof. Step by step movements of rotation are imparted to the turn table 38 through the medium of the ratchet wheel 40 by means of suitable connections with the vertically reciprocating

head 37. These connections include a bell crank lever pivoted at 44 upon an arm 45 which uprises from the bed plate of the machine, one arm 46 of the said bell crank lever being arranged to engage a yoke 47 and the other arm 48 of which is connected to a slide 49 (see Fig. 5). The slide 49 is provided with a pawl 50 (see Fig. 6) which is spring pressed in a direction to engage the teeth of the ratchet wheel 40. By reference to the drawings it will readily be seen that the vertical reciprocating movements of the head 37 are converted by the bell crank lever into horizontal reciprocating movements of the slide 49, such horizontal reciprocating movements being adapted to impart intermittent step by step movements to the ratchet wheel 40 and hence to the turn table 38. It will, moreover, be seen that the ratchet wheel is actually moved during the return or upward movement of the head, the downward portion of the movement of the head representing the idle or return portion of the movement of the slide 49 or that portion of its movement when the pawl 48 is withdrawn from a tooth of the ratchet wheel for the purpose of causing it to engage with another tooth. The lengthwise movement of the slide is somewhat greater than is necessary to move the pawl a distance between two teeth of the ratchet wheel whereby there is a certain amount of lost motion or overthrow, this lost motion being for a purpose to be presently explained.

In addition to the turn table 38, there is another turn table 51 in the machine I am now describing, (see particularly Figs. 4 and 6). This turn table is mounted above the level of the turn table 38, and a portion thereof overlaps a portion of the said turn table 38. The said turn table 51 is mounted upon a central spindle 52, the said spindle being rotatably mounted in the bed plate of the machine, and being also permitted to have a limited vertical or longitudinal movement therein. Near its lower end, the spindle 52 is provided with a feed ratchet 53, the said ratchet wheel being splined to the spindle 52 so that while the two parts will positively rotate together, a limited relative vertical movement is permitted. At its lower end, the said spindle 52 is received within a housing 54, a spring 55 being provided for forcing the spindle and the table carried thereby normally to an upward position. Step by step movements of rotation are imparted to the ratchet wheel 53, simultaneously with the movements imparted to the table 38 by means of a spring actuated pawl 56 which is mounted upon an arm 57, one end of which is loosely disposed around the stem 52, and the other end of which has a slotted connection with a pin 58 carried by the slide 49. When the slide 49 is reciprocated, the arm 56 is given

an angular movement about the ratchet wheel 53 and the pawl 57 is thereby caused to carry the ratchet wheel with it when moving in one direction to pick up a fresh tooth when moving in the opposite direction.

The cross shaft 28 is provided with a cam 59 which engages a cam follower 60 upon a vertical link 61, the upper end of which is pivotally connected with hoppers 62—63. The hoppers or reservoirs 62 and 63 are in turn pivotally supported at 64 upon standards 65 which uprise from the base plate of the machine. The shaft 28, in its rotation, will impart vertical reciprocating movements to the link 61 and tilting or tipping movements to the reservoirs or hoppers 62, 63 about their support 64. The reservoir 62 is arranged in communication with a chute 66 which leads to a point near the periphery of the turn table 51, while the hopper or reservoir 63 is arranged in communication with a chute 67 which leads to a feeding device 68 in proximity to the periphery of the turn table 38 at the side opposite to that at which the turn table 51 is located. The feeding device for the collets comprises a slide 69 which is disposed in a guideway 70, a rocking arm for imparting reciprocatory movements to the slide, and a link 72 which connects the upper end of the arm 71 with the slide 69, the lower end of the said arm 71 being pivotally mounted at 73 to a bracket 74 secured to, or formed a part of, the frame of the machine. A cam 75 mounted upon the shaft 31 engages a follower 76 upon the arm 71 to impart rocking movements thereto. At its outer end, the said shaft 31 is provided with a disk 77 which carries a crank pin 78 radially adjustable thereon. The said crank pin 78 is connected by means of a link 79 with an operating arm 80 which is loosely mounted upon a spindle 81 of a feed roll 82. The feed roll 82 is one of a pair of feed rolls which are arranged to feed a strip of fabric from a roll 83 across the upper surface of one portion of the turn table 38. Mounted fast to the spindle of the feed roll 82 is a ratchet wheel 84, the teeth of the said ratchet wheel being arranged to be engaged by a pawl 85 upon the arm 80. Movements of rotation of the shaft 31 effect reciprocatory movements of the feed rolls 80 through the connections aforesaid whereby to impart the step by step feeding movements to the strip of fabric from the roll 83.

The operation of the machine is as follows: First the reservoirs or hoppers 62 and 63 are charged respectively, the hopper 62 with disks 86 of card board or similar material such as are shown in the upper portion of Fig. 13, and the hopper 63 with collets 87, similar to that shown in the lower portion of the Fig. 12. In first charging

the machines it will of course, also be necessary to fill up the chutes 66 and 67. A roll of fabric will also be mounted in the machine as shown in 83 in Fig. 1, the end of the fabric being passed between the feed rolls 82. The machine being now started up, the active portion of the cam 75 will give a quick rocking movement to the arm 71 whereby the slide 69 will be caused to feed one of the collets 87 which has been presented thereto from the chute 67 to a point in the turn table immediately below a plunger 88 of the head 37, and immediately above a die 89 in the turn table 38. The parts are so timed that just as the collet is brought to the proper position, the plunger 88 will descend and force it into the die 89. The plunger will then retreat as the head 37 moves upward, and it being remembered that a step by step movement is imparted to the turn table 38 during the upward movement of the head 37, such movement of the turn table will now take place, the turn table being moved one-eighth of a revolution, in the construction shown in the drawings. At each eighth of a revolution, the turn table comes to rest and a fresh collet is fed forward by the slide 72 and is forced into the next succeeding die in the turn table by means of the plunger 88, it being understood that the turn table 38 is provided with eight dies 89 equidistantly arranged around the same. When the turn table has moved through one quarter of a revolution, the die containing the cup which was inserted by the plunger 88 as above described is brought opposite a plunger 90. The face of this plunger is made in the form of a cutting die or punch and it is arranged, in its descent, to cut out a disk or washer 91 from the fabric strip 92, and to force it into the receiving portion of the die in the turn table so that it will lie above the collet contained therein as is shown in Fig. 9. At the next eighth of a revolution of the turn table 38, the die containing the washer and collet is brought beneath a plunger 93, the diameter of which, near the lower end thereof, is substantially equal to the interior diameter of the collets 87, and which is provided, at its extremity, with a projection 94 which is arranged to pass through an opening 95 in the collets 87.

When the collet and washer are in the position shown in Fig. 9, immediately beneath the plunger 93, and the head 37 is moved downward, the plunger 93 will force the washer into the collet and the central portion of the washer through the opening therein so that the washer will be caused to lie in the position and form in which it shown in Figs. 10, 13 and 15. At the next step by step movement, the turn table will have completed one-half of a revolution and the die carrying the collet with the cloth

washer contained therein will be immediately beneath the turn table 51. The turn table 51 has a plurality of pockets 96 in which are arranged tubes, the ends thereof being split to form spring fingers 97. The card board disks which are fed from the hopper or reservoir 62 down the chute 66 are delivered into a recess 98 in the bed plate of the machine just beneath one of the pockets 96 in the turn table 51. The head 37 carries a plunger 99 which is located immediately above the top of the spindle 52 of the turn table 51 so that at each reciprocation of the head 37, the turn table 51 is depressed by the action of the said plunger 99 against the resistance of the spring 55. This causes the spring fingers to embrace the disk in the recess 91 and to pick up the same, and as a similar movement occurs after each step by step movement of the turn table 51, (the turn table 51 being actuated, it will be remembered, at the same time the turn table 38 is actuated), the pockets of the said turn table 51 will be loaded in succession. The plunger 99 is arranged in a housing 100 secured fast to the head 37 or made as a part thereof, a strong spring 101 being contained in the housing and operating to press the plunger downward into its operating position. The spring 101 is stronger than the spring 55 so that the spring 55 will be depressed by the action of the plunger, but the spring 101 will take care of any over-throw or excess movement of the head 37. From the foregoing, it will be understood that the pocket 96 in the turn table 51, which is in line with the die 89 of the turn table 38 in the last mentioned position, (namely diametrically opposite to the feeding device 68), will contain a card board disk, and that such card board disk will be held immediately above the mouth above the die 89 as is shown in Fig. 10. The head 37 carries a plunger 102 which is disposed immediately above this point, so that as the head descends, the plunger 102 will enter the pocket 96 to engage the upper face of the said card board disk; in the continued downward movement of the head, the plunger 99 will engage the end of the spindle 52 as aforesaid so that near the completion of the downward movement of the head 37, the turn table 51 will be carried downward to cause the fingers 97 to enter the mouth of the die 89. At the extremity of the said downward movement, the plunger 102 will force the card board disk into the collet in the die 89 so as to complete the formation of a button back. It is during this final movement that the spring 101 of the plunger 99 is depressed.

The button back having now been completed, it only remains to eject the same. This is accomplished by means of a stationary cam 103 (see Fig. 11). The dies 89 are

formed with a relatively stationary cheek piece 104 and relatively movable head 105, the latter being carried by stems 106. The stems 106 are provided with head 107 at the lower end thereof, springs 108 being disposed between the head 107 and the lower surfaces of the turn table 38. The heads 105 rest snugly in pockets 109 in the turn table, the springs holding them firmly therein until the heads 107 are engaged by the stationary cam 103. They are so engaged during a step by step movement of the turn table, the result being to life the button back to a point with its lower face about the level of the top of the turn table. In the continued rotary movement of the turn table, these button backs are received by a discharge chute 110 along which they are gradually forced by the movement of the turn table to be finally delivered at any suitable point.

It will be understood that while I have described the production of a single button back in the cycle of operation of the machine, it is nevertheless true that a complete button back is delivered at each reciprocation of the head 37. The various steps above described are carried on simultaneously upon successive elements at the various points, a new collet being inserted in a die at the first position of the table, a fresh washer being inserted at the third position, the washer being forced home and the central portion being forced to protrude in the fourth position, and the card board disk being forced into place in the fifth position, all at the same time. The delivery takes place, as has been before stated, during the step by step movement of the turn table while the head is retreating after the plungers have operated. It will also be understood that the turn table 51 is moved downward to receive the card board disk at one point therein at the same time as a card board disk is being discharged therefrom at another point into a die in the turn table 38.

In order to insure the correct positioning of the turn tables 38 and 51, I have provided the head 37 with two spring pressed plungers 111, 112, the former being adapted to engage one of a set of recesses 113 with which the turn table 38 is provided, and the other to engage one of a set of recesses 114 with which the turn table 51 is provided. The ends of these plungers are preferably tapered and the recesses 113 and 114 in the turn tables are correspondingly tapered so that the position of the tables may be corrected within small limits by the action upon them of the plungers 111, 112. There is, of course, one recess for each position of each table. The tilting movements which are given to the reservoirs 62 and 63 by the cam 59 during the operation above set forth have the

effect of continuously supplying the chutes 66 and 67 with disks and collets respectively as they are discharged at the lower ends thereof, so as to form a continuous feed therefor. The upper end of the chutes 66 and 67 are preferably flared as appears in Figs. 1, 3 and 5 of the drawings so as to present a wide opening to receive the articles.

In Figs. 16, 17 and 18, I have shown a construction which I may employ when I desire to punch out the card board disks directly in the machine instead of feeding them from the hopper or reservoir 62; in such a case I provide a magazine 115 for containing blank strips of card board or other material of which the disks are to be composed, and I provide feeding means therefor for feeding the blanks forward, and punching means for punching the disks from the blanks. The feeding means may conveniently comprise a feeding roller 116, the said feeding roller being provided with a ratchet wheel 117, a spring pressed pawl 118 which is adapted to engage the teeth of the ratchet wheel, a rocking lever 119 which carries the said pawl, an operating arm 120, the upper end of which is connected by a link 121 with the rocking lever 119, and the lower end of which is pivoted at 122 to a stationary support, and a crank pin 123 radially adjustable upon a disk 124 secured to a driving shaft 125. The driving shaft 125 is provided with a miter gear wheel 126, the teeth of which will be arranged to mesh with the miter gear 26 upon the vertical shaft 25 of the machine. The feeding means just described feeds the blank strip of card board or other material over a table 127 which takes the place of a turn table 51. The table 127 is provided with the female portion 128 of a die, the male portion being comprised in the plunger 102. When the plunger 102 descends, it will cut out a blank disk out of the card board strip and will push it through a passage 129 in the table 127. An arm 130 carried by a spring pressed spindle 131 is supported beneath the table 127, the said arm being provided with a pocket 132 immediately in line with the passage 129. The said pocket is formed in a tube, the ends of which are split to form spring fingers 97 exactly similar to the spring fingers carried by the turn table 51. When the head 37 descends, the said plunger 99 will engage the spindle 131, depressing the arm 130 in the same manner as the turn table 51 was depressed in the example of my invention shown in the other figures so as to cause the spring fingers 97 to present the card board disk directly to the die 89 beneath the same. It is, of course, understood that when the foregoing mechanism is used, the arm 130 and spindle 131 are employed in place of the turn table 51 and the spindle 52, and fur-

thermore that the feed pawl 56 for the turn table 51 is removed, disconnected or otherwise rendered inoperative.

What I claim is:

1. In a machine for forming button backs, the combination with a plurality of receiving dies, and means for moving the dies to various points in the machine, of means for feeding collets to the dies at one point in the machine, means for punching fabric washers from a strip and inserting the said washers in the collets at another point in the machine, and means for feeding a strip of fabric from which the washers are punched, the said feeding means engaging that portion of the material from which the fabric washers have already been punched, whereby tension is applied to the fabric to draw the same across the path of movement of the punching means.

2. In a machine for forming button backs, the combination with a plurality of receiving dies, and means for moving the dies to various points in the machine, of means for feeding collets to the dies at one point in the machine, means for punching fabric washers from a strip and inserting the said washers in the collets at another point in the machine, and fabric feeding means for feed-to engage the fabric strip after the washers may be punched, the said fabric feeding means including a feeding roller arranged to engage the fabric strip after the washers have been punched therefrom, whereby the strip of fabric will be drawn across the path of movement of the punching means.

3. In a machine for forming button backs, the combination with a turn table having a plurality of receiving pockets therein, and means for imparting step by step movements of rotation to the turn table, of means for feeding collets to a point in line with one of the pockets in the turn table when the same is at rest, means for feeding a strip of fabric over another of the said pockets, a plunger carrying head, a plunger therein arranged in line with the first said pocket, another plunger, the end of which constitutes a punch, arranged in line with the other said pocket, and means for reciprocating the head to cause the first said plunger to force a collet into the pocket in line therewith, and to cause the other said plunger to punch a washer from the fabric and to force the same into a collet in the said pocket beneath the same.

4. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements of rotation to the turn table, of means for feeding collets to the pockets in the turn table at one point in the movement thereof, means for inserting fabric washers in the collets at another point in the movement of the

turn table, a member for holding disks in line with a pocket at another point in the movement of the turn table, means for depressing the said member to present a disk in a pocket in the turn table, and a plunger for passing through the said member to force the said disk therefrom into a collet held in the said pocket of the turn table.

5. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements to the turn table, of means for feeding collets to the pockets in the turn table at one point in the movement thereof, means for inserting fabric washers in the collets at another point in the movement of the turn table, a member for holding disks in line with a pocket at another point in the movement of the turn table, such point being that wherein the said pocket in the turn table will have already received a collet and a fabric washer, means for depressing the said member into the pocket in line therewith in the said turn table, and a plunger for passing through the said member to force the said disk into the collet held in the said pocket of the turn table.

6. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements of rotation to the turn table, of means for feeding collets to the pockets in the turn table at one point in the movement thereof, means for inserting fabric washers in the collets at another point in the movement of the turn table, such point being in advance of the first said point, a member for holding disks in line with a pocket at another point in the movement of the turn table, the latter said point being in advance of the second said point in the movement of the turn table, the said member including a tubular element having extensions constituting spring fingers, means for depressing the said member to present a disk in the last said pocket in the turn table, and a plunger for passing through the said tubular element to force the said disk therefrom into a collet held in the last said pocket of the turn table.

7. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements of rotation to the turn table, of a second turn table mounted so as to overlap the first said turn table and having pockets therein arranged to register with the pockets of the first said turn table, means for feeding collets to the first said turn table, means for feeding follower disks to the second said turn table, and means for forcing the disks from the pockets of the second said turn table into

the collets contained in the pockets of the first said turn table.

8. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements of rotation to the turn table, of a second turn table mounted so as to overlap the first said turn table and having pockets therein arranged to register with the pockets of the first said turn table, means for feeding collets to the first said turn table, means for feeding follower disks to a point beneath the second said turn table in line with a pocket therein other than that pocket which at the time is in register with the pocket in the first said turn table, means for depressing the second said turn table for the purpose of causing the same to simultaneously pick up a follower disk thus fed thereto at one point and to present a previously picked up follower disk at another point therein to the pocket in the first said turn table which is in line therewith, and means for forcing the latter said disk into a collet in the first said turn table.

9. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements of rotation to the turn table, of a second turn table mounted so as to overlap the first said turn table and having pockets therein arranged to register with the pockets of the first said turn table, means for feeding collets to the first said turn table, means for feeding follower disks to a point beneath the second said turn table in line with a pocket therein other than that pocket which at the time is in register with the pocket in the first said turn table, means for depressing the second said turn table for the purpose of causing the same to simultaneously pick up a follower disk thus fed thereto at one point and to present a previously picked up follower disk at another point therein to the pocket in the first said turn table which is in line therewith, and means for forcing the latter said disk into a collet in the first said turn table, the latter said means comprising a plunger arranged to pass through the second said turn table into a pocket in the first said turn table.

10. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements of rotation to the turn table, of a second turn table mounted so as to overlap the first said turn table and having pockets therein arranged to register with the pockets of the first said turn table, each said pocket being provided with a downwardly extending tube, the extremities of which are split to form spring

fingers, means for feeding collets to the first said turn table, means for feeding follower disks to a point beneath the second said turn table, means for depressing the second said turn table, whereby to cause the spring fingers in one of the pockets therein to pick up a follower disk at one point and to cause the spring fingers holding a previously picked up follower disk to present the same into the pocket in line therewith in the first said turn table, and means for forcing the latter said disk from the said spring fingers into a collet in the first said turn table.

11. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements of rotation to the turn table, of a second turn table mounted so as to overlap the first said turn table and having pockets therein arranged to register with the pockets of the first said turn table, each said pocket being provided with a downwardly extending tube, the extremities of which are split to form spring fingers, means for feeding collets to the first said turn table, means for feeding follower disks to a point beneath the second said turn table, means for depressing the second said turn table, whereby to cause the spring fingers in one of the pockets therein to pick up the follower disk at one point and to cause the spring fingers holding the previously picked up follower disk to present the same into the pocket in line therewith in the first said turn table, and means for forcing the latter said disk from the said spring fingers into a collet in the first said turn table, the latter said means comprising a plunger arranged to pass clear through the pocket in the second said turn table into the pocket in line therewith in the first said turn table.

12. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements of rotation to the turn table, of means for feeding collets to the pockets in the turn table at one point in the movement thereof, means for inserting fabric washers in the collets at another point in the movement thereof, means for pressing follower disks into the collets at another point in the movement of the turn table, and yielding registering means for insuring the correct register of the turn table at the end of each step by step movement.

13. In a machine for forming button backs, the combination with a turn table having a plurality of receiving pockets therein, and means for imparting step by step movements of rotation to the turn table of a plunger carrying head, a plurality of plungers carried thereby in line with

the pockets in the turn table, means for feeding collets to a point in line with one of the plungers, means for feeding fabric to a point in line with another of the said plungers, means for reciprocating the head to cause the plungers in their movement in one direction to force substantially simultaneously a collet into a pocket at one point in the turn table, and a portion of fabric into a collet which has been so inserted, at another point in the turn table, and a spring-pressed taper ended plunger carried by the said head for engaging tapered recesses in the said table to insure the proper positioning of the same with the other said plungers in line with the pockets, the tapered end of the plunger and the tapered recesses being arranged to fit each other in co-engaging relation prior to the limit of the movement of the spring-pressed plunger carrying means, whereby in the final movement thereof the plunger will be caused to yield.

14. In a machine for forming button backs, the combination with a turn table having a plurality of receiving pockets therein, another turn table having a plurality of pockets therein, a portion of the said table being arranged to overlap a portion of the first said turn table, the pockets of the two said tables being arranged to come into successive register with each other, and means for imparting step by step movements of rotation to the said turn tables, the second said turn table having a limited longitudinal movement with respect to its axis, of a plunger carrying head having plungers arranged in line with pockets in the said turn tables, one of the said plungers being arranged in line with the point of registration of the pockets of the two said tables, means for feeding collets to the first said turn table, means for feeding follower disks to the second said turn table, and means carried by the plunger carrying head for engaging the second said turn table to depress the same longitudinally.

15. In a machine for forming button backs, the combination with a turn table having a plurality of receiving pockets therein, another turn table having a plurality of pockets therein, a portion of the said table being arranged to overlap a portion of the first said turn table, the pockets of the two said turn tables being arranged to come into successive register with each other, and means for imparting step by step movements of rotation to the said turn tables, the second said turn table having a limited longitudinal movement with respect to its axis, of a plunger carrying head having plungers arranged in line with pockets in the said turn tables, one of the said plungers being arranged in line with the

point of registration of the pockets of the two said tables, means for feeding collets to the first said turn table, means for feeding follower disks to the second said turn table, means carried by the plunger carrying head for engaging the second said turn table to press the same longitudinally, and yielding means carried by the plunger carrying head for insuring the registration of the two said tables at the end of their step by step movement.

16. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements of rotation to the turn table, of a second turn table mounted so as to overlap the first said turn table and having pockets therein arranged to register with the pockets of the first said turn table, means for feeding collets to the first said turn table, means for feeding follower disks to the second said turn table, means for forcing the disks from the pockets to the second said turn table into the collets contained in the pockets of the first said turn table, and registering means for the two said turn tables comprising a taper ended yielding plunger for each turn table, each turn table having a plurality of conical recesses for co-engagement therewith, the conical recesses being fitted to the said taper ended plungers to accurately co-engage therewith, means for carrying the plungers, and means for imparting excess movements of reciprocation to the plunger carrying means whereby the plungers will yield after their ends have engaged the said recesses, during the final movement of the said plunger carrying means.

17. In a machine for forming button backs, the combination with a turn table having a plurality of receiving pockets therein, another turn table having a plurality of pockets therein, a portion of the said table being arranged to overlap a portion of the first said turn table, the pockets of the two said tables being arranged to come into successive register with each other, and means for imparting step by step movements of rotation to the said turn tables, the second said turn table having a limited longitudinal movement with respect to its axis, of a plunger carrying head having plungers arranged in line with pockets in the said turn tables, one of the said plungers being arranged in line with the point of registration of the pockets of the two said tables, means for feeding collets to the first said turn table, means for feeding follower disks to the second said turn table, a plunger carried by the said head for engaging the second said turn table to depress the same longitudinally, and a spring resistance for the plunger to permit excess movement of the said head.

18. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements of rotation to the turn table, of a member for holding disks in line with a pocket at one point in the movement of the turn table, means for depressing the said member so as to present a disk in the said pocket, and a plunger for passing through the said member to force the disk therefrom into the said pocket.

19. In a machine for forming button backs, the combination with a turn table having a plurality of collet receiving pockets therein, and means for imparting step by step movements of rotation to the turn table, of a member for holding follower disks in line with a pocket of the turn table at one point in the movement thereof, a reciprocating head, a plunger carried thereby for engaging the said member to force it downward, and another plunger for passing through the said member to force a disk therefrom into a collet contained in a pocket in the turn table.

20. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements of rotation to the turn table, of a reciprocating head, a plunger carried thereby in line with one of the pockets for forcing collets therein, a plunger carried by the said head in line with another of the pockets for forcing fabric washers therein, a plunger carried by the said head in line with another of the said pockets for forcing portions of the fabric washer through a collet in the pocket in the turn table in line therewith, a plunger carried by the said head in line with another of the said pockets for forcing follower disks into the collet in the pocket of the turn table in line therewith, means for feeding collets to the first said plunger, means for feeding fabric to the second said plunger, and a yielding registering plunger carried by the said head for engagement with the said table to correct the registration thereof.

21. In a machine for forming button backs, the combination with a turn table having a plurality of pockets therein, and means for imparting step by step movements of rotation to the turn table, of a reciprocating head, a plunger carried thereby in line with one of the pockets for forcing collets therein, a plunger carried by the said head in line with another of the pockets for forcing fabric washers therein, a plunger carried by the said head in line with another of the said pockets for forcing portions of the fabric washer through a collet in the pocket in the turn table in line therewith, a plunger carried by the said head in

line with another of the said pockets for forcing follower disks into the collet in the pocket of the turn table in line therewith, means for feeding collets to the first said
5 plunger, means for feeding fabric to the second said plunger, a taper ended registering plunger carried by the said head for engagement with conical recesses in the said

table to correct the registration thereof, and a buffer spring for the said registering 10 plunger.

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Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
