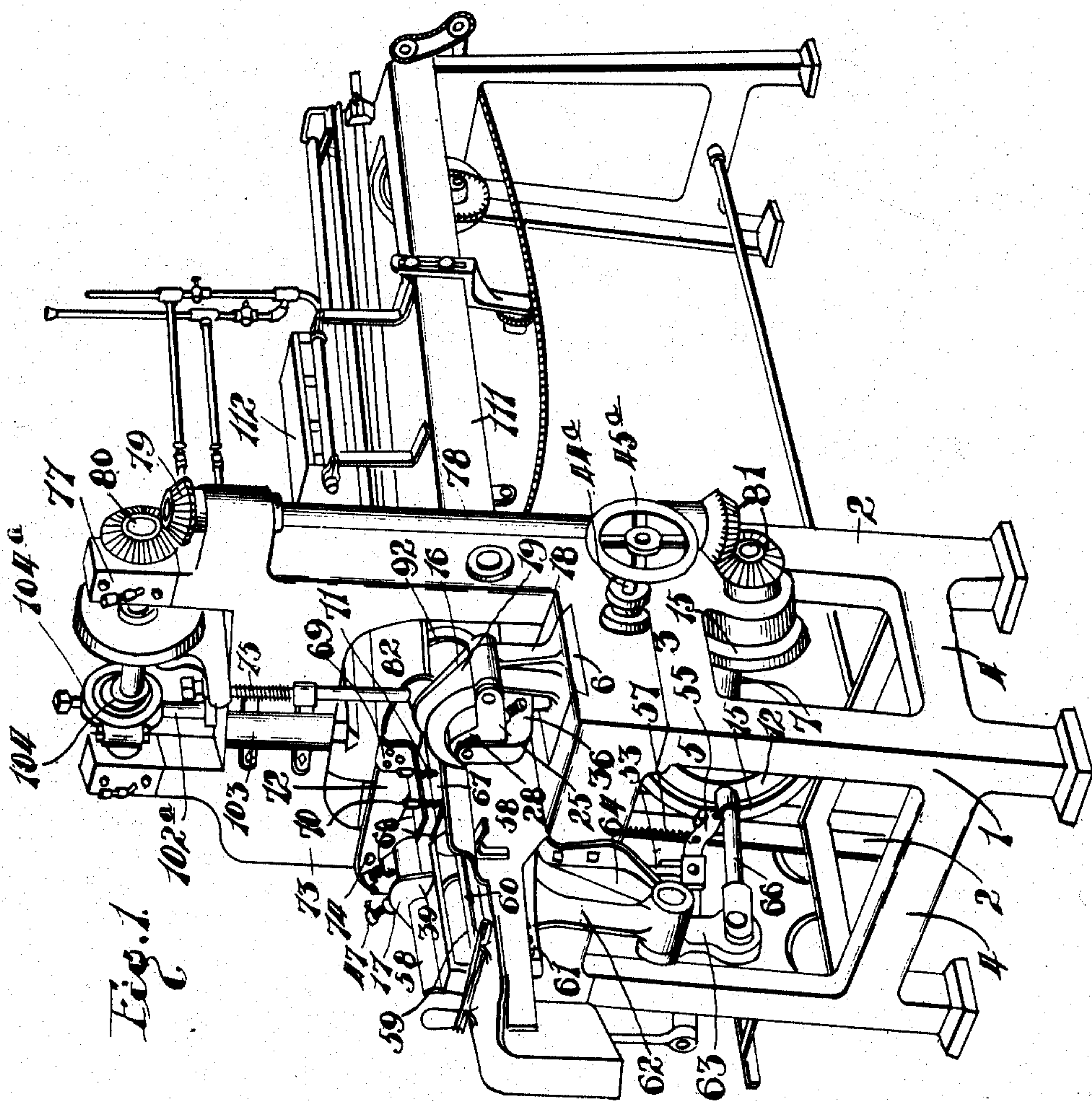


No. 864,325.

PATENTED AUG. 27, 1907.

C. B. McDONALD.
CAN FORMING MACHINE.
APPLICATION FILED MAY 4, 1906.

5 SHEETS—SHEET 1.



Witnesses:

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Inventor:
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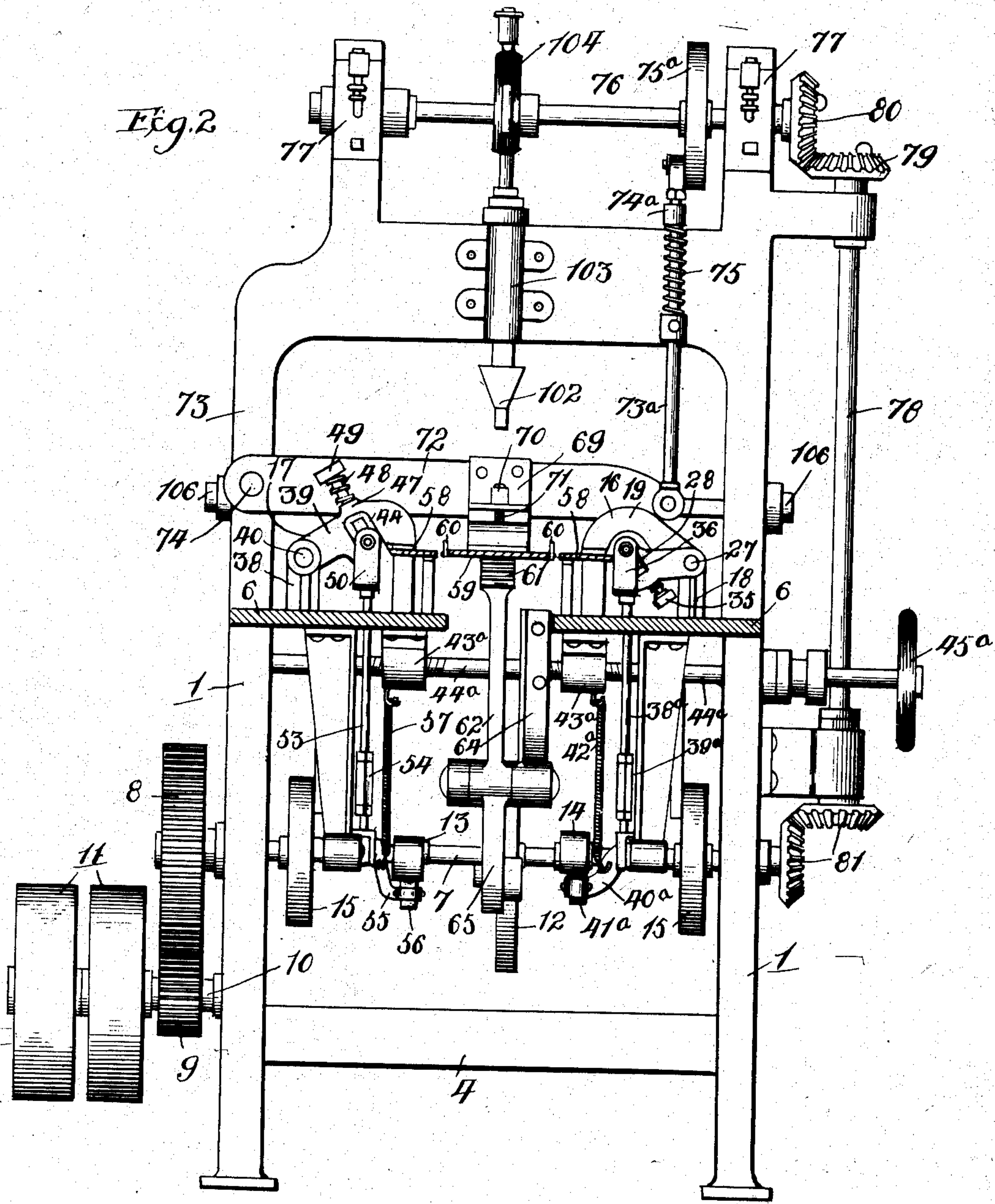
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5 SHEETS—SHEET 2.



Witnesses

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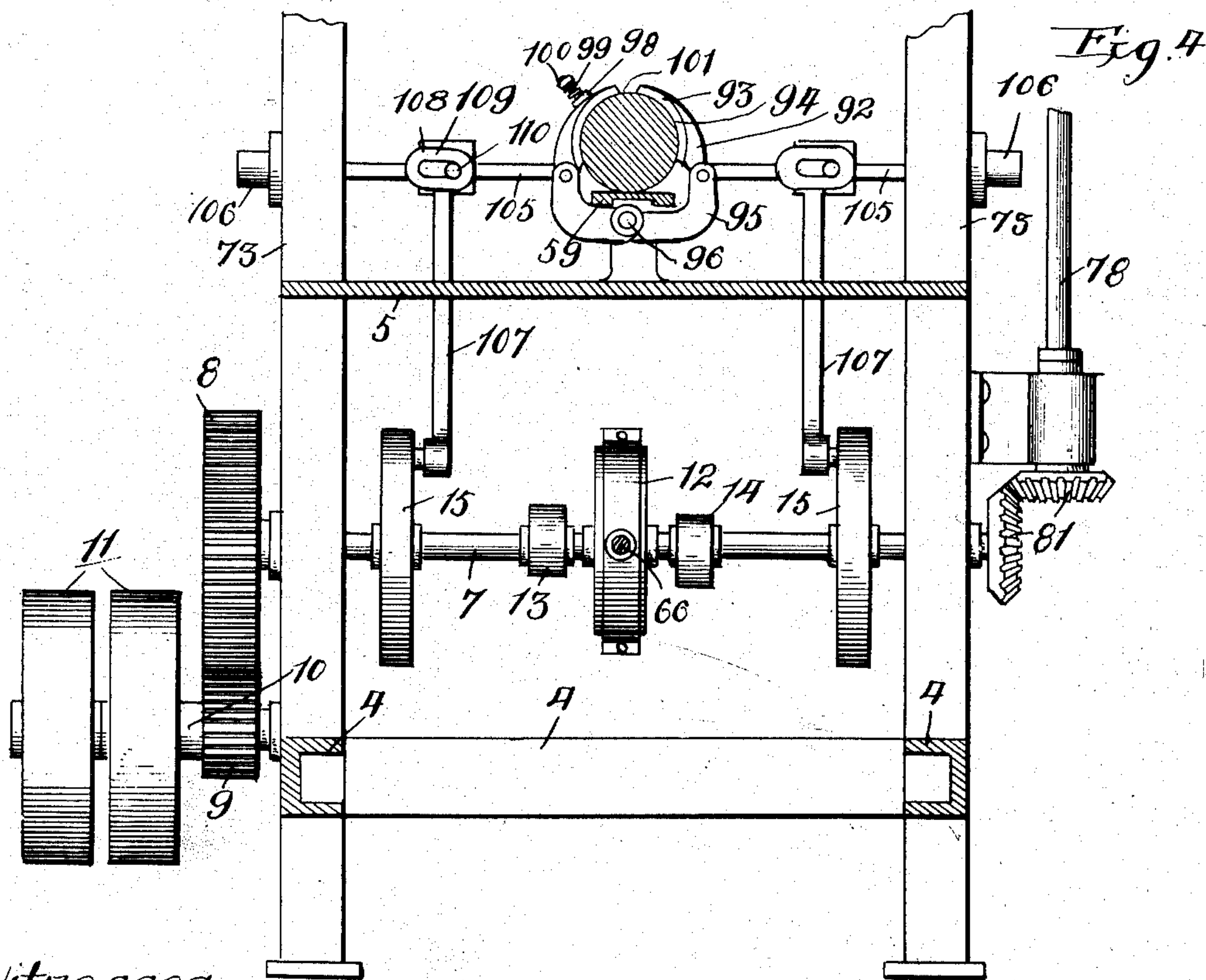
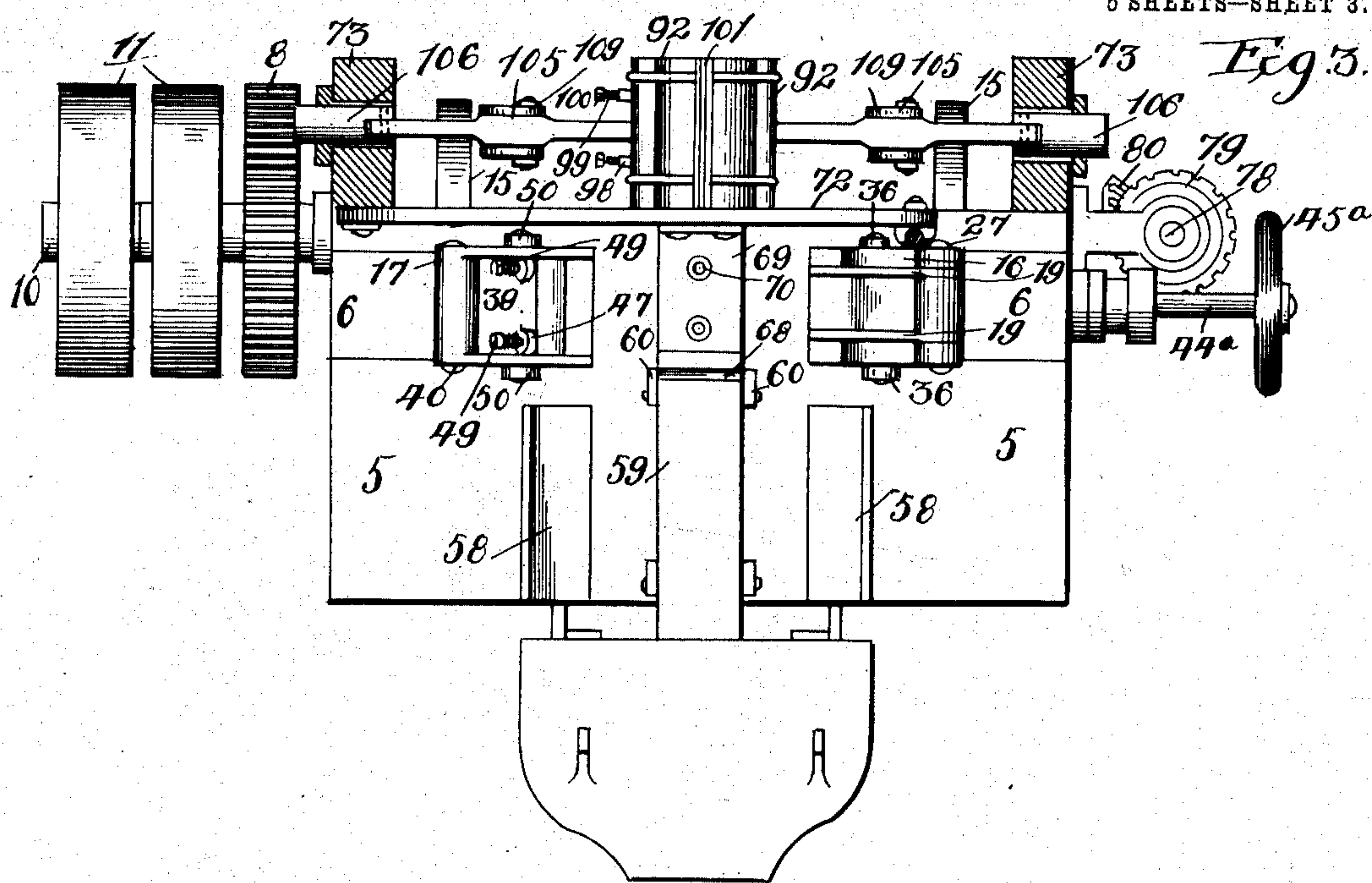
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Mays.

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5 SHEETS—SHEET 3.



Witnesses:

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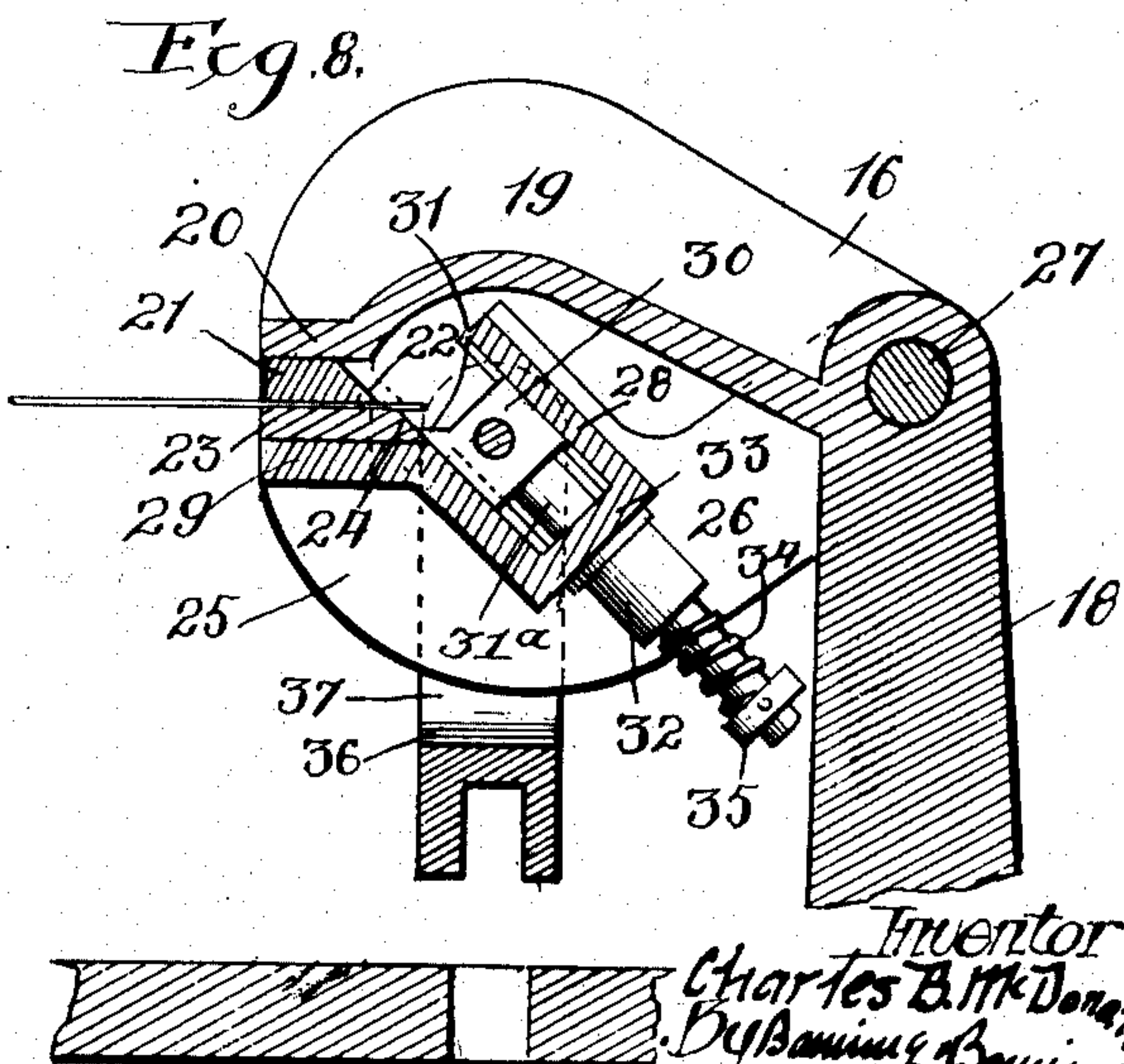
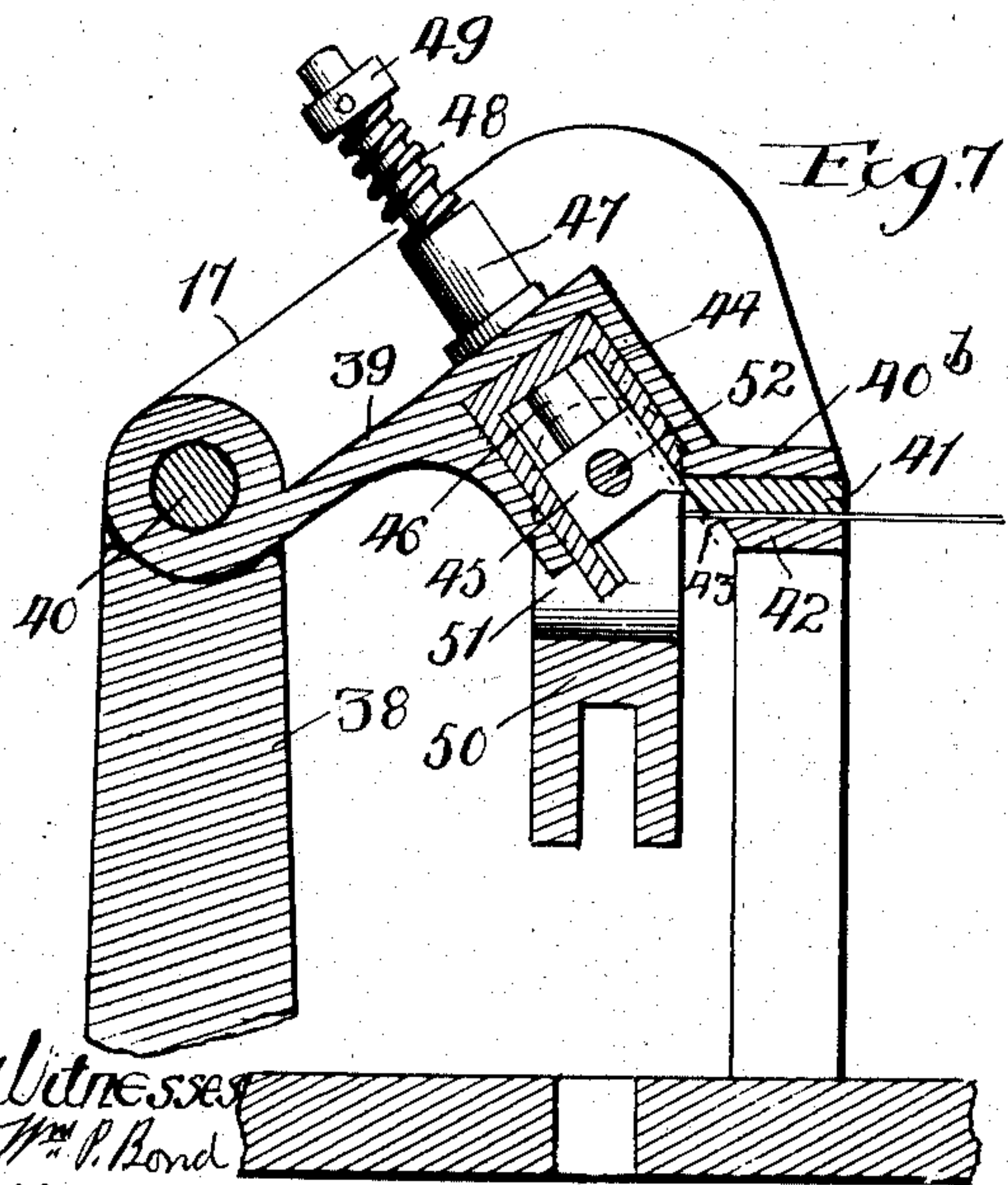
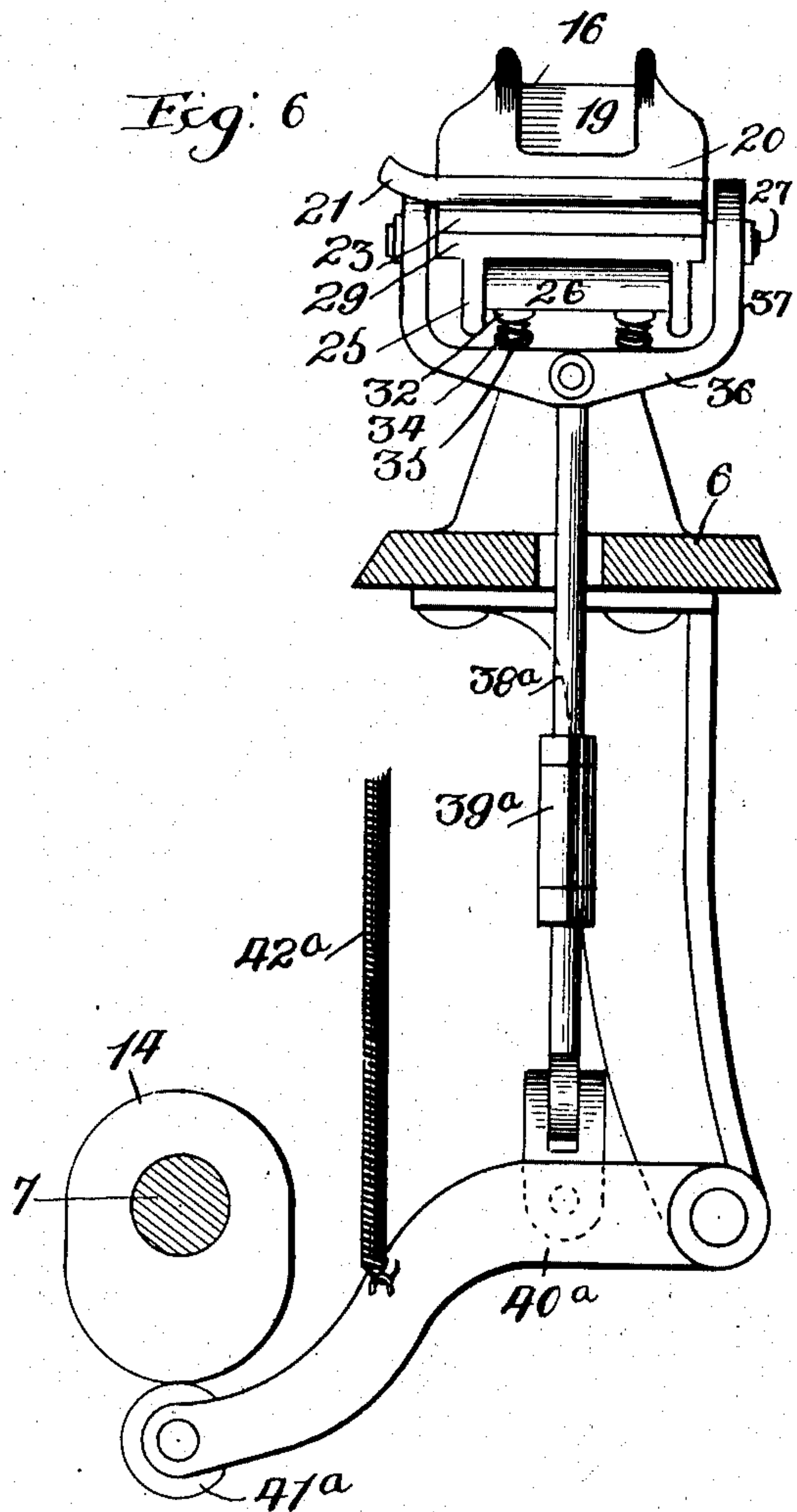
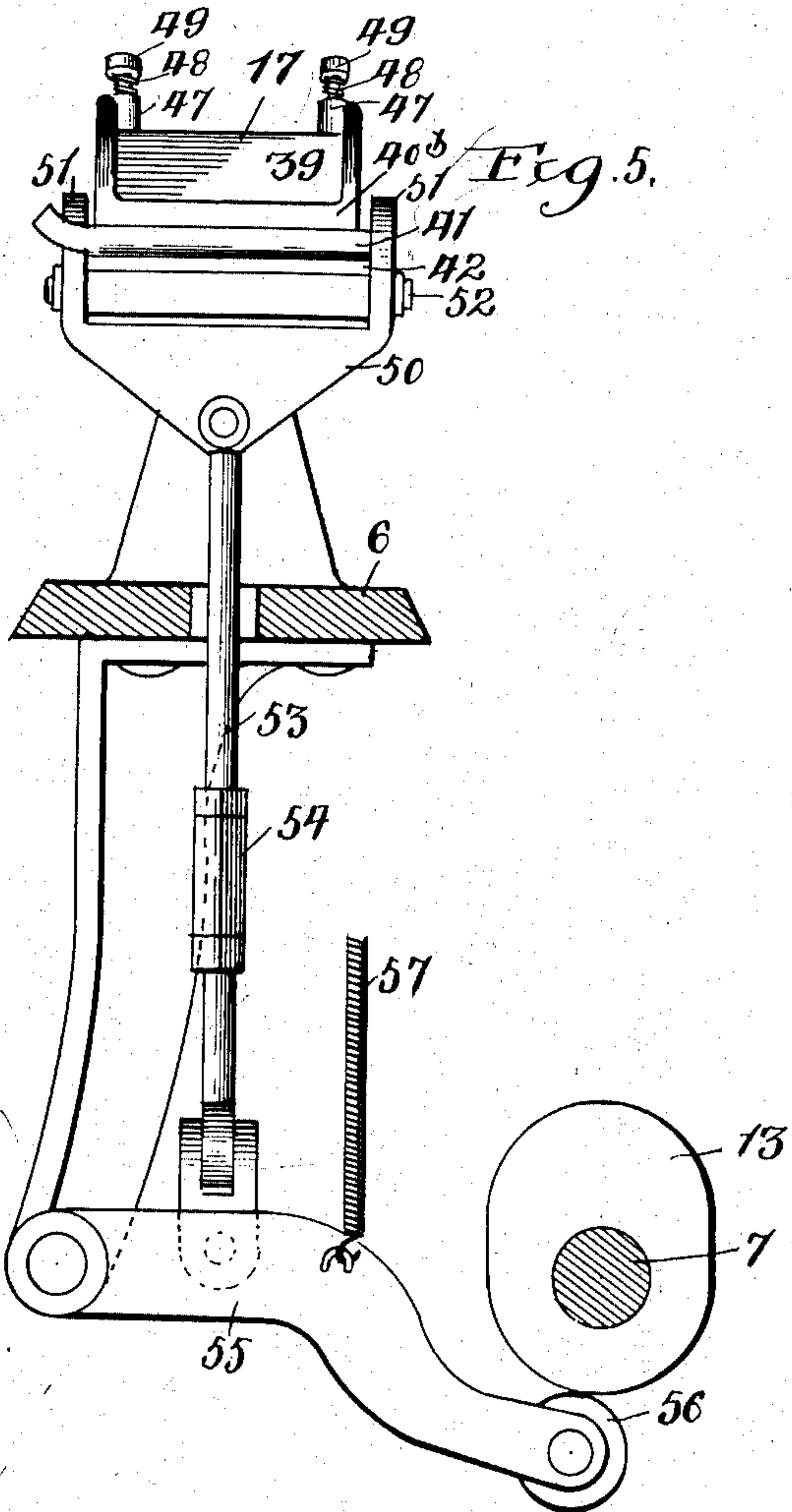
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5 SHEETS—SHEET 4.



Witnesses
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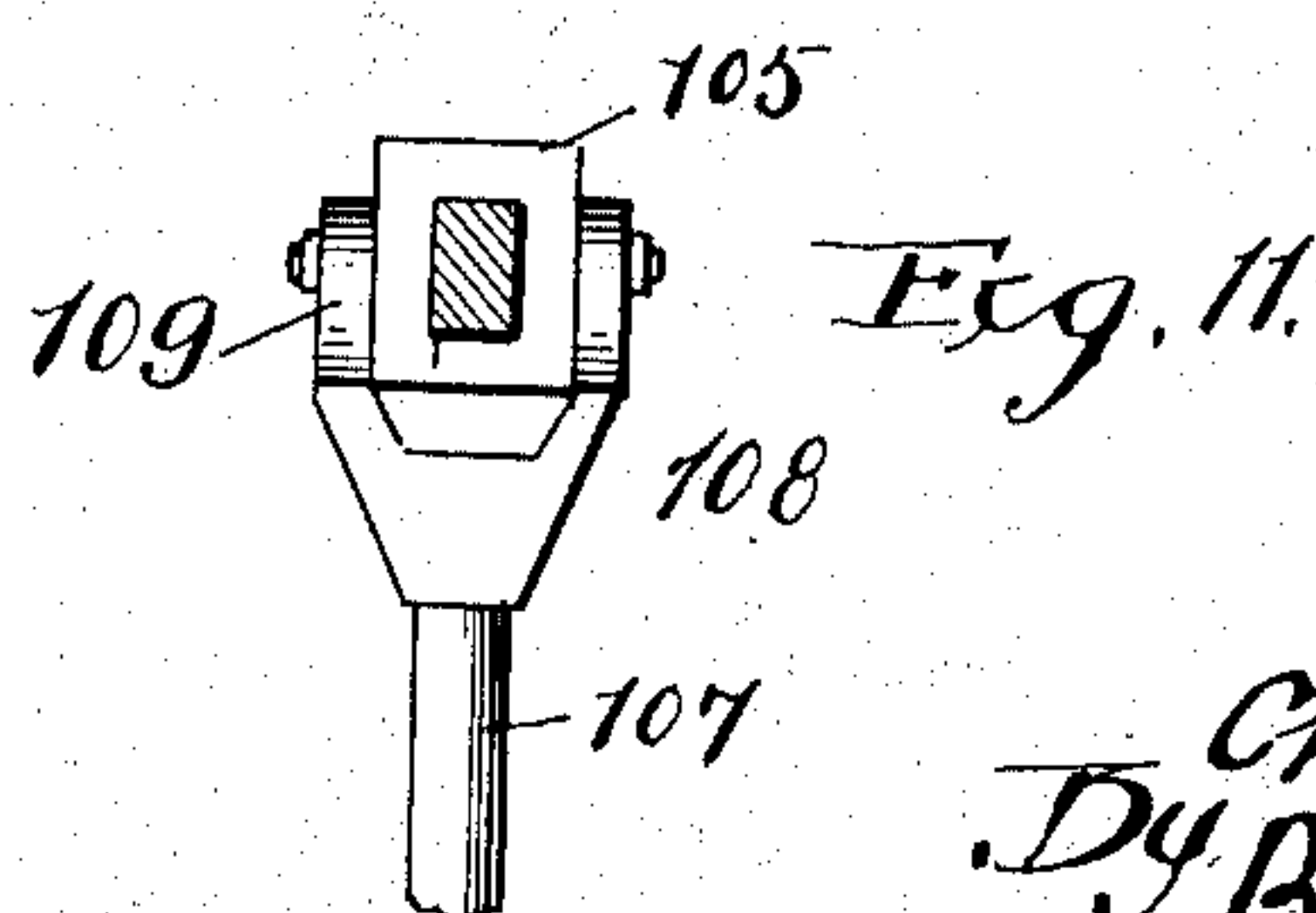
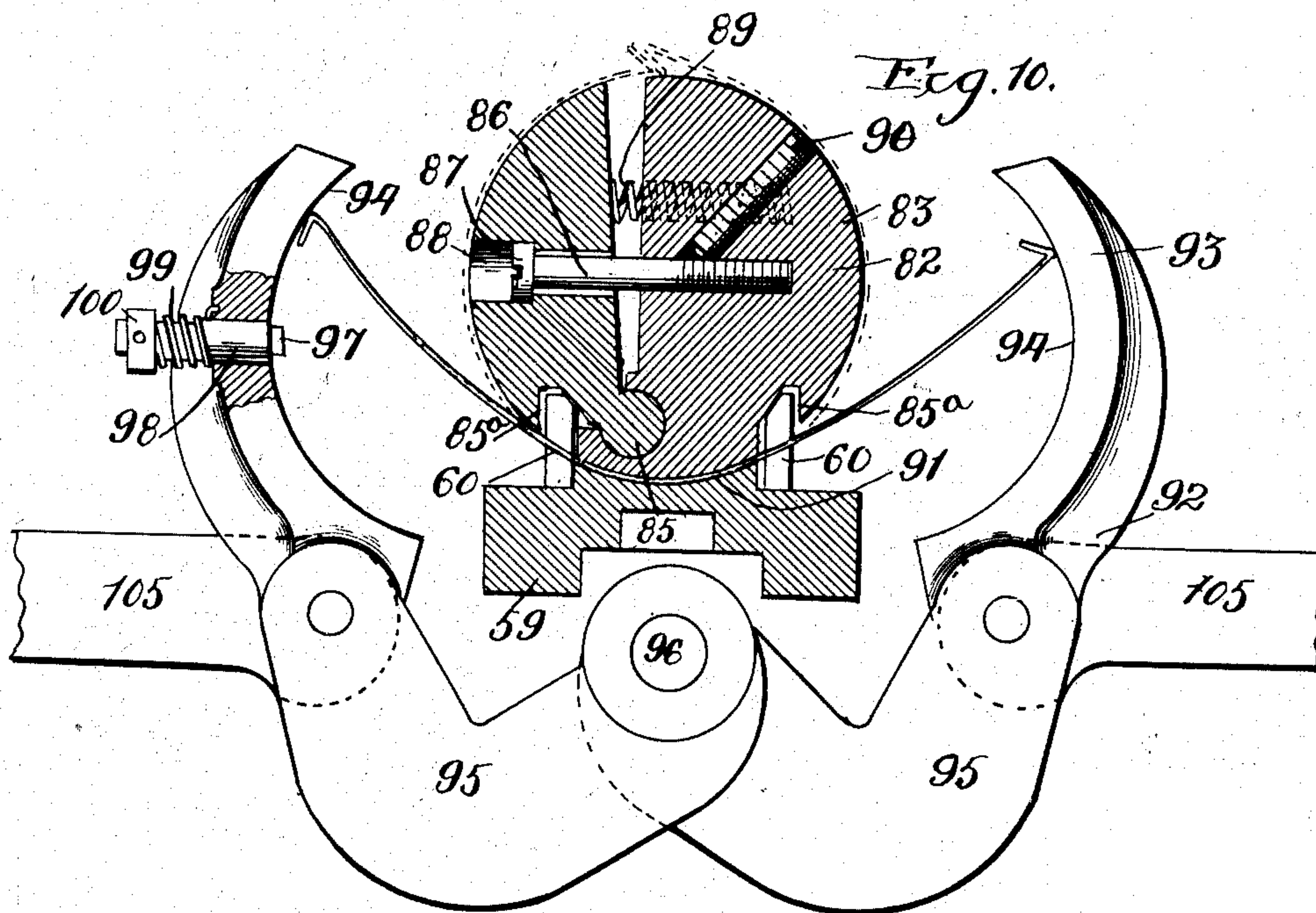
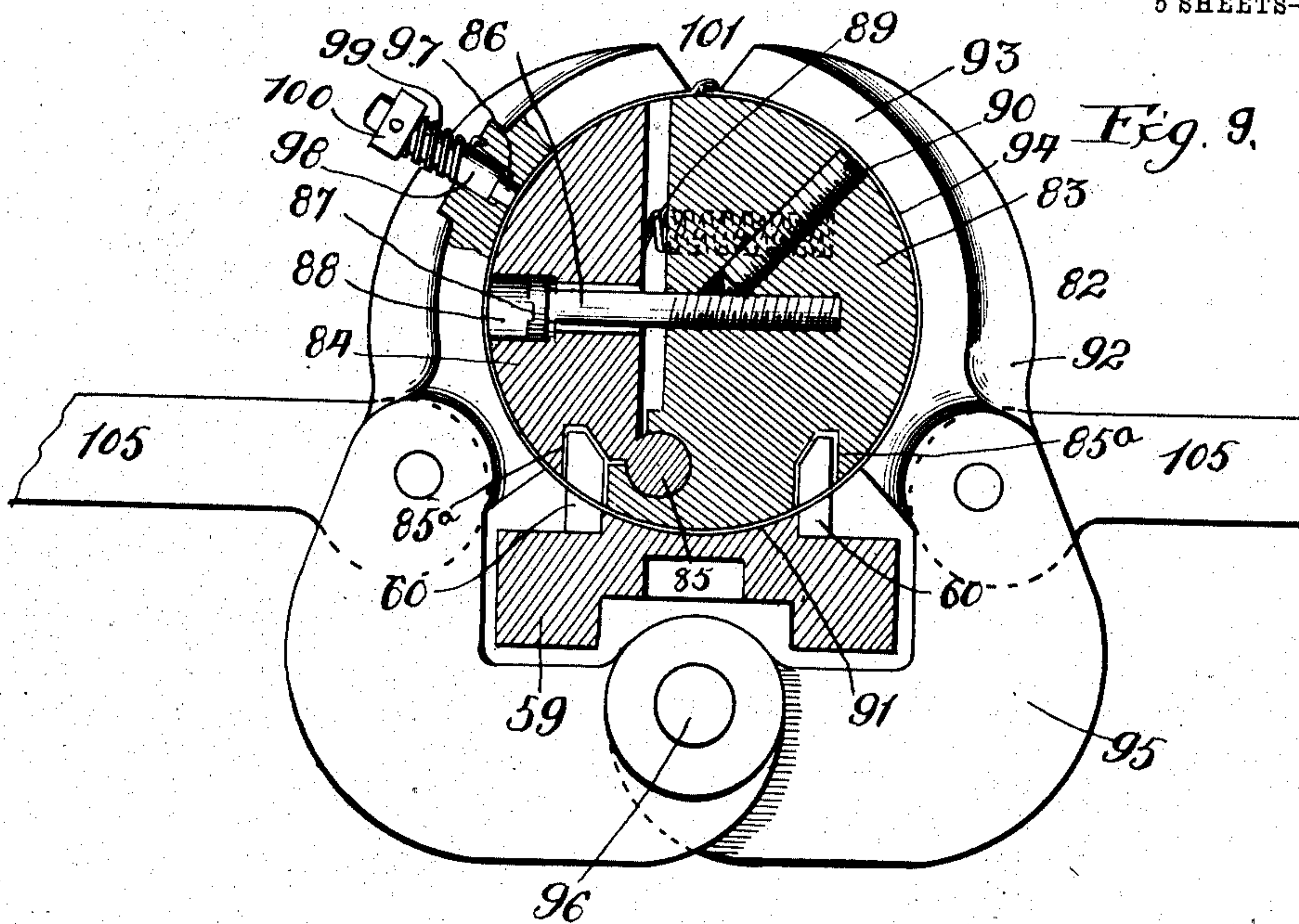
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CAN FORMING MACHINE.
APPLICATION FILED MAY 4, 1906.

5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

CHARLES B. McDONALD, OF CHICAGO, ILLINOIS, ASSIGNOR TO McDONALD MACHINE COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

CAN-FORMING MACHINE.

No. 864,325.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed May 4, 1906. Serial No. 315,201.

To all whom it may concern:

Be it known that I, CHARLES B. McDONALD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain
5 new and useful Improvements in Can-Forming Machines, of which the following is a specification.

The machine of this invention is intended to form bodies of cans from strips or blanks of tin and deliver them in seamed and soldered condition and ready for
10 the insertion thereonto of the heads.

The invention more particularly relates to the mechanism for initially bending the edges of a blank preparatory to forming the seam, to the mechanism for bringing the hooked or bent edges into engagement
15 with one another, and to the mechanism for finally pressing the interlocked edges tightly together to form the seam.

The object of the present invention is to combine these three steps or operations in such a manner that
20 the successive operations will be quickly and systematically and perfectly performed by a machine which is very compact in its structure and is easily operated by the expenditure of a small amount of power applied in such manner that the various steps or operations of
25 the machine will be easily within the control of the operator or attendant.

Another object of the invention is to provide adjusting mechanism for regulating the position of the initial benders to adapt the machine for use in forming can
30 bodies of different size, the adjusting mechanism being so regulated that the adjustment can be made without disassembling any of the bending mechanism, and by the simple operation of turning an adjusting wheel which is within easy reach of the operator.

35 The invention further consists in the construction and arrangement of the several cooperating devices, and in the combination as a whole operating in the manner hereinafter described and for the purposes specified.

40 In the drawings illustrating the invention Figure 1 is a perspective view of the entire machine; Fig. 2 is a front elevation showing the bending mechanism, the platform or table being partially broken away; Fig. 3 is a top or plan view of the forward end of the machine;
45 Fig. 4 is a sectional elevation showing the folders and method of operating the same; Figs. 5 and 6 are details showing the method of operating the bending mechanism; Figs. 7 and 8 are enlarged details partly in section, showing the benders; Fig. 9 is a view partly in
50 cross section showing the mandrel and the folders closed; Fig. 10 is a similar view showing the folders open; and Fig. 11 a detail of the yoke for operating the folders.

The mechanism as a whole is carried by and mounted
55 upon a framework consisting of front posts or legs 1,

rear posts or legs 2, top cross rails 3, and bottom rails 4. The framework supports a table 5 which has slidably mounted therein a pair of adjustable plates 6 which are adapted to be moved toward or from each other as will hereafter appear. The power for imparting
60 movement to the several forming devices is derived from a main shaft 7 which extends transversely of the framework and is suitably journaled therein. The main shaft has on one end a gear wheel 8 meshing with a pinion 9 mounted upon a shaft 10 having mounted
65 thereon fast and loose pulleys 11. The shaft 7 has mounted thereon near its center an eccentric 12, which may be called the rack eccentric, on opposite sides of which are a pair of cams 13 and 14 which may, for convenience, be called the bender cams, and outside of
70 the bender cams are a pair of eccentrics 15 which may, for convenience, be called the folder eccentrics.

The adjustably slidable plates 6 serve as a mounting for two benders 16 and 17, the former of which may, for convenience, be termed the up-bender, and
75 the latter of which may be termed the down-bender, being so called by reason of the fact that the first mentioned bender turns or hooks one edge of the can blank up and the second mentioned bender turns the opposite edge of the can blank down preparatory to the
80 subsequent seaming operation. The up-bender 16, which is illustrated on the right side of Figs. 1 and 2, consists of a standard or upright 18 which is formed integrally with the adjustable plate upon which it is supported, and the upright has integrally formed
85 therewith an inwardly extending overhanging arm 19 terminating in a broad flat faced inner edge 20 to which is secured a stationary bender plate 21 preferably formed of tool steel. The bender plate has a chisel or wedge-shaped lower outer edge 22 over which the tin
90 blank is turned in the operation of bending or hooking the right hand edge of the blank during its passage through the machine. The chisel edge 22 cooperates with a movable clamping or supporting plate 23 preferably formed of machine steel, having an acting inner
95 edge 24 which is beveled or tapered in parallel relation with the bevel of the upper bender edge, and slightly out of alinement to permit a bending rather than a shearing action and between the clamping plate and the bender plate a tin blank is moved prior
100 to the bending operation. The clamping plate is carried by a movable bracket 25 which consists of side arms 26 pivoted to the upright 18 outside of the overhanging arm 19 by means of a pivot pin or bolt 27, and the side arms of the bracket are connected by means
105 of a diagonally disposed guideway 28 the lower portion of which is in alinement with the beveled surface 22 and is extended at its inner upper end to provide a supporting cross plate 29 upon which the clamping plate 23 is mounted. The guideway 28 serves as a
110

mounting for a slidable bender block 30 which has a wedge-shaped edge 31 cooperating with the edge 22 of the upper bender plate, and the block 30 has rearwardly projecting therefrom a stem or shank 31^a 5 which passes through and is slidably mounted within a collar 32 outwardly projecting from the cross head 33 of the guideway 28. The outer end of the stem or shank is surrounded by a coil spring 34 which is held under proper tension by means of a collar 35. Movement is imparted to the bender block through the medium of the yoke 36 having side arms 37 which embrace the pivoted arms 26 of the movable bracket, and the yoke 36 has pivoted thereto a rod 38^a the length of which can be adjusted by means of a turn 10 buckle 39^a. The rod 38^a is connected with a pivoted arm 40^a having journaled in its end a roller 41^a which bears against the cam 14 being held in contact therewith under the tension of a spring 42^a which is secured to a collar 43^a rigidly attached to the under face of one 20 of the adjusting plates 6. The companion sliding plate is likewise provided with a similar collar and through the two collars is entered a right and left hand screw threaded adjusting rod 44^a having on its end an adjusting wheel 45^a. The movement imparted by the 25 adjustable rod 38^a is sufficient on the down-stroke to bring the bender block 30 into contact with the cross head 33, after which a slight additional movement of the rod serves to retract the bracket 25 and the clamping plate carried thereby, which provides sufficient 30 space between the supporting plate and the bender plate for the insertion of the edge of a blank preparatory to the reverse movement of the bender block which is moved back between the guideways sufficiently to carry its acting edge over the outwardly 35 projecting edge of the blank which bends or hooks the edge in an upward direction, as shown in dotted lines in Fig. 8.

The down bender illustrated to the left of Figs. 1 and 2 is intended to perform exactly the same bending 40 or hooking operation on the other end of the tin blank, but the left hand edge of the blank must of necessity be turned in a reverse direction, for which reason the down bender as a whole is constructed and mounted in a different manner from the up bender hitherto described. 45

The down bender is mounted upon an upright support or post 38 similar in formation and location to the post 18. Upon the upper end of the post is mounted an overhanging movable bracket 39 which is pivoted to 50 the upright by means of a pivot bolt or pin 40, and the movable bracket is provided with a broad flat overhanging edge 40^b to which is secured a machine steel clamping or supporting plate 41 similar in function to the plate 23, except that the position of the two plates 55 is reversed with respect to one another. The clamping or supporting plate 41 cooperates with a lower bender plate 42 which is provided with a beveled or wedge shaped inner chisel edge 43 which is parallel to and slightly out of alinement with a diagonally extending 60 guideway 44 similar to the guideway 28, within which guideway a bender block 45 is slidably mounted. This bender block is provided with a stud or stem 46 which, like the stem 31^a, passes through a collar 47 and is surrounded by a spring 48 compressed between the collar 65 and a ring 49. Motion is imparted to the bender block

by means of a yoke 50 having side arms 51 to which the bender block is attached by means of a cross pin or pivot 52, and the yoke has motion imparted thereto by means of a rod 53 having an adjustable turn buckle 54, the rod 53 being secured to a pivoted arm 55 having 70 journaled in its end a roller 56 and being held in contact with the cam 13 by the tension of a spring 57, in all of which respects the construction is similar to that hitherto described.

The blanks are fed through the benders over a pair of 75 stationary side rails 58, shown in Fig. 2, between which is mounted a reciprocating feed plate 59 having at suitable intervals dogs 60 which bear against the edges of the blanks and carry them forward, and reciprocation is imparted to the plate 59 by means of a segmental rack 80 61 on the upper end of an arm 62 which is pivoted near its center to a bracket 64, and the lower end of the arm 65 has pivoted thereto a rod 66 which is reciprocated by the eccentric 12 on the power shaft. As the blanks are passed into position to have their edges bent or hooked 85 they are clamped in the center beneath the plate 67 upturned at its forward end 68 so as not to interfere with the forward travel of the blank, and the plate 67 is located immediately under a bracket 69 from which it is supported by means of pins or studs 70, springs 71 being 90 interposed between the clamping plate and the supporting bracket to hold the clamping plate under the spring tension during the operation of clamping. The bracket 69 forwardly projects from and is rigidly secured to an arm 72 which is pivoted at one end to an upright 95 73 by means of a pivot 74. A slight movement is imparted to the arm 72 through the medium of a rod 73^a, which, in turn, is actuated by a bracket 74^a the end of the rod 73^a being loosely inserted through the bracket, and a coil spring 75 being interposed to permit movement of the rod 73 to be regulated regardless of throw of the eccentric 75^a. The eccentric is mounted upon a shaft 76 carried by journal boxes 77, and the shaft is actuated by means of a vertical shaft 78 having at its 105 upper end a bevel pinion 79 which meshes with a bevel pinion 80 on the shaft 76. Rotation is imparted to the vertical shaft 73 through the medium of intermeshing bevel pinions 81, on the vertical shaft, and the power shaft respectively.

After the blank has been bent or hooked as above indicated, it is carried forward by the movement of the 110 carrier plate 59 beneath the cylindrical mandrel 82 which is rigidly secured to and rearwardly extends from the pivoted arm 72 and is adapted to rise and fall therewith to permit the travel thereunder of the blank preparatory to the forming and seaming operation. The 115 mandrel 82 consists of a fixed section 83, and a spreader section 84, which latter is pivoted to the former by means of a knuckle joint 85, and the sections are each provided with longitudinally extending grooves 85^a for the 120 passage thereunder of the carrier dogs 60 which move the blanks successively forward from one operation to the other. The movement of the spreader section is limited by means of a bolt 86 screw threaded into the fixed section, and the bolt is provided with an enlarged 125 head 87 entered into a recess 88 in the spreader section, which arrangement permits a slight swinging movement of the spreader section, which movement can be regulated by the adjustment of the bolt. The fixed and spreader sections are forced apart by means of a coil 130

spring 89 between the two sections, and the bolt 86 can be locked in its adjusted position by means of a set screw 90 which extends diagonally through the fixed section of the mandrel. The carrier plate 59 immediately beneath the mandrel is provided with a concavity 91 conforming to the curvature of the mandrel so that the tin blank will be forced around the cylindrical mandrel and clamped between two coacting surfaces to insure a true cylindrical formation.

The mandrel as a whole coöperates with a pair of folders 92 each of which consists of clamping arms 93 having a concavely rounded inner or acting face 94 of proper curvature to coact with the mandrel. The clamping arms 93 terminate at their lower ends in L-shaped sections 95 which are pivoted together immediately beneath the center of the mandrel by means of a longitudinally extending pivot 96. The clamping arm which coacts with the spreader section of the mandrel is provided with a slidable pin or stud 97 which passes through a sleeve 98 inserted into the wall of the clamping arm, and the sleeve is surrounded by a pull spring 99 which is secured at its inner end to the wall of the clamping arm and is interposed between the wall and a ring or nut 100 upon the pin or stud 97, to which the outer end of the spring is secured, which spring is of greater strength or tension than the spring 89, so that when the folders are brought together the pin or stud 97 will compress the spreader section of the mandrel under a spring tension and the spreader section will be forced or clamped into proper position with respect to the fixed section of the mandrel, giving a cylindrical contour to the whole. The clamping arms of the folder are of suitable length to leave a wedge-shaped space 101 in the exact center of the top of the mandrel, at which point the two hooks, previously formed, will be brought together and interlocked, and the wedge-shaped space 101 is provided for the action of a longitudinally extending vertically movable clamping die 102 having a vertical stem or rod 102^a which is slidably mounted within a sleeve 103 and has a reciprocating motion imparted thereto by means of an eccentric 104 which operates within a ring 104^a on the end of the stem, which eccentric is properly adjusted to depress the clamping die as soon as the hooked edges of the tin blank have been brought together and interlocked.

Each of the pivoted clamping folders is actuated by means of a transversely extending rod 105 which is pivoted at its outer end to a plunger 106 slidably mounted within the frame-work of the machine, and each rod 105 is actuated by means of a vertically extending arm 107 which terminates at its upper end in a yoke 108 having elongated slotted side arms 109 which embrace the rod 105 and are loosely connected therewith in each case by means of a pin or stud 110, which arrangement serves to give a swinging or rocking movement to the actuating rods 105, the slots permitting sufficient play to give the movement intended. The vertical yoke bars 107 are actuated by means of the folder-cams 15 on the power shaft.

In addition to the mechanism herein described, the machine as shown in Fig. 1 is connected to a soldering table 111 having mounted thereon a soldering box 112, but in view of the fact that the construction of the soldering table forms no part of the present invention

it is not deemed necessary to give a detailed description of the same.

In use, a pile of rectangular blanks 113 is laid on the machine and the blanks are fed forward by the attendant in charge onto the reciprocating rack actuated plate or table, and are carried forward by means of the dogs to the bending or hooking operation. During the forward progress of a blank the clamping and bending plates of the up and down benders will be slightly separated. In this initial position the yoke, actuating the right hand or up bender, will have been thrown to its lowermost position by the action of the right hand bender cam, and simultaneously the yoke actuating the left hand or down bender will have been thrown to its uppermost position, which action in each case serves to bring the slidable bender block into contact with the end wall of the guide within which it travels, after which contact an additional movement of the yoke serves in each case to retract the movable from the stationary portion of the bending mechanism which permits the edges of the blank to pass under the clamping and bending mechanism in position to be bent or hooked by the return movements of the bender block. In each case the outward projection of the bender block will be made under the tension of the coil spring which serves to aid in retracting the bender block after the bending operation and at the same time renders the operation more easy, uniform and satisfactory than would be the case if the spring were not provided. After the blank has been bent or hooked in opposite directions as indicated, it will be carried forward by a second movement of the carrier plate or table under the cylindrical mandrel and between the expanded folders which, during this stage of the operation, will occupy the position indicated in Fig. 10. The passage of the blank beneath the mandrel is permitted by reason of the fact that the fixed section of the mandrel is rigidly secured to the rear face of the pivoted arm 72 which is actuated by means of the cam controlled rod 73. During the progression of the blank beneath the cylindrical mandrel the pivoted arm will be in raised position providing a sufficient space between the lower wall of the mandrel and the curved feed plate to permit of easy insertion of the blank. After the blank has been thus inserted the pivoted arm will be forced down by the action of the cam which clamps the middle of the blank tightly in place between two curved surfaces having the proper contour. After the blank has been thus clamped, as shown in Fig. 10, and while the spreader section of the mandrel is outwardly projected, the folder arms will begin to close, forcing the flexible tin blank around the curved wall of the mandrel until the hooked edges overlap one another, at which point the pin or stud 97 forces the spreader inwardly, allowing the overlying hooked edges to be interlocked together. Simultaneously with the interlocking of the edges the clamping die 102 descends into the space 101 and gives a stamp or blow upon the interlocked edges of the cam, the pressure of which serves to form a tight close seam after which the clamping arms of the folders again retract, the mandrel is slightly raised and the completed can body is carried forward and delivered to the soldering table.

The adjusting mechanism heretofore described permits the slidably mounted plates 6 to be moved toward and from each other by merely turning the hand wheel

45^a and the movement of each plate will in all cases be exactly proportionate to the other by reason of the right and left hand screw threads in the rod 44^a so that no additional adjustment is necessary. The bender cams are of sufficient width to permit the necessary adjustment of the parts and in view of the fact that the operating mechanism for each of the benders is supported from and movable with the plate 6 it will be readily understood that the adjustment can be quickly accomplished by a slight turning of the adjusting wheel without disengaging any of the operating mechanism, which greatly simplifies and expedites the can forming operation.

Although the invention has been described with considerable particularity as to details, it is obvious that the particular cam and other operating mechanism herein described can be changed or modified considerably without substantially affecting the operation of the bending and folding mechanism proper, which more particularly forms the subject matter of the present invention.

What I claim as new and desire to secure by Letters Patent is:

1. In a metal working machine, the combination of a fixed die plate having a beveled edge mounted to permit the edge of a blank to be projected thereover, a movable clamping plate having a beveled edge parallel with and slightly out of alinement with the edge of the fixed die plate, a bender block having a straight line movement in alinement with the bevel edge of the clamping plate, and a guideway for the bender block secured to and movable with the clamping plate, substantially as described.

2. In a metal working machine, the combination of a fixed die plate having a beveled edge mounted to permit the edge of a blank to be projected thereover, a movable clamping plate having a beveled edge parallel with and slightly out of alinement with the edge of the fixed die plate, a bender block having a straight line movement in alinement with the bevel edge of the clamping plate, a guideway for the bender block secured to and movable with the clamping plate, the clamping plate having its movement imparted thereto by the movement of the bender block, substantially as described.

3. In a metal working machine, a bender consisting of a fixed die plate having a beveled edge and mounted for the projection thereover of the edge of a blank, a bracket pivoted in suitable relation to the die plate and having mounted thereon a clamping plate having a beveled edge parallel with the edge of the die plate, an obliquely extending guideway in alinement with the beveled edge of the clamping plate, a bender block slidably mounted within the guideway, and means for imparting a movement to the pivoted bracket and to the slidable bender block, substantially as described.

4. In a metal working machine, a bender consisting of a fixed die plate having a beveled edge and mounted for the projection thereover of the edge of a blank, a bracket pivoted in suitable relation to the die plate and having mounted thereon a clamping plate having a beveled edge parallel with the edge of the die plate, an obliquely extending guideway in alinement with the beveled edge of the clamping plate, a bender block slidably mounted within the guideway, means for imparting a sliding movement to the bender block, and for imparting a movement to the pivoted bracket by bringing the bender block into contact with the end of the guideway, substantially as described.

5. In a metal working machine, a bender consisting of a fixed die plate having a beveled edge and mounted for the projection thereover of the edge of a blank, a bracket pivoted in suitable relation to the die plate and having mounted thereon a clamping plate having a beveled edge parallel with the edge of the die plate, an obliquely extending guideway in alinement with the beveled edge of the clamping plate, a bender block slidably mounted within

the guideway, means for imparting a sliding movement to the bender block and for imparting a movement to the pivoted bracket by bringing the bender block into contact with the end of the guideway, and a spring adapted to permit the forward projection of the bender block under tension, substantially as described.

6. In a metal working machine, the combination of a fixed die plate mounted to permit the projection thereover of the edge of a can blank, a pivoted bracket provided with a clamping face having an edge parallel with the edge of the fixed die plate, a guideway within the bracket, a bender block slidably mounted within the guideway and having a movement in alinement with the edge of the clamping plate and adapted at the limit of its movement within the guideway to move the bracket and retract the clamping plate to permit the insertion of a blank, substantially as described.

7. In a metal working machine, the combination of a fixed die plate mounted to permit the projection thereover of the edge of a can blank, a pivoted bracket provided with a clamping face having an edge parallel with the edge of the fixed die plate, a guideway within the bracket, a bender block slidably mounted within the guideway and having a movement in alinement with the edge of the clamping plate and adapted at the limit of its movement within the guideway to move the bracket and retract the clamping plate to permit the insertion of a blank, a yoke provided with side arms adapted to embrace the bender block, and means for pivoting the side arms of the yoke to the bender block, substantially as described.

8. In a metal working machine, the combination of a fixed die plate having a beveled edge adapted for the projection thereover of a metal blank, a bracket pivoted in suitable relation to the fixed die plate and having a clamping plate provided with a beveled edge parallel with the edge of the die plate, a guideway within the bracket, a bender block within the guideway having a movement in alinement with the beveled edge of the clamping plate and adapted when retracted to abut against the end of the guideway and move the bracket, a yoke adapted to embrace the ends of the bender block, and means for imparting movement to the yoke, substantially as described.

9. In a metal working machine, the combination of two benders adapted to hook the edges of a can blank in opposite directions the up bender having a die plate adapted to overlie the can blank and provided with a beveled edge in oblique relation to the plane of the can blank, a clamping plate underlying the can blank and having a beveled edge parallel with the edge of the die plate, a guideway in oblique relation to the plane of the blank and in alinement with the oblique edge of the clamping plate, a bender block movable within the guideway in alinement with said beveled edge, means for moving the clamping plate and bender block, the down bender having a fixed die plate adapted to underlie the can blank, a clamping plate adapted to overlie the can blank, both the plates having edges in oblique relation to the plane of the blank and parallel with one another, a guideway in alinement with the oblique edge of the clamping plate, a bender block slidable in the guideway, and means for moving the overlying clamping plate and bender block, substantially as described.

10. In a metal working machine, the combination of up and down benders adjustably mounted with respect to one another, each of the benders comprising a die plate and a clamping plate having beveled edges in oblique relation to the plane of the blank and parallel with one another, each bender having a movable bracket to which the clamping plate is secured and having within the bracket a guideway in alinement with the oblique edges of the clamping plates, and each having a bender block slidable within the guideway, the die plates of the two benders being in reverse relation to one another, and the clamping plates, guideways and bender blocks being likewise in reverse relation to one another for bending the edges of a can blank in opposite directions, substantially as described.

11. In a metal working machine, the combination of a pair of plates slidably mounted with respect to one another, a left and right hand screw for simultaneously

moving the plates, up and down benders mounted on the two plates, each of the benders comprising a fixed die plate having a beveled edge, a movable clamping plate having a beveled edge, a slidable bender block having a straight movement in alinement with the beveled edges of the clamping plates, the bender blocks on the two benders being in reverse relation with respect to one another to give an upward bend or hook to one side of the can blank, and a downward hook or bend to the other side, and means for imparting movement to the bender blocks and clamping plates, substantially as described.

12. In a metal working machine, the combination of a pair of supporting plates adjustably mounted with respect to one another, a right and left screw rod for adjusting the two plates, up and down benders carried by the two plates, the up bender comprising a fixed overhanging arm, a die plate having a beveled edge secured to the arm, a pivoted bracket having secured thereto a clamping plate beneath the die plate and having a beveled edge parallel with the edge of the die plate, an obliquely extending guideway in the bracket, a bender block slidably mounted within the guideway, the down bender comprising a fixed underlying die plate having a beveled edge, a pivoted overhanging bracket having secured to its under face a clamping plate having a beveled edge parallel with the die plate, an obliquely extending guideway, and a bender block within the guideway having a movement in alinement with the beveled edges of the clamping plates, and means for imparting movements to the companion bender blocks and brackets for bending the edges of a can blank in opposite directions, substantially as described.

13. In a metal working machine, the combination of a pair of supporting plates adjustably mounted with respect to one another, a right and left screw rod for adjusting the two plates, up and down benders carried by the two plates, the up bender comprising a fixed overhanging arm, a die plate having a beveled edge secured to the arm, a pivoted bracket having secured thereto a clamping plate beneath the die plate and having a beveled edge parallel with the edge of the die plate, an obliquely extending guideway in the bracket, a bender block slidably mounted within the guideway, the down bender comprising a fixed underlying die plate having a beveled edge, a pivoted overhanging bracket having secured to its under face a clamping plate having a beveled edge parallel with the die plate, an obliquely extending guideway, and a bender block within the guideway having a movement in alinement with

the beveled edge of the clamping plate, means for moving the bender blocks and thereafter moving the pivoted brackets when the bender blocks have reached the limit of their travel within the guideways for giving a reverse bend or hook to the opposite ends of a can blank, substantially as described.

14. In a metal working machine, the combination of a fixed die plate having a beveled edge adapted for the projection thereover of a metal blank, a bracket pivoted in suitable relation to the fixed die plate and having a clamping plate provided with a beveled edge parallel with the edge of the die plate, the bracket being further provided with a guideway open at the sides, a bender block within the guideway having a movement in alinement with the clamping plate, a yoke adapted to embrace the bracket and having pivots connecting the arms of the yoke with the sides of the bender block for moving the block within the guideway, and means for retracting the bracket to retract the clamping plate prior to the insertion of a blank, substantially as described.

15. In a metal working machine, the combination of a fixed die plate having an edge adapted for the projection thereover of a metal blank, a bracket pivoted in suitable relation to the fixed die plate and having a clamping face adapted to coact with the fixed die plate, a guideway within the pivoted bracket, a bender block slidably within the guideway to bend the projected edge of the blank, and means for moving the bender block to the limit of the guideway and thereafter retracting the bracket by the continued movement of the bender block, substantially as described.

16. In a metal working machine, the combination of a fixed die plate having an edge adapted for the projection thereover of a metal blank, a bracket movable in suitable relation to the fixed die plate and having a clamping face adapted to coact with the fixed die plate, a guideway within the bracket, a bender block slidably within the guideway to bend the projected edge of the blank, and means for moving the bender block to the limit of the guideway and thereafter retract the bracket by the continued movement of the bender block, substantially as described.

CHARLES B. McDONALD.

Witnesses:

WALKER BANNING,
FRANCES M. FROST.