

No. 809,230.

PATENTED JAN. 2, 1906.

F. E. STRASBURG.
PAPER BAG MACHINE.

APPLICATION FILED APR. 26, 1904.

6 SHEETS—SHEET 1.

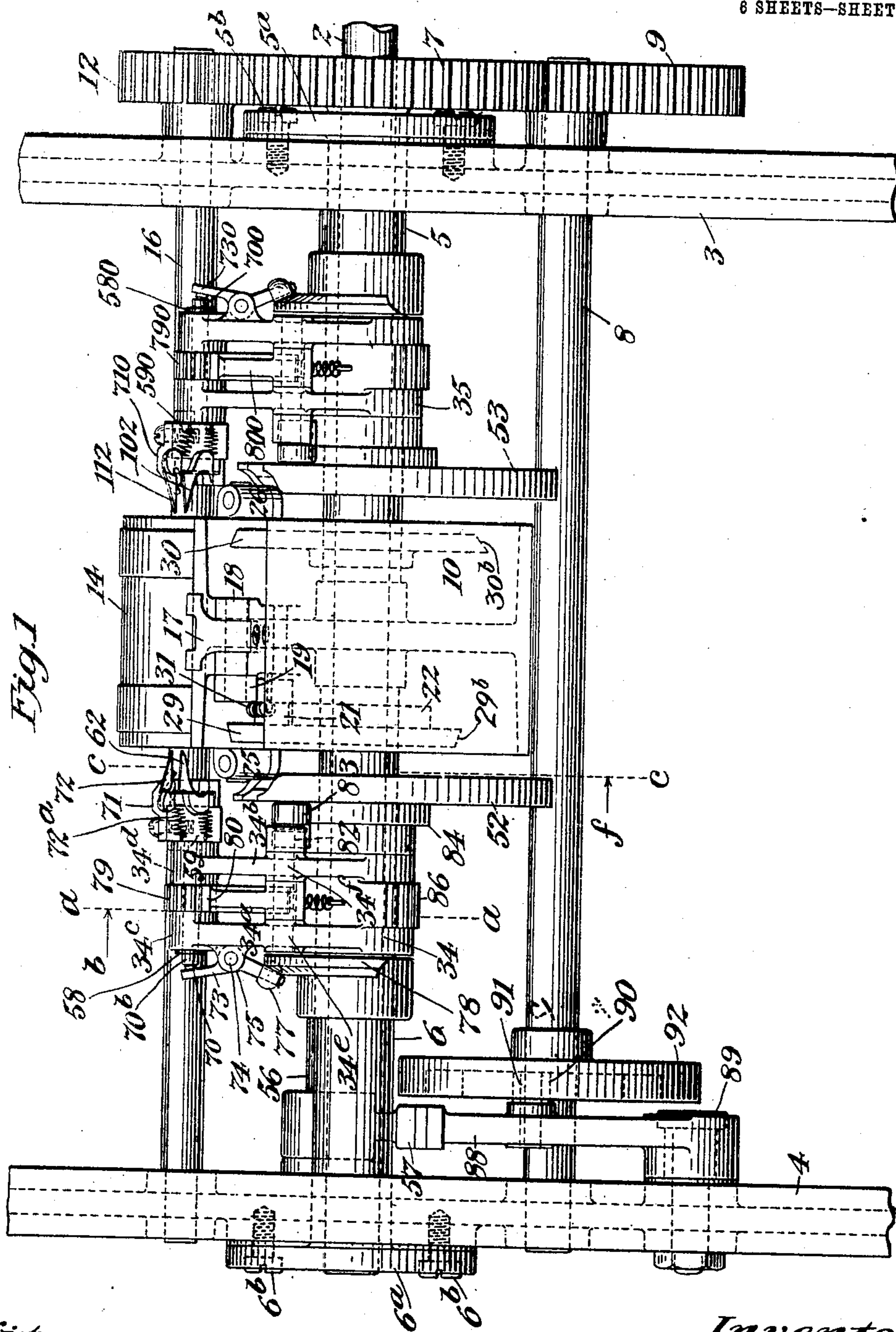


Fig. 1

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Frank D. Lewis

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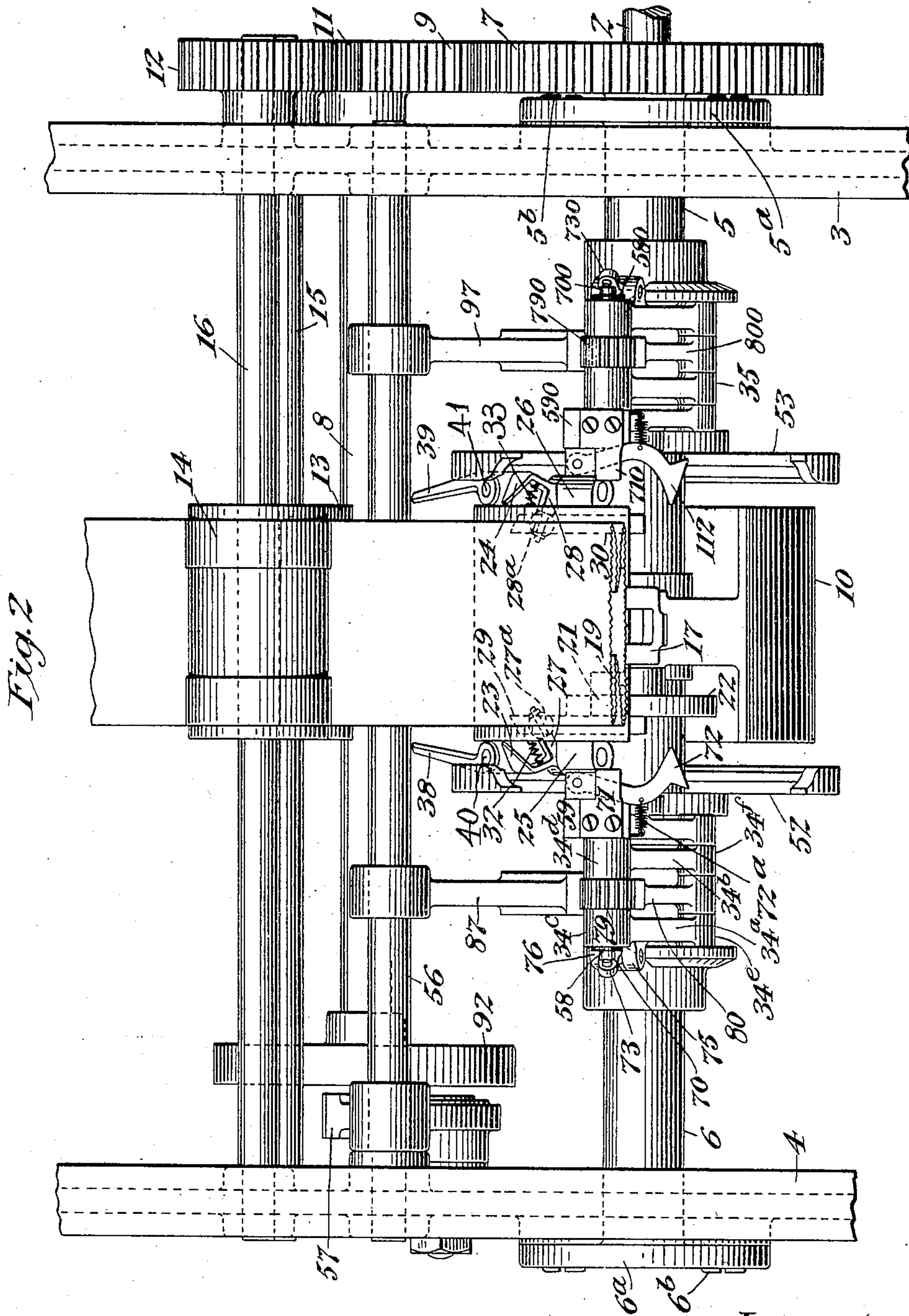
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6 SHEETS—SHEET 2.



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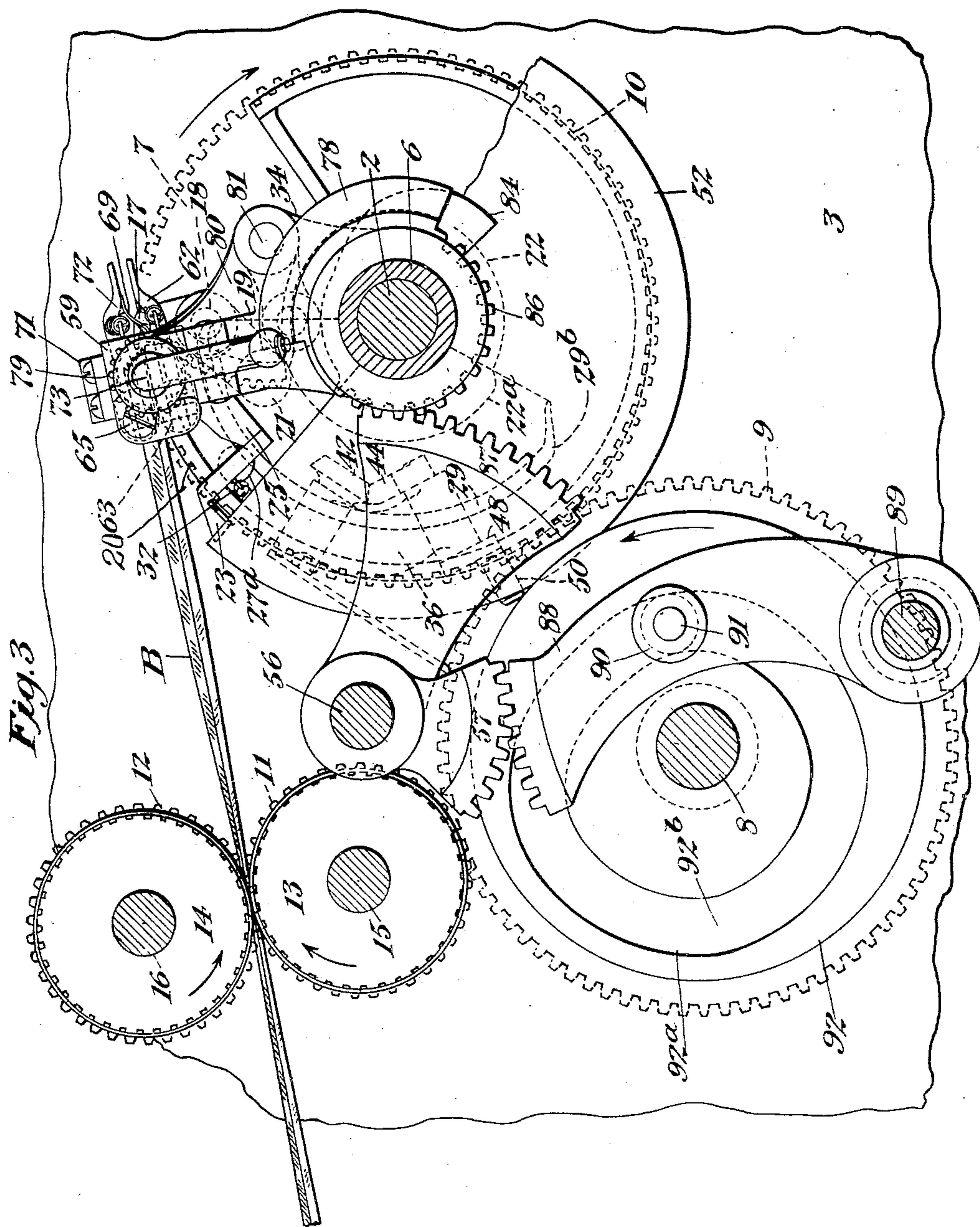
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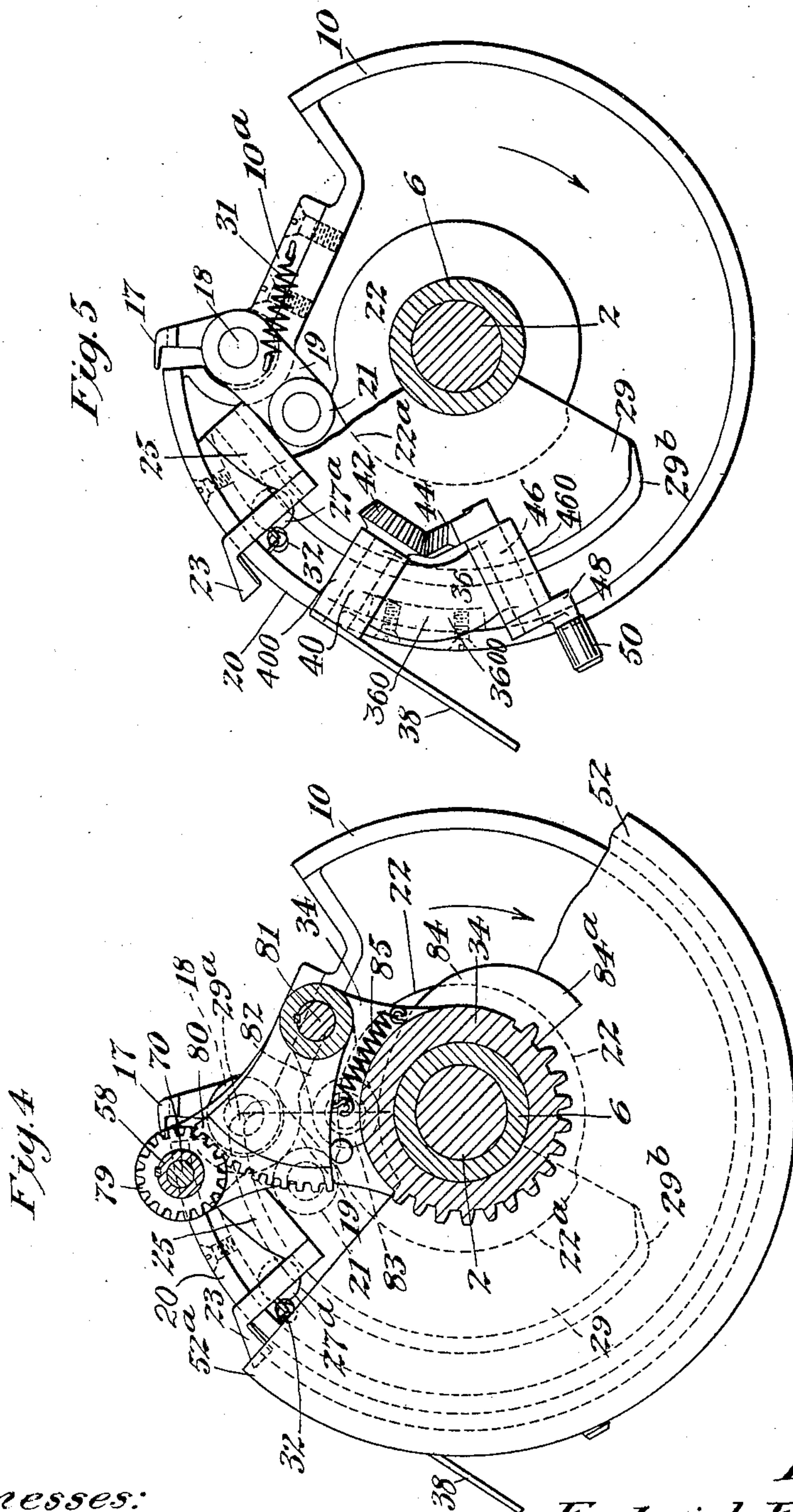
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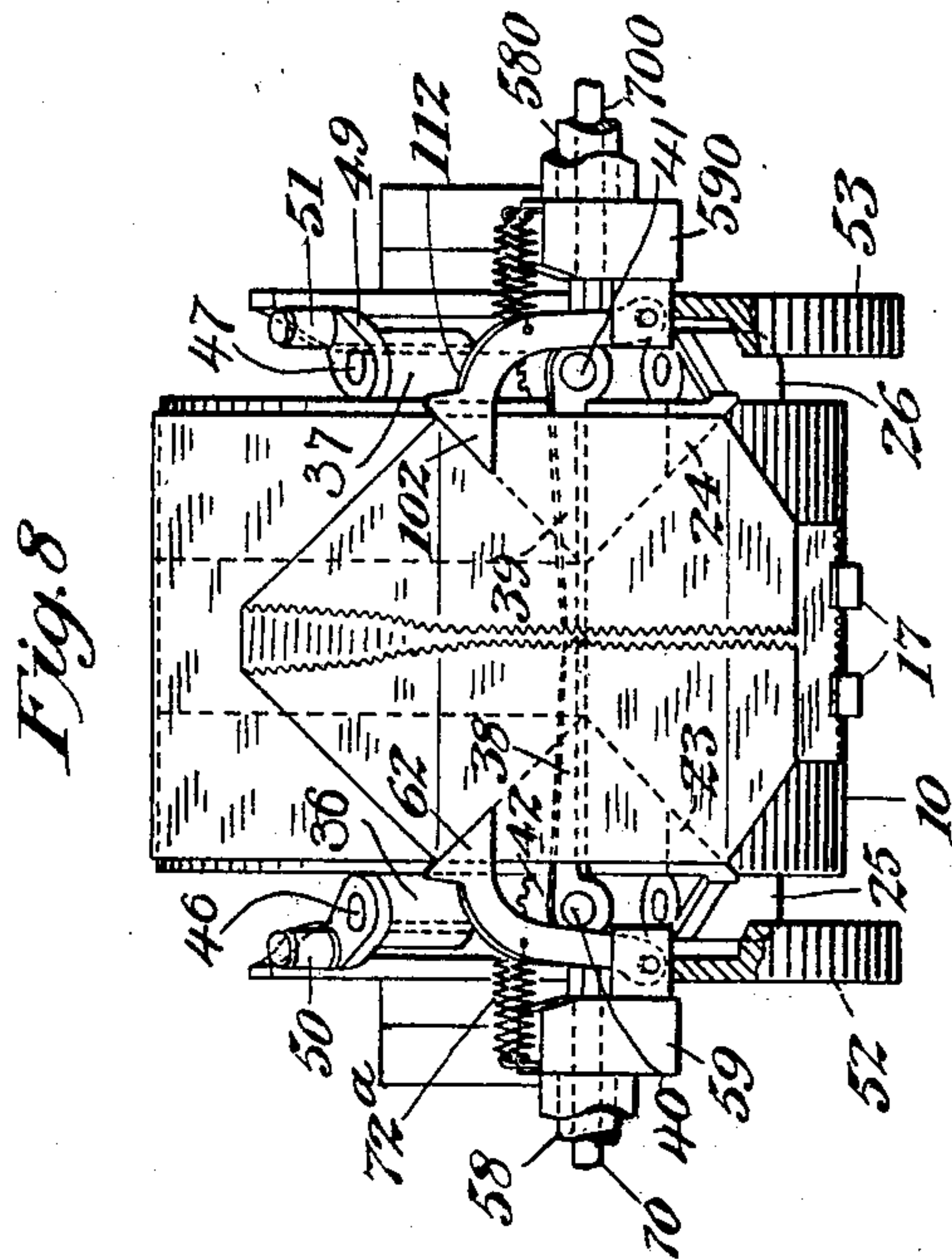


Fig. 8

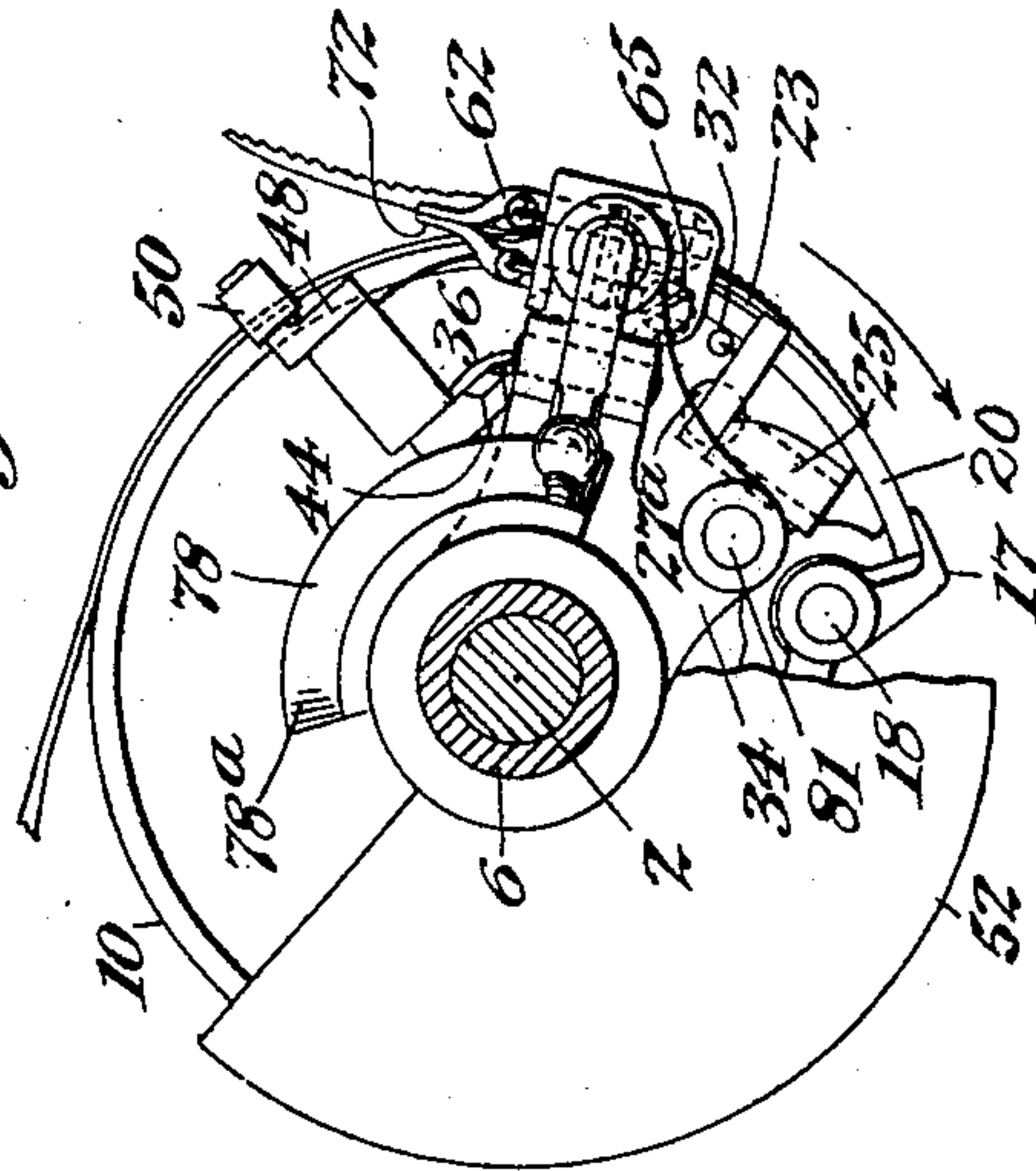


Fig. 9

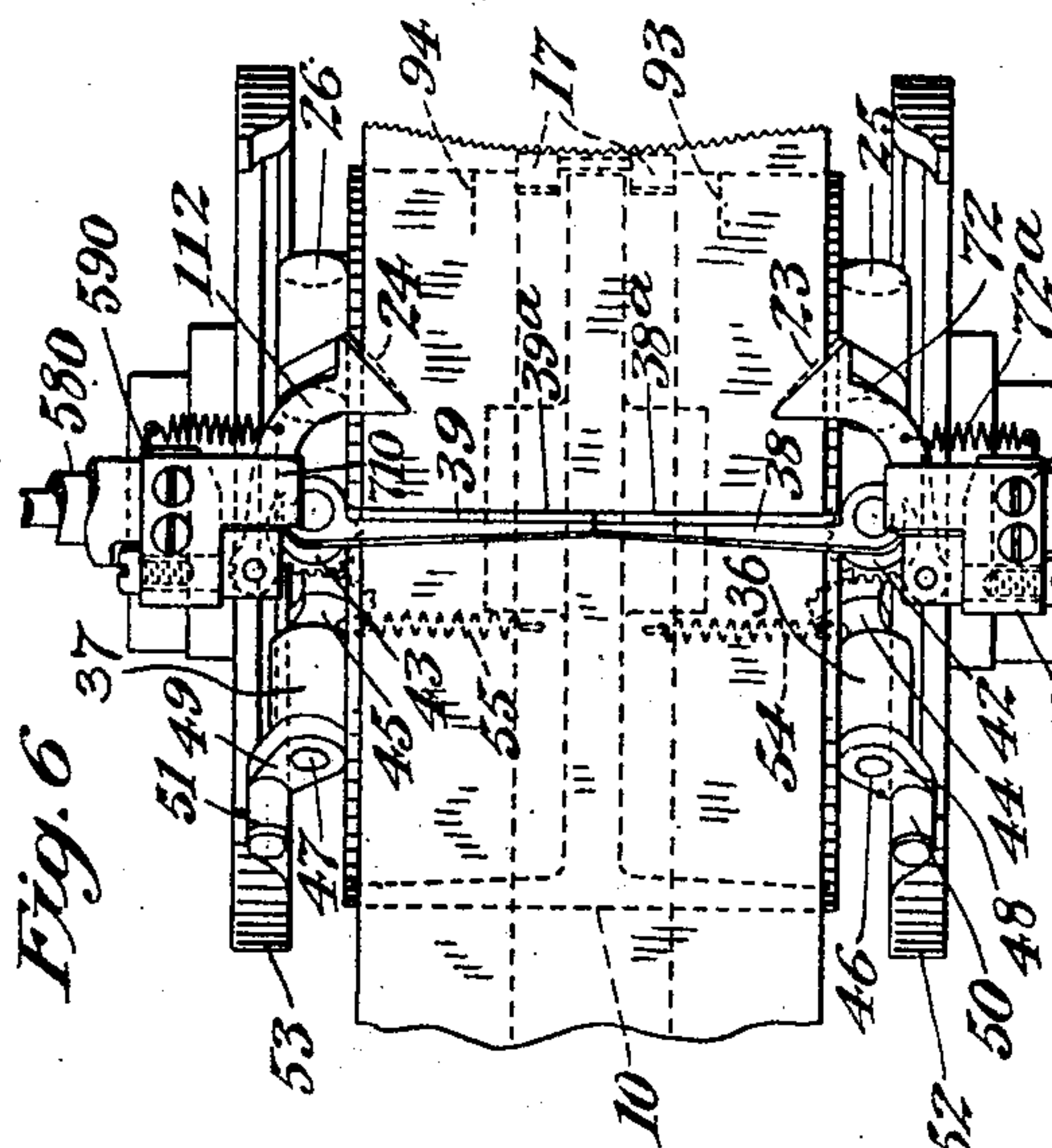


Fig. 6

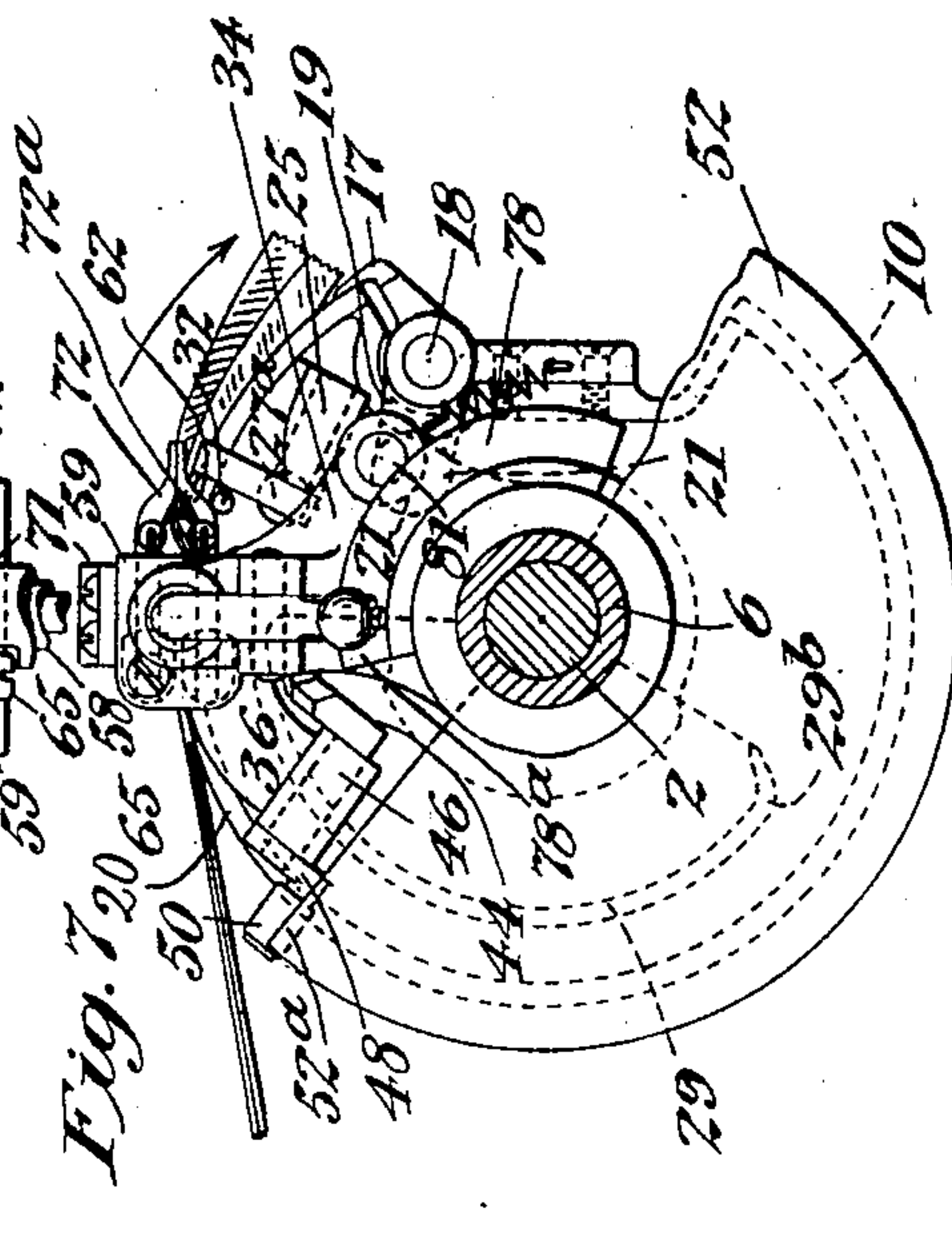


Fig. 7

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6 SHEETS—SHEET 6.

Fig. 10

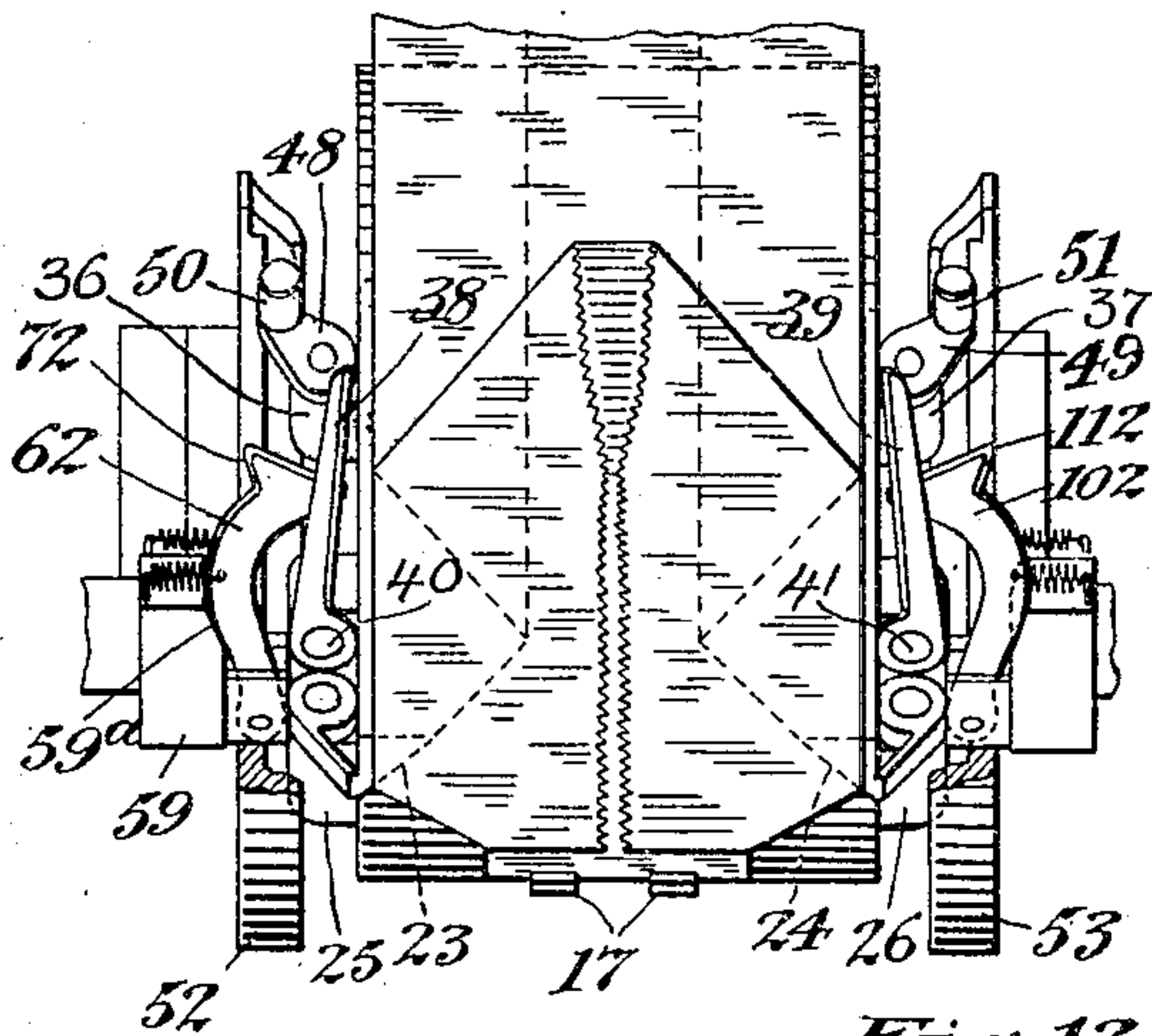


Fig. 11

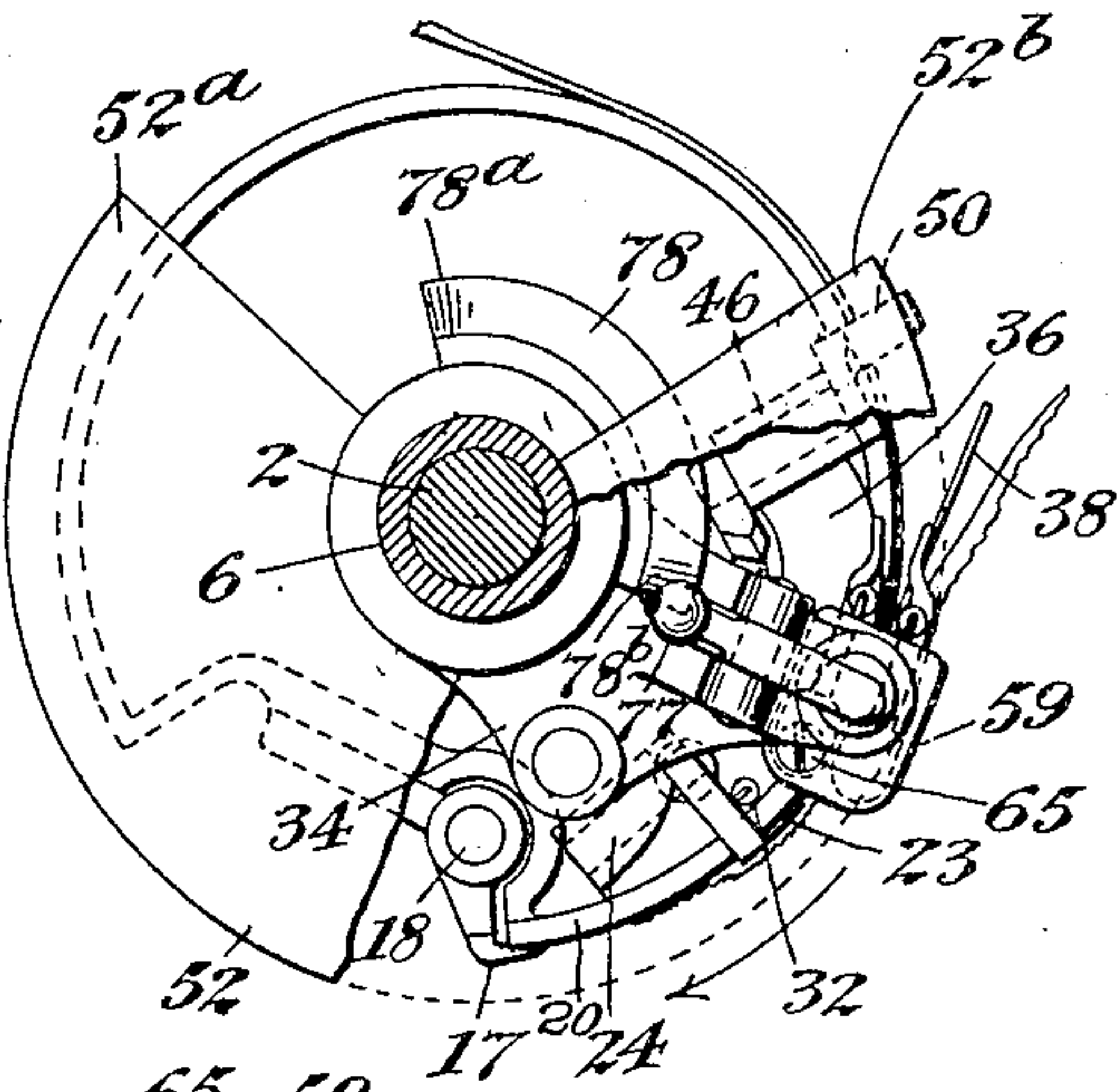


Fig. 12

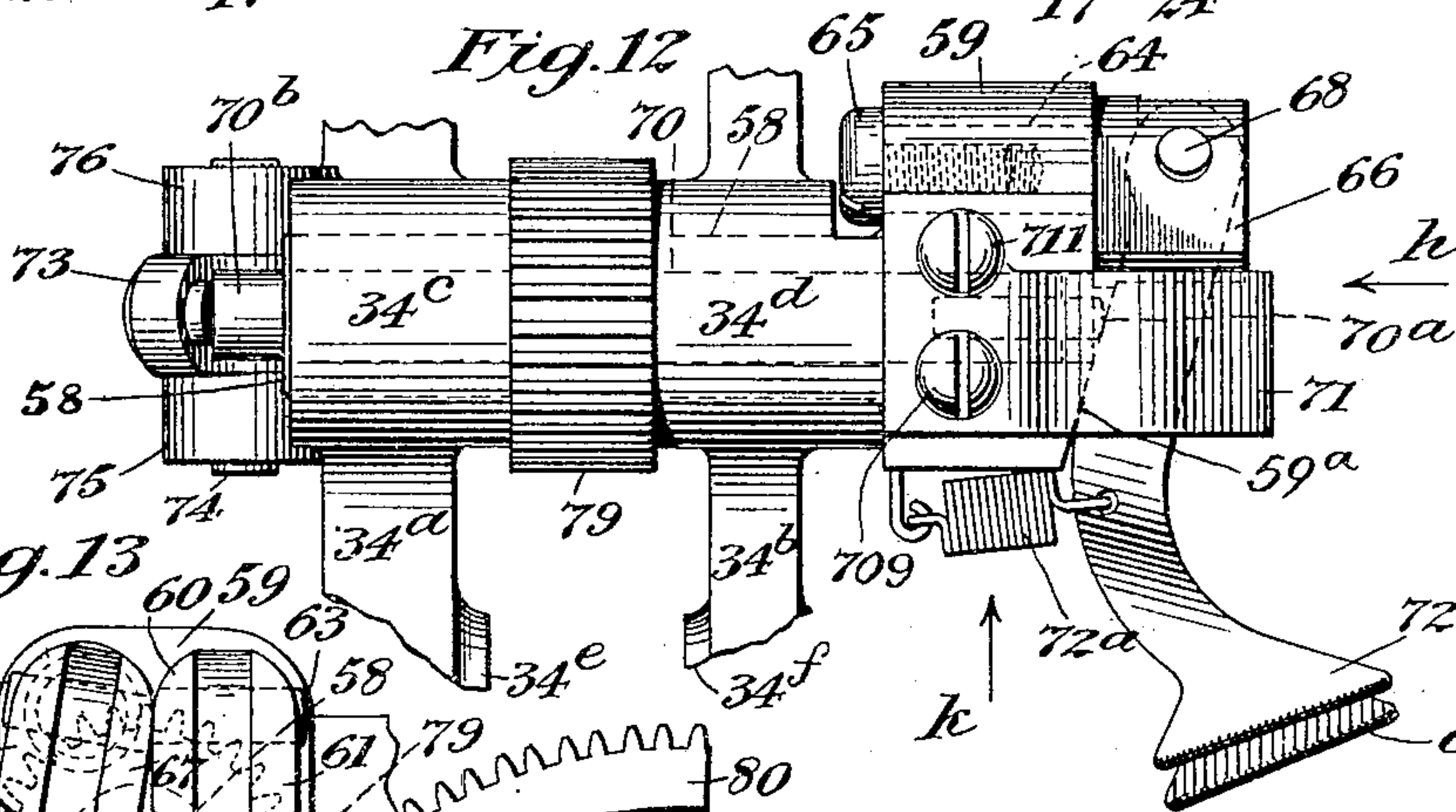


Fig. 13

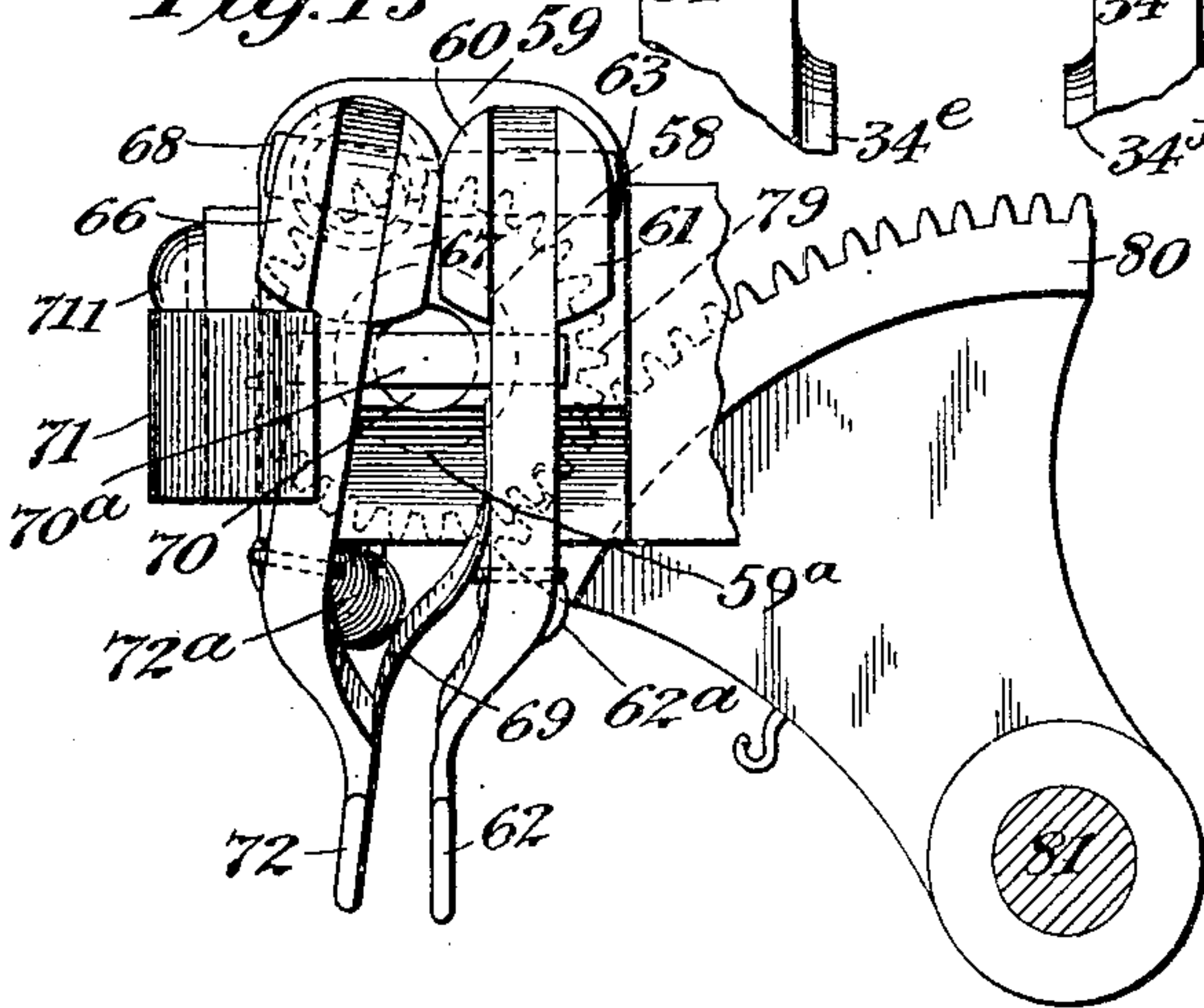
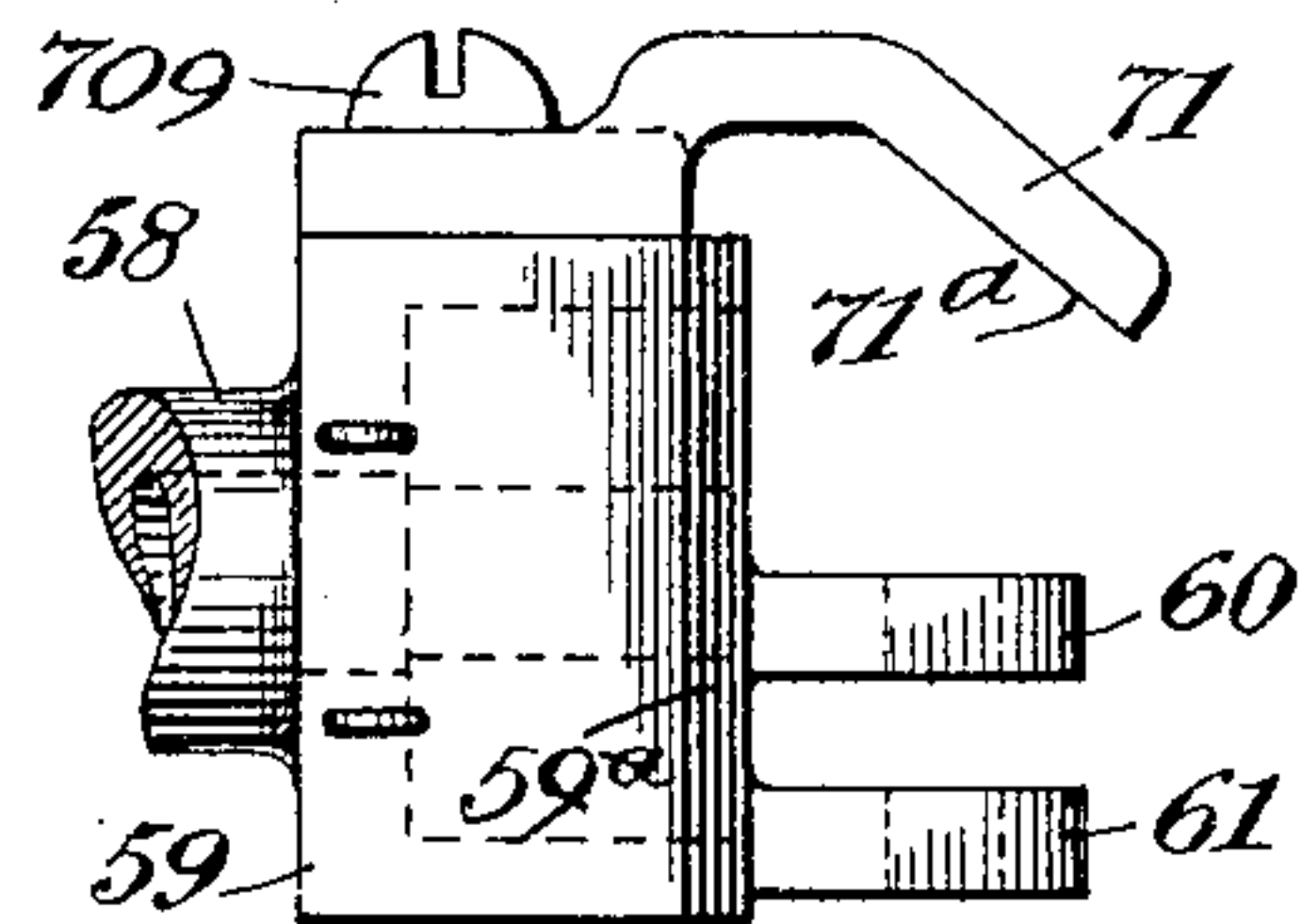


Fig. 14



Witnesses:

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UNITED STATES PATENT OFFICE.

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CONTINENTAL PAPER BAG COMPANY, A CORPORATION OF MAINE.

PAPER-BAG MACHINE.

No. 809,230.

Specification of Letters Patent.

Patented Jan. 2, 1906.

Application filed April 26, 1904. Serial No. 204,992.

To all whom it may concern:

Be it known that I, FREDERICK E. STRASBURG, a citizen of the United States, residing at Rumford Falls, in the county of Oxford and State of Maine, have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a specification.

This improvement relates to paper-bag machines, and directly to that class of paper-bag machines for automatically making square-bottom paper-bags from paper-tubing having an inwardly-folded tuck in each side thereof. My improvement relates to those parts of such a machine as are provided to form the so-called "diamond fold."

In the drawings accompanying this specification, Figure 1 is a rear elevation of so much of a paper-bag machine as will serve to illustrate my improvement. Fig. 2 is a plan view of the same. Fig. 3 is a side elevation of the same, partly in section, with the left-hand side frame of Fig. 1 removed, and the view is taken from the left-hand side of said Fig. 1. Fig. 4 is a side elevation, partly in section, similar to a portion of Fig. 3. The section is taken on line *aa* of Fig. 1 and looking in the direction indicated by arrow *b* in said Fig. 1. Fig. 5 is a similar section taken on line *cc* of Fig. 1 and looking in the direction of arrow *f* in said Fig. 1 and with a part of cam 29 broken away. Figs. 6 to 11, inclusive, are plans and elevations, respectively, illustrating successive positions of the mechanism of my improvement in the operation of opening out the forward end of the bag-tube and folding the same down into the diamond fold. Fig. 12 is a plan view, on an enlarged scale, of one of the upper ply-gripping and turning-over mechanisms. Fig. 13 is an elevation, also on an enlarged scale, of substantially the same parts as shown in Fig. 12 and looking in the direction of arrow *h* in said Fig. 12. Fig. 14 is a side elevation, on an enlarged scale, of head 58 and cam 71 of Fig. 12 and looking in the direction of arrow *k* in said figure.

The general type of machine in which in the present instance I have chosen to incorporate my improvement may comprise side frames, as 3 4, in which may be supported the various parts of my improvement. Main shaft 2 is supported in inwardly-projecting sleeve-like bearings 5 6, having flanges 5^a 6^a, respectively, which by means of screws, as 5^b 6^b, are secured to frames 3 4, respectively. On

said shaft 2 is fixed about midway the two side frames folding-bed carriage 10, and on one end of said shaft is fixed gear 7. Meshing with said gear on shaft 8 is gear 9, of equal diameter to gear 7. Said shaft 8 is so located that gear 9 will mesh not only with gear 7 on shaft 2, but also with gear 11 on shaft 15, which shaft 15 carries feed-roll 13 thereon for coaction with feed-roll 14 on shaft 16. Shaft 16 has fixed thereon gear 12 of the same diameter as gear 11 and meshing therewith. By the means just described rolls 13 14 may be driven at equal peripheral speed from gear 9.

Power may be communicated by some suitable means (not shown) to shaft 2 and thence through gears 7 and 9 to the various parts of the machine.

Carriage 10 is shown in the present instance as having but one folding-bed 20; but my improvement is not limited to such construction, but is equally useful in connection with a revoluble carriage having a plurality of folding-beds. Said folding-bed 20 is provided with the usual front clip 17 for clamping the forward end of the lower ply of the bag-blank to the folding-bed. Said front clip is pivotally mounted on shaft 18 in bracket 10^a on carriage 10. Pivot-shaft 18 is provided with an inwardly-extending arm 19, on the free end of which arm is pivoted roll 21 for engagement with fixed cam 22 on sleeve 6, Fig. 5, for opening said front clip. Roll 21 may be urged toward the face of cam 22, and front clip 17 may be closed when permitted by said cam by means of a spring, as 31, one end of which is attached to arm 19 and the other end to bracket 10^a. The folding-bed is also provided with a pair of oppositely-disposed bevel-edged side clips 23 24, pivotally mounted at 25 26, respectively, on carriage 10 for engaging with the lower plies, respectively, of the bag-blank and clamping the same to the folding-bed. Said bevel-edged side clips are provided with inwardly-extending arms 27 28, respectively, on the free ends of which are pivotally-mounted rolls 27^a 28^a, respectively, for engagement with fixed cams 29 30, respectively, for opening said side clips. The rolls on the free ends of arms 27 28 may be urged toward their respective cams, and side clips 23 24 may be closed when permitted by said cams by means of springs 32 33, respectively. One end of spring 32 is attached to the shank of clip 23 and the other end thereof is attached to the

under side of folding-bed 20. Spring 33, on the opposite side of the folding-bed, is attached in a similar manner to the shank of clip 24 and to the under side of said folding-bed. Fixed
5 cams 29 30 are secured to the inward ends, respectively, of sleeves 6 5.

Oppositely disposed on carriage 10 and below the level of the face of folding-bed 20 are brackets 36 37, Figs. 5 and 6. Said brackets
10 are right and left duplicates of each other, and a description of one will suffice for both. Bracket 36 comprises hubs 400 and 460, joined and supported by web 360. Said web 360 has
15 an inreaching portion 3600, by which said bracket 36 is attached to carriage 10. Bracket 36 overhangs the undercut portion of said carriage, whereby space is provided for cam
20 29. Brackets 36 37 are disposed rearwardly as to the direction of travel of the folding-bed of side clips 23 24, respectively, and have
25 mounted therein means for defining the main transverse crease in the bag-blank. Said means comprises, first, defining-blades 38 39, fixed to the outer ends, respectively, of shafts
30 40 41, mounted for oscillation in the hubs of brackets 36 37, respectively. By means hereinafter described said defining-blades may be
35 swung inwardly and outwardly over the face of folding-bed 20, and when in their inward positions, respectively, Fig. 6, said blades present a substantially continuous edge 38^a
39^a across the folding-bed and directly above the bag-blank. Said blades 38 39 are so disposed in relation to side clips 23 24, respectively,
40 that when said blades are in their inward positions their edges 38^a 39^a, respectively, will define at a suitable distance from said side clips the main transverse crease in a
45 bag-blank folded over said edges. Pivot-shafts 40 41 have their axes non-radial to axis 2 of folding-bed carriage 10, and said shafts are so disposed in relation to the folding-bed
as to cause defining-blades 38 39 to close down upon the folding-bed or upon a bag-blank
thereon as said blades are swung to their inward positions, respectively.

The means for operating defining-blades 38 39 are as follows, and as said means are right and left duplicates of each other the description
50 of one will suffice for both. Fixed upon the inner end of shaft 40 in bracket 36 is a bevel-pinion 42, meshing with bevel segment-gear 44 on the inner end of shaft 46, which
55 shaft is also mounted for oscillation in said bracket. On the outer end of said shaft 46 is fixed arm 48, having pivotally mounted at its free end roll 50 for engagement with
60 fixed cam 52, which cam is fast to sleeve 6. By the engagement of said roll 50 with said cam 52 during the rotation of carriage 10 about
its axial shaft 2 shaft 46 may be caused to oscillate, and through gears 44 42 and shaft 40
65 defining-blade 38 may be moved outwardly from the position shown in Fig. 6, for instance, to the position shown in Figs. 2 and

5, for instance. By means of spring 54, Fig. 6, one end of which is attached to segment-gear 44 and the other end to the under side of folding-bed 20, said segment-gear 44 may
70 be pulled inwardly and roll 50 urged against cam 52 for engagement therewith. Also by means of said spring 54, through bevel-segment 42 and shaft 40, blade 38 may be moved
75 inwardly when permitted by cam 52 from the position of Figs. 2 and 5 to that of Fig. 6. By means of mechanism similar to that just
described defining-blade 39 on the opposite side of carriage 10 may be operated inwardly and outwardly over the folding-bed in coaction
80 and in time with defining-blade 38. By the elongation of one of the defining-blades, as 38, so that in its operative position it will extend substantially across the bag-blank the
opposite defining-blade, as 39, may be dispensed with and the one defining-blade perform
85 the function of the two blades. Also it is apparent that a defining-blade or a pair of defining-blades would be equally efficient in coaction with a non-revoluble folding-bed or
with a flat folding-bed, as well as with a cylindrical one, or with a reciprocating folding-bed.
90

On each side, respectively, of carriage 10 and mounted for oscillation on sleeves 6 5, respectively, are arms 34 35. On said arms are
95 mounted those parts of my improvement provided for gripping the upper ply of the bag-blank and for turning over and folding the same down into the diamond form. As these
mechanisms are right and left duplicates of each other, the description of one will suffice
100 for both. Arm 34 is bifurcated, and its upwardly-extending branch arms 34^a 34^b are provided at their upper and free ends with bearings 34^c 34^d, respectively, in which bearings
105 tubular nipper-trunnion 58 is revolvably mounted. On the inward end of said trunnion 58 is formed a rectangular head 59. Between inwardly-extending ears 60 61 on said
head is pivotally mounted on pin 63 lower
110 bevel-edged side nipper 62. Also in said head 59 and above ears 60 61 is pivotally mounted yoke-shaft 64, which shaft is revolvably secured in said head by means of retaining-
115 screw 65. Between yoke ends 66 67 on the inward end of yoke-shaft 64 on pin 68 is pivoted upper bevel-edged side nipper 72. By
means of pin 68 and shaft 64 upper nipper 72 is allowed movement in two planes relative to
120 trunnion-head 59. Upper bevel-edged side nipper 72 is disposed and adapted for coaction with lower bevel-edged side nipper 62 for
gripping the upper ply of the side tuck adjacent thereto of the bag-blank, Figs. 6, 7, 12,
125 13. Said nippers are normally held apart from each other by means of spring 69, which spring has its heel fast to the inward portion
of lower nipper 62 and presses with its free
end against upper nipper 72 at a point remote
130 from the pivotal end of said nipper.

Nippers 62 72 may be thrust inwardly to grip the bag-blank by the following means: Within tubular trunnion 58 is slidably mounted plunger 70. Said plunger is provided at its inner end with a T-head 70^a, disposed and adapted for coaction with the edges of said nippers adjacent thereto. For sliding said plunger inwardly for coaction with said nippers lever 73 is pivotally mounted about midway its length on pin 74 between ears 75 76, which ears project outwardly from arm 34^a. The upper end of said lever 73 contacts with the outer or rear end 70^b of plunger 70, and the lower end of said lever has pivotally mounted thereon roll 77 for engagement with fixed cam 78 on sleeve 6. By running up onto cam 78 roll 77 may be moved outwardly, thereby swinging lever 73 on its pivot 74 and causing the upper end of said lever to force inwardly plunger 70, whereby head 70^a of said plunger may swing nippers 62 72 inwardly on their respective pivots 63 68 into the path of the bag-blank. At the same time by means of incline 71^a on cam 71, which cam is affixed to head 59 of nipper-trunnion 58 by means of screws 709 711, upper nipper 72 is caused to move downwardly toward lower nipper 62 and to coact therewith for gripping a bag-blank. When roll 77 on arm 73 runs off the end of cam 78, nippers 62 72 are returned to their outward and normal positions by means of springs 62^a 72^a, respectively, in coaction with spring 69, which spring is effective for separating said nippers when permitted by the passage of the shank of nipper 72 under the high part of cam 71. One end of spring 62^a is attached to nipper 62 and the other end to head 59, in which head nipper 62 is pivoted, whereby said spring urges said nipper outwardly from the path of the bag-blank and toward abutment 59^a on head 59. By means of spring 72^a, similar and similarly mounted to spring 62^a, nipper 72 is urged outwardly from the path of the bag-blank and toward said abutment 59^a. The outward movement of nippers 62 72 forces outwardly and back to its normal position plunger 70, which plunger in its turn rocks arm 73 on its pivot, returning said arm to its normal position, Fig. 1.

For oscillating nippers 62 72 for turning over the upper plies of the bag-blank when gripped by said nippers the following means are provided: Between bearings 34^e 34^d on arm 34 and fixed to nipper-trunnion 58 is gear 79, meshing with gear-segment 80, which segment is fixed to shaft 81, pivotally supported in bearings 34^e 34^f on arm 34. On the inwardly-projecting end of shaft 81 is fixed arm 82, which arm has pivotally mounted at its free end roll 83 for engagement with fixed cam 84 on sleeve 6. By the riding up of roll 83 onto the high part of cam 84 arm 82, and therefore segment-gear 80, fixed to the same shaft 81 with arm 82, may be oscillated, and thereby gear 79, fixed on nipper-trunnion 58,

meshing with said segment-gear 80, may be oscillated. Furthermore, gears 79 and 80 are in a ratio of one to four, respectively, and therefore an oscillation of gear 80 through about forty-five degrees will impart to gear 79, and thus to nipper-trunnion 58, an oscillation of about one hundred and eighty degrees. For urging roll 83 to engagement with cam 84 a spring 85 is provided, one end of which spring is attached to segment-gear 80 and the other end to arm 34. Said spring, through gears 80 79, is also effective to return nipper-trunnion 58 and nippers 62 72 to their forward positions, Fig. 3, when allowed by cam 84. On that side of carriage 10 opposite side nippers 62 72 are side nippers 102 112, supported in head 590 of trunnion 580. On said trunnion is gear 790, meshing with segment-gear 800, and within said trunnion is plunger 700, and on trunnion-head 590 is cam 710, all mounted and operative similarly to like parts on the opposite side of carriage 10.

To effect the oscillation of arm 34 in a clockwise direction, Fig. 3, to enable nippers 62 72 to coact with the folding-bed mechanism in the formation of the diamond fold, and to effect the return oscillation of said arm the following means are employed: On the lower side of arm 34 is formed a gear 86, adapted for meshing with segment-gear 87, which segment 87 is fast to shaft 56, mounted for oscillation in frames 3 4. Also fast to said shaft 56 is segment-gear 57, meshing with gear-arm 88, which latter is mounted for oscillation on stud 89 in frame 4. On said gear-arm 88 and about midway its length is pivotally mounted roll 90 on stud 91. Said roll is provided and adapted for engagement with cam-slot 92^a in cam 92, which cam is fixed on shaft 8 for revolution therewith. Cam-slot 92^a is so disposed and timed in cam 92 and gear-arm 88 and segment-gears 57, 87, and 86 are so proportioned in relation to each other that arm 34 may be caused to oscillate in a clockwise direction in synchronous coaction with the folding-bed from about the position of Fig. 7 to about the position of Fig. 11, whereupon said cam causes arm 34 to reverse its direction and to return to its initial position ready to repeat its operation. On the opposite side of carriage 10, Fig. 2, and oscillated by segment-gear 97, fast on rock-shaft 56, is arm 35, similar to arm 34 and provided with mechanism similar to that just described in connection with said arm 34 and operated by similar means in a similar manner, except that arm 35 and its mechanism is of the opposite hand to arm 34 and its mechanism, and said arm 35 and its mechanism is so disposed and adapted to operate upon the opposite side of the bag-blank from arm 34 and its mechanism.

The gripping and turning-over mechanism has been described as coacting with transverse

crease-defining blades; but by the employment of paper-bag blanks provided with a previously-formed transverse crease across each thereof at a suitable position lengthwise of the blank said transverse crease-defining blades
 5 may be omitted. Furthermore, the gripping and turning-over means herein described may be used with equal efficiency in connection with a reciprocating or stationary folding-bed, in which latter case means for oscillating said
 10 gripping and turning-over mechanism may be omitted.

The operation of my improved machine is as follows, and as several of the mechanisms are right and left duplicates of each other I will for clearness describe in detail the operation only of one of a kind of such duplicate mechanisms. Suitable tucked-paper tubing having been previously prepared, preferably
 20 with slits, as 93 94, at proper intervals therein and severed into bag-blanks by any of the well-known means therefor, the forward end of one of said bag-blanks, as B, is presented to the grip of rolls 13 14, which rolls are assumed to be in their initial positions. The
 25 machine is now started and rolls 13 14 revolve in the directions indicated by their relative arrows and feed the bag-blank forward and deliver its leading end onto revolving folding-bed 20 with the lower ply thereof under front clip 17, Fig. 3. Roll 21 on arm 19,
 30 which arm is fast to shaft 18 of front clip 17, Fig. 5, now rides off from high part 22^a of cam 22, and spring 31 causes front clip 17 to close and to clamp the lower ply of the mouth of the bag-blank to the folding-bed. Immediately after the closing of front clip
 35 17 roll 27^a on arm 27 of side clip 23 rides off end 29^a of cam 29, and spring 32 causes said side clip to close and to clamp to the folding-bed the lower ply of the side tuck adjacent thereto of the bag-blank, Fig. 7. Side clip
 40 24 on the opposite side of said folding-bed 20 is operated in unison with clip 23 and by means similar to those just described for operating said side clip 23. Carriage 10 continuing its revolution, bracket 36 thereon is carried onward until roll 50 on arm 48 of
 45 shaft 46 in said bracket reaches low part 52^a at the end of cam 52. By the pull of spring 54 segment-gear 44 on shaft 46 is rotated, and through segment-gear 42 on shaft 40 defining-blade 38 is swung inwardly and downwardly onto the bag-blank and at right angles to the length of said blank, as shown in
 55 Figs. 6 and 7. At the same time and in unison with the movement of defining-blade 38 defining-blade 39 on the opposite side of the folding-bed is swung inwardly and downwardly onto the bag-blank in a similar manner by similar means to those just described for operating defining-blade 38. During the foregoing operations cam 92 has been revolving in an anticlockwise direction and through
 60 roll 90 on arm 88 has swung said arm on its

pivot-stud 89 and through segment-gears 57, 87, and 86 has turned arm 34, which arm carries one of the upper-ply-gripping and turning-over mechanisms from the position of Fig. 3 to that of Fig. 6. The contour of cam-groove 92^a is such that shortly after leaving
 70 the position of Fig. 3 arm 34 is caused to travel at uniform speed with carriage 10. As said arm 34 moves from the position of Fig. 3 to that of Fig. 6 roll 77 on arm 73 mounts rise 78^a of cam 78, and said arm 73 is swung on its pivot 74 and forces plunger 70 inwardly in tubular trunnion 58, Figs. 6 and 7. T-head 70^a of said plunger 70 thereupon swings nippers 62 72 on their respective pivots, lower nipper 62 entering the side tuck adjacent thereto of the bag-blank and upper nipper 72 passing above the upper ply of said side tuck. At the same time upper nipper 72 by engagement with cam 71 is swung
 80 downwardly on pivot-shaft 64 and contacts with the top of said upper ply and grips the same to lower nipper 62. Nippers 102 112 on the opposite side of the bag-blank are operated synchronously with nippers 62 72 and in a similar manner and by similar means to those just described in the operation of said nippers 62 72. The oppositely-disposed upper plies of the side tucks of the bag-blank being now in the grip of their respective nippers 62 72 and 102 112, folding-bed 20 and arm 34 continue their clockwise synchronous movements and roll 33 on arm 82 of shaft 81 rides up onto high part 84^a of cam 84, thereby oscillating segment-gear 80 on said shaft
 85 81. Said segment-gear 80, meshing with gear 79 on trunnion 58, rotates said trunnion and nippers 62 72, mounted in head 72^a thereof, through about one hundred and eighty degrees from the position of Figs. 6 and 7 to the position of Figs. 8 and 9. Nippers 102 112 are operated synchronously with nippers 62 72 and in a similar manner and by similar means. The upper plies of the tucked-paper bag-blank are thereby turned over and the well-known diamond fold formed. Roll 77 now rides down the low end 78^b of cam 78, and springs 62^a 72^a withdraw nippers 62 72, respectively, from the path of the bag-blank, and at the same time, by the force of spring 69, nipper 72 moves to the high part 71^a of cam 71, and said spring 69 separates nippers 62 72 and causes them to release their hold on the bag-blank, Figs. 10 and 11. Nippers 102 112 are withdrawn and release the opposite side of the bag-blank in a similar manner and by similar means and synchronously with the movement of nippers 62 72. Also during the withdrawing and opening of side nippers 62 72 and 102 112 roll 50 on arm 48 of shaft 46 has ridden up onto high part 52^b of cam 52, and through segment-gears 44 42 and shaft 40 defining-blade 38 has been swung outwardly from engagement with the bag-blank, as in Figs. 8, 9, to its outer and idle position,

as in Figs. 10, 11. At the same time and by similar means defining-blade 39 on the opposite side of the folding-bed has been swung to its idle position, as in said Figs. 10, 11.

5 Arm 34 has now reached the end of its stroke in coaction with the folding-bed and immediately thereafter slows down and for an instant stops as high part 92^b of cam 92 engages roll 90 on gear-arm 88. Immediately there-

10 after the direction of movement of arm 88, and therefore arm 34, is reversed to an anti-clockwise direction, and roll 77 mounts rise 78^b of cam 78, roll 83 rides down from high part 84^a of cam 84, and nippers 62 72 are

15 moved inwardly into idle coaction and trunnion 58 is turned over, thereby carrying said nippers backwardly, and roll 77 runs down incline 78^a of cam 78, and said nippers are thereby withdrawn and opened, as in their

20 initial positions of Fig. 3. Nippers 102 112 are at the same time returned by similar means and in a similar manner to their initial positions. During the just-described return

25 movements of nippers 62 72 102 112 carriage 10 has continued its clockwise movement, rolls 27^a 28^a have ridden up onto ends 29^b of cam 29 and 30^b of cam 30, respectively, and side clips 23 24 have released their grip on

30 the bag-blank. Also roll 21 has ridden up onto high part 22^a of cam 22, and front clip 17 has been lifted from engagement with the bag-blank, and said bag-blank is ready to be delivered to some suitable mechanism (not

35 shown) for ironing the diamond fold and for pasting and folding the end flaps thereof for the completion of the bag-bottom. Carriage 10 continues its rotation on shaft 2 and presently returns to its initial position, as in Fig. 3, and the machine is ready for a repetition

40 of the whole operation.

I claim—

1. The combination of a revoluble folding-bed, a pair of side clips thereon, a pair of nipper-trunnions, oppositely disposed with re-

45 spect to the folding-bed, and having their axes substantially coincident with a straight line transverse the folding-bed and mounted for oscillation about the axis of said folding-bed, a pair of side nippers pivotally mounted in

50 each nipper-trunnion for oscillation transverse the folding-bed, one member of each pair of side nippers mounted for oscillation toward and away from the other member of its respective pair, means to oscillate the nip-

55 per-trunnions about their own axis and about the axis of the folding-bed, means to oscillate the side nippers transverse the folding-bed, and means to oscillate one member of each pair of side nippers toward and away from

60 the other member of its respective pair; all combined and operating together substantially as described.

2. The combination of a folding-bed, a pair of side clips 23, 24 thereon; a pair of defining-

blades 38, 39 for defining the main transverse 65 crease and vibrating upon axes substantially normal to the line of their defining edges, said axes forming acute angles respectively with the folding-bed, means for opening out the forward end of the bag-blank and folding 70 the same down over the defining-blades, means for timing the side clips, the defining-blades and the folding means each with the others, and means for delivering the bag-blank to the folding-bed; all combined and operating to-

75 gether substantially as described.

3. The combination of a folding-bed, a pair of side clips 23, 24 thereon; two pairs of side nippers 62, 72 and 102, 112 vibrating inwardly and outwardly, with respect to the path of the 80 bag-blank; nipper-trunnions 58, 580; said pairs of side nippers mounted for oscillation on said nipper-trunnions respectively; cams 71, 710 for closing the side nippers respectively; gears 79, 790, and segment-gears 80, 800 for 85 oscillating the nipper-trunnions respectively; and plungers 70, 700 for vibrating the side nippers respectively; all combined and operating together substantially as described.

4. The combination of a revoluble folding- 90 bed, a pair of side clips 23, 24 thereon; two pairs of side nippers 62, 72 and 102, 112 vibrating inwardly and outwardly, with respect to the path of the bag-blank; nipper-trunnions 58, 580; said pairs of side nippers 95 mounted for oscillation on said nipper-trunnions respectively; cams 71, 710 for closing the side nippers respectively; gears 79, 790, and segment-gears 80, 800 for oscillating the nipper-trunnions respectively; plungers 70, 100 700 for vibrating the side nippers respectively; arms 34, 35 oscillating about the axis of the revoluble folding-bed, said arms having mounted thereon respectively nipper-trunnions 58, 580, cams 71, 710, and segment-

105 gears 80, 800; all combined and operating together substantially as described.

5. The combination of a folding-bed 20, a pair of side clips 23, 24 thereon; two pairs of side nippers 62, 72 and 102, 112 vibrating in-

110 wardly and outwardly, with respect to the path of the bag-blank; nipper-trunnions 58, 580; said pairs of side nippers mounted for oscillation on said nipper-trunnions respectively; cams 71, 710 for closing the side nip-

115 pers respectively; gears 79, 790 and segment-gears 80, 800 for oscillating the nipper-trunnions respectively; plungers 70, 700 for vibrating the side nippers respectively; oscillating arms 34, 35 having mounted thereon 120 respectively nipper-trunnions 58, 580, cams 71, 710, and segment-gears 80, 800; all combined and operating together substantially as described.

6. The combination of a folding-bed, side 125 clips 23, 24 thereon, a pair of defining-blades for defining the main transverse crease, and vibrating upon axes substantially normal to

the line of their defining edges, said axes forming acute angles respectively with the folding-bed; and means for folding the upper plies of the bag-blank over the defining-blades, 5 all combined and operating together substantially as described.

7. The combination of a folding-bed, means for holding a bag-blank thereon; a defining-blade, mounted for vibration upon an axis 10 substantially normal to the line of its defining edge, said axis forming an acute angle lengthwise with the folding-bed and means for folding the bag-blank down over the defining-blade, all combined and operating together 15 substantially as described.

8. The combination of a folding-bed, means for holding a bag-blank thereon; a pair of defining-blades 38, 39 each vibrating upon an axis substantially normal to the line of its 20 defining edge, said axes forming acute angles respectively with the folding-bed, means contacting with the folding-bed, for opening out the forward end of the bag-blank and folding the same down over the defining-blades all

combined and operating together substantially as described. 25

9. The combination of a revoluble folding-bed, a pair of oppositely-disposed trunnions 58, 580 each mounted for oscillation about its own axes and about the axis of the folding-bed, side clips 23, 24 on the folding-bed, a 30 pair of side nippers carried by each trunnion, said side nippers being mounted in their respective trunnions for vibration inwardly and outwardly with respect to the folding-bed, 35 one of each pair of said side nippers being mounted for vibration toward and away from the other nipper of its respective pair, all combined and operating together substantially as described. 40

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 22d day of April, 1904.

FREDERICK E. STRASBURG.

Witnesses:

THEO. HAWLEY,

HAROLD SMITHWICK.