

No. 813,280.

PATENTED FEB. 20, 1906.

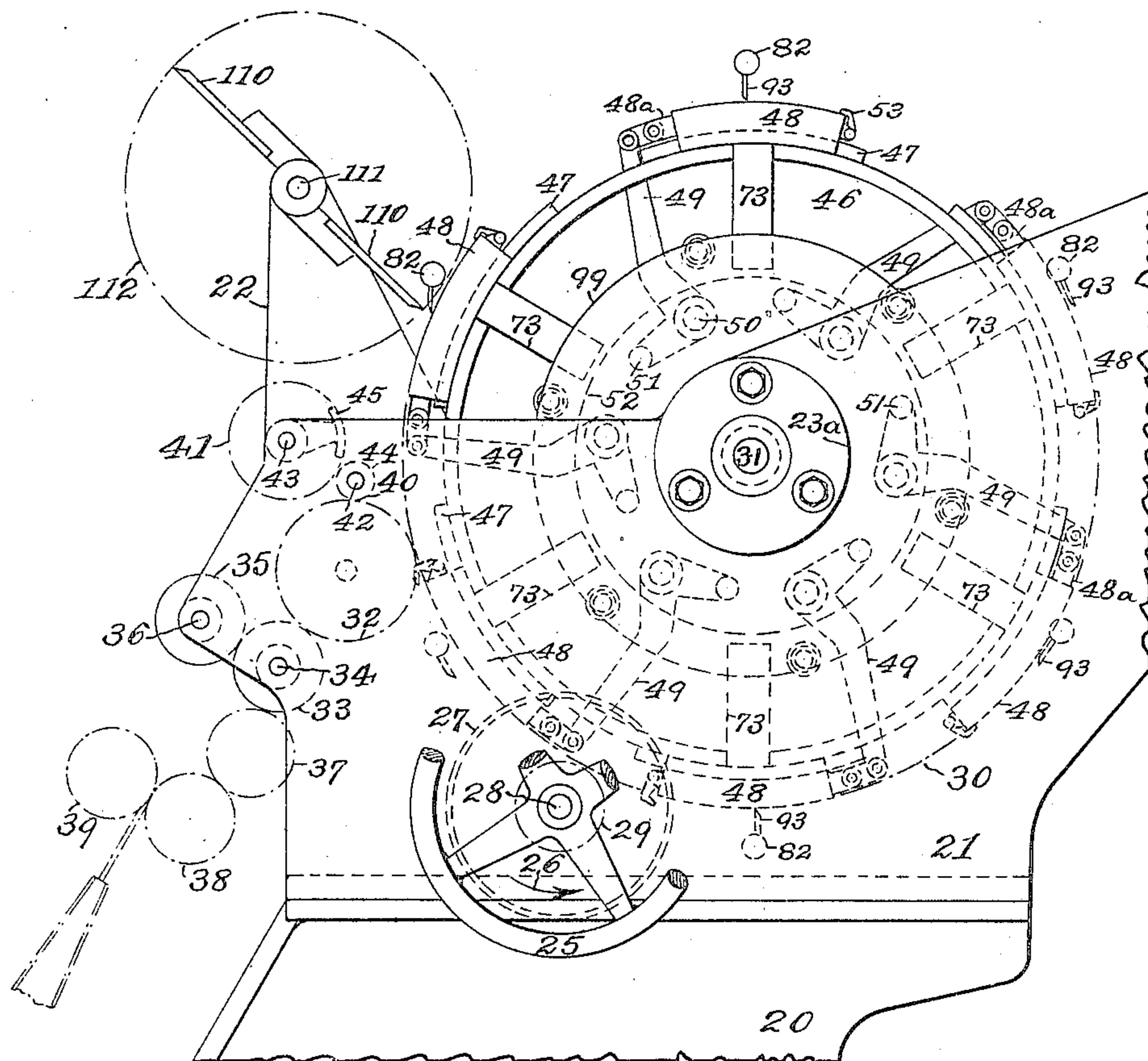
E. E. CLAUSSEN.

PAPER BAG MACHINE.

APPLICATION FILED MAY 20, 1905.

7 SHEETS—SHEET 1.

*Fig. 1.*



Witnesses:  
George Mortonson  
E. M. Averell

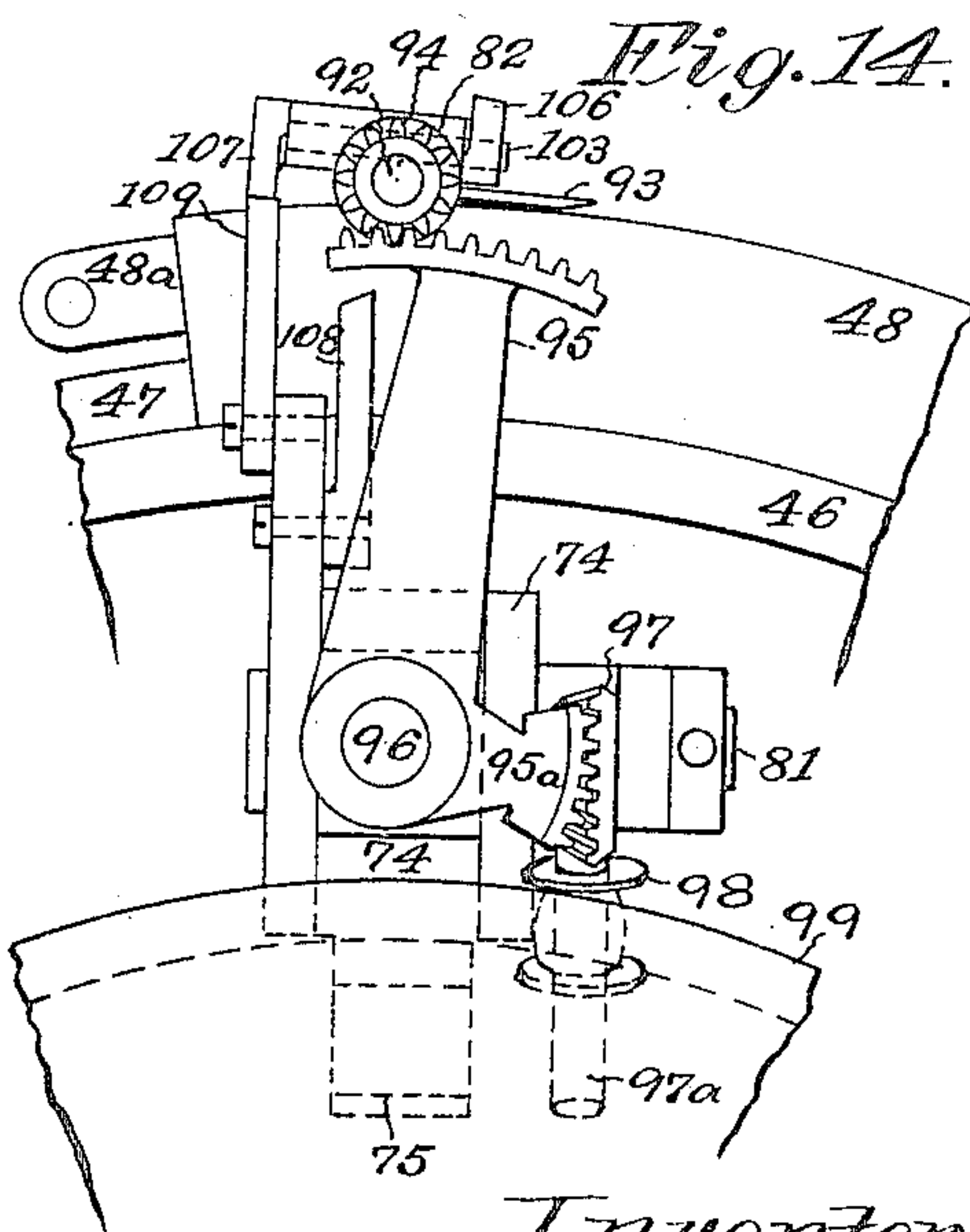
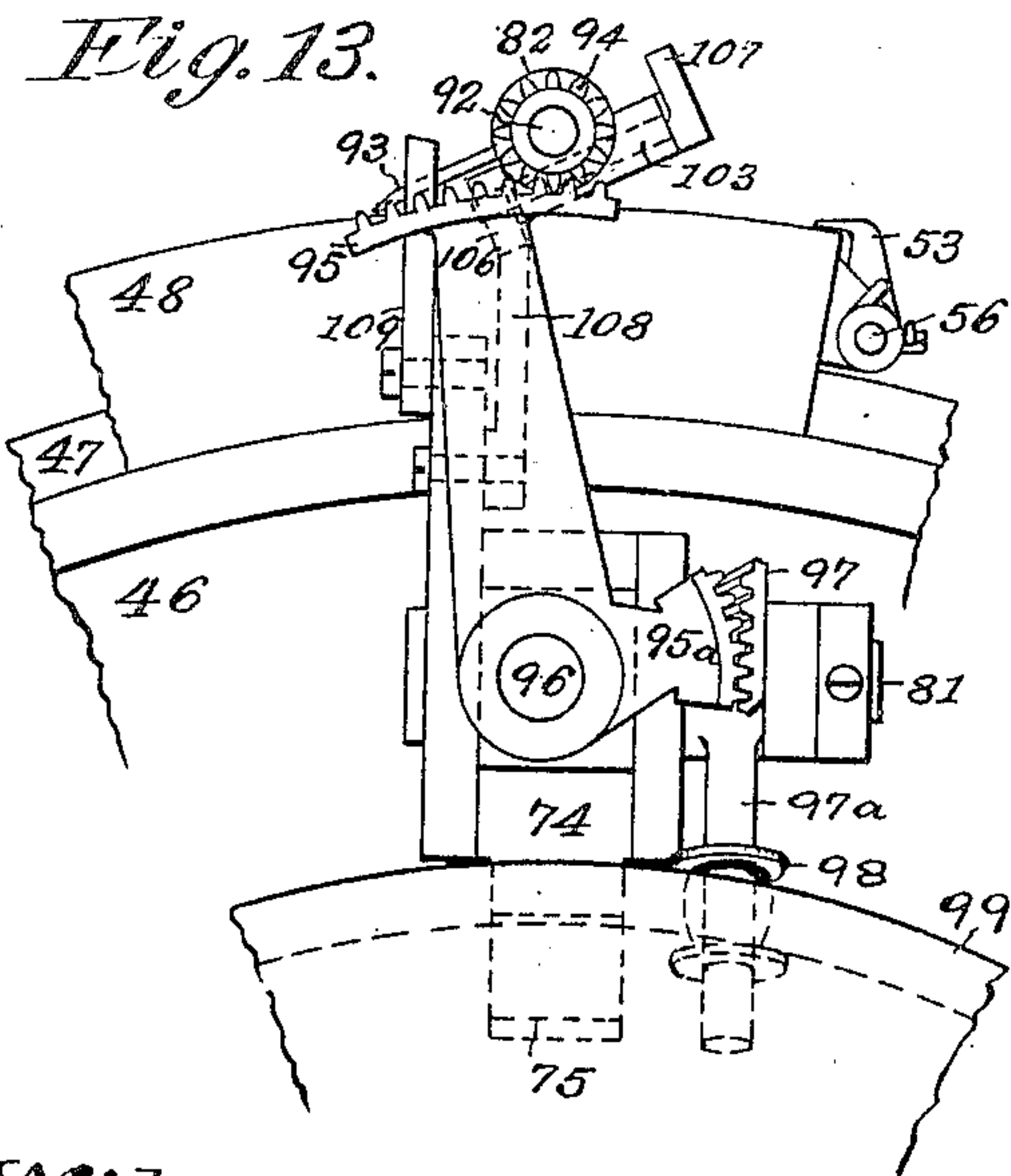
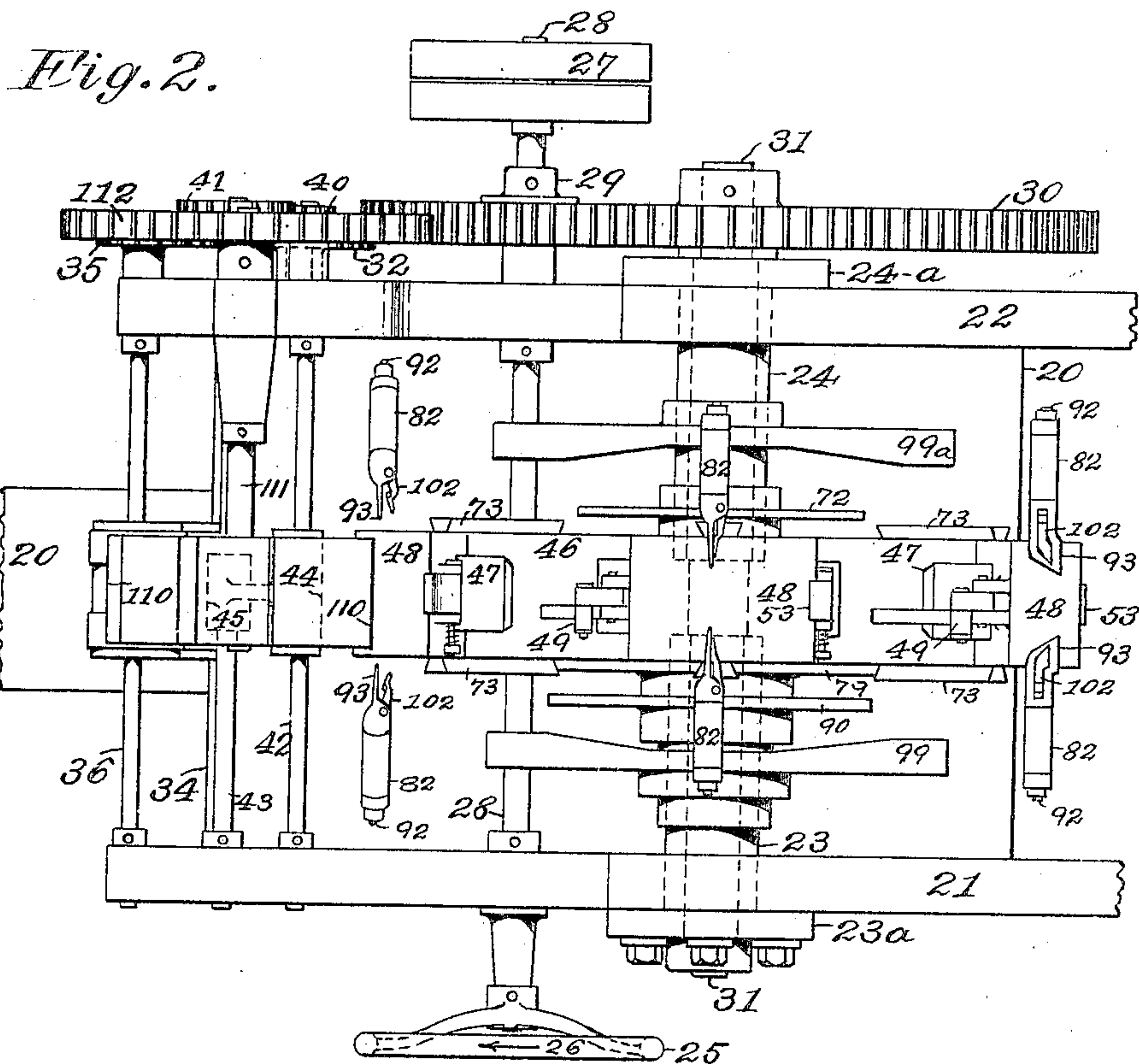
Inventor:  
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7 SHEETS—SHEET 3.

Fig. 4.

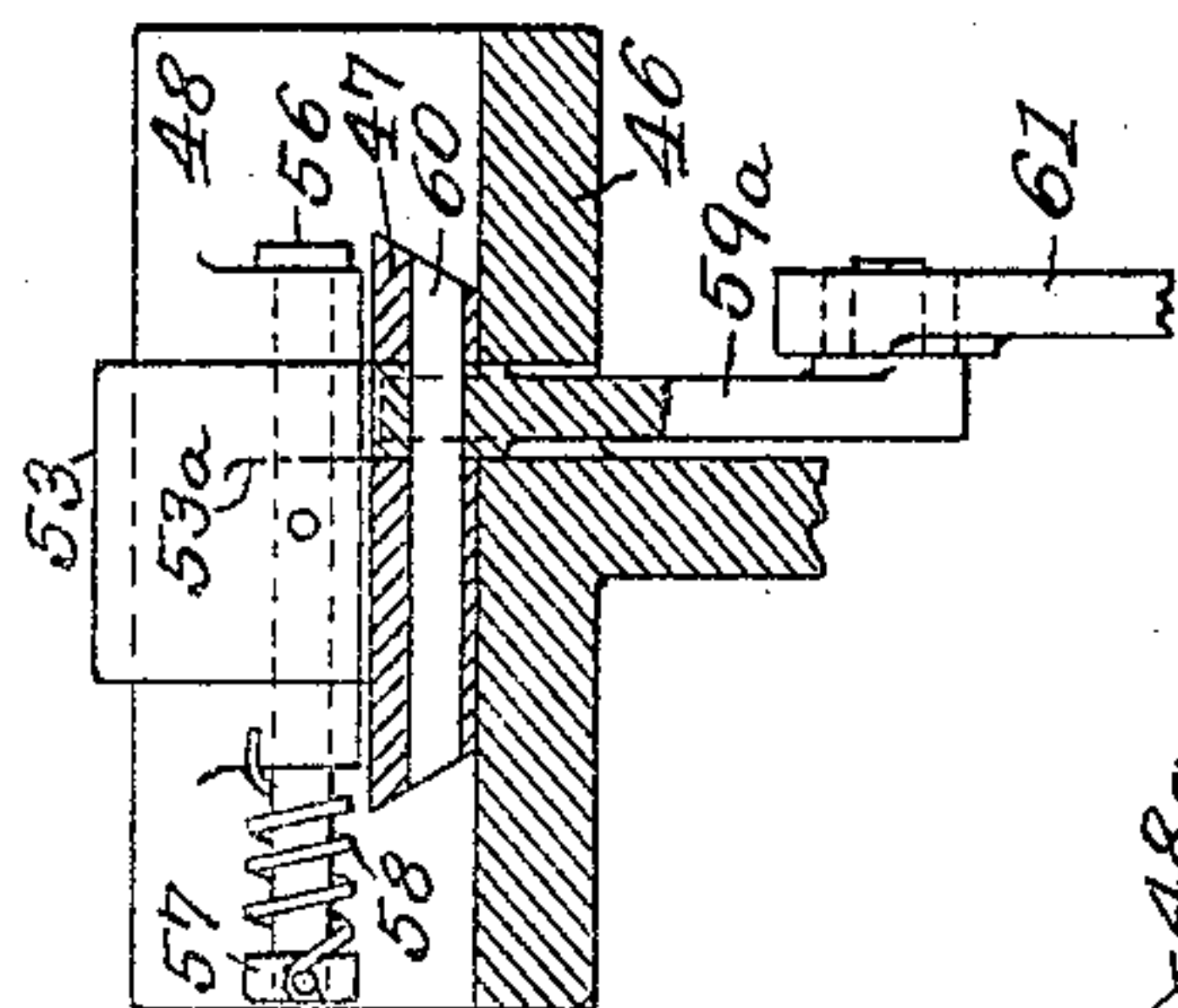
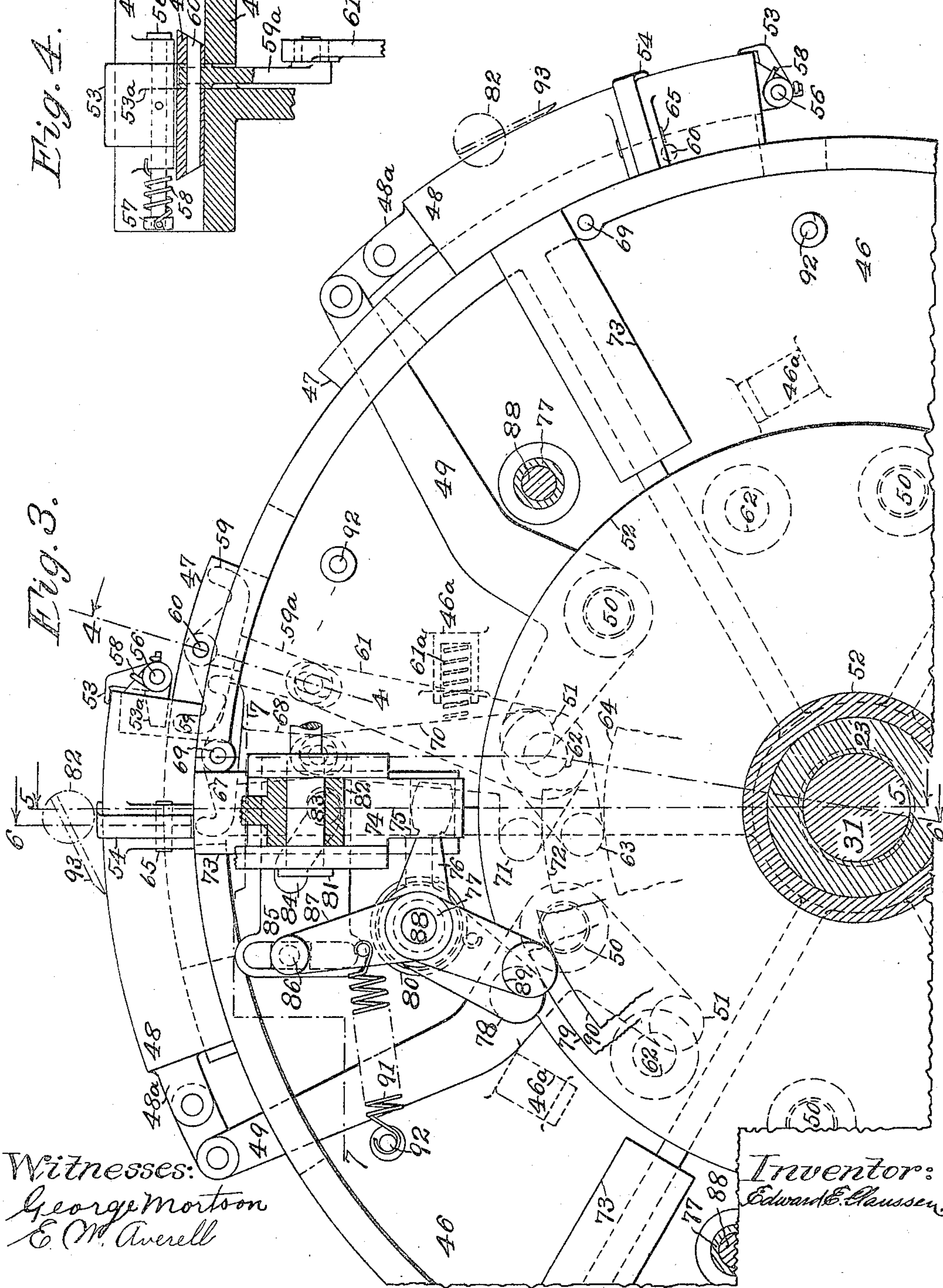


Fig. 3.



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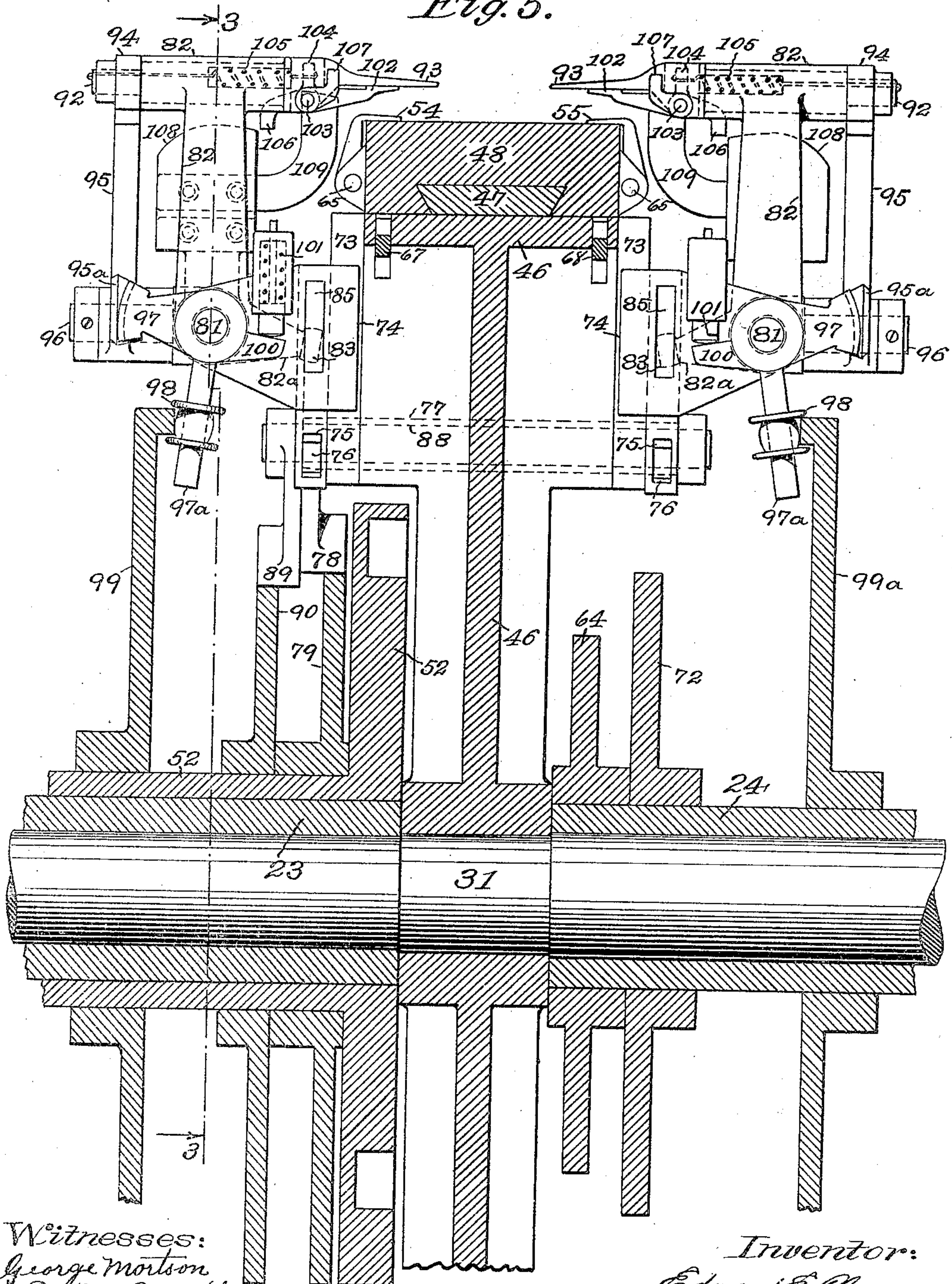
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7 SHEETS—SHEET 4.

*Fig. 5.*



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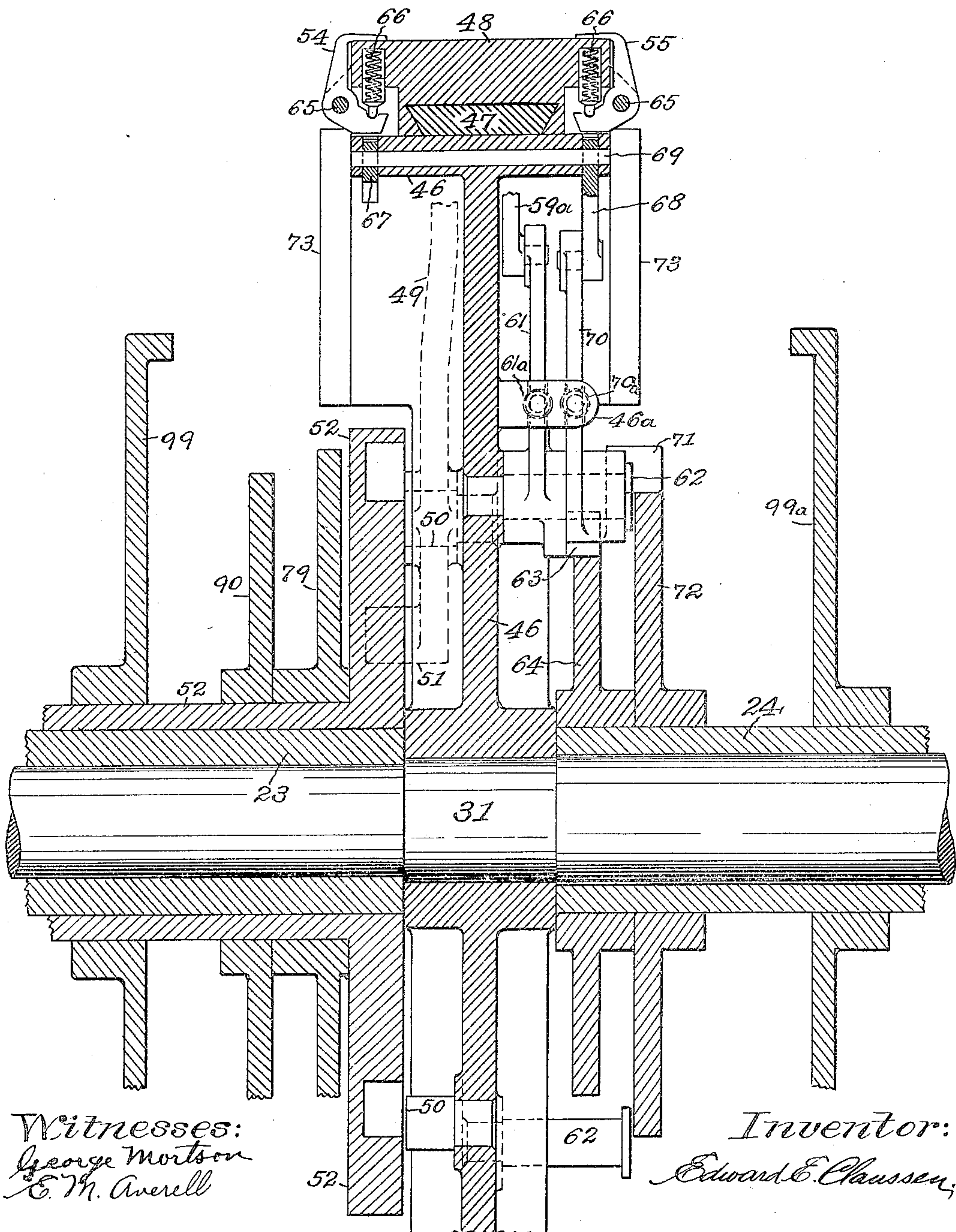
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7 SHEETS—SHEET 5.

*Fig. 6.*



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7 SHEETS—SHEET 6.

Fig. 8.

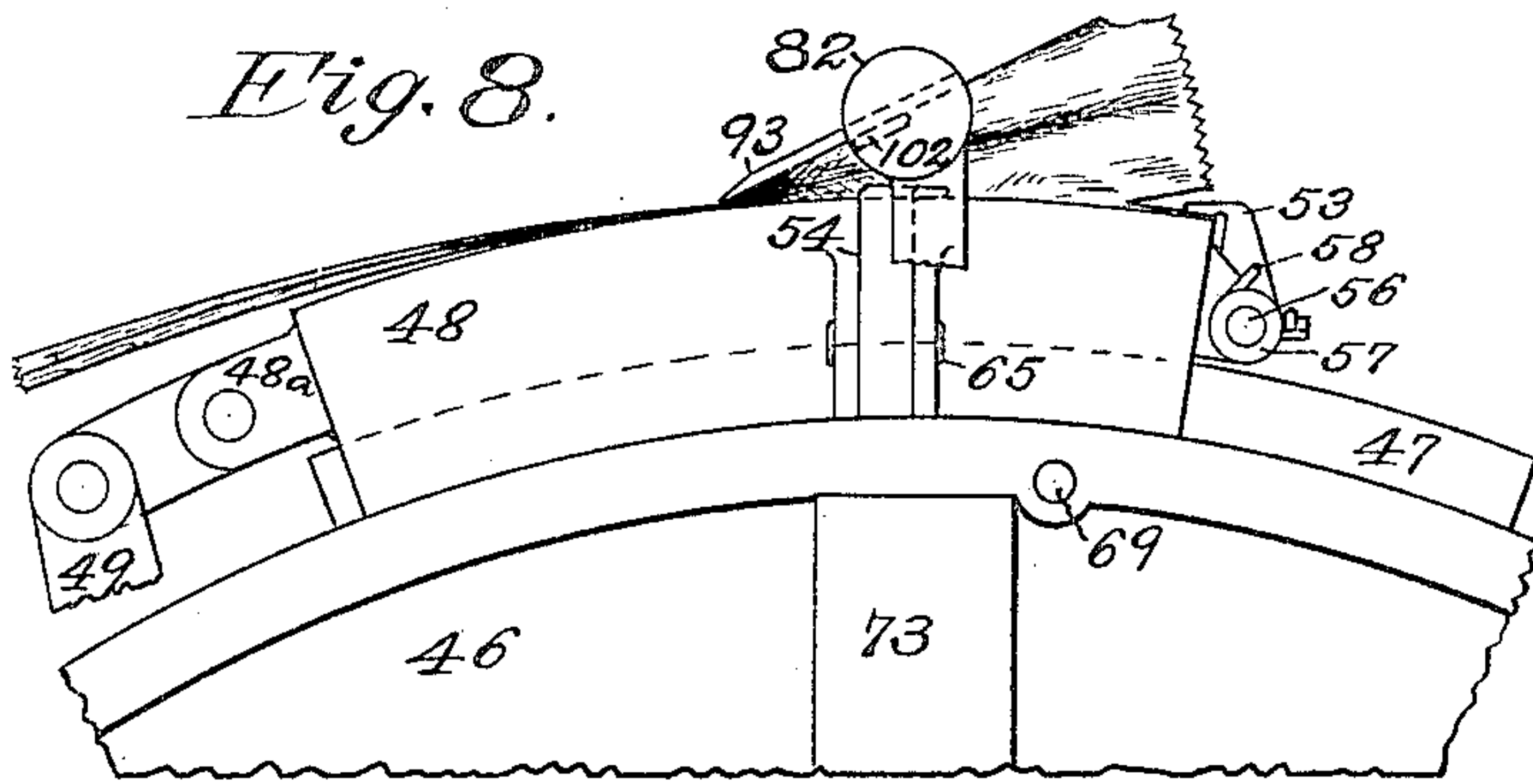


Fig. 9.

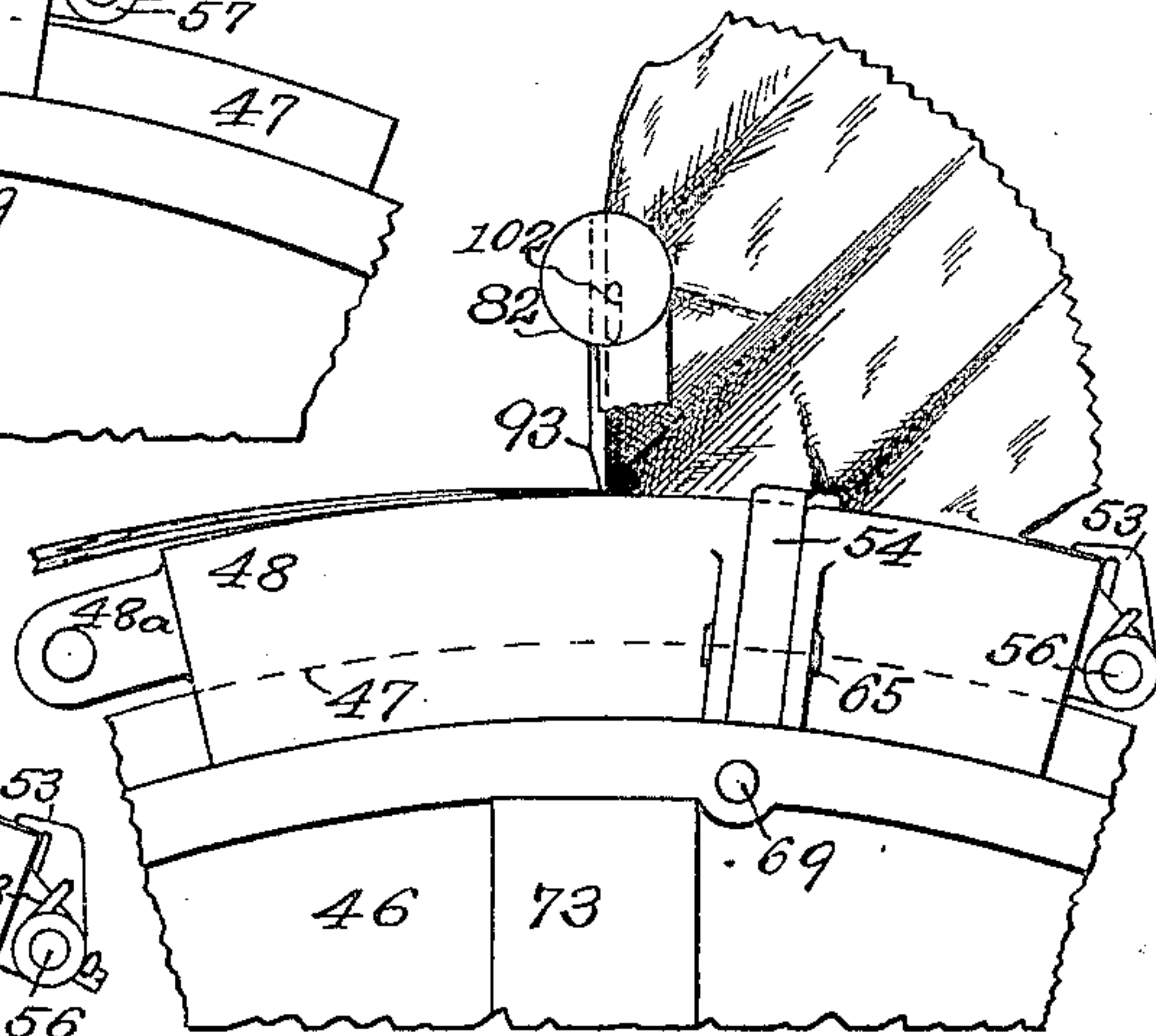


Fig. 10.

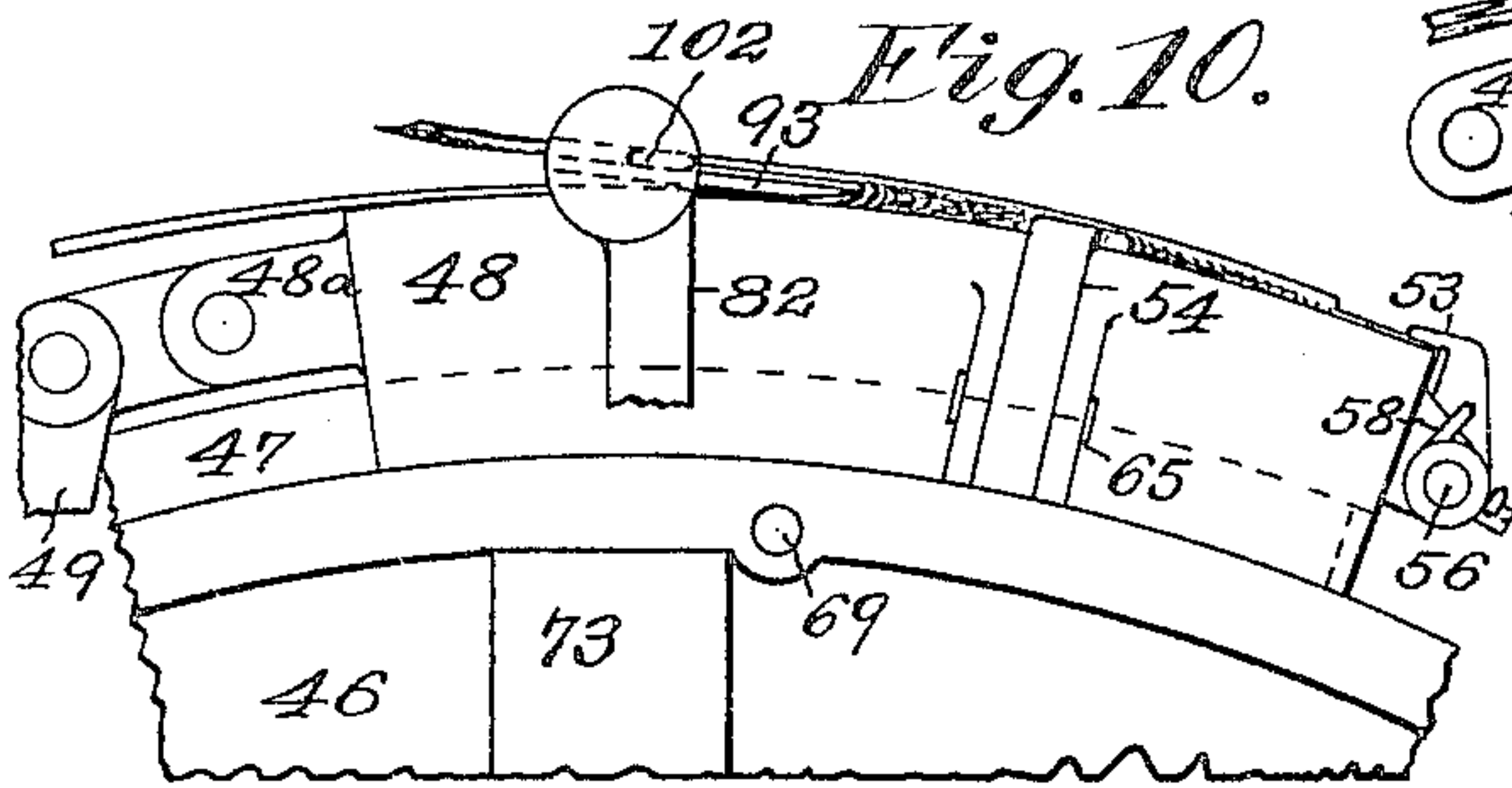
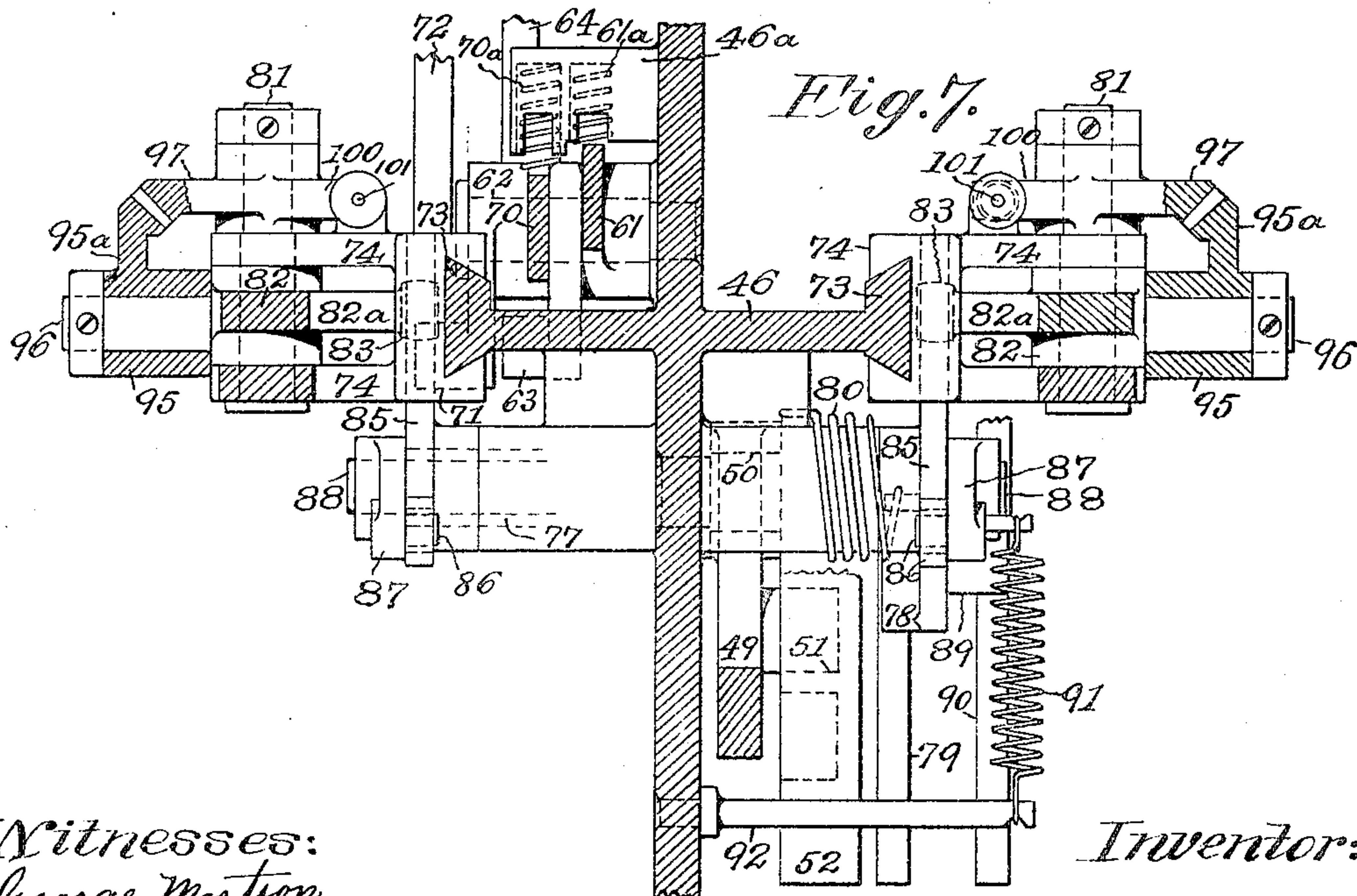


Fig. 7.



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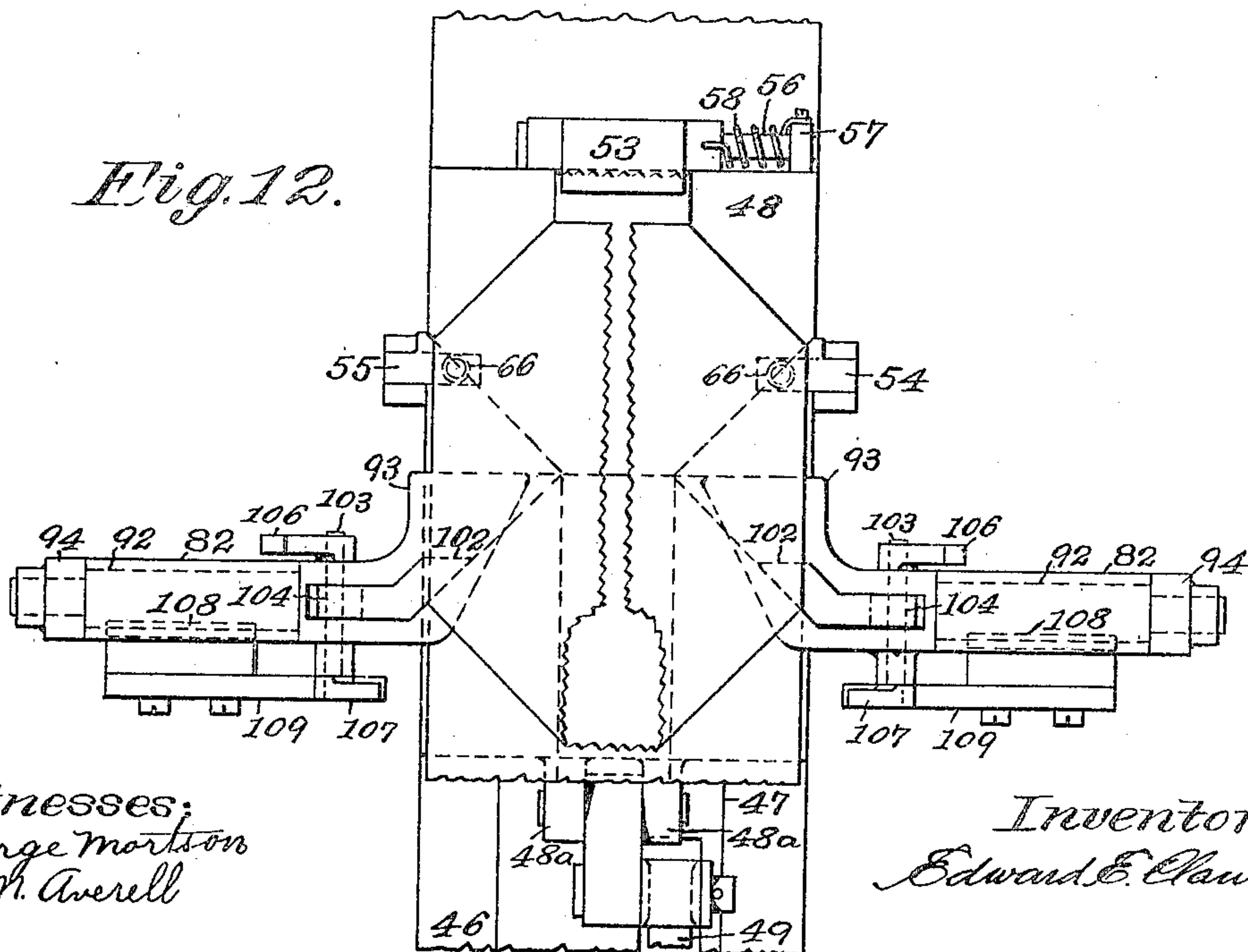
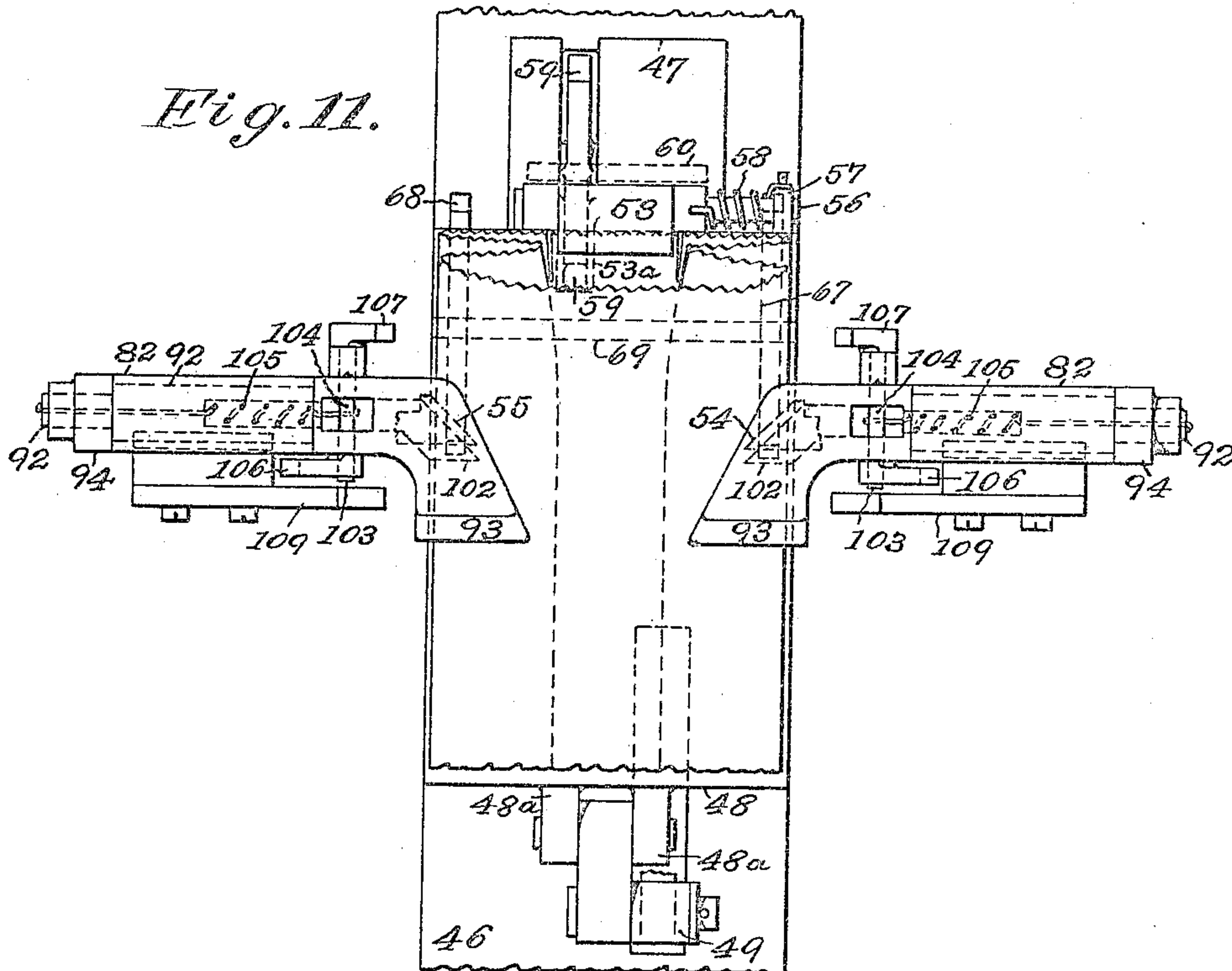


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7 SHEETS—SHEET 7.



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Inventor:  
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# UNITED STATES PATENT OFFICE.

EDWARD EMIL CLAUSSEN, OF HARTFORD, CONNECTICUT, ASSIGNOR TO  
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## PAPER-BAG MACHINE.

No. 813,280.

Specification of Letters Patent.

Patented Feb. 20, 1906.

Application filed May 20, 1905. Serial No. 261,303.

*To all whom it may concern:*

Be it known that I, EDWARD EMIL CLAUSSEN, a citizen of the United States of America, and a resident of Hartford, in the county of Hartford and State of Connecticut, (with a post-office address in the above place,) have invented certain new and useful Improvements in Paper-Bag Machines, of which the following is a specification.

This invention relates to machinery for automatically manufacturing paper bags from tucked-paper tubing, and as herein shown and described is especially adapted for manufacturing such bags in accordance with the methods set forth in Reissue Letters Patent No. 10,083, dated April 11, 1882, granted to M. L. Deering, although portions of this machine are susceptible of use in other methods.

The object of this invention is to provide a machine that is reliable in its action for forming the most intricate part in the manufacture of square-bottom paper bags from bel- lows-sided tubing and producing the dia- mond form, the mechanism for pasting and folding the end flaps being omitted, as the same are well known in the art.

Another object of this invention is to provide a rotary cylinder upon the outer circum- ference of which a series of reciprocating an- nular segmental-shaped folding beds or car- riages are mounted.

In order that those skilled in the art to which my invention relates may fully under- stand the nature and construction of the same and may obtain a better knowledge of the several operations required, I will first give a detailed description of each individual mechanism, reference being had to the ac- companying drawings, which form a part of this specification, and in which—

Figure 1 represents the right-hand side ele- vation of the machine in its preferred con- struction. Fig. 2 is a plan view of what is shown in Fig. 1. Fig. 3 is a sectional side elevation, drawn in an enlarged scale, taken on the broken line 3 3 and in the direction of the arrows of Fig. 5. Fig. 4 is a cross-sectional end view on line 4 4 of Fig. 3. Fig. 5 is a cross-sectional view on line 5 5 in the direc- tion of the arrows of Fig. 3. Fig. 6 is a cross- sectional end view taken on the broken line 6 6 of Fig. 3. Fig. 7 is a plan view on the broken line 7 7 of Fig. 3. Figs. 8, 9, and 10 are fractional side elevations showing the an-

nular segmental-shaped carriage in various positions during the transformation and un- folding of a tucked-paper tube and tucking under a portion of the upper ply and collaps- ing the same into the diamond form. Figs. 11 and 12 show, respectively, plan views of what is represented in Figs. 8 and 10. Figs. 13 and 14 are outside views of what is shown in Figs. 11 and 12.

The direction of the movement of parts is shown by adjacent arrows, and the posi- tions of the different folding instrumentalities are shown irrespective of the relations of the positions to the cams which move these instrumentalities, it being sufficient for the purpose of this description to say that the cams are properly laid out to produce the op- erations of the folding instrumentalities at the proper time and to the required extent.

Mechanism for forming the tucked-paper tube is well known in the art, and examples of such mechanism are shown and described in Letters Patent No. 782,948, granted to Ed- ward E. Claussen and Charles F. Smith, dated February 21, 1905, and others of still earlier date, and those mechanisms are not shown in the drawings, because this machine operates upon continuous tucked-paper tubing as its receiving material and does not itself produce that material.

The bed 20, which supports the various frames and brackets of the machine, may be of any suitable construction adapted to sup- port the side frames 21 and 22, and each frame is provided with the bushings 23 and 24, having the flanges 23<sup>a</sup> and 24<sup>a</sup>, respec- tively, by which they are held to the side frames. The hand-wheel 25 turns in the di- rection of the arrow 26, together with the pul- leys 27, which are fixed upon the pulley-shaft 28, which is journaled crosswise to the ma- chine in the side frames 21 and 22. Upon the shaft 28 is also mounted the gear 29, which meshes into the cylinder-gear 30, fas- tened on the cylinder-shaft 31 and journaled in the bushings 23 and 24. The cylinder- gear 30 also engages into the gear 32, which meshes into the gear 33 on shaft 34 and which latter gear meshes into the gear 35 on shaft 36. The gear 33 furthermore engages and sets into motion the train of gearing 37, 38, and 39, which rotates the drawing-rolls iden- tical in construction, as described in Letters Patent No. 782,948, previously referred to.



For clearness the gears 29, 30, 32, 33, 35, 37, 38, 39, 40, 41, and 112 are shown in dash and dotted lines; but they are understood as having teeth cut around their full circumference.

5 As a means for propelling the severed blanks forward to be converted into square-bottom paper bags I have provided the gear 40, which meshes and receives motion from the gear 32 and which again engages into the  
10 gear 41, the former being fastened upon the shaft 42 and the latter upon the shaft 43, journaled crosswise to the machine in the side frames 21 and 23 and which support the conveyer-roll 44 and the conveyer-sector 45,  
15 respectively, and which carry the blanks forward.

As previously described, the cylinder-shaft 31 is journaled in the bushings 23 and 24 and has fastened thereto the cylinder 46, provided  
20 with V-shaped annular segmental-shaped guides 47, fitted to which are the annular segmental-shaped carriages 48. The guides 47 are in this case six in number; but a larger or a smaller number might have been pro-  
25 vided, according to the size of the machine, and they are distributed at equal distances around the periphery of the cylinder. Each of the six carriages coöperates with a set of folding mechanism which receives motion  
30 from the same cams, and I will therefore describe only one set of the folding mechanism.

The annular segmental-shaped carriage 48 is provided at the rear end with hubs 48<sup>a</sup>, which are linked to the arm 49, which is piv-  
35 oted to the stud 50, carried in the central web of the cylinder 46. The arm 49 has a projection provided with the roll 51, engaging in groove in the cam 52, which is stationarily fastened upon the bushing 23, whereby the  
40 carriage is oscillated in the direction with and against the rotation of the cylinder as the cylinder is revolved. To clamp and hold the lower ply of the tube and the lower plies of the bellows folds to the carriage, I have pro-  
45 vided the front clip 53 and the two oppositely-disposed bevel-edged side clips 54 and 55. The front clip 53 is pivoted on the two forward-projecting lugs at the front end of the carriage on the shaft 56, which carries on its  
50 outer end an adjustable collar 57, to which is fastened one end of the spring 58, the other end being held to the lug of the carriage, and whereby the spring tension may be regulated to hold the front clip to the top surface of the  
55 carriage. The rearward-projecting arm 53<sup>a</sup> of the front clip is engaged by either of the hook-shaped ends of the lever 59, pivoted on the shaft 60 and having the projecting arm 59<sup>a</sup>, which is engaged by the lever 61, pivoted  
60 on the stud 62, which is held in the central web of the cylinder. The lever 61 is also provided with an extension carrying a cam-roll 63, engaging the stationary cam 64, held on the bushing 24. Each of the carriages 48 is  
65 also provided with a pair of bevel-edged side

clips 54 and 55, mounted on each side thereof on pivot 65, having engaging ends upon which the springs 66 press and hold the same with the spring tension upon the top surface of the carriage. To open the same, I have  
70 provided the levers 67 and 68, journaled on the shaft 69, each of which have hook-shaped operating ends. (Best shown in Fig. 3.) The lever 68 is engaged by a pin to the arm 70, which is also journaled on the stud 62 and  
75 provided with an extension carrying the cam-roll 71, engaging the cam 72, fastened on the stationary bushing 24. From the central web of the cylinder projects the boss 46<sup>a</sup>, which is adapted to receive springs 61<sup>a</sup> and  
80 70<sup>a</sup>, which press, respectively, on the levers 61 and 70 and hold the rolls 63 and 71 upon their respective cams.

The folding mechanism which operates upon the upper ply of the tube and the upper  
85 plies of the bellows folds will now be described and is as follows: Integral with the cylinder 46 and on each side thereof are V-shaped guides 73, each of which has fitted thereto the head 74, which is provided at  
90 its lower end with a slot 75, which is engaged by the lever 76, fastened on the sleeve 77, and on the right-hand side of the machine the lever 76 is provided with an arm having a cam-roll 78, which engages a cam 79, fastened  
95 upon the hub of the stationary cam 52 and held upon the sleeve 23. The coil-spring 80 surrounds the hub in which the sleeve 77 is journaled and has one end attached to the cylinder and the other end to a pin in the arm  
100 76, whereby the cam-roll 78 is held spring-pressed against the top surface of the cam 79 and whereby as the cylinder revolves the head 74 is caused to be moved away from and  
105 toward the center of the cylinder for the purpose as will be described later on. The head 74 supports the pivot 81, upon which is mounted for oscillation the tuck-lever 82, which is provided with the arm 82<sup>a</sup> and cam-roll 83,  
110 engaging a groove 84 in the cam-plate 85, which slides in a slot of the head 74 and is engaged by a pin 86 of the arm 87, fastened upon the shaft 88, which is journaled in the sleeve 77, supported in a hub of the cylinder  
115 46. On the right-hand side of the machine the arm 87 has an extension provided with a cam-roll 89, which engages the cam 90, also held upon the hub 52, which again is fastened to the sleeve 23. The spring 91 has one end fastened to a pin in the arm 87 and the other  
120 fastened to a pin 92, held in the central web of the cylinder and whereby the cam-roll 89 is held on the outer circumference of the cam 90. By the means just described the tuck-levers 82 are moved toward or away from  
125 each other, according to the layout of the cam 90 as the cylinder is rotated.

Journaled in the upper hub of the tuck-lever 82 on shaft 92 is the tuck-blade 93, which has on the outer end the sector-pinion 94,  
130



which is engaged by the sector 95 and journaled on the pivot 96, held in and projecting from the lower hub of the tuck-lever 82, as clearly shown in Figs. 5, 7, 13, and 14. The sector 95 is provided near its hub with a sector-pinion 95<sup>a</sup>, which engages the sector 97, journaled upon the pivot 81, and has a projecting shaft 97<sup>a</sup>, upon which is adapted to slide the cam-roll 98, engaging the cam 99, held upon the sleeve 52 upon the right-hand side of the machine. The corresponding cam 99<sup>a</sup> on the left-hand side of the machine is held on the bushing 24. By the means just described the shaft 92, upon which the tuck-blade is mounted, is partially rotated back and forth in the tuck-lever 82, according to the formation of the cam 99. To keep the rolls 98 against the cams 99 and 99<sup>a</sup>, I have provided the lugs 100, projecting from the hubs and in opposite directions of the sectors 97, which are engaged by a plug and spring 101.

The mechanism which clamps the upper ply of the tube and the upper plies of the bellows folds to the tucker-plate will now be described and is best shown in Figs. 5, 11, 12, 13, and 14, and consists of the bevel-edged side nippers 102. The side nipper 102 is pivoted on the stud 103 in the head of the tuck-blade 93, upon which is fastened the short lever 104, to which is fastened one end of the spring 105, and whereby the nipper is held and clamps the tube to the tuck-blade. To open the nippers while the tucker-blades are moved toward each other and also to open the same after the diamond form is completed, I have provided the arms 106 and 107, respectively, which engage cam-plates 108 and 109, fastened to an extension on one side of the head 74.

As a means to insure a safe oscillation of the tuck-blades while they are moving simultaneously toward each other and not strike the edges of the bag-blank, I have provided the compression-plate 110, which is in the preferred construction shown as a double-header—that is, each blade operates on every alternate bag-blank—and they are fastened on the shaft 111 and journaled in an inwardly-projecting hub of the frame 22 and have fastened on the outside thereof the gear 112, meshing into the cylinder-gear 30, and as the compression-plates are revolved they slightly press the tube upon the surface of the carriage while the tuck-blades are forced toward each other into their inner position of the adjustment.

The operation of the machine is as follows: The roll of paper which is to be converted into square-bottom paper bags is mounted at the front end of the machine, and the paper has paste applied and then passes around the die and guide-rolls and is folded around the former and is thereby converted into a continuous tucked paper tube, which is guided

into the bite of the drawing-rolls, and whereby the tube is drawn into the machine and cut into bag-blank lengths of sufficient length to form a completed square-bottom paper bag and then delivered into the bite of the conveyer-roll 44 and the conveyer-sector 45, which conveys the bag-blank to the carriage. As the advancing bottom-forming end of the blank moves toward the carriage the front end of the lower ply of the tube is gripped by the front clip 53 by the action of the cam 64 and its intermediate mechanism. Immediately afterward the side clips 54 and 55 enter between the tucks of the bellows-sided tube and hold the lower ply of the bellows-sided tube to the carriage by the action of the cam 72 and intermediate mechanism. Either one of the compression-plates 110 is then approaching the carriage and slightly presses the bag-blank upon the carriage at a position where the transverse folding-line of the diamond is to be formed, and at the same time the tuck-levers 82 are moved inward and carrying the tuck-blades over across the blank, while the arms 106 are in engagement with the cam-plates 108, thereby opening the nippers 102, so that they enter between the tucks. When the tuck-levers arrive at the inner position of adjustment, the arms 106 disengage from the cam-plates 108, and thereby permit the springs 105 to close the side nippers 102 upon the tuck-blades 93 and hold the upper part of the blank to the tuck-blades. The carriage 48 is then caused to move forward by the cam 52 and its intermediate mechanism, and simultaneously the tuck-levers are moved away from the cylinder by the action of the cam 79 and the intermediate mechanisms, which are the roller 78 and the arm 76, operating in the slot 75 of the head 74. The tuck-blade is also caused to be rotated about its shaft 92, due to the cams 99 and 99<sup>a</sup> acting against the rollers 98, sectors 97, 95, and 95<sup>a</sup>, and pinion 94 and converting the tuck-paper tube into the diamond form by unfolding the same and tucking under a certain portion of the upper ply of the tube, as clearly shown in Figs. 8, 9, and 10. After the diamond form is completed the arms 107 engage the cams 109, and thereby slightly raise the side nippers away from the tuck-blades, thereby releasing the tube and permitting the tuck-levers to be oscillated into their outer position of adjustment.

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

1. In combination the cylinder, the carriage mounted on the cylinder, means for reciprocating the carriage in and against the direction of the rotation of the cylinder, and means for clamping the lower ply of a bag-blank to the carriage substantially as described and set forth.

2. In combination the continuous revolv-



ing cylinder, the carriage mounted on the cylinder, means for reciprocating the carriage in the direction of the rotation of the cylinder, the side clips and the front clip mounted  
5 on the carriage substantially as described.

3. In combination the continuous revolving cylinder, the annular segmental-shaped carriage, means for reciprocating the carriage, the annular segmental-shaped guides  
10 on the circumference of the cylinder, the side clips and the front clip mounted on the carriage, all substantially as described for the purpose set forth.

4. In a paper-bag machine the combination of the cylinder, the carriage mounted on the cylinder, means for reciprocating the carriage on the cylinder, means for clamping the lower ply of the tube to the carriage, means for clamping the upper ply of the tube and  
20 means for tucking under a portion of the upper ply, all substantially as described.

5. In a paper-bag machine the combination of the revolving cylinder, the carriage mounted on the cylinder, the cam 52 and the intermediate mechanism for reciprocating the carriage in the direction of the rotation of the cylinder, means for holding the lower ply of the tube to the carriage, consisting of the front clip and the oppositely-disposed bevel-  
30 edged side clips, the oppositely-disposed tuck-blades, side nippers for holding the upper ply of the tube to the tuck-blades, all combined and operating to unfold the tube while the cylinder revolves and the carriage is oscillated forward in the direction of the  
35 rotation of the cylinder.

6. In a paper-bag machine the combination of the revolving cylinder, the carriage mounted on the cylinder, the cam 52 and intermediate mechanism for reciprocating the carriage, the front clip and the oppositely-disposed bevel-edged side clips, means for opening and closing the front clip and the side clips at predetermined positions, the oppositely-disposed tuck-blades, side nippers for holding the upper ply of the tube to the tuck-blades, all mounted on the cylinder and revolving therewith to unfold the paper tube and tuck under a portion of the upper ply  
50 and collapse the same into the diamond form while the cylinder revolves and the carriage is oscillated forward in the direction of the rotation of the cylinder.

7. In a paper-bag machine the combination of the revolving cylinder, the carriage mounted on the cylinder, the cam 52 and the intermediate mechanism for reciprocating the carriage, means for holding the lower ply of the tube to the carriage, consisting of the front clip and the oppositely-disposed bevel-edged side clips, the oppositely-disposed tuck-blades, means for moving the tuck-blades into and out of operating positions, side nippers for holding the upper ply of the tube to  
65 the tuck-blades, all combined and operating

to unfold the tube and tuck under a portion of the upper ply and collapse the same into the diamond form while the cylinder revolves and the carriage is oscillated forward in the direction of the rotation of the cylinder. 70

8. In a paper-bag machine the combination of the revolving cylinder, the carriage mounted on the cylinder, the cam 52 and the intermediate mechanism for reciprocating the carriage, means for holding the lower ply of the tube to the carriage, consisting of the front clip and the two side clips, the oppositely-disposed tuck-blades, means for moving the tuck-blades into and out of operating positions, means for raising and lowering the tuck-blades away from and toward the top surface of the carriage, side nippers for holding the upper ply of the tube to the tuck-blades, all combined and operating to unfold the tube and tuck under a portion of the upper ply and collapse the same into the diamond form while the cylinder revolves and the carriage is oscillated forward in the direction of the rotation of the cylinder. 80 85

9. In a paper-bag machine the combination of the revolving cylinder, the carriage mounted on the cylinder, the cam 52 and the intermediate mechanism for reciprocating the carriage, means for holding the lower ply of the tube to the carriage, consisting of the front clip and the two side clips, the oppositely-disposed tuck-blades, means for moving the tuck-blades into and out of operating positions, means for raising and lowering the tuck-blades away from and toward the top surface of the carriage, means for oscillating the tuck-blades about their shafts, side nippers for holding the upper ply of the tube to the tuck-blades, all combined and operating to unfold the tube and tuck under a portion of the upper ply and collapse the same into the diamond form, while the cylinder revolves and the carriage is oscillated forward in the direction of the rotation of the cylinder. 90 95 100 105

10. In a paper-bag machine the combination of a revolving cylinder, the carriage mounted on the cylinder, the cam 52 and the intermediate mechanism for reciprocating the carriage, means for holding the lower ply of the tube to the carriage, consisting of the front clip and the two side clips, the oppositely-disposed tuck-blades, means for moving the tuck-blades into and out of operating positions, means for raising and lowering the tuck-blades away from and toward the top surface of the carriage, means for oscillating the tuck-blades about their shafts, side nippers for holding the upper ply of the tube to the tuck-blades, means for opening and closing the side nippers, all combined and operating substantially as described. 110 115 120 125

11. In a paper-bag machine the combination of the revolving cylinder, the carriage mounted on the cylinder, the cam 52 and the intermediate mechanism for reciprocating 130



the carriage, means for holding the lower ply of the tube to the carriage, the compression-plate 110, oppositely-disposed tuck-blades and means for oscillating the tuck-blades substantially as described.

12. In a paper-bag machine the combination of the revolving cylinder, the carriage mounted on the cylinder, the cam 52 and the intermediate mechanism for reciprocating the carriage, means for holding the lower ply of the tube to the carriage, the compression-plate 110, means for rotating the compression-plate, oppositely-disposed tuck-blades and means for oscillating the tuck-blades over the top surface of the carriage.

13. In a paper-bag machine the combination of the revolving cylinder, the carriage mounted on the cylinder, the cam 52 and the intermediate mechanism for reciprocating the carriage, the front clip 53 mounted on the carriage, the lever 59 and its hook-shaped ends, means for oscillating the lever 59, all combined and operating that the front clip is opened and closed at each forward and rearward position of the carriage substantially as described.

14. In a paper-bag machine the combination of the revolving cylinder, the carriage mounted on the cylinder, the cam 52 and the

intermediate mechanism for reciprocating the carriage, the oppositely-disposed bevel-edged side clips 54 and 55 mounted on the carriage, the levers 67 and 68, each lever having hook-shaped ends and means for oscillating the same all combined and operating that the bevel-edged side clips are opened and closed at each forward and rearward position of the carriage substantially as described.

15. In a paper-bag machine the combination of the revolving cylinder, the carriage mounted on the cylinder, the cam 52 and the intermediate mechanism for reciprocating the carriage, the shafts 92, the tuck-blades mounted on the shafts, means for raising and lowering the tuck-blades away from and toward the top surface of the carriage, means for oscillating the tuck-blades about their shafts all combined and operating that the edges of the tuck-blades follow a predetermined line of the carriage as the same is oscillated forward substantially as described.

Signed at Hartford this 19th day of May, 1905.

EDWARD EMIL CLAUSSEN.

Witnesses:

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E. M. AVERELL.