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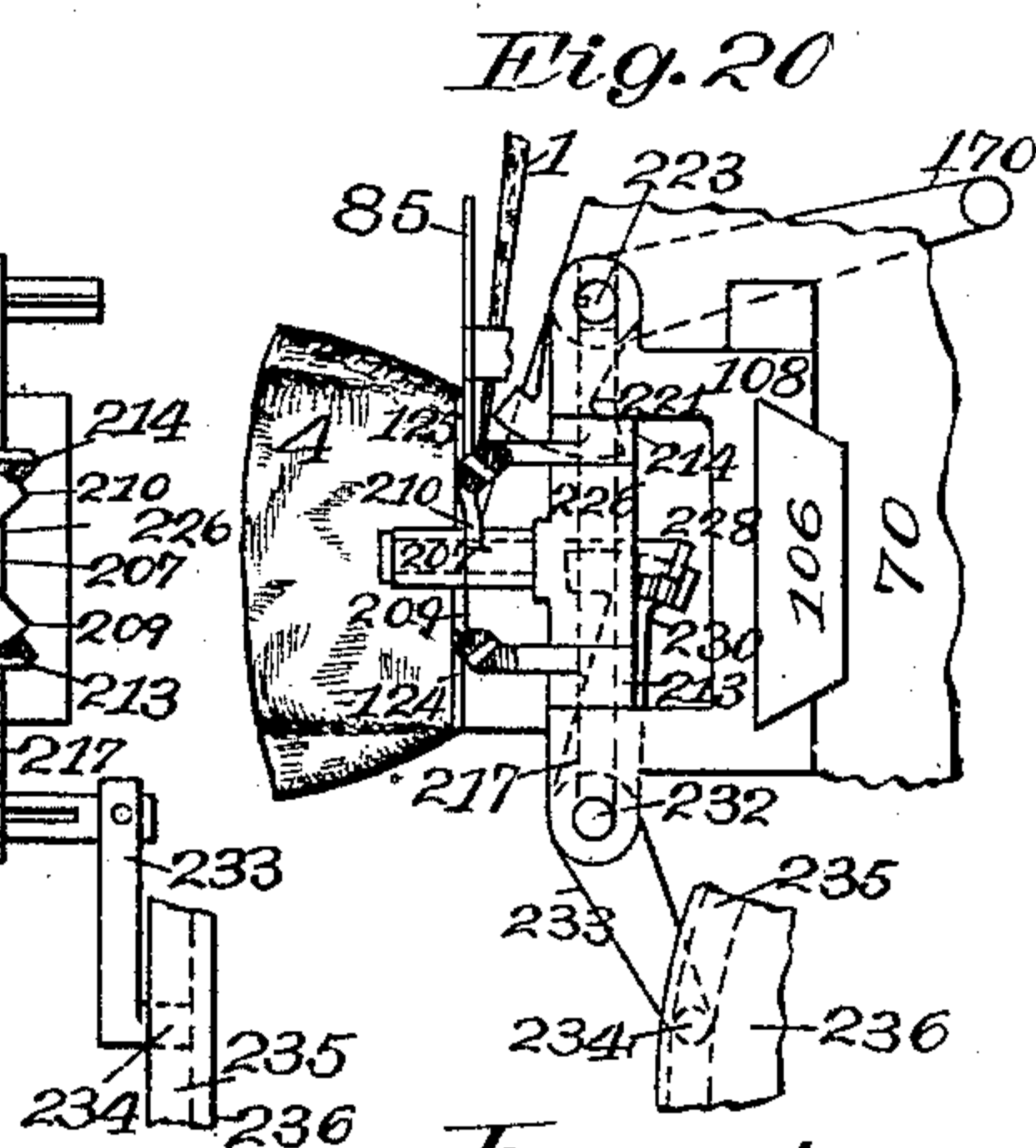
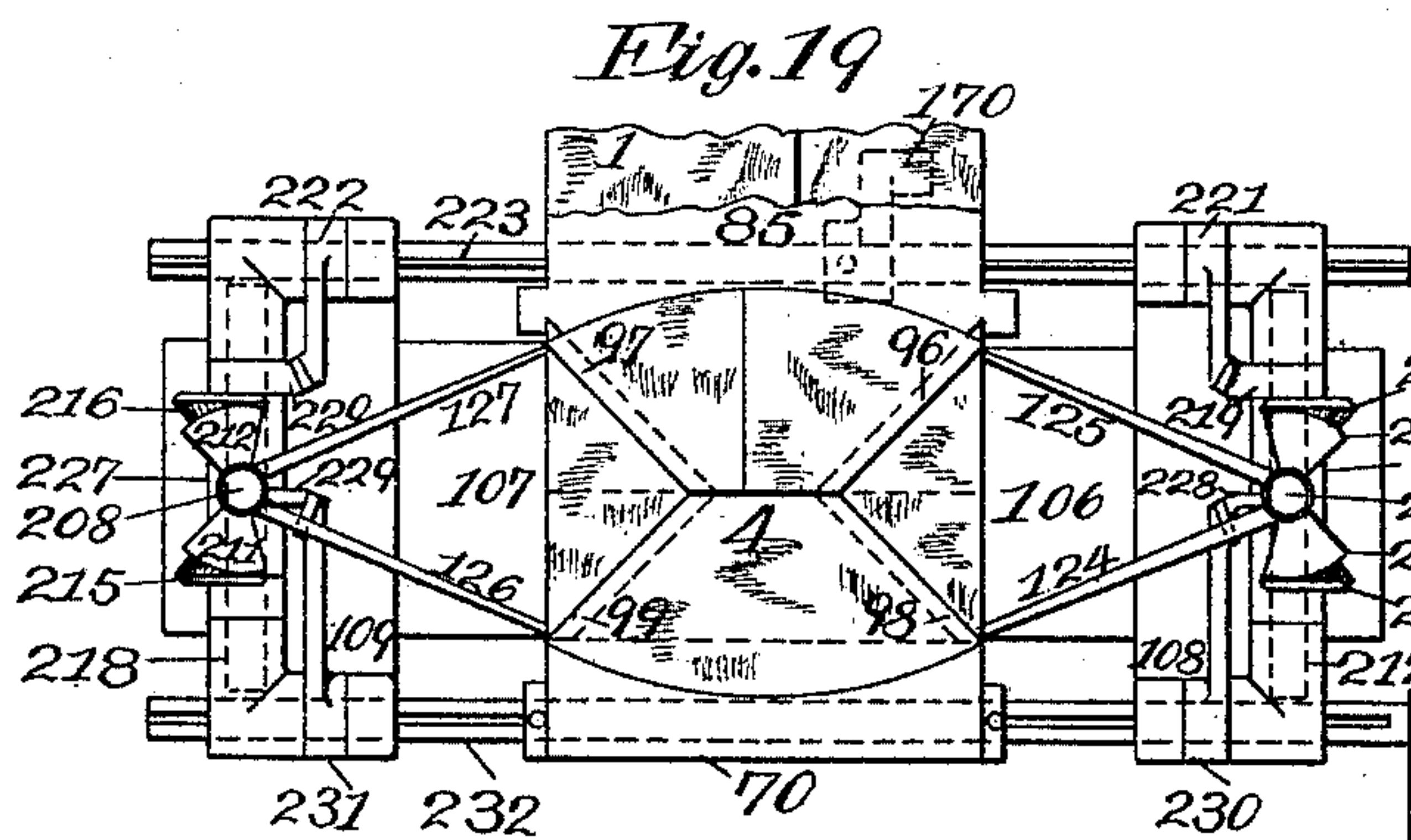
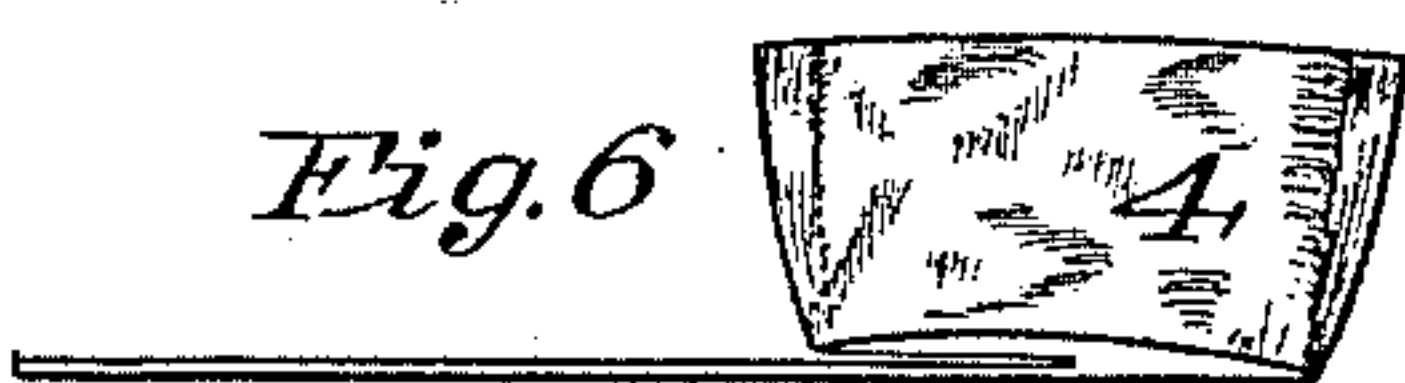
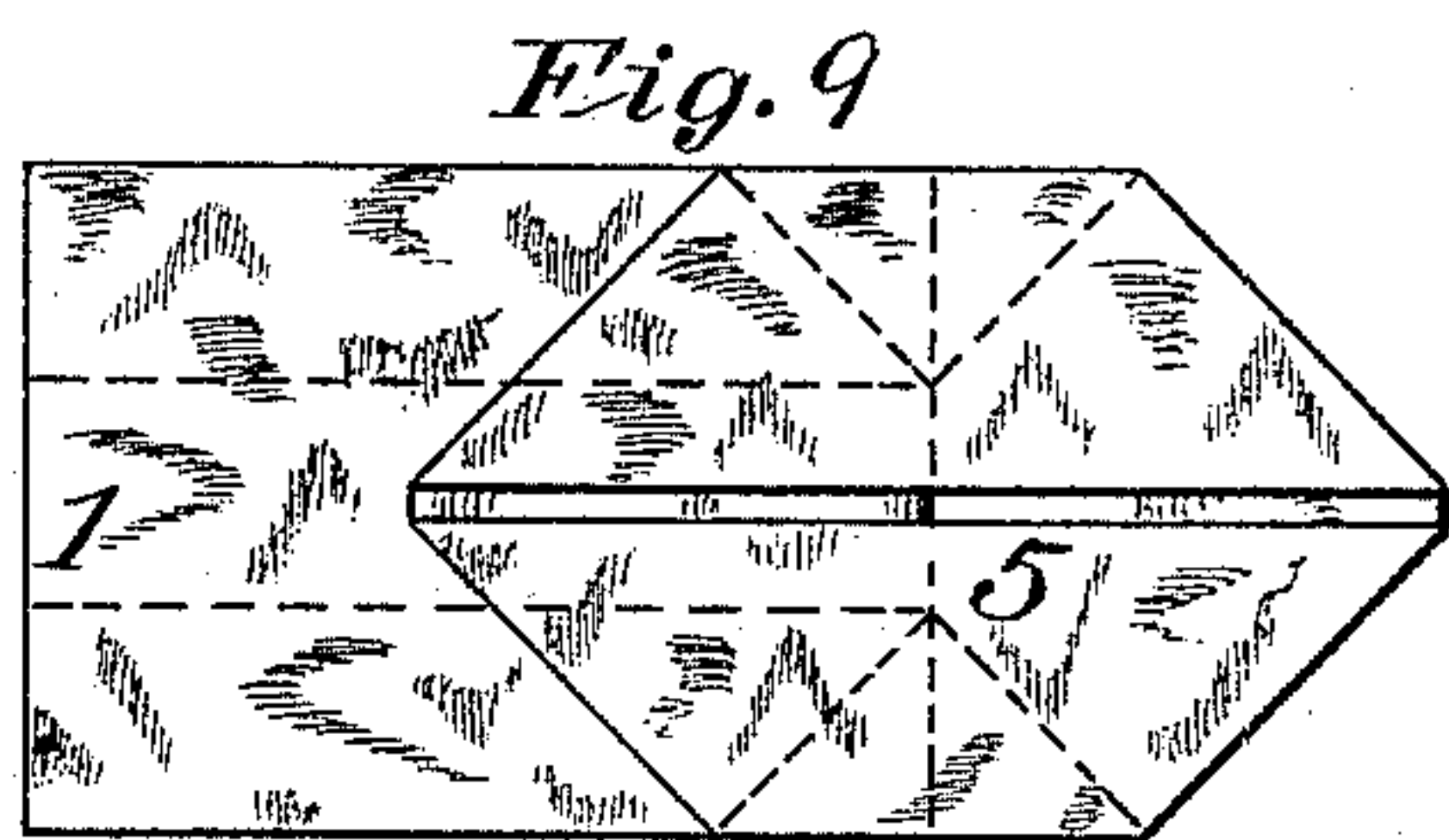
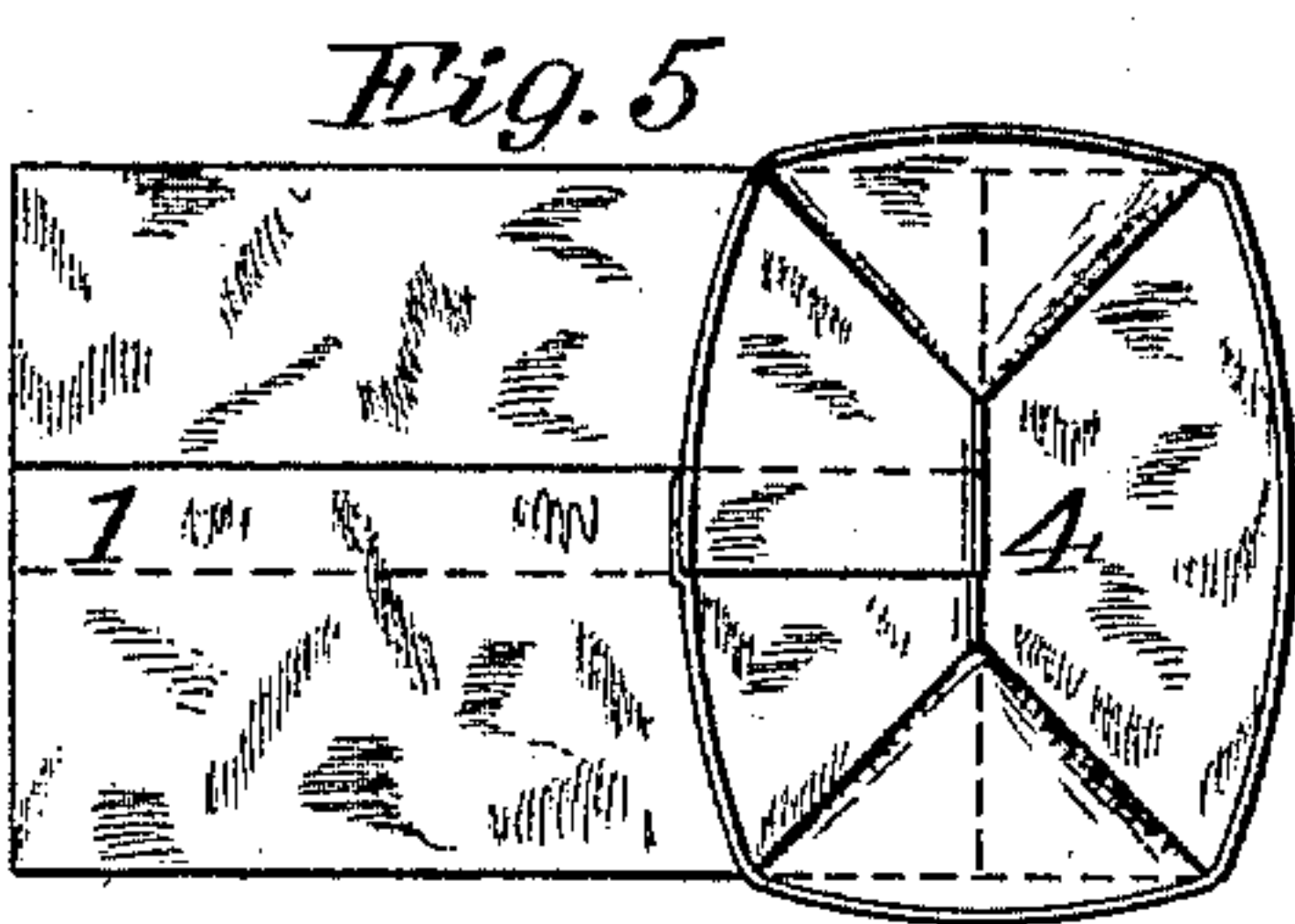
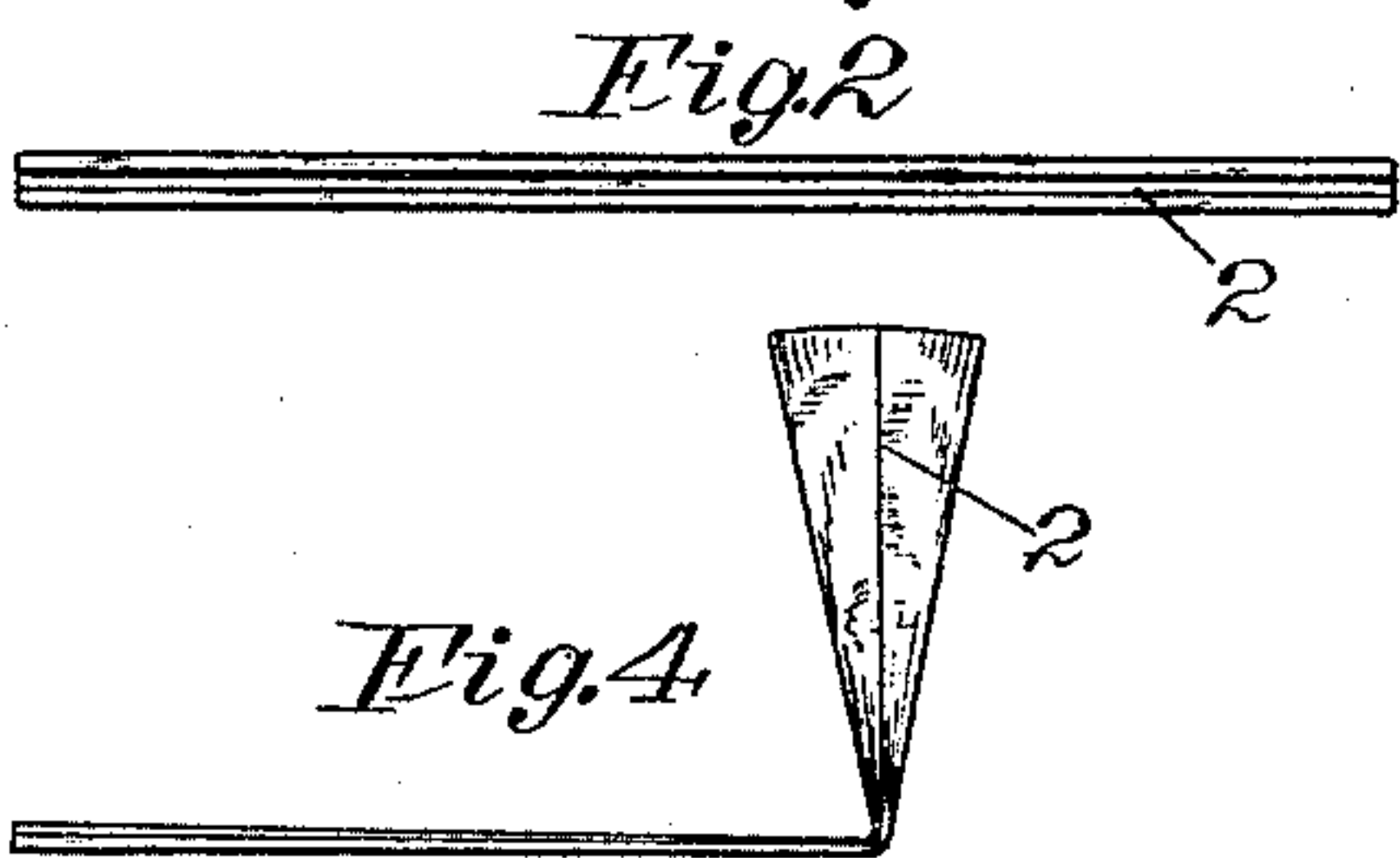
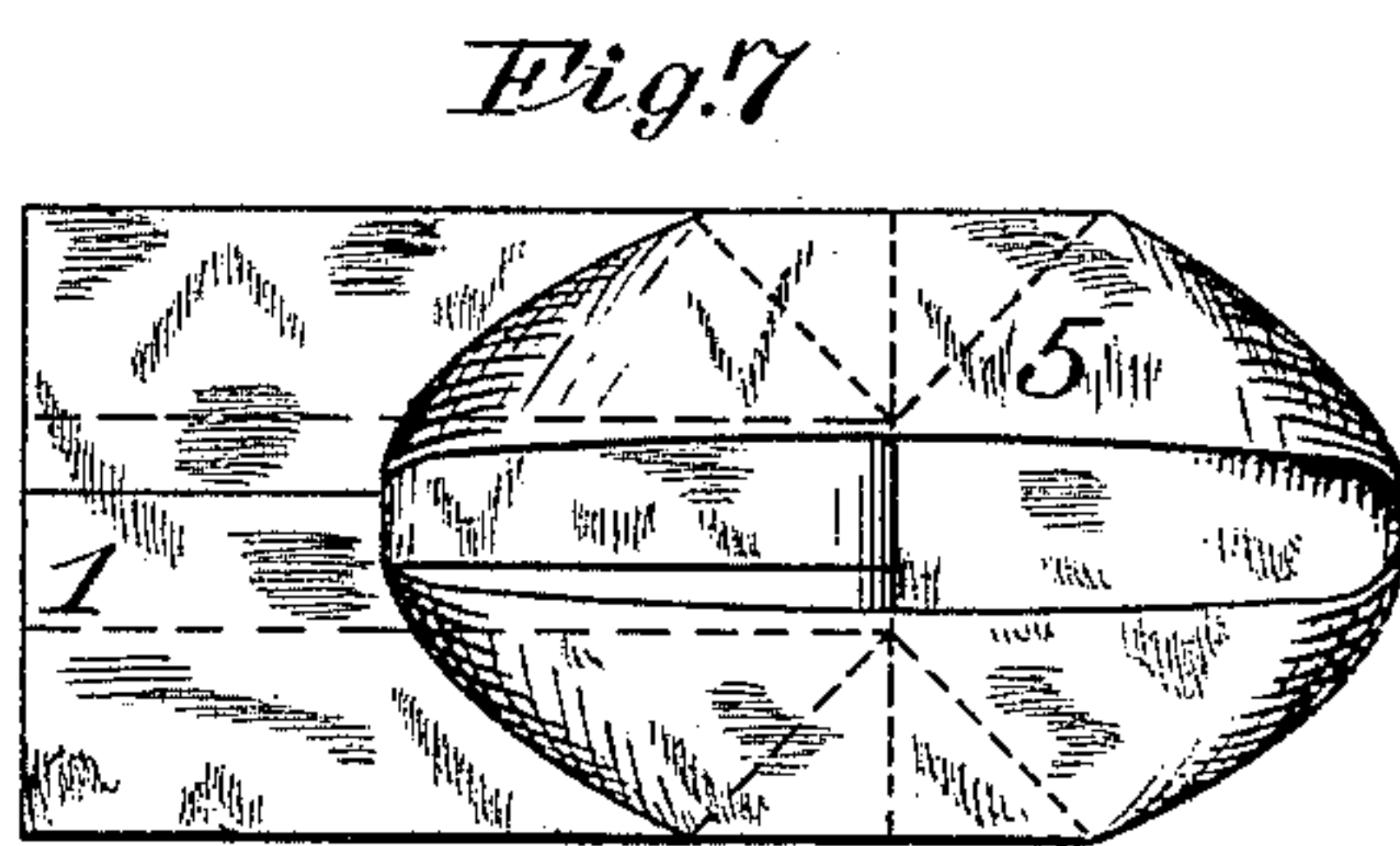
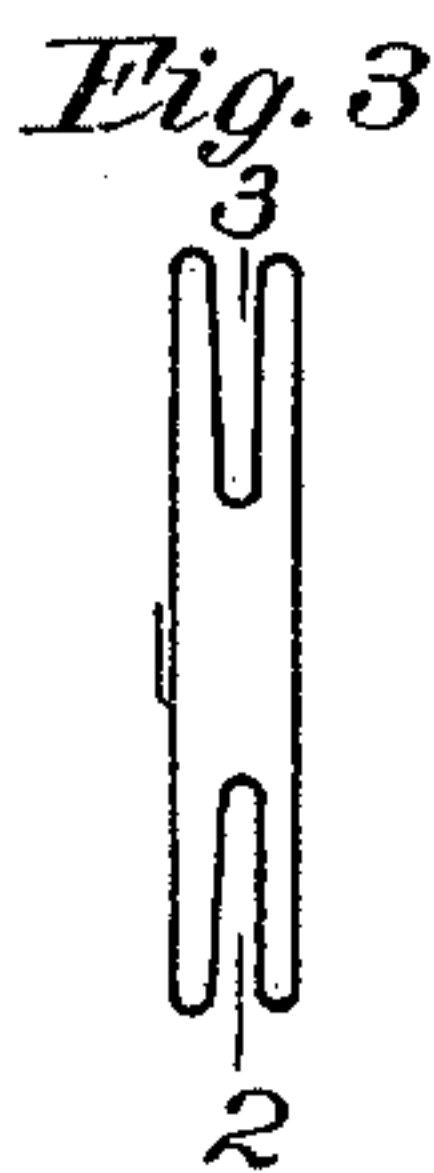
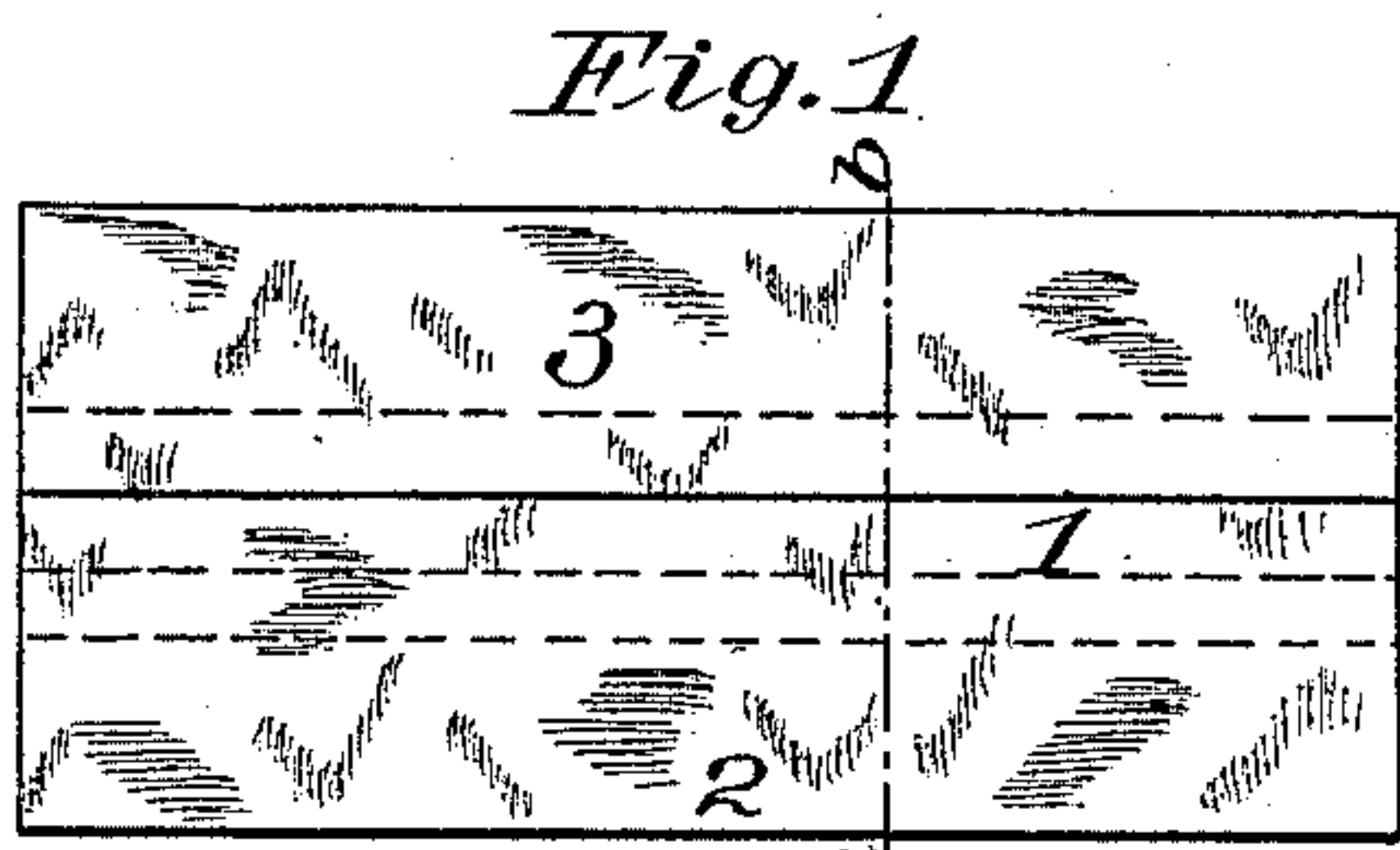
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E. E. CLAUSSEN & G. MORTSON.

PAPER BAG MACHINE.

No. 411,544.

Patented Sept. 24, 1889.



Witnesses:

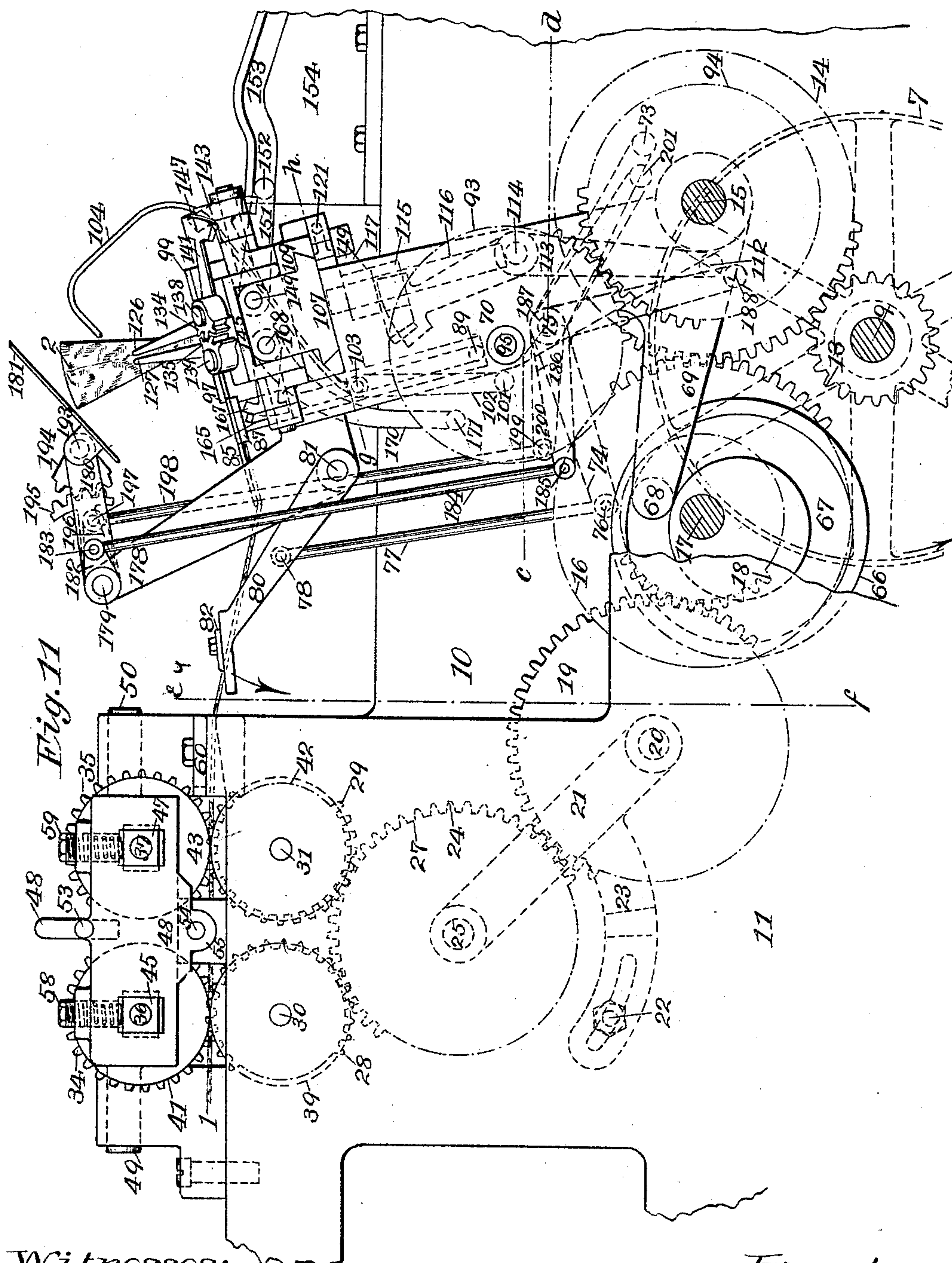
Nary R. Williams.  
Phoebe A. Phelps.

Inventors:  
Edward E. Claussen and George Mortson  
by Albert H. Walker Attorney

7 Sheets—Sheet 2.

## PAPER BAG MACHINE.

Patented Sept. 24, 1889.



*Inventors:*

Edward E. Chausse. George Watson.

for Albert H. Walker Attorney



(No Model.)

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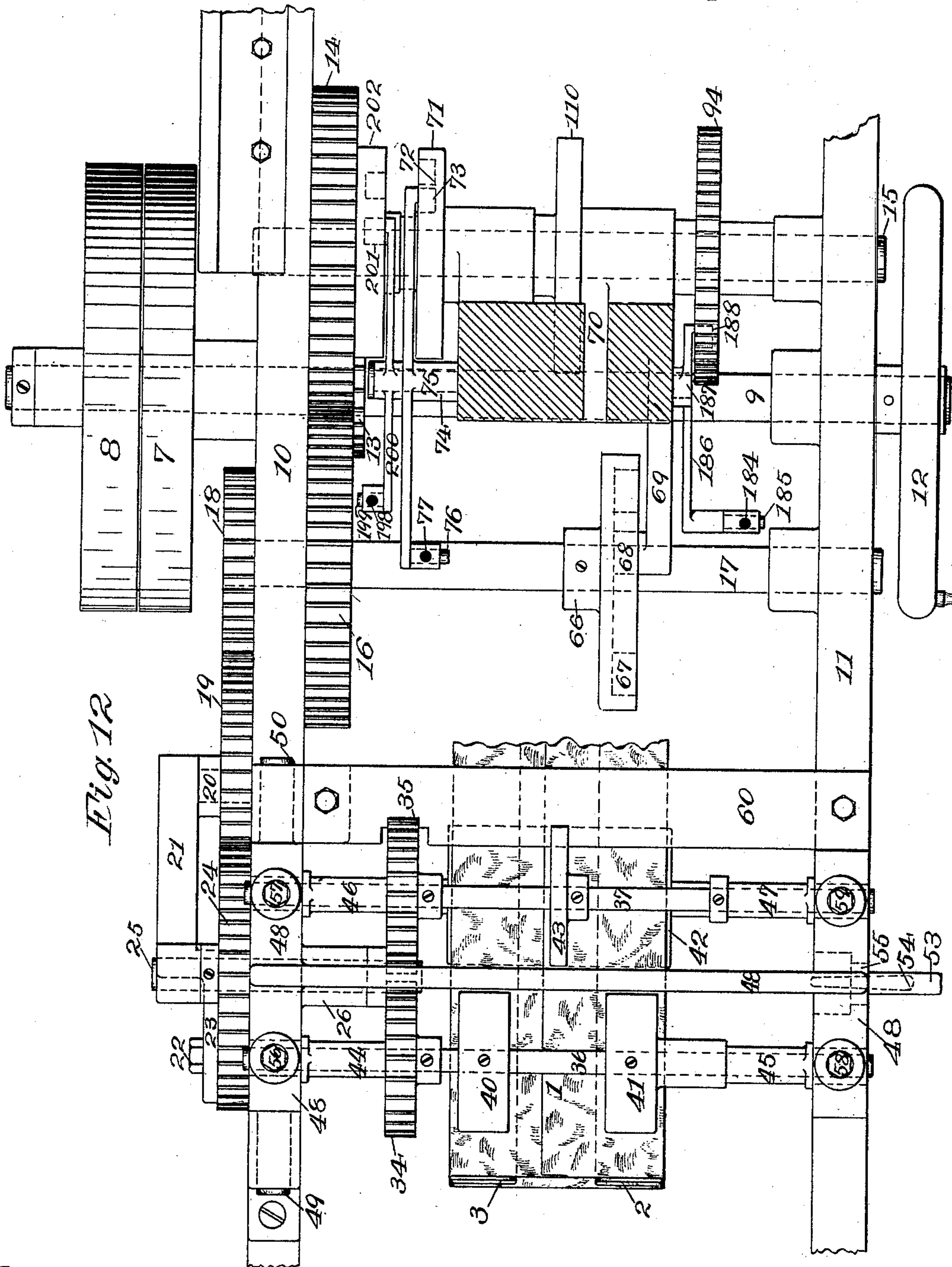


Fig. 12

Witnesses:

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PAPER BAG MACHINE.

Patented Sept. 24, 1889.

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(No Model.)

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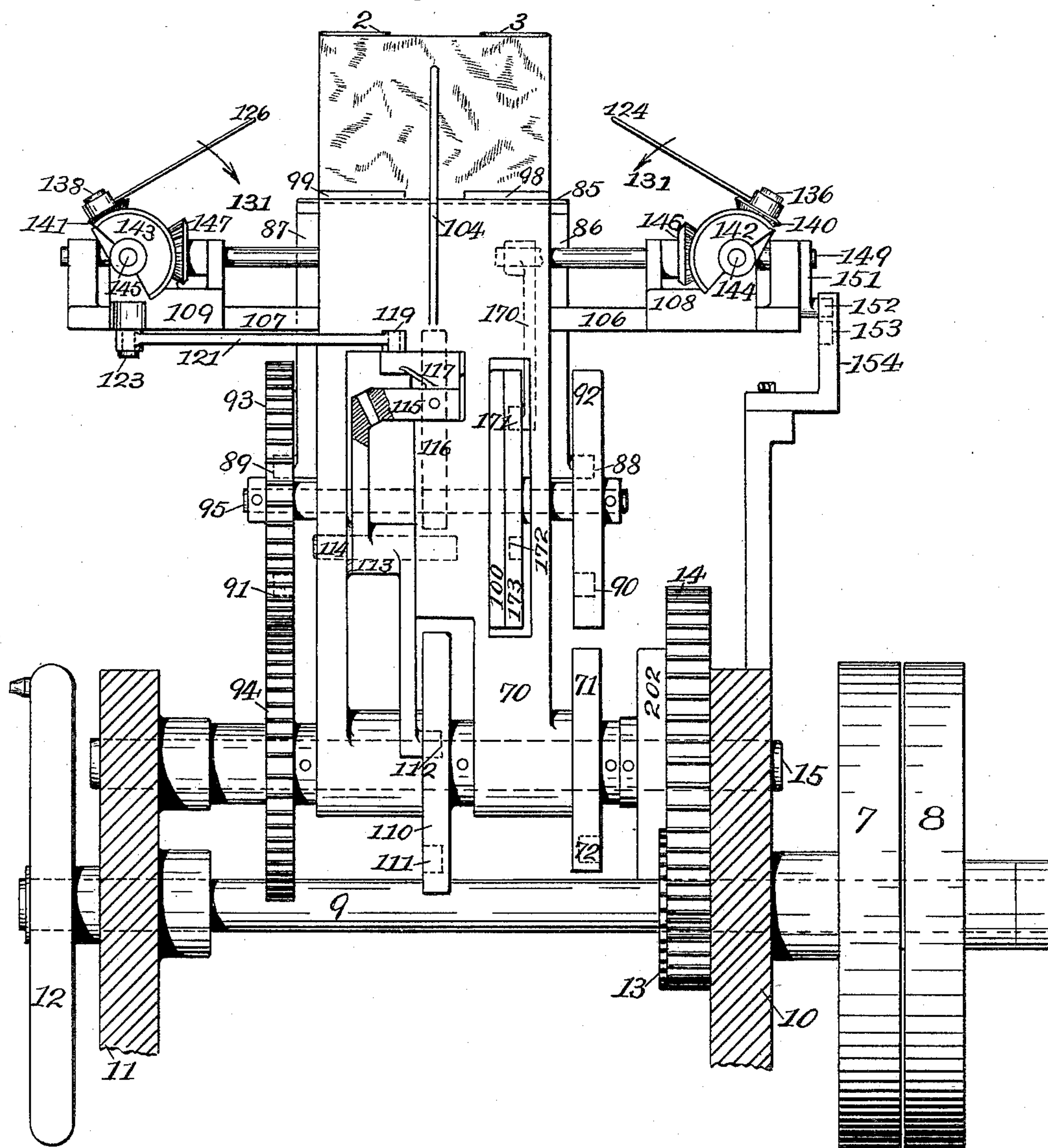
E. E. CLAUSSEN & G. MORTSON.

PAPER BAG MACHINE.

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Fig. 15



Witnesses:

Harry R. Williams.

Phoebe A. Phelps.

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by Albert H. Walker Attor.

(No Model.)

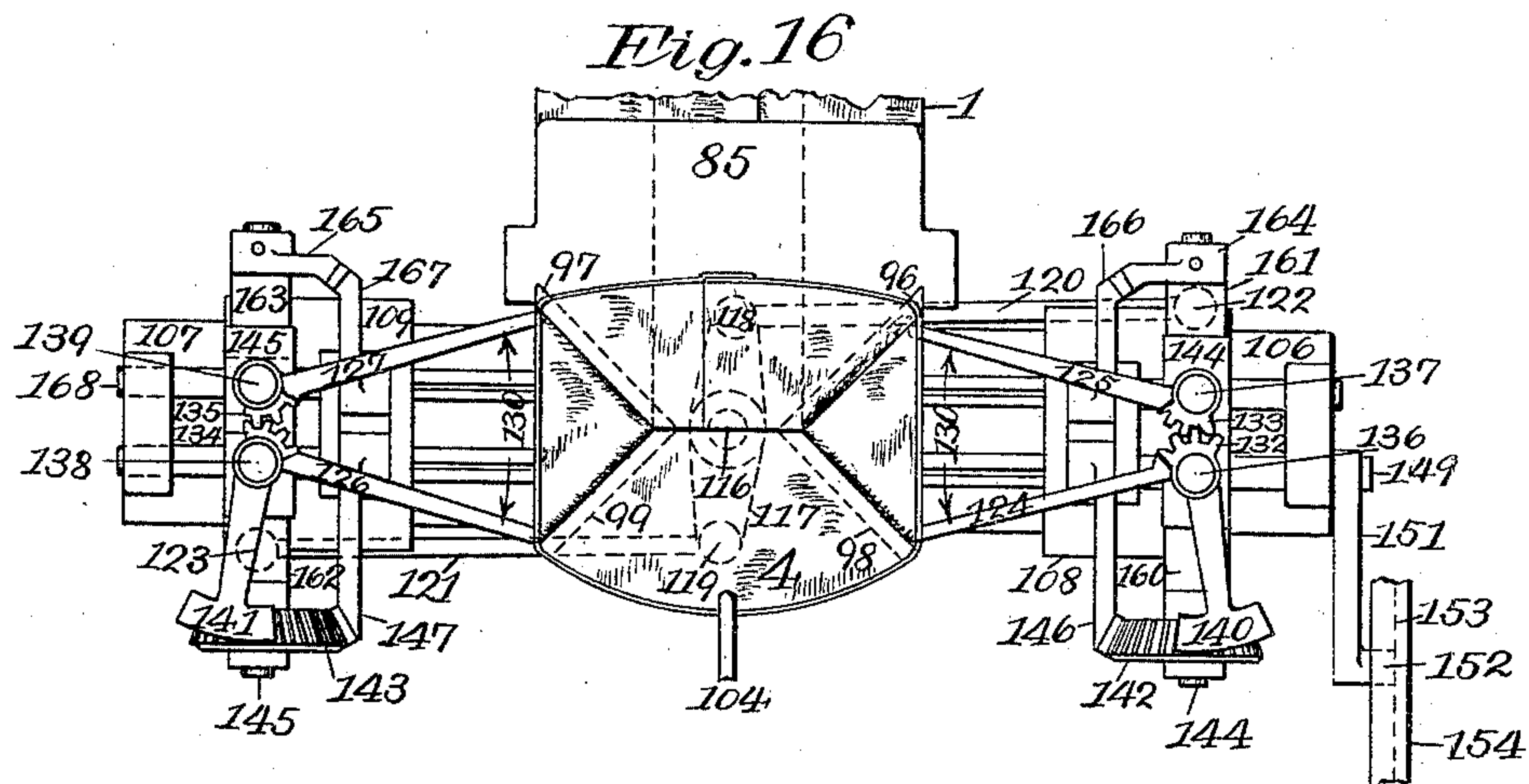
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(No Model.)

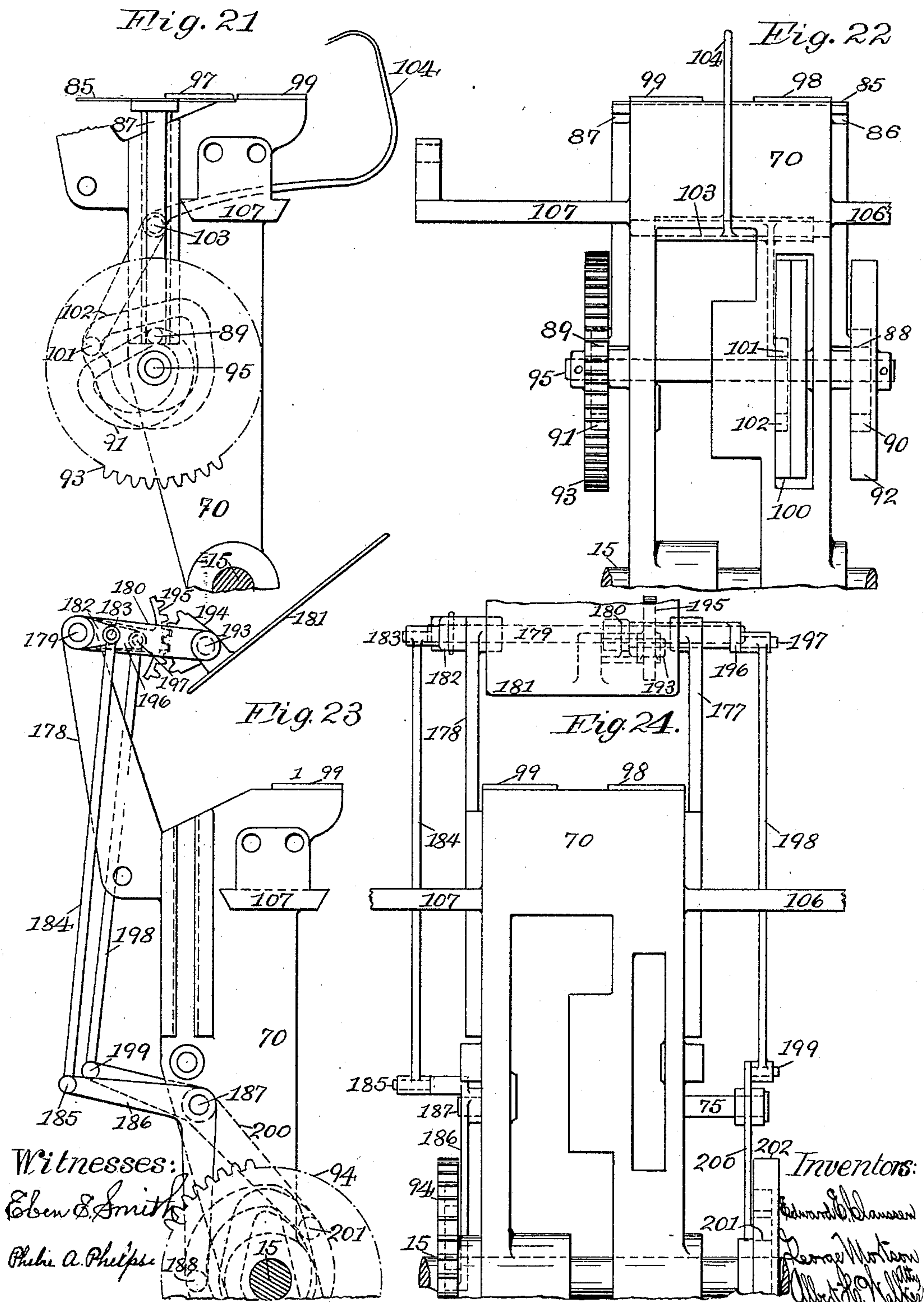
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E. E. CLAUSSEN & G. MORTSON.

PAPER BAG MACHINE.

No. 411,544.

Patented Sept. 24, 1889.





# UNITED STATES PATENT OFFICE.

EDWARD E. CLAUSSEN, OF HARTFORD, AND GEORGE MORTSON, OF BRIDGE-  
PORT, CONNECTICUT.

## PAPER-BAG MACHINE.

SPECIFICATION forming part of Letters Patent No. 411,544, dated September 24, 1889.

Application filed February 18, 1889. Serial No. 300,333. (No model.)

*To all whom it may concern:*

Be it known that we, EDWARD E. CLAUSSEN, of Hartford, and GEORGE MORTSON, of Bridgeport, Connecticut, have jointly invented a certain new and useful Paper-Bag Machine, of which the following description and claims constitute the specification, and which is illustrated by the accompanying seven sheets of drawings.

10 This machine manufactures continuous tucked-paper tubing into tucked-paper tubes like that illustrated in Figures 1, 2, and 3 of the drawings and then into paper-bag blanks which have one end folded down into the dia-  
15 mond shape shown in Figs. 9 and 10 of the drawings, and which blanks may be manufactured into square-bottom paper bags by means of machinery shown in Letters Patent of the United States No. 361,951, of April 26,  
20 1887, or by means of other machinery already well-known in the art. This diamond-folding machine differs materially from all other machines and plans known to us for performing that function.

25 Fig. 1 of the drawings is a plan view, while Fig. 2 is a side view, and Fig. 3 is an end view, of a tucked-paper tube suitable to be made by this machine into a diamond-bag blank and then made by other machinery into a  
30 square-bottom paper bag. Fig. 4 is a side view of the blank of Figs. 1, 2, and 3 after its forward portion has been turned upward on the line *a b* of Fig. 1 to a position substantially at right angles to the rearward por-  
35 tion of that blank. Figs. 5 and 6 are a plan and side view, respectively, of the blank of Fig. 4 after its upturned portion has been opened out into a box-like form. Figs. 7 and 8 are a plan and a side view, respectively, of the  
40 blank of Figs. 5 and 6 when the box-like form is partly folded down into the diamond form, which is the product of this machine, and which is shown in the side and plan views of Figs. 9 and 10. Fig. 11 is a side view of our  
45 machine, that part of a paper-bag machine which manufactures a roll of paper into continuous tucked-paper tubing being broken away from the left-hand end of what is shown in Fig. 11, while that part of a paper-bag ma-  
50 chine which manufactures a diamond-formed

blank like that of Figs. 9 and 10 into a square-bottom paper bag is broken away and removed from the right-hand end of what is shown in Fig. 11. Fig. 12 is a plan view of the left-hand part of what is shown in Fig. 11, and  
55 a horizontal section on the line *c d* of Fig. 11 of the right-hand part of what is shown in that figure. Fig. 13 is a vertical section looking to the left from the line *e f* of Fig. 11. Fig. 14 is a plan view of the upper part of  
60 the right-hand part of Fig. 11. Fig. 15 is an elevation of the right-hand end of what is shown in Fig. 11. Fig. 16 is a plan view of the principal mechanism shown in Fig. 14, but showing that mechanism in the advanced  
65 position it occupies when it has completed the box-like form of Figs. 5 and 6. Fig. 17 shows the mechanism of Fig. 16 when the diamond form of Figs. 9 and 10 is completed. Fig. 18 is a nearly horizontal section on the  
70 line *g h* of Fig. 11. Figs. 19 and 20 are plan and side views of a modified form of the mechanism shown in Fig. 16. Fig. 21 is a side view, and Fig. 22 is a front view, of certain parts of the mechanism less clearly  
75 shown in Figs. 11 and 15. Figs. 23 and 24 are a side view and a front view, respectively, of certain other parts of the mechanism less clearly shown in Figs. 11 and 14.

To promote clearness, the gears 14, 16, 18, 80 19, 24, 27, 28, 29, 34, 35, 93, and 94 have teeth omitted, and are thus not shown in full in side view, and the cam-grooves of all the cams have also been omitted in side view for the  
85 same reason.

The numeral 1 indicates a section of tucked-paper tubing severed from a continuous tucked-paper tube and having two inwardly-projecting tucks 2 and 3 extending the entire length thereof, as shown in Figs. 1, 2, and  
90 3. The box-like form into which this machine first folds the tucked-paper tube 1 is indicated by the numeral 4, and the diamond form into which this machine folds the box-like form is indicated by the numeral 5.

95 The numeral 7 represents the driving-pulley, by which power is communicated to this machine, and a loose pulley 8 runs adjacent thereto on the shaft 9, which revolves in bearings in the frame-pieces 10 and 11, and which  
100



carries the hand-wheel 12 on its end opposite to which the pulley 7 is keyed. The gear 13 is keyed to the shaft 9 and meshes into the gear 14 on the shaft 15, and which latter gear meshes into the gear 16 on the shaft 17, which shaft also has its bearings in the frame-pieces 10 and 11. The gear 18 is also keyed to the shaft 17 and meshes into the gear 19, which is pivoted by the stud 20 to the lower end of the swinging arm 21, which arm, by means of the bolt 22 passing through the curved slot in the segmental arm 23, which projects therefrom, is adjustable to various positions to admit of using gears of various sizes, as the gear 18.

The gear 19 meshes into the gear 24, which is keyed to the shaft 25, which has a single length bearing in the hub 26 of the frame-piece 10, and the inner end of that shaft carries also the fixed gear 27, which meshes into gears 28 and 29, which are keyed to the shafts 30 and 31, respectively, and which respectively mesh into the gears 34 and 35, which are keyed to the shafts 36 and 37, respectively. The drawing-rolls 38 and 39 are fixed to the shaft 30, and the drawing-rolls 40 and 41 are fixed to the shaft 36. The pressing-rolls 42 and 43 are fixed to the shafts 31 and 37, respectively. The shafts 36 and 37 have bearings in the boxes 44, 45, 46, and 47, respectively, and those boxes are carried in the four extremities of a swivel-casing 48, which turns on trunnions 49 and 50. The handle 53 is integral with the swivel-casing 48. The taper pin 54, when driven through the lug 55 of the casing 48 into an adjacent hole in the frame-piece 11, holds one end of that casing firmly to that frame-piece, while the other end of that casing is held firmly to the frame-piece 10 by the trunnions 49 and 50. When the taper pin 54 is removed, the operative is enabled by means of the handle 53 to throw the casing 54 upward upon its trunnions 49 and 50, and thus to thread the continuous paper tube, which comes from the left of the machine, more quickly into this machine than he otherwise could.

The upper drawing-rolls are pressed down upon the lower drawing-rolls, and the upper pressing-roll is pressed down upon the lower pressing-roll by means of springs, and that pressure is adjusted by means of the screws 56, 57, 58, and 59. The bar 60 firmly connects the frame-pieces 10 and 11.

The cam 66 is fixed to the shaft 17, and is provided with the cam-groove 67, in which groove there runs the projection 68 of the arm 69, and which arm is integral with the carriage 70 and imparts thereto a rocking motion on the shaft 15 as a pivot. The cam 71 is fixed to the shaft 15, and is provided with the cam-groove 72, in which runs the projection 73 of the lever 74, which lever is pivoted on the stud 75, and has its working end pivoted by the stud 76 to the connecting-rod 77, the upper end of which rod is pivoted by the stud 78 to the arm 79. That arm

and the corresponding arm 80 have their lower ends fixed to the shaft 81, so as to rock therewith, while their upper ends carry the serrated edged knife 82. The stud 75 and the shaft 81 have their bearings in the carriage 70 and participate in the rocking thereof.

The presser-plate 85 is fastened to the upper ends of the arms 86 and 87, which arms slide up and down in grooves on the opposite sides of the carriage 70, and their lower ends are provided with the projections 88 and 89, respectively, which run in the cam-grooves 90 and 91 of the cams 92 and 93, respectively. Gear-teeth are cut upon the periphery of the cam 93, and those teeth mesh with the gear 94, which is keyed to the shaft 15. The cams 92 and 93 are both keyed to the shaft 95, so that both receive identical motion from the gear 94 and transfer it, through the arms 86 and 87, to the presser-plate 85. Upon the upper side of the presser-plate 85 ledges 96 and 97 are fixed in positions diagonal to the presser-plate and at right angles to each other, and upon the upper side of the carriage, forward of the presser-plate, similar ledges 98 and 99 are fixed in positions diagonal to the carriage and at right angles to each other. The ledges 96 and 98 form a right angle when viewed from above, and the ledges 97 and 99 form another right angle when thus viewed. The inner apexes of those right angles point toward the longitudinal center of the machine, and are separated from each other by a distance substantially identical with that which separates the inner bends of the two tucks of the blank 1. The cam 100 is fixed to the shaft 95, and the projection 101 of the arm 102 runs in a cam-groove on the inside of that cam. That arm is fixed to a sleeve which rocks on the shaft 103, and which sleeve carries a long hook-like arm 104.

The carriage 70 has two oppositely and outwardly extending brackets 106 and 107 cast thereto, and upon which the slides 108 and 109, respectively, reciprocate. These slides receive motion toward and from each other from the cam 110 on the shaft 15, which cam is provided with the cam-groove 111 for the reception of the projection 112 of the lever 113, which is pivoted on the stud 114, and the upper end of which is a sector, which meshes into the sector 115, which is fixed to the upright shaft 116, which rocks in bearings in the center of the carriage. The rock-arm 117 is fixed at its center to the upper end of the shaft 116, and is provided at its ends with the studs 118 and 119, and is thereby pivoted to the inner ends of the connecting-rods 120 and 121, the outer ends of which rods are pivoted by the studs 122 and 123, respectively, to the slides 108 and 109.

On the upper side of the slide 108 the spreading fingers 124 and 125 are arranged and worked, while the spreading fingers 126 and 127 are similarly arranged and worked



upon the upper side of the slide 109. The fingers 124 and 125 are geared together by the sectors 132 and 133, which turn upon pivots 136 and 137, while the fingers 126 and 127 are geared together by the sectors 134 and 135, which are pivoted upon the studs 138 and 139, respectively. The sectors 140 and 141 are integral with the hubs of the sectors 132 and 134, respectively, and mesh with the bevel-pinions 142 and 143, respectively, which pinions are pivoted loosely on the ends of the swivels 144 and 145, respectively. The pinions 142 and 143 also mesh into the sectors 146 and 147, respectively, and those sectors are splined to the shaft 149, and that shaft is provided with the spline 150 and has its bearings in the brackets 106 and 107. One end of the shaft 149 carries the arm 151, the outer end of which is provided with the projection 152, which runs in the cam-groove 153 of the cam 154, which is fastened to the frame of the machine. The studs 136 and 137 are fastened to the swivel 144, and the studs 138 and 139 are fastened to the swivel 145, and those swivels have bearings in the lugs 160 and 161 and 162 and 163, respectively. The sector-pinions 164 and 165 are fastened to the rearward ends of the swivels 144 and 145, respectively, and they respectively mesh with the sectors 166 and 167, which sectors are splined to the shaft 168, which is provided with the spline 169. The arm 170 is fixed to the shaft 168 and its outer end is provided with the projection 171, which runs in the cam-groove 172 of the cam 173.

Extending upward from the rear of the carriage are the arms 177 and 178, and their upper ends carry the shaft 179, which carries the arm 180. The drop-plate 181 is pivoted to the forward end of the arm 180. The shaft 179 also carries the arm 182 outside of the arm 178, and the forward end of the arm 182 is pivoted by the stud 183 to the connecting-rod 184, and the lower end of that rod is pivoted by the stud 185 to the cam-arm 186, which turns on a pivot 187, and the lower end of which is provided with the projection 188, running in a cam-groove on the inside of the gear 94. The pivot 193 of the drop-plate 181 is fastened to the sector 194, which meshes into the sector 195, which swings loosely on the shaft 179 and carries the arm 196, the outer end of which is pivoted by the stud 197 to the outer end of the connecting-rod 198, the lower end of which is pivoted by the stud 199 to the cam-arm 200, which turns on the stud 201, and is provided with the projection 202, which runs in the cam-groove of the cam 202.

The mode of operation is as follows: The forward end of continuous tucked-paper tubing is drawn into the machine by the drawing-rolls 38 and 39 and 40 and 41, and thence passed between the pressing-rolls 42 and 43, and thence carried under the knife 82, and under the presser-plate 85, and over the upper face of the carriage 70 far enough to protrude in advance of the forward edge of the

presser-plate 85 sufficiently to present enough of the paper tube to make the upturned part of the blank shown in Fig. 4. Then the presser-plate 85 descends upon the paper tubing and clasps it to the upper side of the carriage, and then the knife 82, which is adjustable upon the arms 79 and 80, so as to cut off blanks of different lengths, descends and severs a blank like that of Fig. 1 from the continuous tucked-paper tubing. Thereupon the end of the arm 104 rises from its position below the forward end of the blank 1 to its position shown in Fig. 11, and thus raises the forward portion of that blank into the upright position shown in Fig. 4, while the rearward portion of that blank is held in the horizontal position shown in that figure by the presser-plate 85. Then the pair of fingers 124 and 125 and the pair of fingers 126 and 127 are carried forward with the slides 108 and 109 from the positions shown in Fig. 15 till they enter the tucks 2 and 3 of the upright part of the blank of Fig. 4 about midway of the length of that upright part. Then the two pairs of fingers rock downward to a horizontal position extending to the inner bends of the tucks in the paper. Then the pairs of fingers are withdrawn from the tucks, and as they are withdrawn are opened, so that their inner ends follow paths nearly coincident with the adjacent outer sides of the ledges 96, 98, 97, and 99. This withdrawal presses and creases the paper which constitutes the tucks of the blank, and also the adjacent portion of the paper which constitutes the flat walls of the blank, on diagonal lines coincident with the outer edges of the four ledges, respectively, and thus draws the upright part of the blank of Fig. 4 down and out into the box-like form of the blank of Figs. 5 and 6. In the meantime the hook-like arm 104 moves downward and outward to make room for the forward part of the box-like form, and after that form is completed it moves upward again and its end passes over the forward wall of the box-like form, and then the arm descends and draws that wall down into the form of the forward end of the diamond form of Figs. 9 and 10 through the intermediate stage shown in Figs. 7 and 8, while the rear wall of the box-like form is swept and pressed down into the form of the rearward part of the diamond of Figs. 9 and 10 by means of the drop-plate 181. Thereupon the presser-plate 85 rises and releases the completed diamond blank of Figs. 9 and 10, and that blank may be withdrawn from the machine and be transferred by either of several well-known means to that part of a paper-bag machine which is adapted to make such a blank into a square-bottom paper bag.

The manner in which the various parts of this machine which immediately operate upon the paper blank are worked by the various gears, cams, and connections which give them motion will be apparent to all persons skilled in paper-bag machinery who attentively con-



sider the foregoing description of those gears, cams, and connections.

The modified form of mechanism shown in Figs. 19 and 20 differs from the corresponding mechanism which has been hereinbefore described principally in making each pair of spreading fingers turn upon one pivot instead of upon two. Here also three motions are imparted to the spreading fingers, as before—namely, the lateral oscillating motion with the slides 108 and 109, a spreading motion of the fingers, (shown by the arrow 130 in Fig. 16,) and a downward-swinging motion. (Shown by the arrows 131 in Fig. 15.) The first of these three motions is identical with that hereinbefore described in that behalf; but the spreading motion is now produced as follows: Pinion-sectors 209 210 211 212 are made integral with the spreading fingers 124, 125, 126, and 127, respectively, and they are made to respectively mesh with the sectors 213, 214, 215, and 216, respectively, which are fastened in pairs to the shafts 217 and 218, respectively. The sectors 219 and 220 are also respectively fastened to those shafts, and they mesh into the sectors 221 and 222, respectively, both of which are splined to the shaft 223, which shaft receives motion through the cam-arm 170 and the cam 173. The downward-swinging motion is now obtained, as follows: The studs 207 and 208 are tight in the sleeves 226 and 227, which swing loosely on the shafts 217 and 218, and are provided with the pinions 228 and 229, which mesh into the sectors 230 and 231, respectively, which are splined by a feather to the shaft 232, to which is fastened the cam-arm 233, which is provided with the projection 234, working in the groove 235 of the cam 236.

We claim as our invention—

1. The combination of the presser-plate 85, fastened to the upper ends of the vertical arms 86 and 87, and the cams 92 and 93, attached to the lower ends of those arms and alternately raising and lowering those arms and that presser-plate, all substantially as described.

2. The combination of a folding bed, as the upper surface of the carriage 70, provided with the diagonal ledges 98 and 99, the presser-plate 85, provided with the diagonal ledges 96 and 97, and two oppositely-disposed pairs of fingers 124 and 125 and 126 and 127, so constructed and worked as to press and crease a

tucked-paper tube on diagonal lines coincident with the outer edges of the four ledges, and thus to draw part of that tube down and out into a box-like form, all substantially as described.

3. The combination of the rocking carriage 70, the slides 108 and 109 reciprocating thereon and carrying the two pairs of fingers 124 and 125 and 126 and 127 therewith, and the cam 110, and intermediate mechanism, substantially as described, working those slides, all substantially as described.

4. The combination of two pairs of fingers 124 and 125 and 126 and 127, a shaft provided with an arm rocked by a cam, and intermediate mechanism, substantially as described, between that shaft and those fingers, all combined and operating to spread each pair of fingers apart, substantially as described.

5. The combination of two pairs of fingers 124 and 125 and 126 and 127, the swivels 144 and 145, having those pairs of fingers pivoted thereto, respectively, a shaft provided with an arm rocked by a cam, and intermediate mechanism, substantially as described, between that shaft and those swivels, all combined and operating to swing those fingers at right angles to the direction of their spreading, all substantially as described.

6. The combination of the cam 100, the arm 102, worked by that cam and rocking on the shaft 103, and the long hook-like arm 104, worked by the arm 102 and operating, substantially as described, to raise the forward part of a tucked-paper tube into the upright position shown in Fig. 4, and afterward to draw the forward wall of the box-like form of Figs. 5 and 6 down into the form of the forward end of the diamond form of Figs. 9 and 10, all substantially as described.

7. The combination of the drop-plate 181 and two cams, and mechanism, substantially as described, between each of those cams and that drop-plate, whereby the drop-plate receives a compound sweeping and pressing motion, all substantially as described and shown.

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