

No. 700,283.

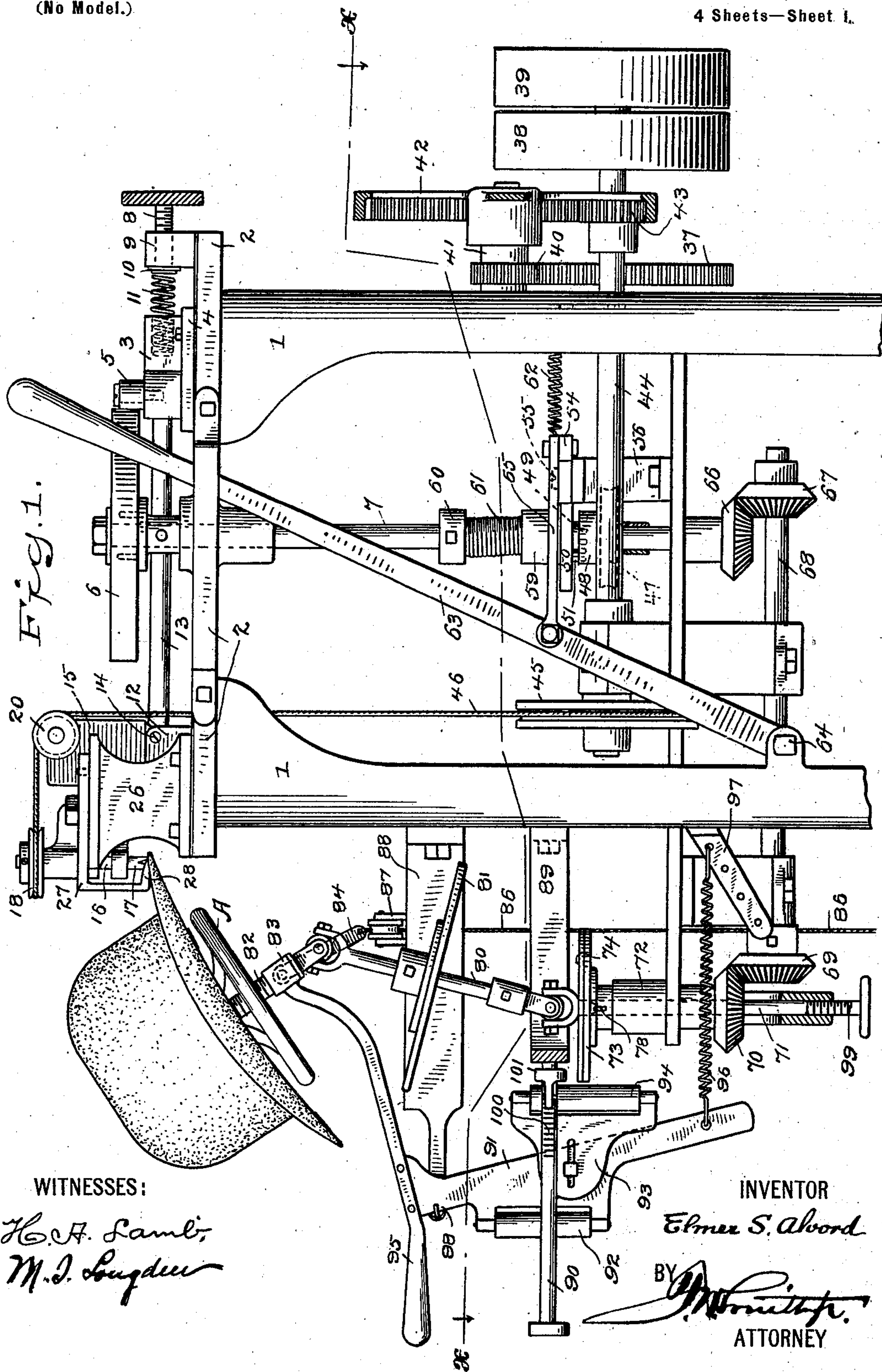
Patented May 20, 1902.

E. S. ALVORD.  
HAT PARING MACHINE.

(Application filed Sept. 25, 1901.)

(No Model.)

4 Sheets—Sheet 1.



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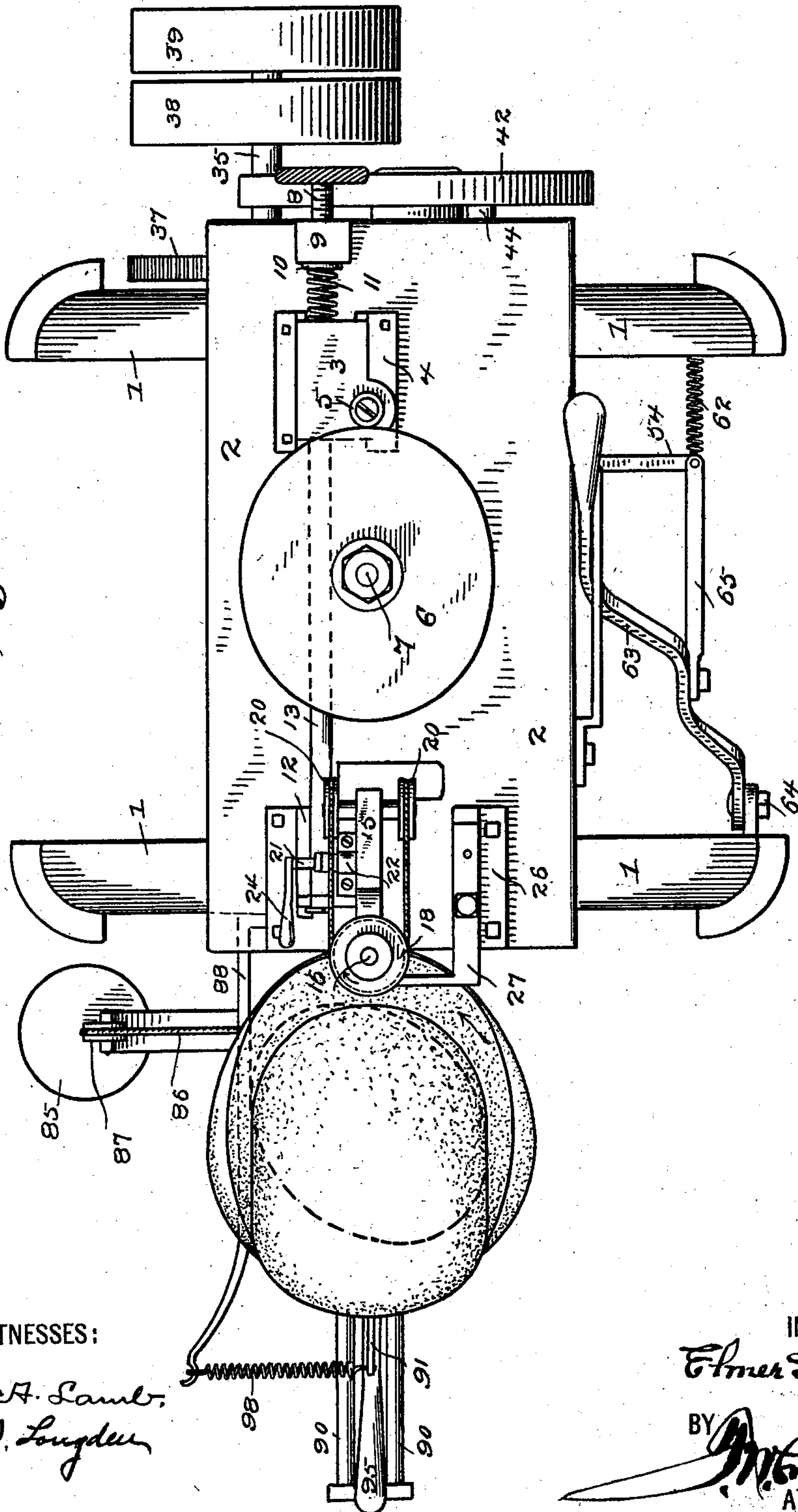
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4 Sheets—Sheet 2.

Fig. 2.



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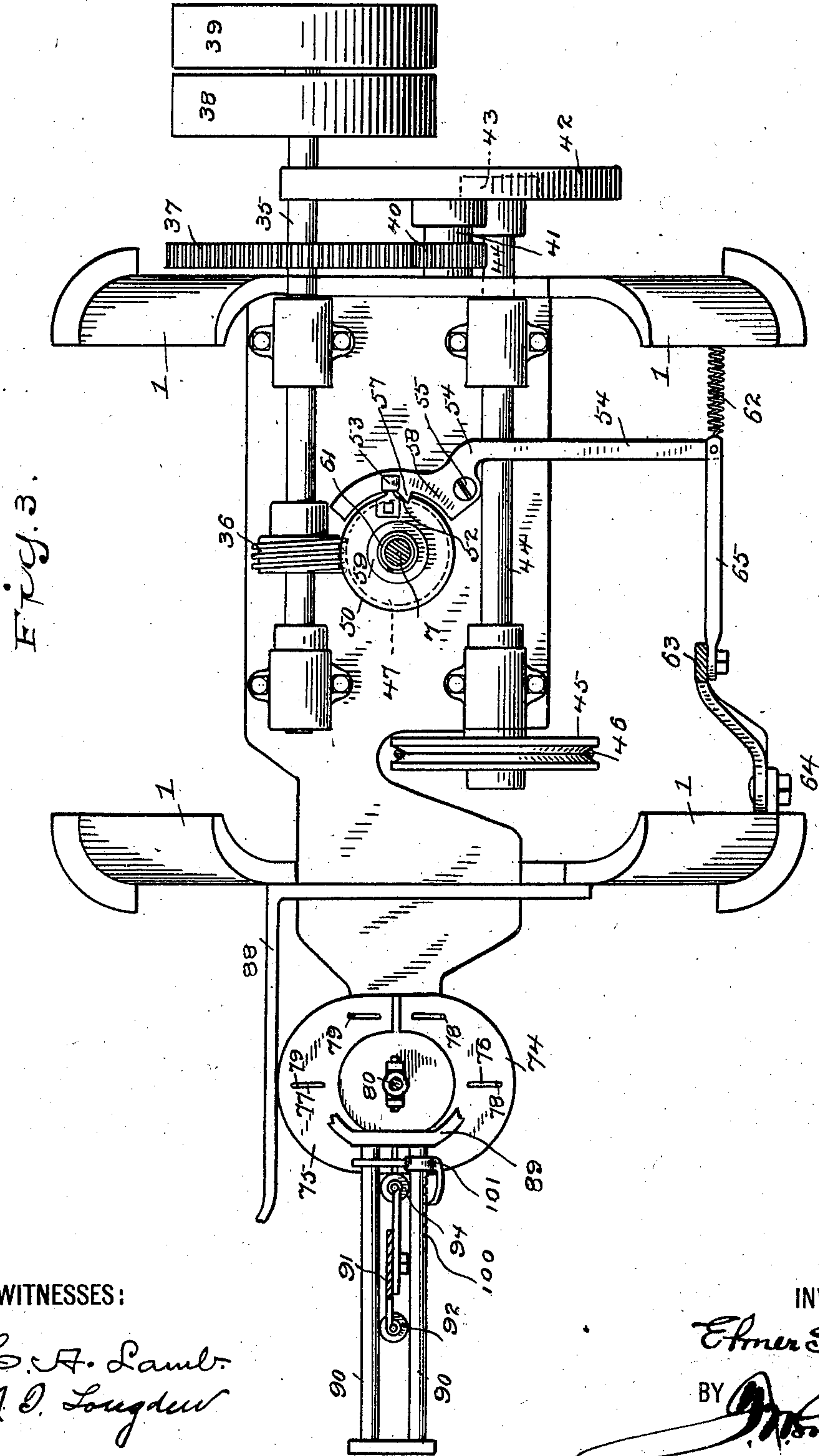
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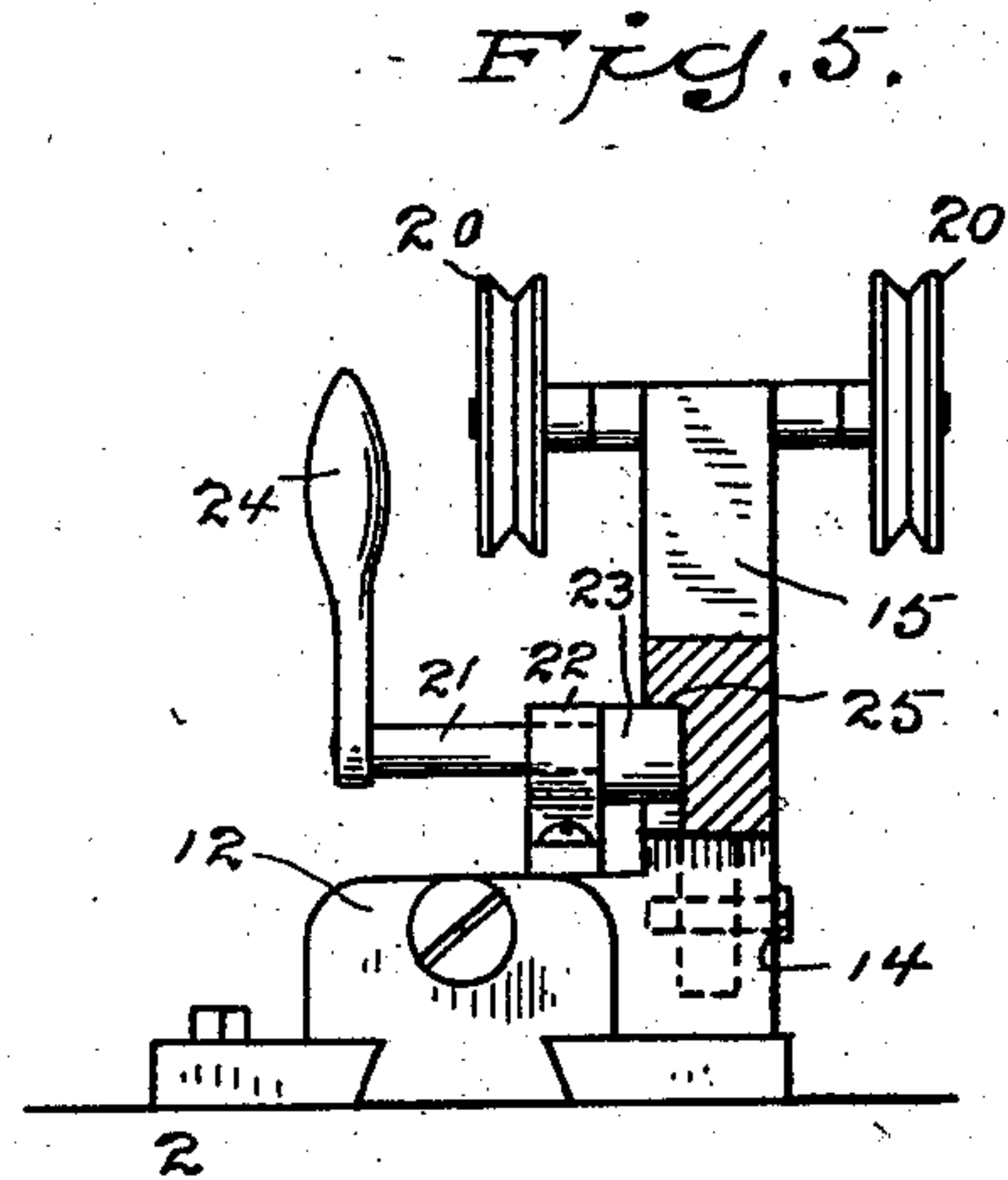
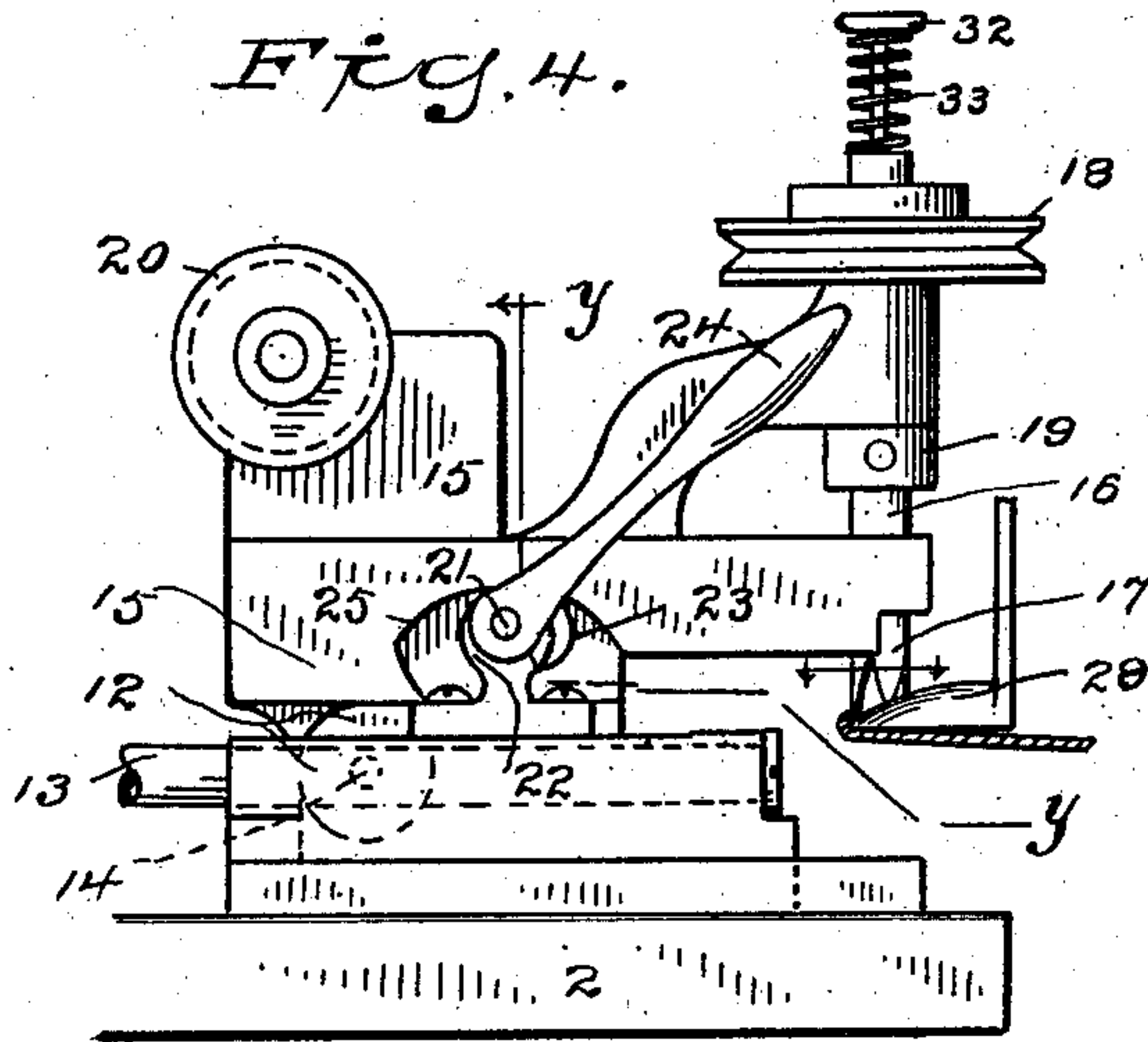


Fig. 8.



Fig. 7.

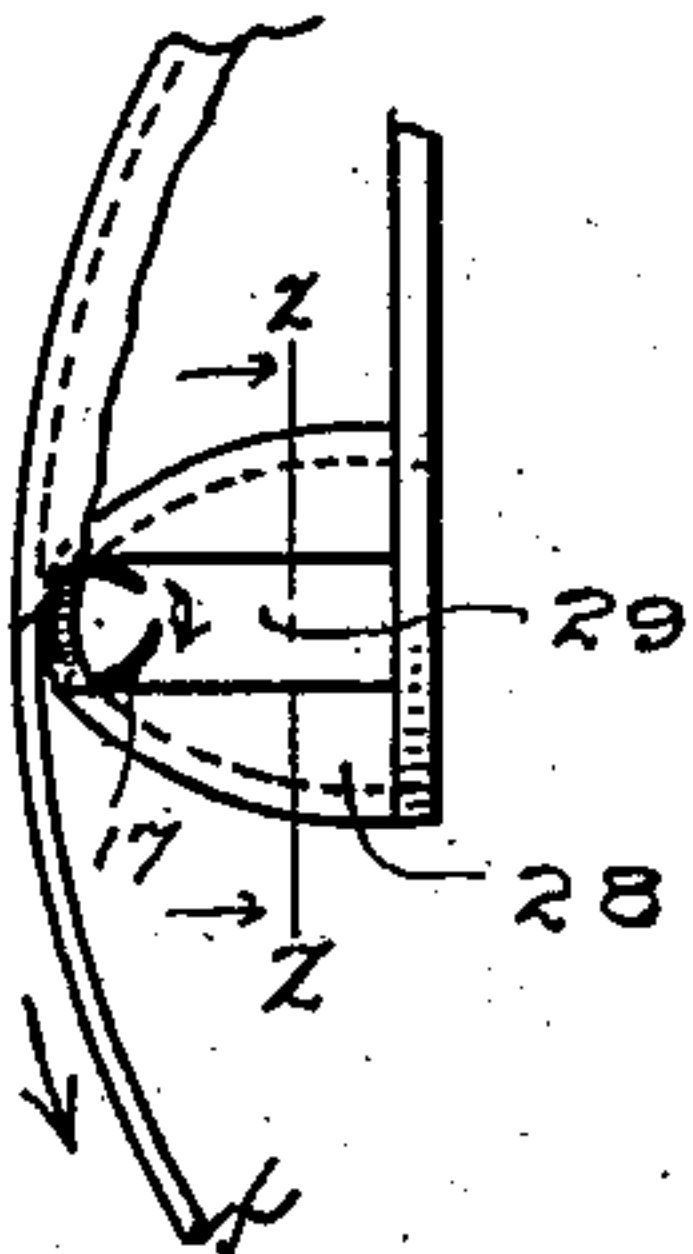


Fig. 9.

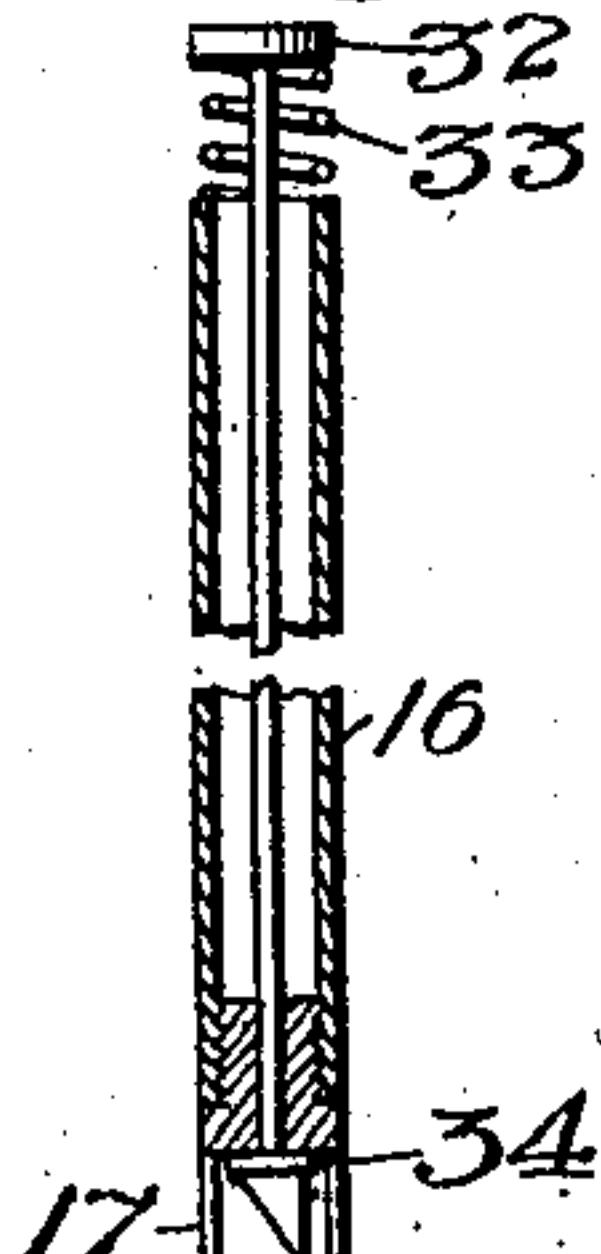
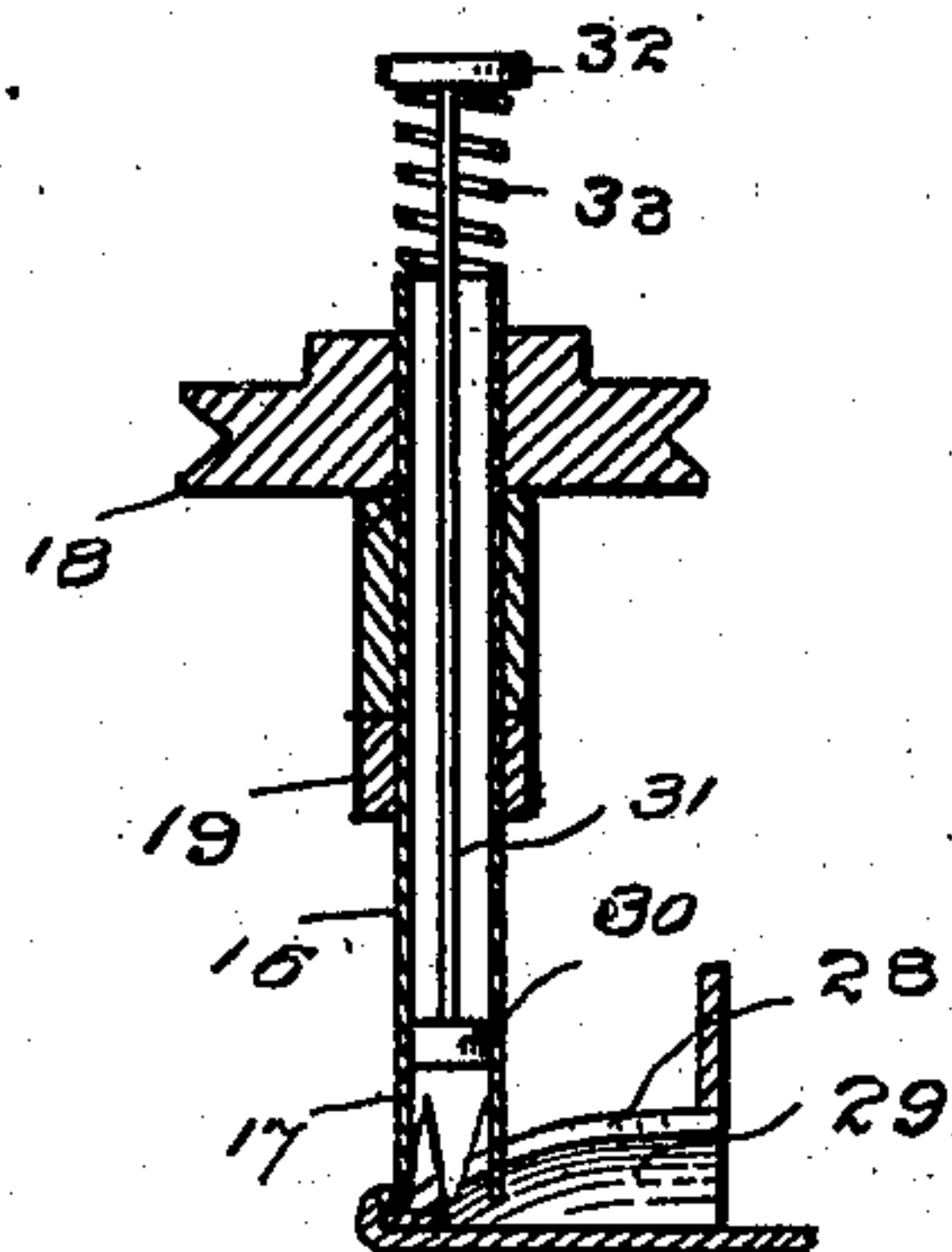


Fig. 6.



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# UNITED STATES PATENT OFFICE.

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TO MICHAEL J. DOYLE, OF DANBURY, CONNECTICUT.

## HAT-PARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 700,283, dated May 20, 1902.

Application filed September 25, 1901. Serial No. 76,521. (No model.)

*To all whom it may concern:*

Be it known that I, ELMER S. ALVORD, a citizen of the United States, residing at Danbury, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Hat-Paring Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain new and useful improvements in hat-paring machines, which are used to pare off the surplus "petticoat" on the edge of the hat-brim after the curling operation has been performed.

The object of my invention is to provide a machine not likely to get out of order and which shall be capable of performing the paring operation quickly and effectively; and with these ends in view my invention consists in certain details of construction and combination of parts, such as will be hereinafter fully described and then specifically be designated by the claims.

In the accompanying drawings, which form a part of this application, Figure 1 is a side elevation of my machine; Fig. 2, a plan view; Fig. 3, a section at the line *xx* of Fig. 1; Fig. 4, a detail elevation of the carriage which supports cutter and also shows a section of the hat-brim with the foot and cutter in proper relative positions with respect to such brim; Fig. 5, a section at the line *yy* of Fig. 4; Fig. 6, a detail sectional elevation of the cutter device; Fig. 7, a detail plan showing a portion of the hat-brim with the foot and cutter in proper relative positions with respect thereto, the cutter being shown in section; Fig. 8, a section at the line *zz* of Fig. 7; Fig. 9, a detail sectional elevation of a modified form of cutter device.

Similar characters of reference denote like parts in the several figures of the drawings.

Heretofore great difficulty has been experienced in producing a machine in which the hat-brim is properly delivered to the cutter. There are a great many things to take into consideration in the operation of paring a hat-brim automatically—namely, the hat must be revolved so as to describe an oval, so that

the ovoidal hat-brim may constantly be kept up to a certain stationary point; the cutter must have a predetermined reciprocation in order to enable it to pare off the desired amount of petticoat from the edge of the ovoidal brim; means must be provided for tilting the sides and ends of the brim respectively downwardly and upwardly when these portions of the brim come in contact with the cutter, because the droop at the ends of the brim brings those portions in a lower plane than the sides, and all parts of the hat-brim must be automatically brought to the same horizontal plane in order that the paring may be properly effected; the hat-block which supports the hat must be capable of being swung by hand so as to bring the hat in proper position relative to the cutter before the machine is started, this being necessary, since all hats are not the same, and the machine must be capable of paring not only brims which have more or less rise at the sides and droop at the ends, but also brims that are known as "straight brims." In order to provide a hat-paring machine that is practical and acceptable, it must answer to all these requirements, and it is the object of my present invention to do this.

There are two well-defined sets of mechanisms which I employ—namely, instrumentalities for giving to the hat itself the proper movements, so that it may always be presented accurately to the cutter, and instrumentalities for presenting the cutter accurately to the brim, so that said cutter may act in conjunction with a suitable foot to properly pare the hat. The means which I employ for imparting motion to these mechanisms from any suitable power-pulley are very ordinary and hardly require detail descriptions, and I will merely touch upon them briefly, since they will be readily understood at a glance and are well within the range of ordinary mechanical skill. I will first describe the cutter and the foot and the means which I employ to give the proper movements to the cutter.

1 is the frame of the machine, and 2 the bed.

3 is a block capable of sliding freely in ways 4 on the bed and carrying on its upper face a friction-roller 5.

6 is a cam carried by a shaft 7, which lat-



ter is journaled vertically within the bed and the frame of the machine.

8 is a screw driven through an ear 9, projecting from the rear of the bed 2, the inner end of this screw carrying a block 10, and 11 is a coil-spring whose extremities bear respectively against the blocks 3 10, so that it will be clear that the roller 5 is normally kept pressed against the edge of the cam 6.

12 is a block adapted to slide freely within ways in the bed, and 13 is a rod which connects the blocks 3 and 12, so that the latter partakes of the movements of the former, and this connection may be made adjustable in any suitable and ordinary manner.

Hinged at 14 to the block 12 is the cutter-carriage 15, within the forward end of which is journaled the vertically-disposed cutter-shaft 16, which carries at its lower end the cutter 17 and at its upper end a pulley 18.

19 is a collar secured to the shaft 16 immediately beneath that part of the carriage within which it is journaled, so that it will be clear that said shaft can have no vertical play, owing to the fact that the pulley 18 and collar 19 confine it in position, as will be clear from Fig. 4.

20 represents pulleys journaled at the rear of the carriage for the purpose presently to be explained.

21 is a rock-shaft journaled within a box 22, secured to the block 12, and carrying at its inner end a cam 23 and at its outer end a lever 24, and 25 is a recess cut within the lower edge of the carriage 15. The swinging of the lever 24 in one direction will cause the cam to operate against the upper wall of this recess, and thereby elevate the carriage, while the reverse movements of the lever will allow the carriage to drop by gravity to its normal position.

Secured to an upright 26, which rises from the bed of the machine, is an angle-bar 27, which carries at its lower extremity the foot 28, that coöperates with the cutter. The upper surface of this foot is convex and gradually tapers down to a very thin edge at the extreme forward part, as shown at Figs. 1, 4, and 6. About one-eighth of an inch from the extreme forward edge of the foot the latter is cut away, as shown at 29, this cut-away portion extending entirely through the foot vertically, so as to afford the greatest facility for disposing of all refuse incident to the paring operation. This foot during the operation of paring is constantly beneath the curl of the hat-brim, while the cutter pierces the petticoat of the curl from above, so that the foot acts as a sort of anvil to keep the hat well up and steady during the operation of the cutter. As will be hereinafter explained, the cutter has a rotary movement in a direction opposite to the direction in which the hat is revolved, and the object of revolving the hat in an ovoidal circuit is to keep the oval-shaped brim always in contact against the foot 28,

while the object of the reciprocation of the cutter-carriage is to enable the cutter to traverse the slightly-different ovoidal circuit, due to the fact that the edge of the curl at the sides of the brim is wider than at the quarters or at the ends.

The cutter-shaft 16 is hollow and contains a disk 30 at the end of a spindle 31, the latter being provided at its upper end with a button 32, between which latter and the end of the shaft is a coil-spring 33. By depressing the button 32 the disk will operate to clean the cutter of all refuse adhering thereto, while the spring will return the disk to normal position. Right in this connection I will say that I prefer to make the cutter separate from the cutter-shaft, so as to facilitate the substitution of new cutters, and, referring to Fig. 9, would state that it is my intention to provide the cutters with an exteriorly-threaded hub 34, which is driven within the bottom of the hollow shaft, the latter being interiorly threaded at that point for this purpose. The substitution of a new cutter in this instance would be effected by removing the button 32 and withdrawing the cutter and spindle and then after assembling the spindle through the hub of a new cutter driving the latter into position and replacing the button.

I will now briefly refer to the very ordinary instrumentalities which I employ for imparting movements to the various parts of my machine from any suitable source of power.

35 is the primary shaft journaled in the frame of the machine and carrying on its inner end a worm 36 and near its outer end a spur-gear 37, while on the extreme outer end of this shaft are mounted the usual power-pulleys 38 39. The gear 37 meshes with a small spur-gear 40, carried by a short shaft 41, journaled in the side of the frame, and this short shaft also carries at its outer end an internal spur-gear 42, which meshes with a small spur-gear 43, mounted on a shaft 44, journaled in the frame of the machine, the extreme inner end of this shaft 44 carrying a pulley 45, which is connected by any suitable belt 46 with the pulleys 18 20, so that it will be clear that rotary movement will be imparted to the cutter from the shaft 44. The sizes of these gears are such that the proper speeds and movements desired are obtained, as will be readily understood by a mere inspection of Figs. 1 and 3 of the drawings.

Loose around the vertical shaft 7 is a worm-wheel 47, which meshes with the worm 36, this worm-wheel appearing in dotted lines in Figs. 1 and 3. 48 is a hub of this worm-wheel and is pierced in its upper surface so as to provide a series of small holes in circular disposition, as shown in dotted lines at 49.

50 is a clutch-disk splined on the shaft 7 and having depending from its lower side a pin 51 and provided in its periphery with a



notch 52. This disk also carries a friction-roller 53, which extends slightly beyond the periphery of the disk.

54 is a suitable clutch-lever pivoted at 55 to a suitable bracket 56, supported on the frame, the inner end of this lever having a tooth 57, adapted to engage with the notch 52, as will be presently explained. Between this tooth and the pivotal point of the lever the latter is inclined upwardly, as shown at 58, so that when the disk 50 revolves the roller 53 will ride up this incline, and thereby elevate the disk bodily, which latter is splined on the shaft 7, so as to have a free movement longitudinally thereof.

59 is the hub of the disk 50, and around the shaft 7 and confined between this hub and a collar 60, secured to said shaft, is a coil-spring 61, which acts to force said disk downwardly, so that the pin 51 will either strike against the top of the hub 48 or engage with one of the holes 49 therein.

62 is a coil-spring, one end of which is connected to the frame of the machine, while the other end is connected with the extreme outer end of the clutch-lever 54, the function of this spring being to throw the tooth 57 normally against the disk 50, so that said tooth will engage the notch 52 as the disk revolves.

63 is a hand-lever which is pivoted at 64 to the frame of the machine and is connected with the extreme outer end of the lever 54 by means of a link 65, whose extremities are pivoted, respectively, to these levers.

When the machine is idle, the tooth 57 will be engaged with the notch 52 and the roller 53 will be at the top of the incline 58 on the lever 54, so that the pin 51 will be raised clear of the holes 49, and the worm-wheel 47 will then revolve loosely around the shaft 7. By swinging the hand-lever 63 the tooth 57 will be withdrawn from the notch 52 and the disk 50 will be depressed by the action of the spring 61, so that the pin 51 will be engaged with one of the holes 49 in the revolving hub 48, thus imparting rotary motion to the shaft 7, and consequently to the cam 6, whereby reciprocatory movements are given to the cutter-supporting carriage 15.

The shaft 7 carries at its lower end a bevel-gear 66, which meshes with the bevel-gear 67, rigid on a horizontal shaft 68, which is journaled in the frame of the machine, and at the outer extremity of this horizontal shaft 68 is secured a bevel-gear 69, which meshes with a bevel-gear 70, that is carried by a shaft 71, which latter is disposed vertically and is suitably journaled in bearings 72, supported on the frame of the machine. This shaft 71 is capable of a free longitudinal movement in its bearings, and with this end in view has an ordinary splined connection (not shown) with the gear 70, so that the shaft can be moved without disturbing the position of said gear, and secured around the upper end of this shaft is a table 73, which supports two complementary sections 74 75 of an ovoidal cam.

These cam-sections have elongated slots 76 77, as shown at Fig. 3, and extending into these slots are guide-pins 78 79, so that it will be clear that these cam-sections may be spread or contracted to increase or decrease the throw of the cams. Any suitable binding-nuts or screws (not shown) are used to hold these cam-sections in their adjustments.

80 is a free shaft that is gimbal-jointed to the shaft 71 and carries an ovoidal cam 81, and 82 is a shaft that is gimbal-jointed to the shaft 80 and carries at its free end the block A, on which the hat is supported during the paring operation. The shafts 80 and 82 are inclined in opposite directions, and around the shaft 82 is swiveled a block 83, from which extends a bracket 84, from the lower end of which bracket a weight 85 is suspended by means of a cord 86, which passes over a pulley 87, that is supported on the bracket 88, which extends from the frame of the machine, the function of this weight being to keep the cam 81 normally against the flat surface of this bracket 88.

The cam-sections 74 75 are so disposed that the greatest diameter of their oval is in a vertical plane at right angles to the vertical plane of the greatest diameter of the hat oval when said hat is in position on the block A and the vertical plane of the greatest diameter of the cam 81 is quartering to the vertical plane of the greatest diameter of the cam-sections 74 75.

89 is an arm extending laterally from the frame of the machine, and 90 represents parallel rods extending from the end of this arm and horizontally disposed. 91 is a carriage which extends vertically between these rods and which carries a friction-roller 92 at its outer end, while adjustably secured to the inner part of this carriage is a plate 93, within the inner end of which is journaled a roller 94, that normally bears against the cam-sections 74 75. The top of this carriage 91 is secured to the hand-lever 95, the inner end of which latter is secured to the block 83. 96 is a coil-spring whose extremities are attached, respectively, to the lower part of the carriage and to the bracket 97, whereby the roller 94 is normally kept in contact with these cam-sections, and 98 is coil-spring, one end of which is attached to the upper part of the carriage 91, while the other end is connected to the outer extremity of the bracket 88, the function of this spring 98 being to steady the carriage in its movements. As the cam-sections 74 75 are revolved so as to force them at their largest diameter against the roll 94 the carriage 91 will be forced outwardly and will be tilted so as to cause the shaft 82 to be thrown inwardly, while said carriage and shaft will be restored to their normal positions when said cam-sections at their smallest diameter are against this roll 94. When the cam 81 is revolved, it will cause the shaft 82 to be swayed in a direction reverse to that previously described.

From the foregoing description it will be



clear that the actions of the cam-sections 74 75 and the cam 81 will cause the shaft 82, which carries the hat-block, to be swayed in opposite directions, and the character of these  
5 cams is such that while the shaft 82 is being revolved the hat will be caused to describe the proper oval, whereby every part of the curled brim will be kept constantly up to a certain predetermined point. Therefore these  
10 cams, the parts actuated thereby, and the inclined and gimbal-jointed shafts all contribute toward the accomplishment of one end—namely, the revolution of the hat in the proper ovoidal circuit.

15 In paring a hat-brim, the parts all being in the position as is shown at Figs. 1 and 2, it will be noted that the extreme inner end of the foot 28 is immediately beneath the curl at the end of the brim, while the cutter 17  
20 extends within the opening 29 in the foot, close to the extreme inner end of the latter, this position of the cutter and foot with respect to the hat-brim being more clearly designated in detail at Fig. 6. As the shaft 71  
25 is revolved the curled portion of the hat-brim will be kept snugly against this stationary foot, while at the same time the cutter will operate to trim off the petticoat or surplus stock from the edge of the curl. As the hat  
30 is revolved so that the quarters and sides are brought in position for paring it will be clear that the shaft 82 must be gradually tilted toward the foot, since the quarters and sides gradually increase in height at the curled  
35 portions, while the greatest droop of the brim is at the ends. Therefore the cam-sections 74 75 now come into play and effect this gradual tilting, so that the curled brim is kept right up to the foot. As the hat is revolved  
40 so as to bring one of the ends again in position for paring the shaft 82 will be gradually tilted away from the foot, so as to gradually elevate the hat, whereby the foot may always be in close contact with the curled brim in  
45 passing from the sides to the ends. It will be clear that the cutter must gradually travel outwardly in trimming from the ends to the sides of the brim and must gradually retract in trimming from the sides to the ends, be-  
50 cause the curled portion of the brim gradually increases in width from the ends to the sides, and these movements of the carriage which bears the cutter are effected and regulated by means of the cam 6, as hereinbefore explained.  
55 In removing the hat after paring the hand-lever 95 is elevated by the operator to throw the brim away from the foot, and the hat is readily removed.

60 Very frequently it becomes necessary to pare flat-brimmed hats, and in order to do this I have provided a screw 99, which takes into the bottom of the bearings 72 and which affords the sole support for the shaft  
71, which latter, as has heretofore been ex-  
65 plained, is capable of a free longitudinal movement in its bearings. By driving this screw

deeper in the bearings the shafts 71, 80, and 82 are forced into a higher plane, and when a flat-brimmed hat is on the block A the curl of the brim will thereby be brought into proper  
70 position with respect to the foot 28. Of course the extreme swaying of the shaft 82 toward and away from the foot will not now become necessary, and therefore I have provided a  
75 rack 100 on the side of one of the rods 90, and around this rod I have arranged a sliding pawl 101, so that by moving this pawl outwardly and locking it with the rack I can carry the roll 94 away from the cam-sections  
80 74 75, so as to prevent the latter from performing their functions against this roller. By operating this screw 99 and the pawl 101 in the manner described I can get the proper  
85 adjustments and tilt to the shaft 82, which carries the hat-block, so that I am enabled to pare a flat brim with the greatest facility. Likewise it will be clear that I can without  
90 any change in the various cams, except the mere adjustment of the cams 74 75, pare any hat-brim irrespective of the droop at the ends or the rise at the sides, and this has never be-  
fore been accomplished by any machine.

I do not want to be limited to any set or sets of mechanisms for connecting my machine with power or for bringing about the  
95 proper rotary movements hereinbefore set forth, since in this respect the instrumentalities which I have shown and described are very ordinary and can be changed without departing from the spirit of my invention. 100

It will be observed by reference to Figs. 6, 7, and 8 that the foot is perfectly clear underneath and is cut away, so as to afford the utmost facility for disposing of the refuse, and  
105 therefore there is no likelihood of clogging.

When the carriage 15 has been thrown back after paring a hat and a succeeding hat placed on the block for paring with the curled  
110 brim in contact with the foot, the carriage is swung downwardly, so as to cause the cutter to initially pierce the petticoat of the brim at the starting of the paring operation.

Having thus described my invention, what I claim as new, and desire to secure by Letters  
115 Patent, is—

1. In a hat-paring machine, the combination of a stationary foot, means for maintaining the curled hat-brim in constant contact with said foot, the rotary cutter, and means  
120 for advancing and retracting said cutter at predetermined times and in direct proportion to the varying width of the curl of the hat-brim, substantially as set forth.

2. In a hat-paring machine, the combination of a stationary foot, means for revolving  
125 the hat in a predetermined ovoidal circuit, whereby constant contact is maintained between said foot and the curl of the brim, the cutter-supporting carriage, the cutter journaled in said carriage, means for revolving  
130 said cutter, and means for reciprocating said carriage simultaneously with the revolution



of the hat and to a degree predetermined by the varying width of the curl of the hat-brim, substantially as set forth.

3. In a hat-paring machine, the combination of the stationary foot, the rotary cutter, means for reciprocating said cutter to a degree predetermined by the varying width of the curl of the hat-brim, means for supporting the hat and for revolving the same in an ovoidal circuit predetermined by the general oval shape of the brim whereby said brim is maintained in constant contact with said foot, and means for varying the plane of the revolution of the hat whereby the raised sides and depressed ends of the brim are acted upon by the cutter in the same horizontal plane, substantially as set forth.

4. In a hat-paring machine, the combination of a stationary foot, means for revolving the hat in an ovoidal circuit predetermined by the general oval shape of the brim whereby all parts of the curl of the brim are presented to said foot in the same vertical plane, means for tilting the hat upwardly and downwardly during its revolution whereby the ends and sides of the curled brim are maintained in the same horizontal plane when presented to said foot, the cutter, and means for advancing and retracting said cutter during the revolution of the hat and in a degree predetermined by the varying width of the curl of the brim, substantially as set forth.

5. In a hat-paring machine, the combination of the stationary foot, the rotary shaft composed of gimbal-jointed sections and having its two upper members inclined in opposite directions, the hat-block carried by the uppermost member, means for swaying said shaft in opposite directions during its revolution whereby the hat will be revolved in an ovoidal circuit and the curled brim maintained in constant contact with said foot, and a cutter having a variable reciprocation during the paring operation, substantially as set forth.

6. In a hat-paring machine, the combination of the stationary foot, the shaft 82 normally inclined away from said foot and carrying at its upper end the hat-block, the vertical shaft 71, the shaft 80 inclined toward the vertical cross-plane of said foot and having its ends gimbal-jointed respectively with the shafts 82 and 71, the cam carried by the shaft 80, the stationary bracket 88, means for resiliently keeping said cam normally in contact with a plain surface of said bracket whereby the revolution of said shaft will cause the hat to be swayed in a plane substantially parallel with the vertical cross-plane of said foot, the hand-lever swiveled to the shaft 82, the carriage depending rigidly from said lever and capable of tilting and reciprocatory movements, the friction-roller supported by said

carriage, the cam carried by the shaft 71, and the spring whereby said roller is maintained in contact with said cam, whereby the revolution of said shaft will cause the hat to be swayed in a plane substantially at right angles to the vertical cross-plane of said foot, substantially as set forth.

7. The combination of a series of gimbal-jointed shafts, one end shaft being engaged with power-transmitting means while the other end shaft supports the hat, and means for swaying the hat-supporting shaft in opposite planes, substantially as set forth.

8. The combination of the rotary shaft incapable of any swinging movement, the cam carried by this shaft, the oppositely-inclined shafts connected with each other and with the first-mentioned shaft by gimbal-joints, the hat-support on the upper shaft, the cam carried by the middle shaft, means for resiliently maintaining this cam against a stationary surface, the lever swiveled to the top shaft, the carriage secured to and depending from said lever, the rollers supported by said carriage, the horizontal guide-rods between which said rollers and carriage extend, and means for maintaining a constant resilient contact between one of these rollers and the first-mentioned cam, whereby combined rotary and swaying movements are given to the hat, substantially as set forth.

9. In a hat-paring machine, the stationary foot cut away as described and gradually tapering down to a thin edge at the extreme front, in combination with means for keeping the curl of the hat-brim always hooked over said foot and in close contact therewith, the rotary cutting-tool journaled in a swinging carriage immediately above said foot and adapted to pierce the curl of the brim when said carriage is lowered and capable of operating within the cut-away portion of said foot, and means for advancing and retracting said carriage to a degree determined by the varying width of the curl of the brim, substantially as set forth.

10. The combination of the shaft 71, the cam carried thereby, the stationary guide-rods one of which is provided with rack-teeth, the carriage having outer and inner rollers depending between said rods, the spring whereby the inner roller is normally kept in contact with said cam, and the pawl capable of sliding on said rack-rod, whereby when said pawl is moved outwardly and engaged with said teeth the inner roller will be held beyond the field of said cam, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ELMER S. ALVORD.

Witnesses:

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CHARLES H. HOYT.