

E. W. BARNUM.
HAT BODY CLIPPING MACHINE.
APPLICATION FILED FEB. 3, 1910.

982,926.

Patented Jan. 31, 1911.

3 SHEETS-SHEET 1.

Fig. 1.

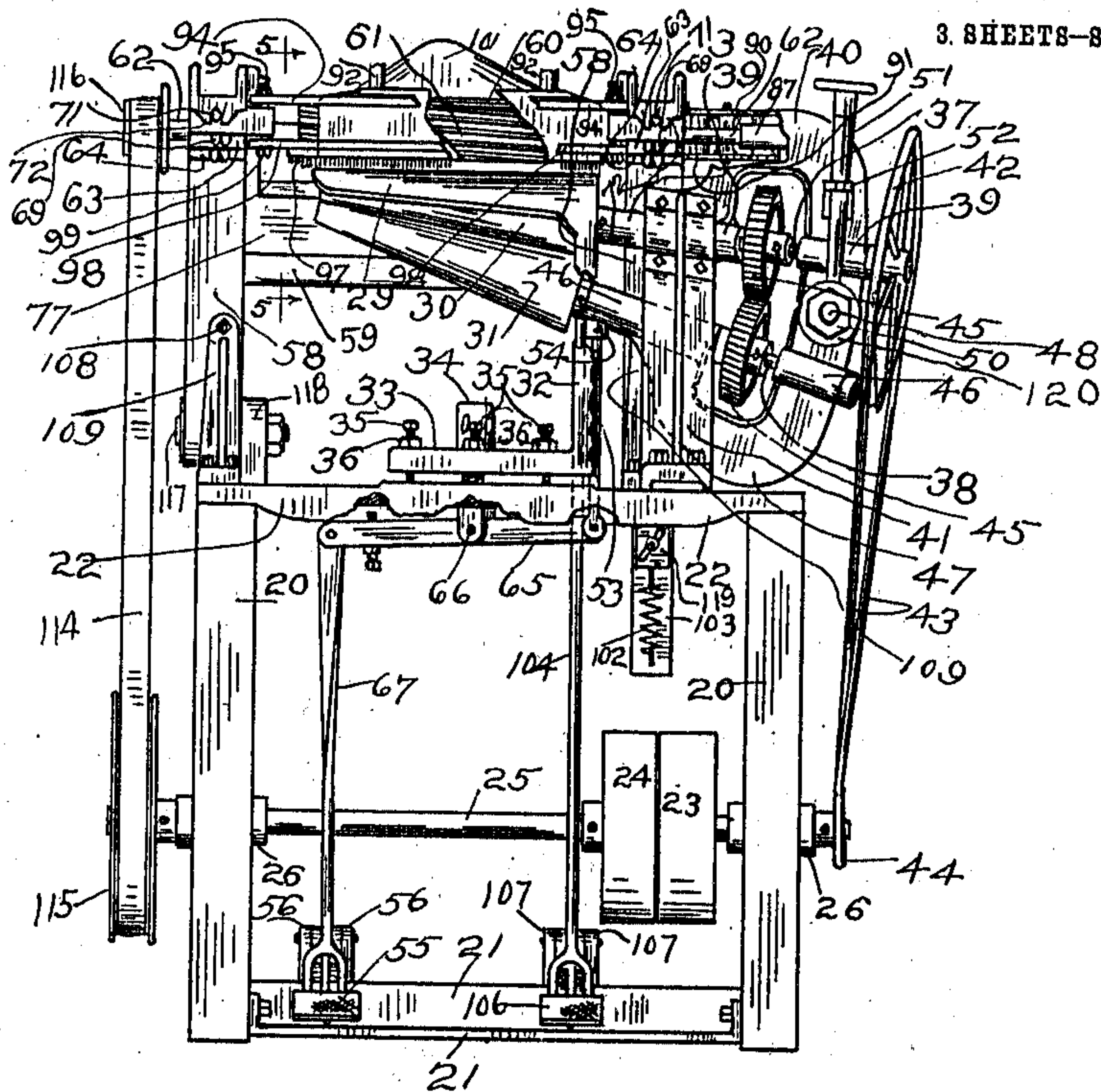
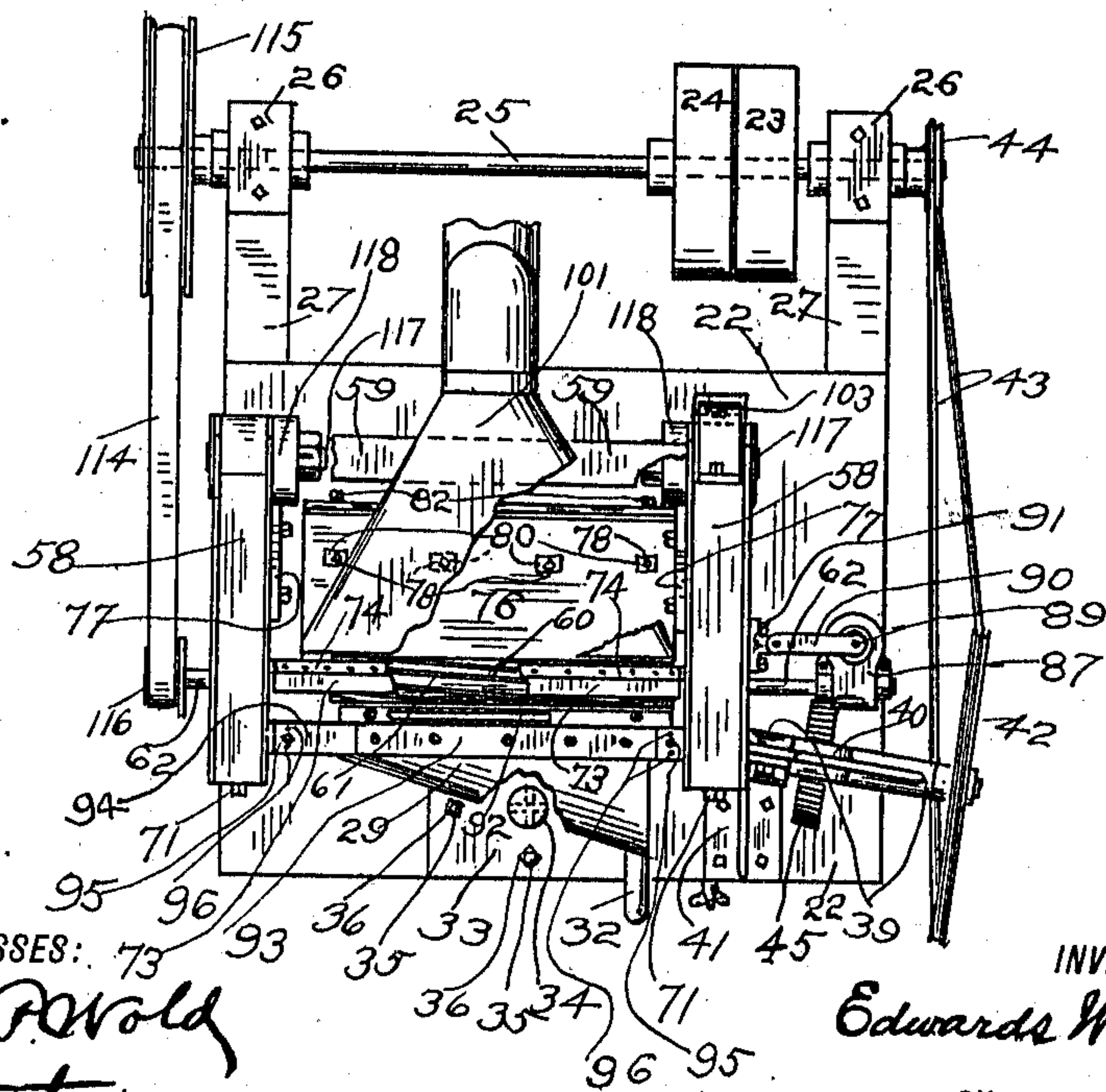


Fig. 2.



WITNESSES:

Ernst P. Vold
J. W. Atherton.

INVENTOR

Edwards W. Barnum

BY

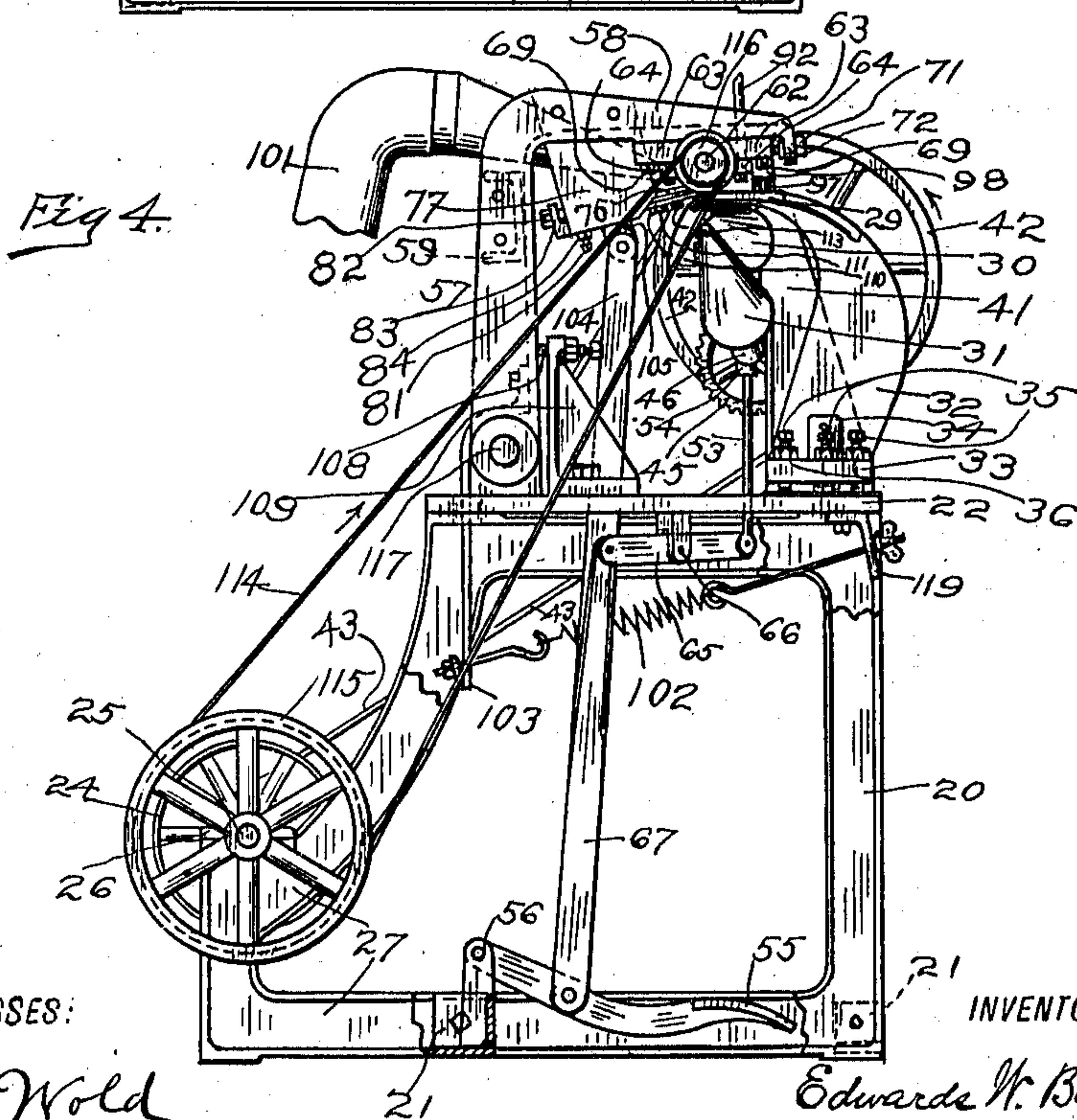
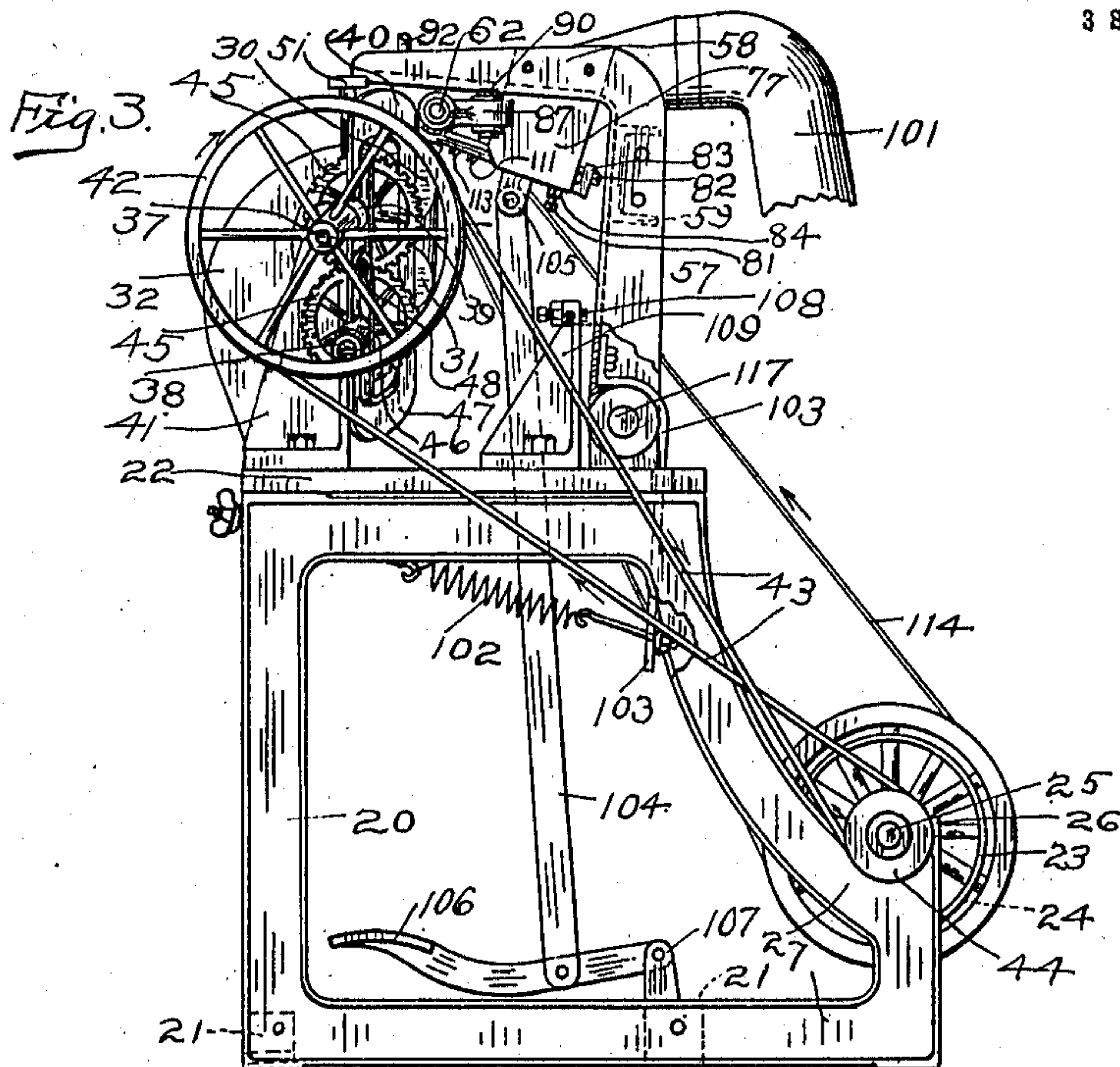
A. M. Wooster
ATTORNEY

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Ernst P. Wold
J. W. Atherton.

INVENTOR

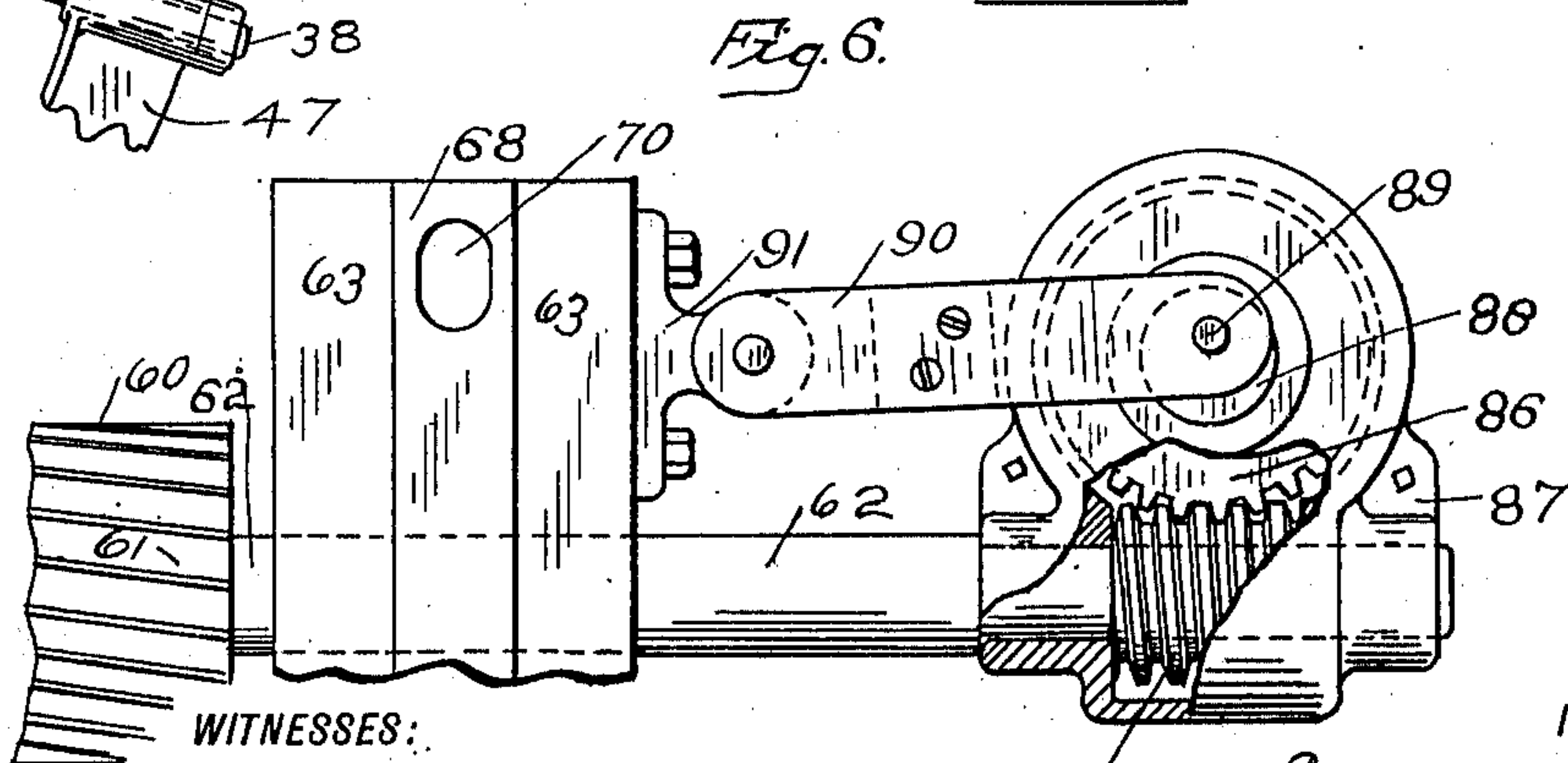
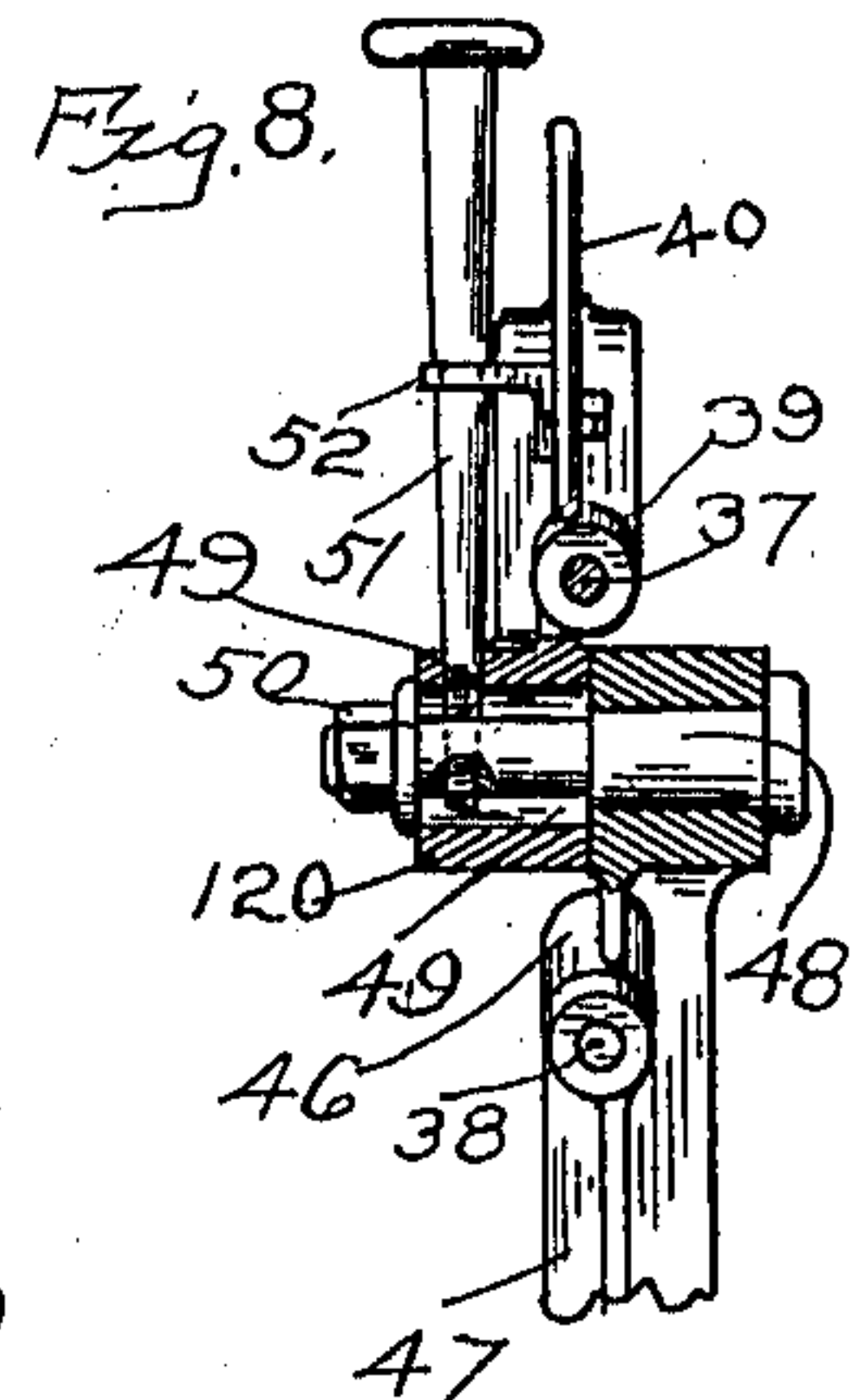
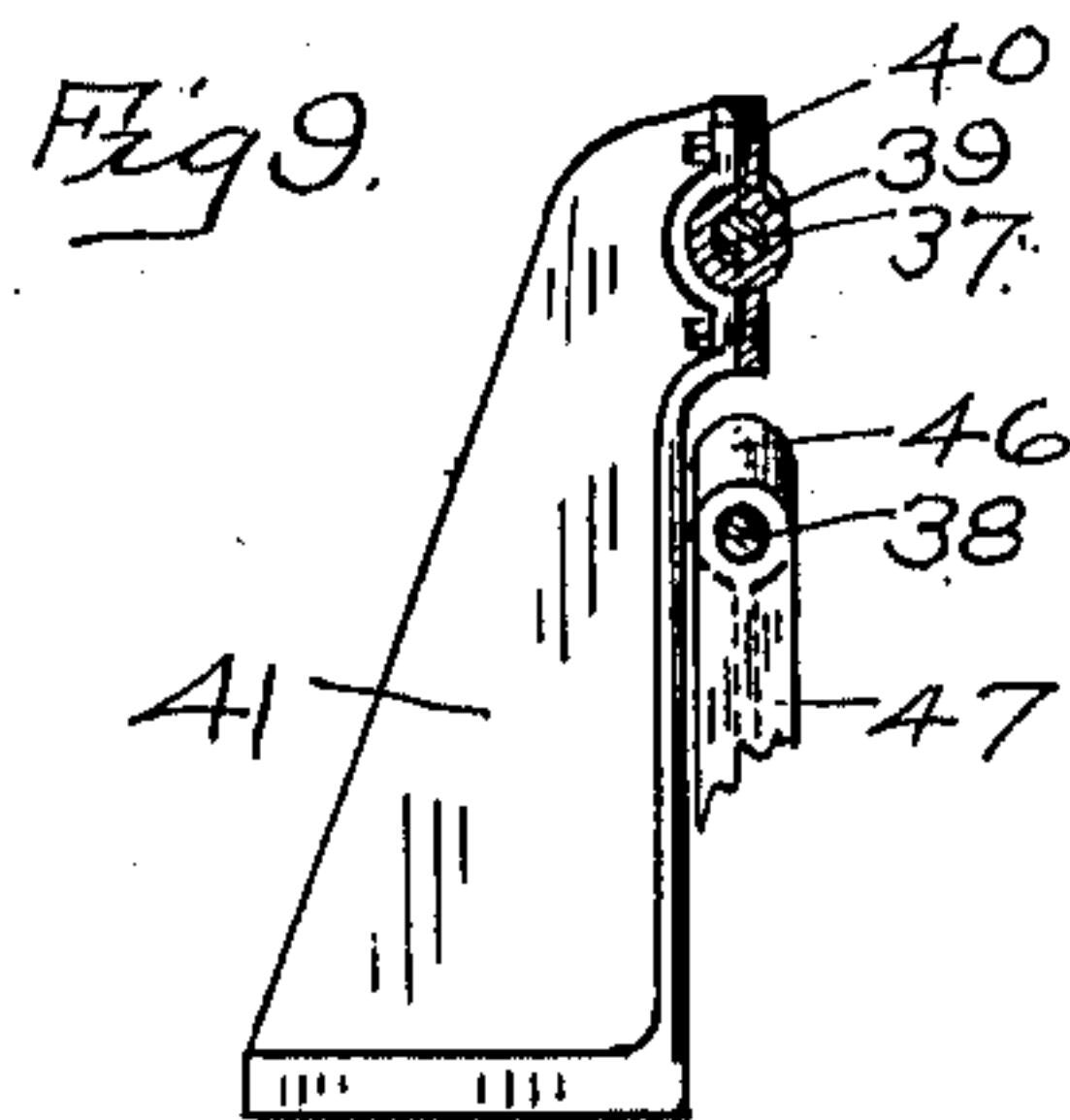
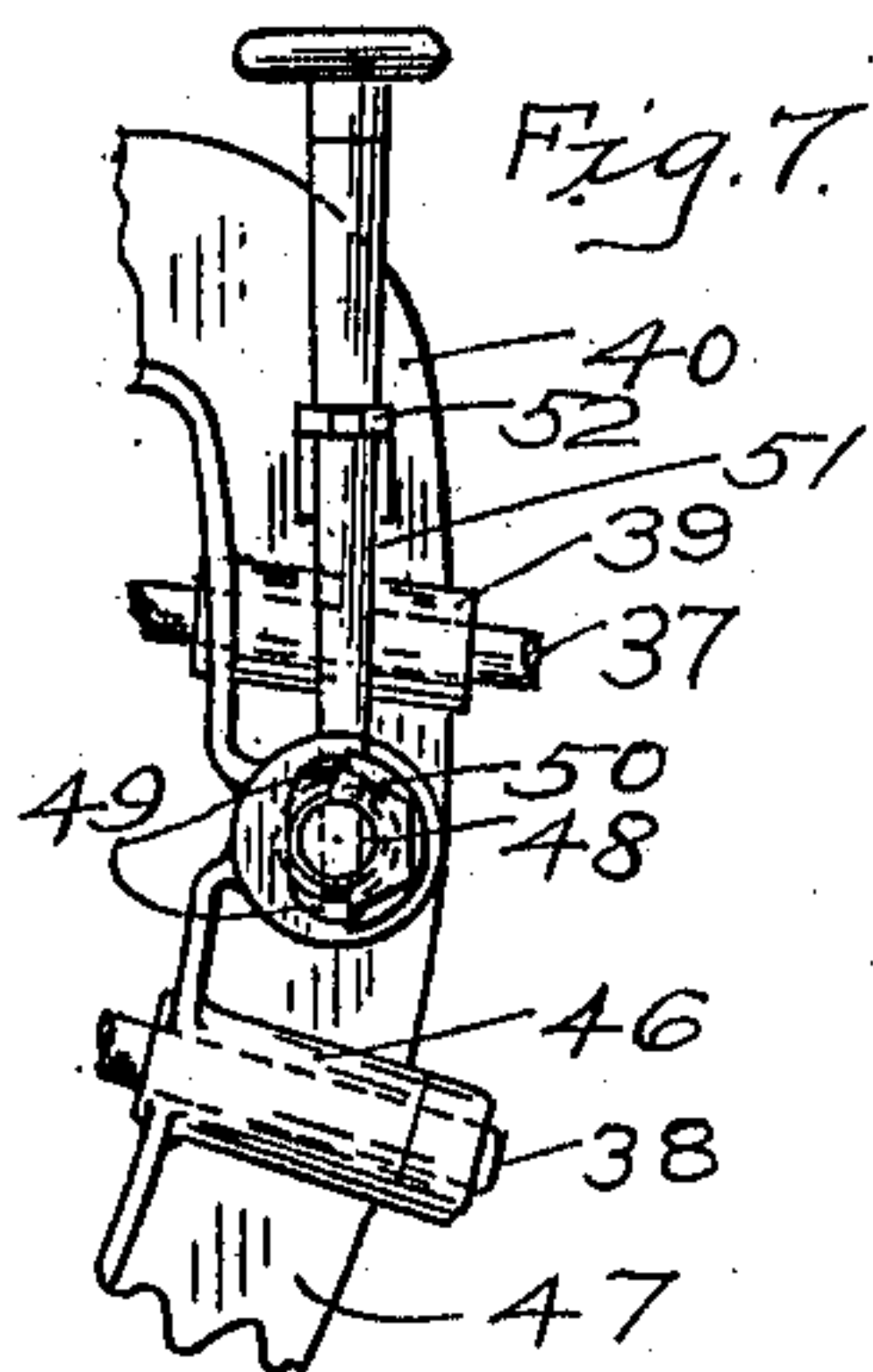
Edward W. Barnum

BY

A. Mcrooster
ATTORNEY

982,926.

3 SHEETS—SHEET 3.



WITNESSES:

Ernst Wold
S.W. Atherton.

INVENTOR

Edwards H. Barnum

BY

A. M. Wooster.
ATTORNEY

UNITED STATES PATENT OFFICE.

EDWARDS W. BARNUM, OF DANBURY, CONNECTICUT, ASSIGNOR TO E. A. MALLORY AND SONS, INCORPORATED, OF DANBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

HAT-BODY-CLIPPING MACHINE.

982,926.

Specification of Letters Patent.

Patented Jan. 31, 1911.

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To all whom it may concern:

Be it known that I, EDWARDS W. BARNUM, a citizen of the United States, residing at Danbury, county of Fairfield, State of Connecticut, have invented an Improvement in Hat-Body-Clipping Machines, of which the following is a specification.

This invention relates to certain improvements in machines for clipping the long hairs of fur hat bodies to a predetermined length.

In hat body clipping machines, as heretofore constructed, it has been common to use a single metal cone of sufficient size to hold the body up to the cutting line, that is, the line at which a series of cutters carried by a clipping cylinder pass a bed knife. The difficulty in using this type of machines has been that it was almost impossible to keep the body uniformly taut at the cutting line. As the body is carried merely by its own weight it does not get sufficient grip upon the cone so that it can be held taut by the hands of the operator without slipping on the cone and being brought to a standstill, or else if the operator relieves his pressure on the body, of its being drawn into the cutters and seriously injured and frequently ruined.

It is one of the objects of the invention to produce a body clipping machine in which the driving shaft shall be journaled near the floor and the swinging frame shall be so constructed and pivoted as to reduce vibration to the minimum and give great steadiness and stability to the machine.

A further object of the invention is to provide means for imparting longitudinal reciprocatory movement to the clipping cylinder whereby a shearing cut is produced and the cutters remain sharp for a much longer period than heretofore as the wearing point is constantly changing.

A further object of the invention is to provide novel means for picking up and raising the nap just before the cutting line.

A further object of the invention is to provide means for protecting the hands of the operator so that they will be in no danger of being drawn into the cutters.

A further object of the invention is to provide adjustments for the several parts which shall be positive, easy to operate and will secure the most perfect regularity and uniformity of results.

With these and other objects in view the invention consists in certain constructions and in certain parts, improvements and combinations which will be hereinafter described and then specifically pointed out in the claims hereunto appended.

In the accompanying drawings forming a part of this specification, in which like characters of reference indicate the same parts, Figure 1 is a front elevation of the machine partly broken away; Fig. 2 a plan view partly broken away; Fig. 3 a side elevation as seen from the right in Fig. 1; Fig. 4 a side elevation as seen from the left in Fig. 1; Fig. 5 a sectional view on an enlarged scale on the line 5—5 in Fig. 1 looking in the direction of the arrows; Fig. 6 a detail plan view on an enlarged scale partly broken away, illustrating the mechanism for reciprocating the clipping cylinder; Fig. 7 a detail front elevation corresponding with Fig. 1 illustrating the mechanism for adjusting the lower feed roller; Fig. 8 a detail elevation partly in vertical section as seen from the right in Fig. 7; and Fig. 9 is a detail elevation of the upper feed roller standard and the lower feed roller bearing partly in vertical section.

In Figs. 1, 2, 4 and 5, the parts are shown in the operative position, and in Fig. 3 in their normal position, the frame which carries the bed knife and clipping cylinder being swung out of operative position. The framework comprises side-pieces which are braced by cross-pieces and support a bed. Power is applied to drive the machine by means of a belt (not shown) passing over fast and loose pulleys and on a driving shaft journaled in bearings which are placed low down in extensions of the side-pieces. These extensions are provided to give a wide base to the framework, which in connection with the fact that the driving shaft is journaled low down and near the floor gives great stability to the framework and does away with much of the vibration which has been such a serious objection in machines of this class as heretofore constructed.

28 (see Fig. 5) denotes a hat body that is being operated upon.

It is of course well understood that machines of this character are not wholly auto-

matic in operation, but that the feeding of the bodies to the cutting line is materially assisted by the hands of the operator. In the present machine, the bodies are fed over
 5 a table or shoe indicated by 29, and between upper and lower conical feed rollers indicated by 30 and 31 which are placed one above the other and both directly under the table or shoe, the bearings for the upper
 10 feed roller being stationary and the bearings for the lower feed roller being movable, as will be more fully described. The table is carried by an arm 32 extending from a plate 33 which is secured to the bed in such
 15 a manner as to permit adjustment of the table relatively to the upper feed roller whose position is fixed as will be more fully explained. The plate is held in place by means of a cap screw 34.
 20 35 denotes tilting screws which pass through plate 33 and bear upon the bed, four of these screws being ordinarily used surrounding the cap screw. The cap screw being loosened it is obvious that plate 33
 25 may receive a tilting adjustment by means of screws 35 to place the table at any required position relatively to the upper feed roller. Having placed the table at the required adjustment, the plate and table are
 30 rigidly locked in place by turning down the cap screw and the tilting screws are locked in place by means of set nuts 36. The feed rollers which are preferably made of wood are carried by upper and lower feed roller
 35 shafts indicated respectively by 37 and 38. Upper feed roller shaft 37 is journaled in bearings 39 upon a bracket 40 carried by a standard 41 which is rigidly bolted to the bed. Upper shaft 37 carries a belt pulley
 40 42 and is driven by means of a crossed belt 43, preferably round, which passes over a pulley 44 on the driving shaft. The lower feed roller is driven from shaft 37 by means of corresponding bevel pinions 45 on the
 45 two shafts. The lower shaft is journaled in bearings 46 carried by an arm 47 which is pivoted on a stud bolt 48 in bracket 40. This stud bolt passes through an elongated hole 49 in a hub 120 on the bracket and is
 50 clamped to the hub by means of a nut 50. The angle of the feed rollers to each other is adjusted in order to produce contact at either end or along their entire length as may be required by means of an adjusting
 55 screw 51 which is held against longitudinal movement by a yoke 52 on bracket 40 and is tapped into stud bolt 48. By loosening nut 50 and rotating the adjusting screw it will be obvious that arm 47 and with it the lower
 60 feed roller shaft and feed roller may be adjusted as above described (see Figs. 7 and 8). The lower feed roller normally drops away from the upper feed roller by gravity, leaving ample space between them through

which a hat body may be passed. This feed
 roller is held in its operative position in use by means of a link 53, one end of which is pivoted to a hub 54 on the inner bearing 46, the other end being pivoted to a lever 65
 70 fulcrumed under the bed as at 66 and connected by means of a rod 67 to a treadle 55 itself pivoted to ears 56 extending upward from one of the lower cross-pieces 21 of the framework. Pressure upon the treadle raises arm 47 and swings the lower feed
 75 roller into position to grip a hat body between the two rollers. The instant the operation, presently to be described, is finished the operator removes his foot from the treadle and the lower feed roller drops
 80 out of operative position releasing the hat body and permitting it to be removed from the machine.

The clipping mechanism is carried by an inverted L-shaped swinging frame 57 which
 85 is pivoted on studs 117 in ears 118 secured to the bed. The swinging frame comprises two side-pieces 58 which are connected together by one or more cross-pieces 59. The object in making the side-pieces L-shaped is
 90 to provide an approximately horizontal portion to carry the clipping mechanism and also to enable the frame to be pivoted to the bed which is much below the clipping mechanism. This in connection with the plac-
 95 ing of the driving shaft near the floor gives great stability and steadiness to the machine and practically eliminates vibration. 60 denotes the cutters or clipping knives which are set spirally in a clipping cylinder 61 car-
 100 ried by a shaft 62 which is journaled in bearing plates 63 having cap plates 64 and adjustably secured to the swinging frame. Each bearing plate 63 is provided with a rib 68 which engages a corresponding groove in
 105 the underside of a side-piece of the swinging frame. The plates are secured to the side-pieces by means of bolts 69 which pass through slots 70 in the plates and engage the side-pieces. Lateral adjustment of the clip-
 110 ping cylinder on the frame is effected by means of adjusting screws 71 carried by lugs 72 at the ends of the side-pieces and engaging the bearing plates.

73 denotes a flexible lubricating strip for
 115 the cutters which is secured to a cross-piece 74 itself secured between the side-pieces of the swinging head.

Coöperating with the clipping cylinder is a bed knife 75 which is rigidly secured to a
 120 bed plate 76 carried by a chair 77 which is suspended from and rigidly secured to the side-pieces of the swinging frame. The attachment of the bed plate to the chair is substantially the same as the attachment of the
 125 plate 33, which carries the table or shoe, to the bed. Cap screws 78 pass through slots 79 in the bed plate and engage the chair,

rounded washers 80 being preferably placed under the heads of the cap screws.

81 denotes tilting screws in the chair upon which the bed plate rests. Longitudinal adjustment of the bed plate and bed knife is effected by means of adjusting screws 82 which pass through lugs 83 extending from the chair and engage the bed plate. Having adjusted the bed plate and bed knife longitudinally by means of the adjusting screws and having secured the desired vertical adjustment of said parts by means of the tilting screws, cap screws 78 are turned down upon the washers to lock the bed plate and bed knife securely in place. The tilting screws are locked in place by set nuts 84.

In order to produce a shearing cut in use and furthermore to produce uniform wear upon the cutters and bed knife, a slow longitudinal reciprocatory movement is imparted to the clipping cylinder. This is effected by means of a worm 85 upon cylinder shaft 62 (see Fig. 6) which engages a worm gear 86 journaled in a casing 87 which incloses the worm gear and worm and in which the cylinder shaft is mounted to rotate. The shaft 88 of the worm gear is provided with a pin 89 placed eccentrically to its axis of rotation. 90 denotes a link one end of which is journaled on the pin, the other end being pivoted to an ear 91 upon one of the bearing plates 63 in which the cylinder shaft is journaled. As the link can obviously have no longitudinal movement it follows that rotation of the worm gear by means of the worm must necessarily impart longitudinal movement to the shaft and casing.

In order to provide efficient means for insuring that the hands of the operator cannot be drawn into the cutters, a combined finger guard and suction pipe is provided just in front of the clipping cylinder and in connection with this finger guard and suction pipe a nap raising brush is preferably used. It is found in practice that the brush is useful in raising the nap and while partly effective is not wholly effective as a finger guard. The combined finger guard and suction pipe is therefore always provided, it being thoroughly effective as a finger guard, as it renders it impossible for the fingers of the operator to get to the cylinder knives and also effective as a nap raising device. In practice the brush also is preferably used, as it raises the long hairs of the body.

92 denotes the combined finger guard and suction pipe which is simply a flattened pipe extending the length of the clipping cylinder and curved to correspond therewith as shown, thus effectually covering the cutters. This combined finger guard and suction pipe is connected with an exhaust fan (not shown) and is secured to an angle plate 93 which in turn is secured to a plate 94.

Plate 94 is adjustably secured to plates 63 by cap screws 95 and tilting screws 96 in the same manner that the bed plate is secured to the chair and plate 33 carrying the table or shoe is secured to the bed. 97 denotes the brush which is made of rather fine stiff bristles and is of a length equal to the length of the longest hat bodies which my machine is adapted to operate upon. It is secured to a plate 98 which in turn is adjustably secured to plates 63 in the same manner that plate 94 is; that is, by cap screws 99 and tilting screws 100. It will be noted that these adjustments of the combined finger guard and suction pipe and of the brush provide for adjusting these members relatively to bearing plates 63, and that said members are afterward fixed to the bearing plates and are adjusted with the bearing plates in the manner described. 101 denotes another suction pipe flattened at its inner end and of a width corresponding with the length of the longest hat body. The flattened inner end of this pipe lies back of the clipping cylinder and bed knife and rests upon the bed plate. It removes from the machine all the hairs that are clipped at the cutting line.

The swinging frame and clipping cylinder are normally held out of operative position by means of a spring 102 one end of which is adjustably secured to a bracket 119 rigidly secured to the bed, and the other end to an arm 103 which is rigidly secured to and extends downward from one of the side-pieces of the swinging frame. The swinging frame is drawn forward into operative position by means of a rod 104, one end of which is pivoted to an ear 105 on the under side of the chair, the other end being pivoted to a treadle 106 which is itself pivoted to ears 107 extending upward from one of the lower cross-pieces 21 of the framework. When the operator places his foot upon the treadle, he swings frame 57 and the clipping cylinder forward into operative position. The position to which the swinging frame and clipping cylinder are carried is determined by stop screws 108 in brackets 109 which are rigidly secured to the bed, the side-pieces of the swinging frame when in operative position bearing against the ends of the stop screws. It will be understood that the adjustment of these stop screws determines the height of the cutting line and enables the operator to clip the hair to any predetermined length.

The clipping cylinder is driven by means of a belt 114 passing over a belt pulley 115 on the driving shaft and a belt pulley 116 on the clipping cylinder shaft. When the clipping mechanism carried by the swinging frame is in operative position the centers of belt pulleys 115 and 116 and the studs 117 upon which the frame swings are in direct

alinement with each other, thus insuring a tight belt when the clipping cylinder is running and also securing the most perfect stability and steadiness of the entire machine.

110 denotes a guard plate which may or may not be used upon the machine which bears upon the hat body in use. The object of this guard plate is to cause the swinging frame and clipping cylinder to rise and fall in use in passing over thickened portions of hat bodies and thereby prevent injury to the bodies and insure a uniform length of the nap without regard to the thickness of the bodies and furthermore by adjusting different portions of the guard plate at a greater or less distance from the bed knife to provide for clipping a nap longest at either brim or tip or longer at the quarter than at either brim or tip. As this guard plate is not a portion of the present invention it will not be described in detail.

The operation of the machine is as follows: The clipping cylinder, bed knife, table, lower feed roller, combined finger guard and suction pipe, and the brush if used, are adjusted to the special requirements of use in the manner already fully described. The operator then places the hat body to be operated upon over the table, under the upper feed roller and over the lower feed roller, as clearly shown in Fig. 5. He then places his foot upon treadle 55 and raises the lower feed roller into position to grip the hat body. In use it is not necessary to stop and start the machine in inserting and removing hat bodies, for the reason that the clipping cylinder and lower feed roller are both normally out of operative position and the hat body may be readily inserted between the upper feed roller and the bed knife or between the upper feed roller and the guard plate if used. As soon as the operator raises the lower feed roller into position to grip the body it will commence to move forward. The operator holds the body taut by pressing it down upon the table to insure that it is drawn forward to the cutting line evenly and smoothly and without wrinkles or folds, the finger guard, as already explained, making it impossible for the operator's fingers to get into the cutters. The operator then places his other foot on treadle 106 and moves the swinging frame carrying the bed knife and clipping cylinder into operative position. As soon as the body has passed entirely around one or more times and has been thoroughly clipped, the operator releases both treadles which permits the lower feed roller to drop down out of operative position by gravity and permits spring 102 to draw the swinging frame carrying the clipping mechanism out of operative position. The clipped body may then

be removed and another body inserted, as already described, when the operation of clipping may be proceeded with as before.

Having thus described my invention, I claim:—

1. In a hat body clipping machine, the combination with clipping mechanism, of a feed table over which the hat bodies are adapted to be passed, a supporting arm therefor provided with a base plate, feed rollers placed one above the other and both located beneath said table, and means for adjusting the base plate to vary the position of said table relatively to the upper feed roller.

2. In a hat body clipping machine, the combination with clipping mechanism, of a feed table over which the hat bodies are adapted to be passed, a supporting arm therefor provided with a base plate, feed rollers placed one above the other and both located beneath said table, the lower roller being relatively movable, and means for adjusting the base plate to vary the position of said table relatively to the upper feed roller.

3. In a hat body clipping machine, the combination with clipping mechanism, of a feed table over which the hat bodies are adapted to be passed, a supporting arm therefor provided with a base plate, feed rollers placed one above the other and both located beneath said table, means for adjusting said lower roller relatively to said upper roller, and means for adjusting the base plate to vary the position of said table relatively to the upper feed roller.

4. In a hat body clipping machine, the combination with clipping mechanism, of a feed table over which the hat bodies are adapted to be passed, feed rollers placed one above the other and both located beneath said table, means for adjusting the table relatively to the upper feed roller, means for normally retaining the clipping mechanism out of operative position, and means for moving said mechanism into operative position.

5. In a hat body clipping machine, the combination of a swinging frame provided with grooved side pieces, slotted bearing plates provided with ribs engaging the grooves of said side pieces, a clipping cylinder mounted in said bearing plates, screws passing through the slots of said bearing plates and engaging said side pieces, and means for adjusting said bearing plates along said side pieces when said screws are loosened.

6. In a hat body clipping machine, the combination of a swinging frame provided with grooved side pieces, bearing plates provided with ribs engaging the grooves of said side pieces, a clipping cylinder mounted in

said bearing plates, and means for adjusting said bearing plates along said side pieces.

7. In a hat body clipping machine, the combination of a swinging frame, a clipping cylinder supported thereby, a chair suspended from said frame, a bed plate secured to said chair, a bed knife secured to said bed plate and cooperating with said clipping cylinder, and means for adjusting said bed plate.

8. In a hat body clipping machine, the combination of a swinging frame, a clipping cylinder supported thereby, a chair suspended from said frame and provided with a slot, a bolt provided with a rounded head bearing and passed through said slot, a bed plate supported by said bolt, means for adjusting said bed plate, and a bed knife secured to said bed plate and cooperating with said clipping cylinder.

9. In a hat body clipping machine, the combination of a feed table over which the hat bodies are adapted to be passed, feed rollers placed one above the other and both located beneath said table, means for adjusting the table relatively to the upper feed roller, of a swinging frame, a clipping cylinder supported thereby, a bed plate adjustably mounted in said frame, and a bed knife secured to said bed plate and cooperating with said clipping cylinder.

10. In a hat body clipping machine, the combination of a swinging frame, bearing plates adjustably mounted in said frame, a clipping cylinder mounted in said bearing plates, and a suction pipe supported by said bearing plates and extending in front of said cylinder to form a guard.

11. In a hat body clipping machine, the combination of a swinging frame, bearing plates adjustably mounted in said frame, a clipping cylinder supported by said bearing plates, a suction pipe supported by said bearing plates and extending in front of said cylinder to form a guard, and means for adjusting said suction pipe.

12. In a hat body clipping machine, the combination of a swinging frame, bearing plates adjustably mounted in said frame, a clipping cylinder mounted in said bearing plates, and a brush adjustably mounted in said bearing plates.

13. In a hat body clipping machine, the combination of a swinging frame, bearing plates adjustably mounted therein, a clipping cylinder supported by said bearing plates, a suction pipe adjustably supported by said bearing plates and extending in front of said cylinder to form a guard, and a brush also adjustably supported by said bearing plates.

14. In a machine of the character described, the combination of a swinging frame, clipping mechanism carried thereby,

a table adjacent to the cylinder over which hat bodies are adapted to be passed, a combined finger guard and suction pipe secured to the frame adjacent to the clipping mechanism and the table, for the purpose set forth, a brush before the finger guard and suction pipe and means for adjusting the finger guard and the suction pipe and the brush relatively to the cylinder.

15. In a machine of the character described, the combination of a swinging frame comprising side-pieces and a cross-piece, a clipping cylinder, bearing plates for the cylinder adjustable on the side-pieces and a combined finger guard and suction pipe adjustable on the bearing plates.

16. In a machine of the character described, the combination of a swinging frame, bearing plates thereon, a clipping cylinder journaled on said plates and provided with a worm, a worm gear engaging the worm and having a pin eccentric to its axis of rotation, a casing in which the worm and gear are journaled and a link pivoted on the pin and to one of the bearing plates whereby reciprocatory movement is imparted to the cylinder.

17. In a machine of the character described, the combination of a clipping cylinder having a worm, a worm gear engaging the worm and having a pin eccentric to its axis of rotation, a casing in which the worm and gear are journaled and a link pivoted on the pin and to a fixed portion of the machine.

18. In a hat body clipping machine, the combination of a clipping cylinder, a bed knife, and crank mechanism for imparting longitudinal reciprocatory movement to said cylinder.

19. In a hat body clipping machine, the combination of a bed, a table and feed rollers supported by said bed, an L-shaped frame pivotally mounted in said bed and having a depending finger, clipping mechanism supported in the overhanging portion of said frame, and means acting on said finger for normally holding the clipping mechanism out of operative position.

20. In a hat body clipping machine, the combination of a bed, a table, and feed rollers, a frame having an overhanging arm and a depending finger, said frame being pivotally mounted in said bed, clipping mechanism supported in the overhanging portion of said frame, a spring secured to said frame and engaging said finger and a treadle for moving said frame against the tension of said spring.

21. In a hat body clipping machine, the combination of a bed, a table and feed rollers, of a frame having an overhanging arm and a depending finger, said frame being pivotally mounted in said bed, clipping

mechanism supported in the overhanging portion of said frame, means for oscillating said frame to bring said clipping mechanism into and out of operative position, and an
5 adjustable stop for limiting the movement of said frame.

22. In a hat body clipping machine, the combination of a swinging frame, bearing plates adjustably mounted in said frame, a
10 clipping cylinder supported by said bearing

plates, and a flexible lubricating strip supported by said frame and engaging said cutters.

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

EDWARDS W. BARNUM.

Witnesses:

JULIA A. FISHER,

SAMUEL B. STURGES.