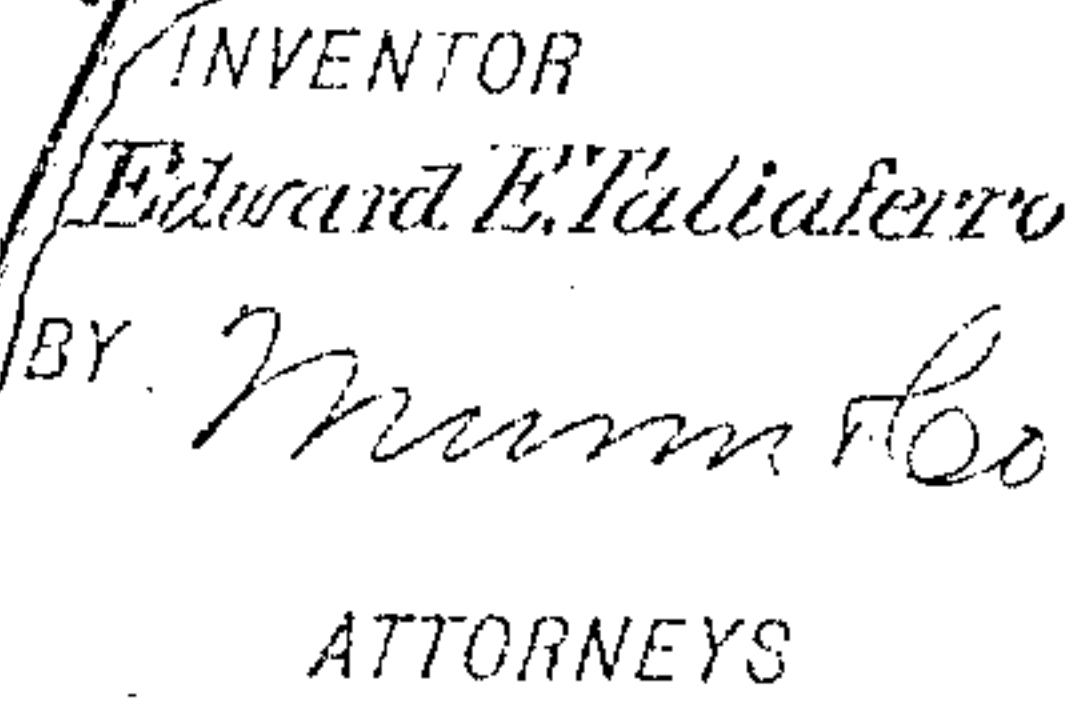


APPLICATION FILED JUNE 30, 1906.

Patented Oct. 6, 1908.
11 SHEETS—SHEET 1.



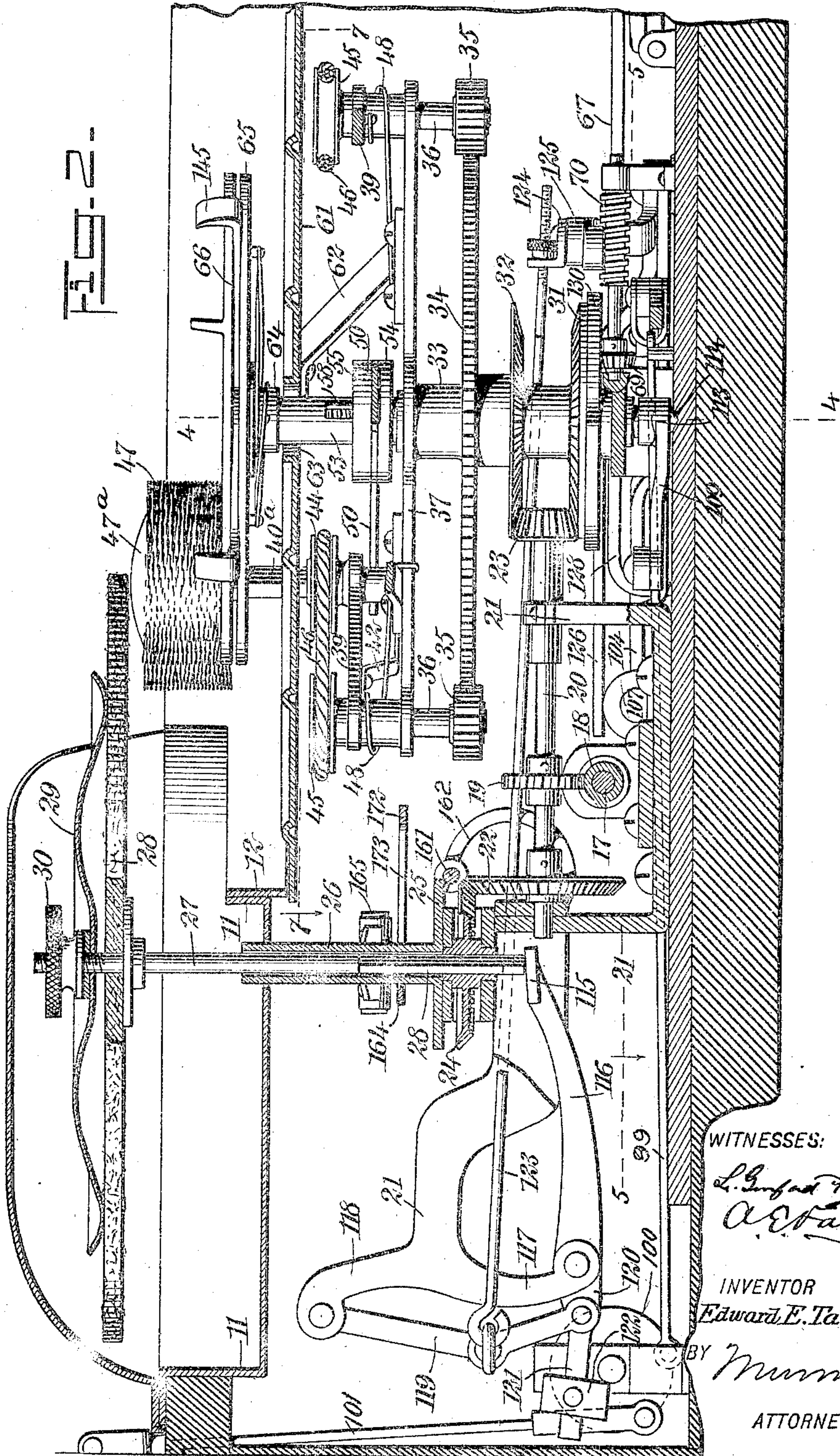
900,448.

E. E. TALIAFERRO.
BLACKING MACHINE.

APPLICATION FILED JUNE 30, 1906.

Patented Oct. 6, 1908.

11 SHEETS—SHEET 2.



WITNESSES:

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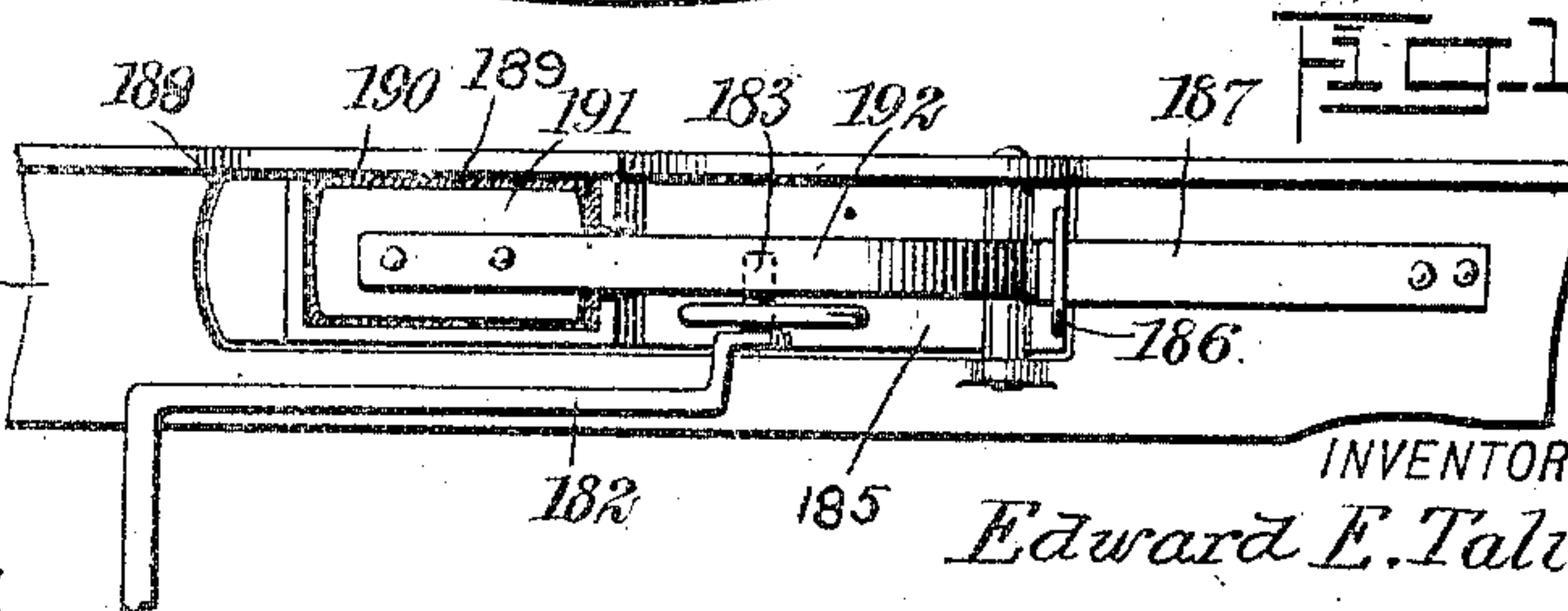
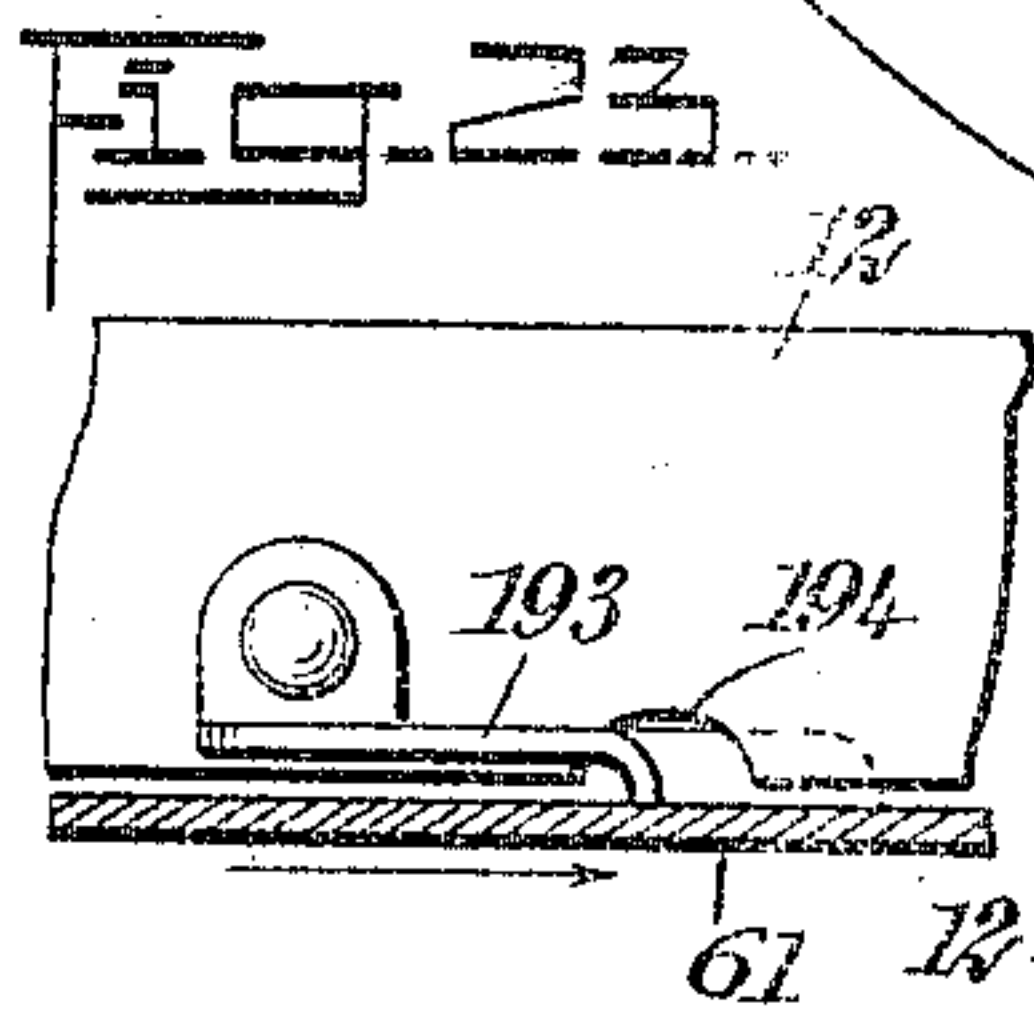
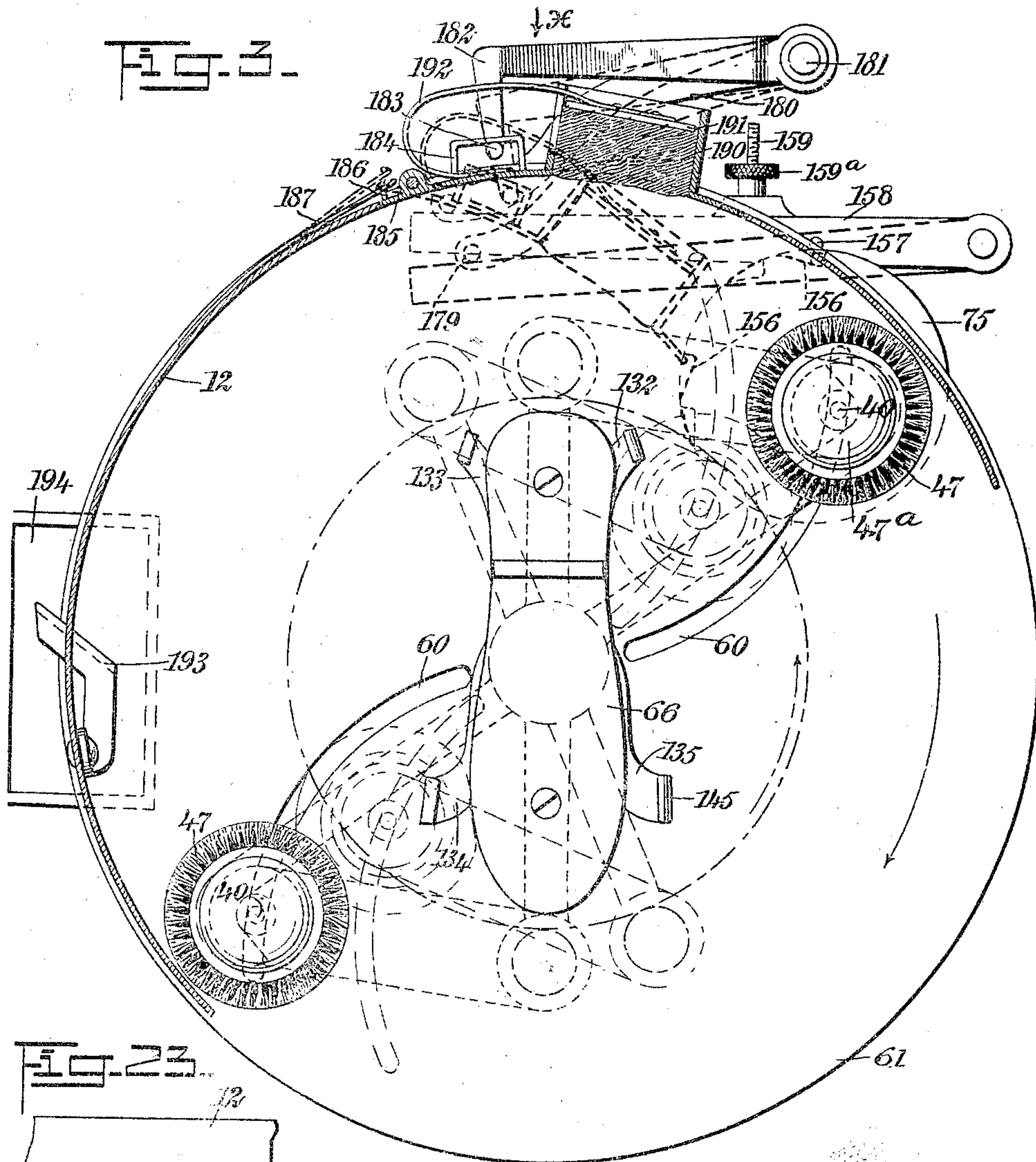
BY *Mum & Co*

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900,448.

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BLACKING MACHINE.
APPLICATION FILED JUNE 30, 1906.

Patented Oct. 6, 1908.
11 SHEETS—SHEET 3.



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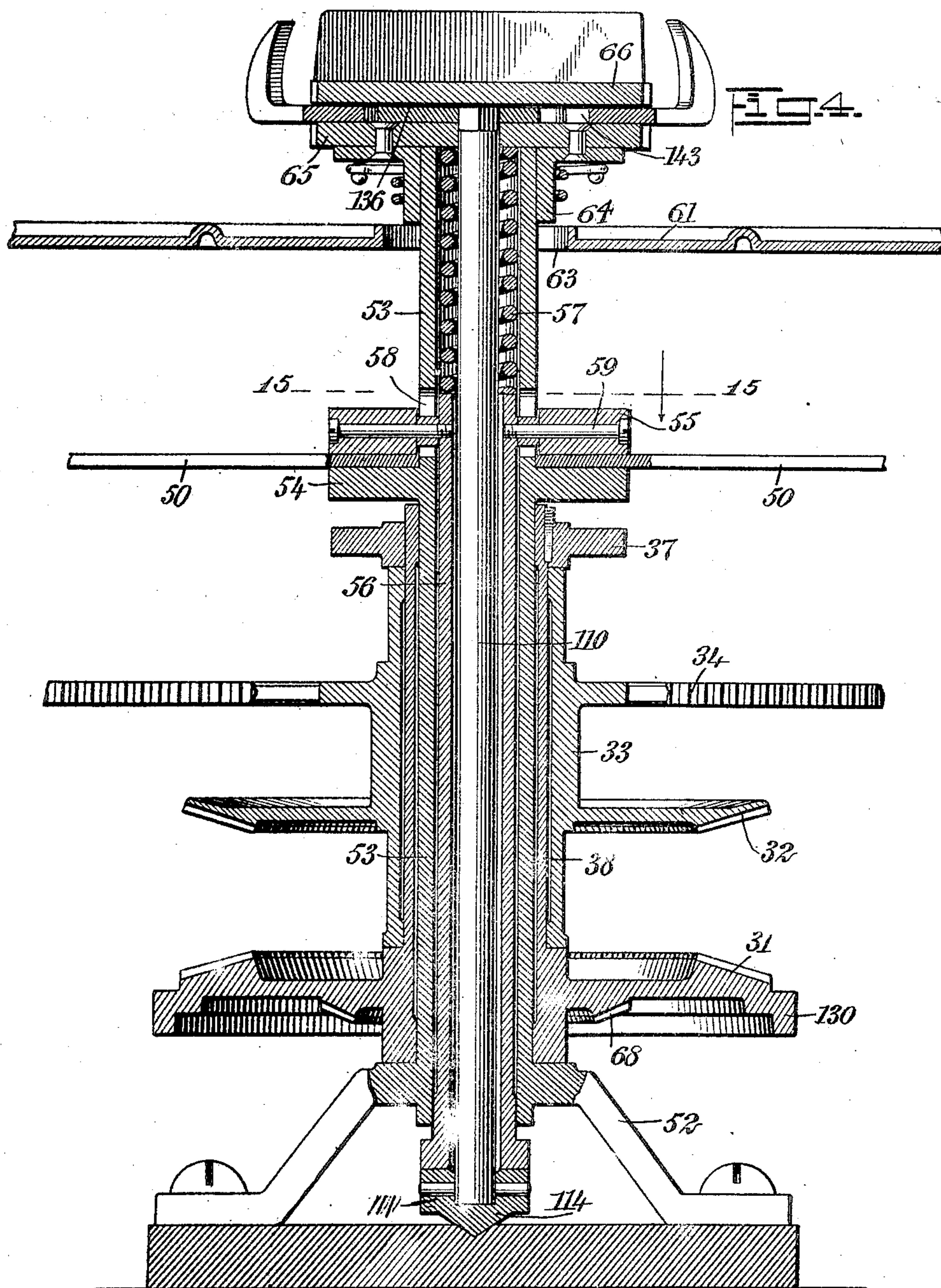
BLACKING MACHINE.

APPLICATION FILED JUNE 30, 1906.

900,448.

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11 SHEETS—SHEET 4.



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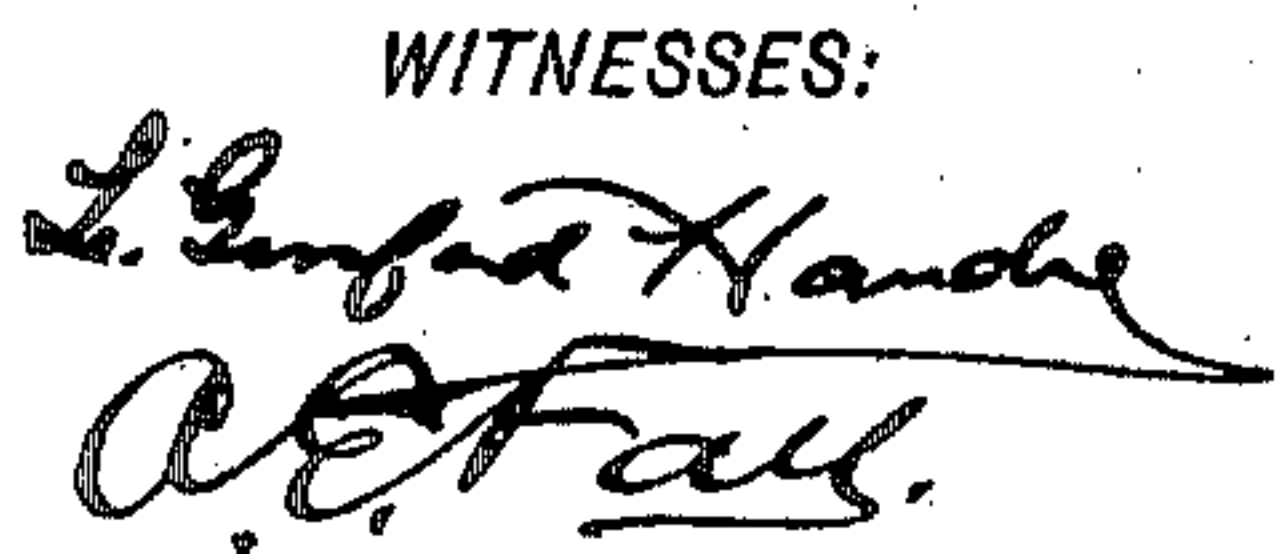
ATTORNEYS

BLACKING MACHINE.

Patented Oct. 6, 1908.

11 SHEETS—SHEET 6.

900,448.



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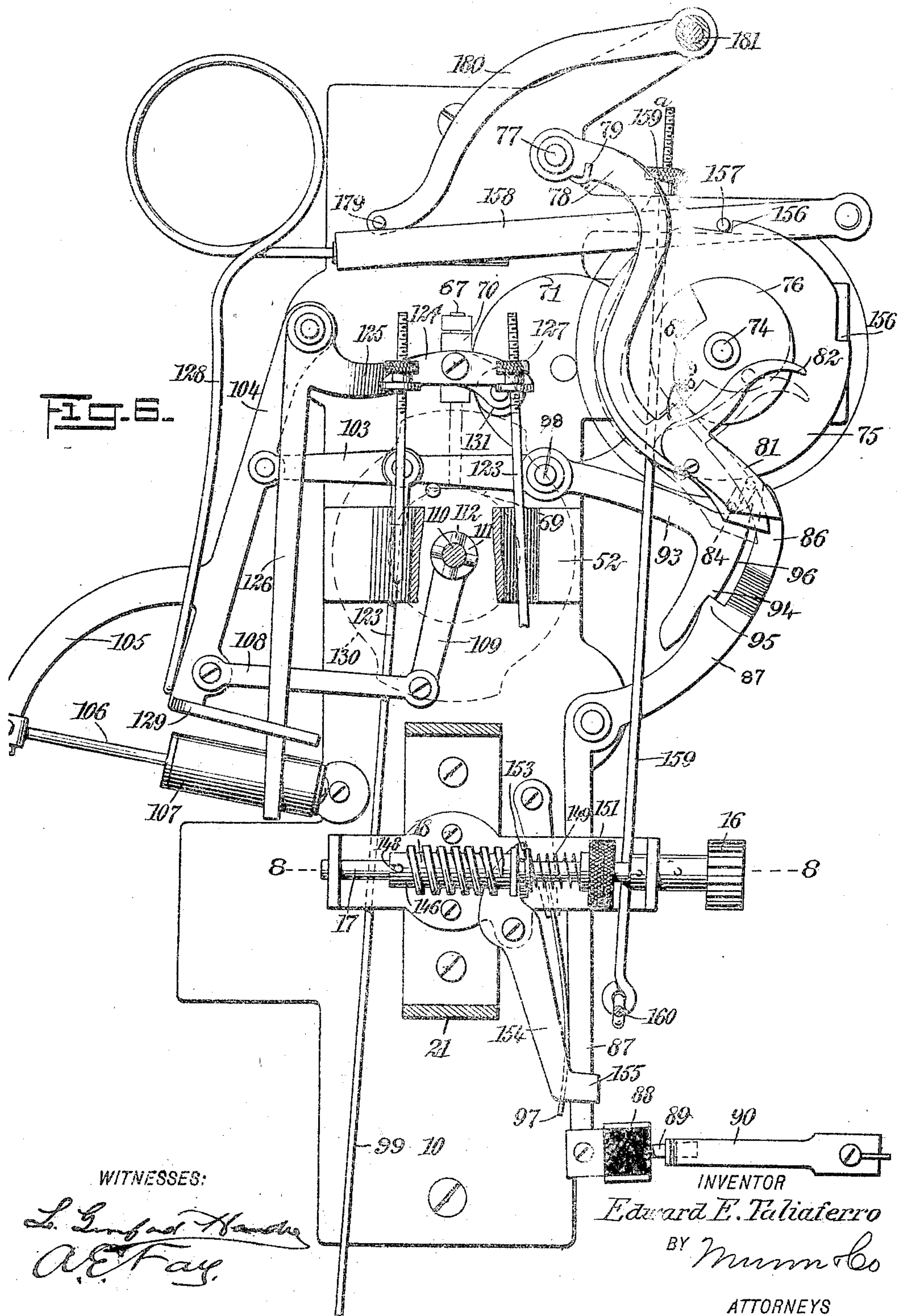
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E. E. TALIAFERRO.
BLACKING MACHINE.
APPLICATION FILED JUNE 30, 1906.

11 SHEETS—SHEET 6.



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APPLICATION FILED JUNE 30, 1906.

Patented Oct. 6, 1908.
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Fig. 7.

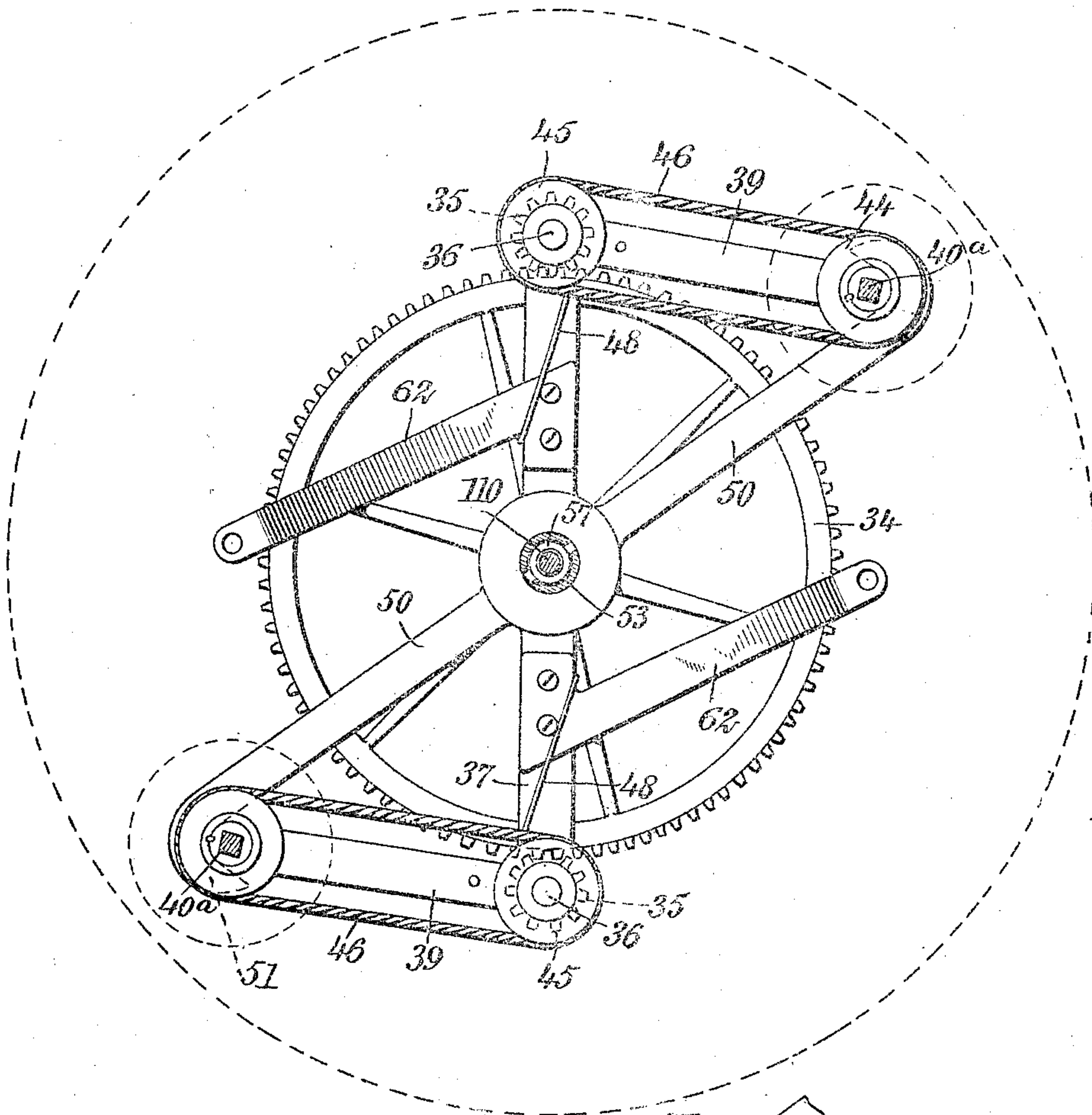
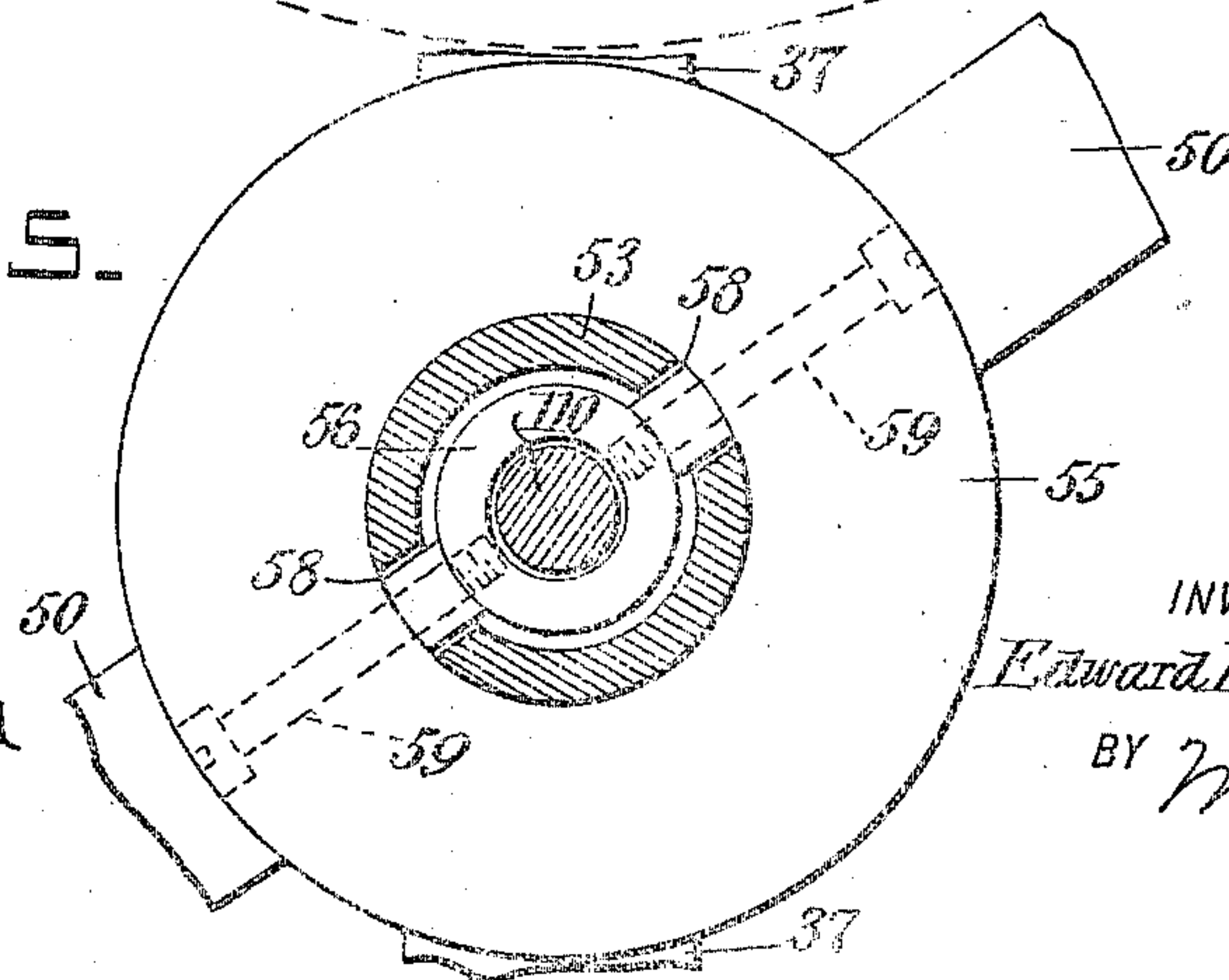


Fig. 15.



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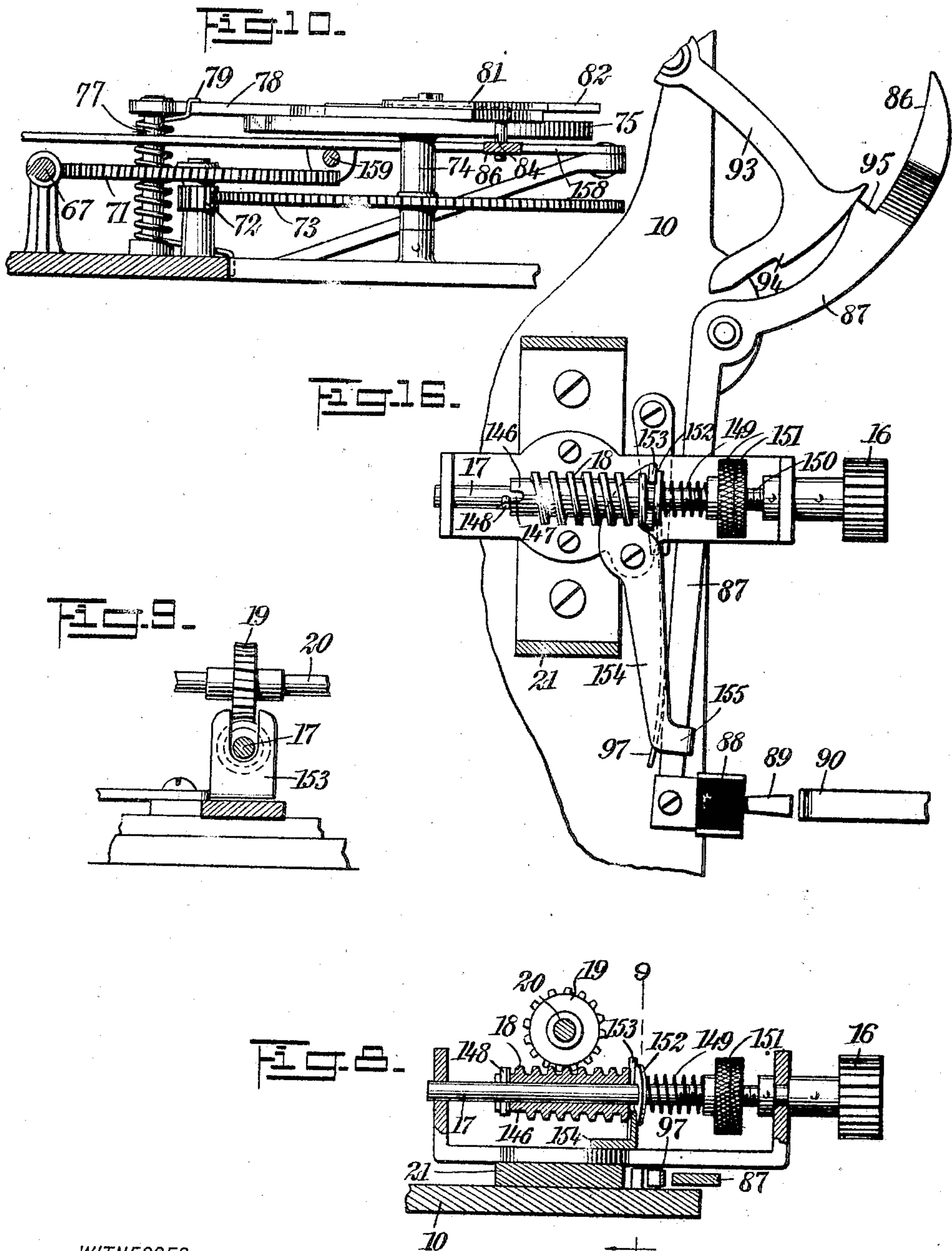
BLACKING MACHINE.

APPLICATION FILED JUNE 30, 1906.

900,448.

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11 SHEETS-SHEET 8.



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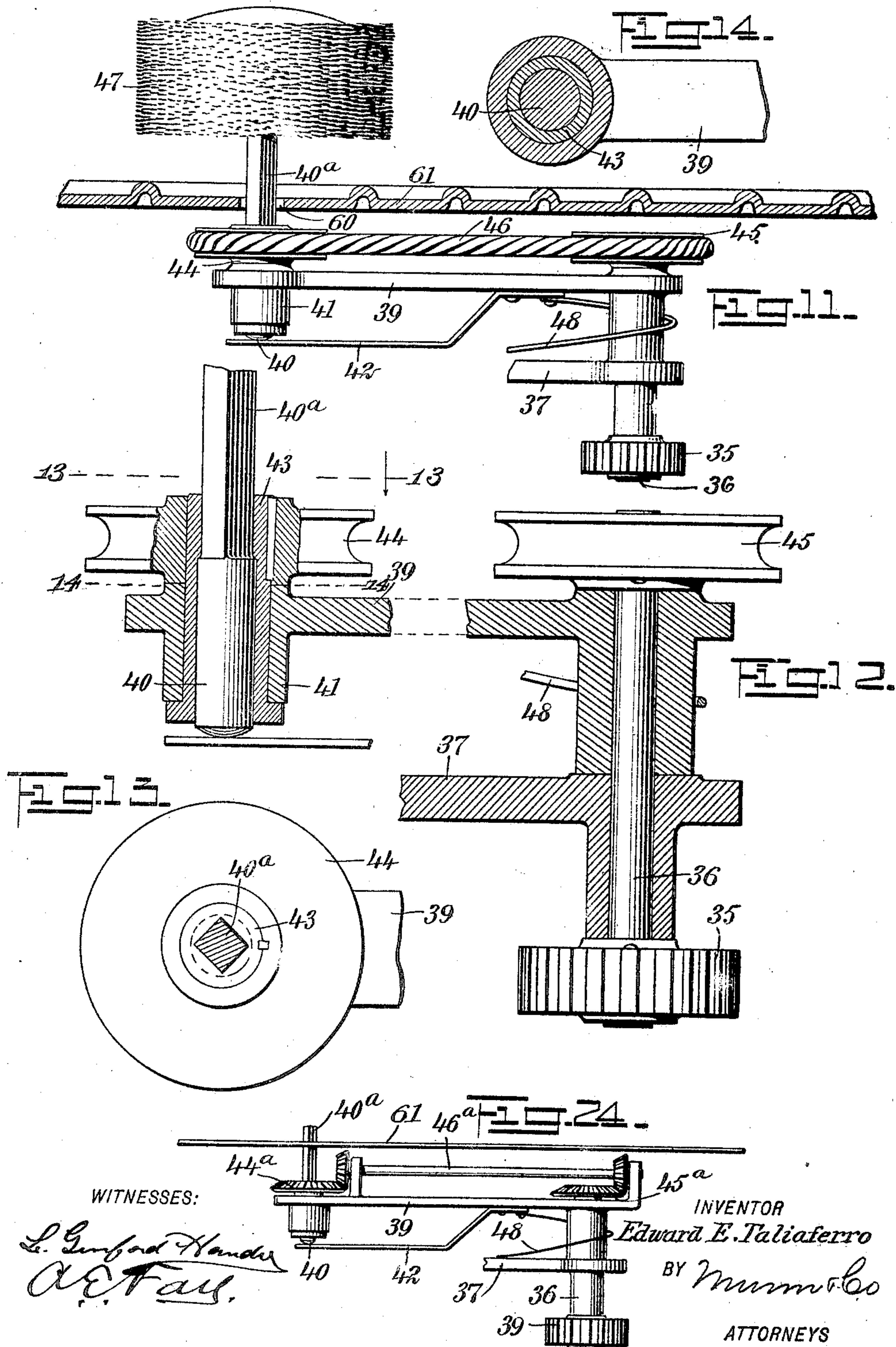
BLACKING MACHINE.

APPLICATION FILED JUNE 30, 1906.

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11 SHEETS—SHEET 8.



E. E. TALIAFERRO.

BLACKING MACHINE.

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Patented Oct. 6, 1908.

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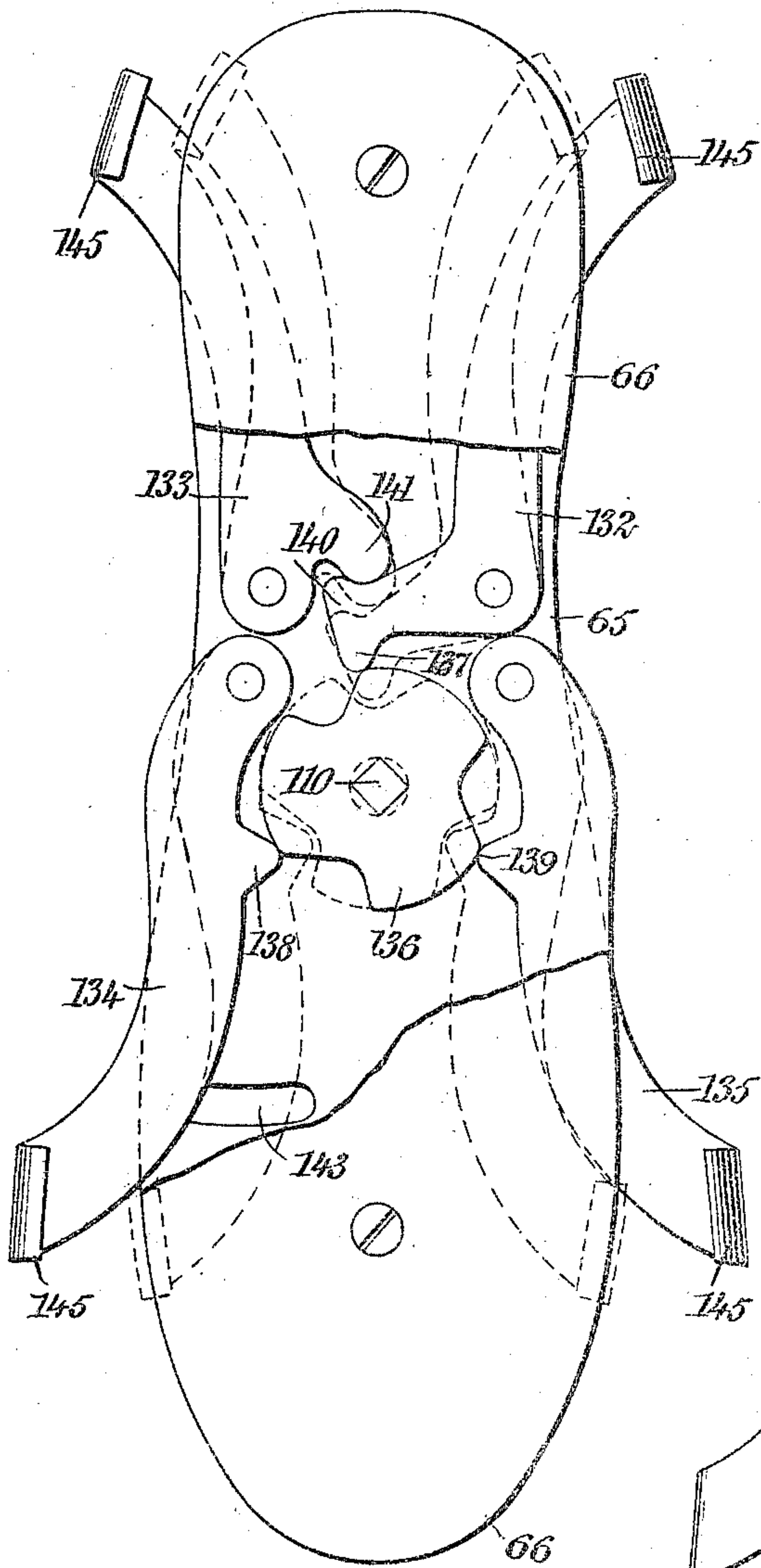
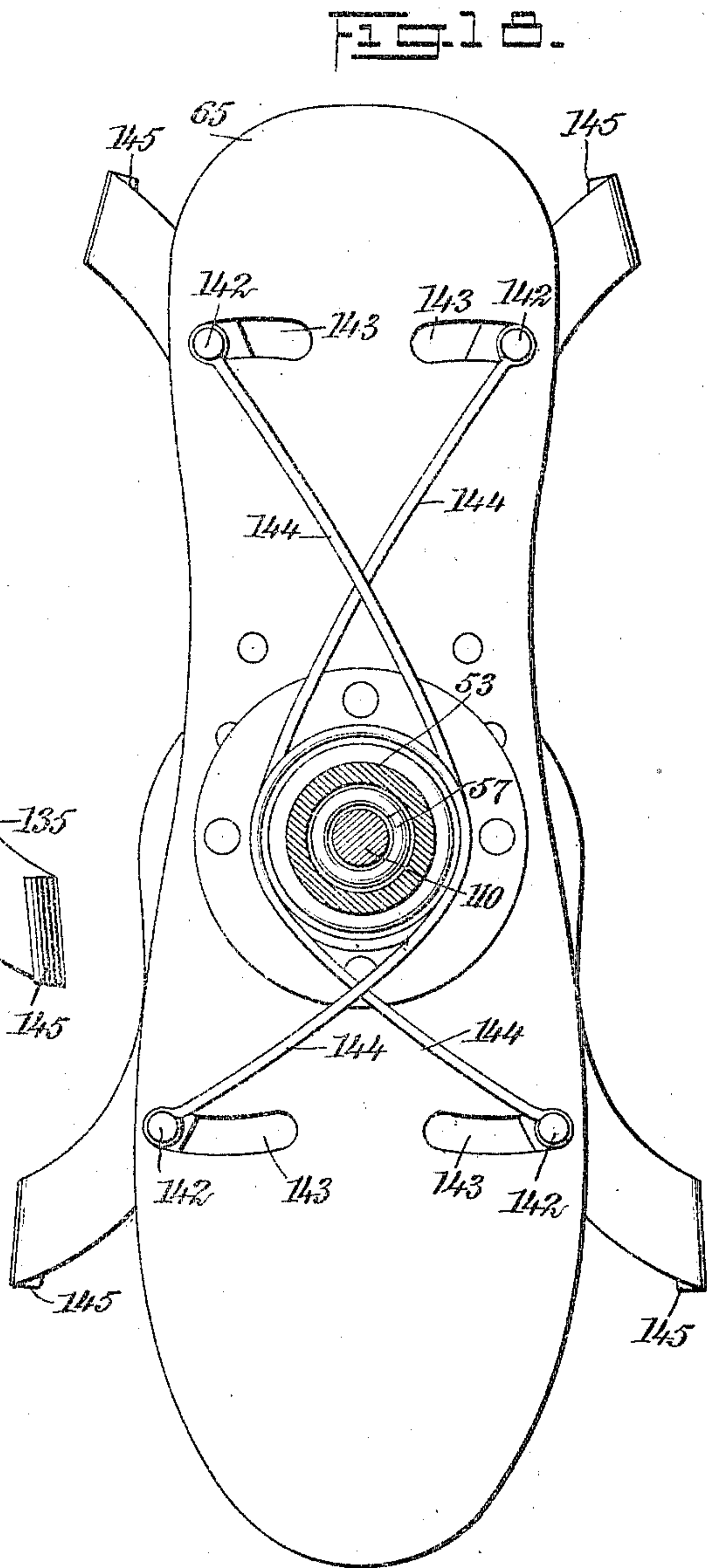


FIG. 17.



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Patented Oct. 6, 1908.

11 SHEETS—SHEET 11.

FIG. 20.

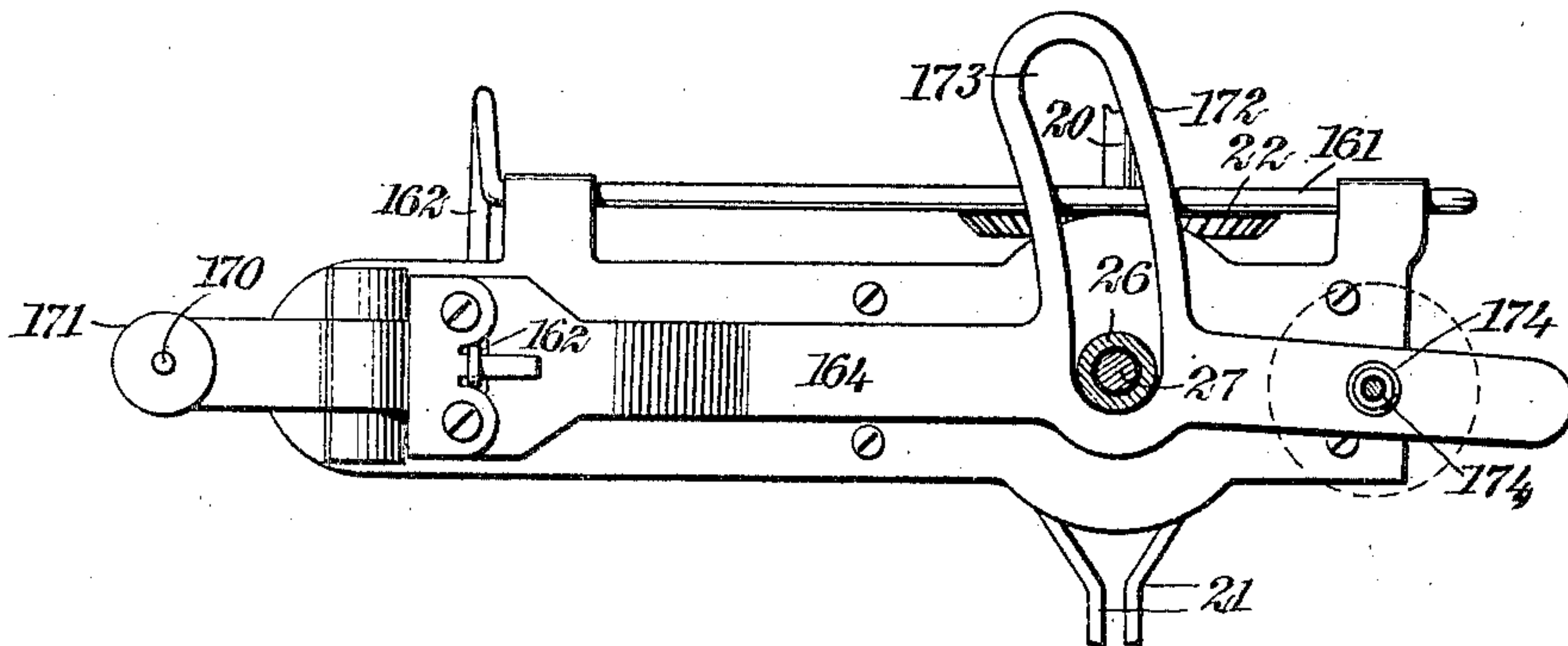


FIG. 21.

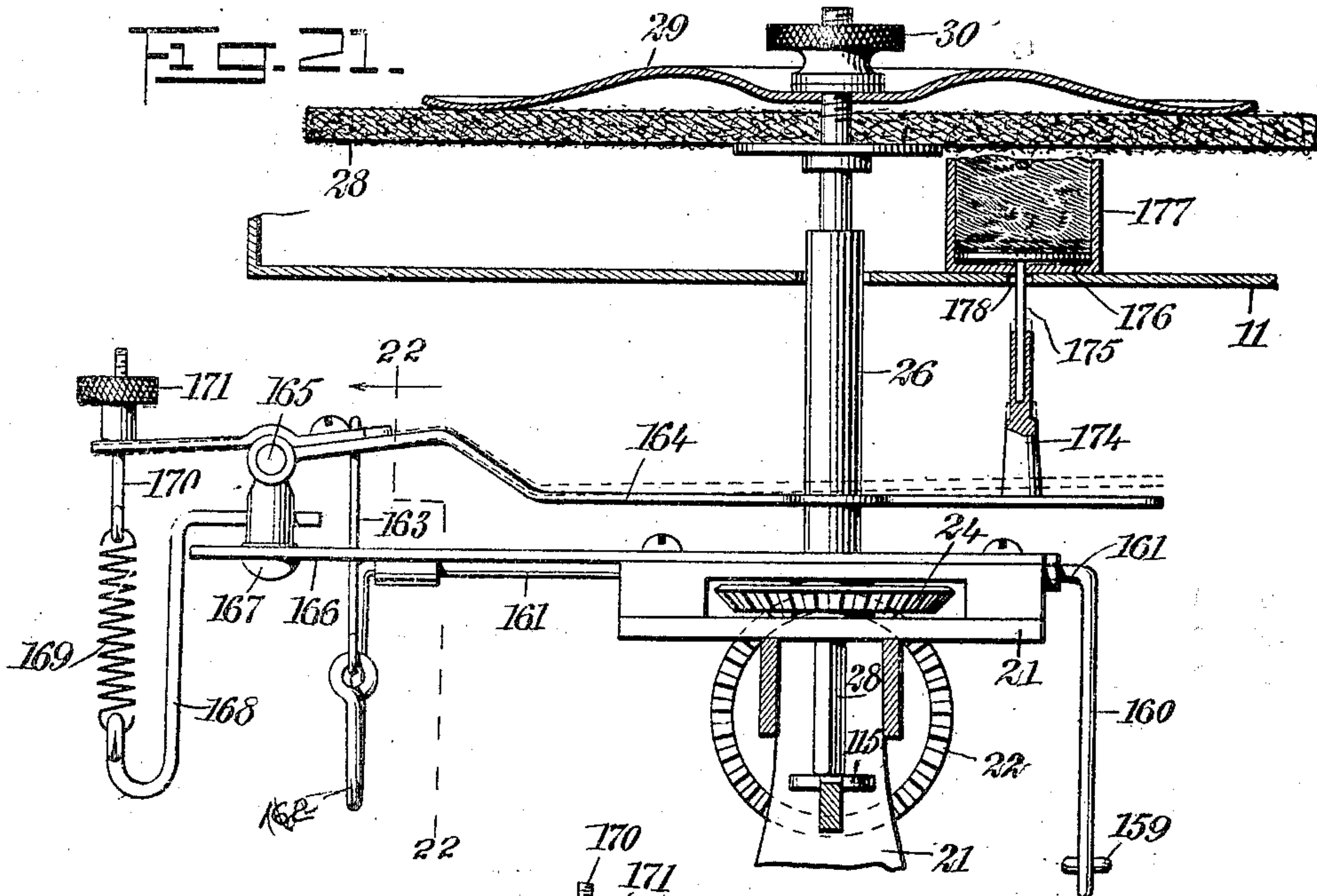
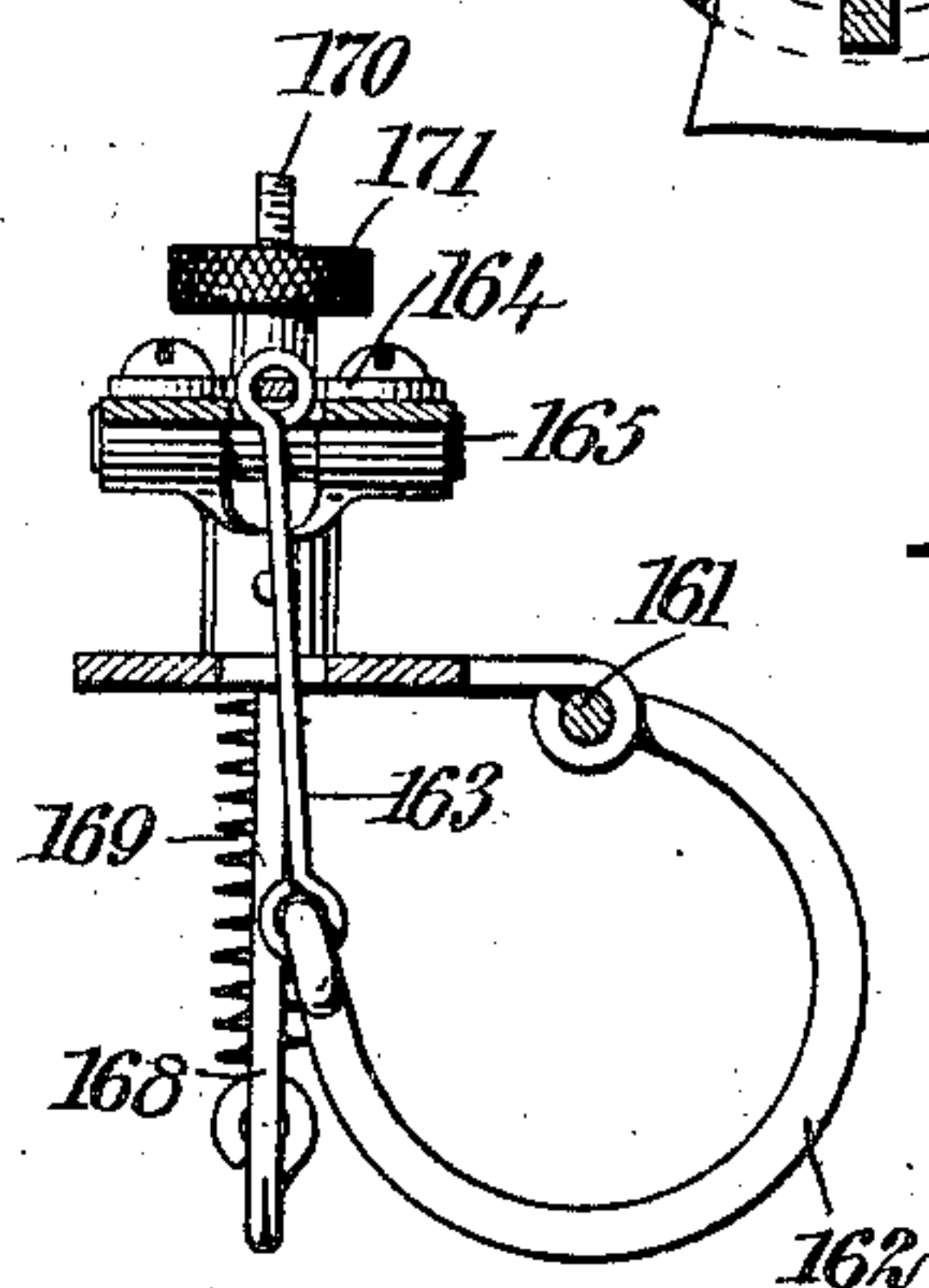


FIG. 22.



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UNITED STATES PATENT OFFICE.

EDWARD ELLETT TALIAFERRO, OF COLORADO SPRINGS, COLORADO.

BLACKING-MACHINE.

No. 900,448.

Specification of Letters Patent.

Patented Oct. 6, 1908.

Application filed June 30, 1906. Serial No. 324,180.

To all whom it may concern:

Be it known that I, EDWARD ELLETT TALIAFERRO, a citizen of the United States, and a resident of Colorado Springs, in the county of El Paso and State of Colorado, have invented a new and Improved Blacking-Machine, of which the following is a full, clear, and exact description.

My invention relates to a machine for blacking boots and shoes, the principal objects thereof being to provide means for efficiently blacking and polishing all portions of the shoe which are ordinarily polished; to provide a simple and efficient means for readily starting the machine and for stopping it; to provide means for causing a set of brushes to travel around the foot form on which the shoe is placed to be polished in such a manner as to efficiently polish all parts of the shoe, and at the same time to draw these brushes away from the machine if stopped to permit the placing the shoe in position without interfering with them; to provide for operating a flexible toe brush in such a manner as to bring it into working position, and to remove it therefrom automatically when the machine is operating; to provide for applying blacking to all the brushes; to provide for automatically stopping the machine after a certain cycle of operations has been completed; to provide also for automatically stopping the machine in case of accident, and to improve blacking machines in various other ways, as will appear below.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a perspective view of certain working portions of a machine constructed in accordance with the principle of my invention, parts being broken away; Fig. 2 is a vertical sectional view of the same taken longitudinally through the center; Fig. 3 is a plan of a portion of the device, parts being shown in section and slightly modified, the corrugations of the plate being omitted; Fig. 4 is an enlarged vertical sectional view on the line 4—4 of Fig. 2; Fig. 5 is a sectional plan view on the line 5—5 of Fig. 2; Fig. 6 is a view similar to Fig. 5, showing the parts in a different position; Fig. 7 is a sectional plan view on the line 7—7 of Fig. 2; Fig. 8 is a transverse sectional view on the line 8—8

of Fig. 6; Fig. 9 is a longitudinal vertical sectional view on the line 9—9 of Fig. 8; Fig. 10 is a transverse sectional view on the line 10—10 of Fig. 5; Fig. 11 is an enlarged side elevation of certain brush operating mechanism which constitutes a part of the invention; Fig. 12 is a vertical sectional view on an enlarged scale, through the center of the mechanism shown in Fig. 11; Fig. 13 is a sectional plan view on the line 13—13 of Fig. 12; Fig. 14 is a sectional plan view on the line 14—14 of Fig. 12; Fig. 15 is a sectional plan view on the line 15—15 of Fig. 4; Fig. 16 is a partly sectional plan view of a portion of the device on an enlarged scale to illustrate a safety clutch, taken on the same plane with Figs. 5 and 6; Fig. 17 is a plan of the foot rest with a part broken away to show the interior construction; Fig. 18 is a bottom plan view of the same with parts in section; Fig. 19 is an end elevation of parts shown in Fig. 3, seen in the direction of the arrow *x* in said figure; Fig. 20 is a plan of a device for operating a blacking-applying arrangement, with parts shown in section; Fig. 21 is an elevation of the same with parts in section; Fig. 22 is a sectional view on the line 22—22 of Fig. 21; Fig. 23 is a detail sectional view showing the dust scraper; Fig. 24 is a side elevation practically similar to Fig. 11, showing a modification, and Fig. 25 is a plan of a corrugated plate hereinafter more particularly described.

I have shown a box or casing 10 in which the main parts of the mechanism are mounted. This casing is provided with a perforation in the top. One part of this perforation is designed to be filled by a plate 11 which in the present instance, is cut out at one side on an arc to permit a ring 12 to enter it. This ring is substantially circular in form and rests upon the edge of the perforation. While the plate is practically continuous and covers the mechanism below the ring is open through its center for a purpose which will be described. The bottom of the box or casing is provided with a slot 14 through which projects a driving gear 15 that is mounted upon the shaft of an engine, motor or the like for operating the mechanism of the blacking machine. This gear meshes with a pinion 16 on a shaft 17 which is the main shaft of the machine. On this shaft is mounted a worm 18 which meshes with a worm wheel 19 on a

shaft 20. This shaft is mounted in bearings on a frame 21 connected with the casing and is provided with two gears 22 and 23. The gear 22 drives a gear 24 rotating on a vertical axis in a bearing on the frame 21 and preferably having a square hole through its center. Above the bearings of the gear 24 is located a plate 25 which supports a vertical tube 26. Through this tube is adapted to pass a shaft 27 which has a square portion 28 thereon for entering the square perforation in the gear 24, whereby the operation of the shaft 17 will rotate the shaft 27. On this shaft is mounted a flexible disk brush 28 which may be secured in position on the shaft by a resilient plate 29 held in position by a nut 30 connected with the shaft so as to adjust the pressure of the brush on the shoe. It will be obvious that the gear 24 rotates continuously when the shaft 20 is in motion and that the brush will be caused to rotate whenever the shaft 27 is lowered into the tube or socket 26 until the square perforation in the gear engages in the square portion of the shaft.

The gear 23 meshes with two gears 31 and 32, mounted to rotate on a vertical axis, and obviously the rotation of the gear 23 will cause these other gears to rotate in opposite directions. The gear 32 is mounted on a rotatable sleeve 33 supported in a way which will be described below. This sleeve is provided with a gear 34 which is in constant mesh with a pair of pinions 35 mounted on vertical shafts 36 and located on opposite sides of the gear 34. These shafts are journaled in a frame 37 which is free to rotate on the axis on which the sleeve 33 rotates.

Referring now to Fig. 4 it will be seen that the gear 31, which it must be remembered rotates in a direction opposite to that of the gear 32, is mounted on a sleeve 38 to which is keyed the frame 37. The opposite rotations of the gear 34 and the frame 37 carrying the pinions 35 will obviously cause said pinions to rotate at a very high rate of speed. Pivotaly connected with the frame 37 on the axes of the pinions 35 are arms 39, as clearly appears in Figs. 7, 11 and 12. At the ends of these arms are journaled shafts 40, these shafts projecting down through bosses 41 on the lower sides of the arms, and being supported by springs 42 connected with the arms. Each shaft is provided with a square part 40^a which engages a square perforation in a bushing 43. On this bushing is keyed a sheave 44. On the shafts 36 are corresponding sheaves 45 which are connected with the first-mentioned sheaves by belts 46. Another way of transmitting the motion of rotation from the shafts 36 to the shafts 43 is shown in Fig. 24 in which gears 44^a and 45^a are connected by a shaft 46^a having pinions thereon meshing with said gears. It will be seen that these brushes will always rotate when the gears 31 and 32 are in operation;

in fact, they have a double rotation, one on their own axis and the other an irregular motion with the axis of the main gears as a guide.

In order to swing the arms 39 inwardly and force the brushes as far in as possible springs 48 are connected with the frame 37 and with the arms 39. If allowed to act in a normal manner these springs will force the brushes inwardly at all times and cause them to press with a yielding pressure against a shoe placed in a proper plane over the center of the rotating system; but for the purpose of moving the brushes outwardly when the machine stops so that they will not interfere with the placing of the boot or shoe in the proper position on the machine a pair of guides 50 are provided. These guides are rotatable about an axis concentric with the center of the gears 31 and 32, and are provided with hooks at their ends. It will be obvious that when during the rotation of the system the bosses 41 or any other element which is connected with the arms 39 come into engagement with the guides 50, if the latter are relatively fixed and the rotation of the arms 39 bodily is toward the guides, the brushes will be forced outwardly along the inner surfaces of the guides until they engage the hooks which limit the motion in that direction. I will now describe how these guides are manipulated and how the sleeves 33 and 38 are supported to rotate in opposite directions, reference being had to Fig. 4. In this figure is shown a bracket 52 mounted on the base of the casing. Extending upwardly from this bracket is a cylinder 53 on the top of which is a plate 54. These three elements are obviously stationary. The sleeve 38 is mounted to rotate on the cylinder 53, while the sleeve 33 is mounted to rotate on the sleeve 38. The plate 54 supports the guides 50, and they are connected together and free to rotate on this plate which serves as a bearing for them. When two brushes are employed, located opposite each other as described, two guides are used extending in opposite directions from the plate 54. Above this plate and above the guides is located an annular plate 55. This plate is rigidly connected with a sleeve 56 which passes down through the cylinder 53, and has a slight vertical motion which is produced in a manner which will be described below. It will be obvious that when the plate 55 is raised sufficiently to permit the guides 50 to rotate freely with the rotating mechanism, the guides will have no effect upon the brushes, allowing them to be operated by their springs as described. When, however, the sleeve 56 is allowed to fall, its weight would be sufficient to hold the guides in fixed position to cause the brushes to move outwardly on account of them. If this is not sufficient a spring 57 can be employed for accomplishing this result. The plate 55 is connected with the sleeve 56

through perforations 58 in the cylinder 53 by means of bolts 59 or the like (see Fig. 15).

Referring to Figs. 3 and 11, it will be seen that the shafts 40 project through slots 60 in a corrugated plate 61. The corrugations on this plate are to receive and hold the dust. They terminate near the periphery so as to feed the dust toward the periphery and down to the scraper, not allowing it to spread over the plate, and fall through the openings through which the brushes pass. This plate is mounted on brackets 62 on the frame 37, as is shown in Figs. 2 and 7. It is provided with a central perforation 63 permitting the cylinder 53 to project through it, and the slots 60 are curved to permit the shafts 40 to pass along them on the axes on which the arms 39 are mounted, as indicated in Fig. 3. At the top of the cylinder 53 is mounted a collar 64 which supports a plate 65 carrying a foot-rest 66. As the cylinder is stationary it will be obvious that the foot-rest is also stationary. From the mechanism so far described it will be understood that the plate 61 rotates under the foot-rest carrying the brushes 47, that these brushes follow the outline of the foot-rest under ordinary circumstances until the sleeve 56 is manipulated to lower the plate 55 and stops the guides 50 so as to force the brushes outwardly along the slots 60. During the rotation of the brushes 47 about the foot-rest and on their own axes the toe brush 28 constantly rotates. The brushes 47 are provided with metallic disks 47^a at their tops to permit the disk brush to rotate over them without creating unnecessary friction.

As the gear 31 rotates it serves another function which consists in the driving of a certain mechanism for the purpose of automatically stopping the machine and for manipulating certain elements thereof. I have located a horizontal shaft 67 adjacent to this wheel, see Fig. 2, and have provided means for transmitting power to it at a very low rate of speed. This may be accomplished in many ways. As shown the gear 31 is provided with an integral beveled gear 68, see Figs. 4 and 2, transmitting power to the shaft 67 through a pinion 69. The shaft 67 is provided with a worm 70 which communicates its rotary motion to a wheel 71. This wheel is provided with a pinion 72 for driving a gear 73 which is mounted on a vertical shaft 74. This shaft carries a disk 75 on which is mounted a cam 76 in the form of a wiper. On a vertical stud 77 is mounted an arm 78 which is provided with a spring 79 for forcing a tooth 80 on the arm into constant engagement with the wiper 76. It will be seen that the latter will cause the arm to oscillate. Pivotaly mounted on the arm is a leaf lever 81. This lever is provided with an arm 82 engaging a pin 83 on the cam 76, and with a pin 84 projecting

downwardly from the main body of the leaf through a slot 85 in the arm 78 in such a position as to engage a projection 86 on a lever 87. The operation of this part of the device is as follows: The constant rotation of the driving gear causes the cam 76 to rotate in an obvious manner, and as the tooth 80 travels outwardly on the diverging surface of the cam 76 it would normally throw the pin 84 into position to engage the projection 86 were it not for the fact that the pin 83 is at the beginning of its stroke out of reach of the arm 82 and, consequently, this pin is free to move backwardly toward the shaft 74; therefore, also as the arm 78 is gradually thrown outwardly there is no danger of the pin 84 being in operative position to engage the projection 86 until the pin 83 comes around nearly to the end of the stroke and engages the arm 82 so as to force the leaf around on its pivot and throw the pin 84 into the slot 85. When this occurs these parts are located in this position, it being understood that the tooth 80 is near the outer limit of its stroke, and when the tooth slips over the nose of the cam the pin 84 will strike the projection 86 and force the lever backwardly on its pivot. This results in stopping the machine, as will be explained.

The lever 87 is provided with an insulating block 88 at the end opposite the projection 86, and in this block is supported a conducting pin 89. When the lever is manipulated in the manner above described the pin 89 is drawn backwardly out of contact with a pair of conducting springs 90 and 91. These two springs are mounted on an insulating block 92 and are connected with a pair of conductors which communicate with the motor and battery or other source of power. It will, of course, be understood that this connection is illustrated for the purpose of showing how the device is employed to stop the machine when electric motive power is used to operate it, and when any other operating power is employed a mechanical substitute will be used.

The lever 87 is normally held in such position by the spring 97 that the pin 89 is in engagement with the springs 90 and 91 and when the parts are in this position the tooth 95 on the lever 87 engages the tooth 94 on the lever 93, as is shown in Fig. 6. When these teeth are disengaged from each other by the swinging of the lever in the manner mentioned the lever 93 is permitted to swing into the position shown in Fig. 5, and, consequently, the parts will remain in inoperative position until the proper means is employed for connecting them up again. It will be seen that at the rear of the tooth 94 is a curved surface 96 which engages the top of the tooth 95 and prevents a spring 97 from forcing the pin 89 into position for conducting current to the motor. The manner in

which the lever 93 is manipulated to start the machine will now be described. This lever is pivoted on a stud 98 and at its end opposite the tooth 94 it is connected by a wire, link or the like 99 with an oscillatable wheel 100. Pivotally connected with this wheel at a point near its surface is a starting rod 101 having a handle 102 projecting above the top of the casing. It will be obvious that when this handle is pulled up the wire 99 will be manipulated and the lever 93 moved into the position shown in Fig. 6 which permits the tooth 95 to engage behind the tooth 94 and allows the spring 97 to turn the lever into this position so that the motor will start. The lever 93 is connected by a link 103 with a lever 104 which is provided with an arm 105 having a piston rod 106 entering a cylinder or dash-pot 107. These features are provided for the obvious purpose of controlling the motion of the various parts connected with them. With the lever 104 is connected a link 108 which is again connected with an arm 109 which is pivoted on a center concentric with the sleeves 33 and 38 by means of a vertical shaft 110. This arm is provided with a collar 111 encircling this shaft, on the upper surface of this collar being located a series of projections 112. These projections are adapted to fit corresponding grooves 113 on the bottom of the cylinder 56. The lower side of the arm 109 is provided with a conical projection 114 assisting in centering it, this projection entering a depression in the base of the casing. It will now be seen how the sleeve 56 is moved vertically to permit the guides 50 to operate in the manner specified above. When the machine is at rest the projections and grooves 112 and 113 fit each other, as is shown in Figs. 1 and 2; but when the operating handle 102 is pulled to start the machine the arm 109 is turned sufficiently to force the sleeve 56 upwardly and permit the above-described operation to take place in the manner specified.

It has been stated that the shaft 27 passed through the socket 26 and was rotated by the gear 24. This shaft, however, is not supported either by the gear or socket or by the bearings thereof. It rests on a plate 115 mounted on a lever 116 which is pivoted on an arm 117 of the frame 21. This frame is provided with another projection 118 which is connected by a toggle-joint 119 with an arm 120 of the lever 116 which projects beyond the pivotal point thereof. This arm 120 is provided with a projection 121 upon which is a counter-balance weight 122 for adjusting the pressure of the toe brush on the shoe. The knuckle of the toggle-joint is connected by a link or links 123 with a bar 124 which is pivotally mounted on an arm 125 of a bell-crank 126. The links 123 are preferably adjustably connected with the bar 124 and

for that purpose are shown as screw-threaded and provided with adjusting nuts 127.

The long arm of the bell-crank 126 projects into the path of a projection 129 on the lever 104, consequently, under ordinary circumstances, when the handle 102 is manipulated to start the machine, the bell-crank 126 will be free to operate, and, consequently, the weight of the brush on the shaft 27 will depress the platform 115, drawing with it the bell-crank 126. When the machine is stopped, however, the lever 104 moves over under the influence of a spring 128, and a projection 129 on the lever engages the bell-crank 126 to pull the bar 124 to the rear, and this operates on the toggle-joint and lifts the toe brush. The device operates in this manner except when controlled by a cam 130. This cam is mounted on the outside of the wheel 31 and is adapted to engage a roller 131 on the arm 125. Obviously when the projecting part of this cam is in contact with the roller, it will prevent the roller from moving inwardly toward the shaft 110, and will not permit the brush to fall, or if the brush is lowered when this part of the cam comes into operative position it will raise it. It will be seen therefore that the toe brush is automatically raised at a certain stage of the operation of the machine and then automatically released from the raising means so that its weight can operate to lower it.

For the purpose of holding the boot or shoe on the foot-rest I have provided the following mechanism, reference being had to Figs. 17 and 18. Between the plates 65 and 66 are pivotally mounted a series of levers 132, 133, 134 and 135, these levers being of several different classes, in order that they may be properly manipulated by each other and by a cam 136. This cam is mounted on the top of the shaft 110 and oscillates with it. The cam 136 is provided with spaced swells, that engage with toes 137, 138 and 139 on the levers 132, 134 and 135 to force them outwardly when the machine stops. The lever 132 has a projection 140 which engages a projection 141 on the lever 133 to operate that in the same manner. The levers are provided with studs 142 which project through slots 143 in the plate 65 and which are connected with springs 144 to normally force the levers inwardly and cause clips 145 thereon to engage the boot or shoe when placed on the foot-rest. The operation of these elements will be readily understood being caused by the oscillation of the shaft 110 about its center when the machine is stopped or started by the manipulation of the handle 102.

As shown in Figs. 5, 6 8 and 16, in order to provide for throwing the machine out of gear in case of an accident so as to prevent breakage I have illustrated the following

mechanism: Instead of mounting the worm 18 directly on the shaft 17 I have placed it on a sleeve 146. This sleeve is slidably mounted on the shaft 17 and is provided with a slot 147 with which a pin 148 on the shaft is adapted to engage. When this pin is in the slot the rotation of the shaft will be transmitted to the worm wheel and, consequently, to the rest of the mechanism. If anything occurs, however, to stop the mechanism driven by the pinion 19 and the latter ceases to rotate freely, the effect of the rotation of the pinion 16 and the worm 18 without transmitting rotation to the pinion 19 will be to cause the worm to travel along the shaft 17 until the slot 147 is brought out of engagement with the pin 148. This tendency is counteracted by a spring 149 which is adjustable along a screw-threaded portion 150 of the shaft 17 by means of a nut 151. If, however, the parts were left in this way the motor would run away, consequently, I have provided means for automatically disengaging the conducting pin 89 from the springs 90 and 91, and therefore, breaking the circuit for supplying current to the motor and stopping the latter. This I have shown in the form of a collar 152 mounted on the sleeve 146, a yoke 153 mounted on a lever 154 for operating the lever when the sleeve slides along the shaft, and a projection 155 on the lever for engaging the lever 87 and forcing it backwardly to withdraw the pin 89 from the springs 90 and 91; thus the transmission of power to the mechanism will not only be stopped by disengaging the motor therefrom, but the motor itself will be stopped when anything occurs to clog the machinery. As a matter of fact this mechanism will operate even if the machinery is not entirely stopped, but is sufficiently slowed up to prevent the transmission of power at the proper rate of speed to the pinion 19.

For the purpose of applying blacking to the brushes I have shown the following mechanism: The disk 75 is provided with a pair of notches 156. These notches are adapted to engage and operate a pin 157 mounted on a lever 158. Through a perforation in this lever passes a rod 159 which is screw-threaded at the rear of the lever in order to allow an adjusting nut 159^a to be placed upon it. This rod is connected with an arm 160 on a shaft 161 which is mounted in bearings on the frame 21. Preferably located at the other end of this shaft is a curved arm 162 connected by a link 163 with a plate 164 which is pivoted on a stud 165 on an extension 166 of the frame 21. This plate is also pivoted on a second stud 167 so that it can swing on two axes. An arm 168 projecting from the stud 167 carries a spring 169 which is provided with a rod 170 passing through the end of the plate and adjustably connect-

ed therewith by a nut 171. This spring connection operates means for normally forcing the plate 164 upwardly about its center 165 and it counteracts the operation of the rod 159 in one direction. It will be seen that the rod 163 is slightly inclined and, consequently, that the operation of the rod when manipulated by the cam face of the disk 75 will pull the plate 164 toward the socket 26. The plate is provided with an extension 172 having a slot 173 which straddles the tube 26 and permits a pivotal motion on the stud 167. On the plate is mounted a vertical socket 174 in which a vertical rod 175 is adapted to be mounted. This rod carries a plate 176 at its top and this plate is mounted in a cup 177 for holding blacking in any desired form. It will be seen that when the spring 169 is allowed to operate to force the plate 164 upwardly the disk 176 which acts as a plunger will operate to force the blacking upwardly and deposit it on the lower side of the toe brush. It will also be seen that the rotation of the toe brush in engaging the top of the blacking holder 177 causes the latter with the plate 164 to rotate outwardly on the stud 167 as a center. This is permitted by a slot 178 in the plate 11 on which the blacking holder 177 rests. It will be seen, therefore, that when the notches 156 come opposite the pin 157 the plate 164 will be elevated and the blacking applied to the principal portions of the under surface of the toe brush. The application of blacking to the other brushes is accomplished by the operation of a part of the same mechanism, namely, the lever 158. This lever bears against a pin 179 on an arm 180, pivotally mounted on a vertical shaft 181, this shaft having attached thereto an arm 182 having a pin 183 engaging in a yoke 184 on a pivoted plate 185 shown in Fig. 3. The plate 185 is in the nature of a lever having a yoke 186 at the rear thereof which is engaged by a spring 187 which normally forces the main portion of the plate inwardly into such a position that it can engage the brushes 47. This plate is mounted to project through an opening 188 in the wall of the ring 12. The plate is provided with perforations 189 through which project blacking applying devices 190. These devices are provided with a plate 191 behind them forced into operative position by a spring 192. I have shown a dust scraper 193 pivoted on the ring 12 and a box for receiving the dust.

It will be seen that in the operation of the safety cut-out the same thing is done as would be the case if the machine had run the regular time and stopped as intended, the shoe clamps being unlocked, the brushes raised, etc. The machine, of course, returns to normal conditions. Polish can be applied as many times during one operation as may be necessary,

Having thus described my invention, I claim:

1. In a blacking machine, the combination of a stationary foot rest, a set of brushes mounted on axes perpendicular to the plane of the foot rest, means for simultaneously rotating the brushes on their own axes and moving them bodily around the foot rest, a vertically movable toe brush normally held in position to engage a shoe on the foot rest, and means for automatically raising the toe brush when the machine is stopped.

2. In a blacking machine the combination of a stationary foot-rest, a set of brushes mounted on axes perpendicular to the plane of the foot-rest, means for simultaneously rotating the brushes on their own axes and moving them bodily around the foot-rest, a revoluble plate mounted under the foot-rest and having curved slots, and shafts for supporting said brushes passing through said slots.

3. In a blacking machine the combination of a stationary foot-rest, a revoluble corrugated plate mounted thereunder and provided with slots radiating from the center thereof, a set of brushes, shafts upon which said brushes are mounted, said shafts passing through said slots, means for simultaneously rotating the brushes on their shafts and for moving the shafts around the foot-rest, and resilient means for normally forcing the shafts toward the foot-rest along said slots.

4. In a blacking machine, the combination of a stationary foot rest, a set of brushes mounted adjacent to the foot rest on movable supports, means for simultaneously rotating the brushes on their own axes and moving them bodily around the foot rest, resilient means for normally forcing the brushes toward the foot rest, guides for forcing the brushes outwardly from the foot rest and provided with means at their outer ends for holding the brushes in the position to which they have been moved, and means for releasing the brushes from the guides to permit them to move inwardly toward the foot rest.

5. In a blacking machine, the combination of a stationary foot rest, a set of brushes mounted on movable supports adjacent to the foot rest, means for simultaneously rotating the brushes on their own axes and moving them bodily around the foot rest, resilient means for normally forcing the brushes toward the foot rest, a rotatable guide for forcing the brushes outwardly from the foot rest and holding them in this position, means for holding the guide stationary, and means for releasing the guide to permit it to rotate and thereby permit the brushes to move inwardly toward the foot rest.

6. In a blacking machine the combination of a foot-rest, a set of brushes adjacent thereto, means for rotating said brushes bodily

around the foot-rest, resilient means for normally urging the brushes toward the foot-rest, a set of rotatable guides adapted to force the brushes away from the foot-rest, means for holding said guides in position to act on the brushes, and means for releasing the guides from the holding means.

7. In a blacking machine the combination of a foot-rest, a set of brushes adjacent thereto, means for rotating said brushes bodily around the foot-rest, resilient means for normally urging the brushes toward the foot-rest, a set of rotatable guides adapted to force the brushes away from the foot-rest, means for holding said guides in position to act on the brushes, and means for releasing the guides from the holding means, said holding means comprising a stationary plate on which the guides rest and a reciprocable plate resting on the guides and adapted to be moved upwardly therefrom.

8. In a blacking machine the combination of a movable and rotatable brush, a guide for said brush, a plate upon which said guide rests, means for clamping said guide to said plate to hold it in stationary position, and means for releasing the clamping means, whereby the guide is free to move with the brush.

9. In a blacking machine, the combination of a revoluble brush mounted on a movable support, resilient means for forcing the brush in one direction, a rotatable guide for moving the brush in the direction opposite to that of the resilient means, means for holding the guide in a fixed position, and means for releasing said guide.

10. In a blacking machine the combination of a rotatable frame, a brush movably mounted thereon, resilient means for forcing the brush toward the center of said frame, a guide mounted to rotate freely and adapted to engage said brush, and means for clamping the guide in a stationary position in the path of the brush.

11. In a blacking machine, the combination of a rotatable frame, a shaft mounted therein, an arm loosely mounted on the shaft, means for rotating the shaft, a shaft on the arm, means for transmitting the motion of the first shaft to the second shaft, a brush on the second shaft, resilient means for turning the arm about the shaft on which it is mounted, a rotatable guide for moving the brush carrying arm in a direction opposite that of the resilient means, means for locking the guide in a fixed position, and means for releasing the said guide.

12. In a blacking machine the combination of a rotatable frame, a gear concentrically mounted with respect to the frame, means for rotating the gear and the frame in opposite directions, a set of pinions rotatably mounted on the frame and engaging said

gear, a brush shaft operatively connected with each of said pinions, and means for swinging said brush shafts about the centers of the pinions as axes.

13. In a blacking machine the combination of a frame, a gear, means for simultaneously rotating the frame and gear in opposite directions, a pinion meshing with said gear, a shaft supported by said frame and carrying said pinion, an arm loosely mounted on said shaft, a brush shaft mounted on the arm, and means for transmitting a motion of rotation from the first-named shaft to the brush shaft.

14. In a blacking machine the combination of a stationary cylinder, a guide supported by said cylinder, means for clamping said guide to the cylinder comprising a plate above the guide, a sleeve passing through the cylinder and connected with the plate, and means for reciprocating said sleeve.

15. In a blacking machine the combination of a stationary cylinder, a guide supported by said cylinder, means for clamping said guide to the cylinder comprising a plate above the guide, a sleeve passing through the cylinder and connected with the plate, means for reciprocating said sleeve, and resilient means for forcing said plate into engagement with the guide to clamp it into stationary position with respect to the cylinder.

16. In a blacking machine the combination of a stationary cylinder, a guide supported by said cylinder, means for clamping said guide to the cylinder, comprising a plate above the guide, a sleeve passing through the cylinder and connected with the plate, means for reciprocating said sleeve, a pair of sleeves mounted concentrically with respect to said cylinder, a gear connected with one of said sleeves, a frame connected with the other sleeve, means for rotating said last-named sleeves in opposite directions, a set of brushes supported by said frame and adapted to engage the said guides, and means connected with said gear for rotating the brushes on their axes.

17. In a blacking machine the combination of a pair of gears, a third gear connected with one of said gears, a frame connected with the other, a brush supported by the frame, means connected with the third gear for rotating the brush on its own axis, and means for rotating said first pair of gears in opposite directions, said means comprising a pinion meshing with both of said gears and located between them, and means comprising a worm for rotating said pinion.

18. In a blacking machine the combination of a pair of gears, a third gear connected with one of said gears, a frame connected with the other gear, a brush supported by the frame, means connected with the third gear for rotating the brush on its axis, means

for rotating said first pair of gears in opposite directions, said means comprising a pinion meshing with both of said gears and located between them, means comprising a worm for rotating said pinion, a sleeve on which said worm is mounted, a shaft on which the sleeve is reciprocally mounted, means for rotating said shaft, and means for transmitting the rotary motion of the shaft to the sleeve and worm.

19. In a blacking machine, the combination with a casing, and brushes mounted therein, of a drive shaft, means for operating the shaft, a sleeve rotatably and reciprocally mounted on the shaft, a worm on the sleeve, means for transmitting motion from the worm to the brushes, said sleeve being provided with a slot, a pin on the shaft for engaging the slot, a spring for forcing the sleeve along the shaft to a position in which the pin will engage in the slot, and means for rendering the shaft-operating means inoperative when the means for transmitting motion from the worm to the brushes is prevented from rotation.

20. In a blacking machine the combination with a casing, and brushes mounted therein, of a drive shaft, means for operating the shaft, a sleeve rotatably and reciprocally mounted on the shaft, a worm on the sleeve, means for transmitting motion from the worm to the brushes, said sleeve being provided with a slot, a pin on the shaft for engaging the slot, a spring for forcing the sleeve along the shaft to a position in which the pin will engage in the slot, and means for rendering the shaft operating means inoperative when the means for transmitting motion from the worm to the brushes is prevented from rotation, said means comprising a collar connected with the sleeve, a lever operable by the collar, a contact breaking device operable by the lever, and automatic means connected with the transmitting means for operating the contact breaking device.

21. In a blacking machine the combination with a casing, and brushes mounted therein, of a drive shaft, means for operating the shaft, a sleeve rotatably and reciprocally mounted on the shaft, a worm on the sleeve, means for transmitting motion from the worm to the brushes, said sleeve being provided with a slot, a pin on the shaft for engaging the slot, a spring for forcing the sleeve along the shaft to a position in which the pin will engage in the slot, and means for rendering the shaft operating means inoperative when the means for transmitting motion from the worm to the brushes is prevented from rotation, said means comprising a collar connected with the sleeve, a lever operable by the collar, a contact breaking device operable by the lever, a lever on

which the contact breaking device is mounted, and means for swinging the lever.

22. In a blacking machine the combination of a pinion, a pair of gears meshing therewith on opposite sides thereof, a set of brushes, means connected with said gears for rotating the brushes bodily and for rotating them on their own axes, a shaft, a cam on said shaft, means connected with one of said pair of gears for rotating said shaft and cam, a movable worm operable by said cam, a pin connected with said worm, a lever adapted to be engaged by said pin, and a circuit breaking device mounted on said lever.

23. In a blacking machine the combination of a pinion, a pair of gears meshing therewith on opposite sides thereof, a set of brushes, means connected with said gears for rotating the brushes bodily and for rotating them on their own axes, a shaft, a cam on the said shaft, means connected with one of said pair of gears for rotating said shaft and cam, a movable arm operable by said cam, a pin connected with said arm, a lever adapted to be engaged by said pin, a circuit-breaking device mounted on said lever, means for normally holding said lever in a position to make the circuit, and means connected with said cam for manipulating the pin to disconnect it from said holding means.

24. In a blacking machine the combination of a polishing brush, means for rotating said brush simultaneously on two different axes, a shaft, means for connecting said shaft with said rotating means, a wiper cam connected with said shaft, an arm having a tooth, means for yieldingly pressing said tooth against the cam, a leaf pivotally mounted on said arm, said leaf having a pin, and a lever having means for stopping said rotating means, said pin being adapted to engage the lever and throw it out of operative position.

25. In a blacking machine the combination of a brush, means for operating said brush, a wiper cam, means connected with the brush-operating means for rotating said cam, an arm, means for yieldingly pressing said arm against the cam, a leaf pivoted on said arm, a pin on the cam for engaging said leaf, a pin on the leaf, and a controlling lever adapted to be operated by said last named pin.

26. In a blacking machine the combination of a brush, means for operating said brush, a wiper cam, means connected with the brush-operating means for rotating said cam, an arm, means for yieldingly pressing said arm against the cam, a leaf pivoted on said arm, a pin on the cam for engaging said leaf, a pin on the leaf, a controlling lever adapted to be operated by the last-named pin, said lever having a tooth, a second lever having a tooth for engaging the tooth on the

first lever when the latter is in operative position, and means for moving the second lever to inoperative position when the pin on the leaf disconnects the tooth on the first lever from the tooth on the second lever.

27. In a blacking machine, the combination of a brush, means for operating said brush, a wiper cam, means connected with the brush-operating means for rotating said cam, an arm, means for yieldingly pressing said arm against the cam, a lever pivoted on said arm, a pin on the cam for engaging said lever, a pin on the lever, a controlling lever adapted to be operated by said pin, and automatic means for locking the controlling lever in inoperative position.

28. In a polishing machine the combination of a starting device, a lever operable thereby, an arm operatively connected with the lever, said arm having a surface provided with projections and grooves, a sleeve having a corresponding surface engaging said surface of the arm, said sleeve being reciprocable, whereby the oscillation of the arm will cause the sleeve to rise and fall, polishing brushes, a guide for the polishing brushes, and means connected with said sleeve for controlling said guide.

29. In a blacking machine the combination of a starting device, a lever, a dash-pot connected with said lever, a spring for forcing the lever in a certain direction, a pair of links pivoted to said lever, an arm connected with one of said links, a rotary brush mounted to swing, means controlled by said arm for controlling the swinging movement of the brush, another lever connected with the other link and with the starting device, and means connected with the last-named lever for automatically stopping the blacking machine.

30. A blacking machine comprising a starting device, a lever connected therewith, a toe brush, a movable shaft on which the toe brush is mounted, a bell crank for controlling the position of said shaft, and means connected with said lever for operating said bell crank.

31. A blacking machine comprising a starting device, a lever connected therewith, a toe brush, a movable shaft on which the toe brush is mounted, a bell crank for controlling the position of said shaft, means connected with said lever for operating said bell crank, and connections between the bell crank and toe brush shaft comprising a plate for supporting said shaft, a lever for supporting the plate, a toggle joint for operating the last named lever and a link for connecting the toggle joint with the bell crank.

32. A blacking machine comprising a starting device, a lever connected therewith, a toe brush, a movable shaft on which the toe brush is mounted, a bell crank for controlling the position of said shaft, means connected with said lever for operating said bell crank,

and connections between the bell crank and toe brush shaft comprising a plate for supporting said shaft, a lever for supporting the plate, a toggle joint for operating the last named lever, a link for connecting the toggle joint with the bell crank, an adjustable counter balance weight for said plate, and means for periodically preventing the operation of said bell crank.

33. In a blacking machine the combination of a starting device, a lever connected therewith, a toe brush, a vertically movable shaft on which the toe brush is mounted, a bell crank for controlling the position of said shaft, a rotatable cam, and means operated by the cam for rendering said bell crank inoperative.

34. In a blacking machine the combination of a rotatable brush, a rotatable disk, said disk having a notch, a lever having a pin adapted to enter said notch, and means controlled by said lever for supplying blacking to said brush.

35. In a blacking machine the combination of a rotatable brush, a rotatable disk, said disk having a notch, a lever having a pin adapted to enter said notch, and means controlled by said lever for supplying blacking to said brush, said means comprising an oscillatable shaft and a bell crank, one arm of said bell crank being operable by said lever, and the other arm being adapted to operate the blacking-supplying means.

36. In a blacking machine the combination of a lever, means for oscillating the lever, a shaft oscillatable by the lever, a pivoted plate, a blacking-supplying device operable by said plate, and a connection between the shaft and plate for oscillating the latter from the former.

37. In a blacking machine the combination of a lever, means for oscillating the lever, a shaft oscillatable by the lever, a pivoted plate, a blacking-supplying device operable by said plate, means connected with said shaft for oscillating it, said plate being oscillatable on two axes, and means for guiding the plate and preventing its movement beyond a certain point in one direction.

38. A blacking-applying device comprising a plate pivoted to oscillate on two axes, a brush located adjacent to the plate, a blacking holder, a plunger movable with and operable by the plate in said blacking holder, means for moving the plate on its axis to force the plunger toward the brush.

39. A blacking-applying device comprising a plate pivoted to oscillate on two axes, a brush located adjacent to the plate, a blacking holder, a plunger movable with and operable by the plate in said blacking holder, means for moving the plate about its axis to force the plunger toward the brush, and means for preventing the motion of the plate beyond a certain point on its other axis,

whereby blacking can be applied to the different parts of the brush.

40. A blacking-applying device comprising a pivoted plate, means for holding blacking mounted on said plate, a plunger at the rear of said means, a spring for forcing said plunger in a certain direction, and means for swinging said plate in the same direction.

41. In a shoe blacking machine, a revoluble brush, a fixed support below the brush, a blacking holder carried by the support and adapted to contact with the under face of the brush, and means for mounting the holder on the support to turn and move radially thereon, whereby the holder will be rotated and moved outwardly by the brush to apply the blacking to said brush.

42. In a shoe blacking machine, a revolving brush, a blacking holder below the brush, a plunger in the holder, a pivoted and pressed plate below the holder, and means for operating the plunger from the plate.

43. In a shoe blacking machine, a revolving brush, a slotted plate below the brush, a blacking holder on the plate, a plunger in the holder, a plate mounted to oscillate on two axes, a rod carried by the last named plate and extending through the slot of the first plate and the bottom of the holder and secured to the plunger, a spring normally holding the last named plate elevated, and means for rendering the spring inoperative.

44. In a shoe blacking machine, a shaft mounted to turn and slide, a brush on the upper end of the shaft, a pivoted and counter-balanced lever having one end engaging the lower end of the shaft, a starting and stopping mechanism, and means for operating the said lever from the starting and stopping mechanism.

45. In a shoe blacking machine, the combination of a foot support, a set of brushes mounted on axes perpendicular to the plane of the foot rest, means for simultaneously rotating the brushes on their own axes and moving them bodily around the foot rest, and a rotatable and slidable toe brush.

46. In a shoe blacking machine, a revoluble brush, a slotted support below the brush, a blacking holder on the support, a member below the support and mounted to swing in a horizontal plane, and a connection between the said member and the blacking holder whereby the latter will move with the said member.

47. In a shoe blacking machine, a revoluble brush, a slotted support below the brush, a blacking holder on the support, a member below the support and mounted to swing vertically and horizontally and a plunger in the holder and having its rod extending through the bottom of the holder and the slot of the support and secured to said member.

48. In a shoe blacking machine, revoluble brushes, a shaft, means for operating the

shaft, a worm slidable on the shaft and having interlocking engagement with the shaft so as to turn therewith, a spring for normally holding the worm in interlocking engagement
5 with the shaft, means for transmitting motion from the worm to the brushes, and means operated by the worm for rendering the shaft operating means inoperative when the means transmitting motion from the
10 worm to the brushes is prevented from rotation.

49. In a shoe blacking machine, revoluble brushes, a shaft, means for operating the shaft, a worm slidable on the shaft and having interlocking engagement with the shaft
15 so as to turn therewith, a spring normally holding the worm in interlocking engagement with the shaft, means for transmitting motion from the worm to the brushes, and
20 means for rendering the shaft operating means inoperative, when the means transmitting motion from the worm to the brushes is prevented from rotation, said means comprising a contact breaking device, and a lever
25 operated by the worm and operating the contact breaking device.

50. In a shoe blacking machine, revoluble brushes, a shaft, means for operating the shaft, a worm slidable on the shaft and having interlocking engagement with said shaft
30 so as to turn therewith, a spring normally holding the worm in interlocking engagement with the shaft, means for transmitting motion from the worm to the brushes, and means for rendering the shaft operating
35 means inoperative when the means transmitting motion from the worm to the brushes is prevented from rotating, said means comprising conducting springs, a lever operated from the transmitting means and carrying a
40 conducting pin normally held in engagement with the said springs and a second lever operated by the worm and operating the first lever when the worm is slid on its shaft against the action of the spring.
45

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD ELLETT TALIAFERRO.

Witnesses:

HARRY SPINGLER,
H. C. HARMON.