No. 740,602. PATENTED OCT. 6, 1903.

C. F. STACKPOLE.

SOLE EDGE BURNISHING MACHINE.

APPLICATION FILED MAR. 28, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

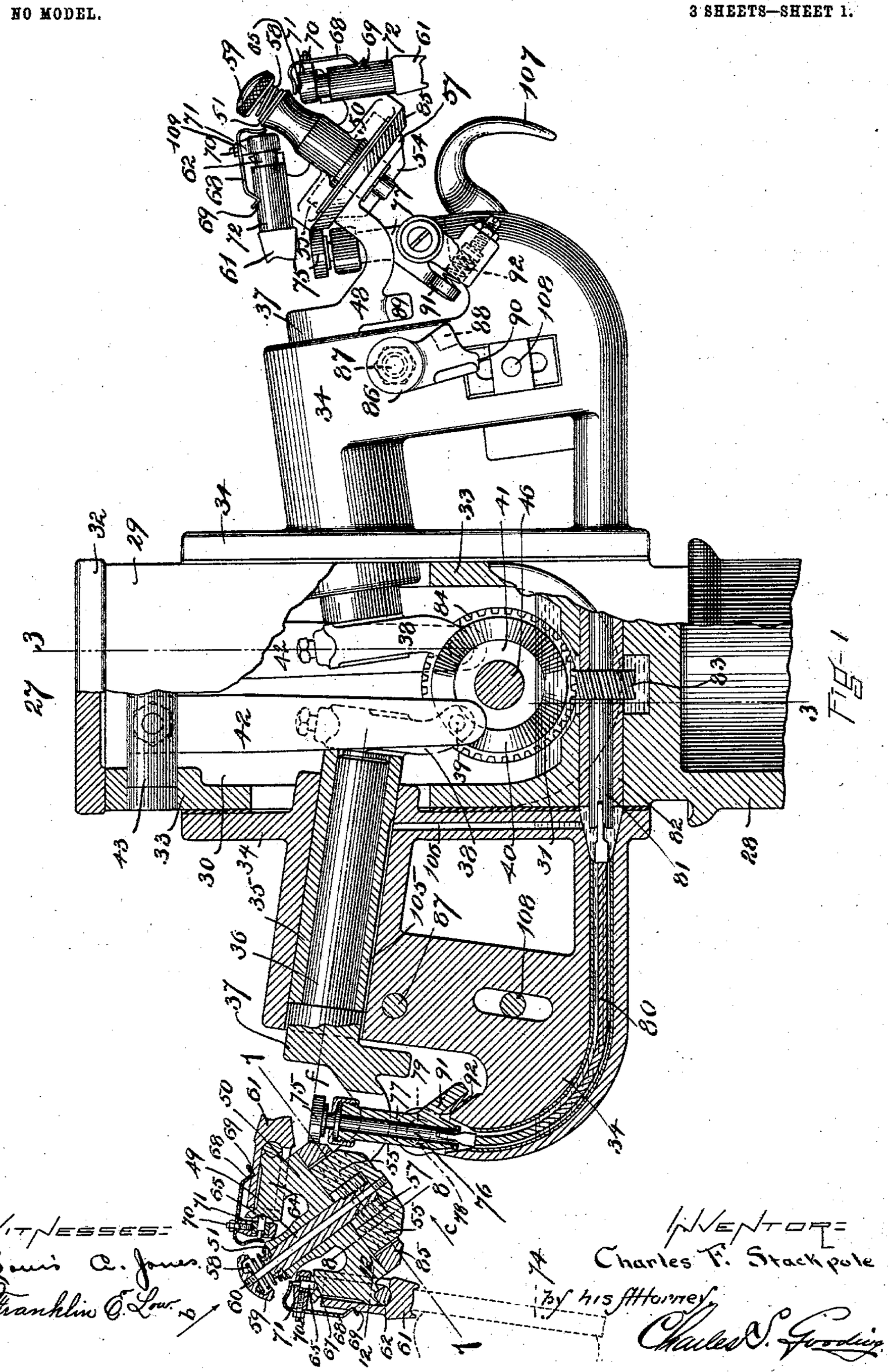

FIG. 1.

WITNESSES:

Louis A. Jones.

Franklin C. Low.

INVENTOR:

Charles F. Stackpole

by his Attorney

Charles S. Goodwin

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NO MODEL. 3 SHEETS—SHEET 2.

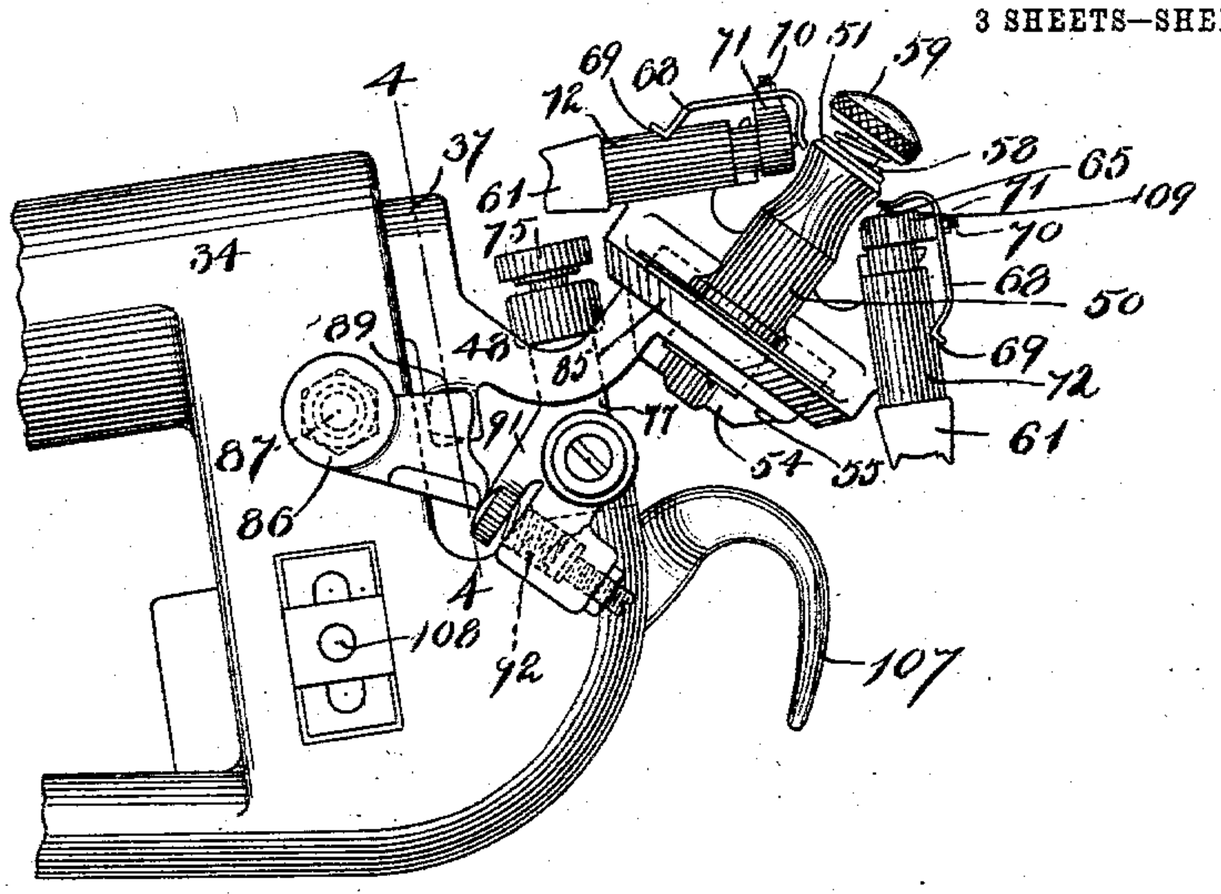

Fig. 2.

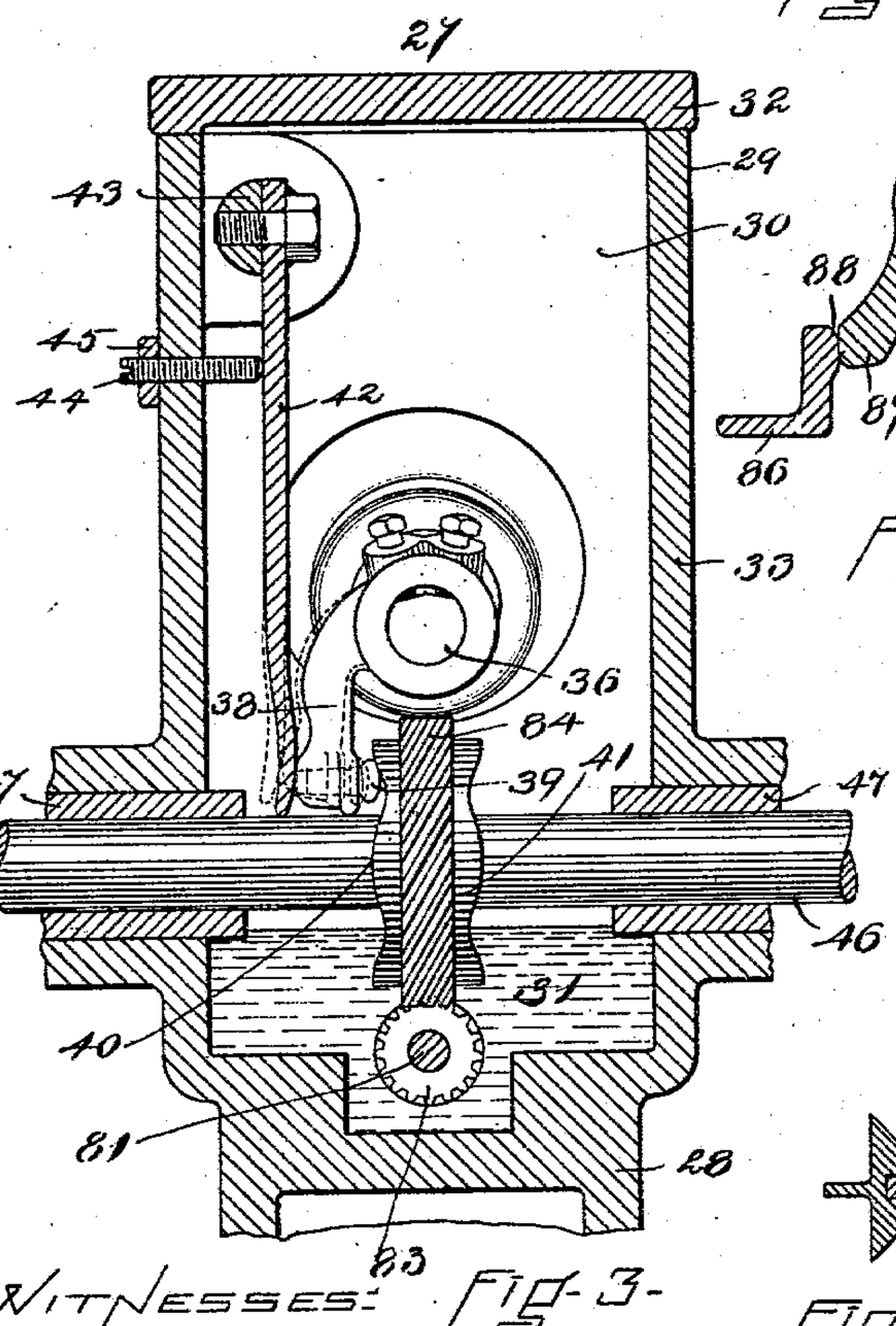

Fig. 3.

Fig. 4.

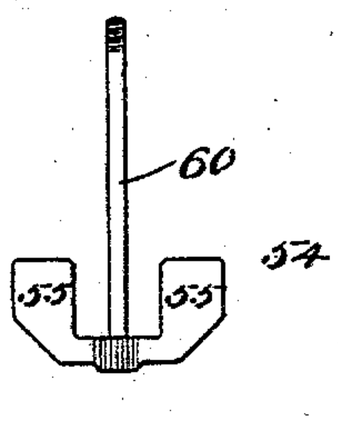

Fig. 5.

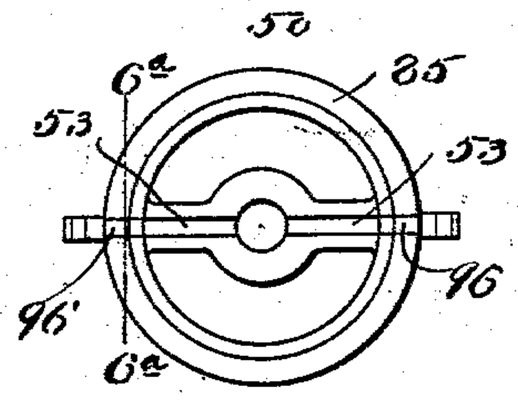

Fig. 6.

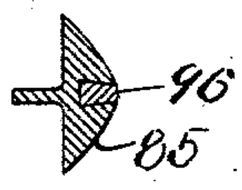

Fig. 6a.

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Charles F. Stackpole,
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SOLE EDGE BURNISHING MACHINE.

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NO MODEL. 3 SHEETS—SHEET 3.

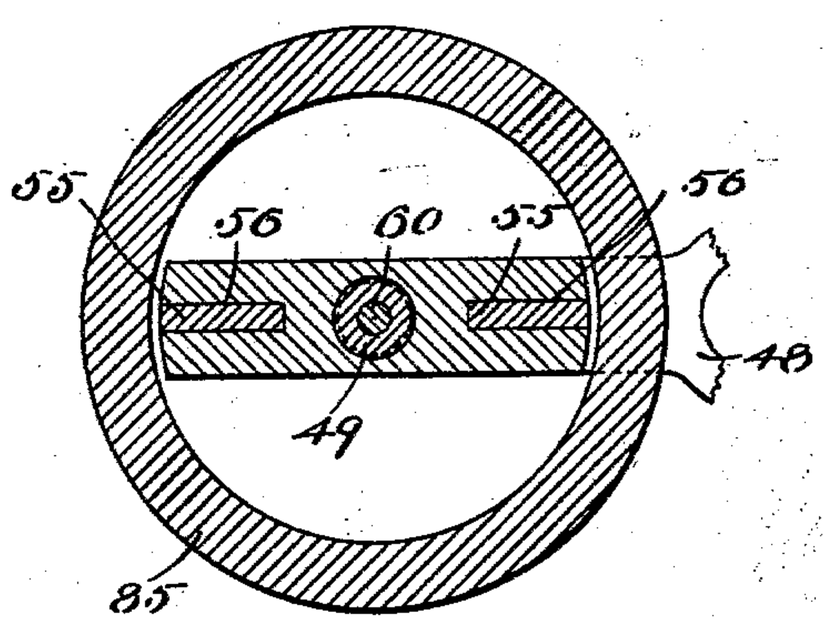

Fig-7-

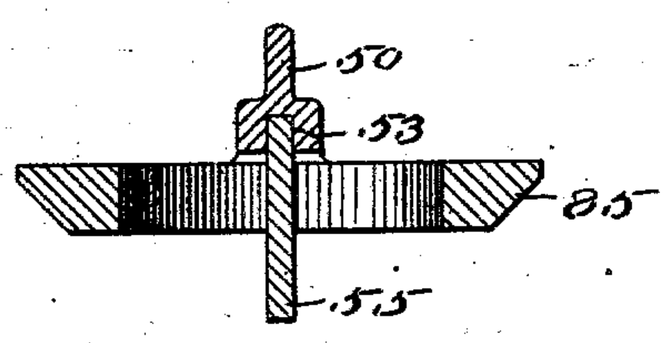

Fig-8-

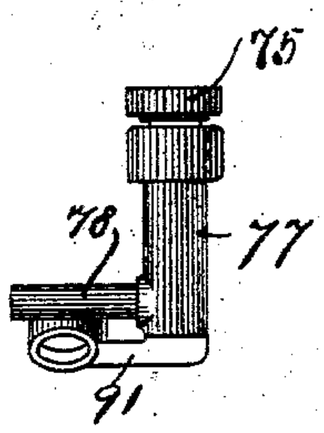

Fig-14-

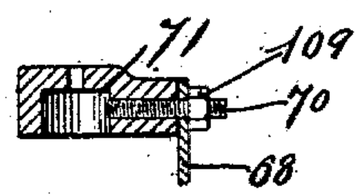

Fig-9-

Fig-10-

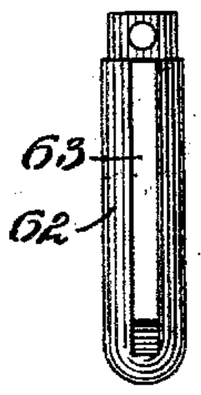

Fig-11-

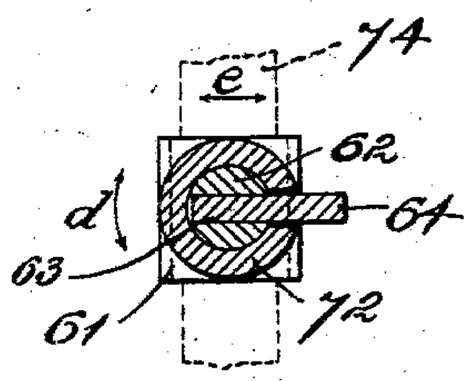

Fig-12-

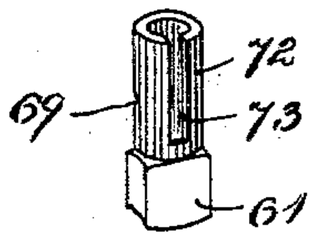

Fig-13-

WITNESSES:
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Franklin E. Low

INVENTOR:
Charles F. Stackpole
By His Attorney, Charles S. Goodwin.

No. 740,602. Patented October 6, 1903.

UNITED STATES PATENT OFFICE.

CHARLES F. STACKPOLE, OF LYNN, MASSACHUSETTS.

SOLE-EDGE-BURNISHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 740,602, dated October 6, 1903.

Application filed March 28, 1902. Serial No. 100,396. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. STACKPOLE, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented new and useful Improvements in Sole-Edge-Burnishing Machines, (Case B,) of which the following is a specification.

This invention relates to machines for burnishing the edges of the soles of boots and shoes.

The object of the invention is to provide a compact, durable, quick-running, and easily-operated machine of the character described; and, further, the object of the invention is to provide a twin sole-edge-burnishing machine in which the burnishing mechanism of each head of the machine is operated from a common driving-shaft, said driving-shaft being located, preferably, in a closed chamber containing a body of oil which keeps the principal working parts thoroughly lubricated and overcomes any tendency to heating or friction due to the high speed of said working parts.

The object of the invention is again to provide a certain improved construction whereby the fore-part and shank burnishing iron may be used upon the same head and one substituted in place of the other at the working point with great ease and rapidity.

The object of the invention is finally to provide a machine so constructed that heat will be imparted to the edge-burnishing irons by a rotary friction device, and thus do away with the unsatisfactory means commonly in use for heating said irons—viz., by a gas-jet.

The invention consists, in a machine of the character described, of a rocker-frame, a rotary tool-carrier journaled thereon, and mechanism to heat and rotate said tool-carrier.

The invention again consists in the instrumentalities hereinbefore set forth, in combination with means to lock said tool-carrier to said rocker-frame.

The invention again consists in a rocker-frame, a rotary tool-carrier journaled thereon, a clutch to lock said tool-carrier to said rocker-frame, mechanism to heat and rotate said tool-carrier, together with the edge-burnishing iron mounted thereon, and means to move said clutch into and out of connection with said tool-carrier; and again the invention consists in a rocker-frame, a rotary tool-carrier journaled thereon, a clutch to lock said tool-carrier to said rocker-frame, mechanism to heat and rotate said tool-carrier, together with the edge-burnishing tool mounted thereon, and means to throw said rotary and heating mechanism out of connection with said tool-carrier.

The invention finally consists in the combination and arrangement of parts set forth in the following specification and particularly pointed out in the claims thereof.

Referring to the drawings, Figure 1 is an enlarged front view of the head of my improved twin sole-edge-burnishing machine with the mechanism thereon, the left-hand portion thereof being shown as a longitudinal vertical central section and the right-hand portion being shown in elevation. Fig. 2 is a front view of the right-hand side of the machine, showing the mechanism by which the tool-carrier is rotated, heated, and thrown out of connection with said tool-carrier. Fig. 3 is a transverse section taken on line 3 3 of Fig. 1 looking toward the right in said figure, the bearings being broken away to save space in the drawings. Fig. 4 is a detail section taken on line 4 4 of Fig. 2 looking toward the left in said figure. Fig. 5 is a detail front elevation of the clutch. Fig. 6 is an underneath plan of the rotary tool-carrier. Fig. 6^a is a transverse section taken on line 6^a 6^a, Fig. 6. Fig. 7 is a detail section through the rotary tool-carrier and clutch, taken on line 7 7 of Fig. 1, viewed in the direction of the arrow *b*. Fig. 8 is a transverse section through the tool-carrier and clutch, taken on line 8 8 of Fig. 1, viewed in the direction of the arrow *c* in said figure. Fig. 9 is an enlarged central section of the pintle-cap, with spring-cap attached thereto. Fig. 10 is a front elevation of the burnishing-iron-supporting pintle viewed in the same direction as in Fig. 1, at the left-hand side of said figure. Fig. 11 is an end elevation, viewed from the right of Fig. 10, of said burnishing-iron-supporting pintle. Fig. 12 is an enlarged transverse section through one of the burnishing-irons and the pintle and rotary tool-carrier, upon which said burnishing-iron is supported, taken on line 12 12 of Fig. 1. Fig. 13 is a perspective view of one of the burnishing-irons. Fig. 14 is a side elevation

of the pivotal bearing for the friction-roll which imparts rotary movement to the tool-carrier, as viewed from the left of Fig. 2.

Like numerals refer to like parts throughout the several views of the drawings.

The mechanism hereinafter described for rotating the tool-carrier, for rocking the frame upon which said tool-carrier is journaled, and the general construction of the machine is substantially the same as that shown and described in another application made by me of even date herewith, the present machine differing from said machine in the manner of heating the edge and shank burnishing irons. The mechanism in the present instance by which the tool-carrier is rotated also supplies frictional heat to said tool-carrier and through said tool-carrier to the burnishing-irons supported thereon, said mechanism remaining normally in contact with a portion of the said tool-carrier and by its rotation imparting frictional heat thereto. Means are also supplied for throwing the rocker-frame out of contact or operative connection with the mechanism which rocks said rocker-frame, and also, preferably simultaneously, removes the frictional rotating mechanism from connection with the tool-carrier.

In the drawings, 27 is the head, which consists of a hollow standard 28 and a casing 29, integral with said standard. The casing 29 is rectangular in shape and is provided with a chamber 30, adapted to contain a body of oil 31, said chamber being closed at the top by a plate 32. The right and left hand side walls 33 33 of the casing 29, Fig. 2, have plates 34 rigidly fastened thereto and constitute, in fact, a portion of the walls of said casing, each of said plates 34 being provided with a bearing-sleeve 35, in which is journaled the cylindrical shank 36 of the rocker-frame 37.

The rocker-frame 37 has an arm 38 fast to one end of the cylindrical shank 36, said arm 38 being provided with a hardened pin 39, arranged to bear against the cam-face 40, formed upon the cam 41, said pin being held in contact with said cam-face by a spring 42, fastened to a stationary cross-shaft 43 upon the casing 29. The spring 42 may be adjusted to press with more or less force against the pin 39 by means of the screw 44, screw-threaded in the casing 29 and locked thereto by a lock-nut 45. The cam 41 is fast to a main driving-shaft 46, journaled to rotate in bearings 47, provided in the walls of the casing 29. Rotary motion is imparted to the shaft 46 by a belt and pulley (not shown in the drawings) or in any desirable manner. The cam-face 40 is of curvilinear outline, adapted to impart several oscillations to the arm 38 during one rotation of the driving-shaft 46. In the present case I have illustrated the throws of the cam-face 40 as four in number, but this number may be increased or diminished if desirable.

The rocker-frame 37 is provided at the end opposite to that at which the arm 38 is fastened with a curved arm 48, integral with the cylindrical shank 36 and having fastened thereto by screw-threaded engagement a post 49, upon which is journaled a rotary tool-carrier 50. The tool-carrier 50 is held against motion lengthwise of the post 49 by a collar 51, screw-threaded against a shoulder upon the upper end of said post 49. The under face of the tool-carrier 50 is provided with a transverse slot 53 to receive the clutch 54, said clutch being provided with two arms 55 55, arranged to slide in slots 56 56 upon opposite sides of a cross-bar 57, formed upon the outer end of the arm 48 of the rocker-frame 37. The arms 55 of the clutch 54 are normally held in the slot 53, thus locking the tool-carrier to the rocker-frame by a spiral spring 58, one end of which bears against the collar 51, the other end against a cap 59, screwed to the outer end of a rod 60, said rod extending from said cap downwardly through the post 49 and having its lower end screwed into the clutch 54.

Upon the tool-carrier 50 are rotatably mounted two edge-burnishing irons or tools 61 61, one of said tools being formed to burnish the edge of the shank portion of a shoe-sole and the other to burnish the edge of the fore part of a shoe-sole. Each of the tools is mounted upon a pintle 62, Figs. 1 and 12. Said pintle is cylindrical in cross-section and has a slot 63 extending lengthwise thereof to receive a rectangular bearing-plate 64, formed upon the tool-carrier 50. The pintle 62 is held upon the plate 64 by a pin 65, Fig. 1, arranged to slide in a hole 66, formed in the upper end of the pintle 62, the lower end of said pin being held in the depression 67 by a spring 68, one end of which bears against the upper end of said pin, the other against a depression 69, formed in the front face of the burnishing-iron 61. The cap 71 is held upon the upper end of the pintle 62 by a screw 70, and the spring 68 is held against said cap by a lock-nut 109, Fig. 9.

The iron 61 is provided with a hollow cylindrical shank 72, which is rotatably mounted upon the pintle 62 and is slotted lengthwise thereof at 73 to allow the iron to rock upon the pintle 62 to a limited extent without coming in contact with the plate 64 upon the tool-carrier 50. It will therefore be seen that the burnishing-tool 61 can rotate upon the pintle 62 to a limited extent in the direction of the arrow *d*, Fig. 12, and also that said tool can rock in a plane transverse to the edge of the shoe-sole 74 in the direction of the arrow *e*, the latter rocking motion being rendered possible by the slot 63 in the pintle 62 being rounded at its lower end, Fig. 10, so that said pintle can rock upon the plate 64, together with the tool 61, the spring 68 allowing the pin 65 to yield slightly in order to accommodate the rocking of the pintle 62 upon the tool-carrier. If desirable, the spring-

pin 65 may be replaced by a pin or screw held rigidly in the pintle, so that the rocking motion transversely of the shoe-sole in the direction of the arrow *e*, as hereinbefore set forth, would be eliminated. It will be seen by the construction hereinbefore set forth that the pintle and the iron thereon cannot rock lengthwise of the edge of the shoe-sole, except as they are rocked bodily by the rocking motion of the frame 37.

In Fig. 1 the shoe-sole 74 is indicated in dotted lines in the proper relation to the burnishing-tool 61, the other burnishing-tool 61 being thrown out of use by the rotation of the tool-carrier, as hereinbefore described, and while out of use being located, as will be seen by reference to Fig. 2, at a point but slightly removed from the axial center of the rocker-frame, the object of this location of the tool when not in operation being to reduce the momentum of the parts which are rocked by the frame 37. The tool-carrier 50 is rotated to bring the different burnishing-tools into and out of operation by a rotary friction-disk 75, fast to a shaft 76, arranged to rotate in a bearing 77, said bearing in turn being provided with a shaft 78, arranged to rock in a bearing 79, provided in the plate 34. Rotary motion is imparted to the shaft 76 and disk 75 by a flexible rotary shaft 80, operatively connected thereto and to a shaft 81, arranged to rotate in bearings 82 in the casing 29. Said shaft 81 has a spiral gear 83 fast thereto and meshing into a spiral gear 84, formed upon the cam-blank 41.

Normally the mechanism for rotating the tool-carrier, hereinbefore described, together with the clutch, are in the positions shown in Fig. 1 with the rotary friction-disk 75 in engagement with a conical annular friction-ring 85, fast to the tool-carrier 50, said friction-disk being kept in constant rotation and the upper edge of the periphery located in the axial center *f*, Fig. 1, of the carrier-frame 37, so that the point upon the friction-ring 85 which is in contact with the rotary friction-disk 75 is practically stationary at all times except when said friction-ring and the tool-carrier are freed from the clutch, which is accomplished by the operator pressing upon the cap 59, compressing the spiral spring 58 and through the post 49 causing the clutch 54 to be withdrawn from the slot 53 in the tool-carrier, and said tool-carrier is then rotated by the friction-disk 75 and friction-ring 85 for a half-rotation, whereupon the clutch 54 (having been released by the operator removing the pressure from the cap 59) springs into the slot 53 and locks the tool-carrier with the shank-iron in the position formerly occupied by the fore-part-burnishing iron. It will be seen that by the rapid rotation of the disk 75, while the friction-ring is locked in a substantially stationary position with relation thereto, frictional heat will be generated, which will be transmitted through the ring 85, forming a portion of the tool-carrier 50, to the burnishing-irons, and will keep said irons hot without the action of a flame, so that in the action of burnishing the edge of a shoe-sole with said irons there will be no possibility of soot being deposited upon the edge of the sole and creating unsatisfactory conditions and performing an inferior class of work.

It is sometimes desirable in the use of my improved machine for burnishing the edges of soles to throw out of action one end of the machine while the other continues in action, and to do this an arm 86 is provided pivoted at 87 to the frame-plate 34. Said arm 86 is normally held in the position shown at the right hand of Fig. 1. If, now, it is desired to throw the rocker-arm out of connection with the cam by which it is rocked, as hereinbefore described, and to remove the friction-disk 75 from contact with the ring 85, the arm 86 is moved from the position shown at the right of Fig. 1 to that shown in Fig. 2, and in so doing a cam-shaped surface 88 upon the rear face of said arm 86 encounters a laterally-projecting arm 89 upon the rocker-frame 37, tipping said rocker-frame and the arm 38, fast thereto, backwardly from the position shown in Fig. 1 until the pin 39, fast to said arm 38, is removed from contact with the cam-face 40, thus throwing out of motion the rocking connection of said carrier-arm, and simultaneously the motion of the arm 86, hereinbefore described, causes a cam-surface 90 upon the lower edge of said arm to come in contact with an arm 91, integral with the pivotal bearing 77, thus tipping said pivotal bearing, together with the rotary disk thereon, from the position shown in Fig 1, at the right hand thereof, to the position shown in Fig. 2, carrying the disk 75 away from the ring 85. A spiral spring 92, contained in a hole formed in the frame-plate 34, keeps the friction-disk 75 normally in contact with the friction-ring 85, as shown in Fig. 1. It will therefore be seen that by moving the arm 86 from the position shown in Fig. 1 to that shown in Fig. 2 the rotary disk 75 is thrown out of contact with the ring 85 and the rocker-arm out of contact with the cam by which it is rocked.

The tool-carrier 50 at the right of the machine, Fig. 1, is rotated by means of the shaft 81 through a flexible shaft (not shown) exactly as in the mechanism illustrated in section at the left of said Fig. 1.

The cylindrical shank 36, the cams 40, gears 83 and 84, shaft 81, and flexible shafts 80 are all kept thoroughly lubricated from the body of oil 31 contained in the closed chamber 30, said oil being partly suspended in the form of vapor within said chamber and being carried by the arms 38 along the cylindrical shanks 36 in the bearing-sleeves 35 and returning through a passage 105, provided upon the under side of the sleeve 35 and leading into a vertical passage 106, formed in the frame-plate 34, and emptying into the chamber 30.

A finger-piece 107 is provided at each end of the machine, by means of which the operator guides and steadies the shoe in the operation of burnishing, said finger-piece being adjustably fastened by means of a bolt 108 to the frame-plate 34.

The friction-ring 85 is formed of composition, largely of copper, and is divided into two parts, said parts being separated from each other by hardened-steel bearing-plates 96, arranged diametrically opposite each other, the object of these bearing-plates being to form a hardened surface against which the friction-disk 75 may bear while the ring 85 is stationary without wearing said ring away, as would be the case if the ring were a continuous piece of composition throughout its entire extent. The object of constructing the ring of copper is in order that the heat generated by the friction-disk 75 may be readily transmitted through said ring to the burnishing-iron in operation upon the sole of the shoe.

The operation of the machine is as follows: The operator holds the shoe in the position shown in dotted lines, Fig. 1, the edge of the sole 74 being held against the lower face of the burnishing-tool 61. After burnishing the edge of the fore part of the sole the operator touches the cap 59, pushing the same downwardly and releasing the tool-carrier from the clutch, as hereinbefore described. Said tool-carrier, together with the tools mounted thereon, is then carried through a half-rotation, carrying the shank-burnishing iron into the position formerly occupied by the forepart-burnishing iron, as hereinbefore described. This action of the substitution of one iron for the other takes place almost instantaneously, so that the operator loses no time in changing from one iron to the other.

It will be seen that the pintle 62 and the iron thereon tip in the direction of the arrow *e*, transversely of the shoe, upon a center near the lower end of said pintle, and as this rocking point is, in the full-sized machine, near the edge of the iron it will be seen that said rocking motion will be very sensitive and that the iron will adapt itself very quickly to any slight change in the position of the edge of the sole of the shoe or in the shape of said edge transversely thereof.

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

1. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, and mechanism in frictional contact with said tool-carrier to heat and rotate the same.

2. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, means to lock said tool-carrier to said frame, and power-driven mechanism in frictional contact with said tool-carrier to heat and rotate the same.

3. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, mechanism to heat and rotate said tool-carrier, and means to throw said mechanism into and out of connection with said tool-carrier.

4. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, a clutch to lock said tool-carrier against rotation with relation to said rocker-frame, and mechanism in frictional contact with said tool-carrier to heat and rotate the same.

5. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, a clutch to lock said tool-carrier to said rocker-frame, mechanism to heat and rotate said tool-carrier, and means to throw said mechanism into and out of connection with said tool-carrier.

6. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, and a rotary friction-roll engaging said tool-carrier imparting frictional heat thereto, and serving as a means to rotate said tool-carrier.

7. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, a friction-ring fast to said tool-carrier, and a rotary friction-roll engaging said friction-ring imparting frictional heat thereto, and serving as a means to rotate said tool-carrier.

8. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, a rotary friction-roll engaging said tool-carrier and imparting frictional heat thereto, and means to move said roll into and out of contact with said tool-carrier.

9. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, a rotary friction-roll, and means to hold said friction-roll normally in contact with said tool-carrier.

10. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, a clutch to lock said tool-carrier to said rocker-frame, and mechanism to alternately rotate and impart frictional heat to said tool-carrier.

11. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, a rotary friction-roll normally engaging said tool-carrier and imparting frictional heat thereto, a flexible shaft connected to said rotary friction-roll, and mechanism to rotate said flexible shaft.

12. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, a rotary friction-roll normally engaging said tool-carrier and imparting frictional heat thereto, a flexible shaft connected to said rotary friction-roll, and a driving-shaft operatively connected to rock said rocker-frame and rotate said flexible shaft.

13. In a sole-edge-burnishing machine, a

rocker-frame, a rotary tool-carrier journaled thereon, burnishing-tools mounted upon said tool-carrier and power-driven mechanism in frictional contact with said tool-carrier to heat and rotate the same.

14. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, mechanism to rock said rocker-frame, mechanism to rotate said tool-carrier, and means to disconnect said mechanisms from said tool-carrier and rocker-frame.

15. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, mechanism to rock said rocker-frame, mechanism to rotate said tool-carrier, and means to simultaneously disconnect said mechanisms from said tool-carrier and rocker-frame.

16. In a sole-edge-burnishing machine, a rocker-frame, a rotary tool-carrier journaled thereon, a rotary friction-roll normally in contact with said tool-carrier, a pivotally-supported bearing therefor, and an arm arranged to rock said bearing and move said roll out of contact with said tool-carrier.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

CHARLES F. STACKPOLE.

Witnesses:
CHARLES S. GOODING,
WILLIAM CLAUS.