No. 607,736. Patented July 19, 1898.

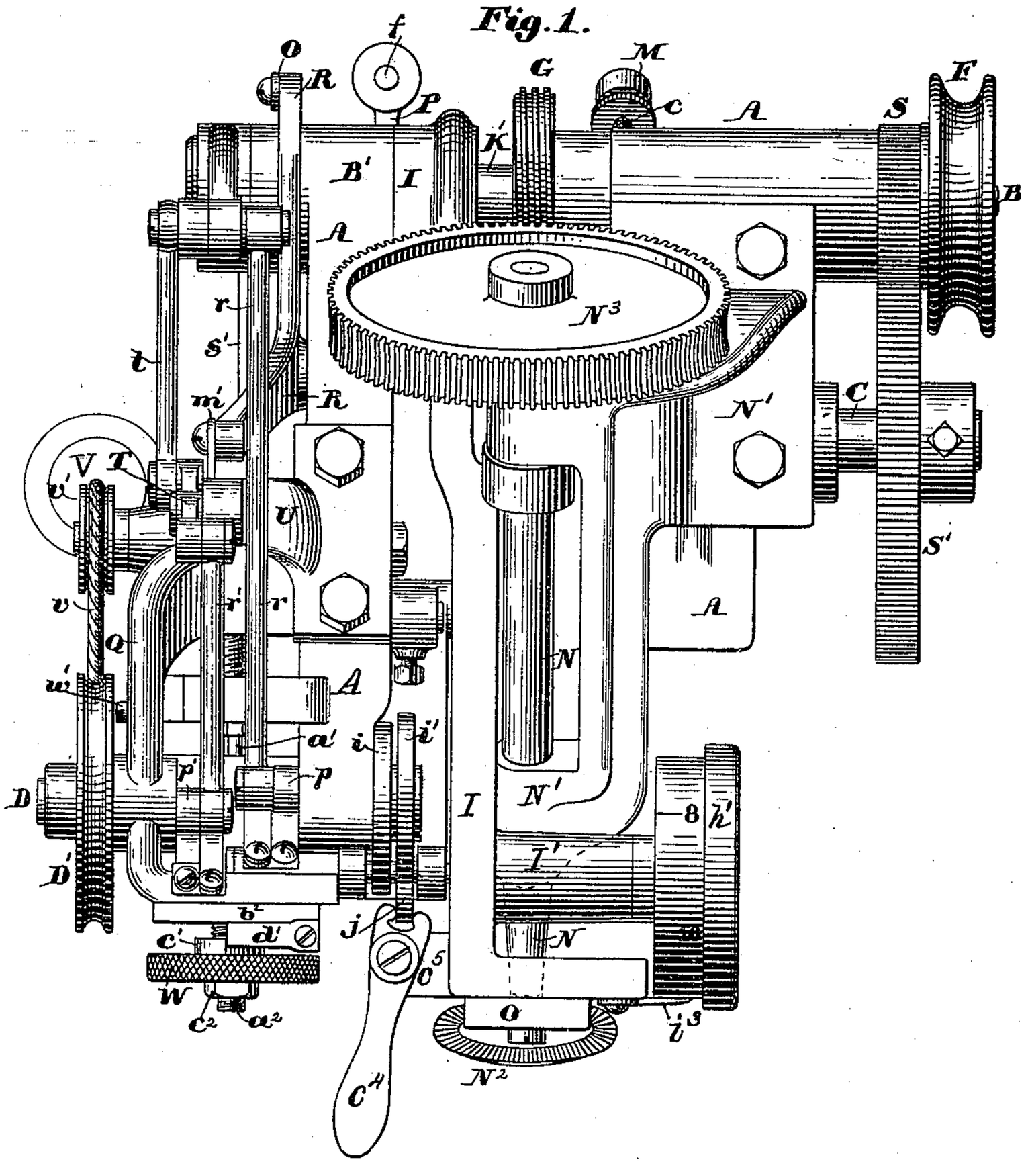
H. T. CROSBY.

SOLE ROUGH ROUNDING MACHINE.

(Application filed Dec. 18, 1897.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



Witnesses:
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Charles B. Choate.

Inventor:
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Atty.

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(No Model.) 4 Sheets—Sheet 2.

Fig. 2.

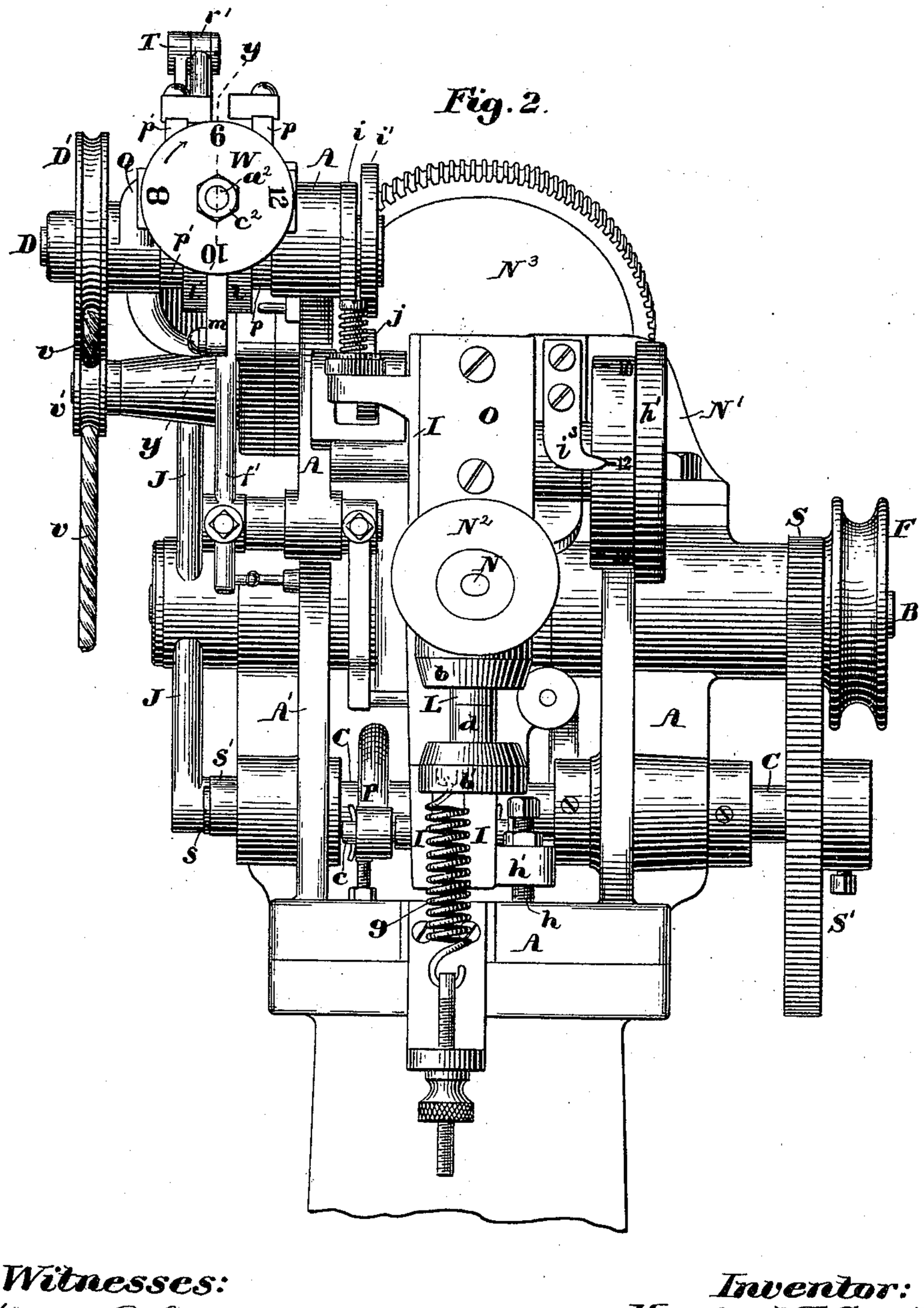

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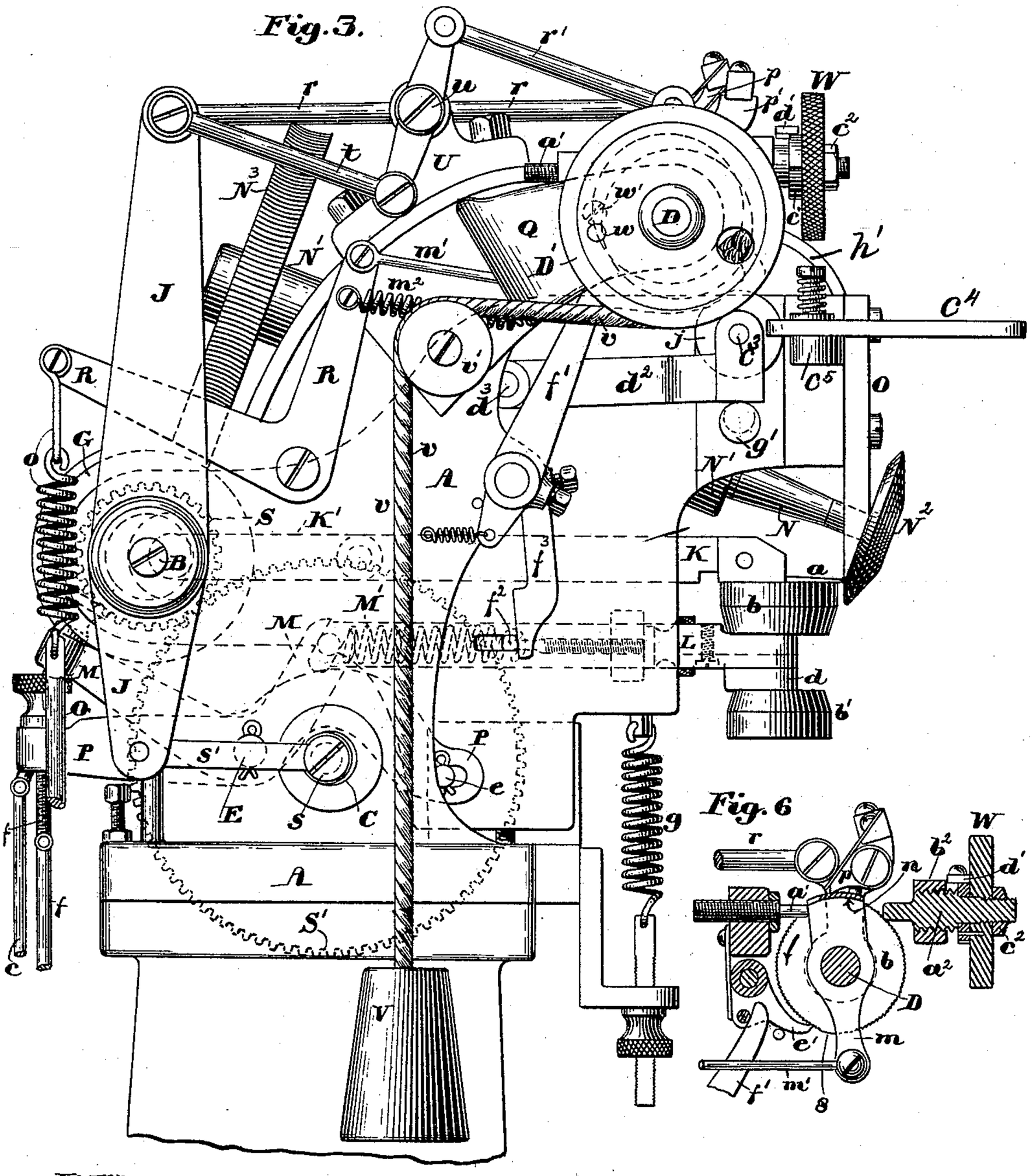
Fig. 3.



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(No Model.) 4 Sheets—Sheet 4.

Fig. 4.

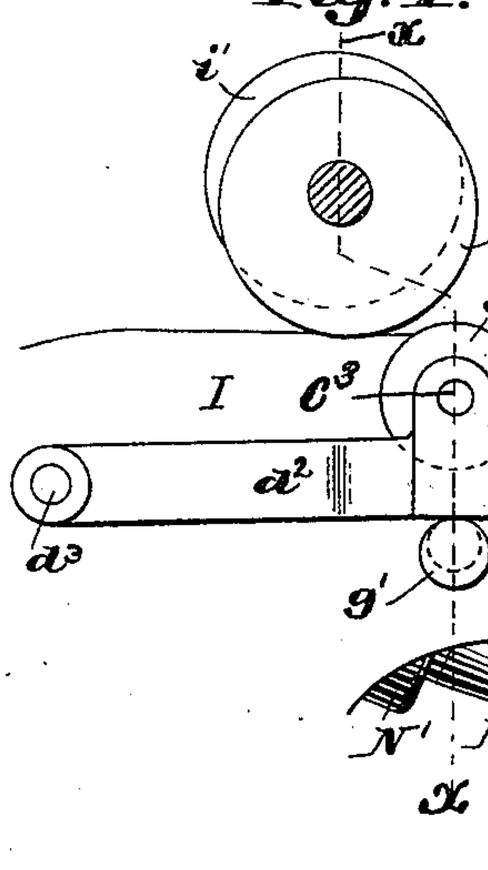


Fig. 5.

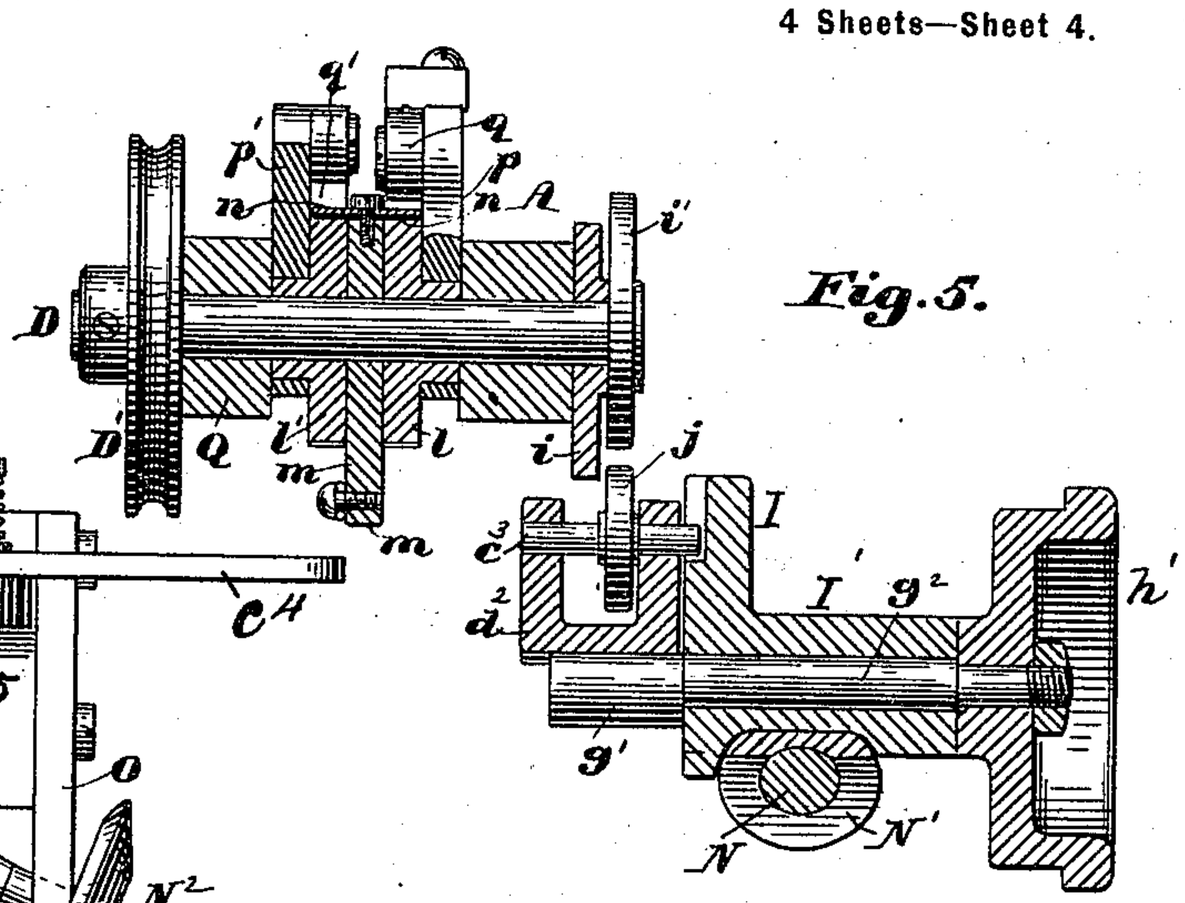


Fig. 7.

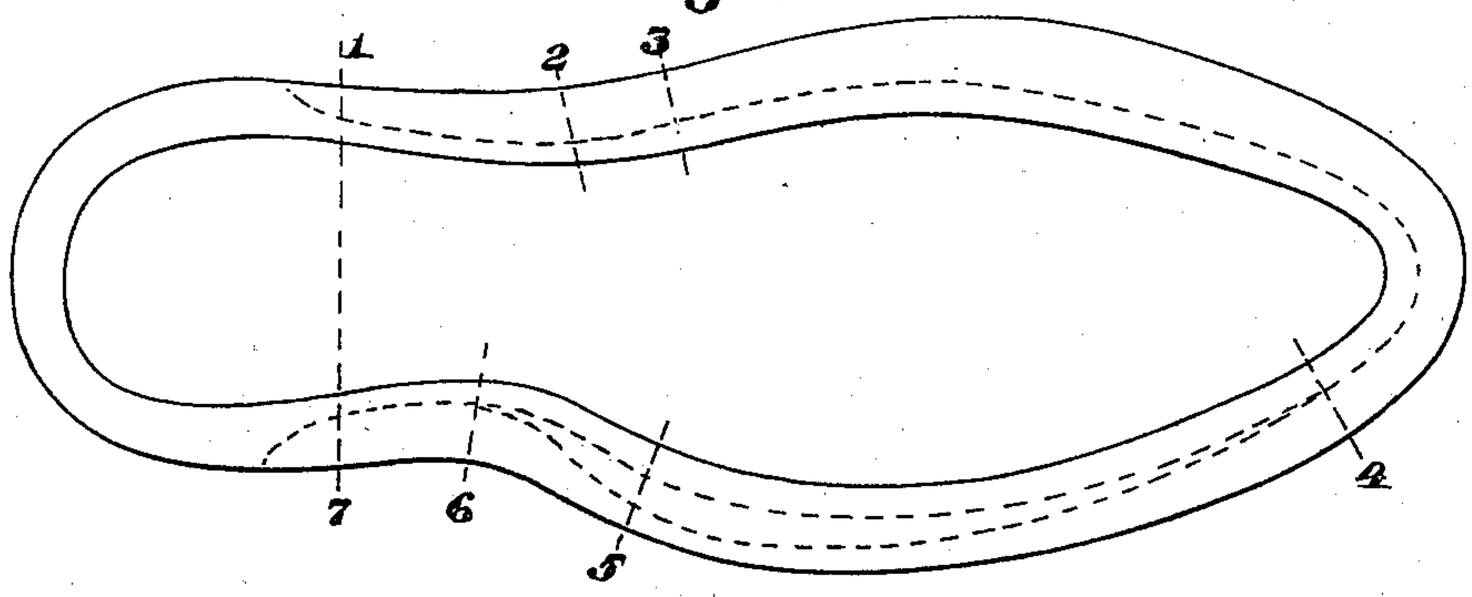
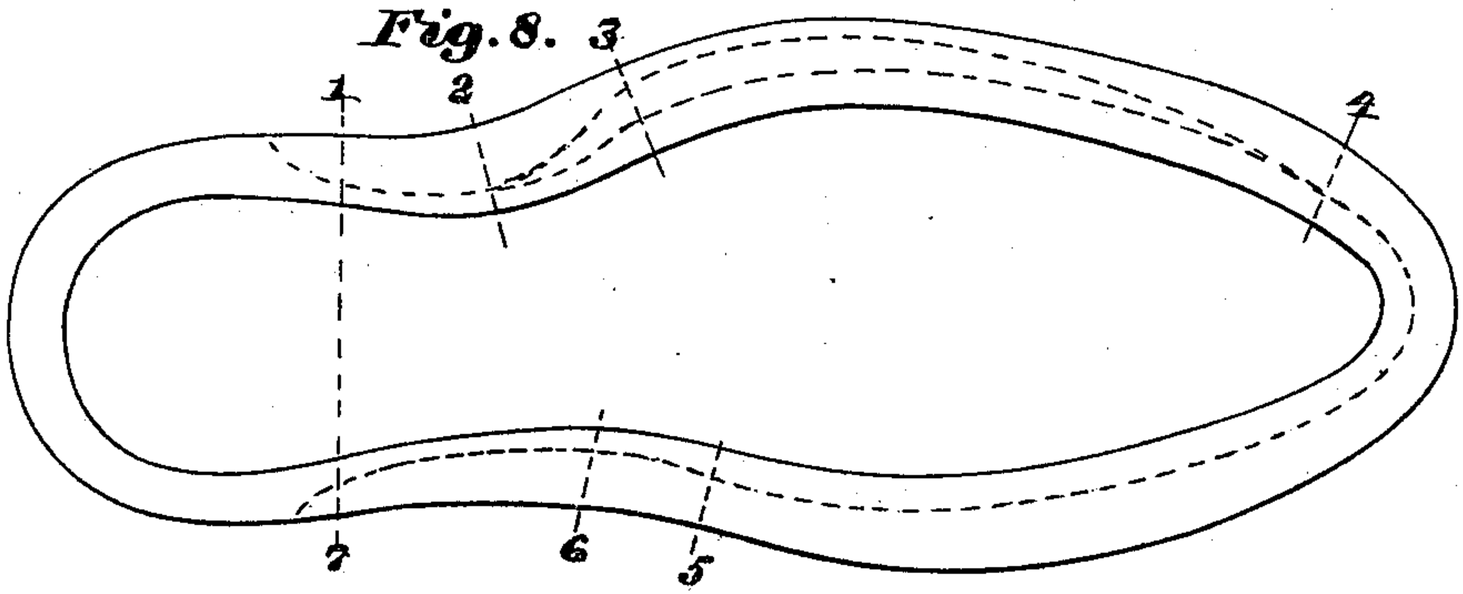


Fig. 8.



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Inventor:
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UNITED STATES PATENT OFFICE.

HANFORD T. CROSBY, OF BOSTON, MASSACHUSETTS.

SOLE-ROUGH-ROUNDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 607,736, dated July 19, 1898.

Application filed December 18, 1897. Serial No. 662,365. (No model.)

To all whom it may concern:

Be it known that I, HANFORD T. CROSBY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Sole-Rough-Rounding Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to sole-rough-rounding machines, is an improvement upon the invention shown and described in another application of mine filed September 10, 1897, and serially numbered 651,197, and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the accompanying drawings, and to the claims hereto appended, in which my invention is clearly pointed out.

Figure 1 of the drawings is a plan of a machine embodying my invention. Fig. 2 is a front elevation of the same. Fig. 3 is a side elevation looking toward the right of Figs. 1 and 2. Fig. 4 is an elevation of a portion of the front end of the cutter-bar-carrying arm, the cams, the stop-roll upon which they act, and the eccentric for adjusting said roll. Fig. 5 is a section on line $x\,x$ on Fig. 4. Fig. 6 is a partial sectional elevation, the cutting plane being on line $y\,y$ on Fig. 2. Figs. 7 and 8 are diagrams illustrating the operation of rough-rounding a right and a left sole, respectively.

In the drawings, A is the frame of the head of the machine, comprising a base and two upwardly-projecting arms in suitable bearings, in which are mounted the driving-shaft B, a fixed journal-pin B′ in axial line with said driving-shaft, the crank-shaft C, the cam-shaft D, and a fixed fulcrum-pin E.

The driving-shaft B has firmly secured upon its outer end the driving-pulley F and near its inner end the worm G and has formed upon its inner end a crank-pin for operating the cutter-bar K.

The fixed journal-pin B′ has mounted upon its inner end the rear end of the arm I in such a manner that said arm may be oscillated to a limited extent about said journal-pin, and said pin has loosely mounted upon its outer end the lever J.

The arm I has formed therein two horizontal guideways, in which are mounted, so as to be movable endwise therein, the bars K and L.

The bar K has pivoted to its rear end one end of the link K′, the other end of which is mounted upon the crank-pin, formed on the inner end of the shaft B, and the front end of said bar has secured thereto the cutter a.

The bar L has mounted on a vertical stud set in its front end the pressure-roll b and is connected at its rear end to the movable end of the short arm of the elbow-lever M, the long arm of which is connected by the rod c to a treadle (not shown) mounted upon the floor in such a manner that a pressure upon the front end of the treadle will move the bar and roll toward the rear against the tension of the spring M′. (Shown only in dotted lines in Fig. 3.)

N is the feed-shaft, mounted in bearings in the stand N′ in an inclined position, and has secured to its front end the feed-disk N^2 and to its rear end the worm-wheel N^3, which engages with and has motion imparted to it by the worm G.

O is the anvil-plate, against which the cutter a abuts after piercing the sole, said plate being firmly bolted to the front end of the arm I.

I have found it desirable in practice to have the lower roll carried by said bar adjustable toward and from the front, and therefore I fit the block d to a groove in the under side of the bar L, so that it can be moved endwise therein, and secure it in adjusted position by a clamping-screw passing through a slot therein and mount the lower pressure and guide-roll b' on a stud set in said block.

The rolls b and b' are made partly frusto-conical, as shown, so as to the better fit against the tread-surface of a sole on the last that has considerable convexity or curve transversely.

The arm I has set in its side, near its lower end, the stud e, which is engaged by one end of the lever P, which is fulcrumed upon the pin E and has connected to its other end the rod or wire f, the lower end of which is connected to a treadle (not shown) in such a manner that if pressure is applied to the front end of the treadle the front end of the arm I, the cutter a, and the anvil-plate O will

be raised to vary the distance of the line of cut from the inseam, said parts being returned to their normal or lowest positions when the pressure is removed from the treadle by the combined action of gravity and the tension of the spring *g*, said normal or lowest position being controlled and regulated by the screw-stop *h*, set in the ear *h'* on said arm I and bearing upon the base-plate of the frame A, as shown in Fig. 2, substantially as in my prior application.

In operating upon a shoe-sole to rough-round it the sole edge is inserted between the pressure-rolls *b* and *b'* on one side and the anvil-plate O and the feed-disk N^2 on the other side, with the tread-surface of the sole toward said rolls and the lower edge of the feed-disk in contact with the inseam, as in my prior application.

The shaft D is mounted in a bearing in the frame A and a bearing in the stand Q and has mounted on one end thereof, at the right of said frame, two cams *i* and *i'*, one or the other of which when the shaft D is rotated acts upon the roll *j* to vary the position of the arm I and the distance of the cutter *a* from the inseam.

The cam-shaft D has firmly secured thereon, between its two bearings, the two ratchet-wheels *l* and *l'*, separated from each other, and between them is loosely mounted upon the shaft D the lever *m*, the upper end of which has secured thereto a thin curved metal plate *n*, which projects laterally over both ratchet-wheels, so as to cover a portion of the teeth of each ratchet, the lower end of said lever *m* having pivoted thereto one end of the link *m'*, the opposite end of which is pivoted to one arm of the elbow-lever R, the other arm of which is connected by the elastic connection *o* to a lever, (not shown,) which may be mounted upon the column, to be operated by the knee of the operator or to a treadle upon the floor, (also not shown.) The shaft D also has loosely mounted thereon, one at the right and the other at the left of said ratchets, the two pawl-levers *p* and *p'*, carrying the pawls *q* and *q'*, respectively, and having pivoted thereto the rods *r* and *r'*, respectively, as shown.

The driving-shaft B has firmly secured thereon, just inside the driving-pulley F, the spur gear-wheel S, the teeth of which engage the teeth of the larger spur gear-wheel S', mounted upon the shaft C so as to be movable endwise thereof to disengage it from the gear S, but when in engagement with said gear S is clamped to said shaft, so that said shaft will be revolved with said gear-wheel S'.

The opposite end of the shaft C has formed thereon the crank-pin *s*, (shown in dotted lines in Fig. 3,) only slightly eccentric to the axis of said shaft, to which is fitted one end of the link *s'*, the opposite end of which is pivoted to the short arm of the lever J, to the movable end of the long arm of which are pivoted upon a common pin the links *r* and *t*.

The rear end of the link *r'* is connected to the upper end of an equal-armed lever T, fulcrumed upon the stud *u*, set in the stand U, secured to or formed in one piece with the frame A, all as shown in Figs. 1 and 3.

The cam-shaft D has firmly secured thereon the grooved pulley D', to which is attached one end of a cord *v*, which after passing partially around said pulley and over the sheave *v'* has attached to its other end the weight V, which when the plate *n* is retracted to its normal position after the cams *i* and *i'* have completed a half-revolution to prevent the pawls engaging the ratchet and the stop-pawls have been disengaged from the teeth of the ratchets will rotate the cam-shaft in the opposite direction to that imparted to it by the ratchet mechanisms, the extent of said backward rotation being limited by a stop-pin *w*, set in said pulley D', coming in contact with a stop-pin *w'*, set in the stand Q, as shown in Figs. 1 and 3.

The shield *n* when in its normal position or with its carrying-arm in contact with the adjustable screw-stop *a'*, with which it is normally held in contact by the spring m^2, will so cover the teeth of the ratchet-wheels that the pawls will not engage said ratchets, and consequently no motion will be imparted to the cams *i* and *i'*, even though the pawl-levers are vibrated, and if the machine be operated under these conditions without the long arm of the lever R being depressed the sole will be trimmed all around the fore part or ball of the shoe at a uniform distance from the inseam.

If a sole is to be trimmed with a "Baltimore edge," the shield must be moved toward the front of the machine a sufficient distance to uncover one or more additional teeth of the ratchet at its back edge, according as to whether the sole to be rough-rounded is a short or a long one. This forward movement is obtained by a downward movement of the elastic connection O, caused by the operator moving the knee-lever or treadle connected therewith to depress the rear arm of the lever R. To limit said forward movement of the shield to any desired point, I provide the screw stop-pin a^2, threaded in the bracket or ear b^2 and having secured thereon the hand index-wheel W and detent-collar *c'* by means of the clamping-nut c^2, said collar *c'* having four detent-notches 1, 2, 3, and 4 formed in its periphery at equal distances from each other, with one of which notches the detent-spring *d'* is engaged whenever the machine is in operation.

The index-wheel W has stamped or otherwise fixed upon its front face the numbers "6," "8," "10," and "12" around its outer edge and at equal distances from each other, the numbers "6" and "10" being in the same vertical plane as the detent-notches 1 and 3 and the numbers "8" and "12" being in the same horizontal plane as the detent-notches 2 and 4.

When the index-wheel W is in the position

shown in Fig. 2 with the index-figure 6 at the top, the screw-stop a^2 will be in the position indicated in Fig. 6 and the machine is adjusted for rough-rounding a No. 5 to $6\frac{1}{2}$ sole with a Baltimore edge; but if said index-wheel be turned one-quarter of a revolution in the direction indicated by the arrow on said wheel the stop-screw will be moved toward the stop a' a distance equal to one-half a tooth of the ratchet, and the machine will be in condition to rough-round a No. 7 to $8\frac{1}{2}$ sole, and so on, each one-quarter of a revolution of the index-wheel in the same direction advancing the screw-stop a distance equal to one-half a tooth of the ratchet until the index-figure "12" is uppermost, which is the limit of movement in that direction.

The cams i and i' are designed to be moved about their axes of motion by the action of the pawls upon the ratchet-wheels only one-half of a revolution, and in order to prevent a greater movement, even if the operator should neglect to remove his foot from the treadle at the proper time, each of the ratchet-wheels l and l' has a section of its periphery left smooth or without teeth, as shown at 8 on Fig. 6.

The stop-pawls e' are pivoted to a portion of the frame A, are pressed into engagement with the teeth of the ratchet-wheels by springs, and retracted therefrom by the rearward movement of the lever f', caused by the contact of the pin f^2 with the arm f^3 when the lever L is moved to the extreme of its forward movement.

So far the several parts are constructed, arranged, and operate substantially as in my before-cited prior application, except that the upper branch of the arm I, upon which the roll j was mounted in said prior application, is omitted in this application and the roll j is located below the cams instead of above them, as in said prior application.

I have found that if the upward movement of the front end of the arm I and of the cutter a were controlled entirely by the action of the cams thereon, as in my said prior application, there was danger of an injury to a boot or shoe when trimming a sole with a "Baltimore edge," so called, from the liability of the operator throwing the cam-operating ratchet mechanism into action too soon when trimming the sole of the right boot or too late when trimming the sole of the left boot, thereby causing too much leather to be cut away from the outer edge of the sole at the junction of the shank with the fore part or near the point where the widest projection of the sole should be. This was due to the fact that the speed of the rotation of the cams was necessarily adjusted to complete the half-revolution required during the time that the shoe was being fed a distance corresponding to the length of that portion of the outer edge of the sole which projects farther from the inseam than upon the inner edge of the sole. If these two movements—viz., the feed of the shoe and the movement of the cams about their axis of motion—were properly adjusted relative to each other when the cams and the roll upon which they acted were arranged as in said prior application and the operator threw the cam-feeding mechanism into operation at just the right time, the sole would be trimmed to the desired shape; but if in trimming the sole of a right shoe, (illustrated in Fig. 7,) when the movement of the cam is adjusted to make its half-revolution while the sole is being fed from the point 4 to the point 6 on said figure, if the operator throws the cam-feeding mechanism into action before the point 4 is reached too much stock will be removed from the sole at the point 5 and between it and the point 6 on said figure, to the injury of the looks of the shoe.

If the sole of a left shoe (illustrated in Fig. 8) was to be trimmed on the machine described in said prior application under the conditions above stated, the trimming would commence at the point 1 on said figure, and if the operator should fail to throw the cam-feeding mechanism into action at the proper point—say at point 2 on said figure—too much stock would be cut away at the point 3 and thus injure the outline of the sole. To obviate this objection is the object of my present invention, and to this end I mount the roll j, upon which the cams i and i' act, below said cams upon a short shaft c^3, fitted to and movable endwise in bearings in the front end of a radius-arm d^2, pivoted at d^3 to the arm I, as shown in Figs. 3, 4, and 5. Said cams i and i' may be simple eccentrics or be slightly varied from the eccentric form and are arranged on the shaft D so that the portion of the periphery of the cam i which is farthest from its axis of rotation is toward the roll j, while the corresponding portion of the periphery of the cam i' is farthest from said roll j, as shown in Fig. 4 and in dotted lines in Fig. 3. The front end of the arm d^2 rests upon the eccentric g', and when in its normal or lowest position the periphery of the roll j is removed from contact with either of the cams i or i', as shown in Figs. 3 and 4. The shaft g^2 of the eccentric g' is mounted in a bearing in the arm I and the hub I′ formed thereon for the purpose of extending said bearings, and said shaft has secured to its end opposite to said eccentric the hand-wheel h', the rim of which is milled to facilitate its operation. Said hand-wheel is provided with a large hub h^2, upon the periphery of which are formed a series of graduation-marks numbered "6," "8," "10," and "12," indicative of some of the sizes of the soles to be trimmed, and an index-finger i^3 is secured to the arm I, with its point resting upon or in close proximity to the periphery of the hub h^2 of the hand-wheel h, as shown in Figs. 1 and 2.

The distance between the peripheries of the roll j and the cam i when in their normal positions and the eccentric g' is in the position

shown in Figs. 3 and 4 is equal to the difference between the projections of the sole edge beyond the inseam in the shank and along the inside of the ball of the foot, and the distance between the peripheries of said roll *j* and the cam *i'* under the same conditions is equal to the difference between the projections of the sole edge beyond the inseam at the shank and at the widest part of the projection on the outside of the shoe when the Baltimore edge is trimmed. With this arrangement of the cams *i* and *i'* and the roll *j* the cam-moving mechanism is adjusted to impart a half-revolution to said cams while the shoe-sole is being fed from the point 4 to the point 5 on the right shoe, (see Fig. 7,) or from the point 3 to the point 4 on the sole of the left shoe (see Fig. 8) when the longest sole is being trimmed.

In Figs. 7 and 8 the inner full lines indicate the outlines of the inseam of one style of shoe, the outer full lines indicate the outline of the sole in the rough, as it is secured to the last, and the dotted lines indicate the shapes to which the sole may be trimmed, whether of even width of projection around the whole fore part of the shoe, or wider upon the outside than upon the inside, or what is termed a "Baltimore edge."

The operation of my invention is as follows: If the sole of a right shoe is to be trimmed to a uniform width of projection on both sides of the fore part, but to a less width in the shank, the truck *j* is moved to a position beneath the cam *i*, the bar L and rolls *b* and *b'* are retracted, and the operator places the tread-surface of the sole against said rolls with the edge of the sole gripped between said rolls on one side and the feed-disk and the plate O on the other side, at a point near the rear of the shank, with the lower edge of the feed-disk in contact with the inseam, with the heel of the shoe at the left of the cutter *a*. The operator then sets the driving-shaft in motion, when the shoe is fed to the left and the sole is trimmed till the point 2 on Fig. 7 is reached, when the operator places his foot upon the treadle connected to the rod *f* and depresses it to raise the front end of the arm I, so as to bring the roll *j* into contact with the cam *i* when the point 3 on the sole has reached the cutter *a*, in which position the arm I is held until the shoe has been fed to and around the toe and along the outside of the fore part to the point 5, when the foot is slowly removed from the treadle to allow the front end of the arm I to descend until arrested by the stop *h* at the time that the point 6 has reached the cutter, when the continued feeding of the shoe to the point 7 causes the shank on the outside of the shoe to be trimmed to the same width of projection as the opposite side, and the shoe is then removed from the machine. If the right shoe is to have its sole trimmed with a Baltimore edge, the same operation as above described applies, until the point 4 in the sole edge reaches the cutter, when the operator throws into action the pawl-and-ratchet mechanism for moving the cams about their axis, the stop-screws a' and a^2 having been previously adjusted to the proper position to control the speed of revolution of the cams to give the desired half-revolution to said cams while the shoe is being fed from the point 4 to the point 5, and when the latter point in the feed of the shoe is reached the operator gradually raises his foot from the treadle while the shoe is being fed from the point 5 to the point 6, when the downward movement of the arm I is arrested by the stop *h* and the cutter will trim the shank from the point 6 to the point 7 to the desired narrower projection. If the sole of a left shoe is to be trimmed with a Baltimore edge, the trimming commences at the rear of the shank, on the outside of the shoe, at the point 1, (see Fig. 8,) and when the point 2 on said Fig. 8 has reached the cutter the operator raises the front end of the arm I until the truck *j* comes in contact with the cam *i'*, said truck having been previously moved to a position beneath said cam *i'*, and when the point 3 in the sole edge has reached the cutter *a* the cam-feeding mechanism is thrown into action to impart to said cam a half-revolution during the time the shoe is being fed from the point 3 to the point 4, when the rotation of the cam ceases and the shoe continues to be fed, while the operator still keeps his foot upon the treadle to hold the roll *j* in contact with the now stationary cam until the point 5 of the sole reaches the cutter, when the foot is removed from the treadle while the shoe is being fed from the point 5 to the point 6, and while the shoe is being fed from the point 6 to the point 7 the cutter trims the sole in the shank to the narrow projection shown. If it is desired to have the same projection of the sole in the shank as along the inside of the fore part and around the toe, the eccentric *g'* is turned about its axis a sufficient distance to raise the roll *j* to such a height as would bring it into contact with the cam *i* when in its normal position, if said roll were below said cam.

It will be understood that when the trimming of a sole is completed and the shoe is removed from the machine the bar L and and rolls *b* and *b'* are pressed toward the front sufficiently for the action of the stud f^2 upon the lever f^3 to trip the stop-pawl *e'*, when the action of gravity upon the weight V will cause the cam-shaft to be rotated in the opposite direction to that imparted to it by the pawls upon the ratchet-wheels carried thereby until arrested by the stop-pin *w* coming in contact with the stop-screw *w'*. It should be further borne in mind that the cams *i* and *i'* remain stationary, except when the extra wide projection of the sole edge upon the outer side of the shoe called the "Baltimore edge" is to be trimmed.

The roll *j* is moved in the direction of the length of its shaft c^3 to transfer it from a posi-

tion beneath the cam i' to a position beneath the cam i, or vice versa, by means of the shipper-lever c^4, pivoted to an ear c^5 on the arm I, as shown in Figs. 3 and 4.

In trimming the soles of shoes with the so-called "Baltimore edge" some manufacturers would prefer to have less projection of the sole on the outside of a No. 6 shoe than upon a No. 10 or 12 shoe, and this can be accomplished by having the speed of the rotation of the cams set for the larger shoe and removing the roll j from contact with the cam i before the cam has completed its half-revolution when trimming the sole of the right shoe and not throwing said roll j into contact with the cam i until said cam has been moved about its axis one-quarter or one-third of its half-revolution when trimming a left shoe.

In two other patents issued to me March 15 and April 12, 1898, and numbered, respectively, 600,668 and 602,211 are shown, described, and claimed certain parts herein shown and described, but not claimed.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a sole-rough-rounding machine the combination of a fixed frame; a cam-shaft mounted in bearings in said frame; a pair of right and left cams mounted upon said cam-shaft; means for automatically imparting intermittent semirotations to said cams; a cutter-carrying arm pivoted to said frame and movable about said pivot in a vertical plane; a revoluble eccentric mounted, or formed, upon a shaft fitted to a bearing in said cutter-carrying arm; a radius-arm pivoted at one end to said cutter-carrying arm, and resting at its other end upon said eccentric; a roll mounted upon a shaft having bearings in the movable end of said radius-arm and movable endwise therein; and means for moving said roll from a position beneath one of said cams to a position beneath the other of said cams.

2. In a sole-rough-rounding machine the combination of a fixed frame; the cam-shaft D mounted in said frame; the right and left cams i and i' mounted upon said shaft; a pawl-and-ratchet mechanism for intermittently moving said cam-shaft about its axis of motion to the extent of one-half a revolution; a cutter-carrying arm pivoted at its rear end to said frame and movable about said pivot; a stop to limit the downward movement of the front end of said arm; a revoluble eccentric-stop mounted in a bearing in said arm; the radius-arm d^2 pivoted to said cutter-carrying arm at one end and resting at its other end upon said eccentric; a hand-wheel for rotating said eccentric; a graduated scale and an index-finger as a guide in setting said eccentric; a roll mounted in the front end of said arm d^2; means for moving said roll in the direction of the length of its axis to positions beneath each of said cams alternately and means for raising the front end of the cutter-carrying arm to bring said roll into contact with said cams.

3. In a sole-rough-rounding machine, the combination of a fixed frame; a cam-shaft, and a feed-shaft mounted in bearings in said frame; a feed-disk mounted upon said feed-shaft; a pair of right and left cams mounted upon said cam-shaft; means for imparting a rotary motion to said feed shaft and disk; means for automatically imparting intermittent semirotations to said cams; the arm I pivoted to said frame at its rear end; a stop to limit the downward movement of the front end of said arm I; the bars K and L fitted to and movable endwise in bearings in the arm I; the cutter a carried by said bar K; the rolls b b' carried by the bar L; means for imparting a rapid reciprocation to the bar K and cutter a; means for imparting intermittent endwise movements to the bar L; the anvil-plate O; the revoluble eccentric g' carried by the arm I; the radius-arm d^2 pivoted at one end to said arm I, and resting at its other end upon the eccentric g'; the roll j carried by the free end of said arm d^2; and means for moving said roll j from a position beneath one of said cams to a position beneath the other of said cams.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 15th day of December, A. D. 1897.

HANFORD T. CROSBY.

Witnesses:
N. C. LOMBARD,
C. B. CHOATE.