No. 865,957. PATENTED SEPT. 10, 1907.

C. P. STANBON.

CHANNELING MACHINE.

APPLICATION FILED APR. 5, 1906.

2 SHEETS—SHEET 1

Fig. 1.

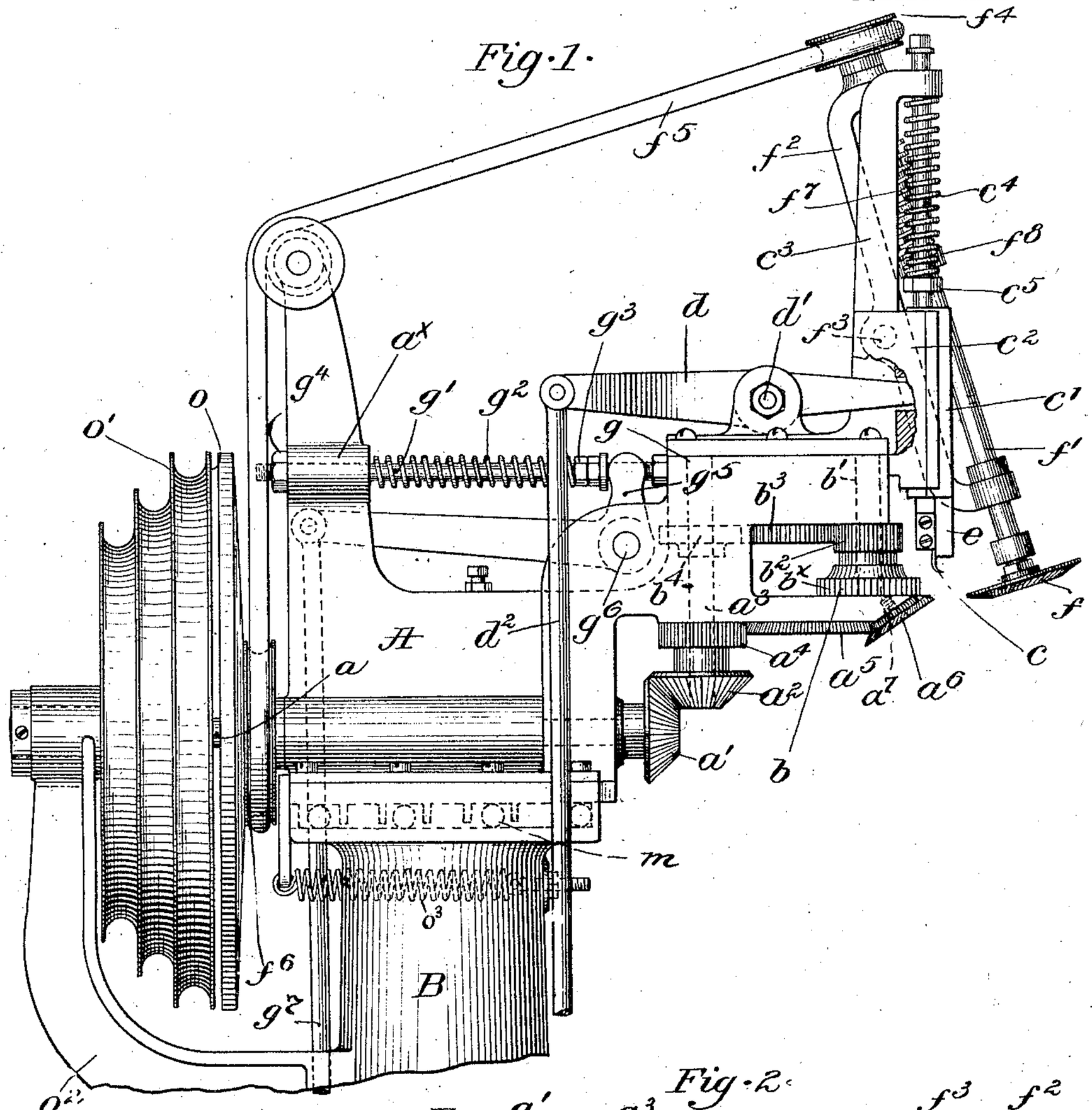
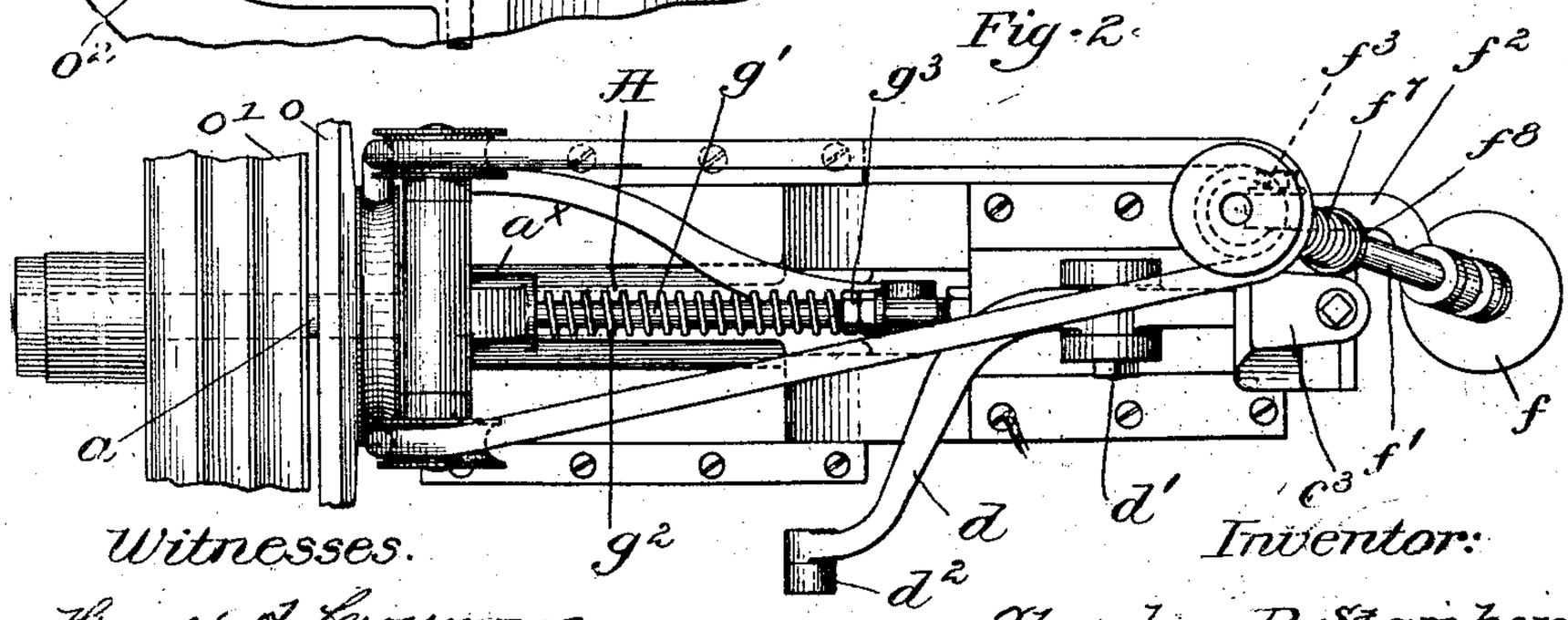


Fig. 2.



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2 SHEETS—SHEET 2

Fig. 5.

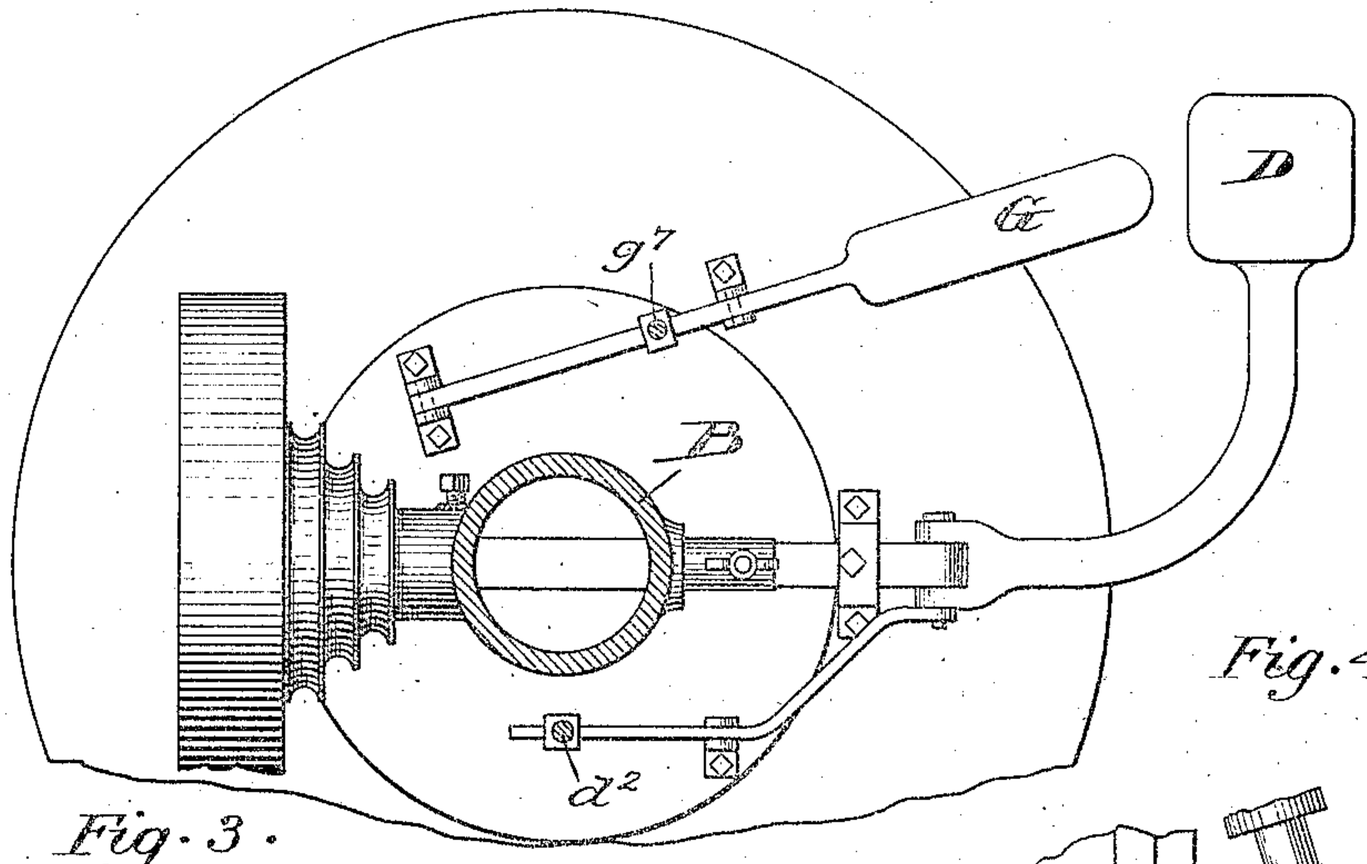

Fig. 3.

Fig. 4.

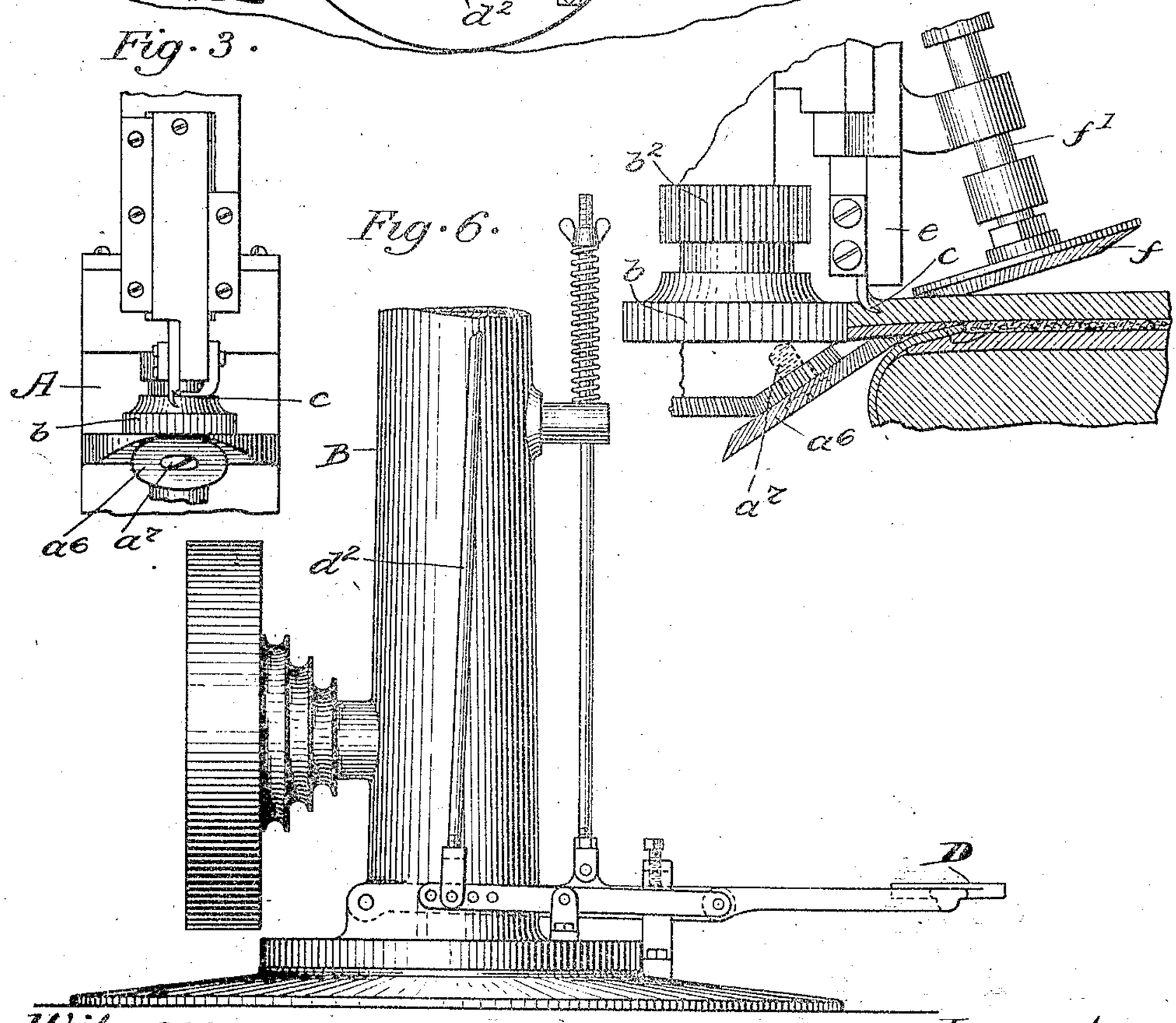

Fig. 6.

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UNITED STATES PATENT OFFICE.

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CHANNELING-MACHINE.

No. 865,957. Specification of Letters Patent. Patented Sept. 10, 1907.

Application filed April 6, 1906. Serial No. 310,005.

To all whom it may concern:

Be it known that I, CHARLES P. STANBON, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented an Improvement in Channeling-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention in channeling machines relates more particularly to machines for channeling the outsoles of boots and shoes after said soles have been "laid" or preliminarily secured in position upon the shoe preparatory to stitching or otherwise fastening the same permanently in place.

It is common in the art to channel outsoles before they are laid or applied to and to form a part of a shoe, but an objection to this method is that the outline of the sole and consequently that of the channel which is usually formed therefrom, does not follow uniformly the outline of the lasted upper, because of the difficulty experienced in lasting the uppers uniformly, and also because of variations in thickness and texture of the stock employed. To overcome these objections, what is known as the "rough rounding and channeling" machine was devised, which was used upon a block sole after the latter was laid upon the shoe to chop away the marginal portion thereof along an outline intended to follow or be graded from the outline of the lasted upper and to channel the sole at the same time. These machines, however, are most difficult to operate, and do not give uniformly satisfactory results. Because of the objections to this last named machine, manufacturers have used quite extensively what is known as the "Arnold" channeler, which is a machine adapted to operate upon the sole after it has been died out and laid to channel said sole at a desired distance inward from the sole outline, this distance being as a rule greater along the shank portion of the sole than about the fore part thereof. The "Arnold" channeler, however, is a hand operated machine requiring skilful operation, and at best has but a limited capacity and is expensive to keep in repair and running order.

My invention aims to produce a machine adapted for the class of work for which the Arnold channeler has heretofore been used, but which shall be power operated, so as to leave the operator free with both his hands to manipulate the shoe during the channeling operation.

The various features comprising my invention will be best understood from a description of one embodiment thereof.

In the drawings forming a part of this specification, Figure 1 is a side elevation of a machine illustrating one embodiment of my invention; Fig. 2 is a top or plan view of Fig. 1; Fig. 3 is a detail in front elevation of the work feeding and channel cutting devices; Fig. 4 is an enlarged sectional detail of the devices shown in Fig. 3, viewed, however, from the left, instead of from the front; Fig. 5, a sectional plan view showing the column, base, and treadle arrangement; and, Fig. 6, a side elevation of the parts shown in Fig. 5.

In the particular embodiment of my invention selected for illustration herein and shown in the drawings, referring first to Fig. 1, the machine head A has suitable bearings for the horizontal main or drive shaft a, provided at its front end with a bevel gear a' in mesh with and driving a bevel gear a^2, fast on the lower end of a vertical shaft a^3, journaled in the overhanging front end of the head. Fast upon this shaft is a spur wheel a^4, in mesh with an intermediate a^5, which drives an obliquely positioned work table or rest a^6, loosely mounted upon a stud a^7 in the head. The edge of this work supporting wheel a^6 is beveled so that it may present at its highest point a substantially horizontal or level work supporting face and immediately back of and above this face is a horizontal feed wheel b, loosely mounted upon a stud b' in the front of the head, the hub of said feed wheel being provided with a spur wheel b^2, driven from an intermediate b^3, by and from a spur wheel b^4, fast upon the upright shaft a^3. Thus, the work supporting wheel a^6 and the feed wheel b are driven at desired speeds from the common main shaft a.

In alinement with the active points of the work supporting and feed wheels, but somewhat in front thereof is the channeling knife c, adjustably mounted in the lower end of the knife carrier c', mounted to slide in vertical bearings c^2, in an arm c^3, rising from the machine head. The reduced shank or stem of this knife slide is encircled by a spring c^4, seated at its upper end against the outturned end of said arm c^3 and at its lower end upon a nut c^5, adjustably mounted upon a threaded portion of the knife carrier shank. To raise and lower this knife carrier for introduction and removal of the work, I have provided a lever d, fulcrumed upon the head at d', engaging at its forward end the said knife carrier and at its rear end provided with a depending actuating rod d^2. Depression of this rod d^2, as by a treadle, lifts the knife blade and its knife; release of said rod permitting the spring c^4 to depress the knife to its lowermost position or upon the work.

The lower end of the knife carrier is provided with a presser e, adjustably mounted thereon and which limits the downward movement of said knife carrier by contact with the sole, and therefore limits or determines the depth of cut of the channel.

Standing in front of the channeling knife and presser, is a bearing wheel f, preferably beveled and mounted in oblique position upon the lower end of an oblique

shaft f', mounted upon the side of said arm c^3 and adjustable as to its angle thereon about a center f^3 shown in dotted lines, Fig. 2, and in dotted lines, Fig. 1. This bearing wheel is intended to assist in the feed of the work, and should always work freely, that is, without requiring any appreciable effort on the part of the operative to rotate it. To this end it may be mounted to rotate with the utmost freedom in or on its supporting bearing, or it may be provided with means for rotating it independently of the contact of the work therewith, thus increasing its freedom of movement insofar as concerns the contact of the work therewith. To this end said oblique shaft f may be provided at its upper end with a pulley f^4, connected by a belt f^5, with a pulley f^6, upon the main shaft a. Whether driven by power or solely by the contact of the work therewith; said bearing wheel rotates with substantial freedom from resistance or effort communicated to it by the work and assists in directing the work to and against the feed wheel b.

For operating the machine the operator through the lever d lifts the channel knife carrier and its knife and presser and inserts the usual extension of sole, as indicated, Fig. 4, over and upon the work supporting wheel a^6 and with the edge of the sole bearing firmly against the feed wheel b. In order to bring the sole to an approximately level position with its edge thus bearing against the feed wheel, it is necessary for the operator to lift or turn the shoe bodily about what may be called a fulcrum point at the point where the sole rests upon the supporting wheel a^6, and thus lift the bearing wheel f against the action of its spring, the parts then being as indicated in Fig. 4. While the weight of the bearing wheel and its shaft and the action of the driving connections therefor under some conditions would be sufficient to maintain it in operative contact with the work yet in practice I prefer to employ a spring encircling the bearing wheel shaft f and marked f^7 in Fig. 2, said spring being seated at its upper end against the bearing in the yoke f^2, and at its lower end against a nut f^8, adjustably mounted on said shaft. The operator now drops the channeling knife upon the sole and starts the machine and simultaneous rotation of the work supporting wheel a^6 and feed wheel b act to carry the sole and the shoe along in the direction of feed past the channeling knife, which, under the action of its depressing spring c^4, buries itself into the substance of the sole and thereafter cuts a channel the depth of which is determined by the adjustment of the presser e, which rests upon and rides along the sole.

To increase the action and effectiveness of the feeding wheel b upon the edge of the sole, said wheel may be provided with projections or friction devices or means. While a rubber surface might be used, yet it is undesirable, because of the short life of a rubber feeding surface. Consequently, I prefer to employ projections that are in the form of comparatively sharp ribs $b^\times$, which extend transversely of the feeding wheel and preferably parallel with the axis thereof.

The operation of feeding the shoe through the machine, which might under some conditions be accomplished with some difficulty because of the irregular outline or profile of the sole, is much facilitated by the bearing wheel f, which, being spring pressed against the sole, and therefore in firm contact therewith, tends by its rotation, whether driven from contact of the sole therewith or from a separate driving mechanism, to swing the approaching portions of the sole inward towards and against the feed wheel, contact with which is essential for accurate work. This bearing wheel of course rises and falls to accommodate itself to the varying shape and level of the sole, and its beveled and rounded edge portion permits it to fall readily into and rise from the shank portion of the shoe as the tool enters upon and leaves the same.

To vary the distance of the channel inward from the edge of the sole, the arm c^3, which carries the channel knife carrier, the presser, and the bearing wheel f, is mounted upon a slide g, fitted in suitable horizontal race-ways upon the top of the head, provided with a rearwardly extended stem g', having a bearing at its rear end in an arm $a^\times$ of the head A. This slide with its channel knife presser and bearing wheel, are pressed normally toward the front of the machine by a spring g^2, seated at one end against said head arm $a^\times$, and at its opposite end against a nut g^3, adjustably mounted on said stem, the forward spring actuated movement of the slide being limited by a nut g^4, threaded upon the rear end of said stem and acting against the rear face of said head arm $a^\times$.

In front of the spring supporting nut g^3 and preferably acting against a washer there placed, is the upright arm of a bell-crank lever g^5, fulcrumed in the head at g^6 and having its horizontal arm provided with an operating rod g^7, by which said bell crank lever may be moved to draw the knife carrying slide rearward against the action of said spring g^2, to bring the channeling knife nearer to the feed wheel, thereby to cause the channel to be cut nearer to the edge of the sole, said spring g^2, being sufficiently strong to return said channeling knife toward or into its normal and most remote position relative to the sole edge when and as the rod g^7 is released.

Referring now to Figs. 5 and 6 the supporting column B for the machine is provided with two treadles D and G, the treadle D being connected with and to operate the rod d^2, previously described as operating the lever d to raise and lower the channeling knife and presser, while the treadle G is connected with the drop rod g^7, which operates the bell crank to vary the in and out position of the channel knife.

In operating the machine the operator first depresses the treadle D to raise the channel knife and presser to permit introduction of the work, and, as the cutting progresses around the sole, changes his foot to the other treadle G, to vary the position of the channel relative to the sole edge.

In machines of this type it is desirable that the feed be at all times under the control of the operator, for, if the feed is uniform with the maximum speed possible along the straighter portions of the sole edge difficulty is experienced in turning sharp toes or entering and leaving the shank, and if the speed is made such that these more difficult portions of the sole may be handled with safety, then the entire operation becomes slower than is desirable or necessary. To accoinplish what is desired in this respect, I have mounted the head to slide inward and outward on and relative to the column B and to enable the head to be moved very easily in this direction, I prefer to employ roller or ball bearings,

typified at *m*, Fig. 1. Upon the rear end of the main shaft *a*, and thus movable toward and from the operator by and with the head A, is a friction driving member, shown as a flat faced disk or wheel *o*. Opposed to this friction disk is a belt pulley *o'*, which may have one or a plurality of belt faces of different diameters, as the manufacturer may desire, said belt pulley being mounted upon a sleeve surrounding the projected end of the main shaft *a* and having its own bearing in an arm o^2 extended upward from the column. A collar upon the rear end of said sleeve confines said belt pulley against front to back movement by and with the head; consequently, the head as a whole with its friction disk, may be moved bodily, rearward or away from the operator, to bring the friction disk into driving contact with the belt pulley to receive motion therefrom to operate the machine, or, it may be drawn to the front of the machine or toward the operator to separate said disk from the belt pulley to arrest the operation of the machine. To throw the head normally toward the front and the operator, so as to leave the machine normally at rest, I have provided a spring o^3 (Fig. 1), the tension of which may be adjusted at will, but which should be merely strong enough to disengage the drive and the feed without imposing upon the operator too much labor to compress it for operating the machine.

The operation of this device is this: the operative having introduced the work, presses the same against the feed wheel *b*, and this sets the entire head rearward sufficiently to bring the friction disk into engagement with the belt wheel and start the machine, and, so long as the operative maintains the work pressed firmly against the feed wheel (which is necessary for accurate and uniform feeding) during just such time will the drive remain operative to feed the work. Upon approaching a sharp toe or other difficult portion of the sole outline to be channeled, such, for instance, as in entering upon or leaving the shank, the operative by slackening up on the inward or pushing pressure immediately stops, or, at his choice, reduces the feed, according to the degree of separation of the friction disk from the belt pulley, so that he may at all times have an opportunity to take a new hold upon the shoe, or to slow up the feed for the better handling of the difficult portions of the channeling operation.

The machine above described is simple in construction and the mode of handling it may be readily acquired by a new operative, who, at no time, need be an expensive operative.

Having described one embodiment of my invention and without limiting the invention to the embodiment thereof here shown and described, what I claim and desire to secure by Letters Patent is,—

1. In a machine of the class described, a column, a belt wheel mounted thereon and against lateral movement combined with the head, tools for acting upon the sole of a boot or shoe mounted thereon, means yieldingly to press said head away from said belt pulley, and means on the said head adapted to be moved by movement of the latter into driving engagement with said belt pulley for driving said tools.

2. In a machine of the class described the column, the fixedly positioned belt pulley, the slidable head mounted on said column, its shaft and friction wheel thereon adapted for contact with said belt pulley and channeling and feeding devices mounted on and movable with said head and driven by said shaft at times and at speeds determined by the position of said head on said column.

3. In a machine for operating on the soles of boots and shoes, a work support, driving means therefor, and means for varying the effective speed of said work support by varying the pressure of the work against said support.

4. In a machine for operating upon the soles of boots and shoes, work supporting means, driving means therefor, and means to render said driving means operative by pressure of the work against said work supporting means, said driving means remaining continuously operative during continuance of said pressure, and becoming inoperative on release of said pressure.

5. In a machine for operating upon the soles of boots and shoes, working devices, a movable support therefor, driving means for said working devices and means to render said driving means effectively operative at varying speeds determined by movement of said support, and means to press said support normally in one direction.

6. In a machine for operating upon the soles of boots and shoes, working devices, feeding means for the work, driving mechanism for said devices and means to render said driving mechanism operative by pressure of the work against said feeding means and inoperative by release of said pressure.

7. In a machine for operating upon the soles of boots and shoes, working devices, work feeding means, driving mechanism and means to render the driving mechanism operative by effective engagement of the work with said work feeding means.

8. The combination of devices for working upon the soles of boots and shoes, a movable support therefor, driving means for said working devices and provisions for rendering the driving means effective by movement of said support in one direction and ineffective by opposite movement of said support.

9. In a channeling machine, channeling means, feeding means for the work, and driving means in operative relation with the feeding means and means for rendering the driving means effectively operative by effective engagement of the work with said feeding means, and inoperative by release of the work from such engagement.

10. In a channeling machine, a column, a head movable across the top of said column, driving means comprising coöperating parts one held by said column and the other by and movable with said head, and channeling and feeding devices mounted on said movable head.

11. In a machine of the character described, the combination of a tool for acting upon the sole of a shoe, feeding means for the work, driving means, connections between the driving and feeding means for operating the latter, and means for rendering the driving means effectively operative at varying speeds by varying pressure of the work upon the feeding means.

12. In a machine of the character described, the combination of a tool for acting upon the sole of a boot or shoe, feeding means for the work, driving means for said feeding means comprising a friction device and means to cause the members of said device to be engaged with varying effectiveness by varying pressure of the work upon the feeding means.

13. A machine of the character described comprising in combination a tool for acting upon the sole of a boot or shoe, feeding means for the work, driving means for operating the feeding means and means for varying the action of the feeding means by variations in pressure of the work against said means.

14. A machine for operating upon boots and shoes, comprising in combination a working tool and support therefor, feeding means for moving the work in the line of feed, and means engaging the work in advance of the tool and acting to impart movement to the work at an angle to the line of feed and towards said tool.

15. A machine for operating upon boots and shoes, comprising in combination a working tool and support therefor, rotative means constructed and arranged to engage the work in advance of said tool and to cause the work to be moved in the line of feed towards the tool at an angle to the feed movement.

16. In a machine of the character described, the combination of an operating tool, feeding means for moving the work past the tool, and means constructed and arranged to engage the work in advance of the tool and to move the work towards the tool at an angle to the line of feed independent of the effort of the operator.

17. In a machine for operating upon the soles of boots and shoes the combination with a knife for acting upon the sole, of a rotary bearing wheel constructed and arranged to engage the work in advance of the knife and to move the work automatically in and at an angle to the line of feed.

18. In a sole channeling machine, the combination of an obliquely disposed supporting wheel, a feeding wheel for engaging the edge of a shoe sole, a channel cutting tool, means for moving it towards and from the feeding wheel and a bearing wheel for engaging the surface of the shoe sole, said bearing wheel having its face disposed obliquely to the work and acting to move the work toward the feeding wheel.

19. A channeling machine comprising an obliquely mounted work support, a horizontal feed wheel constructed for peripheral engagement with a sole edge, channeling devices, a bearing wheel constructed and arranged to engage the work in advance of the channeling device and move the work at an angle to the line of feed, and means to operate said parts.

20. A channeling machine comprising an obliquely arranged work supporting wheel and means to rotate it, a horizontal feeding wheel in juxtaposition thereto and means to rotate it, channeling means movable toward and from the feeding point of said wheel and means to move the same, and an obliquely positioned bearing wheel in addition thereto, substantially as described.

21. A channeling machine comprising an obliquely arranged work supporting wheel and means to rotate it, a horizontal feeding wheel in juxtaposition thereto and means to rotate it, channeling means movable toward and from the feeding point of said wheel and means to move the same, and an obliquely positioned spring supported bearing wheel, substantially as described.

22. In a machine for operating upon boots and shoes, the combination of a tool for acting upon the sole, means for supporting and feeding the work, and a bearing wheel in addition thereto having its acting face disposed obliquely to the surface of the work to engage the same in advance of the tool to direct the approaching work to said supporting and feeding means.

23. A machine for operating upon boots and shoes, comprising in combination a working tool and support therefor, and a bearing wheel constructed and arranged to engage the work on a line disposed at an angle to a plane passing through and containing the axis of the bearing wheel and the working portion of the tool, said bearing wheel tending to move the work at an angle to the line of feed.

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

CHARLES P. STANBON.

Witnesses:

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