

No. 637,926.

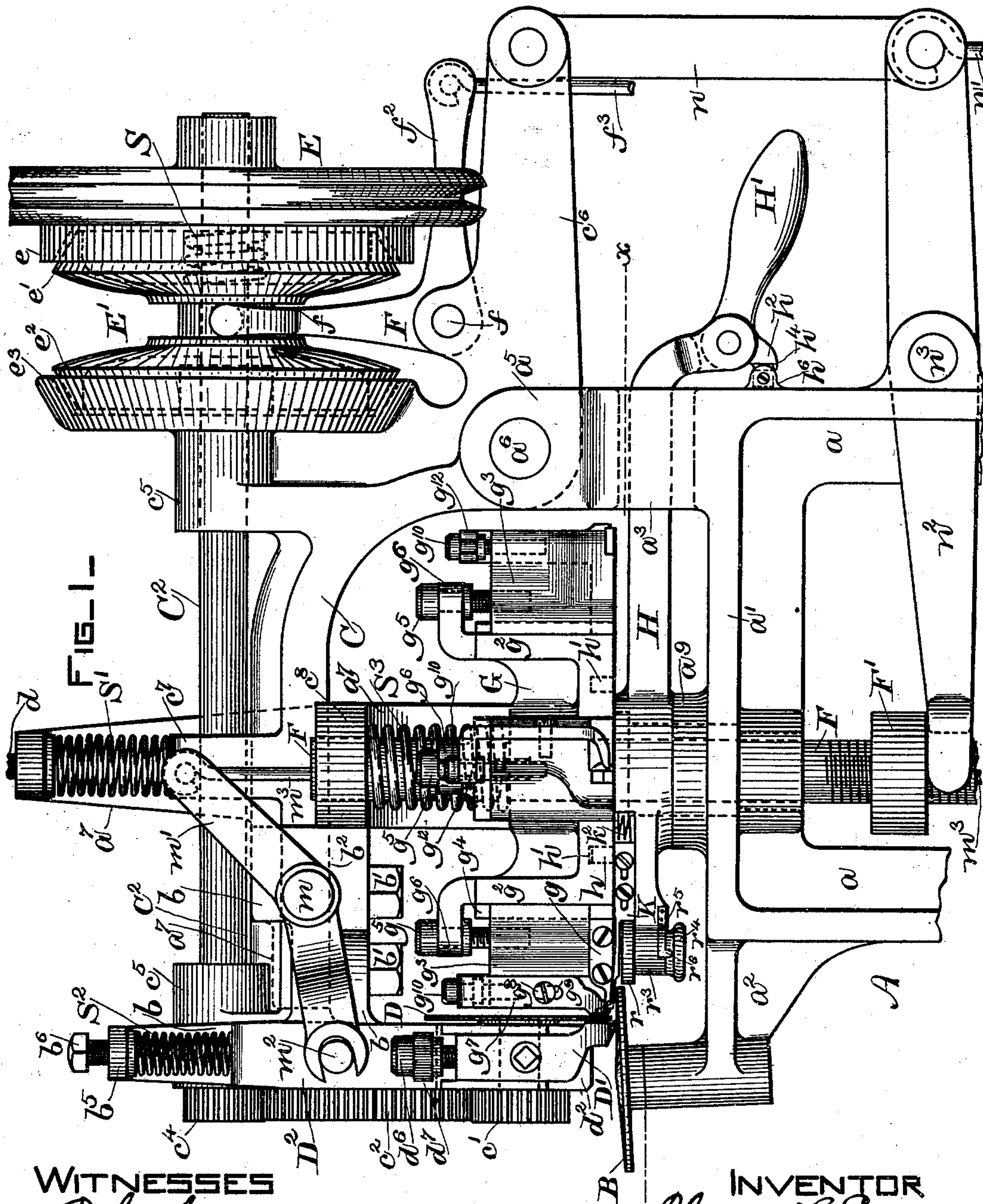
Patented Nov. 28, 1899.

C. L. EATON.
CHANNELING MACHINE.

(Application filed Sept. 4, 1896.)

(No Model.)

3 Sheets—Sheet 1.



WITNESSES

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By his attorney
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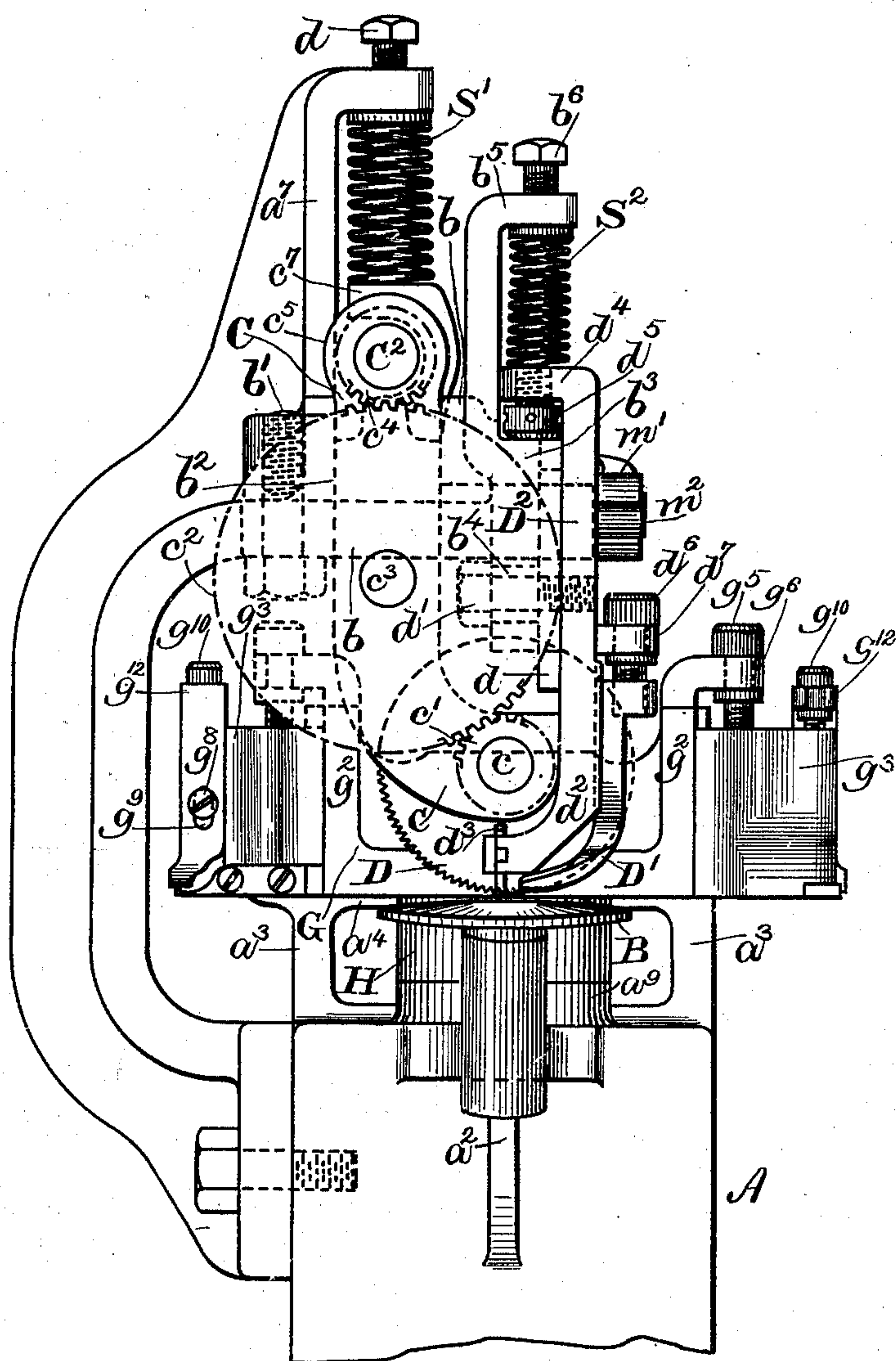


FIG. 2.

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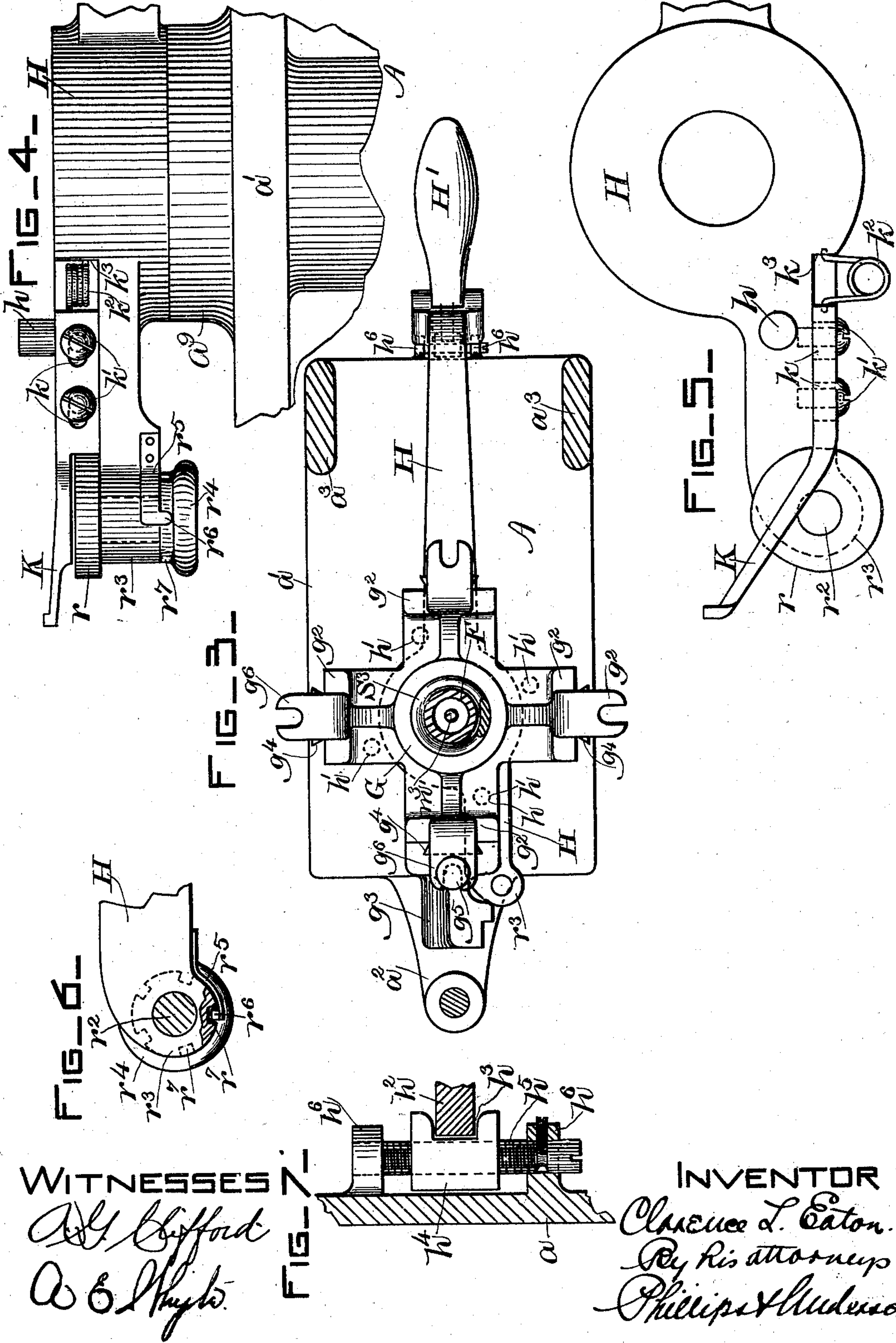
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UNITED STATES PATENT OFFICE.

CLARENCE L. EATON, OF LYNN, MASSACHUSETTS.

CHANNELING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 637,926, dated November 28, 1899.

Application filed September 4, 1896. Serial No. 604,917. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE L. EATON, a citizen of the United States, residing at Lynn, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Channeling-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In channeling-machines as heretofore constructed, wherein the channel and edge of a sole are cut at the same operation, much difficulty is encountered in operating upon those soles having extremely narrow or pointed toes, and also upon those soles the toes of which are square, for the reason that the distance between the channel and edge groove or edge of the sole is greater at the angles existing at the toe portions of these soles than the distance between the points of the channeling and edge-cutting knives, and as the sole is fed past the cutters by the feed-wheel in turning the sole in order to cut at these points the sole is pulled away from the channeling-knife, thereby causing the knife to leave the channel, thus cutting through the between substance of the sole, or the edge-cutter will cut into the sole a greater distance than is desired at these points, or the edge of the sole will buckle up, causing the edge knife to cut a notch in the side of the sole, in each case ruining the sole and rendering it worthless for any practical use. This objectionable operation of the machine arises, as above stated, by reason of the fact that the distance between the angles of the channel and the edge cut at the turning-points of the toe of the sole is greater than the distance between the points of the knives, which are fixed and have no movement relative to each other to accommodate themselves to the greater distance between the channel and edge cut at these points, and when turning the angles at these points the point of the channeling-knife should be the center of motion, while the sole is being turned and the edge thereof fed along past the edge-cutter to cut the edge. It is therefore obvious that either the channeling-knife will be pulled out of its channel and cut through the between substance, or

the edge knife will cut into the sole a greater distance than is desired, or the end of the sole will buckle up and be cut off, as above set forth.

It is desirable in some classes of work, such as soles for "turns," to vary the cut in the edge portions of the same sole—as, for instance, to cut deeper at the shank of the sole than around the fore part, thus leaving a thin edge at the shank and a thick edge around the fore part.

The object of my invention is to obviate the difficulties above noted and to generally improve the construction and operation of the machine, and to this end the present invention consists of a channeling-machine having a channeling-cutter and an edge-cutter, and means to relatively move the same while cutting around an angle in the work.

The present invention further consists of a channeling-machine having a rotating carrier and a plurality of cutters mounted thereon.

It further consists of a channeling-machine having a work-feed and an edge-cutter capable of a lateral movement and means to stop the feed during the lateral movement of the edge-cutter; and it further consists of the devices and combination of devices, which will be hereinafter described and claimed.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the machine, the lower part of the frame being broken away. Fig. 2 is an end view looking toward the right in Fig. 1. Fig. 3 is a sectional plan view taken upon line $x x$ in Fig. 1. Figs. 4, 5, and 6 are enlarged details of the adjustable edge gage. Fig. 7 is an enlarged detail of the adjusting mechanism for the edge-cutter.

A represents the main frame, of suitable size and shape to support the working parts and comprising the standards a and table or bed a' . Frame A has at one end a suitable bracket or support a^2 , upon which is mounted a work-support B, which may be of any suitable construction, the one shown in the drawings being the usual revoluble support common to machines of this type. The bed a' at the end opposite the work-support is provided with the upward extensions a^3 , the upper ends of which are joined by a connecting brace or bar a^4 , forming a rectangular guideway

through which extends the operating-lever for the knife carrier or block, as will be more fully hereinafter described.

Upon the brace or bar a^4 are suitable lugs a^5 , in suitable bearings in which is the shaft a^6 , upon which is mounted the swinging frame C, which carries the work-feeding mechanism, the construction being such that the work-feed is free to move toward and away from the work-support or the work thereon.

In the machine of the drawings the work-feeding mechanism comprises the notched wheel D, carried by a shaft c , mounted in a suitable bearing in the end of swinging frame C, rotary motion being imparted to said wheel D by the pinion c' , fixed to the end of shaft c , the intermediate gear c^2 , mounted upon a stud c^3 , and the gear c^4 , fixed upon the end of the driving-shaft C^2 , which is free to rotate in suitable bearings c^5 upon the swinging frame C. Instead of turning shaft C^2 by hand, as has heretofore been the practice in these machines, in the present invention said shaft is driven by power applied to a suitable driving-pulley E, which is fixed to the end of said shaft, and suitable clutch-and-brake mechanism is provided for controlling the movement of said shaft.

As shown in the drawings, pulley E is provided with a clutch face or member e , which coöperates with a complementary clutch member e' , mounted upon a sleeve E' , splined to and free to move along the shaft C^2 , the sleeve having a brake-clutch member e^2 , adapted to be thrust into contact with a complementary brake-clutch member e^3 , fixed to the frame C. A suitable spring S, (shown in dotted lines, Fig. 1,) placed between the members e and e' of the driving-clutch, acts to force the sleeve along the shaft C^2 and to normally hold the driving-clutch open and the brake-clutch closed.

For the purpose of moving the sleeve E' to close the driving-clutch and to open the brake-clutch, and thus to cause shaft C^2 to rotate and to communicate a rotary motion to the feed-wheel D, there is provided a bell-crank lever F, which is pivoted at f to an arm c^6 of the swinging frame C, one arm f' of which is forked and loosely embraces a groove in the sliding sleeve E' and the other arms f^2 of which is connected by a rod f^3 to a suitable treadle. (Not shown.)

By the mechanism just described a quick and positive action of the feed-wheel is secured and its operation is always under the control of the operator.

The swinging frame C is normally held down and the feed-wheel D in yielding contact with the work by means of a suitable spring S' , which bears at one end against a block c^7 upon swinging frame C and at its other end against an adjusting-screw d , mounted in the upper end of a gooseneck-standard a^7 , connected to or formed on the frame A. Extending from the gooseneck-standard a^7 is a bracket or arm b , which may

be a part of said standard or be formed separately and secured thereto by the bolts b' , as shown. The bracket or arm b is provided with a recess b^2 , which acts as a guide for the forward end of the swinging frame C, and at its end with a suitable support b^3 for the channeling-knife carrier D^2 . The support b^3 has in its face a groove in which a rib d on the knife-carrier D^2 is adapted to fit and slide. The knife-carrier D^2 is held to the support b^3 by a suitable bolt d' , which is adapted to move freely in a slot b^4 in the support b^3 in such a way that the knife-carrier may have a limited free vertical movement. The knife-carrier D^2 is provided with the bent arm d^2 , in which is clamped the channeling-knife d^3 , and at its upper end with the arm d^4 , upon which bears a coiled spring S^2 , the upper end of which bears against an adjusting-screw b^6 held in an overhanging arm b^5 of the bracket b . For the purpose of controlling the downward movement of knife-carrier arm d^4 is provided with an adjusting-screw d^5 , which rests upon the top of bearing b^3 and forms an adjustable stop for the downward movement of the knife-carrier D^2 .

D' represents a suitable presser-foot which slides in ways formed on the knife-carrier D^2 and which is adjustably sustained thereon by means of a bolt d^6 , working in an ear or lug d^7 upon the knife-carrier D^2 .

The end of the swinging frame C is curved forward and extends under and in line with the rib d on the knife-carrier D^2 , as shown in Fig. 2.

The above-suggested arrangement is such that the swinging frame C may be lifted and impart to the feed-roll D a limited vertical movement independent of the knife-carrier D^2 ; but when the end of frame C comes in contact with the rib d on the knife-carrier D^2 it imparts a vertical movement to the knife-carrier D^2 and thereafter they move upward together.

The knife-carrier D^2 and the presser-foot D' are capable of being moved vertically independent of the feed-roll D when it is desired to lift the channeling-knife from the work and to feed the work along and against the edge-cutters only by the following means.

Upon a suitable fulcrum m on the arm b is mounted a lever m' , one end of which is forked and engages a stud m^2 upon the knife-carrier D^2 , the other end being connected by a rod m^3 passing down through the hollow shaft F to a treadle. (Not shown.)

In the present invention the edge-cutting knife is mounted upon a movable carrier, which is capable of lateral adjustment to place the edge-cutting knife at any desired angle relative to the channeling-knife, and also to allow it to be moved laterally in a curved path by the operator to cut the edge of the sole when operating to make a cut around an angle, as hereinbefore set forth.

G represents a movable carrier upon which is mounted the edge-cutter g , and, as shown

in the drawings, said carrier may be constructed in the form of a turret to carry several edge-cutters of different shapes adapted to cut the edge of the sole in several different ways, and thereby increase the capacity of the machine.

As shown in the drawings, the carrier G is fixed to the hollow shaft F, which is mounted to rotate in a bearing in an arm c^8 of the standard a^7 and in a suitable bearing formed in the bed or table a' , the carrier resting upon a lever H, which is fulcrumed upon shaft F and which rests upon a boss a^9 upon the bed or table a' . The carrier G has a plurality of arms g^2 , (in the machine of the drawings four,) each of which carries an edge-cutter g . The edge-cutters are mounted upon vertically-adjustable knife-blocks g^3 , which are each provided with guide-grooves in which are fitted guide-ribs g^4 upon the arms g^2 , the blocks g^3 being adjustably held on the arms g^2 by screws or bolts g^5 , mounted in the overhanging arms g^6 of the arms g^2 . Upon each knife-block g^3 is an adjustable gage or presser-foot g^7 , which is held thereto for vertical movement thereon by a screw g^8 , which passes through a slot g^9 and which is adjustable by a screw g^{10} , mounted in the block g^3 and engaging an overhanging arm g^{12} of said presser-foot.

The carrier G is normally pressed down upon the lever H by a coiled spring S^3 , which bears at one end upon the hub of said carrier and at its other end beneath the arm c^8 , projected from the standard a^7 , and when in this position it is locked to said lever by a stud h , carried by the lever H, which is adapted to take into recesses h' in said carrier.

The frame C is adapted to be raised vertically to lift the feed-roll by a link n , which is pivotally connected to the arm c^6 and its lower end to a rod n' , connected to a suitable treadle. (Not shown.)

In order to simultaneously raise the carrier G upon the lifting of the frame C, I have provided the hollow shaft F with an adjustable nut F' , which is threaded to said shaft and which is adapted to be engaged by the forked end of a lever n^2 , which is pivoted at n^3 to the standard a and at its outer end to the link n and rod n' , the construction being such that a depression of the rod n' will lift frame C and at the same time the carrier G.

The above-described arrangement is such that when cutting a lipped insole, the nut F' having been adjusted to bring the edge knife in the position to cut the lip of a desired thickness, no matter what the thickness of the stock should be the height to which the feed-roll would be raised by the stock from the work-support B would cause a corresponding rise of the carrier G and the edge knife thereon, and thus insure the cutting of the lip of the desired thickness.

In some classes of work it may be desirable to raise the frame C and feed-roll D without imparting any movement to the carrier G and edge knife g , and by adjusting nut F' to

such a position upon shaft F that it will be clear of the lever n^2 the desired result may be obtained.

As hereinbefore noted, the carrier G is locked to the lever H when in its depressed position, and consequently any lateral movement of lever H will cause a corresponding lateral movement to the carrier G and edge knife g , and this lateral movement of the edge knife g is very desirable when cutting around the angles in pointed and square toed soles. The lever H is fulcrumed upon shaft F, and at its forward end is connected to the carrier G by the stud h , as before stated. At its other end lever H is forked and has a handle H' pivoted thereto, by which it may be actuated as desired. The handle H' is provided with a toe h^2 , which is adapted to engage a suitable recess h^3 in a block h^4 upon the frame of the machine, whereby said lever is held from lateral movement at all times except when actuated by the operator to produce the lateral movement of the edge knife g , as hereinbefore referred to. The block h^4 is preferably adjustable in order to adjust the lateral position of lever H when in its locked position, and thereby adjust the relative lateral positions of the channeling-knife and edge knife, and such adjustment may conveniently be secured by mounting said block upon a threaded rod h^5 , fitted to rotate in bearings h^6 on the fixed frame of the machine.

It is obvious that by the arrangement just described the lateral position of the lever H may be adjusted, and by such adjustment move the carrier G and adjust the relative lateral positions of the channeling-knife and the edge-cutting knife, and such adjustment is of great advantage in operating upon certain classes of soles.

Upon the forward end of lever H is mounted an adjustable edge gage K, which is slotted, as shown at k , and freely movable upon studs or screws k' passing through said slots, it being moved forward by a suitable spring k^2 , which bears at one end against a shoulder k^3 and at its other end against said gage K. The gage K has a shoulder which bears against an adjustable stop to limit its forward movement, said stop being a movable cam r , which in the present machine is mounted upon a suitable stud r^2 , free to turn in a bearing r^3 upon the end of lever H, stud r^2 being provided with a suitable head r^4 by which to turn the same and the cam r for the purpose of adjusting the edge gage. In order to hold cam r in its adjusted position, there is provided a flat spring r^5 , attached to the lever H and having a bent finger or stud r^6 , adapted to take into notches r^7 formed in the head r^4 , the arrangement being such that by turning the head r^4 and cam r the position of the edge gage K can be accurately adjusted to suit the work in hand.

It will be noted that the turret or carrier G is provided with several edge knives, which are adapted to make different styles of cuts

in the edge of soles. For instance, one knife is adapted to cut a slit in the edge of a sole for producing a lipped insole, and another a groove or rabbet for producing soles for turns, and the others still different forms of soles, and by lifting the turret or carrier G free of the stud h it may be turned by the operator to bring any desired edge knife into operative position, and thus the capacity of the machine is greatly increased.

It may be desired to make different styles of cuts in one and the same sole, and in such case it has been necessary heretofore to employ two or more machines or to cut the number of soles required with one form of edge knife in the machine and then to change the knives and put the work through the machine a second time; but with the machine of the present invention the operator can cut the edge of the sole—say along the shank portion—with one knife and by revolving the turret or carrier G bring another knife into position and continue cutting around the fore part to the shank on the opposite side, when the shank-cutter can be again brought into use and the cutting of the sole completed.

By making the channeling-knife and the edge-cutting knife relatively movable the machine is capable of readily cutting around the angles in a pointed and square toed sole, where the distance between the channel and edge of the sole is greatly increased, as has been heretofore referred to, and without removing the channeling-knife from the work, which has not heretofore been possible with machines of this character.

The operation of the machine is as follows: The rod n' is depressed, and through link n and lever n^2 operates to raise the frame C, the feed-wheel D, the channeling-knife d^3 , and the carrier G and edge-cutting knife g , mounted thereon. The sole is now placed upon the work-support B with its edge bearing against the edge gage K, and rod n' is released, allowing the springs S^1 , S^2 , and S^3 to throw the feed-wheel and cutters into their operative position in contact with the sole. The rod f^3 is now depressed, thus opening the brake-clutch and closing the driving-clutch and imparting motion to shaft C^2 , and through the train of gears $c^4 c^3 c'$ to the feed-wheel D, which feeds the sole past the cutters, thus cutting the channel and edge thereof. This operation is continued until the cutting has reached a point where it is desired to make a turn, at which point the rod f^3 is released, thus opening the driving-clutch and closing the brake-clutch, stopping the rotation of the feed-wheel and the feed of the work, with the channeling-knife in the work at a point which constitutes the apex of the angle in the channel at the turn. The rod n' is now depressed and frame C elevated a sufficient distance to raise the feed-wheel D from the work, but not to lift the channeling-knife and presser-foot, thus leaving the channeling-knife in the work.

The operator now lifts the handle H' of lever H, thus releasing the toe h^2 from the notch h^3 , and moves the lever H laterally about its fulcrum, thus moving the carrier G, which is locked to said lever by the stud h , thus causing the edge knife to move laterally and complete the cut in the edge, the operator turning the sole by hand upon the channeling-knife as a center until the edge has been cut around both sides of the angle or turn, when the lever H is again locked by the toe h^2 on the handle H' and rod n' released, allowing the feed-wheel D to again engage the work when the rod f^3 is again depressed to open the brake-clutch and close the driving-clutch, and thus impart motion to the feed-wheel D to feed the work past the cutters and complete the channeling and cutting of the edge. If desired, the channeling-knife may be raised when the edge knife is cutting around the angle in the sole by means of the rod m^3 and lever m' , and when this is the case the edge knife may remain fixed while making the turn around the angle.

I desire to state that while I have shown the knife-carrier G as adapted to carry a plurality of edge knives my invention is not limited to such a construction, as it is obvious that but one such knife may be mounted thereon; but it is an advantage to provide more than one, as the capacity of the machine is greatly increased thereby.

In the foregoing specification and following claims I have referred to a "lateral" movement of the edge-cutting knife, and by this I mean a movement toward or away from a line drawn longitudinally through the channeling-knife and its shank or a movement of the edge-cutting knife in a line which would cross the end of the channeling-knife.

Having fully described the construction and mode of operation of my machine, I claim as new and desire to secure by Letters Patent of the United States—

1. In a channeling-machine, the combination with a channeling-knife and an edge-cutting knife held in normally-fixed positions while cutting along the sides of a shoe-sole, of means to impart to the edge-cutting knife a lateral movement with relation to the channeling-knife while cutting around an angle in the sole, substantially as described.

2. In a channeling-machine, the combination with a channeling-knife and an edge-cutting knife, of a movable carrier for the edge-cutting knife, means to normally maintain said carrier in a fixed position, and means under the control of the operator to move said carrier to impart to the edge-cutting knife a lateral movement with relation to the channeling-knife while cutting around an angle in the sole, substantially as described.

3. In a channeling-machine, the combination with a channeling-knife and an edge-cutting knife, of a horizontally-movable carrier for the edge-cutting knife, an adjustable

locking device to normally maintain said carrier in a fixed position and to adjust the position of the edge-cutting knife with relation to the channeling-knife, and means to release
 5 said carrier and impart thereto a lateral movement, to cause the edge-cutting knife to move laterally with relation to the channeling-knife while cutting around an angle in the sole, substantially as described.

10 4. In a channeling-machine, the combination with a movable carrier and a plurality of edge-cutting knives mounted thereon, of a pivoted lever for moving said carrier, means for shifting the carrier with relation to its actuating-lever to bring into operative position
 15 the desired edge-cutting knife, and a locking device for connecting the carrier and lever to maintain the desired edge-cutting knife in operative position, substantially as described.

20 5. In a channeling-machine, the combination with a movable carrier and an edge-cutting knife mounted thereon, of an actuating-lever to move said carrier to impart a lateral movement to the edge-cutting knife, means
 25 to permit a vertical movement of said carrier independently of its actuating-lever, and locking connections between said carrier and lever, substantially as described.

30 6. In a channeling-machine, the combination with a channeling-knife, and an edge-cutting knife, normally held in fixed positions, of a work-feeding mechanism arranged to feed the work against the cutting edges of
 35 said knives, means for moving the edge-cutting knife laterally with relation to the channeling-knife while cutting around an angle in the sole, and means under the control of the operator for stopping the work-feeding
 40 mechanism when it is desired to move the edge-cutting knife, substantially as described.

7. In a channeling-machine, the combination with a knife-carrier and a plurality of edge-cutting knives mounted thereon, means
 45 to bring one of said knives into operative position, of a horizontally-movable actuating-lever, connections between said lever and knife-carrier whereby said lever imparts to
 50 the edge-cutting knife in operative position

a lateral movement with relation to the channeling-knife, substantially as described.

8. In a channeling-machine, the combination with a knife-carrier having a plurality of edge-cutting knives mounted thereon, and
 55 arranged to turn to bring any desired knife into operative position, of a spring acting to depress said carrier, a lever arranged to impart to said carrier lateral movements, and
 60 locking connections between said carrier and lever, substantially as described.

9. In a channeling-machine, the combination with a vertically-movable swinging frame and work-feeding mechanism carried thereby,
 65 of an edge-cutting knife and its presser-foot mounted on a support adjacent to but independent of the swinging frame and means to impart to the work-feeding mechanism a vertical movement while the presser-foot of the
 70 edge-cutting knife holds the work, substantially as described.

10. In a channeling-machine, the combination with a vertically-movable head and work-feeding mechanism carried thereby, means
 75 for vertically moving said head of a channeling-knife carrier mounted upon said head to move therewith and arranged to have an independent vertical movement on said head,
 80 and a lever and connections engaging the channeling-knife carrier to impart thereto its independent movement, substantially as described.

11. In a channeling-machine, the combination with a vertically-movable frame carrying a feed-wheel, of an edge-cutting knife
 85 and presser-foot, a vertically-movable support for said knife and presser-foot, means for moving the movable frame and feed-wheel vertically, and means to maintain the support of the edge knife and presser-foot in its
 90 depressed position with the presser-foot in engagement with the work, during vertical movement of the frame and feed-wheel, substantially as described.

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

CLARENCE L. EATON.

Witnesses:

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 A. O. CLINE.