No. 640,426. Patented Jan. 2, 1900.

C. P. STANBON.

LEATHER PUNCHING MACHINE.

(Application filed Mar. 10, 1898.)

(No Model.) 3 Sheets—Sheet 1.

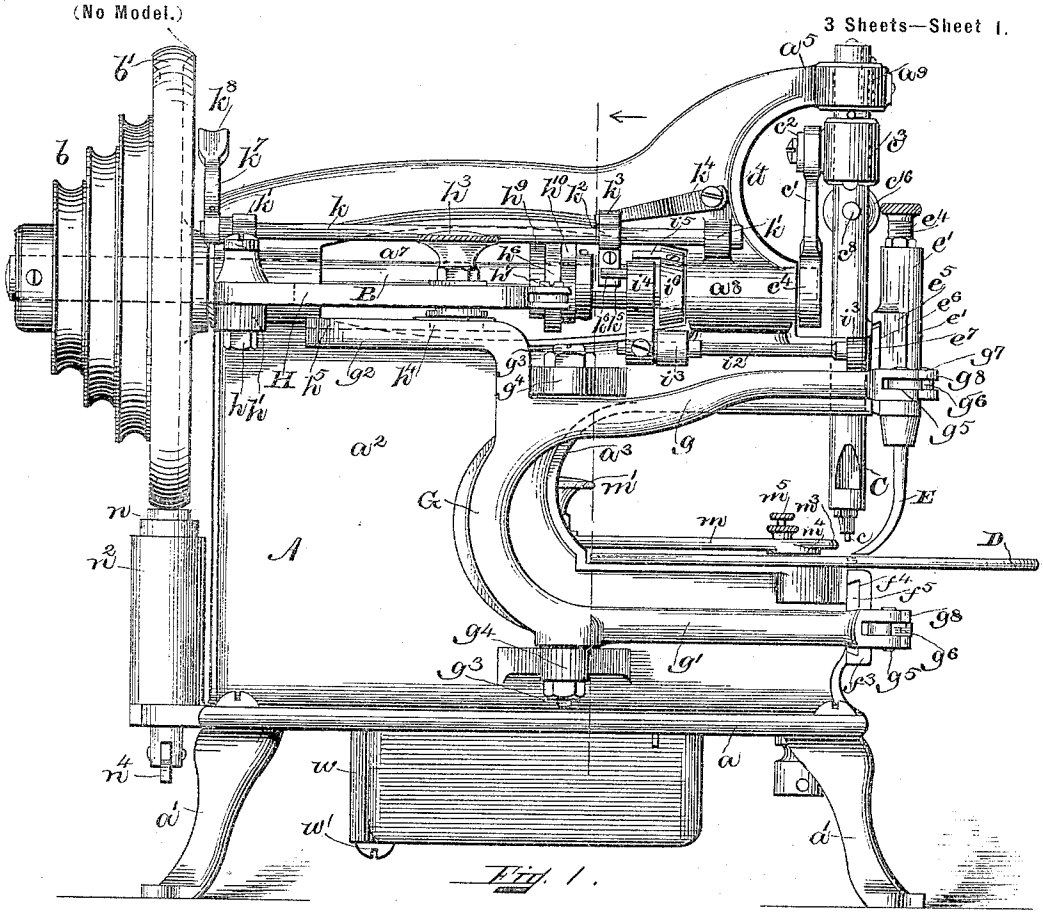


Fig. 1.

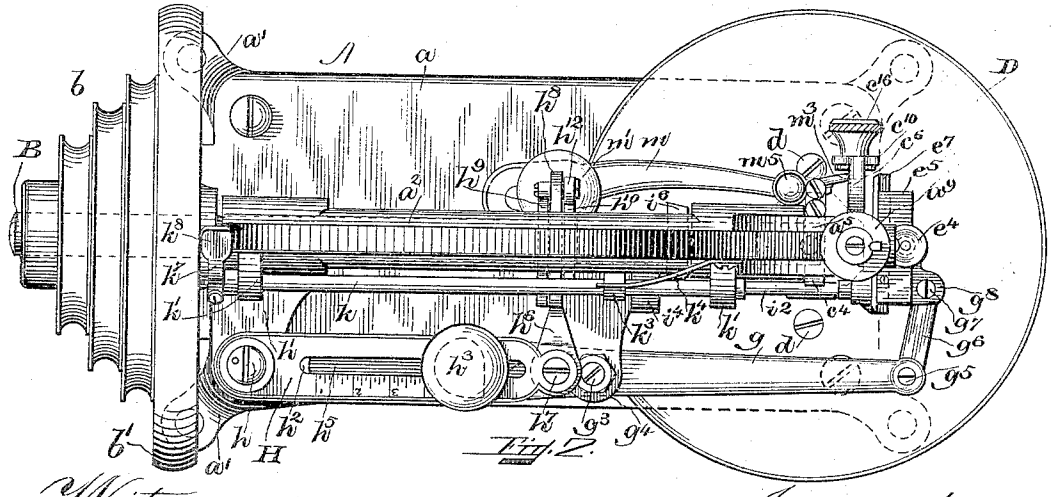


Fig. 2.

Witnesses:
C. Kitching
A. Orne

Inventor:
Charles P. Stanbon,
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Phillips & Anderson

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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(No Model.) 3 Sheets—Sheet 2.

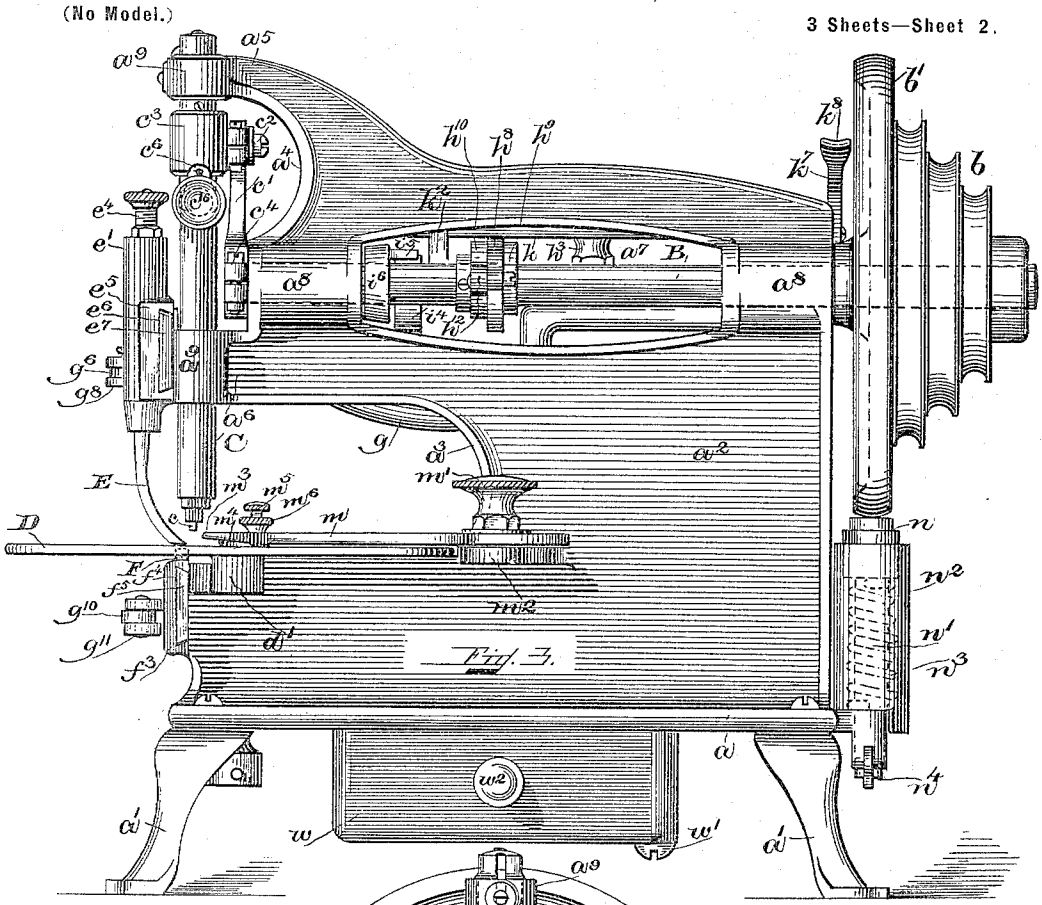


Fig. 3.

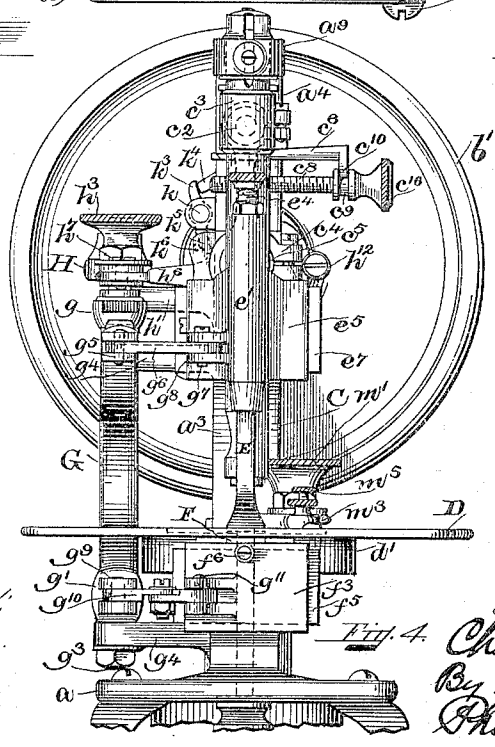


Fig. 4.

Witnesses:
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(No Model.)

3 Sheets—Sheet 3.

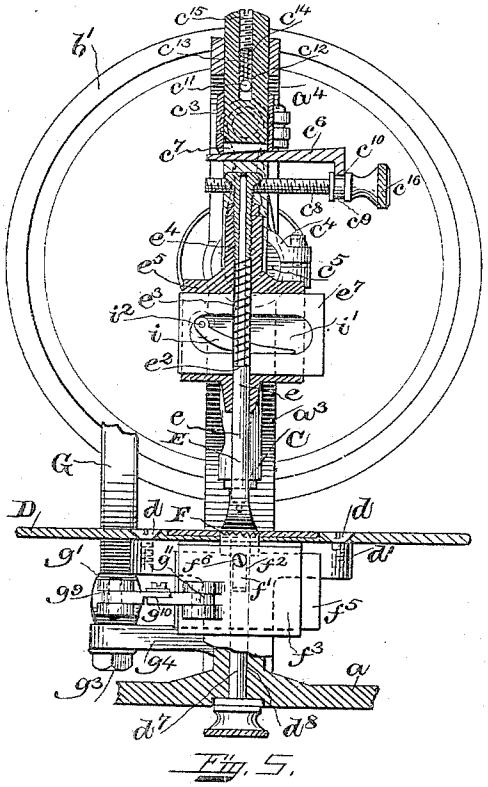


Fig. 5.

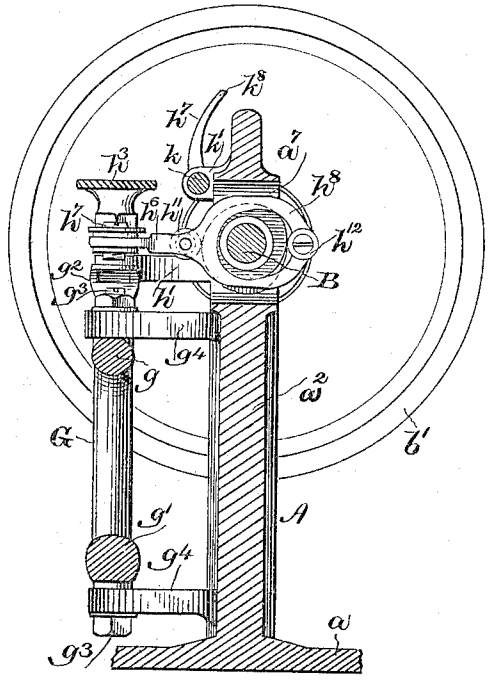


Fig. 6.

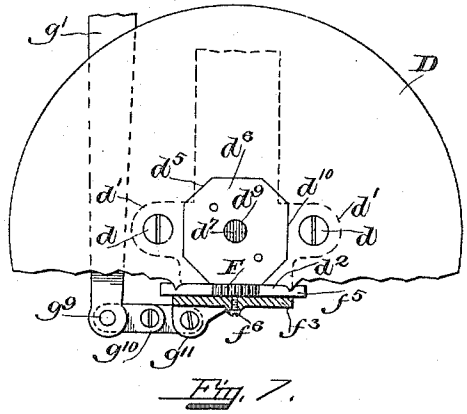


Fig. 7.

Witnesses:
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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES P. STANBON, OF LYNN, MASSACHUSETTS.

LEATHER-PUNCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 640,426, dated January 2, 1900.

Application filed March 10, 1898. Serial No. 673,387. (No model.)

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 certain new and useful Improvements in Leather-Punching 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.

The present invention relates to machines for perforating or ornamenting the parts of boots and shoes—such as tips, vamps, quarters, &c.—and it particularly relates to certain improvements of the punching and feeding mechanism of the machine disclosed in Letters Patent of the United States issued to Benjamin F. Hall, No. 535,898, on the 22d day of November, 1894.

The object of the present invention is to improve the feeding mechanism to insure a correct and uniform feeding of the work beneath the punch and to improve the operation of the machine in other particulars, which will be hereinafter noted.

To the above end the present invention consists of the devices and combination of devices which will be hereinafter described and then particularly pointed out in the claims.

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

Figure 1 represents the machine in side elevation looking at the left side thereof. Fig. 2 is a top plan view of the machine. Fig. 3 is a side elevation opposite to that shown in Fig. 1. Fig. 4 is a front elevation of the machine. Fig. 5 is a fragmentary view of details of construction, parts being in vertical section. Fig. 6 is a vertical section upon the dotted line shown in Fig. 1 looking in the direction of the arrow. Fig. 7 shows a detail of the bed of the machine and showing the construction of the lower feed-plate.

Similar letters of reference refer to corresponding parts throughout the several views.

In the drawings, A represents a frame of suitable size and shape to support the working parts, such frame comprising a base a, supported by suitable legs or standards a', whereby the machine may be secured in suitable position upon a work bench or table in convenient position for the operator.

Rising from the base a is the main frame a^2, which is cut away, as shown at a^3, forming a modified gooseneck construction, and at its upper part it is also cut away, as shown at a^4, forming the projections a^5 and a^6. The upper portion of the frame a^2 is also cut out, as shown at a^7, for a purpose to be hereinafter described. Arranged in suitable bearings a^8 in the frame a^2 is the power-shaft B, which at its rear end, outside of the bearing a^8, is provided with a suitable stepped pulley b and a connected hand-wheel b', by which power is communicated to the shaft B by a belt from any suitable source of power or by means of which the shaft B may be turned by the operator.

In suitable bearings a^9, formed in the forwardly-projected portions a^5 and a^6 of the frame a^2, is arranged for vertical reciprocation a punch-stock C, carrying at its lower end any suitable construction of punch c, arranged to punch holes in the work as it is fed beneath the same.

The punch-stock C is given a rapid vertical reciprocating movement in the bearings a^9 by means of a link c', which at its upper end is connected to a stud c^2, projecting from a collar c^3, embracing the punch-stock C, and at its lower end provided with an eccentric-strap c^4, embracing an eccentric c^5, carried by the forward end of the power-shaft B.

The material to be ornamented is supported by a suitable work-plate D, which is formed of suitable size and shape to support the material and which is secured in position upon the lower part of the frame a^2 in the cut-out portion a^3 by means of screws d, tapped into bosses d', or in any other suitable manner.

It is desirable in machines of this type to adjust the stroke of the punch-stock so that the punch carried thereby will have sufficient movement to entirely pass through the material supported upon the bed-plate in order to completely and entirely sever the piece punched from said material and at the same time to so regulate the stroke of the punch-stock that the cutting edge of the punch will

not have a too violent contact with the punching plate or bed, which would tend to injure and destroy its cutting edge.

In order to regulate the stroke of the punch-stock in the machine of the drawings, I have arranged the collar c^3 to be adjustable upon the punch-stock C, and I have provided a novel adjusting mechanism whereby the position of the collar c^3 may be accurately and quickly adjusted relatively to the punch-stock C, and thereby regulate to a nicety the stroke of the punch c.

The adjusting mechanism of the machine of the drawings comprises a wedge c^6, which is arranged to have a transverse lateral movement in a recess c^7, formed in the punch-stock C, the lower end of the collar c^3 resting upon the inclined surface of the wedge c^6, as clearly shown in Figs. 4 and 5 of the drawings. The wedge c^6 is moved to adjust the collar c^3 by means of a screw c^8, tapped into a threaded aperture in the punch-stock C and having at or near its outer end a groove c^9, embraced by a forked arm c^{10} on the outer end of the wedge c^6. The collar c^3 is held in engagement with the inclined surface of the wedge c^6 by means of a pin c^{11}, arranged in a slot c^{12}, formed in the upper end of the punch-stock C above the collar c^3, the outer ends of the pin c^{11} engaging the upper end of the collar c^3, and said pin c^{11} is acted on by a suitable spring c^{13}, which is arranged in a vertical aperture c^{14} in the punch-stock C, the upper end of which spring is acted upon by a set-screw c^{15}, as clearly shown in Fig. 5 of the drawings. The screw c^8 has a suitably-milled head c^{16}, whereby it may be turned to cause the wedge to move along beneath the sleeve c^3 and by means of which said sleeve c^3 may be raised or lowered upon the punch-stock C, and thereby adjust the connection of the punch-stock C and its actuating mechanism, whereby the movement of the punch c toward the bed-plate d may be accurately adjusted.

In order to insure the accurate feeding of the material being operated upon beneath the punch, the machine of the drawings comprises what I have termed a "feeding presser-foot" and also a coöperating feeding-dog, the presser-foot and feeding-dog being arranged upon opposite sides of the material and having a relative movement toward and from each other to grip the material therebetween and also having a simultaneous lateral movement whereby both surfaces between which the work is held move to feed the work. In the present construction the presser-foot and the feeding-dog move laterally in a horizontal plane, whereby they are held in engagement with the work during the entire lateral movement of the feeding stroke, and thereby a uniform and accurate feeding of the material is secured.

In the illustrated embodiment of the present invention the feeding presser-foot E is downwardly and inwardly bent, as shown in Figs. 1 and 3 of the drawings, and at its lower end is flared or broadened out, as shown in Fig. 4, whereby it engages a considerable portion of the material being operated upon.

The presser-foot E is provided with a shank e, which extends into a tubular bearing e', and in order that it may be yieldingly forced toward the feeding-dog, to be described, it is provided with a shoulder e^2, against which acts a coiled spring e^3, located within the bearing e', surrounding the shank e, the upper end of spring e^3 being acted upon by a tubular threaded screw e^4, by means of which the tension of the spring e^3 may be readily adjusted. The bearing e' is formed upon a slide e^5, in which is formed a dovetailed guideway e^6, said guideway embracing a dovetailed guide e^7, formed integrally with or fixedly secured to the extreme outer end of the projection a^6 of the frame a^2. The feed-dog F consists of a small block having a serrated upper edge f and a downwardly-projecting shank f', the said shank f' being received in a recess f^2 in a slide f^3, the slide f^3 having upon its rear face a dovetailed guideway f^4, embracing a dovetailed guide f^5, formed on the front of the frame a^2 below the table or work-plate D.

The table or work-plate D is provided with a slot d^2, extending transversely across the same or in the direction of the feed of the work, and the serrated upper edge of the feed-dog F is positioned in said slot to have a lateral movement along the same, with its serrated edge preferably lying in the plane of the upper surface of the work-plate D, the said feed-dog being adjustably secured by means of a set-screw f^6, which is tapped into a threaded aperture in the slide f^3 and engages the shank f^2 of the feed-dog F.

It is desirable that the presser-foot E and the feed-dog F move laterally simultaneously, and to secure such an operation of the presser-foot and feed-dog I have arranged a single mechanism to simultaneously reciprocate the slides e^5 and f^3. This mechanism consists of a lever G, which has three arms g, g', and g^2 and which is fulcrumed by means of the studs g^3 in fixed bearings g^4, projecting from the left-hand side of the frame a^2. The arm g is pivotally connected at g^5 to a short link g^6, which in turn is pivotally connected at g^7 to suitable lugs g^8 on the front of the slide e^5, and the arm g' of the lever G is pivotally connected at g^9 to a jointed link g^{10}, which in turn is pivotally connected to lugs g^{11}, formed on the face of the slide f^3. The lever G is swung on its fulcrum to impart lateral reciprocations to the slides e^5 and f^3 by means of a lever H, which is fulcrumed at h in a bracket h', projecting from the side of the frame a^2, and which is provided with a slot h^2, through which passes a set-screw h^3, which set-screw at its lower end carries a swiveling block h^4, arranged to be adjusted along a groove h^5, formed in the upper surface of the arm g^2 of the lever G.

The lever H is actuated to swing the lever G by means of a link h^6, which is pivotally connected at h^7 to the free end of the lever H and which at its opposite end is provided with an enlarged collar h^8, embracing the shaft B in the cut-out portion a^7 of the frame, between the oppositely-placed cams h^9 and h^{10}, engaging cam-rolls h^{11} and h^{12} upon opposite sides of the collar h^8, whereby the lever H is positively moved in both directions and imparts a positive movement to the lever G and through lever G to the slides e^5 and f^3, carrying the presser-foot E and the feed-dog F.

It is desirable that the presser-foot E be raised against the tension of the spring e^3 after it has completed its feed movement in order to disengage the presser-foot from the work to release the work before the presser-foot E and the feed-dog F begin their movement in the opposite direction to again engage the work preparatory to feeding it another step. In the machine of the drawings the lifting of the presser-foot is accomplished by means of a lever i, which is located in a recess i' in the slide e^5 in position to engage a projection or stud (not shown) on the shank e of the presser-foot E. The lever i is fixedly secured to a rock-shaft i^2, which is arranged in suitable bearings i^3, the forward end of the rock-shaft projecting into the recess i' of the slide e^5. Fixedly secured to the rear end of the rock-shaft i^2 is an arm i^4, which is arranged to be acted upon on each rotation of the shaft B by a finger i^5, projecting from a collar i^6, fixedly secured to the shaft B.

The spring e^3 is sufficient to force the presser-foot E in contact with the feed-dog F and hold the arm i^4 in position to be engaged by the finger i^5, which acts on said arm to raise the presser-foot and to return the presser-foot, rock-shaft, and arm to their normal positions to be again operated by the finger i^5 upon the revolution of the shaft B.

In the operation of this machine after a piece of work has been completed, in order to remove the work, if the revolutions of the shaft B have not been stopped in such position that the punch c is elevated from the material, it is customary for the operator to raise the punch-stock and punch by turning the shaft B by means of the hand-wheel b', and in the machine as heretofore constructed he would at the same time with his other hand lift the feed-point against the tension of its spring. Inasmuch as both hands of the operator were thus engaged in manipulating parts of the machine, it necessarily required him to lose control of the work, which was left free upon the work-plate, and in order to remove the work he would have to let go of the hand-wheel after raising the punch from the work. In other words, he would have to position the shaft with one hand and after having positioned it to raise the punch, release said shaft, grasp the work, and raise the presser-foot, which required quite a little time and was generally a clumsy and unhandy arrangement.

In the present invention I have provided a presser-foot-lifting mechanism so arranged that the operator can actuate the same to lift the presser-foot with the same hand and at the same time that he grasps the hand-wheel for the purpose of turning the shaft to raise the punch, leaving his other hand free to remove and renew the work. For the purpose of securing the above-suggested result the machine of the drawings comprises a rock-shaft k, which is mounted in bearings k' upon the side of the frame a^2. (See Fig. 1.) The rock-shaft k carries an arm k^2, which is fixedly secured to said rock-shaft and which at its upper end k^3 is engaged by a suitable spring k^4, the lower end k^5 of the arm k^3 being in position to engage a pin k^6, projecting from the arm i^4 of the rock-shaft i^2 when the rock-shaft k shall be rocked against the tension of the spring k^4, whereby as the rock-shaft k is rocked the lower end k^5 of the arm k^2 will engage the pin k^6, projecting from the arm i^4, moving the arm i^4 outwardly, and thus rocking the shaft i^2 to raise the presser-foot E. In order to rock the shaft k, there is fixed to its rear end a lever k^7, which is immediately adjacent to the hand-wheel b' and at its upper end has a suitable thumb-piece k^8, which is in position to be engaged by the operator by the thumb of the hand by which he grasps the hand-wheel b', and thus the hand-wheel b' may be turned to raise the punch-stock C and the lever k^7 depressed to elevate the presser-foot E at the same time.

The work-plate D, which is preferably made of steel or cast-iron, is cut away, as shown at d^5, adjacent the slot d, and in the recess thus formed is placed a plate of soft metal d^6, preferably brass or other suitable metal, the plate d^6 being secured in the recess d^5, with one side forming one boundary of the slot d, by means of a rod d^7, which passes through an aperture d^8, (see Fig. 5,) and the upper end of said rod is provided with a threaded portion engaging a threaded aperture d^9 in the plate d^6. The plate d^6 may be circular or any other suitable shape desired; but, as shown in Fig. 7 of the drawings, I prefer to form the plate d^6 polygonal in outline, having a plurality of straight sides d^{10}, whereby to accommodate a punch having more than a single punching-point, and whereby the surface against which the punch acts when it becomes worn may be shifted by turning the plate d^6 to thus bring a new surface under the punch.

By arranging the punching-plate so that it forms one side of the slot in the work-bed I am enabled to bring the point at which the punch operates close to the point at which the work-feeding devices engage the material, thereby rendering it much easier for the machine to form the ornamentations on curved lines, the close approximation of the feeding devices and the punch rendering the mate-

rial easy to be turned while working along a curved line.

m represents a suitable guide or gage, which at its rear end is provided with a slot, (not shown,) through which passes a set-screw m', by means of which the gage m is adjustably secured to a lug m^2, projecting from the side of the frame a^2. (See Fig. 3.) At its forward end the gage m has a projecting finger m^3 and a rounded boss m^4 below said finger, the edge of the material being operated upon being positioned beneath the finger m^3 and against the boss m^4. By loosening the set-screw m' the gage m may be positioned upon the work-plate D at any suitable point relatively to the punch and presser-foot, and in order to adjust the height of the finger m^3 above the upper surface of the work-plate D to accommodate the same to different thicknesses of material I have provided an adjusting-screw m^5, which is tapped into a threaded bearing in the outer end of the gage m, the lower end of which bears against the upper surface of the work-plate D and by means of which the outer end of the gage m may be raised and lowered as desired. The adjusting-screw m^5 is engaged by a lock-nut m^6, whereby the screw m^5 is prevented from turning and the desired adjustment of the gage m retained.

In the operation of the machine power is supplied to the pulley b by a belt from a counter-shaft, which counter-shaft is controlled by a suitable clutch actuated by a foot-treadle, and in order to stop the revolution of the shaft B when the clutch of the counter-shaft is released I have provided a suitable brake n, carried by the upper end of a plunger n', fitted in sleeve n^2, fixed to the base a of the frame a^2, said plunger within the sleeve being acted upon by a spring n^3 (see dotted lines, Fig. 3) and connected at its lower end to a lever n^4, which lever is connected by means (not shown) with the clutch-controlling treadle of the counter-shaft, the arrangement being such that when the operator depresses the treadle to start the machine the plunger n' will be depressed to remove the brake n from contact with the hand-wheel, but when the operator releases the treadle to throw off the clutch the spring n^3 will immediately throw the brake in contact with the hand-wheel b' to stop the rotation of the shaft B.

In the operation of the present invention the piece of work to be perforated or punched is superimposed upon the bed-plate D, with its edge against the boss m^4 of the gage m and engaged by the presser-foot and feed-dog. A rotation of the shaft B will now through the link c' impart a series of vertical reciprocations to the punch-stock C and punch c, causing it to punch a series of apertures in the fabric. At the same time the presser-foot and feed-dog will, by means of the mechanism hereinbefore described, alternately release and grip the material and impart thereto an intermittent feeding motion laterally beneath the punch c.

The machine, if desired, may be provided with a box w, which is pivoted by a screw w' to the under side of the machine and arranged to swing in and out beneath and beyond the base, said box being provided with a suitable knob w^2, whereby it may be turned upon its pivot.

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

1. In a leather-punching machine, the combination with a feed-dog and a feed presser-foot, of slides carrying said dog and presser-foot, a forked lever pivotally connected to both slides, and means to actuate said lever to simultaneously reciprocate the slides, substantially as described.

2. In a leather-punching machine, the combination with a feed-dog and a feed presser-foot, of slides carrying said dog and presser-foot, a forked lever pivotally connected to both slides, means to actuate said lever to reciprocate the slides, and an adjustable connection between said lever and its actuating means, substantially as described.

3. In a leather-punching machine, the combination with a punch-stock, of a collar surrounding said punch-stock, a screw-actuated wedge carried by the punch-stock and forming a rest or support for the lower end of the collar, spring-controlled devices acting upon the upper end of the collar and means connected with said collar to reciprocate the punch-stock, substantially as described.

4. In a leather-punching machine, the combination with a punch-stock and a power-driven shaft and connections to reciprocate said punch-stock, of a yielding vertically-movable presser-foot, a hand-wheel on the power-shaft for turning said shaft to raise the punch-stock and a lever located adjacent to the hand-wheel and connected to the presser-foot, whereby the presser-foot can be raised as the hand-wheel is turned to raise the punch-stock, substantially as described.

5. In a leather-punching machine, the combination with a punch-stock and means to vertically reciprocate it, of a feeding presser-foot arranged in front of the punch-stock, a horizontally-reciprocating slide carrying said presser-foot, a feed-dog located beneath said presser-foot, a horizontally-reciprocating slide carrying said feed-dog, a forked lever pivotally connected with the slides of the presser-foot and feed-dog and means to actuate said forked lever, substantially as described.

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

CHARLES P. STANBON.

Witnesses:

T. HART ANDERSON,

A. E. WHYTE.