

(No Model.)

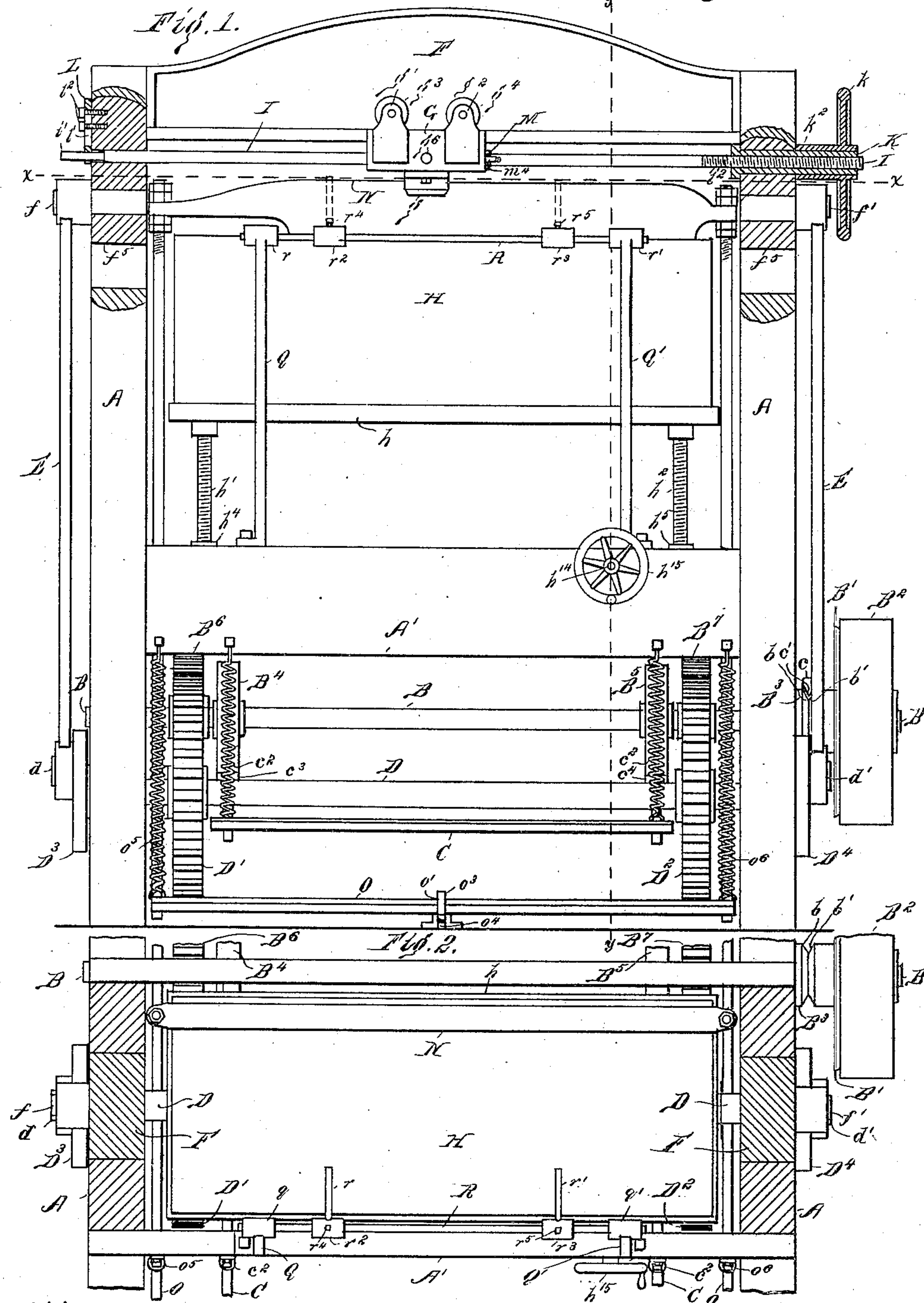
2 Sheets—Sheet 1.

W. C. JAMES.

LEATHER CUTTING MACHINE.

No. 368,672.

Patented Aug. 23, 1887.



Witnesses—

Henry Hyde.
Olive H. French

INVENTOR—

Willard C. James,
By Albert M. Moore,
His Attorney.

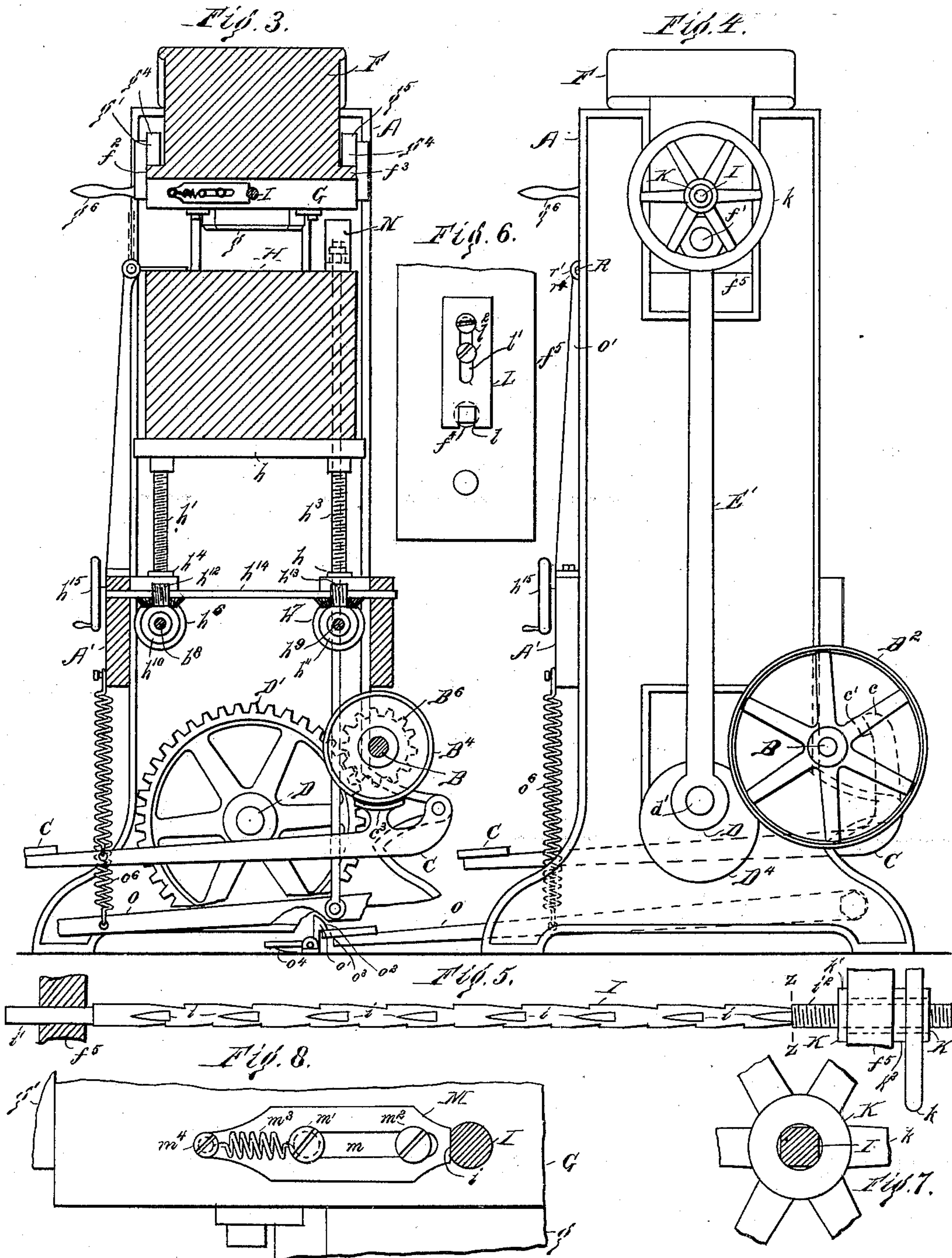
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Oliver H. French.

INVENTOR—

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UNITED STATES PATENT OFFICE.

WILLARD C. JAMES, OF BOSTON, MASSACHUSETTS.

LEATHER-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 368,672, dated August 23, 1887.

Application filed December 10, 1886. Serial No. 221,176. (No model.)

To all whom it may concern:

Be it known that I, WILLARD C. JAMES, of Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Machines for Cutting Leather into Blanks, of which the following is a specification.

My invention relates to machines for cutting leather into blanks; and it consists of the combination and devices, hereinafter described and claimed, for clamping the leather and spacing and gaging the blanks.

In the accompanying drawings, Figure 1 is a front elevation of a machine constructed in accordance with my invention; Fig. 2, a horizontal cross-section on the line $x x$ in Fig. 1; Fig. 3, a vertical section on the line $y y$ in Fig. 1; Fig. 4, a right-side elevation of such machine; Fig. 5, a side elevation in detail of the spacing-rod and of the means used to adjust the same longitudinally; Fig. 6, a left-side elevation of the spacing-rod and its supporting-bracket; Fig. 7, a vertical section on the line $z z$ in Fig. 5; Fig. 8, a side elevation of the cutting-block and the gaging mechanism and a cross-section of the spacing-rod.

The frame is represented by A, clutch-shaft by B, friction-clutch by B' B², part B² of which is also a driving-pulley, which runs loosely on the shaft B and has a constant motion imparted to it by a suitable belt. (Not shown.) The other part, B', splined onto said shaft and turning with it, is capable of sliding thereon. A collar, B³, is secured to said shaft B, the part B' and the collar B³ being beveled at their adjacent outer edges, at $b b'$, to form a V-shaped groove when these parts are in contact, to allow a finger, c , provided with a V-shaped end, c' , and forming a part of the treadle or lever C, to enter between them and to press them apart when the front end of said treadle is depressed by the foot of the operator, to cause the clutch part B' to slide and engage its counterpart B² and rotate the shaft B, the clutch being uncoupled by springs (not shown) in the usual manner. The springs c^2 raise the treadle C when the foot of the operator is removed therefrom. The brake-pulleys B⁴ B⁵ are secured to the shaft B, and the brake-shoes $c^3 c^4$ are secured to the treadle C and press against said brake-pulley (when said treadle C is not depressed) to stop the motion of the shaft B. These parts

are all of the usual operation and of any usual suitable construction.

Secured to the shaft B are pinions B⁶ B⁷, which engage gears D' D² on the main shaft D and cause the latter shaft to revolve when the treadle C is depressed, in the usual manner. Secured to the ends of the main shaft D are crank-wheels D³ D⁴, provided with wrist-pins $d d'$, the latter being connected by pitman-rods E E' to studs $f f'$, which project from opposite sides of the sliding head F and cause said sliding head to have a reciprocating vertical motion when the shaft D is revolved, in the usual manner.

The cutting die or knife g , instead of being fastened to the head F in the usual manner, is secured to a knife-block, G, which is arranged below said head and which has a horizontal traverse thereon, said head being provided with lateral flanges $f^2 f^3$, and the knife block or carriage G being provided with vertical ears $g' g^2$, which reach up outside of said flanges and overlie the same to support said knife-block upon said head. To facilitate the motion of said knife-block upon said head the upper ends of said ears are, preferably, provided with anti-friction rolls $g^3 g^4 g^5$, which rest upon said flanges. This construction allows the knife-block, with the knife, to be moved after each descent of the head F to cut another blank without moving the leather or other stock, which, while being cut, rests upon the cutting-block H, the upper or cutting surface of which is horizontal or at right angles to the path of the head F. The cutting-block is vertically adjustable in the usual manner, the block proper being generally of wood and resting upon a horizontal metallic plate, h , to the under side of which are secured, near each end thereof, vertical screws $h' h^2 h^3$, (one screw of one pair not being shown,) the lower ends of which pass through threaded holes in horizontal bevel-gears $h^4 h^5$, (two being shown,) which engage with other bevel-gears, $h^6 h^7$, on the parallel horizontal shafts $h^8 h^9$, each of which shafts $h^8 h^9$ has two such gears (only one being shown on each shaft in Fig. 3) and one worm-wheel, $h^{10} h^{11}$, which engages a worm, h^{12} , secured to a horizontal shaft, h^{14} , arranged at right angles to the shafts $h^8 h^9$ and supported in the frame A and provided with a crank and hand-wheel, h^{15} , by means of which said shaft

h^{14} may be turned to adjust the block H to the cutting-edges of the die or knife g when the head F is in its lowest position.

To enable the cutting-knife to be moved rapidly over the stock and caused to descend in the proper place to cut each blank as near as possible to the place from which the next preceding blank was cut, and thus to avoid waste, I use a spacing-rod, I, generally cylindrical, but provided with straight rows of notches i , Fig. 5, one side of each notch being at about right angles with the axis of said rod and the other side of said notch being slightly inclined to said axis, as shown in Fig. 5, one end, i' , of which spacing-rod is square in cross-section (the flat side of the square portion of said spacing-rod being in line with the rows of notches) and slides in a round hole, f^4 , in a downhanging bracket, f^5 , Fig. 6, secured to said head F, and the other end of which rod is provided with a screw i'' , which engages a screw-thread formed in the sleeve K, said sleeve being provided with a hand-wheel, k , by means of which it is rotated in the bracket f^5 , also secured to said head F. The sleeve K is prevented from longitudinal motion in said bracket f^5 by the shoulder k' on one side of said bracket and by the collar k^2 on the other side thereof, so that turning said sleeve slides said rod I endwise, said rod being prevented from turning by a square notch, l , in the lower end of the plate L, the latter being provided with a vertical slot, l' , through which a screw or stud, l^2 , is passed into the bracket f^5 , said notch l embracing the square end of said rod I. After sliding the plate L upward until the holding-notch l is clear of the rod I, the latter may be rotated on its axis, for a purpose to be explained. The gage-plate M is preferably of sheet metal and is provided with a longitudinal slot, m , through which pass two cap screws or studs, m' m^2 , into one side of the knife-block, the heads of said screws being of greater diameter than the width of the slot m and retaining the gage-plate on the knife-block and allowing it to slide thereon in a horizontal direction at right angles to the path of said knife-block. The rear end of the gage-plate is straight and vertical, and is forced against the spacing-rod by the contraction of the spiral spring m^3 , attached at one end to the front end of said gage-plate by a stud or screw, m^4 , the other end of said spring m^3 being attached to the stationary screw m' .

The gage-plate may be drawn forward out of contact with the spacing-rod by grasping the stud or screw m^4 . When the knife-block is descending, the rear end of the gage-plate rests in the bottom of one of the notches of the spacing-rod—against the short side of said notch.

It is evident that the gage-plate will not prevent the knife-block from being moved along over the spacing-rod toward the square end of said rod—that is, to the left in Fig. 5—because the longer slightly-inclined sides of

the spacing-notches, or notches in the spacing-rod, will force the gage-plate forward; but when the knife-block is attempted to be moved in the other direction (from left to right in Fig. 5) the rear end of the gage-plate will strike against the short side of a spacing-notch and prevent the motion of said knife-block, rendering it necessary to draw the gage-plate forward (to the left in Fig. 8) before moving the knife-block to the right. All the spacing-notches of the same row are of equal length and are arranged at equal intervals from each other, the distance between the short side of any spacing-notch and the short side of the next spacing-notch of the same row being equal to the proper distance apart of successive cuts of the knife. The distance from the short side of one spacing-notch to the short side of the next spacing-notch, though constant in the same row of spacing-notches, differs in different rows of the same, one row being intended to gage one kind of blanks—as, for instance, soles—another to gage half-soles, and another to gage heel-lifts, and so on, or the different rows of spacing notches may be arranged to gage properly different-sized blanks of the same kind.

In order that the spacing-rod may be removed from the machine and another substituted for it, the screw-thread portion of said rod is of larger diameter than the diameter of the rest of the rod, so that by raising the plate L said rod may be turned and drawn out through the sleeve K to the right in Fig. 5 and a new rod passed through said sleeve from right to left, square end first. This allows of a large number of spacing-rods, each designed for different kind of blanks, being used in the same machine. The principal object, however, of screw-threading one end of the spacing-rod and of using the internally-threaded sleeve K and hand-wheel k is to adjust the spacing-rod longitudinally, so that after the leather or other stock has been clamped in the machine the knife-block may be brought into such a position with its gage-plate resting against the short side of one of the spacing-notches, as above described, as to bring the first cut of the knife in the most advantageous position and as near the edge of the stock as possible, and cut a complete blank.

Before operating the machine it is necessary to clamp the stock firmly upon the cutting-block. In this machine the cutting-block serves as one jaw of the clamp, the other being a bar, N, the lower edge of which is straight and parallel to the cutting-surface of said block, and the ends of which bar are attached to connecting-rods which extend downward inside of the frame A and are pivoted at their lower ends to a treadle or lever, O, the latter being pivoted at its rear end to the frame A back of said connecting-rods P, the front end of said treadle extending for some distance in front of the machine. The leather or other stock, being placed upon

the cutting-block, is clamped between said block and the clamping-bar N by depressing the front end of the treadle O, which is held down by a catch, *o*, pivoted to the floor of the workshop in front of said treadle, said catch being a bell-crank lever, the vertical arm of which is provided with a backwardly-projecting hook, *o'*, and above said hook is beveled or inclined at *o''* in such a manner that when the treadle O is depressed upon the inclined part *o''* the catch or lever *o* will be turned on its pivot and the hook will be thrown forward until the treadle passes below the hook, which is then thrown forward over the tread *o''* of said treadle O by a spring, *o''*, which presses the lower horizontal arm of the catch upward, said spring being attached to the floor or to the stand which supports said catch *o*. Upon pressing the foot upon the front horizontal arm of said catch *o*, the treadle is released and drawn upward by springs *o''* *o''*, connecting said treadle O and frame A, above said treadle. After cutting across the side of leather or other sheet of stock, it is necessary to unclamp the stock and to place the remainder thereof in a suitable position to cut a second row of blanks therefrom. As a matter of economy it is desirable to cut the second row of blanks as near as possible to the front edge left on the stock after cutting the first row of blanks. To accomplish this it is necessary to use a removable gage or stop, against which the front edge of the stock may be placed while being clamped, and it is also necessary that said stop should be removed from the surface of the cutting-block before the cutting is begun.

Q Q' represent vertical standards or rods secured to the cross-girt A' of the frame A. These standards are provided at their upper ends with suitable bearing sleeves, *q* *q'*, to receive a horizontal rod, R, and to allow the same to turn freely therein.

To the rod R are secured fingers *r* *r'*, which are provided with sleeves *r''* *r'''*, to surround the rod R, and with set-screws *r''* *r'''*, which turn radially in said sleeves and thrust against said rod and hold the fingers at any desirable distance apart. The height of the rod is sufficient to allow the fingers *r* *r'* to rest horizontally upon the top of the cutting-block when the latter is in position for cutting, and the length of the fingers is just sufficient to reach the line taken by the front edge of the knife in cutting a row of blanks. The gage-fingers *r* *r'* are turned up over out of the way of the knife by turning the rod R before starting the machine. The gage-fingers should be at such a distance apart as to bring their free ends against like points or notches of the stock after the first cut—that is to say, the distance apart of the fingers should be equal to the width or some multiple of the width of the blanks being cut.

In practice the stock or leather is first clamped as nearly as may be in the proper position upon the cutting-block with the as-

sistance of the gage-fingers *r* *r'*, the spacing-rod is adjusted as above described, and the machine is set in operation by depressing the treadle C. After the first blank is cut, the operator, by means of the handle *g''*, with which the knife-block G is provided, moves the knife-block to the left until the gage-plate springs into the second spacing-notch, and then crowds said knife-block to the right to hold said gage-plate against the short side of said notch, and this he does, without stopping the machine, with his hand upon said handle *g''* until a row of blanks is cut from the stock, whereupon he stops the machine by taking his foot from the treadle C, allowing the same to rise, as above described.

Obviously the gage-plate M is in effect a pawl, and may be made to operate by gravity if placed above the spacing-rod, thus dispensing with the spring *m''*.

I claim as my invention—

1. The combination of the cutting-block, the clamping-bar, a treadle, connecting-rods jointed to the ends of said bar and to said treadle in front of the pivot or fulcrum of said treadle, and a catch adapted to engage the said treadle and to hold the same depressed to clamp stock between said bar and said cutting-block, a cutting knife or die, and a reciprocating head carrying said knife or die, as and for the purpose specified.

2. The combination of the reciprocating head, the knife-block, the knife or die secured to said knife-block and traveling with said knife-block on said head at right angles to the path of said head, a cutting-block arranged with its cutting-surface at right angles to the path of said head, the clamping-bar arranged parallel to the said cutting-surface, a treadle, connecting-rods jointed to the ends of said bar and to said treadle between the ends thereof, and a catch adapted to engage said treadle and to hold the same depressed, as and for the purpose specified.

3. The combination of the reciprocating head, the knife-block adapted to slide on said head at right angles to the path thereof, a die or knife supported on said block, a cutting-block, a spacing-rod supported on said head and provided with one or more rows of spacing-notches, each of said spacing-notches having one side at about right angles to the axis of said rod and another side slightly inclined to said axis, and a gage-plate or pawl secured to said knife-block and free to slide thereon, and adapted to engage said notches, and by resting against the sides of said notches which are at right angles to the axis of said rod to gage the distance between the successive cuts of said die or knife, as and for the purpose specified.

4. The combination of the reciprocating head, the knife-block adapted to slide on said head at right angles to the path thereof, a die or knife supported on said knife-block, a cutting-block, a spacing-rod supported on said head and provided with one or more rows of

spacing-notches, each of said notches having one side at about right angles to the axis of said rod and the other side slightly inclined to said axis, a gage-plate or pawl secured to said knife-block and free to slide thereon, and a spring connected to said gage-plate or pawl and to said block and forcing said gage-plate or pawl against said spacing-rod and into engagement with said notches, as and for the purpose specified.

5. The combination of the head provided with a bracket having a hole, the spacing-rod turning in said hole and provided with spacing-notches and having a square or flat sided portion, and having, also, external screw-threads, a sleeve having an internal screw-thread adapted to engage the screw-thread on said rod, said sleeve turning, without advancing, in another bracket with which said head is provided, a plate movably secured on said head at right angles to said spacing-rod and provided with a notch adapted to engage the flat-sided portion of said spacing-rod and to prevent the turning of said rod, a die or knife, a knife-block supporting said knife and movable on said head parallel with the axis of said spacing-rod, and a gage or pawl movably supported on said knife-block and adapted to engage said spacing-notches, whereby said spacing-rod may be adjusted longitudinally by the turning of said sleeve to adjust said knife-block and knife with reference to stock clamped below the same to bring the first cut of said knife at the edge of said stock, as and for the purpose specified.

6. The combination of the head provided with a bracket having a hole, the spacing-rod turning in said hole and provided with spacing-notches and having a square or flat sided portion, and having an enlarged externally-screw-threaded portion, a sleeve having an internal

screw-thread adapted to engage the screw-thread on said rod and supported in another bracket with which said head is provided, and a plate movable on said head and provided with a notch adapted to engage the flat-sided portion of said spacing-rod to prevent the turning of the same and to be disengaged from said rod to allow said rod to be turned in said sleeve and to be withdrawn therefrom, as and for the purpose specified.

7. The combination of the knife, the knife-block having a gage or pawl, the head on which said knife-block is movable and which is provided with brackets having holes, the spacing-rod provided with two or more rows of spacing-notches adapted to be engaged by said pawl and to gage the distance between successive cuts of said knife, the distance between the spacing-notches of the same row being constant and different from the distance between the spacing-notches of any other row, said spacing-rod turning in said holes in said brackets and having a flat-sided portion provided with as many flat sides as there are rows of spacing-notches, and a plate movable on said head and having a notch adapted to engage said flat-sided portion of said rod and to prevent the same from turning and to be disengaged from said rod to allow the same to be turned to bring a different row of notches into position to receive said pawl, and thereby to vary the spaces between the successive cuts of said knife, as and for the purpose specified.

In witness whereof I have hereunto set my hand, this 19th day of November, A. D. 1886, in the presence of two subscribing witnesses.

WILLARD C. JAMES.

Witnesses:

ALBERT M. MOORE,
HERBERT R. WHITE.