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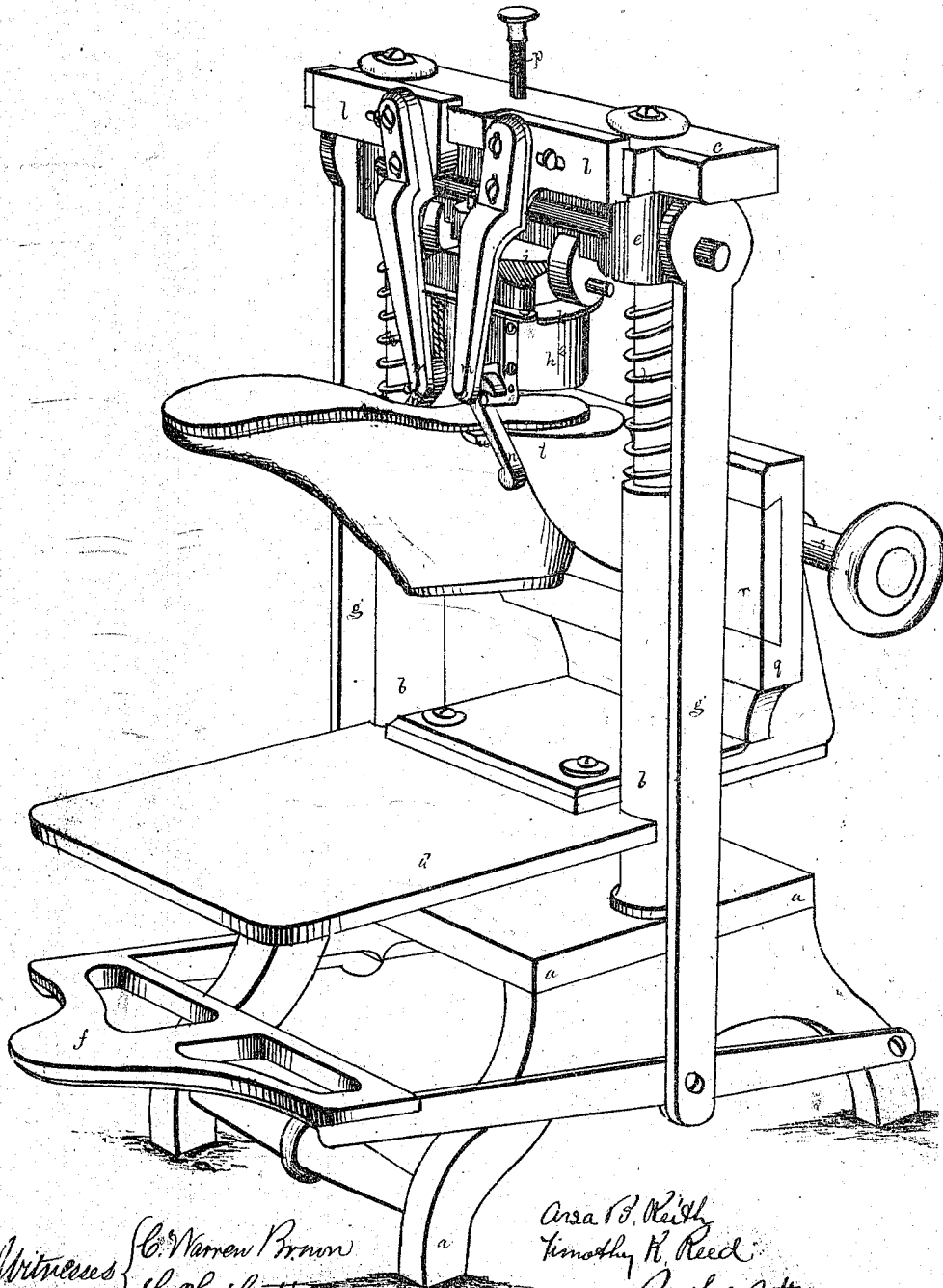
PATENTED JUNE 21, 1870.

A. B. KEITH & T. K. REED.

MACHINE FOR SHAVING HEELS OF BOOTS OR SHOES.

2 SHEETS—SHEET 1.

*Fig. 1.*



Witnesses { C. Warren Brown  
L. H. Latimer.

Asa B. Keith  
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By their Attys  
Crosby, Halsted & Gould

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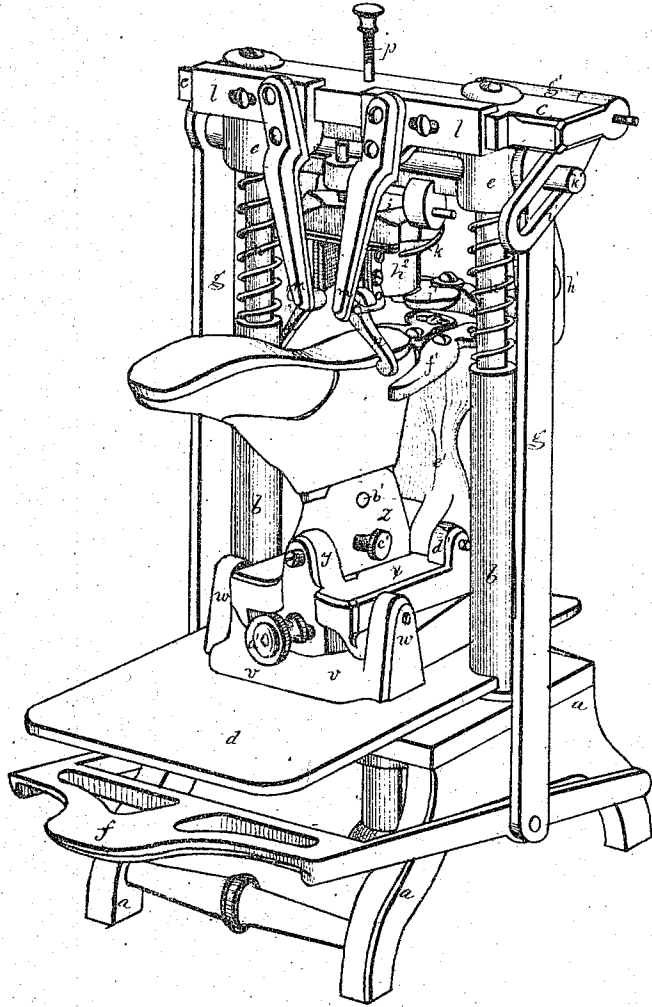
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MACHINE FOR SHAVING HEELS OF BOOTS OR SHOES.

2 SHEETS—SHEET 2.

Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## IMPROVED MACHINE FOR SHAVING HEELS OF BOOTS AND SHOES.

Specification forming part of Letters Patent No. 104,599, dated June 21, 1870.

*To all whom it may concern:*

Be it known that we, ARZA B. KEITH, of North Bridgewater, and TIMOTHY K. REED, of East Bridgewater, all in the county of Plymouth and State of Massachusetts, have invented, jointly, Improvements in Machines for Shaving Heels upon Boots and Shoes; and we do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of our invention sufficient to enable those skilled in the art to practice it.

This invention relates to certain improvements by which, when heels are fixed in position upon boots and shoes, we are enabled to shave or cut them to the proper curvilinear outline by the action of a cutter moving from the tread toward the heel-seat, or vice versa, the cutter operating at one cut around the entire curved boundary of the heel.

In the drawings, Figure 1 represents in perspective our improved machine, having one kind of jack or holder for presenting and holding a boot or shoe to the action of the cutter; and Fig. 2 is a similar view of the same machine, showing a different form of jack or holder designed for the same purpose.

The cutting apparatus used in this machine consists of a curved knife, the edge of which is in the general form of the letter U, the knife being made in two parts hinged together in the sharp bend of the curve. This knife is attached to a holder, which holder is secured to a cross-head which can be made to move up and down, carrying with it the knife, which cuts the superfluous leather from the outside of the curved part of the heel submitted to its operation. The knife-holder is so attached to the cross-head that it may be adjusted to give any desired rake or slant to the rear part of the heel. The knife being in two parts hinged together, can spread and contract, so as to cut the heel broader at the heel-seat than it is at the tread, and devices are introduced to cause the knife to spread or open as it descends and to contract during and because of its upward motion.

The frame of the machine is made up of a base, *a*, standards *b*, which also serve as guides, and a cross top piece, *c*. In the base *a* is a vertical screw on an adjustable rod, to the top of which the movable table *d* is fixed, said ta-

ble being guided and steadied by contact with the standards *b*, the object of said table being to receive and support the shoe-holding mechanism at the proper height.

The cross-head *e* is fitted on the standards *b*, so that it can be moved up and down thereupon, and is guided thereby, the downward movement of the cross-head being effected by power applied to the treadle *f*, which is connected to the cross-head by links *g*. The upward movement of the cross-head is produced by the reaction of springs *h*, which are compressed in the descent of the cross-head.

The cutter *per se* it is not necessary to describe especially, as it is not novel and was shown in the United States Patent No. 6,095, and there described as arranged to cut heels before they were attached to boots and shoes. The cutter is represented by *k* in the drawings.

The cutter-carrier *i* is pivoted to the cross-head *e*, and may be adjusted and fixed in position by set-screws passing through the cross-head and bearing upon the cutter-carrier. The hinge-pivot of the knife or cutter is secured in the cutter-carrier, and the ends of the knife are held so as to keep them from dropping away from the carrier by a bar, *j*, secured to the carrier, there being slots in the ends of the cutter into which said bar extends. Springs *k* are applied from the cutter-carrier *i* to the cutter, which by their reaction contract the spread of the knife as it is raised. On the cross-bar *c* are fitted adjustable slides *l*, to each of which is adjustably attached an arm, *m*, the lower end of which serves to support a piece, *n*, which is pivoted to *m*.

The purpose of the pieces *n n* is to indicate the width of the shoe near the heel-seat, at about the breast of the heel, and to form guides by which the ends of the knife are expanded or separated as it makes its cutting-stroke. On the outer part of each end of the knife is fixed a piece, *o*, which on the first part of the downward movement of the cutter forces the piece *n*, with which it is in contact, against the side of the boot or shoe held in the jack, or against part of the jack, and then, as the cutter continues its downward movement, the pieces *o*, sliding over pieces *n*, cause the spreading or expansion of the cutter. The upper part of each arm *m* is made as the short arm of

a bent lever, and when the cutter is elevated the pieces *o*, by striking against said short arms, throw the pieces *n* outward away from the boot or shoe, affording room for its removal and for the entrance of another.

The distance to which the edge of the cutter can be moved downward can be limited by the adjustable nut on the end of rod *p*, said rod passing through the cross-pieces *e*, and being fixed in the cross-head *e*.

For the purpose of presenting and holding a boot or shoe with a rough heel upon it, to be trimmed to shape by the cutter, there may be, as seen in Fig. 1, fixed to the table *d* a right-angular piece, *g*, in which, as in guideways, are fitted a pair of slides, *r*, which have nuts projecting through the back side of *g*, there being in one nut threads of a reverse though equal pitch to the threads in the other nut, so that a right-and-left threaded and equally-pitched screw-shaft, *s*, will, by rotation in one or the other direction, separate or move toward each other jaws *t*, which are fixed to or form part of slides *r*. Said jaws *t* are made to fit the rear or counter part of the boot or shoe to be operated upon, and any number of pairs may be fitted to the machine to suit different sizes and shapes of boots and shoes, and different cutters may also be applied to the cutter-carrier to suit different sizes of heels.

The upper inner edges of the jaws *t* are made to fit in the crease between the rear part of the sole and the counter of the shoe and protect the latter from the action of the cutter; and, if desired, may form a bed on which the cutter-edge may act in severing the superfluous leather from the rear outline of the sole. The cutter being elevated, the outer ends of the pieces *n* will be spread apart from the shoe, and, the jaws *t* being open, a shoe may be introduced between them, and then clamped by them in position where the rough heel on such shoe will be trimmed on its curvilinear outline by descent of the cutter, the pieces *o* sliding down on the pieces *n* and expanding the cutter. By adjustment of the pieces *n* the width of the heel may be varied. Instead of allowing the pieces *n* to come into contact with the boot or shoe counter, they may come into contact with projections *u*, made on or fixed to the jaws *t*.

In Fig. 2 the cutting apparatus is the same as that shown in Fig. 1, but the jack or holder differs in construction from that shown in Fig. 1. The base-plate *x* of this jack rests loosely on the table *d*, and has pivoted to ears *w* a piece, *x*, which is adjustable at its rear, as to height or angle, by an adjusting-screw. In the center line of the piece *x*, at right angles to the line of the pivot-centers in the ears *w*, are two ears, *y*, to which a last-block, *z*, is pivoted, a part of said block extending below the pivots, and having in said part a nut, by which and a screw, *d'*, working therein, the angle of the last-block can be changed with reference to the top of table *d* and the base of the piece *v*, the piece *x* being slotted where screw *d'* passes through it. The top of the last-block

is slotted to receive a tongue formed on the throat of the last.

In the last-block is pivoted, at *b'*, a pin that enters a hole formed in the last, a part of the pin extending in an opening in said block below the pivot at *b'*, there being in said part a nut in which a clamp-screw, *c*, works through a slot in the last-block, said screw affording means for adjustment of the last-pin as to its angular relation to the groove in the top of the last-block.

At the rear of piece *x* is pivoted to ears *d'* a swinging arm, *e'*, to the top of which are pivoted caliper-arms *f'*; so arranged that they may be adjusted to any desired opening. All of these varied provisions for adjustment of the last holding and supporting mechanism are made so that shoes or boots mounted on variously-fitted lasts may be accurately presented to the action of the cutting-knife. The same kind of jack may also be used to present a boot or shoe mounted on a last to the action of other mechanisms designed to operate on the soles or heels of boots or shoes. With this jack the clamping and holding jaws *t*, (seen in Fig. 1,) which enter between the sole and the counter, are dispensed with, and the caliper-arms *n* operate directly on the counter, or on the sole-edge at the shank part: In Fig. 2 is shown a rocker, *g'*, to one arm, *h'*, of which is attached a stop, *j'*, which is preferably forked, the purpose of said stop being to serve as an abutment with which the heel comes into contact, so as to determine its position relative to the cutter. The other arm, *i'*, which is fixed to the rocker *g'*, is slotted, and a pin, *k'*, fixed in the cross-head, operates to move the stop *j'* back out of the path of the cutter as the cutter and cross-head move down, the stop being restored to its position when the cross-head rises. When lasts are to be supported by their necks, we propose and practice making a series of any number of lasts, within reasonable limits of variation in size, of uniform height from the crown of the ball and heel to the supporting-surface of the neck, and then make the distance from the rear of each last of the series to the last pin-hole or other indicator of longitudinal position with reference to the last-holder the same in all the lasts, so as to avoid need for adjustments of the last-holder. To keep such lasts from lateral swaying on the last-holder, equal tongues or projections may be made on the lasts and a groove or depressions in the last-holder, or vice versa; or the necks may be made of equal size to fit in a socket formed in the last-holder, or vice versa; but where lasts are made at random, with holes for last-pins bored without system and without measurement or guidance, as is the customary practice, then some one or several or all of the provisions for adjustment of the last are very useful, if not absolutely necessary.

The jaws *f'* are designed for use with the other adjustments of the jack (shown in Fig. 2) only when the lasts used are not fitted uni-

ormly, and said jaws then indicate to the operator that he is to make the proper adjustments of the jack necessary to enable the counter-part of the boot or shoe to enter freely between jaws *f'*, which, with the action of the moving jaws *n n* and the abutment of the rear of the rough heel against stop *j'*, will insure proper presentation of the heel to the action of the cutter. The relation between the pivot holding the two parts of the knife and the two jaws *t t*, by which the boot or shoe is held, is such as to insure the cutting of the heel so as to leave it central on the sole, the jaws *t t* approaching to and receding equally from the vertical longitudinal plane passing through the knife-pivot.

We claim—

1. A heel-cutting machine having the following elements in combination, viz: a jack (or last and boot and shoe support) arranged to hold a boot or shoe, with a heel fixed thereto, properly under the action of the cutter, and a curved-edged knife arranged to cut at the same time all around the curvilinear boundary of the heel, nearly at right angles to the tread of the heel.

2. In such a machine provided with an expanding curvilinear-edged knife, the arrangement of caliper-arms *n n*, so as to bear upon the sole or the counter, or clasps around the counter, and in vicinity of the breast of the heel when projections from the knife bear upon said arms and govern the degree of expansion of the knife.

3. The combination of the caliper-arms *n n* with adjustable supports, by which the degree of expansion of the knife may be varied.

4. The caliper-arms *n n*, constructed with short arms or projections, and combined with the projections *o o* from the cutter, by which said arms are held open, for the purpose specified.

5. The combination, with a jack-supporting table adjustable toward and from the cutter, of a jack adapted to hold and support a boot or shoe having a rough heel fixed thereto, so as to present it to the action of the cutter arranged to cut entirely around the curvilinear boundary of the heel in a direction substantially at right angles to the tread.

6. The combination, with a curved-edged knife arranged to shape the curvilinear boundary of a heel fixed upon a boot or shoe by a cut directed substantially at right angles to the tread of the heel, of clamping-jaws arranged to close and open to seize and hold a boot or shoe around the counter, whether provided or not with a ledge or projection entering the crease between the counter and the sole.

Executed May 18, 1876

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