

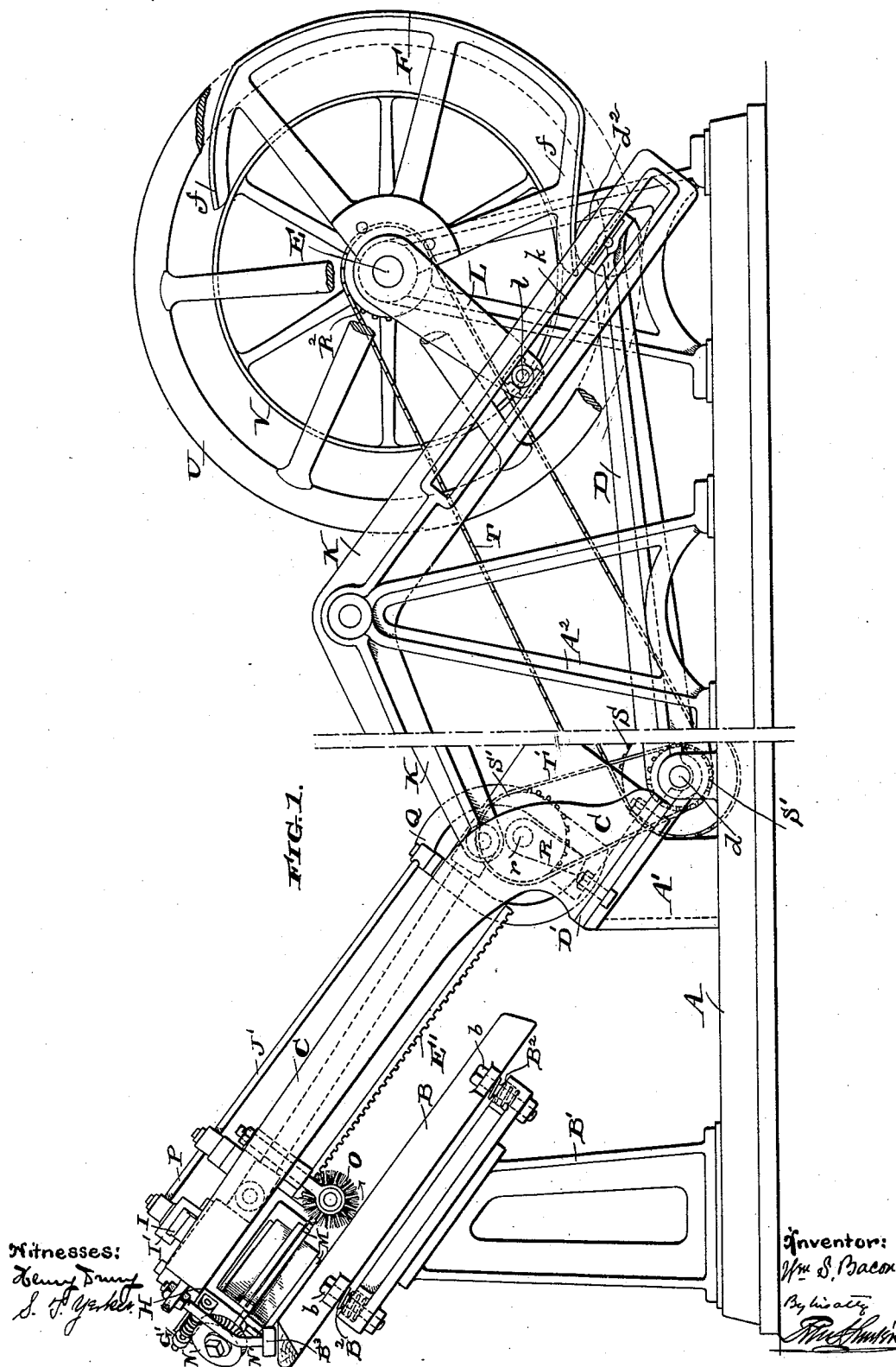
(No Model.)

4 Sheets—Sheet 1.

W. S. BACON.
LEATHER SHAVING MACHINE.

No. 463,592.

Patented Nov. 17, 1891.



(No Model.)

4 Sheets—Sheet 2.

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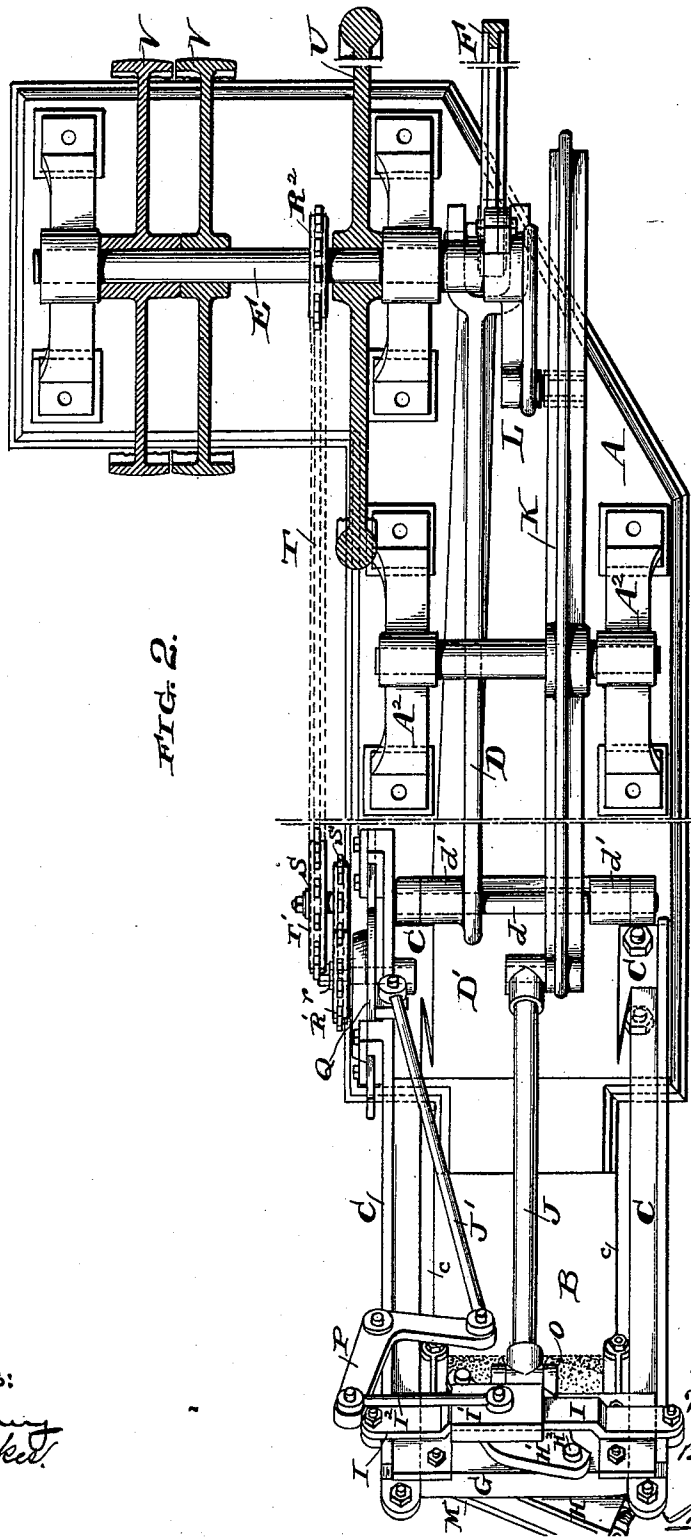


FIG. 2.

Witnesses:
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Inventor:
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By *his atty*
W. S. Bacon

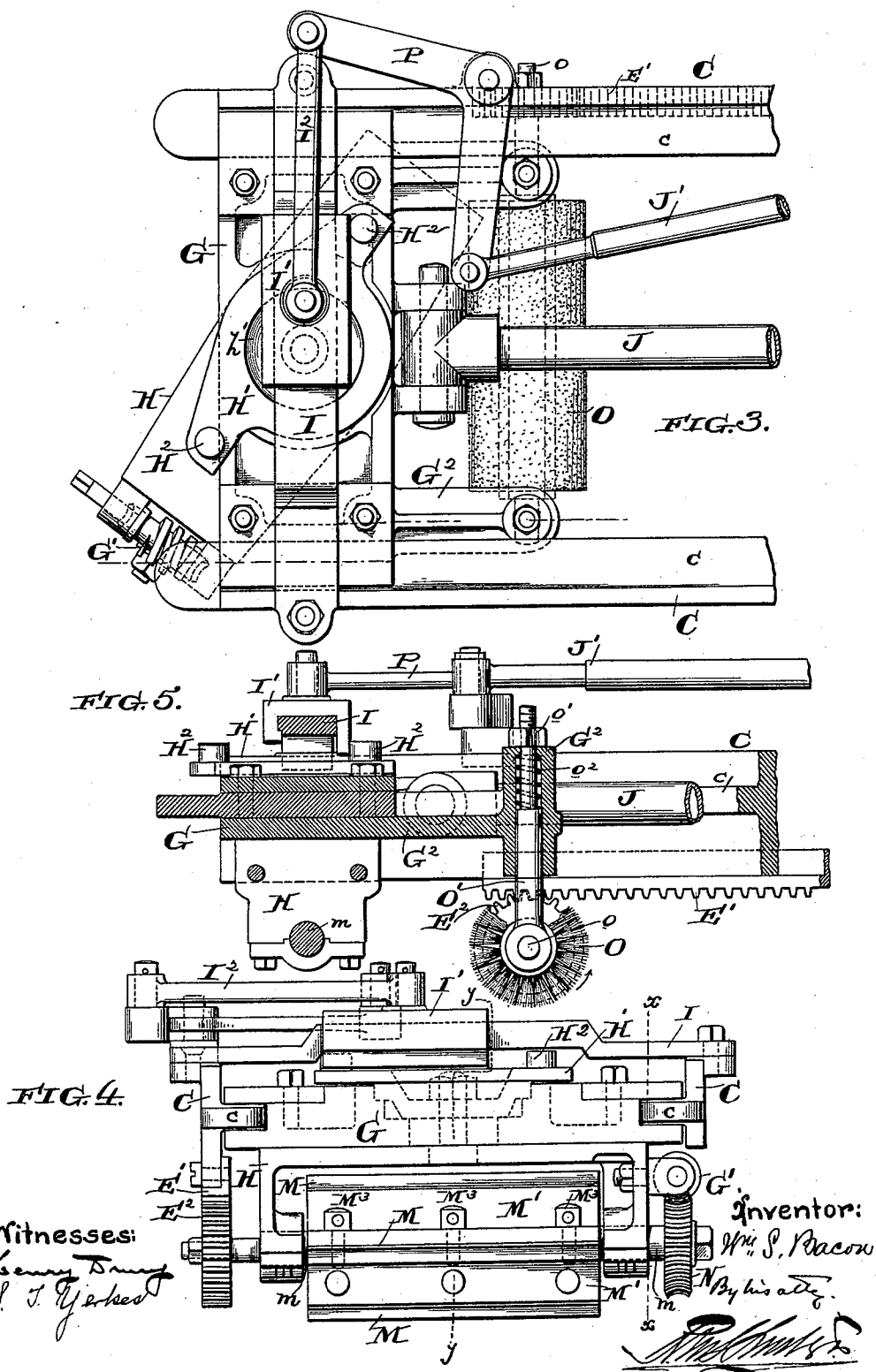
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4 Sheets—Sheet 3.

W. S. BACON.
LEATHER SHAVING MACHINE.

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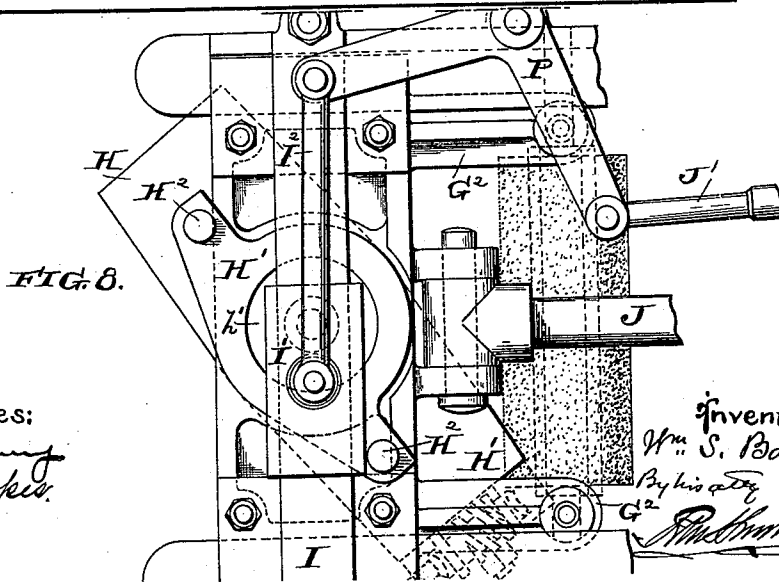
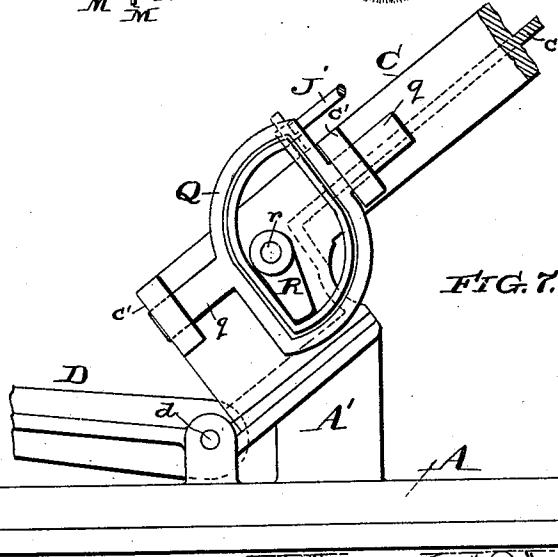
Patented Nov. 17, 1891.



4 Sheets—Sheet 4.

No. 463,592.

Patented Nov. 17, 1891.



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UNITED STATES PATENT OFFICE.

WILLIAM S. BACON, OF PHILADELPHIA, PENNSYLVANIA.

LEATHER-SHAVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 463,592, dated November 17, 1891.

Application filed February 14, 1891. Serial No. 381,440. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. BACON, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Leather-Shaving Machines, of which the following is a specification.

My invention relates to leather-shaving machines; and it consists of certain improvements which are fully set forth in the following specification and are shown in the accompanying drawings, which form a part thereof.

In the preparation of leather for the various manufactures into which it enters it is necessary to shave the surface of the skin to reduce it to an even thickness and to produce a smooth surface. This process is usually performed by hand shaving-tools of a peculiar construction, which are drawn by the operator over the surface of the skin to produce a gradual and even cutting of the surface. It is particularly desirable that this cutting or shaving should be diagonally across the surface of the skin in what is technically known in the art as a "snide" cut. This hand-shaving is slow and highly expensive, and does not produce perfectly satisfactory results, even with expert operators, since the hand process renders it extremely difficult to shave the skin to an even thickness throughout, as the skin before shaving is materially uneven in thickness.

Machines have been devised for shaving leather, but they have been unsatisfactory, and have not produced the smooth surface obtained by hand shaving. Such machines have usually employed rotary cutting-knives, which were passed over the surface of the skin, and these rotary cutters produce an irregular or slightly-roughened surface, which is highly objectionable.

The object of my invention is to accomplish by means of machinery the shaving of the skin in a manner similar to that now accomplished by the hand tools, whereby the gradual and continuous snide cut of the hand-tool may be made with much greater rapidity and with consequent cheapness. A great advantage is also obtained from the employment of a machine over the hand operation, in that the amount or depth of each cut is uniform, and consequently the skin may be shaved to a perfectly uniform thickness.

In carrying out my invention I employ a suitable support or table for the skin to be treated and a shaving-knife, which is moved over the table in contact with the surface of the skin. The knife-holder is supported in a suitable carrier, which is reciprocated in guides to move the knife over the surface of the skin. To raise the knife during its return or backward reciprocation after each cut, the guiding-frame in which the carrier is guided is lifted by suitable cam mechanism during the backward reciprocation or return of the carrier, and thus the knife is raised clear of the surface of the skin. Upon the completion of the backward reciprocation the frame is again lowered or dropped to bring the knife again in contact with the surface of the skin. To accomplish the diagonal or snide cut, I prefer to support the knife-holder in the carrier diagonally, so that it moves in this diagonal position over the surface of the skin. By means of suitable trip mechanism the position of the knife-holder may be shifted after each reciprocation back and forth, so as to throw the knife-frame into the opposite diagonal position. The angle of the cut may thus be varied with each operation and great uniformity in the shaved surface of the skin may be obtained in consequence.

My invention also relates to certain improved constructions and novel combinations of parts, which are hereinafter more fully described and claimed.

While my invention is particularly suited to the shaving of leather, it may be used for a variety of other purposes without in any way departing from the principles of the invention. In leather working it may be used for the purpose of removing the hair from the skin, or for the operation of "fleshing" or removing the thin covering of flesh after the depilatory process has been carried out. These are steps in the art of preparing skins for the leather manufactures distinct from the ordinary shaving of the tanned skin, and my invention is equally adapted to them.

In the drawings, Figure 1 is a side elevation of my improved leather-shaving machine. Fig. 2 is a plan view of the same. Fig. 3 is a plan view, on an enlarged scale, of a portion of the machine, showing the knife-holder and carrier, and the trip for shifting the knife-

holder. Fig. 4 is an end view of the same, with the knife-holder turned in a straight position. Fig. 5 is a longitudinal sectional view of the same on the line $x x$ of Fig. 4. Fig. 6 is a longitudinal sectional view on the line $y y$ of Fig. 4. Fig. 7 is a side elevation of the cam mechanism for operating the knife-holder trip; and Fig. 8 is a plan view similar to Fig. 3, showing the knife shifted to the opposite position or angle.

A is the main frame of the machine.

B is the table or support for the skin, which is carried, preferably, in an inclined position upon an upright B' . In practice the face of this table may be made of glass or other suitable material having a smooth and hard surface.

B^2 are spring-supports between the table and the upright B' , whereby the table B may yield slightly under pressure. The tension of these springs B^2 may be adjusted by means of adjusting-screws b . This adjustment serves also to raise or lower the table. B^3 is a clamping rim or strip of wood or other suitable material upon the upper edge of the table, upon which the skin is clamped during the shaving operation.

C C are two guiding-frames, extending over the table B and carried at their lower ends by the lever D, which is pivoted in the main frame A, as at d . In the drawings I have shown these guiding-frames bolted to a plate or extension D' , which is carried by the lever D and is provided with sleeves d' , journaled upon the shaft d . It is immaterial to my invention, however, in what particular manner this connection between the guiding-frames C C and the lever D is made.

The frame A carries one or more supports A' to support the frames C C in their lowermost position.

E is the main driving-shaft of the machine. F is a cam carried thereby for actuating the lever D, the end of which is held in contact with the cam by the weight of the frames C C and the devices carried thereby. This cam F depresses the free end of the lever D, thereby raising the frames C C, which are carried by the lever. I prefer to form the ends f of the cam F tapering, as shown in Fig. 1, so that the movement of the frames C C will be gradual. The lever D may be provided upon its free end with a roller d^2 , to reduce the friction between the cam F and lever D.

G is a reciprocating carrier or frame carried by the guiding-frames C C and movable longitudinally upon guides $c c$ therein.

H is a knife-holder pivoted, as at h , to the reciprocating carrier G.

H' is a trip-plate carried by the pivot h above the frame or carrier c , so as to be moved with the knife-holder H. This trip-plate is provided with two pins or stops H^2 , located upon relatively opposite sides of the center line of the plate.

I is a shuttle bar or guide carried by the

frames C C and arranged above the sliding carrier or frame G.

I' is a slide or shuttle movable upon the shuttle-bar I and guided thereon. The slide or shuttle I' is adapted to be moved successively into the path of the two pins H^2 upon the trip-plate H' .

I prefer to form the plate H with a counter-sinking recess h' to receive the head of the pivot h and to permit the slide I' to pass freely over it. (See Fig. 6.)

J is a connecting-rod pivotally connected with the sliding frame G and with the bell-crank K. The bell-crank K is pivoted in an upright A^2 of the main frame A.

L is a crank-arm carried by the shaft E, and having a pin l , guided in a slot k in the bell-crank K. The crank-arm L rocks the bell-crank K and reciprocates the frame G longitudinally in the guides $c c$.

The cam F and the crank-arm L are so arranged with reference one to the other that the former operates to raise the guiding-frames C C during the upward or return reciprocation of the frame C, and to lower them during the downward or forward reciprocation.

M are the shaving-knives, of which one or more may be used, as desired. If a single knife is employed it may be connected with the knife-holder H in any convenient manner. To permit a changing of the knife whenever it may be desired without stopping the operation of the entire machine, I prefer to employ the construction shown in the drawings. This consists of a knife-clamp M' , carried by a shaft m , mounted in the knife-holder H. Carried by this clamp M' are a series of knives M, disconnectably clamped therein by means of the clamping-jaws M^2 and screws M^3 .

N is a worm-wheel upon the end of the shaft m .

G' is a worm journaled in the knife-holder H and engaging with the worm-wheel N, so that by turning this worm G' the shaft m may be rotated to bring a new knife M into operative position. By this means a series of knives may be employed and the operative knife may be changed when desired.

G G are worms upon the frame G, in which is journaled a brush O immediately in front of the knife M. This brush O is preferably carried upon a shaft o , journaled in vertical slides O' , carried by the arms G^2 , and adjustable therein by means of adjusting-screws o' and springs o^2 .

E' is a rack upon one of the guiding-frames C.

E^2 is a pinion upon the shaft o of the brush O gearing with the rack E. As the frame G is reciprocated in the guiding-frames C C the pinion E turns in the rack E' , thereby rotating the brush O.

The knife-holder H is turned into successively opposite angular positions by means of

the shuttle or slide I', which is moved successively into position before the different stops H² H² of the trip-plate H'. This trip is preferably operated after each complete back and forth reciprocation of the carrier G.

P is a bell-crank pivoted to one of the frames C.

I² is a connecting-rod connecting the bell-crank P and the shutter or slide I'.

J' is a connecting-rod connecting the other end of the bell-crank P with a cam-yoke Q.

R is a crank working within the cam-yoke Q to operate it and carried upon a shaft r.

The shaft r is operated from the driving-shaft E by means of suitable power-transmitting connections.

R' and R² are sprocket-wheels, respectively, upon the shafts r and E.

S and S' are sprocket-wheels upon the shaft

d. Power is transmitted from the sprocket-wheel R² to the sprocket-wheel S and shaft d by means of a chain T, and from the sprocket-wheel S' to the sprocket-wheel R' and the shaft r by means of a chain T'. By a proper regulation of these power-transmitting devices the shuttle or slide I' will be operated once upon every back and forth reciprocation of the frame G. The cam-yoke Q is guided in its movement by means of extensions or arms q working in guides c' c' upon the frame C. (See Fig. 7.)

U is a fly-wheel carried by the main shaft E.

V and V' are respectively the tight and loose driving-pulleys.

N', Fig. 2, is a clamp carried by the front end of the frames C C for clamping the skin upon the clamping-rim B³ of the table B during the shaving operation.

It is obvious that the mere details of construction which have been shown may be varied without departing from the principles of the invention.

The operation of the machine is as follows:

The shaft E may be rotated sufficiently to cause the cam F to depress the lever D and raise the frames C C to permit the skin to be operated upon to be placed upon the table B and spread over the smooth surface thereof. The machine is now put into operation and when the cam F passes from the end of the lever D the frames C C are dropped, allowing the knife to come in contact with the surface of the skin to be operated upon. The skin is clamped in position between the rim B³ of the table and the clamp N'. The knife M in contact with the surface of the skin is in the diagonal position, as heretofore described, to produce the desired snide cut. The knife is held in position during the cutting operation by the friction between the knife-holder and movable frame G. It is obvious, however, that snap-catches may also be employed for this purpose, if desired. Through the operation of the crank-arm L the bell-crank K is rocked, drawing forward the frame G upon the guides c c of the guiding-frames C C. The knife M moves forward in the diagonal posi-

tion in contact with the surface of the skin stretched upon the table B and shaves it with a diagonal or snide cut in a manner similar to the present hand shaving. The brush O is simultaneously moved over the surface of the skin immediately in front of the knife M, brushing the skin and preparing it for the action of the knife. The rack E' and pinion E² cause the brush O to rotate in the direction in which the knife M moves or away from the moving knife, as is indicated by the arrow in Fig. 1. When the frame G has been moved to its lowest position by the bell-crank K and crank-arm L, having carried the knife M over the surface of the skin to complete one downward cut, the cam F acts upon the lever D and raises the guiding-arms C C, lifting the frame G and moving the knife M from contact with the skin. The arms C C are held in this raised position by the action of the cam F upon the lever D during the period of time that the frame G is being reciprocated back by the crank-arm L and the bell-crank K, and until it is returned to its highest position, when the cam F passes from the lever D and allows the frames C C to drop back with the knife M in contact with the skin. During the upward movement of the frame G the clamp N' is raised from the clamping-rim B³, releasing the skin and permitting its position upon the table B to be shifted by the operator, so as to present a new surface to the action of the knife. During the reciprocation of the frame G the slide or shuttle I has been moved upon the shuttle-bar I' by the action of the power-transmitting devices, and the connecting mechanism described from one side of the bar to the other, as from the position shown in Fig. 3 to that shown in Fig. 8, or vice versa. This movement brings the shuttle I' in the path of the opposite pin or projection H² of the trip-plate H', and as the frame G is moved under the bar I this pin strikes the shuttle I' and shifts the position of the knife-holder H in the manner shown. The operation is then repeated as before. The shuttle I' and its operative mechanism thus constitute a trip for shifting the position of the knife after each back and forth reciprocation. Whenever it may be desired, the operative knife may be changed by turning the worm G', so as to rotate the clamp M'.

For the purpose of shaving leather, the knives M may be similar to those now employed in hand shaving-tools having a turned-over knife-edge, the character of which is well known in the art.

When the machine is used for other purposes, knives of a different character may be used, as the particular work in hand may require. Such a substitution does not involve a departure from my invention.

Having now described at length the nature of my invention and its mode of operation, what I claim as new, and desire to secure by Letters Patent, is as follows:

1. In a machine for shaving leather, &c.,

the combination of a support for the material to be operated upon, a knife, a holder therefor to hold the knife in a fixed position during its reciprocation arranged obliquely to the line of movement, and a trip to trip said holder and change its angle of obliquity after each back and forth reciprocation, power-transmitting devices to reciprocate said holder whereby the knife may be moved over the surface of the material upon the support in an oblique position and shifted after each back and forth reciprocation.

2. In a leather-shaving machine, the combination, with a support for the leather, of a frame arranged above said support and provided with guides and fixed against longitudinal movement, cam mechanism to successively raise and lower said frame, a reciprocating knife holder or carrier guided in said frame, and means to reciprocate the knife-holder therein independently of the movement of the frame, whereby the knife-holder is reciprocated in the guides of said frame and the frame is successively raised and lowered during said reciprocation to move the knife-holder to and from the table.

3. In a leather-shaving machine, the combination of a pivoted lever D, carrying the guiding-frames C C, the reciprocating carrier G, carrying the knife, means to reciprocate the carrier G in the guiding-frames C C, and a cam F, acting upon the lever D to intermittently depress it and raise the guiding-frames C C and the carrier G.

4. In a machine for shaving leather, &c., the combination of a support for the material to be operated upon, a knife, a holder therefor, guides for said holder, and means to reciprocate said holder back and forth to move the knife over the material upon the support, consisting of a bell-crank K, having the slot *k*, connecting-rod J, connecting the bell-crank with the holder, and crank-arm L, having pin *l* moving in the slot *k*.

5. In a machine for shaving leather, &c., the combination of a supporting-table, guiding-frames arranged over said table, cam mechanism to raise and lower said frames, a clamp carried by said frames, a knife-holder and its knife also carried by said frames and free to reciprocate therein, and means to reciprocate said knife-holder in the frames, whereby said clamp and knife are raised and lowered from and to the supporting-table simultaneously with each other with the raising and lowering of the guiding-frames.

6. In a machine for shaving leather, &c., the combination of a support for the article to be operated upon, a reciprocating knife-holder movable over said support, a knife carried by said knife-holder, and a rotating brush arranged adjacent to and in front of the knife and rotating in the direction of the movement of said knife on a transverse axis to its line of movement.

7. In a machine for shaving leather, &c., the combination of a support for the article to be

operated upon, a reciprocating frame movable over said support, guiding-frames for said reciprocating frame, a knife carried by said reciprocating frame, a brush also carried by said movable frame and arranged in front of and adjacent to said knife, a rack carried by said guiding-frame, and a pinion gearing with said rack carried by said brush, whereby the brush is rotated in the direction of the travel of said reciprocating frame and knife during its reciprocations.

8. In a machine for shaving leather, &c., the combination of a support for the article to be operated upon, guiding-frames arranged over said support, a reciprocating frame guided in said guiding-frames, means to reciprocate said reciprocating frame, a knife-holder pivoted to said reciprocating frame and adapted to assume an oblique position with reference to the line of its reciprocation, a knife carried by said holder, a trip-plate carried by said pivoted holder, and a trip to operate said trip-plate and shift the position of the knife after each back and forth reciprocation thereof.

9. In a machine for shaving leather, &c., the combination of a support for the article to be operated upon, guiding-frames arranged over said support, a reciprocating frame guided in said guiding-frames, means to reciprocate said reciprocating frame, a knife-holder pivoted to reciprocating frame and adapted to assume an oblique position with reference to the line of its reciprocation, a knife carried by said holder, a trip-plate carried by said pivoted knife-holder, provided with pins or projections $H^2 H^2$ upon relatively opposite sides, a shuttle-bar I, carried by said guiding-frames, a shuttle I', guided upon said shuttle-bar, and mechanism to shift said shuttle after each back and forth reciprocation of the reciprocating frame.

10. In a machine for shaving leather, &c., the combination of a support for the article to be operated upon, guiding-frames arranged over said support, a reciprocating frame guided in said guiding-frames, means to reciprocate said reciprocating frame, a knife-holder pivoted to said reciprocating frame and adapted to assume an oblique position with reference to the line of its reciprocation, a knife carried by said holder, a trip-plate carried by said pivoted knife-holder provided with pins or projections $H^2 H^2$ upon relatively opposite sides, a shuttle-bar I, carried by said guiding-frames, a shuttle I', guided upon said shuttle-bar, a cam-yoke Q, connecting mechanism between said cam-yoke and shuttle, a crank R to reciprocate said cam-yoke, and power-transmitting devices to rotate said crank-arm, substantially as and for the purpose specified.

11. In a machine for shaving leather, &c., the combination of a support for the material to be operated on, guides located above said table and fixed against lateral movement with reference thereto, a frame guided therein, means to reciprocate the frame in right lines

back and forth over the table in the guides, a knife carried by said frame in an oblique position relatively to its line of movement, and a trip to intermittently trip said knife and change its angle of obliquity.

12. In a machine for shaving leather, &c., the combination of the supporting-table B, the reciprocating frame G, movable over said table, a knife-holder H, carried by said frame G, a knife-clamp M', carried by said knife-holder H and journaled therein, a series of knives carried by said knife-clamp, a worm-wheel N, carried by the knife-clamp, and a worm G' gearing therewith carried by the holder H, substantially as and for the purpose described.

13. In a leather-shaving machine, the combination of a guide-frame, a holder guided therein, a knife carried by said holder, means to reciprocate said holder and its knife, pins

or projections carried by said knife-holder, and a trip adapted to be moved in front of said pins or projections to shift the position of the knife-holder and its knife.

14. In a leather-shaving machine, the combination, with a reciprocating frame and means to reciprocate it, of a pivoted knife-holder carried thereby and provided with projections H² H², a knife carried by said knife-holder, and the shuttle I, movable successively from the path of one of the projections H² to the path of the other projection H² during the reciprocations of the reciprocating frame.

Intestimony of which invention I have hereunto set my hand.

WILLIAM S. BACON.

Witnesses:

OGDEN T. CHRISTY,
H. B. LUFFBERRY.