

F. A. LOCKWOOD.

Machinery for Scouring, Glassing, and Setting
Leather.
No. 157,691. Patented Dec. 15, 1874.

Fig. 2.

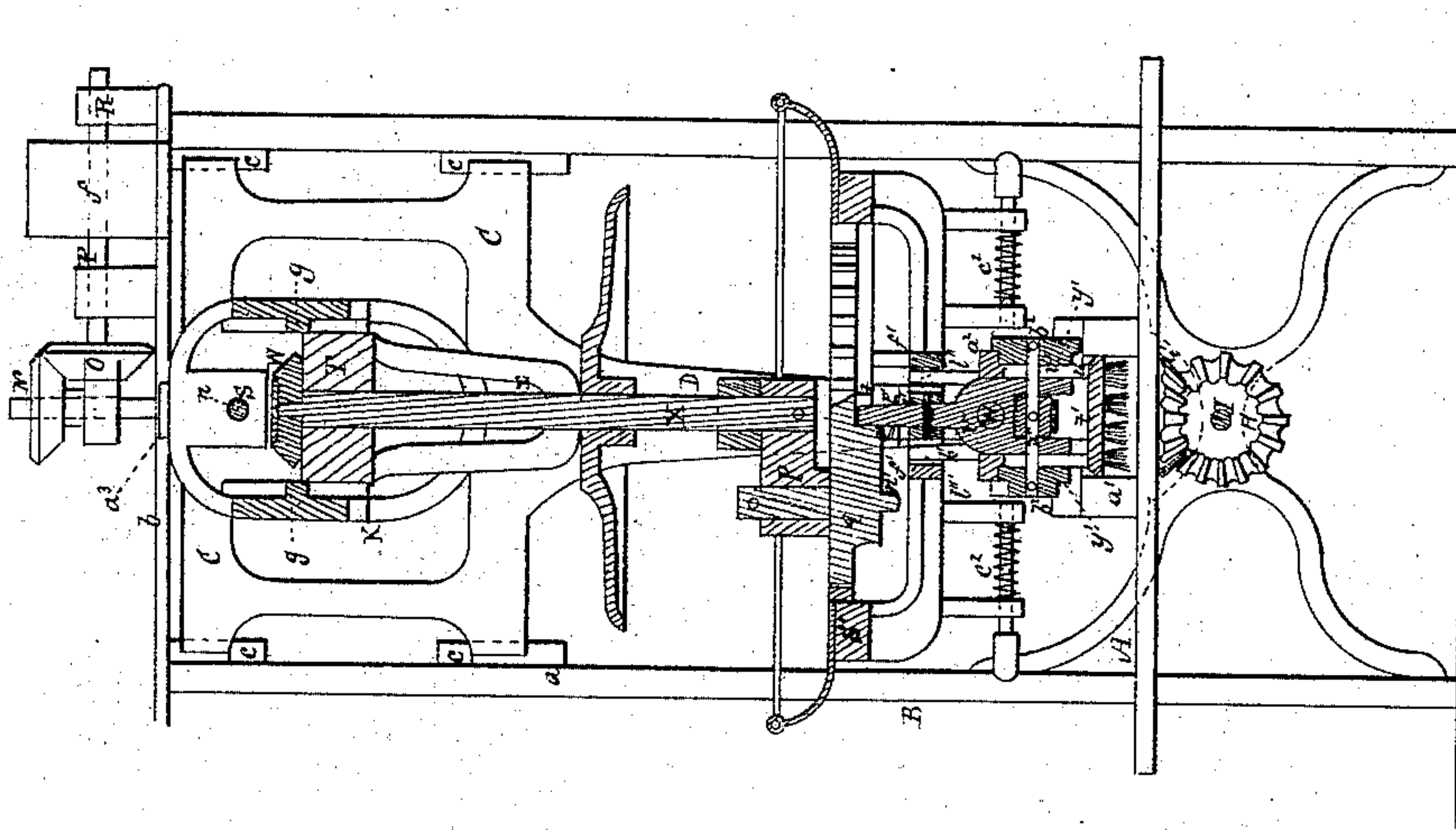
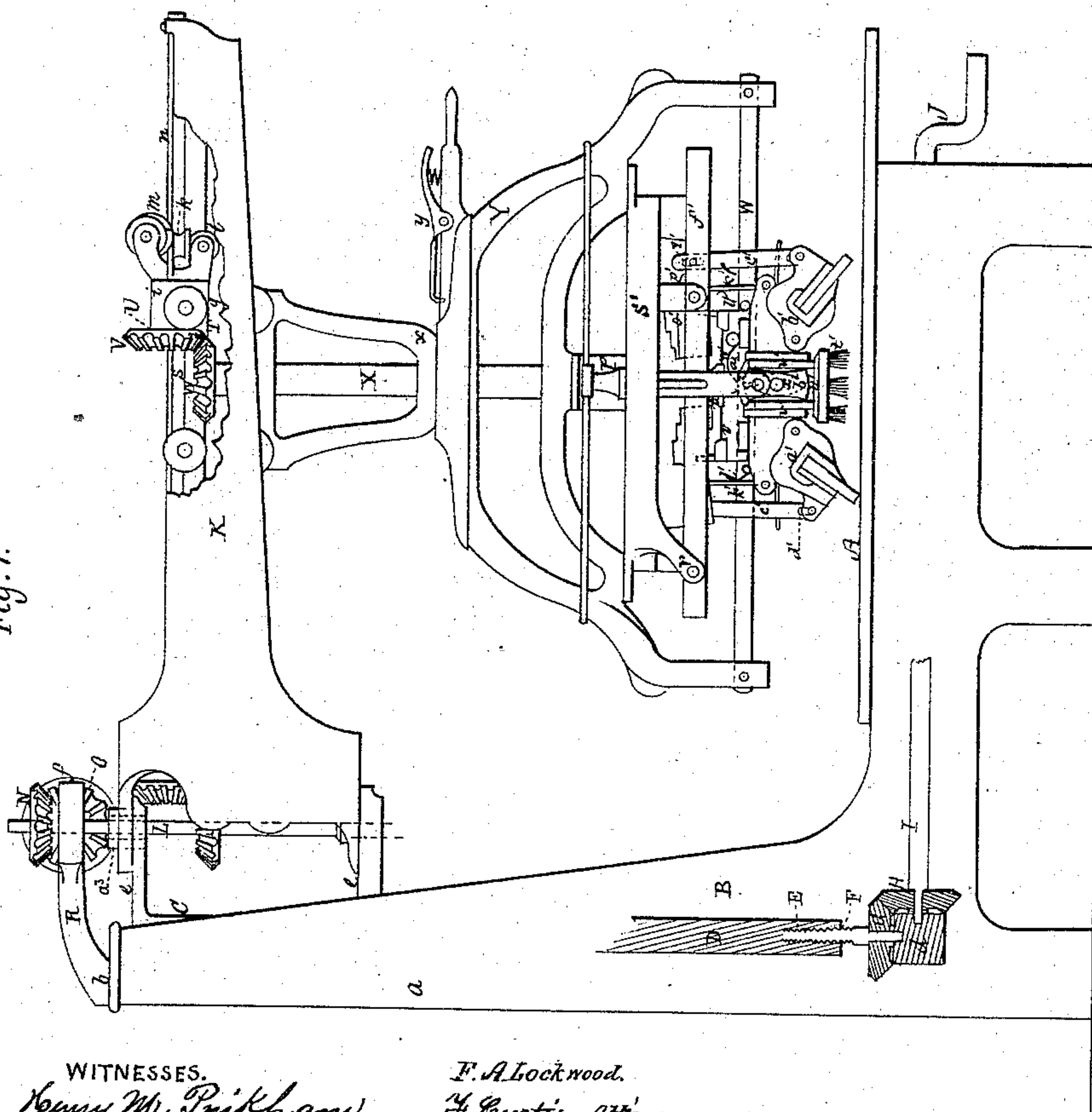


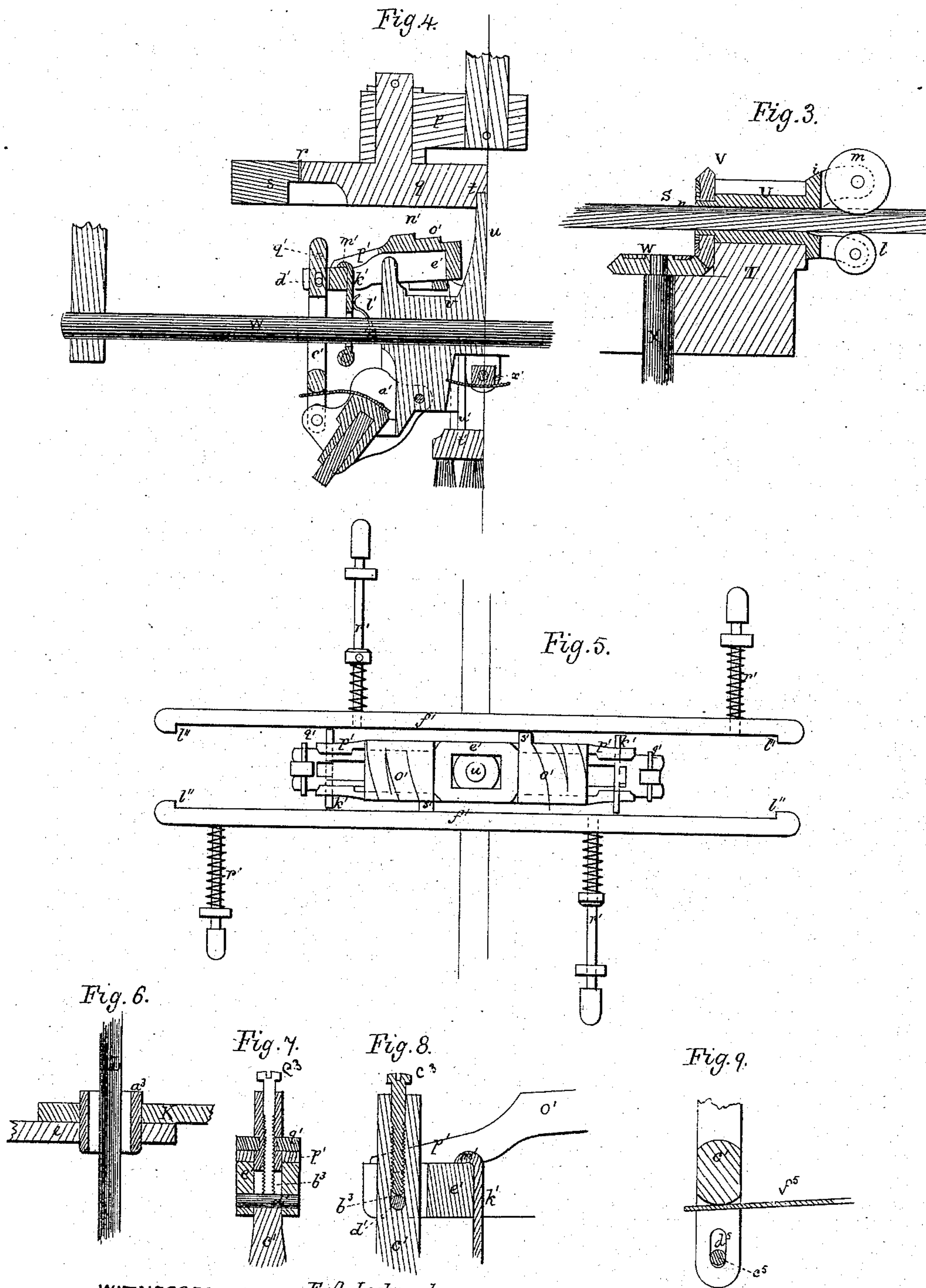
Fig. 1.



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UNITED STATES PATENT OFFICE.

FREDERIC A. LOCKWOOD, OF FALL RIVER, MASSACHUSETTS.

IMPROVEMENT IN MACHINERY FOR SCOURING, GLASSING, AND SETTING LEATHER.

Specification forming part of Letters Patent No. **157,691**, dated December 15, 1874; application filed November 17, 1874.

To all whom it may concern:

Be it known that I, FREDERIC A. LOCKWOOD, of Fall River, Bristol county, Massachusetts, have invented certain Improvements in Machine for Scouring, Glassing, or Setting Leather or Beaming Hides, of which the following is a specification:

The object of this machine is to perform the operations of scouring, setting, or glassing leather or beaming hides; and my present improvements relate to a class of machines in which the various movements required to perform these operations are effected by the tool-supporting mechanism above, and in connection with a stationary table or bed, in contradistinction to the method which has until very recently been generally adopted in employing a table which has been moved about beneath the operating tools.

A prominent example of the class of machines to which these improvements relate is shown in Letters Patent of the United States, numbered 143,829, issued to me on the 21st day of October, 1873; and such improvements, though to a certain extent growing out of or being suggested by such patented machine, nevertheless embrace elements which distinguish them from it.

The purposes of these improvements are to dispense, to a considerable extent, with the complexity of parts and expense of manufacture of my patented machine, to obtain greater power over the movements of the tool-carriage, and, generally, to simplify the construction and reduce the friction of machinery of the character above premised; and the details of the mechanism by which I carry out my object will be hereinafter fully explained.

The drawings accompanying this specification represent, in Figure 1, a side elevation, and in Fig. 2 a vertical cross-section, of a machine embodying my present improvements. Fig. 3 is a section of the anti-friction mechanism which drives the tool-carriage. Fig. 4 is a section of one-half the tool-carriage and the parts immediately connected therewith. Fig. 5 is a plan of the tool-carriage and the stop-rails, to be hereinafter explained. Fig. 6 is a section, showing the attachment of the crane

to the cross-head of the machine. Figs. 7, 8, and 9 are sections of details of the machine, to be hereinafter explained.

In these drawings, A represents a flat horizontal table or platform, of suitable size to receive a skin to be manipulated, while in rear of this table is erected an upright frame or standard, B, composed of two side posts or housings, *a a*, spanned at top by a cross-beam, *b*. Within the upper part of this frame, and sliding upon splines or guides *c c*, making part of each post *a*, I dispose a flat rectangular cross-head, C, from which depends a rigid beam, D, such beam extending downward to the lower part of the frame A', and being formed at its lower end with a female screw, E, into which enters a male screw, F, whose lower end is stepped within a cross-bar, *d*, which unites the lower part of the frame A, the said screw F carrying a horizontal bevel-gear, G, which engages with and is driven by a second beveled gear, H, the latter being in turn affixed to the rear extremity of a long horizontal shaft, I, which passes below the table A, and terminates at front in a crank or handle, J, by which it may be rotated. By means of the screw F, gears G and H, and shaft I, the altitude of the carriage and its accessories may be easily and quickly changed or regulated, according to the character or thickness of the skin to be operated upon. K in the drawings represents a horizontal swinging crane or beam, which is pivoted at rear to the cross-head or carriage B by sleeves or bushings *a*³, let into such beam, (see Fig. 6 of the drawings,) and ears *e e*, making part of such cross-head, the said bushings surrounding loosely a shaft, L, carrying at top a beveled gear, N, which meshes into and is operated by a second beveled gear, O, affixed to one end of a horizontal shaft, P, which is mounted in suitable ears R R, projecting from the cross-bar *b*, said shaft being provided with a pulley, *f*, which drives it. The crane K is hollow or is composed of an open frame, and within it, and extending from end to end thereof, and revolving in bearings at each end, is a horizontal shaft, S; and said crane and shaft support and operate the tool-holding carriage by means

as follows: T represents a block or carrier, which slides within the open crane upon ribs or guides *g g*, applied to each side of the latter, and the said block also slides over or about, and in part incloses by a tubular boss, *i*, the shaft S. Within the boss *i* is disposed a tubular shaft or sleeve, U, and upon the inner end of such sleeve is affixed a beveled gear, V, which engages a companion gear, W, affixed to the upper end of a vertical shaft, X, said shaft being mounted at top in the carrier T, and at bottom in the arched frame, which supports the tool-carrier, and is hereinafter described. The outer end of the tubular shaft or sleeve U carries several anti-friction rollers, *k l m*, &c., one of which, *m*, for instance, travels in a rabbet or channel, *n*, created longitudinally in the shaft S, while the others, *k l*, &c., merely bear and roll upon the said shaft when any endwise movement of the carrier thereupon or thereabout takes place.

It will be seen that, as one or more of the rollers enter a recess or channel in the shaft S, all the rollers and the sleeve U must rotate by and with the shaft, while all the rollers are free to trundle upon said shaft. Therefore, by means of the rollers *k l m*, sleeve U, and gears V and W, I drive or rotate the shaft X and operate the tools, and at the same time reduce the friction between the carrier and shaft to such a degree that I am enabled to slide the tools and their carriage to and fro of such shaft with great ease and freedom.

The main support of the operating tools and their carriage is an open or arched frame, Y, which is disposed below the crane K and above the table A, such frame being supported by the shaft X, and susceptible of being turned freely upon it in a horizontal plane, the support or bearing of this frame being a crank or arm, P, secured to the lower extremity of said shaft X. To the free end or wrist-pin of the crank *p* is pivoted a horizontal spur-gear or epicycle, *q*, which travels within and engages an annular gear or epicycloidal wheel, *r*, which is affixed to, and supported by, a horizontal ring or plate, S', secured to the frame Y, and concentric with the axis of the shaft X. From the under side of the gear or epicycle, and at or near its periphery, depends a stud, *t*, while pivoted or swiveled at its upper end to this stud is a post, *u*, erected upon a barrel or tubular carriage, *v*, which is supported and slides to and fro of a horizontal shaft, *w*, the ends of which shaft are supported in the lower extremities of the legs of the frame Y.

As the tools which operate upon the skin are carried by the barrel or carriage *v*, and as the latter is caused, by means of the epicycloidal wheels *q* and *r*, to travel upon the shaft *w* in reciprocating rectilinear movements in a horizontal plane, the tools are thereby caused to travel over and act upon the skin in a right line, while the rotary motion of which the

frame Y is susceptible combines to permit a universal freedom of motion of the tools in any direction. The upper part or head of the frame Y is a disk, or is provided with arms, which are received within a recess in the lower part of the bracket *x*, which intervenes between the said frame and the crane K; and a spring-latch, *y*, may be applied to the said bracket to operate in connection with and intercept holes created in such disk or arms, and by this means lock the frame and its accessories to such bracket when occasion requires.

The tool carriers or stocks are two in number, in order that the machine may be double-acting—that is, act upon the skin with equal effect at each traverse of the tool-supporting carriage—and are shown at *a'* and *b'*, respectively, each being suspended from and pivoted at its upper inner corner to one end of the barrel or carriage *v*, before named; and, in order that each backward-going tool may be lifted from off the skin while the opposite tool is acting upon it, each tool-stock has pivoted to its outer edge the lower end of a rod, *c'*, the upper end of which is pivoted by a pin-and-slot connection, *d'*, to one end of a working beam or oscillating double lever, *e'*, the point of oscillation of which is the post *u*, hereinbefore named as erected upon the barrel or tubular carriage *v*.

The pivot *c'*, by which the tool-stock is pivoted to the connecting-rod *c'*, plays within a vertical slot, *d'*, created in such bar, in order that some play may be permitted the tool in passing over inequalities of the skin, and preserve the lever *e'* and other portions of the machine from thrusts and strain which would otherwise ensue, a spring, *f'*, being combined with the rod and tool to retain the latter closely upon the skin. As the lever *e'* must tilt from one sloping position to the other with each traverse of the carriage *v*, it becomes necessary to provide a means of alternately locking such lever in its position while the traverse is being made and the tool is acting upon the skin, and, when the traverse is completed, of unlocking or releasing the lever, and permitting it to be tilted in the opposite direction and lower the opposite tool upon the skin, at the same time elevating from off such skin the tool which has completed its traverse; and to effect this result I pivot, at its lower end, to each end of the carriage *v*, or horizontal arms extending therefrom, a vertical latch, *k'*, which is forced outward by a spring, *l'*, the upper part of this latch terminating in a hook, *m'*, which takes hold of the depressed end of the lever, as shown in Fig. 4 of the drawings, the opposite and elevated end of the lever being above the opposite latch. As the outgoing end of the lever *e'* is always depressed and held in such position by one of the latches *k'*, and this hold of the latch upon the lever must, as before stated,

be released as the carriage completes its outgoing movement, I create upon or affix to each end of each rail f^1 a spur or stop, l'' , so situated that, as the carriage completes its movement in either direction, the latch brings up against this stop, and is removed from contact with the lever e' , and the latter is released, while, simultaneously with this release, a stud or cam, n' , depending from the under side of the epicycle q , wipes against or across the upper surface of one of two dually-arranged tubular sliders, o' , sliding upon the said lever e' , and depresses the opposite end of such lever, thus raising from the skin the tool which has performed the duty, and lowering upon such skin the opposite tool, which is next to advance. My purpose in employing the tubular sliders o' in lieu of permitting the stud n' to wipe directly against the lever is to enable me to throw either or both tools out of action or bring them into use, as may be desired, without stopping the motions of the machine.

To operate these sliders without stopping the movements of the machine, I apply to each rail f^1 two horizontal bolts, r' , each of which is forced outwardly by a spring, these bolts being so arranged that, when one is pushed inward by the attendant, its inner end shall protrude beyond the inner face of the rail, and so as to intercept a stud, s' , projecting outwardly from the side of each slider. Supposing one tool to be free from control of the adjacent slider, and in its depressed or working position, and effecting its outgoing movement, and if it is desired to raise it out of action, the attendant pushes inward the bolt which may be in advance of and nearest to the stud projecting from such slider; and as the carriage completes its traverse this stud impinges against the projecting end of the bolt, and the slider is thereby moved upon the lever and pushed thereon outwardly to its fullest extent, and so that its highest grade or step shall be out of the path of movement of the wiper-stud t and over its next step, by which the lever e^1 is brought to a horizontal or midway position, the adjacent tool being elevated by means before stated, where it will remain inactive. Should it be desired to lower this tool into working position, advantage should be taken, preferably, of the movement when it nearly completes its outgoing traverse, when the bolt last named is again pushed inward, and as the carriage completes its traverse in this direction, the stud upon the slider abuts against the bolt. Such slide is pushed inward into the path of movement of the stud t , and the tool is left free to be lowered by such stud. In order to adjust the relative positions of the tools and working beam, and thereby adapt the machine to treat skins of varying thicknesses, I proceed as follows: In the upper part of each bar c^1 I create a transverse vertical slot, b^3 , and in this slot

the pivot d^1 plays, while I screw through the upper part of the said bar c^1 a screw, c^3 , which enters the slot, and constitutes, in practice, a changeable end, to determine the length of such slot. The screw c^3 , when lowered within the slot, determines the height to which the bar c^1 , and consequently the tool, shall rise above the table.

It is very desirable that when one of the slides is pushed outwardly, and the tool thereby thrown out of action, the said tool shall be elevated to the highest possible point; and to effect this result each slider o' terminates at its outer end in wedge-shaped ears p' p' , which operate in connection with trunnions q' q' , projecting laterally from each side of the upper end of the bar c^1 , in such manner that as the slider o^1 is pushed outwardly, as stated, the wedges enter beneath the trunnions, and elevate the said bar c^1 to its highest point with respect to the lever o' .

As one of the functions to be performed by this machine is that of scouring leather, I employ, in addition to the tools a^1 a^4 , a brush, t' , which is disposed intermediate between such tools and centrally of the carriage v , and is suspended from such carriage by side cheeks w' w' , which slide in guides v' , formed upon the sides of the carriage, the brush being depressed toward or upon the table of the machine by springs w' , applied in a proper manner, and being susceptible of vertical adjustment, in order to bring it into action upon a skin, or retain it in a position above the same. To effect this vertical adjustment of the brush at such times as the machine may be in operation, I mount upon each end of a horizontal shaft, x' , which passes through the carriage, a double-pointed wiper-cam, y' , which wipes against the under side of a shelf, a^2 , which constitutes the upper part of each cheek w' , while to the outer face of each cam I affix a double-ended lever or tripper, b^2 .

The longest axes of the two cams y' are in a common plane, but the axes of the trippers are at right angles to each other; consequently the longest plane of one tripper is parallel to that of the cam to which it is attached, and that of the opposite tripper at right angles to its cam.

Below the under side of the ring-plate, and diagonally upon opposite sides of the rails, I dispose two horizontal bolts, c^2 c^2 , which are pressed outward by suitable springs, the inner ends of these bolts, when pressed inward, protruding toward the carriage i to such an extent as to intercept the trippers b^2 .

Supposing the brush to be in its highest and inactive position, in which event both cams are in a vertical position, and maintaining the brush at such elevation, one of the trippers being also vertical and the other horizontal, as the carriage begins its traverse in either direction, the bolt which is adjacent to the vertical tripper is pushed inward, and

the tripper intercepts such bolt and is knocked over by it into a horizontal position, the opposite tripper being brought to an upright position, thus removing the points of the cams from below the shelves a^2 , and permitting the springs to lower the brush upon the skin to be treated.

If the brush is to be elevated, the opposite bolt is to be pushed inward and intercept the opposite tripper, which is in an erect position, this tripper being knocked over, the position of the two cams reversed, and the brush elevated.

It will thus be seen that, without stopping the movements of the machine, I am enabled to throw out of action one or both of the tools and the brush, or to bring into action any or all these objects.

By my method of suspending the operating elements of the machine upon a swinging crane, and the power I possess of turning these elements upon a center, I obtain a universal freedom of motion, which enables me to bring the machine to bear readily, easily, and quickly upon any part of a skin.

Owing to the novel manner in which I make connection between the driving-shaft and the vertical shaft, very little power is required to change the position of the carriage v and its accessories, and in this respect my present machine will be found to present very great advantages.

By the mode of supporting the crane K as herein described, I maintain the tools at all times in a given horizontal position with respect to the skin, or its supporting table or bed, and relieve the operator from any labor of supporting the weight or maintaining the proper elevation of the carriage v .

For glassing leather, and for some other uses, the swinging beam K may be locked in position, and the frame Y moved backward and forward thereupon.

The epicycloidal wheels afford a simple and powerful means of effecting the desired reciprocations of the tool-stock, and of permitting the carriage v to be brought to any desired position, while the rod or shaft X always maintains the same relative position with respect to the tool-stock, or directly over the work to be done.

For the purpose of glassing hides I propose to employ a table covered with india-rubber or other elastic or semi-elastic agent, and disposed below the carriage.

I am enabled to obtain any desired speed of stroke, or any desired pressure upon a skin; and, as before stated, my machine is equally applicable to the purposes of scouring, setting, and glassing leather or beaming hides.

I have found my machine in practice to operate to excellent advantage in glazing paper, and I do not desire to restrict myself in any manner to the uses to which the machine may be put.

I claim—

1. The combination, with the swinging crane K and shaft S, of the carriage T, supported in part by sliding upon and driven by said shaft, substantially as and for the purposes set forth.

2. The combination, with shaft S and carriage T, of the rollers $k l m$, one of which travels in a groove or rabbet in said shaft, as described, whereby such rollers and carriage are compelled to rotate with such shaft, and such rollers constitute anti-friction bearings, to reduce friction between the shaft and carriage, substantially as and for purposes stated.

3. The combination of the crane K, shaft S, tubular carriage T, rollers $k l m$, gears V and W, and vertical shaft X, substantially as and for purposes stated.

4. The screw F, screwing within the beam D, and provided with the gear G, in combination with the rod or shaft I and its gear H, whereby the vertical adjustment of the cross-head and crane is effected, substantially as and for purposes stated.

5. In combination, the cross-head C, susceptible of vertical adjustment, the crane K, the shaft L, acting to operate the crane K, and, in connection with its gear, as a means of rotating the shaft S, gear V, and shaft X, substantially as and for purposes stated.

6. The spring-latch y , in combination with the bracket x and frame Y, substantially as and for purposes stated.

7. The stud n' upon the under side of the epicycle q , in combination with the tilting or oscillating lever e' , or the same and its tubular sliders o' , substantially as and for purposes stated.

8. In combination with the traversing tool-carriage v , the oscillating lever, operated substantially as specified, to effect vertical changes of the tools.

9. The bolts $r' r'$, in connection with the studs s' of the tubular sliders o' , as a means of elevating or depressing one or both the tool-stocks and tools, substantially as and for purposes stated.

10. The combination of the tubular sliders $o' o'$ and tool-stocks $a^1 b^1$, whereby an outward movement of the sliders elevates the adjacent tool, and throws it out of action, and removes itself from the path of rotation of the wiper-stud upon the wheel q , substantially as and for purposes stated.

11. The latches k' , in combination with the carriage v and tilting lever e' , substantially as and for purposes stated.

12. The mechanism for mounting and adjusting the brush t' , consisting of the cheeks u' , sliding within or upon the carriage v , the wiper-cams y' , and trippers b^2 , operating in connection with the bolts c^2 , substantially as and for purposes stated.

13. In combination with the tool-carriage and the lever e , the wheel q and ring r , ar-

ranged and operating substantially as described, to effect the reciprocation of the carriage and the tilting of the lever, for the purposes set forth.

14. The rails *f*, provided with stops *l''*, whereby the latches *l'* are released from contact with the lever, substantially as and for purposes stated.

15. The combination, with the cross-head C

and the swinging crane, of the pivotal bushings or tubes let into the ear of the crane, and the ears *e e* of the cross-head, substantially as set forth.

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Witnesses:

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