

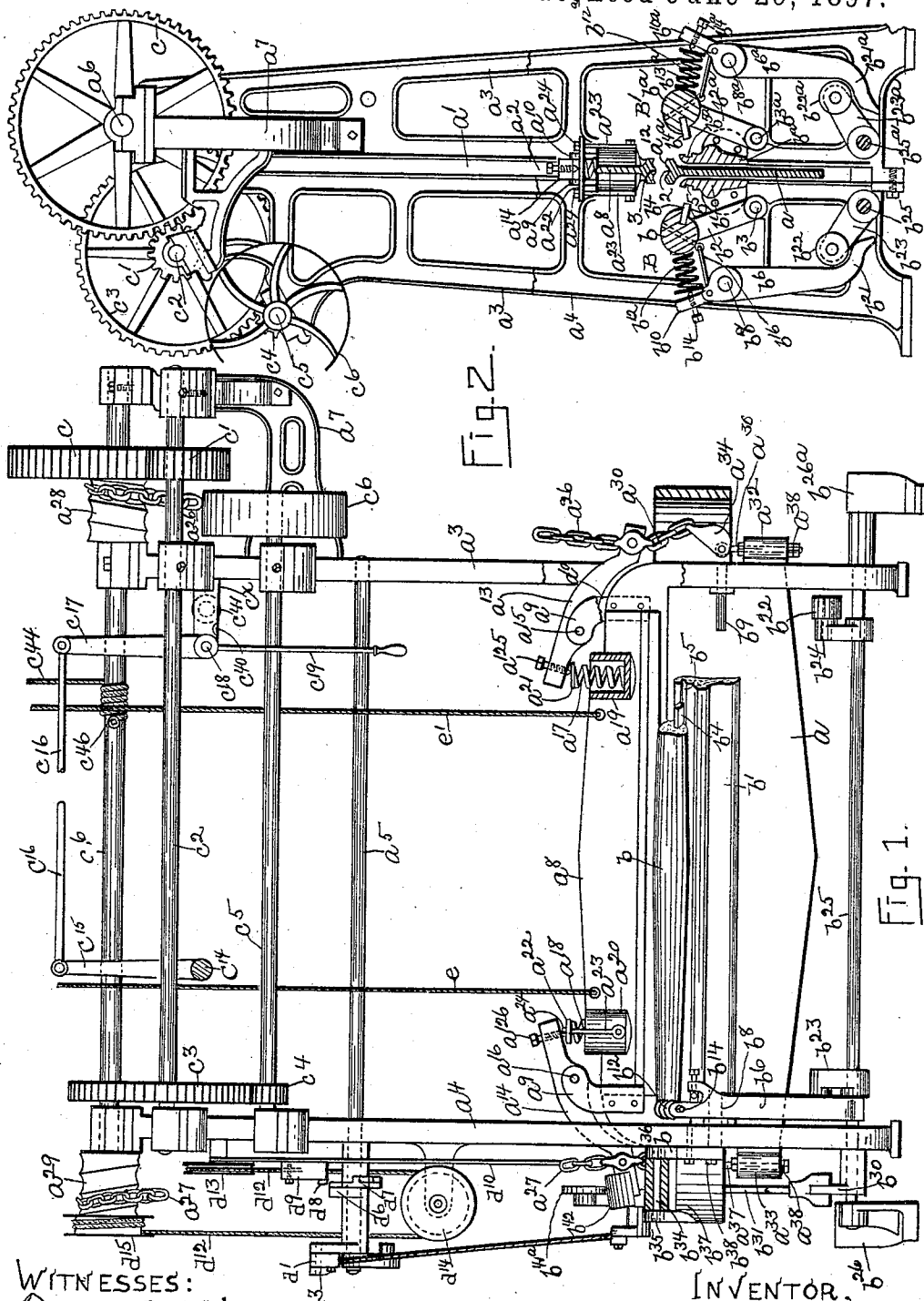
(No Model.)

4 Sheets—Sheet 1.

A. F. JONES.
MACHINE FOR STRETCHING LEATHER.

No. 585,212.

Patented June 29, 1897.



WITNESSES:
Frank E. Wilder
J. Murphy

INVENTOR,
Albert F. Jones
by *Jas. H. Churchill*
ATTORNEY.

(No Model.)

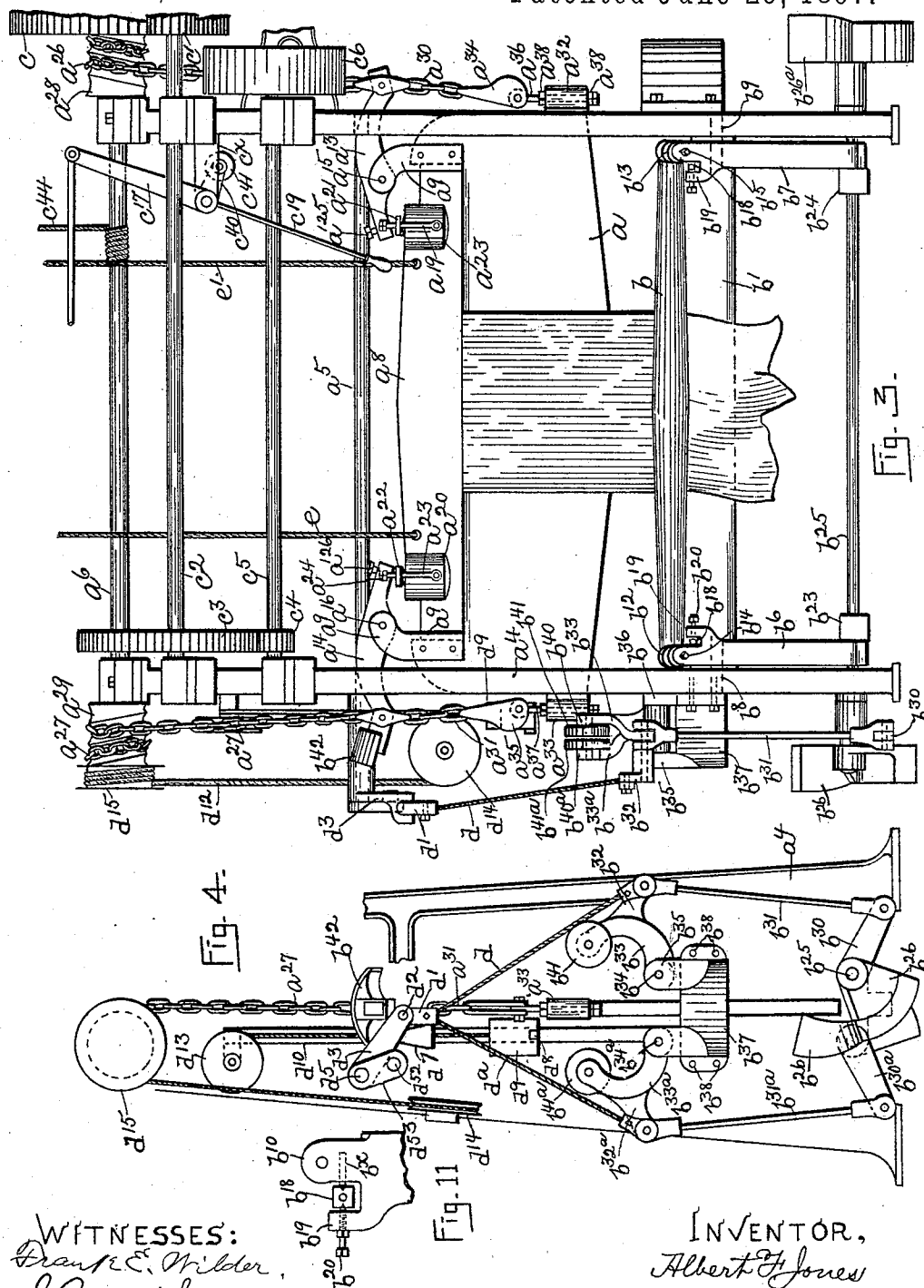
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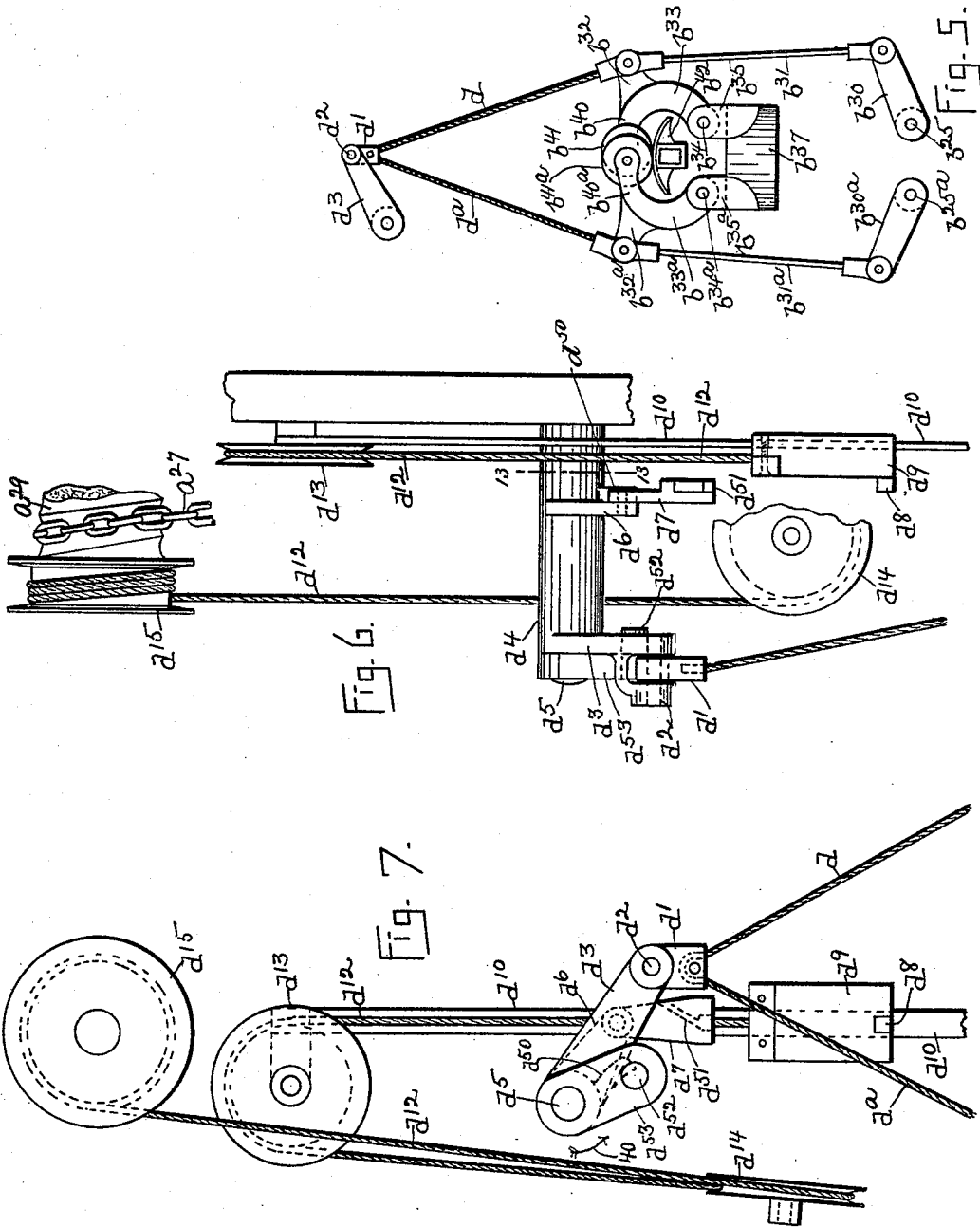
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4 Sheets—Sheet 3.

A. F. JONES.
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Patented June 29, 1897.



WITNESSES:

Matthew M. Blunt.

J. Murphy.

INVENTOR,

Albert F. Jones

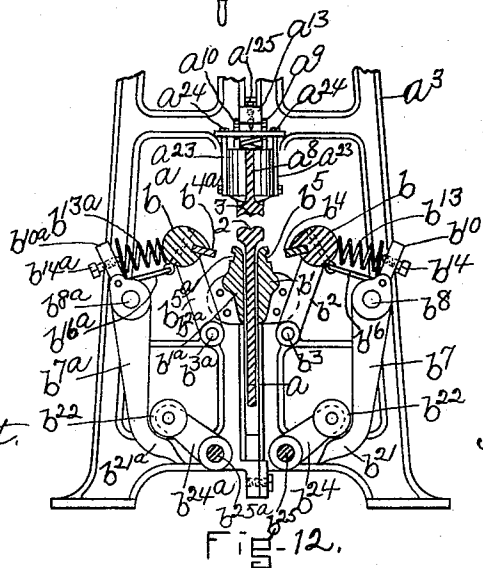
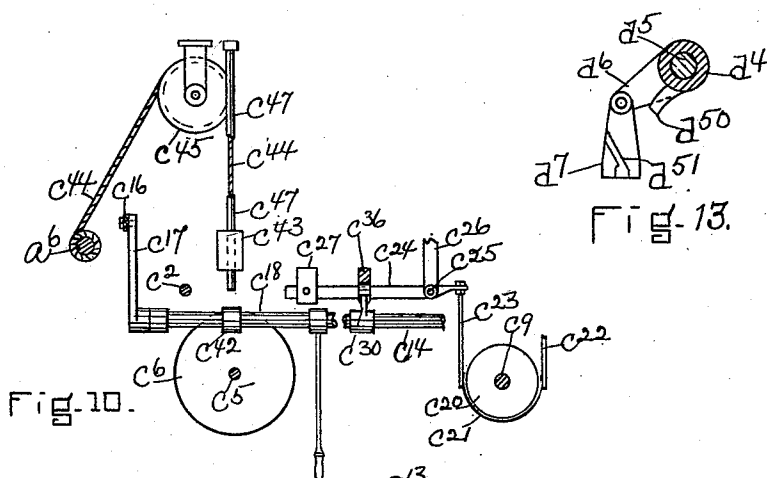
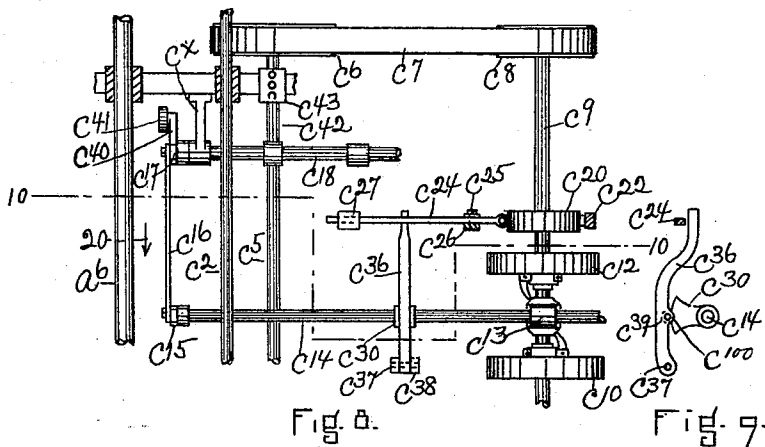
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ATTY.

UNITED STATES PATENT OFFICE.

ALBERT F. JONES, OF SALEM, MASSACHUSETTS, ASSIGNOR TO THE VAUGHN MACHINE COMPANY, OF PORTLAND, MAINE.

MACHINE FOR STRETCHING LEATHER.

SPECIFICATION forming part of Letters Patent No. 585,212, dated June 29, 1897.

Application filed March 27, 1893. Serial No. 535,067. (No model.)

To all whom it may concern:

Be it known that I, ALBERT F. JONES, residing in Salem, in the county of Essex and State of Massachusetts, have invented an Improvement in Machines for Stretching Leather, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to an apparatus or machine for working leather, and more particularly to an apparatus for stretching thick leather, such as commonly employed in the manufacture of driving-belts and of the soles of boots and shoes.

The invention has for its object to provide a machine or apparatus in which the leather in a wet state may be stretched to the amount desired and at the same operation cleaned and substantially dried by the removal of the liquid contained in the leather, thereby expediting the process of manufacture of leather for belting and other purposes. In the manufacture of belt-leather the hide is usually cut up into sections or strips, which are of unequal thickness, being thicker at the butt than at the neck portion of the hide; and one of the objects of this invention is to provide a machine in which the leather may be subjected to a stretching action proportionate or substantially proportionate to its thickness—that is, one in which the thick or butt portion of the hide may be stretched more than the thin or neck portion without injuring the fiber of the leather.

In accordance with this invention the hide or skin to be stretched is secured to a movable support or table, preferably by a clamp, as will be described, and the hide or skin travels with the movable support or table and is subjected to a stretching action by carrying the hide or skin by a gripping or stretching jaw, which is forced against the hide or skin with considerable pressure, and is held stationary while in its operative position, so as to resist the movement or passage of the leather and thereby elongate or stretch the same, the engagement of the gripping or stretching jaw with the hide or skin being for the best results automatically effected, as will be described. The support or table for

the best results is movable in a substantially vertical plane, and has coöperating with it, preferably, two stretching or gripping jaws located on opposite sides of the said table and preferably adjustable, so that one jaw may resist the passage of the hide or skin more than the other jaw, and thereby stretch the portion of the hide acted upon by it more than the portion of the hide or skin acted upon by the other jaw. For the best results, each gripping-jaw is composed of two members, one of which is fixed or stationary and the other of which is movable toward the fixed or stationary member, so as to grip the leather and cause it to be stretched as the movable support or table draws the leather through the said members of the stretching-jaw.

The machine or apparatus is designed to be controlled by an operator, but to provide against accident the said machine may and preferably will be provided with automatic devices, which insure its being stopped in its operation at predetermined points. Furthermore, the movable members of the stretching or gripping jaws may be returned to their normal or open position manually, but preferably they will be automatically returned to their normal position, as will be described. These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a front elevation of a leather-stretching machine embodying this invention, parts being broken away to more clearly illustrate the invention, the movable parts of the machine being in their normal positions; Fig. 2, a side elevation, with parts in section, of the machine shown in Fig. 1, looking toward the left; Fig. 3, a front elevation of the machine, showing it in operation; Fig. 4, a side elevation of the machine shown in Figs. 1 and 3, looking toward the right and with parts omitted; Fig. 5, a detail in elevation to be referred to; Fig. 6, a detail in front elevation of the automatic device for returning the stretching-jaws to their normal position; Fig. 7, a side elevation of the parts shown in Fig. 6; Figs. 8, 9, and 10, details of the driving mechanism to be referred to; Fig. 11, a detail on an enlarged scale to be

referred to, and Figs. 12 and 13 sectional details to be referred to.

In the present instance I have shown a preferred form of machine or apparatus embodying this invention, in which a represents a table or support for the hide or skin to be stretched. The table or support a , which may be of metal, wood, or other suitable material, is vertically movable, in the present instance, in suitable guideways, shown as slots a' a^2 in uprights or side frames a^3 a^4 , tied together in any suitable manner, as by tie-rods a^5 . The uprights a^3 a^4 form the main portion of the framework of the machine and support at their upper ends a table-hoisting shaft a^6 , extended beyond the upright a^3 and supported at its end by an arm a^7 , (see Fig. 1,) secured to or forming part of the said upright. The table or support a has cooperating with it a clamping-jaw a^8 , located above the said table and loosely fitted into and movable vertically between suitable guides, located, as herein shown, at or near the opposite ends of the table, the said guides being shown as two sets of upright arms a^9 a^{10} , firmly secured to or forming part of the table a at opposite ends of the same, as represented in Fig. 1. The clamping-jaw a^8 is movable, as described, and cooperates with a stationary clamping-jaw a^{12} , (see Fig. 2,) which is secured to or which may form part of the table a , as represented in Fig. 2, the clamping-jaw a^{12} being shown in Fig. 2 as provided with a longitudinal central groove or concavity 2, with which cooperates a longitudinal rib or convexity 3 on the clamping-jaw a^8 , so as to obtain a firm hold upon the leather and prevent its being pulled through the clamping-jaws while the machine is in operation. The clamping-jaw a^8 is normally elevated above the table a , so as to leave a suitable space for the passage of the leather or skin, and is adapted to be moved toward the table and the clamping-jaw a^{12} , by suitable means, shown as levers a^{13} a^{14} , pivoted as at a^{15} a^{16} , in the arms a^9 a^{10} , and a yielding connection between the front end of said levers and the clamping-jaw a^8 . The yielding connection referred to is shown as spiral springs a^{17} a^{18} , located in suitable cups or pockets a^{19} a^{20} , secured to or forming part of the clamping-jaw a^8 , the said springs acting upon the under side of cross plates or bars a^{21} a^{22} , vertically movable on guide-rods a^{23} , secured to the opposite sides of the pockets a^{19} a^{20} , the upward movement of the cross-bars a^{21} a^{22} being limited, as herein shown, (see Figs. 1 and 2,) by nuts a^{24} on the guide-rods a^{23} .

The cross-bars a^{21} a^{22} are engaged in the present instance by adjustable screws a^{25} a^{26} , carried by the levers a^{13} a^{14} to regulate the tension of the springs a^{17} a^{18} , the said levers having their rear ends extended through the slots a' a^2 in the uprights a^3 a^4 and having connected to them one end of hoisting devices, which may be ropes, cables, or chains a^{26} a^{27} , the other ends of which are secured to

suitable winding-drums a^{28} a^{29} , fast on the hoisting-shaft a^6 and located, as herein shown, near the opposite ends of the same. The hoisting-chains a^{26} a^{27} constitute the main hoisting-chains for the table a ; but for a purpose as will be described the said hoisting-chains have connected to them auxiliary hoisting devices or chains a^{30} a^{31} , (see Figs. 1 and 3,) the said auxiliary hoisting-chains being shown as connected to the levers a^{13} a^{14} at one end and to lugs or ears a^{32} a^{33} , secured to or forming part of the table a . In the present instance the auxiliary chains a^{30} a^{31} are provided with weighted links a^{34} a^{35} , pivotally connected with suitable bolts a^{36} a^{37} , extended down through the lugs or ears a^{32} a^{33} and fastened thereto by suitable nuts a^{38} . The auxiliary chains or flexible connections a^{30} a^{31} are preferably made of such length as will permit the hoisting-chains a^{26} a^{27} to move the levers a^{13} a^{14} and compress the springs a^{17} a^{18} and thereby bring the movable clamping-jaw a^8 into contact with the leather or skin placed upon the stationary clamping-jaw a^{12} before the said auxiliary chains become taut, so as to effect movement of the table a , whereby the leather or skin is firmly clamped to the table at or about the time the latter commences to be raised by the hoisting-chains, which are wound upon the drums a^{28} a^{29} when the shaft a^6 is revolved by suitable gearing, as will be described hereinafter.

The movable table a has cooperating with it preferably two stretching-jaws B B', (see Fig. 2,) located upon opposite sides of the said table and which are preferably of the same construction, and inasmuch as the said jaws are herein shown of the same construction I will specifically describe but one—namely, the stretching-jaw B. The stretching-jaw B, in accordance with this invention, comprises a movable member b and preferably a stationary member b' , the movable member b being represented in Figs. 1 and 3 as a substantially heavy bar provided at its opposite ends with cranks or arms b^2 , only one of which is shown in Fig. 2, but which arms are pivoted, as at b^3 , to the upright frames a^3 a^4 , the bar b being represented in Fig. 2 as provided with a longitudinal slot, into which is fitted a bar b^4 , constituting a tooth or rib for the movable member, which tooth is adapted to register with a longitudinal groove or channel b^5 in the face of the stationary member b' , the latter being bolted or otherwise firmly secured at its opposite ends to the uprights a^3 a^4 , as represented in Figs. 1 and 2.

The movable member b of the stretching-jaw B is adapted to be moved toward the stationary member b' by means of levers b^6 b^7 , pivoted, as at b^8 b^9 , to the uprights a^4 a^3 , the said levers being provided with the arms b^{10} , between which and the bar b are interposed yielding connections, shown as spiral springs b^{12} b^{13} , (see Fig. 3,) fitted upon suitable lugs (not herein shown) on the bar b and adapted to be adjusted by means of set-screws b^{14} b^{15} ,

extended through the lever-arms b^{40} , the yielding connections enabling the movable member b of the stretching-jaw to adapt itself to variations in the thickness of the leather or skin, while the adjusting-screws b^{14} b^{15} enable the pressure of the movable member of the stretching-jaw to be regulated or varied according to the thickness of the leather or skin.

The movable member b of the stretching-jaw is also preferably positively connected to the operating-levers b^6 b^7 by means of bolts b^{16} , extended loosely through holes in blocks b^{18} , (see Figs. 8 and 11,) pivotally supported between the arms b^{10} and fingers b^{19} on the said arms by means of set-screws b^{20} and pointed plugs or screws b^x , extended into suitable sockets in the arms b^{10} , as clearly shown in Fig. 11. The bolts b^{16} are connected to the bar b and the levers b^6 b^7 below the center line of the springs, for a purpose as will be described. The levers b^6 b^7 have their lower ends inwardly bent or curved, as at b^{21} , (see Fig. 2,) so as to form cam-surfaces, with which engage suitable rollers b^{22} , carried by arms b^{23} b^{24} , (see Fig. 1,) fast on a rock-shaft b^{25} , supported in the uprights a^3 a^4 and extended beyond one of the uprights (herein shown as the upright a^4) to receive a suitable counterbalancing-weight b^{26} , the purpose of which will be hereinafter described. The rock-shaft b^{25} is designed to be turned so as to cause the rollers b^{22} to travel down the cam end b^{21} of the levers b^6 b^7 and thereby turn the said levers on their pivots, so as to compress the springs b^{12} b^{13} and consequently force the movable member b of the stretching-jaw B toward the fixed member b' and into engagement with the leather to be stretched. This movement of the stretching-jaw is preferably effected automatically, as will now be described. The rock-shaft b^{25} has fast on it, outside of the upright a^4 , as herein shown, a crank or arm b^{30} , (see Figs. 1, 3, and 4,) connected by a link b^{31} to an arm b^{32} of a lever b^{33} , loosely mounted on a shaft or arbor b^{34} , supported in ears b^{35} b^{36} , erected upon a yoke-shaped casting b^{37} , secured, as herein represented, to the upright a^4 , as by bolts b^{38} . The shaft or arbor b^{34} is substantially in a vertical line with the rock-shaft b^{25} , and the lever b^{33} is preferably curved and made of such length that its arm b^{40} may extend beyond the shaft or arbor b^{34} when the movable member of the stretching-jaw B is in its normal or open position, and when in this position the arm b^{40} of the lever b^{33} occupies substantially the position represented in Fig. 5, the said arm for the best results being provided with a roller b^{41} , which is adapted to run upon an inclined or cam-shaped surface of a casting or block b^{42} , secured to or forming part of the lever a^{14} .

It will be understood that the stretching-jaw B', located on the opposite side of the table a from the stretching-jaw B, is of substantially the same construction as that heretofore described with relation to the jaw B,

and the corresponding parts of the jaw B' and its operating mechanism are herein lettered the same as the corresponding parts of the jaw B and its operating mechanism, with the addition of the affix "a" to the said parts.

In the normal position of the apparatus represented in Figs. 1 and 2 the clamping-jaw a^8 is elevated above its cooperating fixed jaw a^{12} , and the movable members b b^a of the stretching-jaws B B' are in their open position, (shown in Fig. 2,) and at such time the rollers b^{41} b^{41a} are substantially in line with each other, as represented in Fig. 5, and rest upon the upper surface of the casting or block b^{42} , ready to be thrown back or opened by the oppositely-inclined or cam surfaces of the said casting or block when the latter is elevated by the movement of the hoisting-chain a^{27} . When the hoisting-chain a^{27} is wound upon its drum a^{29} , the lever a^{14} is turned on its pivot, and the casting or block b^{42} is elevated from the position shown in Fig. 1 to that shown in Fig. 3, and on the upward movement of the lever a^{14} the levers b^{33} b^{33a} are turned back on their pivots or arbors b^{34} b^{34a} , which movement turns the cranks b^{30} b^{30a} from the position shown in Figs. 1 and 5 down into the position shown in Fig. 4 by means of the links b^{31} b^{31a} and thereby rocks the shafts b^{25} b^{25a} , so as to depress or move downward the cranks b^{23} b^{24} b^{23a} b^{24a} , which movement, as above explained, turns the levers b^6 b^7 b^{6a} b^{7a} on their pivots and forces the teeth b^4 b^{4a} of the stretching-jaws into contact with the leather, carrying the latter into the grooves or channels b^5 b^{5a} , and the force with which the teeth b^4 b^{4a} engage the leather is determined by the compression of the springs b^{12} b^{13} b^{12a} b^{13a} . The parts are now in position to act upon the leather clamped to the table, and it will be understood that these parts are placed in their operative position at or about the time the auxiliary chains a^{30} a^{31} become taut, so as to effect the movement of the table a by the continued winding of the hoisting-chains a^{26} a^{27} upon their drums a^{28} a^{29} .

As soon as the table a commences its upward movement the leather clamped to it is drawn between the teeth b^4 b^{4a} , carried by the movable members b b^a and the edges or sides of the grooves or channels b^5 b^{5a} of the fixed members b' b'^a of the stretching-jaws, which drawing action accomplishes two results—namely, it stretches or elongates the leather or skin and at the same time scrapes or presses the liquor, sediment, or other foreign matter contained in the leather or skin out therefrom, causing the said liquor to run down upon the unstretched portion of the leather or skin onto the floor or into a suitable receptacle or pan below the machine, thereby not only stretching the leather, but also cleaning and substantially drying the same. The upward travel of the table a may, and preferably will, be effected after the manner herein shown and as will now be described.

The hoisting-shaft a^6 is provided with a

substantially large gear c , which meshes with and is driven by a pinion c' on a shaft c^2 , supported in the uprights a^3 a^4 , and provided at or near its opposite end with a gear c^3 , which meshes with and is driven by a pinion c^4 on a shaft c^5 , supported in the uprights a^3 a^4 , the latter shaft being provided with the pulley c^6 , connected by a belt c^7 (see Fig. 8) to a pulley c^8 on a shaft c^9 , provided with suitable driving-pulleys c^{10} c^{12} , connected by suitable belts (not herein shown) to pulleys on a main or driving shaft, (not shown,) the said belts being arranged to produce opposite rotations of the pulleys c^{10} c^{12} , so that when one pulley, as c^{10} , is rendered fast on the shaft c^9 the belt c^7 will be driven in the proper direction to rotate the hoisting-shaft a^6 , so as to elevate the table, and when the pulley c^{12} is rendered fast on the shaft c^9 the latter is rotated in the opposite direction to cause the hoisting-shaft a^6 to be rotated, so as to unwind the hoisting-chains a^{26} a^{27} and thereby permit the table a to descend. The normally loose pulleys c^{10} c^{12} are adapted to be rendered fast on the shaft c^9 by a suitable clutch mechanism, which may be of any suitable or desired construction, but preferably that shown in United States Patent No. 525,372, dated September 4, 1894, and which is operated by a forked arm c^{13} (see Fig. 10) on a rock-shaft c^{14} , supported in suitable bearings and provided with a crank or arm c^{15} , connected by a link c^{16} (see Figs. 8 and 10) to a crank or arm c^{17} on a rock-shaft c^{18} , also supported in suitable bearings, one, c^x , of which is shown as an arm or bracket secured to the upright a^3 , and the other of which may be in the form of a hanger attached to the ceiling of the room in which the machine is located, the rock-shaft c^{18} being provided with a depending crank or arm c^{19} , constituting a suitable means by which the workman may control the operation of the machine.

The shaft c^9 has fast on it a brake disk or wheel c^{20} , with which coöperates a brake-strap c^{21} , fastened at one end to a depending arm or hanger c^{22} , and at its opposite end to a link c^{23} , (see Fig. 10,) which latter is connected to one arm of a lever c^{24} , pivoted, as at c^{25} , to a suitable hanger or support c^{26} , the said lever being provided, as herein shown, with an adjustable weight c^{27} . The lever c^{24} is adapted to be turned on its pivot by the weight c^{27} , so as to engage the brake-strap c^{21} with the brake disk or wheel c^{20} when the clutch is in its central position and the pulleys c^{10} c^{12} are running free, but when the rock-shaft c^{14} is moved so as to engage the clutch with either of the pulleys c^{10} c^{12} , the lever c^{24} is at such time turned on its pivot, so as to raise its long arm and lower its short arm, which motion drops the brake-strap c^{21} down from engagement with the brake-wheel c^{20} . This movement of the lever c^{24} takes place when the rock-shaft c^{14} is moved in its opposite directions to render fast on the shaft c^9 either the pulley c^{10} or the pulley c^{12} , and the movement of the

lever c^{24} referred to may and preferably will be effected by the mechanism herein shown, which consists of a lever c^{31} , (see Figs. 8 and 9,) pivoted, as at c^{37} , to a suitable support or hanger c^{38} , and provided on its under surface with a projection, preferably in the form of a roller c^{39} , (see Fig. 9,) with which engages an arm or rocker c^{36} , fast on the shaft c^{14} , the surface of the arm or rocker c^{36} being oppositely inclined or curved from its central portion, so that when the said arm or rocker c^{36} is moved in either direction the lever c^{31} will be raised and its end, which projects under and beyond the lever c^{24} , will carry with it the lever c^{24} and effect a release of the brake-strap c^{21} , as above described. The central portion of the rocker c^{36} may be provided with a socket c^{100} for the reception of the roller c^{39} .

For the best results it is desirable that safety devices should be provided by which the clutch may be centered when the table a has reached a predetermined point in its upward movement and also when the said table has reached a predetermined point in its downward movement, thereby insuring the stopping of the machine before injury can be done to it in case the operator should neglect to manually center the clutch so as to stop the machine. The safety device referred to may and preferably will be made after the manner herein shown.

Referring to Figs. 1 and 8, the rock-shaft c^{18} is shown as provided with a crank or arm c^{40} , provided, as herein shown, with a roller c^{41} , which is located substantially in line with the table a or a part carried thereby, which part may be supposed, in the present instance, to be the lever a^{13} , so that if the lever a^{13} should travel up a sufficient distance to engage the roller c^{41} it would carry with it the crank or arm c^{40} , and thereby move the link c^{16} in the direction indicated by the arrow 20, Fig. 8, which movement would rock the shaft c^{14} so as to disengage the clutch from the up pulley c^{10} and bring the said clutch to its central position, at which time the brake-strap c^{21} would be brought into engagement with the brake-wheel c^{20} , as above described, and the table a would be arrested in its upward movement and firmly held by the brake mechanism.

The safety attachment or device to prevent downward movement beyond the normal position of the table may be made as herein shown, and consists of a crank or arm c^{42} , extended from the rock-shaft c^{18} and projecting below a weight or block c^{43} , suspended by a flexible connection or chain c^{44} , which latter is passed over a suitable pulley c^{45} (shown only in Fig. 10) and fastened, as at c^{46} , to the hoisting-shaft a^6 , (see Fig. 1,) the said flexible connection or rope c^{44} being wound upon the shaft a^6 as the table ascends, so as to lift the weight c^{43} , which latter is guided in its upward movement by suitable guide-rods c^{47} , extended through suitable holes in the weight or block c^{43} . When the table descends, the

suspending chain or rope c^{44} is unwound and the weight c^{43} travels downward, and if the clutch is not centered by the operator the weight c^{43} will be brought into contact with the arm or crank c^{42} and carry the said arm or crank downward, which movement will turn the rock-shaft c^{18} so as to move the link c^{16} in a direction opposite to that indicated by the arrow 20, and consequently turn the rock-shaft c^{14} so as to withdraw the clutch from engagement with the down pulley c^{12} , and as soon as the clutch is centered the brake is applied as above described and the machine is stopped.

I have previously described how the rock-shafts b^{25} b^{25a} are rocked so as to bring the stretching-jaw into operation when the lever a^{14} is raised by the hoisting-chain a^{27} , and when the hide or skin has been stretched and the table has returned to its normal or starting position the rock-shafts b^{25} b^{25a} are rocked or turned in the reverse direction, so as to release the stretching-jaws from engagement with the hide or skin to permit the latter, if desired, to be removed from the machine.

The return of the stretching-jaws from their closed or operative position into their normal or open position may and preferably will be effected automatically, as will now be described.

Referring to Figs. 3 to 7, inclusive, I have shown the arms b^{32} b^{32a} of the curved levers b^{33} b^{33a} as connected by ropes, chains, or other suitable flexible connections d d^a to a link or arm d' , loose upon a shaft or arbor d^2 , supported in the forked end of a crank or arm d^3 , which may be secured to a rock-shaft, but preferably to a sleeve d^4 , loosely mounted on a stud or arbor d^5 , extended from the upright a^4 . The sleeve d^4 is provided with a second crank or arm d^6 , (see Fig. 6,) having loosely connected to it a depending dog or arm d^7 , which is adapted to be engaged by a stud or projection d^8 , on a block or casting d^9 , vertically movable on a suitable guide-bar d^{10} , fastened to the framework of the machine—namely, to the upright a^4 —the said casting being secured to the end of a flexible suspension, which may be a cord or chain or rope d^{12} , herein shown as passed about pulleys d^{13} d^{14} , and fastened to the winding-drum d^{15} , to which the end of the flexible suspension d^{12} is fastened, so as to be wound in the opposite direction from the hoisting-chain a^{27} , whereby the flexible suspension d^{12} will be unwound from its drum d^{15} , when the hoisting-shaft a^6 is rotated, so as to wind up the hoisting-chains a^{26} a^{27} . In other words, when the table a is moved upward the block or casting d^9 is moved downward, and vice versa. When the table a is in its uppermost position, the block or casting d^9 is in its lowermost position, and the crank or arm d^3 on the sleeve d^4 is drawn downward by the cords or chains d d^a , the levers b^{33} b^{33a} being at such time in their open position, (represented in Fig. 4.) On the downward movement of the table a

the flexible suspension d^{12} is wound upon its drum d^{15} , and the casting or block d^9 is moved up on its guide-bar d^{10} , and just previous to the time the table reaches its lowermost or normal position the stud or projection d^8 on the block or casting d^9 engages the dog d^7 and moves it upward, thereby rocking the shaft or sleeve d^4 , so as to elevate the crank or arm d^3 , and thereby turn the levers b^{33} b^{33a} toward each other, and when the said levers have passed their dead-centers, the said levers are then brought over the block or casting b^{42} and into the position shown in Fig. 5 by the counterbalancing weighted cranks or arms b^{26} b^{26a} .

In order to avoid possible injury to the parts operated by the projection d^8 engaging the dog d^7 , in case of a continued upward movement of the block d^9 after the sleeve d^4 has been rocked, as described, to bring the levers b^{33} b^{33a} into the position shown in Fig. 5, an additional safety device is provided, which is shown in the present instance as an arm or projection d^{50} on the sleeve d^4 , which arm is normally out of the path of movement of the dog d^7 , but which is brought into the path of movement of the said dog by the rocking of the sleeve d^4 in the direction of the arrow 40, Fig. 7, when the projection d^8 has raised the dog d^7 up into its normal position.

If now the block or casting d^9 should for any reason continue to move upward, it would carry with it the dog d^7 and bring the latter into engagement with the arm d^{50} , and by reason of the side of the dog d^7 being inclined, as shown in Fig. 7, the continued upward movement of the dog d^7 would cause the arm to move the said dog d^7 on its pivot and carry the dog out of the path of movement of the projection d^8 on the block d^9 , which latter would then be free to travel up beyond the dog d^7 . On the return or downward movement of the dog b^9 from its abnormal upper position above the dog d^7 the projection d^8 is adapted to engage a downwardly-inclined projection or cam-surface d^{51} on the dog d^7 and to thereby move the dog d^7 on its pivot out of the path of movement of the projection d^8 and permit the latter to pass below the dog d^7 into its normally operative position. The downward movement of the crank or arm d^3 , effected by the levers b^{33} b^{33a} being thrown into their open position by the block b^{42} , may and preferably will be limited by a suitable stop or arresting device, which is shown as a stud or pin d^{52} , laterally extended from an arm d^{53} , fast on the stud or pin d^5 , on which the sleeve d^4 turns.

I may prefer to employ the automatic device for releasing or opening the stretching-jaws; but I do not desire to limit my invention in this respect, as the said stretching-jaws may be opened by manually rocking the shafts b^{25} b^{25a} so as to effect this result. The clamping-jaw a^8 being loosely fitted in its sockets a^9 a^{10} is raised when the machine is in its normal position at rest by means of suit-

able counterbalancing-weights, (not shown,) which are attached to the ends of flexible suspensions, chains, or ropes $e\ e'$, which in practice are passed over suitable pulleys, (not herein shown,) and which counterbalancing-weights serve to lift the clamping-jaw a^8 when the pressure of the levers $a^{13}\ a^{14}$ is relieved from the said jaw, so that as soon as the table has been returned to its normal position and the stretching-jaws are open the clamping-jaw a^8 is automatically raised by the counterbalancing-weights connected to it to leave the leather or skin free to be removed from the machine.

By reference to Fig. 2 it will be seen that the movable members of the stretching-jaws are connected to the arms $b^{10}\ b^{10a}$ below the center line of the springs $b^{12}\ b^{13}$, which construction insures the positive opening of the stretching-jaws automatically by the said springs when the pressure upon the operating-levers $b^6\ b^7\ b^{6a}\ b^{7a}$ is relieved.

The machine herein shown and described is particularly well adapted for stretching and cleaning leather and skins, and especially thick leather which is to be manufactured into belts, and particularly large driving-belts, where it is particularly desirous that the stretch in the leather should be taken out before the leather is made up into the form of a belt. This apparatus is particularly adapted for this purpose because the thicker portion or butt-end of the leather may be subjected to a greater stretching than the thinner portion of the leather, and as a result both portions of the leather may be subjected to a stretching action sufficient to take out all the stretch of the leather in both the thick and thin parts without injuriously affecting the fiber of either part.

In practice it is now customary to cut the hide or skin into a number of pieces of suitable length and breadth after the hide is tanned, and in the operation of stretching the leather is placed over the stationary member a^{12} of the clamping-jaw so that the thinner portion of the leather will lie on one side of the table and between the members of one stretching-jaw, while the thicker portion of the leather will lie on the opposite side of the table and between the members of the other stretching-jaw. To illustrate, the thinner portion of the leather may be supposed to be passed between the members $b\ b'$ of the stretching-jaw B, while the thicker portion of the leather may be supposed to be passed between the members $b^a\ b'^a$ of the stretching-jaw B', and in this case the portion of the leather acted upon by the stretching-jaw B', being thicker, should be subjected to greater pressure or strain than the thinner portion, and this strain or pressure may be regulated by adjusting the tension of the springs $b^{12a}\ b^{13a}$, interposed between the member b^a and the arm b^{10a} of the levers $b^{6a}\ b^{7a}$.

By reference to Fig. 2 it will be seen that when the leather or skin is firmly clamped

between the clamping-jaws $a^8\ a^{12}$ a portion of the leather or skin would not be stretched by either of the jaws B B', and consequently it is the practice of the operator to place the leather over the table so that the parts on opposite sides of the table will be of unequal length, and then to start the machine in operation, so as to effect a stretching of a portion of the leather, after which the machine is returned to its starting position and the leather shifted over the table so as to bring that portion which was between the clamping-jaws $a^8\ a^{12}$ below one of the stretching-jaws, after which the machine is again started in operation and permitted to run its full stroke or until all the leather on both sides of the table has been stretched.

I have herein shown what I regard as the preferred form of a leather-stretching machine, but I do not desire to limit myself to the particular form of machine shown, as the principle herein embodied may be adapted to other forms of machines.

Furthermore, I do not desire to limit my invention to the particular form of clamp for securing the leather to the table or support, and so also I do not desire to limit my invention to a machine provided with two stretching-jaws located on opposite sides of the movable support or table, for, while I prefer this construction, it is evident that an operative machine would remain if only one stretching-jaw was used, which could be adjusted by the operator to increase or diminish the pressure or grip according to the thickness of the hide. I have more particularly described the machine as employed for stretching leather to be manufactured into belts, but the said machine is also applicable for stretching leather for other purposes—such, for instance, as sole-leather.

I claim—

1. In a machine for stretching leather, the combination of the following instrumentalities, viz: a vertically-movable table or support, a vertically-movable yielding clamping-jaw to secure the leather to the top or upper edge of the said table or support, means to elevate said table, and a stretching-jaw adapted to be moved toward the said table or support substantially at right angles to its path of movement to engage the leather, and held stationary when in engagement with the leather to offer a resistance to the passage of the said leather, substantially as and for the purpose specified.

2. In a machine for stretching leather, the combination of the following instrumentalities, viz: a table or support movable in a substantially vertical plane and over which the hide to be stretched is placed, means to secure the leather to the upper edge of the said table or support, a hoisting-shaft, flexible connections between the opposite ends of the said hoisting-shaft and said table, a pivoted stretching-jaw adapted to be moved toward the said table or support to engage the leather

and held stationary when in engagement with the leather to offer a resistance to the passage of the said leather, and means to adjust the pressure of the pivoted stretching-jaw upon the leather, substantially as described.

3. In a machine for stretching leather, the combination of the following instrumentalities, viz: a movable table or support, a yielding clamping-jaw to secure the leather to the said table or support and capable of being tilted by the hide or skin to adapt itself to differences in the thickness of the hide or skin, and a stretching-jaw consisting of a stationary member, and a movable member co-operating with the said stationary member to grip or press the leather and resist its movement with the table or support, and means to yieldingly engage the said movable member with the stationary member, substantially as and for the purpose specified.

4. In a machine for stretching leather, the combination of the following instrumentalities, viz: a movable table or support, means to secure the leather to the said table or support, a stretching-jaw consisting of a stationary member, and a coöperating movable member composed of a rigid bar provided with cranks or arms, pivots for the said cranks or arms, actuating-levers for said jaw, adjustable connections between the said bar and its actuating-levers, and means to operate said levers, substantially as described.

5. In a machine for stretching leather, the combination of the following instrumentalities, viz: a movable table or support, a clamping-jaw coöperating therewith to secure the leather to the said table or support, means to move the clamping-jaw toward the table to clamp the leather thereto, stretching-jaws located on opposite sides of the said table or support, and means to move the said stretching-jaws into engagement with the leather on opposite sides of the table and hold the said stretching-jaws stationary while the leather is moved with the table or support, substantially as described.

6. In a machine for stretching leather, the combination of the following instrumentalities: a table or support movable in a substantially vertical direction and over the upper edge of which the hide is placed, a movable yielding clamping-jaw to secure the leather to the said table or support, stretching-jaws located on opposite sides of the said table or support, and means to move said stretching-jaws into engagement with the leather and hold them stationary while the leather is moved with the said table or support, substantially as described.

7. In a machine for stretching leather, the combination of the following instrumentalities, viz: a table or support movable in a substantially vertical direction, means to secure the leather to the said table or support, stretching-jaws located on opposite sides of the said table or support, and means to move said stretching-jaws into engagement with the

leather and hold them stationary while the leather is moved with the said table or support, and means to vary the pressure of one of said stretching-jaws, substantially as and for the purpose specified.

8. In a machine for stretching leather, the combination of the following instrumentalities, viz: a vertically-movable table or support, means to secure the leather thereto, a stretching-jaw comprising a fixed member, and a movable member having pivoted cranks or arms, pivoted levers yieldingly connected to the movable member of the stretching-jaw, a rock-shaft provided with arms to engage said levers and move the movable member of the stretching-jaw into engagement with the leather, and means to move the rock-shaft in an opposite direction to release the latter, substantially as described.

9. In a machine for stretching leather, the combination of the following instrumentalities, viz: a vertically-movable table or support, means to secure the leather thereto, a stretching-jaw coöperating with said table, a hoisting-shaft, a main or driving shaft connected to said hoisting-shaft to rotate it in opposite directions, a clutch mechanism to control the rotation of the main shaft, and a mechanism actuated by the said movable table to operate said clutch and reverse the direction of travel of the movable table, substantially as described.

10. In a machine for stretching leather, the combination of the following instrumentalities, viz: a movable table or support, a shaft rotatable in opposite directions, flexible connections attached to said table and to said shaft to be wound thereon, mechanism to rotate said shaft in opposite directions, means to secure the leather to the said table, a stretching-jaw, means to move the said stretching-jaw into engagement with the leather and hold the said jaw stationary while in its operative position, and mechanism to automatically reverse the rotation of the said shaft and thereby prevent further movement of the said table or support when the latter has reached a predetermined point in its travel, substantially as described.

11. In a machine for stretching leather, the combination of the following instrumentalities, viz: a movable support or table, a clamping-jaw for the leather coöperating with said support or table, and movable toward and from the said table to clamp the leather thereto, means to move the said clamping-jaw toward the said table or support, a yielding connection interposed between said clamping-jaw and its actuating means, to permit the clamp to automatically adjust itself to the thickness of the leather between it and the table, and a stretching-jaw coöperating with the leather on the table or support and movable toward and from the table in a path substantially at right angles to the clamping-jaw, substantially as described.

12. In a machine for stretching leather, the

combination of the following instrumentalities, viz: a table or support, a hoisting-shaft connected therewith to elevate the same, a clamping-jaw coöperating with the said table or support and normally removed therefrom, a stretching-jaw, mechanism to move said stretching-jaw toward the table to engage the leather thereon, actuating devices to move the clamping-jaw toward the table, and means carried by one of said devices for actuating the mechanism which operates the stretching-jaw, substantially as described.

13. In a machine for stretching leather, the combination of the following instrumentalities, viz: a movable table or support, a loose clamping-jaw coöperating therewith, actuating-levers adapted to effect the movement of the said clamping-jaw toward the table, a yielding medium interposed between said levers and the clamping-jaw, and a stretching-jaw to act on the leather as it is carried with the table or support, substantially as described.

14. In a machine for stretching leather, the combination of the following instrumentalities, viz: a vertically-movable table or support, a hoisting-shaft, a clamping-jaw coöperating with the said table, actuating-levers for said clamping-jaw, main hoisting devices connected to said levers and adapted to be operated by the hoisting-shaft to actuate the said levers and move the clamping-jaw toward the said table, auxiliary hoisting devices connected to the table and to the main hoisting devices, a stretching-jaw to act on the leather carried by the table, and means carried by one of the actuating-levers to bring the stretching-jaw into its operative position, substantially as described.

15. In a machine for stretching leather, the combination of the following instrumentalities, viz: a vertically-movable table or support, a hoisting-shaft, a clamping-jaw coöperating with the said table, actuating-levers for said clamping-jaw, main hoisting devices connected to said levers and adapted to be operated by the hoisting-shaft to actuate the said levers and move the clamping-jaw toward the said table, auxiliary hoisting devices connected to the table and to the main hoisting devices, pivoted stretching-jaws located on opposite sides of the said table, actuating-levers for said stretching-jaws, yielding connections between said stretching-jaws and their actuating-levers, rock-shafts located on opposite sides of the said table and provided with cranks or arms coöperating with the actuating-levers for the stretching-jaws, and means connected to said rock-shafts and operated by one of the actuating-levers for the clamping-jaw to bring the stretching-jaws into their operative positions, substantially as described.

16. In a machine for stretching leather, the combination of the following instrumentalities, viz: a vertically-movable table or support over which the hide is placed, a yielding

clamping-jaw coöperating with the upper end thereof and capable of being tilted by the leather, to adapt itself to different thicknesses of the hide or skin, and a stretching-jaw coöperating with said table and consisting of a fixed or stationary member extended substantially the length of the table, and a movable member between which and the stationary jaw the leather to be stretched is passed, movable toward and away from the fixed member in a path substantially at right angles to the movement of the table, and means to move the said movable member toward its coöperating fixed member to bite or grip the leather between them, and a yielding connection between said movable member and its actuating means, substantially as described.

17. In a machine for stretching leather, the combination of the following instrumentalities, viz: a vertically-movable table or support, means to secure the leather thereto, a stretching-jaw coöperating with said table, a hoisting-shaft, a main or driving shaft connected to said hoisting-shaft to rotate it in opposite directions, a clutch mechanism to control the rotation of the main shaft, a brake mechanism for said main shaft, and mechanism actuated by the said movable table to operate said brake mechanism to stop the rotation of the main shaft and thereby the travel of the table beyond a predetermined point, substantially as described.

18. In a machine for stretching leather, the combination of the following instrumentalities, viz: a movable table or support, means to secure the leather thereto, a stretching-jaw normally removed from the table or support but adapted to be moved toward the said table to engage the leather and held stationary while acting on the leather to resist its movement with the table, means to automatically maintain the stretching-jaw in engagement with the leather, and means to automatically return the stretching-jaw to its normal position away from the table or support, substantially as described.

19. In a machine for stretching leather, the combination of the following instrumentalities, viz: a movable table or support, means to secure the leather to the said table or support, a stretching-jaw adapted to engage the leather, actuating devices for said stretching-jaw, yielding connections between said jaw and its actuating devices, and a positive connection between the stretching-jaw and the actuating devices located below the center line of the yielding connections, substantially as described.

20. In a machine for stretching leather, the combination of the following instrumentalities, viz: a movable table or support, mechanism to move it, means to secure the leather to the table, a stretching-jaw to engage the leather, actuating devices to operate the stretching-jaw and bring it into engagement with the leather, mechanism to automatically restore the said actuating devices to their nor-

mal position, and a safety device coöperating with said automatic mechanism, and operated by movement of the latter to permit further movement of the said automatic mechanism beyond the point at which the actuating devices for the stretching-jaw are restored to their normal position and thereby avoid injury to the machine, substantially as described.

21. In a machine for stretching leather, the combination of the following instrumentalities, viz: a vertically-movable table or support over the upper edge of which the hide is placed, an automatically-operated clamping-jaw coöperating with the upper edge of said table to secure the leather thereto, and an automatically-operated stretching-jaw to engage the leather and held stationary when in engagement with the leather to offer a resistance to the passage of the leather, substantially as described.

22. In a machine for stretching leather, the combination of the following instrumentalities, viz: a vertically-movable table or support, a shaft rotatable in opposite directions, flexible connections attached to said table near its opposite ends and to said shaft to be wound thereon, mechanism to rotate said shaft in opposite directions, means to secure the leather to the said table intermediate of its ends, a stretching-jaw, means to move the said stretching-jaw into engagement with the leather and hold the said jaw stationary while in its operative position, and mechanism to

automatically reverse the rotation of the said shaft and thereby prevent further movement of the said table or support when the latter has reached a predetermined point in its travel, substantially as described.

23. In a machine for stretching leather, the combination of the following instrumentalities, viz: a vertically-movable table or support, a hoisting-shaft, a clamping-jaw coöperating with the said table, actuating-levers for said clamping-jaw, main hoisting devices connected to said levers and adapted to be operated by the hoisting-shaft to actuate the said levers and move the clamping-jaw toward the said table, auxiliary hoisting devices connected to the table and to the main hoisting devices, pivoted stretching-jaws located on opposite sides of the said table, actuating-levers for said stretching-jaws, yielding connections between said stretching-jaws and their actuating-levers, rock-shafts located on opposite sides of the said table and provided with cranks or arms coöperating with the actuating-levers for the stretching-jaws, and means to move said rock-shafts to open said stretching-jaws, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALBERT F. JONES.

Witnesses:

JAS. H. CHURCHILL,
J. MURPHY.