(No Model.) 6 Sheets—Sheet 1.

B. D. HYAM.

MACHINE FOR TANNING LEATHER.

No. 274,336. Patented Mar. 20, 1883.

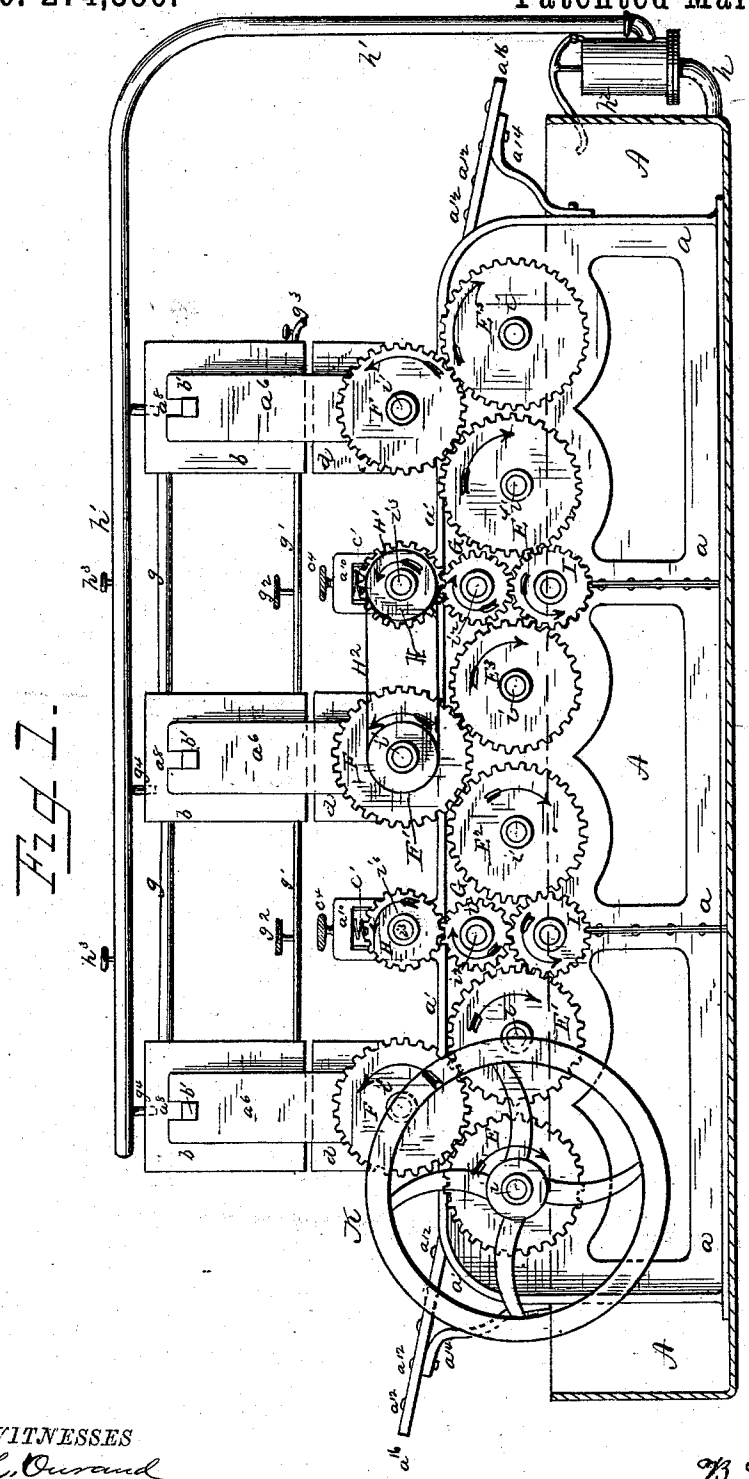


Fig 1.

WITNESSES

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INVENTOR

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MACHINE FOR TANNING LEATHER.

No. 274,336. Patented Mar. 20, 1883.

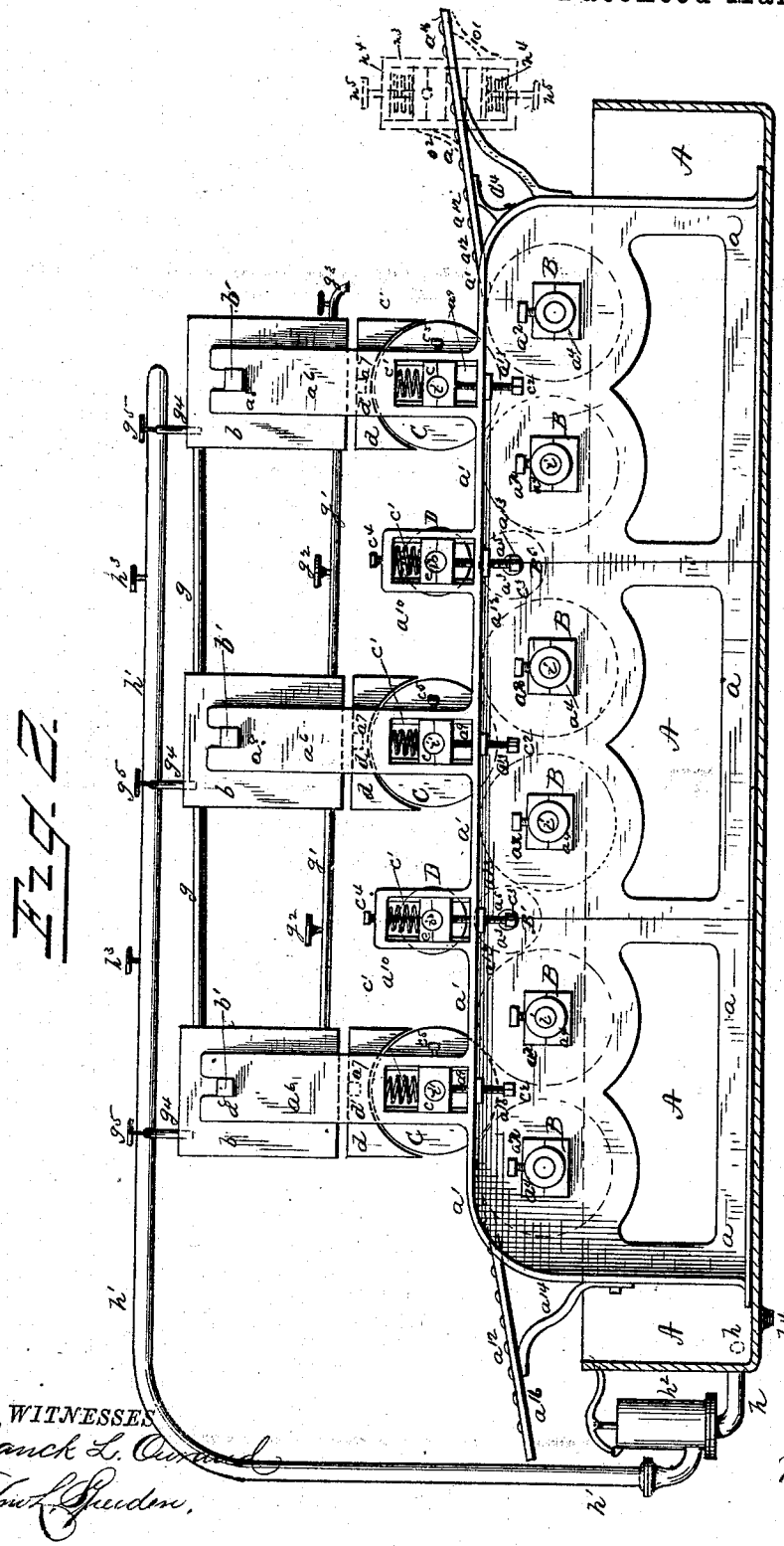


Fig. 2.

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MACHINE FOR TANNING LEATHER.

No. 274,336. Patented Mar. 20, 1883.

Fig. 13.

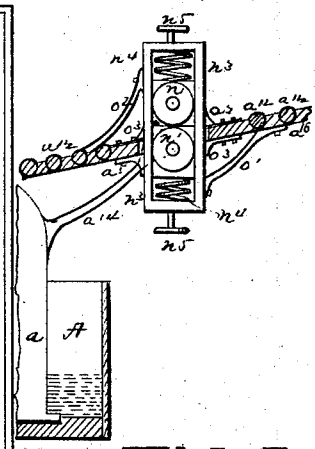


Fig. 14.

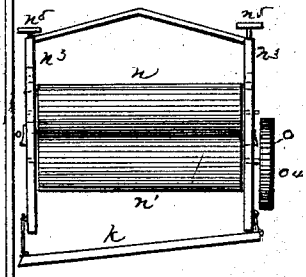
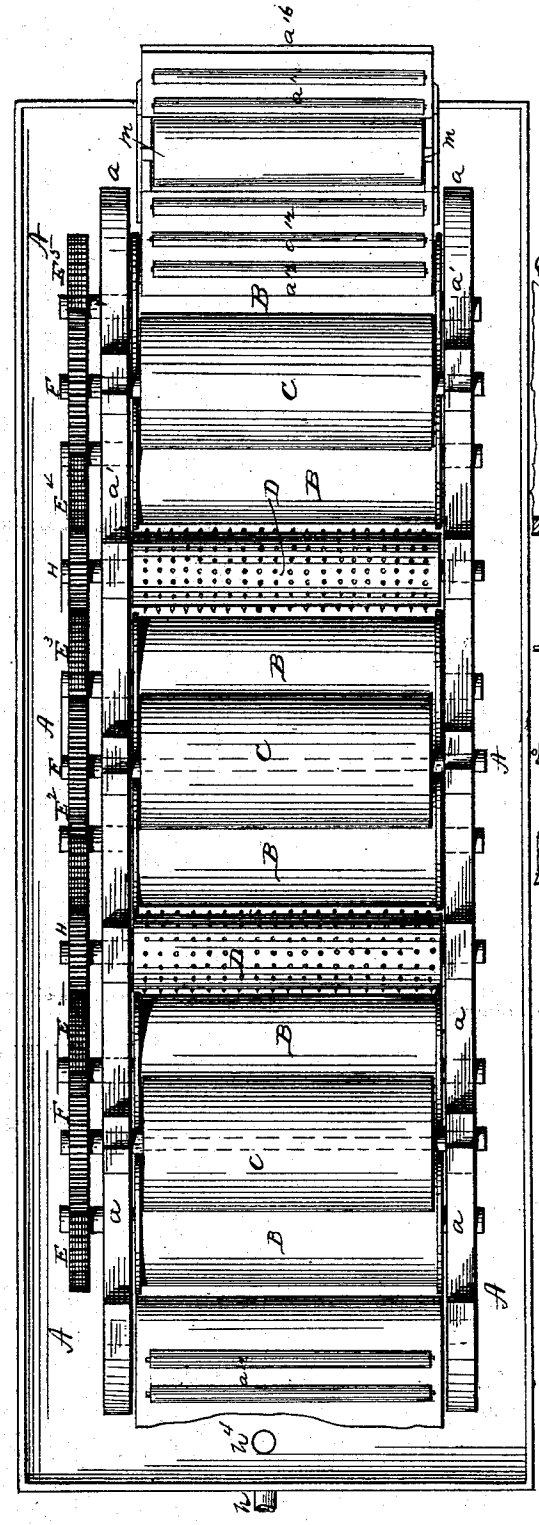


Fig. 12.



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MACHINE FOR TANNING LEATHER.

No. 274,336. Patented Mar. 20, 1883.

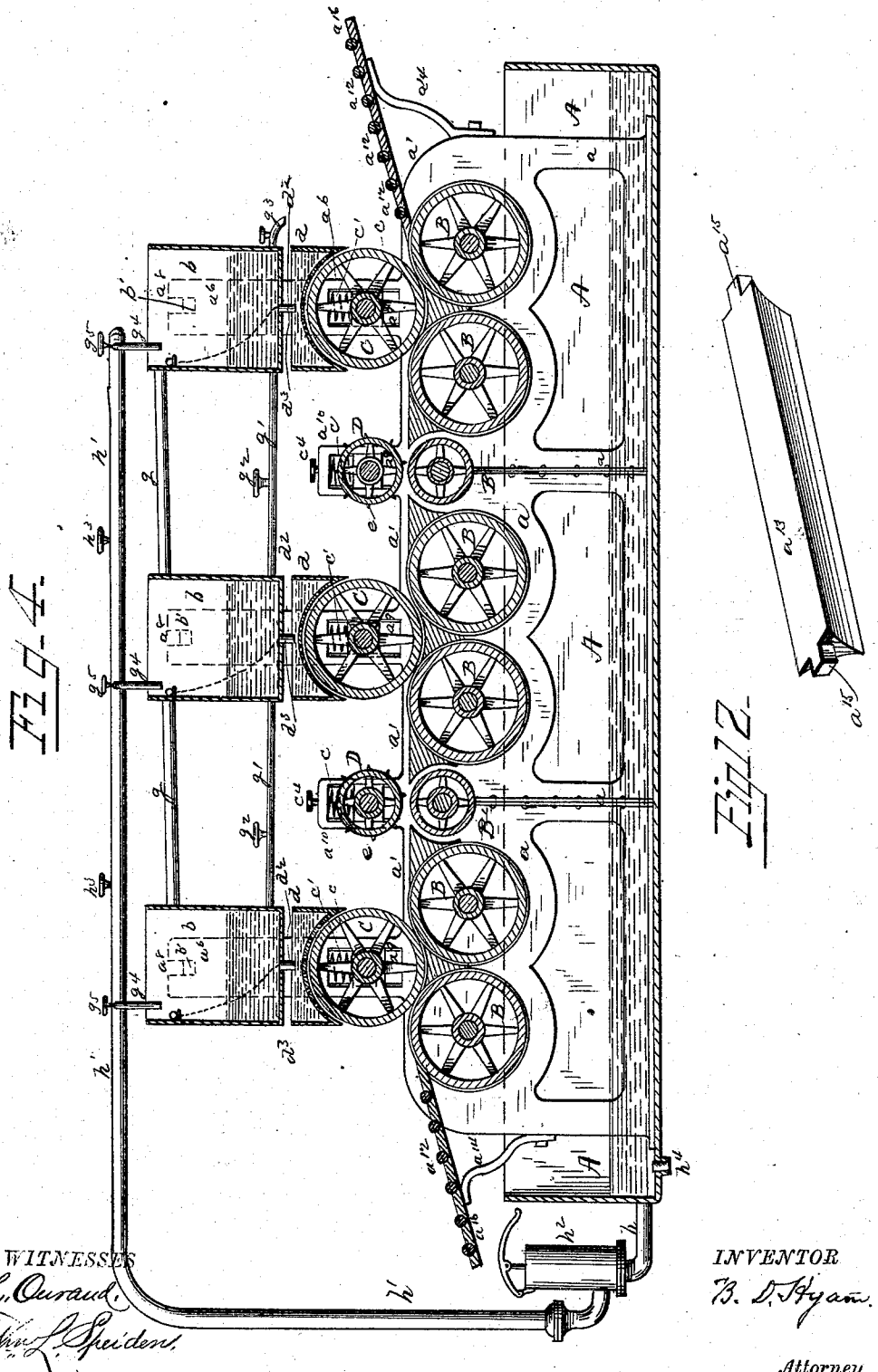


Fig. 1.

Fig. 2.

WITNESSES

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MACHINE FOR TANNING LEATHER.

No. 274,336. Patented Mar. 20, 1883.

Fig. 5.

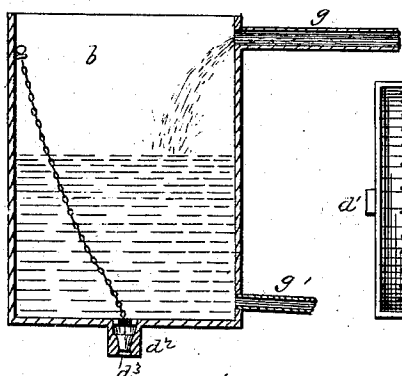


Fig. 6.

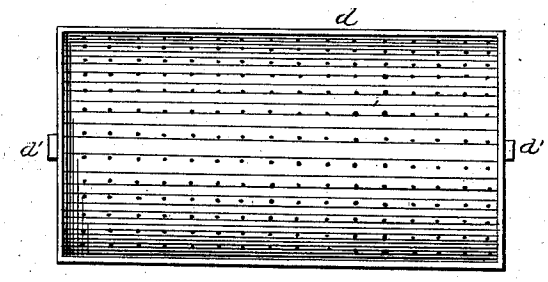


Fig. 7.

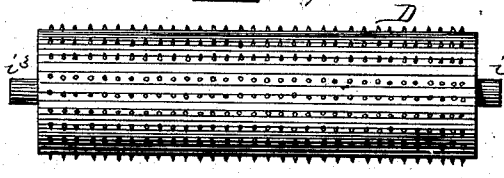


Fig. 8.

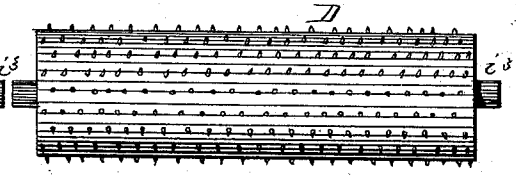


Fig. 9.

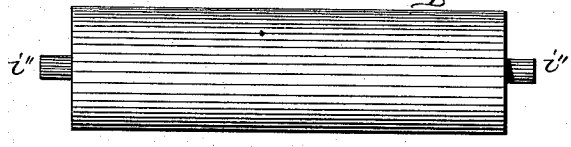


Fig. 10.

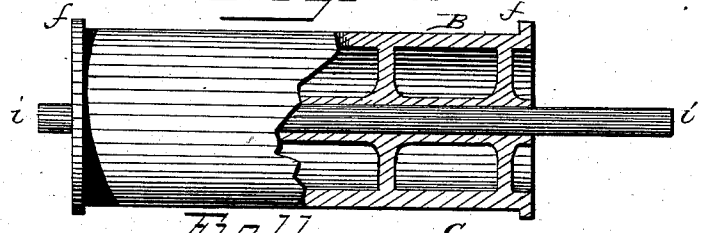
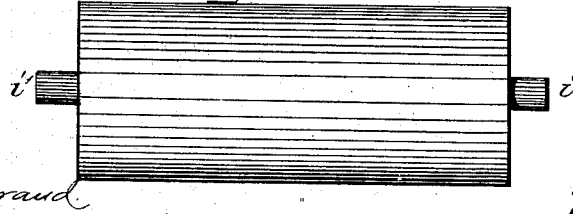


Fig. 11.



WITNESSES

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(No Model.)

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B. D. HYAM.

MACHINE FOR TANNING LEATHER.

No. 274,336. Patented Mar. 20, 1883.

Fig. 15

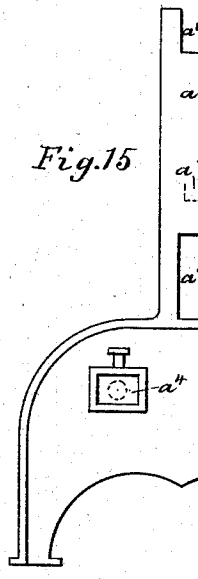


Fig. 16

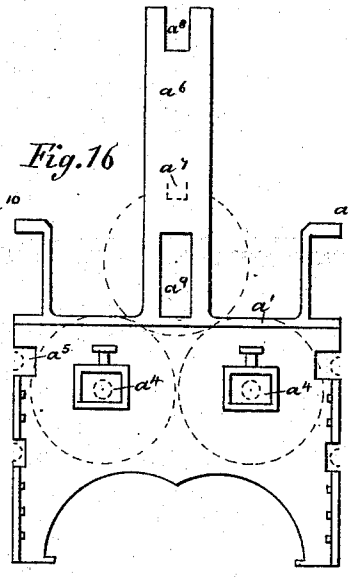


Fig. 17

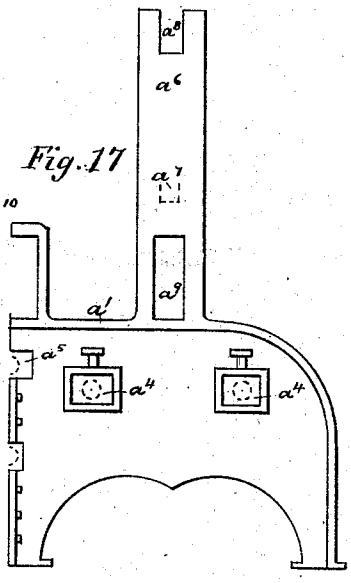


Fig. 18

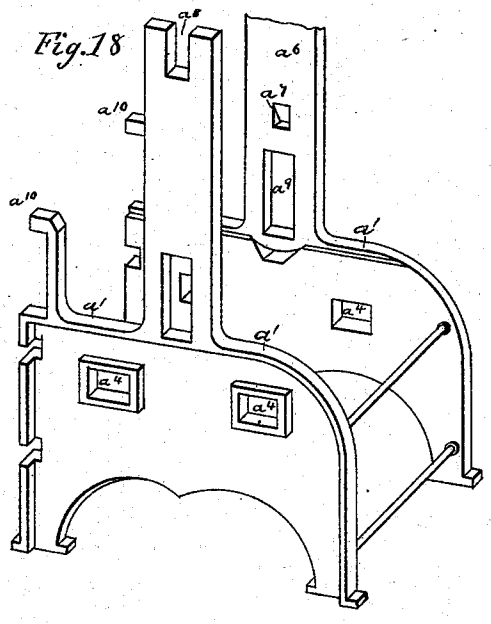


Fig. 19

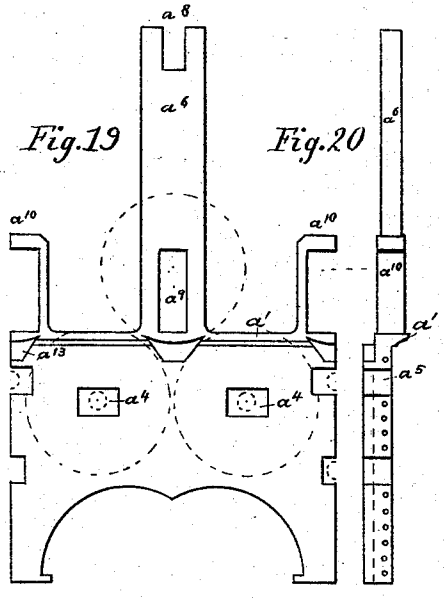


Fig. 20

Witnesses

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UNITED STATES PATENT OFFICE.

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MACHINE FOR TANNING LEATHER.

SPECIFICATION forming part of Letters Patent No. 274,336, dated March 20, 1883.

Application filed August 3, 1882. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN D. HYAM, of Washington city, in the District of Columbia, have invented certain new and useful Improvements in Machines for Expeditiously Tanning Leather by Mechanical Power; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to certain new and useful improvements in machinery for expeditiously tanning hides, skins, kips, and pelts—in short, hides of every kind and description; and it consists in mounting upon a suitable frame arranged in a general receiving or store tank, and under a number of feed or distributing tanks, groups of upper and lower pressure-rollers, and sets of puncturing and pressure rollers intervening, each roller mounted upon proper journal-bearings in suitable journal-boxings secured in apertures in the frame, and in slots in stanchions and frames rising above the frame proper, under tension-springs governed by tension and set screws for regulating the pressure of the said rollers, each of which rollers is provided with a spur, gear, or belt-pulley wheel, and the whole connected by one train of mechanism actuated by one general motor power for simultaneously actuating said pressure and puncturing rollers, whereby they are made to revolve in one general direction and with uniform speed, so that a skin, kip, hide, or pelt put or fed in at one end will be carried through the several sets of rollers and out at the other end without handling, being in its passage alternately saturated, pressed, dried, resaturated, and punctured repeatedly.

It further consists in furnishing said machine with a feed table or apron, over which, on rollers, the hide, skin, kip, or pelt being tanned is carried from the beginning to the end, and in supplementing said table between the rollers with foot-guides or dumb-turners to guide the hides, &c., to the next roller.

My invention further consists in suspending over each set of pressure-rollers feed-tanks connected one with another and with the general store-tank by suitable pipes supplied with valves governed by hand-screws, and with a pump for forcing the liquor from the store to the feed-tanks.

It also consists in providing said feed-tanks with induction and eduction pipes, each having suitable check-valves and stop-cocks, as well as with a general feed-pipe provided with a governing-valve.

It also consists in interposing between the feed-tanks and pressure-rollers a perforated liquor-distributer, boxed on top, and having a perforated concave face below, all of which is more particularly shown and pointed out in the accompanying drawings and the following specification.

Figure 1 is a side elevation of my tanning-machine, showing the store and feed tanks, the liquor-distributers, the supply and distributing pipes and a pump, also the gear and belt-pulley wheels attached to the pressure and puncturing rollers, the principal driving-wheel, and the table or apron. Fig. 2 is a side elevation of my tanning-machine, showing journal-bearings for the several rollers, the tension-springs, the set and tension screws, store and feed tanks, connecting-pipes and liquor-distributers, distributing-pipes, valves, stop-cocks, and the pump, the table or apron, as well as the general waste-plug and the pressure-rollers for expressing the lime-water from the hides, &c. Fig. 3 is a plan of same, with the pipes, feed-tanks, and liquor-distributers removed, showing the arrangement of the pressure and puncturing rollers, the cogged gearings, the frame, store-tank, and waste-plug. Fig. 4 is a longitudinal vertical section of the same, showing the arrangement of the pressure and puncturing rollers, tension-springs, the set and tension screws, the foot-guides or dumb-turners, apron or table, store-tank, pump, supply-pipe feed-tanks, connecting pipes and valves, discharge-pipe and cock, general waste-plug and cock. Fig. 5 is vertical transverse section of the feed-tanks, showing the liquor by wavy lines therein, the supply-pipe, feed-valve, and eduction-pipe. Fig. 6 is an interior plan view of the perforated liquor-distributer, showing the concave face. Fig. 7 is a side elevation of a puncturing-roller, with the needles arranged in parallel rows.

Fig. 8 is a side elevation of a puncturing-roller, showing the needles or points arranged in spiral rows. Fig. 9 is a side elevation of the lower companion roller of the puncturing-roller. Fig. 10 is a side elevation of the lower pressure-roller, showing the flange thereon, and broken away to show the form of construction, showing also the journal-shaft. Fig. 11 is a side elevation of the upper pressure-roller, showing the form thereof and the journal-axle. Fig. 12 is a perspective of the triangularly-shaped foot-guide or dumb-turner, showing the lugs for holding it in place. Fig. 13 is a vertical cross-section of the adjustable frame and rollers for removing the lime-water from hides, skins, and kips, showing its position and adjustments in the feed table or apron. Fig. 14 is a front elevation of the same, showing the dripping-pan for carrying off the lime-water. Figs. 15 and 17 are side elevations of opposite ends of the frame of my machine, showing the projecting flange, the apertures for the journal-bearings for the lower pressure-rollers, the stanchions for supporting the tanning-liquor tanks, and the journal-bearings for the upper pressure-roller, and the frame for securing the journal-bearings for the puncturing-roller. Fig. 16 is a side elevation of an intersecting section of the frame of my machine, showing the apertures for the journal-bearings of the under pressure-rollers, the projecting rim, the stanchion for supporting the tanks and carrying the journal-bearings of the upper pressure-roller, and a section of the frame for supporting the puncturing-roller. Fig. 19 is an elevation of the inside of the same, showing in addition the shoulders for the table or apron and the dumb-turners. Fig. 20 is the end elevation of the same, showing the flange and bolt-holes by which the several sections are united and secured together. Fig. 18 is a perspective of the opposite sides of one end of the frame, showing their relation to each other, the rim on the top, the apertures for journal-bearings for the under pressure-rollers, the stanchions for supporting the tanks for liquor, and the upper pressure-roller, sections of the frame for uniting and securing the bearings for the puncturing-rollers, the shoulders for the table or apron, indentations for the dumb-turners and the projecting flange, by which the several sections are united and secured together.

Similar letters of reference indicate corresponding parts.

Within a substantially-built tank, A, used for catching and storing the tanning-liquor, as hereinafter shown, I secure a firmly-built frame, *a*, preferably of metal, and constructed in sections, that it may be extended longitudinally when it is desired to increase the number of rollers used, or contracted for shorter machines. The frame *a* has a projecting rim, *a'*, on the upper edge, and is provided with apertures a^2 a^3, in which the journal-boxings for the lower pressure-rollers, B B', respectively, are secured.

On and extending upward and forming part of the upper edge of frame *a*, at intervals from end to end, or, more properly speaking, one to each section on the long sides, is a series of stanchions, a^6, having incisions a^8 in the top, for securing the lugs *b'* on the ends of the tank *b*, shoulders a^7, about midway on the inner sides, for securing the lugs *d'* on the distributing-tanks *d*, and slots a^9 in the foot, extending upward from the rim *a'* of the frame *a*, for securing the tension-spring *c'*, and the journal-boxings *e*, in which the journals *i'* on the pressure-rollers C have bearing.

Into the slots a^9, through the projecting rim *a'*, is introduced a tension-screw, c^2, for regulating the pressure of the roller C on the hides and pelts being tanned. Also passing into the slot a^9 from the side is a set-screw, c^5.

On and extending upward and forming part of the top rim, *a'*, of frame *a*, intervening the stanchions a^6 on the sides of frame *a*, are other frames, a^{10}, in which are secured tension-springs *c'*, for regulating the pressure of this roller, and journal-boxings *e*, in which the journals i^3 on the puncturing-rollers D have bearings.

Upward into frame a^{10}, through the rim *a'*, is introduced a set-screw, c^3, and down through the top is introduced a tension-screw, c^4.

Extending from end to end of frame *a*, and projecting beyond the store-tank A at each end, respectively, is a feed and discharge apron or table, a^{16}, supported by braces a^{14}, and provided at intervals with rollers a^{12}, and intersected, where necessary, throughout its length by foot-guides or dumb-turners secured on shoulders on the inner side of the frame *a* by lugs a^{15}. (See Fig. 12.)

In and on frame *a*, I adjust in pairs, mounted on journal-shafts *i* in journal-boxings a^4, in which they revolve, what I call "under pressure-rollers," B B, provided with spur, gear, or belt-pulley wheels E E' E^2 E^3, respectively, for actuating the same on their axis. These pressure-rollers B B are constructed of any hard material not subject to the action of tannic or other acid, or any material used in tanning leather, and are provided further with a raised lip or flange, *f f*, at each end, within which the upper pressure-roller, C, is adjusted, and their entire length must correspond with the width of the frame *a*.

Above the pressure-rollers B B, secured in movable journal-bearings *e*, fitted in the slots a^9 in stanchions a^6, I adjust a pressure-roller, C, of the same diameter and constructed of the same material as, but short enough to lie between, the flanges *f f* of the pressure-rollers B B, and in such position that it comes in contact with and bears equally upon them. The roller C is provided with suitable journal-shaftings, *i'*, carrying a gear, spur, or belt-pulley wheel, F', or a gear-wheel, F, with a pulley-wheel, F', thereon, as may prove most advantageous in the practical use of the same. The gear or spur wheel F or gear-wheel F, with the band-wheel attachment F', is arranged to gear and connect with similar wheels (indicated by

E^2 E^3 and H and H′) on the other rollers for simultaneously actuating the whole as one, as shown.

In the slot a^9 in stanchion a^6 on the journal-boxings c, which secure the journal-shaftings i' of the pressure-roller C, is adjusted a tension-spring, c', a tension-screw, c^2, and a set-screw, c^5, for regulating the pressure of this roller on the skin, pelt, hide, or kip to be tanned.

Mounted on journal-shafts i^2, in suitable journal-bearings a^5 in the frame a, is a series of under single pressure-rollers, B′, constructed of similar material to that used in the rollers B C and of corresponding length, and, at the option of the operator, provided with actuating pulley or gear wheel G, for gearing with spur-wheels H I, if required. This roller forms a revolving bed to resist the pressure of the puncturing-roller D above it.

Immediately above and bearing upon the pressure-roller B′, mounted on its journal-shaftings i^3 in suitable adjustable journal-boxings, e, governed by a set-screw, c^3, tension-screw c^4, and spring c', and secured within a frame, a^{10}, forming part of and on the upper edge of the frame a, I adjust what I call a "puncturing-roller," D, conforming in length with the rollers B, B′, and C, provided, at the option of the operator, with a pulley-wheel, H′, for propulsion with an endless belt, H^2, or a spur-wheel, H, for gearing with the spur-wheel G. The puncturing-roller D is a roller of the same diameter and length as the pressure-roller B′ and of the same material, overlaid with a sheeting of metal or other suitable material not subject to the action of tannic or other acids, provided or studded with an indefinite number of puncturing points or needles, not to exceed fifty to the square inch, arranged in parallel or spiral or other rows, for puncturing the fleshy side of the skin, hide, kip, or pelt as it passes between the puncturing and the pressure rollers D and B′ in the operation of the machine.

A distributing-tank, d, of the same length and width as the pressure-roller C, open on top and provided with a perforated concave bottom, arranged to evenly distribute in a shower or spray the tanning-liquor onto the pressure-roller C and the skin, hide, pelt, or kip below it, is introduced and secured in place by lugs d' on the ends thereof, between each group of pressure-rollers B B and C, and a supply-tank, b, for uniformly ejecting the tanning-liquor onto the skins, hides, kips, and pelts. The tank d is provided with lugs d' on the ends, by which, when inserted in proper shouldered recesses a^7 on the inner sides of the stanchions a^6, it is secured in place, and it is fed through a supply-pipe or sluice d^2 in the bottom of and from the supply-tank b, and the supply of liquor is governed by a check-valve, d^3, arranged in the pipe or sluice d^2.

A supply or feed tank, b, wholly inclosed in parallelopiped form, of the same length and width as but deeper than the distributing-tank d, is adjusted above every distributing-tank d and groups of pressure-rollers B B and C. (See Figs. 1, 2, and 4.) This tank b contains the liquor to be used in tanning, and, if desired, each tank may contain a liquor of a different degree of strength, the other parts being arranged to keep the waste separate. The supply-tanks b are provided with induction-pipes g^4, governed by valve g^5, eduction-pipes d^2, provided with a check-valve, d^3, a stop-cock, g^3, for drawing off the liquor when it is desired to empty the tanks or change the character of the liquor therein with equalizing-pipes g g', the latter having a valve, g^2, and with lugs b' on the ends, by which it is secured in place by inserting said lugs b' into the incisions a^8 in the upper end of stanchions a^6, and the whole is so arranged that the person using the machine can regulate the supply as well as the quantity of liquor used, and, when a better or a different character of liquor is required, that the old supply may be drawn off easily and other liquor introduced.

Passing from the general receiving and store tank A through a force-pump, h^2, to and connecting with the supply and feed tanks b by intervening connecting-pipes g^4, are general supply-pipes h h', provided with valves h^3, through which the tanning-liquor is pumped from tank A into the tanks b or any one of them when required. The several valves h^3 are inserted in pipe h' for the convenience of the operator, to enable him, if he so desires, either to fill one, two, or more tanks at the same time, and the pipe g', arranged at the bottom of the tanks b, is introduced for the double purpose of equalizing the quantity of liquor in the several tanks b when it is not desired to introduce any more from the general store-tank A, and for drawing off the liquor through the stop-cock g^3—that is, emptying all the tanks b at one outlet, while the pipe g is introduced for the purpose of relieving any one of the tanks when pumped too full.

The tank A is constructed of any material which will resist the action of the tannic or any other acid, and it is made sufficiently longer and broader than the frame a so that all the surplus liquor falling from the distributing-tanks d onto the hides, skins, kips, and pelts will be caught therein, and it is provided on the inner sides with grooves for sluice-gates, and with an outlet-pipe, h, and a waste-plug, h^4, passing out from a lower point at one end.

I find it to be advantageous when expeditiously tanning kips, skins, or hides, before introducing them into the tanning-liquor, to extract therefrom as much of the lime-water and other extraneous matter as may be, so that the tannic liquor and acid will meet with as little antagonism therefrom as possible. To this end I introduce into the apron or feed-table a^{16} at a point, m, outside of the tank A, (see Figs. 2 and 13,) a set of adjustable pressure-rollers, n n', arranged in a suitable adjustable frame, n^3, (see Fig. 14,) actuated by power, through which, when first taken from the lime-vats, the hides, skins, or kips are carried through once, as

through a wringer, thus squeezing out the lime-water or other extraneous matter inimical or unfriendly to the tanning-liquid. The lime-water and other matter thus squeezed out falls through the table into a trough, *k*, immediately below the rollers *n n'*, and is thus carried off and not permitted to mingle with the tanning-liquid. The said wringing device consists of an upper and lower pressure-roller, *n n'*, one perpendicularly above the other, and both working on proper journals in suitable adjustable journal-bearings secured in an adjustable frame, n^3, between tension-springs n^4, governed by tension-screws n^5. When used, the frame n^3, with the rollers therein, is set into an aperture, *m*, made by removing two of the rollers, a^{12}, from the bed of the feed-table a^{16}, (see Fig. 13,) until the shoulders *o* rest on the sides of the table a^{16}, and the upper edge of the lower roller is but a little above the plane of the roller a^{12} in the table, when it is then secured by braces o' o^2 and brackets o^3. The journal axle of the lower roller, *n'*, extends beyond the side of the table a^{16} sufficiently far to permit the securing thereon of a pulley-wheel, o^4, for a propelling-belt.

I do not confine myself to any mode of actuating my machine, using indiscriminately the crank and eccentric, the cogged gear, and the pulley-wheel and belt. In Fig. 1 I show both the cogged and belt gear.

K is the general balance or band wheel, carrying on its axle the cogged gear-wheel E, secured on the journal-shaft *i* of the first under or lower pressure-roller, B. The wheel E in turn gears with and propels the gear-wheel F, secured on the journal-shaft *i'* of the first upper pressure-roller, C, which in turn gears with and actuates the second lower or companion roller B through the gear-wheel E', secured on its journal-shaft *i*. Thus connected, the several gear-wheels, as well as the rollers, being of uniform diameter, travel with one motion or speed. These three wheels represent the first group. The second gear-wheel E' of the first group gears with gear-wheel I, which performs the double function of transmitting motion to the second group by gearing with an actuating gear-wheel, E^2, the gear-wheel on the first lower pressure-roller B of that group; also, by gearing with and actuating wheel G, the gear-wheel on the first pressure-roller, B', through which, by gearing with wheel H, the puncturing-roller D is actuated and made to perform its function. A description of one group of these rollers and their connections will be sufficient to show the connection and arrangement of each group. In lieu, however, of the gear-wheels G and H for propelling the puncturing-roller D and its companion pressure-roller B', I prefer to use a series of pulley-wheels and a band. In that event I remove the gear-wheels G and H, let the roller B' run by attrition, and secure a band or pulley wheel, H', on the axle-shaft of the puncturing-roller D, securing at the same time a band or pulley wheel, F', on the face of gear-wheel F, and connecting the wheels H' and F' with a band, H^2. The two pulley-wheels F' and H' being of one diameter, the two rollers C and D must run with one speed, and thus avoid tearing the skin on the one hand and packing it on the other, (see the second group of rollers, Fig. 1;) or, if I prefer it in actual practice, I claim the right to use beltings for all of these rollers. I use, as shown, one puncturing-roller between and to two sets of pressure-rollers, so that no machine is complete without two sets of pressure-rollers with their corresponding supply and distributing tanks and an intervening puncturing-roller; but the series may be extended indefinitely, or until the machine is so extensive that passing a skin once through will be sufficient for one or each course of liquor.

When my machine has been constructed and put together as described, and the tanks *b* supplied with the first course of tanning-liquor, (any kind in use,) the skins, hides, or kips from the lime-vats are passed between the rollers *n n'*, temporarily adjusted in the table at the front under heavy pressure, whereby no inconsiderable quantity, if not nearly all, of the lime-water is taken therefrom, passing thence forward between the pressure-rollers B C B, where, in addition to being rolled, they are subjected to a double bath of the first tanning-liquid, one on passing into and under the rollers, and another on emerging therefrom on the other side. Passing thence, carrying the new charge of liquor, they respectively pass between rollers B' and D, under the puncturing-roller D, the teeth of which entering the flesh side of the skin opens a ready way for the liquor to permeate every fiber thereof. Passing thence into and between a second series of rollers, they are again, respectively, subjected to two baths and a pressure, and so on during one entire day, one skin following another in quick succession, making the operation continuous, until it becomes necessary on the second day to change the liquor for a stronger one. This operation, omitting the lime-rollers, which are removed as soon as the limed skins, kips, and hides required for a run have passed through, is continued from day to day, changing the tanning-liquor each day for one, four, or more days, as experience may suggest or the necessities of the hides may demonstrate as necessary, or the weight or thickness of the skin, hide, kip, &c., may require, until the hide, skin, pelt, or kip is ready to be turned out for the hands of the currier.

The frame *a* is constructed of metal, in sections, and in such a manner that in order to increase the number of groups of pressure and sets of puncturing and pressure rollers D and B' it may be extended to an indefinite length by inserting interior sections between the end sections, the outer ends of which latter are of different form, as shown, and has in each section proper apertures for journal-boxings for the journals of the several pressure-rollers B B B' and the gear-wheel I, a set of stanchions,

a^6, and half of the frame a^{10}, and provided on the inner side with shoulders and recesses for the table a^{16} and shoulders a^{15} of the dumb-turners a^{13}.

Wherever I have used the tension-spring in the tanning-machine proper in connection with the rollers I indicate it by the letter c'.

Pelts, sheep or other light skins may be tanned by my process; but in these, as in other thin, light, and porous skins or pelts, one or two days will suffice to perfectly tan them, care being taken to change the liquor during the process, or, if long machines with numerous sets of rollers and tanks are used, by charging the tanks with liquor of different degrees of strength.

Scientific analysis has demonstrated that leather is an aggregated combination of tannic or other suitable acid or chemicals with the gelatine of the cellular tissue of hides or skins of every description of animal—land, water, or amphibious—and that one hundred parts of dry gelatine, combined with one hundred and thirty-six parts of tannic acid, contains an atom of each ingredient. Wherefore the end arrived at in tanning is to exclude all other matter, and equally and proportionally to combine these elements. To this end some persons have sought to accomplish the process of tanning by a resort to hot liquor or liquors containing chemicals which disintegrate and destroy the cellular tissues of the skin, &c. To avoid the destruction of the hide, skin, kip, &c., others again have adopted the slow process of subjecting them to a bath in vats for an indefinite period, a great part of which period is consumed in neutralizing the lime or other matter in the hide, skin, kip, &c., left therein, respectively, after removing the hair. By my machinery I avoid both of these difficulties. First, I use no hot or other than the most approved tanning-liquor; secondly, I save time by first extracting all the lime and other aqueous matter from the skin, &c., to be tanned before subjecting it to the tanning-bath, and then by means of the pressure-rollers, puncturing device, &c., I so force the tannic acid into every fiber and pore of the skin &c., that a few days is sufficient to accomplish what by the slow vat system takes months.

Hides, skins, kips, and pelts tanned on my machine and by my process I assume will produce as durable, fine, pliable, and bright a leather as that manufactured by any other known system or process, as every part of the gelatine has been converted into good and healthy leather, and no part of the tissue has been destroyed, either by heated or poisonous chemicals on the one hand, or by subjection by long maceration to the action of tannic, gallic, or other powerful acids. In short, I produce by my quick tanning a first class quality of merchantable leather of the various characters in use, and enable a rapid turning of capital.

Having now described my machine and process of tanning leather so that others are enabled to understand and use and practice it, what I deem to be novel, and seek to protect by Letters Patent, is—

1. In a machine for tanning hides, skins, kips, and pelts, pressure-rollers B B and C, arranged in groups, as shown, on a frame below and in combination with a distributing-tank having a concaved perforated bottom, and with actuating mechanism substantially as shown and described.

2. In a machine for tanning hides, skins, kips, and pelts, pressure-roller C, in combination with pressure-rollers B B, provided with flanges $f f$, and adapted to press uniformly upon said rollers, the whole arranged in groups, and mounted on a frame under a liquor-distributing tank, d, provided with a perforated bottom, and actuated to travel in one general direction with uniform speed, substantially as shown and described.

3. The combination of pressure-rollers B B and C, mounted in groups on proper journals in suitable journal-bearings on a suitable frame, and provided with cogged gear-wheels by which they are actuated to travel inward with uniform speed, the frame a, constructed in sections, and provided with uprights or stanchions on the sides for holding and securing a supply-tank, b, distributing-tank d, and journal-bearings for the rollers C, the apron or table a^{16}, extended and continued by dumb-turners a^{13}, and provided with rollers a^{12}, supply-tank b, provided with induction and eduction pipes, valves, and stop-cocks, and a distributing-tank, d, provided with a perforated bottom, in a machine for tanning leather, substantially as shown and described.

4. The combination of pressure-rollers B B and C, the latter adapted to press uniformly upon the two former, and the three mounted in groups on a suitable frame, tension-springs c', set-screws c^3 and c^5, frame a, constructed in sections, and carrying an upper projecting-rim, a', and provided with uprights or stanchions a^6, adapted for holding and securing upper pressure-roller, C, supply-tank b, and distributing-tank d, supply-tank b, provided with lugs b', eduction and induction pipes, valves, and stop-cocks, distributing-tank d, provided with lugs d' and a perforated bottom, pipes g, g', g^4, and d^2, valves g^2, g^5, and d^3, and gear-wheels E, E′, and F, adjusted on the journal-axle i of the pressure-rollers B B and C, respectively, in a device actuated by mechanical power for tanning leather, substantially as shown and described.

5. A distributing-tank, d, open at the top, and having a concaved perforated bottom, and provided with lugs d', by which it is secured in recessed shoulders on the inner side of stanchions a^6, forming part of the frame a, in a device actuated by mechanical power for tanning hides, skins, kips, and pelts, substantially as shown and described.

6. A distributing-tank, d, open on top, and having a perforated bottom, and provided with lugs d', shoulders a^7 on uprights or stanchions

a^6, forming part of frame a, in combination with pressure-rollers C, B, and B, provided with gear-wheels E, E′, and F, mounted in journal-bearings e, governed by tension-springs c', tension-screws c^2, set-screws c^5, adjustable in slots a^9 in the stanchions a^6, and journal-bearings a^4 in frame a, and frame a, provided with table a^{16}, extended by dumb-turners a^{13}, in a device actuated by mechanical power for tanning hides, kips, skins, and pelts, substantially as shown and described.

7. A tank, d, open at top, and having a concaved perforated bottom for evenly distributing the tanning-liquor on the rollers and hides, skins, kips, or pelts below, provided with lugs d', by which it is secured in place, in combination with supply-tank b', pipe or sluice d^2, upright stanchions a^6, table a^{16}, pressure-rollers C, B, and B, provided with gear-wheels E, E′, and F, mounted in suitable journal-bearings, a^4 and e, the former in frame a and the latter in the slot a^9 in stanchion a^6, and governed by springs c', tension-screws c^2, and set-screws c^5, in a device actuated by mechanical power for tanning skins, hides, kips, and pelts, substantially as shown and described.

8. The puncturing-roller D, adapted to work on journals i^3 in suitable journal-bearings, e, secured within a frame, a^{10}, and governed by a spring, c', a set-screw, c^3, and tension-screw c^4, in combination with pressure-roller B′, adapted to work on journals i^2 in bearings a^5, and both mounted on frame a, in a device actuated by suitable driving mechanism for tanning hides, kips, skins, and pelts, substantially as shown and described.

9. In a machine for tanning leather, roller D, studded on its periphery with rows of puncturing-needles, as shown, companion roller B′, provided with journal-shafts i^2 i^3, in combination with journal-bearings e and a^5, tension-springs c', tension-screw c^4, set-screw c^3, frame a^{10} on the upper edge, and forming part of supporting-frame a and projecting rim a', feed-table a^{16}, dumb-turners a^{13}, pulley-wheel H′, belt H^2, pulley-band F′, gear-wheel F, gear-wheel E, and suitable operating mechanism, substantially as shown and described.

10. The roller D, studded on its periphery with rows of needles or points for puncturing skins, kips, hides, and pelts while in the process of being tanned, companion roller B′, journal-bearings e a^5, journal-shafts i^2 i^3, springs c', set-screw c^3, tension-screw c^4, gear-wheels H G, mounted on frame a, in combination with lower companion roller, B B, journal-shafts i, gear-wheels E E′ thereon, journal-bearings a^4, upper pressure-rollers, C, journal-shaft i', carrying gear-wheel F, journal-bearings e, set-screw c^5, tension-spring c', tension-screw c^2, slot a^9, stanchion a^6 on the upper edge, and forming part of frame a, recessed shoulders a^7, distributing-tank d, lugs d', pipes or sluice d^2, valve d^3, supply-tank b, having lugs b' on the ends, pipes g g' g^4, and stop-cock g^3, in a device for tanning skins, kips, hides, and pelts, substantially as shown and described.

11. The roller D, studded on its periphery, and companion roller B′, in combination with companion pressure-rollers B B, pressure-roller C, distributing-tank d, supply-tank b, and table a^{16}, in a device for tanning leather, substantially as shown and described.

12. The roller D, studded on its periphery, and companion pressure-roller B′, pulley-wheel H′, and belt H^2, in combination with companion pressure-rollers B B, gear-wheels E E′, upper pressure-roller, C, gear-wheel F, pulley-band F′, and table a^{16}, having rollers a^{12}, in a machine for tanning leather, substantially as shown and described.

13. The frame a, constructed in sections, and provided with apertures a^4 a^5, for securing journal-boxings, a projecting rim, a', on the upper edge, with recessed shoulders on the inner side for securing a feed-table, a^{16}, and dumb-turners a^{13}, with stanchions a^6, for carrying an upper pressure-roller and distributing and general supply tanks, and with a frame, a^{10}, for securing puncturing-roller D, and also adapted to support the pressure-rollers B B and C in groups, distributing-tank d, supply-tank b, eduction-pipe or sluice d^2, check-valve d^3, connecting and equalizing pipes g g', valves g^2, induction-pipes g^4, pipes h' h, force-pump h^2, and general store-tank A, substantially as shown and described.

14. Pressure-rollers C B B, arranged in groups, distributing-tank d, feed-table a^{16}, gear-wheels F E E′, mounted on frame a, in combination with gear-wheels I, G, and H, pressure-roller B′, and puncturing-roller D, in a machine for tanning leather, substantially as shown and described.

15. The combination of supply-tank b, connecting-pipes g g', pipe or sluice d^2, distributing-tank d, pressure-roller C, under pressure-rollers, B B, having flanges f f, gear-wheels F E E′, gear-wheels I, G, and H, pressure-roller B′, and puncturing-roller D, frame a, and table a^{16}, in a machine for tanning leather, substantially as shown and described.

16. The distributing-tank d, having a perforated bottom, in combination with supply-tank b, ejection-pipe or sluice d^2, pressure-rollers C, B, and B, in a machine for tanning leather, substantially as shown and described.

17. The frame a, having a feed-table, a^{16}, provided with rollers a^{12} and dumb-turners a^{13}, and supporting a pressure-roller, B′, carrying a gear-wheel, G, on the shaft thereof, a roller, D, studded on its periphery, provided with rows of needles or puncturing-points, and carrying a gear-wheel, H, a frame, a^{10}, pressure-rollers B B, arranged in pairs, and provided with gear-wheels E E′, a pressure-roller, C, carrying a gear-wheel, F, and a pulley band-wheel, F′, in combination with distributing-tanks d d, having a perforated concave bottom, supply-tanks b b, provided with outlet-pipes or sluices d^2 d^2, pipes g and g', and stop-cock g^3, in a device actuated by mechanical power for tanning skins, kips, hides, and pelts, substantially as shown and described.

18. The combination of the supply-tank A, frame *a*, projecting rim *a'*, pressure-rollers B B and B', journal-bearings a^4 a^5, journal-shafts *i* i^2, frames a^{10}, puncturing-roller D, journal-bearings *e*, springs *c'*, tension-screws c^4, set-screws c^3, stanchions a^6, journal-bearings *c*, springs *c'*, set-screws c^5, tension-screws c^2, pressure-rollers C, distributing-tanks *d d*, eduction-pipe or sluice d^2, induction-pipes g^4, pipe *h'*, force-pump h^2, and pipe *h*, in a machine propelled by mechanical power for tanning skins, hides, kips, and pelts, substantially as shown and described.

19. In a machine for tanning hides, skins, and kips, frame n^3, set-screw n^5, springs n^4, brackets *o*, braces o^2, pressure-rollers *n n'*, band-wheel o^4, trough *k*, adjustable with and removable from table a^{16}, a device for expressing lime and other aqueous matter from skins, kips, and hides to be tanned, substantially as shown and described.

20. The combination of upper and lower pressure-rollers arranged in groups, a puncturing upper and an under pressure-roller, tanks for securing and for distributing tanning-liquids, and a set of adjustable rollers for expressing the lime and other aqueous matter from skins, hides, and kips before being subjected to a bath of tanning-liquid, secured in a table arranged on a general frame, in a machine for tanning leather, substantially as shown and described.

In testimony that I claim the foregoing as my own invention I have hereunto set my hand, this 3d day of August, 1882, in presence of two witnesses.

BENJAMIN D. HYAM.

Witnesses:
D. O'DONOUGHUE,
E. H. BRADFORD.