

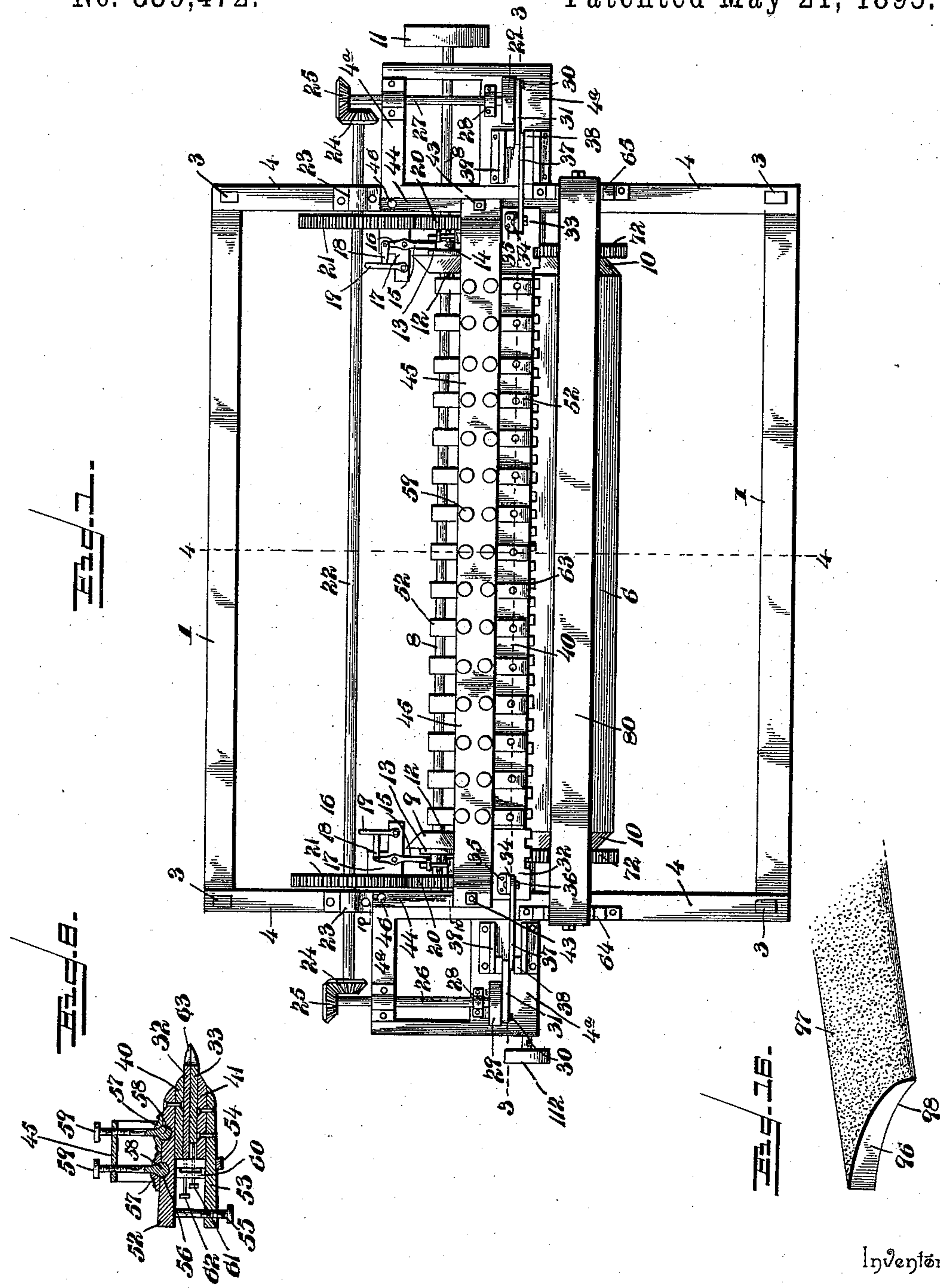
(No Model.)

4 Sheets—Sheet 1.

J. E. FAIRBANKS.  
MACHINE FOR SPLITTING HIDES.

No. 539,472.

Patented May 21, 1895.



Inventor

James E. Fairbanks

Witnesses

C. S. Stewart  
D. D. Hays

By his Attorneys.

C. A. Snow & Co.

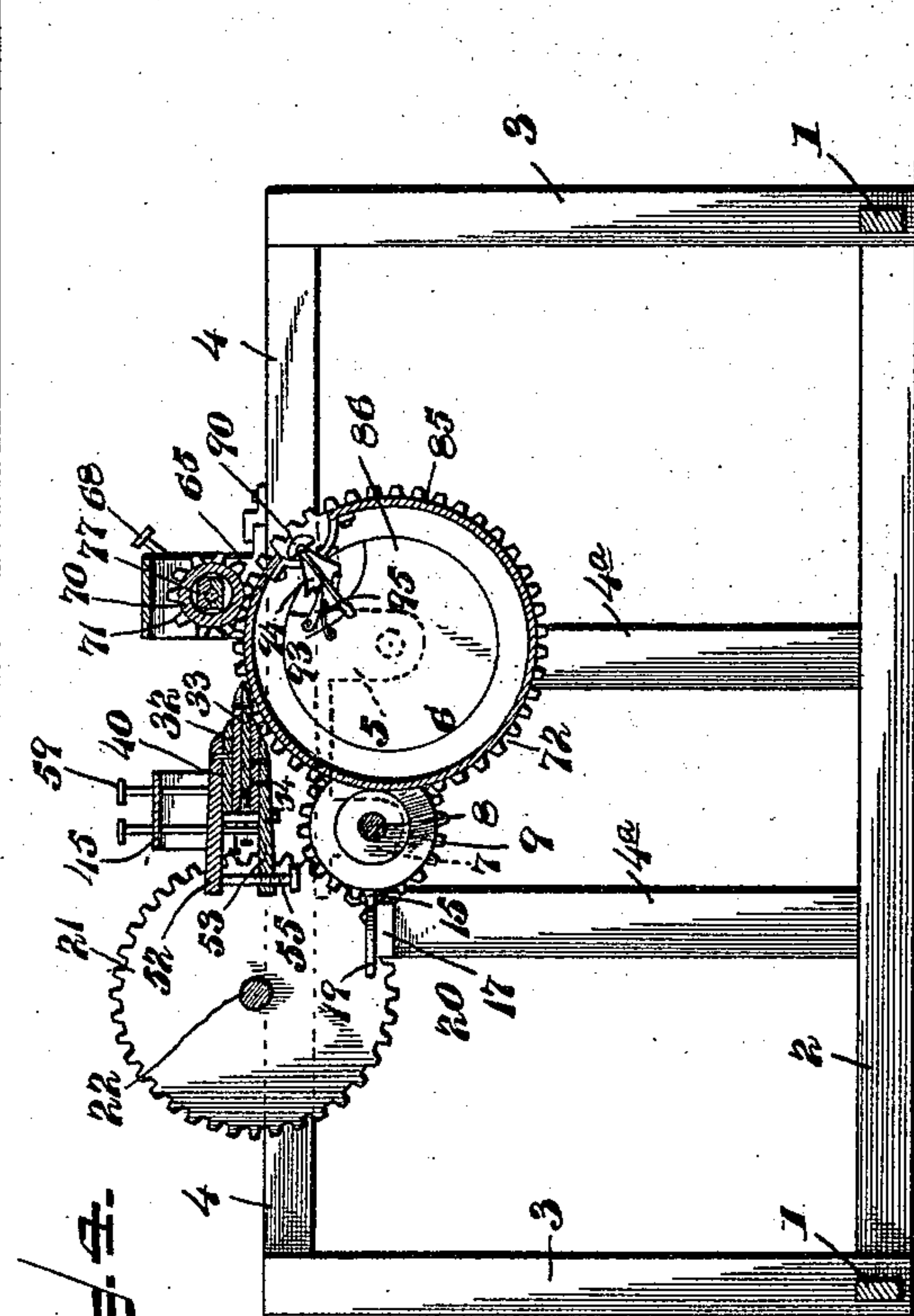
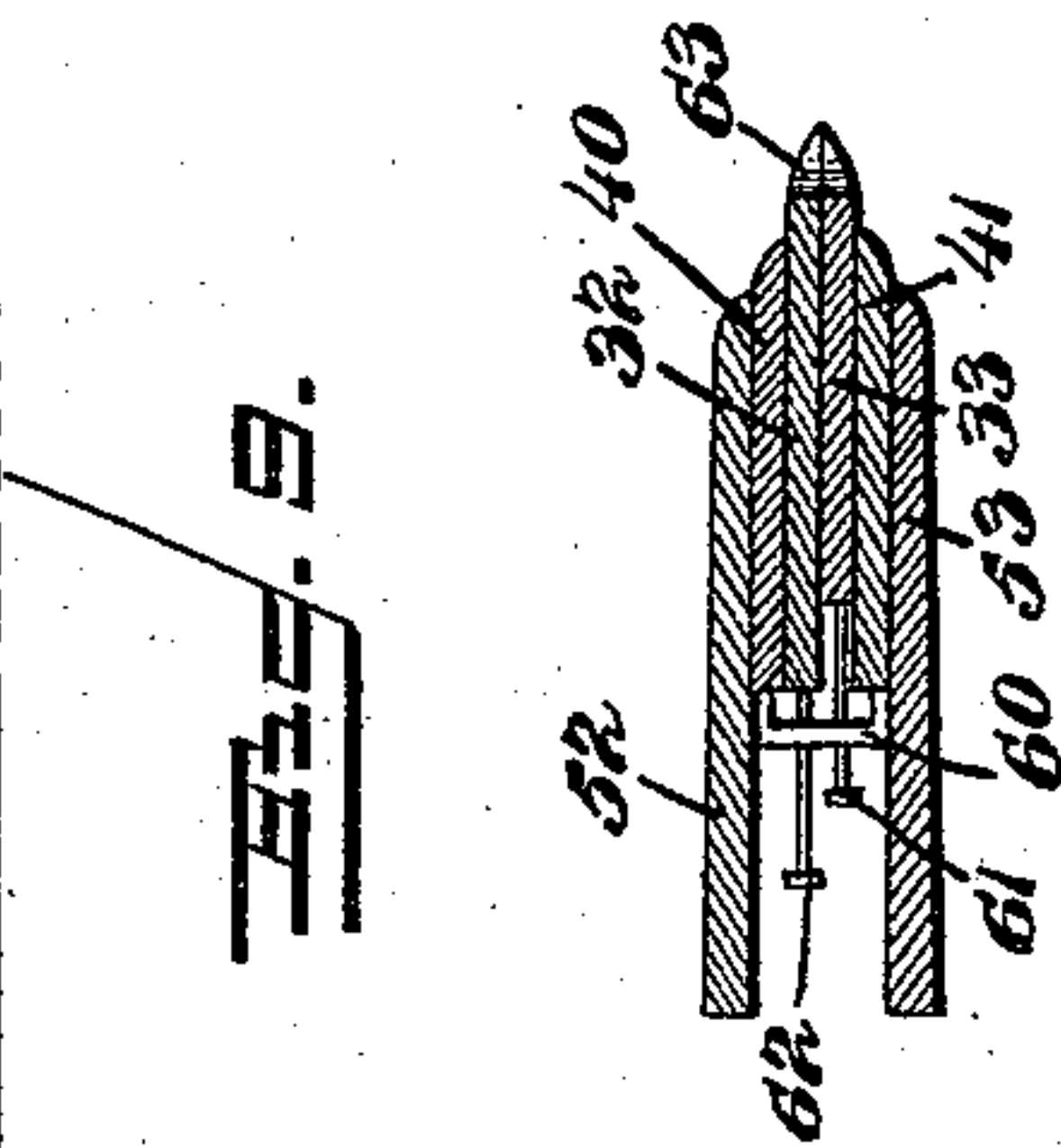
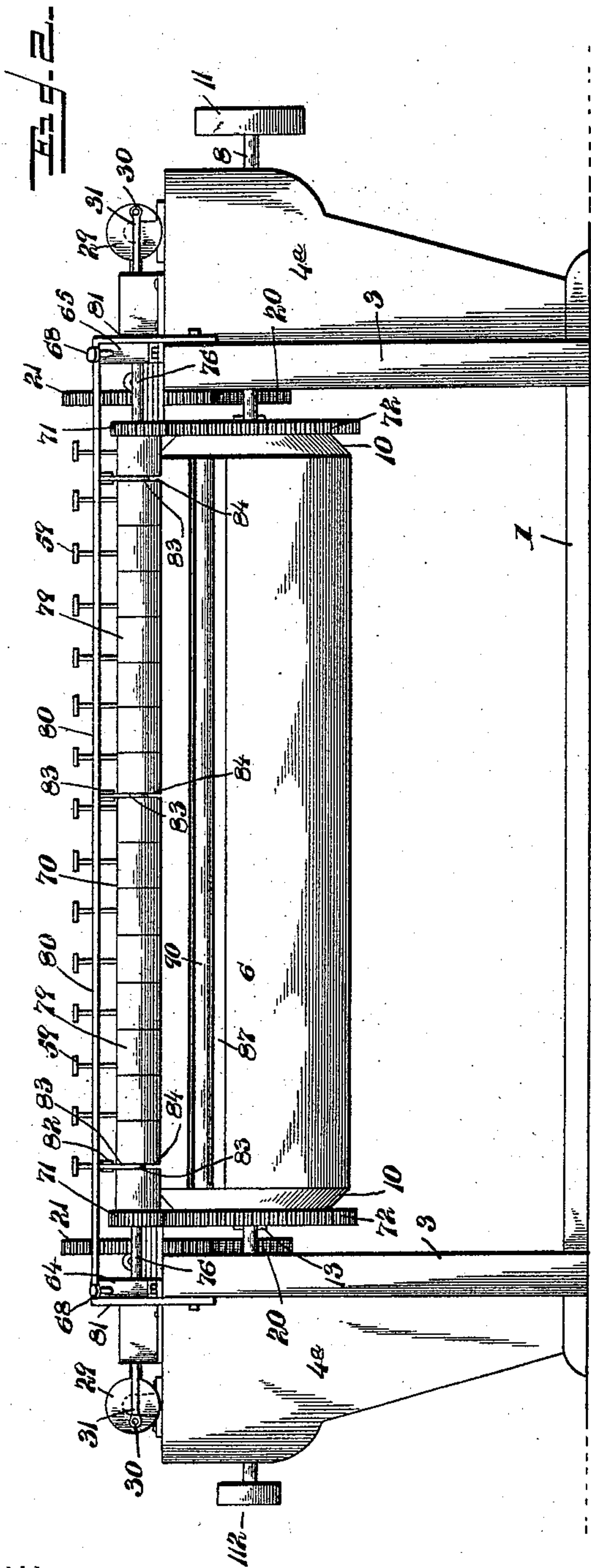
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Inventor

James E. Fairbanks

By *his* Attorneys.

Cash & Co.

Witnesses

*E. H. Stewart*  
*[Signature]*



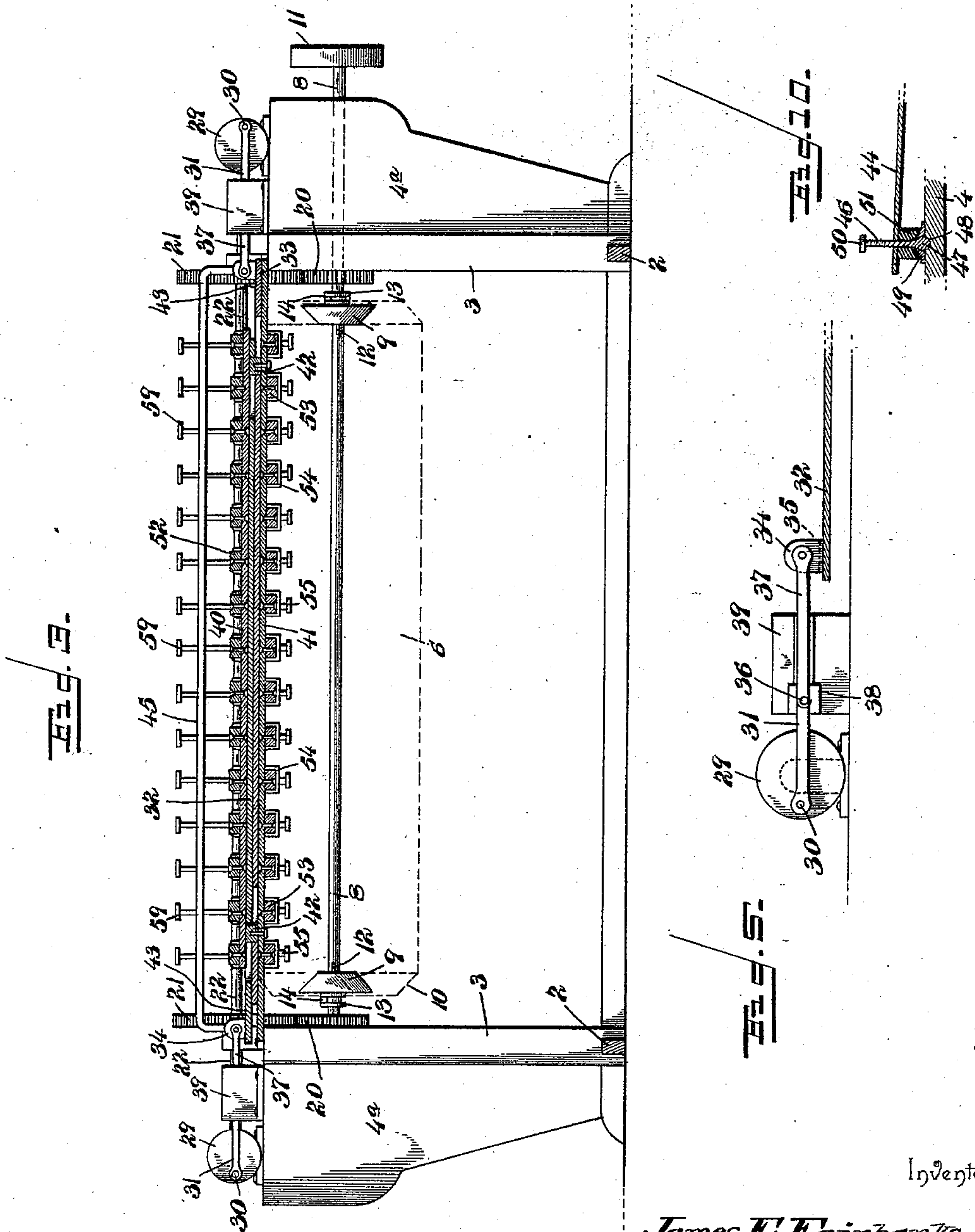
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Witnesses

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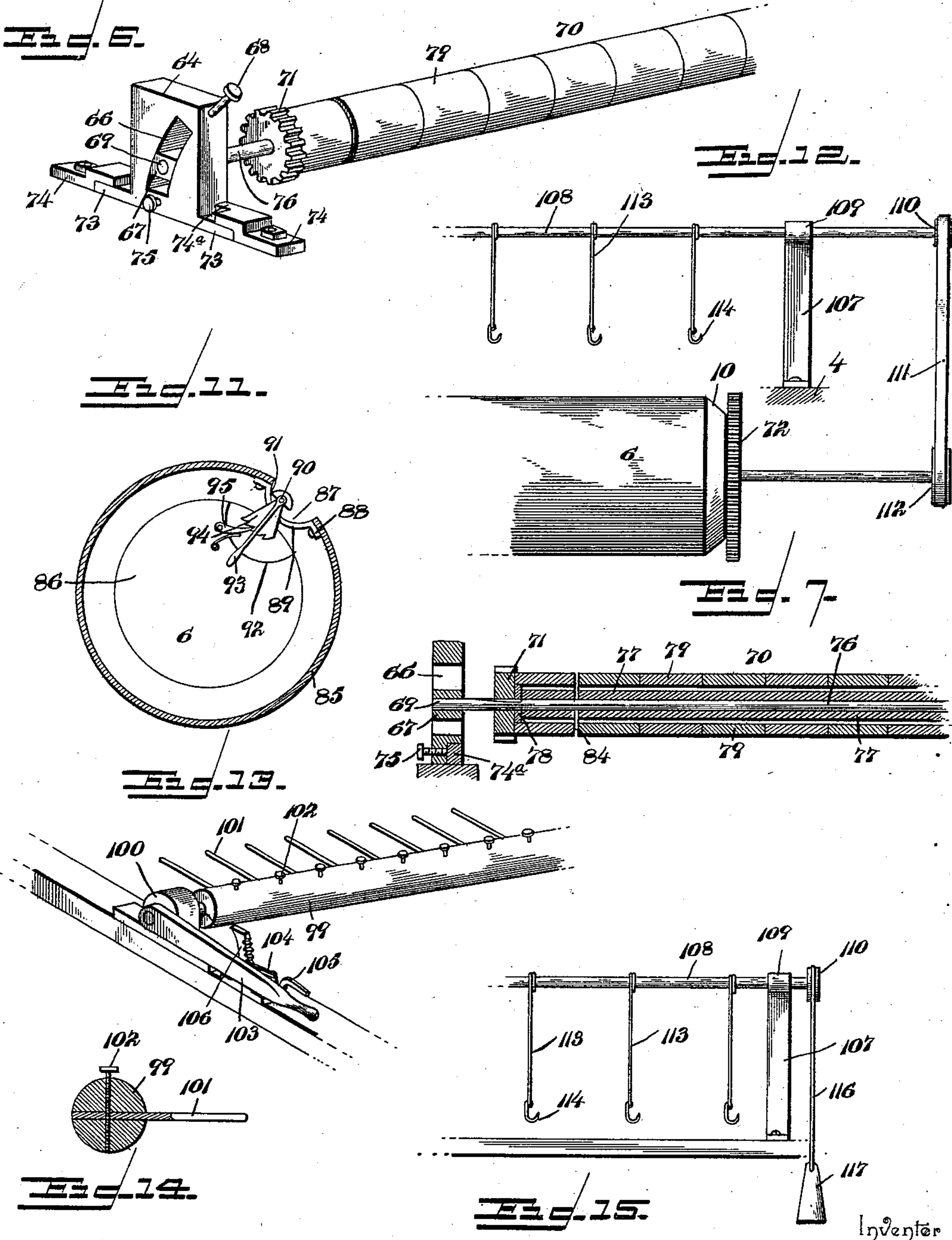
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4 Sheets—Sheet 4.

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Inventor

James E. Fairbanks

Witnesses

*E. H. Stewart*  
*[Signature]*

By *his* Attorneys,

*C. A. Snow & Co.*



# UNITED STATES PATENT OFFICE.

JAMES E. FAIRBANKS, OF HILLSDALE, MICHIGAN, ASSIGNOR OF ONE-HALF  
TO AARON WORTHING, OF SAME PLACE.

## MACHINE FOR SPLITTING HIDES.

SPECIFICATION forming part of Letters Patent No. 539,472, dated May 21, 1895.

Application filed July 6, 1894. Serial No. 516,755. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES E. FAIRBANKS, a citizen of the United States, residing at Hillsdale, in the county of Hillsdale and State of Michigan, have invented a new and useful Machine for Splitting Hides, of which the following is a specification.

The invention relates to a machine for splitting animal hides to separate the fur side from the remainder or body portion of the hide in order that the former may be used in the making of articles of apparel, and the latter in the manufacture of leather for boots, shoes, &c. Heretofore this object has been effected by suspending the hides and shaving from one side or the other in small strips, thus involving a considerable loss; and it is the object of my invention to provide means whereby the hides may be split uniformly to form two integral sheets, the relative thickness of the sheets being regulated by suitable adjusting devices embodied in the machine.

Further objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the appended claims.

In the drawings, Figure 1 is a plan view of a machine constructed in accordance with my invention. Fig. 2 is a front view of the same. Fig. 3 is a vertical longitudinal section on the line 3 3 of Fig. 1. Fig. 4 is a vertical transverse section on the line 4 4 of Fig. 1. Fig. 5 is a detail view of the means for operating one of the knives. Fig. 6 is a detail view, in perspective, of the tension-roller and means for mounting the same. Fig. 7 is a longitudinal central section of the tension-roller. Fig. 8 is a detail transverse section of the knives and supporting-plate and the means for adjusting said knives vertically and angularly. Fig. 9 is a detail transverse section of the knives and supporting-plate, showing the means for adjusting the knives forwardly. Fig. 10 is a detail section of one end of a plate for supporting the yoke, on the line 10 10 of Fig. 1, to show the means for adjusting said plate and the yoke connected thereto. Fig. 11 is a transverse section of the drum to show the means for securing the hides thereto.

Fig. 12 is a view of the means for removing the hides from the drum. Fig. 13 is a view of a modified form of tension-regulating device. Fig. 14 is a transverse section of the same to show the manner of securing the fingers or spurs to the roll. Fig. 15 is a modified form of means for removing the hides from the drum. Fig. 16 is a view of an emery-stone adapted for use in sharpening the knives of the machine.

Similar numerals of reference indicate corresponding parts in all the figures of the drawings.

The framework of the machine consists of longitudinal base beams 1 connected at their extremities by transverse base beams 2, corner uprights 3 connected at their upper ends by the upper cross beams 4 and auxiliary end frames comprising the parallel juxtaposed standards 4<sup>a</sup> which extend from the lower transverse beams 2 to the upper parallel beams 4. Mounted in bearings 5 depending from the beams 4 are the trunnions of the hide-drum 6, the upper side of said drum extending slightly above the plane of the upper sides of the beams 4, and similarly mounted in bearings 7, also depending from the end beams 4, is a shaft 8 which is parallel with the axis of the drum 6 and carries beveled friction pulleys 9, which have frictional contact with the oppositely beveled terminals 10 of the drum, whereby motion is communicated from the shaft 8 to the drum. The shaft 8 receives motion through a belt or drive-pulley 11 by means of a belt. Not shown. Said beveled friction pulleys 9 are feathered upon the shaft 8 by means of the longitudinal keys 12, said pulleys being provided upon their outer sides with collars 13 having peripheral grooves 14, in which are engaged the forked extremities 15 of the horizontally disposed levers 16. These levers 16 are supported by means of brackets 17, and are connected at their rear extremities by means of links 18 to the hand levers 19, also fulcrumed upon said brackets 17. By this mechanism either or both of the gears 9 may be moved out of engagement with the drum. It will be understood that under ordinary circumstances the necessary motion can be imparted to the drum by means of one of these



friction pulleys, and it is only when an excessive load is applied to the drum that both are necessary.

Fixed to the shaft 8 adjacent to the friction pulleys are the spur gears 20, which mesh with similar gears 21 on a shaft 22 which is mounted in bearings 23 on the upper side of the end beams 4. This shaft 22 is extended beyond the end beams 4 and is connected by means of intermeshing gears 24 and 25 with shafts 26 and 27 which extend parallel with the beams 4. These shafts 26 and 27 are provided with crank disks 29 having wrist-pins 30, and said wrist-pins are connected by means of intermediate devices, including the pitmen 31, with the juxtaposed reciprocatory splitting knives 32 and 33. Affixed to the extremities of said knives are the upright ears 34 having feet 35, which are bolted to the knives, and pivotally connected to the said ears, and connecting the same to pins 36 on the extremities of the pitmen 31, are the connecting rods 37, said pins 36 being carried by the cross heads 38 slidably mounted in guides 39. This arrangement of means for operating the knives insures the accurate horizontal reciprocation thereof and avoids the pounding or jarring incident to the direct connection of a pitman thereto.

The splitting knives 32 and 33 are arranged between supporting plates 40 and 41, shown clearly in Fig. 8, which are arranged parallel with the knives and respectively above and below the same. These supporting plates are held at the desired interval to allow free reciprocation of the knives by means of the terminal spacing blocks 42 arranged respectively at the ends of the plates and extending through longitudinal slots provided in the knives.

Arranged above the end bars 4 of the frame work are horizontal plates 44 which support the extremities of a yoke 45 arranged parallel with and above the splitting knives. These plates 44 are supported at their extremities by means of bolts 46 provided at their lower extremities with balls or knobs 47, which are mounted in spherical bearings formed by the depression 48 in the upper surfaces of the bars 4 and the covering caps 49. Said bolts are threaded in perforations in the bars 44, whereby when the bolts are turned by means of their milled heads 50, said bars are adjusted vertically. In order to insure the necessary steadiness of the plates 44 irrespective of their adjustment, I employ cushion-blocks 51, through which the bolts 46 extend, and it is obvious that when the plates are adjusted upwardly, these cushion-blocks expand and fill the interval to form a firm bearing.

Secured to the upper side of the plate 40 are the spaced cleats 52, the front ends of which are set back slightly from the front edges of said plate, and the rear ends of which extend beyond the rear edge of the same, said rearwardly projecting terminals being connected by means of stirrups 54 with cleats 53, which

are secured to the under surface of the plate 41 and are arranged respectively below said cleats 52. The portions of the cleats 52 and 53 in rear of said supporting stirrups 54 are connected by means of set-screws 55, which are threaded in perforations in the lower cleats and bear at their extremities against the undersurfaces of the upper cleats 52. By means of these set-screws 55 the relative positions of the cleats 52 and 53 may be adjusted, and as the plates 40 and 41 are secured to said cleats, said adjustment of the cleats provides for regulating the pressure of the front edges of said plates upon the surfaces of the splitting knives to cause the latter to operate in effective contiguity.

As above described the terminals of the yoke 45 are attached to vertically adjustable supporting plates 44, and in order to provide for still further vertical adjustment of the knives with relation to the surface of the drum 6, I employ set screws 59 threaded in the yoke and provided at their lower extremities with balls or knobs 58 which are mounted in spherical bearings in the upper sides of the cleats 52. Said spherical bearings are formed by means of depressions 56 in the upper surfaces of the cleats, and caps 57 which are bolted over said depressions to complete the bearings. It will be seen that by the manipulation of the bolts 59 the inclination of the splitting knives may be adjusted in order to regulate the distance between the cutting edges of said knives and the surface of the drum 6, as by extending the forward screw 59 the cutting edges of the knives may be lowered, and by an opposite adjustment of said bolt the cutting edges may be elevated. In addition to this angular adjustment, however, the knives may be raised or lowered simultaneously.

In order to provide for the horizontal adjustment of the splitting knives I employ U-shaped plates 60, which are attached to the extremities of the plates 40 and 41, and set screws 61 and 62 threaded in said plates and bearing respectively against the rear edges of the knives 33 and 32. It is preferable to make the knife 33 of less width than the knife 32 in order that interference of the set screws 61 and 62 in adjusting the knives may be avoided.

The cutting edges of the knives 32 and 33 are arranged so that they will lie directly above the drum 6 and tangential to its surface, and such edges are set out from the front edges of the plates 40 and 41 to prevent contact of the said plates with the drum in operation.

By the various means of adjustment above described, the desired position of the splitting knives with relation to the drum may be secured to suit the thickness of the hide under treatment, and the relative thickness of the two parts after the splitting operation has been completed.

Fixed to the beams 4 are standards 64 and 65 provided with segmental slots 66, which



are arranged concentric with the drum. In these slots 66 are mounted the slidable blocks 67, held at the desired adjustment by the set screws 68 and forming bearings for the trunnions 69 of the tension or feed roller 70. Inasmuch as the slots 66 are concentric with the drum, the adjustment of the feed roller may be attained without disengagement of the spur-gears 71 on the extremities of said roll from the gears 72 on the ends of the drum, and at the same time said feed roll may be arranged at varying distances from the cutting edges of the knives to insure the proper presentation of the hide to the latter.

The standard 64 is provided with feet 73, which are fitted in guides 74 secured to the beam 4. Said guides 74 are connected by a bar 74<sup>a</sup> with which the set-screw 75 engages, said set-screw being fitted in a perforation in the base of the standard 64. By this arrangement of parts the standard 64 may be moved toward or from the roller 70 to permit of the mounting or dismounting of the latter.

In order to compensate for inequalities or unevenness of thickness in the hides, I employ a feed or tension roller constructed as shown clearly in Fig. 7, in which 76 represents the central shaft or core, 77 a soft rubber cushion which is fitted upon said shaft and is angular in section, as shown in Fig. 4, said cushion being held in place by the end plates 78, and a series of independent metallic rings 79 which are adapted to yield separately when an enlargement or increased thickness passes thereunder. In order to insure a steady pressure of the feed or tension roller upon the surface of the drum or hide arranged thereon, and in order to provide for the adjustment of this tension to suit hides of different thickness, I employ a truss 80, provided at its extremities with legs 81, which are bolted to the beams 4, and rigid arms 82 depending from said truss at intervals and carrying plates 83 which are fitted between slightly separated ends of the rings 79 and through annular grooves 84 in the cushion 77, and are provided with bifurcations which engage the shaft 76. Thus the pressure of the truss is upon the center or axis of the tension, and affects the entire roll without interfering with the yielding quality of any of the independent metallic rings. It is obvious that suitable adjustment of the truss 80 must be provided to correspond with the adjustment of the axis of the tension or feed-roller 70.

The means for securing a hide to the drum consist of a clamping rod 90 journaled in a longitudinal groove or channel 87 formed in the drum, the floor of said groove or channel being formed by a segmental or arc-shaped casting or trough 89 bolted to the shell 85 of the casing, as shown at 88. Attached to this clamping-rod 90, which is provided with a sharpened clamping edge 91, is a handle 93 bearing a ratchet segment 94 arranged in operative relation with a spring actuated pawl 95, the head 86 of the drum being cut away,

as shown at 92 to provide for the adjustment of the clamping bar to engage the edge of a hide. In operation the edge of a hide is inserted in the groove or channel 87 and is engaged between the clamping edge 91 of the bar 90 and the contiguous side of said groove or channel, the handle 93 being locked in the proper position to hold said clamping bar in engagement with the hide by means of the ratchet and pawl above described.

The essential reason for providing the above described mechanism for raising and lowering the plates 44 and their attached parts is to facilitate the sharpening of the knives and particularly the lower knife 33. This sharpening operation is effected by means of an emery board 96 having a convex emery face 97 and a concave smooth face 98. The smooth face is adapted to lie upon the surface of the drum 6, and the knives should be elevated sufficiently to cause the beveled under side of the knife 33 to bear upon the emery surface 97. The said knife may then be reciprocated, as in operation, until the desired edge has been attained. The sharpening of the upper knife is accomplished in a similar manner, except that the emery-board must be held by the operator in position to bear against the upper beveled surface thereof. It will be seen that the cutting edges of the knives are provided with notches 63, thus forming serrated edges, which expedite the splitting of the hides.

In Fig. 12 I have shown the means for removing the hides from the drum 6, and while I have not illustrated this mechanism in connection with the general figures of the drawings, the arrangement thereof will be understood by a comparison of said Fig. 12 with Fig. 1, in the latter of which the pulley 112, by which said mechanism receives motion, is shown. The mechanism consists essentially of standards 107 adapted to be secured to the end beams 4 and provided at their upper extremities with bearings 109 for the reception of the windlass 108. At one end of this windlass, in alignment with the above mentioned pulley 112, is a pulley 110, said pulleys being connected by means of the belt 111. Attached to the windlass is a series of cords, chains, or other flexible connections, which carry hooks 114 adapted to engage the hide. The object of this mechanism is not to assist in the feeding operation, but simply to take up the slack as the hide leaves the splitting knives and hold the same in position for observation by the operator; and the operation thereof, as will be readily understood, consists in the slow winding of the cords, chains, or connections 113 upon the windlass 108 until the hide is entirely disengaged from the drum. In Fig. 15 I have shown a slightly modified form of this mechanism, in which the motion of the windlass 108 is derived from a weight 117 connected to the pulley 110 by means of a cord 116. This weight is sufficient to wind the flexible connections 113 on



the windlass, and thus take up the slack of the hide as it leaves the splitting mechanism.

In Fig. 13 I have shown a modified form of tension regulating device adapted to be substituted for the feed or tension roller 70, and consisting of a shaft 99 having its terminals mounted in bearings 100 on the beams 4, said shaft being formed in halves or split longitudinally to provide for the attachment of fingers 101, as shown clearly in the detail section in Fig. 14. The halves or sections of the shaft 99 are secured together by means of the screws 102. The means for operating this modified tension regulating device consist of a hand lever 103 carrying a pawl 104, having a handle 105 and adapted to engage a ratchet 106; and in operation said hand lever is raised sufficiently to cause the terminals of the fingers 101 to bear upon the upper surface of the hide, thus holding it in contact with the surface of the drum and insuring the proper presentation of the hide to the splitting knives. The fingers 101 are preferably of spring metal, in order that they may yield when encountered by obstructions or enlargements in the hides.

The operation of the various parts of the mechanism have been indicated throughout the above description, and therefore a detailed description of the general operation of the machine is deemed unnecessary. It should be noted, however, that the opposite reciprocation of the splitting knives prevents lateral vibration of the hides under treatment and insures the proper splitting thereof, and that the means for adjustment of the knives provide for arranging their cutting edges in proper position with relation to the drum to secure the desired thickness of parts of the hide after the splitting operation has been completed. The thickness of a hide occasionally varies at different points, and by means of these adjusting devices the knives may be changed during the operation of splitting to form one or the other of the sections of the hide of a uniform thickness throughout. For instance it may be desired to form the fur side of a uniform thickness, and therefore when a thinner portion of a hide is reached the knives are adjusted toward the drum, and when a thicker portion of the hide is reached, said knives are adjusted from the drum; also a second and subsequent splitting of the hide may be accomplished by means of the mechanism above described, the knives being adjusted closer to the drum after the completion of each operation.

It will be understood that in practice various changes in the form, proportion, and the minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

Having described my invention, what I claim is—

1. The combination of a drum, means for securing hides thereto, parallel juxtaposed

knives arranged with their cutting edges contiguous to the surface of the drum, means for reciprocating said knives in opposite directions, and means for rotating the drum, substantially as specified. 70

2. The combination of a drum, means for securing hides thereto, parallel splitting knives provided with serrated cutting edges arranged adjacent to the surface of said drum, means for reciprocating the knives in opposite directions, and means for rotating the drum, substantially as specified. 75

3. The combination of a drum, means for securing hides thereto, parallel juxtaposed splitting knives, parallel spaced upper and lower plates arranged respectively above and below said splitting knives, means for supporting said plates, adjusting devices carried by the plates and arranged in operative relation with the knives to adjust them in the plane of their widths, means for reciprocating the knives, and means for operating the drum, substantially as specified. 80 90

4. The combination of a drum, means for securing hides thereto, parallel reciprocatory splitting knives, upper and lower plates arranged contiguous to the upper and lower surfaces of said knives, means for supporting said plates, U-shaped bars connecting said plates near their extremities, set screws mounted in said bars and impinging against the rear edges of the splitting knives, means for reciprocating said knives, and means for operating the drum, substantially as specified. 95 100

5. The combination of a drum, means for securing hides thereto, parallel reciprocatory splitting knives, and means for operating the same, upper and lower supporting plates for the knives, cleats secured respectively to the said upper and lower plates and connected for angular adjustment, means for supporting the upper cleats, adjusting devices for regulating the interval between said upper and lower cleats, and means for operating the drum, substantially as specified. 105 110

6. The combination with a drum, and means for operating the same, devices for securing hides to the drum, parallel reciprocatory splitting knives, and means for operating the same, upper and lower plates 40 and 41, upper and lower cleats secured respectively to said upper and lower plates, stirrups carried by the upper cleats and supporting the lower cleats, set screws connecting the rear extremities of said cleats to adjust their relative positions, and means for supporting the upper cleats, substantially as specified. 115 120

7. The combination with a drum, and means for operating the same, of a yoke, parallel spaced upper and lower plates, cleats secured respectively to said upper and lower plates and arranged transversely thereto, the lower cleats being suspended from the upper cleats and being capable of angular adjustment, adjusting screws threaded in the yoke and having spherical terminals fitted in similar bearings in the upper cleats, reciprocatory split- 125 130



ting knives mounted between said upper and lower plates, and means for operating the knives, substantially as specified.

8. The combination with a drum, and means for operating the same, of upper and lower spaced plates, upper and lower cleats secured respectively to said upper and lower plates, the lower cleats being suspended from the upper cleats and being capable of angular adjustment, means for securing said cleats at the desired angular adjustment, a yoke extending over and parallel with said plates, adjusting screws threaded in the yoke and provided with spherical terminals fitting in similar sockets in the upper cleats, two of said screws, one in front of the other, being employed for each cleat, reciprocatory splitting knives arranged between the planes of said plates, and means for operating the knives, substantially as specified.

9. The combination with a drum, and means for operating the same, of a yoke, means for adjusting said yoke vertically, upper and lower parallel plates, upper and lower cleats secured respectively to said plates and connected for angular adjustment, means for securing said cleats at the desired angular adjustment, adjusting screws threaded in the yoke and connected at their lower extremities to the upper cleats, whereby said cleats and plates are suspended from the yoke, reciprocatory splitting knives arranged between the planes of said plates, and means for operating the knives, substantially as specified.

10. The combination with a drum, and means for operating the same, of a yoke, supporting plates to which the terminals of said yoke are attached, adjusting screws engaging the extremities of said supporting plates, cushion blocks arranged beneath said supporting plates, knife guiding devices supported from the yoke, reciprocatory splitting knives mounted in said knife-guiding devices, and means for operating the knives, substantially as specified.

11. The combination with a drum, and means for operating the same, hide splitting knives, and operating connections, of a feeding and tension device having a rotary shaft, a cushion fitted upon said shaft, independent yielding facing rings inclosing said cushion, a truss arranged parallel with the axis of said shaft, and rigid connections between said truss and intermediate portions of the shaft to prevent deflection of the latter, substantially as specified.

12. The combination with a drum, and means for operating the same, hide splitting knives, and operating connections, of a feeding and tension device having independent resilient members to bear upon a hide trav-

ersing the drum, and adjusting means for said feeding and tension device consisting of standards having slots concentric with the drum, bearing blocks fitted slidably in said slots and having the trunnions of said feeding and tension device mounted therein, and means for adjusting said bearing-blocks substantially as specified.

13. The combination with a drum, and means for operating the same, hide splitting knives, and operating connections, of a feeding and tension device consisting of a roller adapted to bear upon a hide traversing the drum, standards having slots concentric with the drum, bearing-blocks for said roller fitting slidably in the slots, means for adjusting said blocks, clips engaging the feet of the said standard, a connecting bar between the clips, and a set screw engaging the standard and said connecting bar, whereby the standard may be adjusted toward and from the roller to facilitate the mounting and dismounting thereof, substantially as specified.

14. The combination with a drum, and means for operating the same, hide splitting knives, and operating connections, of a device for removing the hides from the drum and having a windlass, flexible connections attached to the windlass and bearing hooks to engage a hide, and operating connections between the windlass and said drum substantially as specified.

15. The combination of a drum provided with beveled extremities, oppositely beveled friction pulleys arranged in operative relation with said beveled extremities of the drum, means for adjusting said pulleys to remove one or the other thereof from contact with the drum, and operating mechanism for the friction pulleys with hide splitting knives, and means for operating the same, substantially as specified.

16. The combination of a drum provided with a longitudinal groove or channel, a half-round clamping rod mounted for partial rotation in the groove or channel and having an edge to co-act with one side of the groove or channel, a handle attached to said rod and arranged within the drum near an opening in the end of the latter, and ratchet locking devices comprising a toothed-segment carried by the clamping rod and a spring-actuated pawl to engage the same, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JAMES E. FAIRBANKS.

Witnesses:

I. B. OWENS,  
JOHN H. SIGGERS.