

No. 754,525.

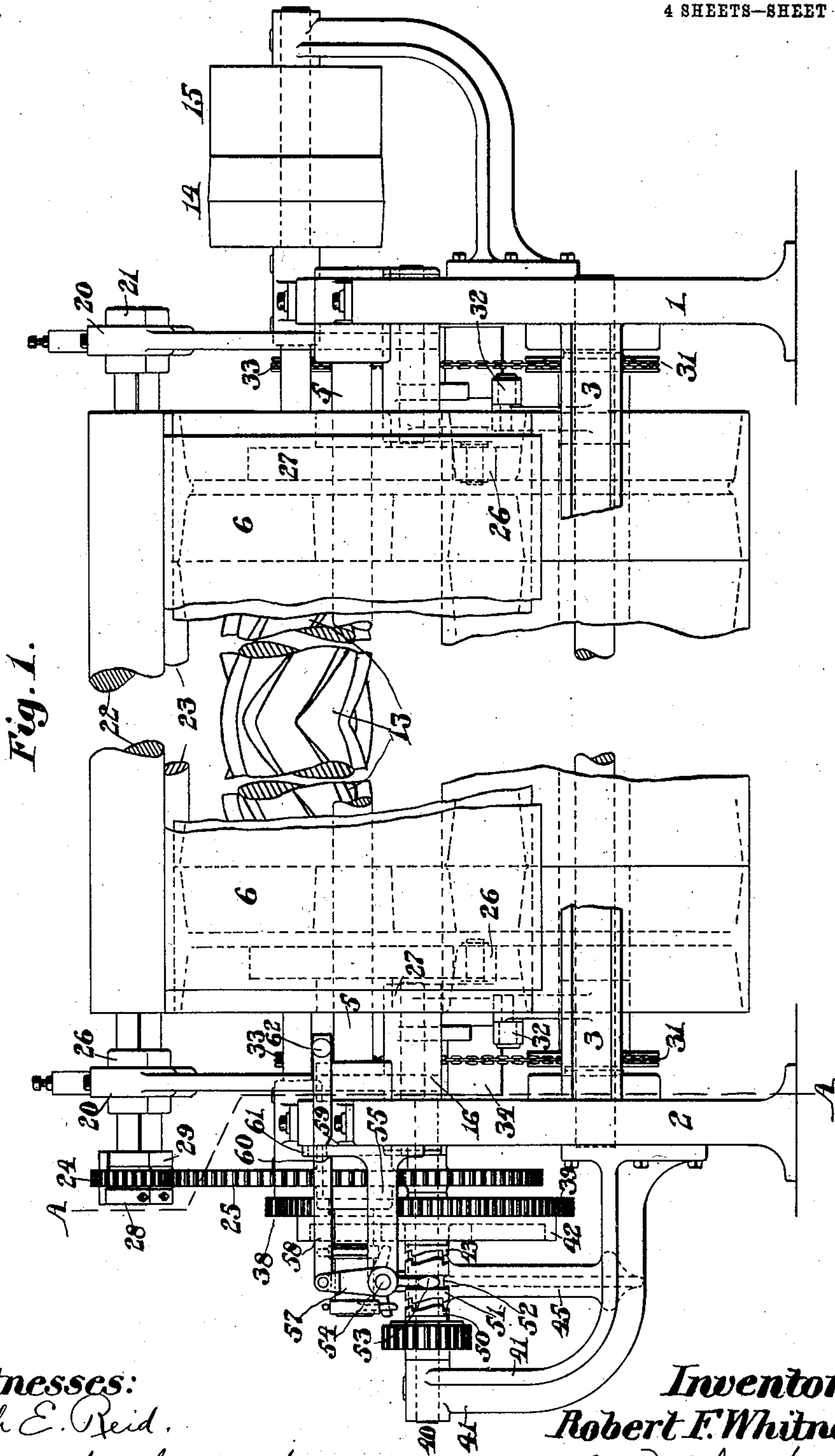
PATENTED MAR. 15, 1904.

R. F. WHITNEY.
HIDE WORKING AND UNHAIRING MACHINE.

APPLICATION FILED MAY 4, 1903.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses:
Josiah E. Reid.
Nathan C. Lombard 2nd.

Inventor:
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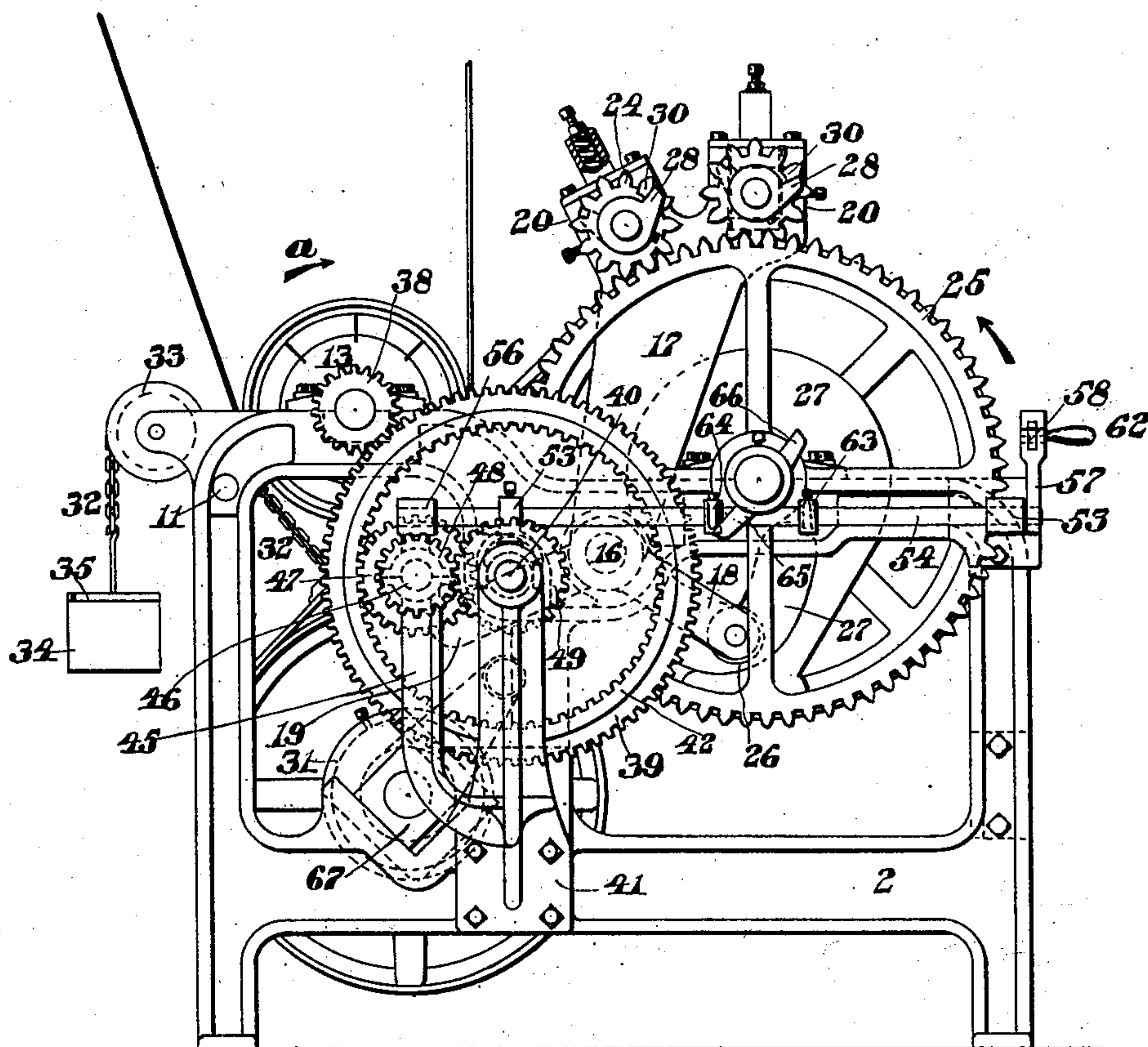
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4 SHEETS—SHEET 2.

Fig. 2.



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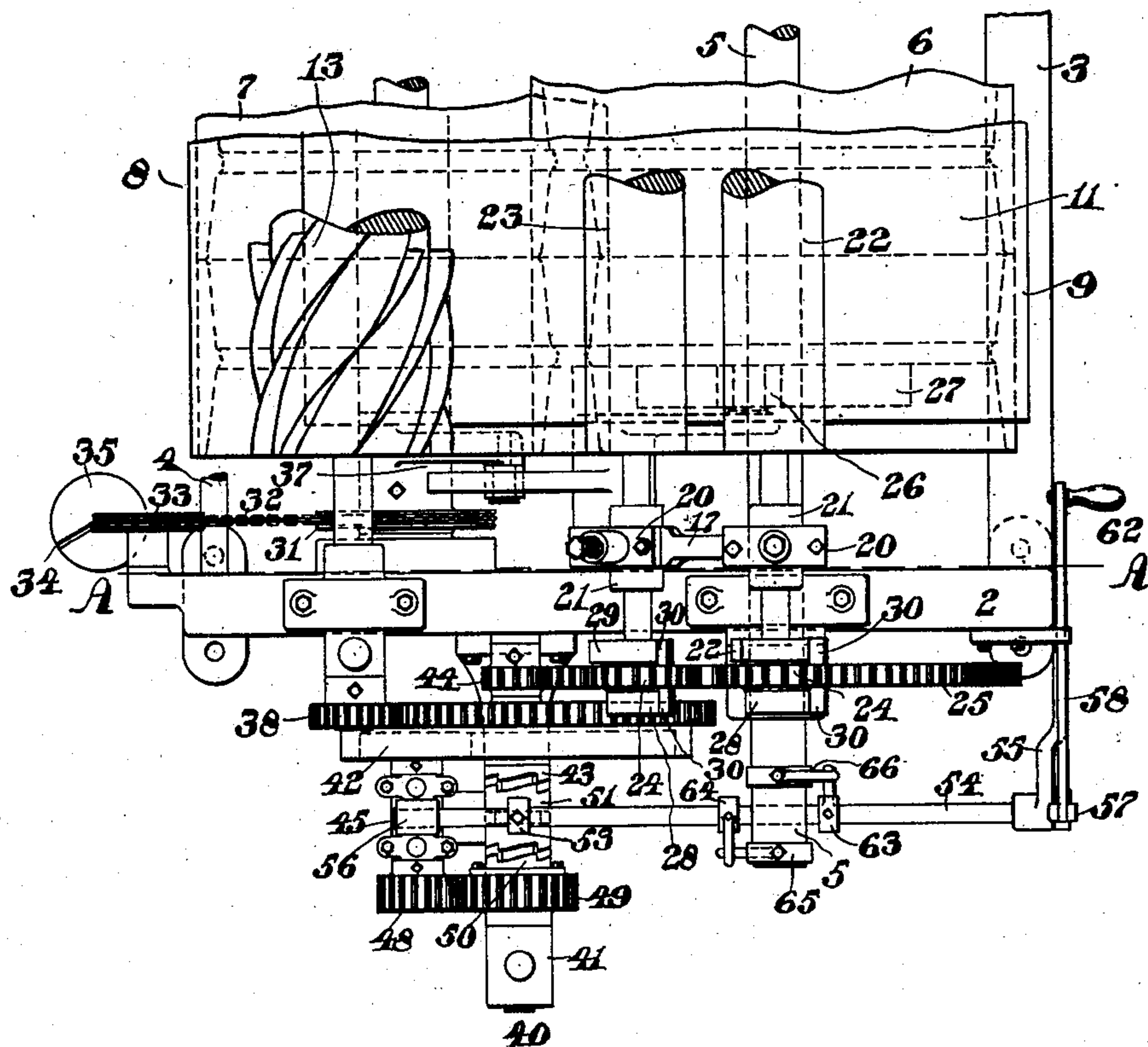
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4 SHEETS—SHEET 3.

Fig. 3.



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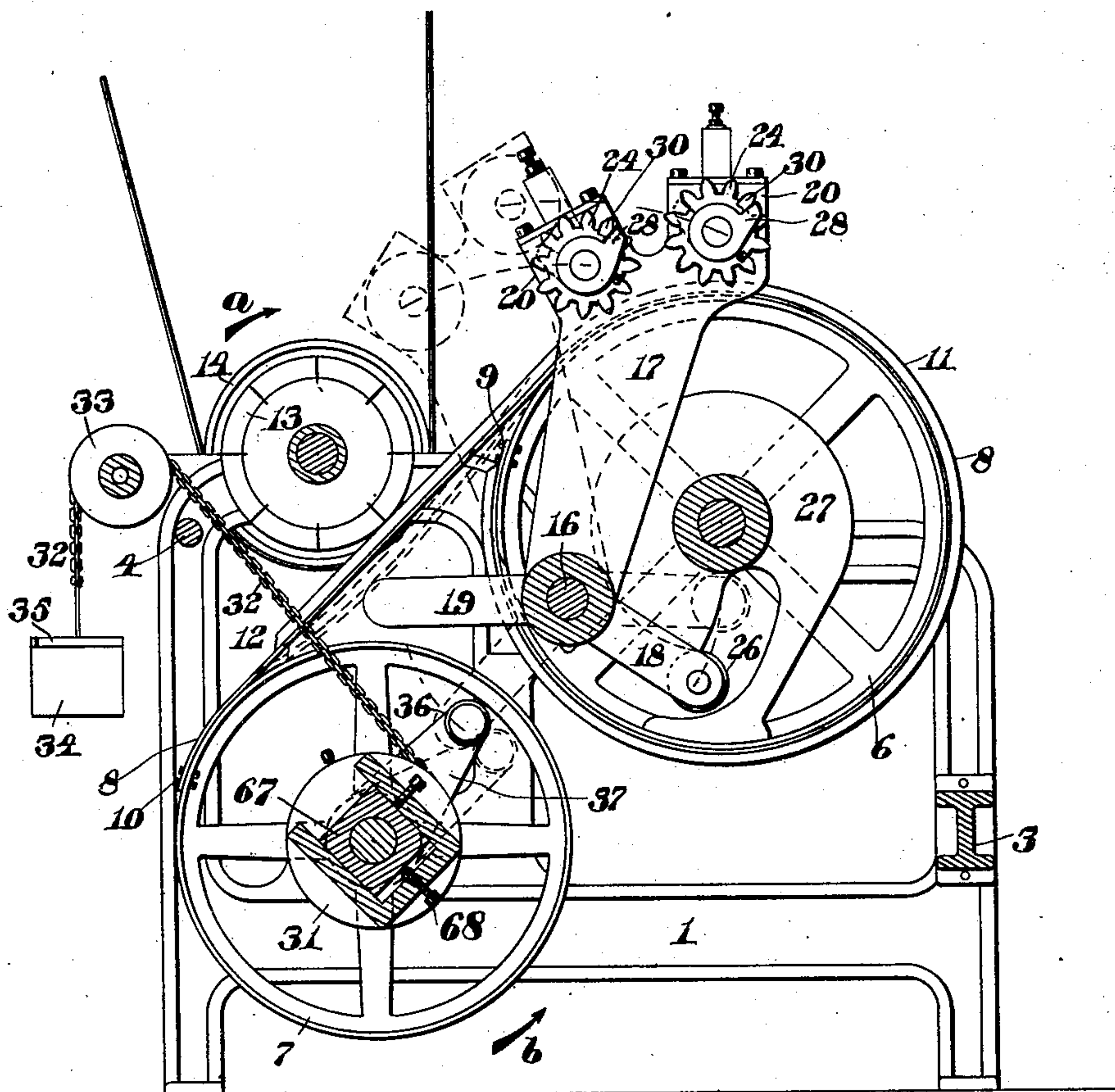
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NO MODEL.

4 SHEETS—SHEET 4.

Fig. 4.



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UNITED STATES PATENT OFFICE.

ROBERT F. WHITNEY, OF WINCHESTER, MASSACHUSETTS, ASSIGNOR OF
ONE-HALF TO ARTHUR E. WHITNEY, OF WINCHESTER, MASSACHUSETTS.

HIDE WORKING AND UNHAIRING MACHINE.

SPECIFICATION forming part of Letters Patent No. 754,525, dated March 15, 1904.

Application filed May 4, 1903. Serial No. 155,511. (No model.)

To all whom it may concern:

Be it known that I, ROBERT F. WHITNEY, of Winchester, in the county of Middlesex and State of Massachusetts, have invented certain
5 new and useful Improvements in Hide Working and Unhairing Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to hide working and
10 unhairing machines; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the accompanying drawings and to the claims
15 hereto appended and in which this invention is clearly pointed out.

Figure 1 of the drawings is a front elevation of a machine embodying my invention, a portion of the center of the machine being broken
20 away to reduce the length of the view. Fig. 2 is an end elevation of the same looking at the left-hand end of Fig. 1. Fig. 3 is a partial plan of the same, the right-hand portion of the same being broken away. Fig. 4 is a
25 vertical transverse section of the same on line A A on Figs. 1 and 3.

In the drawings, 1 and 2 represent, respectively, the right and left hand end frames of the machine; 3, a front tie-girth, and 4 a rear
30 tie-rod by which said end frames are connected together.

In suitable bearings on the frames 1 and 2 is mounted the shaft 5 of a front drum 6, made up, preferably, of a series of pulleys secured
35 on said shaft 5 side by side, as shown in Figs. 1 and 3, said drum in the machine illustrated in the drawings having a diameter of twenty-four inches. A similar drum 7 of less diameter than the drum 6, in the proportion of
40 twenty-one to twenty-four, is in like manner mounted in suitable bearings on the frames 1 and 2 at a lower level than and at the rear of said drum 6 and in such relation thereto that a common tangent to their upper rearward
45 peripheral surfaces shall be at an angle, preferably, of about forty-five degrees to a perpendicular.

An apron of rubber belting 8 is firmly secured to the periphery of the drum 6 by one

end along a line parallel to its axis, as at 9, 50 and is in like manner secured to the drum 7 at 10. To the upper surface of this rubber apron is secured, preferably by vulcanization, a soft-rubber bolster 11, extending from the point where said apron is attached to the drum 55 6 to the point 12 near the point of contact of the apron 8 with the drum 7 and having a width in the direction of the length of said drums somewhat less than the width of said apron, as shown in Figs. 1, 3, and 4. 60

A knife-cylinder 13, provided with two series of operating-blades arranged spirally in opposite directions thereon, is mounted in fixed bearings on the frames 1 and 2 with its axis parallel to the axes of the drums 6 and 7 65 and in a plane at right angles to the plane of movement of said bolster-supporting apron and intermediate between the points of contact of said apron with said drums 6 and 7 and has mounted on the right-hand end of its 70 shaft tight and loose pulleys 14 and 15, respectively, or in place thereof a suitable clutch-pulley, said knife-cylinder being constructed and arranged to be revolved in the direction indicated by the arrow *a* on Figs. 2 and 4 at 75 all times when in operation.

In the inner face of each of the frames 1 and 2 is set in a fixed position an inwardly-projecting stud 16, upon each of which is mounted, so as to be movable about the axis 80 thereof, a three-armed lever, each comprising the arms 17, 18, and 19, the upper ends of each of the arms 17 being provided with suitable housings 20 to receive movable spring-pressed boxes 21, in which are mounted the 85 feed-rolls 22 and 23, each of which has loosely mounted on one end thereof a spur-pinion 24, which engages with the teeth of the spur gear-wheel 25, firmly secured upon the shaft 5 of the drum 6 outside of the frame 2, the pitch- 90 circle of said gear 25 having a diameter equal to the diameter of said drum plus twice the thickness of the apron and bolster and the average thickness of the hides to be worked. The arms 18 of said levers have mounted on 95 studs set in their movable ends and projecting inward therefrom trucks 26, which rest upon and are moved by the cams 27, cast upon or

secured to the spokes of the end pulleys of the drum 6, as shown in Fig. 4, or said cams 27 may be keyed or otherwise secured to the shafts 5 independent of said pulleys, the office of the cams 27 being to move the feed-rolls 22 and 23 from the positions shown in full lines to the positions indicated in dotted lines shown in Fig. 4, or "vice versa," and to hold said feed-rolls firmly in contact with the bolster 11 or the hide placed thereon.

The pinions 24, though mounted loosely on the shafts of the rolls 22 and 23, are connected thereto, so as to impart rotary motion to said rolls, as follows: Each of the shafts on which said pinions are mounted has firmly but adjustably secured thereon two dogs 28 and 29, one on each side of said pinion, and arranged to alternately engage opposite ends of a single tooth 30 of said pinion, which projects from opposite sides of said pinion into the paths of said dogs.

The shaft of the drum 7 has firmly secured thereon just inside its bearings in the frames 1 and 2 two sheave-pulleys 31, to each of which one end of a chain 32 is secured, which passing obliquely upward and over a similar sheave 33, mounted on a stud set in the inner face of a frame 1 or 2, has secured to its other end the weight 34, upon which may be placed supplementary detachable weights 35, whereby said weight as a whole may be increased or diminished at the will of the operator. The force of gravity acting upon this weight tends to rotate the drum 7 in the direction indicated by the arrow *b* on Fig. 4, thereby giving a constant tension to the apron 8 and bolster 11. As the drums 6 and 7 are rotated toward the front or rear said weight rises or falls, respectively, the action of gravity thereon always maintaining a constant tension upon said apron and bolster and exerting a uniform yielding upward pressure of the bolster against the blades of the knife-cylinder 13. The arms 19 of the three-armed levers contact with rolls 36, mounted on the free ends of levers 37, firmly but adjustably secured upon the shaft of the drum 7 when the feed-rolls and the three-armed levers are in the positions indicated by dotted lines in Fig. 4, and moves the drum 7 about its axis in the reverse direction to that indicated by the arrow *b*, thereby raising the weights 34 35 and slackening the apron 8 and allowing it and the bolster 11 to drop away from contact with the blades of the knife-cylinder 13, as indicated by dotted lines in Fig. 4.

It is desirable that the drums 6 and 7 when moving toward the front shall move at a slower speed than when moving toward the rear, and consequently two trains of gearing are employed to transmit the motion of the bladed cylinder to said drums with clutch mechanism arranged to control the transmission of motion through one or the other of said trains of gearing, which is accomplished as follows:

On the left-hand end of the shaft of the knife-cylinder 13 is firmly secured a pinion 38, the teeth of which engage with the spur-gear 39, mounted loosely upon a short shaft 40, mounted in bearings at one end on frame 2 and at the other end in a stand or bracket 41, bolted to the outer surface of said frame 2, as shown in Figs. 1 and 2. The gear-wheel 39 has formed in one piece therewith or secured thereto the internal gear 42 and one jaw 43 of a clutch, all constructed and arranged to revolve on the shaft 40 as one piece. The shaft 40 has firmly secured thereon, so as to revolve therewith, the pinion 44, which engages with and imparts motion to the large gear-wheel 25, hereinbefore referred to. This train of gearing, comprising the pinion 38, spur-gear 39, pinion 44, and spur-gear 25, together with the clutch-jaw 43, shaft 40, and the clutch-sleeve 51, constitutes the means of transmitting power to drum 6 when the apron 8, bolster 11, and the hide resting on said bolster is to be moved toward the front at a slower speed than when it is moved toward the rear through the other train of gearing described in the next paragraph.

The stand or bracket 41 has formed in one piece therewith or secured thereto a side branch bracket 45, in a bearing in the upper end of which is mounted a short shaft 46, on the inner end of which is secured a pinion 47, the teeth of which are engaged by the teeth of the internal gear-wheel 42, and the outer end of said shaft 46 has firmly secured thereon the gear-wheel 48, which engages with and imparts motion to the gear-wheel 49, mounted loosely on the outer end of the shaft 40 and having formed in one piece therewith or attached thereto a second clutch-jaw 50, opposed to and separated from the jaw 43, before referred to.

The train of gearing comprising the pinion 38, the spur gear-wheel 39, the internal gear-wheel 42, the pinion 47, and gears 48 and 49, the pinion 44, and the spur gear-wheel 25 are so proportioned relative to each other and to the other train before referred to that the drum 6 is moved toward the rear at a considerably greater speed than it is moved on the return toward the front, which is a great advantage, in that it requires less power to move said drum and bolster and the hide toward the front at a slow speed than at a fast speed, as when the hide is being moved toward the front it is being moved against the rapid movement of the blades of the cylinder 13 in the opposite direction, and another advantage of the slower return movement of the hide is that it receives a great many more actions of the cylinder-blades in a given distance, which is necessary to remove the finer and more firmly-fixed hairs that were not removed during the advance or rearward movement.

Between the clutch-jaws 43 and 50 the shaft 40 has splined thereon, so as to be movable

endwise thereof, the clutch-sleeve 51, provided on each end with clutch-teeth, with their working faces in opposite directions, and with a centrally-arranged circumferential groove 52, with which the movable end of the shipper-fork 53, mounted on the shaft 54, engages to move said clutch-sleeve endwise to control the motion of the drums 6 and 7. The shaft 54 is mounted in bearings in the stand 55, secured to the outer face of the frame 2 at its front upper corner and in an upward projection 56 on the cap to the bearing of the shaft 46 in the bracket 45, and has secured upon its front end the upwardly-projecting lever 57, to the movable end of which is pivoted the shipper-rod 58, made in the form of a flat bar provided on its under side with a notch 59, the left-hand end of which forms a right-angle shoulder 60 to engage the plate 61 in a slot in which said bar has a bearing, said bar being provided at its right-hand end with a handle 62, by which said bar may be operated by hand.

The shaft 54 has adjustably secured thereon two dogs 63 and 64, which project in opposite directions therefrom, upon which a corresponding pair of dogs 65 and 66, adjustably secured on the shaft 5 of the drum 6, operate to automatically operate the clutch-sleeve 51 to reverse the motions of the drums 6 and 7 and apron and bolster.

The operation of the invention is as follows: The several parts of the machine being in the position shown in full lines in the drawings except the three-armed levers and the feed-rolls 22 and 23, which are in the positions indicated by dotted lines on Fig. 4, and the drums 6 and 7 and cams 27 are turned toward the front of the machine into the positions they occupy when the trucks 26 occupy positions in the inner ends of the curved slots formed in said cams, the hide to be operated upon is placed upon the bolster 11 over the highest part of the drum 6 with its advance end at a point beyond where the feed-roll 23 contacts with said bolster when moved forward. The operator then raises the shipper-lever 58 to release the shoulder 60 and moves said bar to the extreme of its movement toward the right, thereby causing the clutch-sleeve 51 to engage the clutch-jaw 50 and move the drums 6 and 7, the apron 8, and the bolster 11 toward the rear. During the first movement of the top of the drum 6 toward the rear the cams 27, acting upon the trucks 26, will cause said trucks 26 to be moved downward till their peripheries are in contact with the concentric portion of the peripheries of said cams, thereby moving the feed-rolls 22 and 23 into the positions shown in full lines and in contact with the hide resting upon the bolster, when the teeth of the pinions 24, by virtue of said pinions being loose upon their shafts, will drop into engagement with the teeth of the gear 25. This movement of the drums, the apron, and the bolster is continued until one-half or more of the hide

has passed beneath the knife-cylinder 13 and been unhaired and worked, at which time the dog 66 on shaft 5 comes in contact with the under side of the dog 63 on shaft 54 and turns said shaft 54, so as to cause the shipper-fork to move the clutch-sleeve 51 into engagement with the clutch-jaw 43, and thus reverse the motions of said drums, apron, and bolster, at which time the pinions 24 will be moved about the shafts of the feed-rolls until the teeth 30 contact with the dogs 28, and the hide is fed backward to the starting-point, being worked a second time by the cylinder 13. When the drums have turned back to the starting-point, the cam-trucks 26 will have been moved inward to the extreme of their inward movements, and the feed-rolls 22 and 23 will have assumed the positions indicated by dotted lines on Fig. 4, and the dog 65 on shaft 5 will have come in contact with the dog 64 on shaft 54 and turned said shaft about its axis, so as to move the clutch-sleeve 51 into its central position, where it is locked by the shoulder 60 of bar 58 coming in contact with the plate 61 and arrests the motion of the drums, apron, and bolster, and at the same time the arms 19 of the three-armed levers come in contact with the trucks 36 and move the levers 37 into the position indicated by dotted lines on Fig. 4, thereby raising the weights 34 35 and slightly turning the drum 7 toward the front of the machine without moving drum 6, thereby slackening the apron and allowing it and the bolster 11 to fall away from contact with the blades of the cylinder 13, as indicated in dotted lines in Fig. 4. If at any time there is a portion of the hide that needs to be gone over again, the operator can repeat the operation upon any portion by shifting the clutch. When one half of the hide has been unhaired and worked, the hide is turned end for end and the operations are repeated on the other half.

The feed-rolls 22 and 23 are mounted in gibbed boxes and are pressed downward by adjustable spring-pressure in a well-known manner. The drum 7 is mounted in boxes 67, which are adjustable in a direction at right angles to the line of movement of the apron and bolster by means of the set-screws 68 to adjust the surface of the bolster with regard to the blades of the cylinder 13 to compensate for wear or to adjust the bight about said cylinder 13.

The bolster 11 may be made separate from the apron 8 and be secured at one end to said apron and the drum 6, if desired, the main body thereof resting loosely on said apron, without departing from the principles of this invention.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a hide working and unhairing machine, the combination of a pair of revoluble drums mounted in bearings with their axes parallel with each other; an apron firmly se-

cured by its opposite ends to said drums so as to be alternately wound upon each of said drums, while being unwound from the other; a bolster of soft rubber resting upon and movable with said apron; a bladed cylinder mounted in fixed bearings with its axis parallel to the axes of said drums and in a plane at right angles to said apron and intermediate between said drums and provided with two series of blades projecting radially therefrom and arranged spirally in opposite direction thereon, from the center of the length of said cylinder toward each end thereof; means for revolving said bladed cylinder always in the same direction; and means for alternately moving said drums in opposite directions.

2. In a hide working and unhairing machine, the combination of the drums 6 and 7 arranged with their axes parallel to each other; the apron 8 firmly secured to each of said drums; the bladed cylinder 13; a driving-pulley and a pinion carried by said cylinder; the spur-gear 25 fixed on the shaft of drum 6; the arms 17 mounted upon and movable about studs 16; the feed-rolls 22 and 23; pinions 24 carried by said feed-rolls and arranged to engage the gear 25; means for vibrating said arms 17 to move said feed-rolls into and out of contact with the bolster, or a hide resting thereon; gearing arranged to transmit motion from the pinion carried by said bladed cylinder to the gear 25; and means for reversing the motions of said gears and consequently of said drums and said apron.

3. In a hide working and unhairing machine, the combination of a pair of drums arranged with their axes parallel to each other; an apron firmly attached by its opposite ends to both of said drums and adapted to be alternately wound upon each of said drums and unwound from the other; a bladed cylinder mounted intermediate between said drums and above said apron; a rubber bolster resting upon and secured to said apron; the shafts 46 and 40; trains of gearing connecting said bladed cylinder, said shafts 46 and 40 and the front drum; the clutch-jaws 43 and 50 and the clutch-sleeve 51 mounted on shaft 46; and means for moving said clutch-sleeve endwise as and for the purposes described.

4. In a hide working and unhairing machine, the combination of two drums arranged with their axes parallel to each other; a flexible apron firmly secured by its opposite ends to both of said drums and extending from one to the other; a spirally-bladed cylinder mounted in fixed bearings in a plane at right angles to the plane of said apron and intermediate of the axis of said drums; the shafts 46 and 40; trains of gearing connecting said bladed cylinder, said shafts 46 and 40 and the front drum; the clutch-jaws 43 and 50 and the clutch-sleeve 51; means for moving said clutch-sleeve endwise on the shaft 46; a pair of levers each comprising three arms 17, 18 and 19 mounted

on studs fixed in and projecting inward from the inner faces of the frames 1 and 2; a pair of feed-rolls 22 and 23 carried by the arms 17; pinions on the feed-roll shafts arranged to engage the gear 25 carried by the shaft of the drum 6; trucks 26 carried by the movable end of the arm 18; and the cams 27 carried by the shaft of the drum 6 and arranged to act upon said trucks 26 to vibrate said arms 17 and 18 and move said feed-rolls into and out of contact with said apron or a hide resting thereon.

5. In a hide working and unhairing machine, the combination of the drum 6, mounted in fixed bearings; the drum 7 mounted in adjustable bearings at the rear of said drum 6; a flexible apron firmly secured by its opposite ends to both of said drums; mechanism for rotating said drums in opposite directions; the sheaves 31 firmly secured upon the shaft of said drum 7; the sheaves 33 mounted on studs set in the frames 1 and 2; the chains 32 attached to sheaves 31 by their inner ends and extending over the sheaves 33; and the weights 34 attached to the other ends of said chains all constructed, arranged and operating substantially as described.

6. In a hide working and unhairing machine, the combination of the drum 6 mounted in fixed bearings; the drum 7 mounted in adjustable bearings; a flexible apron attached by its opposite ends to both of said drums; the sheaves 31 and the levers 37 all secured on the shaft of the drum 7; the sheaves 33; the chains 32 connected at their inner ends to sheaves 31; the weights 34 secured to their other ends; the trucks 36 carried by the levers 37; the lever-arms 17, 18 and 19; the cam-trucks 26; and the cams 27, all constructed, arranged and operating substantially as described.

7. In a hide working and unhairing machine, the combination of a pair of drums arranged with their axes parallel to each other; a flexible apron firmly connected at opposite ends to both of said drums, and adapted to be alternately wound upon each of said drums while being unwound from the other; a soft-rubber bolster secured to and resting upon said apron; a spirally-bladed cylinder constructed and arranged to contact with said bolster at a point between the bearings of said apron upon said drums; the shafts 46 and 40; trains of gearing connecting said bladed cylinder, the shafts 46 and 40 and the front drum; the clutch-jaws 43 and 50 formed upon or secured to the internal gear 42 and the spur-gear 49 respectively, and mounted loosely on the shaft 46; the reciprocating clutch-sleeve 51; the shaft 54; the shipper-fork 53 and the lever 57 firmly secured upon said shaft 54; the dogs 63 and 64 firmly but adjustably secured on said shaft 54; the shipper-bar 58 provided with the notch 59 and shoulder 60; the latch-plate 61; and the dogs 65 and 66 adjustably secured on the shaft of

the front drum, all constructed, arranged and operating substantially as and for the purposes described.

5 8. The combination of the drums 6 and 7; the apron 8 secured to both of said drums and arranged to be wound upon either of said drums while being unwound from the other; mechanism for moving said drums about their axes in opposite directions; a clutch mechanism for reversing the motions of said drums;
10 and means for automatically operating said clutch to reverse or arrest the motions of said drums.

15 9. The combination with the clutch members 43, 50 and 51 of the shafts 5 and 54 arranged at right angles to each other; the shipper-fork 53 fixed on shaft 54, and the dogs 63 and 64 adjustably secured on said shaft 54; and the dogs 65 and 66 adjustably secured on
20 said shaft 5, in positions to alternately act upon the dogs 63 and 64 to reverse the motion of the reciprocating clutch-sleeve 51.

10. In a hide working and unhairing machine, the combination of two drums arranged

with their axes parallel to each other; a flexible apron firmly secured by its opposite ends to each of said drums and adapted to be wound upon either of said drums while being unwound from the other; a spirally-bladed cylinder mounted in fixed bearings above said
25 apron with its axis parallel to the axes of said drums and intermediate between the points of contact of said apron upon said drums; a train of gearing constructed and arranged to transmit motion from said bladed cylinder to
30 said drums to move them about their axes in one direction at a given speed; and another train of gearing constructed and arranged to move said drums about their axes in the opposite direction at a different speed.
40

In testimony whereof I have signed my name to this specification, in the presence of the subscribing witness, on this 29th day of April, A. D. 1903.

ROBERT F. WHITNEY.

Witness:

WALTER E. LOMBARD,
JOSIAH E. REID.