

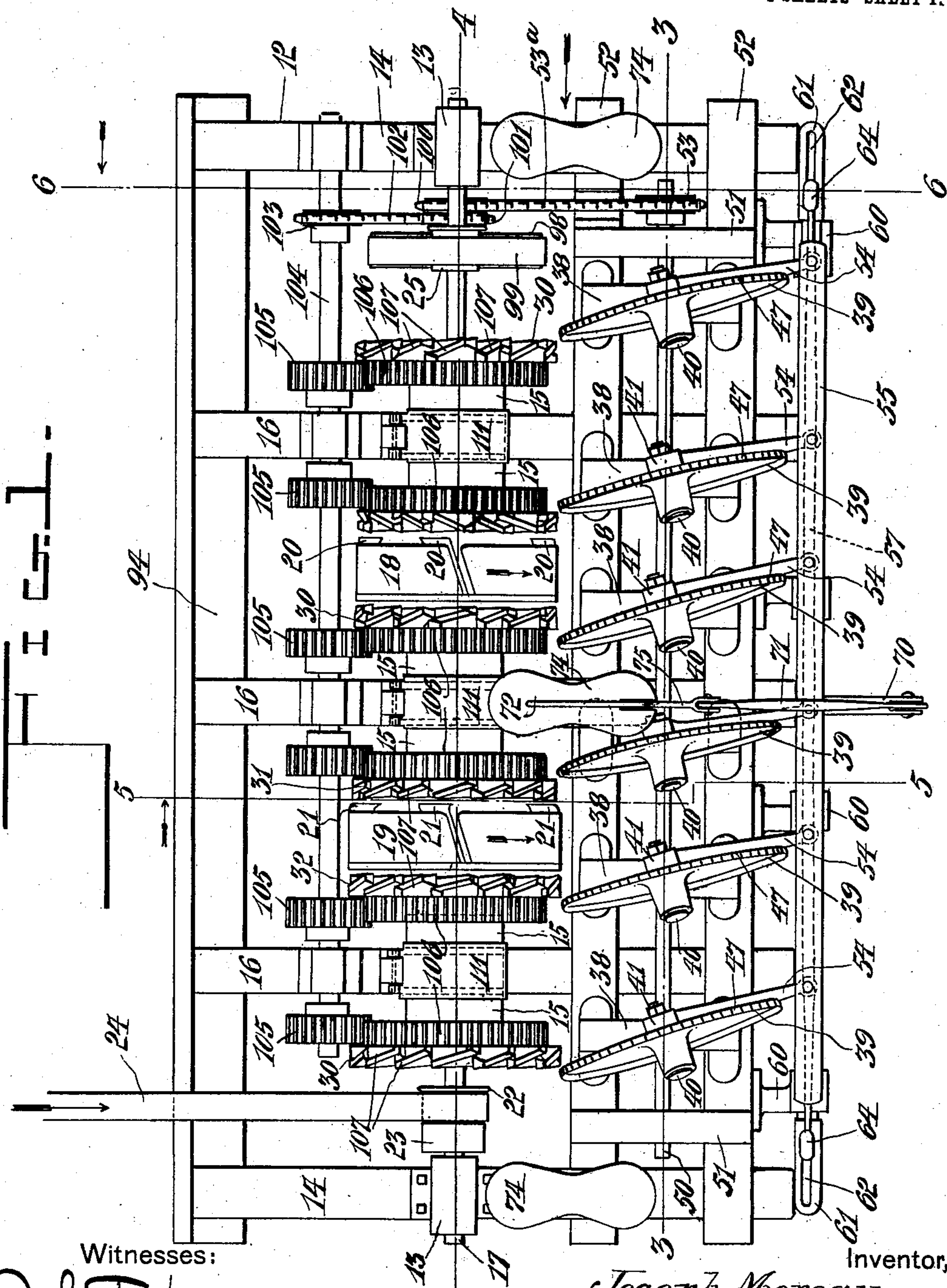
No. 735,793.

PATENTED AUG. 11, 1903.

J. MOREAU.
BARK REMOVING MACHINE.
APPLICATION FILED AUG. 25, 1902.

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses:

John F. Deufferin
George W. Colles

By

Joseph Moreau,
Marion Marion

Inventor,

Attorneys

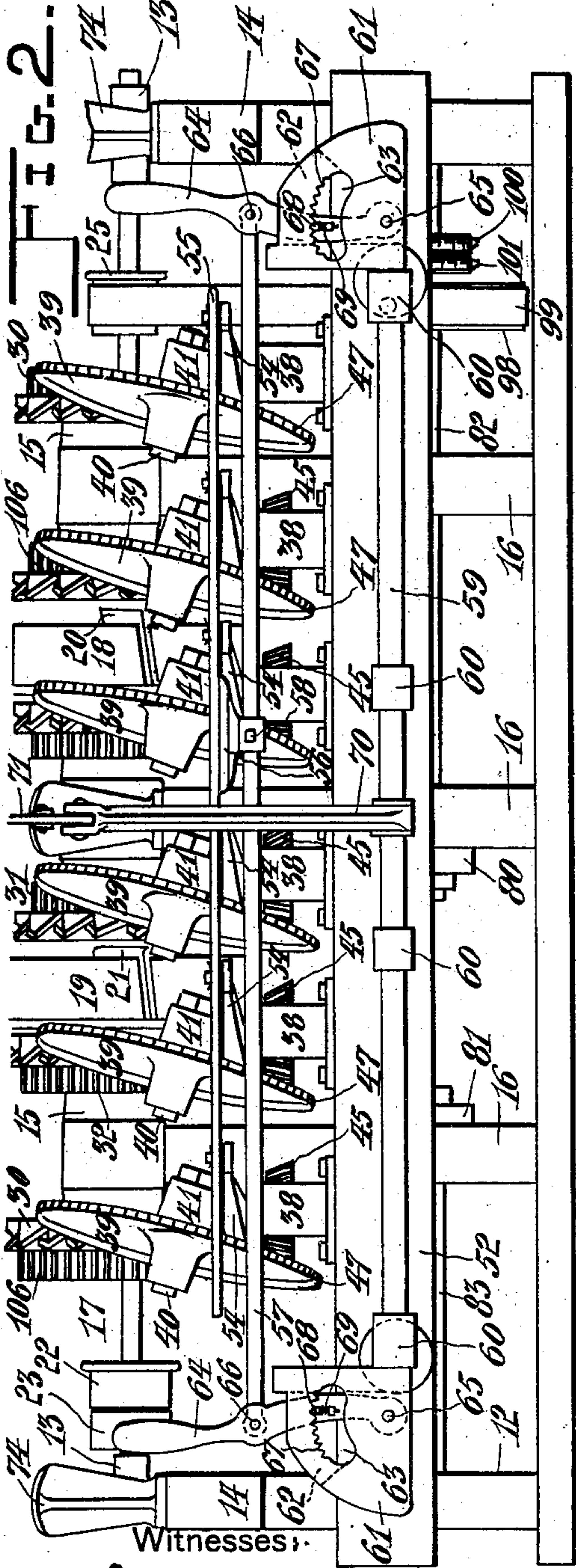
No. 735,793.

PATENTED AUG. 11, 1903.

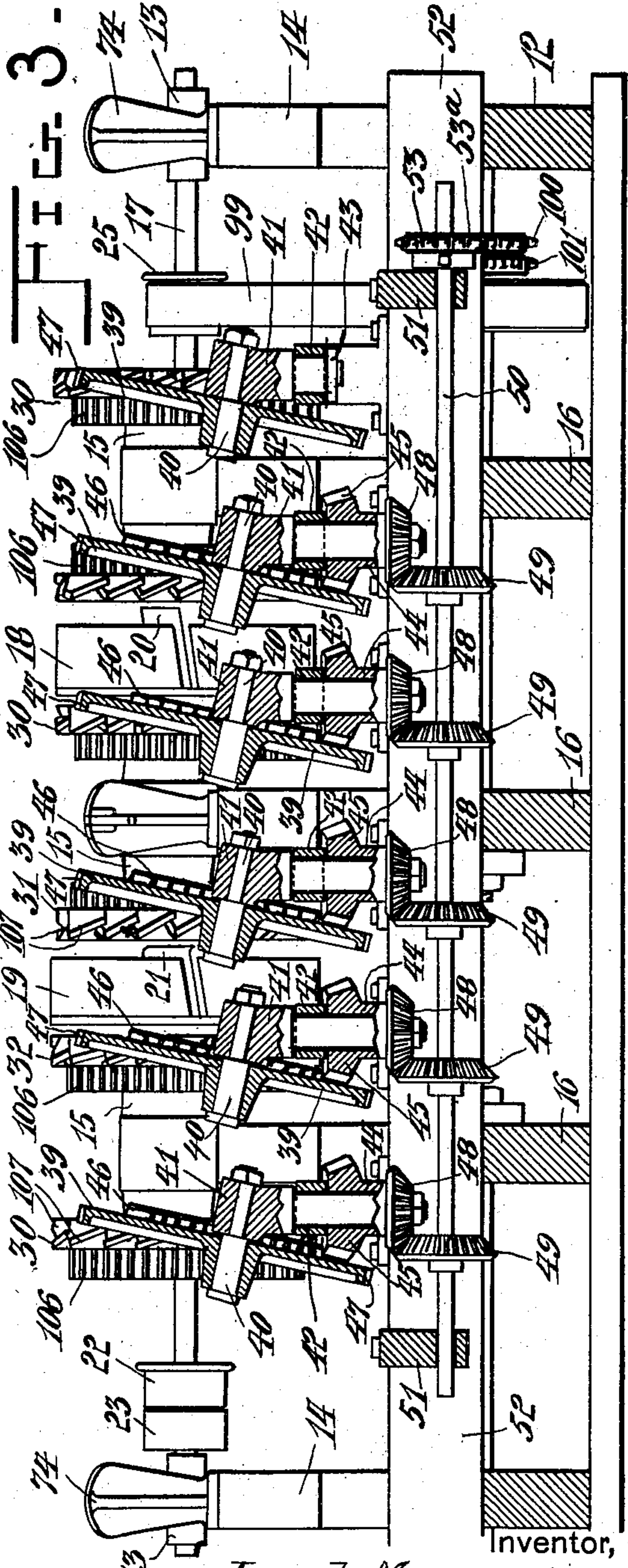
J. MOREAU.
BARK REMOVING MACHINE.
APPLICATION FILED AUG. 26, 1902.

NO MODEL.

4 SHEETS—SHEET 2.



John T. Deufferwiel
George W. Colles



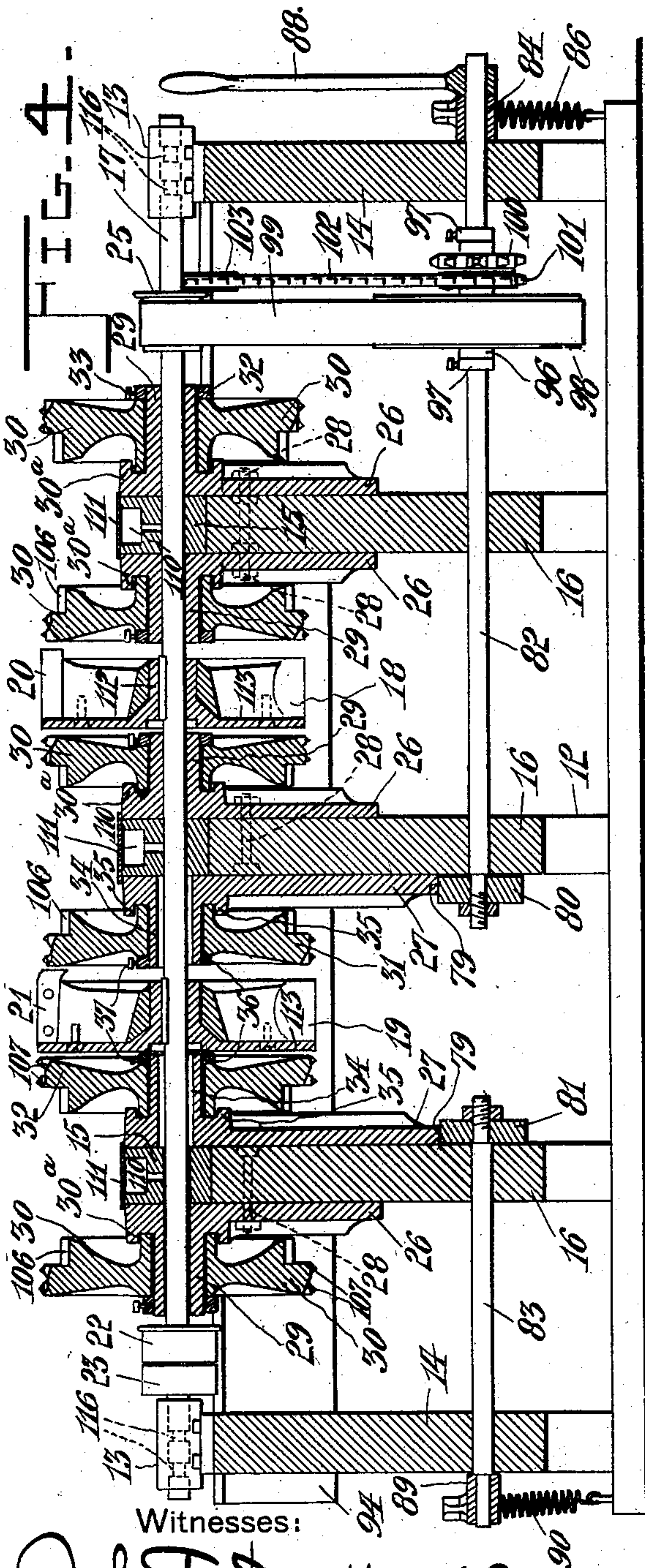
Joseph Moreau,
By Marion Marion
Attorneys

J. MOREAU.
BARK REMOVING MACHINE.

APPLICATION FILED AUG. 25, 1902.

NO MODEL.

4 SHEETS—SHEET 3.



Witnesses:

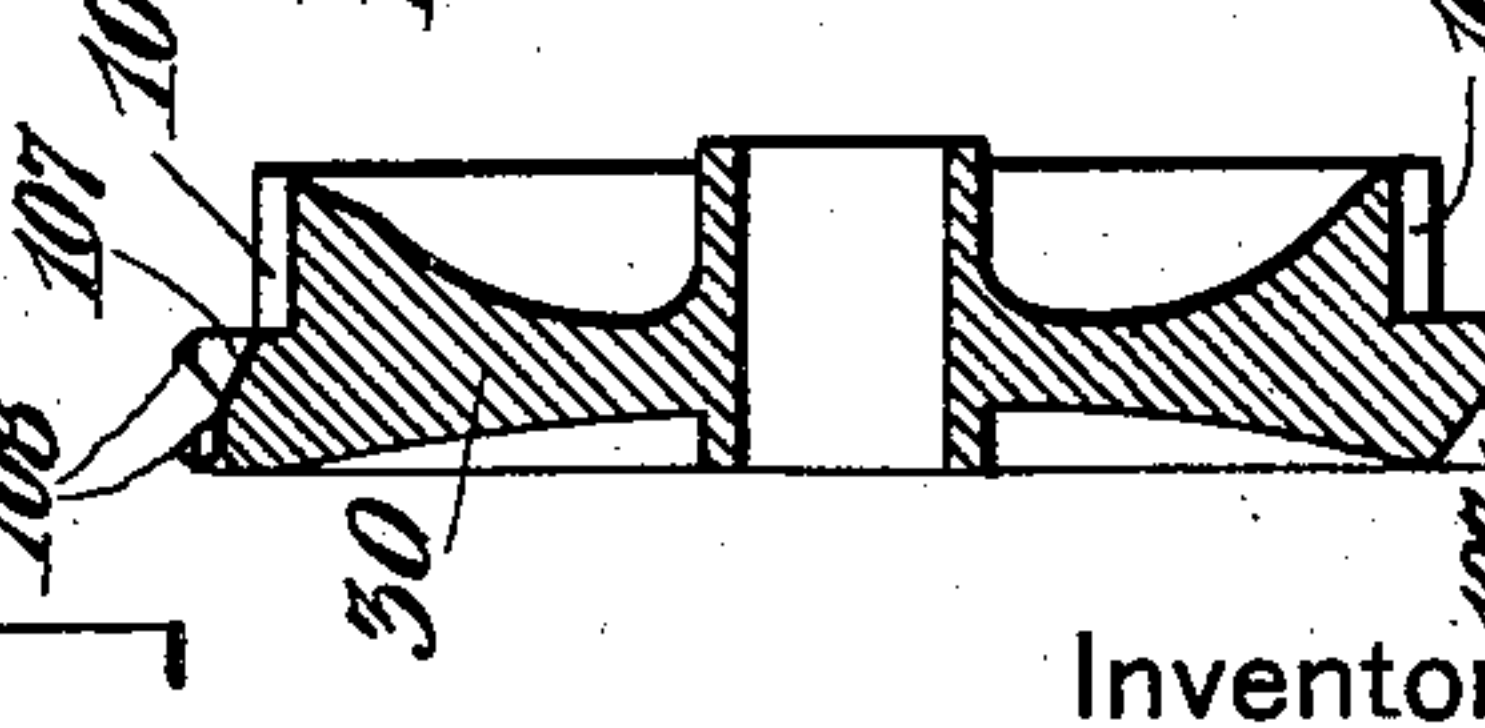
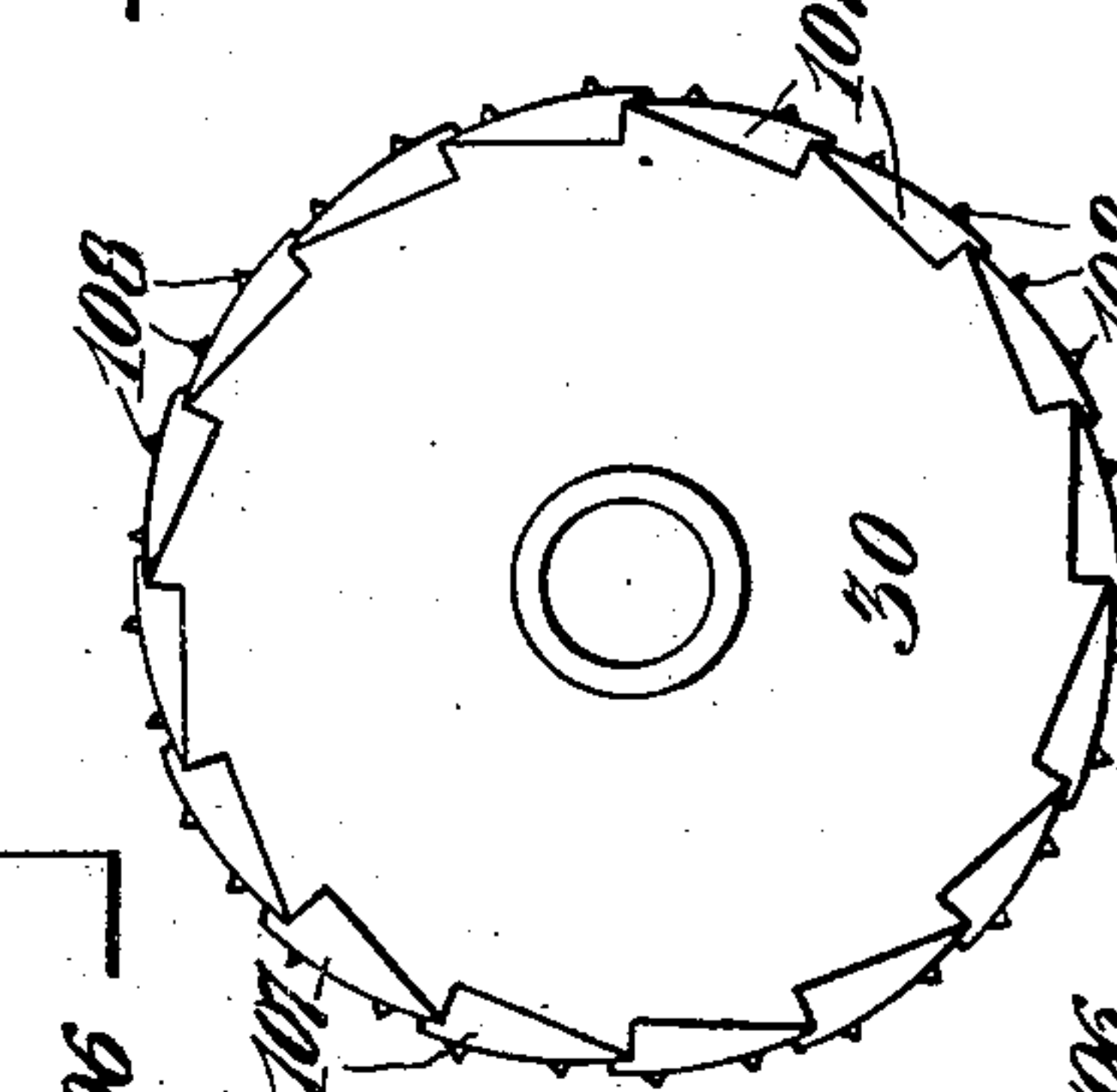
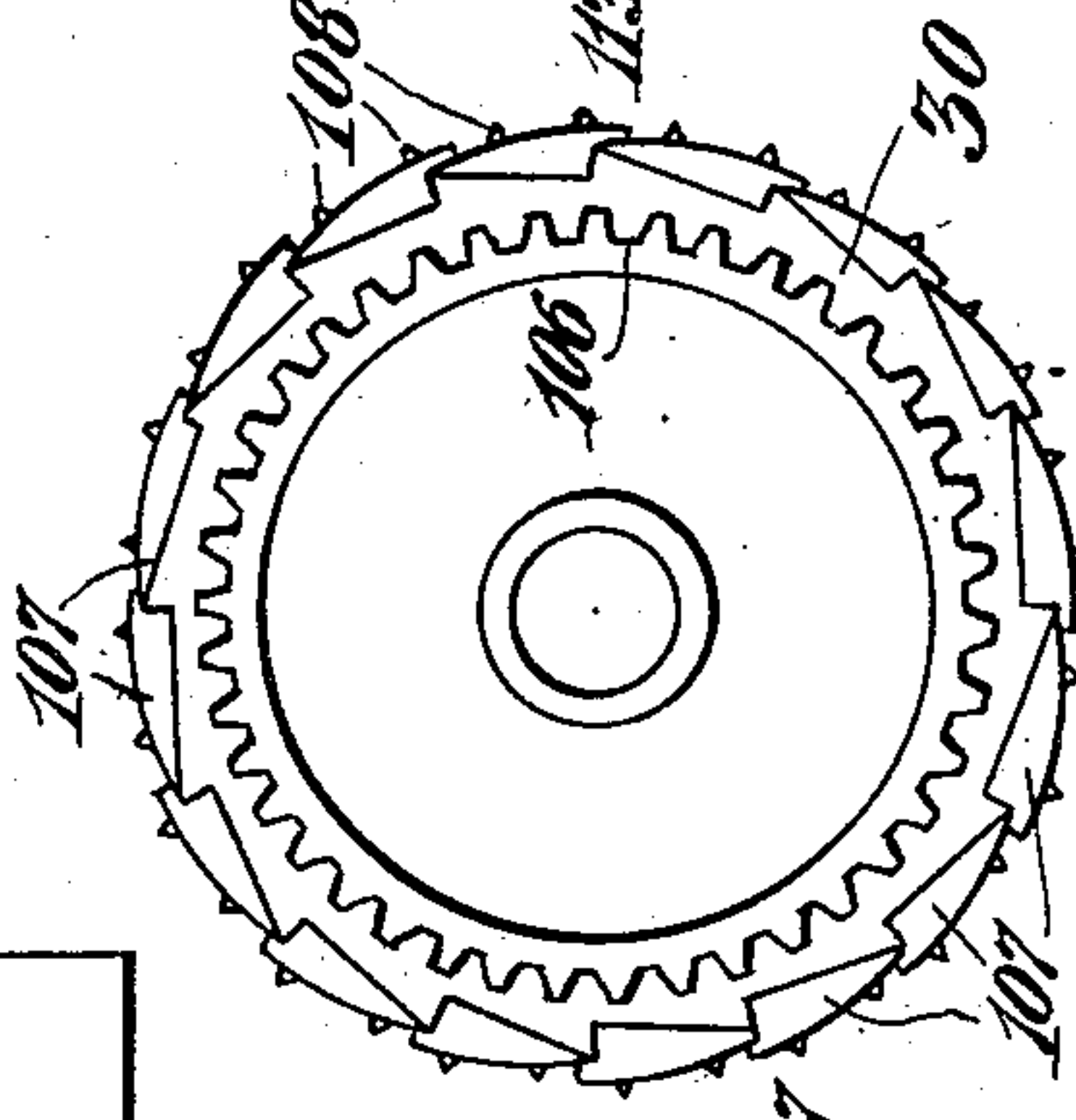
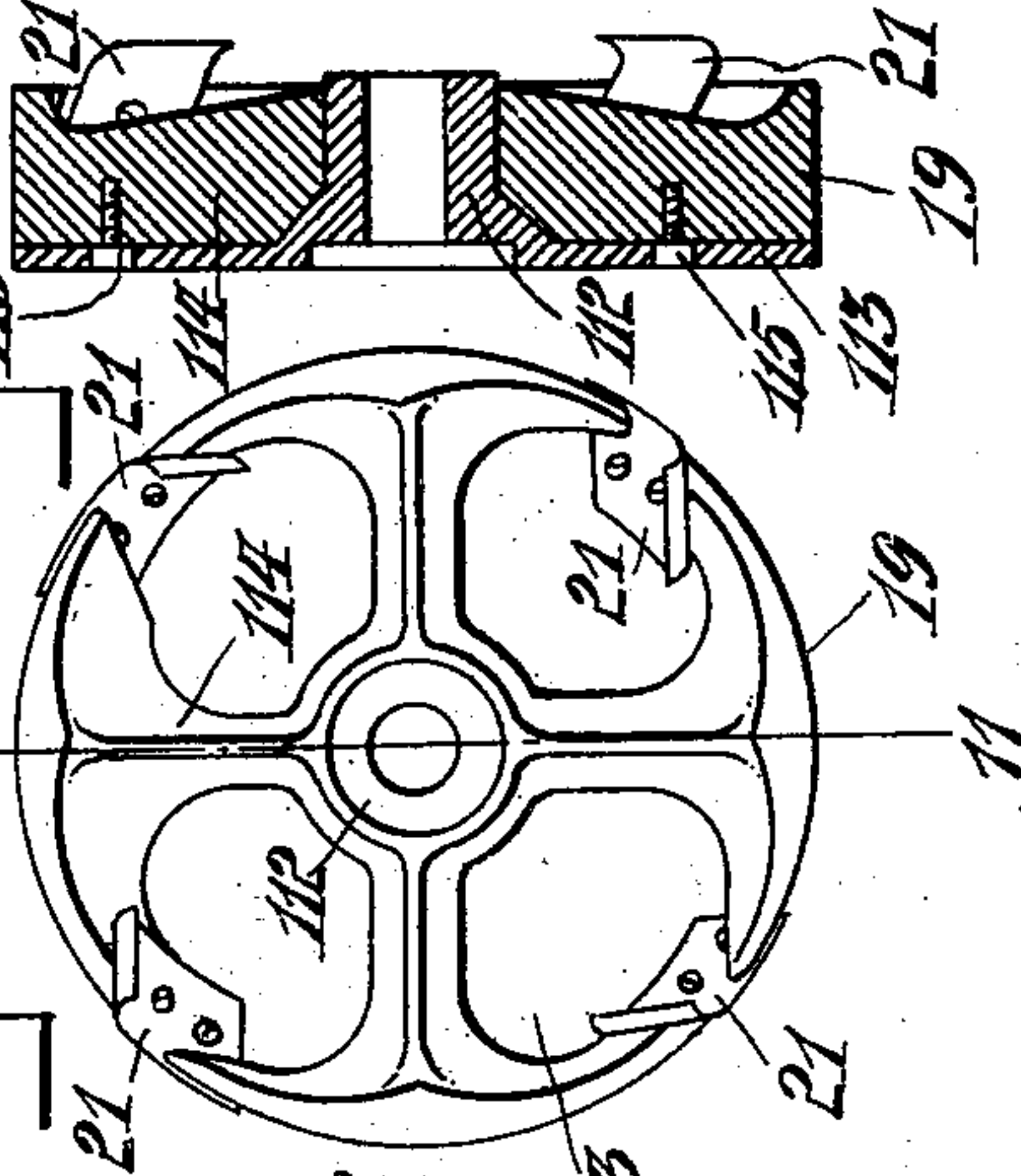
John F. Defferwald
George W. Colles

FIG. 10.

FIG. 9.

FIG. 8.

FIG. 7.



By

Joseph Moreau,
Marion Marion
Attorneys

Inventor,

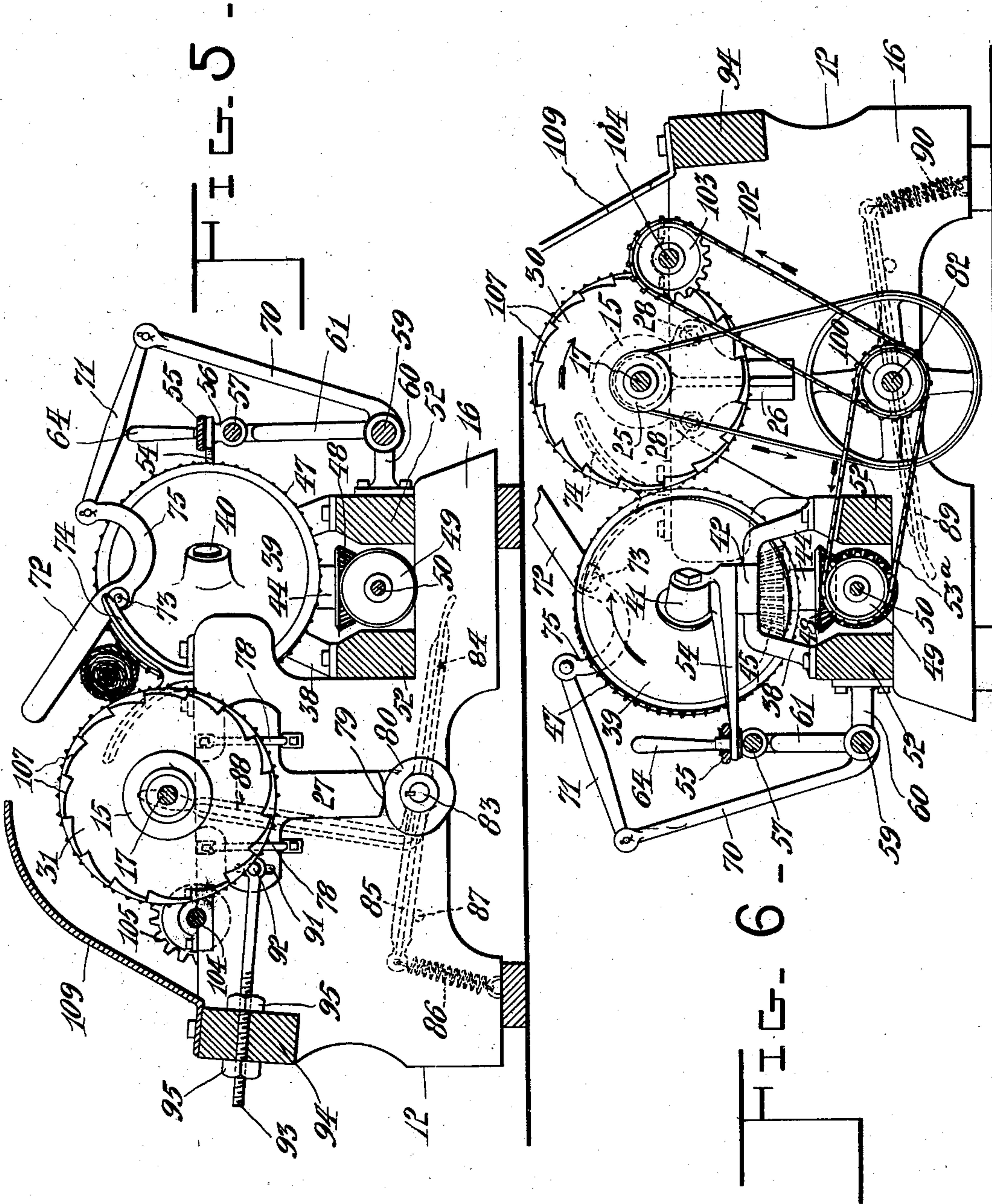
No. 735,793.

PATENTED AUG. 11, 1903.

J. MOREAU.
BARK REMOVING MACHINE.
APPLICATION FILED AUG. 25, 1902.

NO MODEL.

4 SHEETS—SHEET 4.



Witnesses:

John D. Deffenwile
J. Myranda

Joseph Moreau, Inventor,

By *Marion Marion*
Attorneys

UNITED STATES PATENT OFFICE.

JOSEPH MOREAU, OF ST. GERMAIN DE GRANTHAM, CANADA.

BARK-REMOVING MACHINE.

SPECIFICATION forming part of Letters Patent No. 735,793, dated August 11, 1903.

Application filed August 25, 1902. Serial No. 120,926. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH MOREAU, a subject of the King of Great Britain, residing at St. Germain de Grantham, county of Drummond, Province of Quebec, Canada, have invented certain new and useful Improvements in Bark-Removing Machines; 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 appertains to make and use the same.

My invention relates to a machine for removing the bark from logs, and especially those logs which are used in the manufacture of wood-pulp, the object being to quickly and completely remove as much as possible of the bark while removing the minimum amount of wood fiber.

The object of my invention is to produce a simplified and improved machine over that described in another application filed by me for a similar machine, Serial No. 76,306, filed September 23, 1901.

One of the improvements herein set forth lies in the construction of the angularly-set feed-wheels, which are so arranged in the present machine as to be regulable to vary the rapidity of feed, and therefore the angle of said feed-wheels, by a shifting bar and lever set at either end of the machine; and, further, a holding-down arm, which extends over the logs during the process of rossing, or cutting the bark therefrom, is arranged to be operated by the same levers which regulate the position of the feed-wheels.

Another improvement which I have devised and applied in the present machine lies in the independent mounting of the two vertical log-turning wheels on opposite sides of the bark-removing cutter, whereby either may be raised or lowered independently of each other and of said cutter, and they are furthermore provided with means for independent horizontal adjustment for purposes which will be presently explained.

Still another improvement lies in the provision of saddles at intermediate points along the travel of the logs and at those places where the distance between adjacent cutters or feed-wheels is considerable, so that short logs may be readily supported and are prevented from falling down between the wheels and other

mechanism during their travel through the machine.

Still another feature of my invention lies in the improved arrangement of the driving mechanism and general collocation of the parts of the machine.

My invention further resides in the constructions and combinations which are hereinafter more specifically described, and set forth in the claims.

In the drawings accompanying this specification I have shown the most improved embodiment of my bark-removing machine, and wherein—

Figure 1 is a plan view of the complete machine. Fig. 2 is a side elevation thereof from the left side. Fig. 3 is a longitudinal sectional elevation taken on the line 3 3 of Fig. 1, the feed-wheels being shown as having their axes set in the section-plane. Fig. 4 is a longitudinal sectional elevation taken on the line 4 4 of Fig. 1—that is to say, through the main shaft of the machine. Fig. 5 is a transverse sectional elevation taken on the line 5 5 of Fig. 1 looking toward the front of the machine. Fig. 6 is a transverse sectional elevation taken on the line 6 6 of Fig. 1 and looking toward the rear of the machine. Figs. 7, 8, and 9 are respectively a transverse median section and side elevations from opposite sides of one of the log-turning wheels. Fig. 10 is a side elevation of one of the cutter-heads; and Fig. 11 is a transverse section through the cutter-head, taken in the diametrical plane 11 11 of Fig. 10.

The machine comprises a stationary supporting-framework 12, the front end or feed ing end of which is shown on the right of the drawings and the rear or delivery end on the left. On the right of this frame—that is to say, on the upper side of Fig. 1—are mounted a pair of pillow-blocks 13 upon the end beams 14 of the frame and a series of larger intermediate pillow-blocks 15 on the intermediate transverse beams 16 of the frame, these latter pillow-blocks being three in number, as shown, and in these pillow-blocks is rotatably journaled the main shaft 17, which extends the complete length of the machine. On this shaft are keyed at intermediate points thereon two cutter-heads, (designated 18 and 19, respectively,) the former of which carries

cutter-blades 20, adjustably fixed thereon, and is destined to remove the knots and other protuberances on the logs as a preliminary to the bark-removing process, which is performed by the cutter-blades 21, adjustably mounted on the cutter-head 19. These cutters are revolved toward the center of the machine with great rapidity and at the same rate, of course, as the main shaft 17, on which they are keyed. At the rear end of the main shaft are mounted fast and loose pulleys 22 and 23 for driving the machine by means of any suitable belt 24, leading from the source of power, and at the opposite or front end of the shaft 17 is mounted a pulley 25, which is connected through intermediate mechanism with the other parts of the machine to be driven, as will be hereinafter described. On the sides of the beams 16, which support the main shaft, are mounted brackets 26 and 27, the latter being two in number and mounted on the two rearmost beams 16 and adjacent faces of the latter and on opposite sides of the bark-removing cutter 19. These two brackets 27 are not fixed to the beams 16, upon which they are supported, but have independent forward and lateral adjustments thereon, as will be presently described; but the remaining brackets 26, which are four in number and are located on both sides of the front beam 16 and the other sides of the rear beams 16, are fixed thereto in stationary positions by bolts 28 or other suitable means. Each of the brackets 26 carries at its upper end a projecting sleeve 29, which surrounds the main shaft 17 and has mounted thereon one of the six log-turning wheels 30, which turns loosely on said sleeve and is secured against lateral motion thereon at the base of the bracket 26 by an overhanging flange 30^a, which partially surrounds the inwardly-projecting end of the hub of the wheel 30, and at the other end by a collar 32, which is fixed to the end of the sleeve 29 by a set-screw 33. The brackets 27 similarly have projecting from their ends sleeves 34, which also surround the shaft 17, but whose internal diameter is considerably larger than that of the shaft in order to enable the vertical and lateral adjustment of the log-turning wheels just referred to. On these sleeves 34 are similarly mounted other log-turning wheels, which are designated for distinction respectively 31 and 32, for these two wheels perform different functions, as will be seen hereinafter. These wheels 31 and 32 are likewise held against endwise movement upon their pivots by overhanging flanges 35 and adjustable collars 36, fixed thereto by set-screws 37. On the opposite or left-hand side of the frame of the machine are mounted a series of upstanding posts 38, herein shown as six in number, corresponding with the six log-turning wheels, and each post carries adjustably mounted thereon one of the six feed-wheels 39. Each feed-wheel 39 is arranged to rotate loosely on an axle-bolt 40, which is secured in a swivel-head 41 at an angle some fifteen to twenty de-

grees above the horizontal plane, while the swivel-heads 41 are journaled in thrust-collars 42, formed on the upper ends of the stationary posts 38, so that the swivel-heads rotate on vertical pivots, as shown. Beneath the collars 42 the swivel-heads are extended farther, all except the first swivel-head, which merely has a collar-flange 43 fixed thereon to prevent vertical movement in its bearing; but the rearmost five swivel-heads have loosely mounted thereon sleeves 44, which have formed on their upper ends bevel-pinions 45, which mesh with teeth 46 on the rear or lower face of the respective feed-wheels. The edges of these feed-wheels are serrated or toothed, as shown at 47, for the purpose of gripping the logs and assisting their turning or rolling movement, so that the successive portions of their periphery are presented to the knives. On the lower ends of the sleeves 44 are mounted other bevel-pinions 48, which mesh with a series of bevel-pinions 49, carried on a longitudinal shaft 50, journaled in transverse beams 51, which rest on the longitudinal beams 52 of the frame which support the posts 38. At the front end of this shaft, which projects slightly beyond the bearing-block 51, is fixed a sprocket-wheel 53, over which passes a chain 53^a, connecting it with the driving mechanism to be presently described.

The swivel-heads 41 have each extending laterally therefrom toward the left or outside of the machine an arm 54, and these latter are all pivotally connected in parallel planes to the longitudinal shifting bar 55. On the lower side of this bar, at the center thereof, is formed, as shown, a block 56, which has an eye therein, through which passes a longitudinal somewhat-flexible shaft or pole 57, which is secured to the block 56 by a set-screw 58. Below the bar 55 and the pole 57 on the side of the machine-frame is mounted a rock-shaft 59, which is loosely carried in bearing-blocks 60, secured to the side of the frame, and on its ends are fixed quadrant-plates 61, which are slotted both longitudinally and transversely, as shown at 62 and 63, respectively, the former slot being such as to divide the plate 61 into two laminar portions between which is journaled a hand-lever 64, the pivot-pin of which is shown at 65 within the arcuate slot 63. Each of the two hand-levers 64 at the opposite ends of the rock-shaft 59 is pivotally connected, as by a pin 66, to one end of the pole 57, so that by swinging the lever 64 about its pivot the pole 57 and bar 55 may be adjusted in position and in consequence the angle which the axle-bolts 40 and the feed-wheels make with the longitudinal axis of the machine. In order to hold the feed-wheels in their adjusted position, I may further provide the upper edge of the arcuate slots 63 with oblique serrations 67, in connection with which operates a small latch-bolt 68, resiliently pressed into the notches or serrations 67 by a spring 69, both the bolt and spring being mounted on the side of the lever 64.

On the rock-shaft 59, at about the center thereof, is mounted a rock-arm 70, which extends upwardly and is connected at its upper end by a link 71 with the holding-down lever 5 shown at 72, which is pivoted at an intermediate point 73 to the extending end of a saddle 74, the office of which will presently be described. The lever 71 has an upwardly-extending tail portion 75, to which is connected the link 71, and its operative portion extends over the saddle 74—that is to say, over the path of the log passing through the machine, as shown in Fig. 5—and holds the latter down against the cutters and feed mechanism.

I will now describe the mechanism by which the log-turning wheels 31 and 32, which operate in connection with the cutter 19, are adjusted.

The brackets 27, as shown in Fig. 5, have a cross-shaped outline and are held up against the beams which support them by straps 78 embracing the horizontal arms of the cross. The lower end of each bracket 27 is rounded, as at 79, and rests against eccentric cams, (designated 80 and 81, respectively,) which are fixed, respectively, to the ends of the shafts 82 and 83, passing through the opposite ends of the machine and journaled in the beams 16, which support the main shaft. The front end 30 of the shaft 82 has fixed thereto a treadle-lever 84, which has a rearwardly-extending arm 85, connected by a spring 86 with a piece of the frame, so as to hold the lever 84 resiliently in raised position, the upper limit of the motion of the lever being regulated by a stop-pin 87. In order to assist the action of the treadle 84, I may also provide, preferably, a hand-lever 88, likewise keyed to the end of the shaft 82 or forming a part of the same piece on which the treadle 84 and the arm 85 are formed, if desired. It will be seen that by depressing the treadle 84 or drawing the handle 88 to the left the cam 80 will be rotated so as to raise the bracket 27 and by consequence the log-turning wheel 31, and hence will alter the position of the log with respect to the cutter 19, so as to cause the latter to cut more or less deeply into the log, as may be desired. In a similar manner the shaft 83 is extended to the rear end of the machine and has mounted at its rear end a treadle-lever 89, which is held in raised position by a spring 90, secured to the base of the machine, so that by depressing the lever 89 the rear bracket 27, and hence the log-turning wheel 32 is likewise raised with relation to the cutter. Further, to provide for horizontal adjustment of the log-turning wheels, and in addition to hold the brackets 27 steady, each bracket has a slot 91 formed in its outwardly-extending arm in which runs a pin 92, which is secured to the end of the adjusting-bolt 93, passing through the side beam 94 of the frame and adjusted in its endwise position by nuts 95. The lateral positions of the log-turning wheels 31 and 32 do not need frequent adjustment, but may be adjusted once for all at different intervals, according to

the wear and setting of the cutter-blades in the cutter-head; but as for reasons which will be presently seen it is necessary to operate 70 the wheels up and down with the travel of each log through the machine the wheels are provided with the foot-levers 84 and 89, which are designed to be worked by two independent operatives stationed respectively at the feed 75 and delivery ends of the machine. The shaft 82 is preferably utilized also in addition to its main function for carrying the counter-shaft-driving mechanism which connects the main shaft 17 with the two shafts which drive the 80 feed-wheels and the log-turning wheels, respectively. It is in the form of a sleeve 96, loosely mounted on the shaft 82 and fixed in longitudinal position thereon by adjustable collars 97. At its end the sleeve 96 carries a 85 pulley 98, which is connected by a belt 99 with the pulley 25, and also two sprocket-wheels 100 and 101 are fixed to the sleeve 96, over the former of which passes the chain 53^a, and over the latter another chain 102, which connects 90 the sprocket-wheel operatively with the sprocket-wheel 103, located on a longitudinal counter-shaft 104, journaled parallel to and in nearly the same horizontal plane with the main shaft, as shown in Fig. 1. This shaft 104 95 has also mounted thereon a series of spur-pinions 105, which mesh with gears 106 formed on the respective log-turning wheels. These latter are formed as shown in Figs. 7, 8, and 9, being provided with a series of oblique outwardly-extending ribs 107, each of which is provided with a plurality of sharp points 108, which bite into and assist in turning the log, which rests against the wheel, as shown. The set of log-turning wheels 30, 31, and 32 and the 105 feed-wheels 39 either slightly overlap each other or lie in nearly tangent planes, so that the log is adapted to lie in the spandrel-shaped space between the two sets of wheels and when lying in this position is continuously rotated 110 by their rotation and is fed along by the oblique setting of the feed-wheels. The oblique ribs 107 on the log-turning wheels also assist the advance movement, but their primary function is merely to rotate the log against the 115 cutters, so as to present successive portions of its periphery thereto.

It will be understood by those familiar with the manufacture of wood-pulp that the logs for this purpose are cut into short sections of 120 four feet in length, which is a preliminary to barking. However, some of these sections are necessarily less than four feet—as, for instance, three feet—in length, and while the machine herein described is adapted to support logs of the normal length, yet short logs will fall through the machine at intermediate points thereof if not otherwise supported. For this reason I provide saddles 74, located, respectively, at the center between the two 125 cutters 18 and 19 and at the ends of the machine, the two end saddles being for the purpose of sustaining the logs as they enter and are delivered from the machine. 130

For preventing the bark fragments separated by the cutters from flying about and preventing contact of operatives with the revolving cutter-knives I provide a guard-plate 109, secured to the beam 94 and overhanging the main shaft. Also I prefer to provide the journal-boxes of the main shaft with oil-cups 110, which are covered by hinged plates 111, whereby chips and shavings of bark are excluded.

The preferred construction of the cutter-heads is shown in Figs. 10 and 11, comprising a metal forging or casting 112, forming the hub of the cutter-head and having a radial flange 113 at one side, which is secured to the body of the cutter-head 114 by means of screw-bolts 115. The said body 114 is recessed around its periphery and carries the cutter-blades 20 or 21, adjustably fixed thereto by screws, as shown.

To prevent endwise motion of the shaft 17, I may provide the shaft with a series of annular grooves 116 opposite one of the bearings, the bearing-blocks having corresponding ribs which engage with said grooves and forming thrust-collars against which the shaft works.

The two adjustable log-turning wheels 31 and 32 on opposite sides of the main cutter 19 serve different objects, that of the first wheel 31 being to regulate the depth of cut generally upon the log according to the thickness of the bark thereon, so as to enable the operative to regulate this according to his skill and judgment from the front of the machine as he sees the log pass through the same. On the other hand, the wheel 32 is regulated by the operative at the delivery end, so as to take a deeper cut from the hinder end of each log than is taken from the body thereof, this being done by depressing the lever 89 as the rear end of each log comes opposite the cutter 19. The purpose of this is connected with the fact that after the bark has been removed as completely as possible by the machine, which has to be done without removing any of the wood therefrom, there still remain irregular places, such as depressions in the log, from which the bark has not been removed and from which it must be removed by hand. This is done by a draw-knife in the hands of the operative who works over the surface of the log, but as it is not convenient to remove the bark from the end farthest from the operator by this method under ordinary circumstances it has been necessary to turn the log after removing the bark from one end and then remove it from the other. This turning occupies considerable time, and to avoid this waste of time I arrange to cut the log more deeply with the bark-removing cutter at the rear end of each log, whereby the bark is completely removed from this end, and the small amount of wood fiber which is wasted is of trifling value compared with the amount of time required in turning the log in the hand-cutting process. As the turning

is thereby avoided I am enabled by this machine to save considerable time heretofore necessary in the hand trimming of the logs before they are ready for the pulp-mill.

The logs being fed into the machine are laid upon the foremost saddle 74 and between the two front wheels 30 and 39, the latter of which is idle, but the log is immediately set in rotation by the turning-wheel 30, and the wheel 39 rotating by contact therewith causes the log to be pushed along over the other wheels of the series, and hence come in contact successively with the cutters 18 and 19. During the action of these cutters the log may be held down in case it shows any tendency to rising out of the action of the cutters by means of the holding-down lever 72, which is operated by swinging one of the hand-levers 64 inwardly, and at the same time the rate of advancing of the log is regulated by the longitudinal movement of the same hand-lever which adjusts the position of the feed-wheels, as above described.

While I have shown in the accompanying drawings the preferred form of my invention, it will be understood that I do not limit myself to the precise form shown, for many of the details may be changed in form or position without affecting the operativeness or utility of my invention, and I therefore reserve the right to make all such modifications as are included within the scope of the following claims or of mechanical equivalents to the structures set forth.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A bark-removing machine, comprising two parallel adjacent series of wheels between which the log rests, means for rotating said wheels, means carried by said wheels to advance the log through the machine by the rotation of the wheels, rotating cutters mounted between a pair of said wheels and to rotate approximately coaxially therewith, and means for independently adjusting the wheels on each side of one of said cutters so as to bring the said cutter more or less into action.

2. In a bark-removing machine, the combination of a shaft, a rotary cutter mounted thereon and rotating therewith, a log-supporting wheel at one side of said cutter, and means for shifting said log-supporting wheel in its own plane such that the center may occupy any position within a given area.

3. In a bark-removing machine, the combination of a cutter-shaft, a rotary cutter mounted thereon, a pair of log-supporting wheels at either side of said cutter, means for independently raising and lowering said log-supporting wheels, and means for independently shifting said log-supporting wheel laterally in its own plane, substantially as described.

4. In a bark-removing machine, the combination of a cutter-shaft, a rotary cutter

mounted thereon, a support 27 having a sleeve surrounding said cutter-shaft and having a certain play thereon, a log-supporting wheel rotatively mounted on said sleeve adjacent to the cutter, and means for raising and lowering said support while permitting independent adjustment in a horizontal line at right angles to the shaft.

5. In a bark-removing machine, the combination of a cutter-shaft, a rotary cutter mounted thereon, a support 27 having a sleeve surrounding said cutter-shaft and separated therefrom by an open space so as to permit of independent vertical and horizontal adjustment, a log-supporting wheel rotatively mounted on said sleeve adjacent to the cutter, a cam on which the lower end of said support rests, and means at the end of the machine for manually shifting said cam.

6. In a bark-removing machine, the combination of a cutter-shaft, a rotary cutter mounted thereon, a support 27 having a sleeve surrounding said cutter-shaft and having a certain play thereon, a log-supporting wheel rotatively mounted on said sleeve adjacent to the cutter, a cam on which the lower end of said support rests, means at the end of the machine for manually shifting said cam, and means for independently shifting said support from side to side.

7. In a bark-removing machine, the combination of a cutter-shaft, a cutter rotatively mounted on said shaft, a support 27 having a sleeve surrounding said shaft and adjustable in a vertical direction relative thereto, a log-supporting wheel rotatively mounted on said sleeve adjacent to said cutter, an adjusting-shaft 82 parallel to the main shaft and extending to the end of the machine, manually-operated means on its forward end for rocking said shaft, and an eccentric cam mounted on the opposite end of said shaft and on which said support rests.

8. In a bark-removing machine, the combination of a cutter-shaft, a cutter rotatively mounted on said shaft, a support 27 having a sleeve surrounding said shaft, a log-supporting wheel rotatively mounted on said sleeve adjacent to said cutter, an adjusting-shaft 82 parallel to the main shaft and extending to the end of the machine, manually-operated means on its forward end for rocking said shaft, an eccentric cam mounted on the opposite end of said shaft and on which said support rests, and an adjusting-bolt connecting said support with the side of the frame for varying the lateral adjustment of said log-supporting wheel.

9. In a bark-removing machine, the combination of a main shaft, a rotary cutter mounted thereon, a pair of supports adjustably mounted on the side of the frame-posts of the machine on opposite sides of said cutter, each support having a sleeve loosely surrounding said main shaft, a log-supporting wheel rotatively mounted on each sleeve, means for independently adjusting the vertical position

of each support from opposite ends of the machine, and means for adjusting the lateral position of said support, substantially as described.

10. In a bark-removing machine, the combination of a main shaft, a rotary cutter mounted thereon, a pair of supports adjustably mounted on the side of the frame-posts of the machine on opposite sides of said cutter, each support having a sleeve loosely surrounding said main shaft, a log-supporting wheel rotatively mounted on each sleeve, means for causing a log resting on said wheels to advance in the direction of its length, a pair of adjusting-shafts at the respective ends of the machine and parallel with said main shaft, manual adjusting means mounted on the outer end of each shaft at opposite ends of the machine, and a pair of eccentric cams mounted on the respective shafts and supporting the lower ends of said supports, whereby the said log-supporting wheels are raised and lowered relatively to said cutter by operating said manual adjusting means, substantially as described.

11. In a bark-removing machine, the combination of a main shaft, rotary cutters mounted thereon, log-supporting wheels mounted coaxially with said cutters, means for rotating said log-supporting wheels independently of said cutters, a series of feed-wheels mounted in a line adjacent and parallel to said log-supporting wheels, means carried by one or more of said wheels for advancing the log in the direction of its length, and one or more saddles located in the path of the log in the median line between said series of feed and log-supporting wheels for supporting the log on its course through the machine, substantially as described.

12. In a bark-removing machine, the combination of a series of log-supporting wheels, a series of feed-wheels adjacent thereto and swiveled on vertical axes, a holding-down bar overhanging the path of the log and adapted to depress the same against said supporting and feed wheels, means for rotating said supporting and feed wheels to rotate the log and advance the same through the machine, a hand-lever at the end of the machine, and means connecting said hand-lever with said holding-down bar and feed-wheels respectively, whereby the position of the feed-wheels may be regulated and the holding-down bar simultaneously depressed to the necessary extent by the movement of said hand-lever.

13. In a bark-removing machine, the combination of a series of feed-wheels rotatable on independent axes, swivel-heads carrying each of said feed-wheels and enabling the same to be swung about vertical axes to adjust the rate of advancement of the log, a longitudinally-reciprocable adjusting-bar with which the said swivel-heads are connected to move said feed-wheels simultaneously, a hand-lever at the end of the machine connecting with said adjusting-bar to reciprocate the

same, a holding-down lever overhanging the path of the log, a rock-shaft on which said hand-lever is mounted, and intermediate connections between the said rock-shaft and said holding-down lever whereby said holding-down lever is depressed by the lateral movement of said hand-lever.

14. In a bark-removing machine, the combination of a series of posts mounted on the frame of the machine and having collars 42, a series of swivel-heads mounted to turn on vertical axes in said collars, a series of axle-bolts mounted in slightly-inclined planes in said swivel-heads and projecting therefrom, a series of feed-wheels mounted on the respective axle-bolts, gear-sleeves carrying bevel-gears loosely journaled on the lower ends of the respective swivel-heads, a series of bevel-pinions at the upper end of the respective gear-sleeves, gear-teeth formed on the adjacent faces of the respective feed-wheels and engaging the said gear-pinions, a second set of gear-pinions mounted on the lower ends of said gear-sleeves, a longitudinal shaft 50, a series of bevel-gears mounted thereon and engaging the said last-named set of gear-pinions, and means for rotating said shaft, substantially as described.

15. In a bark-removing machine, the combination of a series of posts mounted on the frame of the machine and having collars 42, a series of swivel-heads mounted to turn on vertical axes in said collars, a series of axle-bolts mounted in slightly-inclined planes in said swivel-heads and projecting therefrom, a series of feed-wheels mounted on the respective axle-bolts, gear-sleeves carrying bevel-gears loosely journaled on the lower ends of the respective swivel-heads, a series of bevel-pinions at the upper ends of the respective gear-sleeves, gear-teeth formed on the adjacent faces of the respective feed-wheels and engaging the said gear-pinions, a second set of gear-pinions mounted on the lower ends of said gear-sleeves, a longitudinal shaft 50, a series of bevel-gears mounted thereon and engaging said last-named set of gear-pinions, means for rotating said shaft, a series of radial arms projecting horizontally from said swivel-heads, an adjusting-bar connecting the ends of said arms together, a holding-down bar overhanging the path of the log, a longitudinal rock-shaft at the side of the machine, a rock-arm mounted thereon and connected with said holding-down bar to depress the same, a hand-lever mounted at the end of said rock-shaft and oscillatable in a longitudinal plane relative thereto and fixed to said rock-shaft as regards rotative movement, and a connection between said hand-lever and said adjusting-bar whereby said hand-lever may be adjusted longitudinally to regulate the position of the feed-wheels and simultaneously rocked laterally to depress or raise said holding-down bar, substantially as described.

16. In a bark-removing machine, the combination of a series of feed-wheels mounted

on independent axes slightly inclined to the horizontal, a series of swivel-heads carrying said axes and enabling said feed-wheels to be turned about vertical axes, means for rotating said feed-wheels from a common shaft independently of their position, a longitudinal reciprocable adjusting-bar with which the said swivel-heads are connected operatively to adjust the angle of said feed-wheels, a holding-down bar overhanging the path of the log, a longitudinal rock-shaft mounted in the frame of the machine at one side thereof, a pair of hand-levers pivotally secured to the opposite ends of the said rock-shaft on transverse pivots, a flexible connection between the respective hand-levers and said adjusting-bar, a rock-arm mounted on said rock-shaft, and a connecting-link between said rock-arm and said holding-down bar, whereby the latter may be depressed by the lateral oscillation of said hand-levers, substantially as described.

17. In a bark-removing machine, the combination of a series of feed-wheels mounted on axes slightly inclined to the horizontal, a series of swivel-heads on which the said axes are secured to enable said feed-wheels to be independently rotated about vertical axes, means for rotating said feed-wheels in the same direction independently of their position, a longitudinal adjusting-bar to which all the said swivel-heads are operatively connected, a holding-down bar overhanging the path of the log, a longitudinal rock-shaft extending from end to end of the machine and mounted at the side of the frame, a rock-arm mounted on said rock-shaft and operatively connected with said holding-down bar, a slotted quadrant fixed to each end of said rock-shaft, a pair of hand-levers pivotally mounted in said quadrant and working in the slots thereof, and a flexible pole 57 connected at each end to the respective hand-levers and at the center to said adjusting-bar, whereby said hand-levers may be oscillated longitudinally to adjust the position of said feed-wheels and simultaneously oscillated laterally to raise or depress said holding-down bar, substantially as described.

18. A bark-removing machine comprising a main shaft, one or more cutters mounted thereon and rotating therewith, a series of independent sleeves surrounding said main shaft and supported by the frame of the machine, a series of log-turning wheels rotatively mounted on said sleeve, spur-gears formed on said log-turning wheels, a counter-shaft parallel to the said main shaft, a series of spur-pinions mounted on said counter-shaft and meshing with said gears, a series of feed-wheels mounted adjacent to said series of log-turning wheels and with independent inclined axes, swivel-heads on which the axes of the feed-wheels are mounted, a counter-shaft operatively connected with said feed-wheels to turn them independently of their position, said counter-shaft being located below the series of feed-wheels, operative connections be-

tween said main shaft and each of said counter-shafts, and means for adjusting the position of one or more of said log-turning wheels independently of said cutters, substantially as described.

19. A bark-removing machine, comprising a frame having supporting-posts, a longitudinal main shaft rotatively mounted on said posts at one side of the machine, a pair of rotary cutters mounted on said main shaft and rotating therewith, means for rotating said main shaft from an external source of power, a series of bracket-supports 26 having sleeves surrounding said main shaft, a pair of independently-adjustable bracket-supports 27 having sleeves also surrounding said main shaft and on opposite sides of the rear cutter, log-turning wheels rotatively mounted on all of said sleeves, gears carried by said log-turning wheels, a longitudinal counter-shaft mounted adjacent to said main shaft and parallel thereto, spur-pinions carried by said counter-shaft and intermeshing with said gears, intermediate connections between said main shaft and counter-shaft to turn the cutter and log-turning wheels in opposite directions, a series of feed-wheels mounted on axes inclined to the horizontal in a row adjacent to the said log-turning wheels, a series of swivel-heads carrying said inclined axes and rotatable on vertical pivots, gear-sleeves carried by the lower ends of said swivel-heads and having gears at their upper ends, bevel gear-teeth at the lower side of said feed-wheels intermeshing with said bevel-gears, a counter-shaft mounted below said swivel-heads, gearing connecting said coun-

ter-shaft operatively with said gear-sleeves to rotate the same, connections for driving said second counter-shaft from said main shaft, a longitudinal adjusting-bar at one side of the machine to which all of said swivel-heads are connected, a saddle located in the path of the log to support the latter between said cutters, a holding-down bar overhanging the path of the log, a rock-shaft 59 mounted at the side of the machine below said adjusting-bar, a rock-arm mounted on said shaft and connected operatively with said holding-down bar, a pair of hand-levers 64 pivotally mounted on said rock-shaft and connected with said adjusting-bar to move the same longitudinally and also to oscillate the rock-shaft laterally, means for independently raising and lowering the said supports 27 with relation to the rear cutter, and manually-operated levers at the opposite ends of the machine for respectively operating said raising and lowering means for said supports 27, substantially as described.

20. In a bark-removing machine, the combination of a shaft, a rotary cutter mounted thereon and rotating therewith, a log-supporting wheel at one side of said cutter, means for shifting said wheel in a given line transverse to its axis, and means for independently shifting said wheel in a line transverse both to its axis and to said first-mentioned line.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOSEPH MOREAU.

Witnesses:

J. A. MARION,

ARTHUR BERNIER.