G. S. WITHAM, Jr.

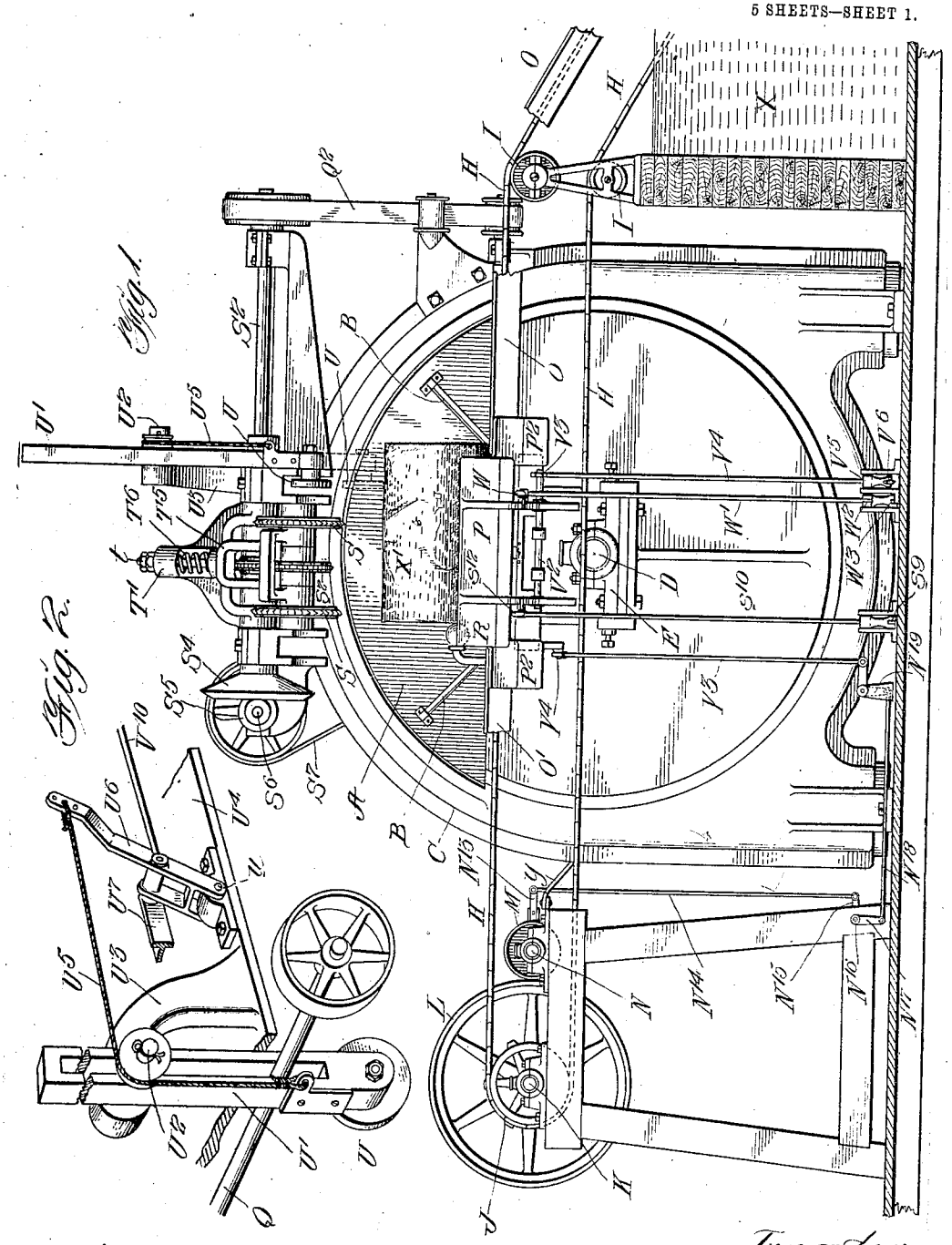
MACHINE FOR REMOVING BARK FROM LOGS.

APPLICATION FILED MAY 13, 1908.

908,433.

Patented Dec. 29, 1908.

5 SHEETS—SHEET 1.



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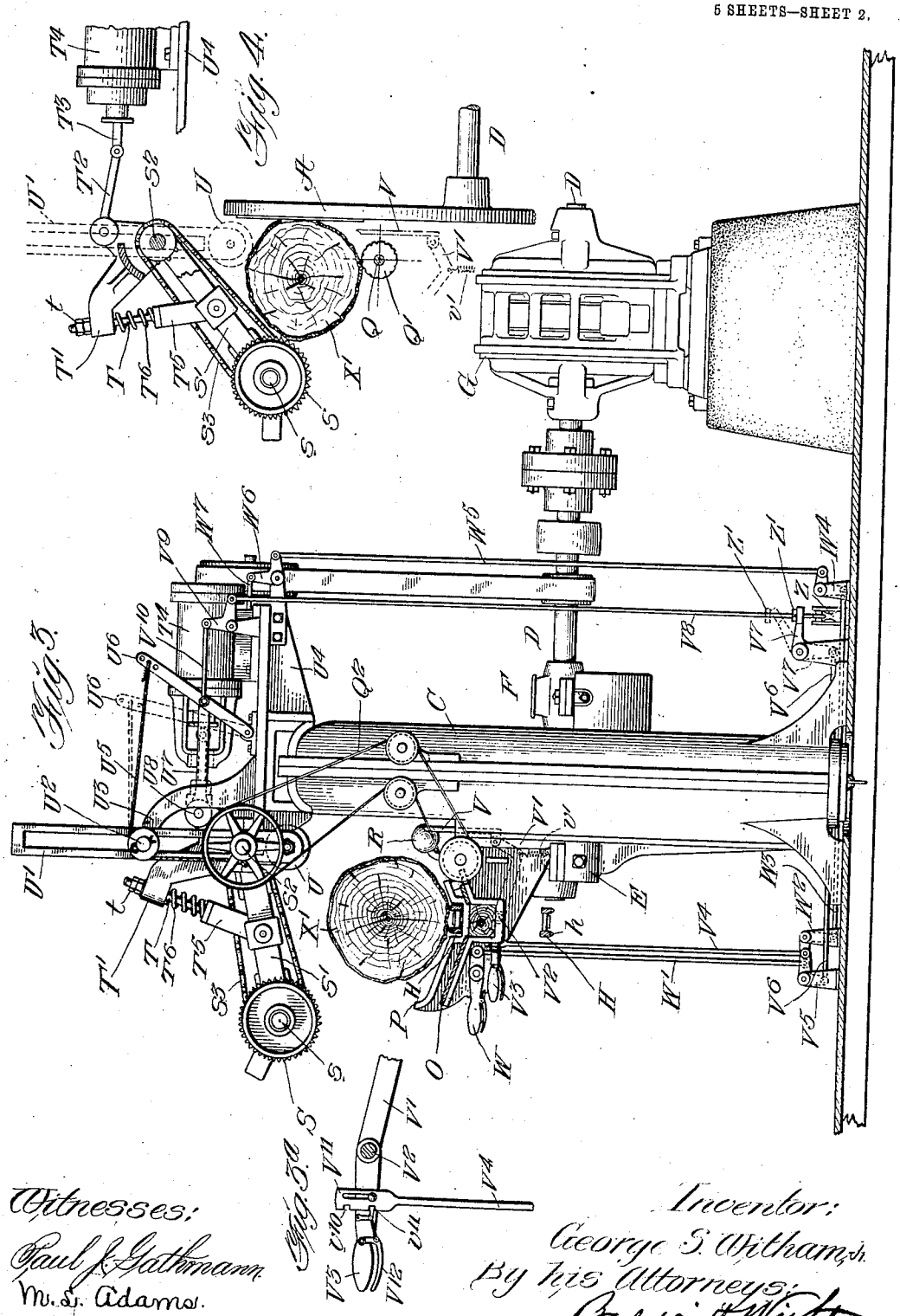

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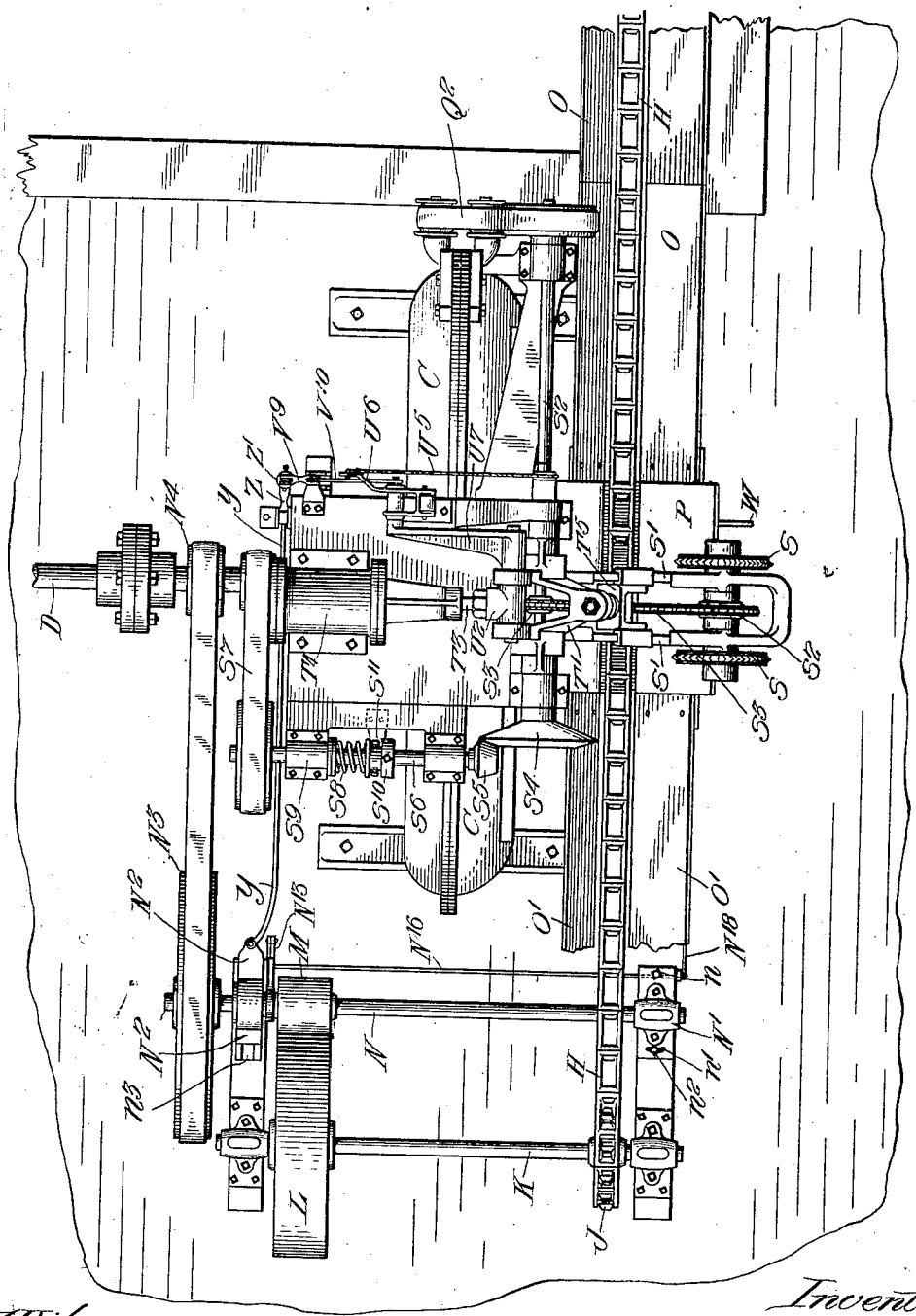

Fig. 5.

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Fig. 7.

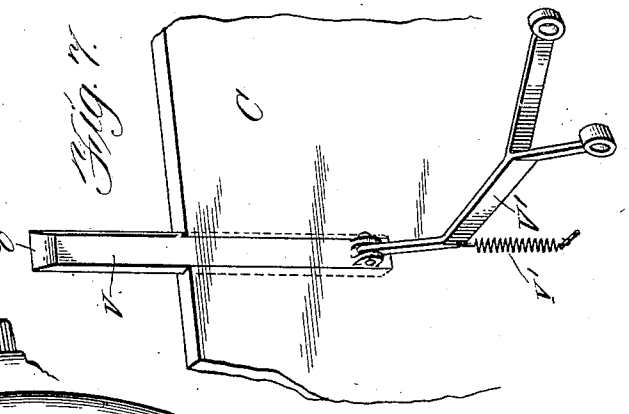
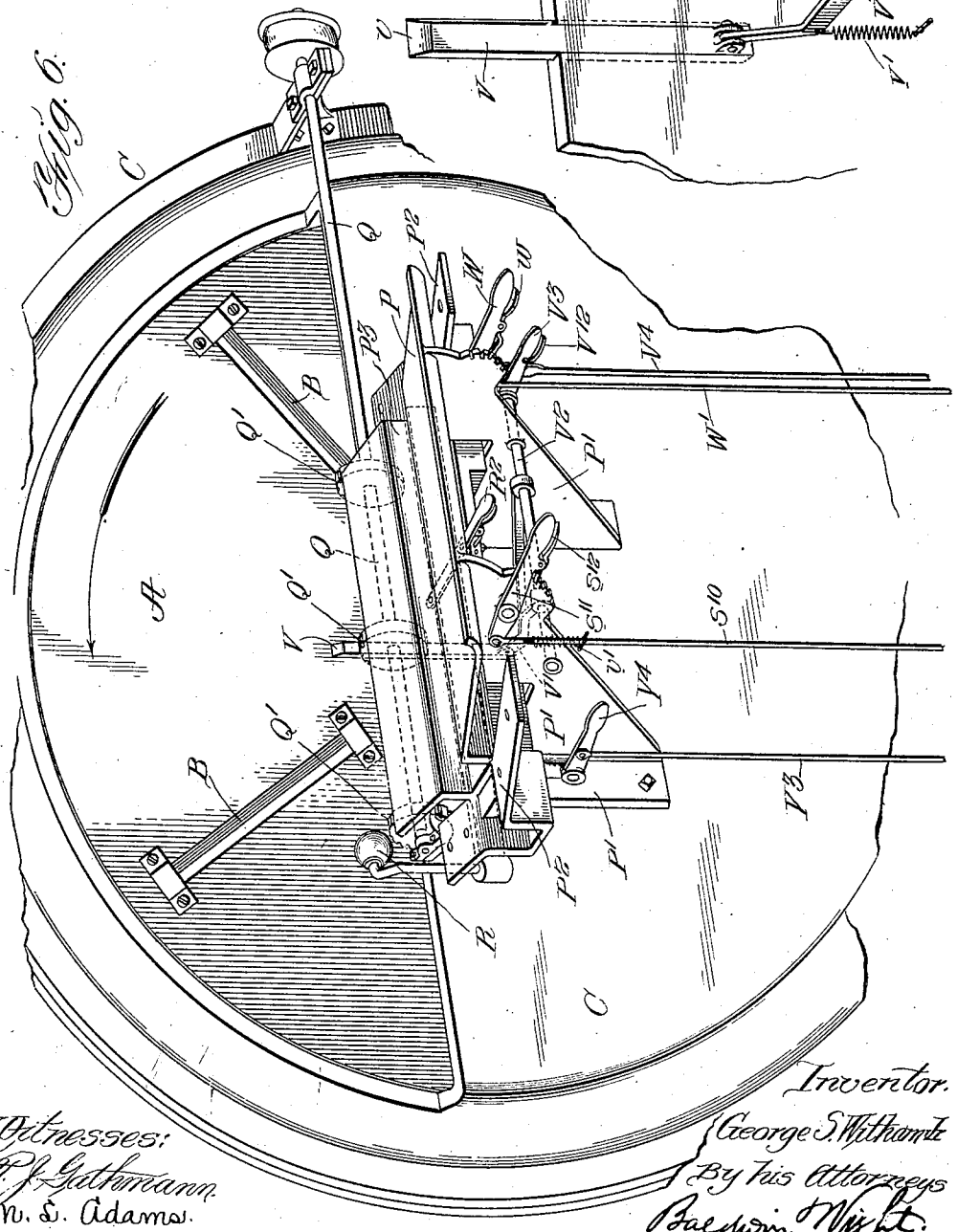


Fig. 6.



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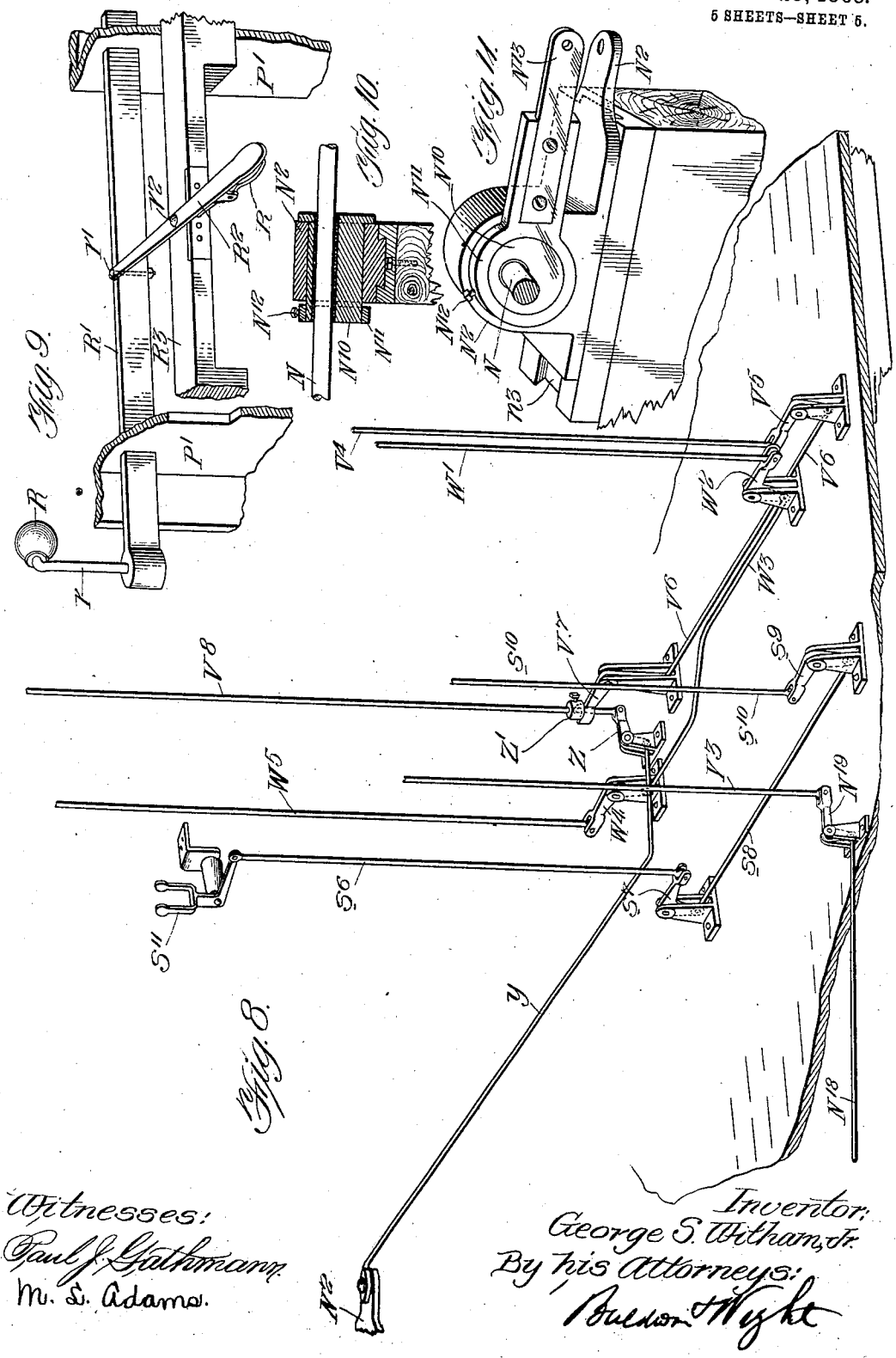

Fig. 8.

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UNITED STATES PATENT OFFICE.

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MACHINE FOR REMOVING BARK FROM LOGS.

No. 908,433. Specification of Letters Patent. Patented Dec. 29, 1908.

Application filed May 13, 1908. Serial No. 432,666.

To all whom it may concern:

Be it known that I, GEORGE S. WITHAM, Jr., a citizen of the United States of America, residing in Sandy Hill, in the county of Washington and State of New York, have invented certain new and useful Improvements in Machines for Removing Bark from Logs, of which the following is a specification.

My invention relates to that class of rossing machines in which the log is held in the path of a vertically arranged rotary disk armed with knives which remove the bark from the log and in which the log is turned or rotated to present its entire bark-covered surface to the action of the knives. A machine of this class is shown in my U. S. Patent No. 878,848 of February 11, 1908, and my present improvements relate especially to the kind of machine shown in said patent. In this class of machines some difficulty has been encountered in uniformly removing the bark without cutting into the good wood by reason of what is known as the "climbing" of the log caused by the fact that as the knives rotate they tend to lift one end of the log out of its horizontal position. I have overcome this difficulty by providing a pressure device which holds down that end of the log which tends to rise while permitting it to freely rotate and which is withdrawn at the proper time to permit the log to be delivered to its carrier after the bark has been removed. I have also provided the machine with what I call a "kicker," which operates to move the barked log away from the path of the knives after the bark has been removed and to deliver it to the log carrier. This kicker is operated automatically in such manner that as soon as the pressure devices, which hold the log in the path of the knives, are withdrawn, the kicker operates to move the log onto its carrier. I have also provided the machine with devices whereby the automatic rotation of the log may be started and stopped at will, so that when logs containing knots, seams or other irregularities are encountered, the automatic rotation of the log may be stopped and the log turned or operated by hand until the knots or seams are removed. I have also improved the details of construction of the machine in the manner hereinafter specified.

In the accompanying drawings,—Figure 1 is a front elevation of a rossing machine embodying my improvements. Fig. 2 is a detail view in perspective illustrating particularly the devices for holding down one end of the log while it is being barked. Fig. 3 is an end elevation of the machine. Fig. 3ª is a detail view of the kicker mechanism. Fig. 4 is an end elevation of parts of the machine showing particularly the devices for raising and lowering the log rotating mechanism. Fig. 5 is a plan view of the machine. Fig. 6 is a perspective view on an enlarged scale showing particularly the log holding table and the lever mechanism connected therewith. Fig. 7 is a perspective view of the kicker and its operating lever. Fig. 8 is a diagram of the operating rods and levers. Fig. 9 is a perspective view of the stop or gage and its operating mechanism. Fig. 10 is a detail view in section showing certain parts of the operating mechanism. Fig. 11 is a detail view in perspective of this mechanism.

The rotary disk A, carrying the radial knives B, is mounted in a suitable housing or casing C. The shaft D of the disk is mounted in suitable bearings E and F at the front and rear of the casing, and this shaft may be operated by any suitable motor G. The conveyer or log carrier H is in the form of an endless chain armed with spurs *h*, which passes over suitable guide pulleys I and carries the log from a pond, or other source of supply, X, to the rotary cutter and thence to any suitable receptacle. The chain passes around a sprocket pulley J on a shaft K carrying a friction pulley L adapted to engage a smaller friction pulley M on a parallel shaft N, which shaft is mounted in bearings N′, N², in the manner illustrated in Fig. 5. The bearing N′ is pivoted to its support at *n*, and it has a curved slot *n′* coöperating with a stud n^2 permitting the bearing N′ to have an adjustment about the pivot *n*. The bearing N² is adapted to slide in a bed plate n^3 in order to give it a slight movement transverse to the shafts K and N so as to withdraw the friction pulley M from the pulley L, or to place it in contact therewith. The shaft N carries a pulley N³ belted to a pulley N⁴ on the driving shaft D.

The logs, as they emerge from the pond, are conveyed through a trough O to a table P which holds the logs while they are being

barked. After the logs are barked, they are carried by the chain through the trough O′ to their destination. The table P is provided with supporting brackets P′, which are firmly attached to the front of the housing C, and it is formed with wings P² to which the ends of the troughs O, O′ are secured. It has a groove or recess P³ through which the chain travels and it carries a shaft Q provided with spur wheels Q′ which assist in turning the log during the cutting operation. As in other machines of this class, I provide a stop R against which one end of the log is forced during the cutting operation and which prevents the log from being moved endwise while being cut, but permits it to freely rotate. This stop, as shown, is in the form of a ball or sphere carried by the vertical arm *r* of a horizontal bar R′ mounted to slide crosswise in the brackets P′ of the table. An operating lever R² is pivotally connected to the bar R′ at *r′* and it is also pivotally connected to a cross bar R³ of the table at *r²*. By means of this lever, the stop may be adjusted to accommodate logs of different lengths, and it may be held in its adjusted position by detent mechanism R⁴.

The spur wheels S are similar to those shown in my patent above mentioned, and perform a similar function, that is to say, they serve to move the log into the path of the knives, press it against the knives and rotate it while being cut. These spur wheels are carried by a horizontal shaft *s* mounted in a frame S′ loosely supported on a horizontal shaft S² above the cutter. The shaft *s* has rigidly secured to it a spur wheel or pinion *s²* traversed by an endless chain S³ gearing with a sprocket pinion *s³* rigidly secured to the shaft S². As the shaft S² is rotated, the spur wheels are revolved. The shaft S² is geared to the shaft Q by means of a belt Q², in the manner indicated in Fig. 3, and the shaft S² is driven by the mechanism illustrated particularly in Fig. 5, where it will be seen, the shaft carries a friction disk S⁴ engaging a friction pinion S⁵ carried by a shaft S⁶ which is connected by means of a belt S⁷ and suitable pulleys to the driving shaft D. The shaft S⁶ is capable of a slight endwise movement for the purpose of placing the friction pinion into and out of engagement with the friction disk S⁴. It is normally pressed forward to cause the engagement of the friction devices by means of a spring S⁸ interposed between the rear bearing and a collar S¹⁰ attached to said shaft. The shaft is moved rearwards to cause the disengagement of the friction devices by means of a forked lever S¹¹ connected by means of a vertical rod *s⁶* with a bell crank lever *s⁷* in turn connected by a rod *s⁸* with another bell crank lever *s⁹* at the front of the machine which bell crank lever is connected by a vertical rod *s¹⁰* with an operating lever *s¹¹* provided with detent mechanism *s¹²*. The mechanism just described is shown most clearly in Figs. 6 and 8. By properly operating the lever *s¹¹* with its detent mechanism *s¹²*, the friction devices may be engaged and disengaged to cause the rotation or the stoppage of the shaft S².

The frame S′, herein before referred to, is connected by means of a rod T with a bell crank lever T′, pivotally mounted on the shaft S² and connected by means of a link T² with the piston rod T³ which operates in a cylinder T⁴ to which steam, air or other suitable motive fluid is supplied. The rod T extends loosely through the forwardly projecting portion of the bell crank lever T′ and carries nuts *t* on its upper end which limit its downward movement. The lower end of the rod is connected to a yoke T⁵ forming part of the frame S′, and between this yoke and the forward end of the bell crank lever T′ is interposed a spring T⁶ which tends to force the spur wheels downwards and forwards and resists their upward movement away from the log. In this way a yielding pressure is exerted on the log while it is being barked and enables the log to accommodate itself to the cutter whatever be its irregularities in shape or formation.

It will be observed, by reference to Fig. 1, that when the disk cutter is rotated in the direction indicated by the arrow, the knives B act on the right hand end of the log in such manner as to tend to raise this end of the log, and this has been found in practice to cause an irregular cutting of the log not only causing all the bark to be removed, but also a large portion of the good wood. In order to prevent this, I have devised a pressure device which, while holding down that end of the log which tends to rise, permits it to freely rotate and insures a uniform barking operation. For this purpose I provide a pressure wheel U freely pivoted at the lower end of a vertically moving frame U′ through which the shaft Q extends and by which at its lower end it is guided and which is also guided by a stub shaft U² carried by a bracket U³ mounted on the platform U⁴ at the top of the housing C. The lower end of the frame U′ is connected by a rope or other similar flexible connection U⁵ with a lever U⁶ pivoted at *u* to the platform U and connected by an arm U⁷ with the cross head U⁸ forming the lower rear end of the bell crank lever T′, the arrangement being such that when the bell crank lever is operated to lower the spur wheels, S, the pressure wheel U is lowered and caused to rest on the top of the log near one end, in the manner indicated in Figs. 1 and 4. The weight of the pressure wheel and its frame is sufficient to hold it in its lowered position and to prevent the log from rising unduly, but the pressure wheel and its frame will rise should

a knot or like obstruction be encountered as to tend to force or break the mechanism should it not yield.

The kicker, herein before referred to, is indicated at V. It consists of a vertically arranged bar-mounted to slide in the casing C, preferably midway between the ends of the table. It is beveled at its upper end v and at its lower end it is connected by a lever V′ with a shaft V^2 mounted in bearings below the central portion of the table and carrying an operating handle V^3, which is connected by a vertical rod V^4 with a bell crank lever V^5, in turn connected by a rod V^6 with a bell crank lever V^7, through the rearward horizontal arm of which extends vertically a rod V^8 connected at its upper end to a bell crank lever V^9 in turn connected by a link V^{10} with the lever U^6. A spring v' moves the kicker downward. The shaft V^2 is, as before stated, provided with a handle V^3 by means of which the kicker may be operated in the manner herein after explained. As indicated most clearly in Fig. 3^a, the connection between the handle V^3 and the rod V^4 is adjustable. It will be observed that the upper end of the rod V^4 is formed with a head V^{11} having two notches v^{10}, v^{11} with which is adapted to engage a latch or detent V^{12}. As indicated in Fig. 3^a, the parts are in condition for automatic operation, but should it be desired at any time to throw the kicker out of operation, this may be done by placing the latch V^{12} in the upper notch v^{10}. When the latch V^{12} is placed in the upper notch v^{10} the kicker will, of course, be depressed to a lower position than it ever at any other time assumes, and when the mechanism is operated, the kicker will never rise to such an extent as to prevent the log from being held by hand against the cutters when the spur wheels S are held in an elevated position. This hand operation is sometimes necessary when logs of abnormal form are encountered. The adjustable bearing N^2 hereinbefore referred to, is connected by means of a rod y to a bell crank lever Z which is pivotally connected with the vertical rod V^8, hereinbefore referred to. A collar Z′ is attached to the rod V^8 just above the bell crank lever V^7 and it is so arranged that when the rod V^8 is moved downwards and the bell crank lever V^7 is in the position indicated by dotted lines in Fig. 3, said bell crank lever V^7 and the devices connected therewith will cause the kicker V to be forced suddenly upwards to move the barked log away from the cutters onto the feed chain. This mechanism is so arranged that whenever the spur wheels S are raised, the kicker is elevated and the friction wheels L and M are made to engage and thus cause the feed chain H to move forwards and feed a fresh log to the table and convey the barked log away, and when the spur wheels S are depressed, the kicker is withdrawn and the friction wheels L and M are separated and stop the chain while a log is being barked.

The valve mechanism for the fluid pressure operating devices is controlled by a lever W provided with detent mechanism w and connected by a vertical rod W′ with a bell crank lever W^2 connected by a horizontal rod W^3 with a bell crank lever W^4 in turn connected by a vertical rod W^5 with a bell crank lever W^6 connected by a rod W^7 with the valve mechanism.

In order that the chain H may be started or stopped at will independently of the raising and lowering of the spur wheels S, I have mounted the shaft N in an eccentric N^{10} surrounded by an eccentric strap N^{11} which is secured to the eccentric by a screw bolt N^{12}. The eccentric strap has an arm N^{13}, to the outer end of which is connected a rod N^{14} connected to an arm N^{15} on a horizontal shaft N^{16} having an arm N^{17} connected by a rod N^{18} with a bell crank lever N^{19} to which is connected a rod Y^3 jointed to a handle Y^4 at the front of the machine. By operating this lever the shaft N may be so moved as to place the friction wheel M in contact with the wheel L or remove it therefrom without sliding the bearing N^2, or in any way interfering with the connections between this bearing and the operating rod V^8, that is to say, the chain H is under perfect control. It may be started or stopped at will whether the spur wheels be in operation or not, or whether they be in their raised or their lowered positions.

The construction of the mechanism illustrated has now been described and the method of operation has been referred to, but the operation more specifically is as follows:—The logs to be barked may be conveyed either from a pond, a saw mill, or other suitable source of supply. If conveyed from a pond, as illustrated, the endless carrier chain is set into operation by means of the lever Y^4 which, through its connections before described, will bring the friction wheel M into frictional engagement with the wheel L, thus causing the chain to move and it will convey the logs to the table P in suitable succession. As soon as a log has reached a proper position on the table, the lever W is operated to admit steam to the cylinder T^4 causing the spur wheels S to be depressed while rotating and thereby the log X′ will be moved from the position shown in Fig. 3 to that shown in Fig. 4. At the same time the pressure wheel U will be lowered onto that end of the log which tends to rise. The log is rotated not only by the spur wheels S, but also by the spur wheels Q′, in the manner before described, and the rotation of the log continues until the bark has been removed. In the act of operating the valve mechanism to lower the spur wheels, the

chain is stopped, so as to prevent other logs from interfering, by means of the connections of the rod V^8 with the adjustable bearing N^2, before described, but as soon as the log has been properly barked, by reversing the lever W, the spur wheels and pressure wheel will be raised and at the same time, the friction wheel M will be made to engage the wheel L and the chain will be started again and will carry the barked log to its destination. The kicker is lowered before an unbarked log arrives on the table by means of the lever V^3, or by its own weight and the spring and it is automatically raised to move a log from the cutter to the table, as before explained. If during the process of cutting the bark from the log, knotty portions or seams are encountered which are difficult to deal with, and it is desired to stop the rotation of the log by the spur wheels without removing the pressure of the spur wheels from the log, this may be done by means of the lever s^{12}, which, through the connections before described, will cause the friction pinion S^5 to be withdrawn from the friction disk S^4. In this way, it will be readily understood, the rotation of the spur wheels S and Q′ will be stopped, permitting the log to be turned by hand without necessitating the operator to press the log towards the cutters, as this is done by the spur wheels S.

In my prior patent, before referred to, I have shown mechanism operating to automatically do some things that are done by hand in the machine illustrated in the accompanying drawings and herein before described. It will be understood, however, that some of the improvements herein shown and described may be embodied in a machine operating in the automatic manner described in my aforesaid patent, and may also be embodied in machines differing in some features of construction from that herein shown.

I claim as my invention:

1. In a rossing machine, the combination of a rotary cutter, devices on which the log is supported while being cut, means for rotating these supporting devices, a stop for preventing endwise movement of the log during the cutting operation, means acting on the upper front portion of the log for pressing it against the cutter and for rotating it while being cut, means for raising and lowering said rotating means, devices for acting on the top of the log at one side of said rotating means and near one end of the log to prevent the log from rising during the cutting operation, and means for raising and lowering said last mentioned devices.

2. In a rossing machine, the combination of a rotary cutter, a support for the log while being cut, means for pressing the log against the cutter and for rotating it, mechanism for bringing the log rotating and pressing means into engagement with the log and for withdrawing it therefrom, and devices operating on the top of the log near one end to prevent this end from rising during the cutting operation which are coincidently with the log turning and pressing means moved into and out of engagement with the log.

3. In a rossing machine, the combination of a rotary cutter, means for supporting a log while being cut, rotary spur wheels adapted to press the log against the cutter and to rotate it during the cutting operation, means for bringing the spur wheels into and out of engagement with the log and for withdrawing them therefrom, a pressure wheel adapted to operate on one end of the log and prevent this end from rising during the cutting operation, and means for raising and lowering said pressure wheel coincidently with the corresponding movements of the spur wheels.

4. In a rossing machine, the combination with a rotary cutter, of a support for the log while being cut, means for pressing the log against the cutter and for rotating it during the cutting operation, and a kicker operating between the cutter and the log for moving the log away from the cutter after it has been barked.

5. In a rossing machine, the combination of a rotary cutter, a support for the log, means for pressing the log against the cutter and for rotating it during the cutting operation, a kicker operating between the log and the cutter, and mechanism operating to actuate the kicker immediately after the log pressing and turning means are withdrawn from the log.

6. In a rossing machine, the combination of a rotary cutter, a support for the log, means for pressing the log against the cutter and for rotating it while being cut, power mechanism for bringing the log turning and pressing means into engagement with the log and for withdrawing it therefrom, a kicker operating between the log and the cutter, and connections between the kicker and the log turning and pressing means whereby when the latter are withdrawn from the log the kicker is actuated to move the log away from the cutter.

7. In a rossing machine, the combination with a rotary cutter, of a support for the log while being cut, means for pressing the log against the cutter and for rotating it during the cutting operation, a kicker operating between the cutter and the log for moving the log away from the cutter after it has been barked, means for automatically thus operating the kicker after the log-pressing means have been withdrawn and devices whereby the automatic operation of the kicker may be suspended.

8. In a rossing machine, the combination

with a rotary cutter, of a support for the log while being cut, spur wheels for pressing the log against the cutter and for rotating it during the cutting operation, means for raising and lowering the spur wheels, a kicker operating between the cutter and the log for moving the log away from the cutter after it has been barked and the spur wheels have been raised, means actuated by the mechanism for raising and lowering the spur wheels for thus operating the kicker, and devices whereby such operation of the kicker may be suspended.

9. In a rossing machine, the combination of a cutter, a support for the log while being cut, means for pressing the log against the cutter and for rotating it, mechanism for bringing the log rotating and pressing means into engagement with the log and for withdrawing it therefrom, a feed chain or log carrier for conveying logs to and from the cutter, means for causing the feed chain to stop when the log-pressing means are brought into engagement with the log and to start when the log-pressing means are withdrawn from engagement therewith, and independent means for starting and stopping the feed chain whatever be the position of the log-pressing and turning means.

In testimony whereof, I have hereunto subscribed my name.

GEORGE S. WITHAM, JR.

Witnesses:
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H. A. WHITE.