June 24, 1947. F. H. SWIFT 2,422,757

HYDRAULIC BARKER

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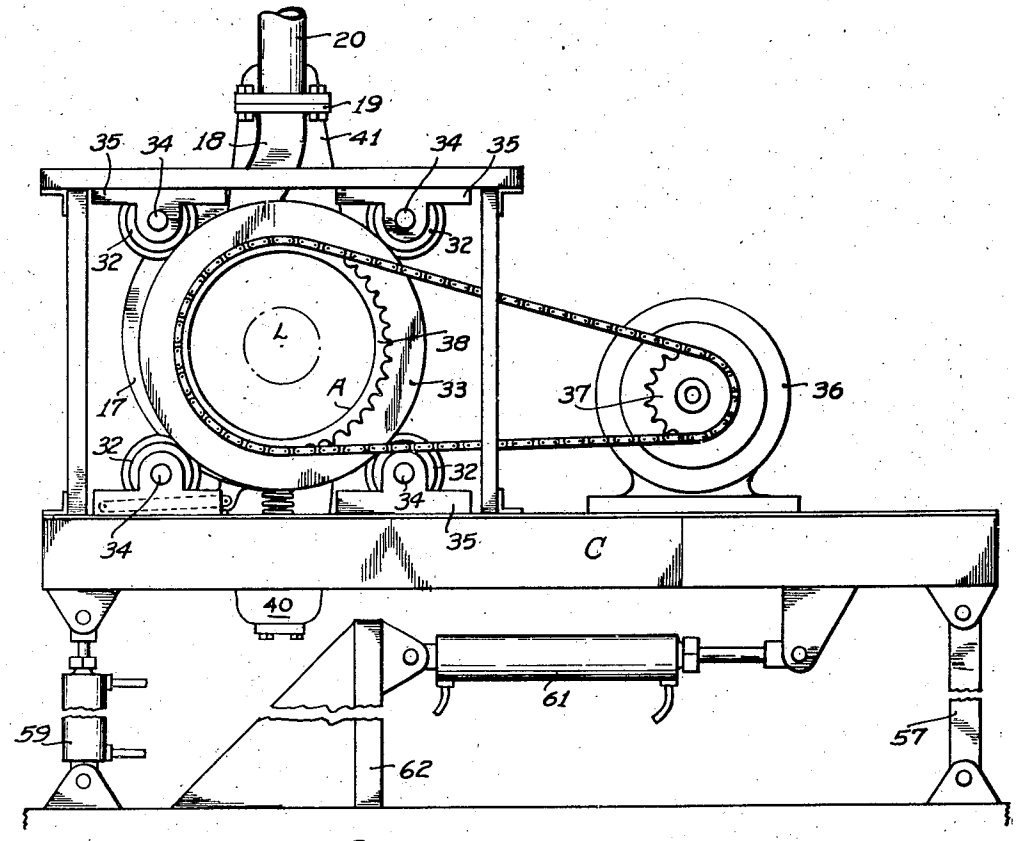


Fig. 1

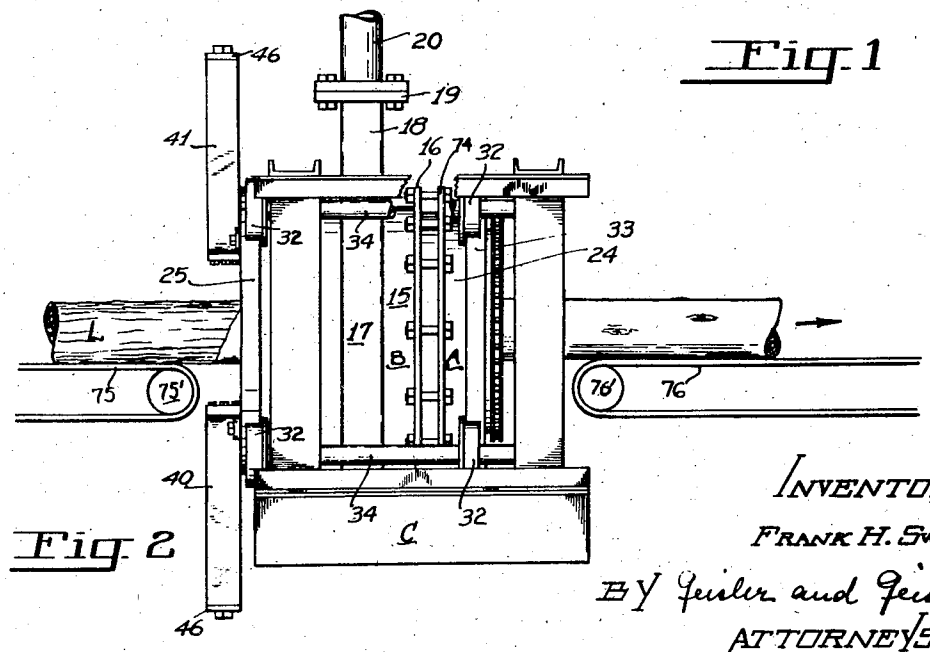


Fig. 2

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HYDRAULIC BARKER

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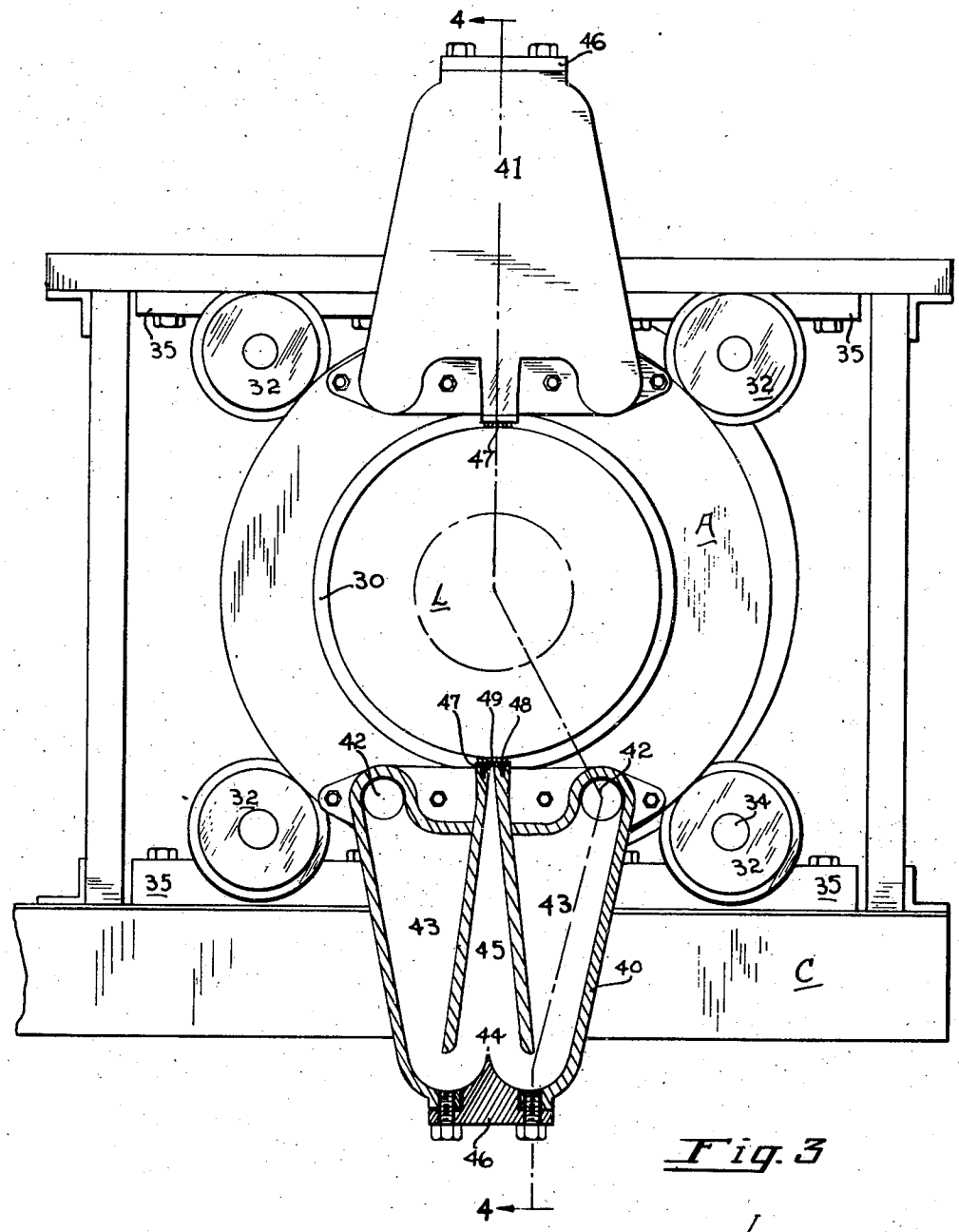


Fig. 3

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HYDRAULIC BARKER

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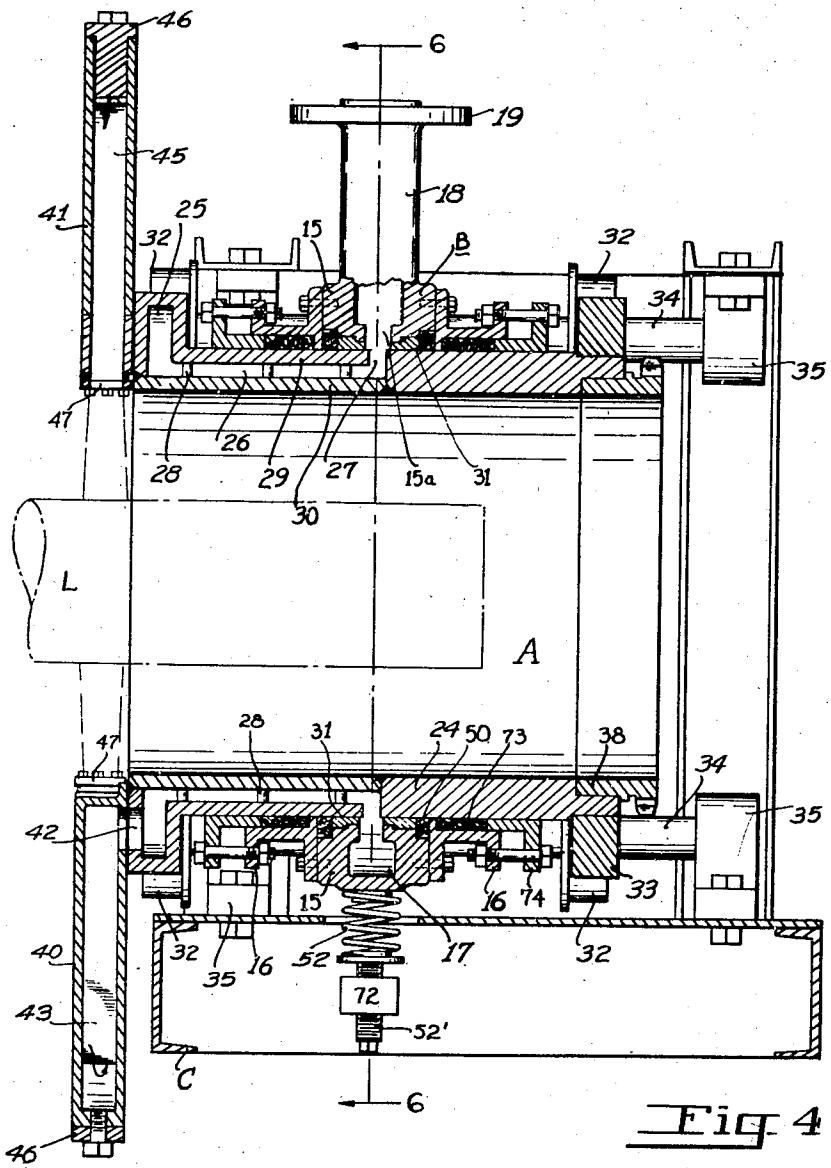


Fig. 4

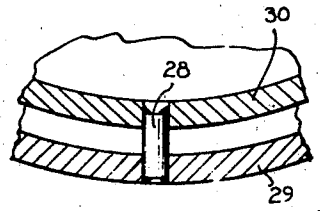


Fig. 5

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HYDRAULIC BARKER

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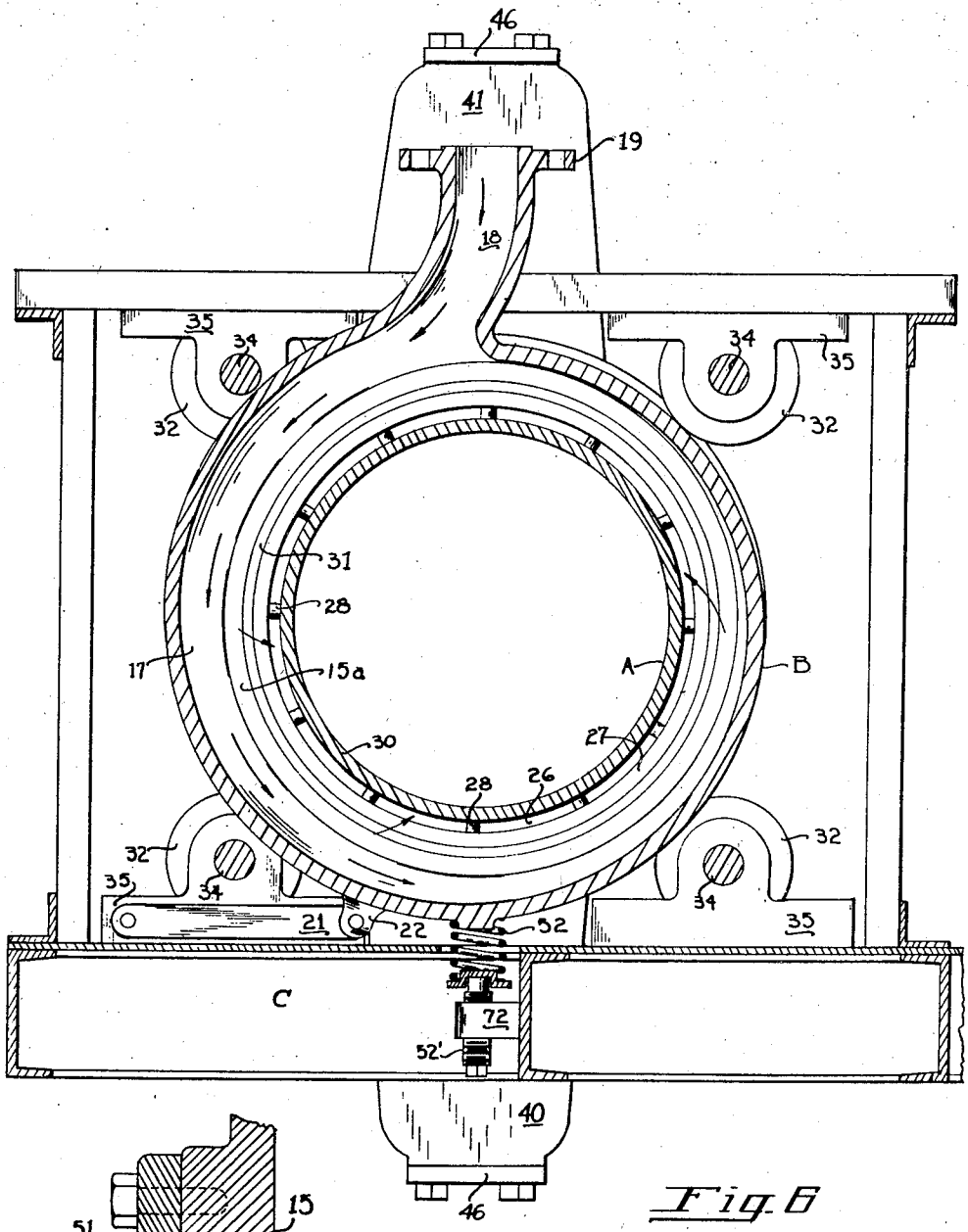


Fig. 6

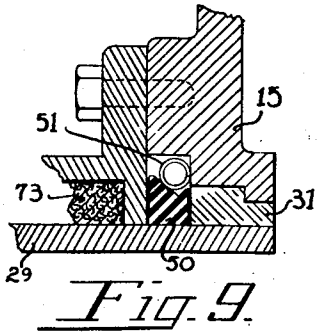


Fig. 9

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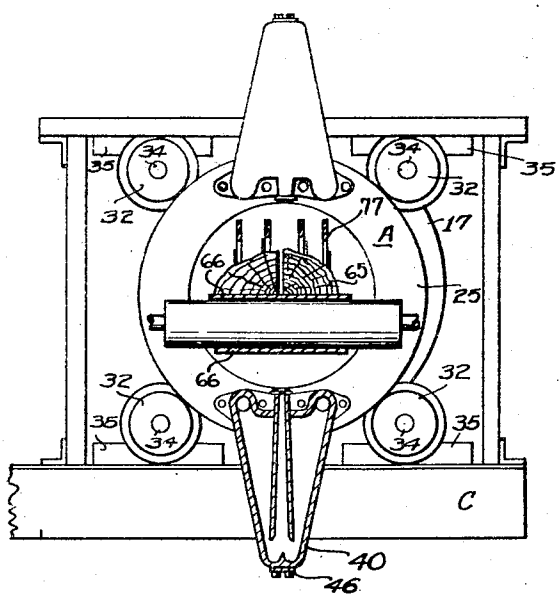


Fig. 7

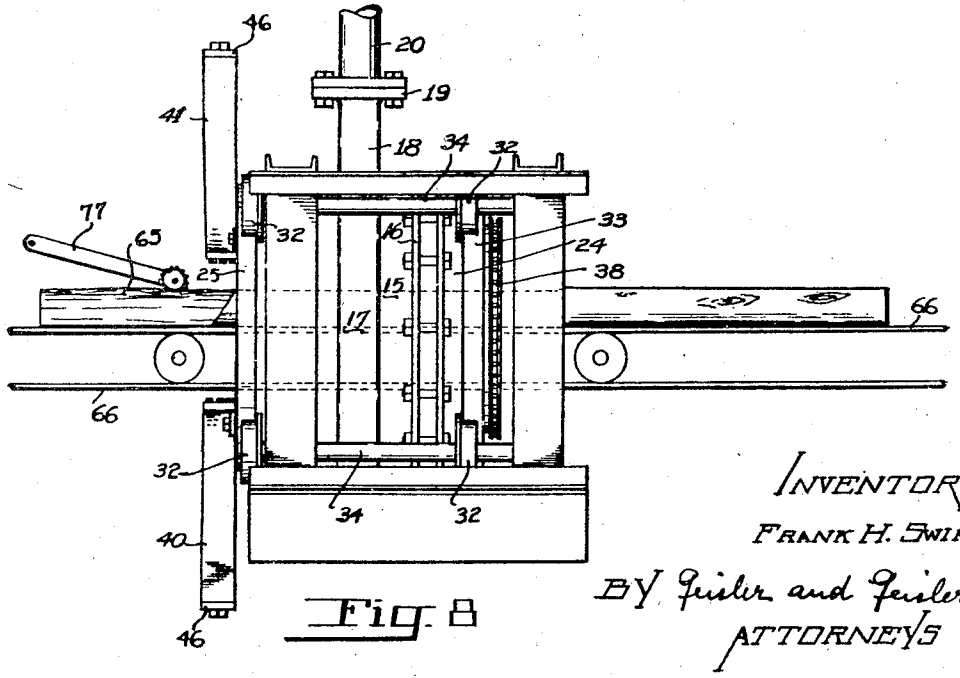


Fig. 8

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UNITED STATES PATENT OFFICE

2,422,757

HYDRAULIC BARKER

Frank H. Swift, Portland, Oreg.

Application January 17, 1944, Serial No. 518,629

2 Claims. (Cl. 144—208)

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This invention relates to means for removing bark from the surface of logs and from slabs of wood and the like. More specifically, this invention relates to hydraulic means for the removal of the bark.

Various devices for debarking logs have been tried out more or less successfully in which a hydraulic nozzle, projecting a powerful jet of water against the log surface, is used to splinter the bark and remove it from the log surface. These devices generally require rotation of the log during the debarking operation.

One of the objects of this invention is to provide an improved hydraulic barker in which no rotation of the log will be required and in which the log is merely moved longitudinally through the device while the bark is being removed.

Another object of this invention is to provide such a barker which can conveniently be used for logs of any length.

An additional object is to provide a log barker in conjunction with a continuous feed in order that logs may be debarked in continuous succession without necessitating the discontinuance of the operation of the barker prior to the loading or positioning of each log.

A further object is to provide a hydraulic barker in which a plurality of debarking nozzles can operate simultaneously, in place of the single hydraulic nozzle common to most hydraulic barkers.

These objects and other advantages I attain by providing a rotatable nozzle assembly, having an inner cylindrical passageway through which the log or slab to be debarked is moved endwise, and by otherwise constructing and arranging my hydraulic barker in the manner hereinafter described with reference to the accompanying drawings in which:

Fig. 1 is an end elevation of the assembled hydraulic barker showing the same mounted on an adjustable base, the view of the barker being taken from the end opposite to that at which the debarking nozzles are located:

Fig. 2 is a side or longitudinal elevation of the barker illustrating a simple means of transporting a log through the barker;

Fig. 3 is an end elevation of the barker, partly in section and drawn to a larger scale, showing the end at which the hydraulic nozzles are located:

Fig. 4 is a longitudinal sectional elevation corresponding to the line 4—4 of Fig. 3;

Fig. 5 is a fragmentary sectional end elevation of the fluid-carrying cylindrical shell, showing

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the manner in which the inner and outer walls are secured together in spaced position;

Fig. 6 is a transverse sectional elevation taken on the line 6—6 of Fig. 4;

Figs. 7 and 8 are end and side elevations respectively showing the manner in which the barker can be used with slabs or cants; and

Fig. 9 is an enlarged section of a packing gland ring as shown at the top and to the left in Fig. 4.

The rotating nozzle assembly, indicated in general by A in Figs. 1 to 4, is mounted for rotation within a stationary drum-type housing B (Fig. 4). The rotating assembly A includes a cylindrical body member 24, extending approximately half the axial length of the rotating assembly, and a thinner companion member 30, of the same internal diameter, rigidly secured to the inner end of the member 24 and in axial alinement with member 24, extending the other half of the length of the assembly. A ring sprocket 38 of the same internal diameter, is secured at the outer end of member 24.

The cylindrical member 30 constitutes the inner wall of an annular passageway 26 which terminates in an end peripheral chamber 25. The outer wall 29, of the passageway 26 and chamber 25, is rigidly secured to the inner wall 30 at its outer end, for example by welding. These outer and inner walls 29 and 30 are also rigidly secured together by rows of stay bolts or pins 28 (see also Fig. 5), and thus with the member 24 form a rigid assembly. The inner end of the outer wall 29 terminates a short distance from the member 24 leaving an inlet ring port 27 for the annular passageway 26 through which the water passes on its way to the end peripheral chamber 25.

A pair of nozzles 40 and 41 are secured to the end of the rotating assembly A (see Figs. 3 and 4), and a pair of ports 42 lead from the end peripheral chamber 25 to each of the nozzles. The nozzles are arranged with their mouths or discharging tips diametrically opposite and the construction and shape of the nozzles will be seen in Fig. 3. Each complete nozzle includes a pair of channels 43 extending outwardly, which direct the fluid radially outward from the inlet ports 42. These channels 43 meet at the end portion 44 which constitutes the entrance into the long tapered nozzle passageway 45 which terminates in the discharging tip or mouth of the nozzle. For convenience in facilitating the cleaning of the nozzle passageways a removable cap 46 is secured to the end portion 44. The long tapered passageway 45 is an important feature of the nozzle and

an important feature of my invention, for I have found that this straight tapered passageway eliminates the tendency for turbulence to be set up in the nozzle, which is a problem generally encountered in short hydraulic nozzles of various types in which such turbulence greatly reduces the effectiveness of the jet discharged from the nozzle mouth. The reason for forming the nozzle with the relatively long passageways **43** therefore is in order to make possible this long straight tapered passageway **45** leading to the nozzle mouth.

The nozzle mouth includes a plate **47** removably secured to the end of the straight passageway **45** by suitable bolts **48**. The plate **47** is formed either with a narrow slit **49** or, if preferred, with a central row of small holes having the same diameter as the slit **49**. In either case a narrow elongated jet is produced extending parallel to the axis of the log being debarked. This plate **47** is made removable so that it can easily be replaced when desired or when it becomes worn.

The entire rotating nozzle assembly A is supported on four flanged rollers **32** at each end. The rollers **32** are mounted on longitudinally-extending shafts **34** and the shafts are supported in blocks **35** at each end. The exterior periphery of the annular chamber **25** serves as a track mounted on the rollers at one end of the assembly and a corresponding ring track **33** is carried on the other end of the assembly. The blocks **35** are supported in a frame structure designated in general by C.

The stationary drum-type housing B is really supported on the rotating nozzle assembly A. The housing B comprises a main annular housing member **15** (Fig. 4) to which a flanged ring **16** is secured at each end. The housing B does not extend over the full length of the rotating assembly A but terminates a substantial distance from each end of the assembly A. The main housing member **15** is formed with an involute chamber **17** (see also Fig. 6) which has an inlet pipe **18** at the top. The inlet pipe has a flanged end **19** to which the fluid supply pipe **20** (Figs. 1 and 2) is connected. The involute chamber **17** is open on its inner periphery, as shown at **15a** in Fig. 4, thus permitting fluid to be delivered from the chamber **17** into the ring port **27**, and thence into the annular passageway **26** and peripheral chamber **25** of the nozzle assembly A. The housing B is held against rotation by a link **21** (Fig. 6), one end of which is connected to an ear **22** on the outside of the housing B and the other end of which is connected to the frame structure C. In order to relieve the rotating assembly A of some of the weight of the housing B and reduce the wear between the two, the housing B is partially supported on an adjustable compression spring **52** mounted on the head of a screw member **52'** which is in turn carried by a suitable lug **72** attached to the frame structure C.

A pair of ring bushings **31** (Figs. 4 and 9) are placed between the rotating assembly A and the main housing member **15** at the opposite sides of the inner periphery of the involute chamber **17**. In an annular space provided in the member **15**, adjacent each of the bushings **31**, a packing gland ring **50**, of micarta or other suitable material, formed in sections held in place by a coiled spring ring **51**, is placed. Further packing rings **73** are placed in the annular cavity provided in the flanged rings **16** and are held in place by locking rings **74** adjustably bolted to the flanged rings **16**, as shown in Fig. 4.

The nozzle carrying assembly A is rotated by any suitable means at the desired speed, for example by a motor **36** (Fig. 1), mounted on the base of the frame structure C, which drives the sprocket **37**, connected by a sprocket chain with the ring sprocket **38** carried at the end of the rotating assembly A.

The operation of my hydraulic barker is illustrated in Fig. 2. The log L is moved longitudinally through the barker by any suitable means, for example by the conveyor chains **75** and **76**. During its travel between the nozzles **40** and **41** of the rotating nozzle assembly A the jets from the nozzles splinter and remove the bark in the adjacent spiral paths. Of course the speed with which the conveyors move the log longitudinally and the speed with which the nozzle assembly is rotated should be properly regulated and synchronized by suitable means (not shown) so that the travel will not be too fast to enable all the bark to be removed but also will not be any slower than necessary in order that maximum efficiency will be obtained.

The conveyors **75** and **76** in Fig. 2 are shown spaced from each other longitudinally of the log. This is done in order that a conveyor will not be positioned beneath the log in the area contacted by the debarking jets from the nozzles. Since the debarking jets strike the log surface approximately at diametrically opposite points there will be little, if any, tendency for the log to be moved out of its line of longitudinal travel through the barker as a result of the force of the jets. However, if desired, the rollers **75'** and **76'**, over which the endless conveyors **75** and **76** pass, can be concaved so as to provide in effect a guiding trough or groove for the log; or concave weighted rollers (not shown) could be arranged to rest on top of the log so as to hold it steady during its axial movement.

The log in passing through the barker preferably should be as nearly concentric as possible with the rotating nozzle assembly A so that the nozzle tips will be approximately equidistant from the log surface while the nozzle assembly is rotated. In order to facilitate the centering of the logs of different diameters I mount the supporting frame structure C for the barker in such way that it is laterally and vertically adjustable, thus enabling the axis of the barker to be easily moved to coincide approximately with the axis of the log. This adjustable mounting for the frame structure C is shown in Fig. 1. At one side the base of the frame structure C is supported on hinged links **57** and at the opposite side it is supported by one or more hydraulic cylinders **59**. A horizontal hydraulic cylinder **61**, pivotally connected to a stationary bracket **62**, has its piston rod pivotally connected to the frame structure C as shown. These hydraulic cylinders are of the positive action type with fluid connections at both ends and are connected to suitable fluid actuating and control means (not shown). If preferred, however, the conveying means for the logs could be adjustably supported so as to center the log with respect to the barker, instead of having the barker adjustably mounted.

In Figs. 7 and 8 I show how my device can be used for removing the bark from slabs, cants, or quarter sections of logs. Since the bark is on only one side of the cants or slabs **65**, thus the top side as illustrated in Fig. 7, a continuous chain conveyor **66** extending through the barker can be used. This protects the bottom side of the slabs from the nozzle jets. For short slabs it may also

be desirable to provide pivotally mounted arms 77 to hold the slabs in place on the conveyor 66 while the bark is being removed from their top surface.

Although I have shown my barker equipped with two debarking nozzles it would be possible to use more nozzles—for example, three nozzles regularly spaced 120° apart on the end of the rotating assembly, provided sufficient water pressure is maintained—or my device could be used with only a single nozzle. However, for all practical purposes I consider the use of two nozzles diametrically opposed to each other to be preferable.

Various modifications could also be made in the structural details of the different parts of my barker without departing from the principle of my invention, for example, in the structure of the rotating assembly or of the stationary housing. Other ways of providing suitable bearing surfaces between the rotating assembly and the stationary housing, and in the packing or sealing rings for preventing any appreciable leakage of water between the rotating assembly and stationary housing, might be suggested, and it is not my intention to limit my invention specifically to the details of construction as shown in the drawings.

I claim:

1. In a hydraulic barker of the character described, a supporting frame, a rotating nozzle assembly, means mounted on said frame rotatably supporting said assembly and means for rotating said assembly, a debarking nozzle carried by said assembly, a central open space extending through said assembly, means for moving a log endwise through said open space, an annular stationary housing concentric with said rotating assembly, located between the longitudinal ends of said assembly and partially supported by said assembly, a ring port in said housing connecting with said assembly, means for delivering water under pressure into said housing and thence into said assembly, and a spring on said supporting frame connected to said housing and acting to reduce the weight of said housing on said assembly.

2. A hydraulic barker of the character described including a supporting frame, a rotating nozzle assembly, means mounted on said frame rotatably supporting said assembly and means for rotating said assembly, said assembly having an inner and an outer shell, an annular chamber between said inner and outer shells, an enlarged annular chamber at one end of said assembly connected with said first mentioned chamber, a debarking nozzle mounted on said assembly adjacent said enlarged annular chamber and connected thereto, a central open space extending through said assembly, means for moving a log endwise through said open space, an annular stationary housing extending around said assembly and supported by said assembly, said housing and said first mentioned annular chamber having ring ports registering with each other, and means for delivering water under pressure into said housing and thence into said assembly chambers.

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