March 20, 1956 J. T. LATIMER 2,738,814

HYDRAULIC SLAB DEBARKER

Filed Oct. 20, 1954 3 Sheets-Sheet 1

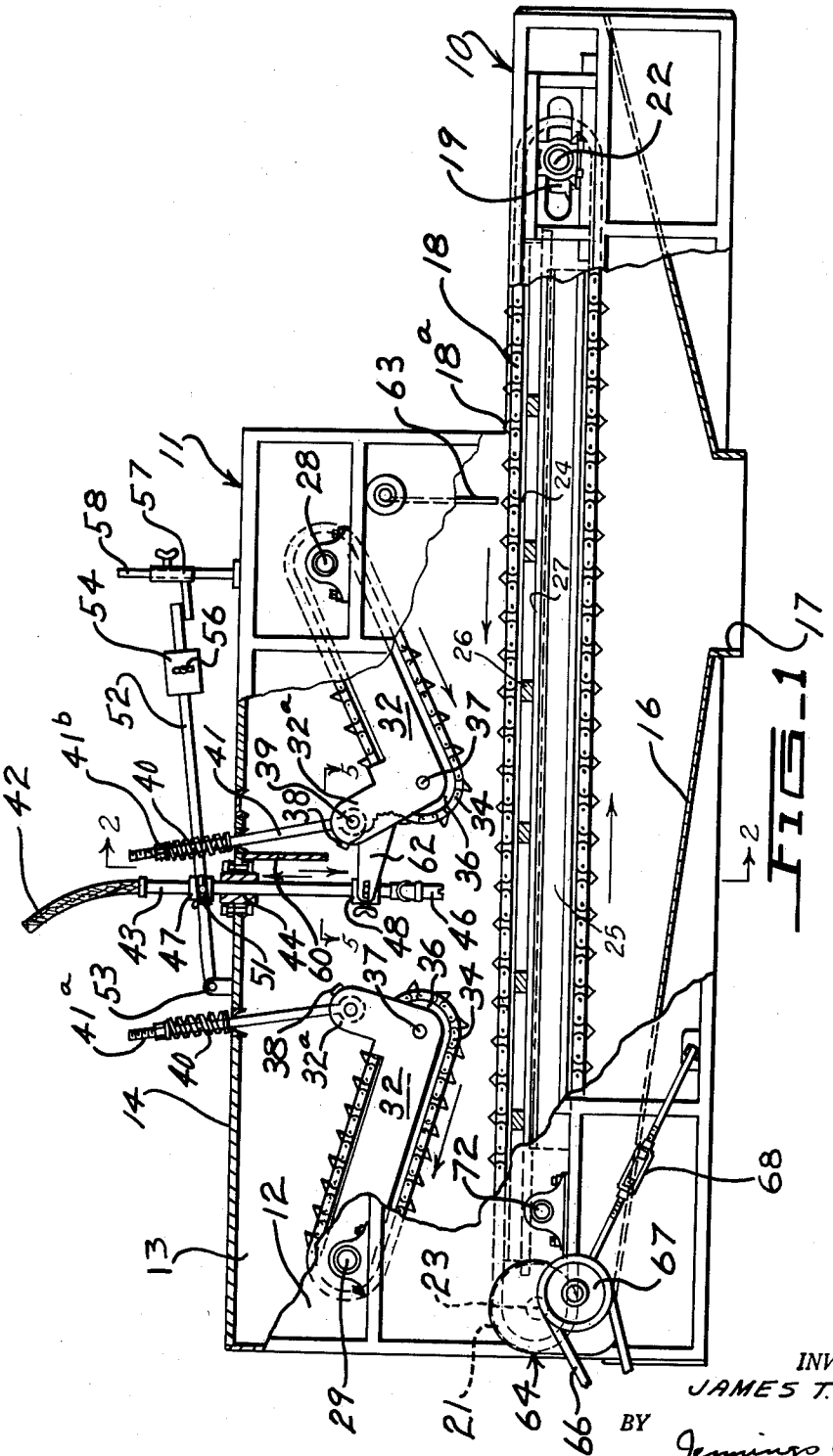


FIG. 1

INVENTOR.
JAMES T. LATIMER
BY Jennings & Carter
ATTORNEYS

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HYDRAULIC SLAB DEBARKER

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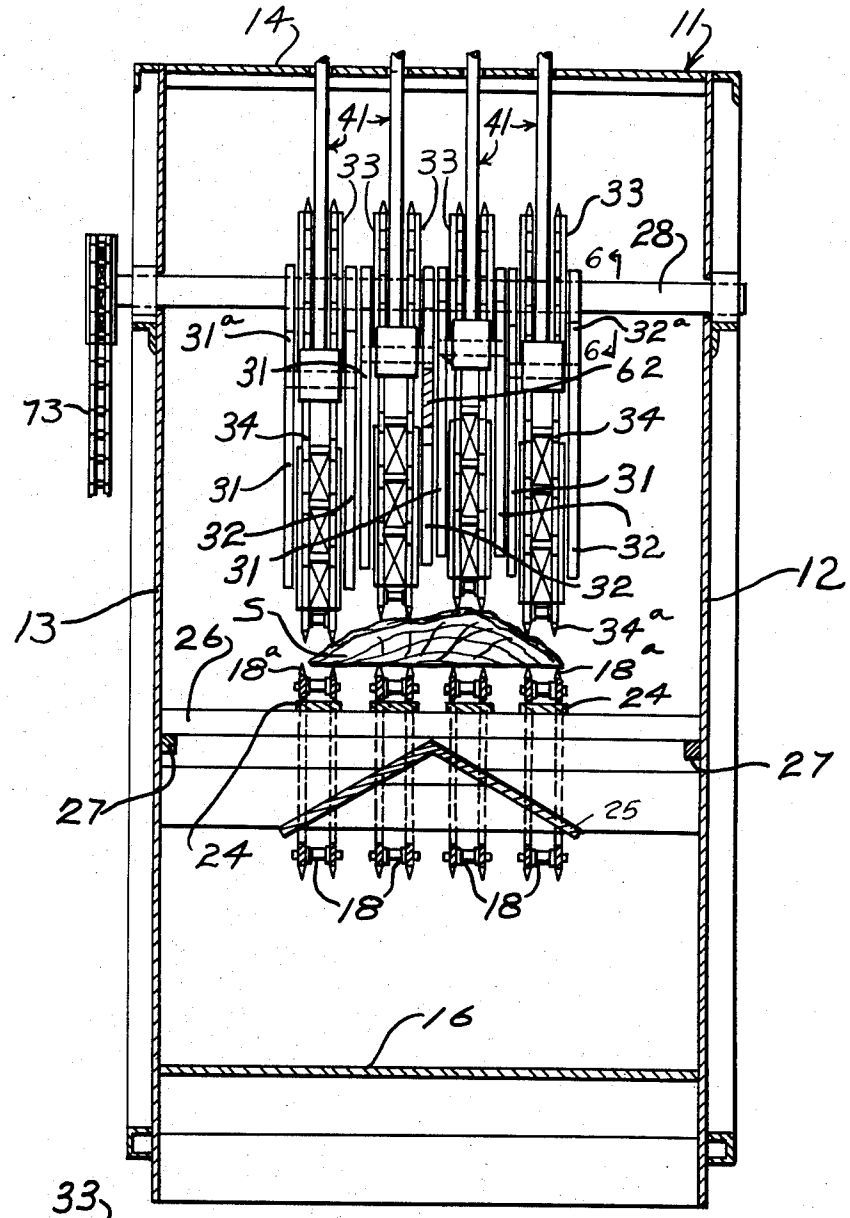


FIG_2

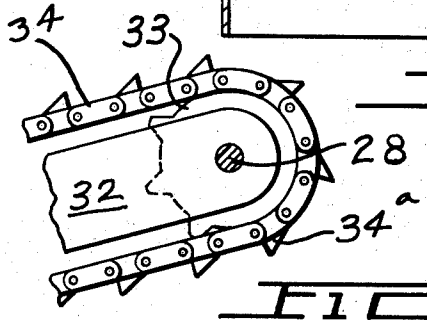


FIG_6

INVENTOR.
JAMES T. LATIMER
BY Jennings & Carter
ATTORNEYS

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HYDRAULIC SLAB DEBARKER

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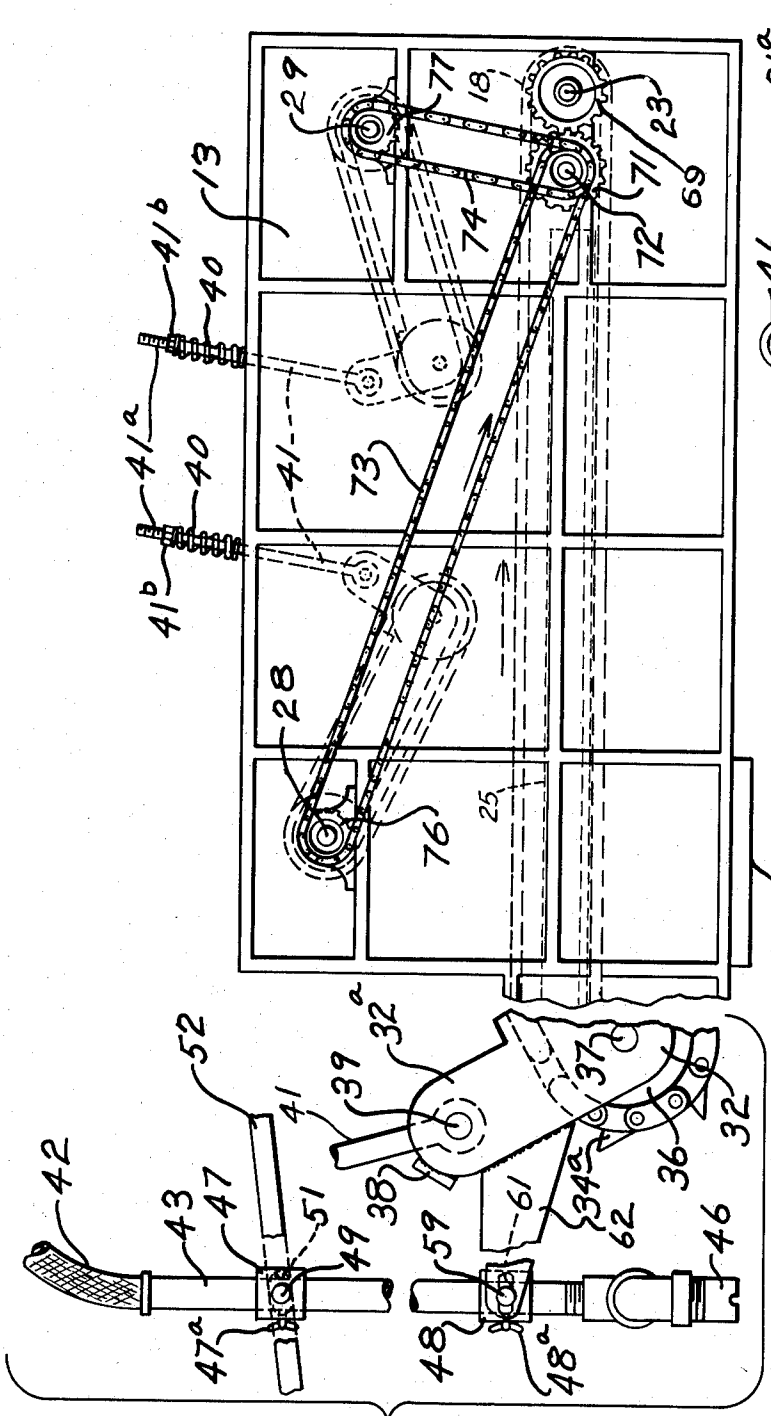


FIG. 3

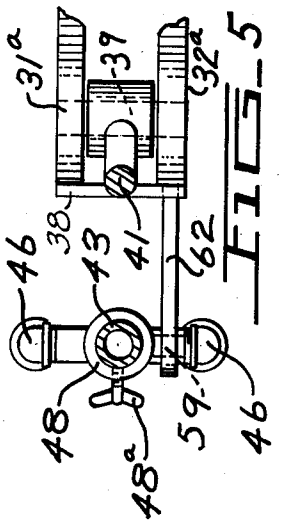


FIG. 5

FIG. 4

INVENTOR.
JAMES T. LATIMER
BY Jennings & Carter
ATTORNEYS

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2,738,814

HYDRAULIC SLAB DEBARKER

James T. Latimer, Birmingham, Ala., assignor to Jackson Industries, Inc., a corporation of Alabama

Application October 20, 1954, Serial No. 463,422

4 Claims. (Cl. 144—208)

My invention relates to an apparatus for removing bark from sawmill slabs and the like.

An object of my invention is to provide an apparatus for removing the bark from slabs and the like by subjecting the bark-carrying slab to the action of a high-velocity stream or streams of water, together with means to hold the slab and positively to propel the same along while under the water stream.

A more specific object is to provide an apparatus of the character designated in which the slabs to be barked are conveyed along on a horizontal conveyor, there being forward and rear sets of positively driven chains disposed to contact the upper surface of the slab and hold it down while the slab is under the debarking stream, thus providing a positive means for holding the slab on the conveyor and for withdrawing it from the low-pressure area surrounding the high-velocity water streams.

Another object is to provide an apparatus embodying the foregoing features and in which the water nozzle is mounted for vertical movement in accordance with the thickness of the slab being debarked, thus maintaining the nozzle at the optimum distance from the slab, and increasing the debarking efficiency of the stream.

A further object is to provide a vertically movable water nozzle of the character designated which shall be adjustably mounted and in which the reaction of the high-pressure water issuing from the nozzle is counteracted by suitable means such as a weight operatively connected to the nozzle-supply pipe.

Briefly, my invention contemplates a debarking apparatus in which the slabs are placed on a horizontal conveyor such as sets of laterally spaced chains with suitable attachments thereon. The slabs pass into a substantially closed housing and come first under a series of vertically and independently movable positively driven chain hold-down units. The hold-down units are mounted for pivotal movement about the shaft that carries the sprockets for driving the chains thereof and the same slope downwardly toward the slab whereby the slab actually is engaged by the chain immediately under the sprockets carried in the free ends of the hold-down units. The high-pressure water nozzle is mounted for vertical sliding movement in the frame. I operatively connect the same to one of the hold-down units whereby the end of the nozzle always stops at substantially the same distance from the surface of the slab to be operated upon. Thus, the nozzle automatically is fixed at the optimum distance in accordance with the thickness of the slab being operated upon. I further provide means for adjusting the distance of the nozzle from the slab and provide a counterweight for holding the nozzle down against the tendency to rise as a high-speed water is discharged therefrom. As will be understood, after the end of a slab is ready to pass from beneath the water streams, there is a tendency for the same to be held back due to the low pressure immediately surrounding the high-velocity streams of water. My improved apparatus thus contemplates that the slab will be engaged between the hold-down units and the conveyor prior to the end coming from beneath the water jet whereby the same is positively pulled from the lower pressure area, thus assuring discharge of the slab from the apparatus.

Apparatus illustrating the features of my invention is shown in the accompanying drawings in which:

Fig. 1 is a side elevation of my improved apparatus with certain parts broken away and in section and showing the hold-down units raised for the accommodation of relatively thick slabs;

Fig. 2 is an enlarged detail sectional view taken generally along line 2—2 of Fig. 1 and with certain parts omitted for the sake of clarity and showing the apparatus operating upon a slab;

Fig. 3 is a fragmental side elevation looking at the opposite side of the apparatus from that shown in Fig. 1;

Fig. 4 is an enlarged, detail fragmental view showing the vertically movable water nozzle and an end of the hold-down unit which controls the vertical movement of the same;

Fig. 5 is an enlarged detail sectional view taken generally along line 5—5 of Fig. 1, and,

Fig. 6 is an enlarged detail sectional view taken generally along line 6—6 of Fig. 2.

Referring now to the drawings for a better understanding of my invention I show the same as embodying a sheet metal housing having an infeed section indicated generally at **10** and a debarking section indicated generally at **11**. The section **11** is closed along its sides by plates **12** and **13** and also has a top plate **14**. The bottom of the housing may be inclined and hopper-like as shown at **16** and there may be a water and bark outlet **17** therein.

The slabs or the like to be debarked are fed into the section **10** onto the upper flights of a plurality of horizontal chains **18** which together form a conveyor. The chains may have suitable attachments **18***a* thereon for engaging the slabs. The chains are supported on front sprockets **19** and rear sprockets **21** which are mounted respectively on shafts **22** and **23**. The upper flight of the chains **18** may be supported on horizontal bars **24** mounted on cross members **26** which in turn are supported from horizontal members **27** secured to the inside of the side walls **12** and **13**. The shaft **23** is driven as will be later explained. Disposed over the lower flight of the conveyor **18** is a bark-deflecting shield **25** of substantially inverted V-shape, as shown in Fig. 2.

The positively driven hold-down units will now be explained and in view of the fact that they are substantially identical, a description of one set of the hold-down units will suffice for both. The units are pivoted on shafts **28** and **29** which are mounted for rotation in suitable bearings carried on the side of the housing. Each hold-down unit comprises side plates **31** and **32** pivoted near their upper ends about the shafts **28** and **29**. Between each set of side plates, fast on the shaft **28** or **29** as the case may be are sprockets **33**. Chains **34** are trained over the sprockets **33** and over sprockets **36** mounted for rotation on pins **37** passing between the pairs of plates **31** and **32** near the free or lower ends thereof. The plates are provided at their lower ends with upwardly extending portions **31***a* and **32***a* which may be cross braced by members **38**. The chains may have suitable attachments **34***a* thereon for engaging the slab as indicated by the letter S.

Spanning the upper end of the extensions **31***a* and **32***a* is a pin **39**. Pivotally mounted on the pin **39** is the lower end of an elongated rod **41** which projects through the top plate **14** and which is threaded as indicated at **41***a* near its upper end. A compression spring **40** surrounds the rod **41** and a nut **41***b* serves to adjust the initial gap between the lower end of the hold-down unit and the horizontal flight of the chain **18**. The spring **40** thus

serves to cushion the downward movement of the unit when the slab runs out from under the same.

From what has been said it will be apparent that each of the hold-down units comprising a set of the plates **31** and **32** and the chain **34** is capable of independent upward movement as illustrated in Fig. 2 of the drawings, whereby attachments **34***a* engage the slab at several places across its width as shown.

High-pressure water may be supplied to the apparatus through a flexible hose **42** under a pressure of around 800 pounds per square inch. The hose **42** connects to the upper end of a vertically disposed supply pipe **43**. The supply pipe **43** is mounted for vertical reciprocation in a bearing **44** carried by the top plate **14** of the housing. As shown in the drawing, at least two nozzles **46** are mounted on a transversely extending manifold which communicates with the lower end of the supply pipe **43** whereby thin, cone-shaped streams of water under the high pressure mentioned strike the slab and remove the bark therefrom in the manner understood for such nozzles.

In order to obtain adjustment of the nozzles and to cause the same to move up and down and thereby remain substantially at a fixed distance from the surface of slabs of different thicknesses, I may provide on the supply pipe **43** an upper collar **47** and a lower collar **48**. The collars **47** and **48** may be adjusted longitudinally of the pipe **43** and held in adjusted position by means of set screws **47***a* and **48***a*, respectively.

Projecting outwardly from the side of the collar **47** is a pin **49**. The pin **49** fits in an elongated slot **51** formed in an arm **52**. The arm **52** is pivoted at **53** to a bracket on the plate **14** and carries a slidable weight **54** on its opposite end. The weight may be held in adjusted position on the arm **52** by means of a set screw **56**. Also, the downward limit of the free end of the arm may be limited by means of an adjustable stop **57** which is slidable on a member **58** mounted on top of the apparatus.

The lower collar **48** carries a pin **59**. Pin **59** fits slidably in an elongated slot **61** formed in the outer end of a bracket **62**. The bracket **62** may be welded to the upstanding portion **32***a* of the side plate **32** of one of the intermediate hold-down units.

I may provide baffle plates **60** and a swing baffle plate **63** at the places indicated.

The apparatus is driven through a gear reduction unit **64** having its output shaft directly attached to the shaft **23**. Power is supplied to the unit **64** from any suitable prime mover, not shown, through a belt **66** to a pulley **67**. A turnbuckle belt tightening arrangement **68** may be provided.

As shown in Fig. 3 shaft **23** carries a gear **69** on the end opposite the gear-reduction unit. Gear **69** meshes with gear **71** mounted on a jack shaft **72** which for the purpose of strength and rigidity spans the width of the apparatus. Shaft **72** carries suitable sprockets over which are trained chains **73** and **74**. Chain **73** passes over a sprocket **76** fast on the shaft **28**, while chain **74** passes over a sprocket **77** fast on the shaft **29**.

From the foregoing the method of constructing and using my improved apparatus will now be readily understood. By adjustment of the nuts **41***b* on the several rods **41**, and by adjusting the position of the collars **47**, **48** and the stop **57**, the initial gaps between the lower ends of the nozzles and hold-down units and the top of chain **18** may be obtained. Likewise, the amount of force required to hold the nozzle supply pipe **43** down may be determined by the positioning of weight **54** on the arm **52**. With the apparatus adjusted so that the chains **34**, at their lower ends beneath the sprockets **36** contact the upper surface of the thinnest slabs to be debarked, the slabs are fed onto the infeed section **10**, on top of the chain **18**. As soon as the slab comes beneath the sprocket **36** the several hold-down units position themselves vertically to the thickness of the slab accordingly and as shown in Fig. 2. The slab thus is adequately held

down while the high-pressure water from the nozzles **46** strikes the bark and removes it. The nozzles **46** are maintained at the optimum distance from the bark being engaged by the movement of the hold-down unit carrying the bracket **62**, whereby the most efficient debarking is obtained.

By positively driving the hold-down units through the shafts **28** and **29**, I provide an apparatus in which the slabs not only are held down while the streams of water are removing the bark but in which the slab may be withdrawn from the low-pressure area surrounding the water jets. As is known, when water is moving at the high velocity necessary to remove bark, there exists around the stream or streams an area of very low pressure. I have found that slabs, being relatively light, tend to slide on the conveying chains **18** due to being held back after the rear ends of the slabs pass immediately from beneath the water jet. In my improved apparatus the chains **34** all are driven, and since the chains of the hold-down units accommodate themselves to the thickness of the slab at the particular point of engagement, I withdraw the slabs without such slipping.

From the foregoing it will be apparent that I have devised an improved apparatus for debarking slabs. It will be understood that the chains **34** all are driven at substantially the same rate as the conveyor chains **18**. Further, it will be seen that the pivotally mounted hold-down units are held down by gravity so that the slabs are subjected to the debarking water streams while being held down by either the front or forward group of hold-down units. Also, the lower ends of the hold-down units preferably are close enough to each other so that the rearmost units will engage the normal length slab before such slab runs from beneath the forwardmost units. In actual practice my apparatus has proved satisfactory in every way.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In apparatus for debarking slabs and the like, a horizontal conveyor on which slabs are placed bark side up, a plurality of downwardly sloping driven hold-down chains disposed for the lower ends thereof to contact the upper surface of a slab as it moves along on the conveyor, frame and sprocket means supporting the chains for independent vertical movement, a debarking nozzle near the lower ends of the chains, and a second group of similar hold-down chains mounted in frames with the lower ends thereof located on the side of the nozzle opposite the first named chains, said second named chains being close enough to the nozzle to engage a slab while the same is under the nozzle.

2. In apparatus for debarking slabs and the like, a horizontal conveyor on which slabs are placed bark side up, a driven shaft spaced above the conveyor and extending across the same, a plurality of sprockets fast on the shaft and spaced from each other, pairs of elongated frames pivotally supported on the shaft and with one of said sprockets therebetween, a sprocket journaled between each pair of said frames near the free ends thereof, chains trained over the sprockets between each pair of frames, attachments on said chains disposed to engage a slab on the conveyor, means limiting the movement of the free lower ends of said pairs of frames toward the conveyor, a high-velocity-water discharge nozzle near the free ends of said pairs of frames disposed to direct a debarking stream onto a slab, and means operatively connecting the nozzle to one of said pairs of frames whereby the nozzle raises and lowers with the pair of frames to which it is connected.

3. In apparatus for debarking slabs and the like, a horizontal conveyor on which the slabs are fed, a first group of slab hold-down units each comprising a pair of laterally spaced elongated frames, a sprocket journaled between the frames near one end thereof, a drive shaft above the horizontal conveyor, a sprocket fast on the shaft, means pivotally mounting the opposite end of the elongated frames on the shaft and on either side of the sprocket, a chain passing over the sprockets and engageable with a slab that moves along on the conveyor, a second group of hold-down units substantially duplicating the structure of the first group, a second driven shaft on which the second hold-down units are pivotally supported, means associated with the ends of said units remote from the driven sprockets limiting movement of said remote ends toward the conveyor, a debarking nozzle between the groups of hold-down units, and means to deliver a stream of debarking fluid to the nozzle.

4. Apparatus as defined in claim 3 in which the means limiting the movement of the remote ends of the units

toward the conveyor comprises a cover plate over said units and forming part of a housing for the apparatus, a rod on the free end of each unit projecting upwardly through said plate, threaded upper ends on said rods, springs surrounding the rods, lower ends of said springs resting on top of said plate, and nuts on the upper threaded ends of said rods engaging upper ends of said springs.

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