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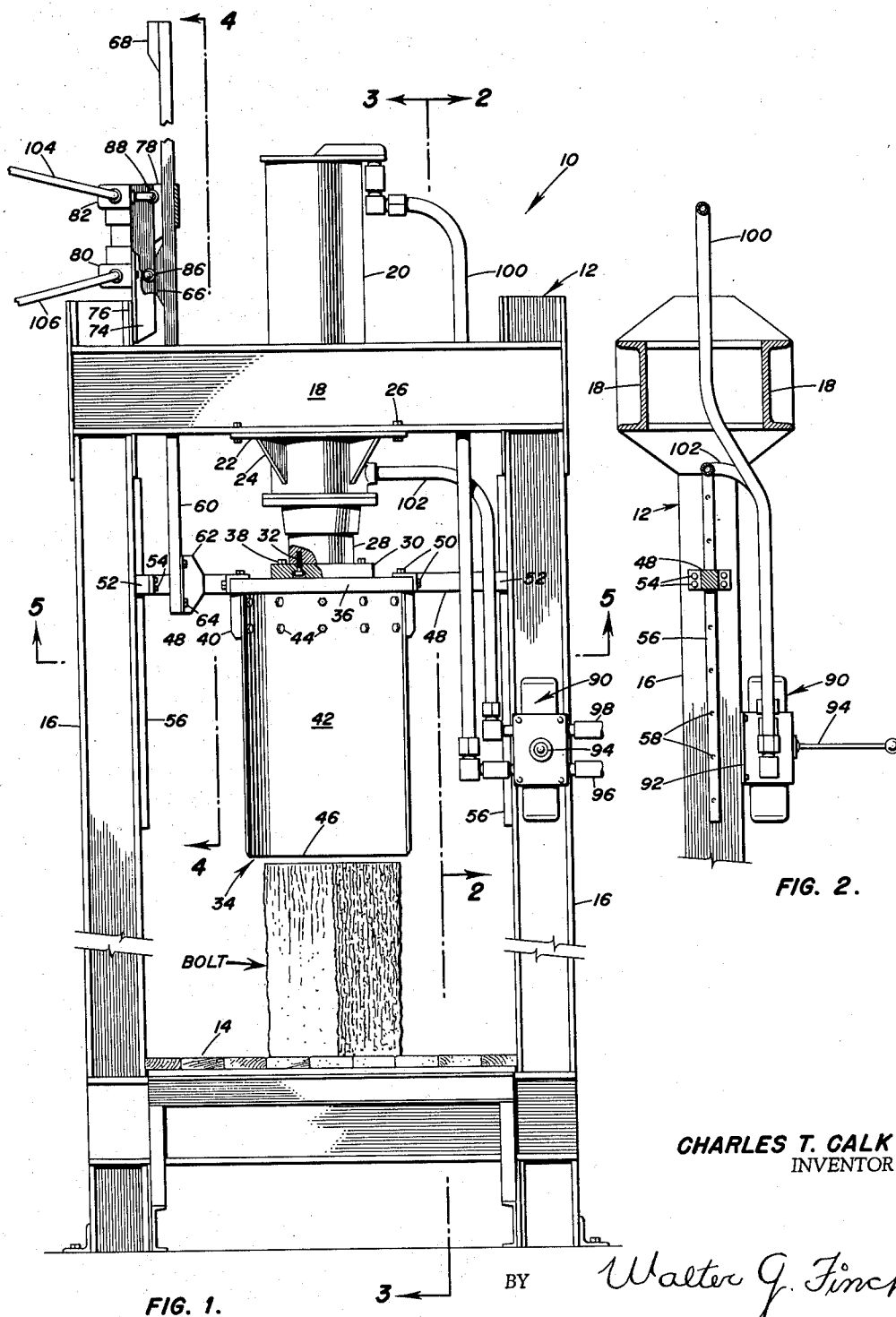
C. T. CALK

3,097,676

DEVICE FOR DEBARKING STAVE AND HEAD BOLTS

Filed July 6, 1960

3 Sheets-Sheet 1



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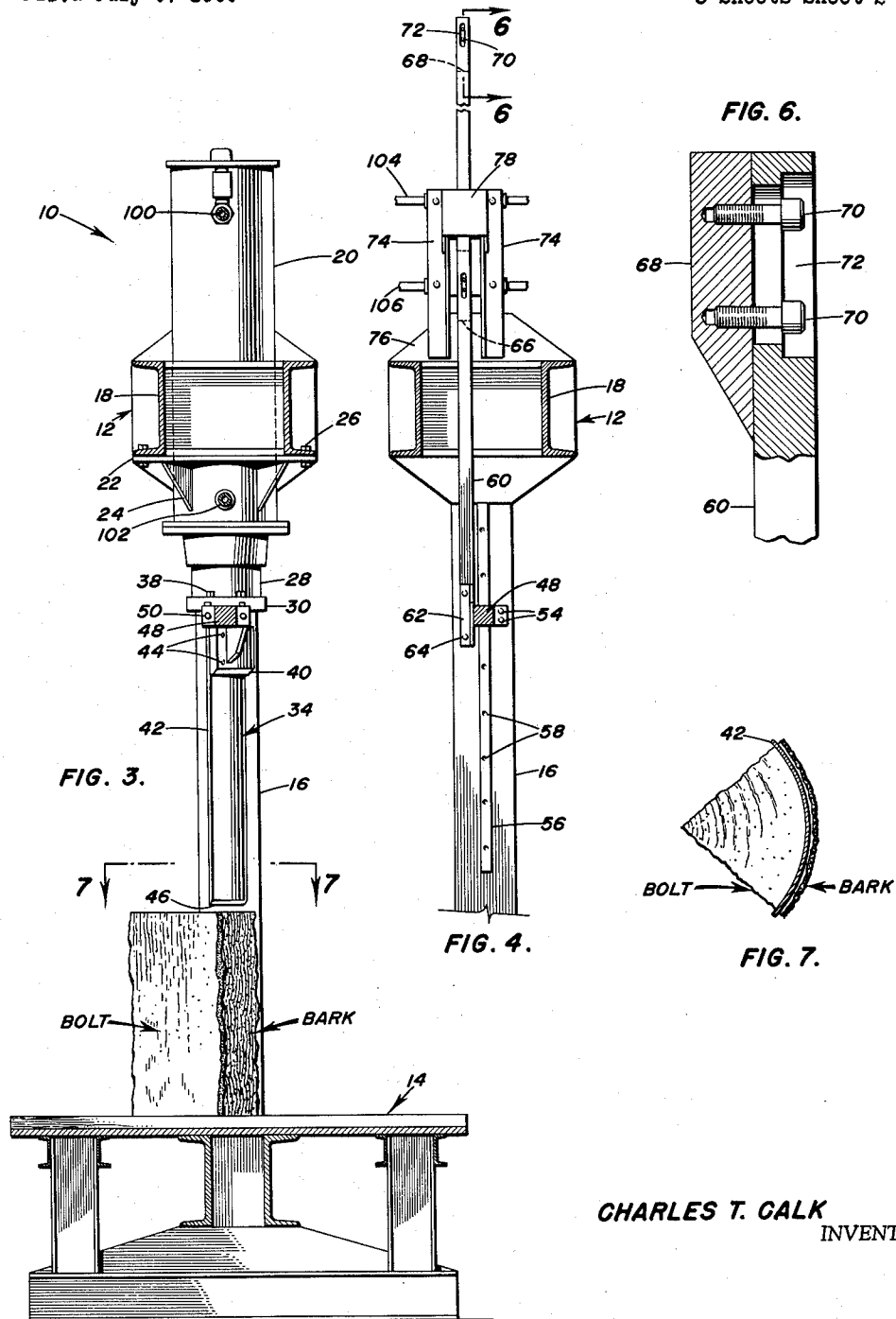
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DEVICE FOR DEBARKING STAVE AND HEAD BOLTS

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FIG. 5.

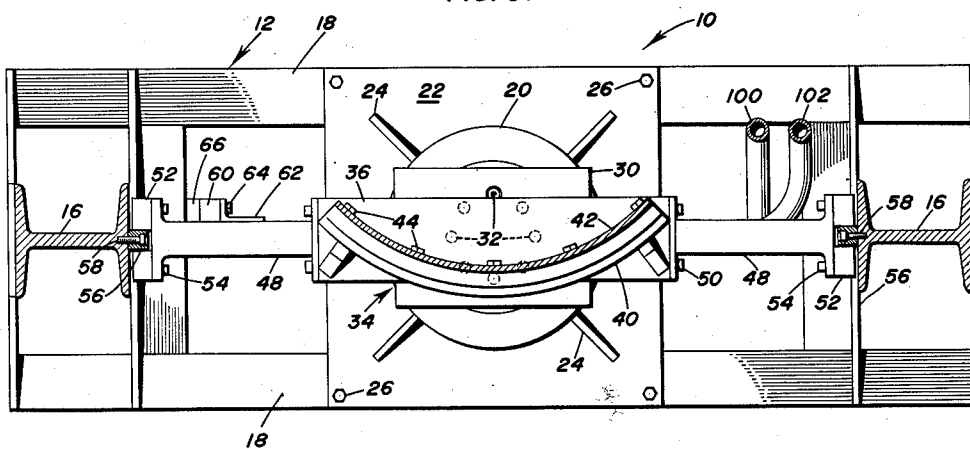
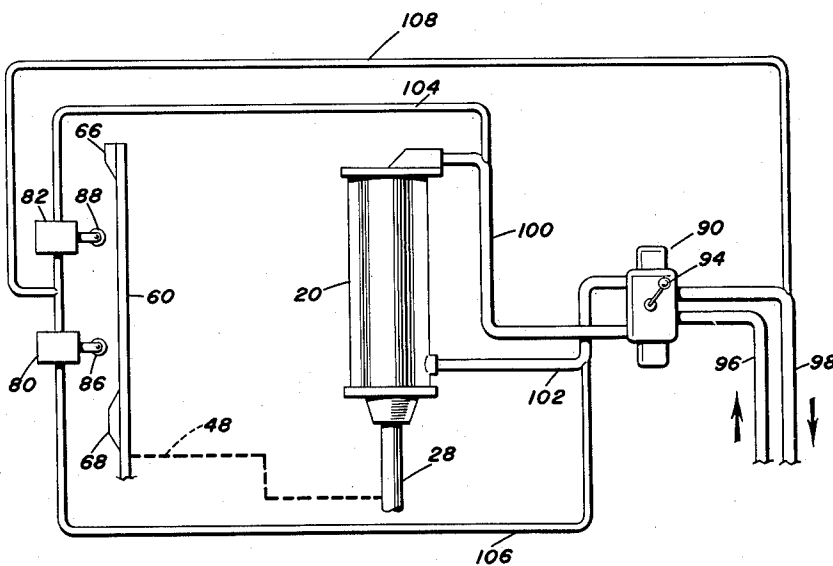


FIG. 8.

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DEVICE FOR DEBARKING STAVE AND HEAD BOLTS

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3 Claims. (Cl. 144—208)

This invention relates generally to power driven shears, and specifically to a hydraulically actuated device for debarking stave and head bolts.

In the cooperage, or barrel and keg manufacturing industry, oaken logs are sawn into short standard lengths and then split into quarters. These quarters are commonly known as bolts. The bark must then be removed before sawing the bolts into staves and head boards. Because the logs are dragged considerable distances over the ground their bark becomes packed with small stones and abrasive dirt both of which are extremely destructive to sawing machinery of the cooperage mills.

It has been determined that no more than three bolts, from which the bark has not been removed, can be cut into staves before it becomes necessary to shut-down in order to resharpen the saws. Consequently, it is imperative to remove the bark from the bolts, and in many cooperage mills this operation is performed manually. This particular task is expensive and time consuming and greatly limits the output of the cooperage mills.

It is, therefore, a primary object of the present invention to provide a comparatively inexpensive and simple machine which will very rapidly and effectively remove bark from bolts.

Another object of this invention is to provide a unique stave and head bolt debarking machine which is economical to manufacture, efficient and reliable in operational use, and which is easy to assemble and disassemble for maintenance and care.

These and other objects and advantages of this invention will become more readily apparent from the following specification and accompanying drawings wherein:

FIG. 1 is a front elevation of the stave and head bolt debarking machine incorporating features of this invention;

FIG. 2 is a fragmentary vertical cross-section taken along line 2—2 of FIG. 1;

FIG. 3 is a full vertical cross-section taken along line 3—3 of FIG. 1;

FIG. 4 is a fragmentary vertical cross-section taken along line 4—4 of FIG. 1;

FIG. 5 is a horizontal cross-section taken along line 5—5 of FIG. 1;

FIG. 6 (sheet 2) is a fragmentary detail cross-section taken along line 6—6 of FIG. 4;

FIG. 7 is a fragmentary section taken along line 7—7 of FIG. 3 in order to more fully illustrate the appearance of the bolts which are prepared for sawing by the stave and head bolt debarking machine; and

FIG. 8 is a schematic diagram of the hydraulic system of the stave and head bolt debarking machine of the present invention.

Referring now to FIG. 1 of the drawings, there is shown a stave and head bolt debarking machine 10 which comprises basically a structural supporting frame 12, a bolt supporting table 14, and an hydraulic cylinder 20 which supports and drives a blade assembly 34.

As best illustrated in FIGS. 1 and 3, a pair of vertical columns 16 are spanned at their upper ends by a pair of spaced channel shaped cross-members 18. The hydraulic cylinder 20 is suspended from the lower flanges of cross-members 18 by bolts 26, and a plate 22 which is welded to the cylinder 20 and further secured by gussets 24.

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A heavy rectangular flange plate 30 is secured to the lower surface of a piston 28 of the cylinder 20 by a circle of recessed cap screws 32.

The blade assembly 34, which is suspended from plate 30 by bolts 38, consists of a heavy gauge elongated rectangular plate 36 to which is welded an arcuate blade mounting plate 40. A curved blade 42, which has its lower end 46 ground to a knife edge is fastened to plate 40 by a plurality of bolts 44.

The curvature of blade 42 corresponds approximately to what has been found to be the average radius of the bolts passing through a cooperage mill, thus insuring that the bark will be sheared away from the majority of bolts with but a single pass of the blade, thereby reducing material and time loss to a minimum.

In order to prevent rotation of the blade assembly 34 during a shearing operation of a bolt, each of a pair of vertical guide rails 56 is secured, by a plurality of recessed cap screws 58, to the inner surface of columns 16. A pair of laterally extending guide arms 48 are fastened, by bolts 50 (FIG. 3) to the ends of plate 36.

The outer ends of arms 48 are arranged to secure, by means of cap screws 54 (FIG. 2), a pair of bronze guide blocks 52, one on each side of rail 56.

The left hand guide arm, as viewed in FIG. 1, carries a bracket 62 which supports a cam rod 60 by means of bolts 64. The rod 60 carries a pair of cam blocks 66 and 68 whose spacing corresponds to the stroke of piston 28. Their function will be described subsequently. As can best be noted in FIGS. 1 and 6, cam blocks 66 and 68 are adjustably maintained on rod 60 by cap screws 70 whose heads are received by a shouldered or stepped slot 72.

As will be noted in FIGS. 1 and 4, a pair of angle iron legs 74 are welded to a structural gusset 76, the purpose of the legs 74 being to support bypass valves 80 and 82 whose function will be described subsequently along with cam blocks 66 and 68.

Finally, a manually operated control valve 90 is bolted to a mounting plate 92 which is welded to the right hand column 16, as viewed in FIG. 1.

The sequence of operation of the stave and head bolt debarking machine 10 will now be described. A bolt is delivered to the table 14 by means of a conveyor (not shown) and it is aligned under the blade 42 by one of a pair of operators. A second operator then moves a control handle 94 downwardly thereby permitting valve 90 to pass hydraulic fluid from a supply line 96 to a line 100 connected to cylinder 20. The hydraulic fluid pressure in the cylinder 20 causes the piston 28 to be driven downwardly, thereby causing blade 42 to shear away the bark from the bolt.

The fluid in the lower portion of cylinder 20 is expelled through a line 102 and the valve 90 to a return line 98. As the piston 28 continues downwardly in the cylinder 20, the rod 60 is also carried downwardly therewith and as the piston 28 approaches the end of its stroke, cam block 66 engages a plunger 88 to open the bypass valve 82. The fluid from line 100 will now be divided to return line 98 through a bypass line 104, valve 82, and line 108, and the travel of the piston 28 in the cylinder 20 will cease.

The operator will now move the control handle 94 upwardly to cause the fluid from the supply line 96 to be fed through valve 90 and line 102 to cylinder 20, thus driving the piston 28 upwardly. Fluid in the upper portion of cylinder 20 will be expelled through line 100 and the valve 90 to the return line 98.

As the piston 28 moves upwardly in the cylinder 20, the rod 60 is carried upwardly and as the piston 28 nears the end of its upstroke, cam block 68 engages a plunger 86 to open the bypass valve 80. The fluid from the line

102 will now be diverted to the return line 98 through a bypass line 106, valve 80, and line 108. It should be noted that as block 66 or 68 engages plunger 86 or 88, respectively, rod 60 is prevented from being deflected away by means of a guide channel member 78 whose sides are welded to the legs 74.

Obviously, many variations and modifications of the present invention are possible in light of the above teachings. It is, therefore, to be understood that within the scope of the appended claims the invention may be practiced otherwise than as specifically described.

What is claimed is:

1. A stave and head bolt debarking machine, comprising, a structural supporting frame having a pair of spaced vertically extending guide tracks, a carriage mounted for reciprocating movement in said guide tracks, a hydraulic cylinder secured vertically at and between the upper ends of said guide tracks and having a piston connected to said carriage for driving and retracting said carriage along said guide tracks, a support positioned at the lower ends of said guide tracks for supporting and positioning a bolt to be debarked, blade means secured to said carriage and spaced above said support for debarking said bolt upon downward movement of said carriage, said blade means including a blade which is arcuately shaped in its horizontal plane and has a cutting edge of corresponding curvature facing said support, and fluid circuit means for controlling the operation of said machine, said circuit means including a source of fluid pressure, a fluid supply control circuit having a first fluid line connected to one end of said cylinder, a second fluid line connected to the other end of said cylinder, and valve means for controlling the direction of fluid flow through said lines, said first and second fluid lines thereby serving alternately to supply and receive, respectively, fluid from said cylinder, and a bypass circuit including bypass means situated remotely with respect to said valve means, said by-pass means being responsive to pre-determined stroke positions of said carriage, a fluid by-pass line connected from said first fluid line and said second fluid line to said by-pass means, and fluid passage means from said by-pass means to said source of fluid pressure, whereby upon actuation of said by-pass means by said carriage, fluid is diverted from said cylinder to said by-pass circuit thus causing the movement of said piston to halt.

2. The debarking machine of claim 1, wherein said carriage includes a horizontally positioned flange plate

means secured to the lower end of said piston and a blade mounting plate mounted vertically on said flange plate means, said mounting plate having an arcuate shape corresponding to that of said blade and having means adapted to hold said blade in abutting contact with said flange plate means and said mounting plate downwardly from said flange plate means to a distance intermediate therewith and the cutting edge of said blade.

3. A stave and head bolt debarking machine, comprising, a structural supporting frame having a pair of spaced, vertically extending guide tracks, a carriage mounted for reciprocating movement in said spaced guide tracks, fluid circuit means including a cylinder having a piston mechanically connected to said carriage for driving and retracting said carriage along said spaced guide tracks, an arcuate shaped blade, said carriage including a horizontally positioned flange plate means secured to the lower end of said piston and a blade mounting plate mounted vertically on said flange plate means, said mounting plate having an arcuate shape corresponding to that of said blade and having means adapted to hold said blade in abutting contact with said flange plate means and said mounting plate downwardly from said flange plate means to a distance intermediate therewith and the cutting edge of said blade, said fluid circuit means including a first fluid line connected to said cylinder for passing fluid for advancing said piston and a second fluid line connected to said cylinder for passing fluid for retracting said piston, a fluid by-passing device for each said first and second fluid lines, means for opening the respective by-passing devices to pass fluid on predetermined stroke limits of said piston in said cylinder to halt movement of said piston, and a support positioned at the lower end of said spaced guide tracks for supporting and positioning a bolt to be debarked, whereby upon downward movement of said carriage said bolt is debarked by said arcuate shaped blade.

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