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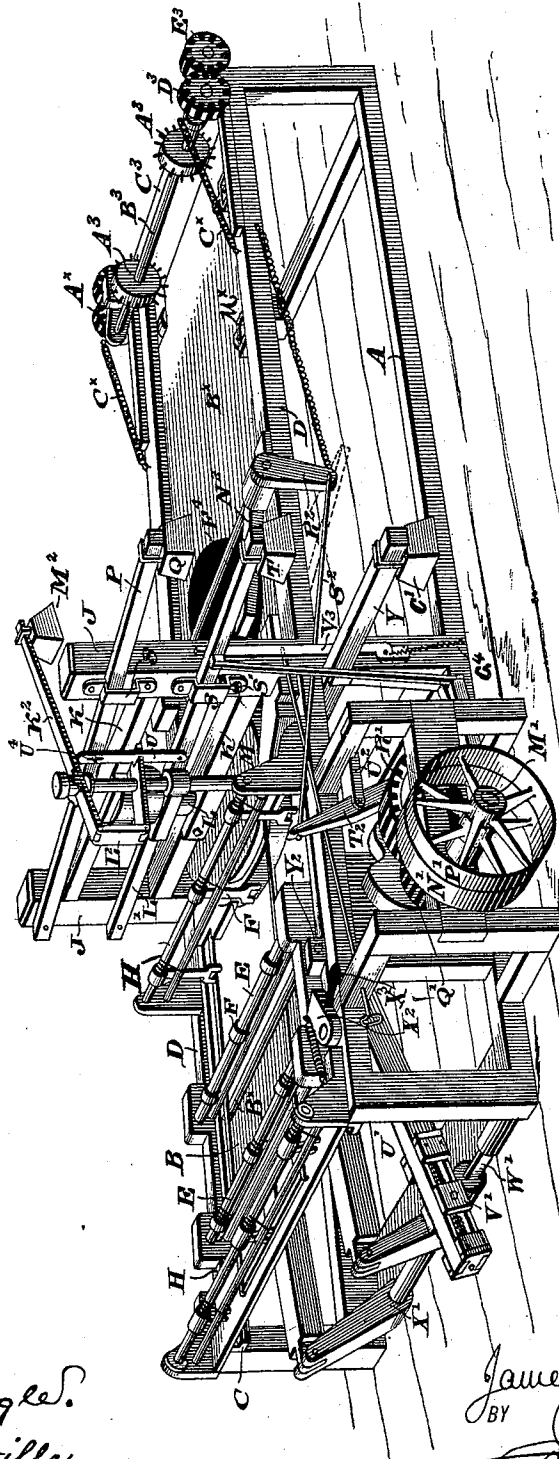
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J. A. CAMPBELL.
BARREL HEAD CUTTING MACHINE.

No. 493,064.

Patented Mar. 7, 1893.

Fig. 1.



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(No Model.)

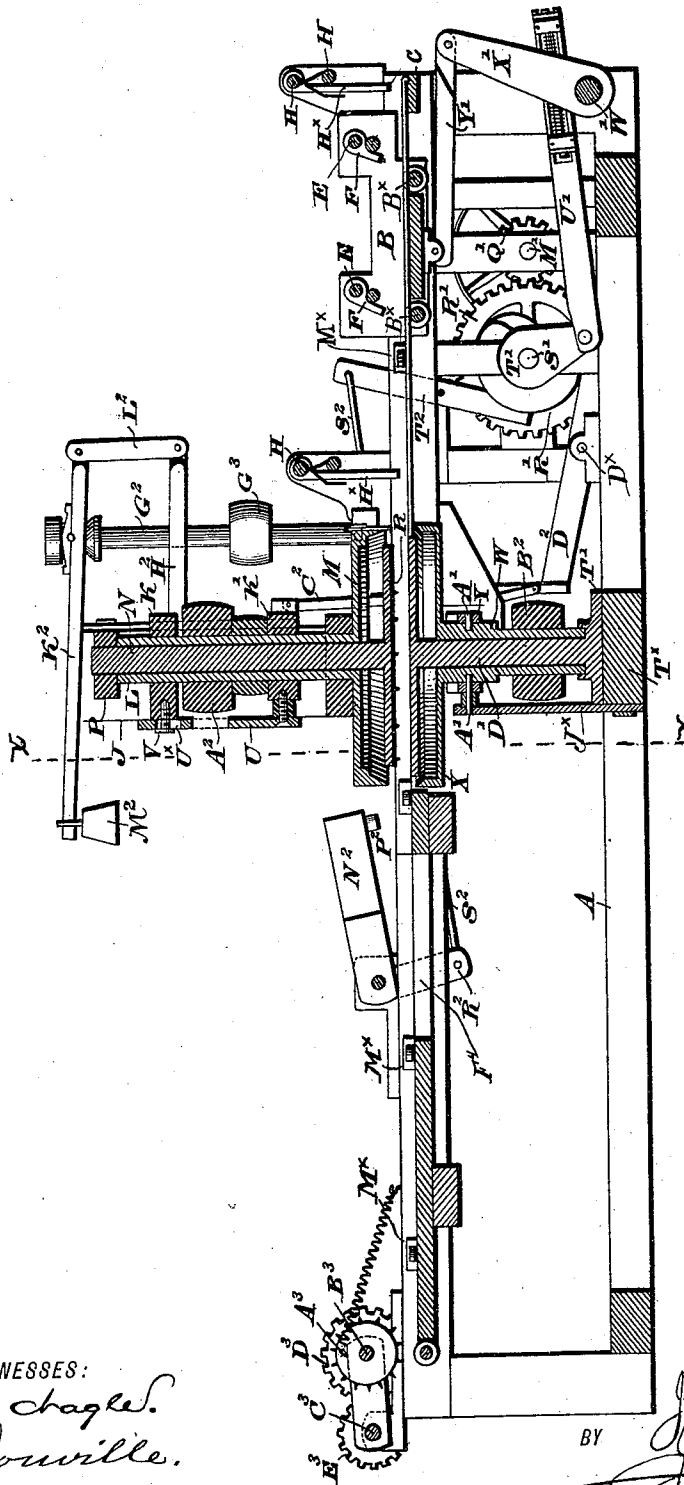
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Fig. 2.



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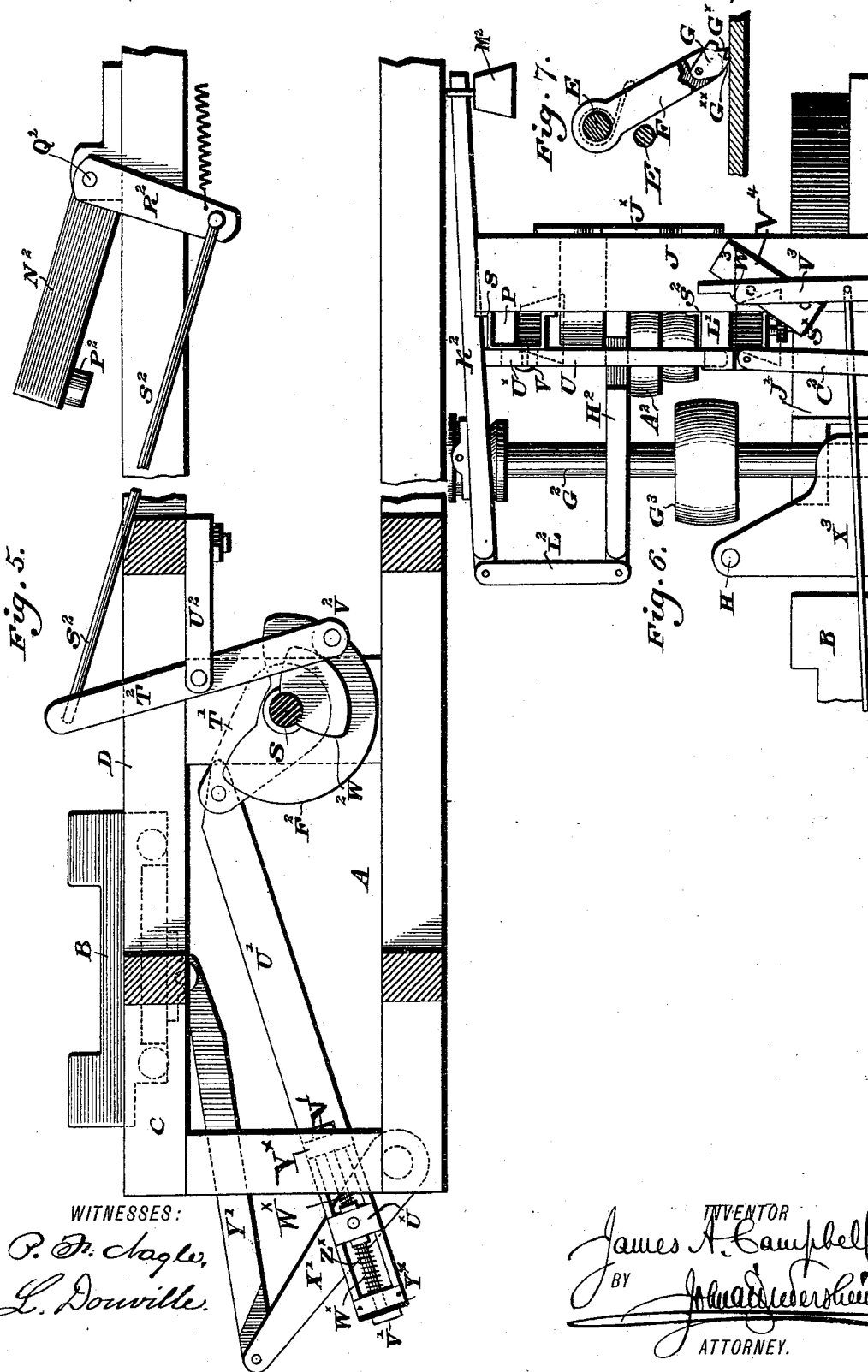
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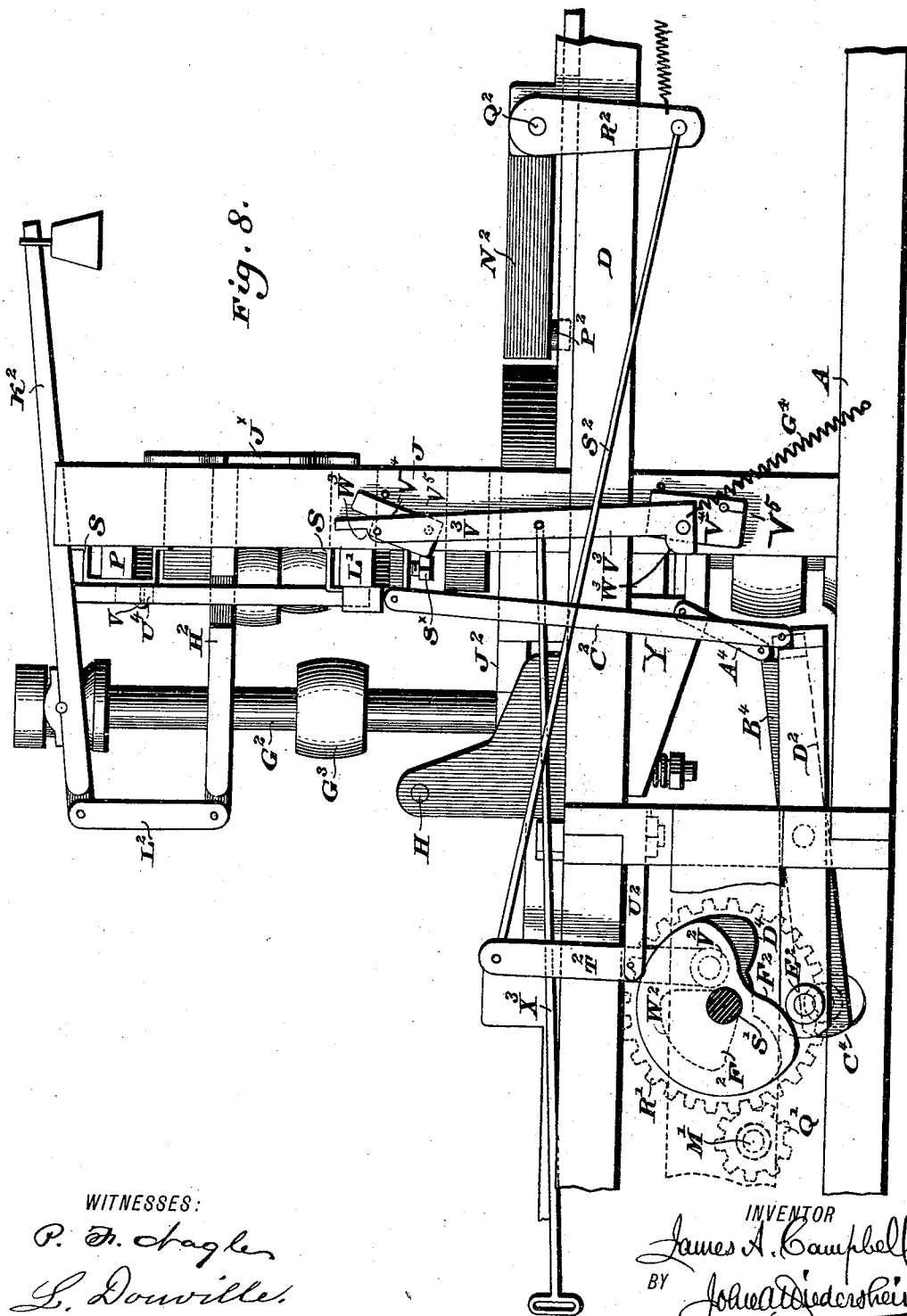
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BARREL-HEAD-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 493,064, dated March 7, 1893.

Application filed June 9, 1891. Serial No. 395,641. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. CAMPBELL, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented a new and useful Improvement in Barrel-Head-Cutting Machines, which improvement is fully set forth in the following specification and accompanying drawings.

My invention relates to improvements in barrel head cutting machines, and consists: first, of a machine having mechanism substantially as described for automatically feeding, stopping and cutting the boards for the purpose set forth.

It further consists of novel mechanism for automatically withdrawing the board from beneath the cutting mechanism when the cutting has been effected.

It further consists of novel cutting mechanism.

It further consists of feeding fingers or dogs, substantially as described.

It further consists of the combination of parts hereinafter set forth.

Figure 1 represents a perspective view of a machine embodying my invention. Fig. 2 represents a central longitudinal section, in elevation, of the machine. Fig. 3 represents a vertical section of the machine on line *x, x*, Fig. 2, on an enlarged scale. Fig. 4 represents a perspective view of a portion of the circular head with the cutting blade. Figs. 4^a and 4^b represent in different positions, perspective views of the portion of the circular head having the gouging tool. Fig. 4^c represents a perspective view of the portion of the circular head having the planing tool. Fig. 5 represents a side view on an enlarged scale of the operating mechanism of the feeding table and board stop. Fig. 6 represents a side view partly in section of the boring device with adjacent parts. Fig. 7 represents a partly side and partly sectional view of one of the spring dogs on the feeding table. Fig. 8 represents a side view of a portion of the operative parts of the mechanism.

Similar letters of reference indicate corresponding parts in the several figures.

Referring to the drawings: A designates the frame of the machine, consisting of uprights, side bars and suitable strengthening cross bars and B designates a feeding table mov-

able in the guides C, formed in the sides of the upper side bars D. The said table is provided with cross bars E, which carry the spring dogs F, each of the latter having a pivoted pawl G provided with upper and lower teeth G^x and G^{xx}, see Fig. 9, the said teeth G^x being adapted to bite or grip the board when the table is moved in one direction, so as to feed the same to the cutters, but also adapted to be raised from the board by the contact of the tooth G^{xx} with the board, so as to freely pass over the same when the table is moved in the opposite direction or away from the cutters, so that the said tooth G^x is not worn by being rubbed or dragged over the board.

Secured to suitable supports on the sides of the frame A, and at or near the portion thereof on which the table B operates, are the cross bars H, which are also provided with the dogs H^x similar to the dogs F, for preventing the return of the boards, on the backward movement of the table. Secured to the sides and extending above the frame A are the uprights J having the connecting cross bars K and K', in which is journaled the hollow shaft or collar L, having connected with its lower end the circular head M, to the rim of which are secured cutting tools of the device. Within the hollow shaft L is a stem or shaft N, the upper end of which is secured to the lever P, pivoted at one end to one of the uprights J, and carrying on its other end a weight Q. The other end of the shaft N is connected with a clamping head or disk R having pins thereon for holding the board in place during the cutting operation.

To the shaft L is secured a lever L' which is pivoted at one end to one of the uprights J, and at its other end carries a weight T. A vertical bar U is pivoted at its lower end to the lever L', and is provided at its upper end with a slot U⁴ in which is located the stud V, which connects it with the lever P. Keepers S secured to an upright J limit the movements of said levers P and L'. The lower keeper S is provided with a screw S^x for adjusting the play of the lever L' therein.

Connected with the base of the frame A and the lower ends of the uprights J is a cross bar T^x in which is journaled a hollow shaft or collar W having at its upper end a circular head X, the rim of which carries the lower cutting tools of the machine. A lever Y piv-

oted to a suitable support Z has its forked or bifurcated end pivotally connected to the shaft W by means of the studs A' which fit in a groove B' on said tube, so that said shaft
 5 may be freely rotated without moving said lever, while at the same time the lever which carries the weight C' may lower said shaft without affecting its rotation.

Within the shaft W is a stem D' having at
 10 its upper end a clamping head or disk E', which with the head R holds the board, which is being cut, in fixed position during the cutting operation.

The rims of the cutter heads M and X are
 15 each provided with the cutters F', G', and H'. The advance cutter F' which projects at substantially a right angle from the rim, is adapted to cut or saw out a circular head from the board held by the clamping disks; the next
 20 cutter, G', is of the form of connected gouges or chisels, inclined to the axis of the cutter head so as to form a beveled edge or rim on the head, while the cutter H' is of the character of a plane and inclined so as to smooth
 25 the beveled edge.

To reciprocate the table B so as to feed the boards to the cutters the following mechanism is employed. A driving shaft M' is journaled in a suitable portion of the frame A, and carries the loose and fast pulleys N' and P', and a pinion Q', the latter meshing with a gear wheel R' on a shaft S' journaled in the frame A. On the shaft S' is a crank arm T' which has a pitman connection U' with one
 35 of the arms X', rigidly secured to a rock shaft W', journaled in the lower end of the frame A, said arms X', X' being pivotally connected by the bars Y', Y', with the table B. The connection of the pitman U' with the arm X',
 40 is by means of a block U^x pivoted to said arm and adapted to move lengthwise on said pitman, being held in place thereon by means of the bolts or stops W^x which move in the blocks Y^x secured to the pitman, the said
 45 bolts having the coiled springs Z^x thereon, and bearing against the said blocks and the heads of the bolts. The nuts V' on the threaded ends of the bolts control the play of the springs.

To rotate the cutter heads M and X, the shafts or collars L and W are provided with the pulleys A² and B² respectively, which receive motion by means of bands or belts thereon, connected with any suitable motor.
 55 The cutter head X has a slight rising and falling motion imparted to it by means of the link A⁴, the lever B pivoted to a suitable portion of the frame of the machine and having a roller C⁴ which is engaged by a cam D⁴ on
 60 the shaft S'.

Connected with the lever L' is an arm C² of a lever D² which is pivoted to the frame A, at D and carries an anti-friction roller E² at one end, the latter being in contact with a
 65 cam F² on the shaft S', whereby as said shaft is rotated the lever is operated so that the end of the lever D² connected with the arm

C² is raised and thereby the lever L' and thus the shaft L and cutter head M with its cutters.

A shaft G² carrying a boring tool at its lower end for forming holes or recesses in the board for a purpose hereinafter explained, is journaled at one side and in advance of the cutting mechanism, in the arms H² extending
 75 from the cross bar K and has its lower end guided in an arm of a block J² secured on the frame of the machine and is provided with an operating pulley G³ thereon. A lever K² pivotally connected to the shaft G² and to a
 80 pivoted attachment L² of the arm H² and carrying a weight M², bears upon the upper end of the bar U. In rear of the cutting mechanism, and in line with the boring shaft G² is an oscillating dog N² carrying a stud P²
 85 adapted to enter the hole or recess made by the boring tool in the board. The pivoted stud or shaft Q² of the dog N² has a rigid arm R² which is connected by the wire or rod S² with a lever T² mounted on the arm U² of the
 90 frame A, and carrying on its lower end an anti-friction roller V² engaging with a cam W² on the shaft S'.

To limit the travel of the table B when required, the frame A is provided with a spring-controlled dog X² adapted to engage a stud
 95 or projection Y² on the side of the said table and provided with a handle X³ on its outer side for manipulating the same.

On the rear end of the frame A and at a
 100 little farther distance from the boring shaft than the length of the boards operated on, are the studded wheels A³ mounted on the shaft B³ which is journaled in bearings A^x connected with the rotary shaft C³ and operated
 105 by the latter by means of the meshing gear wheels L³ and E³, the shaft C³ receiving power from any suitable motor so as to be driven at a much higher rate of speed than the mechanism operating the feeding device and there-
 110 by draw the board, when the last cut has been made therefrom, out of the way of the stud P² of the dog N². The springs C^x keep the shaft B³ normally lowered.

The manner of operating the machine is as
 115 follows:—The boards from which the barrel heads are to be cut are fed to the device from any suitable table, and then passed onto the frame A under the dogs of a bar H, and between the dogs of the bars E of the table B
 120 and the rollers B^x thereof, below said bars E, whereby when the shaft M' is rotated the table B with its dogs gripping the board advances the latter on the frame A between the side spring rollers M^x, on the sides of the
 125 frame to and beneath the cutting device, where owing to the timing of the parts, it is stopped by the stud P² of the dog N² abutting against its end. Each of the said rollers is journaled in a bifurcated or forked end of a rod M⁴,
 130 which latter has a bearing in a bracket secured to the inner side of the side bars D of the frame, and has a coil tension spring secured to its end within the bracket, and to

the bracket so as normally to force said roller against the board on the table B. Similar rollers are used in rear of the cutters for guiding the board from the frame, see Figs. 2 and 3. The parts are so timed that when said stud P² engages the board, the clamping head R is lowered so that it bears upon the board owing to the weight Q on the attached lever P, thereby preventing any lateral movement of the same. At the same time the shafts L and W with their cutter heads M and X are rotated by the proper mechanism, and owing to the weighted lever L' connected with the shaft L, and the weighted lever Y of the shaft W, the cutters bear against the board, so that it is operated on from both above and below, the knife blade or cutters F' coming in contact with the board slightly in advance of the other cutters, so as to cut out the head from the board, the gouges or chisels G' then beveling the edge portion, and the cutters H' planing or smoothing the portion roughly beveled by the gouges. As the one side of the barrel has a larger bevel on one of the faces of its edge than the other, the cam and other parts operating the lower cutter head X are so arranged that its work, cutting the small bevel, is stopped a short time in advance of that of the upper cutter head M, and it is lowered so as to be out of the way of the said cutters of the head M. While the cutters are at work, the boring tool on the shaft G², is also being operated by means of a band connecting its pulley with a pulley on the shaft L, so that a hole or recess is made in the board a short distance in advance and at one side of the barrel head that is being formed. During the cutting operation, the table B is removed from the cutters, and the further rotation of the driving shaft removes the cutters, boring tool, and clamping head R from the board, and the dog N² is raised so that its stud is above the path of travel of the board, so that the latter may be advanced on the return movement of the table B, caused by the further rotation of the driving shaft S', the part operated on passing with the barrel head from beneath the cutting mechanism to the rear of the frame A, the barrel head falling into the opening F⁴ as it reaches the same. The stud P² of the dog N² during this advance movement of the table, having been lowered during the latter part of the said advance movement now rides on the board, so that when the latter has been advanced the proper distance or the space sufficient to cut therefrom another barrel head, the said stud P² will drop into the recess made in the board by the boring tool. Secured to the levers L' and W', and to cross bars of the uprights J are belt guides J' for the operating pulleys of the shafts L and W, said guides being pivoted to said levers and vertically movable on said bars. The further operations of the several parts are as have been described.

When the last cut has been made from a

board, the first portion of the advance movement of the table B advances the outer end of the board so that it is gripped by the studied wheels A³, when owing to the rapid rotation of the latter the board is removed from the cutting mechanism and the stud P², before the latter can enter the last hole or recess made by the boring tool, the next board being stopped in its advance by the said stud.

Owing to the spring connection, as described and shown, of the pitman U' and arm X' of the rock shaft W', the extended or lengthened travel of the table B and advance of the board on the frame A are provided for, without any breaking of the parts by the contact with the board of the stud P².

The machine by a change of or employment of different cutters may be readily adapted for cutting heads of butter tubs or other articles, as can be easily understood.

By having the slot U⁴ as before described in the upper part of the connecting bar U, the connected lever L' is permitted to descend a short distance or sufficiently for the cut of the upper cutters, without driving the lever P after the clamping head R has come in contact with a board. It also permits the lever P to be assisted in its upward movement after the upper cutters are free from the board, by means of the mechanism raising the lever L'.

To adjust the cutters G' or H' in position on the cutter heads the same are slotted as at S³ see Fig. 4 for a screw T³ which is inserted in an opening in the cutter head, passing through said slot into a second opening in the rim, the said screw having a reduced portion forming a shoulder U³ which bears against the cutter so as to keep it in place. The spring dog X² see Fig. 1 which engages the stop on the side of the feeding table B to limit its movement, when removed from the path of said stop permits the extreme movement of the table, but when in the path of the stop Y² limits the return of the table to the proper place necessary for the advance of the board thereon to the required position for it to be engaged by the clamping heads.

To prevent the operation of the cutters, a lock is employed, said lock consisting of a link V³ pivotally attached to the arms V⁴, which latter are pivoted to the frame A at V⁵. The said link is provided with the shoulders W³ adapted to engage the under sides of the levers L' and Y, when raised, and prevent their descent, and is operated by the rod X³ which is guided on the frame A. A spring G⁴ which is so secured to the lower end of the link and to the frame A, as to be on opposite sides of the lower pivotal point V⁵ when the link V³ is engaged or disengaged respectively with the levers L' and Y, to hold the said link in place until operated by the said rod. In the drawings an extra pulley is shown under pulley A² the same merely serving as a supporting block for said pulley A².

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. A barrel head cutting machine having a frame, a movable feeding table thereon, a clamping head, upper and lower circular cutting heads, mechanism for stopping the board operated on, and mechanism independent of said feeding and operating mechanism for withdrawing the board from beneath said cutting mechanism, said parts being combined substantially as described.

2. A barrel head cutting machine having a frame, a feeding table movable thereon and provided with spring dogs having pawls pivoted thereon, clamping disks, upper and lower rotary heads with cutters, mechanism substantially as described for automatically stopping the board when in proper position between the cutter heads, and mechanism independent of said feeding and stopping mechanism for advancing the board from the frame when the last cut thereof is made, said parts being combined substantially as described.

3. A frame, board feeding mechanism mounted thereon, rising and falling cutting mechanism and boring mechanism mounted in said frame, mechanism for stopping the board fed to the cutting mechanism when in proper position and mechanism substantially as described connected with said frame and operated independent of the feeding mechanism for automatically removing the board from the frame when the last cut has been made thereon said boring mechanism operating to produce an opening engaged by said stopping mechanism, said parts being combined substantially as described.

4. A frame, feeding mechanism mounted thereon, cutting mechanism on said frame, boring mechanism, a stop on the frame in the rear of the boring mechanism for automatically checking the advance of the board at regular intervals, to the cutting mechanism, and adapted to engage the opening in the board made by said boring mechanism, said parts being combined substantially as described.

5. A frame, board-feeding mechanism thereon, adjustable rotary cutting mechanism located both above and below the plane of the feeding mechanism, and in rear thereof, stopping and boring mechanism in connection therewith adjacent to the cutting mechanism, for stopping the travel of the boards on said frames, said parts being combined substantially as described.

6. A frame, feeding mechanism thereon, rotary cutting mechanism on opposite sides of said feeding mechanism, boring mechanism and a stop adapted to engage the opening made by said boring mechanism, and mechanism substantially as described independent of the feeding mechanism for removing the boards fed from said frame, said parts being combined substantially as described.

7. A frame with uprights having cross bars,

a hollow shaft journaled in said bars and provided at its end with a cutter head, a stem rising and falling in said collar having a clamping head at one end, weighted pivoted levers secured to said shaft and stem, a bar pivotally connected to said levers, the pivotal connection with the upper or stem lever being in a slot in said bar, a driving shaft and mechanism connected with said driving shaft and the lower or shaft lever for raising the same, said parts being combined substantially as described.

8. A frame, a rotatable hollow shaft having suitable bearings and provided with a cutter head, a weighted lever connected with said shaft, a stem in said shaft having a clamping head, a weighted lever connected with said stem, a bar slotted at its upper end and connected with said weighted levers, a vertical shaft carrying a boring tool and having a weighted lever connected therewith and bearing on said bar, a driving shaft and mechanism connected with said driving shaft and shaft lever for raising the latter and a stop adapted to engage the hole made by the boring tool, said parts being combined substantially as described.

9. In a barrel head cutting machine, a frame with a movable feeding table thereon, said table having cross bars with pivoted dogs provided with spring pawls having upper and lower teeth, substantially as and for the purpose set forth.

10. A frame with a rotary shaft journaled therein, a feeding table movable thereon, a rock shaft journaled in said frame and having rigid arms pivotally connected with said table, a crank arm connected with said rotary shaft, a pitman pivoted to said crank arm and having a spring connection with a rigid arm on said rock shaft, said parts being combined substantially as described.

11. A frame, a feeding table movable thereon and having shafts with dogs thereon and rollers below said shafts, a rotary shaft, rotary cutting mechanism, a rotary boring shaft, a stop adapted to engage an opening made by the operation of said boring shaft weighted levers on said cutting and boring mechanisms, mechanisms connected with said rotary shaft for reciprocating said table, and mechanism substantially as described connected with said cutting mechanism for raising the same from the board operated on, said parts being combined substantially as described.

12. A frame with cross bars having pivoted dogs thereon, a feeding table movable on said frame and having cross bars with rollers below the same, spring dogs on said cross bars of the table with pivoted pawls having upper and lower teeth, said parts being combined substantially as described.

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