(No Model.) 4 Sheets—Sheet 1.

A. HITZERT.

BARREL HEAD MACHINE.

No. 568,978. Patented Oct. 6, 1896.

Fig. 1.

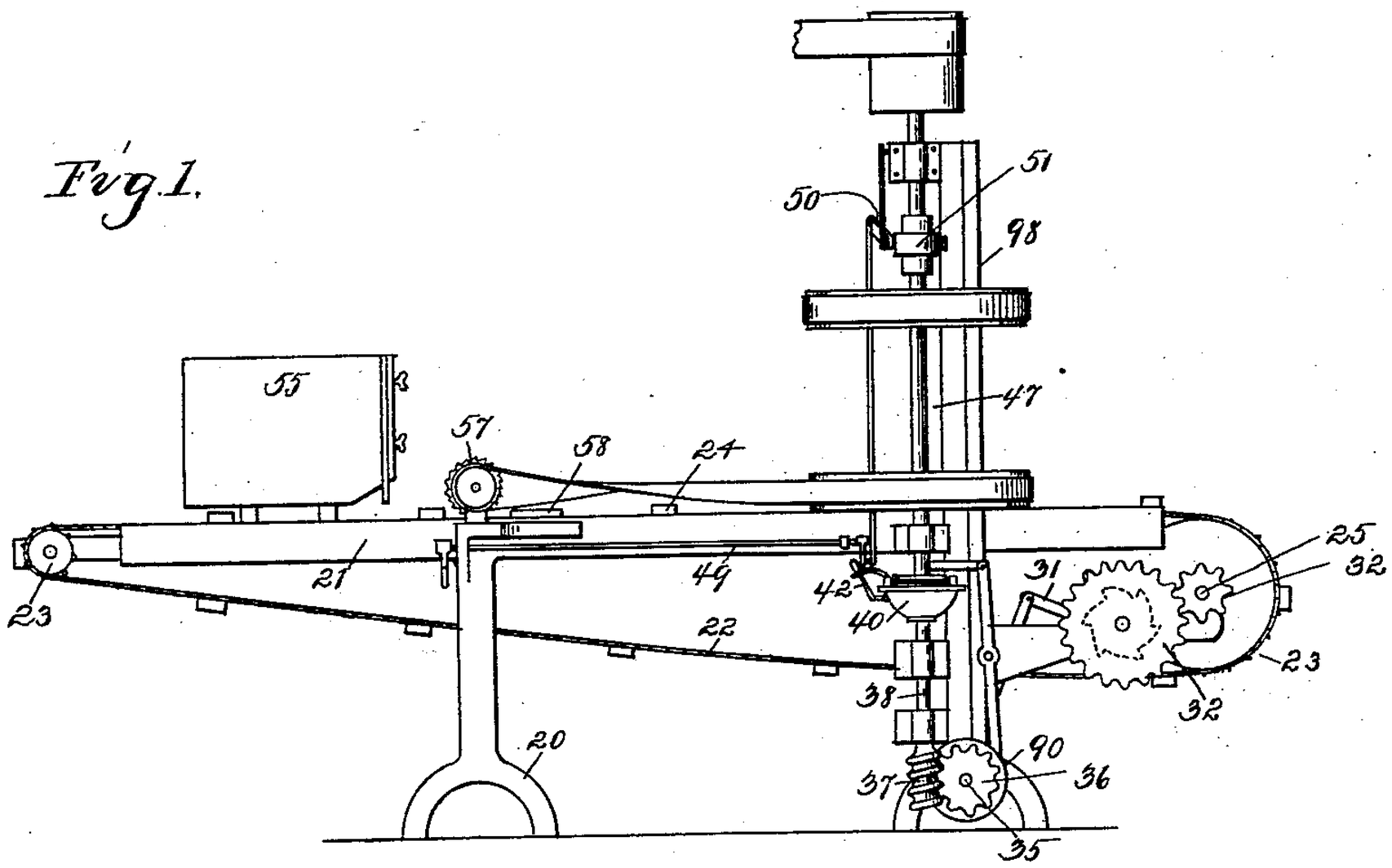

Fig. 2.

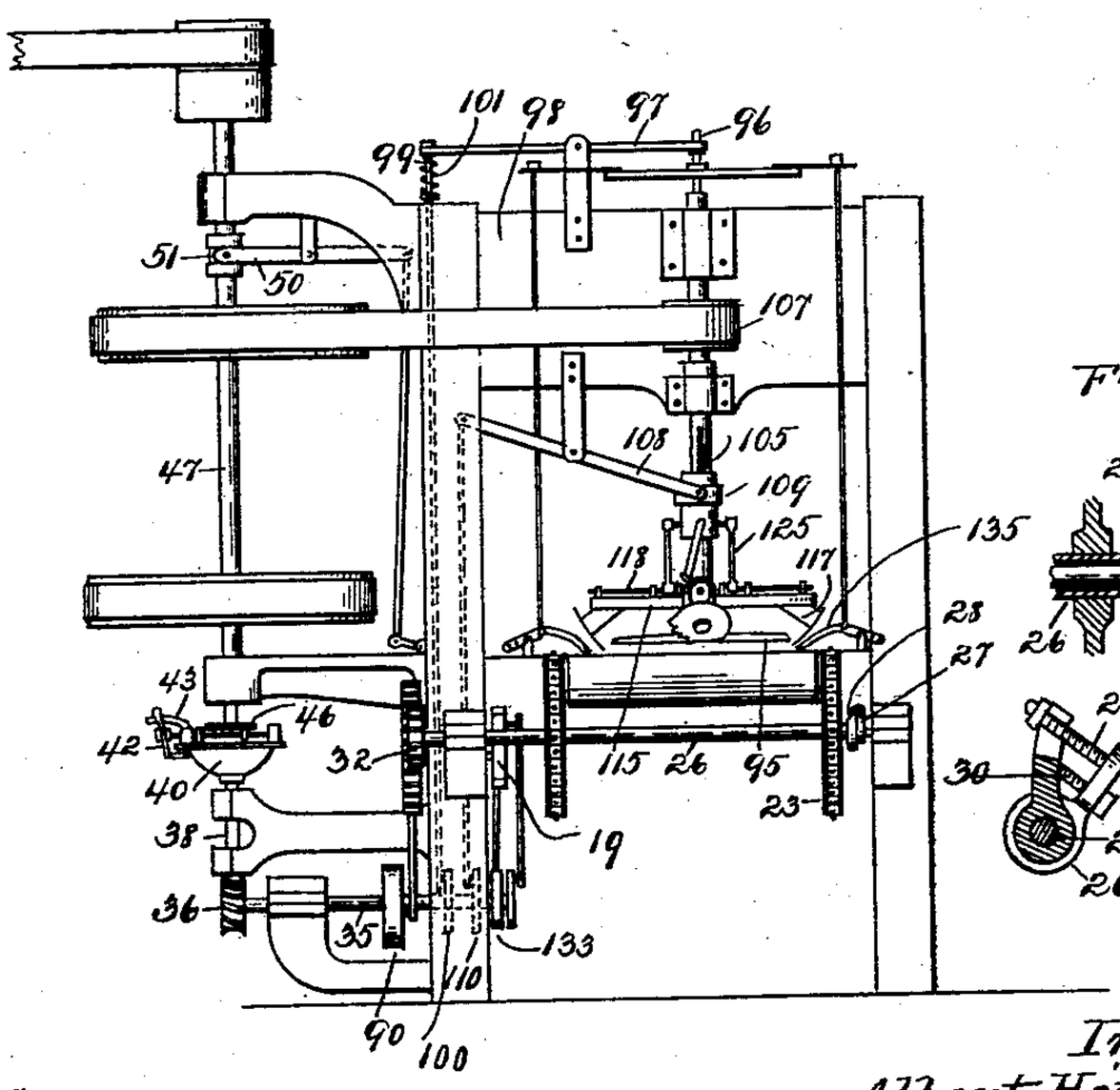

Fig. 4.

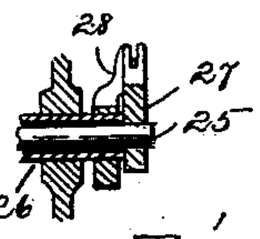

Fig. 3.

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(No Model.) 4 Sheets—Sheet 2.

A. HITZERT.

BARREL HEAD MACHINE.

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Fig. 5.

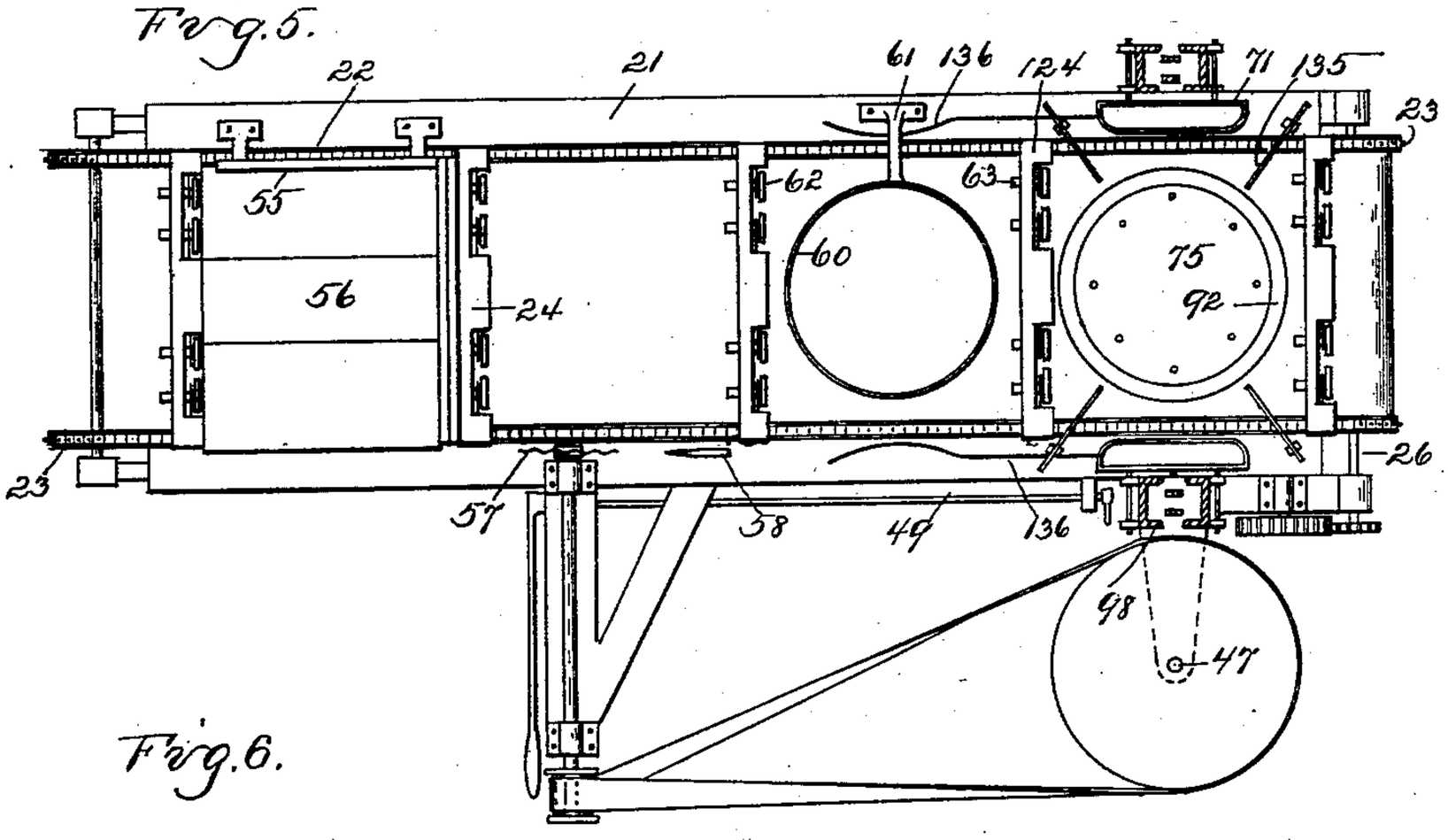


Fig. 6.

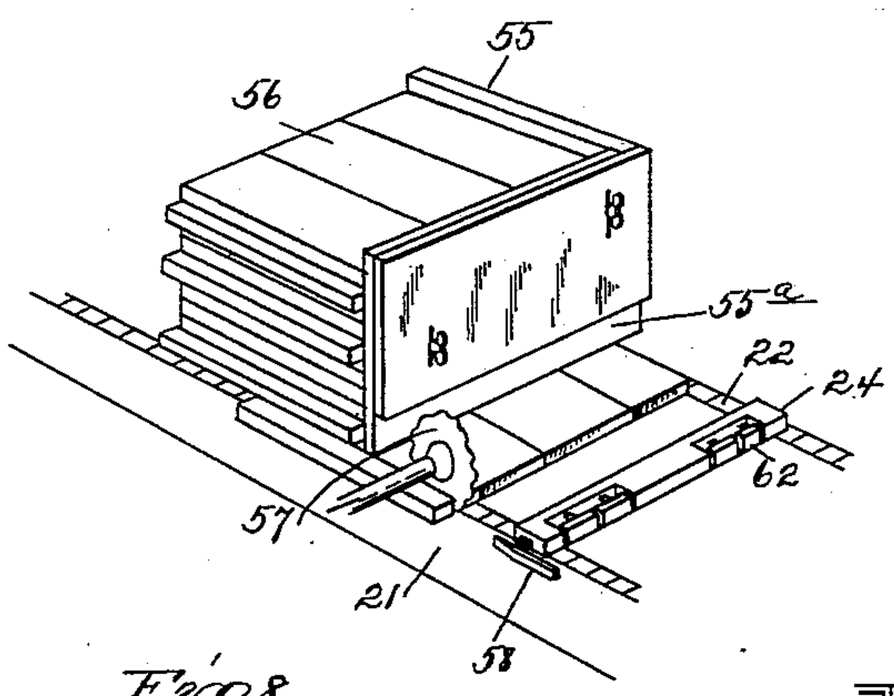


Fig. 8.

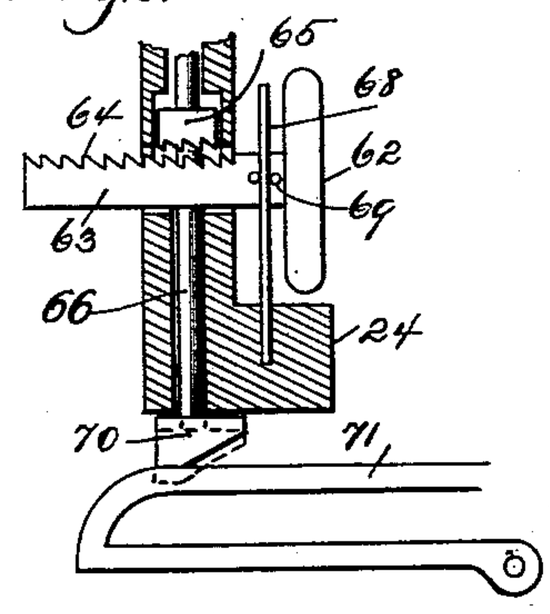
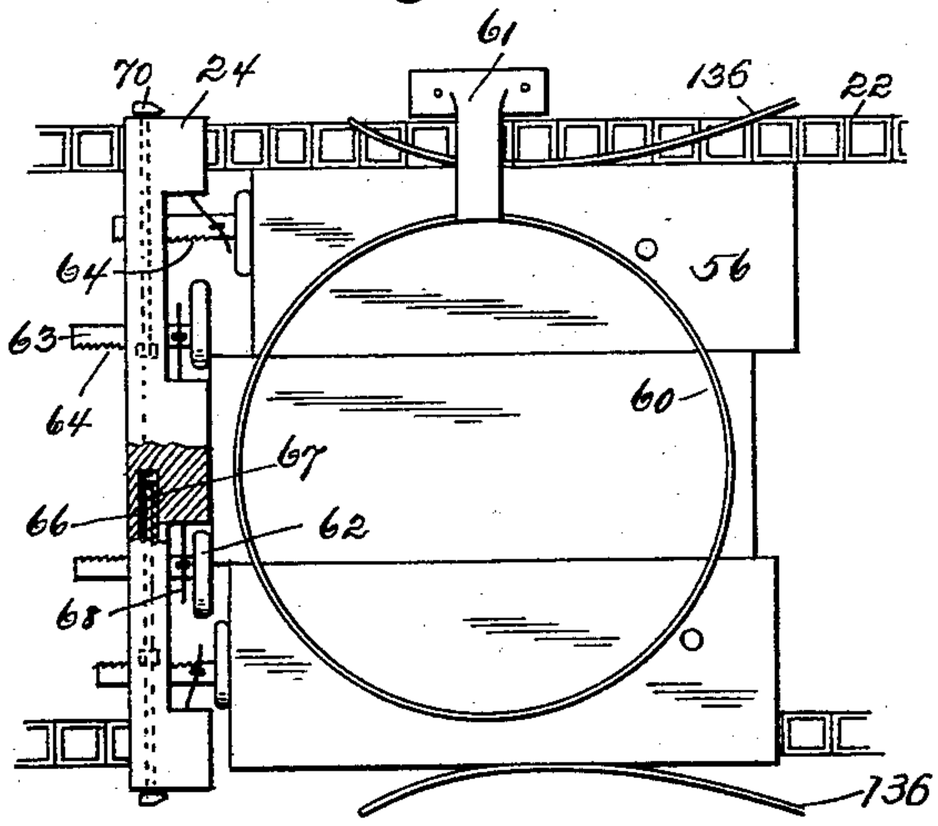


Fig. 7.



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BARREL HEAD MACHINE.

No. 568,978. Patented Oct. 6, 1896.

Fig. 9

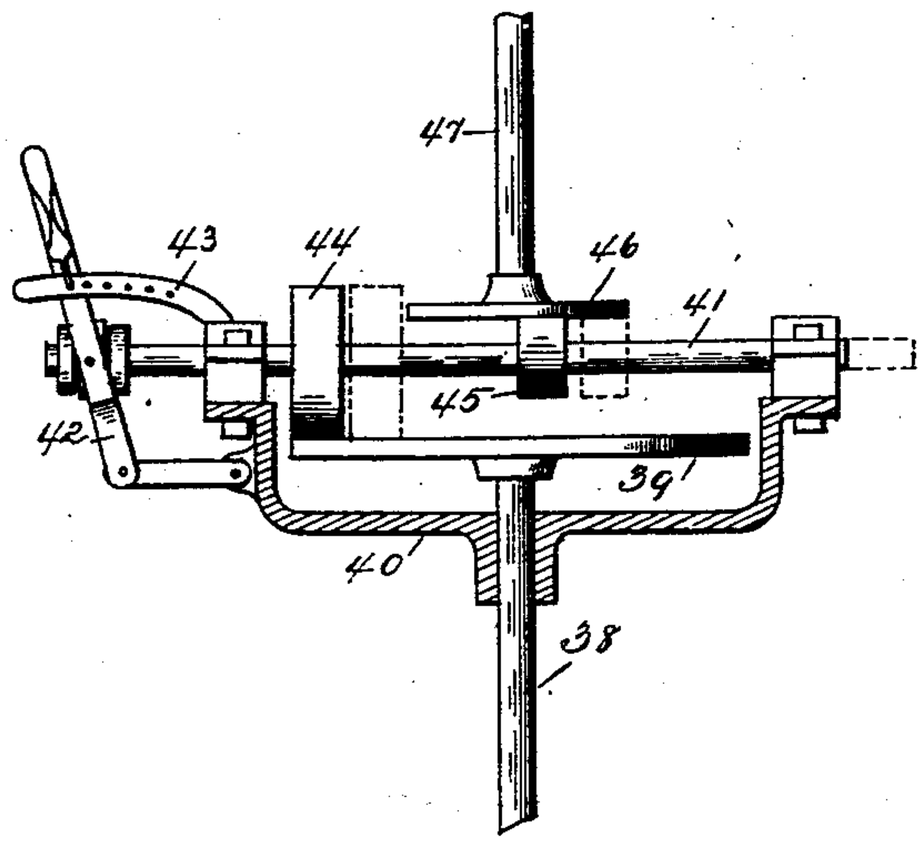


Fig. 10.

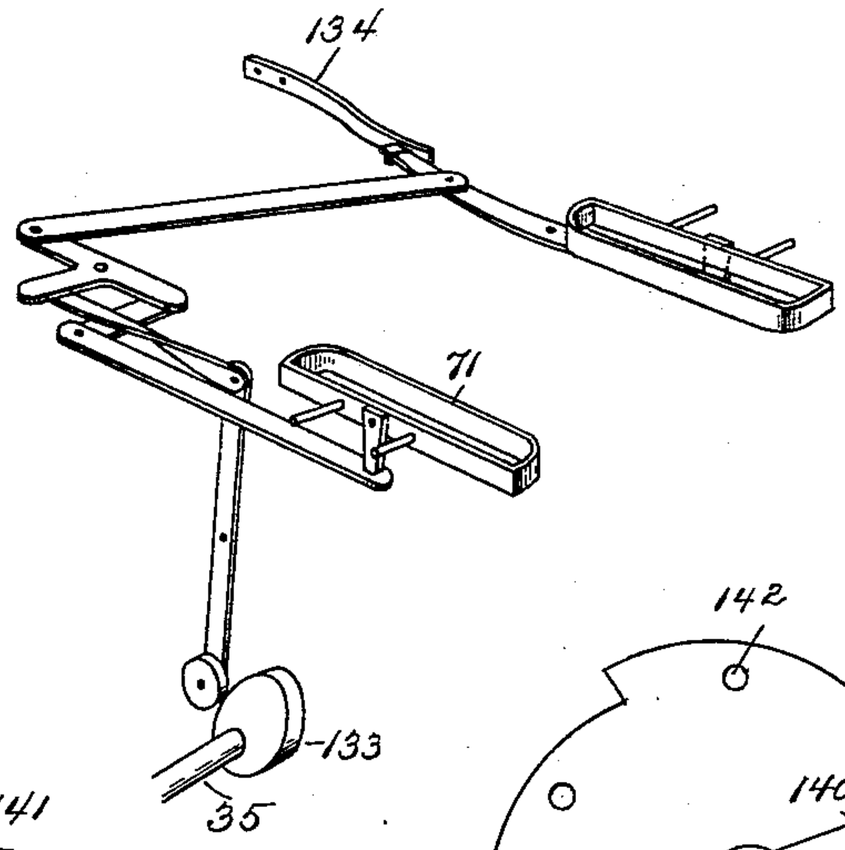
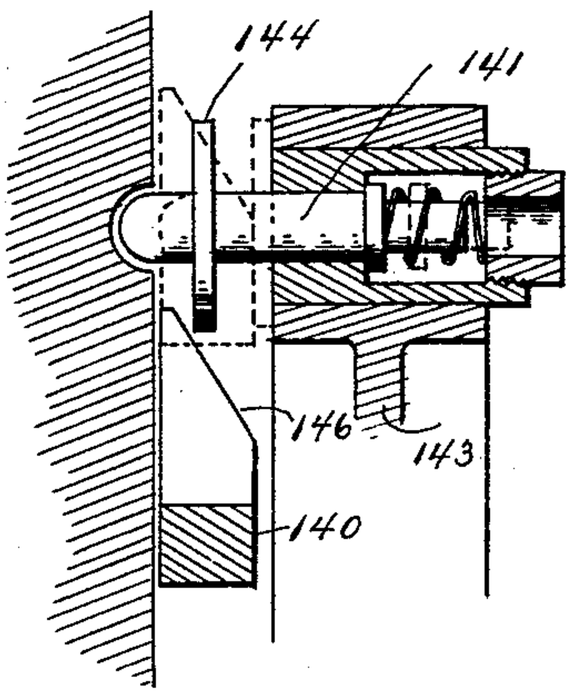


Fig. 17.



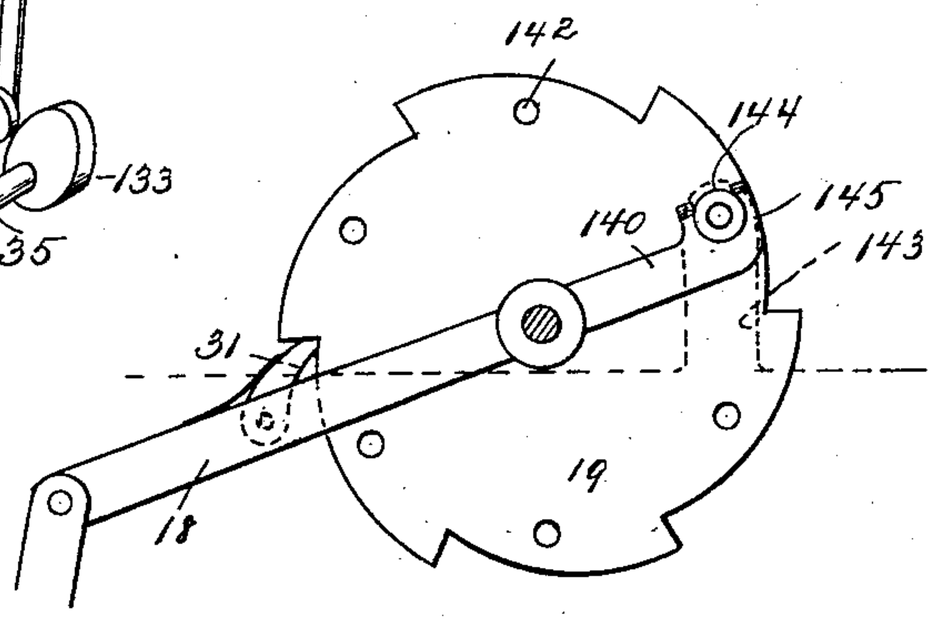


Fig. 16.

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BARREL HEAD MACHINE.

No. 568,978. Patented Oct. 6, 1896.

Fig. 11

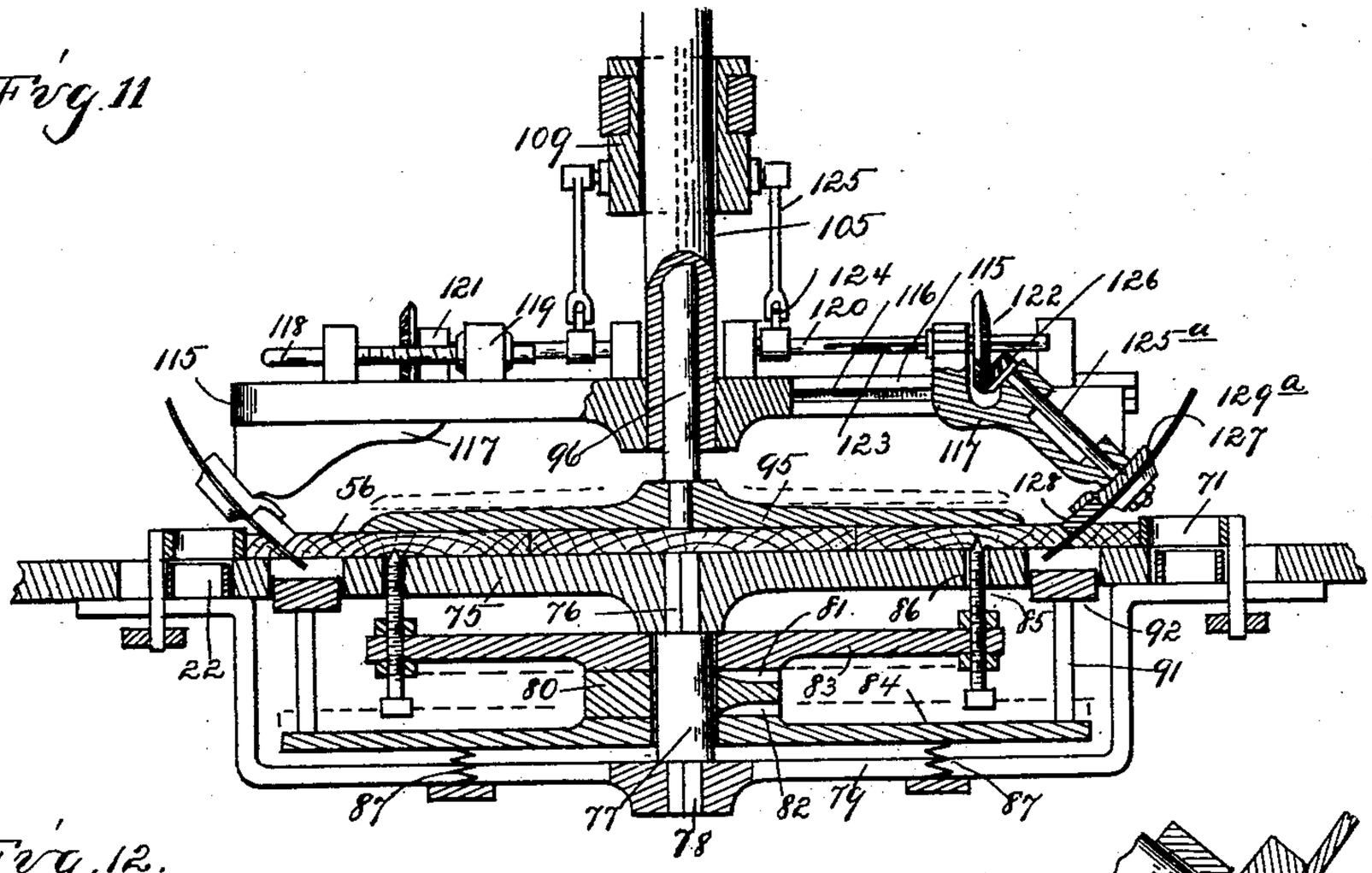


Fig. 12.

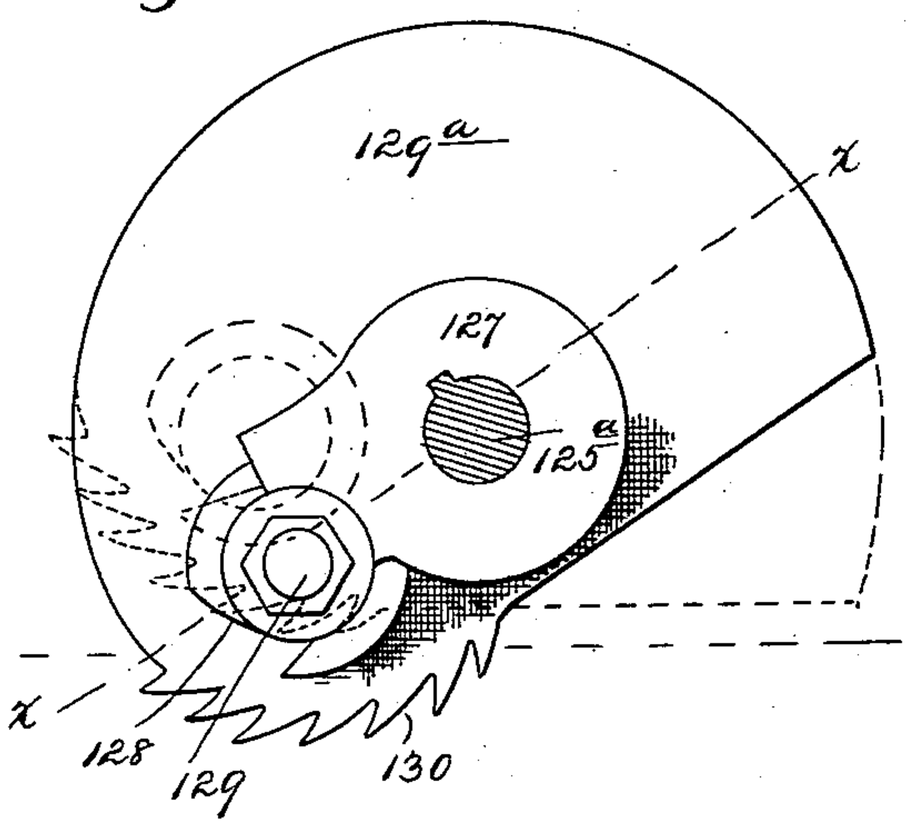


Fig. 13.

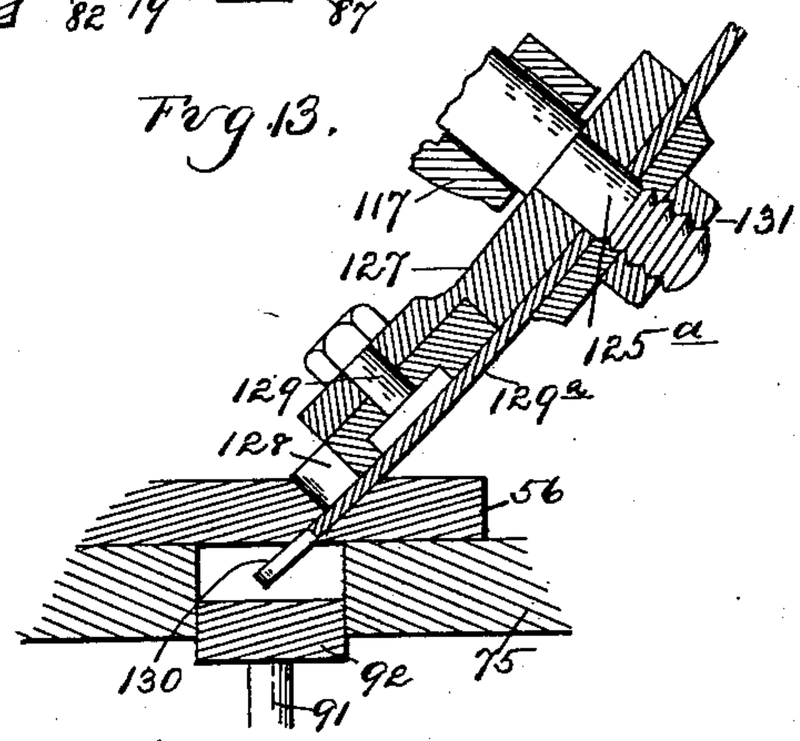


Fig. 15.

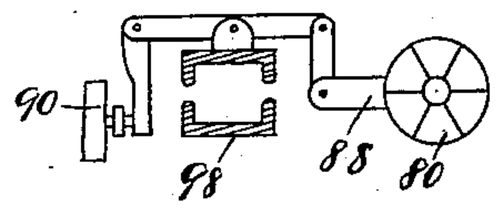
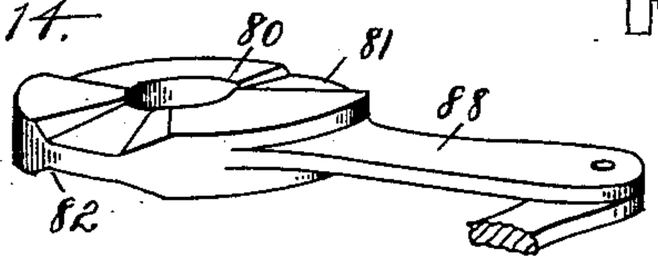


Fig. 14.



Witnesses
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O. F. Barthel

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Attys.

UNITED STATES PATENT OFFICE.

ALBERT HITZERT, OF SAGINAW, MICHIGAN, ASSIGNOR OF ONE-HALF TO JACKSON & CHURCH, OF SAME PLACE.

BARREL-HEAD MACHINE.

SPECIFICATION forming part of Letters Patent No. 568,978, dated October 6, 1896.

Application filed April 8, 1895. Serial No. 544,921. (No model.)

To all whom it may concern:

Be it known that I, ALBERT HITZERT, a citizen of the United States, residing at Saginaw, in the county of Saginaw and State of Michigan, have invented certain new and useful Improvements in Barrel-Head Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention consists in the construction of a machine designed for cutting barrel-heads from blanks of lumber, and especially in the construction of a cutter arranged above the blank, with means for clamping the blank upon the table and means for moving the cutter into and out of the work to cut both bevels and cut out the head from the blank; further, in cross-bars for the carrier having adjustable sections or plates on their front face, by means of which the different boards composing the blank may be adjusted in relation to the cutting-line to cut out the knots as far as possible; further, in the holding or clamping devices for the work, and in the construction, arrangement, and combination of the various parts, as more fully hereinafter described.

In the drawings, Figure 1 is a side elevation of my improved machine. Fig. 2 is an end elevation thereof. Figs. 3 and 4 are cross and longitudinal sections illustrating the connection between feed-chain sprocket-wheels and their drive-shaft. Fig. 5 is a horizontal section just above the line of the table. Fig. 6 is a perspective view of the left-hand end of the machine as shown in Fig. 5. Fig. 2 is a plan of a part of the table, showing the indicator and showing in section one of the carrier-bars. Fig. 8 is a horizontal section through one end of one of the carrier-bars, illustrating the action of the releasing device for the adjusting-plates for the blanks. Fig. 9 is a vertical sectional elevation illustrating the drive connection from the drive-shaft to the machine. Fig. 10 is a perspective view illustrating the actuating-levers for the side-work clamps. Fig. 11 is an enlarged vertical section through the cutter-head and the table beneath the same, partly in elevation. Fig. 12 is an enlarged elevation of one of the cutters. Fig. 13 is a section thereof on line $x\,x$, showing the cutter in the work. Fig. 14 is a perspective view of the cam-plate which actuates the work-holding dogs and receding saw-ring in the table. Fig. 15 is a diagram of the actuating-levers therefor. Fig. 16 is an elevation of the ratchet-wheel and pawl for actuating the carrier. Fig. 17 is a cross-section through the locking mechanism for the carrier.

20 is a suitable frame, having the table 21 at the top. 22 are sprocket-chains running over the sprocket-wheels 23 at opposite ends of the machine and connected by the carrier-bars 24, which are adapted to feed the blanks along the table.

25 is the shaft for one pair of the sprocket-wheels. On this shaft is the sleeve 26, Figs. 3 and 4, to which sleeve the sprocket-wheels are secured.

27 is a finger secured to the end of the shaft 25, and 28 is a finger secured to the end of the sleeve, the ends of the two fingers being in line, and are adapted to be adjusted in relation to each other by the adjusting-screws 29 30. This adjustment enables me to adjust the carrier-chain to bring the cross-bars in proper relation to the other parts of the machine. The carrier is intermittently actuated through a ratchet-wheel 19 and a pawl 31 on the lever 18 and gearing 32 to the shaft 25, the pawl being actuated from a crank connection with the horizontal shaft 35, Figs. 1 and 2, which I shall call the "cam-shaft," as it carries the cams for actuating the mechanism in the device. This shaft is provided with the worm-wheel 36, with which a worm 37, Figs. 1 and 2, on the vertical shaft 38 engages. I preferably lock the carrier in the intervals between its movement, and accomplish this by the devices shown in Figs. 16 and 17.

140 is an extension of the lever 18 beyond its pivot.

141 is a spring latch-pin adapted to engage in the dents 142 in the face of the ratchet-wheel 19. This latch-pin is supported on the arm 143 beside the wheel and has a collar or shoulder 144 near its inner end.

The extension 140 of the lever has the upwardly-extending lugs 145, having the outer beveled face 146, as shown in Fig. 17. When

the parts are as shown in Fig. 16 and in dotted lines in Fig. 17, the end of the lever keeps the latch from engagement with the detent in the ratchet-wheel, but as soon as the lever moves it withdraws from the latch, which is held against the face of the wheel. When the wheel reaches the end of its movement caused by the rocking of the lever 18, the pin will engage in one of the detents and hold it (and the carrier, which is geared to the shaft of the ratchet-wheel) against movement while the lever is returning. As the lever returns the bevel-faces 146, engaging beneath the collar 144, will lift out the pin, and thus free the ratchet-wheel for its next movement.

The shaft 38 at its top is provided with the horizontal circular disk 39 above the yoke 40. (See Figs. 2 and 9.)

41 is a horizontal shaft slidingly journaled in bearings in the yoke 40, being adjustable longitudinally by means of the lever 42, this lever having means to engage the segment 43 to hold it in its adjusted position. On the shaft 41 are two friction-wheels 44 and 45. The wheel 44 bears against the upper face of the disk 39, and the wheel 45 bears against the under face of a disk 46 on the end of the main drive-shaft 47, driven from any suitable source of power. This shaft 47 may be lifted to raise the disk 46 from engagement from the wheel 45. This I have shown as accomplished by the rock-shaft 49, connecting, through a lever 50, to a collar 51 on the shaft.

It is evident that the feed devices of the machine may be stopped or started by raising or lowering the disk 49 through the connection described. It is also evident that the speed of the cam-shaft may be varied by adjusting the shaft 41 in or out.

55 is a fence at one end of the table, behind which are piled the boards or blanks 56, from which the heads are to be cut. (See Fig. 6.) Each blank is composed of two, three, or more boards, as plainly shown in Figs. 5 and 7. The bottom of the fence is raised sufficiently above the table to permit the bars of the carrier to pass beneath and is preferably provided with an adjustable board 55ª. As the blank passes from the fence it is trimmed to a proper width by the saw 57, driven by suitable belt connection from the drive-shaft 47, the waste being separated from the blank by the splitter 58.

60 is a ring supported by the bracket 61 above the table in such relation to the cutters that the carrier will stop the blank beneath the ring before feeding it to the cutters in the precise relation to the ring that the subsequent movement of the carrier will bring the blank to the cutters. This enables the operator standing beside the ring to examine the blank and ascertain if there are any knots in the line of the cutters and, if so, to adjust one or more of the sections or boards to get the knots out of the line of the cutters or cut the head to leave out the knots at the ends of the boards. This adjustment I accomplish by means of the plates 62, Figs. 5, 7, and 8, forming complementary portions of the front face of the carrier-bars 24, and having stems 63, projecting through apertures in the bars. These stems have ratchet-teeth 64 on one side, with which the toothed collars or dogs 65 on shafts 66 are adapted to engage to hold the plates in their adjusted positions.

67 are springs for holding the dogs in engagement. 68 are flat springs engaging between pins 69 on the stems, acting to return the plates to their initial position when the dogs are released.

70 are end projections of the shafts 66 beyond the end of the carrier-bar.

The operator pushing on one of the stems 63 may push out the plate 62 until the knot is out of the line of the cut, as shown in Fig. 7, and the dog 65 will hold it in such position until the blank has been operated on by the cutters, when the dogs will be released by striking any desired abutment which will force in the shafts 66 to release the dogs 65 from the ratchet-teeth on the stems. These shafts may strike the side clamps 71 to trip the dogs. After the blank has been adjusted as described, the next feed motion of the carrier brings the blank upon the end section of the table beneath the cutters, the operation and construction of which I will now describe.

Figs. 11, 12, and 13 show the cutters and the table beneath the same.

75 represents the clamping-section of the table, circular in form.

76 is a pin on the journal 77, supported by the pin 78 in the stirrup-shaped bracket 79, secured to the under side of the table.

80 is a plate or disk journaled on the journal 77 and having suitably-shaped cam-faces 81 82 on its upper and lower faces adapted to bear against complementary faces on disks or heads 83 84. The disk 83 rests on the plate 80 and carries the adjustable pointed pins or dogs 85, engaging in apertures 86 in the clamping-section 75 of the table. The disk or head 84 is held in contact with the plate 80 by the springs 87 beneath.

88 is a lever or arm on the plate 80, connected by suitable levers with a cam 90, Fig. 2, by means of which the plate 80 is intermittently rocked, so that its cam-faces will simultaneously depress the disk 84 and elevate the disk 83, forcing the dogs 85 up into the blank on the top of the section 75. To the edge of the disk 84 are secured the vertical pins 91, carrying at their upper ends the ring 92. This ring in its upper position forms a complementary part of the table, but when lowered, as shown in Fig. 11, leaves a circular groove or recess in the table-top below the blank, into which the edges of the cutters can enter. This ring I shall call the "receding cutter-ring," that is, a ring-shaped section of the table that recedes before the cutters below the table-top.

95 is a clamping-plate secured to the lower

end of the vertical shaft 96. At its upper end this shaft has connected to it the lever 97, supported on the standard 98 and connected through the rod 99 with the cam 100 on the cam-shaft 35.

101 is a spring acting to hold down the shaft 96 and its clamping-plate.

105 is a hollow shaft journaled in vertical bearings in the standard 98 and through which the shaft 96 projects.

107 is a pulley on the shaft 105, driven from the drive-shaft 47.

108 is a lever engaging the collar 109, embracing the shaft 105, the collar being feathered on the shaft 105. This lever is connected with the cam 110 on the cam-shaft, by means of which it is intermittently actuated to intermittently vertically reciprocate the collar 109 upon the shaft 105.

115 is the cutter-head secured to the lower end of the shaft 105 and provided with radial slots or guideways 116, in which engage the inclined brackets 117. I have shown four of these brackets. Each bracket is adjusted in the ways and held in its adjusted position by means of the radial adjusting-screw 118, engaging a screw-threaded bearing on the bracket, and an ear 119 on the head.

120 are radial rock-shafts supported on ears 121 on the head 115 and bracket 117, said shafts passing through the hubs of bevel gear-wheels 122, journaled in the upper end of the brackets.

I provide a spline on the gear-wheel and a keyway 123 on the shaft to permit the adjustment of the gear-wheel on the shaft while constantly maintaining a drive connection between them. Each shaft is rocked through the rock-arm 124, connected by the link 125 to the collar 109.

125ª are shafts journaled in inclined bearings in the brackets 117, having a bevel-pinion 126 at the upper end, engaging the bevel gear-wheel 122, and at its lower end carrying the cutters.

127 is the cutter-head secured on the end of the shaft 125ª. 128 is a cutter thereon secured by the screw-bolt 129 and acting to cut the upper bevel on the head.

129ª is a sector-shaped convex disk having the curved saw-toothed section 130 on one edge eccentrically arranged in relation to its axis, the shaft 125ª, to the end of which it is secured by the nut 131.

The raising and lowering of the collar 109 will, through the connections described, rock the shaft 120 and the shaft 125ª and its cutters, as shown in full and dotted lines in Fig 12, into and out of the work. As the tooth-section 130 on the disk or saw cutter projects below the cutter 128, and as these cutters are brought into work at an obtuse angle to the plane of the blank, the saw-teeth will cut under the blank and cut the under bevel while the cutter 128 cuts the upper bevel of the barrel-head, the head and its cutters being constantly revolved through the connections described.

The operation of the device is as follows: The operator fills the fence with blanks or boards, as shown in Fig. 6, the machine, properly adjusted, is set in motion, the carrier first takes the lower blank from the fence, past the saw 57, which trims it, and at the next intermittent feed under the marker 60, when the blank is adjusted to cut out the knots, as described. The next movement brings the blank upon the cutter-section of the table. The sections or boards I preferably clamp together, while being cut, by side clamps 71, actuated by the lever system shown in Fig. 10, and the cam 133 on the cam-shaft, these clamps having a spring 134 to withdraw them when the head is cut. I also preferably clamp down the corners by the lever-clamps 135, Figs. 2 and 5, secured to and operated by the shaft 96. At the same time the clamps above described are applied, the clamping-head 95 is lowered, the dogs 85 are pressed up into the blank, and the receding ring 92 lowers. Simultaneously the collar 109 is lowered and puts the cutters to work upon the blank, as described. The parts then return to their initial position, the dogs retract, the ring 92 is lifted, the carrier feeds out the formed head, and a new blank is fed in and the operation repeated.

The cams on the cam-shaft and the levers and connections are so constructed as to properly time the operation of the parts to effect the work as described.

I may, and preferably do, connect the springs 136 to the side clamps 71, these springs bearing against the sides of the work while under the marker 60.

What I claim as my invention is—

1. In a barrel-head machine, a carrier comprising carrier-chains, a cross-bar, a series of adjustable plates or heads on the front face of the cross-bar, dogs for holding the plates in their adjusted position, means for tripping the dogs and means for returning the plates, substantially as described.

2. In a barrel-head machine, the combination of a carrier having chains and cross-bars, a series of adjustable plates or heads on the front face of the cross-bars, springs acting to hold the plates in their initial position, dogs for holding them in their adjusted position, and means for tripping the dogs, substantially as described.

3. In a barrel-head machine, a carrier, the cross-bars thereon, the heads 62, having ratcheted stems 63 passing through the cross-bar, springs 68 for holding the heads in their initial position, the spring-pressed rods 66, having toothed dogs 65 adapted to engage the ratcheted stems, and means for shifting the rods 66, to release the dogs in the travel of the carrier.

4. In a barrel-head machine, the combination of an intermittently-actuated carrier,

cross-bars thereon, having adjustable heads or plates on the front face, and an indicator such as the ring 60, in the relation and for the purpose described.

5. In a barrel-head machine, the combination of the table the intermittently-actuated carrier comprising the connecting cross-bars running over the table, a fence at one end of the table, having its bottom edge elevated above the table the width of the blanks, the adjustable plates on the front face of the cross-bars, the trimming-saw, 57 at one edge of the table, the cutters, and the indicator, such as the ring 60, between the fence and cutters.

6. In a barrel-head machine, the combination with endless-carrier sprocket-chains, clamping device, cutters, and means for actuating the same, of sprocket-wheels over which the chains pass, a shaft on which the wheels at one end are mounted, a sleeve on which the opposite wheels are mounted, a shaft passing through the sleeve, and means for adjusting the sleeve transversely of the shaft and locking the same in its adjusted position, comprising a finger on the shaft, a finger on the sleeve, and an adjusting means connecting the fingers, substantially as described.

7. In a barrel-head machine, the combination of suitable clamps for the lumber, of a revolving cutter-head above the work, and cutters thereon comprising separate blades arranged one in advance of the other united and arranged at an obtuse angle to the plane of the work and means for moving the cutters into the work to cut out and to cut both the bevels on the edge of the head.

8. In a barrel-head machine, the combination of suitable clamps for the lumber, of cutters comprising separate cutting-blades the cutting edges of which are arranged one in advance of the other and the whole above the work, arranged at an obtuse angle to the barrel-head, means for revolving the cutters and for moving them into and out of the work to cut both the bevels as described.

9. In a barrel-head machine, the combination with suitable clamps for the lumber, of a rotary cutter-head above the work, curved disk cutters secured at the edges of the head at an obtuse angle to the barrel-head, having eccentrically-arranged saw-teeth thereon and means for rocking the cutters to bring the teeth in and out of the work.

10. In a barrel-head machine, the cutter comprising a head, a concavo-convex sector-shaped disk, a pivotal support therefor and cutter-teeth eccentrically arranged at one edge of the disk a support for the head and means for actuating the cutters.

11. In a barrel-head machine, the combination of the cutter-head, the inclined shaft such as 125ª thereon, the cutter 128 thereon, the curved disk 129ª, having eccentrically-arranged teeth at one edge, and means for rocking the shaft to bring the cutters into and out of the work.

12. In a barrel-head machine, the combination of the cutter-head, having a revolving radial guide therein, an inclined bracket adjustably secured in said guide, a shaft journaled in said bracket, carrying the cutters at its lower end, and means for rocking the shaft to bring the cutters into and out of the blank or work.

13. In a barrel-head machine, the combination of the revolving cutter-head, the radial rock-shafts thereon, the inclined shafts at the outer edge of the head, the eccentrically-arranged cutters at the lower end thereof arranged eccentric to the rock-shaft a gear connection between the two shafts, and means for rocking the rock-shaft for the purpose described.

14. In a barrel-head machine, the combination of the revolving cutter-head, the inclined brackets 117 thereon, the inclined shafts journaled in the brackets, the eccentrically-arranged cutters at the lower end of the shafts arranged eccentric to the rock-shaft, horizontal shafts journaled on the head and extending to the brackets, a gear connection between the two shafts and means for actuating the rock-shaft.

15. In a barrel-head machine, the combination of the table a vertical revolving hollow shaft above the table journaled in stationary bearings, carrying the cutter-head at its lower end, a shaft extending through the hollow shaft, a clamping-disk at the lower end of the shaft, means for intermittently reciprocating the inner shaft, cutters on the head and means for moving the cutters upon the head intermittently in and out of the work.

16. In a barrel-head machine, the combination of the hollow shaft 105, carrying the cutters, the reciprocating shaft 96 within, the clamping-plate at the lower end thereof, and the corner-clamps 135, connected to and operated by the shaft 96, substantially as described.

17. In a barrel-head machine, the combination of the table, the movable clamp above the table, of a series of dogs normally beneath the table, and devices for moving them up through the table into the work as the upper clamp moves down.

18. In a barrel-head machine, the combination of the table, the movable clamp above the table, the disk 83 below the table, the adjustable pointed dogs or pins 85 at the edges of the disk entering apertures in the table and normally below the top thereof, and intermittently-actuating devices for the disk to raise the dogs above the table, for the purpose described.

19. In a barrel-head machine, the combination with the table, the feeding devices for the material on and over the table and the reciprocating cutters above the same as described, the ring 92 in the table below the cutters,

means for holding the ring normally to form a complementary portion of the table, and mechanism acting automatically for causing the ring to recede as the cutters lower comprising the rotating cam-plate 80 and levers for turning the plate during the movement of the cutters, substantially as described.

20. In a barrel-head machine, the combination of the table-section 75, the journal 77, the pin thereon entering the section 75, the bracket 79 supporting the lower end of the hub, the ring 92 around the section 75, the spring-supported disk 84 carrying the ring, the dogs 85, the disk 83 carrying the dogs and the intermittently-actuated cam-plate 80 between the two disks, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ALBERT HITZERT.

Witnesses:
WM. A. BROWN,
JOHN L. JACKSON.