March 17, 1925. 1,529,685

E. F. BEUGLER

MACHINE FOR MAKING BARRELS

Filed June 22, 1922 4 Sheets-Sheet 1

Fig. 2.

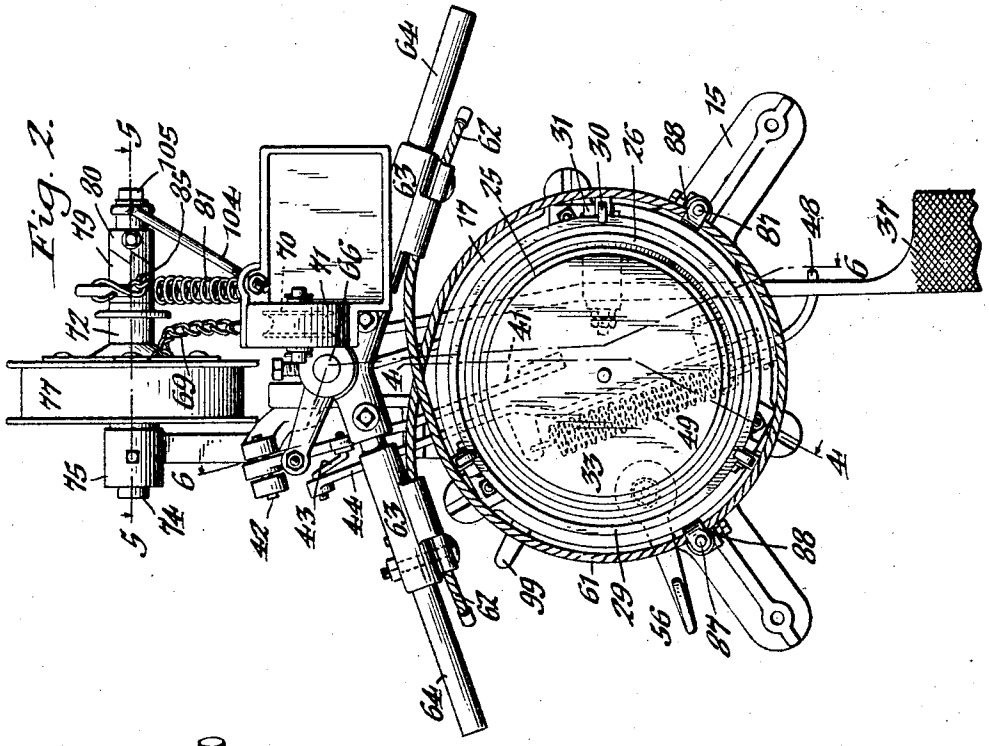
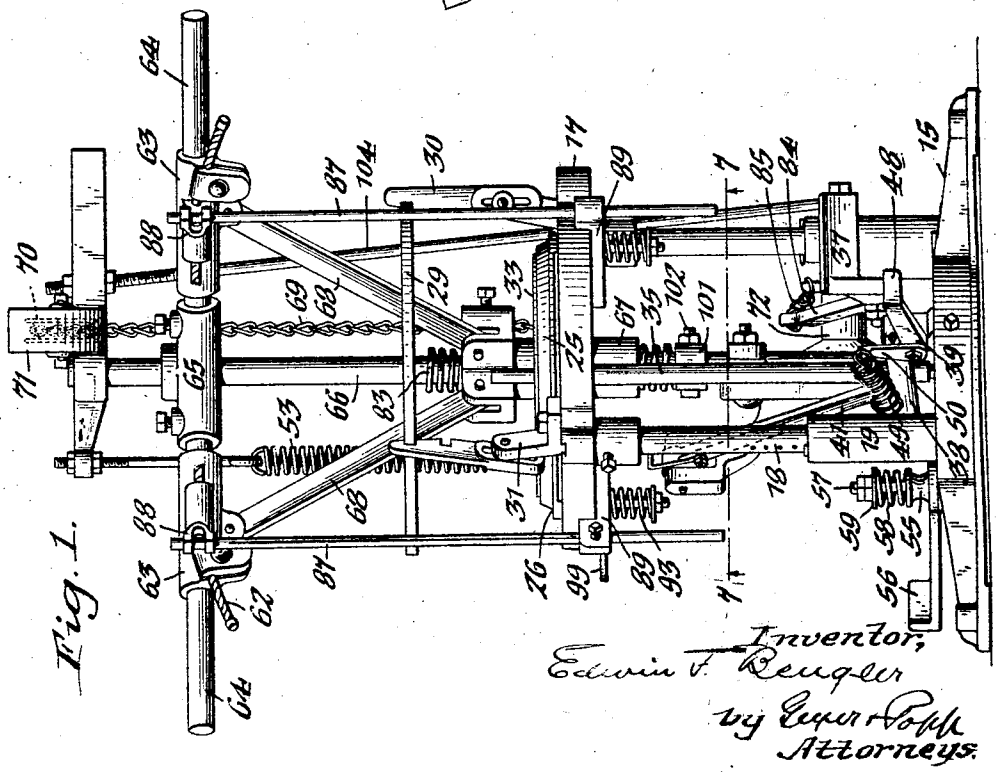


Fig. 1.



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MACHINE FOR MAKING BARRELS

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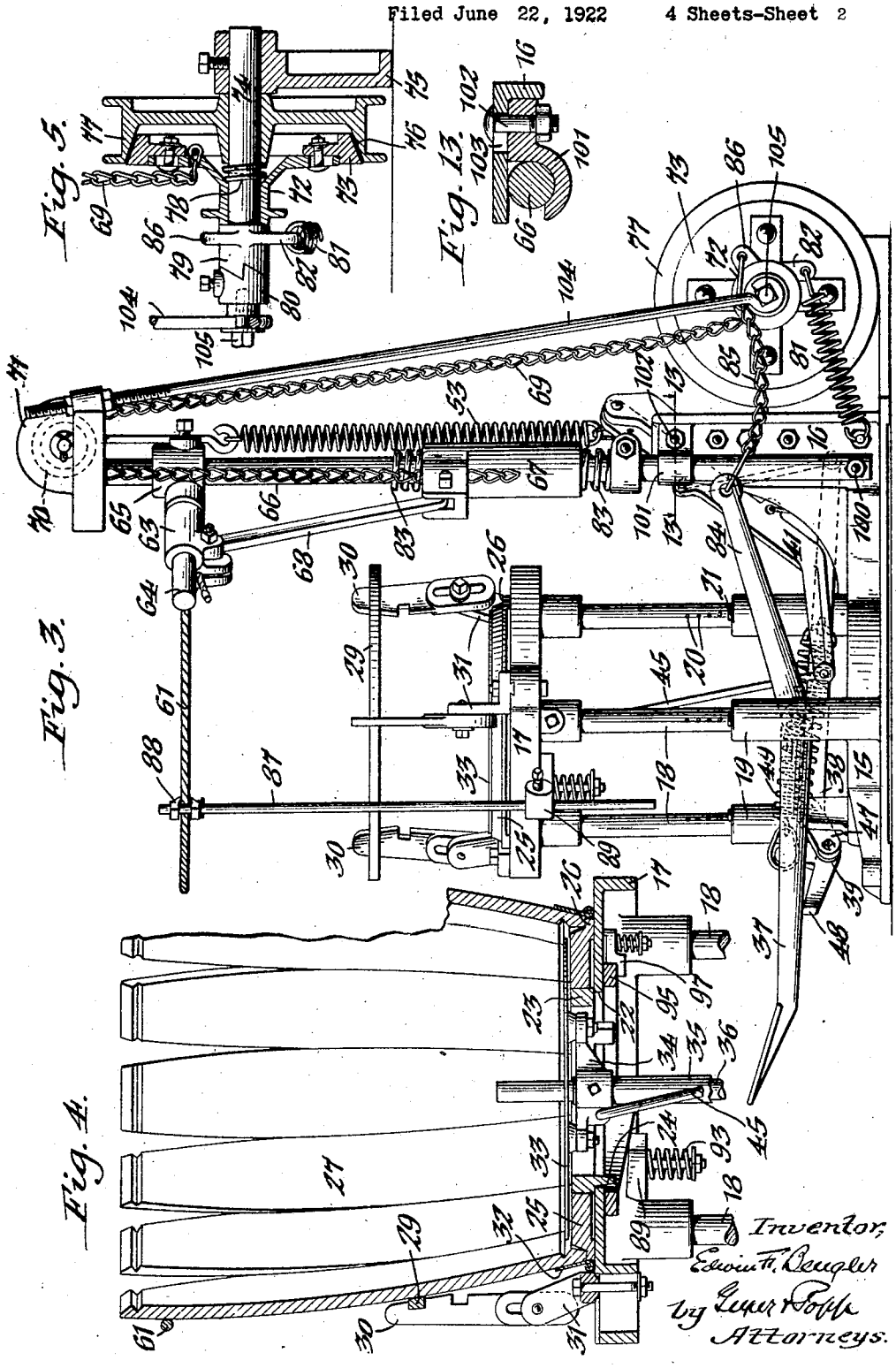


Fig. 5.

Fig. 13.

Fig. 3.

Fig. 4.

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MACHINE FOR MAKING BARRELS

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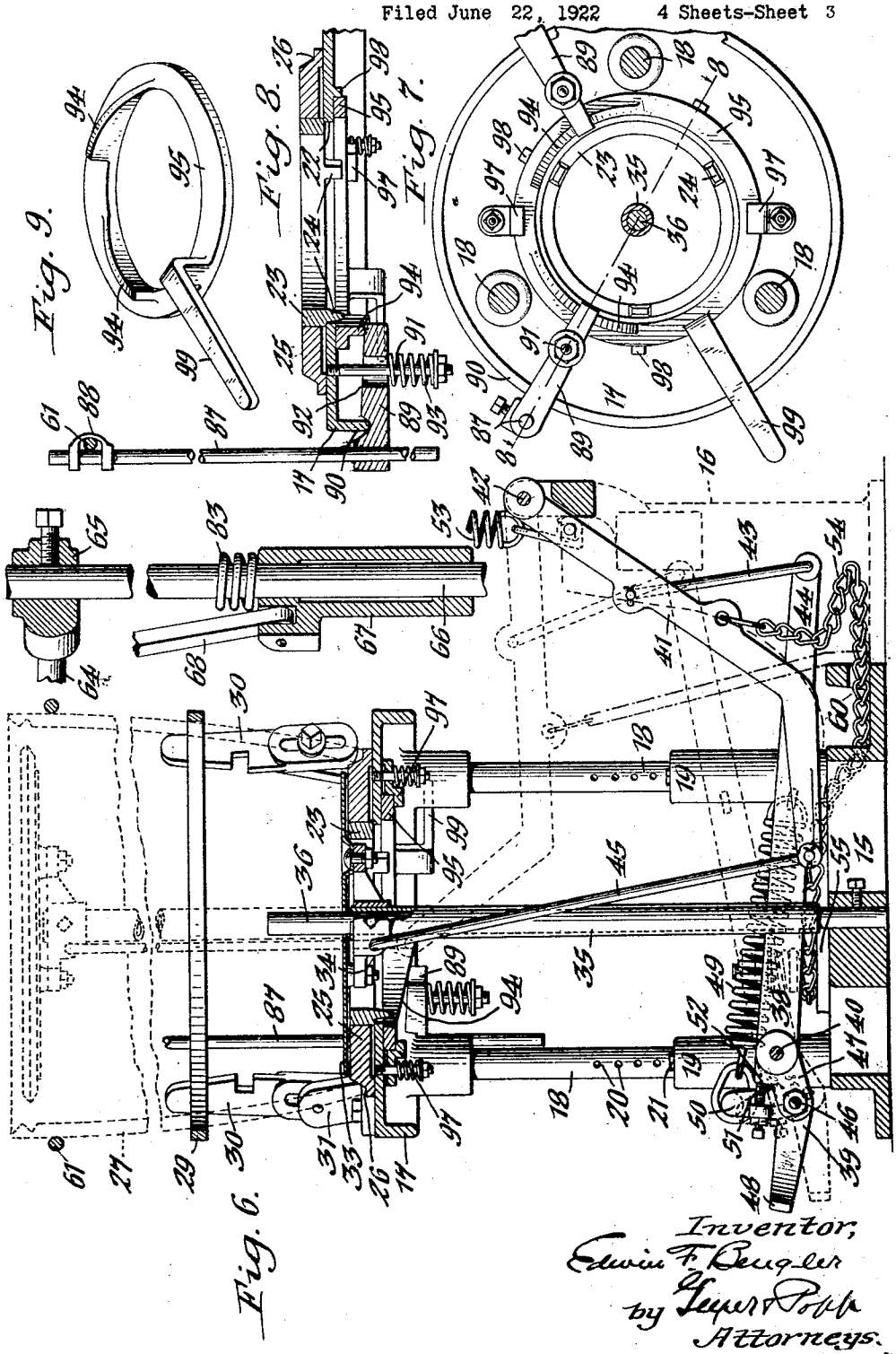


Fig. 9.

Fig. 8.

Fig. 7.

Fig. 6.

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March 17. 1925. 1,529,685

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MACHINE FOR MAKING BARRELS

Filed June 22, 1922 4 Sheets-Sheet 4

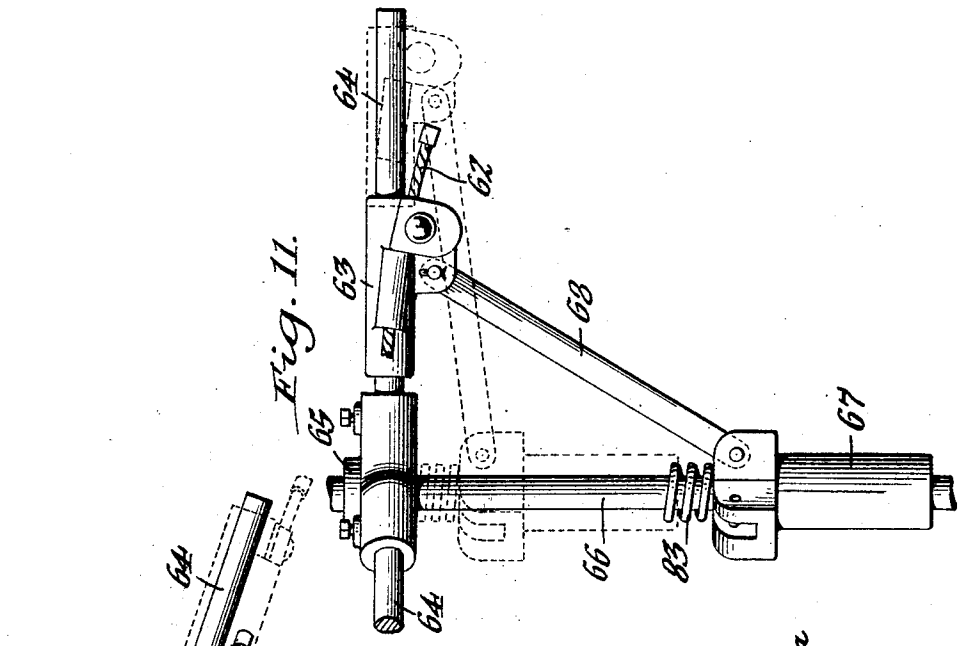


Fig. 11.

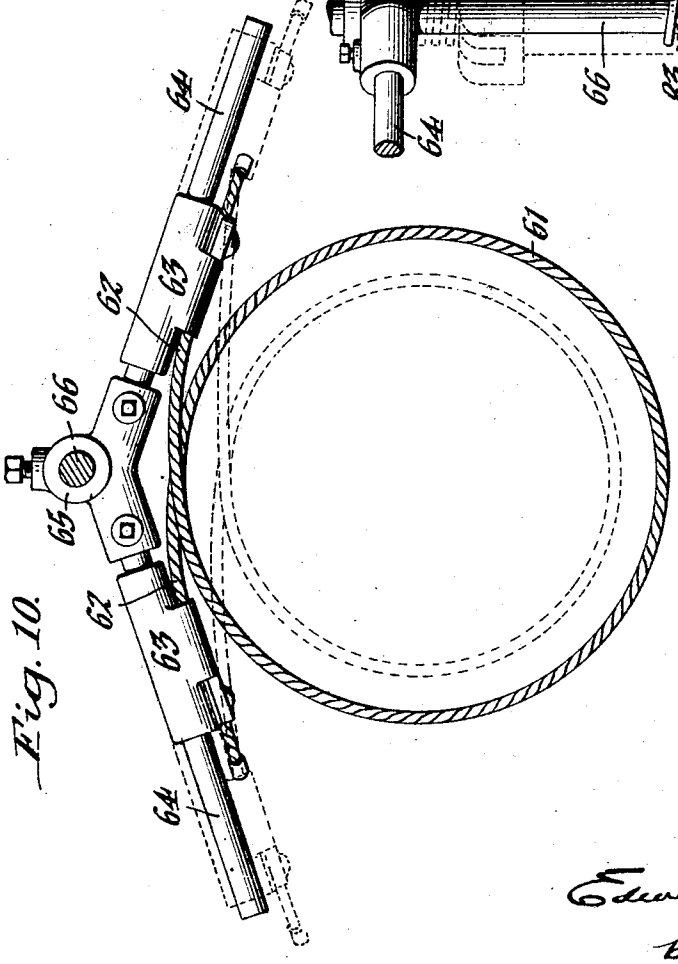


Fig. 10.

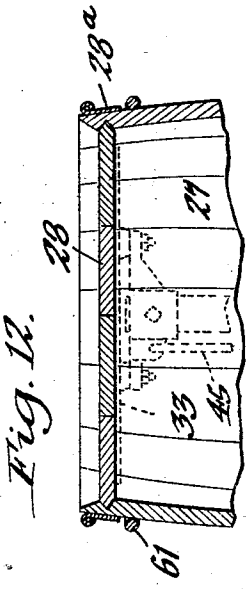


Fig. 12.

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COPY

Patented Mar. 17, 1925. 1,529,685

UNITED STATES PATENT OFFICE.

EDWIN F. BEUGLER, OF BUFFALO, NEW YORK, ASSIGNOR TO E. & B. HOLMES MACHINERY COMPANY, OF BUFFALO, NEW YORK, A CORPORATION OF NEW YORK.

MACHINE FOR MAKING BARRELS.

Application filed June 22, 1922. Serial No. 570,111.

To all whom it may concern:

Be it known that I, EDWIN F. BEUGLER, a citizen of the United States, residing in Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Machines for Making Barrels, of which the following is a specification.

This invention relates to a machine for making barrels and is of the type in which the staves are first assembled loosely upon a suitable support and then drawn together about the head for receiving the hoops.

Its object is to provide an improved machine of this character which is simple and compact in construction, which enables barrels to be made expeditiously with a minimum expenditure of labor and power, and which requires no special skill or undue effort on the part of the operator for manipulating it.

In the accompanying drawings:

Figure 1 is a front view of a barrel making machine embodying my improvements. Figure 2 is a top plan view thereof. Figure 3 is an elevation view of the right hand side of the machine. Figure 4 is an enlarged fragmentary vertical section on line 4—4, Fig. 2 and showing the barrel staves assembled loosely on the machine before being drawn together about the head. Figure 5 is an enlarged transverse section on line 5—5, Fig. 2. Figure 6 is an enlarged fragmentary vertical section taken substantially in the plane of line 6—6, Fig. 2. Figure 7 is an enlarged fragmentary horizontal section on line 7—7, Fig. 1. Figure 8 is a vertical section on line 8—8, Fig. 7. Figure 9 is a perspective of the rotatable cam ring for adjusting the cable loop supporting rods. Figure 10 is an enlarged plan view of the cable loop and associated parts. Figure 11 is a fragmentary front view thereof. Figure 12 is a fragmentary sectional view of a barrel showing the head in place. Figure 13 is an enlarged horizontal section on line 13—13, Fig. 3.

Similar characters of reference indicate corresponding parts throughout the several views.

In its general organization, the machine comprises a main frame for supporting its working parts, a platform for supporting the staves of a barrel in a loosely assembled condition preparatory to securing the head in its upper end, a vertically movable head support for holding the head in alinement with the croze in the staves preparatory to contracting them about the head, means for compressing the staves about the head, and a unitary, manually operated device for successively actuating said head support and said stave compressing means.

The main frame of the machine comprises a base 15 which terminates at its rear end in a substantially upright bracket 16.

17 represents the barrel supporting platform which is arranged centrally above the base 15 and mounted for vertical adjustment relatively thereto for making barrels which vary in height, the preferred means for this purpose comprising a plurality of upright supporting rods or legs 18 secured at their upper ends to the underside of the platform while their lower ends engage vertical sockets 19 formed on said base. Each supporting rod is provided near its lower end with a vertical row of holes 20 for receiving a cotter pin 21 which is adapted to rest on the upper end of the corresponding socket 19 for supporting the platform in a set position. The latter is provided in its top with a central opening 22 and resting on the same about said opening is a centering ring 23 having depending centering lugs 24 which are adapted to bear against the edge of the opening, as clearly shown in Figs. 7 and 8. Removably fitted over this centering ring is an annular stave-supporting plate 25 which is provided at its outer edge with a marginal base flange 26 forming a circular seat for supporting the lower ends of a set of staves 27 of a barrel in a loosely assembled condition preparatory to securing the head 28 between the upper ends of the staves and applying the upper hoop 28ª to the outer sides thereof. For barrels of different diameters, different sized supporting plates 25 are employed, it being only necessary to substitute one plate for another of a size corresponding to the diameter of the barrels to be made on the machine. By this construction, no fastening devices are required and the parts 23, 25 can be readily applied to and removed from the platform when desired.

The staves are held in an annular row in a substantially vertical position by a bilge or retaining hoop 29 surrounding the staves at a point below the bilge line of the barrel

and carried by a set of adjustable supporting arms 30 mounted on brackets 31 adjustable radially of the platform 17. The lower ends of the staves are fitted snugly and tightly together within an end hoop 32 resting on the platform and encircling the base flange of the supporting plate 25, as shown in Fig. 4.

33 represents a vertically movable head support which is preferably constructed in the form of a disk and which is adapted to support the head in line with the croze at the upper ends of the staves preparatory to the operation of contracting or compressing the staves about the head. This head support is mounted on a spider 34 secured to the upper end of a lifting tube 35 guided for vertical movement on an upright rod 36 extending centrally through the platform opening 22 and suitably fastened at its lower end to the base 15, as shown in Fig. 6.

To elevate the head support 33 quickly and with very little effort on the part of the operator, a system of levers and connecting links are employed, which, as shown in Figs. 1, 2, 3 and 6, preferably comprise a vertically-swinging treadle or foot lever 37 fulcrumed intermediate its ends on the base 15 of the machine, a divided or sectional lever 38, 39 pivoted to swing vertically on a horizontal pin 40 located at the front end of said base, a vertically swinging elevating lever 41 disposed opposite the sectional lever and fulcrumed at its rear end on a pivot pin 42 secured in the upper rear end of the upright bracket 16, a link 43 connecting the comparatively long rear arm 44 of the lever section 38 with the elevating lever 41 at a point forwardly of its fulcrum, and an upright lifting link 45 connected at its lower end to the front end of said elevating lever and at its upper end to the spider 34 of the head support. As shown in Fig. 6, the lever section 39 is in the form of a bell crank which is pivoted at 46 to the short arm 47 of the lever section 38, the front arm 48 of said lever section 39 being offset laterally, as shown in Fig. 2 and disposed below and in the path of movement of the foot lever 37.

These lever sections are so connected with each other that during the initial operating or down stroke of the foot lever 37, the same are adapted to swing as a single lever or unit about the fulcrum pin 40 to cause the head support 33 to be raised into the upper end of the barrel, as shown by dotted lines in Fig. 6, while on the final down stroke of said foot lever the lever section 39 rocks independently of its companion section 38 for a purpose hereinafter described. To this end a yielding connection is employed between these levers which preferably consists of a coil spring 49 connected at its front end to the upright arm 50 of the bell crank lever 39 while its rear end is connected to the arm 44 of the lever section 38. An adjustable stop 51 mounted on said arm 50 and abutting against a forwardly facing shoulder 52 on the short arm 47 of the lever section 38 serves to hold the companion lever section 39 from swinging upwardly about its pivot 46 under the pressure of the spring 49. In the normal inoperative position of these lever sections, shown by full lines in Fig. 6, said spring is under tension and disposed at an angle to the lever arm 44 so that its front end is above the sectional lever fulcrum 40. Upon the initial downward stroke of the foot lever 37, the same contacts with the arm 48 of the lever section 39 and swings it together with the rear section 38 in a corresponding direction, this being due to the initial tension on the spring 49, which for the time being holds the lever sections 38 and 39 immovable relatively to each other and thus compels the lever section 38 to move upwardly to raise the head support to the position shown by dotted lines in Fig. 6. In other words, the spring 49 tends constantly to hold the stop 51 of the lever section 39 against the stop shoulder 52 of the lever section 38 during the initial operative stroke of the foot lever. A suspension spring 53 normally under tension and fastened at its lower end to the elevating lever 41 assists the elevating operation of the head support, requiring only a little effort on the part of the operator for this purpose. This spring also functions to cushion the return or downward movement of the head support and associated parts.

Means are provided for positively arresting the upward movement of the head support so that the barrel head is positioned properly in line with the croze in the staves. The preferred means for accomplishing this result consist of a flexible connection 54 which may be in the form of a chain fastened at one end to the elevating lever 41 and at its other end to an adjustable windlassing drum 55 having a handle 56 fulcrumed on a vertical stud 57 secured to the base 15 of the machine, as shown in Figs. 1, 2 and 6. A spring 58 surrounding this stud and bearing at its lower end against the drum and at its upper end against a retaining washer 59 serves to frictionally hold said drum in adjusted position. By turning the drum handle in one direction or the other, the active length of the stop chain is increased or decreased to correspondingly limit the height to which the head support is to be raised. As shown in Fig. 6, this chain passes through a guide opening 60 in the rear portion of the base 15, so that in the elevated position of the lever 41 that portion of the chain between

the latter and said guide opening is distended in a substantially vertical line.

The contraction of the upper ends of the set of staves for engaging the croze thereof with the edge of the barrel head preparatory to applying the upper hoop 28ª thereto is effected by means which preferably comprises a flexible line or draw cable having its central part doubled to form a loop or noose 61 adapted to embrace or surround the upper ends of the barrel staves, while the ends 62 of said cable are connected with means for pulling or drawing them in opposite directions for tightening the loop around the staves and causing the latter to be contracted into engagement with the barrel head. The preferred means for thus drawing out the ends of the cable comprise two horizontally movable slides or carriages 63, 63 to which the opposite ends of said cable are detachably connected, respectively, and which are arranged to slide on forwardly diverging guide rods 64 arranged transversely above the rear part of the platform 17 and fastened at their inner ends to a vertically adjustable, clamping collar 65 mounted near the upper end of an upright supporting post 66 suitably fastened at its lower end to the base bracket 16, as shown in Fig. 3. These cable slides are caused to move toward and from each other for either loosening or tightening the loop of the cable by means which include a vertically movable toggle slide 67 guided on the post 66, two toggle bars or links 68 connecting opposite sides of the toggle slide with the corresponding cable slides 63, an elevating or hoisting chain 69 passing around a pulley 70 journaled in a housing 71 secured to the upper end of said post and fastened at one end to said toggle slide and at its other end to a winding drum 72 formed on the hub of a shiftable clutch member 73 mounted on a horizontal arbor 74 carried by an extension 75 of the base bracket 16. Said shiftable clutch member is adapted to be moved into and out of frictional engagement with its companion clutch member 76, which latter may be formed on the inner side of the rim of a driving pulley 77 also journaled on the arbor 74 and driven from any suitable source of power. A spring 78 normally holds the clutch members out of engagement, while a rotatable cam or shifting sleeve 79 interposed between the hub of the slidable clutch member 73 and a collar 80 fixed on the end of said arbor serves to move said clutch member 79 into engagement with its companion driven clutch member 76. A coil spring 81 connected at one end to the bracket 16 and at its other end to a depending arm 82 of the shifting sleeve 79 tends normally to hold the latter in its inoperative or released position.

Springs 83 surrounding the upright post 66 and located above and below the toggle slide 67 serve to absorb the shocks incidental to the raising and lowering movements of the latter.

The shifting sleeve 79 of the windlassing clutch is turned in the proper direction to move the clutch member 73 into engagement with its companion clutch member to raise the toggle slide 67 and in turn contract the cable loop 61 about the barrel staves through the medium of the foot lever 37, the clutch being engaged after the head support 33 has been elevated and the heading applied thereto. In other words the initial stroke of the foot lever raises the head support into its operative position and the final stroke thereof actuates the shifting sleeve to engage the clutch and operate the hoisting drum 72. For this purpose the rear arm 84 of the foot lever is operatively connected to the shifting sleeve by a flexible member 85, which may be in the form of a chain, as shown in Fig. 3, the front end of said chain being directly connected to said lever arm and its rear end being fastened to an arm 86 extending upwardly and rearwardly from said shifting sleeve. Normally there is sufficient slack in this chain to permit of the initial movement of the foot lever without affecting the clutch operating mechanism.

The cable loop is preferably held in a horizontal position above the platform 17 upon a pair of upright rods 87 having suitable guides 88 at their upper ends for supporting the loop at its front side. Each rod is mounted for vertical adjustment in the outer end of a rock bar 89 preferably fulcrumed on the bottom edge of the platform rim 90. A stud bolt 91 depending from the platform passes through a slot 92 in the respective rock bar and a spring 93 applied to said bolt resists the inward rocking movement of the corresponding rod 87. The upper sides of the inner ends of the rock bars bear against cam flanges 94 depending from a rotatable adjusting ring 95 disposed centrally on the underside of the platform 17 and held frictionally in place by a pair of retaining clips 97 yieldingly mounted on said platform as shown in Figs. 6 and 7. Centering lugs 98 formed on the underside of the platform about its opening 22 serve to guide this ring during its rotary movement. A suitable operating handle 99 extends laterally from said ring, as shown in Figs. 7 and 9. By rotating the cam ring in one direction or the other, the cable supporting rods 87 are correspondingly tilted inwardly or outwardly to enable the size of the cable loop to be changed to suit barrels of different diameters. It will be understood however, that the ends of the cable which are attached to the horizontal slides are first loosened therefrom before adjusting the loop to a desired size.

It is necessary that the pull on the ends

of the cable should be substantially tangential to the periphery of the circular row of barrel staves in order to avoid any lateral strain or displacement of the staves at this time. In order, therefore, to keep the pull tangential regardless of the size of the loop corresponding to a certain sized barrel, the upright post 66 on which the operating mechanism of the cable is mounted is adjustably mounted on the bracket 16 so as to be tiltable toward and from the platform 17. To this end, said post is pivoted at its lower end to the bracket 16 by a bolt 100 and held in adjusted position by a strap 101 adjustable horizontally at the upper end of said bracket. This adjustment may be effected by a clamping bolt 102 engaging said strap and passing through a horizontal slot 103 in the bracket. In the upright position of the post shown in the drawings, the cable loop is of the proper size for making large barrels, while for barrels of a smaller diameter said post is tilted forwardly and the cable loop correspondingly reduced.

A diagonal brace rod 104 may be employed for further holding the post in a set position, one end of this rod being pivotally fastened to one end of the arbor 74 by means of a bolt 105, while its upper end is suitably connected to the pulley housing 71 or other adjacent part, as shown in Fig. 3.

Briefly stated, the operation of the machine is as follows:

A set of staves of a barrel are assembled in an annular row on the supporting plate 25 with their lower ends snugly fitted within the end hoop 32, as shown in Fig. 4. The operator then depresses the foot lever 37, the initial movement thereof forcing the head supporting disk 33 upwardly into the upper end of the barrel, as shown by dotted lines in Fig. 6. While in this position, the heading is placed on said supporting disk, after which the foot lever is further depressed to engage the clutch 73, 76 and cause the cable loop 61 to be drawn tightly about the staves and compress them into engagement with the barrel head. The upper hoop 28^a is then driven into position and the foot lever released, whereupon the parts automatically return to their original position and are ready to make the next barrel.

I claim as my invention:

1. A machine of the character described, comprising a platform for the assembled staves, a vertically movable head support, means for compressing the staves about said head, and unitary means for actuating said head support and said stave compressing means.

2. A machine of the character described, comprising a platform for the assembled staves, a vertically movable head support, elevating means for said head support, means for compressing the staves about said head, and a single means operatively connected to said elevating means and said stave compressing means for successively controlling the actuation of said parts, respectively.

3. A machine of the character described, comprising a platform for the assembled staves, a vertically movable head support, elevating means for said head support, a draw cable including a loop arranged to encircle the staves, means for contracting said cable loop to compress the staves into engagement with the head, and a foot lever for controlling said elevating means and said loop contracting means, one arm of said lever being operatively connected with the head support elevating means and the other arm operatively connected with the loop contracting means.

4. A machine of the character described, comprising a platform for the assembled staves, a vertically movable head support, elevating means for said head support, a draw cable including a loop arranged to encircle the staves, a single means for contracting said cable loop to compress the staves into engagement with the head comprising a pair of horizontally movable cable slides, a vertically movable toggle slide operatively connected to said cable slides, means for actuating said toggle slide in a direction to contract the cable loop about the barrel staves, and a single means operatively connected to said head support elevating means and said toggle slide actuating means for successively controlling the movement of said parts.

5. A machine of the character described, comprising a platform for the assembled staves, a vertically movable head support, elevating means for said head support, a draw cable including a loop arranged to encircle the staves, means for contracting said cable loop to compress the staves including a power driven member, a clutch for said member, and a control lever operatively connected with said elevating means and said clutch.

6. A machine of the character described, comprising a platform for the assembled staves, a vertically movable head support, elevating means for said head support, a draw cable including a loop arranged to encircle the staves, means for contracting said cable loop to compress the staves including a power driven member, a clutch for said member, a shifting device for said clutch, a control lever for said elevating means and said clutch shifting device, one arm of said lever being operatively connected with the elevating means, and a flexible connection between the other arm of said lever and the clutch shifting device whereby said parts are actuated at predetermined points in the movement of the lever.

7. A machine of the character described

comprising a stave assembling platform, a vertically movable head support, and means for lifting said support comprising two oppositely disposed vertically swinging levers, a link connecting the levers with each other, a second link connecting one of said levers with said head support, and a control lever operatively connected with the other of said levers.

8. A machine of the character described, comprising a base, a stave assembling platform mounted on said base, a vertically movable head support, and means for lifting said support comprising a vertically-swinging elevating lever fulcrumed at the rear end of said base, a link connecting said lever with said head support, a second lever fulcrumed for vertically swinging movement at the front end of said base, a link connecting the rear arm of said second lever with the elevating lever, and an operating lever arranged to actuate the other arm of said second lever.

9. A machine of the character described, comprising a base, a stave assembling platform mounted on said base, a vertically movable head support, and means for lifting said support comprising a vertically-swinging elevating lever fulcrumed at the rear end of said base, a link connecting said lever with said head support, a second lever fulcrumed for vertically swinging movement at the front end of said base, a link connecting the rear arm of said second lever with the elevating lever, a suspension spring applied to the latter for cushioning the return movement of said head support, and an operating lever arranged to engage the other arm of said second lever.

10. A machine of the character described, comprising a stave assembling platform, a vertically movable head support, an elevating lever operatively connected to said head support, a draw cable including a loop arranged to encircle the staves, means for contracting said cable loop to compress the staves including a power driven member, a clutch for said member, means for controlling said clutch, and means for successively actuating said elevating lever and said clutch controlling means comprising a foot lever, a flexible connection between said foot lever and said clutch controlling means, a lever consisting of two sections arranged to normally swing about a common fulcrum, one of said lever sections being operatively connected to said elevating lever and the other arranged in the path of movement of said foot lever, and means for yieldingly connecting said lever sections whereby they are held immovable relatively to each other to swing about their common fulcrum during the initial operating stroke of the foot lever.

11. A machine of the character described, comprising a stave assembling platform, a vertically movable head support, an elevating lever operatively connected to said head support, a draw cable including a loop arranged to encircle the staves, means for contracting said cable loop to compress the staves including a power driven member, a clutch for said member, means for controlling said clutch, and means for successively actuating said elevating lever and said clutch controlling means comprising a foot lever having its rear arm operatively connected to said clutch controlling means, a vertically-swinging lever having its rear arm operatively connected to said elevating lever, a second vertically movable lever fulcrumed on the front arm of said first-named lever and having its front arm arranged in the path of movement of said foot lever, and a spring connecting the rear arm of the first named lever with the corresponding arm of the second lever, said spring tending to hold the connecting levers immovable relatively to each other during the initial operating stroke of the foot lever but permitting said second lever to move independently of its companion lever on the final stroke of the foot lever.

12. A machine of the character described comprising a stave assembling platform, a vertically movable head support, an elevating lever operatively connected to said head support, a draw capable including a loop arranged to encircle the staves, means for contracting said capable loop to compress the staves including a power driven member, a clutch for said member, means for controlling said clutch, and means for successively actuating said elevating lever and said clutch controlling means comprising a foot lever, having its rear arm operatively connected to said clutch controlling means, a vertically-swinging lever having itsc rear arm operatively connected to said elevating lever and its front arm provided with a stop shoulder, a bell crank lever fulcrumed on the front arm of said last-named lever and having its front arm arranged in the path of the movement of said foot lever, the rear arm of said bell crank lever being provided with a stop normally engaging said stop shoulder, and a tension spring connecting the rear arm of said swinging lever with the corresponding arm of said bell crank lever.

13. A machine of the character described, comprising a base, a stave assembling platform, a vertically movable head support, means for lifting said head support, and means for arresting the upward movement of said support including an adjustable drum mounted on said base and having a handle. a flexible member connected at one end to said drum and at its other end to said lifting means, and means for frictionally holding said drum in adjusted position.

14. A machine of the character described, comprising a stave assembling platform, a draw cable including a loop arranged to encircle the staves, and yielding means for supporting said loop in a substantially horizontal position, said supporting means being movable in unison with the loop during its expanding and contracting movements.

15. A machine of the character described, comprising a stave assembling platform, a draw cable including a loop arranged to encircle the staves, upright posts mounted on said platform and capable of tilting radially thereof, and guides carried by said posts for supporting said cable loop in a substantially horizontal position.

16. A machine of the character described comprising a stave assembling platform, a draw cable including a loop arranged to encircle the staves, rock bars yieldingly mounted on said platform, upright posts carried by said bars, and guides on said posts for supporting said cable loop in a substantially horizontal position.

17. A machine of the character described comprising a stave assembling platform, a draw cable including a loop arranged to encircle the staves, yieldable means for supporting said loop in a substantially horizontal position and means for adjusting said loop supporting means whereby the size of said loop is varied.

18. A machine of the character described comprising a stave assembling platform, a draw cable including a loop arranged to encircle the staves, vertically swinging rock bars fulcrumed on said platform, upright supporting devices carried by said rock bars for holding said cable loop in a substantially horizontal position, means for yieldingly resisting movement of said rock bars in one direction, and adjustable means for positively limiting their movement in the opposite direction.

19. A machine of the character described comprising a stave assembling platform, a draw cable including a loop arranged to encircle the staves, vertically swinging rock bars fulcrumed on said platform, upright supporting devices carried by said rock bars for holding said cable loop in a substantially horizontal position, means for yieldingly resisting movement of said rock bars in one direction, and a cam ring rotatably mounted on said platform and co-operating with said rock bars for limiting their movement in the opposite direction.

20. A machine of the character described comprising a stave assembling platform, a draw cable including a loop arranged to encircle the staves, vertically swinging rock bars fulcrumed on said platform, upright posts mounted in the outer arms of said bars, guides carried by said posts for supporting said cable loop in a substantially horizontal position, springs applied to one side of the inner arms of said rock bars for yieldingly resisting movement thereof in one direction, and an adjustable cam ring mounted on said platform and cooperating with the other sides of said inner arms for positively limiting the movement of the rock bars in the opposite direction.

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