(No Model.)

H. CAMPBELL.

CROZING MACHINE.

No. 492,137. Patented Feb. 21, 1893.

Fig. 1.

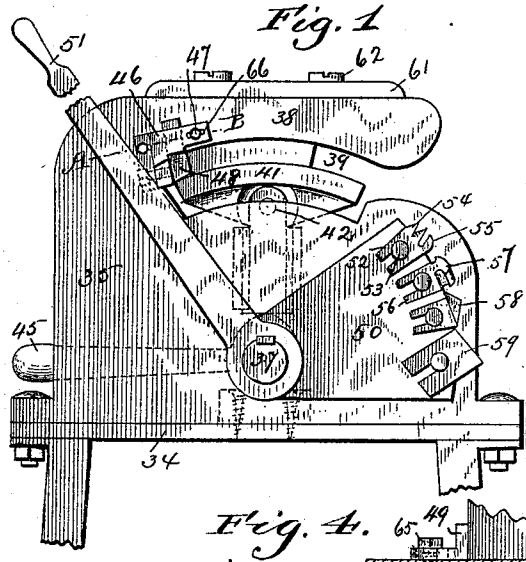


Fig. 3.

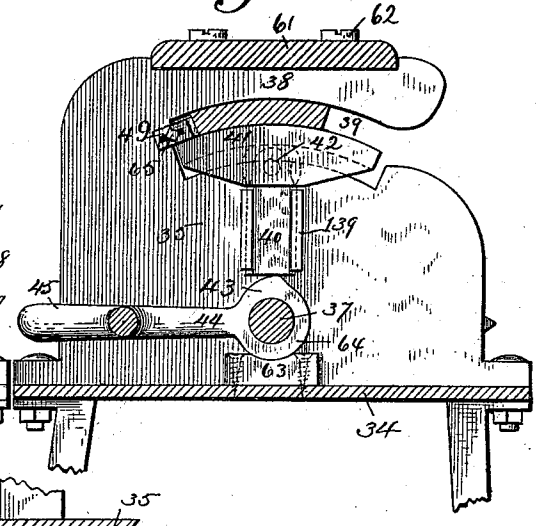
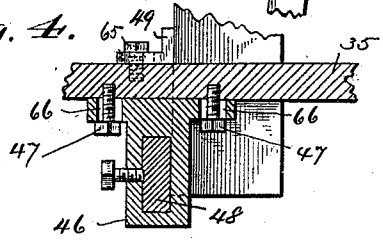


Fig. 4.



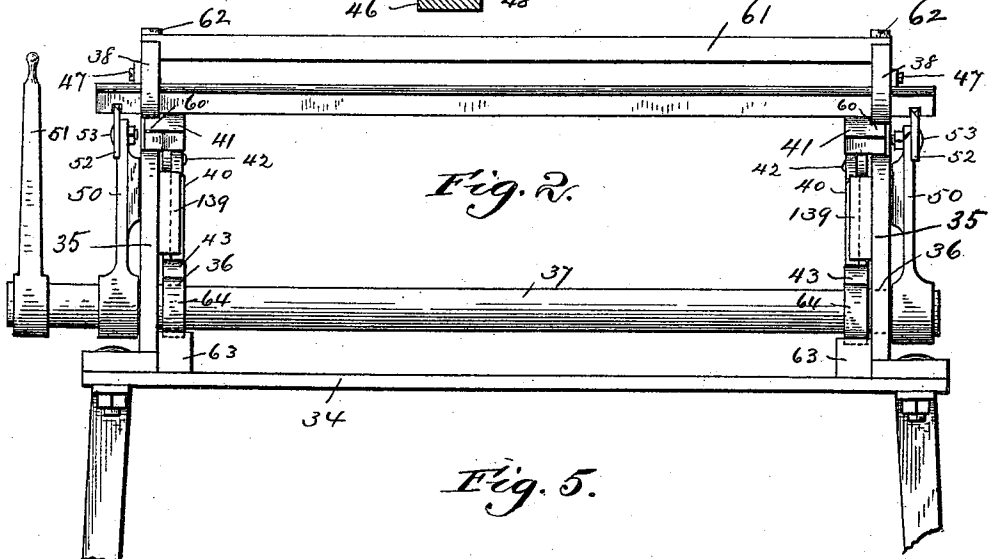


Fig. 2.

Fig. 5.

Witnesses:

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

HENRY CAMPBELL, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE CAMPBELL BARREL MACHINE COMPANY, OF SAME PLACE.

CROZING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 492,137, dated February 21, 1893.

Application filed November 20, 1891. Serial No. 412,529. (No model.)

To all whom it may concern:

Be it known that I, HENRY CAMPBELL, a citizen of the United States, residing at Baltimore city, in the State of Maryland, have invented certain new and useful Improvements in Crozing-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My present improvement relates to that class of crozing machines by which the staves are operated upon individually, before they are combined together in the form of the barrel, keg, or other article to be produced. By my invention I am enabled to utilize unskilled and cheap labor and to expeditiously form in the stave a croze or crozes of perfect and uniform character and of a greater or less depth according to the thickness of the stave.

The special objects of my invention are to obviate the difficulties heretofore encountered by reason of the varying thicknesses of staves, and of their transverse curvature, which render it almost impossible to produce a finished barrel in which the exterior surfaces of the staves are flush with each other without a planing operation.

The present invention is especially adapted for operation upon staves designed for tight work, *i. e.* for barrels or other vessels which are to contain liquids, or upon any staves which are so thick and stiff that they cannot be flattened during the crozing process. On the other hand a comparatively thin stave, such for instance as is employed in a flour or sugar barrel, can be bent so that its cross-section will assume exactly the curve desired preliminary to the crozing operation.

With such objects in view my invention consists in the parts and combinations thereof hereinafter more particularly set forth and claimed.

In order to make the improvements more clearly understood I have shown in the accompanying drawings means for carrying them into practical effect, without however intending to limit the application of the invention to the particular construction, which, for the sake of illustration, I have delineated.

In said drawings.—Figure 1 is an end view of a crozing machine embodying my invention. Fig. 2 is a rear view of the same. Fig. 3 is a transverse vertical section. Fig. 4 is a sectional view on line A—B, Fig. 1, the part 46 being also further broken away to show the clamping-screw which secures the part 48. Fig. 5 is a side view of the end of a finished stave.

Referring to the drawings, 34 indicates a bed plate adapted to be mounted upon legs at a height about equal to that of the waist of the operator, or to be secured to any preferred stand or foundation.

35, 35 indicate two segmental heads secured to said bed plate and provided with bearings 36 in which is mounted a shaft 37.

38 indicates rests situated at the circumference of the heads 35 and having between themselves and the shaft spaces or slots 39 in which the stave or staves to be crozed is or are received with their convex faces against the rests 38 and their concave faces toward the shaft.

139 are guides formed in or attached to the heads 35 and fitted with radially movable slides 40.

41 are clamps carried by the outer ends of the slides and preferably pivoted thereto at 42. Such pivoting causes the outer surface of the staves to conform in position to the rest, and the croze always to be cut in uniform relation to the said outer surface. These clamps may be convex on their outer faces, adapted to correspond with the concavity of the stave. I also prefer to form the inner faces of the rests 38 concave to correspond with the convex face of the stave. It will thus be seen that when the stave is in place beneath the rest, and the slides 40 are forced outward, the stave will be tightly clamped at each end between the said parts 38 and 41. The slides are actuated by cams or eccentrics 43 carried by an oscillatory part 44 having an actuating lever of any suitable form, such, for instance as that shown at 45, though I wish it to be understood that my invention may be availed of when another form of actuating lever is employed. Said part 44 is in the form of a yoke mounted on the shaft 37 and oscillatory independently thereof.

63 indicates blocks situated beneath the circular ends 64 of the yoke 44 and adapted to

receive the down thrust on the latter when the stave is clamped, thus relieving the shaft of any binding pressure.

46 indicates brackets rigidly mounted on the heads 35 by bolts 47 but adjustable toward and from the position of the stave by reason of the slots 66.

48 are stops or templets of wood, vulcanite, or soft metallic alloy clamped in said brackets and adapted to abut the rear edge of the stave.

49 are stops having slots and adjusting screws 65 engaging said stops and the heads 35 by which the stops 49 may be brought into a line parallel with the shaft 37, to the end that the stave when in place against said stops may also be parallel with the shaft and have its crozes cut on true transverse lines.

I do not regard the stops 49 as absolutely essential to the operation of the machine, but I prefer to employ them in connection with the templets 48 in order to more perfectly insure the true position of the stave at right angles to the planes in which the cutting devices move.

50 indicates two arms or sectors keyed upon or otherwise rigidly connected with the shaft 37, this shaft may be turned by any suitable actuating means, such for instance as a hand-lever 51.

The cutters for forming the croze proper are indicated at 52. They consist of a plate adjustably secured to the arm 50, as by a bolt 53 passing through a slot in the plate. The plate is formed with two scoring teeth 54 having their edges a distance apart equal to the width of the croze.

55 is a tooth having a cutting edge parallel with the shaft 37 and situated in line with the space between the edges of the scoring teeth. The tooth 55 removes the wood from between the scores cut by the teeth 54 and finishes the croze.

56 is the howeling cutter mounted on the arms 50 behind the crozing cutters and having a curved cutting edge 57.

58 is the cutter adapted to form the chine, and 59 that for cutting the chamfer at the end of the stave, these latter knives being mounted in the order named upon the arm 50 after the howeling cutter, and having their edges positioned to give a drawing cut.

The stave having been introduced into the spaces 39, through the openings 60, and placed against the wooden stops 48, the lever 45 is turned forcing out the clamps 41 till the stave is firmly held. The lever 51 is then drawn or turned so as to carry the arms 50 and the cutters across the concave face of the stave, this motion being repeated if necessary to perfect the croze. When the stops 48 are first inserted in the machine, and the above cutting operation performed, cuts will be formed by the knives in the stops exactly in line and corresponding with the crozes in the stave. Thereafter said stops will permit the free passage of the knives but will support the material at the rear of the stave and prevent its splintering as the cutters pass through it.

61 is a brace bar connecting the heads 35 and secured thereto by bolts 62.

What I claim is—

1. In a crozing machine the combination of the heads having rests or supports for the convex faces of the ends of the stave, a longitudinal shaft mounted in bearings in said heads and having mounted thereon suitable crozing cutters, guides on said heads extending in a direction from the shaft bearings toward said rests, slides adapted to reciprocate in said guides, toward and from the rests, clamps carried by the guides and adapted to engage the concave side of the stave, and means for operating said slides and shaft, substantially as set forth.

2. In a crozing machine the combination of the heads having rests or supports for the ends of the stave, a longitudinal shaft mounted in bearings in said heads and carrying suitable crozing cutters, guides on the heads extending in a direction from the shaft bearings toward said rests, slides movable in said guides toward and from said rests, convex clamps pivotally mounted on the slides and means for actuating said slides and shaft, substantially as set forth.

3. In a crozing machine the combination of heads or plates having rests to prevent the outward movement of the stave, and laterally open spaces for the ends of the stave between the head and rests, stops for the rear edge of the stave, a shaft having crozing cutters operating parallel with said heads, and adjusting devices for said stops, substantially as set forth.

4. The combination of the shaft carrying crozing cutters, clamps for the stave, and an oscillating part concentric with said shaft and adapted to operate said clamps, substantially as set forth.

5. The combination of the shaft carrying crozing cutters, clamps for the stave, and an oscillating part concentric with said shaft and adapted to operate said clamps and bearings for supporting said oscillating part independently of the shaft, substantially as set forth.

6. In a crozing machine the combination of heads or plates having rests to prevent the outward movement of the stave, stops of relatively soft material for the rear edge of the stave, at each end thereof and crozing cutters operating parallel with said heads and in line with said stops substantially as set forth.

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

HENRY CAMPBELL.

Witnesses:
H. N. LOW,
F. J. BENJAMIN.