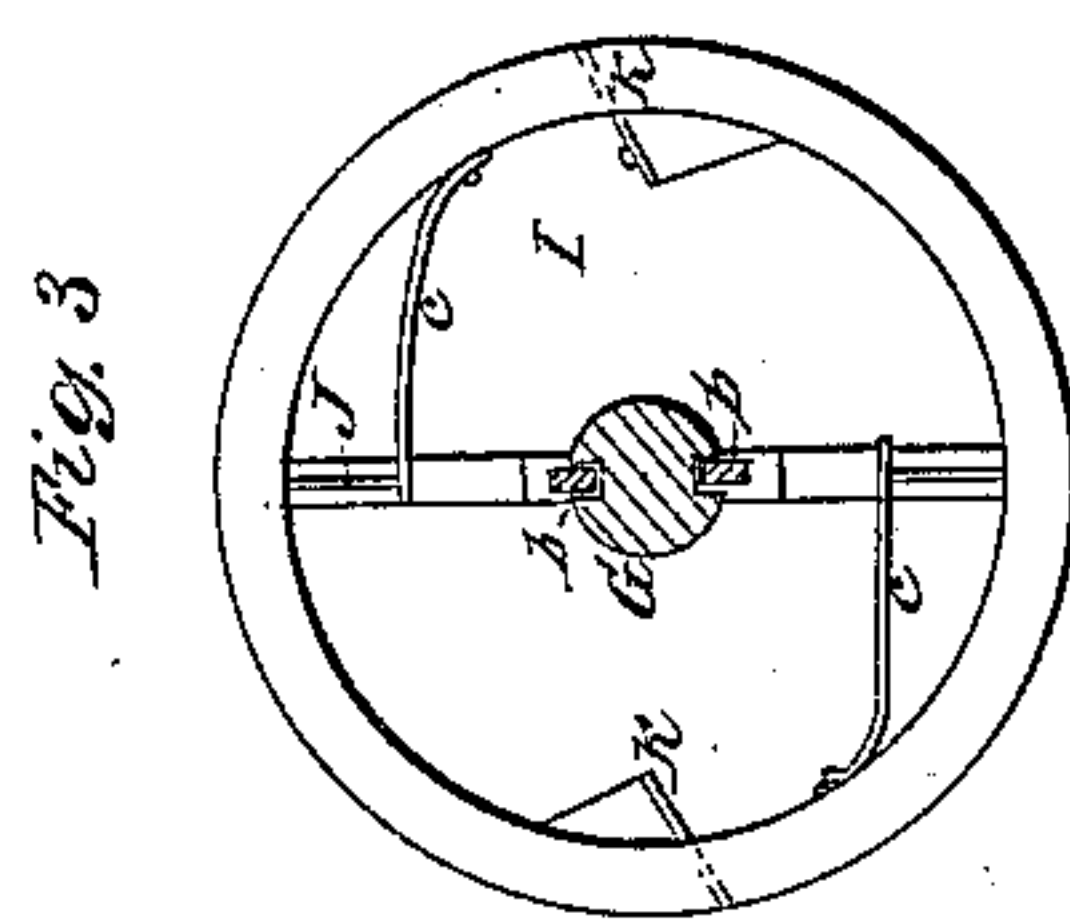
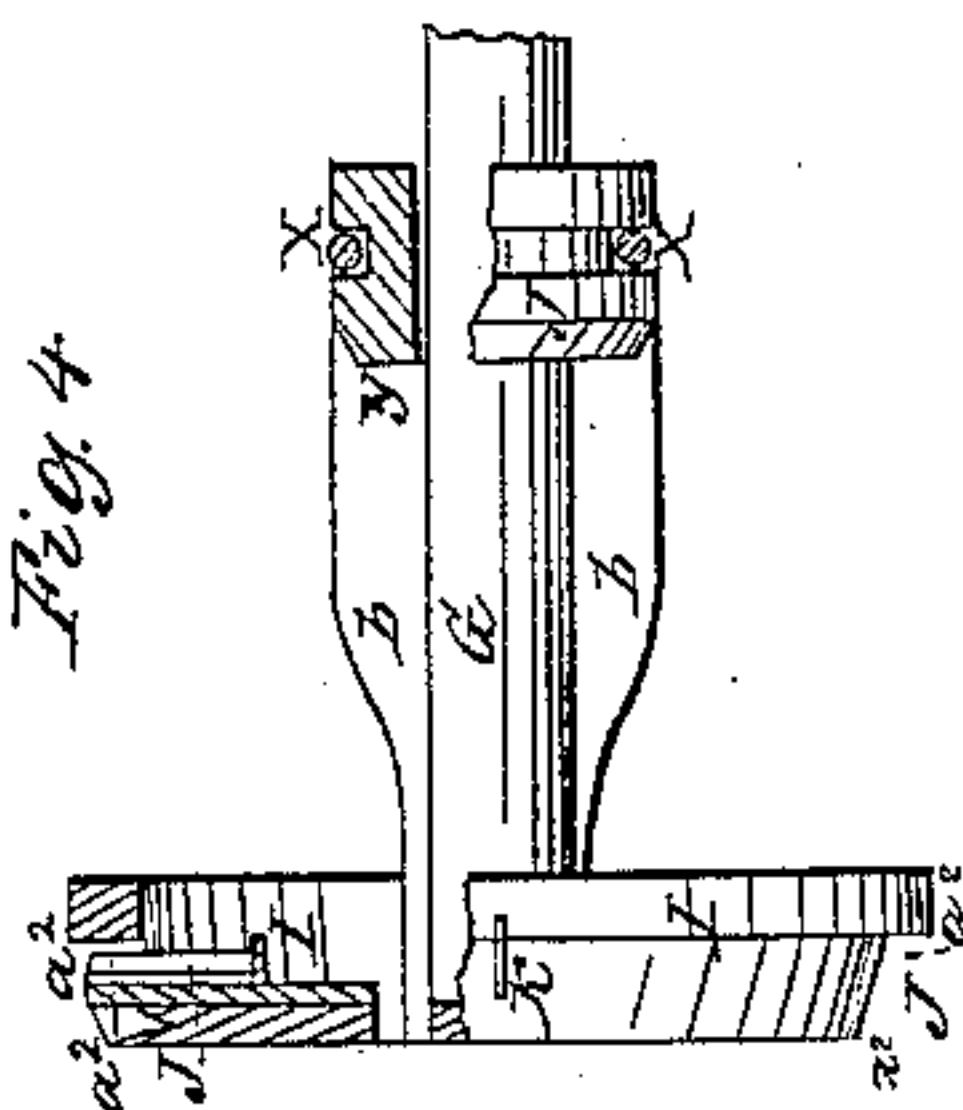
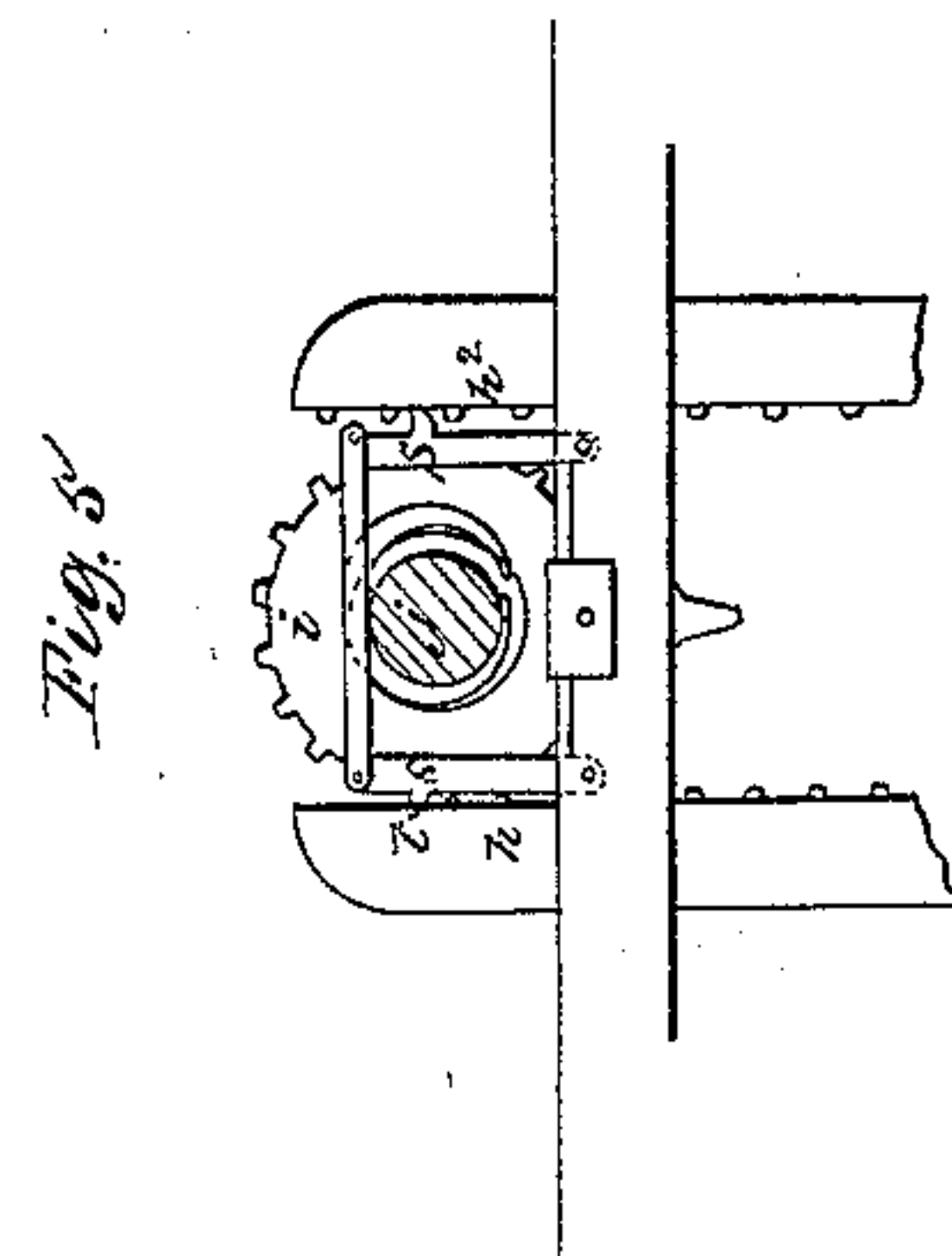
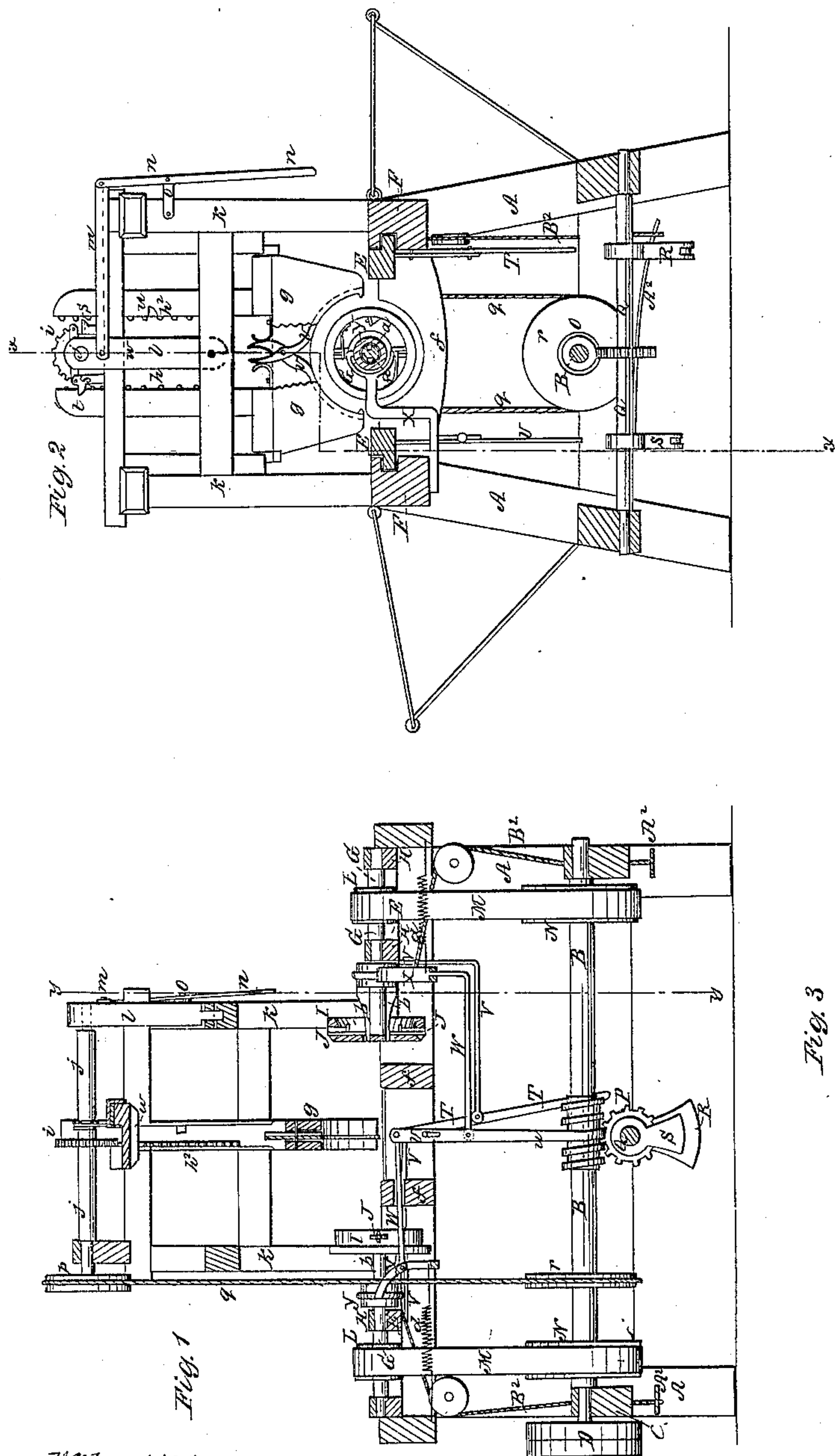


C. Murdock,
Crozing Stares.

No 78,470,

Patented June 2, 1868.



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United States Patent Office.

CHARLES MURDOCK, OF ELLENVILLE, NEW YORK.

Letters Patent No. 78,470, dated June 2, 1868; antedated May 18, 1868.

IMPROVEMENT IN MACHINES FOR CROZING AND CHAMFERING BARRELS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, CHARLES MURDOCK, of Ellenville, in the county of Ulster, and State of New York, have invented a new and "Improved Machine for Chamfering and Crozing Barrel-Staves;" and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing, forming part of this specification.

The present invention relates to a machine for chamfering and crozing the staves of barrels, casks, &c., when in the form of a barrel and hooped; and consists, principally, in a novel and peculiar arrangement of cutter-blades, of the proper shape for chamfering and crozing, whereby, at the proper times, they are caused to move forward toward the barrel, and acting upon the inner surface of the same, produce the necessary chamfer thereof, and crozes or grooves therein, to receive the barrel-heads, the cutters, after such operation has been completed, being withdrawn from the barrel; when it can be removed and another inserted in its place, and so on, as long as may be desired.

In addition to the chamfering and crozing-devices, I have also arranged a holder for the barrel while being operated upon by the cutter-blades, which is also so arranged that, at the proper time, it will raise the barrel up from the plane of operation of the cutters, and deliver the same from the machine, as will be hereinafter more fully explained, as well also as the crozing and chamfering-devices.

In the accompanying plate of drawings my improvements are illustrated—

Figure 1 being a longitudinal vertical section, taken in the plane of the line *x x*, fig. 2.

Figure 2, a transverse vertical section, taken in the plane of the line *y y*, fig. 1.

Figures 3, 4, and 5, detail views, to be hereinafter more fully referred to.

A A, in the drawings, represent the framework of the machine, which is of the proper construction to sustain the working-devices of the same.

B, the driving-shaft, extending lengthways of the framework, having bearings at each end in the cross-pieces C C of the same, to which shaft, through a fixed and loose pulley, D, motion can be communicated in any proper manner, or not, as may be desired.

E, two sliding frames, both moving in the same horizontal plane, and in suitable guides or grooves, F, of the framework, which frames extend entirely across the width of the upper portion of the framework, and are moved forward and backward, from the ends to the centre, and *vice versa*, through an arrangement of devices, and for a purpose to be hereinafter explained.

In each frame, and extending in the direction of the length of the machine, is a horizontal shaft, G, having and turning in bearings of the cross-pieces H of the frames.

On the inner end of each shaft G is fixed a cutter-head, I, in which are secured the croze, J, and chamfer, K, cutters, as will be presently more fully specified.

L, a pulley, on each shaft G, between the cross-bars H, from which passes a connecting-belt, M, to pulleys N N, at or near each end of the driving-shaft, so that, as the said driving-shaft is revolved, the cutter-heads I shall also have a rotary movement.

On the driving-shaft B, at or near its centre, is fixed a short worm-gear, O, engaging with which, upon its under side, is a gear-wheel, P, of a transverse horizontal shaft, Q, turning in bearings at each end of the framework A.

At or near one end of the transverse shaft Q is a sector-shaped arm, R, and at the other another sector-shaped arm, S, which arms, as their common shaft is revolved, respectively abut against the lower end of lever-rods T and U, hung on fulcrums to the framework upon each side of the same, one of which lever-rods, T, is connected, by connecting-rods V V, to both of the sliding cutter-head carrying-frames, hereinbefore referred to, the rods V V being hung to their common lever T, one above and the other below its fulcrum, at equal distances therefrom.

The other lever-rod U is connected through rods W W hung at one end to the same, in a similar manner to that described for the lever-rod T, but attached at the other to right-angular shaped arms *x x*, hung upon the

framework at one end, and with its other end of a jaw-shape, and engaging with a loose sleeve, Y, upon the frame-shafts G, arranged so as to slide upon and yet revolve with the same, by means of a slot, *a*, in the shaft, and stud or pin in the sleeve, engaging with the same.

Each sleeve Y has wedge-shaped arms, *b b*, attached to it, extending in the direction of the shafts G, and through the cutter-heads, on which arms *b* the inner ends of the croze-cutters rest, so that, as the sleeves are made to travel toward the cutter-heads, the croze-cutters will be forced out or made to project beyond the periphery of the cutter-head, the cutters being retracted or drawn in, when the sleeves move backward, by means of bent springs *c*, properly arranged with regard to the cutters therefor, and the sleeves, by the spiral springs *d*, hang at one end to the jaw-arms, and at the other to the framework.

In the space between the two cutter-heads are two fixed supports or rests, *f f*, for a barrel, extending across the width of the framework of the machine, and properly cut out in a curved shape corresponding to the periphery of the barrel, and to bring the ends of the barrel, when placed thereon, in the same horizontal plane with the cutter-heads, so that, when moved forward, by the sector-shaped arms, acting through the connecting-levers, arranged as described, they shall enter the ends of the barrel, to allow their cutters to operate upon the same.

Above and midway between the two fixed supports *f f* for the barrel, before referred to, and between the cutter-heads, is a frame, *g*, placed in a vertical position, and secured to parallel upright rack or toothed bars, *h h*², having teeth upon their faces opposite each other, with which rack-bars, at the proper times and in turn, the pinion or gear-wheel *i* of the horizontal longitudinal shaft *j*, turning in bearings of the upper portion of the central upright extension *k*, of the main framework, is engaged, by swinging one end of the said shaft forward or backward, as the case may be, it being hung at one end to permit the same in an upright swinging arm, *l*, of the extension-frame, and connected through a rod, *m*, with a lever or operating-handle, *n*, turning upon a fulcrum at *o* of the framework *k*.

On the end of the shaft *j*, turning in a fixed bearing, is a pulley, *p*, connected by a belt, *q*, with a pulley, *r*, upon the driving-shaft of the machine, so that, as the driving-shaft revolves, the said shaft *j*, with its pinion-gear, will be also revolved, and according as it is interlocked with either the one or the other of the rack-bars *h h*², raise or lower the frame *g*, it being held in its highest or lowest position by interlocking the proper one of the two catches *s s*, hung upon the shaft *j*, either with the notch *t* of the rack-bar *h*, or the notch *u* of the other rack-bar, *h*².

The lower or under edge of the frame *g* is cut out in the form of a circle, corresponding to the periphery of the barrel, about which it fits when in its lowest position, and in connection with the fixed rests, before referred to, tightly holds the same while being subjected to the action of the cutter-heads, the barrel being grasped by and between two spring-jaws, *v v*, hung in the frame, so that, as the frame rises, the barrel will be carried with it, thus allowing another one to be laid in the machine, said jaws being opened by their abutment against the wedge-shaped projecting piece *w*, upon the lower side of the upper cross-bar of the extension-frame of the main framework, as the barrel-holding frame moves upward, thus releasing them from the barrel, leaving it free to roll out of the machine.

The action of the several parts of the machine having thus been described separately, I will now in general terms state their operation, with regard to each other, which is as follows:

The staves are first made up in the form of a barrel and hooped, and then the barrel placed in the machine, on the fixed rests *f f* provided therefor. The driving-shaft then being turned in the proper direction, the upper barrel-holding frame is caused to travel downward, and partially encircling the barrel, grasping it by its spring-jaws, and tightly holds it in position, when the sector-shaped arm R, abutting against the lever-arm T, pulls it in the proper direction to cause the cutter-heads to travel toward and enter the barrel at each end, and, as they are revolved, the chamfer-cutters thereof produce the desired chamfer upon the ends of the barrel-staves. The arm T now moves over and upon the circular edge or periphery of the arm, which consequently causes no further forward movement to the cutter-heads, but holds them in a fixed position, as it were, while the other sector-shaped arm, S, abutting against the lever-arm U, slides through the connecting-devices before described, the loose sleeves of the cutter-head shafts toward the cutter-heads, thus, through their wedge-shaped arms, throwing out the croze-cutters, which consequently produce the necessary croze or groove in the ends of the barrel.

This being accomplished, the sectors R and S have passed by their respective lever-arms, leaving them free, when the frame is pulled back by the action of the bent springs A², connected thereto through cords B², and the sleeves retracted by the spiral springs *d d*, connected to them, as explained.

The pinion of the shaft *j* is now thrown into connection with the rising rack-bar *h* of the barrel-holding frame *g*, which lifts the same, and, as its jaws abut against the projection *w*, disengages them from the barrel, which rolls out from the machine, another one having been previously inserted therein, which is done as the said frame *g* is travelling upward, over which the barrel just operated upon rolls. The pinion-wheel, then thrown into connection with the barrel-frame, which then travels downward, again grasping the barrel, when the same operations again take place as above described, the various mechanical devices being all arranged with regard to each other, so as to have them occur at the proper times.

In case of any unevenness of the inner surfaces of the staves about the croze-groove, caused by the staves projecting beyond each other, which unevenness, unless removed, would prevent the barrel-heads from nicely fitting around the staves, I attach to or form with the croze-cutters, and upon each side thereof, an additional cutter-blade, *a*², which, as the croze-cutters are acting on the barrel-ends, shave and cut the surfaces of the stave perfectly smooth and even about the croze, as is obvious, without further explanation.

In lieu of throwing in and out of gear the pinion-wheel *i* with the rack-bars *h* and *h*², by means of a hand-lever, as explained, it is obvious it could be accomplished automatically by properly connecting its shaft or other proper parts with the driving-shaft of the machine.

Having thus described my invention, I claim as new, and desire to secure by Letters Patent—

1. The combination of the sliding frames E E, upon each side of the main frame, and bearing the crozing and chamfering-cutters J K, with the barrel-holding frame g, all operating as described, whereby both ends of the barrel are chamfered and crozed at the same time, as herein shown and described.
2. The arrangement of the sliding frames E E, in which the cutter-head shafts are hung and turn, connecting-rods V V, and lever-arm T, in combination with the sector-shaped arm R, all arranged together, and operating as and for the purpose specified.
3. The arrangement of the sliding sleeve Y, having wedge-shaped arms, of the cutter-head shafts, connecting levers W W, lever-arm U, and sector-shaped arm S, all connected together, and operating as and for the purpose specified.
4. The barrel-holding frame g, having spring-jaws, for grasping and holding the barrel while being operated upon by the croze and chamfer-cutters, arranged so as to be raised or lowered, substantially in the manner described, and for the purpose specified.

The above specification of my invention signed by me, this 3d day of October, 1865.

CHARLES MURDOCK.

Witnesses:

ALBERT W. BROWN,
M. M. LIVINGSTON.