J. NAYLOR, Jr. & J. GREENWOOD.

Machine for Trussing and Squaring Barrels.

No. 167,190. Patented Aug. 31, 1875.

Fig. 1.

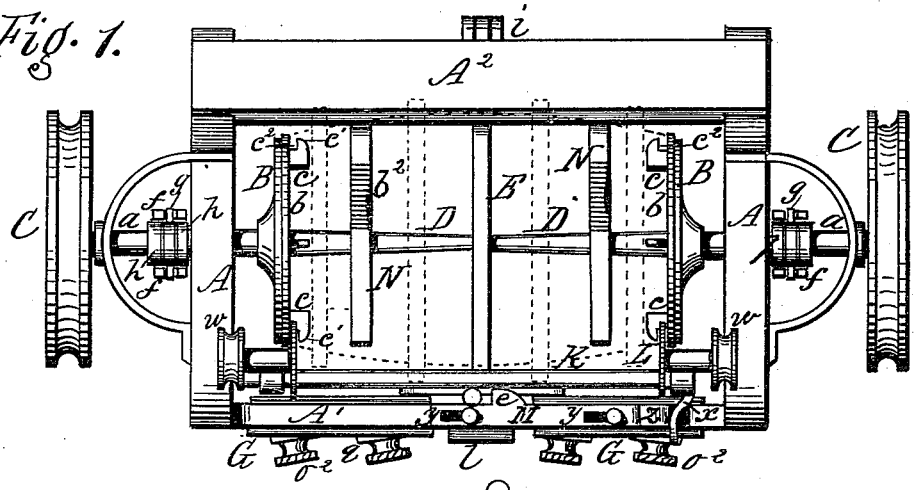


Fig. 2.

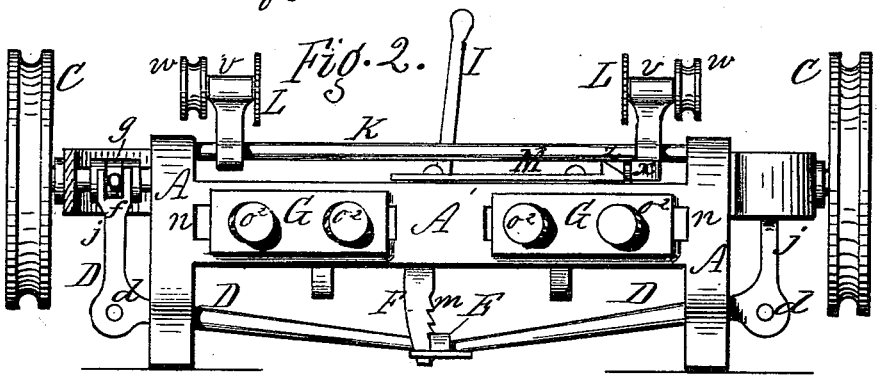


Fig. 3.

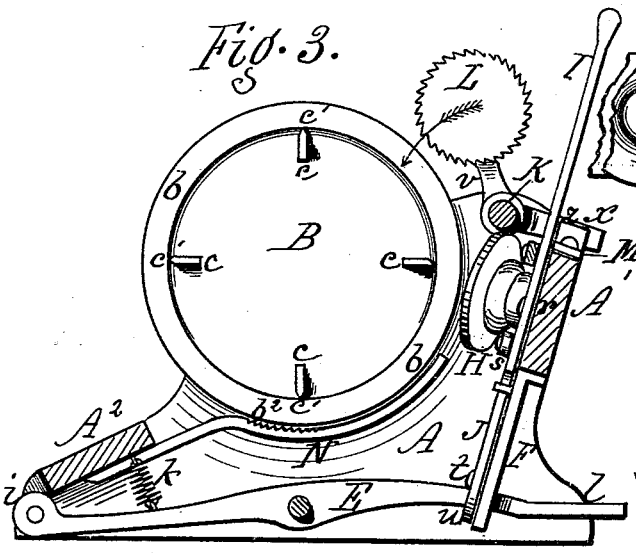


Fig. 4.

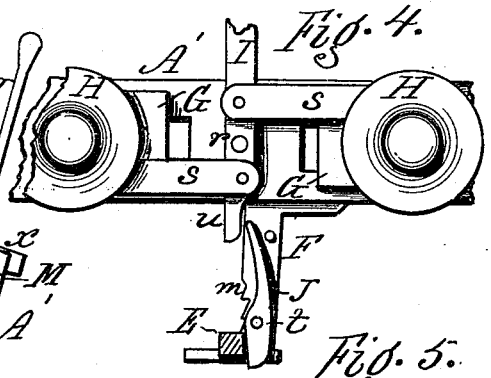
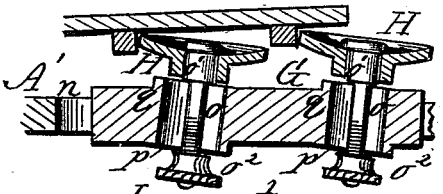


Fig. 5.



Witnesses.

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UNITED STATES PATENT OFFICE.

JAMES NAYLOR, JR., AND JOHN GREENWOOD, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN MACHINES FOR TRUSSING AND SQUARING BARRELS.

Specification forming part of Letters Patent No. **167,190**, dated August 31, 1875; application filed May 24, 1875.

To all whom it may concern:

Be it known that we, JAMES NAYLOR, Jr., and JOHN GREENWOOD, both of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Machines for Trussing and Squaring Barrels; and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a plan. Fig. 2 is a side elevation. Fig. 3 is a cross-section. Figs. 4 and 5 are an elevation and section, respectively, of the trussing-rollers and their connecting parts.

Our improvement relates to machines in which the trussing is done by rollers or disks, which press against the hoops while the barrel is revolved.

The invention consists in the combination and arrangement of parts, as hereinafter described.

A represents the frame. B B are the circular clamping heads or disks, between which the barrel is secured while being operated on. These heads receive rotary motion by means of pulleys C C, attached to their shafts *a a*, said pulleys being connected by bands with the line-shafting above. The clamping-heads and their shafts have an end movement sufficient to allow the insertion and removal of the barrel. *b b* are circular packings on the inner faces of the clamping-heads, for the purpose of receiving the ends of the staves; and *c c* are dogs or spurs projecting from the faces of the clamping-heads, inside the packings, for the purpose of catching into and holding the ends of the barrel while being revolved. The outer extremities c^1 of the dogs are made rounded and sharp-edged, to cut into and hold in the staves; and next to the packing they are made with square notches c^2, for the purpose of allowing the saws to enter in squaring the ends of the staves, as will presently be described. D D are toggle-levers, of elbow form, which are pivoted at *d d*. The upper ends *j j* have forks *f f*, which embrace clutches *g g*, resting loosely upon the shafts *a a*, between shoulders *h h*. The lower ends extend longitudinally beneath the machine, and enter sockets in the treadle E, which acts as a fulcrum to the toggle-levers. The treadle is pivoted at *i*, and is drawn upward by a spring, *k*. At the outer end it has a foot-piece, *l*.

When the treadle is elevated, the levers D D are thrown above a horizontal line, and the clamp-heads B B are thrown open. When the treadle is depressed, the levers are thrown down, and the clamp-heads are closed upon the ends of the barrel.

F is a ratchet-bar, having a series of ratchet-teeth, *m*, at its lower end, with which the treadle engages when depressed, as shown in Figs. 2 and 4, thereby holding the clamping-heads closed upon the barrel during its rotation. G G are metallic boxes or bearings, which slide longitudinally in slots or ways *n n* of the supporting-bar A′ of the main frame. H H are the trussing rollers or disks, which rest in said slides, and move forward and backward with them. These rollers are of concave form, and are set angularly, and their rims bear against the outer edges of the truss-hoops, so that as the barrel is revolved the pressure of the rollers against the truss-hoops will force the latter to place on the barrel.

There are as many of the trussing-rollers as there are truss-hoops, and, if desired, they may be used on both sides of the machine, but are generally sufficient on one side only if the barrel is rotated rapidly. The two sets of trussing-rollers move toward each other, thus pressing toward the center on the opposite quarters of the barrel.

By setting the trussing-rollers in the inclined position shown in Fig. 5, they can be used near together without striking the truss-hoops in the rear, or interfering with each other in operation, which is essential in small-sized barrels and casks. This allows a close working of the trussing-rollers, and a close proximity of the trussing-hoops to each other when necessary, which could not be allowed if the trussing-rollers stood horizontally. *o o* are screw-bolts forming bearings upon which the rollers H H turn loosely. These bolts extend through elongated angular slots *p p* of the boxes G G, which allows an adjustment in said slots by means of shoulders o^1 o^1 on one side, and nuts o^2 o^2 on the other, which strike against the sides of the boxes. In order to allow the square fitting of the shoulders and nuts the boxes have offsets *q q* at right angles to the axis of the shafts *o o*. The trussing-

rollers turn only by friction with the truss-hoops, against which they press. The adjustment in the slots *p p* enables the rollers to be adjusted to meet the truss-hoops of various-sized barrels, or barrels having a greater or less bilge, in which the hoops may be nearer together or farther apart. I, Fig. 4, is a lever, pivoted centrally at *r* between the boxes G G. *s s* are connecting-rods connecting this lever with the boxes G G. By throwing the lever upward the boxes will be drawn toward each other; by throwing it downward they will be separated from each other. By this means the trussing-rollers are brought to bear against the truss-hoops on the opposite quarters of the barrel, or be released at pleasure. J, Fig. 4, is a dog, pivoted at *t* to the inner side of the ratchet-bar F, and bearing at its lower end against the treadle E, when the latter rests in the notches of the ratchet-bar. *u* is a projection on the lower end of the lever I, which comes in coincidence with the upper end of the dog. When the lever is thrown up to its full extent the projection *u* trips the dog J, and throws the treadle from its engagement with the ratchet-bar, and thereby releases the clamping-heads to discharge the barrel, as before described. K is a shaft extending longitudinally of the machine in front of the supporting-bar A^1. *v v* are crank-bearings made fast to the shaft. L L are circular saws attached to shafts which rest in the bearings *v v*, and are operated by pulleys *w w*, connected by bands with the line-shafting overhead. The saws are located at such a distance apart as to correspond with the length of the barrel, and with the clamp-heads when closed upon the barrel. *x* is an arm made fast to the shaft K, and extending out over the bar A^1. M is a slide resting on top the bar A^1, and gaged in its forward and backward movement by slots and pins *y*, or any equivalent device. The slide has a wedge-shaped head, *z*, at its end, which strikes under the arm *x* and elevates it, and also a shoulder, *e*, against which strikes the lever I when elevated. When the slide is forced forward it raises the arm *x*, and turns the saws down, as indicated by the arrow, Fig. 3, to cut off or square the ends of the staves—the saw, in that case, cutting through the staves and striking into the square notches c^2 of the dogs *c*, which rest in coincidence therewith, as before described. The slide M may be retracted by a spring, or by the use of elastic bands connecting the pulleys *w* with the shafting overhead, which will also elevate or remove the saws from the barrel when not in use. N N are traction-bars concentric with the clamp-heads B B, and placed on a line with, or a little below, the bottom of said clamping-heads. They are made in segment form, extending backward, as shown in Fig. 3, and are attached in front to the cross-piece A^2. The upper surfaces of the traction-bars are preferably serrated a portion of their extent, as shown at b^2. The object of these traction-bars is to discharge the barrel when it is released, which they do by reason of the rotary motion of the barrel attained while in the machine—the barrel striking the bars and bounding out automatically when released from the clamping-heads.

The operation is as follows: The barrel is placed between the clamping-heads, and clamped in place by pressing the foot upon the treadle, and bearing the same down till it engages with the ratchet-teeth *m*. The barrel is then revolved, while the lever I is forced up, bearing the edges of the trussing-rollers against the truss-hoops. When the truss-hoops are all forced to place, a further elevation of the lever I causes the same to strike the slide M, thereby depressing the saws to square the ends of the barrel, after which a still further elevation of the said lever causes it to trip the dog J and release the treadle from the ratchet, and allows the clamping-heads to open and discharge the barrel, which, under the rotary motion already obtained, strikes upon the traction-bars N N and bounds off, as before described.

In the initial movement to clamp the barrel in place, an excess of pressure is applied, in order to level or plumb the ends of the staves, which are liable to project irregularly, and out of line endwise. This pressure levels or evens them all, as nearly as can be, before being sawed off. For this purpose the packings *b b* are important, as they receive the contact of the staves, and form soft cushions, which prevents abrasion or roughing of the wood at the ends, and also the breaking of the staves, which frequently occurs where solid face-plates are used. These packings also serve to give additional hold or friction on the staves, and assist in retaining the barrel in place during the action of trussing.

We are aware that it is not new to force hoops upon vessels by the pressure of a cam or roller while the vessel is revolved, as the same is shown in Patent No. 24,576. Our invention relates specially to forcing the truss-hoops on barrels in opposite directions to meet the quarters of the barrel, and consists in the special arrangement of the rollers and their connecting parts, as hereinbefore described.

Having thus described our invention, we do not claim, broadly, forcing hoops on vessels by pressure while revolving; but

We claim—

1. The clamping-head B, provided with the packing *b*, to receive the ends of the staves and prevent abrasion or breaking of the same, and having the sharp-edged dogs or spurs *c*, to hold the ends of the barrel while under action, as herein shown and described.

2. The spurs *c*, constructed with the sharp-edged projections c^1, to cut into and hold the barrel, and provided with the square notches c^2, to receive the saws in squaring the ends of the barrel, as herein shown and described.

3. The combination, with the rotary clamping-heads B B, of the two boxes or bearings

G G and the two sets of trussing-rollers H H, set angularly, and capable of motion toward each other, to bear against the truss-hoops upon the opposite quarters of the barrel, as shown and described.

4. The combination, with the trussing-rollers H H and boxes G G, of the screw-bolts *o o*, forming bearings for the rollers, and made adjustable longitudinally in the boxes by means of the shoulders o^1 o^1 and nuts o^2 o^2, as and for the purpose specified.

5. The combination, with the trussing-rollers H H, saws L L, and treadle E, of the lever I, connecting-rods *s s*, slide M, and dog J, the whole arranged as described, so that the lever acts in succession upon the rollers, saws, and treadle, to truss the barrel, saw the ends, and then release the barrel from the clamping-heads, as herein shown and described.

6. The combination, with the clamping-heads B B, of the traction-bars N N, resting in line with the bottom of the clamping-heads, and concentric therewith, for the purpose of discharging the barrel by its own rotation when released, as herein shown and described.

7. In a machine for trussing barrels, the combination, with the clamping-heads B B, of the saws L L, resting outside the clamping-heads, and attached to swinging or sliding bearings *v v*, whereby they may be brought into and out of contact with the ends of the barrel, as shown and described.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

JAMES NAYLOR, JR.
JOHN GREENWOOD.

Witnesses:
R. F. OSGOOD,
EDWIN B. SCOTT.