2 Sheets—Sheet 1.

J. NAYLOR, Jr.
Barrel-Machine.

No. 196,927. Patented Nov. 6, 1877.

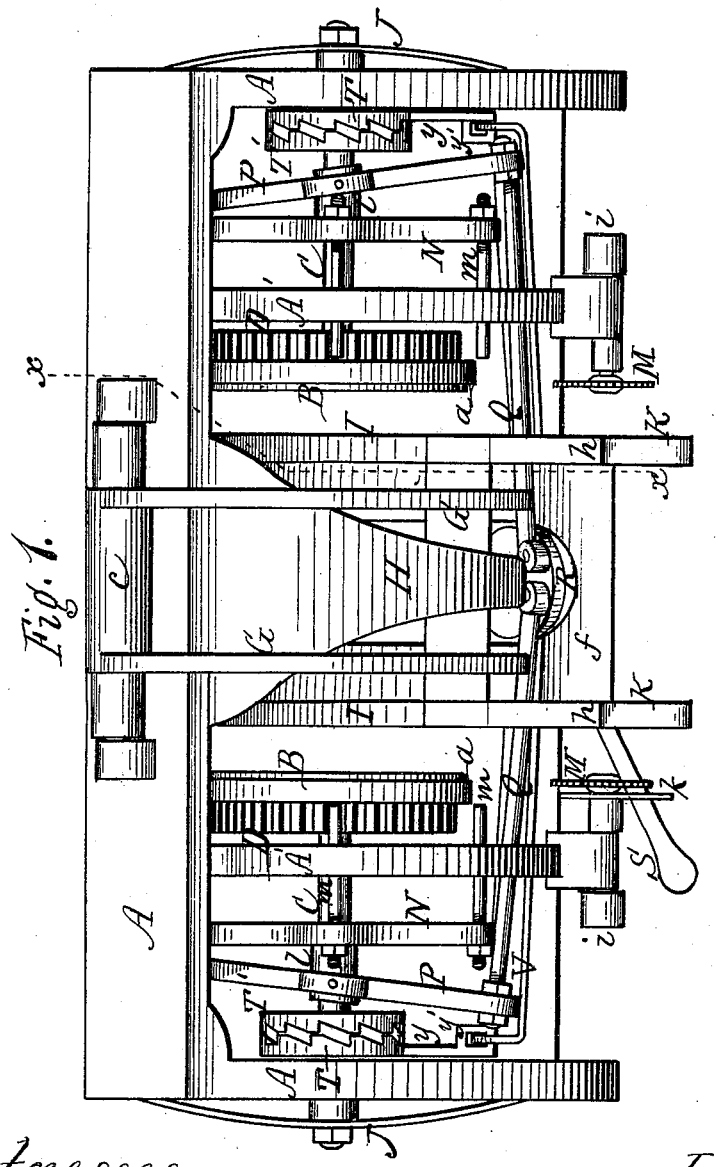

Fig. 1.

Witnesses.
A. M. Sprague
Edwin Scott.

Inventor.
James Naylor, Jr.,
per R. F. Osgood,
Atty.

2 Sheets—Sheet 2.

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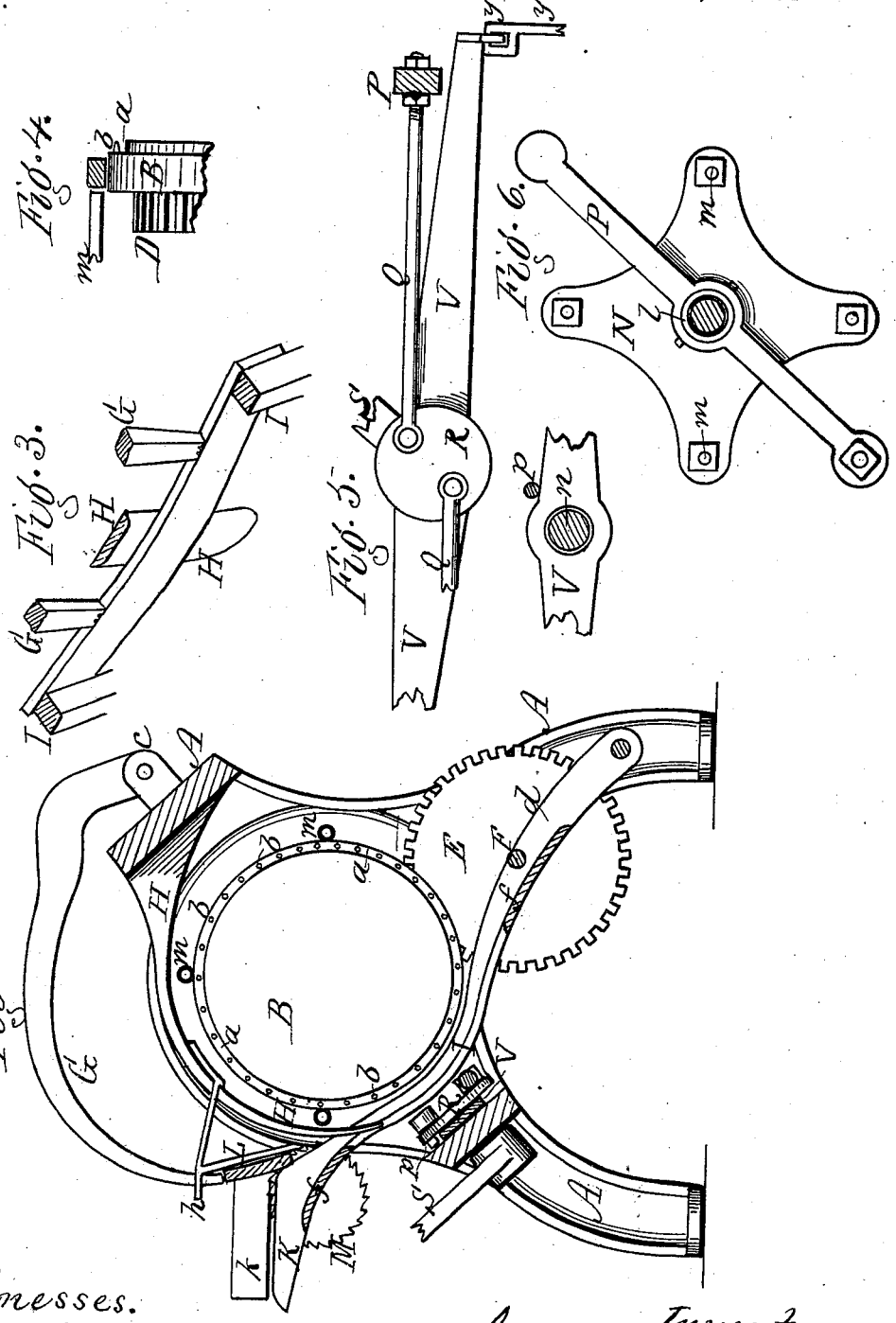

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UNITED STATES PATENT OFFICE.

JAMES NAYLOR, JR., OF ROCHESTER, NEW YORK.

IMPROVEMENT IN BARREL-MACHINES.

Specification forming part of Letters Patent No. **196,927**, dated November 6, 1877; application filed July 29, 1876.

To all whom it may concern:

Be it known that I, JAMES NAYLOR, Jr., of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Barrel-Machines; and I 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 of my improved machine. Fig. 2 is a vertical cross-section in line *x x* of Fig. 1. Fig. 3 is a diagram illustrating the method of bilging the staves. Figs. 4, 5, and 6 are detail views.

My improvement relates to a barrel-raising machine. The staves are fed automatically into the machine, the ends are squared and cut, the staves set up in the form of a barrel, and the truss-hoops applied, in a simple and effective manner.

The invention consists in the construction and arrangement of parts hereinafter more fully described.

A represents the frame, which may be of any suitable construction. B B are the revolving disks or chucks, which serve to receive the staves. They are of circular form, and attached to shafts C C, which have endwise movement in the frame, to allow the disks to clamp the staves and release the same after the barrel-cylinder is formed. They are provided on the back side with spur-gears D D, which engage with corresponding spur-gears E E on a shaft, F, by which said disks are both driven at uniform speed. The spur-gears D D are of sufficient width to keep in gear with the wheels E E during the endwise movement of the disks. The faces of the disks are provided with rabbets or offsets *a a* of sufficient size to receive the ends of the staves, and these offsets are provided with projecting spurs or points *b b*, Figs. 2 and 4, which strike into the ends of the staves, thereby retaining them in place upon the disks. Instead of this arrangement, the edges of the disks may have grooves sunken therein to receive the ends of the staves.

G G are drivers for forcing the staves down into place. They are simply arms pivoted, at *c*, on top of the frame, or otherwise arranged to have a vertical movement, and so located that in the downstroke they strike on top of the edges of the staves. H is the bilger, attached to the frame and standing between the drivers. It is a fixed plate of curved form, with a narrow tongue extending so low as to hold behind the center of the staves when forced down by the drivers. The lower extremity of the plate is preferably a spring, which will yield to a certain extent to prevent breakage of the staves.

The tongue is situated radially beyond the periphery of the disks, a distance equal to the bilge of the barrel. I I are ways on which the ends of the staves rest as they are forced down. At the top they leave an open throat for the easy entrance of the staves. Immediately below and in front of the disks they are concentric with the disks, so that after the staves are entered the ends are forced into the offsets *a a*, where they are held by the points *b b*, while the central portions of the staves are bilged by resting outside the bilger, as before described.

At the rear and under the machine the ways form an inclined plane, *d*, Fig. 2, down which the barrel rolls to be discharged when it is released. The ways are connected by a bed-plate, *f*, and they are hung on a pivot, *g*, at the rear. When so pivoted they are adjustable higher or lower in front.

K K is a bed or table in front for receiving the staves. L L are gages for locating the position of the staves to be forced down into the machine. A throat is left at the lower end of the gages, between them and the ways, to allow the staves to pass. These gages are preferably springs that will yield to a certain extent to outward pressure; but they may be made stiff. *h h* are stops to prevent rising of the staves.

M M are saws for squaring the ends of the staves. They are driven by pulleys *i i*, or equivalent, and are located at such a position as to cut the ends of the staves of the right length to enter the machine. *k* is a gage or stop on one side for evening the staves preparatory to being sawed.

N N are followers, situated, respectively, at each end of the machine. They have collars

l l, which slide loosely on the shafts C C. *m m* are arms attached to the followers, projecting through the cross-plates A′ A′ of the frame, and resting closely to, but just outside of, the disks B B. These arms strike the truss-hoops, which are placed around the disks, and force the same on the barrel when set up.

The arms may be threaded and attached to the follower by nuts, as shown, by which means they can be adjusted out and in.

P P are levers jointed, at the upper end to the frame, and pivoted in the center to the collars *l l* of the followers N N. They move the followers out and in.

Q Q are connecting-rods, attached at one end to the lower ends of the levers P, and jointed at the other end to a central crank-wheel, R, operated by a hand-lever, S. As this hand-lever is thrown in one direction or the other, the followers will be correspondingly opened or closed.

J J are springs or weights of any desired form, to which the shafts C C are attached at the outer ends. These springs or weights draw the disks outward and hold them there, except when thrown inward by the operating mechanism.

T T, Fig. 1, are half-ratchets, turning freely on the shafts C C at the ends of the frame. T′ T′ are corresponding half-ratchets fixed to the said shafts, being prevented from turning thereon. The teeth of these two half-ratchets engage. When in one position they fit together, allowing the disks B B to be retracted by the springs or weights. When in the opposite position the teeth rest upon each other, forcing the disks inward. *y y* are arms attached to the turning half-ratchets T T, and provided with loops *y′ y′* at their ends.

V is a rock-lever, jointed at the opposite ends to the loops *y′ y′* of the half-ratchets, and turning freely on the hub *n*, Fig. 5, of the crank-wheel R. This rock-lever is alternately rocked or thrown in one direction and the other by a pin, *p*, on the under side of the crank-wheel, which strikes it as the said wheel is turned. This action alternately rocks the turning half-ratchets T T, thereby moving the disks B B out and in.

The operation of the machine is as follows: The staves are placed upon the bed or table K, with the ends resting against the stop *k*. They are then moved up to the gages L L, with the edges standing upward. The gages locate them in position to be driven down into the throat. The drivers G G now come down and force the staves downward, one by one. In passing down, the ends ride upon the ways I I, and the center passes over the bilger H, thereby bilging the staves, as before described. When the staves reach the concentric portion of the ways, their ends strike into the offsets *a a*, and are retained by the points *b b*. The disks in this position are just so far apart as to receive the staves in the bilged form. As the disks revolve, they carry the staves free of the bilger, and they are then held in place between the disks by their natural spring. This process of feeding in is continued till the whole barrel-cylinder is completed. When this is done, the hand-lever S is thrown in the opposite direction. The first movement of the lever, operating through the crank-wheel R, connecting-rods Q Q, and levers P P, is to force the followers N N inward, thereby causing the arms *m m* to drive the truss-hoops on the barrel. The still further movement of the hand-lever in the same direction causes the pin *p* to strike the rock-lever V, tilting the same, and thereby closing the half-ratchets T T′, so that the disks B are retracted by the springs J J. The retraction of the disks frees the barrel-cylinder, which falls upon the inclined plane *d* below, and rolls away from the machine.

On the reverse motion of the hand-lever the first action is to retract the follower, and the disks are then thrown forward to reset the machine.

Various modifications of the machinery may be made without affecting the principle of operation. Different mechanism may be employed for moving the disks and the followers in and out; but the movements above described are essential to produce the desired result.

The work of setting up, squaring, and trussing the barrels is done in a very rapid and effective manner by this machine, requiring only the feeding in of the staves by hand.

I am aware that machines for setting up barrels have before been known. In one case an expanding-disk is used in the center for bilging the staves. In another the staves are drawn in by hooks, and the bilging formed by the end compression of the staves in the grooves in which they travel to enter the disks. Such I do not claim.

What I claim herein as new is—

1. In a barrel-machine, such as described, the disks B B, having an end movement and receiving simultaneous motion by means of connecting-gearing, and the ways I I, located under the said disks, pivoted at the lower end, so as to be adjustable vertically, and constructed with an open throat at the top, and a concentric depression directly below and in front of the disks, for the purpose of forcing the ends of the bent staves into contact with the disks, as shown and described, and for the purpose specified.

2. In a barrel-machine, the combination of the ways I I, the bilger H, and the driver or drivers G G, for bilging the staves as they enter the disks, substantially as described.

3. The bilger H, constructed with a spring end to prevent breakage of the staves, as herein described.

4. In a barrel-machine, the combination, with the ways I I and bilger H, of the gages L L, for placing the staves into position to be driven into the machine, as and for the purpose specified.

5. In a barrel-machine, the combination, with

the ways I I and bilger H, of the saws M M, for equalizing the staves preparatory to entering the machine, as herein shown and described.

6. In a barrel-machine, the combination, with the revolving disks B B, of the followers N N, provided with the projecting arms *m m*, resting outside the disks, and having an endwise motion to drive the truss-hoops upon the barrel, as herein described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JAMES NAYLOR, JR.

Witnesses:
R. F. OSGOOD,
EDWIN SCOTT.