S. Andrews,

Dressing Staves.

No. 7,077. Patented Feb. 12, 1850.

Fig. 4.

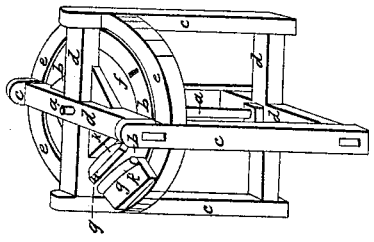


Fig. 5.

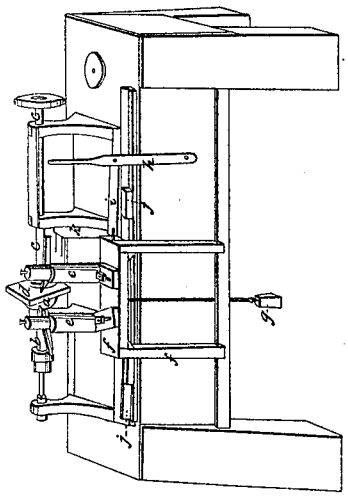


Fig. 2.

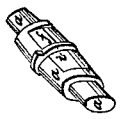


Fig. 7

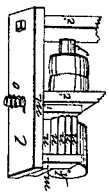


Fig. 3

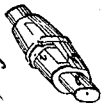


Fig. 1.

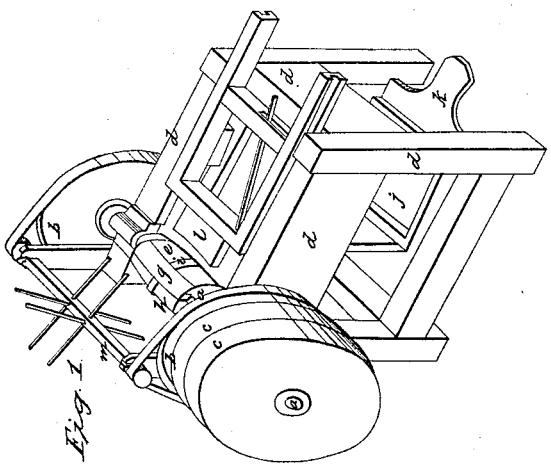
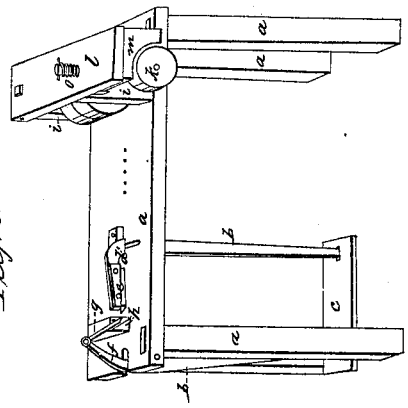


Fig. 6.



Witnesses:
L. D. Morse
P. H. Bruyne

Inventor:
Moses Andrews

UNITED STATES PATENT OFFICE.

SOLOMON ANDREWS, OF PERTH AMBOY, NEW JERSEY.

BARREL MACHINERY.

Specification of Letters Patent No. 7,077, dated February 12, 1850.

To all whom it may concern:

Be it known that I, SOLOMON ANDREWS, of Perth Amboy, in the county of Middlesex and State of New Jersey, have invented new and useful Improvements in Machinery for Making Kegs, Barrels, &c.; 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 annexed drawings, making part of this specification, in which—

Figure 1 is the stave cutter, and Figs. 2 and 3 the shaft of the stave cutter detached therefrom.

A shaft of iron as seen at (*a*) having two bearings, and a fly wheel (*b*) at each end, and a tight and loose pulley (*c*) on one end; is placed upon a strong frame of wood or iron (*d*) upon which it may revolve. This shaft which is enlarged between its bearings as seen at (*e*) should be a little less than the diameter of the keg or barrel for which the staves are intended, and may be solid or hollow, but for small kegs it is better to be made solid.

An eccentric groove (*f*) is made in the enlarged part of the shaft, which groove extends over or around one half of its circumference, and of sufficient depth to permit a stave of the necessary thickness to lie underneath its periphery. The knife (*g*) made in the form of the stave desired to be cut, is fixed on this cylinder at the commencement of the eccentric groove, parallel with the shaft, and a cover, or cap of iron or brass (*h*) extends from the back of the knife over or around the enlarged part of the said shaft, to the end, or outlet of the said eccentric groove. A piece of metal which I call a cam ring (*i*) and about an inch wide is fastened to this cylinder, and extends from the back or outlet of the eccentric groove, around the cylinder as far as the edge of the knife, and underneath the same, terminating within the eccentric groove, underneath the cap. This cam ring is eccentric, being so thick at one end, as to be on a line with the surface of the cap, from which it diminishes in thickness as it passes around the cylinder until it terminates underneath the cap in a thin edge, being of just sufficient thickness under the edge of the knife, to allow a stave of the required thickness to pass between it and the edge of the knife. The cam ring at this point may be elevated or depressed at pleasure, to regulate the thickness of the stave. To this cap on the under side, just back of the knife, is fixed a straight spring which extends a few inches toward the cylinder, and which is intended to press upon the last stave as it passes under the cap, to prevent their falling out too easily.

The knife and cap are fastened on the cylinder with screws at each end, so that they may readily be taken off in case of clogging. The knife and cap may be made of one piece of sheet steel, the front edge being ground for cutting, in which case the knife is made equally strong and much thinner. The tools for trimming the ends of the stave, cutting the bevels and the croze, are fixed on the cylinder immediately in front of the knife, and in the order herein expressed; the ends being first trimmed, the bevel then cut, the croze next, and the stave then cut off the block. A bed piece made of wood is firmly fixed upon the frame, end up, in front of the knife and in close contact with it, as it revolves with the cylinder. A carriage is made to slide backward and forward upon the frame, being brought forward by a weight (*j*) hung below the frame, or by springs: the weight is connected to the carriage by leather straps, which pass over an iron roller in front of the cylinder or shaft. To bring it backward the operator steps upon the foot piece (*k*), the weight of his body counterbalancing the suspended weight on the carriage, which can then be readily and quickly withdrawn by the hand.

The block from which the staves are to be cut is secured to this carriage by two dogs, one fixed, the other movable, in the ordinary way; which block (*l*) resting upon the platform of the frame, is driven up in contact with the cam ring on the cylinder by the weight which is suspended to the carriage as aforesaid, passing over the bed piece. As the staves are cut off from the side of the block, one at each revolution of the cylinder, it is continually fed up in contact with the eccentric cam ring, by the falling weight attached to the carriage. About ten inches above the shaft is a small parallel shaft or whirl (*m*) made of wood, having a small pulley at each end for belts

passing around the fly wheels. It is thereby made to revolve very rapidly in the same direction. Through this small shaft are passed two pairs of tough sticks, about one half an inch in diameter, at right angles with each other, and about four inches apart, for the purpose of knocking away any staves which may be occasionally brought over by the motion of the cylinder.

Fig. 4 is a perspective view of the stave jointer. A perpendicular shaft as seen at (*a*) passes through a horizontal wheel (*b*) with a smooth upper surface, being more or less in diameter as the stave is for a large or small cask, so as to suit the curve of the stave. The face or upper surface of this horizontal wheel, should be of cast iron, or steel, to prevent its wearing. Four posts as seen at (*c*) are connected together by four cross pieces marked (*d*) the shaft passing through the center of the upper cross pieces, which may constitute a bearing. And a circular rim (*e*) connects the said posts together at the periphery of the horizontal wheel, constituting a frame within which the horizontal wheel revolves. Four or more plane bits, one of which is seen at (*f*) are set in the face of this horizontal wheel, the cutting edges being on the upper surface of it. Attached to this outside rim of the frame, and on the frame work opposite thereto, or inside part of the frame, on a line with the face of the wheel, are fixed by hinges, stave holders marked (*g*). These holders are oblong pieces of wood about three quarters of an inch thick, and the length of the stave to be jointed; and as wide as the radius of the keg or barrel for which the stave is intended. The hinges on the one side are so placed as to bring the opposite or face sides over the cutting edges of the plane bits. These face sides are fitted to the curve of the stave so that when the stave is placed thereon its edge is brought down upon the face of the wheel over the edges of the plane bits, on a radial line with the center of the keg or barrel intended to be made. Flanges or thumb pieces (*k*) project at right angles from these face sides of the stave holders to receive and support one edge of the stave and bear upon it when brought down upon the plane bits; and by this contrivance the stave is easily held firm by the fingers and can be jointed to an exact equal width at each end, the said flanges or thumbpieces being arranged perfectly parallel to the plane of the wheel. These stave holders called right and left are placed opposite to each other, to enable the operator to joint the staves longitudinally with the grain of the wood, using either one at his pleasure.

Fig. 5, is the machine for turning heads and may be described as follows, viz: A chuck (*a*) is fixed to the mandrel (*b*) of a lathe; the face of which chuck is covered with india rubber, say one quarter of an inch thick. This chuck should be nearly the diameter of the head to be turned. In the center of this chuck is a hole about an inch and a half deep, and a quarter to half an inch in diameter, into which is fitted a movable steel center made to slide easily in the said hole. Behind this center is a spiral spring placed on the bottom of the hole, one end pressing thereon, the other against a shoulder on the said movable center. This center projects, in a state of rest, at least one inch beyond the face of the chuck, and may be pressed into the hole, against the spiral spring until its point is even with the face of the chuck; the spiral spring reacting to drive it out when the pressure is released. Opposite to this chuck in the mandrel (*c*) of the movable head, is a hole an inch and a half deep, with a small mandrel made to fit in it, and to revolve freely in the said hole. To the end of this small mandrel is fixed on a universal joint, a plate of iron of the same diameter as the face of the chuck. A sliding gage (*k*) attached to the movable head by a tightening screw, and having two pins projecting from it, parallel with the lathe, receives the square block (*d*) from which the head is to be turned, the said block resting on the one pin at the bottom and against the other at its posterior part, the said pins receiving one right angle of the block between them. The block may rest here or be held in this position by the fingers at one corner until the back mandrel is brought up, so as to bring the head block in contact with the movable center in the chuck where it is held between that center and the back plate. By continuing to bring up the mandrel (*c*) toward the chuck, the head block (*d*) slides off the end of the gage pins and is brought in contact with the rubber on the chuck, being firmly held between it and the back plate. By means of this contrivance the head block is put into the lathe, and the head taken out while the lathe is in motion and without stopping it.

The chisels which turn the head are fixed in two puppets (*e*) one on either side of the head block. These two puppets are attached to an iron slide (*f*) which is made to move backward and forward upon rails fixed to the lathe, and running parallel therewith. This slide is kept firmly on the rails by a weight marked (*g*) unless sufficiently heavy without it. A handle (*h*) with a connecting rod (*i*) serves to move this slide and the chisels, backward and forward, the distance being regulated on each side by two gage blocks marked (*j*). In use, the face side of the head, which is toward the chuck, is first cut by pulling the handle until the slide strikes one gage block (*j*); it is then pushed

back until the slides strikes the other gage block (*j*), when the head is turned off, and its edge brought to a proper thickness to fit the cross in the stave. The puppets have in each a groove to adjust them to the size or diameter of the head.

Fig. 6 is the machine for locking hoops, Fig. 7 being a detached portion thereof for bending the same in the process of locking. A bench (*a*) of a convenient height to work at in a sitting posture has two pendant iron levers (*b*) suspended from its top at its anterior end, and projecting downward near the floor. To them is attached a paddle (*c*) moving freely on two pins, passing through the lower ends of the said levers. One of these iron levers at its upper end is bent forward at a right angle, and a little obliquely to the right, say ten degrees as at (*d*) to receive a knife (*e*) which is fastened on the side of it with two screws, which knife is sufficiently long to cut the lock in the hoop. There is also a short knife attached to the end of the said lever, to finish cutting the lock or notch in the hoop in its proper form, being nearly at a right angle with the long knife. Or the knife may be made of one piece of sheet steel, by bending one end at the proper angle to cut the said lock, or notch. The other lever projecting above the bench about four inches is bent backward at an angle of about forty-five degrees as seen at (*f*) having a chisel (*g*) fastened on a movable joint at its upper end, while the lower end of the said chisel slides down an inclined plane (*h*) which gives it the proper direction, as the peddle below is brought toward the operator. The bevel of the chisel is so placed on the inclined plane, that when brought down upon it, the cutting edge is projected forward upon the hoop, so as to cut off a chip at the corner of the lock, the hoop being placed flat upon the top of the bench, and the distance between the locks being regulated by a small gage pin put into a hole in the top of the bench. Two upright posts (*i*) are framed into the top of the said bench at its posterior end. A shaft of iron (*j*) having on it a loose and tight pulley, is made to revolve in the said posts transversely across the bench, the pulleys being between the two posts; one end of the said shaft projecting over the side of the bench about six inches. On this projecting end of the shaft is a solid iron wheel or roller, about three inches long, its diameter somewhat less than the keg or barrel intended to be made, and may be more or less conical to adapt it to the thick and thin edge of the hoop. The upper ends of these upright posts have each a tenon, the one nearest the projecting end of the shaft being about six inches long. A piece of plank or cap (*l*) having two mortices through it to fit the said tenons loosely is placed thereon, one end of this plank or cap projects over the side of the bench as far as the projecting end of the shaft. A bed piece of iron (*m*) being the segment of a circle adapted to the circumference of the large roller and fitted to receive five or more small iron rollers (*n*) about three quarters of an inch in diameter which may be distinctly seen in Fig. 7, is secured to the under side of the projecting ends of this cap, so as to bring the peripheries of the small rollers in contact or nearly so with the periphery of the large roller. The one end of this cap may be secured to the upright post by a pin passing through the mortise and tenon. The other or projecting end of the cap is allowed to move a little perpendicularly on the tenon of other upright post; being kept down by a strong spiral around the said tenon, as seen at (*o*).

The hoops are to be passed between the large roller and the segment of small rollers giving them a proper bend; the segment of small rollers yielding for any irregularities in the hoops by means of the spring, &c. Another mode of bending the hoops is by passing them around the said iron roller underneath a band running over the said iron roller, and another of wood about the same diameter, placed at the forward end of the bench to correspond with it. This band should be of india rubber or gutta percha (the latter is best) to resist the moisture or dampness of the hoops, and its elasticity will be found sufficient for all the irregularities of the hoops.

I claim as my invention in the stave cutter, and desire to secure by Letters Patent—

1. The eccentric groove and cap extending over or around the shaft to the side opposite the knife, the said cap constituting a part of the eccentric cam ring passing around the shaft, and having an opening through the said cam ring at the posterior termination of the cap, where the staves make their exit: and I also claim the whirl or secondary shaft, as described, in combination therewith.

2. I claim as my invention the right and left stave holders, in the jointer, having flanges or thumbpieces to support the edge of the stave during the operation of jointing, and to insure an equal width at each end.

3. I also claim as my invention, the horizontal jointer in combination with an inside and an outside frame, to which the right and left stave holders are attached by hinges, and by which arrangement four or more boys may work around one horizontal wheel or jointer and operate simultaneously, being also thereby enabled to join the staves with the grain of the wood, without loss of time.

4. I claim as my invention the movable center in the head machine in connection

with the opposite face plate on an universal joint, between which the head block is held before it is brought in contact with the rubber on the face of the chuck, and the slide which holds the chisels, constructed substantially in the manner set forth.

5. I claim as my invention the combination of the cutter (*c*) with the jointed spring cutter (*g*) and levers (*b*, *b*,) in Fig. 6, for cutting the locks in wooden hoops substantially as herein before described.

SOLOMON ANDREWS.

Witnesses:
JOHN D. SEE,
HUGH HICKS.