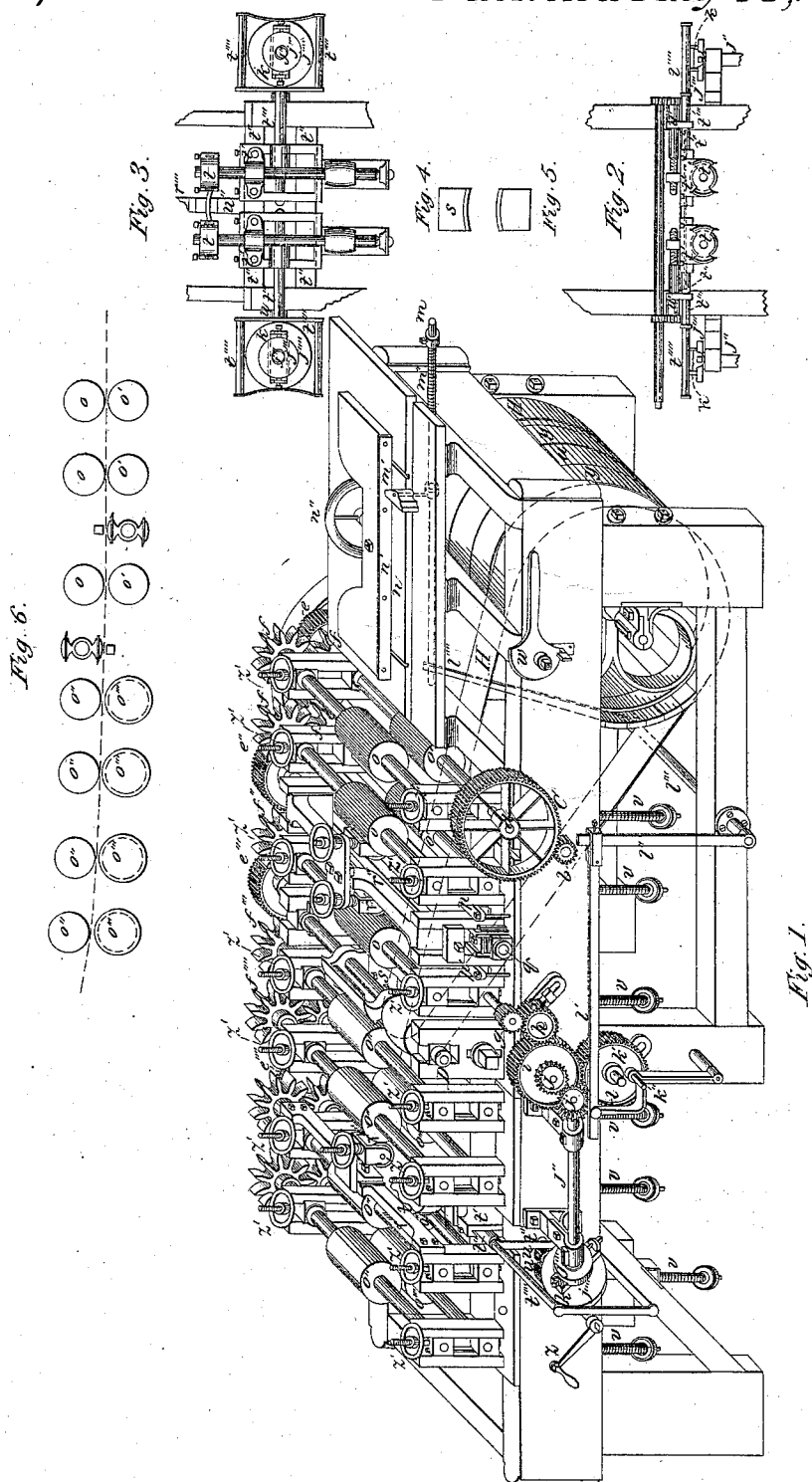


W. Hawkins,
Dressing Stares.

N^o 8,245.

Patented July 22, 1851.



UNITED STATES PATENT OFFICE.

WM. HAWKINS, OF MILWAUKEE, WISCONSIN.

STAVE-DRESSING MACHINE.

Specification of Letters Patent No. 8,245, dated July 22, 1851.

To all whom it may concern:

Be it known that I, WM. HAWKINS, of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain
5 new and useful Improvements in Machinery for Dressing and Jointing Staves; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings,
10 forming part of this specification, in which the same letters of reference in the different figures refer to like parts.

Figure 1, is a perspective view of the machine the parts colored blue being a wood
15 frame, (this may be of iron); Fig. 2, is a ground plan and Fig. 3, an elevation of that part of the machine used in jointing the staves.

a, Fig. 1, is a drum or driver to which motion is communicated from the first mover
20 by means of a band passing over a pulley on the opposite end of the drum shaft which is not shown, there is upon this shaft at the same end a small pulley from which a band
25 passes to a large pulley on the shaft upon which the pinion b, is placed, and through the said pinion to another C, on the shaft d, which carries the lower fluted rollers o'. This shaft carries a spur wheel e, this in
30 turn gears into a wheel of the same size which is fixed upon a stud attached to the frame in the same manner as shown at h, and h', Fig. 1, and this gears into another wheel of the same size upon the shaft of the
35 second fluted roller o' and so on by a similar arrangement, only that the two stud wheels e'' and e''' are placed above the roller shafts instead of below, all the shafts of the lower rollers are geared together in
40 such a manner as to secure a uniform and constant motion in the same direction, while a corresponding motion is secured to the upper rollers by means of the finger wheels f, f, f' f' &c. The first three upper rollers
45 and the first two lower rollers are fluted while all the others are plain. Those rollers thus geared together effects the feed motion of the machine.

The lower roller shaft upon which the
50 pinion g, is placed having a motion common to all the roller shafts communicates that motion through the stud wheel h, to the spur wheel i, and the miter wheel j. The spur wheel i, gives motion to the stud wheel
55 k', which carries the pin k'', this at every revolution comes in contact with the bent

lever l, carrying it forward until the pin passes the elbow when it lets go, in this motion the pitman l', the lever l'', and by the partial turning of the shaft l''', the lever
60 l'''' and the sliding rod or pitman m, to which the starting hand m', is attached are all carried forward in the direction of the rollers a distance that may be increased or diminished by simply raising or lowering
65 the end of the pitman l', attached to l'', and as soon the pin k'', lets go the bent lever l, the spiral spring m'', on the sliding rod m, carries this whole series of levers, &c., back to the position shown in the drawing, and
70 this operation will be repeated as often as k', makes a revolution. This effects the starting of the stave into the machine at the proper time.

Motion having been communicated to the
75 miter wheel j, as above described it will be transferred through j', to the cam i''', which will of course make one revolution for every revolution of i, of k', and all the movements depending on these, the shaft upon which i, 80
and j, are fixed passes through the frame to the opposite side and carries the same kind of miter wheel as j' and arranged in exactly the same manner to give motion to a cam on the opposite side of the machine in all re- 85
pects the same as i''' Fig. 1, and which together with the other parts attached may be better understood by reference to Figs. 2, and 3. The disk j'', is fixed permanently upon the shaft j'' while the cam j''', is 90
fixed upon the knee piece k, which works in a groove or recess in the disk j'', which keeps it in position while it allows it to move in the direction of its length by means of the set screws acting on opposite sides of the 95
disk j'''—there is a bolt passing through the knee piece in a slot and screwing into the disk by means of which, when once adjusted the whole is secured firmly together. There is attached to the cam yokes t''', pitmen 100
t''' which pass into the bosses on the carriages t', and fit in holes in them snugly, so that they may slide in and out under the action of the screws to be described presently; there are two clamps u', u', Fig. 2, 105
which connect the screw shafts with the pitmen above described these clamps are secured firmly to the pitmen t''', t''' and have bosses extending to the spur wheels u, u, in which the screw shafts revolve the motion 110
being communicated by means of the crank shaft upon which the crank z, and the spur

wheels u, u , are fixed the object being to set the jointing cutters t, t , to any required width, the screws being right and left, the screw shafts revolving in the same direction
 5 moves the carriages and cutters in opposite directions.

The carriages t', t' , are neatly fitted upon the planed ways $t'' t''$ as shown in Fig. 1, so that they may move freely to and from
 10 each other under the action of the cams $j'''' j''''$. The carriages extend down below the ways and support the lower end of the cutter shafts as shown in Fig. 3. The cams $j'''' j''''$, are composed of parts of two circles, and as above set forth may have any
 15 required amount of throw, and being an irregular cam they will not fill a rigid yoke, and as it is necessary that the motion should be positive and steady, I make the outer
 20 piece of the yoke in the form of a semi-elliptic spring and thus secure the filling of the yoke as is more clearly shown in Fig. 3. The yoke may be dispensed with by using
 25 springs to throw out the ends of the pitmen toward the cams so as always to keep the cams bearing on their ends.

There is attached to the ways t'' , an upright w'' , upon which the stave rests, (as shown in Fig. 3); while the operation of
 30 jointing is being performed, and upon this upper side the roller r'''' , Figs. 1 and 3, acts in the same manner and by the same means as described in the case of r , and r' , Fig. 1, at the same time that it is held by large rollers
 35 as in the case of the other cutters. This roller is supported by the cross bar r'''' Fig. 1.

All the lower roller shaft boxes are fixed permanently in the stands as shown, having
 40 underneath them a small set screw by means of which their height can be regulated, while the upper roller shafts are made to revolve in boxes that are free to move up and down to a limited extent in the stands,
 45 to allow of thicker or thinner staves passing between them. These boxes have attached to their upper side small screw bolts z' , &c., Fig. 1, upon which a large round washer
 50 nut is screwed and rests upon the top of the stands by means of which the height of the rollers is regulated and they are prevented from falling too low when there is no stave between them.

The rolls rest upon the stave with a force
 55 equal to their own weight and in addition their power is increased by means of the spiral springs v, v , Fig. 1, which are placed upon the small rods upon which the large round washer nuts are screwed, and upon
 60 the upper side of which the spring v , acts at the same time that it presses upon the under side of the frame. These rods pass up through the frame and the bottoms of the stands and through recesses cast in the sides
 65 of the stands extending above the upper

boxes having a short hook upon their upper end which turns over and rests upon the top of the box, by this means the rollers are allowed to rise up sufficiently to allow the
 70 staves to pass and at the same time are made to act with any required force by turning the nut on the lower end of the rod up or down.

The rollers are so arranged in the frame as that o, o, o , and $o', o' o'$, Fig. 6, shall
 75 have their axes parallel with the frame of the machine, so that the bolt will pass in straight to the first or under cutter, by which the under part of the stave is merely smoothed; and the rollers o'' and o''' are
 80 arranged so that their axes shall form a curved line rising upward from the plane of the rollers o, o' , for the purpose of bending the stave in the direction of the curve so formed; this upsets the grain of the wood
 85 immediately under the upper cutter, and compresses it close together, which allows the upper cutter to take off the excess of wood on the bolt without splintering or splintering said bolt, and leaving it perfectly
 90 smooth. The rollers o'' , in rear of the cutters are perfect, straight cylinders, and the rollers o''' , underneath them are convex, so that the stave when dressed will rest its
 95 whole surface on the under or convex rollers, and the upper surface of said stave will only be touched by the upper rollers on the crown of its curved surface; this drives the stave through in a perfect straight line, and
 100 feeds it to the cutters for dressing the edges thereof, without the use of guides. In machines for a similar purpose where convex and
 105 concave rollers are used, the difference in diameter, and consequent velocity with which different portions of the rollers travel, forces the stave out of line, the slightest variation
 110 from a straight line multiplying itself by the conical shape of such rollers, which prevents the stave from coming to the edging tool or cutters without the most rigid guides and with great friction. By my arrangement
 115 this is entirely obviated, and the stave will pass through straight, without any friction further than the mere carrying of the stave between the rollers.

There is in addition to the rollers above described for securing the stave while it is
 being dressed on either side of the shaft q , and as near it as may be and allow room for
 the cutters two bed pieces or plates the ends
 120 of which are seen at p , and p' , Fig. 1, these extend across the frame resting in the stands as shown and held securely by means of the bolts passing through the frame, their under
 125 surfaces on the sides nearest the cutters are concave so as to allow them to approach as near the cutters as may be; while immediately over these the two small rollers r , and
 130 r' , Fig. 1, are placed in such a manner that they are made to press upon the stave by

means of the spiral springs acting upon the upper side of the fork in which the roller plays and upon the under side of the arm attached to the cross bar r'' , while their height is regulated by means of the nut running upon the stem of the fork which carries the roller and acting upon the upper side of the arm.

There is under the cutters s , which are secured to a revolving shaft or cylinder d , a strong bed plate extending across the frame and fastened to it, having its upper surface over which the stave passes, convex to fit the concave surface of the stave; there is on each side of the bed plate two small rollers about $1\frac{1}{2}$ inches diameter and 12 inches long placed in small stands, similar in all respects to the large ones, these small rollers being fixed, secured and held in all respects in the same manner as the larger ones before described and placed as near the cutters as possible. They cannot be seen.

In the drawing w , is an eccentric trip for stopping and starting the feed.

n , is a table upon which the staves are laid, against the fence n' , there is in this table two grooves as shown while there are two corresponding cleats on the under side of the fence n' , working in these grooves to insure its parallelism. There is a nut attached to the under side of the fence having a stem passing through the fence and a nut as shown, into this nut the screw shaft upon which the hand wheel n'' , is placed passes, by means of which the adjustment of width is readily made, while that of length is effected by sliding the hand m' , along the rod m , and securing it by means of a small set screw.

The cutters on the revolving shaft q , are convex as shown in Fig. 5, and those at s , are concave as shown in Figs. 1 and 4, the first dressing the inside and the latter the outside surface of the stave while the radial line of the cask or bevel edge of the stave is effected by simply grinding the cutters in t , t , beveling or longest at the lower edge. Motion is given to the cutters s , by means of the band x , and to q , by x' , and the motion of t , t , by y and y' .

The following is the operation of the machine. The machine being in motion and a stave placed upon the table n , against the fence n' , the wheel k' , in its revolution brings the pin k'' , in contact with the bent lever l , carrying it forward and with it through the connections the starting hand m' , which carries the stave forward until the first two rollers o , and o' , take hold of it and so it passes through the machine, in the mean time the pin k'' , having let go the lever l , the spring m'' , at once brings the starting hand and all the other parts of that movement back to the position shown in the drawing and puts it in readiness to re-

ceive another stave. Meanwhile the stave thus started into the machine passes over the shaft q , and in doing so its under side is dressed, and as it passes under the cutters s , its upper or outer surface is dressed, it then passes between the cutters t , t , in which operation it is jointed; as has been before stated the shafts j'' , j'' , and of course the cams j''' , j''' , also make a revolution in exactly the same time occupied between the starting of one stave and the next or a stave will pass between the cutters t , t , in the same time the cams make a full revolution, if then the starting motion be so set that the stave shall reach the cutters at the moment when the cams have their longest point inward, as the stave passes through the cams in their revolution will cause the cutters to recede from each other until the cams have made one half a revolution at which time the center of the stave will have reached the cutters, the cutters will now approach each other during the next half of the revolution and when the entire revolution has been effected the cutters will be in exactly the same position they were in at the commencement of the operation, the first stave will have passed through them and the second will just be entering and so on, thus the rough stave that is placed upon the table n , is delivered at the other end of the machine ready for the truss hook.

I will here remark that the bilge of the cask may be made greater or less as the throw of the cams is greater or less, and it may be rounding or angular as the form of the cam is parts of two equal circles or more angular in form; and further that the machine will work staves of any length as the spur wheel or pinion g , is greater or less, the wheel i , having 50, teeth to work a stave of 28, inches in length in this machine (the rollers being $4\frac{3}{4}$, in diameter) requires g , to contain 25 teeth; to work 31, inches g , must have 23 teeth and to work 44, inches requires 16, teeth, and I find the machine to work very well when so speeded that the feed of one foot will occupy the time of 3600 revolutions of the main cutters. If the feed motion and the reciprocating motion of the cams be so arranged that the cams shall make one half a revolution during the passage of a stave then the stave will have a straight bevel or swell from end to end or a firkin or bucket formed stave will be produced, and it is clear that the dressing the staves may be effected in one machine and the jointing in another by arrangement analogous to those above set forth and described.

Having thus fully described my invention what I claim therein as new and desire to secure by Letters Patent is—

The arrangement for starting each stave or introducing it to the feed at the proper

moment, consisting of the wheel k' , with its
stud k'' , the bent lever l , the pitman l' ,
lever l'' , shaft l''' , lever l'''' , sliding rod
 m , spring m'' , and adjustable starting bar,
5 in combination with the apparatus for giving
the reciprocating motion to the jointing
cutters, so that the greatest width of the
stave may be given on different lengths of

staves uniformly at the middle or such other
point as may be desired, the whole being 10
combined, arranged, and operated in the
manner substantially as herein specified.

WM. HAWKINS.

Witnesses:

S. H. WALES,
P. I. MEEHAN.