

(No Model.)

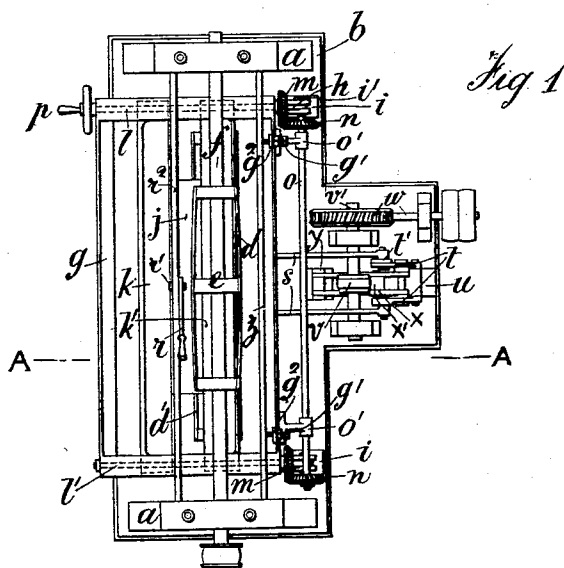
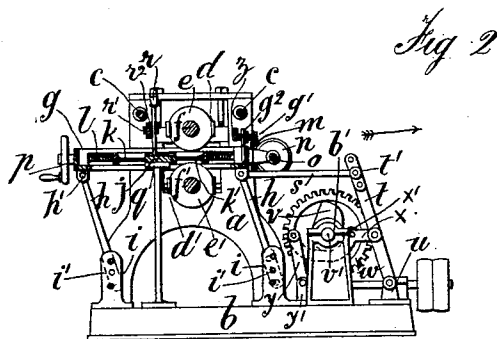
2 Sheets—Sheet 1.

A. DUNBAR.

MACHINE FOR BACKING AND HOLLOWING CASK STAVES.

No. 580,261.

Patented Apr. 6, 1897.



Witnesses

James Johnson
Luis Proctor

Inventor

Alexander Wilson

(No Model.)

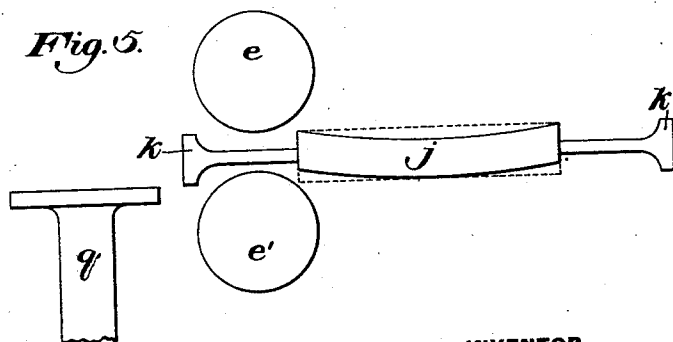
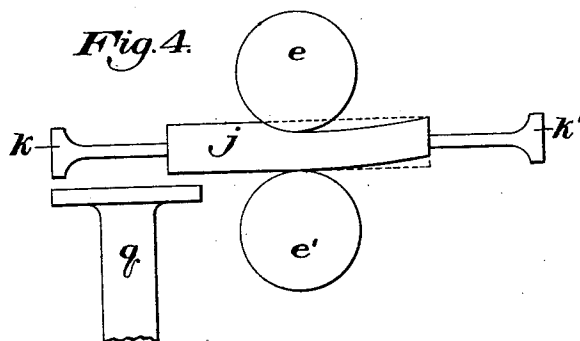
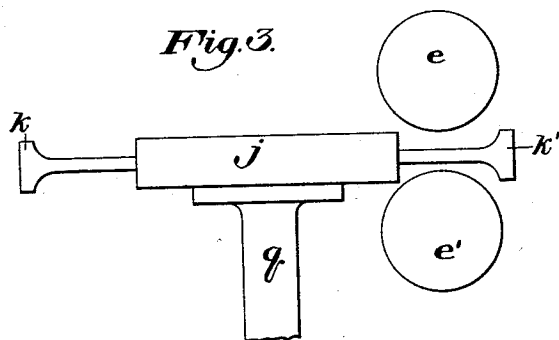
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WITNESSES

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UNITED STATES PATENT OFFICE.

ALEXANDER DUNBAR, OF LIVERPOOL, ENGLAND.

MACHINE FOR BACKING AND HOLLOWING CASK-STAVES.

SPECIFICATION forming part of Letters Patent No. 580,261, dated April 6, 1897.

Application filed May 20, 1896. Serial No. 592,259. (No model.) Patented in England March 8, 1893, No. 5,000; in Spain February 5, 1894, No. 15,487; in France February 8, 1894, No. 236,129; in Belgium February 10, 1894, No. 108,661; in Italy February 19, 1894, No. 35,785; in Germany March 2, 1894, No. 79,058; in Austria July 13, 1894, No. 3,198; in Hungary November 7, 1895, No. 4,517, and in Portugal January 20, 1896, No. 2,067.

To all whom it may concern:

Be it known that I, ALEXANDER DUNBAR, a subject of the Queen of Great Britain, residing at Liverpool, in the county of Lancaster, England, have invented a new and useful Improvement in Machines for Backing and Hollowing Cask-Staves, (for which I have obtained patents in Great Britain, No. 5,000, dated March 8, 1893; in France, No. 236,129, dated February 8, 1894; in Belgium, No. 108,661, dated February 10, 1894; in Germany, No. 79,058, dated March 2, 1894; in Spain, No. 15,487, dated February 5, 1894; in Italy, No. 35,785, dated February 19, 1894; in Austria, No. 3,198, dated July 13, 1894; in Hungary, No. 4,517, dated November 7, 1895, and in Portugal, No. 2,067, dated January 20, 1896,) of which the following is a specification.

Figure 1 is a plan of a machine constructed in accordance with my invention for backing and hollowing cask-staves. Fig. 2 is a vertical transverse section at the line A A of Fig. 1, and Figs. 3, 4, and 5 are diagrammatic views illustrating the passage of the oscillating carrier-frame.

The object of the invention is to provide an effective machine for imparting the requisite transverse curvature, commonly called "backing" and "hollowing," to the backs and fronts of staves used in making casks.

a are end frames secured to a bed-plate b and coupled by the bars or struts c .

d d' are cutters secured to disks ee' on shafts ff' . The shafts ff' are carried in bearings in the frames a and are caused to rotate by means of belt-pulleys. The center disk of the shaft f is of larger diameter than the end disks, so that the cutters d , which act on the inner surface, may be adapted to the longitudinal curvature of the staves. The said cutters d will vary in length and shape according to the length and shape of the inner joint of the staves. The lower cutters d' , which act on the back of the staves, are usually as long as the longest staves the machine will take, are straight, and are not changed according to the length of the staves.

g is a frame carried by arms h , pivoted to the said frame at h' and at i' to lugs or brack-

ets i , secured to the bed-plate b . The lower ends of the arms h and the lugs or brackets i are made with three or more pivot-holes i' therethrough, so that the radial length of the arms h may be varied according to the diameter of the casks to be made by moving the pivot-pins from one set of holes to another.

k k' are two gripper-bars free to slide to and fro in bearings in the ends of the frame g .

l l' are screws carried in bearings in the frame g and passing through nuts in the gripper-bars k k' . One end of each screw has a right-handed thread, and the other end a left-handed thread, so that as the screws l l' are caused to rotate the bars k k' approach or recede from each other, according to the direction in which the screws are turned. The screws l l' are fitted at their ends with bevel-wheels m , which gear with bevel-wheels n on a shaft o , carried in bearings o' , affixed to the frame g .

p is a hand-wheel for giving motion to the screw l and by means of the gearing above mentioned simultaneously to the screw l' .

q is a table on which the staves are placed.

r is a cam-lever pivoted at r' to the bar r^2 . The bar r^2 is secured to the end frames a .

s are rods pivoted to the frame g and to a lever t at t' . The lever t is pivoted to a bracket u on the base-plate b .

v is a cam on a shaft v' , carried in bearings b' on the bed-plate b .

w is a worm wheel and gear for giving motion to the shaft v' and cam v .

x are links connecting the lever t to parallel levers y , pivoted to the lugs y' on the bed-plate b .

x' is a roller carried by the links x .

The cam v acts against the roller x' .

g' are set-screws passing through arms g^2 , secured to the frame g . The length of the arms and the position of the set-screws are such that the said set-screws may rest against the bar z , connected to the two end frames a .

The action of the machine is as follows: The frame g being in the position shown a stave j is placed on the table q and held firmly down by means of the cam-lever r . The hand-wheel p is then turned until the bars

5 $k k'$ grip the stave tightly between them. The
 clamp upon the table is then released, as the
 table and clamp are employed merely for
 leveling and holding the stave in case it is
 10 warped, and the cam v acts on the roller x'
 and causes the frame g to travel in the direc-
 tion of the arrow, so that the stave, which
 is thicker than the bars $k k'$, is carried trans-
 versely and in a circular arc, owing to the
 15 pivotal arms $h h'$, through between the cut-
 ters $d d'$, which are caused to rotate rapidly.
 The stave is thus given the desired transverse
 curvature on the back and front. When the
 cam v has passed the roller x' the frame g
 20 falls back, owing to being on a slight incline,
 until the set-screws g' strike against the bar
 z , and the said frame is again in the position
 shown on the drawings, where it remains at
 rest until the cam v again acts on the roller
 25 x' . While the frame g is at rest the hand-
 wheel p is turned until the gripper-bars re-
 lease the stave. The said stave is then re-
 moved and replaced by another requiring to
 be backed and hollowed.

30 I claim—

1. In apparatus for backing and hollowing
 staves, the combination with parallel cutter-
 shafts and cutters thereon, of an oscillating
 carriage substantially parallel with said shafts
 35 and arranged to swing transversely and carry
 the stave between the cutters; substantially
 as described.

2. In apparatus for backing and hollowing
 staves, the combination with parallel cutter-
 shafts and cutters thereon, one of said cutters
 35 having a longitudinally-curved cutting edge,

while the other is straight, of an oscillating
 carriage substantially parallel with said shafts
 and arranged to swing transversely and carry
 the stave between the cutters; substantially
 40 as described.

3. In machines for backing and hollowing
 cask-staves, the combination of rotating cut-
 ters $d d'$, adjustable oscillating frame g , stave-
 grippers $k k'$, and operating-gear with a lever
 45 t , connecting-rods s and cam v for giving mo-
 tion to the said lever t substantially as set
 forth.

4. In apparatus for backing and hollowing
 staves, the combination with parallel cutter-
 shafts and cutters thereon, of an oscillating
 carriage substantially parallel with said shafts
 and arranged to swing transversely and carry
 the stave between the cutters, said carriage
 having grippers, and a table, having a tem-
 50 porary clamp arranged to level and hold the
 stave; substantially as described.

5. In apparatus for backing and hollowing
 staves, the combination with parallel cutter-
 shafts and cutters thereon, of an oscillating
 carriage substantially parallel with said shafts
 and arranged to swing transversely and carry
 the stave between the cutters, and an adjust-
 60 able stop for the frame; substantially as de-
 scribed.

In testimony whereof I have hereunto set
 my hand this 8th day of May, 1896.

ALEXANDER DUNBAR.

Witnesses:

JAMES JOHNSON,
 JNO. F. W. COTT.