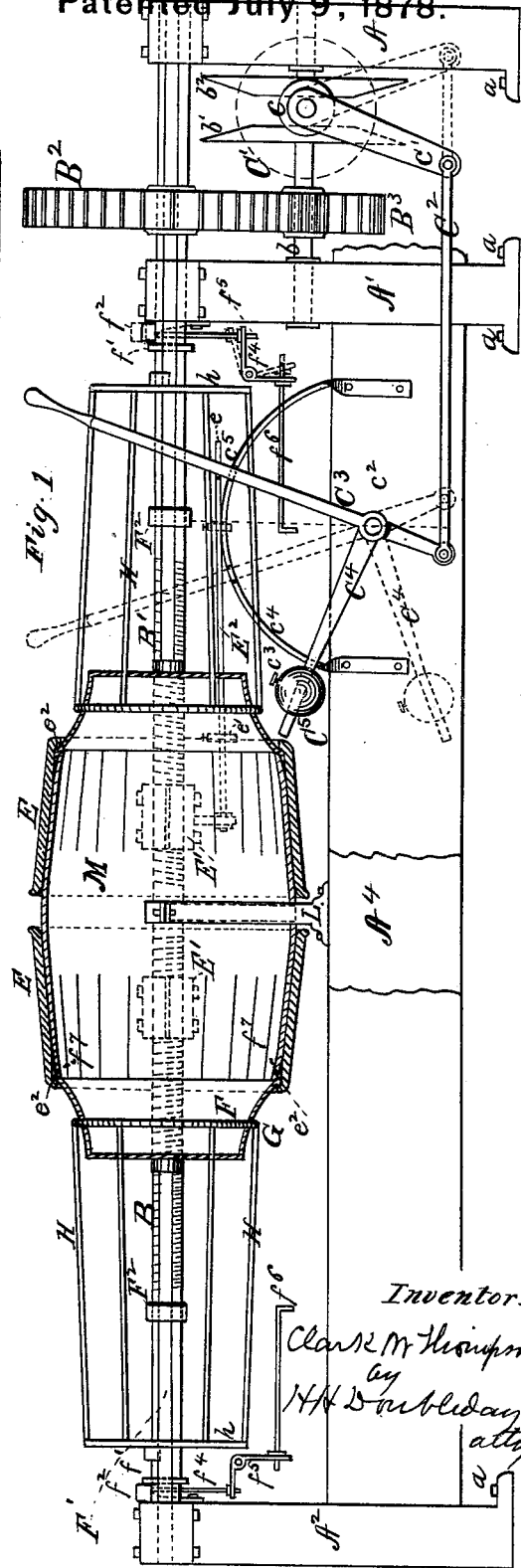
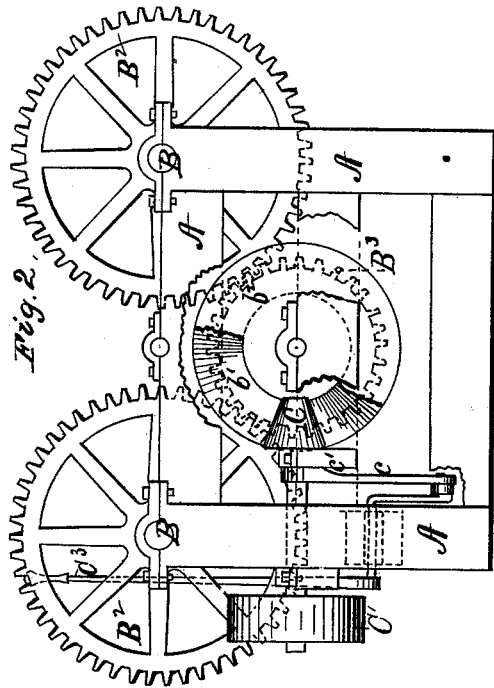


C. W. THOMPSON.
Machine for Making Barrels.

No. 205,923.

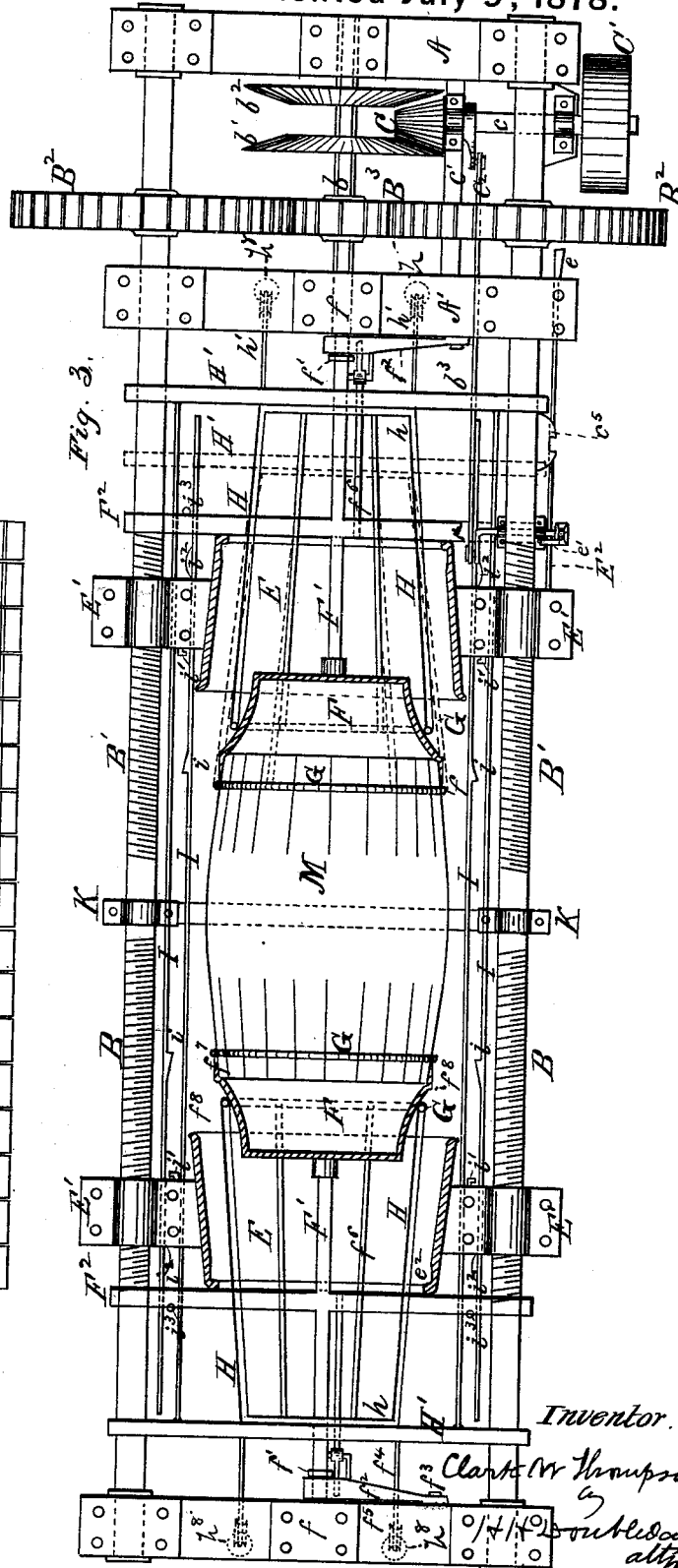
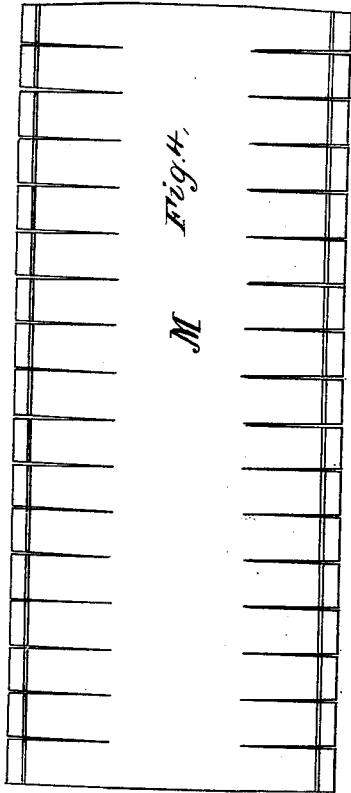
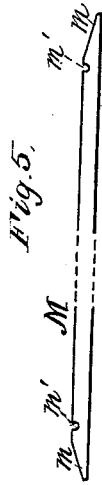
Patented July 9, 1878.



Witnesses.
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UNITED STATES PATENT OFFICE.

CLARK W. THOMPSON, OF WELLS, MINNESOTA.

IMPROVEMENT IN MACHINES FOR MAKING BARRELS.

Specification forming part of Letters Patent No. 205,923, dated July 9, 1878; application filed May 1, 1877.

To all whom it may concern:

Be it known that I, CLARK W. THOMPSON, of Wells, in the county of Faribault and State of Minnesota, have invented certain new and useful Improvements in Machines for Making Barrels; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Figure 1 is a side elevation of my improved machine, partly in section. Fig. 2 is an end view. Fig. 3 is a top or plan view. Fig. 4 is a plan view of a sheet of veneer from which the barrel is to be made; and Fig. 5 is a transverse section of the veneer.

A¹ A² A³ are square or rectangular frames, made preferably in one piece, of cast metal, each being composed of two legs or posts, a cap-plate, and a girt, A³. The frames A¹ A² are connected with each other by means of a wide sill, A⁴, upon each side of the machine, the whole being secured to the floor by means of bolts *a*, which pass through the feet of the posts, thus forming a strong rigid frame-work, upon which the operative parts of the machine are supported.

B B¹ are shafts mounted in bearings upon the frames, and provided with right-hand screw-threads at B; and left-hand screw-threads at B¹. B² B² are spur-gears keyed to shafts B B¹. B³ is a spur-gear keyed to shaft *b* and meshing with gears B² B². *b*¹ *b*² are beveled friction-pulleys, also keyed to shaft *b*. C is a beveled friction-pulley, arranged between pulleys *b*¹ *b*² on shaft *c*. C¹ is a band-wheel on shaft *c*.

*c*¹ is an eccentric-lever, in which the end of shaft *c* is supported in such manner that by moving this lever from the position shown in full lines to that shown in dotted lines, Fig. 1, the friction-pulley C may be released from pulley *b*¹ and caused to engage with pulley *b*², and the direction of rotation of the screw-shafts B B¹ thereby reversed, the belt-pulley C¹ being driven continuously in one direction.

C² is a link connecting eccentric-lever *c*¹ with a hand-lever, C³, pivoted at *c*² to the sill A⁴. C⁴ is an arm projecting at right angles

from hand-lever C³, and carrying an adjustable weight, C⁵, secured in position on arm C⁴, by a set-screw, *c*³.

A semicircular standard, *c*⁴, rises from the sill A⁴, and has a notch, *c*⁵, cut in its upper surface, in which the lever C³ rests when the parts are in the position shown in Fig. 1.

E E are cup-shaped dies, having, with exception to be hereinafter noted, an internal conformation conforming to the desired external conformation of the barrel. E¹ E¹ are carriers projecting from each side of each die, these carriers being fitted with internal screw-threads, which engage with the threads of shafts B B¹, so that as these shafts are rotated in one direction the dies approach each other, a reverse motion of the shafts moving the dies from each other, as will be readily understood.

E² is a tripping-rod, attached to and traveling with one of the carriers E¹. Rod E² slides in a groove formed in the upper face of the curved standard *c*⁴, and carries at its rear end a wedge, *e*, and also an adjustable collar or lug, *e*¹, located nearly in a line with the outer end of the die.

*e*² are flanges projecting inwardly from the smaller outer ends of the dies. Connected with each die is a bell-shaped or conical follower, F, mounted upon one end of a shaft, F¹.

F² is a cross-bar, sliding freely upon the screw-shafts B B¹. Shaft F¹ is attached near one end to the cross-bar F², and has its other end supported in a boxing or strap, *f*, upon frame A¹ or A², in such manner that the shaft and follower are free to move backward and forward when actuated, as will be hereinafter explained.

*f*¹ is a collar on shaft F¹, near boxing *f*. *f*² is a locking-latch, pivoted at *f*³, with its free end interposed between flange *f*¹ and the boxing *f* when not held out of such position by rod *f*⁵, bell-crank lever *f*⁴, and rod *f*⁶, as will be explained.

The edge of the follower F is formed into a wedge-shaped ring or flange, *f*⁷, the inside of which is flaring to fit the outside of the barrel, the outside of this flange forming a shoulder, *f*⁸, at the point where it joins the body of the follower, with which shoulder the flange *e*² of the die engages as the die is forced upon the barrel, as is indicated in Fig. 1.

The inside of the die is chambered out at

this end to receive the flange f^7 , and the inside of the flange forms, practically, a continuation of the inner face of the die.

G is a contracting-hoop, formed preferably of coiled steel wire, as is fully set forth in another patent of mine.

H H are elastic pusher-fingers attached to a head, h , which is supported upon and carried by a bar, H' , sliding on shafts B B'. These pusher-fingers are elastic, and their free ends clasp the outside of the follower F upon opposite sides. Any number of fingers may be used; but in practice I prefer to use six or eight.

$h^1 h^1$ are cords or chains connected with bar H' , and running over pulleys attached to one of the frames A'. $h^2 h^2$ are weights attached to the pendent ends of cords $h^1 h^1$, to draw the pusher-fingers backward from a position into which they have been forced by devices which I will next proceed to describe.

I I are draw-rods, connected rigidly at one end to bar H, the other end of each draw-rod sliding freely in an elongated slot in the bar F² at the opposite end of the machine, it being, of course, understood that there is one of the cup-shaped dies, one follower, one elastic hoop, and one set of pusher-fingers at each end of the machine.

$i^1 i^1$ are hooks on the carrier E'. $i^2 i^2$ are tripping-inclines on the draw-rods I I. $i^3 i^3$ are tripping-pins in the slots in the bars F².

When preferred, springs may be employed to keep the draw-rods in contact with the tripping-pins, except when they (the rods) are forced away from the pins by the tripping-inclines i^2 .

K (shown partly in full lines and partly in dotted lines in Fig. 3) is a saddle, supported upon standards L, one at each side of the machine, at a point between the inner ends of the dies, to support the barrel both before and after it has been acted upon by them, (the dies.)

M is the barrel, shown in a flat sheet of veneer, with a suitable number of gores cut in from both edges, (see Fig. 4,) and having the customary chamfer m and croze m' . (See Fig. 5.) It is bent into cylindrical shape, and placed upon the saddle K, between the dies, the latter having been withdrawn as far as possible from each other.

The hand-lever C³ is then thrown into the position shown in full lines in Fig. 1, which causes the friction-pulley C to impinge upon pulley b^2 , and rotate the screw-shafts B B' in such direction as to force the cup-shaped dies E upon the ends of the barrel and compress the ends of the same into the desired shape.

As the dies advance toward each other their flanges e^2 engage with the shoulders f^3 of the cone-followers F, and force the flanges f^7 upon the ends of the staves. (See Figs. 1 and 3.) This advancing movement of the dies moves the tripping-rod E² forward, so that when they (the dies) reach the desired point the wedge e forces the lever out of its retaining-notch e^5

in standard e^4 , when the weighted lever C⁴ C⁵ moves the lever into the position shown in dotted lines, Fig. 1, thus carrying friction-pulley C into contact with pulley b^1 , and causing the screw-shafts B B' to rotate in an opposite direction, which moves the dies in an opposite direction—that is, away from each other.

When the dies were carried forward, as in Fig. 1, the hooks i^1 became engaged with the shoulders of the dogs or teeth i on the draw-rods, so that as the dies move backward each one draws forward the bar H' at the opposite end of the machine, with which it is connected by a pair of the draw-rods. This forward movement of the bar H' and pusher-fingers H crowds the elastic hoops G over the expanding cone-shaped follower F and its flange f^7 , producing a high tension of the hoop, until the hoop engages with the barrel, the fingers being now in the position represented by dotted lines, Fig. 3. At this point the tripping-inclines $i^2 i^2$ engage with the tripping-pins $i^3 i^3$, Fig. 3, and release the dog-teeth i from the hooks $i^1 i^1$ on the carriers E, and the weights h^2 and chains h^1 draw the bars H' and pusher-fingers H backward upon the follower F, the position of all the parts at this stage in the operation being shown in full lines, Fig. 3.

The dotted lines G in this figure represent the position occupied by the elastic truss-hoop on the cone-follower before the pusher-fingers were advanced.

The locking-latches f^2 , which are interposed between the collar f^1 and the boxings f at each end of the machine, prevent the dies from drawing the flanges f^7 off the ends of the barrel when the dies are first started backward; but before the dies reach the position shown in Fig. 3 they have come in contact with the rods f^6 , and, by means of these rods, bell-crank levers f^4 , and rods f^5 , have lifted the latches, so that the further backward movement of the dies will withdraw the flanges f^7 from the barrels, the dies being in contact with the bars F², and carrying the bars, shafts F¹, and follower F back with them, as can be readily understood from an examination of Fig. 3 without further explanation.

Just before the dies reach the extreme limit of their rearward movement the adjustable collar and dog or spur e^1 strikes the hand-lever C³ and moves it (the lever) such distance as will release the friction-pulley C from pulley b^1 and stop the further revolution of the screw-shafts B B'.

The barrel is now removed with its elastic truss-hoops. New hoops are placed upon the cone-follower, as in full lines in Fig. 1, and dotted lines, Fig. 3. Another veneer-cylinder is placed in the saddle K, the hand-lever is moved into the notch e^5 in the curved standard, and the above-described operation of bending the staves and trussing a barrel is repeated.

From the above description and an examination of the drawings it will be seen that an important feature of my invention consists

in connecting the devices which thrust the elastic contracting-hoops upon the ends of the barrels with the forming-dies, whereby as both of the dies retreat these hoops are advanced. Thus, the simultaneous advancing and withdrawing of both dies become valuable, they being thus made to perform a function which is new in this class of machines.

So, also, retaining the ends of the staves in position or shape after the dies are withdrawn and before the contracting-hoops are put on is a feature which is in great measure dependent upon simultaneously advancing and withdrawing the forming-dies, from the fact the withdrawal of these retaining-hoops is effected by devices actuated by the forming-dies.

Another important feature in my system of manufacturing barrels by the use of the herein-described apparatus is, that I am enabled to manufacture barrels from green timber, which I accomplish as follows: I first cut the veneer and chamfer and croze it at the same operation. I then pass it through a machine which cuts the desired number of gores in it, after which it is formed into a cylinder, and held by any form of hook which may be most convenient. It is next placed in this machine and the ends of the staves bent into the proper shape, and the contracting-hoops G placed upon their ends.

After the barrel has been thus shaped I remove it from the machine, and season it either in the open air, by artificial heat in a suitable kiln, or by the use of superheated steam in a properly-constructed receiver.

It will be readily understood that the contracting-hoop G will retain the edges of the staves in the position in which they are thus placed during the operation of seasoning; and that by the use of this machine, in combination with the contracting-hoop, I am enabled to manufacture a barrel directly from green timber without any intermediate operation of seasoning or trussing.

What I claim is—

1. In a machine for making barrels, two forming-dies operated by screw-shafts, and simultaneously forced upon both ends of the barrel by the rotation of the shafts in one direction, in combination with mechanism, substantially as described, for reversing the direction of rotation of the shafts, whereby the dies are simultaneously withdrawn from both ends of the barrel, substantially as described.

2. In a machine for making barrels, the combination, with the dies E E, of right and left hand screw-shafts for supporting and actuating the dies, substantially as set forth.

3. In a machine for making barrels, the combination, with a forming-die which compresses the barrel into the desired form, of a

hoop which is thrust upon the end of the barrel by the advancing die, and independent mechanism for applying an elastic compressing-hoop, which is passed over the end of the barrel after the die is withdrawn from contact with the barrel, substantially as set forth.

4. In a machine for making barrels, a forming-die which compresses the ends of the staves into the desired shape, a contracting-hoop adapted to retain the ends of the staves in the position in which they have been placed by forming-die, and mechanism, substantially as described, which expands the contracting-hoop and places it upon the end of the barrel.

5. In a machine for making barrels, a forming-die which compresses the end of the staves into the desired shape, a contracting-hoop mechanism, substantially as set forth, which expands the hoop and places it upon the end of the barrel after the forming-die has been withdrawn from the barrel, and a support for the barrel separate and apart from the forming-die, substantially as described.

6. In a machine for making barrels, the combination, with the forming-dies, of a retaining-hoop which is forced upon the end of the barrel by the advancing die, and mechanism actuated by the said die for withdrawing the said hoop from the barrel, substantially as set forth.

7. In a machine for making barrels, a forming-die which compresses the ends of the staves into the desired shape as it advances upon one end of the barrel, and a hoop arranged at the opposite end of the barrel, in combination with a hoop-driving mechanism, substantially as described, whereby when the forming-die recedes from the end of the barrel the said hoop is advanced upon the opposite end of the barrel.

8. In a machine for making barrels, the combination of the following elements, namely: a forming-die which advances upon the barrel and compresses the ends of the staves into the desired shape, a hoop placed upon the ends of the staves by the said advancing die, a locking device which holds the hoop in its place upon the barrel when the die begins its receding movement from the barrel, and mechanism connecting the die with the hoop, substantially as described, to withdraw the hoop from the barrel as the die is completing its receding movement.

In testimony that I claim the foregoing as my own I affix my signature in presence of two witnesses.

CLARK W. THOMPSON.

Witnesses:

H. H. DOUBLEDAY,
M. P. COLLAN.