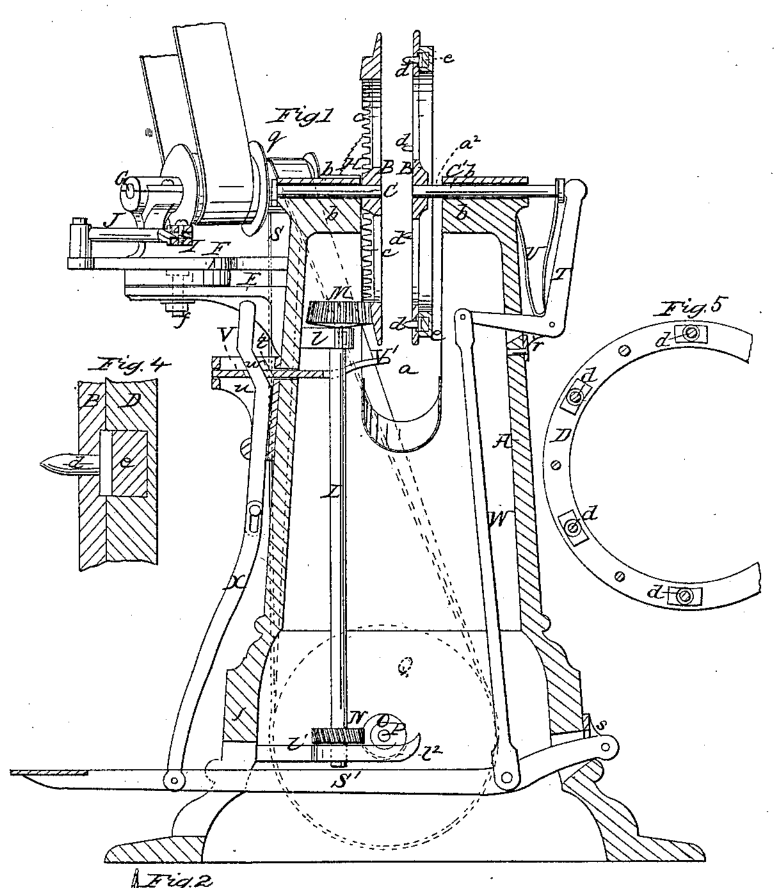
2 Sheets-Sheet 1.

W. H. Doane,

Making Barrel Heads.

No. 35,674. Patented June 24, 1862.



Witnesses:

Gustavus Dieterich
C. S. Sharp

Inventor:

Wm. H. Doane
by
Mason, Fenwick & Lawrence
Attys.

2 Sheets—Sheet 2.

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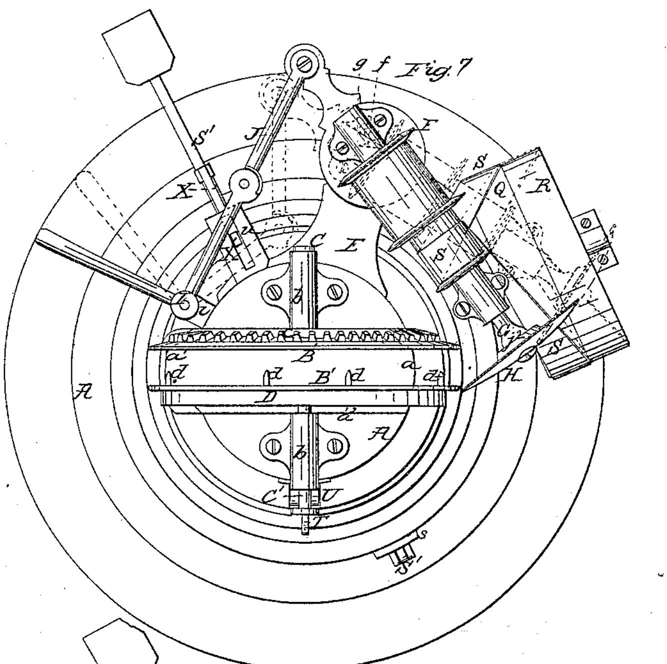

Fig. 7

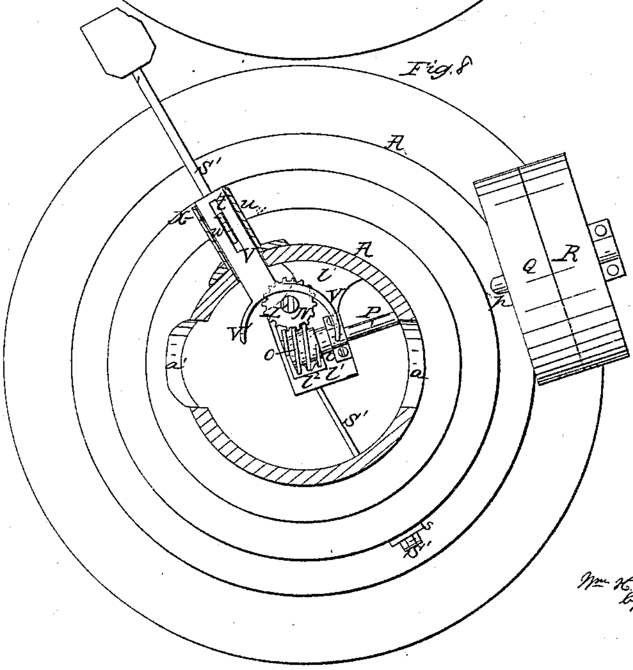

Fig. 8

Witnesses:

Gustavus Dieterich

E. S. Jacob

Inventor:

Wm. H. Doane
by Munn & Co
Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM H. DOANE, OF CINCINNATI, OHIO.

IMPROVED BARREL-HEAD CIRCLING AND BEVELING MACHINE.

Specification forming part of Letters Patent No. **35,674**, dated June 24, 1862.

To all whom it may concern:

Be it known that I, WILLIAM H. DOANE, of the city of Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Barrel-Heading-Circling Machines; 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, forming part of this specification, in which—

Figure 1 is a vertical transverse section of a heading-circling machine as improved by me. Figs. 2, 3, 4, 5, and 6 are details or views of parts of the same. Fig. 7 is a plan or top view, and Fig. 8 a horizontal section of the same.

Similar letters of reference in the several figures indicate corresponding parts.

The improvements which I have made relate, first, to the throwing of the mechanism in and out of gear through the direct agency of the saw mechanism; second, to the manner of making the clamping-disks capable of yielding to irregularities in the heading stuff; third, to an angular connection sliding bar for drawing back the heading-stuff-supporting prongs when the machine is ready to operate; fourth, to a peculiar formation of the bearing-box of the worm or feed shaft; fifth, to an arrangement of the supporting-prongs within the hollow supporting-structure; and, sixth, to a manner of holding the inner-bevel-cutting tools in positions tangential to the axis of their stock.

To enable others skilled in the art to make and use my invention, I will proceed to describe the same with reference to the drawings.

A designates a hollow supporting-structure for the mechanism used in circling and beveling barrel-heading stuff to be arranged upon and within. It is in form of a truncated cone which enlarges in bell shape from its base. Clear through the center of the upper portion of the truncated cone a narrow passage, $a\ a'\ a^2$, is formed. Within the space $a\ a'\ a^2$, and on the upper part of the cone, clamping-disks B B′ are arranged to revolve, being hung on the ends of short arbors C C′, which find their support in boxes *b b*, formed on the top of the conical structure A.

The disk B has its clamping-face made smooth; but on its outer face cog-teeth *c* are formed, while the other disk, B′, has sharp pins *d* protruding through it beyond its clamping-face, the pins having broad heads and being loosely set in the disk, and are confined in position by means of a flat detachable ring, D, which has rubber springs *e* set in one of its faces for the heads of the pins to bear against.

The arbor of the disk B′ has a collar at its outer end, and it is made longer than the box, in which it turns and slides, in order that the disk B′ may be moved toward and from the disk B.

From the outer side of the upper portion of the conical structure A a slotted bracket, E, extends horizontally, and upon this bracket a frame, F, which supports the circling and beveling saw-arbor G, is arranged to swing in the path of a horizontal circle, being fastened to the same by means of a screw-pivot, *f*, which extends down through an oblong slot, *g*, in the bracket and made adjustable in the same accordingly as the saw H requires to be set in or out to accommodate stuff for barrel-heads of varying diameters.

The saw H is thrown in and out of operative position by means of an elbow-lever, I, which is pivoted to a bracket, *i*, of the structure A, and connected with the saw-arbor frame F by means of a link, J, said link, together with one end of the elbow-lever, forming a toggle-joint.

In construction the saw H is of the ordinary dishing form, and in arrangement it stands in the usual relation to the circumference of the clamping-disks B B′. The tools *j j*, which are combined with the saw and cut the inner or smaller bevel with a raking or draw cut by reason of their tangential set, are confined in a new way—to wit, by lateral pressure induced by means of screw-threaded wedge-bolts, $j'\ j$, which are flattened on one side, and fitted within recesses of the arbor-stock j^2 and drawn up against the tools by means of screw-taps or nuts, as shown in Figs. 2 and 3.

Within the structure A, to one side of its vertical axis and directly under the arbor C of the clamping-disk B, a vertical shaft, L, is arranged, it being supported by upper and ower bearing-brackets, *l l′*, which extend out from the inner surface of the structure A. This shaft has a bevel-wheel, M, on its upper end and a worm-wheel, N, on its lower end. The bevel-wheel gears with the cog-teeth of the clamping-disk B, and the worm-wheel gears with a worm, O, of a transverse feed-shaft, P, which has its bearings on the bracket l' and on the structure A, as indicated at *o p*. The bearing l' is made hollow below the worm, so as to hold a quantity of lubricating material for lubricating the worm, as indicated at l^2. The feed or worm shaft has two pulleys, Q R, arranged on its outer end, outside of the structure A. The pulley Q is made fast and the pulley R left loose. From these pulleys an endless belt, S, extends and passes round a pulley, *q*, of the saw-arbor. This belt slips from the pulley Q upon the pulley R when the saw is thrown out of operative position, and vice versa when the saw is thrown into operative position. Thus the feed is governed entirely by the movement of the saw-frame, and the feed-works are automatic, requiring no clutch or shipper to stop and start them. This is a very important thing, and it has not been accomplished in any machine of like character heretofore, all machines having a separate feed shaft and a clutch or shipper, and sometimes both, to start and stop them. On my machine the feed-shaft is so placed that when the feed-belt is attached from the pulley on saw-arbor to pulley on feed-shaft below the operation of adjusting the saw-frame on a horizontal circle, so as to throw the saw in and out of contact with the heading stuff, insures the stopping or starting of the feed-works. In a word, when the saw is thrown into the work, it moving on a circle, the feed-belt runs on the tight pulley, which causes the feed to start simultaneously with the saw, striking into the heading stuff, and when the heading is finished and the saw thrown out it carries the feed-belt upon the loose pulley, stopping the feed.

T is a bell-crank pivoted to an outside bracket, *r*, of the structure A. One arm of this crank extends up outside of the said structure and bears against the collared end of the adjustable arbor C' of the clamping-disk B'. The other arm extends laterally to the inside of the structure A, and upon it a U-shaped spring, U, rests, the upper ends of said spring bearing, respectively, one against the outside surface of the structure A and the other against the collar of the movable arbor of the clamping-disk B'.

S' is a bent foot lever or treadle pivoted to an outside bracket, *s*, on one side of the structure A, and extending from said bracket entirely across and through the opposite side of the base portion of the structure A.

V is a forked horizontal slide arranged upon the structure A a short distance below the clamping-disks B B'. The prongs *v' v'* of this slide extend within the structure A on opposite sides of the screw-wheel shaft L, and are long enough when the slide has been moved inward the full extent of the play allowed it to stand under the space between the clamping-disks, and to support the heading stuff while it is being clamped between the disks. Through the other portion of the slide an oblong slot, *t*, is cut. This slot runs obliquely down through the slide, and is situated outside of the circumference of the structure A, being inclosed by a slotted box-form guide-bracket, *u*, of the structure A, as shown. This slide and the bell-crank T are connected to the foot-lever S' by means of vertical rods W X, the rod W being straight and pivoted to the horizontal arm of the bell-crank within the structure A, and to the rear portion of the foot-lever, while the rod X is angular, as at *w*, and pivoted by its lower end to the front portion of the foot-lever outside of the structure A, and connected to the slide V through its angular end and the oblique slot, the angular portion *w* of the rod X being narrower than the slot and occupying such relation to it that it when the foot-lever is depressed forces the slide outward and withdraws the prongs from under the heading stuff which may have been clamped between the disks B B', and vice versa when the foot-lever is elevated by the spring U; and while these results are produced at the extreme movements up and down the slide loses its connection between said extreme movements both as the angular rod rises and falls, and the prongs remain stationary under the heading stuff until the clamp B' has been forced against the same, and also under a converse movement of the lever until the clamp B' has been moved out of contact with the circled and beveled or finished barrel-head.

It will be readily seen that if the prongs were to move back instantly the foot lever or treadle is depressed, the head would drop before it was clamped, and, vice versa, when the head was finished and the foot taken off the lever to let it drop out the prongs would fly in and strike it; but by the peculiar shape and relative widths of the angular part *w* of the rod and of the oblique slot these difficulties are obviated, as the head is clamped one way before the prongs are moved back, and unclamped the other way before the prongs slide in to receive the next head.

The general operation is about as follows: The stuff from which the heads are cut is placed between the clamps on the prongs, and the operator then depresses the treadle, which forces the clamp B' against the stuff, the spurs in the clamp penetrating the stuff and clamping it tightly and yielding to inequalities in thickness. The treadle is now pressed down farther and the prongs moved out of the way by the action of the inclined or angular part of the rod X. The clamp-shaft C being geared to the feed-pulley shaft L, inside the cone structure, by actuating the toggle-jointed lever the saw is moved toward the stuff, which starts the feed and rotates the clamps and stuff with them and cuts the head.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. So arranging the feed or driver shaft and the pulleys thereon relatively to the saw-arbor frame that the movement of the saw-arbor

frame will cause the belt to change from the fast to the loose pulley, and vice versa, and thus cause the saw to be put in operation by its movement to the work and out of operation by the opposite movement of said frame, substantially as described.

2. The manner of making the disk or clamp self-yielding on different parts of its clamping-surface by means of yielding pins or projections, so that it will adapt itself to pieces of heading of uneven thickness and hold them firmly while being cut, substantially as described.

3. The angular connection sliding bar and slotted slide with prongs operated with or without the foot lever for drawing the prongs back out of the way, so that the heading may revolve when clamped and the feed started, and for producing a lost motion, substantially as set forth.

4. Making the lower half the box or bearing $l\ l'\ l'$, which supports the worm-shaft on the inside of the structure A, hollow, so that it may be filled with oil for the worm to run in, and arranged inside of the hollow pedestal, thus preventing friction and wear and insuring lubrication, substantially as set forth.

5. Arranging the heading supporting-prongs as described, and also the gearing and shafting within the conical structure entirely out of the way, and substantially as described.

6. The combination of the inner beveling-tools of a heading-machine with the flattened wedge screw-bolts j' and their nuts, substantially in the manner and for the purpose described.

W. H. DOANE.

Witnesses:
W. E. LOUDON,
J. Q. HAYES.