No. 634,172. Patented Oct. 3, 1899.

T. JOHNSON.

BARREL HOOP FORMER.

(Application filed Mar. 13, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

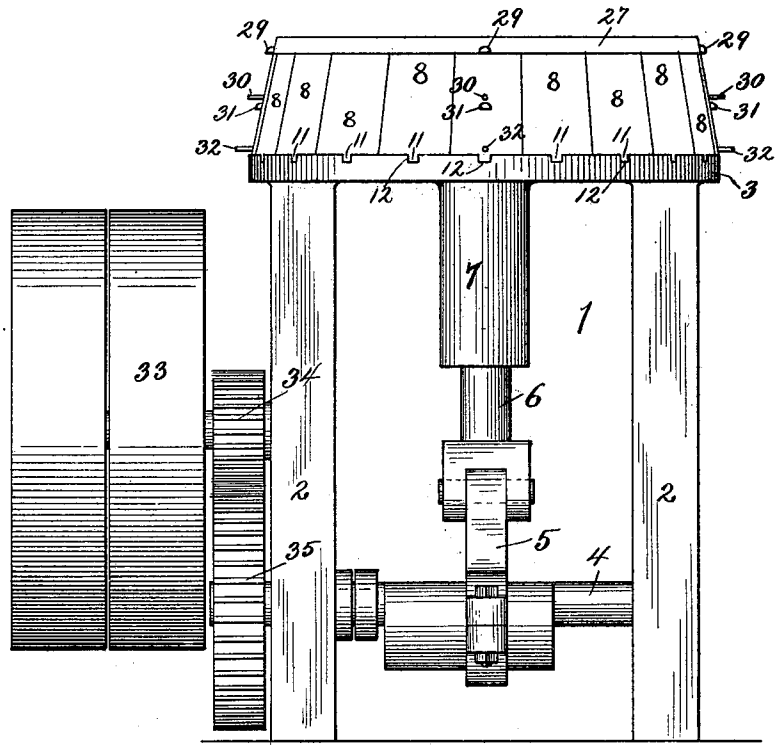
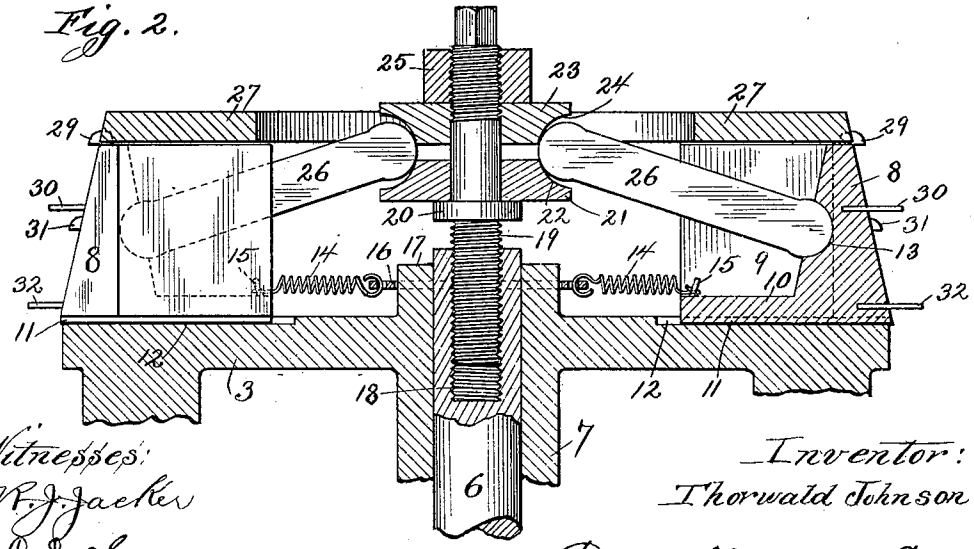


Fig. 2.



Witnesses:
R. J. Jaeker
L. E. Serage

Inventor:
Thorwald Johnson.

By Oberu, Hibben & McElroy
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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Fig. 3.

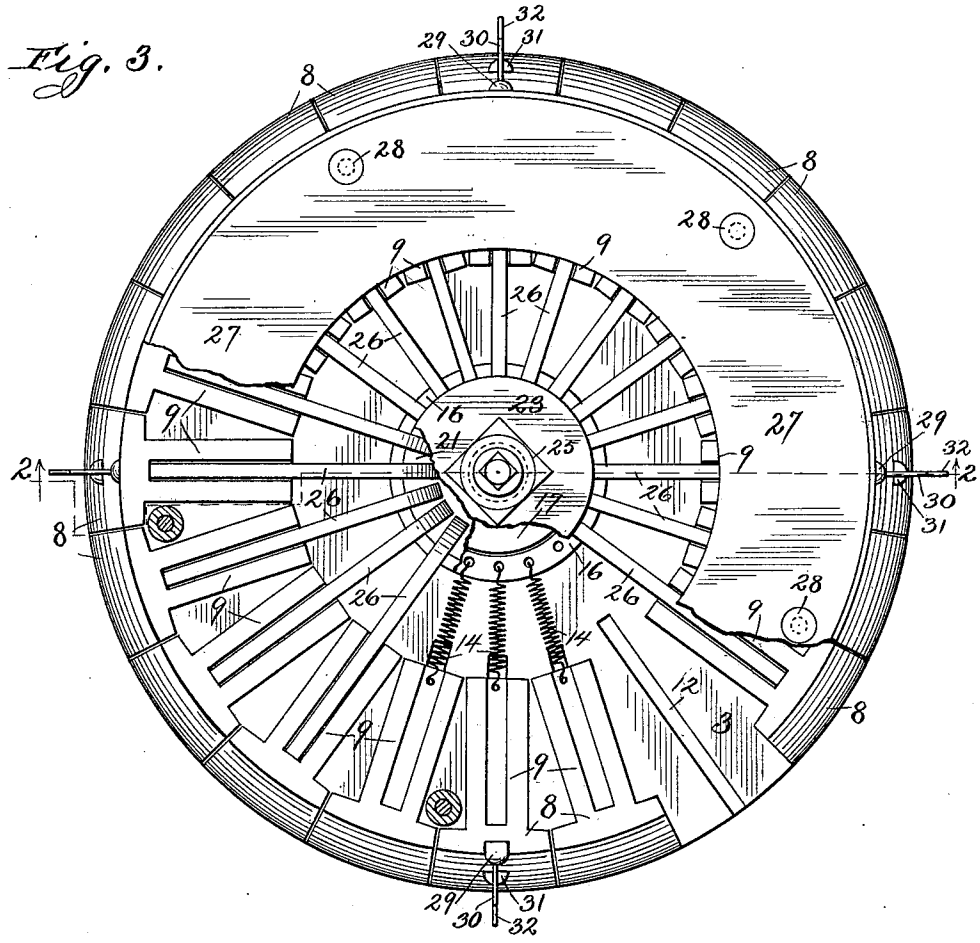


Fig. 4.

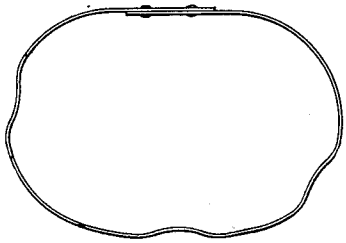


Fig. 5

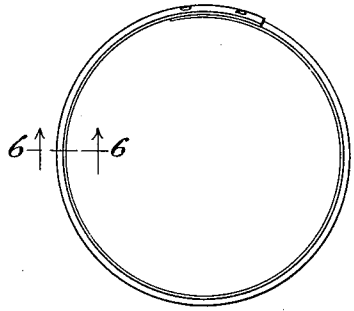
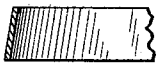


Fig. 6.



Witnesses:
W. J. Jacker.
L. E. Serage

Inventor:
Thorwald Johnson.

By Coburn, Hibben & McElroy
Attys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C

UNITED STATES PATENT OFFICE.

THORWALD JOHNSON, OF CHICAGO, ILLINOIS.

BARREL-HOOP FORMER.

SPECIFICATION forming part of Letters Patent No. 634,172, dated October 3, 1899.

Application filed March 13, 1899. Serial No. 708,809. (No model.)

To all whom it may concern:

Be it known that I, THORWALD JOHNSON, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Barrel-Hoop Former, of which the following is a specification.

My invention has relation to a machine for coopers' use; and its object is to provide a device for accurately forming hoops, and more especially chime-hoops, which may be simultaneously flared and stretched. The hoop iron or steel before being cut or riveted together in the form of a barrel-hoop is usually flared either at the mill or at the cooper-shop. My machine is adapted to give the proper form to the hoops, whether the hoop-iron has been preliminarily flared or not. When the ends of the steel hoop are riveted, the form of the hoop is irregular and the joint always becomes flattened in the riveting operation. My machine forms the entire hoop into a perfect circle and is capable of flaring the same, besides taking out all the stretch, so that when driven on the barrel it will fit accurately and will hold tightly.

In the drawings, Figure 1 is an elevation of the machine; Fig. 2, a section on line 2 of Fig. 3; Fig. 3, an enlarged plan view with a portion of the cap broken away; Fig. 4, a view of a hoop before being formed in the machine; Fig. 5, a view of such hoop after being formed in the machine, and Fig. 6 a section on line 6 of Fig. 5.

The preferable form of my machine is illustrated in the drawings, and, as shown, it comprises a frame 1, composed of legs or standards 2 and a circular head or bed-plate 3. In the lower part of such frame is journaled a driving-shaft 4, having a crank attachment 5 for actuating a vertical reciprocating rod 6. This rod bears or is guided in a depending sleeve 7, preferably integral with the bed-plate, and passes through such plate, as seen in Fig. 2. Upon the edge of the circular bed-plate is arranged a circular former comprising a suitable number of members or sections 8, which are flared or beveled, and when in normal position correspond to a transverse section of an end of a barrel. It is obvious that any suitable number of these sections to accomplish the desired purpose may be employed. These sections are arranged radially of the reciprocating rod 6 and are adapted to move outwardly, so as to increase the diameter and circumference of the circular former. Each section has two parallel vertical webs or portions 9 and a flat base 10. This base has a slide 11, adapted to move in a radial channel or way 12. Each section also has a concavity or socket 13, as shown in Fig. 2. The sections are spring-pressed and normally held inward toward their center, as illustrated in Fig. 3, by means of a series of springs 14, attached at one end to the pins 15 on the sections and at the other end to a ring 16, loosely encircling a hub 17, through which the reciprocating rod 6 passes.

The reciprocating rod may be provided with a screw-threaded hole 18, into which screws a rod or stem 19, provided with a circular bearing-plate 21, resting on a rigid collar or enlargement 20 and having a bearing-surface 22 similar to a cone-bearing. A similar plate 23, having a bearing-surface 24, is also arranged on the rod 19, but in inverted position. An adjusting-nut 25 screws upon the upper end of the rod 19 to bring and hold the parts of the bearing closer together when a longer radial thrust of the members of the former is desired. The outer end of the rod may have an angular head, whereby it may be screwed into or out of the rod 6 to provide an additional and further adjustment of the amount of thrust. A series of movable connectors is arranged between the reciprocating rod and the sections. As shown, these connectors comprise a series of links or flat bars 26, corresponding to the number of sections 8, which are arranged between the bearing-plates on the rod 19 and the individual bearing-sockets 13 in each section and are detachable from the sections and the reciprocating rod. The ends of these links or bars are preferably rounded to fit the socket-like bearing at their ends.

An annular cap or plate 27 is secured in any suitable manner over the tops of the sections, as by means of bolts 28. Upon the rim of this plate is a suitable number of lugs 29, acting as stops or sets for the hoop to prevent the hoop from being forced off upwardly in the expanding operation, and on some of the sections are secured pins 30, the hoop being placed in position between the lugs and

pins, and thereby held properly for the forming operation. Some of the sections may also be provided with similar lugs 31 and pins 32, arranged below the upper set of lugs and pins to accommodate hoops of larger diameter without employing any of the adjustments above described.

The crank-shaft 4 may be driven in any suitable manner—as, for instance, by the pulleys 33 and the train of gears 34 and 35, the latter gear being secured on the crank-shaft.

Power applied to the pulley causes the rod 6 and the smaller rod or stem 19 to reciprocate vertically. This motion is communicated to the movable connectors 26, and as the rod 6 moves downward the outer ends of such connectors move laterally, thereby thrusting the radially-arranged sections 8 outwardly and increasing the size of the circle made by the former. The machine is designed to operate continuously, and when the rod 6 is on its upward stroke—the former then having its smallest diameter—a hoop is placed, say, between the lugs 29 and pins 30, and on the downward stroke when the circle of the sections is expanded such hoop will be accurately formed, flared, and stretched, corresponding to the contour and flare of the expanded circle. The hoop is removed on the next upward stroke, and the sections are restored to normal position by the springs 14.

To obtain a greater amount of expansion or a further thrust of the connectors, the nut 25 may be screwed downward, thereby forcing the bearing-plate 23 downward and lowering the bearing-point of such movable connectors. In case insufficient expansion or thrust is thereby obtained the rod 19 may be screwed inward into the rod 6. Large hoops may be accommodated between the lugs 31 and the pins 32 without changing the above-mentioned adjustments to any great extent.

While I have herein shown and described my invention as used for forming barrel-hoops and the like, it will be understood that I do not limit myself to such particular use, but contemplate using my invention wherever applicable for expanding and forming purposes. Furthermore, my machine may be constructed of any desired power or capacity to form rims, hoops, or the like of any thickness.

I claim—

1. A former comprising a plurality of expanding members yieldingly held toward a center to form a circle, a rod reciprocating at such center, a series of radial connectors between said rod and members and means for varying the outward throw of said connectors with respect to the same movement and same length of such rod.

2. A hoop-former comprising a plurality of members forming a circle having its circumference flared to correspond with the ends of a barrel, means for yieldingly holding said members toward a common center, a rod reciprocating at such center, a series of radial connectors between such rod and the members, and means for varying the outward throw of said connectors with respect to the same movement and same length of such rod.

3. A hoop-former comprising a plurality of members yieldingly held toward a common center to form a circle, a rod reciprocating at such center, a series of links or bars arranged between the rod and members whereby the motion of the rod is communicated to the members, said links being normally in an oblique position with respect to the rod but adapted to be brought toward a horizontal position when the rod is operated and the members outwardly thrust and means for normally holding said members toward a common center.

4. A hoop-former comprising a plurality of members or sections forming a circle with a flaring circumference corresponding to the ends of a barrel, a rod reciprocating at right angles to the plane of such sections, a movable connection between such rod and each of such sections to move the latter radially to expand the circle, such connectors bearing on said rod, and means for adjusting such bearing longitudinally on said rod.

5. A hoop-former comprising a plurality of movable members or sections forming a circle with a flaring circumference corresponding to the ends of a barrel, a rod reciprocating at right angles to the plane of such sections and a series of connectors loosely and detachably positioned between the rod and the members, such connectors consisting of loosely-arranged links.

6. A hoop-former comprising an expansible circular form made in sections with its outer portion or circumference inclined outward and downward to correspond to the ends of a barrel, a reciprocating rod and a series of radial connectors between such rod and the sections such connectors comprising links unsecured to the rod and sections but having rounded ends bearing thereagainst.

7. A hoop-former comprising a circular form corresponding to the ends of a barrel and consisting of expanding or outwardly-movable sections, a reciprocating rod arranged at the center of such form, and movable and detachable connectors between said rod and each of the sections and comprising links 26 unsecured to the rod and sections but loosely pivoting thereagainst at their ends.

8. A former comprising a plurality of expanding members yieldingly held toward a common center to form a circle, a rod reciprocating at such center, a series of radial connectors positioned between said members and rod, a bearing on said rod to receive the inward end of such connectors and means for adjusting said bearing longitudinally on said rod.

9. A former comprising a plurality of expanding members yieldingly held toward a common center to form a circle, a rod reciprocating at such center, two bearing-plates

on said rod, means for adjusting such plates toward or away from each other, and a series of connectors bearing at one end in such bearing-plates and at the other against said members.

10. A former comprising a plurality of expanding members yieldingly held toward a common center to form a circle, a rod reciprocating at such center, a rod or stem 19 adjustable longitudinally in one end of such rod, bearing-plates on said stem, means for adjusting such plates toward or away from each other and a series of connectors bearing at one end in such bearing-plates and at the other against said members.

11. A former comprising a plurality of expanding members yieldingly held toward a common center to form a circle, and each having a socket 13, a rod reciprocating at such center and having its outer free end screw-threaded, a circular bearing-plate 21 having a bearing-surface 22 and arranged on said rod, a similar but inverted plate 23 also arranged thereon, an adjusting-nut 25 screwing on the rod for adjusting said plates, and a series of links 26 having rounded ends and bearing respectively in said plates and in said sockets.

12. A hoop-former comprising an expansible circular form made in sections with its outer portion or circumference inclined outward and downward to correspond to the ends of a barrel, stops 29 to prevent the hoop from being forced upwardly in the expanding operation, and means for actuating said expansible form.

THORWALD JOHNSON.

Witnesses:
SAMUEL E. HIBBEN,
LOUISE E. SERAGE.