No. 629,444. Patented July 25, 1899.

H. O. HEM.

HOOP SIZING AND FLARING MACHINE.

(Application filed Nov. 21, 1898.)

(No Model.)

Fig. 1.

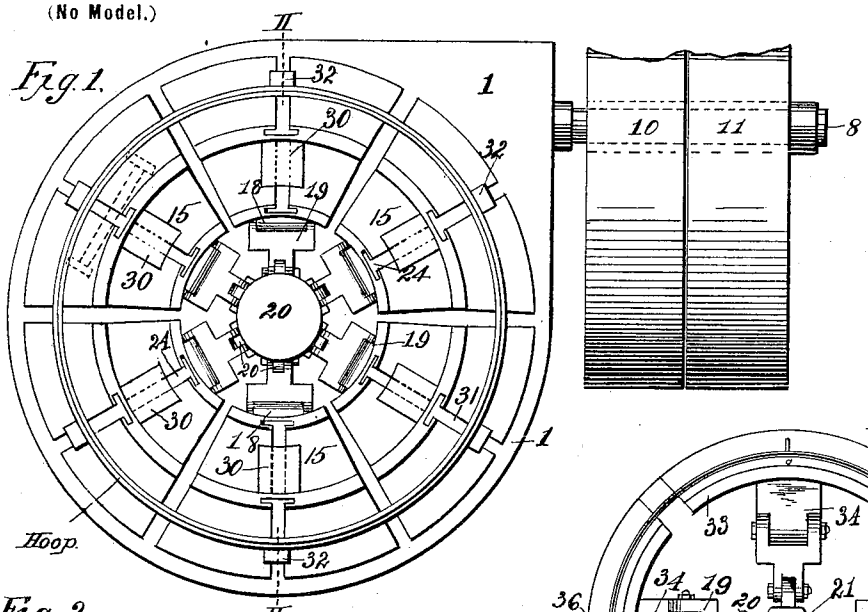


Fig. 2.

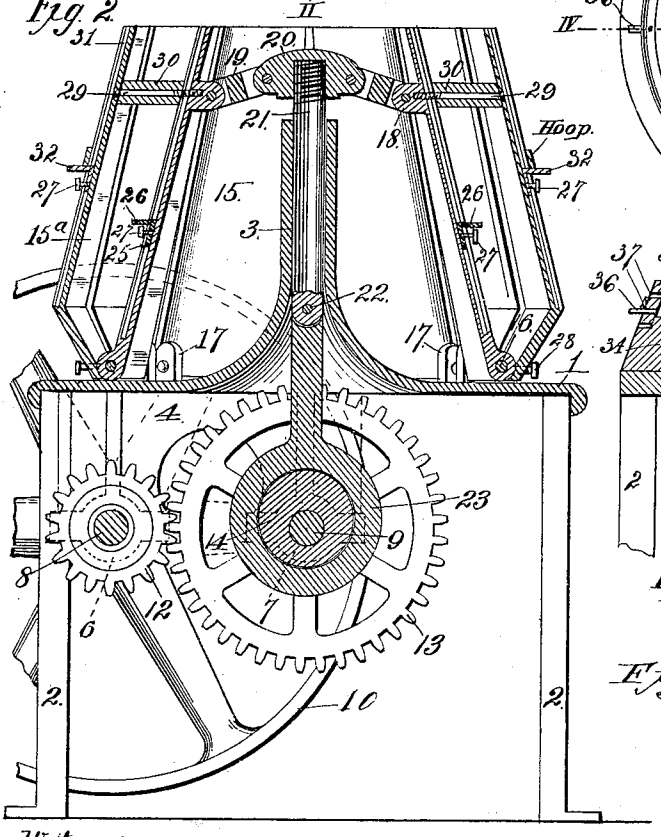


Fig. 3.

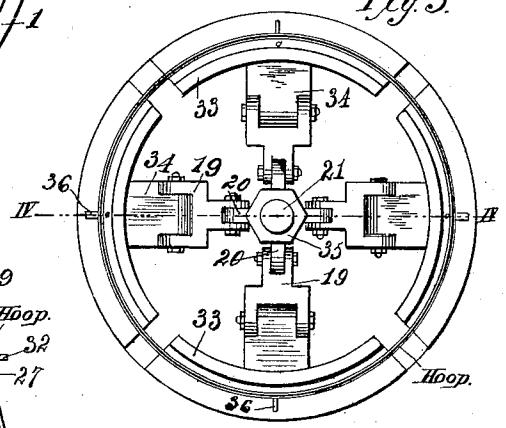


Fig. 4.

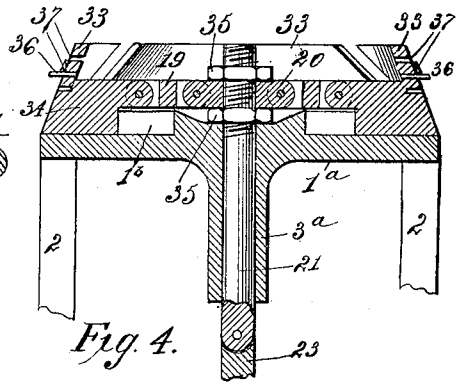


Fig. 5.

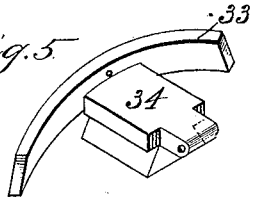
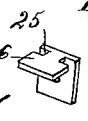


Fig. 6.



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UNITED STATES PATENT OFFICE.

HALVOR O. HEM, OF KANSAS CITY, KANSAS.

HOOP SIZING AND FLARING MACHINE.

SPECIFICATION forming part of Letters Patent No. 629,444, dated July 25, 1899.

Application filed November 21, 1898. Serial No. 697,097. (No model.)

To all whom it may concern:

Be it known that I, HALVOR O. HEM, of Kansas City, Wyandotte county, Kansas, have invented certain new and useful Improvements in Hoop Sizing and Flaring Machines, of which the following is a specification.

My invention relates to a machine for sizing and flaring hoops such as are used on barrels; and my object is to provide a machine of this character consisting, essentially, of a frustum which is contracted to receive each hoop and expanded to stretch it to a uniform size and flare.

A further object is to provide said frustum with adjustable gages to support the hoop, fitted over the frustum in a horizontal position at the desired elevation.

A still further object is to provide a machine of this character which is positive, reliable, and rapid in action and simple, strong, and durable of construction.

To these purposes the invention consists in certain novel and peculiar features of construction and combinations of parts, as will be hereinafter described and claimed, and in order that it may be fully understood reference is to be had to the accompanying drawings, in which—

Figure 1 represents a top plan view of a hoop sizing and flaring machine embodying my invention. Fig. 2 is a vertical section of the same, taken on the line II II of Fig. 1. Fig. 3 is a top plan view of a slightly-modified form of hoop sizing and flaring machine embodying my invention. Fig. 4 is a vertical section taken on the line IV IV of the same. Fig. 5 is a detail perspective view of one of the adjustable segments forming the frustum of Figs. 3 and 4. Fig. 6 is a perspective view of one of the adjustable gages for supporting the hoop at any desired elevation on the frustum.

In order to fully understand the reasons why the hoops are not uniform in size and flare, it will be necessary to explain how they are made.

A straight piece of band-iron, of proper length, has holes punched at both ends to receive rivets, the holes in all hoops of the same size being the same distance apart. This punctured band-iron is then run through the flaring-machine, which is constructed of two rollers held tightly but yieldingly together, adjusting means being provided for holding one end of the rollers more tightly together than the other, so that when the band-iron passes between them it is compressed on one edge more than on the other, or, in other words, one edge is stretched more than the other, in order to flare the hoop. This action of course stretches the hoop as a whole somewhat; but on account of the fact that the pieces of band-iron differ in thickness and are of different degrees of hardness some of the pieces will stretch more than others and when the hoops are riveted together they will consequently be of different sizes. Now to avoid the necessity of discarding the largest hoops they are all made so that the largest will fit and the smaller ones have to be stretched, and this stretching is accomplished by taking the hoop after it is riveted together and driving it down over a cone until it is of the required size and flare. My invention is designed to provide an automatic means for stretching and flaring these small-sized hoops with greater rapidity and at less expense than the same work can be accomplished by hand.

Referring now to the drawings in detail, 1 designates the top of a metallic table or frame, the legs 2 of the same being secured to the floor in any suitable manner. This top is provided centrally with an upwardly-projecting tubular guide 3 and with a depending portion 4, which, in conjunction with the caps 6 and 7, forms bearings for the parallel shafts 8 and 9, respectively, the shaft 9 being located in axial alinement with said tubular extension. The shaft 8 projects outward beyond the side of the table-top, and mounted thereon are fast and loose pulleys 10 and 11. Upon the shaft, beneath the table, is a gear-pinion 12, meshing with a gear-wheel 13 upon shaft 9, and mounted also upon the last-named shaft is the eccentric 14.

The expansible cone or frustum is composed of plates or members 15, segmental in cross-section, arranged in a circle around and concentrically of the tubular extension 3. Said plates or members are pivoted at their lower ends to swing radially toward or from said tubular extension upon the bolts 16, mounted in lugs 17, cast with and projecting upward

from the table-top. Said plates, near their upper ends, are provided centrally with the inwardly-projecting lugs 18, pivotally connected by the radial links 19 with the cap or collar 20, screwed or otherwise secured upon the upper end of the vertical rod 21, the latter extending down through the tubular guide extension 3 and being pivoted, as at 22, to the eccentric-strap 23, which once in each revolution of the shaft 9 elevates and lowers the cap 20 and through the instrumentality of the links 19 swings the segments inward and outward, thereby contracting and expanding the frustum or cone.

Each segment 15 is provided at its outer side and centrally with the longitudinal T-shaped groove 24, and fitting adjustably in said grooves are adjustable gage-supports, said supports consisting of the upright portion 25, fitting in said grooves, the horizontal T-shaped portion 26, projecting horizontally out through said grooves, and the set-screws 27, extending through arms 25 and impinging upon the segments 15 in order to secure the gage-supports at the desired point.

In sizing and flaring the hoop the gages are first adjusted to the proper point to limit the downward movement of the hoop when dropped over the frustum when contracted—that is, when the eccentric has lifted the cap or collar 20 to its highest point, as shown in Fig. 2. The continued revolution of the shaft causes the eccentric to lower said cap and expand the frustum, as hereinbefore explained, until the eccentric brings the cap to its lowest position, thereby stretching the hoop to a predetermined size and flare, as will be readily seen.

By employing the adjustable gages it is obvious that hoops varying considerably in diameter may be stretched upon the same frustum; but in order to make it possible for a single machine to stretch hoops of any reasonable size the frustum is made of double construction—that is to say, is provided with a second circular series of segmental plates 15^a, corresponding to the series 15 and concentrically surrounding the same, the proportion being such that the upper ends of plates 15^a shall just overlap the lower ends of plates 15, so that hoops just small enough to fit upon the upper or narrow portion of the inner frustum or hoops large enough to embrace the outer frustum near its base, as well as all intermediate sizes, may be sized and flared.

The plates 15^a, forming the outer frustum, of course surround the inner series concentrically and are preferably secured thereto at their lower ends by bolts 28. At their upper ends connecting-bolts 29 are employed to tie said plates the proper distance apart, said bolts extending through separating-sleeves 30, which prevent the plates from approaching each other—that is to say, by means of the bolts 28 and bolts 29 and sleeves 30 the outer cone temporarily is formed rigid with the inner cone and the movement of the latter through the instrumentalities described is of course imparted to the former. Furthermore, the plates 15^a, forming the outer frustum, are provided with longitudinal grooves 31, corresponding to grooves 24, and mounted therein are adjustable gage-supports 32 of the type already described.

In practice the fast pulley 10 is connected by a belt (not shown) to a counter-shaft or other motive power, and the motion imparted to said pulley is transmitted through the medium of the gearing described to the eccentric, causing the frustum to alternately expand and contract. With each contraction a previously sized and flared hoop is removed and replaced by a new one, which is sized and flared by the following expansive movement, as will be readily understood.

In Figs. 3 to 5, inclusive, I have shown a slightly-modified construction, this construction consisting in the main in the employment of radially-sliding segmental plates instead of swinging plates. In this case the table 1^a is provided with radial grooves 1^b and with a central tubular guide 3^a, extending downward instead of upward, as does guide 3 of Fig. 2.

33 designates a series of segmental plates arranged in a circle to form a frustum, and 34 a series of blocks secured thereto or cast therewith and dovetailed, preferably, to slide radially in the grooves 1^b. These blocks, like the plates 15, are toggle-jointed to the reciprocatory rod 21, extending up through the tubular guide through the medium of the links 19 and the collar 20, mounted upon said rod. In this case the collar is shown as adjustable upon the rod by means of the adjusting-nuts 35, the adjustment of the collar upon the rod obviously varying the expansive movement of the frustum, and thereby accommodating it to hoops of varying sizes. In this case also various-sized hoops may be accommodated by fitting the gage-supports, in the shape of pins 36, in different holes 37 in the segmental plates 33, said pins being designed, like the gage-supports previously described, to limit the distance the hoop drops down upon the frustum.

From the above description it will be apparent that I have produced a machine by which hoops which are irregular as to size or flare may be made uniform with extreme rapidity and with a greater degree of accuracy than is possible by hand, and it is to be understood that I reserve the right to make such changes in the detail construction, arrangement, proportion, or form of the parts as will not be a departure from the spirit and scope or sacrifice any of the advantages of my invention.

Having thus described the invention, what I claim as new, and desire to secure by Letters Patent, is—

In a hoop sizing and flaring machine, the combination of a series of segmental plates arranged to form a cone, a reciprocating rod

arranged axially of said cone, links connecting the rod with the plates to cause the alternate contraction and expansion of the cone, and gage-plates mounted upon the segmental plates and adjustable longitudinally thereof to accommodate hoops of varying size, substantially as described.

In testimony whereof I affix my signature in the presence of two witnesses.

HALVOR O. HEM.

Witnesses:
M. R. REMLEY,
F. S. THRASHER.