

(No Model.)

C. R. SMITH.
HOOP.

No. 555,712.

Patented Mar. 3, 1896.

Fig. 1.

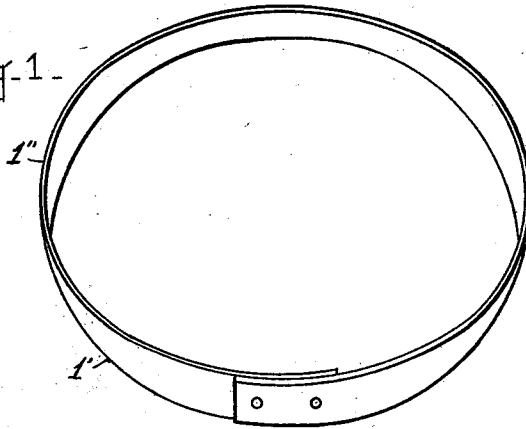


Fig. 2.

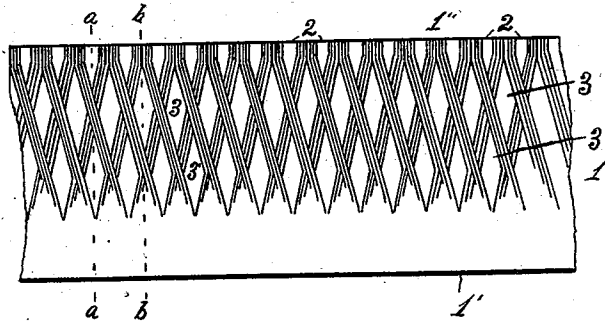


Fig. 3.

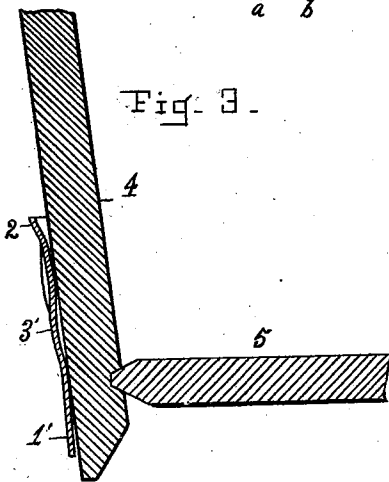
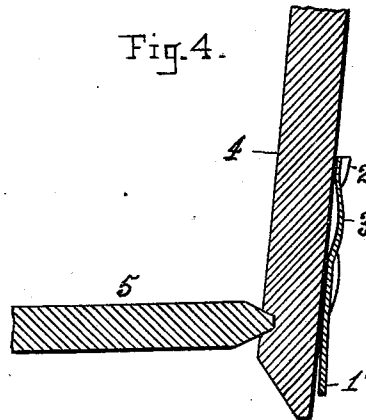


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

CHARLES R. SMITH, OF NEENAH, WISCONSIN.

HOOP.

SPECIFICATION forming part of Letters Patent No. 555,712, dated March 3, 1896.

Application filed December 23, 1895. Serial No. 573,061. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. SMITH, a citizen of the United States, and a resident of Neenah, in the county of Winnebago and State of Wisconsin, have invented a new and useful Improvement in Hoops, of which the following is a specification.

My invention relates to an improvement which is particularly applicable to hoops formed of a band or ribbon of steel for use upon pails, tubs, casks, barrels, &c., which have a tapering or bilging form, upon which the hoops are flared for fitting said taper or bilge.

In the manufacture of pails, barrels, &c., of wood in order that the vessels may withstand being stored in warm and dry places, as they sometimes are for a long time before being put to use, it is essential that the wood of which the vessels are made is dry and that their hoops are tightly driven, so that if shrinkage of said wood takes place, as it often does, their hoops will not fall from them and allow said vessels to fall to pieces. At another time the vessels may be stored in a very damp place or be filled with liquid, when the wood of the vessels will swell and burst their hoops, or if the hoops are sufficiently strong for withstanding the strain the staves or heads of the vessels will be compressed to such an extent as to crush them inward or outward from their normal position and to impair the liquid-holding quality of said vessels. In order to avoid these consequences I provide the hoops along that edge which has the largest diameter when placed upon a vessel with a series of corrugations, and also inside of said corrugations with one or more rows of diamond-shaped elevations which overlap each other and said corrugations and extend with said corrugations over the major part of the width of said hoop, producing thereby a hoop having the quality of expanding or contracting, as the wood of the vessel may require.

My invention is illustrated in the following drawings, in which—

Figure 1 is a perspective view of a hoop flared for fitting a pail or other tapering vessel. Fig. 2 is a side elevation, upon a larger scale than Fig. 1, as are the following figures, of a portion of a completed hoop. Fig. 3 is

a vertical section of a part of one of the staves and a portion of the bottom of a vessel and of the hoop upon the line *a a* of Fig. 2, and Fig. 4 is a similar section upon the line *b b* of Fig. 2.

Similar numerals indicate like parts in the several views.

1 indicates the hoop; 1', its plain edge or edge of the smallest diameter; 1'', its opposite edge or the flared one having the larger diameter; 2, a series of corrugations along the edge 1''; 3 3', a series of elevations which are arranged in two rows lengthwise of the hoop; 4, a stave of a vessel; 5, its bottom.

In order to produce a hoop that will fit properly to the surface of a pail, barrel, or any vessel having a taper or bilge, the straight band of which the hoop is formed must be flared. This is done by passing the band between two revolving rolls, which are so arranged that one edge of the band is compressed to a greater or less extent, the degree of the compression increasing from one edge to the other and being governed by the taper of the vessel upon which the hoop is to be used. The greater the compression the more flare will be given to the band. The ends of the band may be connected in any suitable manner.

In order to obtain the desired benefit from the improvement the band from which the hoop is made should be flared to such an extent that after the succeeding operations have been completed and the band is formed into a hoop the hoop will have slightly less flare than the flare or bilge of the vessel upon which it is to be used, so that the edge of the hoop having the largest diameter will engage the surface of the vessel and leave the edge having the smallest diameter standing off slightly from said surface.

The edge of the hoop having the largest diameter is provided with a continuous series of corrugations which extend inward toward the opposite edge about one-tenth of the width of the hoop. At right angles from the lowest depression of said corrugations and about one-fourth of the width of the hoop from said corrugated edge are arranged the apexes of a series of nearly diamond-shaped elevations, and beyond and intermediate of said elevations is arranged another and similar series, but hav-

ing a slightly lower elevation, the apexes of both series being rounded off in all directions. Said apexes, together with those of the edge corrugations, are adapted to bear upon and
 5 penetrate slightly into the wood of the vessel as its circumference is increased by the swelling of the wood, the innumerable depressions and elevations of the surface of the hoop, together with its resiliency, allowing the hoop
 10 to expand to quite an extent in the direction of its length before a strain of any extent is produced along the plain edge of the hoop. The number of these series of elevations and the length transversely of the hoop of the
 15 bases of the elevations of each series and also of the corrugations at the edge of the hoop may be more or less than is here shown as the width of the hoop requires in order that the major portion of its width may be covered by
 20 them.

Those conversant with the use of metal hoops upon pails, tubs, barrels, &c., when made of wood, are aware that if a hoop bursts its commencement is universally at that edge of
 25 the hoop where the greatest strain exists, and, as the larger the circumference the greater will be the expansion, upon that edge of the hoop will the break commence. With this improvement the corrugations 2 and diamond-shaped elevations 3 and 3', with their rounded
 30 apexes 3'' and overlapping bases 3''', are along that edge of the hoop where the greatest strain exists, said elements, together with the elasticity of the hoop, permitting the hoop to fit
 35 itself to the surface of the vessel and to receive the tension caused by driving the hoop or by the swelling of the wood of the vessel before a direct demand is made upon its tension along its plain edge, and consequently
 40 its tendency to burst from the swelling of the

wood of the vessel is greatly lessened. It may be noted that these elevations in penetrating the wood of the vessel serve to retain the hoop in its place whenever a slight shrinkage of the wood takes place. The principal advantages of them are, however, to give to the
 45 hoop the necessary elements for permitting it to expand when the wood swells or to contract when it shrinks, said elements being along that edge of the hoop where the greatest
 50 change in the dimension of the vessel must take place.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

55 A hoop for pails, tubs, or cooper's ware, having a taper, consisting of a flared band of spring metal having in combination a plain edge for the one having the smallest diameter, and along its opposite edge a series of
 60 corrugations extending inward at right angles therewith a distance approximating one-tenth of the width of said hoop, one or more rows lengthwise thereof of diamond-shaped elevations having apexes of a rounded form, which
 65 apexes together with those of said corrugations are arranged in a zigzag line across the hoop for a distance exceeding one-half the width thereof, the bases of said corrugations and elevations overlapping each other, and
 70 the flare of said hoop being adapted for the apexes of said corrugations and elevations engaging the surface of said ware and to thereby hold the aforesaid plain edge of the hoop from
 75 direct pressure thereon, substantially as described.

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Witnesses:

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