(No Model.)

J. BERKEY.

WOODEN RIM FOR WHEELS.

No. 558,470. Patented Apr. 21, 1896.

Fig. 1

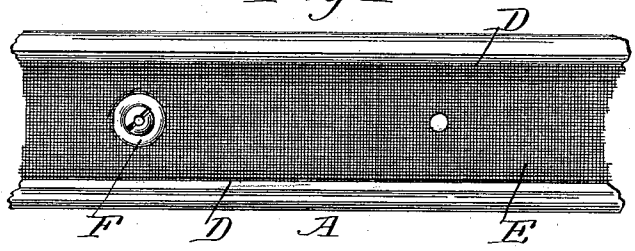


Fig. 2.

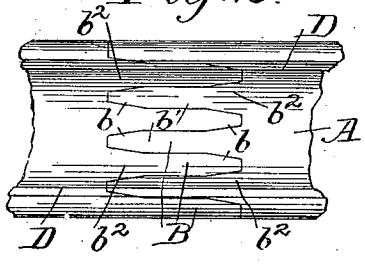


Fig. 3.

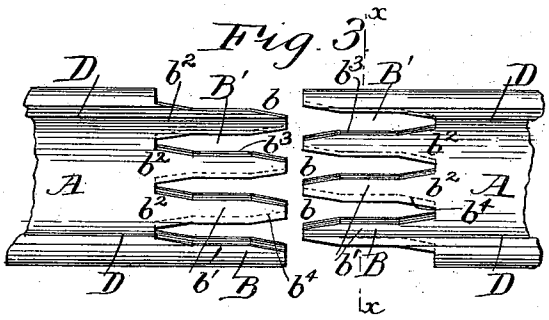


Fig. 5.

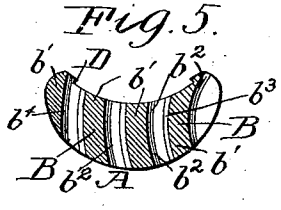


Fig. 4.

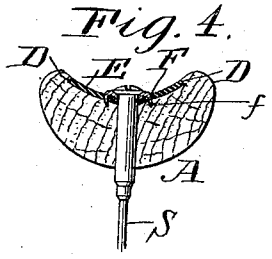
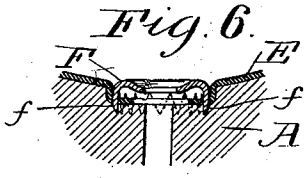


Fig. 6.



Witnesses,
Chas. C. Parker.
G. A. Pennington

Inventor,
Julius Berkey
by F. S. Bacon
Atty.

UNITED STATES PATENT OFFICE.

JULIUS BERKEY, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR TO THE BERKEY & GAY FURNITURE COMPANY, OF SAME PLACE.

WOODEN RIM FOR WHEELS.

SPECIFICATION forming part of Letters Patent No. 558,470, dated April 21, 1896.

Application filed July 19, 1895. Serial No. 556,518. (No model.)

To all whom it may concern:

Be it known that I, JULIUS BERKEY, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Wooden Rims for Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in wooden rims for wheels, and it is embodied in the structure hereinafter described, and definitely pointed out in the claims.

The invention consists in an improved joint for uniting the ends of the wood-rim member and in improved means for strengthening the rim longitudinally, so that the splitting of the rim at the center or on the line of the spoke-apertures will be prevented without increasing the thickness of the stock.

Heretofore it has been suggested to form a wooden rim for pneumatic-tire bicycle-wheels of laminated or veneer strips properly fashioned with the usual concaved periphery and covexed inner face. To prevent the wood from cracking or checking at its glue-joints, a covering of textile fabric has been secured around its convexed face, its edges slightly overlapping the edges of the rim. The covering serves as a binder for the inner face as well as a protector to the wood. It, however, does not strengthen the rim at its weakest point, which is at its center along the line of spoke-apertures, but rather by skrinkage tends to draw the edges apart. Again, such coverings are expensive and unsightly.

One of the objects of this invention is to avoid any objections that can be urged against coverings for the convexed face and to so apply the strengthening-band that the same is obscure and the spreading tendency of the edges or splitting of the rim is wholly overcome.

A further object of the invention is to provide a tongue-and-groove joint for the ends of the rim which will prevent all independent lateral movements of the ends and to so fashion the tongues that they will hold fast in the event that a slight longitudinal movement should happen before the glue is well set or in the event that the glue should become soft.

A still further object of the invention is to provide a very light and durable rim at a minimum expense.

The invention is illustrated in the accompanying drawings, wherein like letters of reference designate corresponding parts in the several views, and in which—

Figure 1 is a plan view of a section of a rim showing the reinforcing ring or band in place. Fig. 2 is a similar view showing the joint. Fig. 3 is a view similar to Fig. 2, showing the joint separated. Fig. 4 is a cross-section through the rim shown in Fig. 1. Fig. 5 is a cross-section on the line $x\,x$ of Fig. 3. Fig. 6 is a view of a modified form.

In the drawings, A designates the wooden rim, made with the usual convexed inner face and concaved outer face. The rim is constructed of a single piece of material, which has been found more desirable than veneer or laminated stock.

To unite the ends of the stock so that a firm unyielding joint is acquired, I form on each end a series of tongues B, separated by the grooves B′. These tongues are made with tapering points b, the straight longitudinal and parallel central sections b', and the inclined widened bases b^2. Each tongue is formed concavo-convex—that is to say, one side having the longitudinal curved bulge b^3 while the opposite side has the curved recess b^4, both of which extend the length of the tongue. It will be seen by such a construction that the amount of stock in each tongue is substantially the same, and that by the widened base the joint at the base, where the usual squared tongue is the weakest, is in my structure strengthened. The purpose of forming the tapered ends b is to adapt the same to the space between the widened bases, and also to avoid the objection of an extended or widened transverse securing-surface at the ends with which a firm glue-joint cannot be well made. By my form the end securing-surface is distributed along the sides and a very tight joint may be formed at that point. I, however, wish it understood that I do not

broadly claim a tapered tongue, nor do I claim a tongue having a concavo-concave or a concavo-convex cross-section, in which case the stock of the concaved tongues is much less than the others and thereby greatly weakens the joint.

The object of forming the straight parallel sections *b'* is to overcome the known objection to the tapered tongue, which latter separate at all points as soon as they are moved slightly longitudinally away from the adjoining tongues in the same manner as a wedge when loosened; but by the use of the straight sections I acquire the benefits of a straight closely-united face which will maintain its close contact even when moved slightly and thus prevent the joint from being destroyed. In other words, I secure the benefits of both the straight and tapered tongue.

By the concavo-convex cross-sectional form of tongue it will be seen that all lateral movement is prevented and at the same time the stock or strength of each tongue is not impaired.

In the use of wooden rims it is necessary to form an alternating series of apoke-apertures at the center of the rim, each aperture being inclined in the direction of its spoke. The tension is therefore slightly lateral instead of direct or radial. It has been found that this strain, aided by the pressure on the edges of the rim, will tend to split the rim along the line of perforations. This tendency to split has lead to the suggestion of increasing the thickness of the wood at the center, but such increases the rigidity of the rim as well as its weight. It has also been suggested to place plates across the concaved face of the rim and to provide such plate with teeth, which take into the wood at or near the edges. Such structures are wholly unsatisfactory, as involving unnecessary expense, and increases the weight as well as weakening the rim at the narrow edge sections where the teeth penetrate.

To overcome the objections known to exist and to add the requisite strength to the weakest part of the rim throughout its entire circumference, I slightly recess the concaved wall from a point a short distance back from the edges, as at D, and insert in or fill this recess with a ring or continuous band of canvas of web or other strong fabric E, the canvas filling out the recess and making an even outer surface. This fabric is securely glued or cemented throughout its entire inner surface directly to the wood and forms, in substance, an integral strengthening-band for the entire rim and from points substantially from edge to edge transversely. This strengthening-band being of light material adds but little to the weight, and by actual test has been found to increase the strength of the rim from three to four fold.

The strengthening-band is carried directly over the spoke-apertures or the usual countersinks for the heads of the spokes, as shown in Fig. 6, and by a suitable implement openings may be made in the band to admit the ends ot the spokes.

On the ends of the spokes S, I place the toothed washers F, the teeth of which take into the fabric at different points around the apertures, and serve as means to further strengthen the material at the apertures and reinforce the walls of the countersinks, as shown at *f* in Figs. 4 and 6.

It will be noticed that the reinforcing-band of fabric which is seated in the recess of the rim extends to a point between the center and edge of the rim and lies substantially flush with the face of the rim. By this means there will be an unoccupied space between the edge of the rim and reinforcing-band, and to this section of the rim the tire is cemented, thereby sealing the edges and preventing moisture from gaining access to the edges of the fabric. This feature of the invention is of great importance.

It is to be understood that I do not limit my invention to the recessing of the rim, as the fabric may be applied to the rim without forming the recess. Again, I do not wish to be understood as broadly claiming a protecting fabric covering for the entire rim, nor a covering of textile fabric inclosing a joint; but what I believe to be new and an important advance in the art is the strengthening of longitudinally-grooved wooden rims to effectually prevent the splitting along the line of spoke-apertures by applying a strengthening-band of fabric around the rim longitudinally and across the base of the tire-seat.

I am aware that it has been heretofore suggested to place a metal strengthening-band across the seat of the rim, its edges being bent over or otherwise secured to the edges of the rim. Such structures are, however, objectionable, as they destroy the elasticity of the rim, add unnecessary weight, tend to draw and break the edges of the rim, and cannot be made a fixed or integral part of the base of the concaved face of the rim.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. A solid-wood wheel-rim having a concaved seating-face and spoke-apertures, and an exposed fabric reinforcing-band extended entirely around the rim over the apertures so that the spoke-heads will engage the fabric, said band being cemented throughout to the seat of the rim, its width being less than the width of the rim whereby its edges terminate on opposite sides at points between the edges and center of the rim, substantially as described.

2. A wood wheel-rim having a joint, consisting of tongue-and-grooved ends, the tongues having a concavo-convex form in cross-section, substantially as described.

3. A wood wheel-rim having a joint, consisting of tongue-and-grooved ends, the tongues formed with tapered sections and straight

sections, and concavo-convex in cross-section, substantially as described.

4. A joint for the ends of wood rims, consisting of tongue-and-grooved ends, the tongues having tapered outer and inner ends, and straight parallel sections between the ends, substantially as described.

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

JULIUS BERKEY.

Witnesses:
G. A. PENNINGTON,
L. S. BACON.