I. KESTER.

Carriage-Wheel.

No. 169,272. Patented Oct. 26, 1875.

Fig. 1.

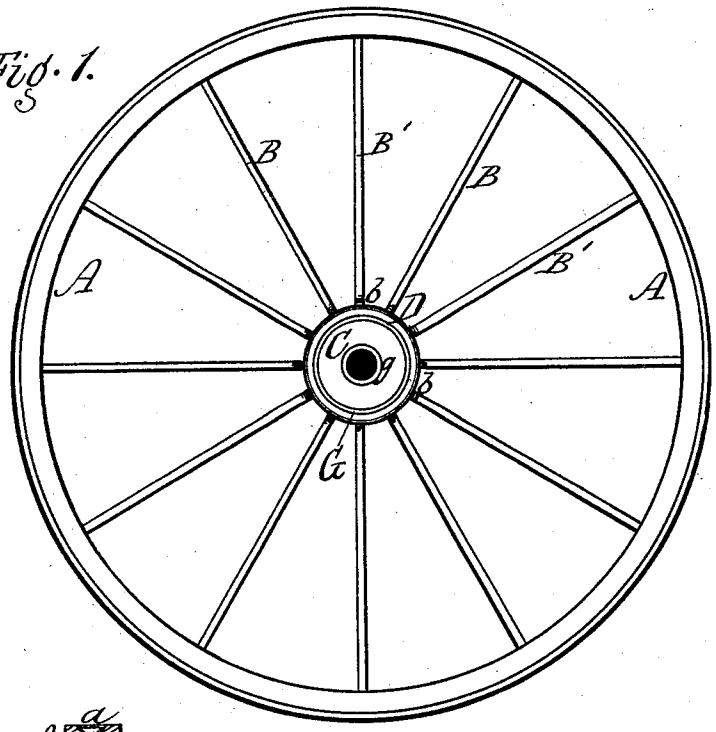


Fig. 2.

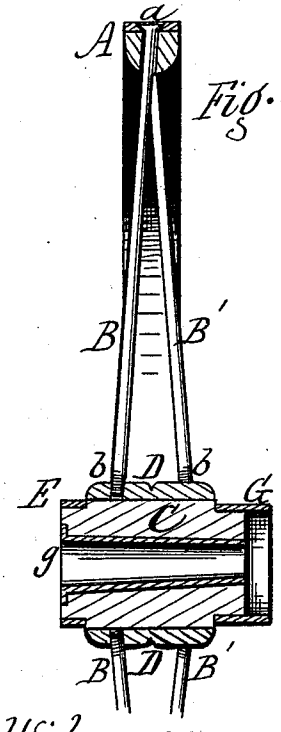


Fig. 3.

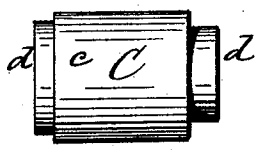
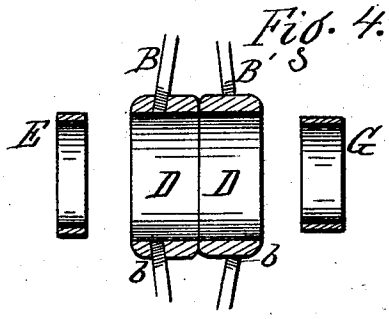


Fig. 4.



Witnesses.

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UNITED STATES PATENT OFFICE.

IRA KESTER, OF WAYLAND, NEW YORK.

IMPROVEMENT IN CARRIAGE-WHEELS.

Specification forming part of Letters Patent No. **169,272**, dated October 26, 1875; application filed May 24, 1875.

To all whom it may concern:

Be it known that I, IRA KESTER, of Wayland, in the county of Steuben and State of New York, have invented a certain new and useful Improvement in Carriage-Wheels; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of the wheel. Fig. 2 is an axial section. Fig. 3 is an elevation of the wooden hub with the rings and bands removed. Fig. 4 is a section of the ring and bands.

My improvement relates to those wheels which have two sets of spokes set bracing from the hub to rim to give greater strength. In wooden hubs such spokes have generally been mortised and tenoned into the hub. In metallic hubs they have sometimes been attached to end rims of the hub by screw-threads and nuts.

The object of my invention is to render available a wooden hub, (which has particular advantages over a solid metal one,) and to furnish a means by which the threaded ends of the spokes may be securely attached thereto without danger of breaking out; also, to so arrange the parts that by letting out one set of the spokes, and taking up the other set, the rim may be tightened, or be set dishing in either direction, at pleasure.

To this end my invention consists in combining, with a wooden hub, one or more iron rings, shrunk upon the body of the hub, and provided with two sets of screw-holes, into which the threaded ends of the bracing spokes enter, all as hereinafter described.

A is the rim. B B and B′ B′ are the two sets of bracing spokes. They are made of metallic rod, and are provided with beveled heads *a a* at the outer end, and screw-threads *b b* at the inner end. They are passed loosely through holes formed in the rim and tire, and the heads *a* rest in countersunk sockets of the tire, while the lower threaded ends *b* enter into screw-holes formed in the ring or rings, as will presently be described. The two sets of spokes alternate in position, or break joints, as usual. C is the wooden hub. It is turned with a plain cylindrical surface, *c*, to receive the ring or rings, and with two offsets, *d d*, to receive the end bands. Its diameter is somewhat smaller than ordinary wooden hubs, to enable the rings and bands to be applied thereon without increasing the usual size of the hub. D is the ring, of which one may be used, as shown in Fig. 2, or two, as shown in Fig. 4. It is simply a cylinder of wrought or malleable iron, of a length equal to that of the center of the hub, and of a thickness sufficient to receive and hold the screw ends of the spokes. It is tapped with two sets of screw-holes, corresponding in number and position with the ends of the spokes, the two sets of holes being at such distance apart as to give the proper bracing position to the spokes. In case two rings are used, they can be set nearer together or farther apart, at pleasure, thereby making the spokes more or less bracing, according to the size of the wheel, or the use to which it is to be applied. E and G are the ordinary end bands of the hub, which are fitted on the offsets *d d* after the ring D has been applied.

In application, the ring D is heated, and the wooden hub is driven fast into the ring, which is then cooled to shrink it on the hub. The spokes are then inserted through the rim and tire, and the ends screwed into the holes in the ring. The end bands are then applied, the hub bored, and the box *g* fitted therein, which completes the wheel.

The essential feature of the invention is the combination, with the wooden hub and the bracing spokes, of the band D, shrunk upon the hub, and provided with the two sets of screw-holes to receive the ends of the spokes. By this means I retain all the advantages of a wood hub, and secure a metallic connection for the spokes, by which they are made secure and fast, and cannot draw or break out, as they would do if screwed directly into the wood. They can also be adjusted out or in at pleasure, either for tightening up the wheel, or setting it more or less dishing. The latter effect is secured by screwing up on one side and letting out on the other. It enables me to adjust the dish of all the wheels on a carriage just alike, which cannot be done in the old style of wheels. It also furnishes a very cheap and effective connection for the spokes, and

any one of the latter can be removed at any time by unscrewing it and drawing it out through the rim. The hold of the ends of the spokes in the ring is sufficient to retain them at all times without passing into the wood, and I therefore avoid the weakening of the hub by mortising to the center, which is necessary where shoulder-spokes are used. I secure all the advantages of a wooden hub and avoid the great expense of a metal one. When covered by the ring and bands the wooden hub presents the appearance of a metal one, the whole surface being incased. The rim of the wheel has a greater elasticity than one with shouldered spokes, and there is less danger of depression of the rim between the spokes.

I can make this wheel at slight cost over a solid wooden one, and at much less cost than a solid metal one, and when the wooden center becomes worn I can replace it at small cost, without discarding the iron ring and other parts.

Having thus described my invention, I do not claim, broadly, in a carriage-wheel, two sets of bracing spokes; neither do I claim, broadly, a wooden hub incased in a metallic covering as a shield; neither do I claim iron rings placed upon a wood hub, and provided with sockets to receive tenoned spokes; but

What I claim as new is—

The combination, with a wooden hub, C, and two sets of bracing spokes, B B′, of the ring or rings D, shrunk upon the hub, and provided with two sets of screw-holes for the connection of the screw ends of the spokes, the whole arranged as herein described, and operating in the manner and for the purpose specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

IRA KESTER.

Witnesses:
F. E. HOLLIDAY,
G. T. KESTER.