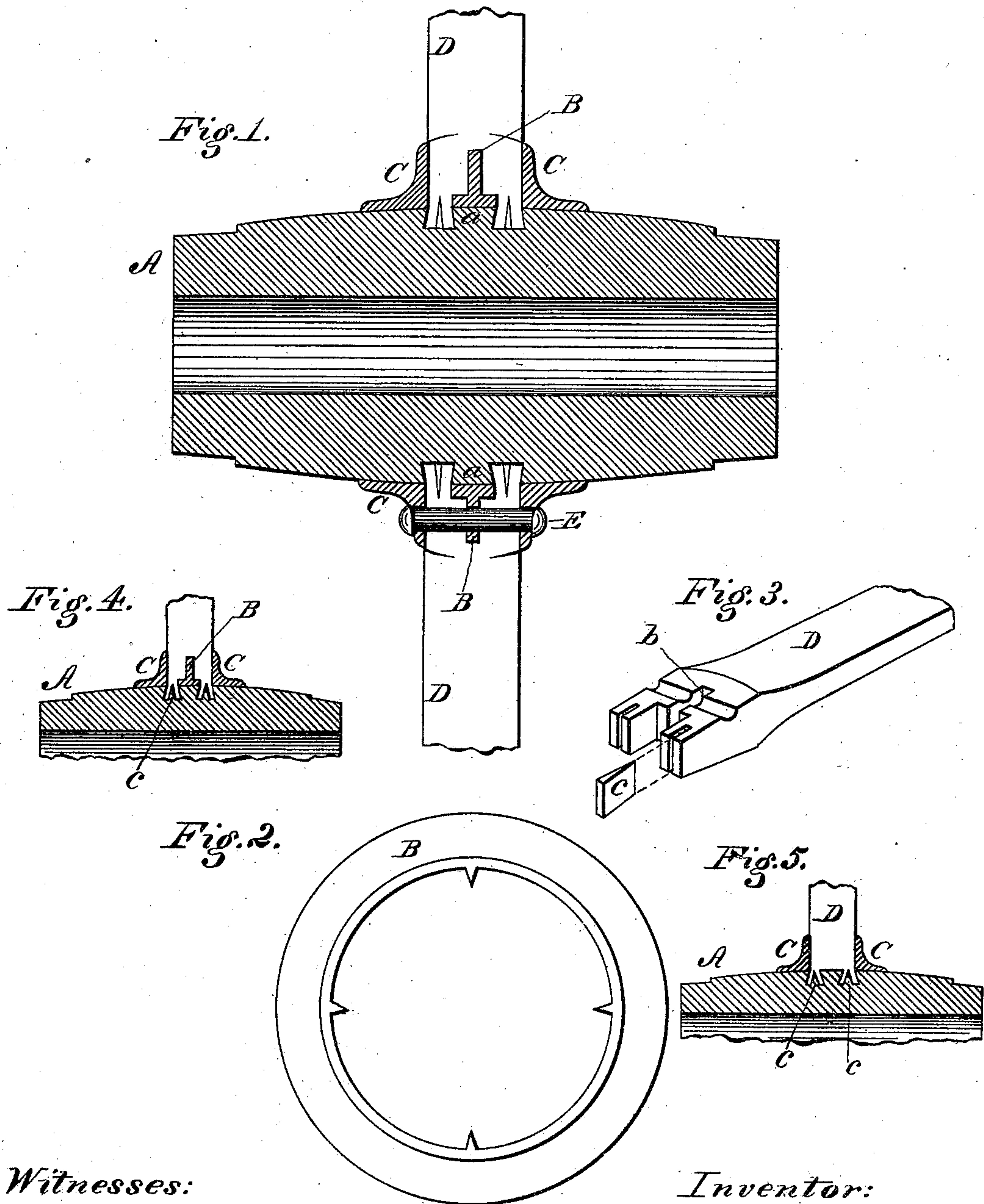


A. C. FISH.
VEHICLE-WHEEL.

No. 177,488.

Patented May 16, 1876.



Witnesses:
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UNITED STATES PATENT OFFICE.

ABNER C. FISH, OF RACINE, WISCONSIN.

IMPROVEMENT IN VEHICLE-WHEELS.

Specification forming part of Letters Patent No. 177,488, dated May 16, 1876; application filed January 31, 1876.

To all whom it may concern:

Be it known that I, ABNER C. FISH, of Racine, in the county of Racine and State of Wisconsin, have invented certain Improvements in Carriage-Wheels, of which the following is a specification:

My invention relates to that class of wheels which have circumferentially-grooved wooden hubs with the ends of the wooden spokes seated in a continuous band therein, and metal bands applied around the hub against the sides of the spokes; and the invention consists in the employment of a band passing through the middle of the spoke ends in combination with two side bands or flanges, and transverse bolts or rivets passing through the three bands and the spokes, and in forming wedges to spread the ends of the spokes on and in one piece with the hub, all as hereinafter described.

Figure 1 represents a central axial section through my improved wheel; Fig. 2, a side view of my middle band; Fig. 3, a perspective view of one of the spokes; Fig. 4, an axial section of a wheel containing both the middle band and the solid wedge; Fig. 5, an axial section of a wheel having the solid wedge without the middle band.

In constructing the wheel represented in Fig. 1, I provide an ordinary wooden hub, A, and form in the middle thereof two parallel circumferential grooves of a dovetail form in cross-section, leaving a dovetail belt of wood, *a*, between the grooves, as shown in Fig. 1. I next provide a metal band, B, having a narrow rib or flange around its middle, and shrink or force it firmly around the hub upon the middle belt *a*, as shown, after which I apply around the ends of the hub outside of the grooves the two bands or plates C, as usual. I next provide the wooden spokes D, each having at the inner end a notch, *b*, to admit the band B, and two tongues to enter the grooves, with a slit in the end of each tongue to receive an expanding wedge, *c*. After inserting the points of the wedges in the tongues I drive the spokes firmly home between the bands or plates C, over the band B, into the hub, seating the ends of the tongues solidly upon the bottom of the grooves, so that they will be expanded tightly therein by the wedges, as shown. After the spokes are all driven home

so that their inner ends form a solid continuous band of wood around the hub, holes are drilled through the three bands between the spokes, and rivets or bolts E inserted, as shown, so as to secure the bands in place, and also prevent the spokes from being withdrawn.

Instead of inserting the separate loose wedges in the ends of the spokes, as shown in Figs. 1 and 3, continuous wedge-shaped bands may be left in the grooves upon and a part of the hub, as shown in Fig. 4, the remaining features being the same as in Fig. 1.

As shown in the drawing, the wedges formed upon the hub are made with a sharp edge or point, adapted to enter and spread the ends of the spokes without assistance and without requiring them to be cut away and weakened.

I am aware of the patent granted to P. B. Watson, April 14, 1874, in which a metal annulus surrounding the hub is provided at the middle with metal wedges to spread the ends of the spokes, which pass down beyond the wedges into two shallow grooves in the hub, separated from each other by a wide rib or partition of wood upon which the metal wedges rest. This wheel, however, differs materially from mine in this, that its spokes are spread by metal wedges instead of by wooden wedges formed on the hub; that were his metal wedges omitted his spokes could not be applied, and it is not intended or adapted for use without the metal annulus and wedges therein; and that instead of the widened ends of his spokes being seated entirely and deeply in the hub they bear mainly in the metal band and slightly in the hub.

By leaving the wedges on the hub in one piece therewith, I save the expense of the separate wedges and the trouble and labor of adjusting the same, and also have the pressure applied endwise to the grain of the wedges so that there will be no loosening of the parts from a shrinkage of the wedges.

The formation of the wedge upon the hub constitutes a feature which can be used in all hubs having their spokes inserted into grooves of a dovetail form, whether the bands are used or not, and whether the hub has one or two grooves. Fig. 5 represents a hub having two grooves and the two outside metal bands or rings, with the wedges to spread the spokes

formed solidly thereon in the same manner as in Fig. 4.

In order to prevent the hub from turning within the band of spokes the bands will be provided with internal spurs, as shown in Fig. 2, to enter the hub, or the bands may be screwed to the hub, although it is designed to apply the bands in the first instance so tightly that there will be no danger of their becoming loose. By the employment of the middle band I add greatly to the strength of the wheel; by the use of the wedge formed on the hub the wheel is cheapened and simplified; and by the band B and the two dovetail grooves the wheel is rendered very strong and durable, and I am enabled to produce a strong wheel with a small hub, and to avoid cutting away the wood sufficiently to weaken the hub, as is necessary in most wheels using grooved hubs.

While it is preferred to leave the wooden tongue between the two grooves, the middle band may be seated in the middle of a single wide groove, in which case the wooden belt *a* will be removed.

What I claim as my invention is—

1. The combination of the wooden hub A, provided with the two dovetail grooves, the bands B B C, the wooden spokes D, and the bolts or rivets E passing through the three bands and the spokes, as shown.

2. A wooden hub, provided with a circumferential groove, and a continuous pointed wedge, *c*, formed solidly therein, as shown, and adapted to spread solid-ended split spokes entirely within the hub, without increasing their width outside of the same, as shown.

3. In a carriage-wheel, the combination of a circumferentially-grooved wooden hub, having a continuous wooden wedge, *c*, formed thereon within the groove, and wooden spokes having their ends split and driven directly into the groove over the wedge, without the interposition of or assistance from other parts or devices, as shown.

ABNER CROSBY FISH.

Witnesses:

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