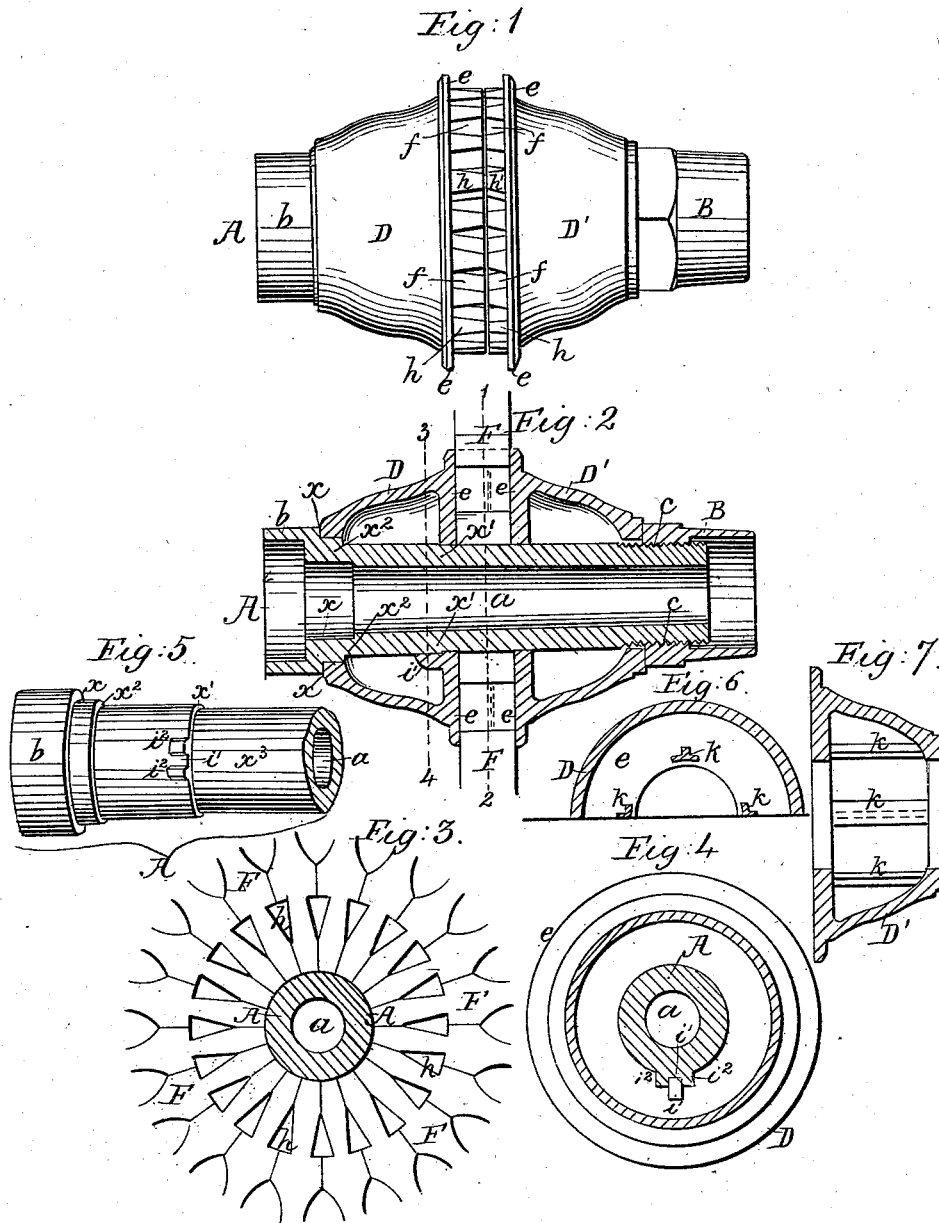


W. C. JOHNSON.

Wheel Hub.

No. 113,171.

Patented March 28, 1871.



Witnesses.

Jno. B. Harding.  
Thos. McIlwain

Inventor

W. C. Johnson  
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# UNITED STATES PATENT OFFICE.

WILLIAM COALE JOHNSON, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVEMENT IN HUBS FOR WHEELS.

Specification forming part of Letters Patent No. 113,171, dated March 23, 1871.

I, WILLIAM COALE JOHNSON, of Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain Improvements in Metallic Hubs and Axle-Boxes, of which the following is a specification:

### *Nature and Object of the Invention.*

My invention consists of metallic hub and axle-box, constructed in the manner too fully explained hereafter to need preliminary description; the object of my invention being the firm securing of the spokes to the hub, and the ready detachment of one or more of the spokes without disturbing the others.

My invention has for its further object the attainment of lightness and simplicity in the construction of the said hub and axle-box, and the ready disconnection of the same from and connection to each other.

### *Description of the Accompanying Drawing.*

Figure 1 is an exterior view of my improved metallic hub and axle-box; Fig. 2, a longitudinal section of the same; Fig. 3, a transverse section on the line 1 2, Fig. 2; Fig. 4, a transverse section on the line 3 4, Fig. 2; Fig. 5, a perspective view of part of the box; and Figs. 6 and 7, views of one of the sections of the hub slightly modified.

### *General Description.*

A represents the axle-box, in which is the usual tapering opening *a* for the reception of the axle, and which has an enlargement, *b*, at its rear end, and screw-threads *c* formed at its opposite or front end, adapted to the internal threads of a nut or screw-cap, B, between which and a shoulder, *x*, on the said enlargement *b* of the box the two sections D and D' of the metallic hub are securely retained. (See Fig. 2.)

Each of these sections of the hub is entirely separate from the other and detachable from the box, and is cast hollow, and adapted to the box in the manner best observed in Fig. 2.

At the inner end of each of the said sections is formed a transverse circular plate or flange, *e*, between which and a corresponding flange of the opposite section the spokes E of the wheel are retained.

The inner ends of the spokes are tenoned, as shown in Fig. 3, and are adapted to mor-

tises *f*, formed between the two sections of the metallic hub, by means of tapering or wedge-shaped projections *h* and *h'* on the opposing faces of the flanges *e e* of the said sections.

Owing to the double tapering form of the mortises in the hub, the spokes are wedged tightly into the same, when the two sections are forced together by means of the screw-cap B, and the loosening or longitudinal withdrawing of the spokes from the mortises is effectually prevented, owing to the shape of the tenons, which are enlarged at or near their inner ends, as shown in Fig. 3.

It will be observed, on reference to Fig. 1, that the projections *h'* of the front section, D', of the hub are considerably shorter than the corresponding projections *h* of the rear section, D. This is an important feature of my invention, as it enables the front section to be readily withdrawn from the rear section and spokes, when one or more of the latter have to be removed or renewed, without disturbing the whole, which could not be easily done if all of the said projections were of the same length, as some of the spokes would adhere to one section and some to the other, while the resistance to the separation of the said sections would be greatly increased.

In order to prevent the box from turning within the hub, the rear section, D, of the hub is cast with a projection or tongue, *i*, adapted to a recess, *i'*, formed between two projections, *i<sup>2</sup> i<sup>2</sup>*, cast on the box. This effectually prevents the whole wheel from turning independently of the box, as the front section, D', is connected to the rear section by means of the spokes.

The opening at the rear end of the section D of the hub is sufficiently enlarged to enable it to pass over the projections *i<sup>2</sup>* of the box, and the said opening is adapted to a collar, *x<sup>2</sup>*, formed on the box between the shoulders *x* and *x'* of the same.

In consequence of this arrangement, the reduced portion *x<sup>3</sup>* of the box, Fig. 5, is merely contained within the hollow portion of the section without serving as a bearing for any portion of the same, and will not, therefore, require to be turned down or finished, but can be left in its original rough state.

The hollow sectional hub, constructed precisely as above described, answers well for

carriages and other light vehicles; but for heavy wagons I prefer to strengthen the sections of the hub by means of braces *k*, cast in and with the said sections, as shown in Figs. 6 and 7, and extending across the same from the inner edges of the flanges *e* close to the box.

Independently of the advantages of lightness and strength possessed by the above arrangement of box and hub, one or more of the spokes can be at any time removed and replaced without injuring or taking the wheel apart, and worn-out boxes can be renewed without discarding any portion of the hub, as in other wheels of this class, where one of the sections of the hub is cast in one piece with the box.

*Claims.*

1. The combination of the metallic axle-box A and two detachable hollow sections, D D', each having at its inner end a flange, *e*, on

which are projections *h h'*, forming mortises of the character described.

2. The combination of the sections D D' and their projections *h h'*, when the latter are of the form described, so as to prevent the longitudinal withdrawal of the spokes when one series of projections is shorter than the other, to prevent the lateral withdrawal of the spokes when the sections are separated, all as set forth.

3. The combination of the said box A, two detachable hollow sections, D D', their flanges *e*, and projections *h h'*, when the said sections have internal braces *k*, as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. C. JOHNSON.

Witnesses:

WM. A. STEEL,  
F. B. RICHARDS.