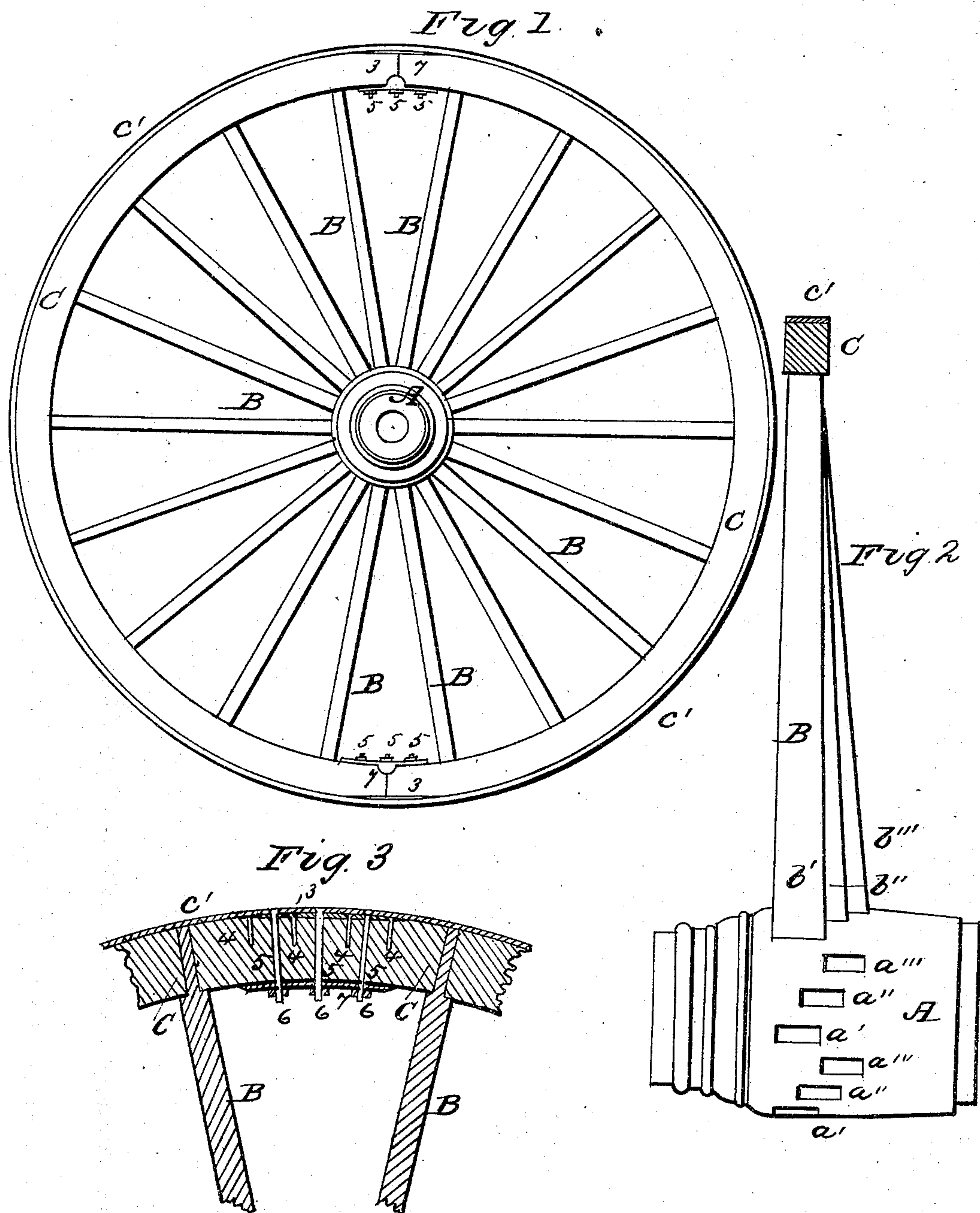


C. M. FOULKE.

Wheel Hub.

No. 88,705.

Patented April 6, 1869.



Witnesses  
Benj Monson.  
Wm H. Morison.

Inventor  
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# United States Patent Office.

CHARLES M. FOULKE, OF PHILADELPHIA, PENNSYLVANIA.

Letters Patent No. 88,705, dated April 6, 1869.

## IMPROVEMENT IN CARRIAGE-WHEELS.

The Schedule referred to in these Letters Patent and making part of the same.

### To all whom it may concern:

Be it known that I, CHARLES M. FOULKE, of the city of Philadelphia, in the State of Pennsylvania, have invented a new and useful Improvement in Wheels for Vehicles; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a front-side elevation of a wagon-wheel, having my said improvement applied thereto, and

Figures 2 and 3, enlarged sections of the same.

Like letters of reference indicate the same parts, when in the different figures.

The object of my improvement is to give increased strength to the wheel, without adding, in any objectionable degree, to its weight; and

My invention consists, substantially as hereinafter described and specified, in securing the spokes in the hub in spirally-arranged groups of three, regularly arranged directly around the said hub.

Referring to the drawings—

A is the hub of the wheel;

B-B, the spokes; and

C C, the felloes.

The mortises in the hub A, for the reception of the spokes B, are made at regular or equal distances apart from each other laterally, around the said hub; but, in their longitudinal relation to the said hub, they are made in spirally-arranged groups of three, *a' a" a'''*, as represented in fig. 2.

The ends of the mortises of each group being also so inclined, respectively, as to bring the outer ends of the three spokes, *b' b" b'''*, of each group, when inserted, in the same plane around the hub, for the purpose of receiving the felloes without straining the spokes into the required positions for the purpose; and also so that the whole front edge of the spoke *b'*, nearest to the front end of the hub A of each group, will be nearly in the same plane with the face of the rim of the wheel, while the other two spokes, *b" b'''*, will necessarily be inclined forward, as represented in fig. 2.

It is found that the construction and arrangement described and shown, give additional strength to the wheel, both from the increased bracing effect of the inner, or back spoke *b'''*, of each of the spiral groups of three, and from the more extended distribution, or separation of the mortises in the hub; and that this increased strength is obtained without necessarily increasing the weight of the wheel.

The abutting ends of the felloes C C are secured together without the use of a dowel-pin, which pin necessarily required a weakening of the ends of the felloes by the boring of holes therein for its reception.

My improvement in this part of the wheel is clearly shown in fig. 3, C C being sections of two felloes abutted

accurately and closely together, midway between the two adjacent spokes B B, (see fig. 1,) and held securely and rigidly in that position; first, by means of a steel plate 3, which is of the same width as the felloes, in length about six inches, more or less, and gradually thinned toward its ends. It has four countersunk holes for receiving the heads of four wood-screws, 4 4 4 4, by which it is firmly secured to the two abutting felloes, in a recess made for the purpose on the outer edge of the same, and so as to afford thereat also the required regularity in the curve of the rim. There are, also, three other, though larger holes made in the said plate 3, between the four screws, 4 4 4 4, the middle hole being directly over the joint formed by the abutting ends of the felloes.

The tire *c'* is applied and secured around the rim in the usual manner; but at the part which covers the plate 3, there are three countersunk holes, corresponding in positions with the open holes in the said plate 3, and through these and the holes in the felloes C C, three strong bolts, 5 5 5, having heads to fit the countersinks in the tire, are driven, and firmly held down by means of screw-nuts 6 6 6, applied to their respective projecting ends, an iron clip-plate, 7, intervening and clamping against the inner edges of the felloes, as shown in figs. 1 and 3.

It will be seen that this mode of securing the joints of the felloes in the rim of a wheel, will effectually prevent any indentation or variation in the regularity of the curve of the rim of the wheel—a result to which wheels have heretofore been very subject while in use; and that, as the central one of the three bolts 5 5 5, fits in a hole made radially through the joint of the two abutting felloes C C, a lateral motion of the abutting ends of the said felloes against each other will be effectually prevented, and the ends of the felloes much less weakened than if the usual dowel-pin were used for the same purpose.

In a wheel of this construction, and having only two felloes, C C, in its rim, it will be perceived that the number of the spokes must divide evenly by 2 and by 3; and for this reason I find that eighteen spokes, as shown in fig. 1, will be the best number for most vehicles.

Having thus fully described my improvement,

What I claim as new, and desire to secure by Letters Patent, is confined to the following, viz:

I claim the arrangement of the mortises *a' a" a'''* in the spiral groups around the hub A, for the insertion of the spokes B-B, substantially as described and set forth, for the purpose specified.

CHARLES M. FOULKE.

Witnesses:

BENJ. MORISON,

WM. H. MORISON.