

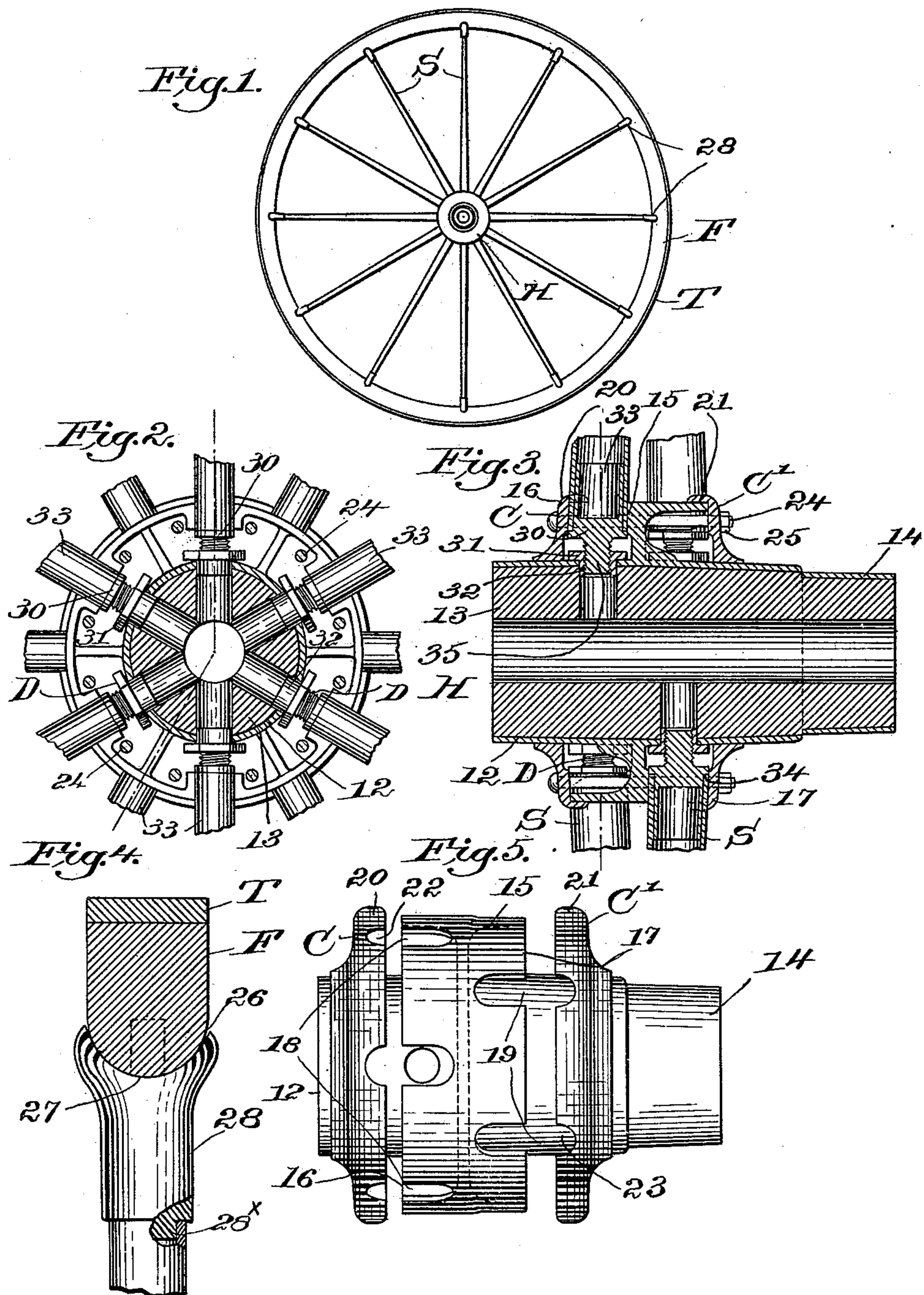
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Patented Nov. 21, 1899.

F. J. MERCER.  
WHEEL.

(Application filed July 8, 1899.)

(No Model.)



Witnesses.  
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# UNITED STATES PATENT OFFICE.

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## WHEEL.

SPECIFICATION forming part of Letters Patent No. 637,470, dated November 21, 1899.

Application filed July 8, 1899. Serial No. 723,154. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK J. MERCER, of Hyde Park, county of Norfolk, State of Massachusetts, have invented an Improvement in Wheels, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

10 This invention relates to wheels, and more especially to a means for tightening the spokes from the hub between the latter and the felly or rim, whereby a strong and serviceable wheel can be produced, and in the present instance the spokes are individually or separately adjustable toward the periphery of the wheel, so that the ends of said spokes can be made to abut with the proper pressure against the felly, and the construction is such that  
15 the spoke-adjusting devices are simple in operation and are readily accessible, and being individually operable they may be separately adjusted to true the wheel after its different parts are assembled or to subsequently compensate for any shrinkage in the felly or spokes, provided either of these parts be of wood.

The wheel in the preferred embodiment thereof illustrated in the accompanying drawings includes in its organization a hub, a felly, a series of spokes, and means for adjusting the spokes radially outward or toward the felly or rim for tightening the spokes, and as the spokes are separately adjustable any one  
30 or more of them can be manipulated independently of the remainder of the series.

In the drawings, Figure 1 is a side elevation of a wheel involving my improvements in the preferred embodiment thereof, and the same being on a reduced scale. Fig. 2 is a sectional front elevation of the hub with the several spokes therein. Fig. 3 is a longitudinal central sectional view of the same. Fig. 4 is a sectional elevation of a portion of the felly and one of the spokes, showing a convenient means of uniting the spoke and felly. Fig. 5 is a detail plan view of the main portion of the hub with the spokes, &c., detached.

The hub is denoted in a general way by H, and it includes in its construction, in the form thereof represented, a body portion 12, which may consist of a substantially cylindrical

jacket or casing which is adapted to snugly receive the core 13, in which the axle (not shown) is adapted to turn, and the band 14 is driven on the outer end of the core and is adapted to abut against the body portion 12. The body portion 12 is provided with a circumferential web or annular projection 15, from which the flanges 16 and 17 extend oppositely, the flange 16 having the recesses or openings 18, while the flange 17 has corresponding recesses or openings 19, which constitute seats or sockets for the spokes. It will be seen upon inspection of Fig. 5 that the recesses 18 and 19 are arranged in staggered or alternate relation, by reason of which the simple structure is compact and strong.

The spokes are denoted by S, and they may be of any suitable kind, this being simply a matter of choice or expediency; but those represented are tubular and metallic, whereby strength and lightness are obtained, and said spokes taper outward, and their inner or enlarged ends are adapted to snugly fit within the seats 18 and 19, formed in the respective flanges 16 and 17, and said spokes are held against lateral movement by cap-plates, as C and C', of substantially circular shape and having central openings adapted to receive the body portion or cylindrical section 12 of the hub, and these cap-plates are adapted to abut against the opposite or outer edge of the oppositely-disposed flanges 16 and 17. The spoke-holding plates C and C' are provided with inwardly-disposed annular flanges or rims 20 and 21, which overlap slightly the adjacent edges of the flanges 16 and 17. These cap-plates are removable from each side of the wheel, as shown in Fig. 5, so that the spoke-adjusting devices can be readily reached. In the present case the cap-plates are provided upon the flanges 20 and 21 with concavities or recesses 22 and 23, respectively, complementary to or adapted to register with the recesses 18 and 19 upon the oppositely-projecting flanges 16 and 17, and these sockets or recesses 22 and 23 are adapted to also receive the spokes, which extend in staggered relation about the hubs, whereby the spokes can be firmly held at this point against lateral play; but it will be obvious that their free outward adjustment may be attained at any time. The cap-plates C and C' are united to each other



in some suitable manner and held rigidly against the flanges 16 and 17 and also against the spokes by some suitable means, as the circular series of bolts 24, extending through the webs of the two cap-plates and provided with the usual nuts 25, by removing which either one or both of the plates can be moved outward.

The felly or rim is denoted by F, and it is provided with a tire T, and the inner portion of the felly is shown as rounded or convexed, as at 26, to fit within the concavities or seats 27 in the tips or socketed members 28, each constituting, in effect, a part of the spokes. The socketed members or tips 28 may have suitable tenons, as 28<sup>x</sup>, to set into the open outer end of the spokes.

The oppositely-projecting flanges 16 and 17 constitute, in effect, a casing for inclosing the spoke-adjusting devices, which are of such a nature as to effect the movement of the spokes outward, so that all of said spokes can be tightened or forced into firm engagement with the felly or so that any one or more of them can be adjusted to the wheel in case any shrinkage should take place either in the felly or the spokes, provided, of course, they are of wood, or in case either of the parts are bent or twisted.

Each of the spokes is shown in Fig. 3 as united to the hub by an adjusting device, as D, consisting of two parts, as 30 and 31, the part 31 being in the nature of a nut having an inwardly - extending projection 32, passing through registering openings formed in the body portion 12 and the inclosed core 13, respectively. The parts 30 have the projecting hollow stems or studs 33, which can be driven in the chamber or bored lower ends of the spokes or otherwise connected thereto, and the bodies 34 of said parts 30 are adapted to fit firmly against the inner ends of the spokes and are provided with threaded studs or screws 35, adapted to engage in the nuts 31, which are carried by the body portion of the hub.

It will be seen upon inspection of Fig. 3 that the projections or studs 33 are entered in the open inner ends of the spokes and that they form parts of the bolts 30, and upon turning the nuts 31 upon said bolts the said bolts can be forced radially outward, thereby tensioning the spokes. By the construction specified it is unnecessary to thread the spokes, and the wheel also can be readily assembled, as it is simply necessary to place the threaded

nuts of the bolts in position with the nuts turned on as far as they will go and afterward place the spokes over the projections 33. When this has been done, the nuts can be turned to the proper extent. It will be seen also that the spokes are clamped between the places at which the adjusted bolts and nuts are locked, and they serve to prevent side play of the spokes, as in case such motion results it will cause a corresponding motion of the bolt 30, and consequently a grinding between the threads of the two parts.

With the parts assembled as indicated in Fig. 3 it will be assumed that it is necessary to adjust one or more of the spokes, and provided a spoke upon the right-hand side of the wheel is to be adjusted the cap-plate C' will be moved slightly outward by taking off the nuts 25, so that access may be had to the inside of the hub. When this is done, any one or more of the nuts 31 can be turned to force the spokes outward the proper degree or extent.

Before the cap-plates are applied, the wheel can be trued very accurately and easily by the manipulation of the several adjusting-nuts.

The invention is not limited to the precise details or arrangement of parts hereinbefore specified, for these may be variously modified within the scope of the following claims.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a wheel a felly, a spoke having an open inner end, a bolt separate from the spoke and having a projection fitted in said open end, a hub and a nut supported against the hub and in threaded engagement with the bolt.

2. In a wheel a felly, a spoke having an open inner end, a bolt separate from the spoke and having a projection fitted in said open end, a hub, a nut supported against the hub and in threaded engagement with the bolt, and means for clamping the spoke at a point beyond the threaded surface of the bolt and nut.

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

FREDERICK J. MERCER.

Witnesses:

GEO. W. GREGORY,  
ALEXANDER C. PROUDFIT.