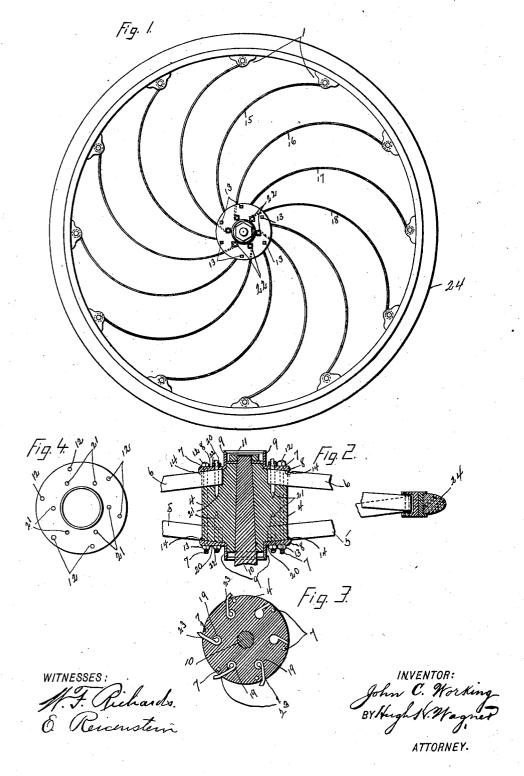
J. C. WORKING.

HUB.

(Application filed Apr. 29, 1901.)

(No Model.)

2 Sheets-Sheet I.

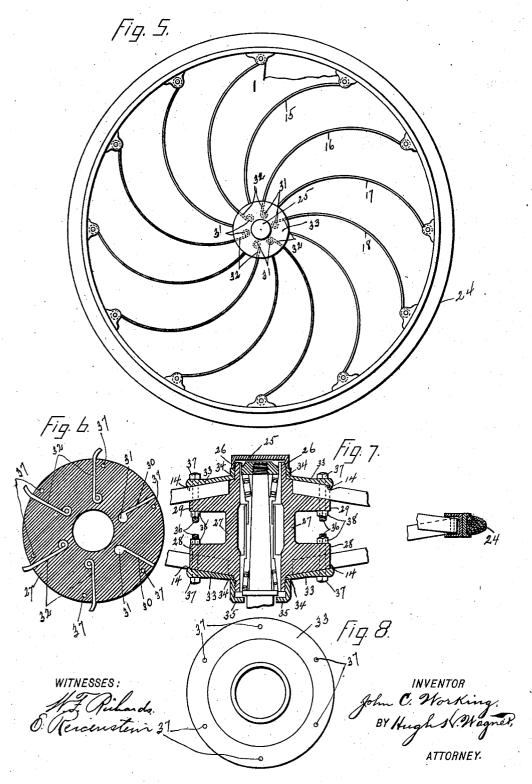


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2 Sheets-Sheet 2.



UNITED STATES PATENT OFFICE.

JOHN C. WORKING, OF DENVER, COLORADO, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE FURMIDGE SPRING WHEEL COMPANY, OF PIERRE, SOUTH DAKOTA.

HUB.

SPECIFICATION forming part of Letters Patent No. 691,735, dated January 21, 1902.

Application filed April 29, 1901. Serial No. 57,947. (No model.)

To all whom it may concern:

Beit known that I, JOHN CALVIN WORKING, of the city of Denver, county of Arapahoe, State of Colorado, have invented certain new and useful Improvements in Hubs, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings, forming part of same, in which—

Figure 1 is a side elevation of a wheel provided with my improved hub. Fig. 2 is a view, partly in section, showing my improved hub and the manner of attachment of the spokes thereto. Fig. 3 is a detail, partly in 15 section, of the hub, showing the manner of attachment of the spokes thereto. Fig. 4 is an end view of the hub, showing the ends of the bolts illustrated in Fig. 2. Fig. 5 is a view similar to Fig. 1, but showing the man-20 ner of attachment of the spokes of the wheel when the hub is made of metal. Fig. 6 is an end view of the main hub portion, showing the slots therein and spokes fitted into some of said slots. Fig. 7 is a longitudinal sec-25 tional view of my said hub when constructed of metal, showing the same in detail and also the manner of attaching the spokes thereto and the assemblage of the whole, together with one form of axle illustrated running 30 therethrough. Fig. 8 is an end view of the entire hub.

My invention relates to hubs used in wheels having bowed spokes of resilient material. As shown at 1, said spokes are preferably pivotally attached to stirrups placed upon the inner side of the rim of the wheel, preferably by means of a bolt running through sides of the stirrup, around which the end of the spoke is curled, forming an eye.

40 I will first describe the construction of my improved hub when made of wood and afterward will describe the same when composed all of metal. The former is shown more particularly in Figs. 1 to 4 and the latter in Figs. 45 5 to 8.

In Fig. 2, 4 indicates the round wooden hub, 5 the spokes fastened thereto on one end thereof, and 6 the spokes entering thereinto and attached thereto at the other end of the 50 hub. 7 indicates a bolt running entirely

through the hub, binding thereto the flanges 8, which by means thereof are bound firmly to each end of the hub. Said flanges 8 have collars 9 projecting laterally from the central portion of the same, forming a space through 55 which the axle 10 of the vehicle passes. This axle may be of any desired pattern. As shown at 11, this collar projects on the end side of the hub beyond the end of the axle and the axle-cap, protecting it from harm. Bolts 7 60 are made operative by their heads 12 and the nut 13. After the flanges 8 have been fitted over the wooden hub the bolts 7 are run through the flange on one end of the hub, through the wood, and through the opposite 65 flange and the nuts 13 screwed home, whereby the whole is bound together as a firm and compact structure. The flanges 8 have on their inner side a rim 14, which encircles the end of the wooden part of the hub completely, 70 except that at the point where each spoke enters the hub said rim is notched to allow said spokes to pass therethrough. As shown, the several spokes are suitably attached to the rim of the wheel and alternately connected 75 with opposite sides of the hub-that is to say, (referring to Fig. 1,) while the spoke numbered 15 will be brought to one end of the hub, as indicated at 5, Fig. 2, the spoke numbered 16 will enter the hub at the end oppo- 80 site to that where the spoke numbered $\hat{1}\hat{5}$ is attached, (designated at 6, Fig. 2.) Spoke numbered 17 will again be attached to the same end of the hub as that numbered 15, and spoke numbered 18, again alternating, 85 will be attached at the same end of the hub as the spoke numbered 16, and so on around the wheel.

The spokes are attached to the hub in the following manner: Each spoke is provided 90 with an eye 19, which is formed by the end thereof simply being turned around into that shape. Passing through the flanges 8 at the part marked 20 are the bolts 21, which also pass through the eyes 19. The nuts 22 hold 95 said bolts in place, and the combination of the two assists in binding the structure together. Slots 23 are cut in the wooden portion of the hub 4 at the required number of points on its circumference, allowing the 100

spokes to enter from the rim of the wheel to be attached in place in the hub. These spokes are attached to the hub in the following manner: The flanges 8 not being attached 5 to the wooden part of the hub, the slots 23 are exposed to view from both ends of the hub, as well as places for the eyes 19. The spokes are simply slipped into the slots and eye-spaces at their respective ends of the hub. The o flanges 8 are then placed in position, the bolts 21 are driven in through both flanges 8 into the wooden portion 4, and the nuts 22 screwed home.

24 indicates the rubber or other tire to the 15 wheel, attached in any ordinary or desired manner.

When the hub is constructed entirely of metal, some variations in these parts are nec-While any form of axle may be used 20 in this hub, in the drawings I have shown it

with a Timken roller-bearing.

As part of my special hub construction I provide a cap 25, which incloses the end of the hub and axle away from the body of the The screw-threads 26 form the means of attachment of this cap to the main part of the hub. This main portion of the hub 27 is constructed entirely of metal and has projecting therefrom two annular flanges 30 28 and 29, which project from the periphery of the hub at points adjacent to its ends. Said annular flanges are both provided with slots, as in the wooden hub before described, having at the bases of said slots, near the cen-35 ter of the hub, holes drilled thereinto approximately the size of the eyes upon the spokes, which are inserted into said metal hub in the same way as into the wooden one—that is to say, from the ends—by being slipped into the 40 slots in their straight portion, the eyes being inserted into the round holes at the bases of The construction of these slots is shown at 30, and the holes for the eyes at 31.

32 indicates the appearance of the end of 45 the hub when the spokes are in position, but before the flanges 8 are adjusted to their places at the ends of the hub. To hold the spokes within the slots, I provide annular flanges or caps 33, which fit to the ends of the 50 hubs at both ends, there being two to each hub. These flanges bear upon the central portion of the hub 27 at 34 and are retained in position at the bottom, where they rest upon said central portion of the hub, by the 55 cap 25, before described, and the cap 35 at the other end of the hub. The cap 35 is screw-threaded and fastens upon the main portion of the hub in a manner similar to the cap 25, but differs from it in having an aper-

60 ture in its center for the passage of the axle. The upper part of these flanges or caps 33 is held firmly in position bearing against the flanges 29 by means of the bolts 36, which

run through the flanges 29 and flanges or caps 33 and have heads 37 and nuts 38 to retain 65 them in place. The flanges 33 have the rim 14, the same as in the wooden form of this hub, which is notched at various parts of its circumference for the admission of the spokes.

I am aware that many minor changes in 70 the form and arrangement of the parts constituting the different parts of my invention may be made and that minor changes of construction in the same may be made without departing from the nature and spirit thereof. 75

Having thus described my invention, what I claim, and desire to secure by Letters Pat-

ent, is-

1. A hub adapted to receive spokes at points adjacent to its ends, having on its periphery 80 raised portions formed integral therewith containing grooves for the reception of the spokes, caps to hold the spokes in said grooves, and caps 25 for retaining said caps in place, substantially as described.

2. The combination of main hub portion having flanges, grooves in said flanges, spokes fitting therein, caps to retain said spokes in said grooves, and screw-threaded caps to hold said first-mentioned caps in position, sub- 90

stantially as described.

3. A hub comprising a central core, having grooves in the ends thereof extending from the periphery a suitable distance toward the center thereof, with holes at the inner ends 95 of the same, adapted to receive and contain flat resilient spokes, having eyes formed on their inner ends adapted to fit in said holes.

4. A hub comprising a central core having raised portions on its periphery adjacent to 100 its ends, grooves in said raised portions adapted to receive and contain flat resilient spokes, said grooves terminating in holes adapted to receive and contain eyes formed on the ends of said spokes.

5. A hub comprising a central core, grooves in said hub adjacent to its ends adapted to receive and contain flat spokes, and a flange or cap having a notched or recessed rim 14, adapted to overlap a part of said central core, 110 and in said recesses to afford bearing-surface for said spokes.

6. A hub comprising a central core having grooves therein adapted to receive and contain resilient spokes having eyes on the inner 115 ends thereof fitting into holes at the inner ends of said grooves and bolts passing through said eyes and into the main hub portion.

In testimony whereof I have hereunto affixed my signature, in the presence of two 120 witnesses, this 22d day of April, 1901.

JOHN C. WORKING.

Witnesses:

HUGH K. WAGNER, O. Rercenstein.