

(No Model.)

G. H. GRAHAM.
CAR WHEEL.

No. 477,532.

Patented June 21, 1892.

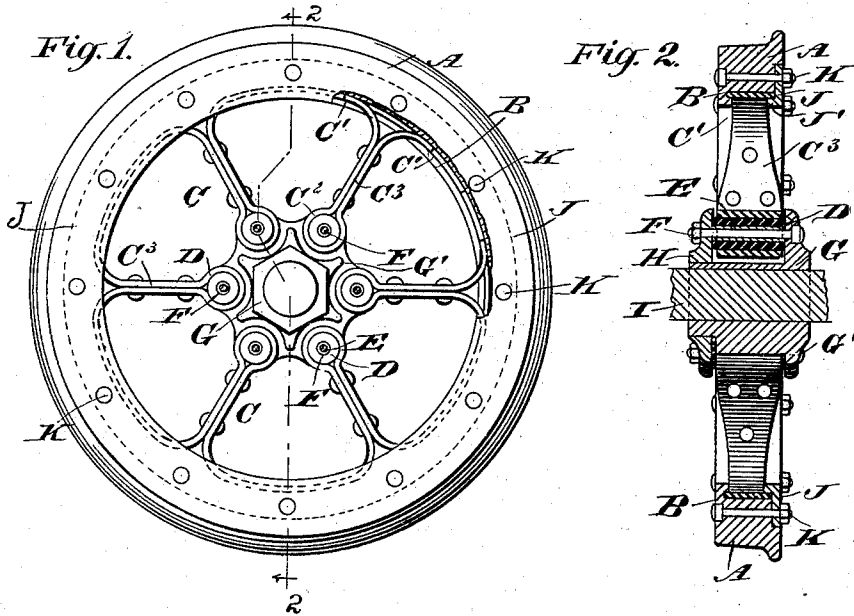


Fig. 3.

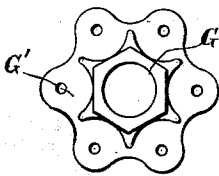


Fig. 4.

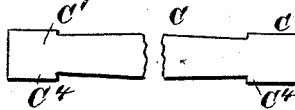


Fig. 5.

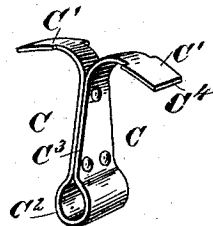


Fig. 7.

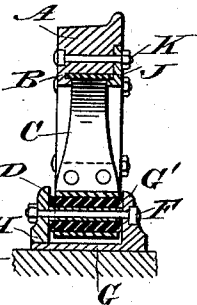
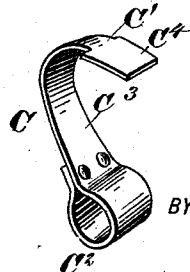


Fig. 6.



WITNESSES:

J. B. Griswold
E. M. Clark

INVENTOR

G. H. Graham

BY

ATTORNEYS.

UNITED STATES PATENT OFFICE.

GEORGE H. GRAHAM, OF OAK PARK, ILLINOIS.

CAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 477,532, dated June 21, 1892.

Application filed March 11, 1892. Serial No. 424,536. (No model.)

To all whom it may concern:

Be it known that I, GEORGE H. GRAHAM, of Oak Park, in the county of Cook and State of Illinois, have invented a new and Improved Car-Wheel, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved car-wheel which is simple and durable in construction, composed of but a few parts, and constructed mostly or entirely from rolled, forged, or drawn metal to reduce to a minimum the chances of breaking from crystallization or other causes.

The invention consists of a tire formed at its inner surface with segmental recesses adapted to receive the segmental ends of the spokes, which are pivoted at their inner ends to the hub.

The invention also consists of certain parts and details and combinations of the same, as will be hereinafter described, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a face view of the improvement with parts in section. Fig. 2 is a transverse section of the same on line 22 in Fig. 1. Fig. 3 is a face view of the hub with face-plate removed. Fig. 4 is a plan view of the blank for forming the spokes. Fig. 5 is a perspective view of one of the spokes. Fig. 6 is a perspective view of a modified form of spoke, and Fig. 7 is a transverse section of a modified form of the improvement.

The improved car-wheel is provided with a tire A, formed with the usual tread and flange, and also formed at its inner surface with segmental recesses B, into which fit the correspondingly-shaped segmental ends C' of the spokes C, each made of a single piece of metal bent upon itself to form an eye C², from which extends the shank C³, which terminates in the segmental ends C', as plainly illustrated in Fig. 5. The two parts forming the shank C³ are preferably riveted together, as illustrated, and the said shank extends, preferably, radially, but may be curved, if desired.

In the eye C² of each spoke C fits a trans-

versely-extending rubber cylinder D, lined at its inside with a tube E, through which passes a bolt F, which latter thus forms a pivot for the spoke, as will be readily understood by reference to Figs. 1 and 2. The bolt F is held in the annular flange G' of the hub G, and also serves to hold the face-plate H of the said hub against the front face of the inner ends of the spokes, as plainly shown in Fig. 2. It will be seen that by this construction considerable elasticity is given to the spokes, as the same may give in either direction at their ends C' or at the shank C³, as the spokes are pivoted to the hub. The end of the hub G is preferably made of polygon form on the outside and is engaged at this point by a similar-shaped opening in the face-plate H, so that the latter cannot turn on the hub.

In constructing the car-wheel each of the ends C' of a spoke C is formed with an offset C⁴, extending transversely and fitting into a corresponding recess extending from the segmental recess B.

In order to place the ends C' in position, a ring J is provided, fastened by bolts K to the tire A at the rear side thereof, the said ring being formed with an inwardly-extending flange J', engaging the underside of the projection C⁴ at one side of the end C', the other side of the said projection being fitted into the extension of the recess B.

In order to prevent all noise at the pivotal end of the spokes, the rubber cylinder D is preferably made somewhat longer than the eye C², so that the rubber fits snugly at its ends between the flange G' and the face-plate H of the hub.

As illustrated in Figs. 6 and 7, the spoke C is only formed with one segmental end C', as the other end and part of the shank are omitted, part of the eye C² being riveted to the single shank, as will be plainly understood by reference to the said figures.

The hub G is secured in the usual manner to the axle I, so that further description of this part is not deemed necessary.

It is understood that the several parts of the wheel described, with the exception of the rubber cylinder D, are made from rolled, forged, or drawn metal, so that the chances of

breaking from crystallization or other causes are reduced to a minimum. It will further be seen that any of the parts of the wheel can be readily renewed and replaced by a new one without discarding the other parts.

The cushion formed by the rubber cylinders D and interposed between the tire A and the hub prevents injury to the axle by absorbing the vibration and jarring which tends to promote crystallization of the molecules in the metal, and when these wheels are applied to electric cars, which are subject to severe shocks and jarring, they preserve the motors and truck from crystallization and allow an elastic torque for the motors in starting.

It will further be seen that a wheel constructed in the manner shown and described permits independent expansion of the hub and tire, and consequently reduces breakage from unequal expansion caused by heating, due to hot boxes or sudden application of the brakes. The spokes in expanding give laterally sufficiently to prevent any part of the wheel from breaking. In case the tire should become cracked from any cause whatever the ring J and the spokes C prevent the pieces from falling out and causing injury.

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

1. A car-wheel comprising a tire formed at its inner surface with segmental recesses, spokes having segmental ends fitting into the said recesses, and a hub carrying pivots engaging the inner ends of the said spokes, substantially as shown and described.

2. A car-wheel comprising a hub, a tire,

spokes connecting the said tire with the said hub, and a rubber cushion arranged on the inner end of each of the said spokes, substantially as shown and described.

3. A car-wheel provided with a spoke formed with a shank, an eye arranged on one end of the shank, and a segmental end arranged on the outer end of the shank, substantially as shown and described.

4. A car-wheel comprising a tire formed at its inner surface with segmental recesses, a hub carrying bolts forming pivots, spokes, each formed with a shank, segmental ends projecting from the said shanks and engaging the recesses in the said tire, the inner ends of the said spokes being formed with an eye, and a rubber cylinder fitting in the said eye of each spoke and through which passes the bolt of the said hub, substantially as shown and described.

5. A car-wheel comprising a tire formed at its inner surface with segmental recesses, a hub carrying bolts forming pivots, spokes, each formed with a shank, segmental ends projecting from the said shanks and engaging the recesses in the said tire, the inner ends of the said spokes being formed with an eye, a rubber cylinder fitting in the said eye of each spoke and through which passes the bolt of the said hub, and a ring bolted to the said tire for holding the segmental ends of the spokes in place, substantially as shown and described.

GEORGE H. GRAHAM.

Witnesses:

HERMAN HAAS,
FRANCIS L. GRAHAM.