(No Model.)

W. J. WILLITS.

CAR WHEEL.

No. 280,702. Patented July 3, 1883.

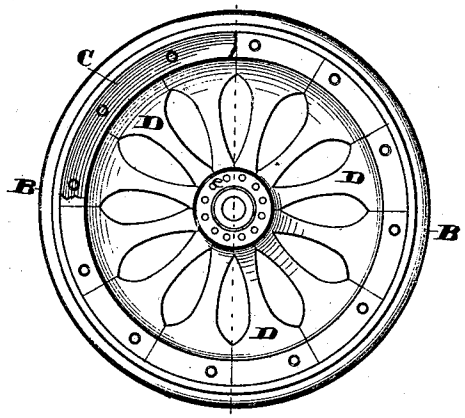

Fig. 1

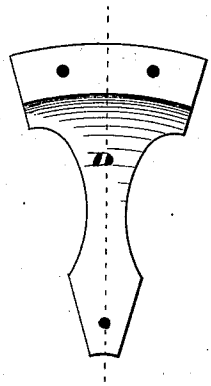

Fig. 3

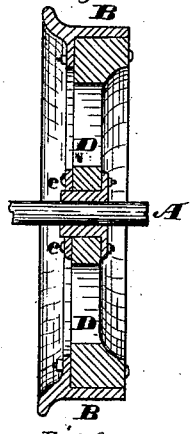

Fig. 2

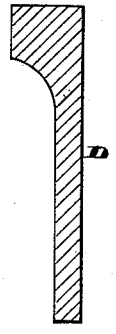

Fig. 4

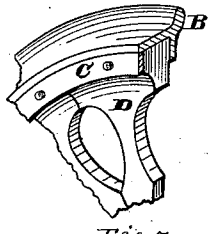

Fig. 5

Witnesses.
John C. Perkins
George F. Downing

Inventor.
Warren J. Willits
By H. A. Simpson,
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UNITED STATES PATENT OFFICE.

WARREN J. WILLITS, OF THREE RIVERS, MICHIGAN, ASSIGNOR TO THE SHEFFIELD VELOCIPEDE CAR COMPANY, OF SAME PLACE.

CAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 280,702, dated July 3, 1883.

Application filed October 17, 1882. (No model.)

To all whom it may concern:

Be it known that I, WARREN J. WILLITS, of Three Rivers, in the county of St. Joseph and State of Michigan, have invented certain new and useful Improvements in Car-Wheels; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to an improvement in car-wheels, and especially to an improvement on the car-wheel patented to G. S. Sheffield, September 5, 1882, No. 263,732, the object being to provide a car-wheel which will be simple and economical in its construction, of light weight, and of sufficient elasticity to prevent shocks to the car.

With these ends in view my invention consists in certain features of construction and combinations of parts, as will hereinafter be described, and pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view of a car-wheel embodying my invention. Fig. 2 is a vertical section. Fig. 3 is a plan view of one of the spokes or body-sections of the wheel. Fig. 4 is a vertical section of the same, and Fig. 5 is a view in perspective of a portion of the wheel with an annular retaining-ring for securing the body in place.

A represents the tread of the wheel, which may be made of cast or wrought iron or steel, with a chilled wearing-surface, if desired. The tread A is provided with an inwardly-projecting flange, B, which is made integral therewith.

C represents the spokes or body-sections of the wheel, made of wood, cut or sawed or compressed to the desired shape, or of paper or other equivalent material, compressed, with substantially the form represented in the drawings, the object being to insure the required strength, together with lightness and elasticity, so as to produce a light and easy running wheel. Spokes C are made with thickened ends *a*, as represented in Figs. 2 and 4, so as to afford a firm bearing for the entire width of the inner surface of the tread. The remaining portion, *b*, of the spoke is reduced in thickness to secure the desired lightness and elasticity to the body of the wheel. The outer ends of the spokes are made in the form of a sector of a circle, and, when secured together, their edges fit snugly one against the other, and are secured in place by bolts *c*, extending transversely through the thickened ends *a* and the flange B. Greater durability may be imparted to the wheel by placing an annular ring, D, against the outer edges of the spokes and inserting the bolts through the same, as illustrated in Fig. 5. The annular ring protects the spokes, and also affords an unyielding bearing for the heads or the nuts of the fastening-bolts. Suitable lock-nuts may be employed for preventing the accidental displacement of the fastening-bolts *c*; or, instead of bolts, the parts may be secured by rivets, the ends of which may be upset on the flange B and the annular ring D. The opposite edges of the spokes are preferably cut away at *d d*, as shown, in order to reduce their weight and allow for their slight yielding to cushion any shocks to which the wheel is subjected. The inner ends of the spokes are made wedge-shaped, and are snugly fitted together on the hub E, and held in place by bolts or rivets *e*, extending transversely through the hub-flange *e'* and the metal collar *e²*. The flange *e'* is made integral with the hub, and is preferably placed opposite the flange B of the tread.

Instead of cutting away the edges of the spokes, as at *d d*, the spokes may have unbroken wedge-shaped edges, so as to fit one against the other throughout their length, and a lengthwise opening formed in the spoke. If the spoke is made of compressed paper, it may be corrugated, or have any desired shape imparted thereto.

From the foregoing it will be observed that the spokes, by being formed with thickened outer ends, constitute both the spokes and felly of the wheel. The felly, instead of being separate, as is ordinarily the case, is made up of the outer ends of the spokes and made integral therewith.

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

1. A car-wheel consisting of a metal tread

and hub, and spokes, each made of a single piece of wood or equivalent material, the outer ends of the spokes being of increased thickness, to constitute a sectional felly for the wheel, substantially as set forth.

2. A car-wheel consisting of a metal tread and hub, and wedge-shaped spokes having thickened outer portions made integral therewith, and constituting a sectional felly for the wheel, substantially as set forth.

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

WARREN J. WILLITS.

Witnesses:
CHARLES P. WEBSTER,
A. W. BRIGHT.