

(No Model.)

S. T. WILLIAMS.  
WHEEL.

No. 305,727.

Patented Sept. 23, 1884.

Fig. 1.

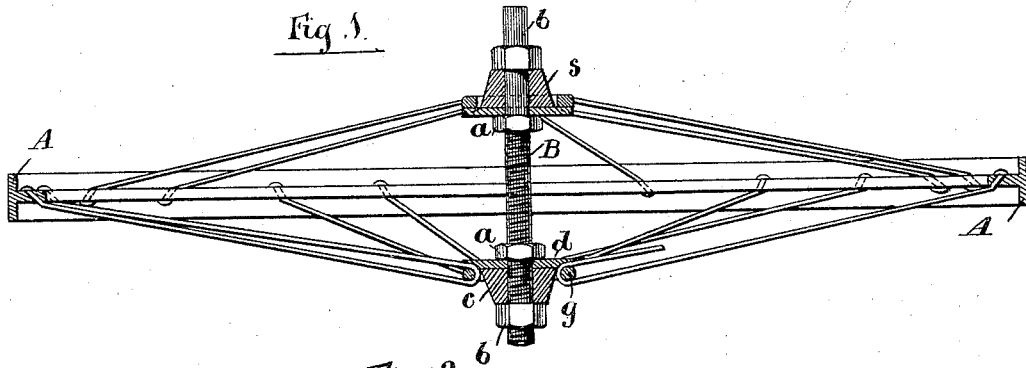


Fig. 2.

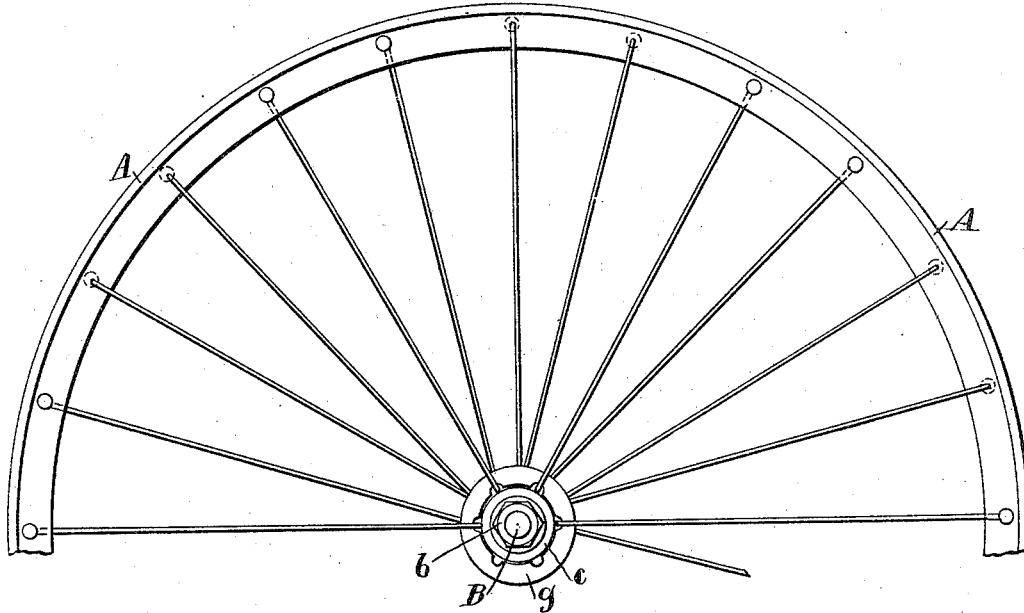


Fig. 3.

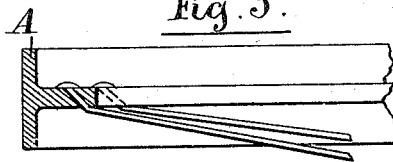


Fig. 4.

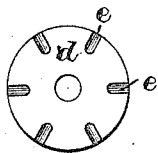
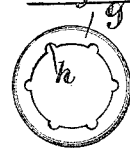


Fig. 5.



Witnesses:  
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Inventor:  
Samuel T. Williams  
by his Attorney  
Ernest Webb.

# UNITED STATES PATENT OFFICE.

SAMUEL T. WILLIAMS, OF RED BANK, NEW JERSEY.

## WHEEL.

SPECIFICATION forming part of Letters Patent No. 305,727, dated September 23, 1884.

Application filed November 6, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL T. WILLIAMS, a citizen of the United States, residing at Red Bank, in the county of Monmouth and State of New Jersey, have invented certain new and useful Improvements in Wheels, of which the following is a full, clear, and exact description.

This invention relates to that class of vehicle-wheels constructed entirely, or nearly so, of metal—such as are usually found in velocipedes and the like—and in which the spokes are made of thin strips of metal or wires.

The object of the present invention is to simplify and improve the construction of such wheels, to provide means for tightening and regulating the tension of the spokes, whereby all the spokes may be tightened or released at one and the same operation and with great facility.

To these ends the invention consists in the details of construction hereinafter particularly described and claimed.

In the accompanying drawings, in which similar letters of reference indicate like parts, Figure 1 is a sectional view of a wheel embodying my improvements; Fig. 2, a side elevation of part of a wheel. Fig. 3 is an enlarged detail illustrating how the spokes are connected to the felly. Fig. 4 is a view of the annular adjusting-plate. Fig. 5 is a view of the ring through which the spokes are passed and by which they are distended.

The letter A designates a tire and felly, which compose the outer rim of the wheel, and preferably made integral or of one piece of metal, and is T-shaped in cross-section. B is the hub, screw-threaded on one end to receive ordinary nuts, *a* and *b*, and also the conical nut *c*. The annular plate *d* slides freely over the screw-threaded hub, and is provided on one side with a number of short radial grooves, into which the spokes fit. The ring *g* is provided with transverse grooves or notches *h* on its inner edge corresponding in number to the number of grooves *e* on the annular plate *d*. The spokes are made of flexible wire or strips of metal, one piece of which serves as two spokes in the wheel, and is bent around through the ring *g* and into one of the notches *h*. The ends of the spokes are preferably fastened to the felly by passing them through holes bored diagonally through said

felly and riveting or clinching the ends on the other side.

Heretofore in fastening the ends of spokes to a felly of the construction shown the hole was bored parallel to the hub. This necessitated the bending of the spoke at the attaching end to nearly a right angle in order to pass it through the hole, thereby rendering the spoke weak at that point and less capable of bearing the strain to which it is subjected. By making the hole diagonal the angle of the bend in the wire is more obtuse and the strain consequently more nearly direct.

In appearance one side of the hub is preferably a fac-simile of the other; but in this instance I make one of them stationary, the tightening of the spokes being performed by the operation of one side only, and in the manner which I will now proceed to describe. If the spokes are loose, the outside nut, *b*, is turned entirely off the hub or away from the conical nut, and with a wrench or other suitable tool the conical nut is turned away from the other end of the hub. The edge of the base of the conical nut projects under or behind that portion of the spoke which passes through the grooves in the ring *g*. As it is turned away from the other end of the hub it brings with it the ring *g* and the connected spokes, thus increasing the distance between the ring and felly, and consequently tightening the spokes. The plate *d* is then placed up and held by nut *a* against the conical nut, with the grooves *e* fitting over the wire at those points where it passes around the ring *g*. The nut *b* is then screwed up against the outer end of the conical nut, thus preventing any accidental outward turning of the conical nut, while the plate *d* and nut *a* prevent the inward turning thereof.

If it is desired to loosen the spokes, the operation is nearly the reverse of that described for tightening them.

Let it be understood I do not limit my invention to the employment in one wheel of all the parts which I have described, as such employment is not absolutely necessary, as, for instance, I might dispense with the annular plate *d* or the nut *b*; nor do I limit my invention to precisely the constructions shown.

What I claim is—

1. The combination, in a wheel having two

spokes formed of a single piece of wire having its two ends fastened in the felly, substantially as described, of the ring *g*, having notches *h*, through which the wire is passed  
5 and retained in position, and the internally-screw-threaded conical nut *c* on the hub *B*, the edges of the base of said conical nut engaging the ring *g* or spokes to tighten the same, as set forth.

10 2. The combination, in a wheel having spokes, substantially as described, of the ring *g*, having notches *h*, the spokes passed through said ring and held in position in the notches, the internally-screw-threaded conical nut *c*,  
15 hub *B*, the annular plate *d*, having the short

radial grooves *e*, and the nut *a*, to hold said plate against the spoke-retaining ring, all as set forth.

3. In a vehicle-wheel, substantially as described, a combined tire and felly made **T** 20 shape in cross-section, having the diagonal holes in the felly portion to receive the ends of the spokes of the wheel, as shown, and for the purpose set forth.

In testimony whereof I have hereunto set 25 my hand this 1st day of October, A. D. 1883.

SAMUEL T. WILLIAMS.

Witnesses:

ARTHUR C. WEBB,  
ERNEST C. WEBB.