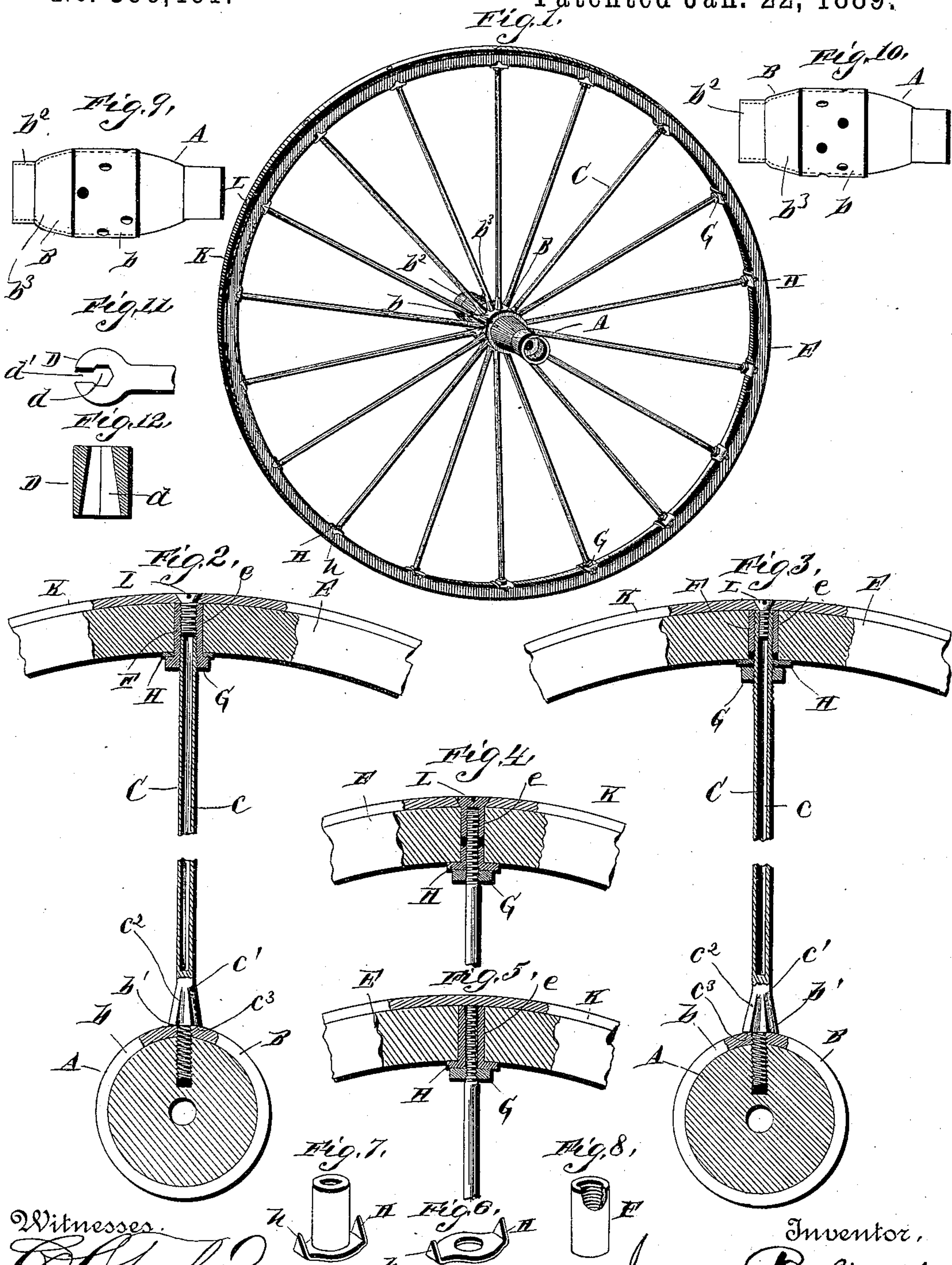


(No Model.)

J. BOLICK.  
VEHICLE WHEEL.

No. 396,461.

Patented Jan. 22, 1889.



Witnesses.

*W. Taylor,*  
*E. Higgins*

Inventor.

*Jerome Bolick.*

By his Attorneys

*C. A. Newell*



# UNITED STATES PATENT OFFICE.

JEROME BOLICK, OF CONOVER, NORTH CAROLINA.

## VEHICLE-WHEEL.

SPECIFICATION forming part of Letters Patent No. 396,461, dated January 22, 1889.

Application filed October 27, 1888. Serial No. 289,266. (No model.)

*To all whom it may concern:*

Be it known that I, JEROME BOLICK, a citizen of the United States, residing at Conover, in the county of Catawba and State of North Carolina, have invented new and useful Improvements in Vehicle-Wheels, of which the following is a specification.

This invention relates to improvements in vehicle-wheels; and it consists in a certain novel construction and combination of devices fully set forth hereinafter in connection with the accompanying drawings, and specifically pointed out in the appended claims.

In the drawings, Figure 1 is a perspective view of a wheel embodying my improvements. Fig. 2 is a longitudinal sectional view of one of the spokes. Fig. 3 is a similar view showing a slightly-different arrangement of the parts in the tightening device. Fig. 4 is a similar view showing another arrangement of the parts of the tightener. Fig. 5 is a similar view showing still another arrangement of the parts. Fig. 6 is a detail view of the washer as illustrated in Fig. 2. Fig. 7 is a similar view showing the washer formed integral with the socket as shown in Fig. 5. Fig. 8 is a similar view of the socket, as shown in Fig. 3. Fig. 9 is a similar view of the hub of the improved wheel. Fig. 10 is a similar view of a hub embodying the improvements and adapted for a slightly-different arrangement of spokes. Fig. 11 is a view of the wrench which I propose to use to secure the inner ends of the spokes in the hub. Fig. 12 is a central sectional view of the collar which is welded to the inner end of the spoke.

Referring by letter to the drawings, A designates the hub of the improved wheel, which is enveloped by the sleeve B, which comprises the central band, *b*, having the perforations *b'*, the sand-band *b<sup>2</sup>* on the inner end of the hub, and the connecting portion *b<sup>3</sup>*, which extends from the outer edge of the sand-band to the inner edge of the central band. This sleeve is slipped on the hub from its inner end, and is designed to protect the entire inner end of the hub, and also strengthen the same and prevent splitting. The perforations *b'* in the central band are preferably arranged in groups of threes, as shown in Figs. 1 and 9 of the drawings; but they may be arranged

in groups of twos, as shown in Fig. 10, if preferred.

The spokes C consist each of the tubular portion *c* and the solid portion *c'*, which is provided with a left-hand screw-thread and passes through one of the perforations in the central band and screws into a registering aperture in the hub. A collar, *c<sup>2</sup>*, is welded on the solid portion of the spoke above the screw-threaded portion thereof, and is provided at its lower end with a shoulder, *c<sup>3</sup>*, which bears on the band *b*, the collar being conical in shape and tapered toward its upper end to the thickness of the spoke. This collar is also formed hexagonal in transverse section to enable a wrench—such as that shown in Fig. 11 of the drawings—to be applied to screw the threaded shank *c'* into the hub. The said wrench is provided with a head, D, having a central hexagonal perforation, *d*, designed to fit snugly around the collar of the spoke, and *d'* is an opening in the head of the wrench, which communicates with the central perforation to enable the tubular portion of the spoke to be passed into the central perforation. After the wrench has been engaged with the tubular portion of the spoke it is slipped down until it engages the hexagonal collar.

The felly E of the wheel is provided at suitable intervals with radial perforations *e*, in which fit the tubular sockets F, and the outer ends of the spokes extend into the said sockets and fit snugly therein.

The outer ends of the spokes are provided with exterior right-hand screw-threads, and nuts G G engage the said screw-threads and bear against the inner side of the felly, whereby when the nuts are screwed outwardly on the spokes the felly is extended. I may form this nut integral with the inner end of the tubular socket, as shown in Fig. 2, in which case the bore of the socket is threaded and the socket turns with the nut.

H represents a washer, which is arranged around the outer end of the spoke between the nut and the felly, in order to prevent the rotation of the nut from marring or disfiguring the latter, and it is provided at its ends with ears *h h*, which pass up on opposite sides of the felly and hold the washer in place.



This washer may be formed integral with the inner end of the tubular socket, as shown in Figs. 4, 5 and 7 of the drawings.

K represents the tire, which encircles the felly of the wheel in the ordinary manner, and L L represent screws, which pass through perforations in the tire and extend into the felly to secure the tire in place. In Fig. 2 this screw is shown as engaging the threads in the bore of the socket; but, if preferred, the spoke may be extended outward and have its bore threaded to receive the said screw, as shown in Fig. 3, or the screw may be provided with a threaded bore to receive the exteriorly-threaded end of the spoke, as shown in Fig. 4.

To tighten the felly, turn the nuts outwardly on the spokes, and as the spokes are provided at their inner ends with left-hand screw-threads the rotation of the nuts G will not unscrew the spokes from the hub, but will tend to tighten them therein. Further, the act of tightening the felly also tightens the screws which secure the tire to the felly, the felly being firmly compressed between the tire and the nuts G.

The various forms of my device which I have shown in the drawings are analogous in construction and operation, as will be readily seen, the main differences between the same being that in Fig. 3 all the parts are separate and are applied independently to the wheel, in Fig. 2 the socket is formed integral with the nut, thereby increasing the number of threads which engage the threaded portion of the spoke, and in Figs. 4 and 5 the washer is formed integral with the socket, thereby enabling the latter to be held firmly in its place in the perforation of the felly without supplemental securing means.

I am aware that it is not broadly new to provide wheels with tubular spokes, and therefore I do not desire to claim this; but in my improved spoke I form the inner end, which screws into the hub, solid, so as to increase its strength, and I also weld or forge or otherwise firmly secure the hexagonal conical collar on the said solid portion in such a position that the shoulder at its inner end will bear on the band of the hub. I may form the spokes entirely of metallic tubes and drive plugs in their inner ends to form the solid portions.

From the above description it will be seen that tire-bolts are dispensed with, and the screws which secure the tire in place engage the outer ends of the spokes in such a manner as to clamp or lock the tightener and prevent its parts from jarring loose. In Figs. 3, 4, and 5 the screws are shown as engaging directly with the outer ends of the spokes, and in Fig. 2 the screw engages the socket, which is screwed on the spoke, and therefore the

screw indirectly engages the spoke and locks it in the same manner as in the other figures.

The act of tightening the nuts draws the screws L down, thereby stretching the spokes and making in effect a suspension-wheel.

Having thus described the invention, I claim—

1. In a wheel, the combination of the hub, the spokes having the hollow portions *c* and the solid portions *c'* at their inner ends, the said solid portions being screw-threaded to screw in apertures in the hub, the rigid tapered collars *c''*, hexagonal in transverse section on the solid portions of the spokes, tapered toward their outer ends, and provided at their inner ends with shoulders bearing on the hub, and the felly secured to the outer ends of the spokes, substantially as specified.

2. In a wheel, the combination of the sockets F, fitting in radial perforations in the felly, the exteriorly-threaded spokes C, extending into the said sockets, the nuts G, screwing on the threaded portions of the spokes, and the washers H, fitting around the spokes and interposed between the nuts and the felly, substantially as specified.

3. In a wheel, the combination of the sockets F, fitting in perforations in the felly, the exteriorly-threaded spokes C, extending into the said sockets, the nuts G, screwing on the threaded portion of the spokes and bearing against the inner side of the felly, and the screws L, passing through the tire and engaging the outer ends of the spokes, substantially as specified.

4. In a wheel, the combination, with the hub, of the sleeve fitting over the inner end of the hub and comprising the sand-band, the central band provided with perforations registering with perforations in the hub, and the intermediate connecting portion between the sand-band and central band, and the spokes fitting in the registering perforations, substantially as set forth.

5. In a wheel, the combination of the sockets F, fitting in perforations of the felly, the exteriorly-threaded spokes extending into the sockets, and the nuts G, screwing on the spokes and bearing against the felly, as set forth.

6. In a wheel, the combination of the sockets F, fitting in perforations of the felly, the screws L, engaging the tire and entering the felly, the exteriorly-threaded spokes extending into the sockets, and the nuts G on the threaded portion of the spokes.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JEROME BOLICK.

Witnesses:

J. H. SIGGERS,  
E. G. SIGGERS.