(No Model.)

F. A. NICKERSON.

METALLIC WHEEL.

No. 382,658. Patented May 8, 1888.

Fig. 1.

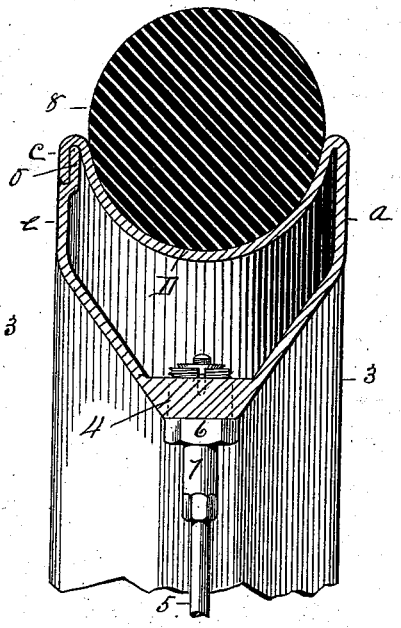


Fig. 2.

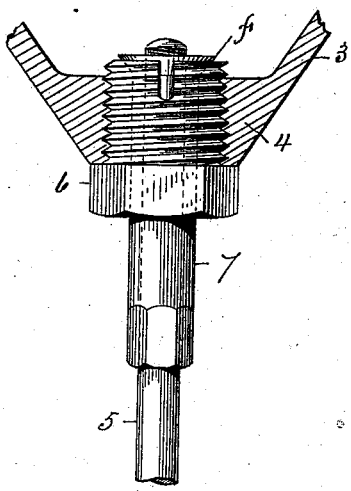


Fig. 3.

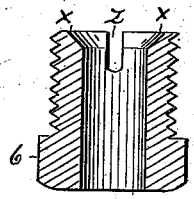
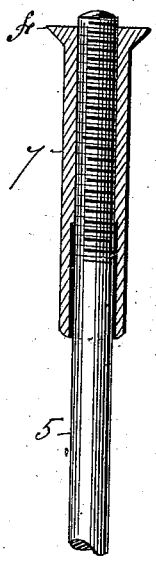


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRED. A. NICKERSON, OF SPRINGFIELD, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE WARWICK CYCLE MANUFACTURING COMPANY, OF SAME PLACE.

METALLIC WHEEL.

SPECIFICATION forming part of Letters Patent No. 382,658, dated May 8, 1888.

Application filed August 29, 1887. Serial No. 248,130. (No model.)

To all whom it may concern:

Be it known that I, FRED. A. NICKERSON, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Metallic Wheel-Rims and Means for Connecting Metallic Spokes thereto, of which the following is a specification.

This invention relates to metallic wheel-rims, and pertains to improvements in the construction of said rims and in means for connecting the outer ends of metallic spokes with said rims; and the invention consists in the peculiar construction of a wheel-rim and in the construction and arrangement of the devices for attaching said rim to the spokes, all as hereinafter fully described, and pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a transverse sectional view of a portion of a wheel-rim constructed according to my invention, said figure showing the outer end of a wheel-spoke connected to said rim by devices embodying my improvements, and showing the tire of the wheel in section. Fig. 2 is a sectional view of that part of the wheel-rim to which the spokes are attached, and a side elevation of said spoke-attaching devices and of a part of a spoke. Fig. 3 is a sectional view of the spoke-attaching nut. Fig. 4 is a side elevation of one end of a spoke and a longitudinal section of the bushing constituting one of said connecting devices.

In the drawings, 3 indicates the wheel-rim, which is of suitable metallic construction and is formed from a strip of sheet metal having the thickened portion or rib 4 thereof formed in said strip by rolling, in the usual way. When said strip of metal from which the rim is to be made is rolled or formed, the said thickened portion 4 thereof is brought nearer to one edge of said strip than to the other, in order to leave sufficient width of sheet metal on one side of said strip to form the side *a* of the rim, the tire-groove D, and to provide a border to one side of said groove sufficiently wide to allow a hook, *c*, to be formed thereon. The sheet metal on the opposite side of said thickened portion 4 is of sufficient width to constitute the side *e* of the rim, and the edge of said side *e* has an offset, *o*, formed thereon, the face of which is made to recede sufficiently toward the center of the tire-groove to receive the hook-shaped edge *c* and to leave the outer surface of said edge *c* in the same plane as the side *e* of the rim, as shown in Fig. 1.

The rim 3 is formed by rolling, in any well-known manner familiar to persons skilled in the art of so making hollow metallic wheel-rims. The above-described manner of uniting the edge of the side *e* of the rim and the hook-shaped edge *c* thereof forms a lap-joint at one edge of the rim about opposite the center of the tire. The said thickened portion 4 of the wheel-rim 3 provides a sufficient thickness of metal for rigidly securing the ends of the spokes 5 of the wheel thereto, and said thickened portion of the rim is drilled and tapped to adapt it to receive the nut 6, which is perforated longitudinally, as shown in Fig. 3, has one end counterbored, as at *x* in said figure, to give to one end of said perforation an outwardly-tapering form, and is slotted, as shown, from said inwardly-tapering end toward the opposite end. The end of the spoke 5 which is attached to the wheel-rim is screw-threaded, as shown in Fig. 4. A bushing, 7, having an exterior diameter about equal to said perforation through the nut 6, is internally screw-threaded and is adapted to be screwed onto the end of the spoke 5, as shown. Said bushing is counterbored at one end, as shown in said Fig. 4, and the last-named end of said bushing has a form given thereto, as shown, which adapts it to have a wrench applied thereto to turn it, and on its outer end is formed a head, *f*, which has its under side tapered to correspond with the internally-tapered end of the nut 6.

The end of each spoke 5 is connected to said thick portion of the rim 3 as follows: The nut 6 is placed on the end of the spoke, with its head toward the wheel-hub, and the bushing 7 is then screwed onto the end of the spoke, and ordinarily it is not screwed fully onto the latter at first, in order that it may be finally adjusted to place, as below described. The nut 6 is then brought up over the bushing, as shown in Figs. 1 and 2, and screwed into the

thick portion of the rim 3, and, finally, by a wrench applied to the end of said bushing, the latter is screwod onto the end of the spoke until its head *f* is brought into engagement with the internally-tapered end of said nut, or to the position shown in Fig. 2, and the bushing is then screwed onto the end of the spoke until the requisite tension is imparted to the latter, it being understood, of course, that the opposite end of the spoke is rigidly attached to the hub of the wheel.

A wheel-rim constructed, as above described, with the thickened portion 4, adapted to have the nut 6 screwed therein for each spoke, together with said nut and bushing as means of attaching the spokes to the rim, provides a spoke-and-rim construction, in so far as it relates to connecting the ends of the spokes to the rim, which possesses marked advantages over means heretofore employed for making such connections. One great advantage in said construction is that the end of the spoke is connected to the rim entirely from the inner side of the latter, or that side opposite to the tire-groove, and without making any perforation through the latter opposite the ends of the spokes. Another advantage pertaining to said construction is that by means of the bushing 7 and its screw-connection with the spoke the desired tension of the latter may be easily adjusted at all times.

The purpose of the longitudinal slot *z* in the internally-tapered end of the nut 6 is to permit the slotted end of the nut to be spread more or less when the head of the bushing is forced against it in tightening the spoke, and thereby to cause said nut to be so locked in the rim that it cannot work loose.

The tire 8 of the wheel may consist of the ordinary rubber one, or it may be made of any other suitable material, and the sides *e* and *a* of the wheel-rim may be made either of the form shown in Fig. 1, or they may be curved from the thickened portion 4 to those parts of the rim constituting the borders of the tire-groove D thereof.

What I claim as my invention is—

1. A tubular metallic wheel-rim made from a strip of metal, having the solid thickened rib 4, to which the ends of the spokes are connected, that portion of said strip on one side of said rib forming one side of the tire-groove of the rim, and having the hook-shaped edge *c*, the portion of said strip on the opposite side of said rib forming the side *e* of the rim and having its edge offset to form with said hook-shaped edge a lap-joint on one edge of the rim, substantially as set forth.

2. In combination with a hollow metallic wheel-rim having a rib, 4, and with a wheel-spoke, 5, having a screw-threaded end, a hollow nut, 6, screwing into said rib, and a headed bushing, 7, passing through said nut and engaging therewith and screwing onto said spoke, substantially as set forth.

3. In combination with a hollow metallic wheel-rim having a rib, 4, and with a wheel-spoke, 5, having a screw-threaded end, a hollow longitudinally-slotted nut, 6, screwing into said rib, and a bushing, 7, having a head whose under side is tapered passing through said nut and engaging with the slotted end of said nut and screwing onto said spoke, substantially as set forth.

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