(No Model.)

W. P. BETTENDORF.

METALLIC WHEEL.

No. 386,572. Patented July 24, 1888.

Fig. 1.

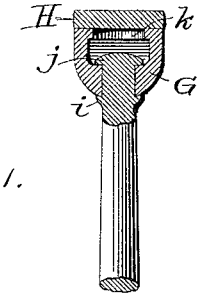
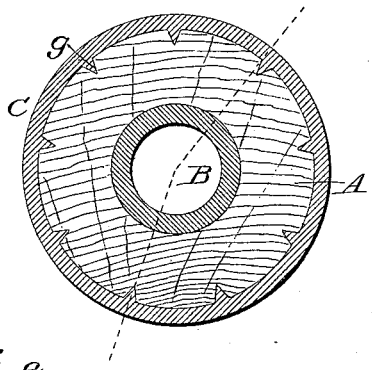


Fig. 2.



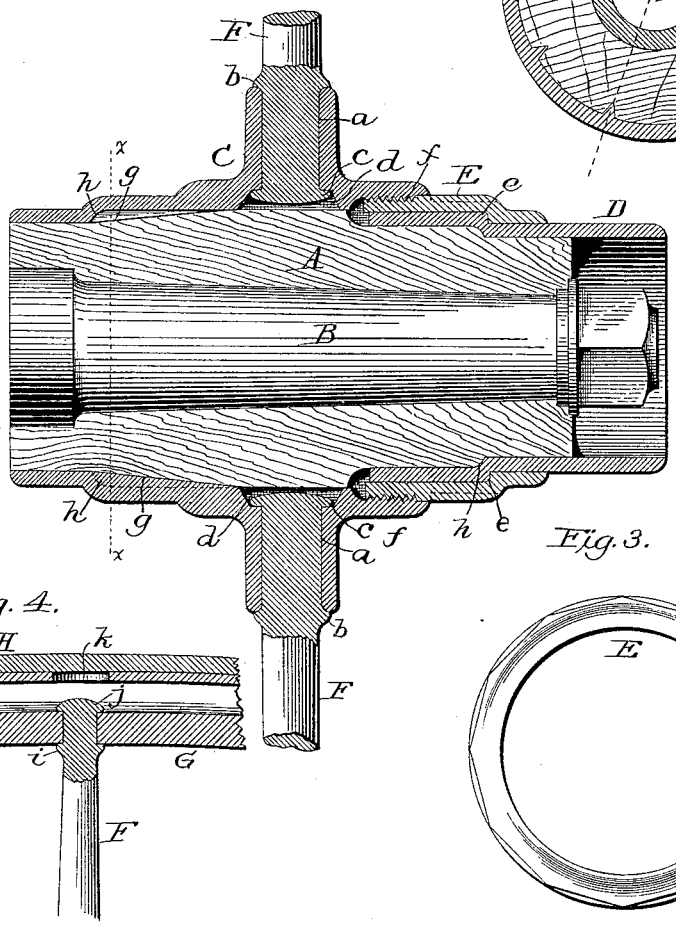


Fig. 3.

Fig. 4.

WITNESSES.

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METALLIC WHEEL.

SPECIFICATION forming part of Letters Patent No. 386,572, dated July 24, 1888.

Application filed July 5, 1887. Serial No. 243,428. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM P. BETTENDORF, of Davenport, in the county of Scott and State of Iowa, have invented certain Improvements in Metallic Wheels, of which the following is a specification.

The aim of this invention is to provide a wheel the principal portions of which shall be of metal, and which shall be particularly adapted for use on carriages.

In the accompanying drawings, Figure 1 represents a central axial section through the hub and a portion of the rim of a wheel constructed on my plan. Fig. 2 is a transverse section on the line *x x*. Fig. 3 is an end view of the nut forming part of the metal hub. Fig. 4 is a section through the rim on a line at right angles to the axis.

Referring to the drawings, A represents a wooden hub which is provided with a metallic axle-box, B, inserted and secured therein in the manner ordinarily practiced. The hub A, or, more strictly speaking, the core of the hub, is not provided with mortises for the spokes, but is surrounded by a metal shell or hub proper, in which the spokes are seated and secured. This metal shell consists of the three sections C, D, and E. The portion C, which is of tubular form, is adapted to surround the inner end of the hub, and is formed with a series of tubular or mortised sockets, *a*, in which the inner ends of the metal spokes F are seated and secured. I prefer to form the spokes of wrought metal, and after inserting them within the sockets to upset them in an endwise direction in such manner as to form a flange or bead, *b*, at the outer end and a corresponding flange or head, *c*, at the inner end of the socket. The socket-openings terminate at the inner face of the hub in an annular groove or recess, *d*, which affords room for the headed or enlarged ends of the spokes outside of the wooden core.

The hub-section D, which is also tubular, is adapted to encircle the outer end of the wooden core, and is provided on the outer surface with an annular shoulder, *e*.

The section E, which is, in fact, a nut, is adapted to fit over and around the section D and against its shoulder *e*, and is extended inward within the end of the section C, its inner end being provided with an external screw-thread which engages a corresponding thread within the section C, as shown at *f*. The nut E is made of polygonal form on its extremity, as shown in Fig. 3, or otherwise adapted to receive a wrench or equivalent tool by which it may be revolved. As it is screwed inward, it has the effect of drawing the hub-sections C and D inward toward each other and forcibly upon the two ends of the wooden core, which is thus confined securely between them.

In order to prevent the wooden core from turning within the shell, and to prevent the shell-sections from turning in relation to each other, I provide the metal portions with internal longitudinal ribs, *g*, which seat themselves in the wood, as shown in Figs. 1 and 2.

In order to secure the core the more effectually against end motion, I prefer to provide the shell-sections with internal annular shoulders, *h*, and to give the wood a corresponding form in order that the metal shoulders of the two parts may bear against the wood in opposition to each other. By turning the nut E the shell may be retracted to compensate for shrinkage of the wood; or, on the other hand, the parts may be separated to admit of the wood being driven out of the shell in order to give access to the interior of the shell, should it be required to replace broken spokes.

The spokes may be connected at their outer ends to a tire of any suitable character; but I prefer to employ a rim or felly, of tubular or U form in cross section, as shown at G, and to apply around its outer surface an ordinary flat tire, H, shrunk thereon.

The inner side of the felly is punched or drilled to receive the outer ends of the spokes, which are inserted therein and secured firmly thereto in any appropriate manner, but preferably by upsetting the metal lengthwise of the spoke in such manner as to form the bead or shoulder *i* at the inner surface of the felly, and a head, *j*, within the outer or grooved surface of the felly, as plainly shown in Fig. 1.

It will be observed that the outer headed end of the spoke lies within or below the periphery of the felly, so that it in no wise interferes with the application of the tire. If the felly is of tubular form, it will be provided at suitable points with openings *k*, as shown in

Figs. 1 and 4, through which access may be had to the ends of the spokes. If, however, it is of U form in cross-section, its periphery, being open before the application of the tire, gives free access to the ends of the spokes.

I am aware that wooden spokes have been seated in a socketed metal shell containing a wooden core held in place by a separate ring fastened immovably in one position by screws, and also that wooden spokes have been clamped between the two parts of a metal hub containing a wooden bolt, the construction being such that the adjustment of the parts had the effect of contracting the spoke-sockets. To such constructions I lay no claim, my invention having reference solely to a wheel in which the two parts of the hub may be contracted upon the wooden core, and in which metallic spokes are seated and secured rigidly in sockets wholly in one part of the hub.

Having thus described my invention, what I claim is—

1. In a metal wheel, the metallic hub section C, provided with mortises extending therethrough, and with an internal shoulder, *h*, in combination with the metal spokes seated in said mortises and enlarged, as described, so that they are carried and sustained wholly by said section C, the wooden core seated in the section C, and removable therefrom without disturbance of the spokes, and the metal hub-section D, removably united to section C and acting solely to confine the wooden core in place.

2. In a metal wheel, the combination of the two metallic hub-sections C and D, one of which is provided with a spoke-receiving socket, and the nut E, lying between and connecting said sections, as described, whereby they may be contracted forcibly upon an internal core without affecting the sockets or the spokes.

3. A metallic hub consisting of two separable parts, C and D, the former provided with sockets or mortises extending through from the exterior to the interior, the metallic spokes seated in said mortises and secured by enlargements *b c*, and the removable wooden core having the axle-box seated therein, said members constructed and combined substantially as described.

4. The wooden core having the annular shoulders at the two ends, in combination with the metal hub-sections C and D, provided with corresponding internal shoulders, and the nut E, encircling the section D and engaging a shoulder thereon and threaded into the end of section C, as shown.

In testimony whereof I hereunto set my hand, this 11th day of June, 1887, in the presence of two attesting witnesses.

WILLIAM P. BETTENDORF.

Witnesses:

GEO. H. FRENCH,

FRED M. DECKER.