

No. 657,435.

Patented Sept. 4, 1900.

C. MINSHALL.
FELLY PLATE.

(Application filed Mar. 24, 1900.)

(No Model.)

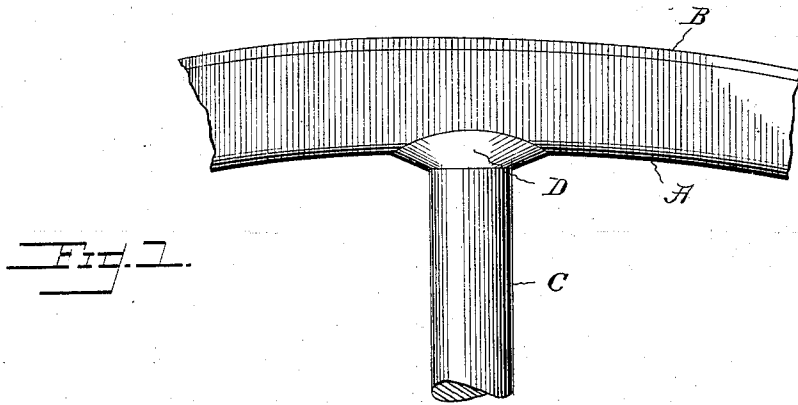


Fig. 1.

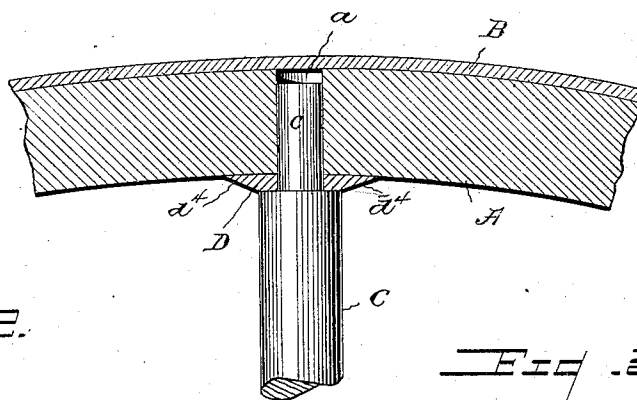


Fig. 2.

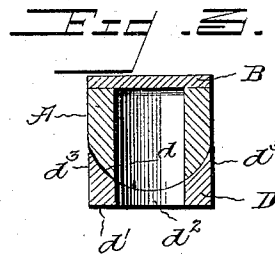


Fig. 3.

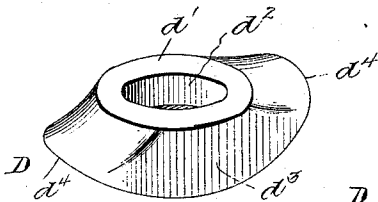


Fig. 4.

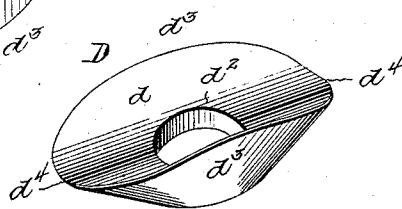


Fig. 5.

Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES MINSHALL, OF TERRE HAUTE, INDIANA.

FELLY-PLATE.

SPECIFICATION forming part of Letters Patent No. 657,435, dated September 4, 1900.

Application filed March 24, 1900, Serial No. 10,035. (No model.)

To all whom it may concern:

Be it known that I, CHARLES MINSHALL, a citizen of the United States, residing at Terre Haute, in the county of Vigo and State of Indiana, have invented certain new and useful Improvements in Felly-Plates; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to vehicle-wheels; and its object is to prevent the crushing and splitting of the rim or felly by the thrust of the spoke when subjected to a heavy load. Heretofore it has been customary to give the shoulder of the spoke a broad bearing on the inside of the felly by forming a flat surface on the felly around the socket for the spoke-tenon. Moreover, the end of the tenon has been brought out flush with the outside of the felly, so as to bear against the inside of the tire, and thus obtain the benefit of a direct thrust on the end of the spoke, thereby relieving to a considerable extent the pressure on the shoulder of the spoke. In this way the tendency of the spoke to crush and split the felly has been lessened as much as possible; but such a construction requires great care in forming and fitting the parts, and it frequently happens in service that owing to shrinkage of the felly or to other causes the ends of one or more tenons will after a while be found projecting beyond the felly, necessitating the removal of the tire and the cutting off of the projecting portion. The difficulty is obviated to some extent by previously countersinking the end of the tenon, so that in case it is forced beyond the felly the pressure will crush or upset its end; but the countersinking must be carefully done after the wheel is assembled, and unless the tool is accurately applied to the end of the tenon it will cut away part of the felly, and thus injure the wheel instead of improving it. I have found by careful experiment that these difficulties can all be obviated by placing between the spoke-shoulder and the felly a plate made of stiff metal and so shaped as

to receive and distribute the thrust on the shoulder.

In the accompanying drawings, Figure 1 is a side elevation of a portion of a felly and spoke with my plate applied thereto. Fig. 2 is a longitudinal sectional elevation of the same. Fig. 3 is a cross-section, and Figs. 4 and 5 are perspective views of the plate on an enlarged scale.

The felly A is of uniform cross-section, not being provided with any flat bearing around the spoke-socket *a*. It is thus much easier and cheaper to make and has a lighter and neater appearance. Its outside is suitably shaped to receive the tire B. Its inside is rounded, as shown. The spoke C has a square shoulder *c* and a tenon *c'*, fitting the socket *a*. The tenon is shorter than the socket, so that its end does not touch the tire, as clearly shown in Fig. 2.

The plate D is made of cast-steel or malleable iron or other strong and stiff metal. Its outer surface *d* is curved in both directions to accurately fit the inside of the felly. On the opposite side of the plate is a flat annular surface *d'*, surrounding the hole *d²* for the spoke-tenon. The flat annular surface fits the shoulder *c* of the spoke, the outer edge of said annular surface lying flush with the outside of the spoke in order to give a neat finish. The sides *d³* of the plate are deep in order to embrace the sides of the felly, and they stand at substantially right angles with the annular surface *d'*. The ends *d⁴* of the plate extend along the felly a suitable distance and taper off in thickness, as shown. The side edges are curved to give a graceful appearance and secure lightness with a proper distribution of the metal to resist the strains brought upon it. This plate is interposed between the spoke-shoulder and the felly and serves to distribute the thrust over a large surface of the felly. Any tendency of the felly to spread is resisted by the embracing sides of the plate, which are the thickest and strongest part of it, as clearly shown in Fig. 3. I have found by actual test that a plate of this shape and made of a stiff metal will enable the felly to withstand a crushing strain some three times as great as that which the ordinary construction will stand, and this, too, without the aid of the resistance offered by

the end of the spoke-tenon. It will be noticed that I rely wholly on the plate, a space being left between the end of the tenon and the tire to allow for shrinkage of the felly.

5 I thus avoid the necessity for and the expense involved in fitting and countersinking the end of the tenon.

I am aware that it has been proposed to use metallic spoke-sockets adapted to receive the
10 tenon and shouldered end of the spoke and that sheet-metal washers have been suggested to prevent the crushing of the felly by the spoke; but these sockets require careful fitting and are too expensive for ordinary use,
15 besides affording lodgment for dirt and moisture when the spoke wears loose or shrinks, it being a difficult matter to make a joint between wood and metal that will stand the test of practical service. The sheet-metal washers
20 are useless in practice, owing to their lack of strength. In my device the metal is so distributed that all strains are resisted and all the joints remain tight. Furthermore, it will be noticed that the edges of the plate are flush

with the edges of the felly, so that there is no
25 danger of stripping off the plate when the wheel runs along a car-track or a curbstone.

Having thus described my invention, what I claim, and desire to secure by Letters Pat-
30 ent, is—

A cast-metal felly-plate D, having the curved surface d , the flat annular surface d' , the hole d^2 , concentric with said annular surface, the deep sides d^3 rising from the edge of the annular surface, the tapering ends d^4 extending from the edge of the annular surface,
35 the outer edge of the annular face d' being adapted to lie flush with the outer surface of the spoke, and the sides d^3 being substantially flush with the spoke and with the edges
40 of the felly.

In testimony whereof I affix my signature in presence of two witnesses. ,

CHARLES MINSHALL.

Witnesses:

EDWARD SENDELBACH,
JACOB J. WIESNER.