

(No Model.)

B. SCHAD.  
VEHICLE HUB.

No. 512,666.

Patented Jan. 9, 1894.

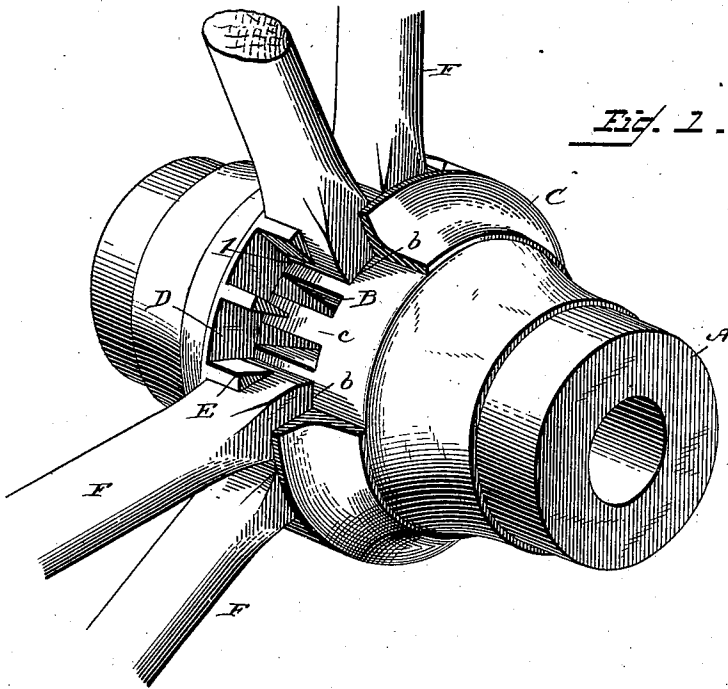


Fig. 1.

Fig. 2.

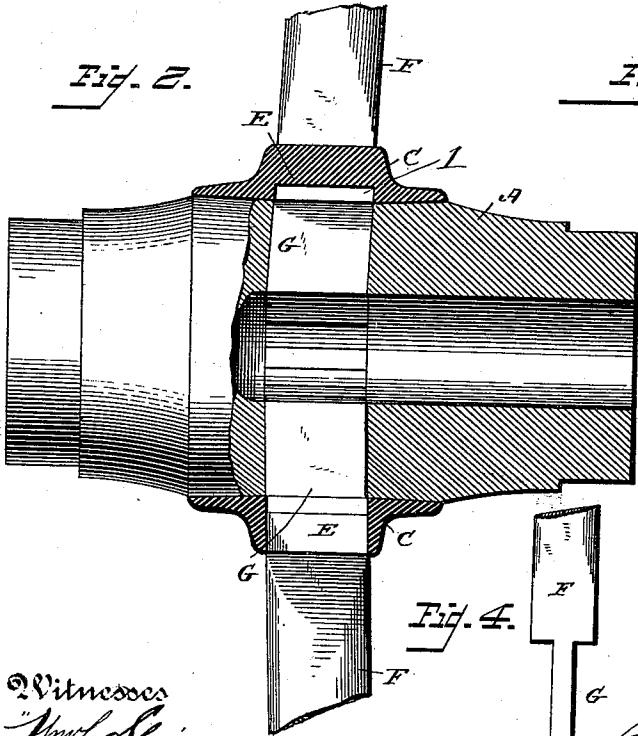


Fig. 3.

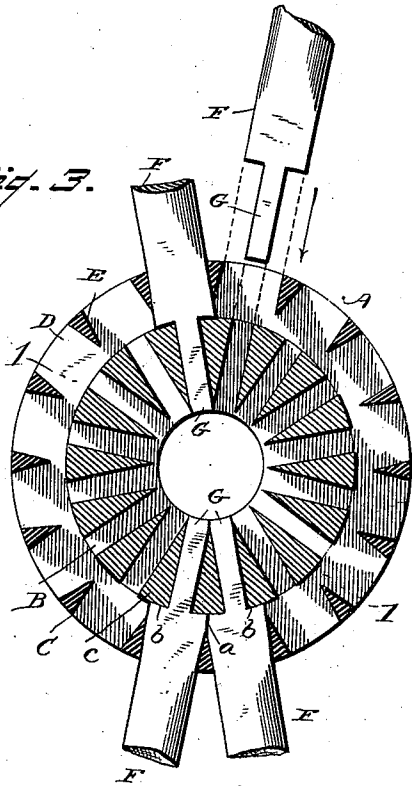


Fig. 4.



Witnesses  
*Wm. H. Anderson*  
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 By his Attorney  
*W. H. Anderson*

# UNITED STATES PATENT OFFICE.

BARNHARD SCHAD, OF BATAVIA, NEW YORK, ASSIGNOR OF FIVE-SIXTHS TO JOSEPH C. SHULTS, FRANK J. SHULTS, HENRY C. TIFFANY, AND LEVANT M. HACKLEY, OF SAME PLACE.

## VEHICLE-HUB.

SPECIFICATION forming part of Letters Patent No. 512,666, dated January 9, 1894.

Application filed March 11, 1889. Serial No. 302,765. (No model.)

*To all whom it may concern:*

Be it known that I, BARNHARD SCHAD, a citizen of the United States, residing at Batavia, in the county of Genesee and State of New York, have invented certain new and useful Improvements in Vehicle-Hubs; 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 has reference to wheel hubs, and is an improvement upon that for which Letters Patent were granted to me under date of September 20, 1887, No. 370,285, and while employing the principle involved in that invention has for its objects to effect a lock between the metal portion or band of the hub and the wood center of the hub proper by the expansion of the spoke from its normal shape so as to cause it to fill the space under the tongue of the metal band between it and the wood center of the hub; also to produce as near as possible a wholly wooden bearing for the spokes and to that extent form a wheel having the maximum of elasticity, the same being effected by the expanded portion of the spoke tenons below the metal tongues pressing with expansive force one against the other and at the shoulder portion resting upon the wooden center of the hub; also to compress the hub by the metal band the length of the mortises and to allow it to expand from the ends of the mortises outwardly toward the outer edges of the band and thus so bind the wooden center of the hub that its liability to move endwise will be overcome; also to lessen the size, weight and consequently amount of metal in the band without impairing the strength of the hub and yet at the same time improving its shape and appearance.

With the foregoing objects in view, and such others as may appear, the invention for accomplishing the same will now be described and then particularly specified in the claims, reference being had to the accompanying drawings forming a part of the same, and in which—

Figure 1 is a perspective of a hub with a portion of the band broken away and some of the spokes removed; Fig. 2 a side view of the same partly in longitudinal section. Fig. 3 is a cross section; Fig. 4 a view of one of the spokes showing the shape of its portion which enters the mortise of the band and also of tenon before it is forced to its place in the mortises.

In the drawings the letter A designates the wooden center of the hub, or the hub proper, which is turned to the desired shape and formed with the mortises B. The metal band C is formed with the mortises D coinciding with the mortises in the hub center and may be either straight or staggering. The mortises are made to enlarge or expand gradually from the top downwardly and will be about three sixty-fourths of an inch more or less wider at the terminus of the metal tongues of the mortises than at the top or mouth of the mortises. The tongues E of the mortises will terminate about five thirty-seconds of an inch more or less above the top of the wooden center of the hub so as to leave a space between the end of the metal tongue of the mortise and the wooden center of the hub. It will be observed that this construction forms a band having an annular groove or way *l*, formed on its interior face unobstructed by the tongues E which terminate above or on a line with the top wall of said groove, and that the lower edges of the side walls of said groove or way terminate on a line with the inner face proper of the band and back from outside edges of the band as clearly illustrated in Fig. 2 of the drawings. This obviates the necessity of cutting a groove in the face of the wooden center of the hub which would tend to weaken the same, and possesses other advantages obvious to those skilled in the art. The spokes F which are to be forced into these mortises are formed with the portion designed to fit in the mortises of the band with practically straight sides and each one of practically uniform dimension throughout the length designed to fit in the mortise and of such dimension that it will fit or enter tightly in the mouth of the mortise so as to be compressed by the walls thereof

where it enters the mortise. The compression of the spoke at such point and the gradual expansion of the mortise downwardly from such point will cause the fibers of the spoke to expand below the point of compression so as to gradually fill the space between the walls of the mortise from the mouth of the mortise to the terminus of the tongues E of the band in the same manner as described in my heretofore referred to Letters Patent. When however the end of the tongue E is reached the fibers of the spoke will expand still farther so as to pass beneath the end of the tongue E and together with the expanded portion of the spoke in the adjoining mortise fill the space between the terminus of the tongue E and the top of the wooden center of the hub and thus by that portion of the two spokes forcing themselves against each other beneath the tongue E form a lock as shown at *a* which will still further secure the spokes in place in the mortises and prevent them from "drumming" out the felly. The shoulders *b* of the spokes will rest upon the wooden center *c* of the hub while the tenons G of the spokes will enter the mortises H of the hub center A. If desired the tenons G may pass below the ends of the tongues of the wooden center and expand below the same so that the adjoining spokes will meet under the tongues and thus form a second lock for the spokes.

In order to form a most effectual union between the wooden hub and its metal band, the interior of the band at the ends of the mortises is smaller in diameter than from the ends of the mortises outwardly to the outer edges of the band so that from the ends of the mortises outwardly in opposite directions the inner diameter of the band will gradually expand or enlarge, the expansion in both directions being about one thirty-second of an inch. The effect of such construction is to bind and compress the wood of the hub the most at the middle by the narrow portion of the band embedding itself to some extent in the wood and thus cause the portions of the wood beyond such points to expand and tightly fit to the flaring walls of the band outwardly as far as the ends of the metal band, and thus by such means to effectually resist the strain in the direction of the length of the hub and guard against any tendency to move the band in the direction of the length of the hub.

It will here be remarked that the thickness of the metal band at the end of the mortises is about seventeen thirty-seconds of an inch in thickness, and the metal tongues of the band are about eleven thirty-seconds of

an inch from the mouth of the mortise to the terminus of the tongues.

The effect of the construction hereinbefore described is to form a wheel or hub in which the spokes will be effectually locked in their mortises by both the expansion of the portion fitting in the mortises from its normal to its abnormal shape and by its expansion under the tongues of the band between them and the wooden center of the hub; also in which the wooden center of the hub will be expanded outwardly toward both the front and rear of the band from the ends of the mortises; also in which the bearing of the spokes may be said to be absolutely upon wood and not upon metal and thus as a consequence given the maximum of elasticity; and also in which by reason of the construction of the metal band the spoke tenon which enters mortises in the wooden center of the hub is made much stronger than under other constructions.

Having described my invention and set forth its merits, what I claim is—

1. The vehicle hub composed of the wooden center, the metal spoke band made in one piece and formed with mortises for the spokes and having its interior flaring or expanding outwardly from the ends of the mortises in opposite directions to opposite ends of the band, substantially as and for the purposes set forth.

2. The vehicle hub composed of the wooden center, and the encircling metal spoke band formed with mortises expanding from their top downwardly, with tongues terminating above the wooden center to leave a space between them and said center, and having its interior expanding outwardly from the ends of the mortises toward opposite ends of the band, the portion of the band at the outer ends of the mortises extending below the terminus of the metal tongues, substantially as and for the purposes set forth.

3. In a wheel hub, the combination with the wooden center, of a metal band having dovetail mortises, the side walls of which enlarge or expand from top downwardly, and formed with an annular groove below said mortises to form a continuous annular space within the metal band and between it and the face of the wooden center, substantially as and for the purposes described.

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

BARNHARD SCHAD.

Witnesses:

LUCIUS F. ROLFE,  
JOHN J. KANE.