F. W. KUEHN.
Vehicle-Wheel.

No. 218,444. Patented Aug. 12, 1879.

Fig. 1

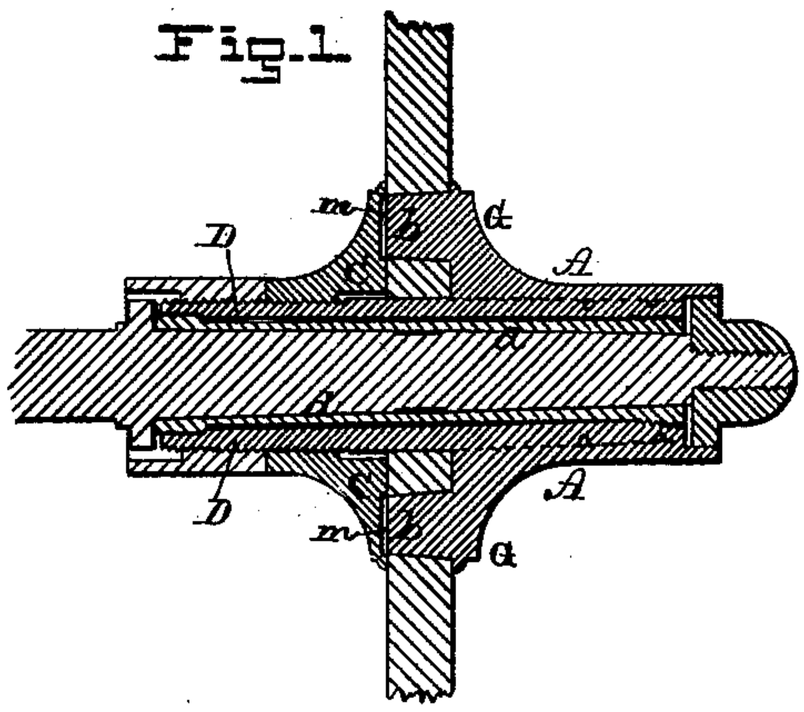


Fig. 2.

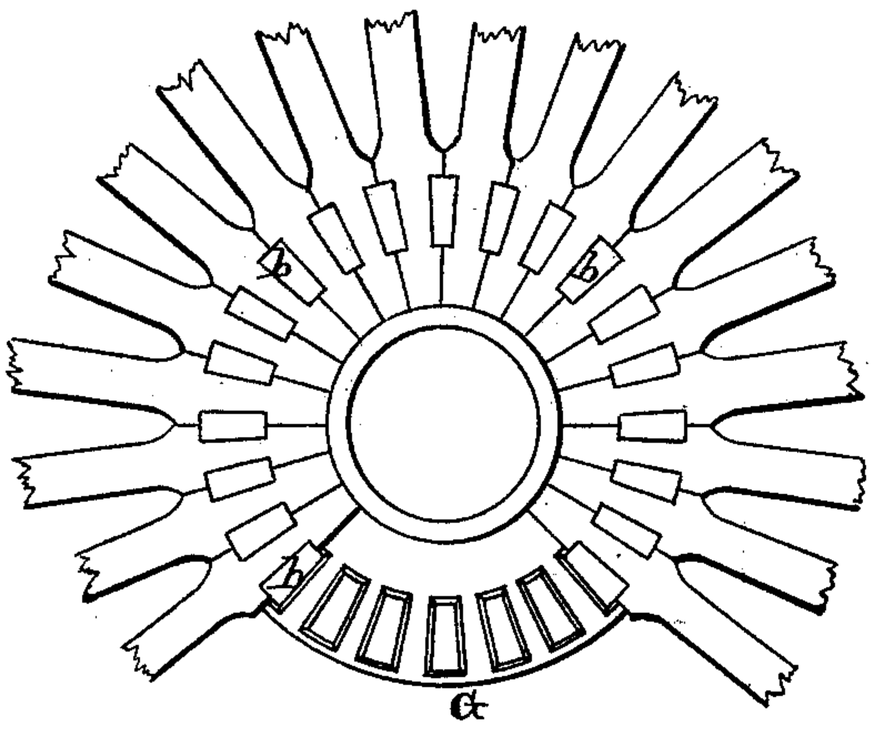
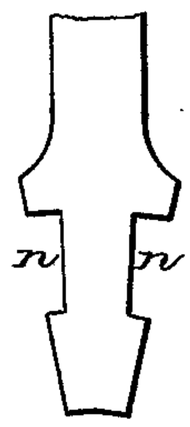


Fig. 3.



WITNESSES:

Jas. F. DuHamel,
W. S. L. Haines

INVENTOR:

F. W. Kuehn
per
F. A. Lehmann,
atty

UNITED STATES PATENT OFFICE.

FREDRICK W. KUEHN, OF RESERVE TOWNSHIP, ALLEGHENY COUNTY, PA.

IMPROVEMENT IN VEHICLE-WHEELS.

Specification forming part of Letters Patent No. **218,444**, dated August 12, 1879; application filed June 14, 1879.

To all whom it may concern:

Be it known that I, FREDRICK W. KUEHN, of Reserve township, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Wheels for Vehicles; and I do hereby 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 pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in wheels for vehicles; and it consists in a nave-box which has a screw-thread on the outside of its inner end and a thread on the inside of its outer end, and which is united to the hub in the act of casting, as will be more fully described hereinafter.

The accompanying drawings represent my invention.

Figure 1 is a vertical section of my invention, and Figs. 2 and 3 are details of the same.

The hub or nave A is of cast-iron, and has on the inside of its flange G a series of projections, *b*, in number corresponding to the number of spokes to be contained in the wheel. The projections *b* are distributed at equal distances from the center of the hub and from each other, and their forms are truncated cones pointing to the center of the hub, increasing in width and length from their faces downward to the place of their attachment. This form is adopted to tighten the spokes when being driven home by forcibly increasing the pressure against one another.

The spokes have recesses *n*, one on a side, with well-defined shoulders, by which they are held in place by the projections *b*. They are tapering toward their inner ends, and when in place bear against one another so as to present a solid body, remaining a little higher than the inclosed projections.

The nave-box D is made of wrought-iron, and united with the nave in the process of casting. It is threaded inside at its outer and outside at its inner end, and is provided with a shoulder at its inside, offering a bearing to the movable box *d*, which is made of cast-iron, threaded at one end and screwed into the nave-box D.

To cast the nave the mold in the sand has a circular opening for the introduction of the nave-box. This box, having recesses or indentations in its sides, as shown by dotted lines in Fig. 1, is placed in the opening, and then the molten metal is poured into the mold around the box. The metal entering these indentations unites the two parts rigidly together.

The box *d* has a flange at its end that bears against the shoulder in the nave-box, and by it is held in place.

The object of introducing the box *d*, and making it removable, is to readily replace it by another when worn out without injury to the nave, and to protect the nave-box against friction.

The inner flange or clamping-plate, C, is screwed on the nave-box D, and may be tightened whenever the shrinking of the spokes requires it. The face of this plate is formed to only press against the slightly-projecting spokes, in order to confine them anew should they become loosened from shrinking, but not to come in contact with the projections *b*, which would prevent the tightening of the spokes. To attain this end the face of the clamping-plate C has a circular cavity, *m*, where it covers the projections *b*, and is thus prevented from bearing against them.

The advantage gained by constructing wheels in the aforesaid manner is to remove all friction from the nave-box by transfering it to a removable box that is secured at both ends—at the one by a screw-thread, at the other by a shoulder bearing against its flange.

Another advantage is to be found in the construction of the spokes, they having shoulders above and below the projections *b*, and being forcibly driven into their places, and compressed, as it were, into one solid piece, cannot become loose if made of seasoned wood, but when necessary may be taken out separately without injury to the remainder. Should, however, the wood shrink and the spokes become loose, by simply tightening the clamping-plate the spokes are again firmly held in their places.

In case a spoke should break and require to be removed, it can be done without taking off the tire from the wheel or disturbing the fel-

lies by pushing the spoke out of its place and substituting another one, whereby time and money are saved.

The nave-box D is made of wrought-iron to give greater strength to the hub.

Having thus described my invention, I claim—

A nave-box, D, which is united to the hub in the act of casting, and having a screw-thread cut on the outside of its inner end and a thread on the inside of its outer end, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 5th day of June, 1879.

FREDRICK W. KUEHN.

Witnesses:
D. MEYER,
F. WM. KUEHN, Jr.