(No Model.)

P. ARBEL.

CAR WHEEL.

No. 506,199. Patented Oct. 10, 1893.

FIG. 1.

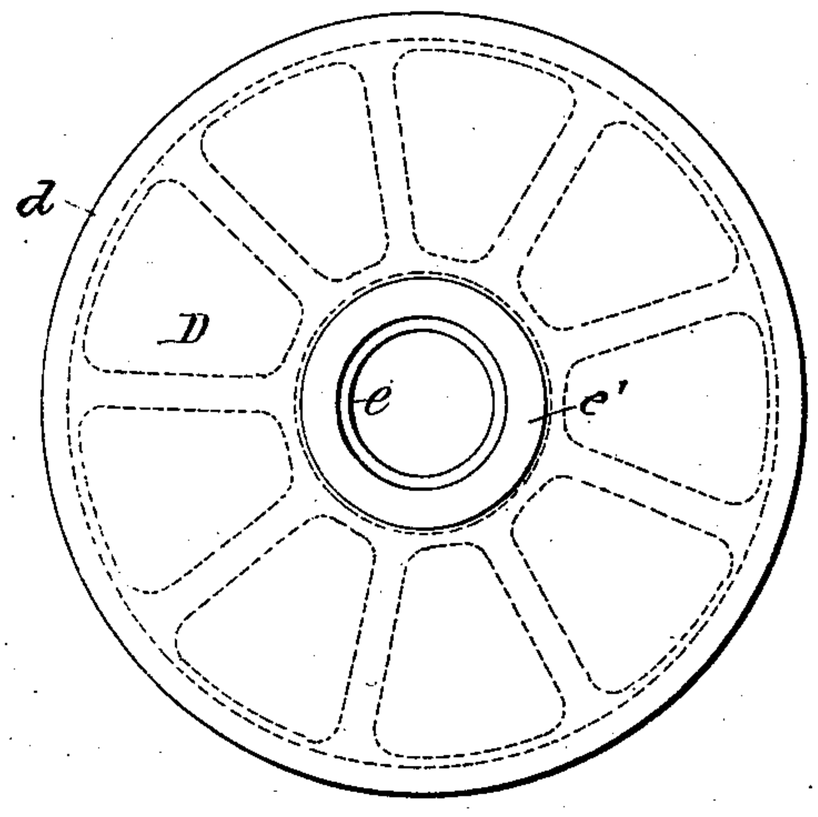


FIG 2

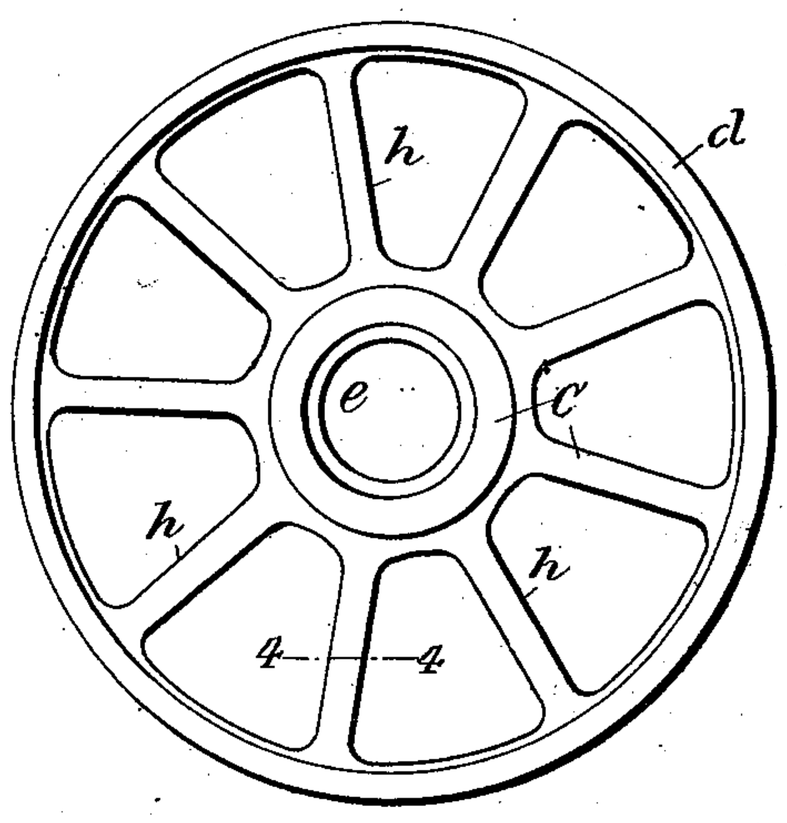


FIG. 3.

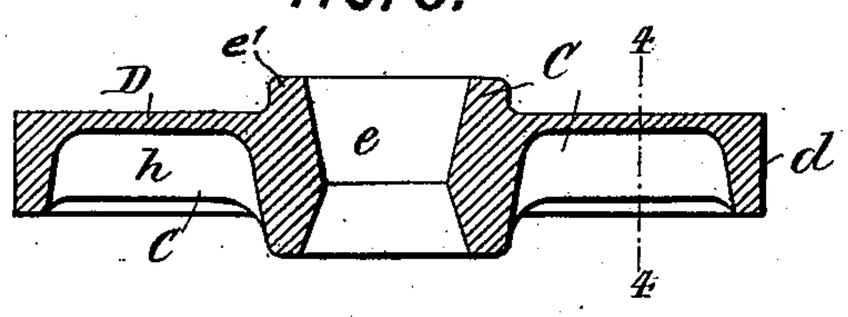


FIG. 4.

FIG. 5.

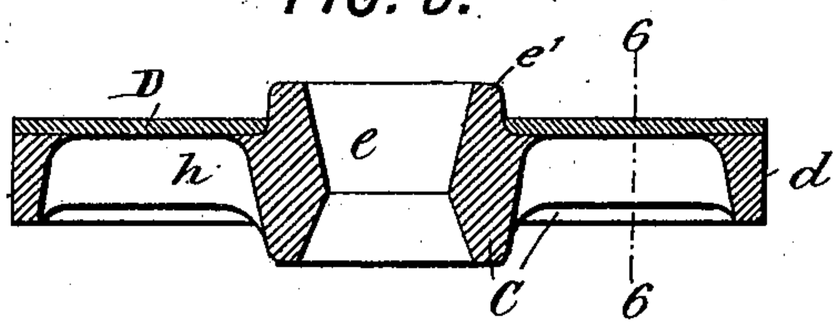
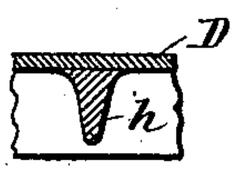


FIG. 6



WITNESSES:

Fred White

C. K. Fraser.

INVENTOR:

Pierre Arbel,

By his Attorneys,

Arthur C. Fraser & Co.

UNITED STATES PATENT OFFICE.

PIERRE ARBEL, OF PARIS, FRANCE, ASSIGNOR TO THE SOCIÉTÉ ANONYME INDUSTRIELLE DES ESTABLISSEMENTS, ARBEL, OF SAME PLACE.

CAR-WHEEL.

SPECIFICATION forming part of Letters Patent No. 506,199, dated October 10, 1893.

Application filed July 3, 1893. Serial No. 479,547. (No model.) Patented in France February 11, 1891, No. 211,341.

To all whom it may concern:

Be it known that I, PIERRE ARBEL, a citizen of the Republic of France, residing in Paris, France, have invented certain new and useful Improvements in Car-Wheels, of which the following is a specification.

This invention is the subject matter of Letters Patent in France, No. 211,341, dated February 11, 1891.

This invention relates to metal wheels for railway cars and other purposes. The improved wheel is forged from steel, iron or other suitable metal, with spokes connecting the nave and rim, and with the spaces between the spokes filled in on one side of the wheel by a solid web, all forged or welded integrally together. This improved wheel presents the advantages of both a spoked wheel and a disk wheel.

Figures 1 and 2 of the accompanying drawings are elevations of the opposite side of my improved wheel as it results from the forging operations. Fig. 3 is a diametrical section thereof. Fig. 4 is a fragmentary transverse section through one of the spokes on the line 4—4 in Figs. 2 and 3. Fig. 5 is a similar section to Fig. 3 showing the wheel before the web is welded to it; and Fig. 6 is a transverse section on the line 6—6 in Fig. 5.

My improved wheel is the product of the new method for the manufacture of forged car wheels claimed in my allowed application for United States patent, filed April 12, 1893, Serial No. 470,071. I will not herein describe the process of manufacture, but will refer to my said application for a full exposition thereof.

The improved wheel consists of a nave or hub *e*, a rim *d* with radial spokes *h h* connecting them, and appearing on one side of the wheel as shown in Fig. 2, and with a web D closing the spaces between the spokes and appearing on the opposite side of the wheel as shown in Fig. 1. On the web side of the wheel it presents a flat or plane surface, with the exception only that the nave *e* projects preferably beyond this surface as shown at *e'* although this is not indispensable. The nave also projects on the opposite side to approximately an equal extent beyond the width of the rim, as shown in Fig. 3. The spokes *h* are wedge-shaped in cross-section, as shown in Fig. 4, their broader sides joining or merging into the web D, as shown in the same figure.

In the manufacture of the wheel, one forging C is first formed, including the nave, spokes and rim. The web D is made as a separate plate, with a central opening fitting over the nave projection *e'*, as shown in Fig. 5. In the formation of the forging C, the spokes *h* are formed with fins on their broader sides, shown clearly in Fig. 6, and when the web D is thus put in place it comes against this broadened portion of the spokes, as shown in Fig. 6, and by the welding of the web to the forging C, the fins on the spokes are made to constitute the gradual merging of the spokes into the web that is seen in Fig. 4.

The wheel shown in Figs. 1, 2 and 3 is illustrated in the condition in which it comes from the final forging, and is designed to be finished by boring out the opening through the nave, and by turning off the rim. For a car wheel, the flange may be formed by turning away the tread, or the wheel may be forged with a flange, or the rim may be turned off and a separate flanged rim may be applied over it, being fastened by shrinking or in any other known way.

In placing the wheel on its axle its web is arranged on the outside of the wheel, so that the outer sides of the wheels of a car present a smooth and plane surface, in order to reduce to the minimum the air current by which dust is raised, and in order to provide no recesses or cavities in which dust can lodge and be centrifugally held during running, as is the case with most prior constructions of car wheels, and which has the disadvantage that the dust is deposited on the axle box and on the axle between the wheel and box, so that it finds its way between the bearing surfaces.

My improved wheel has important advantages over all other constructions of car wheels heretofore made. Over cast iron wheels, or wheels with cast iron centers and steel rims, it has the advantage of greater strength and security, being freed from the liability of accidental breakage that is inherent in a cast iron wheel. As compared with various con-

structions of composite wheels or wheels built up of different members, it has the advantage of greater simplicity, cheapness and reliability, and of less weight. As compared with forged spoke wheels, it has the advantages of greater strength in proportion to its weight, and of creating less dust. As compared with forged disk wheels, it has the advantages of greater stiffness due to the radial ribs or spokes, and of affording no cavities for the accumulation of dust on the outer side of the wheel. In short, it combines the advantages of both the forged disk wheel and forged spoke wheel, while avoiding their disadvantages, and possesses all the substantial merit existing in any of the built up wheels, with the advantages thereover of being more economical, and affording more solidity in proportion to its weight.

I claim as my invention—

1. The improved forged wheel consisting of the rim, nave and spokes, with a web closing the openings between the spokes, all welded together, substantially as specified.

2. The improved forged wheel consisting of the rim, nave and spokes, with a web upon one side of the spokes and rim, all welded integrally together, substantially as specified.

3. The improved forged wheel consisting of rim, nave and spokes, the spokes being wedge-shaped in cross-section, with a web on one side of the spokes and rim, being formed on the thicker side of the spokes and the spokes merged into the rim, all being welded together, substantially as specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

PIERRE ARBEL.

Witnesses:
A. S. HAUPTMAN,
GEORGE KLEINE.