June 30, 1925. 1,543,774

E. IBACH

MANUFACTURE OF METAL WHEELS

Original Filed Jan. 17, 1921 2 Sheets-Sheet 1

Fig. 1

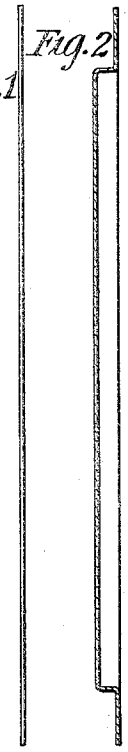


Fig. 2

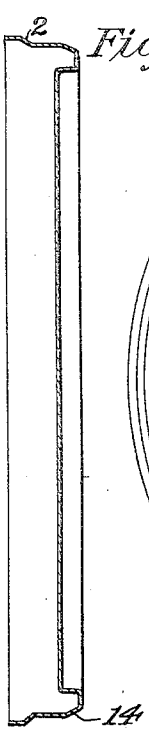


Fig. 3

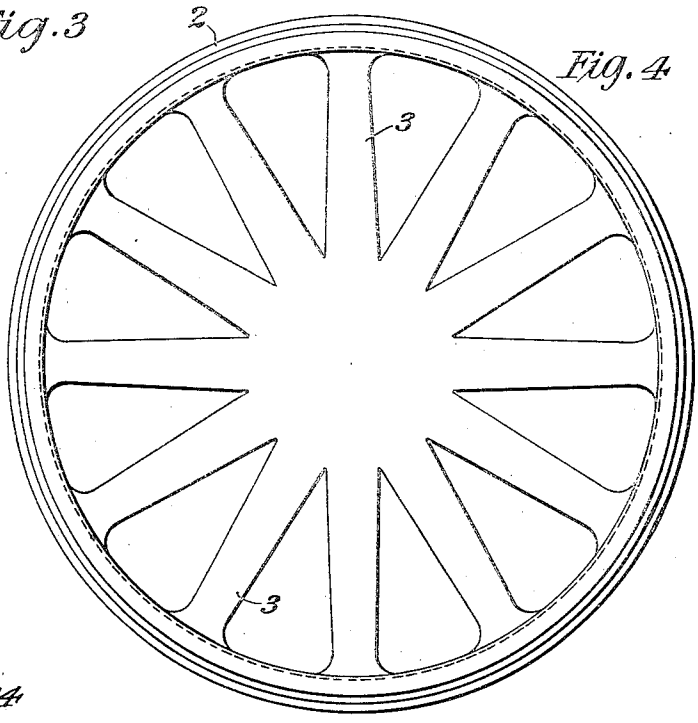


Fig. 4

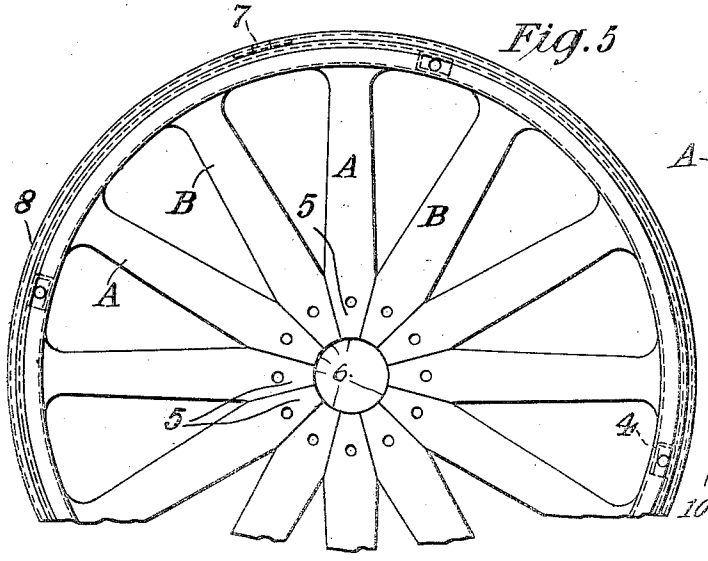


Fig. 5

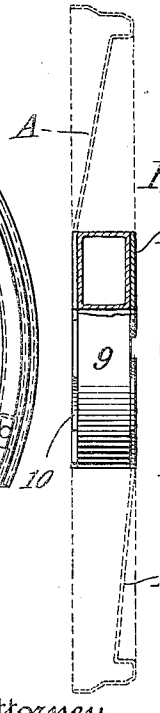


Fig. 7

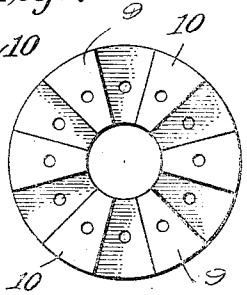
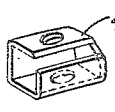


Fig. 6

Fig. 8



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MANUFACTURE OF METAL WHEELS

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Fig. 9

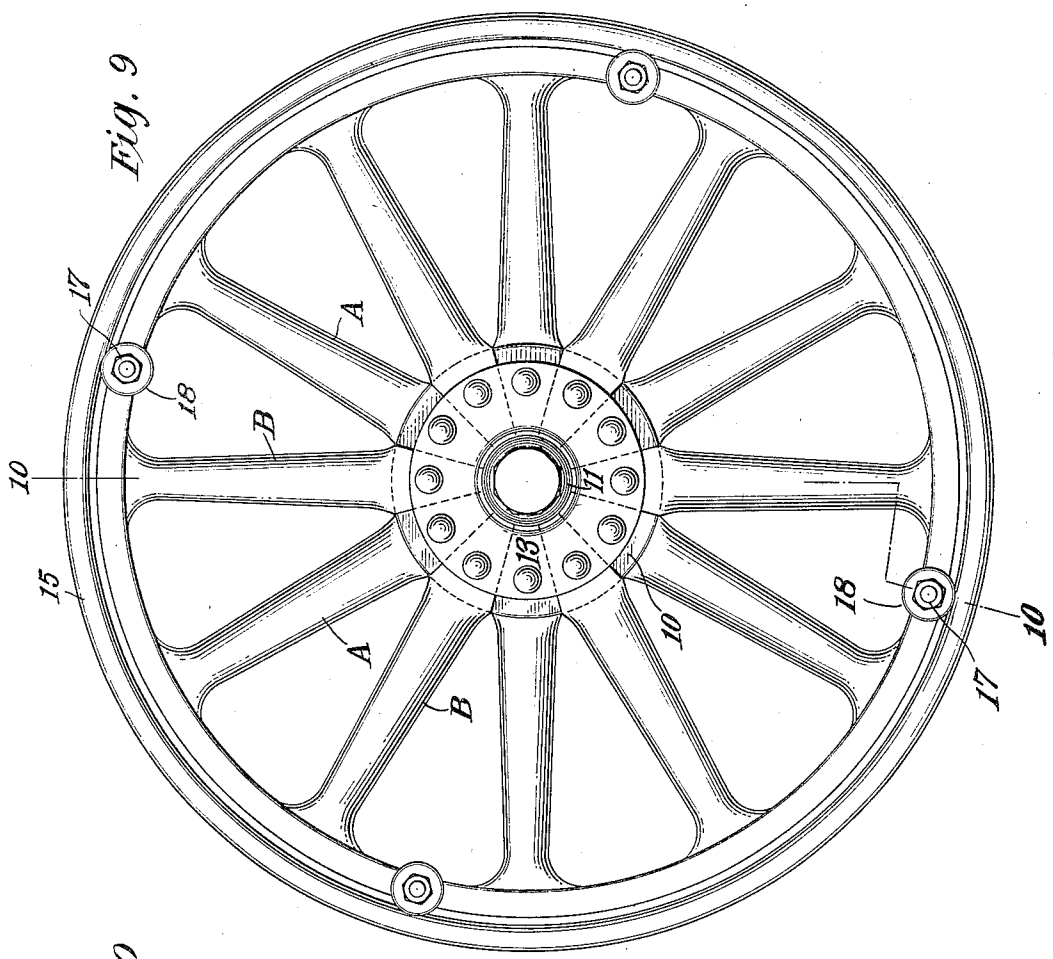
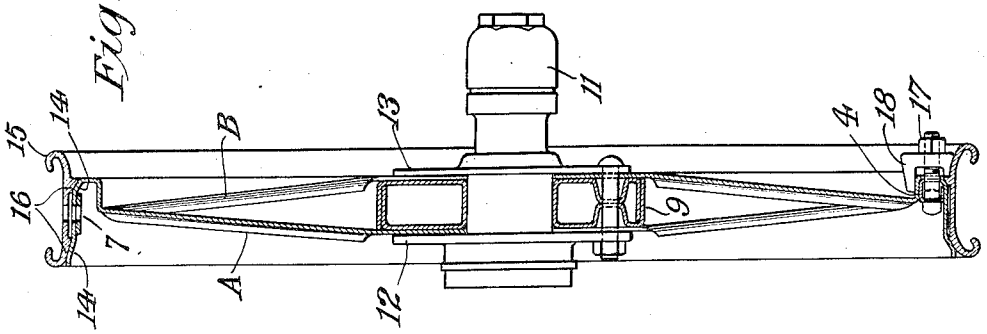


Fig. 10



Inventor
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By his Attorney
Clarence O'Brien

Patented June 30, 1925. 1,543,774

UNITED STATES PATENT OFFICE.

EMIL IBACH, OF BETHLEHEM, PENNSYLVANIA, ASSIGNOR TO BETHLEHEM STEEL COMPANY, OF BETHLEHEM, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

MANUFACTURE OF METAL WHEELS.

Application filed January 17, 1921. Serial No. 437,725.

To all whom it may concern:

Be it known that I, EMIL IBACH, a citizen of the Republic of Germany, residing at Bethlehem, Northampton County, Pennsylvania, have invented new and useful Improvements in the Manufacture of Metal Wheels, of which the following is a specification, reference being had to the accompanying drawings, in which—

Fig. 1 is an elevation of a circular plate suitable for shaping into a wheel in accordance with my invention; Fig. 2 is a section of the blank after the first stamping operation; Fig. 3 is a section of the blank after the rim seat has been shaped thereon; Fig. 4 shows the blank after cutting away the metal between the intermediate portions of the spokes; Fig. 5 shows the blank after the spoke ends have been cut apart and the hub aperture formed; Fig. 6 is an elevation of the spacer; Fig. 7 shows the spacer in position and partly in section; Fig. 8 is a detail of a reinforcement piece; Fig. 9 is an elevation of the completed wheel; and Fig. 10 is a section 10—10 of Fig. 9.

My invention relates to metal wheels and comprises a wheel made from a flat plate, and formed with a felloe, and with alternately staggered spokes designed to be arranged either side a spoke spacing member in the region of the hub, and the method of making such a wheel. My invention also consists in the various features which I shall hereinafter describe and claim.

Referring to the drawings, in Fig. 1 I have shown a circular metal blank cut from a metal plate or sheet of a suitable thickness. I have found that in the manufacture of wheels for Ford cars 1/16th of an inch is a suitable thickness. The blank is next stamped to depress the main central portion leaving as is shown in Fig. 2, the peripheral portion in its original condition. The peripheral portion is next bent to form the felloe or rim seat 2, as is shown in Fig. 3. The intermediate portions of the spokes 3 are then stamped out and the metal thus removed from between the spokes may be later utilized for the reinforcement pieces 4 shown in Fig. 8. Next the spoke ends 5 are sheared apart and the end faces 6 are rounded to arcs corresponding to the circumference of the hub. The intermediate portions of the spokes 3 are then arched or grooved, and the valve hole 7 and bolt holes 8 are punched in the felloe 2. The spokes are then bent alternately or staggered to form two sets of spokes A and B, for instance, I have shown a wheel having twelve spokes, or six spokes in each set. By springing the spokes, the spoke spacing member 9 may be inserted between the sets of spokes 3 and adjusted in place.

The spoke spacing member 9 is intended to hold the keystone ends 5 of the spokes 3 the proper distance apart, and has a plurality of segmental plates 10 secured to each side preferably by spot welding. These plates 10 correspond in size and shape to the spoke ends 5 and are regularly spaced a sufficient distance apart to permit the insertion of the spoke ends 5 therebetween. For instance, I have shown six spoke ends 5 in a set and with a corresponding number of the segments 10 arranged between. When the spoke spacing member 9 is in place, the spoke ends 5 are fitted between the segments 10 and are held there permanently when the hub barrel 11 and flanges 12 and 13 are assembled on the wheel. The segments 10 serve to hold the spoke ends 5 in place, prevent them from shifting due to torsional loads, and with the spokes supply a flat continuous surface for flanges 12 and 13 of the hub 11 to press against.

To reinforce the felloe 2, I provide reinforcement lugs 4, one of which is secured by spot welding or other suitable means in position about each bolt hole.

The felloe 2 is equipped with taper seats 14 and the rim 15, which I have shown of the clincher type, has complementary taper seats 16 on its under side. The rim has a continuous seat upon the felloe and is secured thereon by means of bolts 17, and wedge clamps 18.

I have found that it is of considerable advantage to be able to construct from a single sheet metal blank a wheel which is of the staggered and grooved spoke type. Other features of importance are the means and method of securing the spoke ends about the spacer, and the provision for a rim seat. Such a wheel has the advantage of being strong but very light and may be manufactured at an extremely low cost.

The terms and expressions which I have employed are used as terms of description and not of limitation, and I have no intention, in the use of such terms and expres-

sions, of excluding any equivalents of the features shown and described, or portions thereof, but recognize that various modifications are possible within the scope of the invention claimed.

What I claim is:

1. The method of making a metal wheel which comprises taking a round metal plate, flanging it to form a rim seat, cutting the body of the plate to form metal spokes, substantially equal in length and separated at their hub ends, bending the spokes alternately to form two sets of spokes and securing the severed ends of each set of spokes against opposite sides of a spacer.

2. The method of making a metal wheel which comprises taking a round metal plate, flanging it to form a rim seat, cutting pieces from the body of the plate and leaving the intervening metal to form the bodies of spokes, cutting apart the spoke ends without removing any metal from between adjacent ends bending each spoke alternately to form two sets of spokes, and securing the severed ends of the spokes against a spacer.

3. The method of making a metal wheel which comprises taking a round metal plate, cutting out the body of the metal to form spokes, aperturing it for a hub, shearing it on radial lines to form spoke ends, bending the peripheral portion of the plate to form a rim seat, bending the spokes alternately and inserting between the spokes a spacer to hold the spokes in position.

4. In a metal wheel comprising a unitary structure made from a round metal plate, a rim seat having integral therewith a plurality of spokes which together form a complete circle in the region of the hub, the spokes being bent alternately and forming two sets of spokes, in combination with a spoke spacing member having on its sides segments of the same shape as the spoke ends, the segments on one side being arranged in staggered relation to the segments on the opposite side, the spoke ends of each set fitting between the segments on one side of the spacer and being held therein by the hub flanges.

5. In a metal wheel made from a single disk, a rim seat having integral therewith alternately bent spokes, substantially equal in length and separated at their hub ends, said hub ends being of keystone shape, a spoke spacer having on each side segments spaced apart and shaped like the spoke ends, the spoke ends filling the spaces between the segments, and means for holding the spoke ends in position in the spacer.

EMIL IBACH.