A. THOMPSON.

PRESSED METAL WHEEL.

APPLICATION FILED MAY 11, 1909.

980,023. Patented Dec. 27, 1910.

Fig. 1

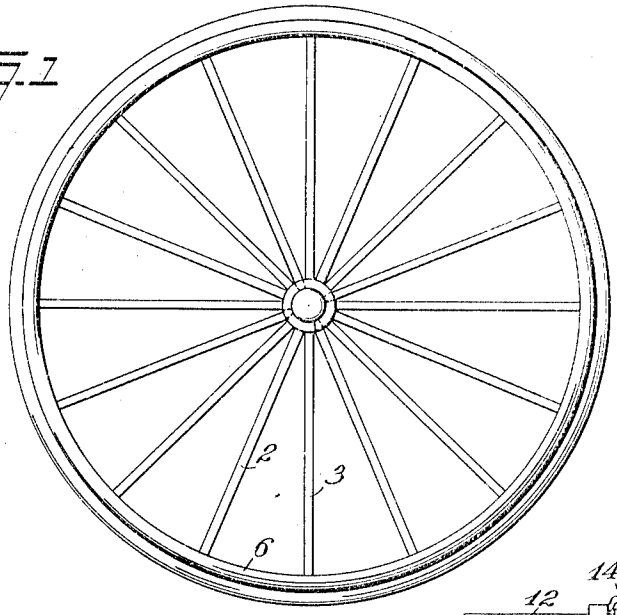
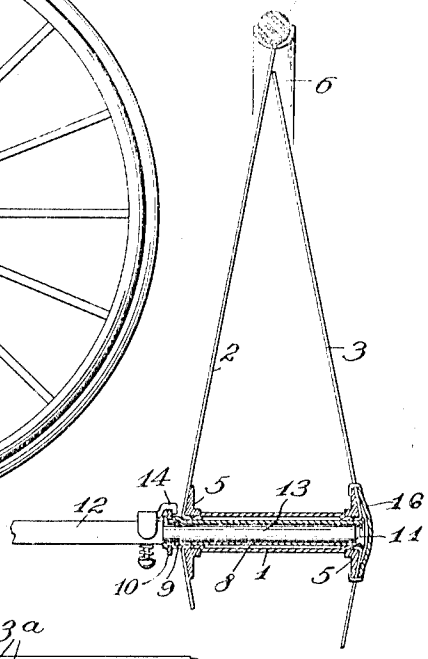


Fig. 2



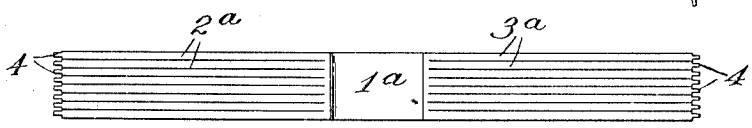


Fig. 3

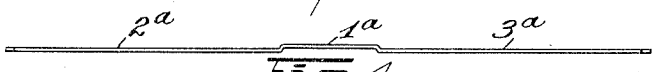


Fig. 4

Fig. 5

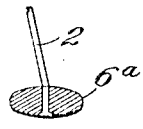


Fig. 6

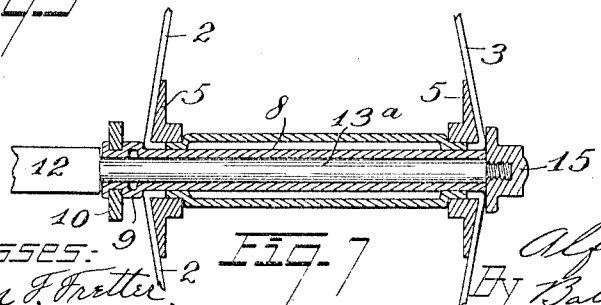


Fig. 7

Witnesses:
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By Bates, Coutts & Hull,
Attys

UNITED STATES PATENT OFFICE.

ALFRED THOMPSON, OF ERIE, PENNSYLVANIA, ASSIGNOR TO THE ERIE WHEEL COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

PRESSED-METAL WHEEL.

980,023. Specification of Letters Patent. Patented Dec. 27, 1910.

Application filed May 11, 1909. Serial No. 495,272.

To all whom it may concern:

Be it known that I, ALFRED THOMPSON, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented a certain new and useful Improvement in Pressed-Metal Wheels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to pressed metal wheels, and has for its object to produce a wheel composed mainly of a single blank of sheet metal, which wheel shall be strong and durable and yet simple of construction and economical of production.

Generally speaking, the invention may be defined as consisting of the combinations of elements embodied in the claims hereto annexed and illustrated in the drawings forming part hereof, wherein—

Figure 1 is a side elevation of a wheel constructed in accordance with my invention; Fig. 2 is a central transverse section through the hub and rim of the wheel, said view also showing in elevation one end of the axle for the wheel; Fig. 3 is a plan view of the blank from which the hub and spokes are formed, said blank being off-set at its center and having its ends slitted so as to form the spokes; Fig. 4 is a side elevation of the blank shown in Fig. 3; Fig. 5 is a side elevation of the blank shown in Fig. 3 rolled into a tube with collars at the ends of the hub; Fig. 6 is a detail view showing the end of one of the spokes secured into a metal rim and illustrating the manner in which the spokes are secured to such rim when no tire is used; and Fig. 7 is a view similar to Fig. 2 showing the axle with a nut for holding the wheel in place.

Taking up a description of the invention by the use of reference characters, 1 represents the hub portion of the wheel and 2 and 3 the spokes. These parts are formed out of the single blank that is shown in Fig. 3, in which blank, 1^a is a plane portion at the center of the blank that is adapted to be rolled into a tube so as to form the barrel portion of the hub. Extending from the plane portion 1^a at one end thereof is a series of tongues 2^a, which constitute the spokes 2, the same being formed by simply slitting the blank from its end substantially to the portion 1^a. In so slitting the blank, no part of the metal is removed except at the extreme ends of the tongues where the center of each tongue is reduced in size by the removal of a slight portion of the metal on each side thereof, as shown at 4, said reduced portions forming short tenons which are adapted to be projected through the rim of the wheel and to be riveted thereto. On the opposite side of the plane portion 1^a are tongues 3^a from which the spokes 3 are formed, said tongues also having the reduced portions or tenons 4 by which the spokes are secured to the rim of the wheel.

It is desirable when rolling the blank into the forms shown in Fig. 5 to have the plane portion 1^a form a tube of larger diameter than the tube that is formed by the tongues 2^a, 3^a, and for this reason the said plane portion is offset or depressed from the plane of the said tongues, as shown in Fig. 4. When, therefore, the blank is rolled into the tube shown in Fig. 5, the hub part 1 is of larger diameter than the tubular structure formed by the parts 2^a, 3^a, so that a slight shoulder or abutment is formed at the end of the hub portion against which collars 5 are adapted to rest, said collars being inserted over the tongues 2^a, 3^a. After these collars are in position, the tongues 2^a and 3^a are bent outwardly into the position shown in Fig. 2 so as to become the spokes of the wheel. As the tongues 2^a and 3^a are directly opposite each other, it will be necessary, in making a wheel with a comparatively small number of spokes, to bend the tongues toward the tangents to the hub ends a short distance, to cause the spokes 2 to be staggered with respect to spokes 3. One set of tongues will preferably be bent in one direction and the other set in the opposite direction, whereby this staggering of the spokes will be secured with a comparatively slight bend of the inner ends of the spokes with respect to the hub. The outer ends of the spokes are inserted through spoke apertures in the rim 6 or 6^a, as shown in Figs. 2 and 6. As appears from Figs. 3 and 4, the tongues 2^a and 3^a, out of which the spokes are formed, are of precisely the same length, from which it follows that when the spokes

are bent into the proper position, as shown in Fig. 2, the wheel will run perfectly true and will need no subsequent adjustment, as is always necessary in cases where the spokes of the wheel are of built-up construction.

In the form shown in Fig. 2, the rim 6 is bent into a crescent shape, in order to receive a rubber tire 7, the tenon portions 4 on the ends of the spokes being inserted through spoke apertures in the rim and riveted in the bottom of the latter. In the form shown in Fig. 6, the said tenon portions 4 extend through the metal rim 6ª and are riveted against the outer side of the rim.

Through the hub portions 1, I insert a closely fitting tubular bearing 8, the same being preferably formed of sheet metal and having a circumferential bead 9 near the inner end of the hub, the bearing being forced into the hub until the said bead abuts against the stop formed at the bends of the spokes 2. Over the extreme end of the tubular bearing, I place a ring or washer 10, which is forced up against the bead 9 and held in place by upsetting or riveting the end of the tubular bearing against the ring. To prevent the wheel from working off the bearing, the latter may be slightly upset or riveted at 11.

In the construction shown in Fig. 2, the axle 12, having the spindle 13, is provided with a spring retaining catch 14 which engages over the ring 10 and thus prevents the wheel from coming off the spindle.

As shown in Fig. 7, the spindle 13 may be modified, as shown at 13ª, by extending the same beyond the hub and threading the extended portion for the reception of a nut 15, said nut engaging with the outer end of the hub and holding the wheel in position.

When a nutless construction is used, as in Fig. 2, the end of the hub is preferably hidden by a cap-plate 16, which may be secured in placed by tongues which are bent over to embrace the adjacent ring 5.

By the construction described, I have produced a particularly strong, durable, but comparatively inexpensive wheel. The collars 5 coöperate with the inner ends of the tongues 2ª and 3ª to form abutments for the same. These collars have their outer surfaces beveled to conform generally to the inclination which must be given to the spokes to enable them to reach the central portion of the rim 6.

Having thus described my invention, what I claim is:

1. In a pressed metal wheel, the combination, with a tubular hub having a reduced end, of spokes integral with said hub and projecting from such reduced end, a collar on such reduced end and forming a bearing for the inner portions of the spokes, and a rim secured to the outer ends of said spokes.

2. In a pressed metal wheel, the combination, with a tubular hub having each end thereof reduced in diameter, of spokes projecting outwardly from each reduced end of the hub, a collar applied to each reduced end of the hub and engaging the inner ends of the spokes, and a rim secured to the outer ends of said spokes.

3. In a pressed metal wheel, the combination of a tubular hub having its opposite ends reduced in diameter, integral spokes projecting from such reduced ends, a collar applied to each reduced end of the hub and engaging the inner ends of the spokes, and a rim to which the outer ends of the spokes are secured, the outer faces of said collars tapering inwardly or toward the center of the hub to form bearings for the inner portions of the spokes.

4. In a pressed metal wheel, the combination of a tubular hub having integral spokes projecting from an end thereof and provided, near such end and between the spokes and the center of the hub, with an abutment, and a collar applied to the end of the hub between the spokes and the abutment and arranged to be engaged by the inner ends of the spokes.

5. In a pressed metal wheel, the combination of a tubular hub portion, a collar at each end of said hub portion said collar having an internal diameter that is less than the diameter of the hub portion, a series of spokes at each end of the hub portion, said spokes being integral with the hub portion and extending through the said collars, a rim to which the outer ends of the spokes are secured, and a tubular bearing within the hub portion, said bearing being fitted to an axle.

6. In a pressed metal wheel, the combination of a hub portion having reduced ends, a tubular bearing extending through said hub portion and fitting said reduced ends, means at each end of said hub portion for holding the same in shape, integral spokes projecting from said hub portions, and a rim to which the outer ends of the spokes are secured.

7. In a pressed metal wheel, the combination, with a central hub portion having reduced ends, of a collar at each reduced end of said hub portion and fitting the same closely, spokes integral with said hub portion and having their inner ends extending through said collar and being bent outwardly, a rim to which the outer ends of the spokes are attached, and a tubular bearing within the hub portion and fitting the reduced ends thereof, said bearing being provided with a projection adapted to engage the spokes at the points where they bend about one of said collars.

8. In a pressed metal wheel, the combination, with a tubular hub having a reduced end, of spokes integral with said hub and pro-

jecting from such reduced end, a collar on such reduced end, and a rim secured to the outer ends of said spokes.

9. In a pressed metal wheel, the combination of a tubular hub, integral spokes bent outwardly from opposite ends of said hub, a tubular bearing within the hub, said bearing having an outwardly projecting bead engaging with one of its sides the adjacent inner ends of the spokes at the points where they are bent with respect to the hub, and a ring secured to said bearing on the opposite side of the bead from the spokes.

10. A wheel comprising a tubular hub portion having reduced ends, spokes projecting from each reduced end of the hub, a collar applied to each reduced end of the hub and engaging the inner ends of the spokes, a rim secured to the outer ends of said spokes, and a tubular bearing within the hub and engaging the reduced ends thereof, said bearing having outwardly projecting portions adapted to engage the spokes at the points where they are bent about said collars, and said bearing having means coöperating with one of said outwardly projecting portions whereby it may be attached to an axle.

11. A wheel comprising a tubular hub portion having a reduced end, spokes projecting outwardly from such reduced end, a collar applied to the reduced end of the hub and engaging the inner ends of the spokes, a rim secured to the outer ends of said spokes, and a bearing within the hub and provided with an outwardly flared end adapted to engage the spokes on the outer side of said collar.

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

ALFRED THOMPSON.

Witnesses:
GEORGE M. FLETCHER,
JOHN A. CARTER.