J. S. CULP.

PRESSED STEEL WHEEL.

APPLICATION FILED AUG. 6, 1919.

1,375,899.

Patented Apr. 26, 1921.

2 SHEETS—SHEET 1.

Fig. 2.

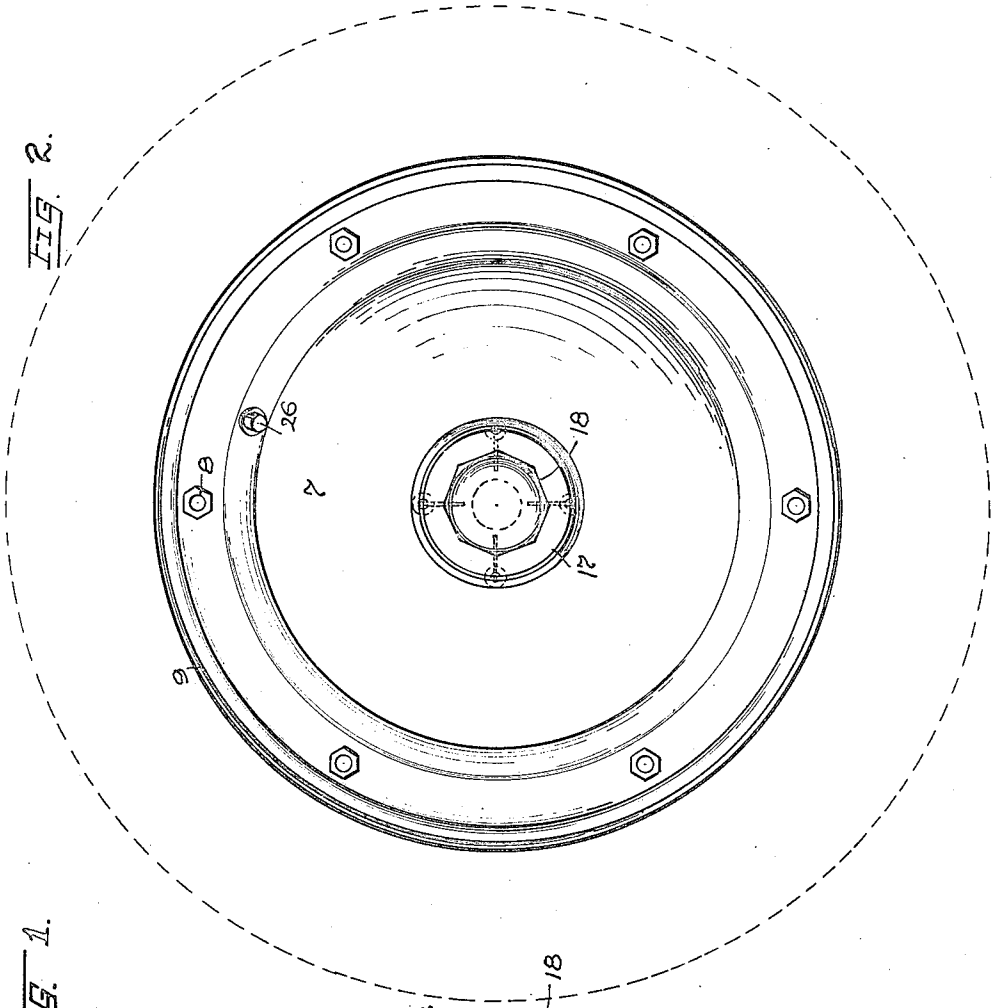
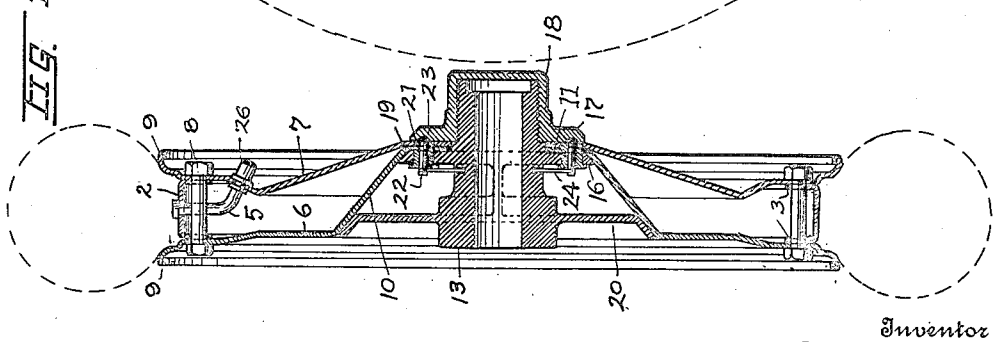


Fig. 1.



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2 SHEETS—SHEET 2.

FIG. 3.

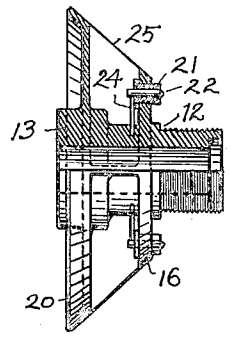


FIG. 4.

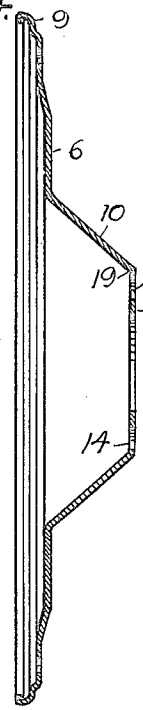


FIG. 5.

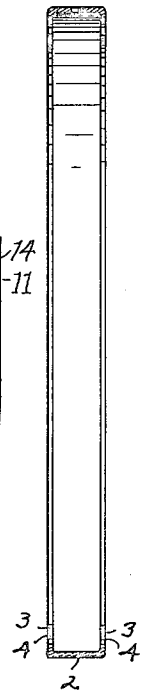


FIG. 6.

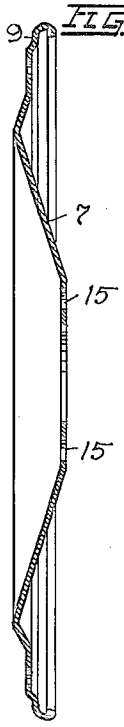
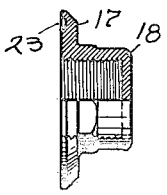


FIG. 7.



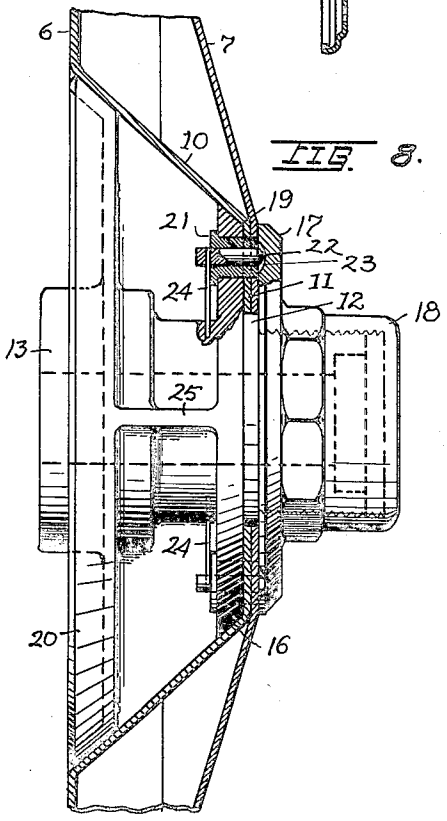
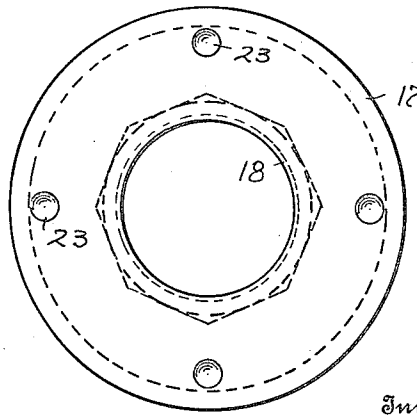


FIG. 8.

FIG. 9.



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UNITED STATES PATENT OFFICE.

JAY S. CULP, OF CLEVELAND, OHIO, ASSIGNOR TO THE RELIANCE WHEEL CO., OF YOUNGSTOWN, OHIO, A CORPORATION OF OHIO.

PRESSED-STEEL WHEEL.

1,375,899. Specification of Letters Patent. Patented Apr. 26, 1921.

Application filed August 6, 1919. Serial No. 315,608.

To all whom it may concern:

Be it known that I, JAY S. CULP, citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Pressed-Steel Wheels, of which the following is a specification.

This invention consists in a pressed steel wheel in which a set of flanged disks are secured in separable connection with a flanged felly band and with a separate hub, all substantially as hereinafter shown and described and more particularly pointed out in the claims. The conception involves the making of a pressed steel wheel with a minimum number of parts and with a special form of hub adapted to contribute very materially to the rigidity and strength of the wheel, and the hub and wheel parts are particularly constructed and assembled to permit quick and convenient removal of the main body of the wheel from the hub without removing the hub from the axle.

In the drawings accompanying this application, Figure 1 is a sectional view centrally through the hub and the wheel parts. Fig. 2 is a side view of the wheel and hub cap assembled. Figs. 3 to 7, inclusive, are separate views, mainly in section, of the hub and the parts forming separable elements of the wheel. Fig. 3 illustrates the hub, Fig. 4 the inner disk or side member of the wheel, Fig. 5 the flanged felly band, Fig. 6 the outer disk or wheel member and Fig. 7 the hub cap or nut which is used to fasten the complete assembly together. Fig. 8 is an enlarged view and side elevation of the hub and its hub cap and with a portion in section to show one of the lock pins and also showing a central portion of the tube disks in section and clamped upon the hub. Fig. 9 is a face view of the inner side of the hub cap showing the shallow depressions therein which are adapted to receive the lock pins.

The invention comprises a felly band having a flange 3 at each side provided with openings 4 at intervals. This band also has an opening radially therein adapted to receive the bent valve 5 of a pneumatic tire. Two pressed steel plates or disks 6 and 7, respectively, are adapted to bolt against the flanges 3 on opposite sides of band 2 by a set of bolts 8 placed within and extending through the openings 4, and each disk or side plate has an outwardly turned flange 9 corresponding in shape or contour to the sides or bead of the tire at its base where it is adapted to encircle and rest upon the band 2. The inner disk or plate 6 is pressed and extended toward the front side of the wheel in the form of a truncated cone 10. The outer flat truncated portion 11 of this cone has a round opening centrally therein to receive a shouldered extension 12 of a hub member 13, and a series of smaller round openings 14 are provided at intervals in face 11 adjacent its central opening.

Disk 7 forming the front side plate of the wheel is also dished and extended downwardly on conical lines at a different pitch or angle relatively to the cone 10 of plate 6, and the central portion of this outer plate 7 is also provided with a central opening for the hub and a series of small round openings 15 which equal in number and are adapted to register with openings 14 in the rear plate 6 when said plates are assembled and their central portions clamped together between the annular flange 16 of hub 13 and the annular flange 17 of the hub cap 18 which is adapted to be screwed upon the screw-threaded extension of the hub. The border edge of flange 16 is beveled to fit the inner conical wall 10 of rear plate 6, and the diameter of flange 16 is approximately the same as the smallest end of cone 10 so as to fit snugly within the corner 19, and hub 13 is further provided at its rear end with a beveled flange 20 which is of larger diameter than flange 16 so as to fit within and engage the conical wall 10 at its base or larger diameter. The rear wheel disk 6 is thus braced and strengthened at its center front and rear, and the reinforced cone 10 in turn braces and upholds the front disk 7, and further support is provided by flange 17 of the hub cap 18 when the parts are clamped together.

The locking of the front and rear plates

upon the hub to prevent independent rotation of either one of said parts is obtained by inserting separate short cylindrical tubes or sleeves 21 through openings in flange 16 and the openings 14 and 15 in plates 6 and 7. These tubes or sleeves 21 are flanged at one end to bear against the rear side of the hub flange 16, and the length of these tubes or sleeves correspond approximately to the combined thickness of flange 16 and the two plates 6 and 7. The hub is affixed to the plates by the tubes or sleeves 21 to drive or rotate the parts together, and a set of slidable locking pins 22 are placed centrally within the tubes or sleeves 21 to effect locking of the hub cap 18 when it is screwed to its final clamping position on the hub extension, this result being accomplished by the projecting front ends of the pins when they occupy the notches or concavities 23 in the rear clamping face of the flange 17 of hub cap 18, see Figs. 8 and 9. The pins are maintained in this projecting locking position by a short piece of spring wire 24 socketed at one end in the radial opening in hub 13 and engaged with or extending through the rear end of the pin. However, by applying a wrench to the hub cap this hub cap can be unscrewed, the pins being forced inward to accommodate this movement. In brief, while the locking effect of the pins is sufficient to prevent accidental displacement of the hub cap the pins will not prevent wrench rotation of the cap. A single locking pin might be used but a plural number is preferred to better safe-guard locking of the hub cap in place.

Hub 13 may be constructed internally to receive a cage for roller bearings or it may be bored to fit or clasp upon an axle in any suitable way, and where separate flanges of different diameter are formed integral with the hub I prefer to unite them by ribs or webs 25, as shown in Figs. 3 and 8.

Outer plate 7 has an opening through which the bent valve tube 5 is adapted to extend so that the tire may be inflated without removing the front plate, and a cap 26 may be employed to cover the projecting part of the inflating tube 5.

What I claim is:

1. A pressed steel vehicle wheel, comprising a hub having a flange, a hub cap screw-engaged with said hub, separate rear and front plates clamped with said flange and hub cap, locking members extending through said flange and both plates, and means extending through said members adapted to lock said hub-cap.

2. In a pressed steel vehicle wheel, separate front and rear plates of disk shape, one of said plates having a central portion of conical shape extending to and bearing against the other plate, a hub having a flange engaged with said conical portion, and a hub cap screw-engaged with said hub in clamping relations with said plates opposite the hub flange.

3. In a pressed steel vehicle wheel, separate front and rear plates of disk shape and distended centrally on conical lines toward the front side of the wheel and having registered openings centrally thereof, a hub member having beveled flanges of different diameters in bracing engagement with the conical portion of one of said plates, and a hub cap screw-engaged with the outer end of said hub member having clamping engagement with the front plate opposite the smaller flange.

4. In a pressed steel vehicle wheel, separate front and rear plates and a flanged hub extending centrally through said plates, a set of locking members extending through the flanged hub and said plates, a hub cap screw engaged with said hub and clamped against the front plate, and a set of spring-pressed locking pins extending outwardly through said locking members into engaging and locking relation with said hub cap.

5. In a pressed steel vehicle wheel, a set of plates distended centrally into bracing and abutting relation and provided each with a central opening and a series of smaller registering openings, a hub member having a pair of flanges engaged in bracing relations with the distended portion of one of said plates, a set of separate locking elements projected from one of said flanges through the smaller registering openings in said plates, a screw cap engaged with said hub in clamping relations with one of said plates, and spring pressed locking pins extending through said locking elements into locking contact with said hub cap.

6. In a pressed steel vehicle wheel, a pair of plates and a separate hub extending through the same having locking elements engaged with said plates to prevent independent rotation of the parts, a screw cap engaged with said hub opposite said plates, pins extending through said locking members into locking engagement with said hub cap, and springs adapted to press said pins outwardly to effect automatic locking of the hub cap.

7. A pressed steel vehicle wheel, comprising a hub member having a screw-threaded extremity and separate integral flanges of different diameter, one of said flanges having openings at different radial points therein provided with tubular members adapted to effect locking of the removable wheel parts thereon, and pins within said locking members having springs adapted to press said members outwardly to effect locking of still another part of said wheel.

8. A pressed steel wheel, comprising a pair of pressed steel disks of conical shape and extended into meeting relations cen-

trally with registering openings, a flanged hub removably seated within the centrally extended portions of one of said disks and projecting through and beyond the other disk, a screw nut removably secured upon said hub and clamping said disks together, and locking members uniting said hub and disks against independent rotation and having locking engagement with said screw nut.

Signed at Cleveland, in the county of Cuyahoga, and State of Ohio, this 15 day of July, 1919.

JAY S. CULP.