J. LEDWINKA.

METAL WHEEL.

APPLICATION FILED MAY 17, 1919.

1,427,747.

Patented Aug. 29, 1922.

2 SHEETS—SHEET 2.

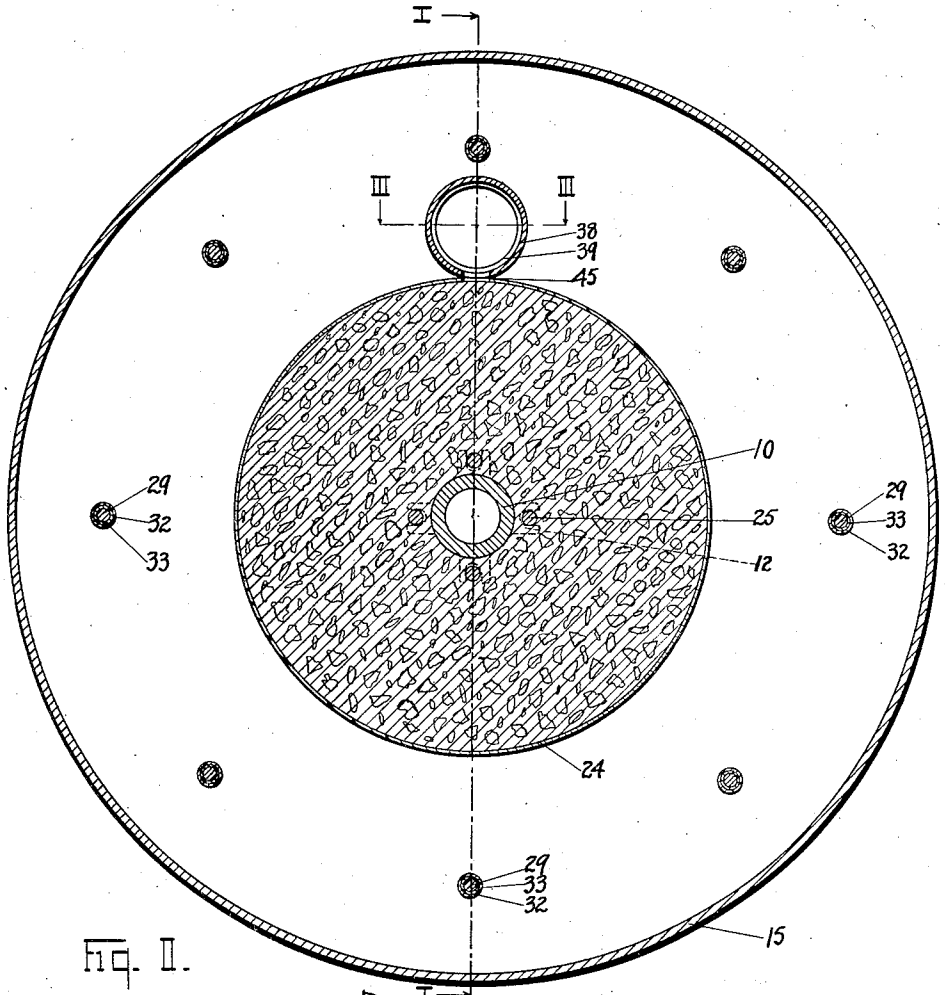


Fig. II.

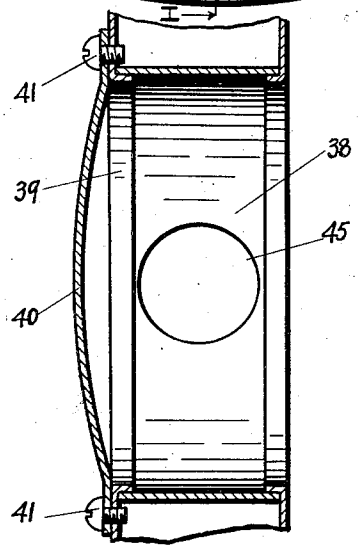


Fig. III.

INVENTOR.

Joseph Ledwinka

BY Chester H. Braselton

ATTORNEY

J. LEDWINKA.

METAL WHEEL.

APPLICATION FILED MAY 17, 1919.

1,427,747. Patented Aug. 29, 1922.

2 SHEETS—SHEET 1.

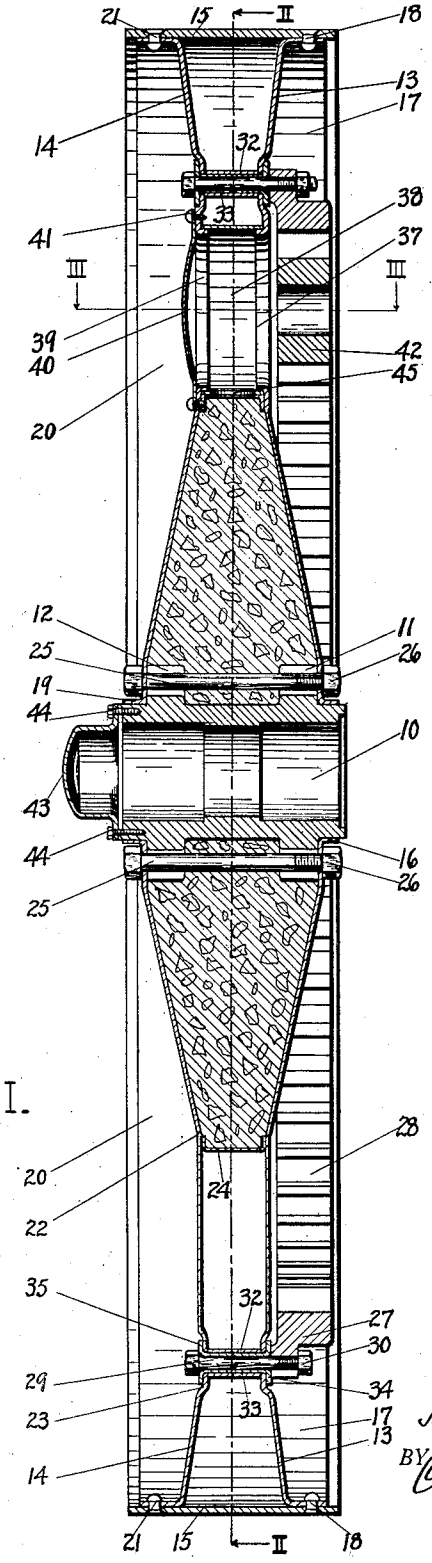


Fig. I.

INVENTOR.
Joseph Ledwinka
BY Chester H. Braselton
ATTORNEY

UNITED STATES PATENT OFFICE.

JOSEPH LEDWINKA, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO BUDD WHEEL COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

METAL WHEEL.

1,427,747. Specification of Letters Patent. Patented Aug. 29, 1922.

Application filed May 17, 1919. Serial No. 297,842.

To all whom it may concern:

Be it known that I, JOSEPH LEDWINKA, a citizen of the United States, residing at Philadelphia, county of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Metal Wheels, of which I declare the following to be a full, clear, and exact description.

This invention relates to improvements in wheels, and particularly to wheels of the disc type especially adapted for use in connection with trucks, tractors and the like.

One object of the invention is to provide a wheel of this character which is of simple construction and efficient in operation.

A further object of the invention is to provide an improved form of disc wheel, which is provided with a filler portion adapted to give strength and rigidity to the wheel and to increase the weight thereof.

A further object of the invention is to provide a wheel of this character having certain novel features of construction, which will be more fully described hereinafter.

Further objects of this invention relate to economies of manufacture and details of construction as will appear from the detailed description to follow.

The objects of the invention are accomplished in one instance by the devices and means described in the following specification, but it is evident that the same may be varied widely without departing from the scope of the invention as pointed out in the appended claims.

A structure constituting one embodiment of the invention, which may be the preferred, is illustrated in the accompanying drawings, forming a part hereof, in which:

Figure I is a vertical, sectional view taken along the line I—I of Figure II, and illustrating the relative position of the various parts of the wheel structure with respect to each other.

Figure II is a vertical, sectional view, taken along the line II—II of Figure I, and illustrating the relative position of the elements of the wheel structure.

Figure III is a detail-sectional view, taken along the line III—III of Figure II, and illustrating the construction of the spacing collar and the cover member.

Referring to the drawings, similar reference characters designate corresponding parts throughout the several views, and the sectional views are taken looking in the direction of the small arrows at the ends of the section lines.

In the embodiment of the invention illustrated herewith, the wheel comprises a tubular hub member 10 provided with a plurality of pairs of radially extending oppositely positioned ears 11 and 12 located at opposite ends of the hub member and extending radially therefrom for a purpose which will be hereinafter described. A pair of wheel discs 13 and 14 of similar construction are each provided with a central opening within which is positioned the hub 10, and the discs extend radially therefrom to the inner surface of the wheel rim 15 to which they are firmly secured.

The wheel disc 13 is provided with an annular flange 16 surrounding the central opening formed therein, said flange being formed in such a manner as to bear against and be supported by the outer circumferential face of the hub 10. Positioned upon the outer peripheral edge portion of the disc 13 is an annular outwardly turned flange 17 which bears against the inner circumferential surface of the rim 15 and is secured thereto by means of a plurality of rivets or suitable fastening means 18. The wheel disc 14 is provided with an annular flange 19 surrounding the central opening therein, which is similar in all respects to the flange 16 formed upon the wheel disc 13, and is adapted to bear in a similar manner against the outer circumferential face of the wheel hub. An outwardly extending annular flange 20 is formed upon the outer peripheral edge of the wheel disc 14, and is adapted to bear against the inner circumferential surface of the rim 15 and be secured thereto by a plurality of rivets or suitable fastening means 21.

The wheel discs are formed in such a manner as to converge from their point of attachment to the hub throughout a portion of their radial extent to a point indicated by 22 from which point they extend substantially parallel with each other in a radial direction to a point indicated by 23, from which point they diverge from each other towards the wheel rim. By means of this construction an enlarged portion or space is provided between the wheel discs adjacent

the hub, while the space inclosed between the discs is considerably restricted adjacent their points of attachment to the rim. A spacing ring 24 is inserted between the discs in such a manner as to be substantially concentric with the axis of the wheel and located along the line where the discs cease to approach each other. This spacing ring may be held in position with respect to the discs in any suitable manner and its presence forms a central compartment within the discs and adjacent to the hub portion. Each of the discs is provided with a plurality of registering openings positioned adjacent their points of bearings upon the hub, and a plurality of bolts 25 are passed through the registering openings and between the oppositely positioned pairs of ears 11 and 12 formed upon the hub and secured in place therein by nuts 26 threaded thereon. These bolts 25 serve to retain the wheel discs in proper position relative to each other and to the hub member.

A ring 27 provided with an internal gear 28 is firmly secured to the wheel discs in such a manner as to be substantially concentric with the axis of the wheel by means of a plurality of bolts or suitable fastening means 29, which are passed through registering openings formed in the discs 13 and 14 and through the ring 27, the several parts being held in proper position relative to each other by means of nuts 30 threaded upon the ends of the bolts 29. A plurality of spacing sleeves 32 are positioned between the wheel discs in such a manner as to register with the various registering openings provided for the reception of the bolts 29. Positioned within each of the sleeves 32 in such a manner as to extend outwardly beyond the wheel discs 13 and 14 are bushings 33, each of which is provided at opposite ends thereof with outwardly turned flanged portions 34 and 35, formed in such a manner as to overlie the outer surfaces of the wheel discs 13 and 14 adjacent the registering openings formed therein for the reception of the bolts 29. The wheel discs are preferably arranged in such a manner that the corresponding openings for the reception of the bolts 29 register with each other, then the sleeves 32 are properly arranged in position in such a manner as to register with the corresponding openings formed in the wheel discs and the bushing members 33 are inserted within the openings and through the corresponding sleeves 32, whereupon the outer end portions of the bushings are bent over in such a manner as to form the overlying flanges 34 and 35. The various sleeves and bushings thus being arranged in proper position with respect to the wheel discs, the bolts 29 are inserted within the bushings and passed through the registering openings in the gear ring 27, and the nuts 30 are applied thereto in such a manner as to hold these several parts firmly secured in position relative to each other.

A pair of registering openings 37 are formed in the wheel discs 13 and 14 positioned in such a manner as to register with each other when the discs are in assembled position, and located at a point adjacent the inner circumference of the gear 28. A spacing sleeve 38 is positioned between the wheel discs in such a manner as to have the interior portion thereof coincide with the openings formed in the wheel discs, whereupon the edge portions of the wheel discs adjoining the openings 37 formed therein are bent inwardly to form flanges 39 extending inwardly towards the center of the wheel and bearing against the inner edge portions of the sleeve 38. A cover 40 is provided for attachment to the outer wheel disc 14 in such a manner as to extend over the opening 37 formed in the wheel discs, and screws 41 are provided for detachably securing the cover plate 40 to the wheel disc 14. The cover is capable of being readily and easily removed from the wheel disc upon detachment of the screws 41, thus exposing the opening 37 formed in the wheel discs and permitting the removal there-through of the pinion 42 together with the driving shaft (not shown) by which the same is carried. The pinion 42 is adapted to drive the wheel through engagement with the internal gear 28, and the opening 37 formed in the wheel disc provides a ready means for easily removing the driving pinion and the shaft by which the same is carried whenever it is deemed desirable to remove the same for the purpose of replacement or repair without the necessity of previously removing the wheel from the axle.

A dust cap 43 is secured to the outer end portion of the hub 10 by means of a plurality of attaching screws 44, and serves to inclose the axle bearing and prevent the access of foreign matter thereto.

The interior space between the wheel discs and adjacent the hub may be filled with concrete or other suitable material, which in its original state is plastic so as to enable the same to be readily inserted within the space. The concrete or other suitable material is adapted to be inserted into the inner circular space formed between the wheel discs by being passed through an opening 45 formed in the spacing sleeve 38 and the ring 24 and communicating with the interior space formed between the wheel discs. The insertion of concrete or other suitable material of this character serves to give added strength and rigidity to the wheel structure, and also gives added weight thereto. The type of wheel illustrated herewith is particularly adapted for use in connection with tractors, and one object of the invention is to provide a means for giving one of the

wheels used upon a tractor a greater weight, and consequently enable the same to exert a greater tractive force than the wheel positioned upon the opposite side of the tractor. In the form of tractors wherein this type of wheel is particularly adapted for use to obtain the results mentioned above, one of the wheels is offset transversely from the central longitudinal line of the tractor farther than the other, thus rendering it desirable to give the wheel located farthest from the center line of the vehicle a greater weight than the wheel located nearest thereto in order to prevent side draft and cause the two wheels to act more uniformly in exerting tractive force. When the type of wheel illustrated herewith is employed in connection with a tractor of the character described, it is desirable to place concrete or other suitable plastic material of like character within the central portion of the wheel which is positioned farthest from the center line of the vehicle, so as to give that wheel greater weight than the oppositely positioned wheel and thus increase its traction, since from this fact that the wheel is located farther from the center line of the vehicle than the other it normally carries less of the weight of the vehicle than the opposite wheel.

While the type of wheel illustrated herewith is particularly adapted for use in this connection, since from its construction ready means is provided for increasing the weight of one of the wheels over that of the other, it is to be understood that this type of wheel may be used with equal readiness for all of the various purposes to which disc wheels of this general type are ordinarily employed.

While I have shown and described in considerable detail a specific embodiment of my invention, it is to be understood that this showing and description is illustrative only, and for the purpose of rendering my invention more clear, and that I do not regard the invention as limited to the details of construction illustrated or described, nor any of them, except in so far as I have included such limitations within the terms of the following claims, in which it is my intention to claim all novelty inherent in my invention broadly as well as specifically.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a wheel structure, a hub, a rim, a pair of wheel discs connecting said hub and rim, a driving gear concentric with the axis of the wheel and carried by said wheel, said wheel discs being provided with registering openings positioned adjacent the toothed surface of the driving gear.

2. In a wheel structure, a hub, a rim, a pair of discs disposed between said hub and rim, a driving gear concentric with the axis of the wheel and secured against the face of one of said discs, said discs being provided with a pair of registering openings disposed adjacent the toothed surface of said gear, and a cover for said openings removably secured to the disc opposite said gear.

3. In a wheel structure, the combination of a hub, a rim, a pair of discs between said hub and rim, a spacing ring interposed between said discs intermediate said hub and rim and forming a chamber around said hub, and a filling of relatively heavy material disposed in said chamber.

4. In a wheel structure, the combination of a hub, a rim a pair of discs between said hub and rim, a spacing ring interposed between said discs intermediate said hub and rim and forming a chamber around said hub and a filling of concrete disposed in said chamber around said hub.

5. In a wheel structure, the combination of a hub, a rim, and a pair of discs between said hub and rim each of said discs having inner converging portions, intermediate substantially parallel portions spaced from each other and outer diverging portions connected to the rim.

6. In a wheel structure, the combination of a hub, a rim, a pair of disks between said hub and rim, said disks comprising inner converging portions, intermediate substantially parallel portions and outer diverging portions, and a gear secured against one of said disks with its outer periphery substantially in line with the outer edge of the intermediate portion of said disk.

7. In a wheel structure, the combination of a hub, a rim, a pair of disks between said hub and rim, said disks having a plurality of registering openings, sleeves interposed between said disks in line with said openings, bushings within said sleeves and provided with end flanges engaging said disks, a gear and a plurality of bolts extending through said gear and bushings and connecting said gear to said wheel.

8. In a wheel structure, a hub, a rim, a pair of wheel discs between said hub and rim, a spacing ring interposed between said hub and rim and forming a chamber around said hub, said ring having a filling opening therein, and a filling of relatively heavy material introduced into said opening.

9. In a wheel structure, a hub, a rim, a pair of wheel discs between said hub and rim, one of said discs having an opening formed therein, a spacing ring interposed between said discs intermediate said hub and rim and forming a chamber around said hub, and having a filling opening therein adjacent the opening in said disc, and a filling of relatively heavy material introduced into said chamber through said opening.

10. In a wheel structure, a hub, a rim, a

pair of wheel discs between said hub and rim, a gear secured against one of said discs concentric with the axis of the wheel, said discs having alined openings positioned adjacent the toothed surface of said gear, a spacing ring interposed between said discs intermediate said hub and rim and forming a chamber around the hub, said ring having a filling opening adjacent the openings in the discs, and filling material introduced into said chamber through said filling opening.

In testimony whereof, I affix my signature.

JOSEPH LEDWINKA.