

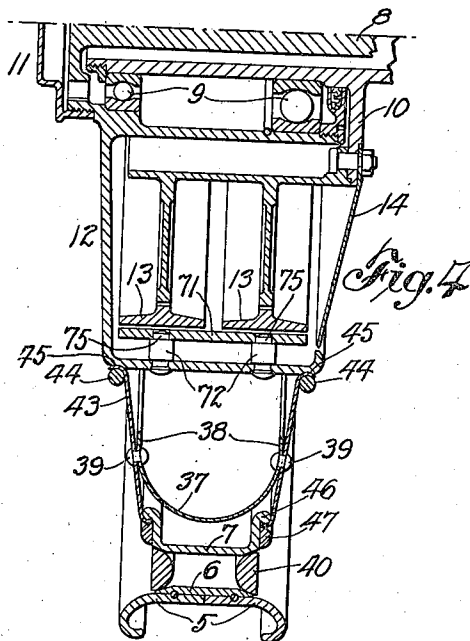
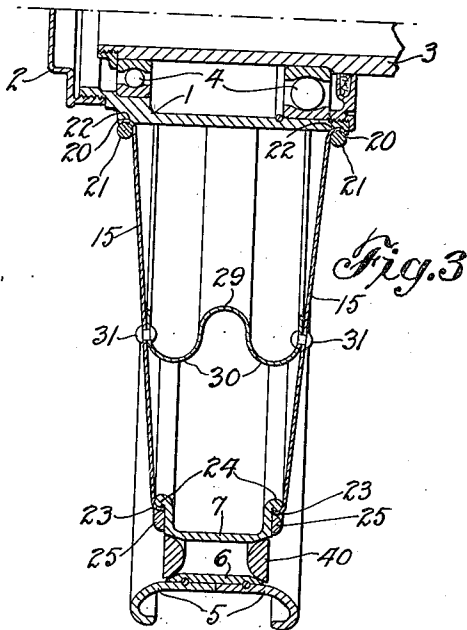
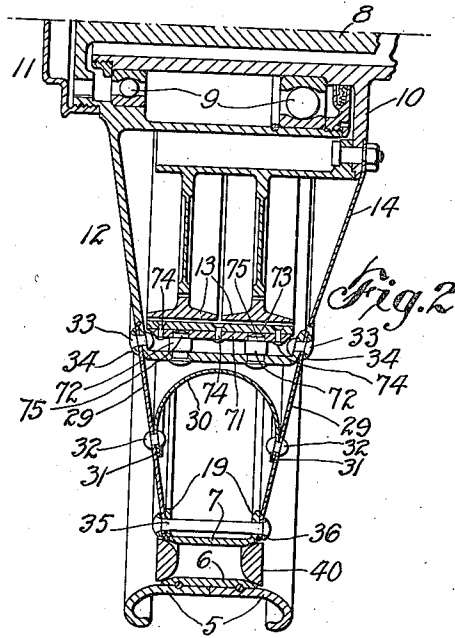
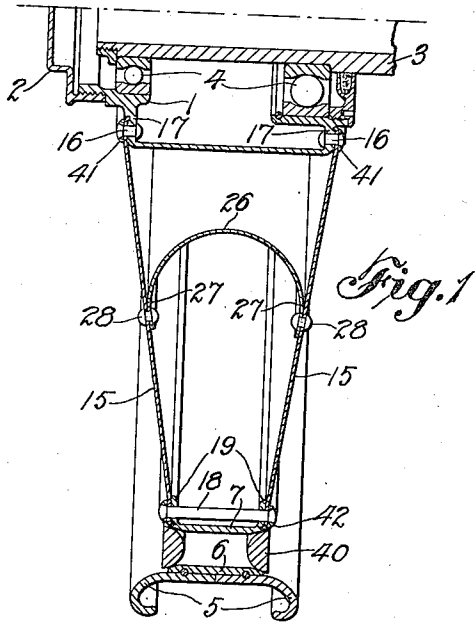
W. J. P. MOORE.
WHEEL.

APPLICATION FILED OCT. 21, 1915.

1,243,751.

Patented Oct. 23, 1917.

2 SHEETS—SHEET 1.

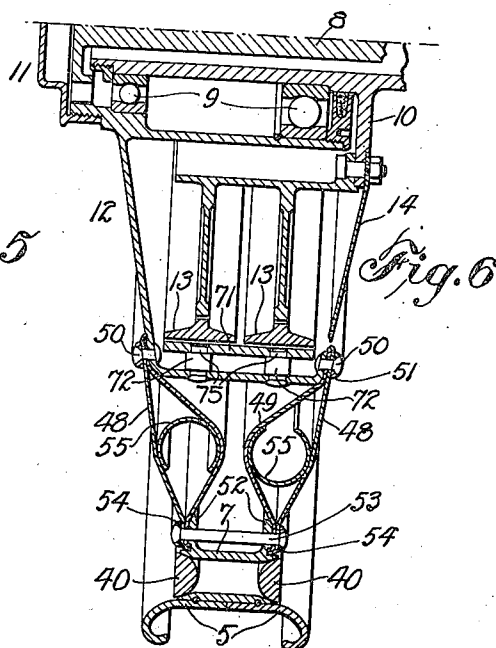
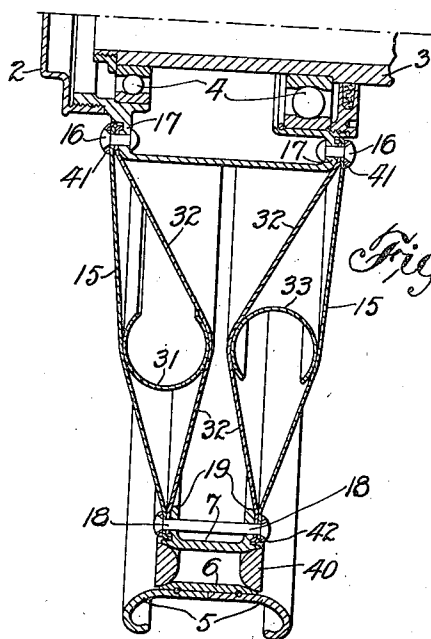


Inventor
William J. P. Moore,
per Chas. A. Wasker,
Att'y.

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Inventor
William J. P. Moore
per Fred A. Wasker
Atty.

UNITED STATES PATENT OFFICE.

WILLIAM J. P. MOORE, OF NEW YORK, N. Y.

WHEEL.

1,243,751.

Specification of Letters Patent.

Patented Oct. 23, 1917.

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To all whom it may concern:

Be it known that I, WILLIAM J. P. MOORE, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Wheels, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention refers to novel and ingenious improvements in wheels of the class particularly referred to as tension wheels wherein suitable metallic disks are held in tension between the rim of the wheel and its hub or central member. The object of the present improvements is to provide more effective bracing and stiffening means for the disks, and means by which they can be more easily assembled or disassembled; together with improved means for more surely holding and tightening the main disks at the point where they are connected to the rim of the wheel. The invention, therefore, consists in the combination of the described means with a pair of disks to brace the same and hold them under the proper tension, together with means for attaching and tightening the disks to the rim, and in various details and peculiarities in the construction, arrangement and combination of the various parts, substantially as will be hereinafter described and then more fully pointed out in the claims.

15 In the accompanying drawing illustrating my invention:

Figure 1 is a radial section of my improved wheel;

Fig. 2 is a similar radial section of a form of the wheel including the brake drum;

40 Fig. 3 is a radial section of a modified form of the bracing means between the disks;

Fig. 4 is a radial section of another modified form of the means for bracing the disks, the same being shown in connection with a form of wheel which includes a brake drum;

45 Fig. 5 is a radial section of a wheel showing a modified form of the bracing means between the disks;

50 Fig. 6 is a similar radial section showing the application of the modified bracing means of Fig. 5 to a form of wheel which includes a brake drum.

Similar characters of reference designate corresponding parts throughout the different figures of the drawing.

The views in Figs. 1, 3 and 5 represent my invention as applied to a wheel to be commonly used as the front wheel of an automobile, the same having the hub 1 on which is a cap 2, while 3 denotes the axle, and 4 the ball bearings within the hub. The rim of the wheel may be of the demountable type having clencher sections 5, clencher band 6, inner ring 7, perforated locking rings 40, with which will be associated the usual parts for holding these elements together in the required manner. It will be noted, however, that in the present application, I am not concerned with the features of the demountable rim, nor of the hub and axle devices, but only to the bracing construction of plates or disks and other parts that lie between the hub or central member of the wheel and its outer encircling rim.

75 In Figs. 2, 4 and 6 I have delineated an embodiment of the mechanical parts of my invention in a form of wheel commonly adapted for use as the rear wheel of an automobile and containing a brake drum, brake shoes, etc. In these figures, 8 denotes the driving shaft, 9 the ball bearings, 10 the axle, 11 the hub cap, which parts are arranged and related in any desired manner, while 12 denotes the brake drum which is adapted to contain the braking parts, as for example, the shoes 13; the inside opening into the drum being covered by a side disk or plate 14. In these Figs. 2, 4 and 6, the rim is the same as that shown in Figs. 1, 3 and 5 whereof I have said that a specimen of demountable rim is illustrated consisting of the clencher sections 5, clencher band 6, inner ring 7, and clamping rings 40.

95 In the combination of parts shown in Figs. 1, 3 and 5, I employ two outer annular disks 15, which in Figs. 1 and 3 are placed at a slight inclination to each other, the space between them being narrower at the edge closest to the rim and wider near the hub, while in Fig. 5 these annular disks are bent to a greater or less extent near the middle points of their width. The inner peripheral edges of these disks 15 in the form shown in Figs. 1 and 5 are secured by bolts or rivets 16 to the flanges 17 on

the inside of hub 1, there being, if desired, washer rings 41 interposed between the outer heads of the rivets or bolts 16 and the adjoining edges of the disks into which 5 washer rings the rivet heads are countersunk; while the outer peripheral edges of the disks 15 are secured by the bolts or rivets 18 to the flanges 19 on the inner ring 7 of the demountable rim, washer rings 42 10 being similarly inserted between the heads of rivets 18 and the disks 15. In Fig. 3 the annular disks 15 have their inner peripheral edges 20 secured to the hub 1 by means of circular rings 21 which are applied in a 15 heated condition and are allowed to cool so as to shrink and thus tightly clamp the edges 20 of the disks to the hub, said hub being preferably provided with shallow grooves 22 into which the rings 21 firmly 20 set the edges 20. The outer peripheral edges of the disks 15 are bent at 23 to engage the flanges 24 of the inner ring 7, and are securely held against said flanges by the circular rings 25 that are applied when 25 hot and allowed to shrink on in cooling, though they may be secured and held in any desired manner. The means interposed between the disks 15 for bracing and securely holding the same differ somewhat in 30 these Figs. 1, 3 and 5, and I will proceed to explain the details of the same for each figure.

In Fig. 1, I employ a circular brace 26, the cross-section of which is an arc that is 35 substantially a semicircle or thereabout, its edges 27 being pressed tightly against the inner adjacent surfaces of the disks 15 and securely riveted thereto by a series of rivets 28 on both sides of the wheel, it being noted 40 that in this form of brace the convexity thereof is toward the hub. A curved circular brace of this kind when securely riveted to the inclined annular disks will make a firm and stiff combination which will have 45 great rigidity and will cause the main disks that carry the weight of the wheel and the car to be kept in a strong tension at all times.

In Fig. 3 I use a circular brace similar 50 to the brace 26, except that in lieu of a single convex member I have convoluted the member so that it is of a triple bent form having a central curvature or convexity 29 which bulges toward the hub, and at each 55 side of which is a convexity 30 lying toward the rim, said convoluted brace being securely placed between the inclined main disks 15 and secured thereto by means of circular rows of rivets 31 on both sides of 60 the wheel. This convoluted or corrugated inner brace for the disks may partake of a great number of different bends and not merely the three illustrated, it being desirable to make the same in accordance with

the results of experience, and it will be 65 found that such a transversely curved, convoluted brace will afford great stiffness, so that the tension of the main disks of the wheel will be at all times maintained.

In Fig. 5 the form of the brace is still 70 further modified. In that figure I have already stated that the outer disks 15 are bent more or less at about their middle points. This is for the purpose of accommodating the inner bracing devices and en- 75 abling the wheel to be tensioned more successfully. Between the outer main annular disks 15 are two other reversely-bent or cone-shaped annular disks 32, the inner peripheral edges of which are secured by the 80 rivets 16 to the flanges 17 between said flanges and the edges of the outer disks 15, while the outer peripheral edges of these inner disks 32 are secured between the flanges 19 of the rim 7 and the edges of the outer 85 disks 15 by means of the rivets or bolts 18. Thus it will be seen that the outer main annular disks 15 and the inner disks 32 provide a pair of duplicate structures within each of which a bracing device may be em- 90 ployed, and for this purpose I select and use circular split tubes 33, one being placed between one outer disk 15 and the adjacent inner disk 32, and the other being placed between the other outer disk 15 and 95 the adjacent inner disk 32. The circular slots in the tubes 33 may vary to a greater or less extent in width, and I do not wish to be confined to any particular form or size therefor, but these slots enable the tubular 100 braces 33 to have considerable spring action outwardly. These braces 33 are inserted between the respective disks at the middle points of the radii of said disks where they will fit into the central bendings of the disks. 105 One way of arranging these split tubes 33 is to place them so that the slots or openings therein will be oppositely located, that slot in one tube 33 being toward the rim of the wheel, and that of the other tube being toward the hub of the wheel, all as clearly indi- 110 cated in Fig. 5, but this is by no means essential and the slots in both tubes may be in the same position if desired. When the parts are assembled, and the bolts are tightened 115 up, the pressure on the tubular braces 33 will be such as to strongly bind the same between the disks, and a stiff and practical tension will be given to the disk members of the wheel, so that a very strong combi- 120 nation will be provided.

In Fig. 2 I have delineated a form of drum-provided driving wheel whose disk-bracing appliance is the same as that shown in Fig. 1; in Fig. 6 I have delineated a 125 drum-provided driving wheel whose disk-bracing appliance is the same as that shown in Fig. 5; while in Fig. 4 I have delineated

a drum-provided driving wheel whose disk-bracing device is similar to that shown in Fig. 2, though not the same.

Referring now to Fig. 2 it will be observed that the drum 12 is surrounded by the annular disks 29, which are much narrower than the disks 15, inasmuch as they occupy only the small space between the drum 12 and the rim of the wheel. These disks 29 are similar in shape, function and inclination to the disks 15, and between them is the convex circular bracing member 30 whose edges 31 are secured to the disks 29 by rivets 32 or other equivalent fastening means, in like manner as the circular convex bracing member 26 is securely fastened to the lateral disks 15 in Fig. 1. These disks 29 are preferably secured to the brake drum 12 by means of rivets 33 in association with circular washer rings 34, and to the rim of the wheel by means of the rivets or bolts 35 and circular washer rings 36 which fasten the outer peripheral edges of the rings 29 to the flanges 19 of the inner ring 7 belonging to the rim of the wheel. The convexity of the circular brace 30 in this case is toward the brake drum in like manner as the circular brace 26 in Fig. 1 bulges toward the hub.

In Fig. 4, however, I employ a circular convex bracing member 37 which bulges toward the rim of the wheel; and whereas in Figs. 1 and 2 the edges of the members 26 and 30 are flexed inwardly so as to lie closely against the outwardly converging faces of the main disks, yet in Fig. 4 the circular brace 37 has its inner edges 38 for a short distance running substantially parallel to each other beyond the rivets 39 by which these edges 38 are securely fastened to the main annular disks 43, since the said disks 43 are inwardly diverging at the points opposite the edges 38, viewing the same in the direction in which these edges 38 project, it being recollected that the convexity of the member 37 is toward the rim of the wheel. Further, it will be noted that in Fig. 4 the annular disks 43, although substantially like the disks 29 of Fig. 2 in nearly every respect, are not secured to the drum and to the rim by means of rivets, but are bent at their inner and outer peripheral edges so as to be secured at their inner edges to the brake drum 12 by means of the circular wires 44 that are applied in a heated state and allowed to cool and thus shrink against the bent edges of the disks and bind the latter closely against the drum 12, preferably forcing these edges into shallow recesses 45 in said drum; and also the outer peripheral edges of the disks 43 are bent with a suitable curved bending so as to engage the flanges 46 of the rings 7 belonging to the rim of the wheel, said bent edges of

the disk 43 being securely held by the circular wires 47 which are applied to the flanges 46 in a heated state and allowed to cool and shrink upon said flanges, thereby binding the edges of disks 43 to said flanges in a secure and immovable way.

In Fig. 6 I have shown the same bracing instrumentalities made use of in Fig. 5 applied to the brake drum construction of wheel. In this form of the invention the outer annular disks 48 are bent near their middle portions, and between them are interposed reversely-bent or cone-shaped annular disks 49, said disks 48 and 49 being secured to the brake drum 12 by means of rivets 50 and circular washer rings 51 and being secured likewise to the flanges 52 of the ring 7 belonging to the wheel rim by means of rivets or bolts 53 and washer rings 54. Between each disk 48 and its adjacent inner disk 49 I place a split circular tube 55, one of which is shown as having its slot toward the hub of the wheel and the other toward the rim, these split tubes being circular in form and applied to the disks 48 and 49 in such a way that they will closely fit within the bends or bulges of the latter, and thus make a tight and effective tensioned construction for the annular disks, the effect being the same therefore in making a stiff and unyielding tension wheel in the case of a wheel having a brake drum as is found to be the case with the other construction of wheel without a brake drum, as shown in Fig. 5.

All the various inner circular bracing members, irrespective of the particular form, consist of spring pieces that have been properly tempered so as to have a spring-like or elastic character, and they are arranged so as to put a tension upon the said disks, either by drawing said disks toward each other or by pressing them apart, as the case may be, for it will be manifest that when these circular curved spring members are riveted to the two disks in the process of assembling and the disks are then connected to the inner and outer members of the wheel, these spring bracing parts will be allowed to press in against the disks or expand outwardly against them so that a very strong tension will be placed upon the disks and this tension will be constantly maintained.

Referring to the brake drums 12 and the shoes 13 therein, it will be noted that I have illustrated an auxiliary ring 71 placed a short distance within the outer circular wall of the brake drum by means of spacing pins 72 which are riveted to the wall of drum 12 and which have the opposite ends formed with reduced portions 75 which enter perforations in the ring 71, the same being a split ring. This auxiliary ring 71

provides a wearing surface for the shoes as a substitute for the ordinary wearing surface on the inside of the drum and permits an easy removal and substitution of such wearing surface since all that it is necessary to do when the ring 71 is worn out is to collapse the ring 71 and remove it and insert a new one in place thereof; said ring 71 moreover may be provided with a lining as shown at 73 in Fig. 2, said lining 73 being of asbestos, or any other suitable material, and being fastened to the auxiliary ring 71 by means of rivets or bolts 74. When said lining is worn out it can be removed and the ring 71 relined with ease and effectiveness.

Many changes in the precise construction and arrangement of the various parts may be made without exceeding the scope of my invention, and I desire the liberty of making all such changes as may be found useful and desirable in the practical construction and operation of the invention.

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

1. In a wheel, the combination with the central member thereof and the outer rim, of a pair of annular disks secured to the central member and also to the rim, and a bracing member intermediate the disks, and consisting essentially of a circular transversely-curved member, said member being properly tempered so as to have a spring-like character and thus place a tension upon the disks.

2. In a wheel, the combination with the central member thereof and the outer rim, of a pair of annular disks secured to the central member and also to the rim, and a bracing member intermediate the disks and consisting of a circular curved member having its outer edges pressing firmly with a spring action against the annular disks.

3. In a wheel, the combination with the central member thereof and the outer rim, of a pair of annular disks secured to the central member and also to the rim, a tension device for the wheel consisting of a

circular transversely-curved member intermediate of the disks at points substantially midway between the central member and the outer rim, said transversely curved member having its outer edges pressing firmly with a spring action against the annular disks.

4. In a wheel, the combination with the central member and the outer rim, of a pair of annular outer disks, and a pair of annular inner disks, all of said disks being secured to the central member and also to the rim, and tension devices for regulating the tension of the several parts consisting of circular split tubes placed between the inner and outer disks.

5. In a wheel, the combination with the central member and the outer rim, of a pair of annular outer disks and a pair of annular inner disks, all of said disks being secured to the central member and also to the rim, and tension devices for regulating the tension of the several parts consisting of transversely-curved circular members located between the inner and outer disks at points substantially midway of their width.

6. In a wheel, the combination with the central member and the rim, of a pair of bent outer disks, a pair of inner cone-shaped disks, all of said disks being secured at their inner peripheries to the central member, and at their outer peripheries to the rim, and resilient bracing means for said disks consisting of circular split tubes placed between the inner and outer disks and fitting into the bent portions thereof.

7. In a wheel, the combination with a central member and a rim, of a pair of bent outer disks, a pair of inner cone-shaped bracing disks, all of said disks being secured at their inner peripheries to the central member and at their outer peripheries to the rim, and tensioning means for the several disks consisting of circular transversely-curved spring braces located between the inner and outer disks and engaging the bent portions thereof.

In testimony whereof I affix my signature.

WILLIAM J. P. MOORE.