C. KEHR.

WHEEL.

APPLICATION FILED JULY 29, 1910.

1,009,151. Patented Nov. 21, 1911.

2 SHEETS—SHEET 1.

Fig. 1.

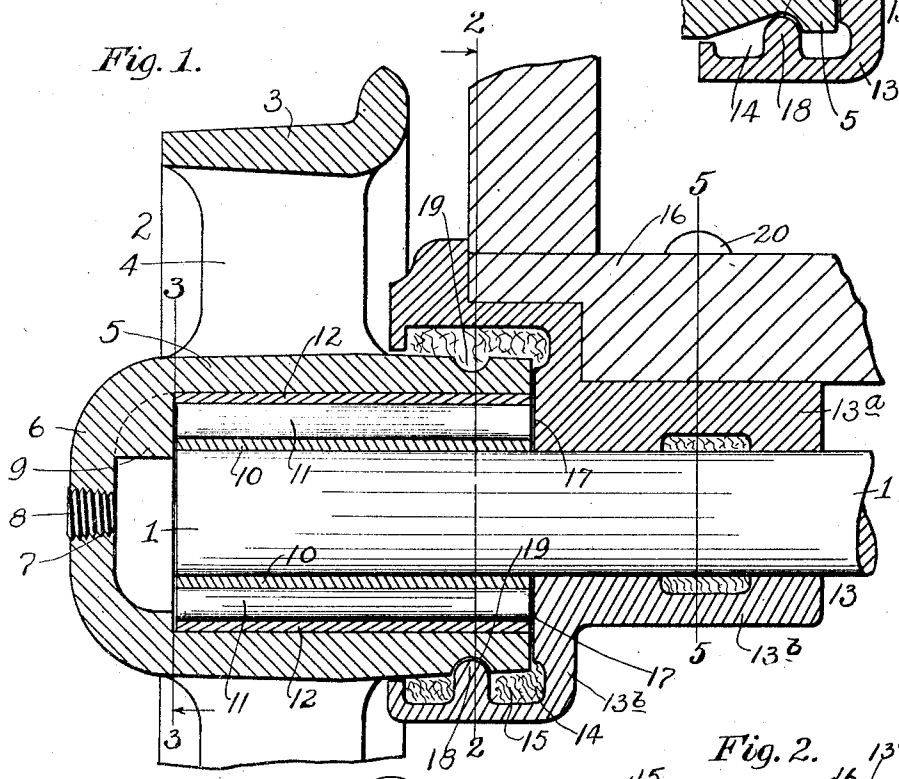


Fig. 4.

Fig. 2.

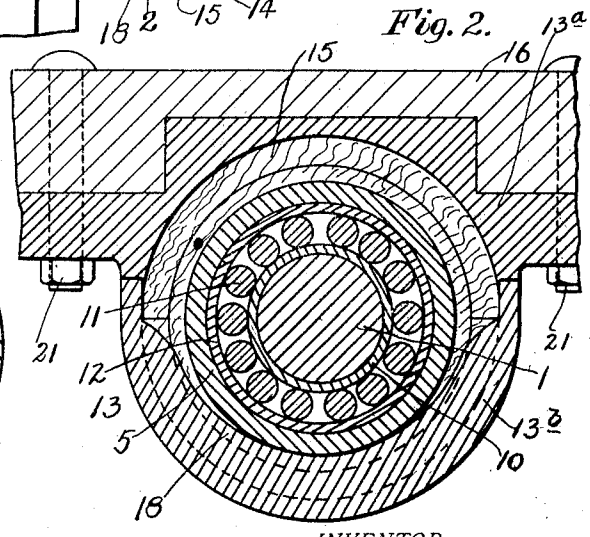
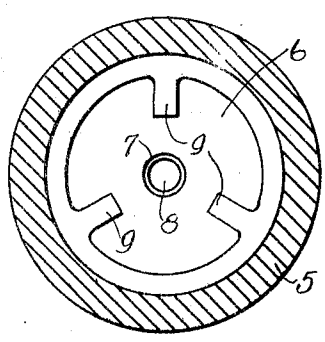


Fig. 3.



WITNESSES

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2 SHEETS—SHEET 2.

Fig. 5.

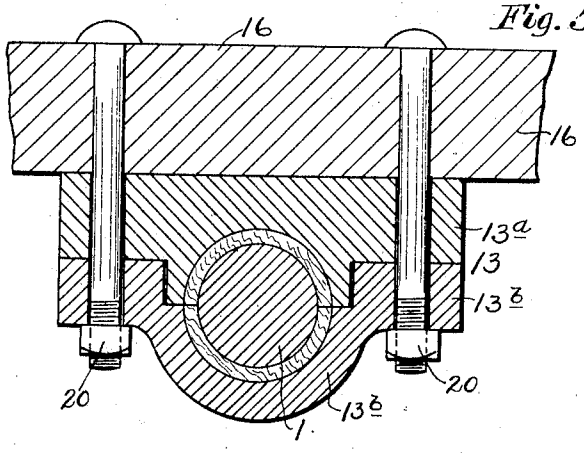


Fig. 7.

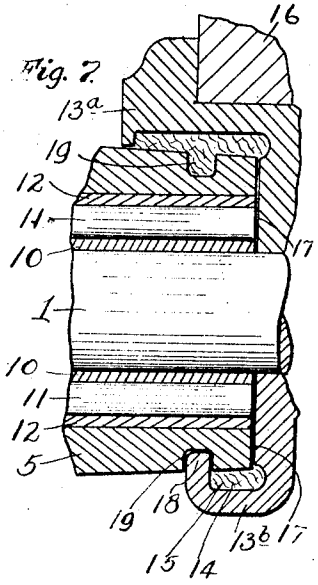


Fig. 8.

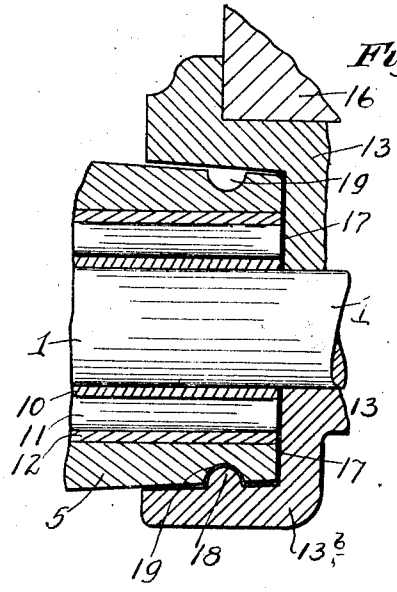
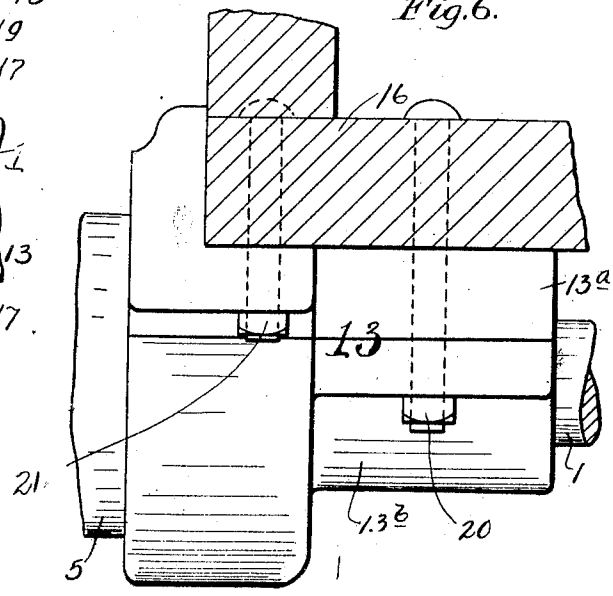


Fig. 6.



WITNESSES

Carrie P. Ivy

Wm Whaley

INVENTOR

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UNITED STATES PATENT OFFICE.

CYRUS KEHR, OF KNOXVILLE, TENNESSEE, ASSIGNOR TO SANFORD-DAY IRON WORKS, OF KNOXVILLE, TENNESSEE, A CORPORATION OF TENNESSEE.

WHEEL.

1,009,151. Specification of Letters Patent. Patented Nov. 21, 1911.

Application filed July 29, 1910. Serial No. 574,556.

To all whom it may concern:

Be it known that I, CYRUS KEHR, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented a new and useful Improvement in Wheels, of which the following is a specification, reference being had to the accompanying drawing.

My improvement relates generally to wheels, pulleys, etc., arranged to rotate upon one end of a shaft or axle. The improvement is specially applicable to mine cars and similar cars in which the axles are secured to the car body while the wheels are secured rotatably around the ends of the axles.

The object of the invention is (1) to provide an efficient means for holding the wheel on the axle without drilling or grooving the latter, and at the same time providing for the ready removal of the wheel from the axle without removing the entire pedestal or bearing box, (2) to provide for such removal of the wheel while the wheel is a single casting without loose caps or other parts, and (3) to provide a construction requiring a minimum of machine work and which is at the same time practically dust and oil tight, to the end that oil or similar lubricant may be constantly kept within the hub and dust, cinders, etc., excluded therefrom.

In the accompanying drawings, Figure 1 is a horizontal upright section of a car structure embodying my improvement; Fig. 2 is a section on the line 2—2 of Fig. 1, looking toward the right; Fig. 3 is a section on the line 3—3 of Fig. 1, looking toward the left; Fig. 4 is a detail section of a portion of the hub and lower half of the bearing box; Fig. 5 is a section on the line 5—5 of Fig. 1; Fig. 6 is a sectional side elevation, the view being perpendicular to the axle; Fig. 7 is a sectional detail view showing a modification of the lower section of the bearing box; Fig. 8 is a detail section showing a modification of both sections of the bearing box.

For convenience in description, the side or portion of the wheel directed away from the car will be herein designated the "front" side or portion, while the opposite side or portion will be termed the "rear" side or portion.

In the particular form of the structure shown by the drawings, 1 is one end of a car axle which is secured to the car body. The bearing surface of this axle is of plane cylindrical form and the entire axle is preferably of such form, for then no machine work is required thereon other than cutting the end smoothly in a plane to which its axis is perpendicular. The wheel, 2, has a rim, 3, spokes, 4, and a hub, 5. The body of the hub is cylindrical and it has an interior cylindrical chamber extending from the rear end to the front end of the hub, the rear end being open to the same diameter as the interior chamber. Across the front end of said hub extends an end wall, 6, which is cast integral with the remainder of the hub. Through the center of said end wall extends an aperture, 7, into which is fitted a screw plug, 8. Said aperture is designed for the introduction of lubricant. On the inner face of said wall are three shoulders or abutments, 9, equi-distant from each other and bearing against the end of the shaft, 1. A sleeve, 10, surrounds the shaft, 1, from the end of the latter to the plane of the end of the hub, said sleeve preferably fitting said axle loosely enough to turn and permit easy removal. Around said sleeve is a series of anti-friction rollers, 11, as long as the sleeve. Surrounding said rollers is another sleeve, 12, which is of the same length as said rollers and the sleeve, 10. Said sleeves and said rollers bear by their front ends against said abutments, 9. At its rear, said hub is extended a suitable distance to enter a bearing box, 13, having an annular packing groove, 14, in which is packing, 15, for preventing the passage of oil, dust, or water. The box, 13, is formed of cast metal and secured to the car body, 16. And said box consists of an upper section, 13^a, and a lower section, 13^b. Upright bolts, 20, extend through the car body and both of said sections for securing said box firmly to the car body. And forward of said bolts, 20, shorter bolts, 21, extend through flanges, 22, on the upper bearing box section, 13^a, and through the car body, 16, whereby said bearing box section, 13^a, is secured to the car body, 16, independently of the lower bearing box section, 13^b. Each section of the bearing box has an inner, upright, flat face, 17, in the same plane with such face of the other section, and said faces together form an abutment for the rear end of the hub and the rear ends of the sleeves, 10 and 12, and the

anti-friction rollers, 11. It has already been pointed out that the front ends of the axle and said sleeves and rollers bear against the abutments, 9, in the front end of the hub. To maintain this position of these parts, a key rib or lip, 18, directed toward the axle and concentric thereto, is formed on the lower section, 13b, in the packing groove, 14; and in the hub is formed a circumferential groove, 19, receiving said key rib or lip. The packing, 15, is, of course, divided by said rib or lip.

As will be readily understood from an inspection of the drawings, the hub is free to turn, the grooved portion thereof slipping on said rib or lip, but the latter prevents the hub from slipping endwise. It is to be observed that the essential part of said groove is the rear face thereof; for it is necessary only that the rib or lip hold the hub from moving forward (toward the left) and for this it is sufficient if there is an annular shoulder such as is presented by the rear wall or face of said groove. In Fig. 4 the slope of the forward portion of the groove is such as to leave practically only the one shoulder.

It will be observed that the wheel can be removed from the axle by merely loosening the nuts on the bolts, 20, sufficiently to allow the lower box section, 13b, to descend for the release of the rib or lip, 18, from the groove, 19, the upper box section being allowed to retain its position, secured by the shorter bolts, 21, while the longer bolts, 20, remain in place therein.

The only machine work needed by the wheel is the finishing of the hub chamber and the threading of the aperture, 7. This calls for only easy and simple lathe work.

The bearing box and the rib or lip together constitute mechanism abutting against the inner end of the roller bearing mechanism and the hub and engaging the hub against movement on the axle away from the bearing box.

In Fig. 7, the portion of the lower section of the bearing box in front of the rib or lip, 18, is omitted. In Fig. 8, the packing groove, 14, and the packing, 15, are omitted from both sections of the bearing box, the rib or lip, 18, being retained on the lower section, and the upper section having an inner face extending across the groove, 19, without entering the same. In each of these modifications, the faces, 17, of the bearing box and the key rib or lip, 18, coöperate for maintaining the position of the wheel; and in each of said forms, the wheel may be removed by merely loosening the bolts, 20, and lowering the lower bearing box section, 13b, far enough to release the rib or lip, 18, from the groove, 19.

I claim as my invention:

1. In a structure of the nature described, an axle, a wheel having a hub surrounding said axle and having an annular circumferential shoulder, and a bearing box surrounding said axle and the adjacent end of said hub and comprising an upper section resting wholly outside the cylindrical extension of said shoulder and a lower cast metal section having a portion formed integral therewith and engaging said shoulder, and means for detachably securing said lower section against said upper section, substantially as described.

2. In a structure of the nature described, an axle, a wheel having a hub surrounding said axle and having an oil inlet and an annular circumferential shoulder, and a bearing box surrounding said axle and the adjacent end of said hub and comprising an upper section resting wholly outside the cylindrical extension of said shoulder and a lower cast metal section having a portion formed integral therewith and engaging said shoulder, and means for detachably securing said lower section against said upper section, substantially as described.

3. In a structure of the nature described, an axle, a wheel having a hub surrounding said axle and abutting against the end of said axle and having an annular circumferential shoulder, a bearing box surrounding said axle and the adjacent end of said hub and comprising an upper section resting wholly outside the cylindrical extension of said shoulder and a lower cast metal section having a portion formed integral therewith and engaging said shoulder, and means for detachably securing said lower section against said upper section, substantially as described.

4. In a structure of the nature described, an axle, a wheel having a hub surrounding said axle and extending over its outer end and having an annular circumferential shoulder, a bearing box surrounding said axle and the adjacent end of said hub and comprising an upper section resting wholly outside the cylindrical extension of said shoulder and a lower cast metal section having a portion formed integral therewith and engaging said shoulder, and means for detachably securing said lower section against said upper section, substantially as described.

5. In a structure of the nature described, an axle, anti-friction mechanism, a wheel having a hub surrounding said axle and said anti-friction mechanism and having an annular circumferential shoulder, a bearing box surrounding said axle and the adjacent end of said hub and comprising an upper section resting wholly outside the cylindrical extension of said shoulder and a lower cast metal section having a portion formed integral therewith and engaging said shoulder, and means for detachably securing said

lower section against said upper section, substantially as described.

6. In a structure of the nature described, an axle, a wheel having a hub surrounding said axle and having an annular circumferential shoulder, a bearing box surrounding said axle and the adjacent end of said hub and having an annular packing groove and comprising an upper section resting wholly outside the cylindrical extension of said shoulder and a lower cast metal section having a portion formed integral therewith and engaging said shoulder, and means for detachably securing said lower section against said upper section, substantially as described.

7. In a structure of the nature described, an axle, a wheel having a hub surrounding said axle and having an annular circumferential shoulder, a bearing box surrounding said axle and the adjacent end of said hub and having an annular packing groove and comprising an upper section resting wholly outside the cylindrical extension of said shoulder and a lower cast metal section having adjacent said packing groove a portion formed integral therewith and engaging said shoulder, and means for detachably securing said lower section against said upper section, substantially as described.

8. In a structure of the nature described, an axle, a wheel having a hub surrounding said axle and having an annular circumferential shoulder, a bearing box surrounding said axle and the adjacent end of said hub and having a packing groove and comprising an upper section resting wholly outside the cylindrical extension of said shoulder and a lower cast metal section having in said packing groove a portion formed integral therewith and engaging said shoulder, and means for detachably securing said lower section against said upper section, substantially as described.

In testimony whereof I have signed my name, in presence of two witnesses, this 18th day of July, in the year one thousand nine hundred and ten.

CYRUS KEHR.

Witnesses:
C. A. MORSE,
CARRIE R. IVY.