Aug. 24, 1926. 1,596,938

P. E. MOORE ET AL

WHEEL AND AXLE

Filed August 20, 1925 3 Sheets-Sheet 1

Fig. 2.

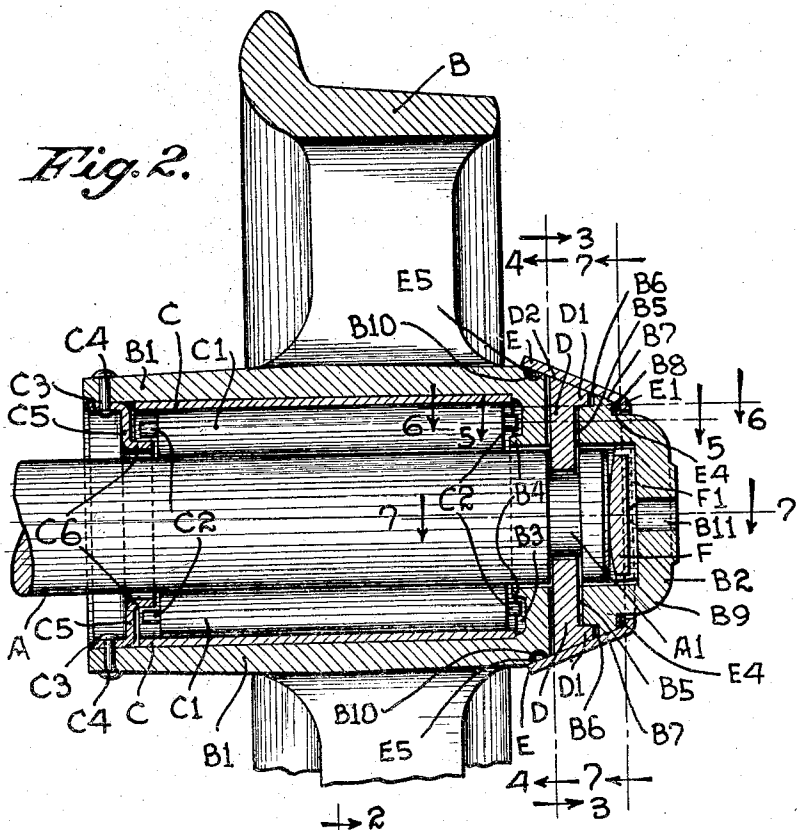
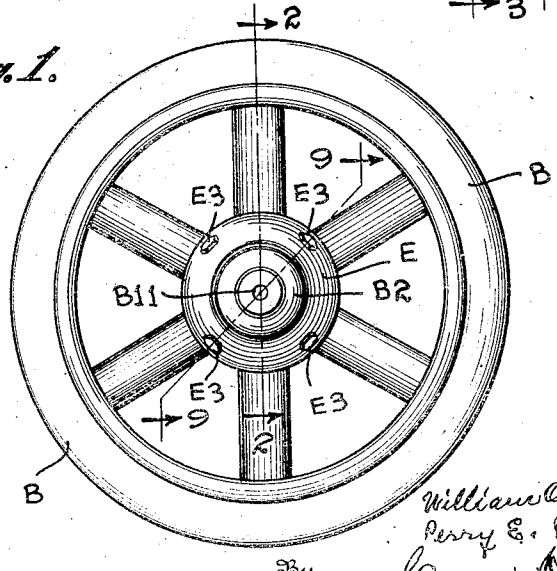


Fig. 1.



Inventor

William O. McKamey,
Perry E. Moore
By Cyrus Keller
Attorney

Aug. 24, 1926. 1,596,938

P. E. MOORE ET AL

WHEEL AND AXLE

Filed August 20, 1925 3 Sheets-Sheet 2

Fig. 3.

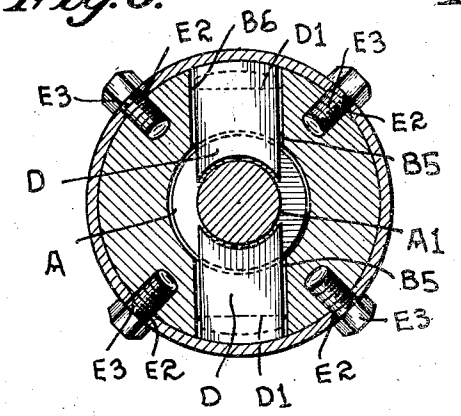


Fig. 4.

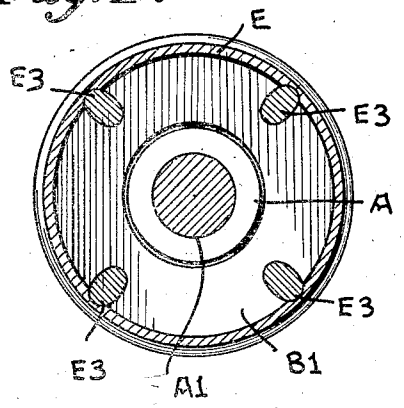


Fig. 6.

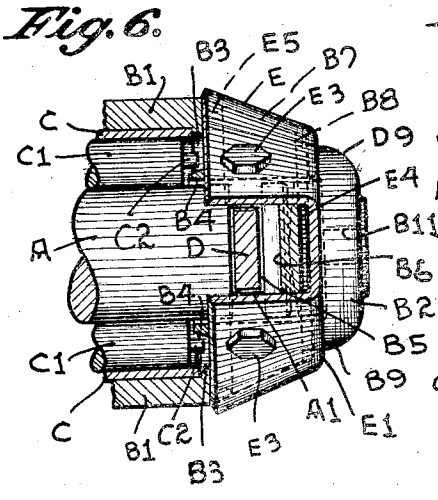
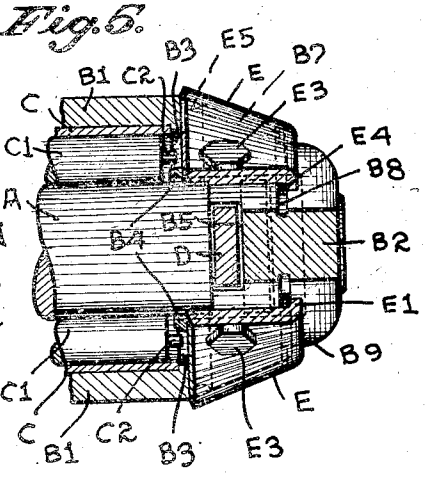


Fig. 6.



Inventor

William O. McKamey
Perry E. Moore

By Cyrus Kehr

Attorney

Aug. 24, 1926. 1,596,938

P. E. MOORE ET AL

WHEEL AND AXLE

Filed August 20, 1925 3 Sheets-Sheet 3

Fig. 7.

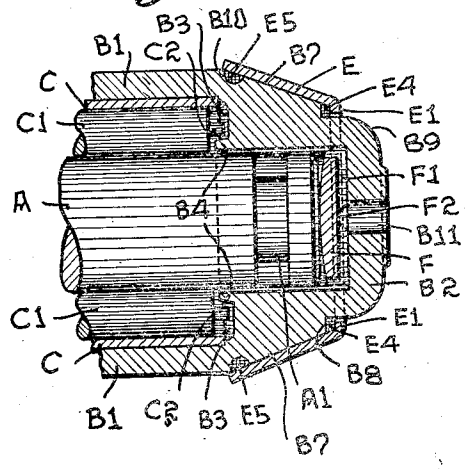


Fig. 9.

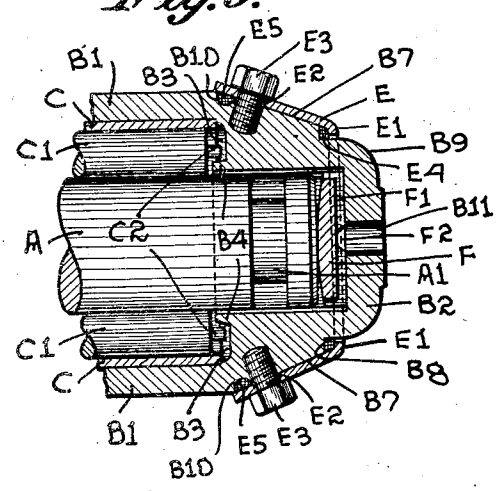


Fig. 8.

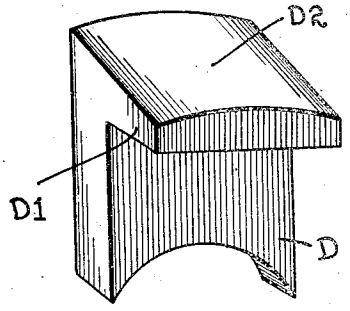


Fig. 10.

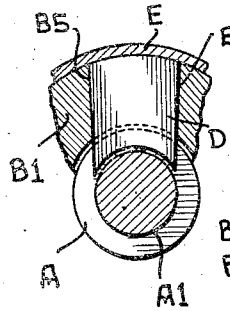


Fig. 11.

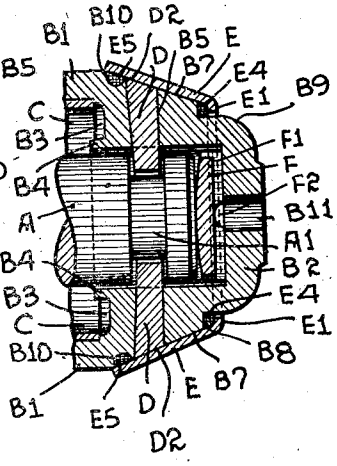


Fig. 12.

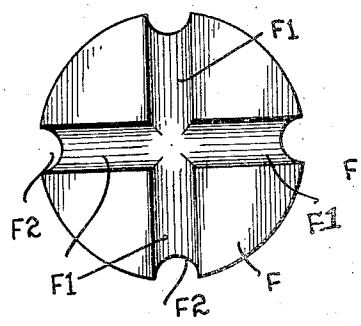
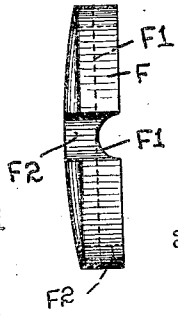


Fig. 13.



Inventors

William O. McKinney

Perry E. Moore

By Cyrus Keller

Attorney

Patented Aug. 24, 1926. 1,596,938

UNITED STATES PATENT OFFICE.

PERRY E. MOORE AND WILLIAM O. McKAMEY, OF KNOXVILLE, TENNESSEE.

WHEEL AND AXLE.

Application filed August 20, 1925. Serial No. 51,402.

This invention relates particularly to such wheels and axles as are used on mine cars and similar railway cars; but it will be seen that this improvement may be otherwise applied.

The object of the invention is to provide improved means for mounting the wheel on the axle and securing the wheel to the axle and to make provision for lubricating the axle and the parts bearing thereon.

In the form shown by the drawings, all the means for holding the wheel against endwise movement on the axle, in either direction, are applied at the end of the axle, means for making engagement between the axle and the inner end of the hub being absent.

In the accompanying drawings,

Fig. 1 is an elevation of the outer face of a wheel to which my improvement is applied;

Fig. 2 is an upright section on the line, 2—2, of Fig. 1;

Fig. 3 is a section on the line, 3, 4—3, 4, of Fig. 2, looking toward the right;

Fig. 4 is a section on the line, 3, 4—3, 4, of Fig. 2, looking toward the left;

Fig. 5 is a horizontal section on the line, 5—5, of Fig. 2;

Fig. 6 is a horizontal section on the line, 6—6, of Fig. 2;

Fig. 7 is an upright, transverse section on the line 7—7, of Fig. 2;

Fig. 8 is a perspective of one of the keys;

Fig. 9 is an oblique section on the line, 9—9, of Fig. 1, looking in the direction of the arrow;

Figs. 10 and 11 are detail views illustrating other shapes of the hub walls to engage the keys;

Fig. 12 is an elevation of a disc placed at the end of the axle;

Fig. 13 is a view looking at the edge of said disc.

Referring to said drawings, A is an axle of ordinary form and having at its outer end a circumferential channel, A^1, to receive keys, D.

B is a wheel having a hub, B^1, surrounding the axle. As an integral part of the hub, an end wall, B^2, extends across the end of the axle and has its inner face positioned to bear against the disc, F, as herein described. The part of the hub surrounding the axle adjacent the end wall at each side of the channel. A^1, is contracted to nearly meet the surface of the axle. From said contracted part of the outer end of the hub, the hub is extended to make room for a tubular lining, C, and anti-friction rollers, C^1, bearing on the axle and having at each end a small journal, C^2. At the outer (right hand) ends of these rollers, the hub has an annular channel, B^3, into which the adjacent journals, C^2, extend. At the inner end of the hub a ring, C^3, is fitted against the inner face of the hub and secured to the hub by means of rivets or screws, C^4. Said ring has a transverse flange, C^5, extending toward the axle. On the inner part of said flange is another flange, C^6, turned toward the outer end of the hub and serving to engage the adjacent journal, C^2, when the wheel and hub are removed from the axle. At the same time, the journals, C^2, at the outer ends of the rollers, C^1, are engaged by the flange or lip, B^4, forming the inner wall of the channel, B^3. Thus the wheel and hub may be removed from the axle without displacing the rollers from the hub.

In the transverse plane cutting the annular channel, A^1, of the axle, the hub is provided with radial apertures, B^5, into which are placed keys, D. The drawings show two such apertures placed diametrically opposite each other. At the outer side of each aperture, B^5, and at the outer face of the hub, the aperture, B^5, is extended laterally (toward the end wall, B^2) to form a recess, B^6. The outer end of each key, D, has a lateral extension, D^1. Each key extends into one of the apertures, B^5, the extension, D^1, resting in the recess, B^6, whereby the movement of the key toward the axle or into the channel, A^1, is limited. The length of the key is limited so as to prevent the inner end of the key from making contact with the neck of the axle formed by forming the channel, A^1. This is for the purpose of preventing the keys from wearing the axle neck to a smaller diameter. It will be understood that such wearing would weaken said neck. The inner end of each key is curved to conform approximately to the curvature of the axle neck. The part of the hub, B^7, at each side of the plane cutting the apertures, B^5, is tapering or oblique to resemble a truncated cone. At the outer end of said slanting face is

an annular face or shoulder, B^8, in a plane to which the axle is perpendicular. Between said shoulder and the end wall, B^2, the hub has a cylindrical part, B^9.

The outer ends of the keys, D, are provided with slanting faces, D^2, which are even with the slanting face, B^7, of the hub when the keys are in the working position. A cap, E, surrounds the part, B^9, of the hub and has a flange, E^1, parallel to the face or shoulder, B^8. The main part of said cap extends over the oblique face, B^7, of the hub and bears against said face and lies over the outer ends, D^2, of the keys, D. Four cap screws, E^3, extend through apertures, E^2, formed in said cap and into the adjacent wall of the hub. Between the flange, E^1, and the shoulder, B^8, is an annular packing, E^4, which serves to prevent the outward passing of lubricant and to prevent the inward moving of dust and dirt. Under the other edge of the cap, E, a circumferential channel, B^{10}, is formed on the outer face of the hub. Said channel receives packing, E^5, to prevent outward movement of lubricant and inward movement of dust and dirt.

Fig. 10 shows the part, D^1, of the key omitted and the outer end of each aperture, B^5, is made wider in the transverse plane of the axle, and the outer parts of the keys are correspondingly widened. By this means the tapering keys are held by the slanting faces of the apertures, whereby the keys are prevented from bearing on the neck of the axle in the channel, A^1.

In Fig. 11, the parts are the same as in Fig. 10, excepting that another face in the aperture is made slanting for supporting the key away from the axle neck.

Between the end wall, B^2, and the end of the axle is a disc, F, which serves as a buffer between said walls and the axle when there is end thrust. Said disc is chilled to make it hard and adapted to endure wear. The face which makes contact with the axle is preferably made slightly convex as shown by the drawing. On the axial line of the hub the wall, B^2, has a port, B^{11}, for the introduction of lubricant. The face of the disc, F, which meets the wall, B^2, is provided with channels, F^1, which extend from the middle of the disc to its periphery. At the outer ends of the channels, F^1, the disc has notches, F^2. These channels and notches allow flow of lubricant from the port, B^{11}, to the axle, and thence around the axle to and around the rollers, C^1. Any suitable closing plug or similar device (not shown) may be placed into the port, B^{11}.

In order that the hub end wall, B^2, may press the disc, F, against the end of the axle, the channel, A^1, is to be wide enough to allow slight movement of the keys parallel to the axle.

We claim as our invention:—

1. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having a radial aperture in the plane of the axle channel, a key seated in said aperture and supported by the hub and extending into said channel without bearing on the axle neck, and means for keeping said key in said aperture, substantially as described.

2. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having a radial aperture in the plane of the axle channel, a key having a lateral extension and seated in said aperture and supported by the hub and extending into said channel without bearing on the axle neck, and means for keeping said key in said aperture, substantially as described.

3. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having a radial aperture in the plane of the axle channel, a key seated in said aperture and supported by the hub and extending into said channel without bearing on the axle neck, a cap surrounding the adjacent part of the hub and extending across the outer end of the key, and means for securing the cap to the hub, substantially as described.

4. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having a radial aperture in the plane of the axle channel, a key having a lateral extension and seated in said aperture and supported by the hub and extending into said channel without bearing on the axle neck, a cap surrounding the adjacent part of the hub and extendiing across the outer end of the key, and means for securing the cap to the hub, substantially as described.

5. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having a plurality of radial apertures in the plane of the axle channel, a key seated in each of said apertures and supported by the hub and extending into said channel without bearing on the axle neck, and means for keeping said keys in said apertures, substantially as described.

6. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having a plurality of radial apertures in the plane of the axle channel, keys having lateral extensions and seated in said aperture and supported by the hub and extending into said channel without bearing on the axle neck, and means for keeping said keys in said apertures, substantially as described.

7. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub

having an end wall and extending around the axle and having a radial aperture in the plane of the axle channel, a key seated in said aperture and supported by the hub and extending into said channel without bearing on the axle neck, means for keeping said key in said aperture and supported by the hub, and a hardened disc between the end of the axle and the end wall of the hub, substantially as described.

8. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having an end wall in which is a lubricant port and extending around the axle and having a radial aperture in the plane of the axle channel, a key seated in said aperture and supported by the hub and extending into said channel without bearing on the axle neck, means for keeping said key in said aperture, and a channel disc between the end of the axle and the end wall of the hub, substantially as described.

9. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having a radial aperture in the plane of the axle channel, a key seated in said aperture and supported by the hub and extending into said channel without bearing on the axle neck, and retaining means extending over the outer end of the key, substantially as described.

10. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having a radial aperture opposite said channel, a key extending into said aperture from the outer face of the hub and into said channel, and a key-retaining member separate from the key, substantially as described.

11. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having a radial aperture opposite said channel, a key extending into said aperture from the outer face of the hub and into said channel, and retaining means separate from the key and engaging the outer part of the key, substantially as described.

12. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having a radial aperture opposite said channel, and a key extending into said aperture and into said channel and formed for supporting engagement with the hub wall, substantially as described.

13. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having a radial aperture opposite said channel, said aperture being larger at its outer end than at its inner end, and a key larger at its outer end than at its inner end and resting in said aperture and supported by the hub and extending into said channel, substantially as described.

14. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a hub having a radial aperture opposite said channel, said aperture being larger at its outer end than at its inner end, a key larger at its outer end than at its inner end and resting in said aperture and supported by the hub and extending into said channel, and a retaining member supported by the hub and extending over the outer end of the key, substantially as described.

15. In a structure of the kind described, the combination with an axle having a circumferential channel near its end, of a surrounding member extending across and around the end of the axle and having a radial aperture opposite said channel, and a key extending into said aperture and into said channel radially to the axle and formed for supporting engagement with said surrounding member, substantially as described.

In testimony whereof we have signed our names, this 15th day of August, in the year one thousand nine hundred and twenty-five.

PERRY E. MOORE.
WILLIAM O. McKAMEY.