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GROOVED WHEEL FOR MONORAILWAY AND TRAMWAY SYSTEMS.  
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925,106.

Patented June 15, 1909.

Fig.1.

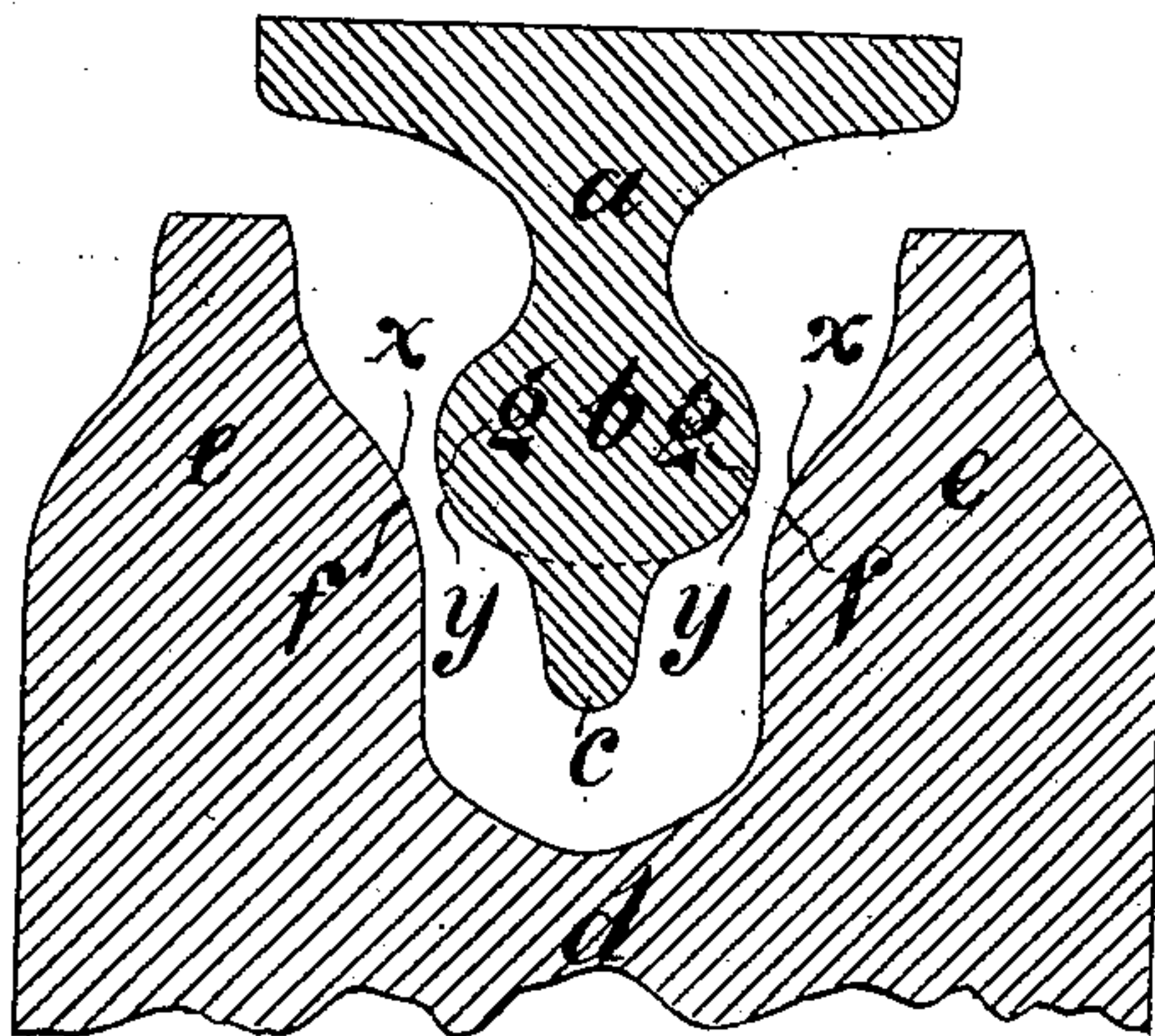


Fig.3.

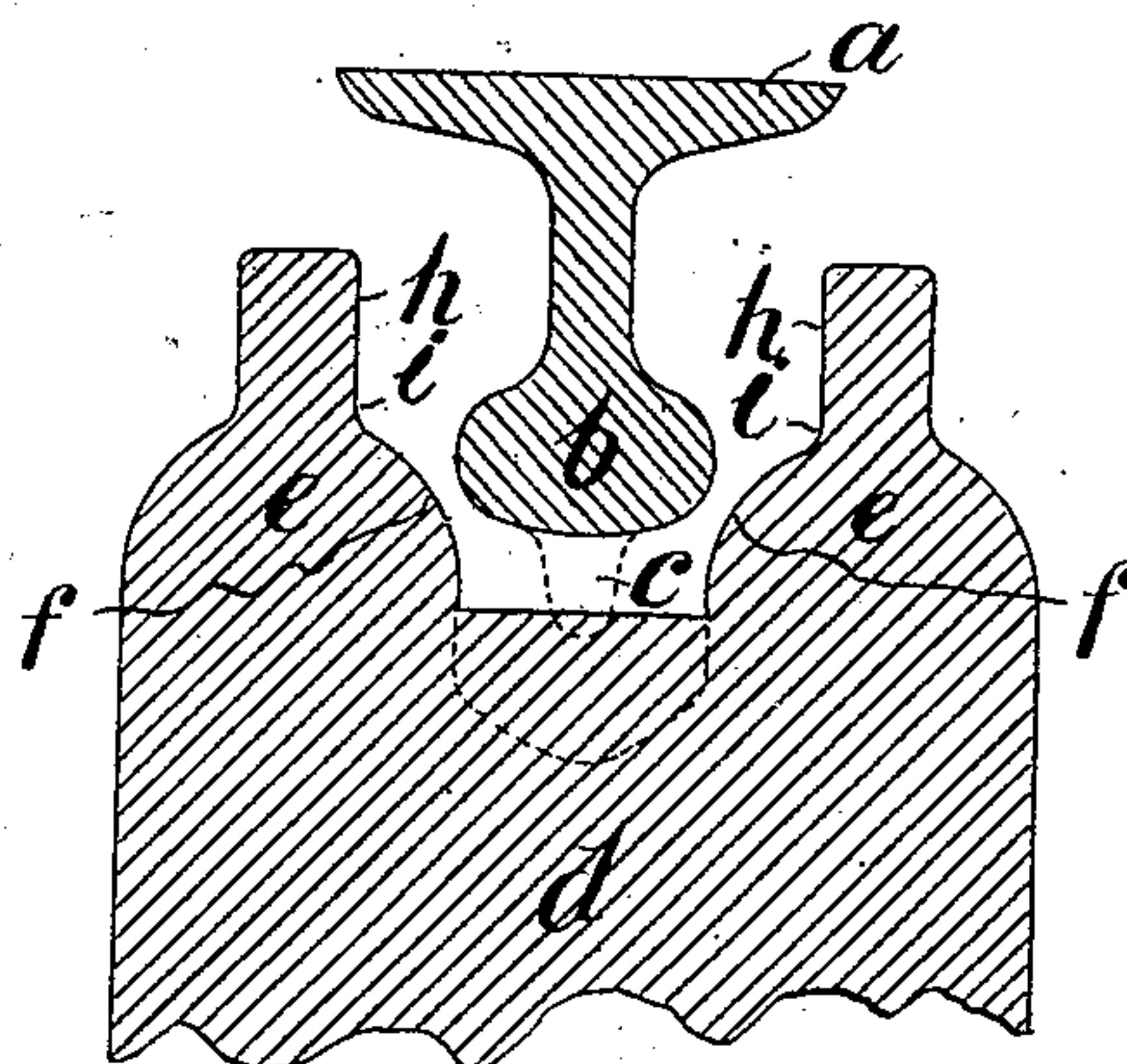
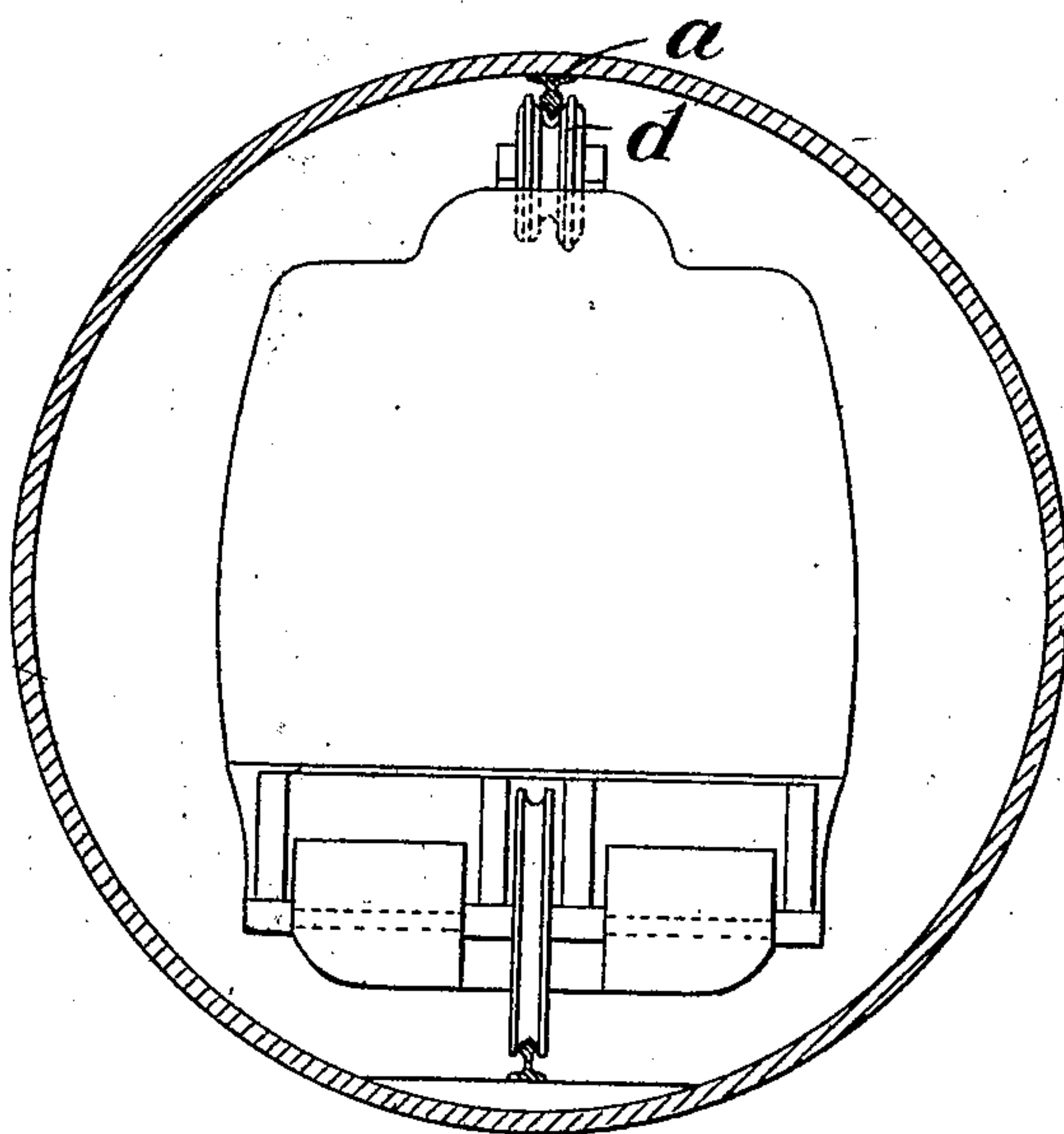


Fig.2.



Witnesses:

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# UNITED STATES PATENT OFFICE.

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## GROOVED WHEEL FOR MONORAILWAY AND TRAMWAY SYSTEMS.

No. 925,106.

Specification of Letters Patent.

Patented June 15, 1909.

Application filed July 24, 1908. Serial No. 445,098.

*To all whom it may concern:*

Be it known that I, ELFRIC WELLS CHALMERS KEARNEY, of 17 Old Queen street, Westminster, London, England, and a subject of His Majesty the King of England, have invented new and useful Improvements in Grooved Wheels for Monorailway and Tramway Systems, of which the following is a specification.

10 This invention relates to improvements in grooved wheels for mono-railway or tramway systems in which the vehicles run on a single rail and are kept upright by means of a guide or guard rail and grooved wheels loosely carried by bearings attached to the vehicle.

15 The primary object of the invention is to provide a construction of wheel whereby the contact between the same and the rail or guide therefor is reduced to a minimum and a good rotating action of the wheel is secured when this is in contact with the rail. In the latter connection the groove in the wheel is preferably made wider than the bulb-shaped head of the rail or guide so that both the 20 sides of the groove will not make contact with the rail or guide at the same time.

25 According to my invention instead of making the groove of the wheel to correspond with the guide-rail head and arranging the latter to extend practically to the bottom of the groove, I arrange the wheel and the guide rail head so that when the latter is in contact with the wheel it will touch on the sides or a side of the groove thereof only, the 30 contact parts of the sides of the groove being rounded or curved oppositely to the curvature of the guide-rail head so that the contact is made between convex surfaces and point contact between the guide-rail head and the 35 wheel can therefore only take place at any given instant.

40 To make the invention the better understood I have illustrated in the accompanying drawings a form of wheel according thereto, Figure 1 illustrating the formation of the wheel groove and the relation of the guide-rail head thereto the section being on the plane of contact, and Fig. 2 by way of example, the application of such form of wheel to a tube mono-railway. Fig. 3 illustrates a 45 modified form of the wheel groove.

50 In the drawings, *a* designates the guide-rail having a bulb shaped head *b* which may as already known be provided with a tongue or rib *c* for the purpose of giving greater stiffness to the rail and thereby in certain

structures, as for example in an open air mono-railway or tramway to permit the number of supporting standards for the guide rail to be reduced, *d* designates the grooved 60 wheel, the inner surfaces of the flanges *e* whereof are rounded or curved, at *f f*, oppositely to the curvature, at *g g*, of the guide-rail head.

As shown, the wheel *d* is mounted so that 65 there can only be contact of the inner sides of the flanges *e* with the guide-rail, and the distance between such side surfaces, where these make contact with the guide-rail, is preferably such that there can only be con- 70 tact at one side of the rail at one time.

The height of the flanges *e e* above the contact points *x x* and *y y*, is such as to prevent possibility of the wheel *d* running off the 75 guide-rail.

By reason of the contact between the wheel and the guide-rail, when such contact takes place, being a lateral one between convex surfaces, one of which is lengthwise disposed and the other circularly disposed, it 80 will be understood that at any instant there is only point contact between the wheel and the rail. Friction between the grooved wheel and the guide-rail is thereby reduced to a minimum while at the same time a 85 good rotating action of the wheel is secured. Further there will be less wear of either the guide-rail or the wheel and as the wear takes place between convex surfaces the effect of such wear will be less prejudicial than with 90 grooved wheels of ordinary formation. Moreover should there be a small obstruction on the line, the car is permitted to rise a couple of inches or so without in any way 95 damaging the upper rail.

While in the application of my invention to a tube mono-railway as shown in Fig. 2 I have illustrated the guide-rail *a* with a tongue or rib *c*, I do not regard such tongue or rib as an essential in such an application, 100 as supporting standards for the guide-rail when used in a tube would not be necessary.

As where the outer parts of the groove faces curve away from the convex surfaces *f f* as shown in Fig. 1, there is a possibility, 105 when the wheel is resisting lateral thrusts, *e. g.*, when the train or car is rounding a curved portion of the line at high speed, of the wheel riding down the guide-rail head and disengaging itself therefrom, I prefer for 110 high speed mono-railways to adopt a modification as substantially illustrated by Fig. 3



which overcomes this possibility. To this end, I form the opposite faces of the groove such that flat or substantially flat surfaces  $h, h$  outwardly extend beyond the convex surfaces  $f, f$  and form therewith circumferential recesses  $i, i$ , into one or other of which, according to the direction of the lateral thrust, the guide-rail head would be received on any riding downward of the wheel, and thereby hold the wheel against further lateral movement tending to disengage it from the guide-rail.

In the best embodiment of the invention and as shown the flat surfaces  $h, h$  would lie in planes at right angles to the axis of the wheel, but obviously such flat surfaces may lie in planes at other than right angles to the wheel axis, so long as the angle of inclination is such as to form a circumferential recess sufficient to avoid the further lateral movement above referred to.

As will be seen, the circumferential recesses are located outside the circumferential line of contact of the wheel with the guide-rail.

Having thus described my invention I declare that what I claim and desire to secure by Letters Patent is:—

1. A grooved wheel adapted to engage a guide rail having a bulb shaped head and having the inner sides of its flanges formed with convex surfaces and constructed with substantially flat surfaces extending outwardly from the said convex surfaces, forming therewith circumferential recesses.

2. A grooved wheel adapted to engage a guide rail having a bulb shaped head and having the inner sides of its flanges formed with convex surfaces and constructed with flat surfaces extending outwardly from the said convex surfaces, forming therewith circumferential recesses.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ELFRIC WELLS CHALMERS KEARNEY.

Witnesses:

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