

Description

The invention concerns a wheel bearing, in particular for toy vehicles, comprising a bearing bracket for rotatable reception of a plurality of wheel axles.

It is well-known to reduce bearing friction by means of ball bearings, but this and corresponding solutions have not been used much in connection with toys because of the manufacturing costs and the relatively small physical dimensions. It is likewise known to reduce the bearing friction in simple slide bearings by reducing the mutual speed difference of the cooperating faces, which can be obtained by reducing the bearing diameter. Then, however, the bearings cannot sufficiently withstand the overloading of the wheels when a toy train carriage drives normally, and when a child rests its weight upon the train carriage.

A bearing and wheel axle arrangement is already known (GB-A-2 037 596) with a pair of wheels in the vicinity of the ends of the axle, in particular for toy vehicles comprising a bearing bracket for rotatable reception of the axle, wherein two sets of cooperating bearing faces are provided for the wheel axle, and the axle and the bracket are mutually moveable between two positions.

The object of the invention is to provide a wheel bearing structure which involves very low friction and which is particularly suitable for toy use.

This object is achieved in that the wheel bearing is constructed as stated in the characterizing portions of claims 1 and 2, the axles being journalled elastically movable so that very low friction is obtained in normal use and so that, when overloaded, the axles are relieved by some stronger support means preventing destruction of the thin bearings.

The invention will be explained more fully by the following description of some embodiments with reference to the drawing, in which

fig. 1 is a perspective view of a train bogie, in particular for a toy train whose wheels are journalled in accordance with the invention,

fig. 2 shows one end of the train bogie of fig. 1 without wheels,

fig. 3 is a bottom view of the train bogie with wheels,

fig. 4 shows another embodiment of one of the axle bearings, while

fig. 5 is a bottom view of another embodiment of a train bogie.

The train bogie shown in fig. 1 comprises a box-shaped body 1 and two bearing consoles or plates 2, 3, which are parallel with long sides of the body. The bearing consoles are connected with the body via elastic connecting plates 4, 5. The wheels

6-9 are secured in pairs to a rigid axle 10 and 11, respectively, as shown in fig. 3.

Fig. 2 shows one end of the bogie without a wheel axle, and it appears clearly that the side members of the body have a pair of cuts 12, 13 whose common central axis is flush with a pair of small holes 14, 15 in the bearing consoles 2, 3. The cuts 12, 13 have a radius of curvature corresponding to the radius of the axles and are slightly spaced from the axle under normal loading of the bogie. As appears from fig. 3, the outer ends of the axle are turned down to a relatively small diameter which fits the bearing holes 14, 15. Thus, there is produced a bearing with a very low friction; however, the bearing is then very fragile and may break upon heavy overloading. According to the invention, the bearing consoles 2, 3 are elastically secured to the body 1 so that a strong vertical pressure on the body 1 causes the connecting plates to deflect, so that the axles rest on the internal side of the cuts 12, 13 which serves as a bearing face.

Fig. 4 shows another embodiment of a bearing set consisting of bearing faces having a relatively large and a relatively small radius of curvature, respectively. The shown part 16 corresponds to the side members on the body in the embodiment described above, while the shown part 17 represents another plate rigidly connected with the bogie. An elastic tongue or bearing wall portion 18 is punched in the plate 17, the inner side of said tongue being downwardly formed with a track 19 which is adapted to receive a pointed tip 20 at the end of an axle 21 (whose wheel is not shown). As shown in fig. 4, the plate portion 16 has a relatively large cut 22 which is slightly spaced from the axle 21 under normal loading conditions. When the train bogie is overloaded, the pointed tip works somewhat higher up in the track 19, the bearing wall portion 18 being able to move slightly away from the plate portion 16, so that the axle 21 is caught by the bearing face inside the cut 22. Thus, it is obtained in the same manner as explained in the foregoing that the thin pointed bearing, which has a very small frictional resistance, is relieved.

It is observed that the plate 17 in fig. 4 might itself be an elastic side member of a train bogie, so that it is not necessary to provide the tongue 18. Such an embodiment is shown at the bottom of fig. 5.

The train bogie in fig. 5 comprises an upper plate 23 having rectangular holes to receive the wheels 24-27. A pattern of reinforcing ribs extends outwardly from the underside of the plate 23, i.e. out from the plane of the paper in fig. 5. Thus, the reinforcing ribs comprise the walls 28, 29, which have two pairs of opposed cuts to receive the axles 30, 31. The side walls 32, 33 of the bogie are

formed with two pairs of opposed tracks to receive respective pointed tips at the ends of the axles, as appears from the figure. Further, four pairs of bearing pedestals are provided, such as those indicated at 34, 35, which serve both as a bearing face with a relatively large diameter in the same manner as the cut 22 in fig. 4 and also to secure the axles from dropping out of the bearing tracks. With suitable dimensioning and selection of elasticity of the side walls 32, 33, the operation of the embodiment of fig. 5 is the same as explained in connection with fig. 4.

Claims

1. Arrangement of a wheel axle, in particular for toy vehicles, comprising
 - (a) a pair of wheels (6, 7; 8, 9) at the respective end portions of the wheel axle (10, 11) which wheel axle is accommodated in bearings of a body (1);
 - (b) the body having two bearing consoles (2, 3) integral with the body and arranged in parallel to each other;
 - (c) the wheels being accommodated between a wall of the body (1) and a respective one of said bearing consoles (2, 3);
 - (d) the body walls having cut-outs (12, 13) which are open at their bottom end and the closed top end of the cut-outs serve as a stopping means for the wheel axle in an extreme position;
 - (e) each bearing console having a bearing hole (14, 15) of reduced diameter with respect of the diameter of the wheel axle for rotatably accommodating corresponding end shafts of the wheel axle projecting beyond the wheels;
 - (f) the bearing consoles being arranged on the body in an elastic pivoting manner to allow a certain elastic travel of the wheel axle in the cut-outs.
2. Arrangement of a wheel axle, in particular for toy vehicles, comprising
 - (a) a pair of wheels (24, 25; 26, 27) at the respective end portions of the wheel axle (21; 30, 31), which wheel axle is accommodated in bearings of a body (23, 32);
 - (b) the body having two opposing elastically deformable outer bearing wall portions (18) and two opposing inner plate portions (16; 34, 35);
 - (c) the bearing wall portions and the plate portions being integral with the body;
 - (d) the wheels being accommodated between the bearing wall portions and the inner plate portions;

- (e) each plate portion having a bearing (22) for holding the wheel axle in a direction perpendicular to its axis the bearing being of a wider diameter than the diameter of the wheel axle so that the wheel axle, to a certain extent, can perform movements perpendicular to its axis;
- (f) each bearing wall portion having a track (19) adapted to receive a pointed tip (20) at the ends of the wheel axle, the tracks lying in a common plane;
- (g) each track having a straight portion perpendicular to the wheel axle followed by a curved portion, the curved portion being directed towards the plane of the neighbouring plate portion so that, when the wheel axle performs movements perpendicular to its axis, the pointed tip will elastically deform the bearing wall portions.

Patentansprüche

1. Anordnung einer Radachse, insbesondere für Spielfahrzeuge, dadurch gekennzeichnet, daß
 - (a) ein Räderpaar (6, 7; 8, 9) an den entsprechenden Endteilen der Radachse (10, 11) in Lagern eines Körpers (1) aufgenommen ist;
 - (b) der Körper zwei Lagerkonsolen (2, 3) aufweist, die mit dem Körper einstückig ausgebildet und parallel zueinander angeordnet sind;
 - (c) die Räder zwischen einer Wandung des Körpers (1) und einer der Lagerkonsolen (2, 3) angeordnet sind;
 - (d) die Körperwandungen Ausschnitte (12, 13) aufweisen, die an ihren Bodenenden offen und deren geschlossene oberen Endteile als Anschlagmittel für die Radachse in einer extremen Lage dienen;
 - (e) jede Lagerkonsole mit einem Lagerloch (14, 15) von verringertem Durchmesser im Hinblick auf den Durchmesser der Radachse zwecks drehbarer Aufnahme der entsprechenden Endschäfte der Radachse ausgebildet sind, die über die Räder hinausragen;
 - (f) die Lagerkonsolen an dem Körper mit elastischer Verschwenkbarkeit angeordnet sind, um einen gewissen elastischen Bewegungsweg der Radachse in den Ausschnitten zu ermöglichen.
2. Anordnung für eine Radachse, insbesondere für Spielfahrzeuge, dadurch gekennzeichnet, daß
 - (a) ein Paar von Rädern (24, 25; 26, 27) an den entsprechenden Endteilen der Radachse (21; 30, 31) angeordnet ist, wobei die

formed with two pairs of opposed tracks to receive respective pointed tips at the ends of the axles, as appears from the figure. Further, four pairs of bearing pedestals are provided, such as those indicated at 34, 35, which serve both as a bearing face with a relatively large diameter in the same manner as the cut 22 in fig. 4 and also to secure the axles from dropping out of the bearing tracks. With suitable dimensioning and selection of elasticity of the side walls 32, 33, the operation of the embodiment of fig. 5 is the same as explained in connection with fig. 4.

Claims

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- (e) each bearing console having a bearing hole (14, 15) of reduced diameter with respect of the diameter of the wheel axle for rotatably accommodating corresponding end shafts of the wheel axle projecting beyond the wheels;
- (f) the bearing consoles being arranged on the body in an elastic pivoting manner to allow a certain elastic travel of the wheel axle in the cut-outs.

2. Arrangement of a wheel axle, in particular for toy vehicles, comprising

- (a) a pair of wheels (24, 25; 26, 27) at the respective end portions of the wheel axle (21; 30, 31), which wheel axle is accommodated in bearings of a body (23, 32);
- (b) the body having two opposing elastically deformable outer bearing wall portions (18) and two opposing inner plate portions (16; 34, 35);
- (c) the bearing wall portions and the plate portions being integral with the body;
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(e) each plate portion having a bearing (22) for holding the wheel axle in a direction perpendicular to its axis the bearing being of a wider diameter than the diameter of the wheel axle so that the wheel axle, to a certain extent, can perform movements perpendicular to its axis;

(f) each bearing wall portion having a track (19) adapted to receive a pointed tip (20) at the ends of the wheel axle, the tracks lying in a common plane;

(g) each track having a straight portion perpendicular to the wheel axle followed by a curved portion, the curved portion being directed towards the plane of the neighbouring plate portion so that, when the wheel axle performs movements perpendicular to its axis, the pointed tip will elastically deform the bearing wall portions.

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- (b) der Körper zwei Lagerkonsolen (2, 3) aufweist, die mit dem Körper einstückig ausgebildet und parallel zueinander angeordnet sind;
- (c) die Räder zwischen einer Wandung des Körpers (1) und einer der Lagerkonsolen (2, 3) angeordnet sind;
- (d) die Körperwandungen Ausschnitte (12, 13) aufweisen, die an ihren Bodenenden offen und deren geschlossene oberen Endteile als Anschlagmittel für die Radachse in einer extremen Lage dienen;
- (e) jede Lagerkonsole mit einem Lagerloch (14, 15) von verringertem Durchmesser im Hinblick auf dem Durchmesser der Radachse zwecks drehbarer Aufnahme der entsprechenden Endschäfte der Radachse ausgebildet sind, die über die Räder hinausragen;
- (f) die Lagerkonsolen an dem Körper mit elastischer Verschwenkbarkeit angeordnet sind, um einen gewissen elastischen Bewegungsweg der Radachse in den Ausschnitten zu ermöglichen.

2. Anordnung für eine Radachse, insbesondere für Spielfahrzeuge, dadurch gekennzeichnet, daß

- (a) ein Paar von Rädern (24, 25; 26, 27) an den entsprechenden Endteilen der Radachse (21; 30, 31) angeordnet ist, wobei die



Radachse in Lager eines Körpers (23, 32) aufgenommen ist;

(b) der Körper zwei einander gegenüber liegende elastisch verformbare äußere Lagerwandteile (18) und zwei einander gegenüberliegende innere Plattenteile (16; 34, 35) aufweist;

(c) die Lagerwandteile und die Plattenteile einstückig mit dem Körper ausgebildet sind;

(d) die Räder zwischen den Lagerwandteilen und den inneren Plattenteilen aufgenommen sind;

(e) jeder Plattenteil ein Lager (22) zur Halterung der Radachse in einer senkrecht zur Achse des Lagers gerichteten Richtung und mit einem größeren Durchmesser als dem der Radachse aufweist, so daß die Radachse in einem gewissen Ausmaß senkrecht zur Achse gerichtete Bewegungen durchführen kann;

(f) jeder Lagerwandteil eine Führung (19) aufweist, die ausgebildet ist, um die verjüngte Spitze an den Enden der Radachse aufzunehmen, wobei die Führungen in einer gemeinsamen Ebene liegen;

(g) jede Führung einen geradlinig gerichteten Teil senkrecht zur Radachse aufweist, dem ein kurvenförmiger Bereich folgt, der so auf die Ebene des benachbarten Plattenteils gerichtet ist, daß, wenn die Radachse Bewegungen senkrecht zu ihrer Achse durchführt, die verjüngte Spitze die Lagerwandteile elastisch verformt.

Revendications

1. Ensemble à essieu de roue, notamment destiné à des véhicules jouets, comprenant

(a) une paire de roues (6, 7; 8, 9) placées aux parties d'extrémités respectives de l'essieu (10, 11), l'essieu étant logé dans des paliers d'un corps (1),

(b) le corps ayant deux consoles (2, 3) d'appui solidaires du corps et disposées parallèlement l'une à l'autre,

(c) les roues étant logées entre une paroi du corps (1) et une console d'appui respective (2, 3),

(d) les parois du corps ayant des découpes (12, 13) qui débouchent à l'extrémité inférieure et l'extrémité supérieure fermée des découpes étant utilisée comme dispositif d'arrêt de l'essieu en position d'extrémité,

(e) chaque console ayant un trou de palier (14, 15) de diamètre réduit par rapport au diamètre de l'essieu et destiné à loger les arbres correspondants d'extrémité de l'essieu dépassant des roues afin qu'ils puissent tourner,

sent tourner,

(f) les consoles étant disposées sur le corps afin qu'elles puissent pivoter élastiquement et permettent un certain déplacement élastique de l'essieu dans les découpes.

2. Ensemble à essieu de roue, notamment destiné à des véhicules jouets, comprenant

(a) une paire de roues (24, 25; 26, 27) placées aux parties respectives d'extrémités de l'essieu (21; 30, 31), l'essieu étant logé dans des paliers d'un corps (23, 32),

(b) le corps ayant deux parties externes opposées (18) de parois d'appui déformables élastiquement et deux parties internes opposées (16; 34, 35) de plaques,

(c) les parties de parois d'appui et les parties de plaques étant solidaires du corps,

(d) les roues étant logées entre les parties de parois d'appui et les parties de plaques,

(e) chaque partie de plaque ayant un palier (22) destiné à retenir l'essieu en direction perpendiculaire à son axe, le palier ayant un diamètre supérieur à celui de l'essieu afin que l'essieu puisse se déplacer perpendiculairement à son axe avec une certaine amplitude,

(f) chaque partie de paroi d'appui ayant une voie (19) destinée à loger un bout pointu (20) d'une extrémité de l'essieu, des voies étant placées dans un plan commun,

(g) chaque voie ayant une partie rectiligne perpendiculaire à l'essieu suivie par une partie courbe, la partie courbe étant dirigée vers le plan de la partie voisine de plaque afin que, lorsque l'essieu effectue des mouvements perpendiculaires à son axe, le bout pointu déforme élastiquement les parties d'appui.

