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Chain suspension, especially for an outdoor play tool.

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Description

Background of the invention

The invention relates to a chain suspension, particularly for the suspension of swings and similar recreational devices, said suspension being mounted on a support so that the swing or the device which is suspended by the chain can swing freely forwards and backwards under the suspension, and where the suspension constitutes a pivot element mounted in the support, said pivot element housing a body in such a manner that the body can turn freely around an axis which intersects the axis of rotation of the pivot element.

Suspensions of this kind are used especially for the hanging up of swings and other recreational appliances which are provided with a seat on which the user can sit and swing forwards and backwards.

In their simplest form, known suspensions of this kind comprise a hook or an eye to which the chain can be secured by one of its links.

However, this method of suspension suffers many drawbacks and disadvantages, namely first and foremost a weakening of the strength of the suspension due to the wear between the hook and the chain link. Since there is no possibility in practice of keeping these parts lubricated, and since the contact surfaces are always the same, the wear becomes relatively great.

In order to avoid this wear, from German publication no. 36 17 157 it is known to configure the suspension as a horizontally-extending axle with two swing ropes or chains secured to its ends, and with the axle housed in a bearing housing which is mounted in a fixed manner on a supporting crossbar. The swing can hereby swing freely forwards and backwards in the suspension.

However, it is seldom that a swing moves in the plane at right-angles to the swing axis. Therefore, there will almost constantly be a twisting influence on both the suspension as well as the two ropes or chains in the swinging-out of the swing to the sides. This load gives rise to wear on the suspension, namely on the chain, and the resulting friction has a damping effect on the swinging movements.

In an attempt to eliminate this disadvantage, it is known from Swiss patent publication no. 572.755 to configure the suspension in two parts which are housed together through a vertically-extending axle. The upper part of the suspension is secured to the support boom, and the two ropes or chains are secured to the lower part of the suspension. The swing can hereby turn around a vertical axis and thus allow a swing movement which deviates from the plane at right-angles to the swing axis without the swing hereby being subject to unnecessary load. However, the actual swinging movement is hampered for the reason that the suspension cannot turn around the swing axle, which results in a considerable damping of the movement and the possibility of the generation of disturbing noise, particularly when the swing is suspended by chains.

From US-A-2 182 587 there is known a chain suspension for a recreational device, said suspension being constituted of a pivot element being mounted on a support so that the device which is suspended by the chain can swing freely forwards and backwards. The pivot element houses a hook in such a manner that the hook can turn freely around an axis which intersects the axis of rotation of the pivot element.

Advantages of the invention

With a suspension according to the invention comprising a retaining part secured to the body, said retaining part being provided with an elongated opening for the passage of a chain link in such a manner that the chain can be secured by the abutment of the succeeding chain link against the retaining part, what is achieved first and foremost is a considerably safer suspension, in that the suspension can turn around two mutually intersecting axes, which means that the chain is not loaded by either bending or twisting.

The chain is hereby loaded uniformly in its tractional direction, which means longer lifetime and optimum strength.

Moreover, the housing in the suspension ensures that the friction becomes relatively small, whereby the swinging becomes even and the change from one direction of movement to the opposite takes place without any disturbing jolts. Moreover, the nuisance of noise is completely eliminated. The suspension also provides an easy possibility for adjustment of the swing's height, in that the chain is easily moved in the retaining part.

As disclosed in claim 2, by suspending the retaining part in which the chain runs in a body housed in the pivot element, this body will serve as a swivel which cancels out all twisting effects on the chain. Kinking of the chain during use, and thus variation of the chain length, is hereby avoided.

As disclosed in claim 3, by configuring the retaining part from one piece of bent wire to form an opening for a chain link, and letting the opening extend under the body in its axis of rotation, it is achieved that the tractional forces from the chain are absorbed by the pivot pin in its central axis. This provides maximum strength and results in the least possible loading of the suspension.
As disclosed in claim 4, by suspending the pivot element on an axle, the ends of the axle can be secured in a pair of carrier pieces which can extend down from a crossbar or boom on a swing frame.

As disclosed in claim 5, by suspending the pivot element in an axle journal, the axle can extend through a post so that the suspension can be mounted on the inside of the post, which then comprises the one part of a swing frame.

As disclosed in claim 6, by allowing the axle to extend into a bearing bush in the post, the axle will be free to turn and will afford the possibility of providing a decoration plate on the opposite end of the post. This plate will then turn with the axle when the swing is used.

Finally, as disclosed in claim 7, it is expedient to secure the bearing bush in the post, e.g. by means of a transverse bolt in a bush, in that this hereby results in a simple and safe mounting of the bearing bush.

The drawing

Example embodiments of the suspension according to the invention will now be explained with reference to the drawing, where

fig. 1 shows an example embodiment of the suspension mounted on a horizontally-extending boom,
fig. 2 shows the parts of the suspension disassembled,
fig. 3 shows a cross-section of the suspension partly assembled,
fig. 4 shows an example embodiment of a suspension mounted on a vertical post,
fig. 5 shows the parts of the suspension disassembled, and
fig. 6 shows a cross-section of the mounted suspension.

Description of the example embodiments

In figs. 1-3 is shown an example of a preferred embodiment of a chain suspension for use on swing frames with a horizontally-extending boom. The suspension is mounted as shown in fig. 1. On a horizontally-extending boom 16 there are secured two downwardly-projecting carrier pieces 15. The carrier pieces are provided with throughgoing holes for an axle 13 which is shown in fig. 3.

Fig. 2 shows those parts of the suspension which are mounted between the two carrier pieces 15. These consist of a pivot element 1 which is configured as a barrel-shaped body with an outwardly-projecting portion which constitutes a guide 27 for the body 3 which is to be mounted in the pivot element 1.

The pivot element 1 is configured with two holes which extend at right-angles to each other, one of which is a throughgoing hole 28 for the axle 13, the end of this hole being enlarged to form a bearing housing 29 for the ball bearings 30. The other hole extends through the guide part 27 for a gudgeon part 31 on the body 3.

To hold the parts 1, 3 together, a hole is provided through the body 3 and the gudgeon part 31, through which a gudgeon pin 8 with a head 32 can be inserted so that the head 32 forms a seating for the body 3.

The opposite end of the gudgeon pin 8 is provided with a smaller, transverse hole 33 through which a support pin 34 can be inserted when the body 3 is to be mounted, as shown in fig. 3.

In the pivot part 1, and parallel with the axle hole 28, there is also provided a hole 35 between the ends of the bearing housings 29, so that the support pin 34 can secure the gudgeon pin 8 in the pivot element 1.

The body 3 will now be able to turn freely around the axis 4, which at the same time is the central axis for the gudgeon pin 8.

In the one half of the body 3 there is also provided a blind hole 11, as shown in fig. 2. In the other half there is a throughgoing 12.

In these holes 11, 12, a retaining part in the form of a bent wire shackle 6 can be inserted, this forming an elongated opening 7 through which a chain link 44 on a suspension chain 36 can pass, as shown in fig. 1, and is hereby secured in the shackle 6.

The shackle’s one leg 9 can be inserted in the blind hole 11, while the other leg is longer and has an end provided with a thread 10. When the shackle is inserted in the holes, it is secured to the body 3 by means of a nut 37 on the other side of the body, in that the nut is screwed firmly on the thread 10.

The shackle is also bent at an obtuse angle, as shown in fig. 2, in order for the opening 7 to extend around the axis of rotation 4. A chain 36, as shown in fig. 1, will hereby be able to be secured at a chain link 44 so that the supporting part of the chain will substantially extend precisely in the axis of rotation 4 for the body 3.

When mounting the pivot element 1 in the carrier pieces 15, the axle 13 is inserted through the parts and the two bearings 30.

The axle 13 is provided with threads 14 at the ends, as shown in fig. 3, so that it can be secured by means of end nuts 38. These nuts can be covered by means of pressed-on caps 39 so that the whole of the suspension constitutes a closed entity, partly to protect the suspension, and partly to avoid direct dismantling of the suspension.
Figs. 4-6 show an example of a preferred embodiment of a suspension for use with a swing frame consisting of two posts 18.

This suspension similarly comprises a shackle 6 mounted on a body 3 which, as shown in fig. 6, can turn around an axle journal 8.

The axle journal 8 is secured by means of a pin 34 through a hole in the pivot element 2.

This pivot element 2 is of asymmetric configuration so that it can lie up against the one side of the post 18, and has an outwardly-extending guide part 40 for the collar 31 with the journal part 8.

The axle on which the pivot element 2 turns comprises an axle journal 17, see fig. 5, which extends from an axle 19. A transverse bore 41 extends through the axle journal 17 for a locking pin 42.

A plate 21 with holes is secured at the opposite end of the axle 19, thus enabling a decoration plate 22 to be mounted as shown in figs. 4 and 6.

The axle 19 is suspended in two bearings 30 which are provided in bearing housings in the ends of a bearing bush 20 which is inserted in a bore through the post 18.

In order to secure the bush 20, it is provided with a peripheral recess 26 around its centre. This enables a retaining bush 23 to be inserted in the recess 26 transversely to the bush 20 as shown in fig. 6. This retaining bush can be secured by means of a bolt 24 with nut 25.

When the bearings 30 with the axle 19 and the axle journal 17 are inserted in the post 18, the parts are secured by means of a locking disk 42 with a bore for a locking pin 42, this pin being inserted through the disk 43 and the bore 41 in the axle 17.

The pivot element 2 can now be secured to the axle journal 17 by means of a nut 45 in the side of the pivot element 2. Mounted in this manner, the suspension is now able to function with an inclined chain traction stemming from the inclined extension from the post and down to the one side of the seat of the swing. Since the traction through the body 3 is taken up by the axle 19 at the one bearing 30, the stress is easily able to be absorbed without the parts being damaged, even at relatively high loads.

With the turning of the axle 19 during the use of the swing, the decoration plate 22 will describe a forwards and backwards movement to the pleasure of possible spectators.

It will be understood that the chain 36 can be inserted in the shackle 6 by coaxing the individual links 44 through the opening 7. There will be no risk of the link 44 sliding in the shackle, in that the following link will extend at right-angles to the opening 7 and hereby block for any further extraction of the chain, cf. figs. 1 and 4.

The pivot elements 1, 2 and the body 3, the bearing bush 20, the retaining bush 23 and the end covers 39 are preferably made of synthetic materials, while the remaining parts are made of metal.

Claims

1. Chain suspension, particularly for the suspension of swings and similar recreational devices, said suspension being mounted on a support so that the swing or the device which is suspended by the chain (36) can swing freely forwards and backwards under the suspension, and where the suspension constitutes a pivot element (1) mounted in the support, said pivot element (1) housing a body (3) in such a manner that the body (3) can turn freely around an axis (4) which intersects the axis (5) of rotation of the pivot element (1), characterized in that a retaining part (6) is secured to the body (3), said retaining part (6) being provided with an elongated opening (7) for the passage of a chain link (44) so that the chain (36) can be secured by the abutment of the succeeding chain link against the retaining part (6).

2. Chain suspension according to claim 1, characterized in that the body (3) with the retaining part (6) is suspended in the pivot element (1, 2) on an axle journal (8) which is secured in the pivot element (1, 2).

3. Chain suspension according to claim 2, characterized in that the retaining part (6) is configured as a piece of wire which is bent in a U-shape to form an opening (7), the ends (9, 10) of said wire being bent at an obtuse angle in relation to the U-part, said ends (9, 10) being introduced into the body (3) through holes (11, 12) which extend substantially at right-angles to the axle journal (8), so that the opening (7) extends under the body (3) in its axis of rotation (4).

4. Chain suspension according to claim 1, characterized in that the pivot element (1) is mounted on a throughgoing axle (13), the free ends (14) of which are secured to carriers (15) which are mounted on a support piece such as a support boom (16).

5. Chain suspension according to claim 1, characterized in that the pivot element (2) is mounted on an axle journal (17) which extends outwardly from the end of a support piece such as a post (18).
6. Chain suspension according to claim 5, characterized in that the axle journal (17) constitutes the end of an axle (19) which extends through a bearing housing (20) in the post (18), and which has a decoration plate (22) secured on the opposite end (21).

7. Chain suspension according to claim 6, characterized in that the bearing bush (20) is secured in a bore (46) in the post (18) by means of a transverse locking element (23, 24, 25) which extends in a recess (26) in the periphery of the bush (20).

Patentansprüche

1. Kettenaufhängung, insbesondere für Schaukeln und ähnliche Freizeiteinrichtungen, wobei die Aufhängung an einem Träger derart angeordnet ist, daß die Schaukel oder die von einer Kette (36) getragene Vorrichtung unterhalb der Aufhängung frei nach vorne und rückwärts schwingen kann, wobei die Aufhängung einen Drehzapfen (1) bildet, der an dem Träger angeordnet ist und einen Körper (3) in einer solchen Weise aufnimmt, daß der Körper (3) frei um eine Achse (4) drehen kann, welche die Achse (5) des Drehzapfens (1) kreuzt, dadurch gekennzeichnet, daß ein Rückhalteteil (6) mit dem Körper (3) verbunden ist und eine langgestreckte Öffnung (7) zur Durchführung eines Kettengliedes (44) aufweist, so daß die Kette (36) dadurch gesichert werden kann, daß das nachfolgende Kettenglied gegen das Rückhalteteil (6) anstößt.

2. Kettenaufhängung nach Anspruch 1, dadurch gekennzeichnet, daß der Körper (3) mit dem Rückhalteteil (6) in dem Drehzapfen (1, 2) auf einem Achszapfen (8) angeordnet ist, der in dem Drehzapfen (1, 2) gesichert ist.

3. Kettenaufhängung nach Anspruch 2, dadurch gekennzeichnet, daß das Rückhalteteil (6) als Drahtteil ausgebildet ist, das U-förmig gebogen ist, um eine Öffnung (7) zu bilden, wobei die Enden (9, 10) dieses Drahtteiles im Verhältnis zu dem U-förmigen Teil in einem stumpfen Winkel abgebogen sind, wobei diese Enden (9, 10) in den Körper (3) durch Öffnungen (11, 12) eingeführt werden, die sich im wesentlichen im rechten Winkel zur Drehachse (6) erstrecken, so daß sich die Öffnung (7) unter den Körper (3) zur Drehachse (4) erstreckt.

4. Kettenaufhängung nach Anspruch 1, dadurch gekennzeichnet, daß der Drehzapfen (1) auf einer durchgehenden Achse (13) angeordnet ist, deren freie Enden (14) an Trägern (15) gesichert sind, die an einem Tragteil angeordnet sind, beispielsweise dem Tragbalken (16).

5. Kettenaufhängung nach Anspruch 1, dadurch gekennzeichnet, daß der Achszapfen (17) angeordnet ist, welcher sich nach außen vom Ende eines Tragteiles, beispielsweise eines Pfostens (18) erstreckt.

6. Kettenaufhängung nach Anspruch 5, dadurch gekennzeichnet, daß der Achszapfen (17) das Ende einer Achse (19) bildet, welche sich durch eine Laufhülse (20) im Pfosten (18) erstreckt und mit einer Dekorationsplatte (22) versehen ist, die an dem gegenüberliegenden Ende (21) angeordnet ist.


Revidications

1. Suspension de chaîne, notamment pour la suspension de balançoires et de dispositifs de divertissement identiques, ladite suspension étant montée sur un support pour que la balançoire ou le dispositif qui est suspendu par la chaîne (36) puisse se balancer librement d’avant en arrière sous la suspension, et dans laquelle la suspension est constituée avec un élément de pivotement (1) monté sur le support, ledit élément de pivotement (1) logeant un corps (3) de telle manière que le corps (3) puisse tourner librement autour d’un axe (4) qui coupe l’axe (5) de rotation de l’élément de pivotement (1), caractérisée en ce qu’une pièce de retenue (6) est fixée au corps (3), ladite pièce de retenue (6) comprènt une ouverture longitudinale (7) pour le passage d’un maillon de chaîne (44) de sorte que la chaîne (36) puisse être fixée par butée du maillon de chaîne qui suit contre la pièce de retenue (6).

2. Suspension de chaîne selon la revendication 1, caractérisée en ce que le corps (3) avec la pièce de retenue (6) est suspendue dans l’élément de pivotement (1, 2) sur un tourillon (8) qui est fixé dans l’élément de pivotement (1, 2).

3. Suspension de chaîne selon la revendication 2, caractérisée en ce que la pièce de retenue (6) est configurée comme un morceau de fil mé-
tallique recourbé en forme de U pour former une ouverture (7), les extrémités (9, 10) dudit fil métallique étant recourbées suivant un angle obtus par rapport à la pièce en U, lesdites extrémités (9, 10) étant introduites dans le corps (3) par des trous (11, 12) qui sont sensiblement à angle droit par rapport au tourillon (8), de sorte que l’ouverture (7) s’étend sous le corps (3) dans son axe de rotation (4).

4. Suspension de chaîne selon la revendication 1, caractérisée en ce que l’élément de pivotement (1) est monté sur un axe transversal (13), dont les extrémités libres (14) sont fixées à des supports (15) qui sont montés sur une partie porteuse telle qu’une poutre porteuse (16).

5. Suspension de chaîne selon la revendication 1, caractérisée en ce que l’élément de pivotement (2) est monté sur un tourillon (17), qui se prolonge vers l’extérieur à partir de l’extrémité d’une partie porteuse telle qu’un poteau (18).

6. Suspension de chaîne selon la revendication 5, caractérisée en ce que le tourillon (17) constitue l’extrémité d’un axe (19) qui s’étend à travers un carter de palier (20) dans le poteau (18), et qui a une plaque de décoration (22) fixée à son extrémité opposée (21).

7. Suspension de chaîne selon la revendication 6, caractérisée en ce que le manchon de palier (20) est fixé à l’intérieur d’un alésage (46) dans le poteau (18) au moyen d’un élément transversal de blocage (23, 24, 25) qui se place dans un évidement (26) dans le pourtour du manchon (20).