Sept. 29, 1953 G. K. WARE 2,653,821

ROLLER SKATE WITH REMOVABLE TRUCK ASSEMBLY

Filed Aug. 25, 1948

Fig. 1.

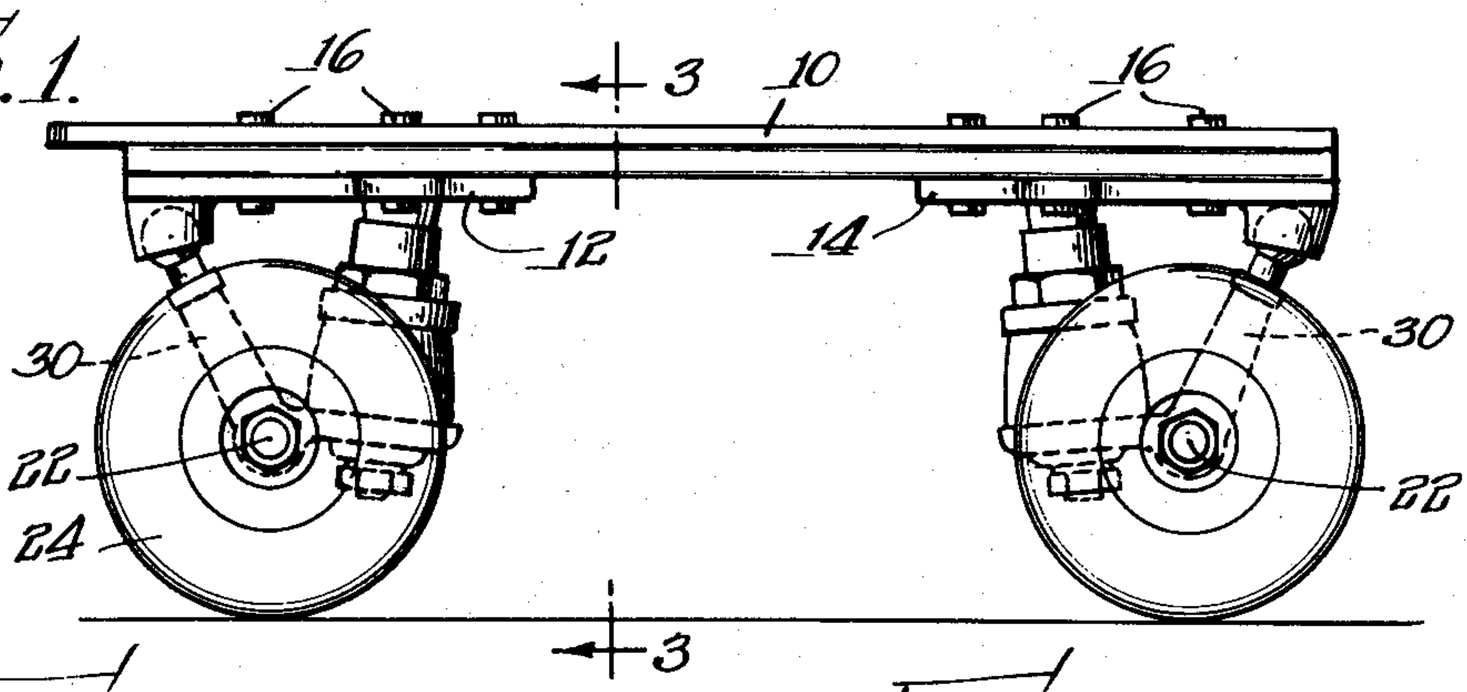


Fig. 2.

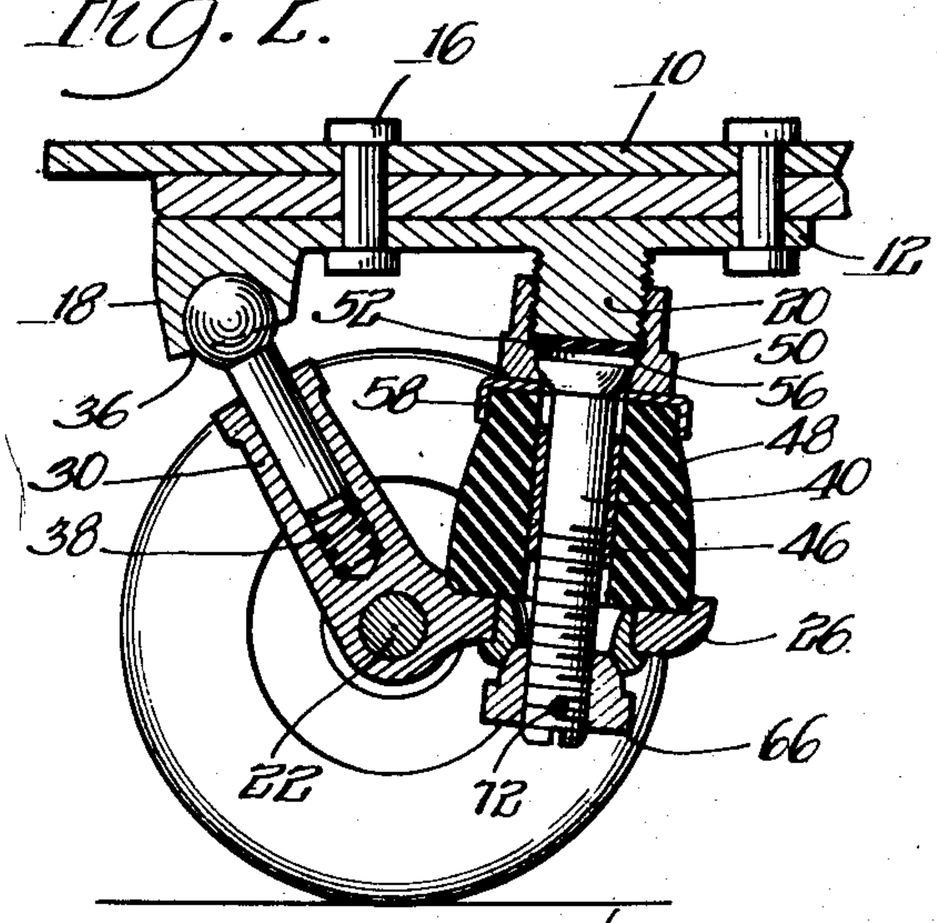


Fig. 3.

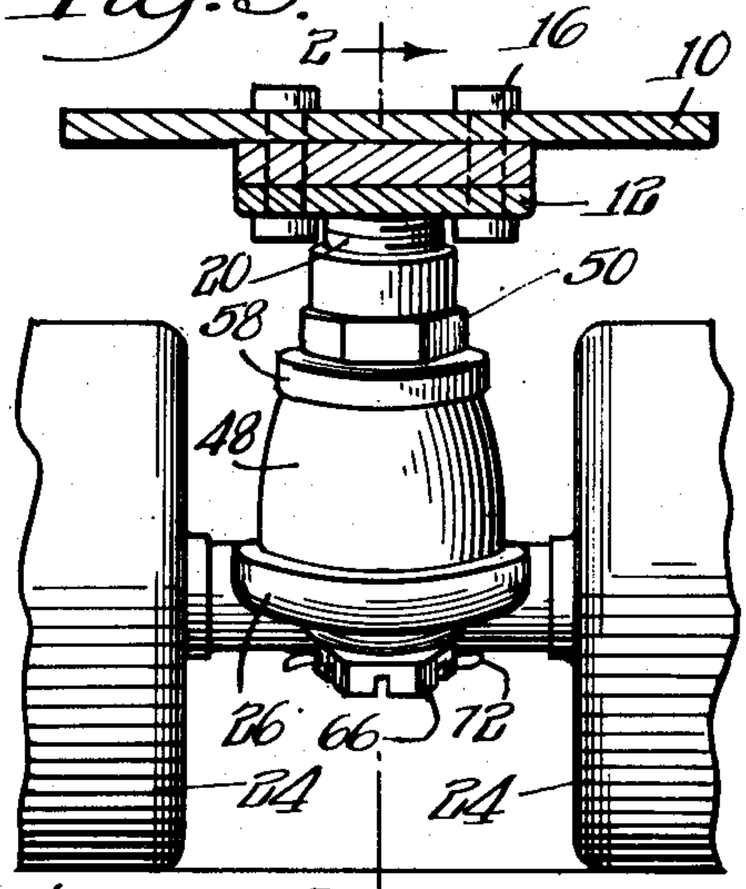


Fig. 4.

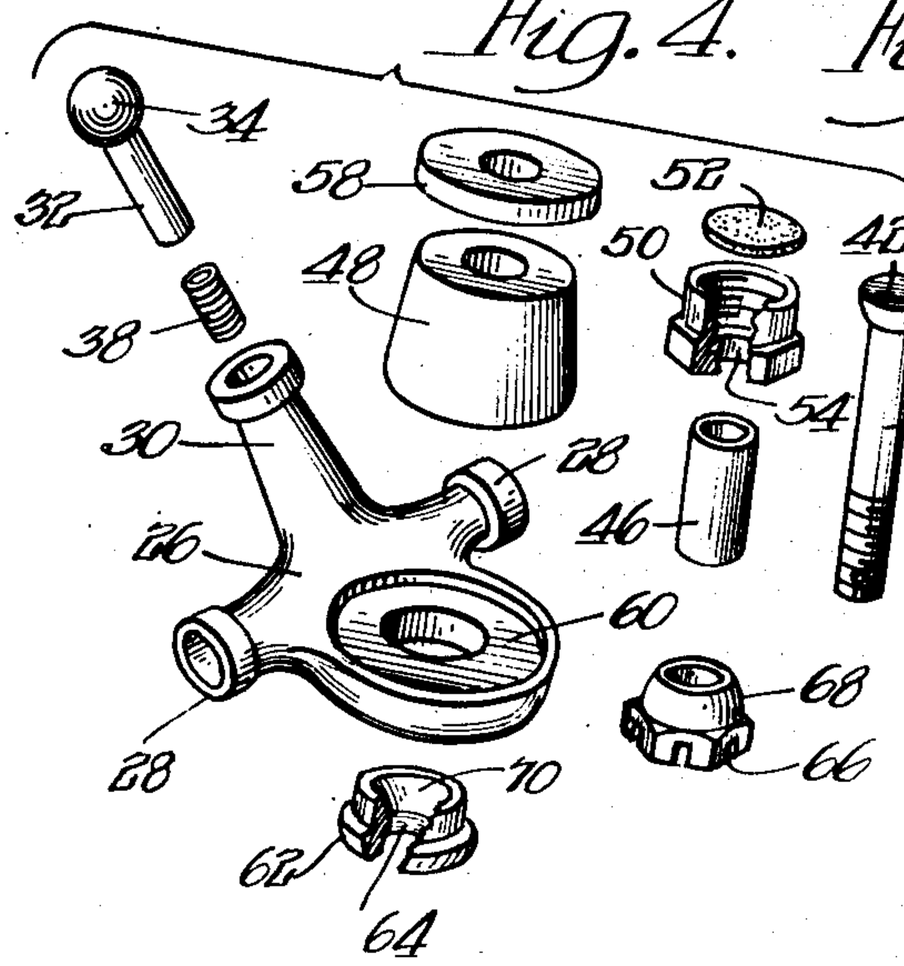
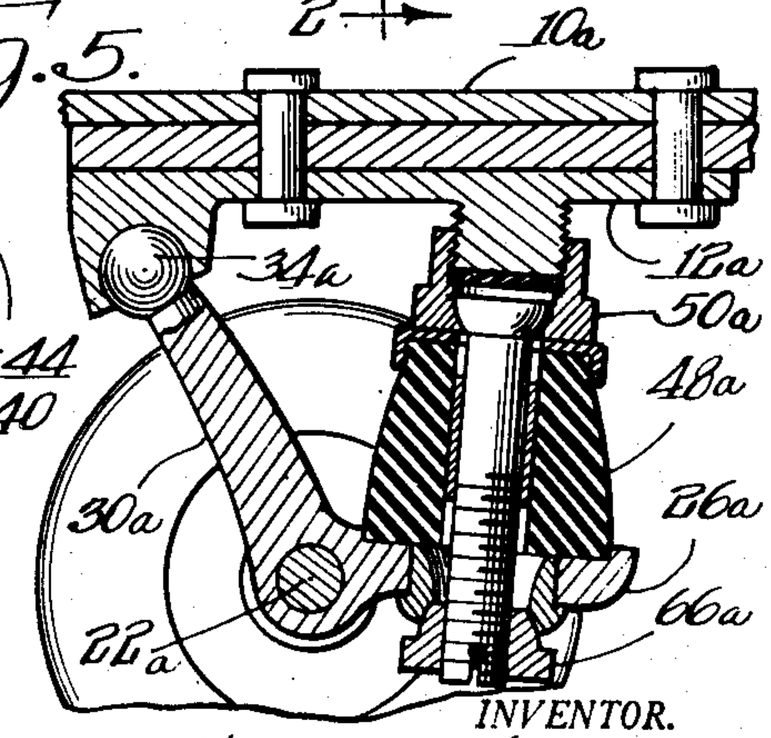


Fig. 5.



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ROLLER SKATE WITH REMOVABLE TRUCK ASSEMBLY

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6 Claims. (Cl. 280—11.28)

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This invention relates to roller skates, and concerns particularly structures for effecting the mounting of the wheel axles and associated parts.

In roller skates, particularly for rink and stage use, it is desirable to provide flexible mountings for the wheel axles so as to facilitate the twisting of the axles relative to the skate frame, as the skate is turned, and also to absorb shock and impact as the skate is engaged with the ground, floor, or other support surface in use.

Difficulty has heretofore been encountered in providing flexible wheel axle mountings which will have the required degree of flexibility and resiliency, and smoothness of action, while at the same time having requisite strength and durability, and simplicity of construction.

In accordance with the present invention, an improved flexible and resilient mounting for roller skate wheel axles is provided, which is "full floating" in its operation, which is rugged and durable, and which may be readily fabricated of a minimum number of parts.

It is accordingly an object of the present invention to provide an improved flexible and resilient mounting for roller skate wheel axles.

More specifically stated, it is an object of the invention to provide an improved yieldable and resilient support structure for roller skate wheel axles having greater smoothness of operation, increased strength and durability in relation to the weight of the parts provided, and greater simplicity and economy of construction.

A further object of the invention is to provide an improved yieldable and resilient mounting for roller skate wheel axles wherein the parts may be secured to and removed from the skate sole plate by access only to the bottom thereof, for purposes of replacement and repair.

A still further object of the invention is to provide an improved "full floating" mounting for roller skate wheel axles, wherein the yieldability and resiliency of the support structure is provided by a single flexible member, for economy and simplicity of construction.

Various other objects, advantages and features of the invention will be apparent from the following specification when taken in connection with the accompanying drawings wherein certain preferred embodiments are set forth for purposes of illustration.

In the drawings, where like reference numerals refer to like parts throughout:

Fig. 1 is a side elevation of a roller skate structure constructed in accordance with and embodying the principles of the present invention,

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in accordance with one preferred embodiment thereof;

Fig. 2 is a partial sectional view, on an enlarged scale, of the front wheel support structure of the skate shown in Fig. 1, and taken as indicated by the line 2—2 of Fig. 3;

Fig. 3 is a transverse sectional view of the skate structure of Fig. 1 on the line 3—3 thereof;

Fig. 4 is an exploded view of the several parts comprising the wheel axle support; and

Fig. 5 is a view similar to Fig. 2 but illustrating a modified embodiment of the invention.

Referring more specifically to the drawings, and first to the embodiment illustrated in Figs. 1–4, in Fig. 1 there is illustrated a roller skate of the rink or stage type comprising a sole plate 10 having front and rear wheel hanger brackets secured thereto as indicated at 12 and 14. The sole plate and hanger brackets are secured together by suitable means, such as rivets 16, to provide an integral frame structure. As will be understood, the sole plate is adapted to be secured to a shoe or the like (not shown) in any suitable and conventional manner.

In Figs. 2, 3 and 4, the support parts for the front wheel axle are shown. Both wheel axle supports may be identical, or substantially identical, so that only one need be described. As shown in Fig. 2, the hanger bracket 12 more specifically comprises a front boss or projection 18 and a rear boss or projection 20, the latter being externally threaded along its length, as shown.

The wheel axle, indicated at 22, carries the front wheels 24 at its opposite ends, in the usual manner, and is supported by a wheel truck 26, the general shaping of which is best shown in Fig. 4. More specifically, the support truck 26 comprises a pair of oppositely projecting sleeve portions 28 for supporting the axle 22, and an angularly upwardly extending neck portion 30 within which is slidably mounted a shaft 32 fixed to a ball member 34, the latter having interfitting engagement with a spherically shaped socket formed in the hanger boss 18. The boss 18 is sufficiently peened over, as indicated at 36, so that the ball 34 remains in permanent association with the hanger boss 18, after assembly of the parts, to form a permanent universal mounting. A compression spring, as indicated at 38, may be disposed within the sleeve 30 in engagement with the end of shaft 32. This spring may in certain instances be desired, but its presence is not mandatory to the operation of the parts, and it may in most instances be omitted. The ball 34,

its shaft 32, and the cooperating telescoping sleeve 30 of the wheel truck form a strut support for the wheel axle, the function of which will presently more particularly appear.

The principal support interconnection between the hanger bracket 12 and the wheel truck comprises the parts which are mounted upon and carried by the hanger boss 20. As best shown in Figs. 2 and 4, these parts comprise an elongated action screw 40, the lower end of which is suitably threaded and the upper end of which is provided with a head portion 42 having a lower spherical surface 44. The action screw is embraced by a metal sleeve 46, which sleeve is in turn embraced by a rubber collar 48, the latter forming the yieldable and resilient support means for controlling the operation of the action screw, as will presently appear.

The upper headed end of the action screw is retained in position by means of a nut 50 having threaded interconnection with the hanger boss 20, the nut being arranged to retain a rubber washer or gasket 52 against the end of the boss. The nut 50 is provided with an inner spherical surface 54, Fig. 4, shaped to engage and conform with the spherical surface 44 on the head of the action screw. These two spherical surfaces form a universal mounting permitting universal movement between the action screw and the nut. A space 56 is provided between the action screw head and the rubber washer 52, to permit such movement, and in the event the action screw shifts sufficiently so that its head engages the rubber washer, the yieldable and resilient material of the washer insures a shockless engagement. A metal washer 58 underlies the nut 50 and forms the upper abutment for the main support collar 48.

A universal connection between the lower end of the action screw and the truck 26 is also provided, to permit further universal motion between the parts. As best shown in Fig. 4, the truck member 26 is provided with a washer-like portion 60 arranged to receive a press-fitted bushing 62, the lower portion of which is provided with a cylindrical bearing surface 64. A castle nut 66 is threaded onto the lower end of the action screw, and is provided with a spherical bearing surface 68 shaped to engage and cooperate with the spherical surface 64 of the bushing insert. As will be seen, the bushing 62 and nut 66 thus provide a second universal connection, permitting a degree of universal movement between the lower end of the action screw and the wheel truck 26. The bushing insert 62 is provided with a conical clearance surface 70, Fig. 4, to facilitate such movement. The castle nut, after adjustment, may be retained in position by suitable means such as a cotter pin 72. The lower surface of the rubber collar 58 is compressively engaged against the washer portion 60 of the wheel truck, the degree of such compression when the skate is not in use being determined by the adjustment of the castle nut 66.

In operation, the castle nut 66 is tightened, as stated, to apply a predetermined initial compression to the rubber collar 58. As an upward thrust is imparted to the wheel axle, in use, as the wheels are brought into impact with the ground or floor, it will be seen that the three universal connections comprising the ball 34 and its associated socket, the connection between the action screw head and the nut 50, and the connection between the castle nut 66 and the bushing insert 62, combine to provide a "full floating" support for the wheel axle truck 26 in respect to the fixed frame 10 of the skate. More particularly, these three universal connections combine to permit the truck casting to tilt or shift universally, in substantially any desired direction, under the control of the resilient compression collar 48. The telescoping action of the strut 30—32 combines with the flexibility of the collar 58 to permit the truck casting to tilt clockwise, as seen in Fig. 2, upon an upward thrust imparted to the wheel. The compressibility of collar 48 also permits the truck to shift a limited degree upwardly axially of the action screw, as well as to tilt in one direction or the other to facilitate turning and to maintain both wheels in engagement with the floor as the sole plate 10 is tilted from its normal horizontal position. The three universal connections provide a smooth action and do not reach their limiting positions in normal operation, viz., the strength of the rubber collar is such that it constitutes the limiting factor as the parts are stressed so that no shock is imparted to the action screw or its associated parts at any time. The connections provided insure that the service stresses imparted to the support structure are resisted at all times by the rubber collar 58 rather than by a stress or shock imparted to the action screw.

It will be noted that the controlled yieldability and resiliency of the support structure is provided by a single rubber collar member 58 permitting of maximum simplicity and economy of construction. It will furthermore be noted that the entire wheel support structure can be removed from the sole plate by access only to the lower side thereof, upon the removal of the single nut 50 which permits the withdrawal of the complete support as a unit from the skate frame. The initial compression applied to the rubber collar 48 is not disturbed by the application of the support to the sole plate, or by the adjustment or tightening of nut 50.

The action screw 40, the nuts 50 and 66, and the ball member 34 may be of hard steel to provide the proper bearing action, whereas the remaining parts may be fabricated of lighter material, such as aluminum or the like, whereby to provide a structure of minimum weight in respect to its durability and strength characteristics.

In certain instances the telescoping action of the strut member may not be required, in which case the structure of Fig. 5 may be employed. In the structure of Fig. 5, the parts are essentially the same as previously described, except that the ball member as indicated at 34A is provided as an integral part of the arm 30A of the wheel axle truck, whereby the wheel axle is caused to swing substantially in an arc of movement about the ball 34A as a center, when the rubber collar 58A is compressed. The three universal connections otherwise function substantially as in the previously described embodiment, and it is believed that the operation thereof will be understood from what has heretofore been pointed out.

It is obvious that various changes may be made in the specific embodiments set forth without departing from the spirit of the invention. The invention is accordingly not to be limited to the particular embodiments shown and described, but only as indicated in the following claims.

The invention is hereby claimed as follows:

1. A roller skate structure comprising a frame arranged for connection at its upper side to a shoe or the like, a wheel axle support bracket,

strut means interconnecting the support bracket and frame, an action screw interconnecting the frame and support bracket, said action screw being pivotally shiftable in respect to the frame and in respect to the support bracket, a member encircling the action screw adjacent the upper end thereof and removably connected to the frame for connecting the action screw to the frame, and means connected to the action screw adjacent its lower end for connecting the action screw to the support bracket.

2. A roller skate structure comprising a frame arranged for connection at its upper side to a shoe or the like, a wheel axle support bracket, an elongated action screw interconnecting the frame and support bracket, said screw having a head portion provided with a bearing surface, a nut encircling the action screw and engageable with said bearing surface and threadedly connected to the frame, a nut threadedly engageable with the opposite end of the action screw, said last named nut having a bearing surface engageable with the support bracket, a single collar of compressible resilient material embracing the action screw and controlling the movement thereof, said action screw being universally shiftable in respect to the frame and the support bracket, and a strut interconnecting the frame and support bracket, said strut and action screw being relatively angularly disposed.

3. A roller skate structure comprising a hanger adapted for connection upon its upper side to a shoe or the like, a wheel axle support bracket disposed below the hanger, strut means interconnecting the hanger and support bracket, an action member, pivot means interconnecting the hanger and the upper end of the action member, and pivot means interconnecting the support bracket and the lower end of the action member, said first named pivot means including a sleeve removably connected to a dependent boss on the hanger operable upon separation to effect the removal of the action member from the hanger bracket upon the lower side thereof.

4. A roller skate structure comprising a frame arranged for connection at its upper side to a shoe or the like, a wheel axle support bracket, an action screw interconnecting the frame and support bracket, strut means interconnecting the frame and support bracket, means pivotally connecting said action screw to both said frame and said support bracket and including a securing collar encircling the action screw and means removably connecting the collar and the frame, said collar upon removal from the frame being operable to effect the removal of the action screw from the frame from the lower side thereof.

5. A roller skate structure comprising a frame, a wheel axle support bracket, strut means interconnecting the frame and support bracket, an elongated action member, upper pivot means interconnecting the upper end of the action member with the frame for pivotal movement of the action member with respect to the frame about a center adjacent the upper end of the action member, lower pivot means interconnecting the lower end of the action member with the axle support bracket for pivotal movement of the action member with respect to the support bracket, said lower pivot means including a pair of relatively shiftable bearing members under maintained engagement with one another during pivotal movement therebetween and one of said bearing members having an upwardly and inwardly inclined bearing surface to locate the center of movement of the action member adjacent the lower end thereof whereby the centers of the pivotal movements of the upper and lower ends of the action member are spaced from one another substantially the length of the action member.

6. A roller skate structure as claimed in claim 1, wherein the member encircling the upper end of the action screw is threadedly connected to the frame, and wherein the means connecting the lower end of the action screw to the support bracket consists of a member encircling and threadedly connected to the action screw.

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