

June 26, 1951

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2,558,696

ROLLER SKATE

Filed Dec. 9, 1946

2 Sheets-Sheet 1

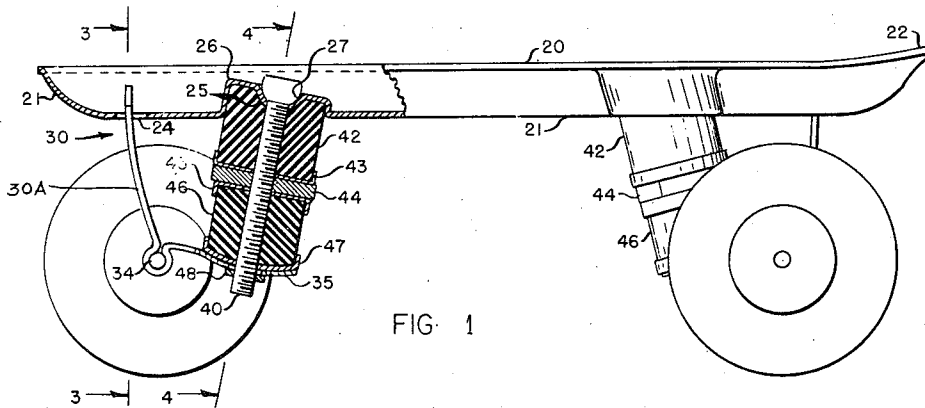


FIG. 1

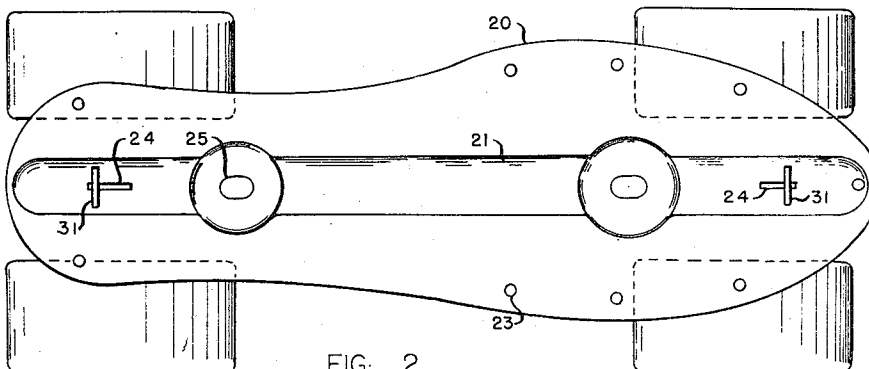


FIG. 2

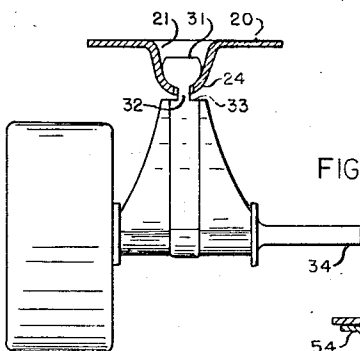


FIG. 3

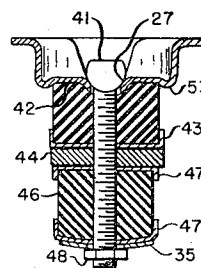


FIG. 4

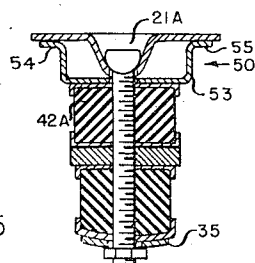


FIG. 5

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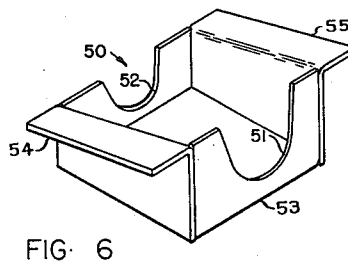
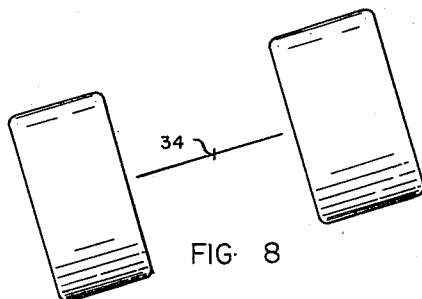
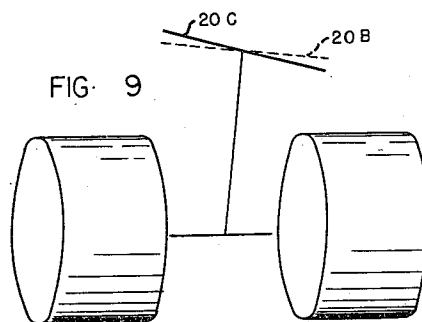
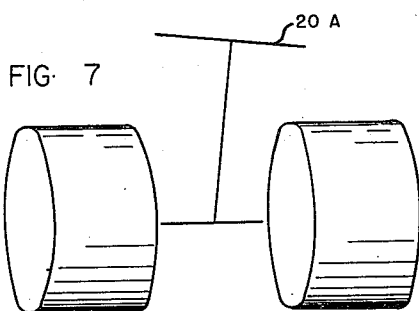
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ROLLER SKATE

Earl Van Horn, Mineola, N. Y.

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10 Claims. (Cl. 280—11.28)

1

This invention relates to an improved roller skate, and its object is to provide a flexible connection between the foot-plate and the king-pins in addition to the usual flexible connection between the wheel axles and the king pins in order to make its use simulate that of ice skates. By the use of this invention the skater's foot assumes substantially the same positions in going around curves that it would assume if he were making the same curves with ice skates.

A further advantage of this invention is that it facilitates the use of roller skates and lessens muscular strains on the skater.

A further object is to simplify the construction of roller skates and to provide a rugged structure of few parts which is inexpensive to manufacture.

These and other objects of the invention will appear in the following specification, in which I will describe certain embodiments of the invention, and in which its novel features will be pointed out in claims.

Referring to the drawings,

Fig. 1 is a side elevation, partly in section, of a roller skate which is made according to and embodies my invention;

Fig. 2 is a plan view of the skate shown in Fig. 1;

Figs. 3 and 4 are sectional end elevations of the skate shown in the preceding figures, the sections being taken respectively on the lines 3—3 and 4—4 of Fig. 1;

Fig. 5 is a sectional end elevation of a modified construction;

Fig. 6 is a perspective view on an enlarged scale of a part of the structure shown in Fig. 5;

Fig. 7 is a diagrammatic end elevation of the skate taken from its rear end or from the left-hand end of Fig. 1, with the foot-plate and kingpin tilted and the roller axle moved out of its normal position at right angles to the longitudinal axis of the skate;

Fig. 8 is a diagrammatic plan view of the rollers and their axle in the positions in which they are shown in Fig. 7; and

Fig. 9 is a diagrammatic end elevation similar to Fig. 7, with the foot-plate tilted at a greater inclination.

Referring to Figs. 1-4, 20 designates a foot-plate provided with a straight longitudinal channel 21, the bottom of which is substantially semi-circular in transverse section. The front end 22 of the plate is bent upwardly, as shown in Fig. 1, to conform to the usual shape of the sole of a shoe. Spaced rivet holes 23 in the plate are

2

shown in Fig. 2. Elongated slots 24 are formed in the bottom of the channel 21 near its ends.

An axle bracket, designated generally in Fig. 1 by the reference numeral 30, has a truck arm 30A with a head 31 at its upper end, the width of which is slightly less than the length of the slot 24 so that it may be inserted into the channel through the slot 24. Below the head is a narrow neck 32, the width of which is slightly less than that of the slot 24. Below the neck is a part 33, which is wider than the slot. When the head is inserted through the slot into the channel and is turned 90°, the truck arm is locked to the foot-plate. The lower edge of the head 31 is shaped to conform to the inner surface of the channel and forms therewith a universal joint.

The truck arm 30A of the axle bracket 30, which is preferably stamped out of sheet metal, extends downwardly to and around a wheel axle 34 and a part of the axle bracket extends from the axle in a substantially horizontal direction to form an arm 35 having a perforated concave circular depression therein through which the shank 40 of a threaded kingpin passes freely. The connection between the lower part of the kingpin and the axle bracket constitutes a universal joint.

The kingpin has an enlarged head 41, which is oval in cross section, the under surface of which is rounded to fit the inner surface of the channel 21.

A portion of the channel 21 is pressed upwardly to form a circular receptacle 25, the upper surface 26 of which is inclined at an angle to the foot-plate 20. A concave oval pocket 27 similar in shape to that of the head 41 of the kingpin is depressed in this upper part of the receptacle 25, with a clearance hole therein through which the shank 40 of the kingpin passes. This forms a universal joint connection between the foot-plate and the kingpin. The oval shape of the head of the kingpin and of the pocket 27 prevents the kingpin from rotating when a torsional force is applied thereto. 42 is a resilient member which surrounds the kingpin shank with its upper end projecting into and engaging the lower surface of the receptacle 25, and with a flanged washer 43 under its lower end. 44 is a nut in threaded adjustable engagement with the kingpin shank 40. Under the nut 44 is another flanged washer 45 over the upper end of another resilient member 46, which also surrounds the kingpin shank. This member 46 rests upon the arm 35 with an interposed flanged washer 47. The lower side of this washer forms a convex circular surface which rests in and is free to move on the concave cir-

cular depression in the arm 35 of the axle bracket 30. 43 is a nut on the shank 40 of the kingpin under the arm 35 of the axle bracket, which holds the resilient members 42, 44 under pressure.

The resilient members resist the relative movement between the foot-plate and the kingpin and between the kingpin and the axle bracket to a greater or less extent, depending upon the degree of pressure on them. The pressure on the upper resilient member can be increased by moving the nut 44 upwardly. This simultaneously decreases the pressure on the lower resilient member 46. The pressure of the lower resilient member can be adjusted independently by means of the nut 48.

I have thus described one of the trucks for one of the wheel assemblies. It is to be understood that a similar organization is provided on the skate near its other end.

When the foot-plate is tilted into the position in which it is shown by a full line at 20A in Fig. 7, and by a dotted line 20B in Fig. 9, the wheel axle 34 will be shifted into the position shown in Fig. 8. This operation is similar to the usual one, with the exception of the fact that, because of the flexible connection between the foot-plate and the kingpin, action of the kingpin on the truck arm is not positive but is cushioned to the extent determined by the amount of pressure exerted on the upper resilient member 42 by the nut 44.

One accustomed to roller skating will feel that such positions thus diagrammatically represented are natural ones. An ice skater, however, actually tilts his foot to a greater extent in making a curve of the same radius and at the same rate of speed. By the use of my skate, the foot-plate may be tilted further as represented by the line 20C in Fig. 9 without shifting the wheel axles to an appreciable extent. Thus, an ice skater finds it an easy matter to use roller skates if they are made according to the present disclosure. Habitual roller skaters also find that the greater flexibility of this arrangement relieves much of the strains on the muscles, especially about the ankles.

Because of the adjustability of the degree of pressure on the members 42 and 46, these parts may be regulated to suit the individual user's weight, tastes and requirements. The cushioning effect of the resilient members around the kingpins absorbs shocks and prevents breakage of the kingpins and other parts of the wheel assemblies.

In Fig. 5 the channel 21A is of uniform cross-sectional shape throughout its length. As the kingpin preferably extends from the foot-plate at the angle offset from the normal, I interpose a housing 50 such as that shown in Figs. 5 and 6 between the channel and the upper resilient member 42A, to provide an abutment surface at right angles to the axis of the kingpin, for the upper end of the resilient pressure member 42A. The housing is stamped out of sheet metal and bent into the form shown in Fig. 6, with its abutting edges welded together. Its opposite ends 51, 52 are cut away to conform to the outer surface of the channel 21A. These cut-out portions are of different depths so that the position of the bottom plate 53 is at an angle normal to the axis of the kingpin shank 40. The upper parts of the side plates of the housing are bent outwardly as at 54, 55 to form flanges which rest upon flat portions of the under surfaces of the foot-plate 20.

Various modifications in construction, mode of operation, method and use of an invention may and do occur to others, especially after benefiting from knowledge of such a disclosure as that herein presented of the principles involved, but the invention itself is not confined to the present showing.

I claim:

1. In a skate, a footplate, a roller assembly including an axle, an axle bracket having a truck arm interconnecting the footplate and the axle, a kingpin, a universal joint connection between the footplate and the upper part of the kingpin, a universal joint connection between the lower part of the kingpin and the axle bracket and a resilient pressure member interposed between said universal joint connections.

2. In a skate, a footplate, a roller assembly including an axle, an axle bracket having a truck arm interconnecting the footplate and the axle, a kingpin interconnecting the footplate and the axle bracket, a universal joint connection between the upper part of the kingpin and the footplate, a universal joint connection between the lower part of the kingpin and the axle bracket, and an adjustable resilient pressure member interposed between said universal joint connections.

3. In a skate, a footplate, a roller assembly including an axle, an axle bracket having a truck arm interconnecting the footplate and the axle, a threaded kingpin interconnecting the footplate and the axle bracket, a universal joint connection between the upper part of the kingpin and the footplate, a universal joint connection between the lower part of the kingpin and the axle bracket, a resilient pressure member surrounding the kingpin interposed between said universal joint connections, and a nut on the lower end of the kingpin.

4. In a skate, a footplate, a roller assembly including an axle, an axle bracket having a truck arm interconnecting the footplate and the axle, a universal joint connection between the upper part of the truck arm and the footplate, a threaded kingpin interconnecting the footplate and the axle bracket, a universal joint connection between the upper part of the kingpin and the footplate longitudinally spaced from the universal joint between the truck arm and the footplate, said kingpin passing through a part of the axle bracket near the axle, a universal joint connection between the lower part of the kingpin and the axle bracket, a resilient pressure member surrounding the kingpin interposed between the universal joint connections of the kingpin, and a nut on the kingpin below the axle bracket.

5. In a skate, a footplate, a roller assembly including an axle, an axle bracket having a truck arm interconnecting the footplate and the axle, a threaded kingpin interconnecting the footplate and the axle bracket, a universal joint connection between the footplate and the kingpin, a resilient pressure member beneath the footplate and around the kingpin, a universal joint connection between the axle bracket and the kingpin, a resilient pressure member above the axle bracket and around the kingpin, and an adjusting member in threaded engagement with the kingpin interposed between said pressure members.

6. In a skate, a footplate, a roller assembly including an axle, an axle bracket having a truck arm interconnecting the footplate and the axle,

5

a universal joint connection between the upper part of the truck arm and the footplate, a threaded kingpin interconnecting the footplate and the axle bracket, a universal joint connection between the upper part of the kingpin and the footplate, longitudinally spaced from the universal joint between the truck arm and the footplate, said kingpin passing through a part of the axle bracket near the axle, a universal joint connection between the lower part of the kingpin and the axle bracket, resilient pressure members surrounding the kingpin interposed between the universal joints of the kingpin, a nut on the kingpin between said pressure members, and a nut on the kingpin below the axle bracket. 15

7. In a skate, a footplate having a longitudinal channel depressed therein, a wheel assembly including an axle, an axle bracket having a truck arm extending from the axle to and through the footplate, and a kingpin passing through a part of the axle bracket near the axle and through the footplate, said truck arm and kingpin having heads engaging the inner surface of the channel and forming universal joints therewith. 20

8. In a skate, a footplate, a roller assembly including an axle, an axle bracket having a truck arm interconnecting the footplate and the axle, a kingpin, a direct flexible joint connecting the upper part of the kingpin with the footplate, 25

6

said joint being constructed to permit the lower part of the kingpin to move laterally in relation to the footplate, a universal joint connection between the lower part of the kingpin and the axle bracket and a resilient pressure member interposed between said direct joint and said universal joint connection.

9. A skate as set forth in claim 8 having means to adjust the pressure of said resilient member.

10. A skate as set forth in claim 9 wherein the resilient pressure member surrounds the kingpin.

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