March 31, 1953 F. M. WISELEY 2,633,364

ROLLER SKATE

Filed Feb. 21, 1949

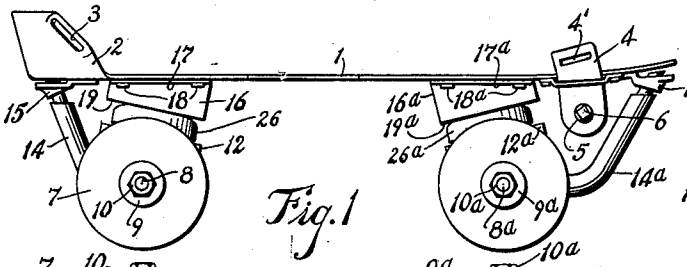


Fig. 1

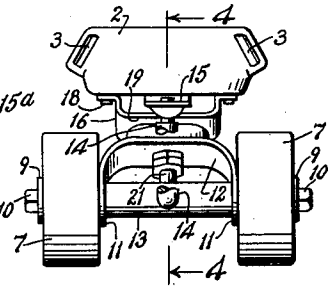


Fig. 3

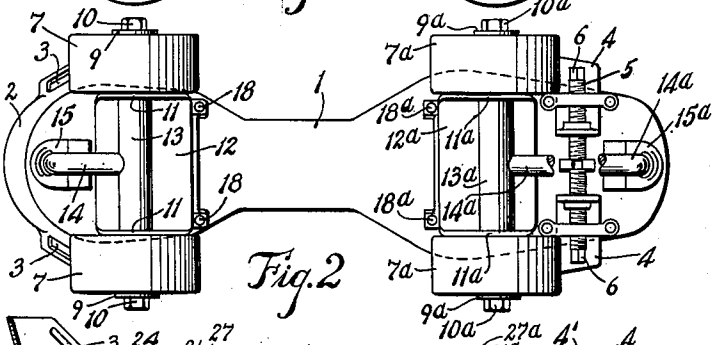


Fig. 2

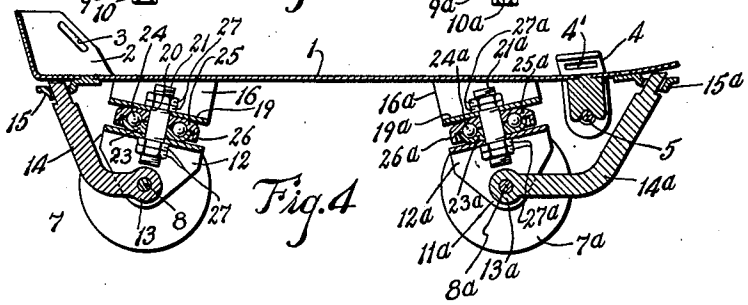


Fig. 4

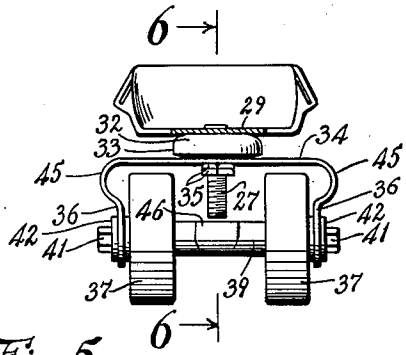


Fig. 5

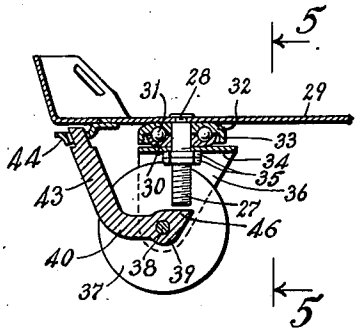


Fig. 6

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ROLLER SKATE

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7 Claims. (Cl. 280—11.28)

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This invention relates to roller skates and particularly to an improved construction thereof characterized by an improved mounting for the rollers and increased ease in executing turns and other maneuvers while skating.

An object of the invention is to provide a roller skate having spring means interposed between the rollers and the foot plate adapted to absorb the shocks derived from skating over rough or uneven surfaces.

Another object of the invention is to provide a roller skate having spring mounted rollers which is so constructed and arranged that shifting of weight by the user will cause the roller axles to move out of parallelism with each other and so cause the skate to travel in a curve as desired by the user.

A further object of the invention is to provide a roller skate in which the roller axles are pivoted for angular movement with an interposed ball bearing to increase the ease with which the aforesaid turning and other maneuvers may be executed.

A still further object of the invention is to provide a roller skate having the above desirable features and which is composed of few parts, is of simple design, is economical to manufacture, and is reliable in operation.

With the above objects in view, together with such other objects and advantages as may subsequently appear, the invention resides in the parts and in the construction, combination and arrangement of parts hereinafter described, by way of example, in the following specification of certain modes of execution of the invention, and illustrated in the accompanying drawings and in which drawings:

Fig. 1 is a side elevation of a roller skate embodying one mode of execution of the invention,

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

Fig. 3 is a rear elevation of Fig. 3, certain parts being broken away for clearness of illustration,

Fig. 4 is a longitudinal, medial, sectional view taken generally on the line 4—4 of Fig. 3,

Fig. 5 is a front elevation of the rear wheel portion of a roller skate embodying a modified form of the invention; the view being taken from approximately the position indicated by the line 5—5 in Fig. 6, and

Fig. 6 is a sectional view taken on the line 6—6 of Fig. 5.

Referring first to Figs. 1 to 4, the form of the invention there shown comprises a foot plate 1 having the usual upstanding heel engaging flange

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2 at the rear end; the ends of the flange being provided with suitable strap slots 3, 3, and the forward end of the foot plate having the usual clamping elements mounted thereon together with the usual operating screw 5 having a square head portion 6 adapted to be engaged by a key to attach and detach the skate. Preferably, the clamps 4, 4 are provided with strap slots 4', 4' to permit the skate to be attached to shoes having soles which are not suitable to be engaged by the clamps.

The rear wheels 7, 7 including the usual antifriction bearings are mounted on the opposite ends of an axle bolt 8 and are secured thereon by washers 9, 9 and nuts 10, 10. The bolt 8 is mounted in and carried by the spaced, downturned end portions 11, 11 of an inverted U-shaped spring member 12 and between these end portions the bolt extends through the head portion of a T-shaped element 13, the stem 14 of which extends rearwardly and thence upwardly to loosely engage a socket member 15 fixed to the lower rear portion of the foot plate 1 and by such engagement to limit the extent of turning movement of the roller assembly as a unit.

Fixed to the under side of the rear end of the foot plate 1 is a second U-shaped spring member 16 having laterally extending flanges 17, 17 by which it is secured to the foot plate by rivets 18, or, if desired, by welding or brazing. The bottom portion 19 of the member 16 is upwardly and rearwardly inclined and at its center is provided an opening 20 to receive one end of a stud 21 the other end of which extends through an opening in the center of the spring member 12 and mounted on the stud 21 and interposed between the adjacent faces of the spring members 12 and 16 is a ball bearing assembly comprising a lower ball race 23, a series of ball bearings 24, and an upper ball race 25 having a depending skirt portion 26 overlying the exterior of the race 23 to exclude foreign matter from the ball races.

The roller assembly is secured to the member 16 with the interposed ball bearing by pairs of lock nuts 27, 27 on each end of the stud 21 which are set to permit turning movement of the roller assembly without end play. The stud 21 is of such length and is so set by the adjustment of the lock nuts 27 that the ends thereof are spaced only sufficiently from the foot plate and the member 13 to permit such spring action of the members 12 and 16 as will not exceed the elastic limit of the material.

The front roller assembly is identical with

that of the rear roller assembly except the upper spring member is reversed so that the stud is oppositely inclined and the means for limiting the pivotal movement of the assembly is extended forwardly and thence upwardly. Consequently, the same numerals have been applied with the addition of the letter *a*.

It will be appreciated that due to the opposite inclinations of the front and rear studs, that when the weight of the skater is applied directly downwardly on the skate, the roller assemblies will tend to assume parallel positions, and that when the weight is shifted sidewise on the skate, the roller assemblies will tend to move about the studs in opposite directions with the rollers at the side of the skate having the greatest weight moving toward each other thus tending to cause the skate to move in a curved path moving toward the side at which the weight is applied. Further, the spring members will absorb the shocks and prevent their being communicated to the body of the user. Still further, the parts comprising the front and rear assemblies are identical, simple in design and light in weight; all contributing to a construction that is economical to manufacture and assemble and one that is pleasing to the user because of its light weight and ease of control.

Referring now to the form of the invention shown in Figs. 5 and 6, a stud 27 having a reduced diameter neck portion 28 is riveted in a hole in the foot plate near the rear end thereof with the stud depending from the bottom of the plate. Mounted on the stud 27 and engaging the footplate is a ball bearing assembly of the same type as used in the first form of the invention and comprising a lower race 30, a series of ball bearings 31, and an upper race 32 having a depending skirt portion 33 to exclude foreign matter from the races and bearings. Pivotally mounted on the stud 27 and engaging the lower race is a resilient yoke member 34 held on the stud by a pair of lock nuts 35 which are adjusted to permit pivotal movement only of the yoke member. The depending arms 36, 36 of the yoke member 34 extend on the outside of the roller assembly comprising a pair of rollers 37, 37 mounted on a bolt 38 with the interposed head 39 of a T-shaped member 40. The ends of the bolt pass through holes in the lower ends of the arms 36, 36 which are located to the rear of the axial line of the stud 27 and nuts 41, 41 and washers 42, 42 on each end of the bolt 38 secure the rollers on the bolt and at the same time secure the bolt in the arms 36, 36. The stem 43 of the member 40 extends rearwardly and thence upwardly to loosely engage a socket member 44 carried by the rear end of the foot plate 29 to limit the extent of pivotal movement of the yoke and roller assembly about the stud 27. To distribute the bending of the yoke member incident to yielding to loads imposed thereon, the upper ends of the depending arms are preferably bowed outwardly as indicated at 45, 45, and to limit the extent to which this yielding action can be effective, the stud 27 is of sufficient length to contact a lug 46 extending laterally from the head 39 of the member 40 before the yoke is sprung beyond its elastic limit. Since, as in the first form of the invention, the front roller assembly is of the same character as the rear assembly above described except for the same type of reversal, involving placing the axial line of the rollers in front of the axial line of the stud and locating the stop for the pivotal movement at the front of the skate, detailed description has not been thought necessary.

This second form of the invention is best adapted to street skates such as used by children and is both light in weight and of sturdy construction. The resilience of the yoke members will absorb the shocks of the uneven street and sidewalk surfaces and the ball bearings associated with the supporting yokes will reduce the effort required to execute turns.

The foot plate portion of either form of the invention may be made in one piece as shown or it may be made adjustable to accommodate different sizes of shoes. Further, it may be equipped with attaching means as shown, or it may be made flat for permanent attachment to skating shoes.

While I have illustrated and described certain forms of my invention, I do not limit myself to the specific constructions disclosed, and the invention embraces all such modifications of the parts and their equivalents and of all such arrangements and combinations thereof as shall come within the purview of the appended claims.

I claim:

1. A roller skate comprising a foot plate attachable to the shoe of the user, a pair of rollers mounted on a common axle and disposed beneath and adjacent the front end of the foot plate; a second pair of rollers disposed beneath and adjacent the rear end of said plate and separate resilient mounting means for each of said pairs of rollers; each of said mounting means including an inverted U-shaped flat metal spring member arranged with its ends engaging and carrying said axle adjacent each of said rollers a second U-shaped spring member having its ends attached to the side edges of said foot plate and having its bottom portion disposed in a plane at an acute angle to the plane of said foot plate, a pivot pin carried by and depending from said bottom portion upon which said first named spring is pivotally mounted and a ball bearing mounted on said pivot pin and disposed between said spring members.

2. A roller skate comprising a foot plate attachable to the shoe of the user, a pair of rollers mounted on a common axle and disposed beneath and adjacent the front end of the foot plate, a second pair of rollers disposed beneath and adjacent the rear end of said plate and separate resilient mounting means for each of said pairs of rollers; each of said mounting means including an inverted U-shaped flat metal spring member arranged with its ends engaging and carrying said axle adjacent each of said rollers, a second U-shaped spring member having its ends attached to the side edges of said foot plate and having its bottom portion disposed in a plane at an acute angle to the plane of said foot plate, a pivot pin carried by and depending from said bottom portion upon which said first named spring is pivotally mounted and a ball bearing mounted on said pivot pin and disposed between said spring members; the bottom portion of first named rear spring member associated with the pair of rollers being inclined in the opposite direction of the inclination of the corresponding member associated with the front pair of rollers.

3. A roller skate comprising a foot plate attachable to the shoe of the user, a pair of rollers mounted on a common axle and disposed beneath and adjacent the front end of the foot plate; a second pair of rollers disposed beneath and adjacent the rear end of said plate and sepa-

rate resilient mounting means for each of said pairs of rollers; each of said mounting means including an inverted U-shaped flat metal spring member arranged with its ends engaging and carrying said axle adjacent each of said rollers a second U-shaped spring member having its ends attached to the side edges of said foot plate and having its bottom portion disposed in a plane at an acute angle to the plane of said foot plate, a pivot pin carried by and depending from said bottom portion upon which said first named spring is pivotally mounted and a ball bearing mounted on said pivot pin and disposed between said spring members; the bottom portions of the spring members attached to the foot plate being inclined in planes which intersect below the foot plate.

4. A roller skate comprising a foot plate attachable to the shoe of the user, a pair of rollers mounted on a common axle and disposed beneath and adjacent the front end of the foot plate; a second pair of rollers disposed beneath and adjacent the rear end of said plate and separate resilient mounting means for each of said pairs of rollers; each of said mounting means including an inverted U-shaped flat metal spring member arranged with its ends engaging and carrying said axle adjacent each of said rollers a second U-shaped spring member having its ends attached to the side edges of said foot plate and having its bottom portion disposed in a plane at an acute angle to the plane of said foot plate, a pivot pin carried by and depending from said bottom portion upon which said first named spring is pivotally mounted and a ball bearing mounted on said pivot pin and disposed between said spring members; each of said ball bearings comprising a lower race element having a ball engaging raceway in its upper face, a series of ball bearings in said raceway, and an upper race element having a ball engaging raceway in its lower face adapted to engage said series of ball bearings and having a skirt portion loosely extending over the periphery of said lower race to exclude foreign matter from said raceways.

5. A roller skate comprising a foot plate attachable to the shoe of the user, a pair of rollers mounted on a common axle and disposed beneath and adjacent the front end of the foot plate; a second pair of rollers disposed beneath and adjacent the rear end of said plate and separate resilient mounting means for each of said pairs of rollers; each of said mounting means including an inverted U-shaped flat metal spring member arranged with its ends engaging and carrying said axle adjacent each of said rollers a second U-shaped spring member having its ends attached to the side edges of said foot plate and having its bottom portion disposed in a plane at an acute angle to the plane of said foot plate, a pivot pin carried by and depending from said bottom portion upon which said first named spring is pivotally mounted and a ball bearing mounted on said pivot pin and disposed between said spring members; said pivot pins being so disposed as to limit the extent of yielding of said spring members.

6. A roller skate comprising a foot plate having means for attachment to the shoe of the user and pairs of rollers at the front and rear ends of said plate, a pair of flat metal springs, each carrying an axle supporting one pair of said rollers, a pair of pivot pins each pivotally connecting one of said springs to said foot plate, ball bearings mounted on said pivot pins and interposed between each of said springs and said foot plate, and means including said pivot pins and non-rotatable members mounted one on each of said axles and disposed in the path of axial movement of said pivot pins incident to yielding action of said springs effective to limit the extent of yielding action by said spring.

7. In a roller skate, a front pair of rollers mounted on an axle bolt, a rear pair of rollers mounted on a second axle bolt, a foot plate and means for resiliently supporting said foot plate on said rollers comprising an inverted U-shaped spring element having its ends mounted on said first axle bolt adjacent to the rollers carried thereby, a second inverted U-shaped spring element having its ends mounted on said second axle bolt adjacent to the rollers carried thereby, and pivot pins connecting said pairs of rollers to said foot plate adjacent the front and rear ends of said foot plate, and means including a pair of members mounted one on each of said axles and having a portion thereof engaging the foot plate at a point longitudinally spaced from the pivot pin associated with the axle on which said member is mounted; each of said members having a portion thereof axially aligned with and normally spaced from the adjacent end of said associated pivot pin and engageable by said end upon yielding of the spring element with resultant limitation of the extent of yielding of said spring members.

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