

Feb. 25, 1941.

R. R. WARE

2,233,355

ROLLER SKATE

Filed Jan. 20, 1940

2 Sheets-Sheet 1

FIG. 1.

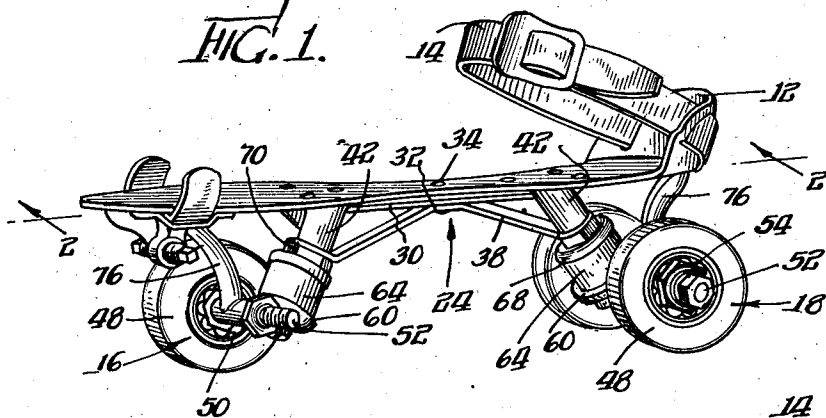


FIG. 2.

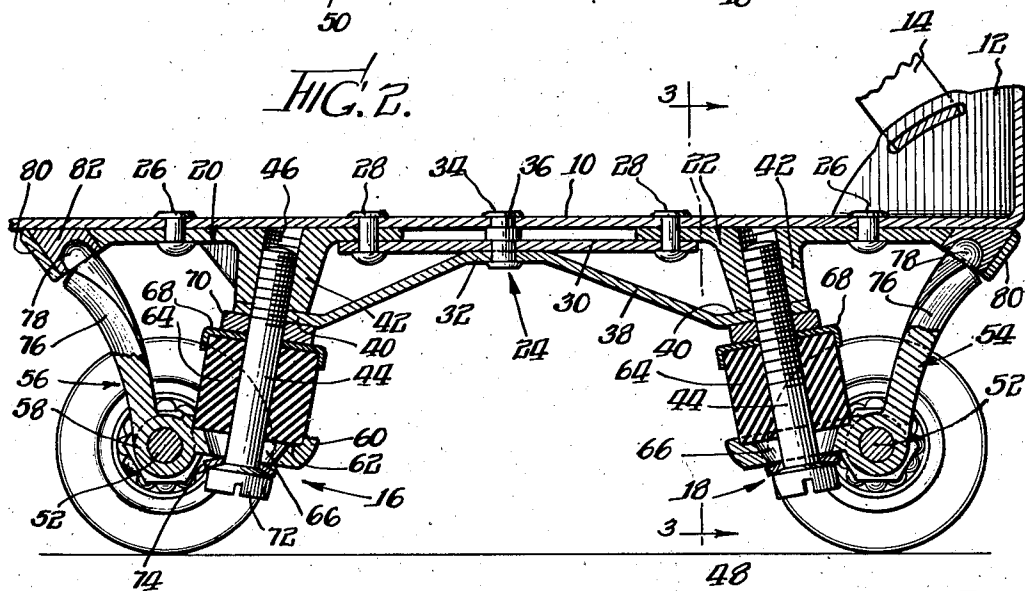


FIG. 3.

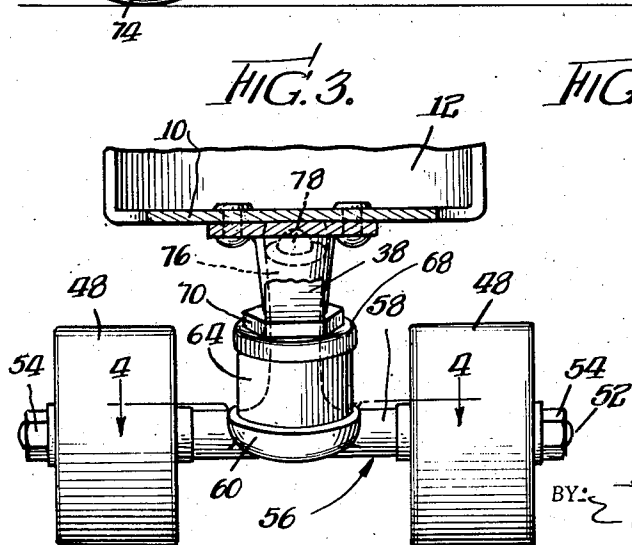
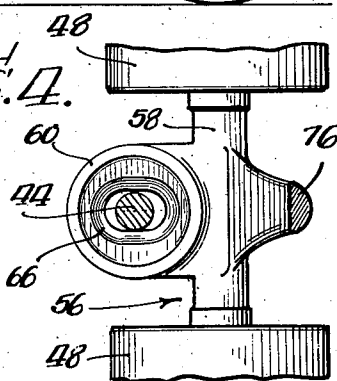


FIG. 4.



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FIG. 5.

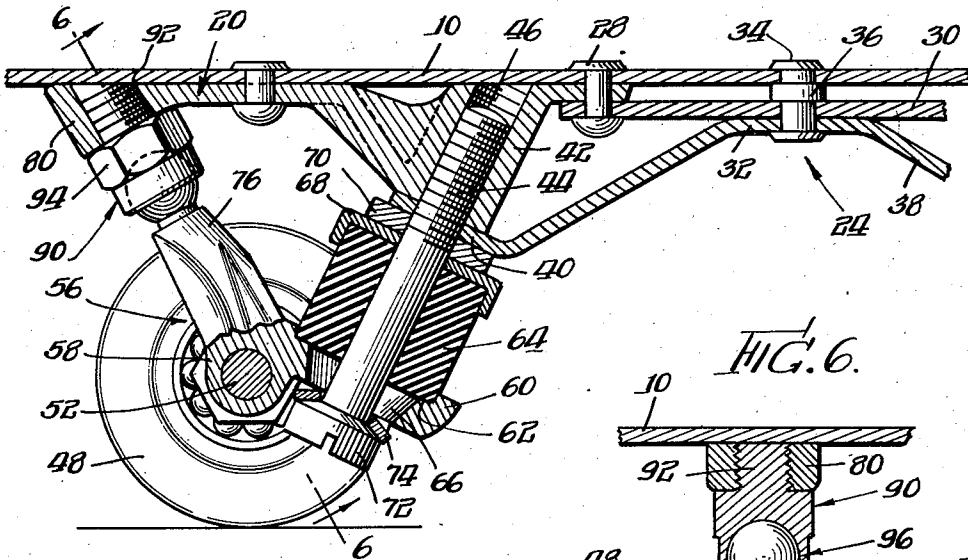


FIG. 6.

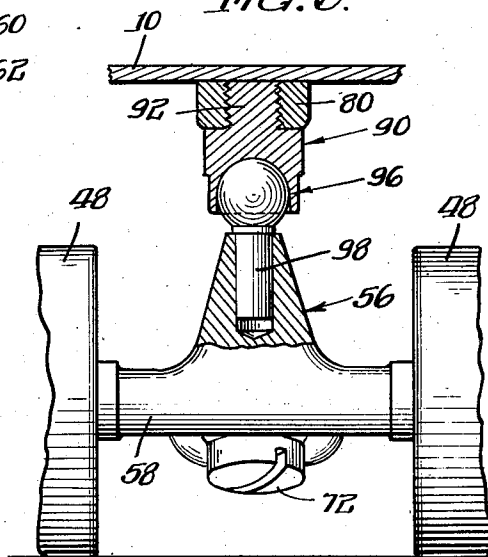


FIG. 7.

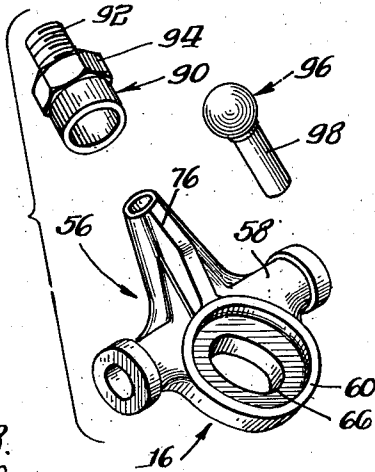


FIG. 8.

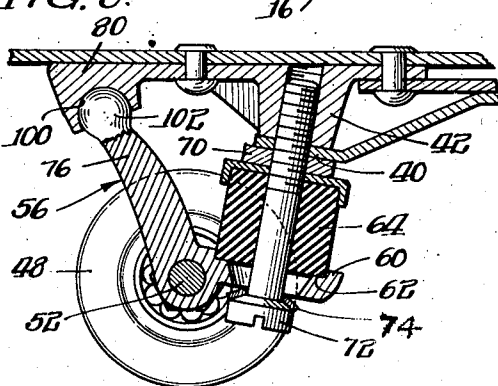
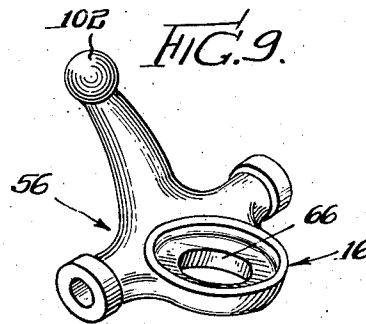


FIG. 9.



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UNITED STATES PATENT OFFICE

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ROLLER SKATE

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Application January 20, 1940, Serial No. 314,749

2 Claims. (Cl. 280—11.28)

The present invention relates to a roller skate construction and more particularly to the wheel, roller or axle supporting assembly.

The present invention more particularly contemplates a skate of the type provided with resiliently supported axle mountings adapted to permit the axles to yield with respect to the body portion of the skate and to swivel about predetermined axes for shifting the wheels into planes adapted to facilitate turning and control. To this end the present invention provides suitable yielding or cushioning connections operatively associated with positive mechanical controls for directing the yieldable movements of the axle assemblies in accordance with a predetermined plan.

In constructions of this type, it has been found that the relatively movable parts are subjected to material wear and abrasion when subjected to regular and continuous use. The present invention concerns yet more particularly high-grade skates of the type embodying a strong, permanent construction in which the main or body portions are incapable of substantial flexure. I have observed that, in high-grade skate constructions of which I am aware, replacement and repair have been impractical or impossible due to the corresponding necessity for replacing permanently assembled portions of the skate body which were originally constructed with a view to remaining permanently and undetachably connected. Thus, it has been frequently necessary to discard the entire device due to excessive wear of some relatively shiftable parts.

It is accordingly an object of the present invention to obviate the foregoing difficulties and to provide an improved skate construction which embodies the foregoing permanence and rigidity which characterizes the high-grade type of skate construction but in which the parts subjected to frictional wear are replaceable by ordinary unskilled persons.

Another object of the present invention more particularly contemplates the provision of a main frame or body portion rigidly and permanently constructed and permanently mounting mechanical supporting elements complementary to and adapted to coact with relatively movable carriage or axle supporting units so constructed and arranged as to facilitate replacement in the event of wear.

Yet more particularly, the present invention contemplates a construction, as above, in which the replaceable members wear or deteriorate in

service, preferably without detrimental effect on the permanent portions of the body.

It will thus be evident that, in accordance with these objects, the life of skates incorporating the present principles is materially lengthened and the operation improved.

The present invention, moreover, contemplates a new and improved disposition of the wheels of a roller skate with respect to the body portion and has for its object to provide a mounting such that a new plan of resilient movement is provided wherein the wheel carriages are yieldably mounted for universal swiveling about a predetermined point adjacent the front or rear portion of the skate.

Other objects and advantages of the invention will be apparent from the following description, when taken in connection with the accompanying drawings, wherein

Figure 1 is a perspective view of the roller skate embodying the present invention;

Figure 2 is a sectional view taken centrally and longitudinally through the skate of Figure 1 on a vertical plane designated by the line 2—2;

Figure 3 is a sectional detailed view taken from the skate of Figure 2 on the vertical plane 3—3 thereof;

Figure 4 is a detailed sectional view taken on the line 4—4 of Figure 3;

Figure 5 is a sectional view taken in the same manner as Figure 2, but showing a slightly modified form of a roller skate embodying the present invention;

Figure 6 is a detailed sectional view taken through the scale of Figure 5 on the line 6—6 thereof;

Figure 7 is a perspective view of parts comprising the wheel carriage assembly, the parts being shown in spaced relation to indicate their individual construction;

Figure 8 is a view taken as in Figure 5 but showing yet a further modification of the present invention; and

Figure 9 is a perspective view of the unit forming the wheel carriage of Figure 8.

Referring to the figures of the drawings, wherein one illustrated embodiment of the present invention is disclosed more in detail, I have shown, in Figure 1, a roller skate having a body portion or plate 10 providing a heel-receiving enclosure 12, its rear extremity in turn carrying the conventional strap 14.

The present skate mounts four forward and rearward wheel or roller assemblies 16 and 18, both embodying the same principles, being sub-

stantially identical in general form of construction, as will hereinafter appear to anyone skilled in the art. The front and rear carriage or roller assemblies are mounted upon respective front and rear brackets 20 and 22 which cooperate with a central truss construction, identified generally by the reference numeral 24, for permanently rigidifying the body of the skate and providing a torsion resistant frame. To this end, it will be noted that each of the brackets is permanently associated with the plate 10 by riveted fasteners 26 and 28. It is to be particularly noted that central rivets 28 serve further to engage and permanently fasten a longitudinally extending strip or frame member 30 forming a part of the central cooperating truss construction 24. The remainder of this truss consists of an angularly-formed strap 32 centrally fastened to the elongated upper strap 30 and to the plate 10 by means of a rivet fastener 34 provided with a central spacing collar 36. It should be noted that the strap 32 is inclined downwardly, as at 38, on either side of its central point of securement to diverge from the frame member 30, and terminates in upwardly inclined attachment flanges 40 at either extremity.

The brackets 20 and 22 are each formed with a downwardly extending embossment 42 for receiving a fastener 44 and, in terminating the clamping surfaces against the extremities 40 of the strap 32, are clampingly received, as will be hereinafter more fully described. Thus, the portions 40 of the strap are centrally apertured to permit passage of the bolt 44, the extremity of which threadedly engages an interiorly threaded bore 46 in each embossment 42. It will be accordingly appreciated, from the foregoing, that the structural elements described cooperate as a permanent torsion resistant assembly.

The respective wheel assemblies comprise wheels or rollers 48 rotatably mounted by anti-friction ball-bearings 50 upon transverse axles 52. Internally threaded fastening nuts 54 on the extremities of the axles cooperate with a central supporting bracket 56 to maintain the fixed axial disposition of each of the rollers upon its respective axle shaft. The construction of the axle bracket 56, as more clearly shown in Figures 2 to 4, includes an integral sleeve 58 embracing the axle 52 and within which the axle 52 may be either fixedly or slidably engaged. A laterally and generally horizontally extending flange 60 projects at a slightly downward inclination from the sleeve 58.

Each flange 60, as shown in Figure 4, has an annular periphery extending about an annular, upwardly facing recess 62, formed to receive the lower end of a cylindrical cushioning member 64. Attention is particularly directed to the fact that the buffer 64, which is formed of rubber or any equivalent elastic material, is centrally apertured to permit passage of the stud shaft 44, and the buffer receiving flange 60 is similarly apertured for an identical purpose, as at 66. The upper extremity of each of the cylindrical buffers is likewise received within a suitable annular cup 68, through which the threaded stud 44 passes and resides adjacent a jam-nut 70.

From the foregoing, it will be obvious that the bolt or stud 44 extends through the aperture 66 in the flange 60, then axially centrally through cylindrical buffer 64, and through the annular receiving cup 68. On the other side of the cup 68 the threaded shank 44 receives jam-nut 70 and the truss attachment flange 40, and termi-

nates, as hereinbefore mentioned, within the internally threaded recess 46 in the permanent bracket 42. Accordingly, therefore, the truss extremity 40 is locked between the jam-nut 70 and the embossment 42, while the resilient buffer 64 is oppositely embraced by the axle flange 60 in the upper receiving cup 68.

Attention is particularly directed to the fact that the aperture 66 is relatively elongated in a forward direction and is, moreover, defined by upwardly and outwardly tapered side walls, whereby the axle assembly may move angularly with respect to the axis of the fastener 44. The fastener in turn is provided with a headed portion 72 having a frusto-conical tapered clamping surface bearing a frusto-conical washer 74. It is thought that it will be obvious from the foregoing that the frusto-conical fastener portions 72 and 74 cooperate with the relatively enlarged and tapered aperture 66 to facilitate the foregoing angular yielding of the wheel assemblies in service.

The present invention contemplates controlled, yieldable movement of the carriage about a predetermined point, in accordance with a fixed plan, to which end each bracket 56 connects with the main frame or body of the skate through the agency of an upwardly projecting arm 76 integral with the central portion or sleeve 58 and projecting into engagement with one of the brackets 20 and 22. To this end, arm 76 terminates in a hemispherical projection or ball 78 forming the male element of a ball and socket joint and received within a suitable complementary socket formed within an embossment 80 in the bracket 20, for example, spaced longitudinally from the bolt-receiving embossment 42.

For accommodating the male pivot member 78, the embossment is provided with a hardened insert 82. More particularly, the hardened insert is selected from material of such relatively hard, tough properties that it possesses substantially absolute wear resistance, relative to the complementary portion 78. Thus, in practical application of the present invention, the bracket 56, and accordingly the lever arm 76 thereof, may be formed of any suitable cast material having the desired antifriction properties, as well as suitable structural characteristics. To this end, for example, the brackets 56 may comprise malleabilized iron or bronze. In cooperation therewith, it is accordingly desirable to provide a complementary insert 82 of suitable hardened steel.

Attention is accordingly particularly directed to the fact that the angular movement of the arm 76 about the ball and socket connection with the insert 82, while necessarily and ultimately resulting in some wear of the frictionally shiftable parts, nevertheless, is incapable of operating to detrimentally affect the insert 82. That is to say, the superior hardness and wear resistance of the insert are such that the relatively softer material of the projection 78 is incapable of effecting appreciable wear.

While it is a corollary of the foregoing that all essential wear of the parts is concentrated at the frictional ball member 78, nevertheless, this member is readily replaceable by a simple operation and involves only the renewal of an inexpensive part. In other words, as will be obvious from the foregoing disclosure, the mere removal of one of the bolts or fasteners 44 permits the entire bracket 56, as well as the associated wheels or rollers, to fall away from the remainder of the skate assembly. A renewal bracket 56, fitting 75

properly with the socket insert 82, is disposed in the position shown in Figure 2, and the fastening stud or bolt 44 replaced and tightened until it tensions moderately against the resilient cylinder 64.

I have shown in Figures 5 to 7 a modification of the present invention wherein the hardened socket insert 82 is substituted by a socket member 90 of modified form. As clearly apparent from consideration of Figures 7 and 8, the socket 90 is mounted exteriorly of the embossment 98 through the agency of a projecting shank or stud 92, which is provided with threads as shown, received within the complementary threaded aperture in the embossment 98. It should further be noted that the socket member has a cup-like configuration and is provided with a hexagonal external periphery 94 adjacent the shank 92 for facilitating engagement or disengagement with the embossment.

From the foregoing, it will be obvious, therefore, that the socket member 90 may be freely mounted in or removed from the bracket 20. In accordance with the present embodiment, it should be further noted that the complementary ball element 96 of the ball and socket joint similarly comprises a spherical portion integral with an outwardly-extending shank 98. It should also be noted that the bracket or wheel carriage 56 receives the shank 98 in a position clearly shown in Figure 6. The parts may be rigidly forced together or otherwise suitably engaged.

It should be noted that the present embodiment affords opportunity for employing a hardened spherical ball 96 in conjunction with a suitable complementary bearing socket 90. Thus, even after considerable wear the socket 90 may be freely removed from the assembly for replacement. Various other desirable combinations of bearing materials will at once occur to those skilled in the art after consideration of the foregoing teachings.

In spite of material wearing influences to which the relatively movable pivot portions are subjected, the present invention provides a skate construction which may be maintained regularly in perfect operating condition sufficient to meet the demands of the most expert user. Of great significance, however, is the fact that maintenance and repair do not involve even a remote variation in the main frame or body of the skate. That is to say, the body portion, as well as associated brackets, remain permanently and rigidly assembled, as does the permanent insert 82. These are accordingly never, throughout the life of the skate, released or disassembled. The insert 82 remains permanently in the position shown, being located in the position shown under great frictional pressure or permanently engaged by a transverse pin or fastener, or in any other suitable manner.

It is also of particular importance to note that the present invention adapts itself to the provision of special antifriction combinations at the frictionally engageable bearing surfaces. Thus, I appreciate that metals in bearing contact exhibit a superior frictional efficiency when so selected that their atomic units exert a mutually repulsive action. In accordance with the present invention, I am enabled to render available the advantages of this principle by constructing the bracket of some suitable bearing material adapted to cooperate with the insert 82. Accordingly, with an insert formed of hardened steel, bracket 56 may comprise cast iron or the malleablized

derivative thereof, or such material as bearing bronze.

In Figures 8 and 9 I have shown a yet further modification of the present invention which, while devoid of many of the important features of the foregoing devices, nevertheless affords the same novel plan of yieldable coaction between the wheel carriages or brackets and the body of the skate. In other words, it will be noted that in accordance with the present embodiment the embossment 98 is formed with a hemispherical recess 100 to receive a complementary ball or sphere 102 on the extremity of the carriage or bracket 56.

While in accordance with the present embodiment it will be seen that the features of replaceability are not completely present, nevertheless it will be apparent that the wheel brackets 56 are still mounted so that they are resiliently yieldable against the yielding tension of the cylindrical members 64 about a point which is the center of the sphere 102. Thus it will be seen that the pair of wheels of each wheel unit are not only yieldable upwardly and rearwardly with respect to the body of the skate, but that they are substantially universally movable about the center of the sphere 102. The present invention, accordingly, provides for a plan of yieldable action whereby each wheel carriage or bracket is universally shiftable about a predetermined point longitudinally spaced toward the extremity of the skate body. This greatly facilitates the use and adaptability of skates and increases the enjoyment by the user.

It will be obvious from the foregoing that the present invention provides the above-mentioned improvements without adding appreciably, if at all, to the cost of production. The foregoing improved results are obtained by the use of a minimum of special materials, and the inserts are simple in form and adaptable to rapid assembly. The instant axle bracket construction, while performing numerous important functions, is adapted to creation by a simple casting or forming operation and requires only a minimum of material. In operation, accordingly, the wheel assemblies are limited to a predetermined pattern of movement with respect to a pivot point within the socket 78.

Changes may be made in the form, construction, and arrangement of the several parts without departing from the spirit or scope of the invention or sacrificing any of its attendant advantages, and the right is hereby reserved to make all such changes as fairly fall within the scope of the following claims.

The invention is hereby claimed as follows.

1. A roller skate construction comprising a body portion, roller means associated with said body portion, and means for mounting said roller means upon said body portion and disposing said roller means for yieldable movement relative to the body portion under the application of predetermined forces to the skate body, said last-named means comprising a roller supporting bracket resiliently associated with said body portion, said bracket having an arm terminating in a relatively soft bearing extremity spaced from said roller means, and relatively hard, wear-resistant, complementary bearing means permanently mounted on said body portion and receiving said first-named bearing means in bearing relationship for universal movement for disposing the wheels within a predetermined path of yieldable movement, said bearing extremity being formed of cooperating antifriction bearing

material with respect to the second bearing means.

5 2. A roller skate construction comprising a body portion, roller means associated with said body portion, and means for mounting said roller means upon said body portion and disposing
10 said roller means for yieldable movement relative to the body portion under the application of predetermined forces to the skate body, said last-named means comprising a roller supporting bracket resiliently associated with said body portion, a member projecting outwardly from the axis of said rollers into interengagement with

said body portion, said member bearing adjacent its outer extremity a ball pivot member, means providing a complementary socket recess for receiving said ball means and permanently mounted on the body portion of said socket, said recess providing means being formed of substantially relatively hard wear resistant material, and the ball means received thereby being formed of cooperating complementary antifriction bearing material which is relatively soft and adapted to preferentially wear when frictionally actuated within the socket. 5 10

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