Nov. 12, 1935. C. VOGT 2,021,035

ROLLER SKATE

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Fig. 1.

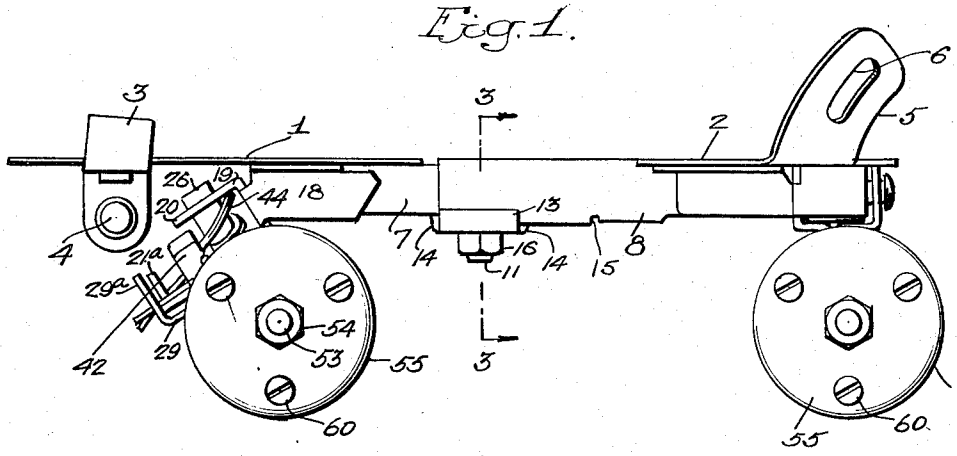



Fig. 2.

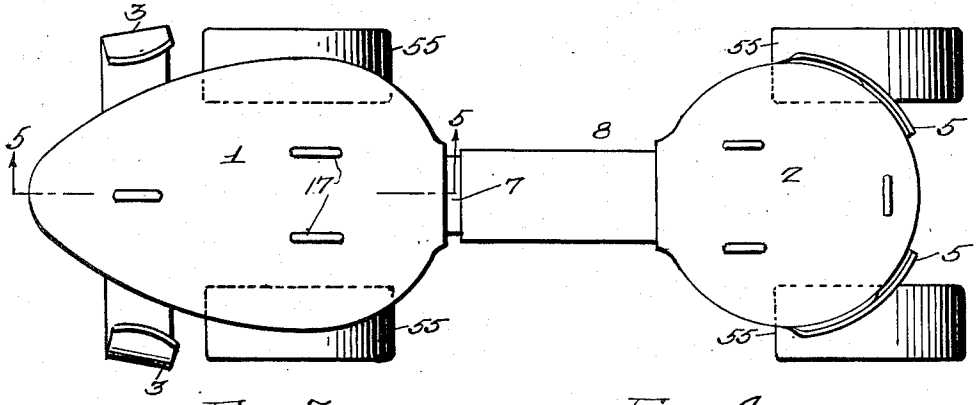



Fig. 3.

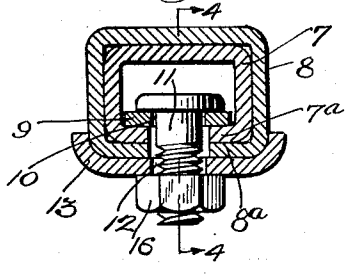
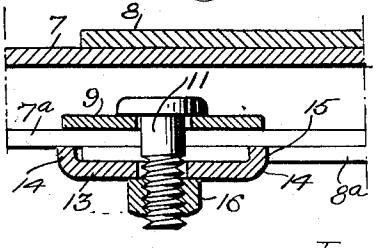



Fig. 4.




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Fig. 5.

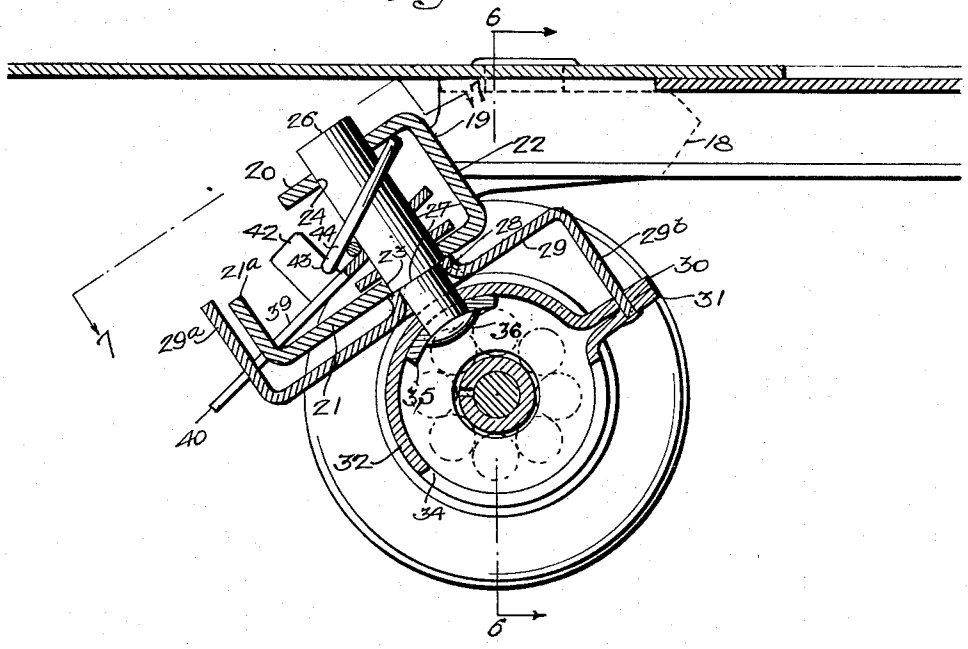
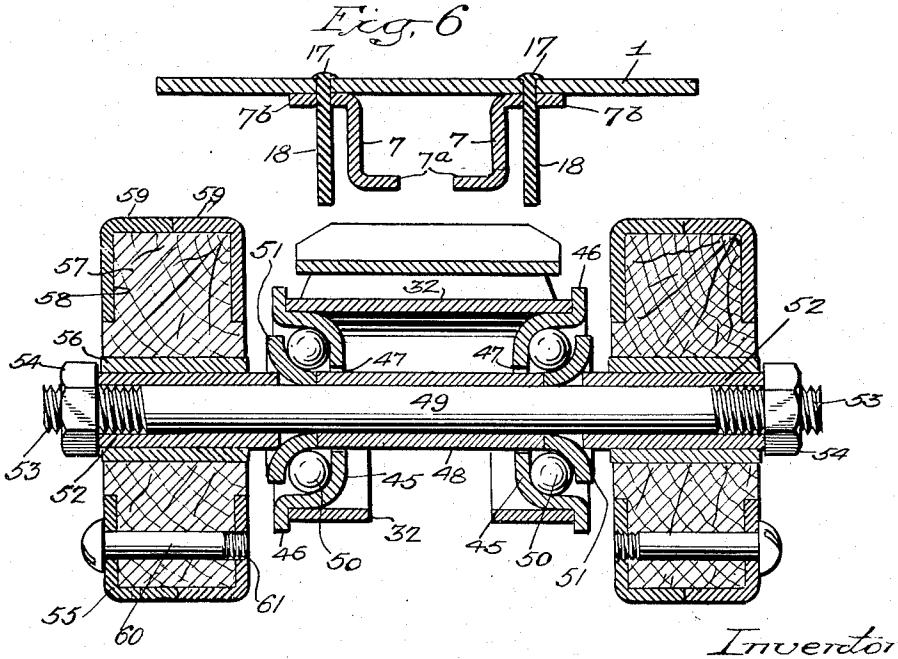



Fig. 6




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Fig. 7.

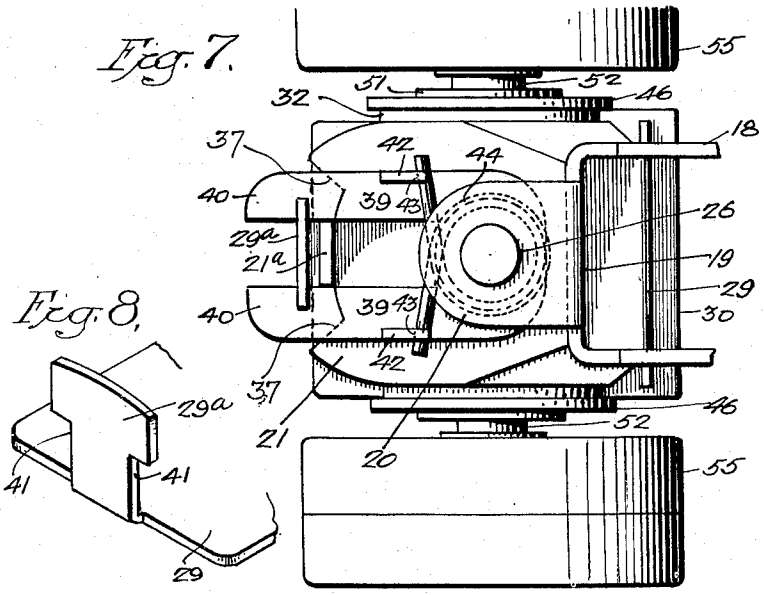



Fig. 8.

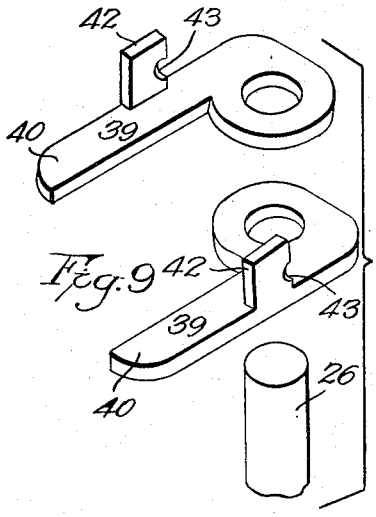



Fig. 9




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# UNITED STATES PATENT OFFICE

2,021,035

## ROLLER SKATE

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Application September 21, 1933, Serial No. 690,450

24 Claims. (Cl. 208—179)

This invention relates to new and useful improvements in skates and has particular relation to skates of the type mounted on wheels or rollers.

The principal object of the invention is to provide a skate as set forth having novel features of construction permitting the person skating thereon to describe curves of substantially small radii.

Another object of the invention is to provide a skate as set forth having novel features of construction permitting pivoting of the forward rollers of the skate with respect to the latter.

Another object of the invention is to provide a skate of the character set forth being provided with a double bearing for the pivotable spindle or pin of the front roller assembly.

Another object of the invention is to provide a skate of the character set forth having novel means for centering the front axle transversely with respect to the longitudinal axis of said skate.

Another object of the invention is to provide a skate of the character set forth including toe and heel supporting plates adjustably connected one to the other by means of a novel structural member.

A more specific object of the invention is to provide a skate of the character set forth having novel means including bearings fixed in a false axle together with a split sleeve arrangement for mounting the front axle in its supporting structure.

Other features and details of the invention and the construction thereof are set forth hereinafter and disclosed in the accompanying drawings, in which:

Fig. 1 is a view in side elevation of the skate constituting the present invention;

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

Fig. 3 is an enlarged view in section on line 3—3, Fig. 1;

Fig. 4 is a fragmentary view in section on line 4—4, Fig. 3;

Fig. 5 is an enlarged view in section on line 5—5, Fig. 2;

Fig. 6 is a view in section on line 6—6, Fig. 5;

Fig. 7 is a view in plan on line 7—7, Fig. 5;

Fig. 8 is an enlarged fragmentary view in perspective of the centering plate for the front roller assembly;

Fig. 9 is a detached view in perspective of the spindle control elements and their relationship to each other and said spindle.

Referring now more particularly to the drawings, a skate made in accordance with this invention comprises front and rear top or shoe plates 1 and 2, respectively. In the present instance the front plate 1 is provided with the customary shoe cleat elements 3 adjacent each side thereof, which may be adjusted by means of the threaded element 4 to meet the needs of the particular skater. The rear top plate 2 is provided with the customary back plates 5 having slots 6 therein through which pass the customary ankle straps (not shown).

The aforementioned top plates 1 and 2 are mounted upon longitudinally extending channel members 7 and 8, respectively, and these channel members are of such cross sectional shape and size as to permit the former to fit within the rear channel member 8 in the manner of a telescopic joint. It will be noticed that these channel members 7 and 8, which are positioned with the opening facing downward, are provided at their lower or flange edges with inwardly extending flanges 7a and 8a. A washer 9 is disposed within the channel member 7 and rests upon the upper surfaces of the inwardly extending flanges 7a thereof, the washer in the present instance being provided with an aperture 10 therein through which extends a bolt 11, said bolt 11 also extending through an aperture 12 formed in a plate 13 having a transverse cross-section shape permitting said plate 13 to snugly embrace the external surface of the outer channel member 8 as shown in Fig. 3. The longitudinal extremities of the plate 13 are turned up as at 14 and these bent up portions are intended to engage suitably positioned slots 15 formed in the bottom webs 8a of the channel 8 as shown in Fig. 4. A nut 16 is tightened on the bolt 11 as illustrated in the drawings, and precludes relative longitudinal movement of the overlapping channel members 7 and 8. In the present instance the web of the inner channel 7 is split axially adjacent the forward end and the inwardly projecting flanges thus formed by the cut are turned and bent outwardly such as shown at 7b in Fig. 6 and these outwardly turned flange portions 7b of the channel member 7 are secured to the underside of the forward plate 1 by means of rivets 17, which project upwardly through said flanges 7b and top plate 1. The rivets 17 are an integral part of plates 18, which extend rearwardly with respect to the skate from the spindle supporting bracket which is designated generally as 19.

More in detail the spindle supporting bracket

19 includes upper and lower flanges 20 and 21, connected by a web 22 from which the aforementioned plates 18 project. The forward portion of the lower web 21 of the bracket is upturned as at 21a to form a tongue the purpose for which will be set forth in detail hereinafter. The flanges 20 and 21 of the bracket 19 are provided with aligned apertures 23 and 24 respectively, and a spindle 26 is rotatably mounted therein as shown in Fig. 5 of the drawings. In the present instance the spindle 26 is provided with a shoulder 27, which is disposed in co-planar relation with the lower face of the bottom flange 21 of the spindle bracket 19 and this shoulder and the surrounding surface of said flange 21 rest upon the annular surface formed about the opening 28 in a plate 29. The front end 29a of the plate 29 is bent upwardly parallel with respect to the axis of the spindle 26 and the rear end 29b of which is bent in the opposite direction also parallel to the axis of said spindle 26. The portion 29b is permanently connected to the projecting flanges 30 and 31 of a split sleeve member 32 as at 33. The sleeve 32 has a portion cut therefrom as at 34 and an aperture is formed in the top portion of said sleeve in alignment with the apertures 23 and 24 in the spindle bracket 19. The spindle 26 extends through the aperture in the plate 32 and the latter is secured to said spindle by means of an arcuately shaped plate 35 disposed within the sleeve 32 and permanently retained on the spindle by distorting or flattening the head thereof as at 36.

In the present instance the bottom flange 21 of the pivot spindle bracket 19 has two segments cut therefrom as indicated at 37—37 leaving a central portion 21a which is bent upwardly parallel to the axis of the spindle 26. The angularly disposed edges 37—37 of the cut out portions constitute stops which are engaged by the projecting tongue 29a of the plate 29 to limit rotation of the latter, the spindle 26 and the sleeve 32 secured thereto. A pair of annular elements 39 loosely embrace the spindle 26 and these members 39 are provided with forwardly projecting portions 40, which engage undercuts 41 in the projecting tongue 29a of the plate 29. An upstanding lug 42 is formed along the outer edge of each of the parallel arms 40 and these lugs are provided with notches 43 in the inner edge thereof, which slots are arranged for engagement by the extremities of a spring 44 which is coiled about the spindle 26 as shown in Figs. 5 and 7 of the drawings. The spring 44 functions to yieldingly maintain the spindle 26, plate 29 and sleeve 32 in the relative positions shown in the drawings and yet permit the pivoting of these elements with respect to the bracket 19 in a direction and degree depending upon the location and amount of pressure applied to the top plate 1 by the skater, the extent or degree of pivot of the aforementioned elements being positively limited by the projecting edges 37 of the flange 21 of the bracket 19. The upwardly projecting tongue of the plate 21 extends between the arms 40 and functions as a centering means for the relative pivotable elements of the front wheel assembly when in normal position and when these latter elements pivot in either direction the tongue 21a maintains the opposite arm 40 in its normal position axially with respect to the skate, while the other arm is actuated by means of the tongue 29a of the plate 29, which rotates with the spindle 26. Obviously this rotation occurs against the action of the spring 44 and by maintaining the other arm 40 in its normal position, the extent of compression of the spring 44 is increased and affords an increased spring action to return the pivoted elements of the assembly to their normal position axially of the skate.

A particular feature of the invention resides in the novel mounting of the front axle and the centering thereof transversely of the skate, and referring now more particularly to Fig. 6, of the drawings, a cup-like element 45 having a radial flange 46, is positioned in each end of the sleeve 32 and these cup-like members 45 are of such size that the flanges 46 thereof extend beyond the edges of said sleeve 32 as shown. An aperture 47 is formed centrally in the concave portion of each of the cup-like members 45 and these apertures are of such diameter as to loosely embrace a sleeve 48, which is in turn mounted upon but not secured to a shaft 49 constituting the front axle of the skate. The cup-like members 45 constitute in each instance one member of a race for ball bearings 50 which are retained therein by means of a diverging curved element 51, the inner edge of which is intended to abut the edges of the sleeve 48. It is pointed out that with the edges of the diverging members 51 and the sleeve 48 in contact as shown, the curvature of said members 51 bears such relation with respect to the curvature of the cup-like members 45 that the ball bearings 50 will not be bound between the latter two members but will be free to move about the race formed thereby.

A split sleeve 52 embraces a portion of the axle 49 adjacent each end thereof and the inner end of each of said sleeves 52 engages the convex surface of the curved bearing retaining elements 45. Each end portion of the axle 49 is threaded as at 53 and retaining nuts 54 are tightened thereon and engage the outer ends of the split sleeve members 52, forcing into successive contact the sleeve member 48, the bearing retaining elements 45 and the split sleeves 52 just described, definitely center the axle 49 of the front roller assembly transversely with respect to the longitudinal axis of the skate and axially with respect to the sleeve 32.

A wheel designated generally as 55 is mounted upon each of the split sleeves 52 as shown and these wheels are each provided with a hub 56 in the form of a sleeve movably mounted upon said sleeves 52 for rotation circumferentially thereof as well as movement axially between the limits afforded by the ball bearing retaining elements 45 and the nuts 54. In the present instance the body of the wheel 57 is composed of wood, hard rubber or other composition and this body member is cut down as at 58 to receive circular angle members 59—59 as shown in Fig. 6, said cutout 58 being of such dimensions that the outer surface of the circular angle members 59 form a continuous smooth surface with the remaining surface of the body member 57. The circular angle members 59 are detachably secured to each wheel by means of bolts 60 which extend completely through the wheel and threadably engage the radial leg of the inner angle member as at 61.

By arrangement of the spindle bracket 19 at an angle with respect to the top shoe plate 1, the moment the skater applied pressure to the right or left side thereof, the spindle 26 will pivot in said bracket and dispose the axle 49 and wheels 55 at an angle with respect to the transverse position in which they are normally maintained, the wheels 55 remaining in the turned position only so long as the pressure is applied to the plate

1, and when this pressure ceases or is lessened the spring will return the spindle 26 and wheels 55 to normal transverse position or positions corresponding to the degree of pressure yet existing on the plate 1.

In using the skate which is the subject of this invention, the skater may describe fancy figures and other courses that have heretofore been impossible with the customary type of skate. The demountable rims of the wheels or rollers permit replacement after wear and prolong the life of the skate considerably beyond the life of a wheel rim, whereas prior to this invention a worn wheel or roller very often required the purchase of an entirely new pair of skates. The skate described is of substantially rugged construction and provides a skate that is desirable in the open market.

While one embodiment of the invention has been set forth for descriptive purposes, it is not intended to be restricted thereto except as set forth in the attached claims.

What is claimed is:

1. In a skate including front and rear foot support sections adjustably connected together, bearings mounted below said front section and disposed at a rearwardly inclined angle with respect thereto, a spindle journaled in said bearings, a sleeve arranged for rotation with said spindle, and means operable to positively limit rotation of said sleeve and the spindle.

2. In a skate including front and rear foot support sections adjustably connected together, bearings mounted below said front section and disposed at a rearwardly inclined angle with respect thereto, a spindle journaled in said bearings, a sleeve connected to said spindle and arranged for rotation therewith, an axle rotatably supported axially in said sleeve, sleeves rotatably mounted on the axle adjacent its ends, rollers rotatably mounted on said sleeves, and retaining means threaded on the ends of the axle contacting said last mentioned sleeves and securing the axle longitudinally with respect to the first-mentioned sleeve.

3. In a skate including front and rear foot support sections adjustably connected together, bearings mounted below said front section and disposed at a rearwardly inclined angle with respect thereto, a spindle journaled in said bearings, a sleeve rotatable with said spindle, an axle rotatably supported in said sleeve, rollers rotatably mounted on said axle adjacent the extremities thereof, means for centering the axle longitudinally of its supporting sleeve, and means rotatable with the spindle and axle supporting sleeve arranged to contact one of the spindle bearings and limit rotation of the spindle.

4. In a skate including front and rear foot support sections adjustably connected together, bearings mounted below said front section and disposed at a rearwardly inclined angle with respect thereto, a spindle journaled in said bearings, a sleeve rotatable with said spindle, an axle rotatably supported in said sleeve, means for centering the axle longitudinally of its supporting sleeve, means rotatable with the spindle and axle supporting sleeve arranged to contact one of the spindle bearings and limit rotation of the spindle, and means tending to resist rotation of the spindle and maintain the axle perpendicular to the axis of the skate.

5. In a skate including front and rear foot support sections adjustably connected together, spaced parallel bearings mounted below said front section and disposed at a rearwardly inclined angle with respect thereto, a spindle journaled in said bearings and having its axis perpendicular to the plane of said bearings, a sleeve connected to said spindle at its lower end and arranged for rotation therewith, bearings adjacent each end of said sleeve, and an axle rotatably journaled in said bearings.

6. In a skate including front and rear foot support sections adjustably connected together, bearings mounted below said front section and disposed at a rearwardly inclined angle with respect thereto, a spindle journaled in said bearings and having its axis perpendicular to the plane of said bearings, a sleeve connected to said spindle at its lower end and arranged for rotation therewith, bearings adjacent each end of said sleeve, an axle rotatably mounted in said bearings, means for centering the axle longitudinally with respect to the sleeve, means on one of said spindle bearings to limit rotation of the spindle, and means embracing the spindle tending to resist rotation thereof and maintain the axle transversely of the axis of the skate.

7. In a skate including front and rear foot support sections adjustably connected together, bearings mounted below said front section and disposed at a rearwardly inclined angle with respect thereto, a spindle journaled in said bearings, a sleeve rotatable with said spindle, an axle rotatably supported in said sleeve, means for centering the axle longitudinally of its supporting sleeve, means rotatable with the spindle and axle supporting sleeve arranged to contact one of the spindle bearings and limit rotation of the spindle, and spring controlled means embracing the spindle and engaging the means limiting rotation of said spindle, said spring controlled means tending to resist rotation of the spindle and maintain the axle transversely of the skate.

8. In a skate including front and rear foot support sections adjustably connected together, bearings mounted below said front section and disposed at a rearwardly inclined angle with respect thereto, a spindle journaled in said bearings, a sleeve rotatable with said spindle, an axle rotatably supported in said sleeve, rollers rotatably mounted on said axle adjacent the extremities thereof, means for centering the axle longitudinally of its supporting sleeve, means rotatable with the spindle and axle supporting sleeve arranged to contact one of the spindle bearings and limit rotation of the spindle, means embracing the spindle and engaging the means limiting rotation thereof, and resilient means engaging lugs on said last mentioned means tending to resist rotation of the spindle.

9. In a skate including front and rear foot support sections adjustably connected together, bearings mounted below said front section and disposed at a rearwardly inclined angle with respect thereto, a spindle journaled in said bearings, a sleeve rotatable with said spindle, an axle rotatably supported in said sleeve, rollers rotatably mounted on said axle adjacent the extremities thereof, means for centering the axle longitudinally of its supporting sleeve, means rotatable with the spindle and axle supporting sleeve arranged to contact one of the spindle bearings and limit rotation of the spindle, means embracing the spindle and engaging the means limiting rotation thereof, and a spring extending about said spindle and engaging lugs on said last-mentioned means tending to resist rotation of the spindle and maintain the axle transversely of the skate.

10. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, a spindle journaled in said bearings, and an axle supporting sleeve secured to the lower end of said spindle, said sleeve having its axis coplanar with and perpendicular to the axis of the spindle.

11. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, a spindle journaled in said bearings, an axle supporting sleeve connected to the lower end of said spindle and arranged for rotation therewith, and means operable to positively limit rotation of said sleeve and the spindle.

12. In a skate including a foot support, spaced parallel bearings mounted below said support adjacent the toe end thereof, a spindle journaled in said bearings, and an axle supporting sleeve secured to the lower end of said spindle, said sleeve having its axis coplanar with and perpendicular to the axis of the spindle.

13. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, and disposed at a rearwardly inclined angle with respect thereto, a spindle journaled in said bearings and having its axis perpendicular to the planes thereof, means on one of said spindle bearings to limit rotation of the spindle, and means embracing the spindle tending to resist rotation thereof.

14. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, a spindle journaled in said bearings, a sleeve secured to said spindle and arranged for rotation therewith, means on one of said bearings arranged to limit rotation of the spindle, and means embracing the spindle tending to resist rotation thereof and maintain the sleeve transversely of the foot support.

15. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, a spindle journaled in said bearings, means rotatable with the spindle arranged to contact one of said bearings and limit rotation of said spindle, and spring controlled means embracing the spindle and engaging the means limiting rotation of said spindle to resist rotation thereof.

16. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, a spindle journaled in said bearings, an axle supporting sleeve rotatable with said spindle, means rotatable with the spindle arranged to contact one of the bearings and limit rotation of said spindle, and spring controlled means embracing the spindle and engaging the means limiting rotation thereof, said spring controlled means tending to resist rotation of the spindle and maintain the sleeve transversely of the foot support.

17. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, a spindle journaled in said bearings, means rotatable with the spindle arranged to contact one of the bearings to limit rotation of said spindle, means embracing the spindle and engaging the means limiting rotation thereof, and resilient means engaging lugs on said last-mentioned means tending to resist rotation of said spindle.

18. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, and disposed at a rearwardly inclined angle with respect thereto, a spindle journaled in said bearings, means rotatable with the spindle arranged to contact one of the bearings to limit rotation of said spindle, means embracing the spindle and engaging the means limiting rotation thereof, and resilient means engaging lugs on said last-mentioned means tending to resist rotation of said spindle.

19. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, a spindle journaled in said bearings, an axle supporting sleeve rotatable with said spindle, means rotatable with the spindle arranged to contact one of the bearings to limit rotation of said spindle, means embracing the spindle and engaging the means limiting rotation thereof, and resilient means engaging lugs on said last-mentioned means tending to resist rotation of the spindle and maintain the sleeve transversely of the foot support.

20. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof and disposed at a rearwardly inclined angle with respect thereto, a spindle journalled in said bearings, a sleeve secured to the lower end of said spindle, said sleeve having its axis coplanar with and perpendicular to the axis of the spindle.

21. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, a spindle journalled in said bearings, means embracing the spindle, and resilient means associated with the spindle and engaging lugs on said last mentioned means tending to resist rotation of said spindle.

22. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, a spindle journalled in said bearings, an axle supporting sleeve rotatable with said spindle, means embracing said spindle, a resilient means associated with the spindle and engaging lugs on said last mentioned means tending to resist rotation of the spindle and said sleeve.

23. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, a spindle journalled in said bearings, means rotatable with said spindle, means embracing the spindle and engaging said last mentioned means, and resilient means engaging lugs on the means embracing said spindle tending to resist rotation of the latter.

24. In a skate including a foot support, bearings mounted below said support adjacent the toe end thereof, a spindle journalled in said bearings, an axle supporting sleeve rotatable with said spindle, a second element rotatable with the spindle, means embracing said spindle and engaging said last mentioned means, a resilient means associated with the spindle and engaging lugs on the means embracing the spindle tending to resist rotation of the spindle and said sleeve.

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