Nov. 23, 1965 J. A. HAGNER 3,219,358

SKATES HAVING RESILIENT RUNNER

Filed July 29, 1963

FIG. 1.

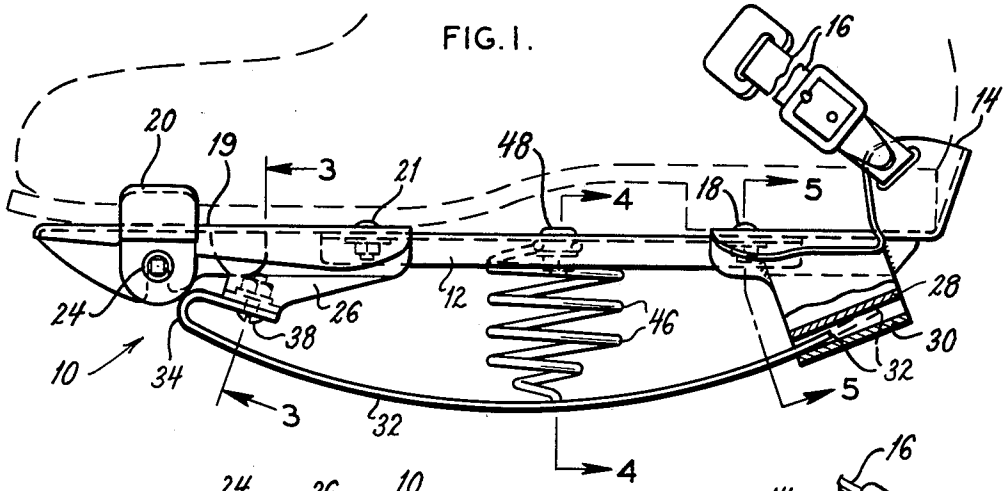



FIG. 2.

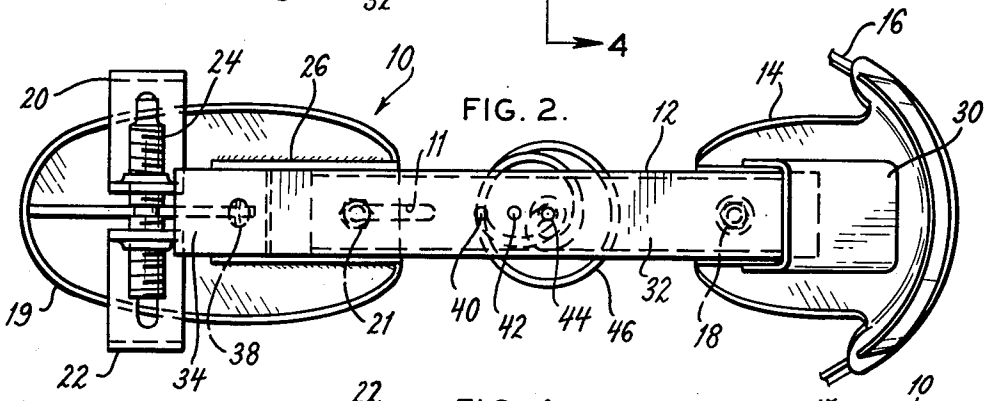



FIG. 4.

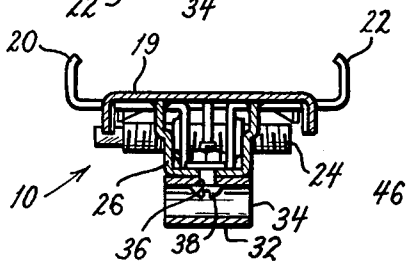
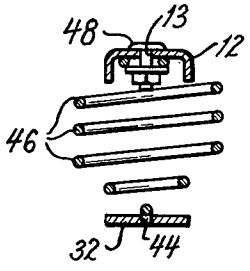



FIG. 3.



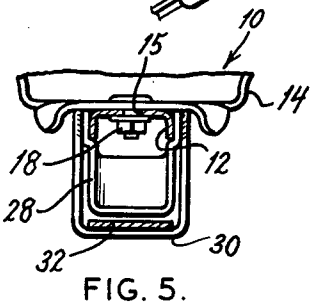




FIG. 5.

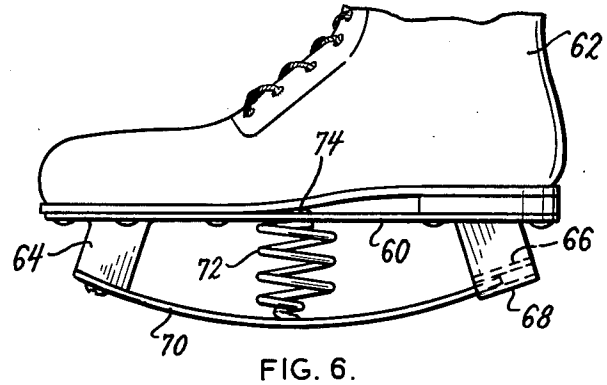



FIG. 6.

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3,219,358

# SKATES HAVING RESILIENT RUNNER

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11 Claims. (Cl. 280—11.14)

This invention relates to improvements in skates. More particularly, this invention relates to improvements in skates which can be used off ice as well as on ice.

It is, therefore, an object of the present invention to provide skates which can be used off ice as well as on ice.

Skates which can be used on ice have been known and used for many years; and such skates have provided many persons wtih healthful and enjoyable entertainment. However, those skates have little or no utility off ice. It would be desirable to provide skates which could be used on ice but which could also be used off ice; because such skates would have more utility and value than would ordinary skates. The present invention provides such skates; and it is, therefore, an object of the present invention to provide skates which can be used on ice and which can also be used off ice.

The skates provided by the present invention have runners which enable the user of these skates to skate on ice. These runners are wide; and hence the user of these skates can skate on crusted snow as well as on ice. In addition, these runners are flexible and resilient; and consequently the user of these skates can experience a bounding and rocking sensation when using these skates off ice. As a result, the skates provided by the present invention are useful off ice as well as on ice. It is, therefore, an object of the present invention to provide skates which have runners that can be used on ice but which are wide so the skates can be used on crusted snow and which are flexible and resilient to enable the user to bound and rock when using these skates off ice.

Other and further objects and advantages of the present invention should become apparent from an examination of the drawing and accompanying description.

In the drawing and accompanying description two preferred embodiments of the present invention are shown and described, but it is to be understood that the drawing and accompanying description are for the purpose of illustration only and do not limit the invention and that the invention will be defined by the appended claims.

In the drawing:

FIG. 1 is a side elevational view of one form of skate that is made in accordance with the principles and teachings of the present invention,

FIG. 2 is a bottom view of the skate of FIG. 1,

FIG. 3 is a sectional view through the skate of FIG. 1, and it is taken along the broken plane indicated by the broken line 3—3 in FIG. 1,

FIG. 4 is another sectional view through the skate of FIG. 1, and it is taken along the plane indicated by the line 4—4 in FIG. 1,

FIG. 5 is still another sectional view through the skate of FIG. 1, and it is taken along the broken plane indicated by the broken line 5—5 in FIG. 1, and

FIG. 6 is a side elevational view of another form of skate that is made in accordance with the principles and teachings of the present invention.

Referring to FIGS. 1–5 in detail, the numeral **10** generally denotes one form of skate that is made in accordance with the principles and teachings of the present invention. That skate includes a flanged channel **12** which has a short, longitudinally-extending slot **11** therein and which has openings **13** and **15** therein. The opening **13** is adjacent the center of that channel; and the slot **11** is disposed intermediate the opening **13** and the front of that channel. The opening **15** is adjacent the rear of that channel.



A heel-confining socket **14** is mounted atop the rear portion of the flanged channel **12**, and that socket has an ankle strap **16** secured to it. A rivet or a nut and bolt combination **18** cooperates with the opening **15** in the flanged channel **12** to secure the socket **14** to that channel. A shoe-engaging portion **19**, which has a downwardly extending flange thereon, is disposed atop the flanged channel **12**. A nut and bolt combination **21** cooperates with the slot **11** in that channel to releasably secure the shoe-engaging portion **19** at different points along the length of that channel. A shoe-engaging clamp **20** and a shoe-engaging clamp **22** are secured to the underface of the shoe-engaging portion **19**; and an adjusting screw **24** engages those clamps and can be rotated to cause those clamps to move toward or move away from the edges of the sole of a shoe.

The channel **12**, the socket **14**, the shoe-engaging portion **19**, and the components associated with that channel, that socket, and that shoe-engaging portion are similar to the corresponding components of ice skates of standard and usual design, but they are made sturdy. When so made, that channel, socket, shoe-engaging portion and associated components will be able to withstand the dynamic stresses to which the skate **10** will be exposed when it is used for bounding and rocking purposes.

A generally U-shaped bracket **26** extends downwardly from the lower face of the shoe-engaging portion **19** of the skate **10**. A generally U-shaped bracket **28** extends downwardly from the lower surface of the heel-receiving socket **14**. Also, a U-shaped bracket **30** extends downwardly from the lower face of that socket. The closed end of the bracket **28** is spaced a short distance above the closed end of the bracket **30** to define a generally horizontally-directed slot.

A flexible and resilient runner **32** has a reentrant leading end **34**; and an opening **36** is provided in the upper portion of that leading end. A fastener **38**, such as a rivet or a nut and bolt combination, extends through the opening **36** and through an opening in the closed end of the bracket **26** to fixedly secure the front end of the runner **32** to the skate **10**. The runner **32** is wide; and it is rectangular in cross section, as shown particularly by FIGS. 3–5. The runner **32** is arcuate in elevation, and it will preferably constitute part of the arc of a circle.

Alined and spaced openings **40**, **42** and **44** are provided in the runner **32**, and those openings are shown in FIG. 2. A compression spring **46** has the lower end thereof extending into the opening **44** and has the upper end thereof abutting the under face of the flanged channel **12**. A nut and bolt combination **48** secures that upper end of that spring to that chnanel. That spring will be in a compressed condition whenever it is interposed between the flanged channel **12** and the runner **32**.

The rear end of the runner **32** extends into the generally horizontally-directed slot defined by the closed ends of the brackets **28** and **30**. That slot is large enough to permit the rear portion of the runner **32** to move freely therein; and hence the central portion of the runner **32** can flex and bend readily without binding.

While the runner **32** is flexible and resilient, it is stiff enough to yield only imperceptibly under the static load constituted by a user's weight. Consequently, whenever the user is skating on ice, the runners **32** of his skates will provide full and adequate support for him; and any bending or flexing of the runners **32** will be almost imperceptible. The wide bottom surfaces of the runners **32** will enable the users of the skates **10** to skate with minimal stresses and strains on their ankles. Consequently, many persons who find it difficult to skate with ordinary ice skates will find it very easy to skate with the skates of the present invention. Moreover, the wide bottom sur-

faces of the runners **32** make it possible for the user of the skates **10** to skate on crusted snow.

Whenever the skates **10** are used for bounding and rocking purposes, the runners **32** will yield and bend in response to the dynamic load constituted by the weight of the user as the user bounds and rocks. The front ends of the runners **32** will be fixedly secured to the skates, but the rear portions of those runners will be able to move back and forth in the slots defined by the closed ends of the brackets **28** and **30**. The springs **46** of the skates **10** will help return the runners **32** to the configuration shown in FIG. 1; and will also help the users to bound and rock quite vigorously. Persons using the skates **10** have been able to bound a few feet into the air.

The shoe-engaging portion **19** can be set at different points along the length of the flanged channel **12**. Where that shoe-engaging portion is moved rearwardly an appreciable distance along the length of that flanged channel, the lower end of the spring **46** will be set in the opening **44** or in the opening **42** as desired. Preferably, that lower end will be set in the opening which holds that spring closest to a vertical position.

The shoe-engaging portion **19** is shown in its forward-most position; and, when that portion is in that position, the rear end of the runner **32** will be in the position shown by solid lines in FIG. 1. When that shoe-engaging portion is set in its rearmost position, the rear end of the runner **32** will be in the position shown by dotted lines in FIG. 1. This is desirable because it means that the rear end of that runner will be confined and enclosed at all times, and hence can not injure anyone or anything.

When using the skates **10** off ice or snow, the user can rock from side to side—the runners **32** and the springs **46** yielding to permit such rocking. Also, the user can rock back and forth—the curved bottoms of the runners **32** facilitating such rocking. Further, the user can twist his body or legs—the curved bottoms of the runners **32** facilitating such twisting. Moreover, the user can bounce straight up and down, can bounce so he moves forwardly or rearwardly, and can bounce so he moves to his left or right. As a result, the user can perform many healthful and entertaining movements.

Referring to FIG. 6 in detail, the numeral **60** denotes a shoe-engaging portion that can be secured to a shoe **62** by screws or the like. That shoe-engaging portion has a bracket **64** adjacent the front end thereof, and it has two U-shaped brackets **66** and **68** adjacent the rear thereof. The closed ends of the brackets **66** and **68** are spaced apart to define a slot which is comparable to the slot between the closed ends of the brackets **28** and **30**. A flexible and resilient runner **70** has the front end thereof secured to the bracket **64** and has the rear end thereof extending into the slot between the closed ends of the brackets **66** and **68**. That runner has a transverse cross section which is comparable to that of the runner **32**, and that runner is arcuate in elevation. Preferably, that runner is a section of an arc of a circle.

The runner **70** has an opening therein comparable to the opening **44**; and that opening accommodates the lower end of a compression spring **72**. A fastener **74**, such as a rivet, secures the upper end of the spring **72** to the shoe-engaging portion **60**. The spring **72** will be compressed whenever it is interposed between the runner **70** and the shoe-engaging portion **60**.

The principal differences between the skate of FIG. 6 and the skate of FIGS. 1–5 are that the runner **70** does not have a reentrant front end and that shoe-engaging portion **60** is fixedly secured to the shoe **62**. If desired, the shoe-engaging portion of the skate of FIGS. 1–5 could be fixedly secured to the shoe; and, if desired, the shoe-engaging portion **60** could be made so it was releasably securable to a shoe. Similarly, if desired, the runner **70** could be made with a reentrant front end and the runner **32** could be made without a reentrant front end. The reentrant front end provides added flexibility for skates intended to be used by young, lightweight children.



Where desired, heavy springs **46** and **72** can be used with skates intended for older and larger users, and lighter springs **46** and **72** could be used with skates intended for younger and smaller users. With such an arrangement, many of the parts of the skates could be standardized and yet the desired amount of bouncing and rocking could be provided for each age and weight group. Skates intended for very small and lightweight children can be made without the springs **46** and **72**.

If desired, bosses could be formed on the upper surface of the runner **32** at the points where the openings **40**, **42** and **44** are provided. Those bosses could coact with a closed turn at the bottom of the spring **46** to fix the position of that bottom of that spring. Similarly, a boss could be formed on the upper surface of the runner **70** to accommodate a closed turn at the bottom of the spring **72**.

In the preferred embodiments of skates provided by the present invention, the runners **32** and **70** have had angular extents of about one hundred and fifteen degrees. However, those runners can have longer or shorter extents, as desired.

Whereas the drawing and accompanying description have shown and described two preferred embodiments of the present invention, it should be apparent to those skilled in the art that various changes may be made in the form of the invention without affecting the scope thereof.

What I claim is:

**1.** A skate which comprises:
(a) a shoe-attaching portion,
(b) a resilient and flexible runner which has a reentrant leading portion,
(c) said reentrant leading portion of said runner being secured to said shoe-attaching portion to normally prevent relative movement between that leading portion and that shoe-attaching portion,
(d) said runner being wide,
(e) said runner being arcuate and normally being part of the arc of a circle,
(f) a sliding connection between the rear portion of said runner and said shoe-engaging portion which will permit said runner to flex and bend without binding and cramping, and
(g) a compression spring intermediate the central portion of said runner and the central portion of said shoe-engaging portion,
(h) said compression spring coacting with the restorative forces within said runner to enable the user of the skate to bound and rock,
(i) said runner being capable of being set at different positions relative to said compression spring,
(j) said runner having a plurality of openings therein,
(k) each of said openings being adapted to accommodate the lower end of said compression spring,
(l) whereby said compression spring can be held generally vertical although said runner is set at different positions relative to said compression spring.

**2.** A skate which comprises:
(a) a shoe-attaching portion,
(b) a flexible and resilient runner which has the leading portion thereof secured to said shoe-attaching portion to normally prevent relative movement between that leading portion and that shoe-attaching portion,
(c) said runner being wide,
(d) said runner being arcuate and normally being part of the arc of a circle,
(e) a sliding connection between the rear portion of said runner and said shoe-engaging portion which will permit said runner to flex and bend without binding and cramping, and
(f) a compression spring intermediate the central portion of said runner and the central portion of said shoe-engaging portion,

(g) said compression spring coacting with the restorative forces within said runner to enable the user of the skate to bound and rock,
(h) said runner being capable of being set at different positions relative to said compression spring,
(i) said runner having a plurality of openings therein,
(j) each of said openings being adapted to accommodate the lower end of said compression spring,
(k) whereby said compression spring can be held generally vertical although said runner is set at different positions relative to said compression spring.

3. A skate which comprises:
(a) a shoe-attaching portion,
(b) a flexible and resilient runner which has the leading portion thereof secured to said shoe-attaching portion to normally prevent relative movement between that leading portion and that shoe-attaching portion,
(c) said runner being wide,
(d) said runner being arcuate,
(e) a sliding connection between the rear portion of said runner and said shoe-engaging portion which will permit said runner to flex and bend without binding and cramping, and
(f) a compression spring intermediate the central portion of said runner and the central portion of said shoe-engaging portion,
(g) said compression spring coacting with the restorative forces within said runner to enable the user of the skate to bound and rock,
(h) said runner having an opening therein to accomodate the lower end of said compression spring.

4. A skate which comprises:
(a) a shoe-attaching portion,
(b) a flexible and resilient runner which has the leading portion thereof secured to said shoe-attaching portion to normally prevent relative movement between that leading portion and that shoe-attaching portion,
(c) an open-end sliding connection between the rear portion of said runner and said shoe-engaging portion which will permit said runner to flex and bend without binding and cramping, and
(d) a compression spring intermediate the central portion of said runner and the central portion of said shoe-engaging portion,
(e) said compression spring coacting with the restorative forces within said runner to enable the user of the skate to bound and rock,
(f) said runner being wide,
(g) said runner being arcuate,
(h) said runner being stiff enough so the yielding thereof under the static load of the user thereof is substantially imperceptible and so it will not conform to uneven surfaces.

5. A skate which comprises:
(a) a shoe-attaching portion,
(b) a flexible and resilient runner which has the leading portion thereof secured to said shoe-attaching portion to normally prevent relative movement between that leading portion and that shoe-attaching portion,
(c) an open-end sliding connection between the rear portion of said runner and said shoe-engaging portion which will permit said runner to flex and bend without binding and cramping, and
(d) a compression spring intermediate the central portion of said runner and the central portion of said shoe-engaging portion,
(e) said compression spring coacting with the restorative forces within said runner to enable the user of the skate to bound and rock,
(f) said runner being stiff enough so the yielding thereof under the static load of the user thereof is substantially imperceptible and so it will not conform to uneven surfaces.



6. A skate which comprises:
(a) a shoe-attaching portion,
(b) a flexible and resilient runner which has the leading portion thereof secured to said shoe-attaching portion to normally prevent relative movement between that leading portion and that shoe-attaching portion, and
(c) an open-end sliding connection between the rear portion of said runner and said shoe-engaging portion which will permit said runner to flex and bend without binding and cramping,
(d) said runner being wide,
(e) said runner being arcuate,
(f) said runner being stiff enough so the yielding thereof under the static load of the user thereof is substantially imperceptible and so it will not conform to uneven surfaces.

7. A skate which comprises:
(a) a shoe-attaching portion,
(b) a flexible and resilient runner which has the leading portion thereof secured to said shoe-attaching portion to normally prevent relative movement between that leading portion and that shoe-attaching portion, and
(c) an open-end sliding connection between the rear portion of said runner and said shoe-engaging portion which will permit said runner to flex and bend without binding and cramping,
(d) said runner being stiff enough so the yielding thereof under the static load of the user thereof is substantially imperceptible and so it will not conform to uneven surfaces.

8. A skate which comprises:
(a) a shoe-attaching portion,
(b) a flexible and resilient runner which has the leading portion thereof secured to said shoe-attaching portion to normally prevent relative movement between that leading portion and that shoe-attaching portion,
(c) said runner being wide,
(d) said runner being arcuate,
(e) an open-end sliding connection between the rear portion of said runner and said shoe-engaging portion which will permit said runner to flex and bend without binding and cramping, and
(f) a compression spring intermediate the central portion of said runner and the central portion of said shoe-engaging portion,
(g) said compression spring coacting with the restorative forces within said runner to enable the user of the skate to bound and rock,
(h) said runner and said compression spring having interacting surfaces that normally prevent relative movement of said runner and the lower end of said compression spring,
(i) said runner being stiff enough so the yielding thereof under the static load of the user thereof is substantially imperceptible and so it will not conform to uneven surfaces.

9. A skate which comprises:
(a) a shoe-attaching portion,
(b) a flexible and resilient runner,
(c) a connection between the front part of said shoe-attaching portion and the front part of said runner, and
(d) a second connection between the rear part of said shoe-attaching portion and the rear part of said runner,
(e) one of said connections being a sliding connection,
(f) said one connection enclosing and confining the connected part of said runner,

(g) said one connection being an open-end connection,

(h) said runner being stiff enough so the yielding thereof under the static load of the user thereof is substantially imperceptible and so it will not conform to uneven surfaces.

**10.** A skate which comprises:

(a) a shoe-attaching portion,

(b) a flexible and resilient runner,

(c) a connection between the front part of said shoe-attaching portion and the front part of said runner, and

(d) a second connection between the rear part of said shoe-attaching portion and the rear part of said runner,

(e) one of said connections being a sliding connection,

(f) said one connection being an open-end connection,

(g) said runner being stiff enough so the yielding thereof under the static load of the user thereof is substantially imperceptible and so it will not conform to uneven surfaces.

**11.** A skate which comprises:

(a) a shoe-attaching portion,

(b) a flexible and resilient runner,

(c) a connection between the front part of said shoe-



attaching portion and the front part of said runner, and

(d) a second connection between the rear part of said shoe-attaching portion and the rear part of said runner,

(e) one of said connections including an open-end slot which permits free movement of the attached part of said runner,

(f) said runner being stiff enough so the yielding thereof under the static load of the user thereof is substantially imperceptible and so it will not conform to uneven surfaces.


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A. HARRY LEVY, *Primary Examiner.*