May 29, 1962 H. O. WESCH 3,036,389

AMUSEMENT DEVICE

Filed Nov. 25, 1960

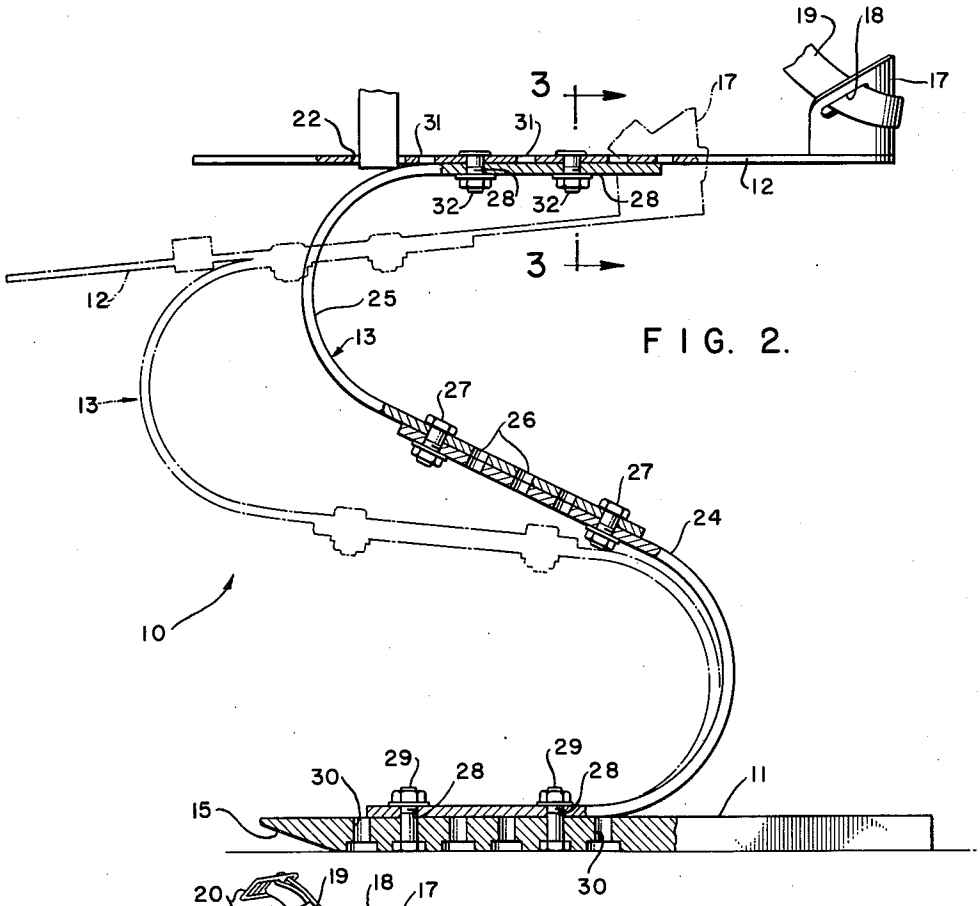


FIG. 2.

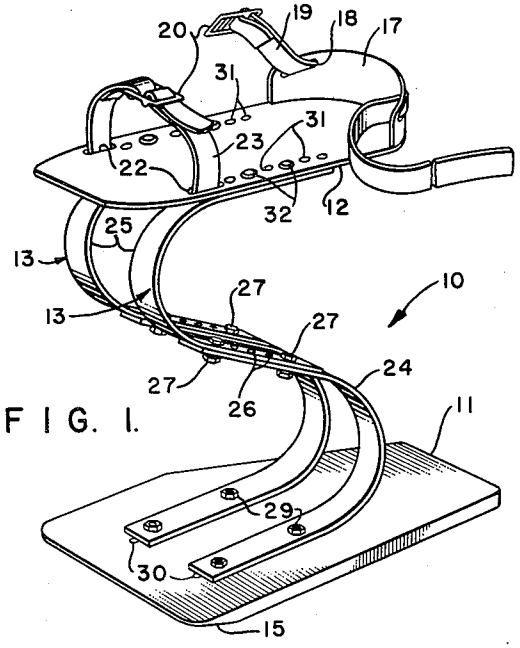
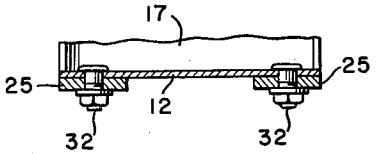


FIG. 1.

FIG. 3.



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AMUSEMENT DEVICE

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This application relates to amusement devices and more particularly to an improved spring device designed for clamping to the foot and resiliently supporting the user's weight under wide range vigorous spring action conditions effective to lift him off the ground as well as to propel him forwardly in long steps or leaps depending upon the manner in which the devices are manipulated in use.

Many proposals have been made heretofore for constructing resilient footwear because of the exhilarating effects thereby made possible and because of the intriguing and stimulating effects produced. Despite the many efforts which have been made to provide a safe and fully effective device of this type, the constructions heretofore suggested have been subject to numerous defects and shortcomings entirely avoided by the present invention. One of these has been the lack of suitable provision for adjusting the resilient members to accommodate users of different weights and the resilient effects desired by a particular user. Accordingly, it has been necessary to manufacture such devices in a wide range of sizes and load ratings, a requirement inconsistent with economical manufacture and merchandising.

Another serious disadvantage of prior constructions has been the absence of suitable provision resisting flexibility in any except a vertical plane extending longitudinally of the footwear. In consequence, users have prudently lacked confidence as respects the safety and reliability of the prior spring footwear.

Still another serious shortcoming of prior designs has been the lack of desirable flexibility in longitudinal tilting movement of the foot-engaging plate relative to the ground. In other words, jumping footwear devices having sufficient load supporting ability have lacked any substantial capability for maneuvering the foot and ankle in customary longitudinal pivotal movement as is necessary and desirable in sporting activities including walking, jumping, running and leaping.

Accordingly, it has been a primary object of the present invention to provide a new and improved article of footwear adapted to be clamped to the foot and featuring simple, inexpensive, highly flexible spring means having wide range flexibility in a vertical plane extending longitudinally of the foot and exhibiting high resistance to torsional or tilting movement in other planes. These and other objectives are accomplished according to this invention by the provision of a plurality of generally S-shaped spring members secured in multiple to a pair of generally flat plates one of which is engageable with the ground and the other of which is clampable to the user's foot.

Desired wide range adjustment is accomplished simply and inexpensively by the provision of a number of mounting positions for the springs with respect to each plate, and additionally, by making each S-shaped spring in two halves overlapping at their mid-portions and securable in different adjusted positions in the area of overlap. Owing to the use of either wide thin spring stock or of round spring stock arranged into the manner stated, and in multiple side-by-side relation, the resulting structure has unusual stability laterally as well as in all directions except a longitudinal vertical plane.

Accordingly, it is a primary object of the present invention to provide a new and improved amusement device for attachment to the feet.

Another object of the invention is the provision of resilient footwear which is unusually safe for use by both youngsters and older persons and which is easily adjustable to accommodate persons of widely varying weights.

Another object of the invention is the provision of a resilient article of footwear providing the user with a great flexibility of foot movement lengthwise of his foot while providing high resistance to tilting and torsional movement.

Another object of the invention is the provision of a new and improved exercising, body building, and muscle conditioning device as well as one useful in developing poise, balance and grace of movement.

These and other more specific objects will appear upon reading the following specification and claims and upon considering in connection therewith the attached drawing to which they relate.

Referring now to the drawing in which a preferred embodiment of the invention is illustrated.

FIGURE 1 is a general perspective view of a preferred embodiment of the amusement device provided by this invention;

FIGURE 2 is a side elevational view partly in section and on enlarged scale of the device shown in FIGURE 1, the dot and dash line showing one of the many operating positions of the device; and

FIGURE 3 is a cross-sectional view taken along line 3—3 on FIGURE 2.

Referring more particularly to FIGURES 1 to 3, there is shown a typical embodiment of the amusement device designated generally **10**. The principal components include a flat base plate **11** and a foot clamping plate **12** arranged generally parallel to one another and held resiliently connected by a plurality of generally S-shaped spring members **13, 13**.

The ground-engaging plate **11** is preferably formed of non-metallic materials, as for example, plywood, pressed wood, hard rubber, or the like material, highly resistant to abrasion and shock. Although not shown, it will be understood that the lower surface of base plate **11** may be covered in part or in full with resilient material, as rubber, safeguarding against slippage and resistant to wear and abrasion. Preferably, the lower forward corner of plate **11** is beveled or cut away, as indicated at **15**, to permit the user to tilt the device forward onto surface **15** in running, jumping, or the like movements. This construction also facilitates walking for reasons which will be readily understood.

Upper plate **12** is desirably formed of sheet metal and includes an upturned arcuate heel-engaging plate **17** formed with slots **18** to receive a strap **19** having a buckle **20** by which the device can be clamped to the foot. The forward end of the plate is provided with slots **22** to receive a toe-embracing strap **23** provided with a buckle or separable fastener **20**.

A particularly important feature of the invention resides in the provision of a plurality of highly resilient S-shaped members **13** tempered in a manner well known to those skilled in the manufacture of tough springs to withstand the most vigorous and abusive use. Although these spring assemblies can be made in a single continuous piece of metal of either round or other shape, superior results are achieved through use of a pair of similarly shaped U-shaped strips of thin wide spring material. These strips are designated **24** and **25** in FIGURE 2 and, as there shown, will be understood as interchangeable with one another in the interest of economy and simplicity of manufacture and servicing. The generally U-shaped components have diverging legs one of which is provided with a plurality of closely spaced holes **26** for receiving the assembly fasteners or bolts **27**. The other leg of each unit is provided with a single pair of openings **28** receiving fastener bolts **29** extending

through any of a plurality of similar holes 30 formed in base plate 11. Holes 28 of upper member 25 are securable by bolts 32 to a selected pair of holes 31 provided along either lateral edge of upper plate 12.

Preferably the S-shaped springs 13 are assembled to plates 11 and 12 with the return bend portion of upper element 25 located beneath the toe of the wearer and with the other return bend portion located beneath the heel of the wearer. Although the reverse assembly of the spring members to plates 11 and 12 is preferred by some users, the majority prefer the arrangement first described because of the similarity of the spring action thereby achieved to normal action of the leg and foot muscles.

In the preferred assembly the application of weight to the foot plate causes springs 13 to distort downwardly and forwardly as indicated by the dot and dash line in FIGURE 2. Foot plate 12 may be readily manipulated into various angular positions within a vertical plane including that shown depending upon the intensions and manipulations performed by the user. When distorted to positions generally indicated in dot and dash lines, the stored energy in the compressed springs is available, for example, for effective forward jumping movement or for taking a long forward step. This objective is further facilitated if the user shifts his weight forward thereby tilting base plate 11 onto its inclined surface 15 and then relieving the applied weight allowing the stored energy to propel the user forwardly.

The use of multiple spring assemblies 13 arranged in side-by-side relation with their opposite ends firmly clamped to plates 11 and 12 enables the user to avail himself of the very high torsion resisting capabilities of the described assembly. In other words, the device is found to have a very soft and wide-range resilient action in a vertical plane passing centrally and longitudinally of plates 11 and 12 but very high resistance to sidewise tilting or unequal vertical loading of spring assemblies 13, 13, as well as to attempt to depress the springs in planes rotated in either direction away from a central longitudinal vertical plane. This distinguishing and characteristic property of the described construction is unique and the basis for the highly desirable operating characteristics of the construction for the purposes intended.

It is also pointed out that the spring assemblies can be formed advantageously of multiple runs of spring wire, multiple layers of thin strip spring material, as well as from a combination of spring strip and wire components.

While the particular amusement device herein shown and disclosed in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of the presently preferred embodiments of the invention and that no limitations are intended to the details of construction or design herein shown other than as defined in the appended claims.

I claim:

1. An amusement device adapted to be secured to the feet, said device comprising a pair of of generally parallel plates held in assembled relation to the oppositely directed ends of a plurality of similar S-shaped high-strength spring means capable of supporting the wearer's weight with wide-range resilient movement of said plates in a vertical plane, and means carried by one of said plates for securing said device firmly to the foot.

2. An amusement device as defined in claim 1 characterized in that said plurality of S-shaped spring means are disposed in side-by-side parallel relation transversely of said parallel plates and cooperate with said plates in resisting torsional forces applied to said spring means.

3. An amusement device as defined in claim 1 characterized in that said S-shaped spring means are so arranged that the return bend portion of the upper half thereof is located beneath the toe and the return bend portion of the lower half beneath the wearer's heel.

4. An amusement device as defined in claim 1 characterized in that each of said spring means are formed in two halves overlapping in the midportion of said S-shaped spring means, and means for rigidly securing said overlapping portions securely in different adjusted positions to vary the load bearing capabilities and resiliency of said amusement device.

5. An amusement device as defined in claim 1 characterized in that the lower or ground-engaging one of said parallel plates is provided with means for securing the same to the juxtaposed ends of said S-shaped spring means adjustably in different positions lengthwise of the plane of said spring means.

6. An amusement device as defined in claim 1 characterized in that the lower or ground-engaging one of said parallel plates has its lower forward end corner cut off on a bevel to facilitate forward tilting of the device and effective in effecting the forward propulsion of the wearer as stored energy of the compressed springs is released.

7. An amusement device as defined in claim 1 characterized in that said spring means are substantially identical and in that each comprises relatively wide thin strips of highly resilient spring metal.

8. An amusement device as defined in claim 1 characterized in that the upper one of said plates is essentially of metal and in that said lower or ground-engaging plate is essentially of non-metallic material.

9. An amusement device as defined in claim 1 characterized in that the upper ends of said S-shaped spring means are secured generally centrally of the upper one of said plates.

10. An amusement device as defined in claim 1 characterized in that the lower ends of said S-shaped spring means are secured to the lower one of said plates in an area disposed substantially forwardly of the center portion thereof.

11. An amusement device as defined in claim 1 characterized in that said S-shaped spring means have their upper ends projecting rearwardly and secured to the central portion of the upper plate and their lower ends projecting forwardly and secured to said lower plate in an area offset forwardly of the center of the lower plate.

12. An amusement device adapted to be worn on the feet and to support the user resiliently in a vertical plane extending centrally and longitudinally of the user's foot, said device comprising a plurality of similar wide strips of spring metal of S-shape having their end portions arranged generally parallel and extending in opposite directions, means rigidly securing one of said end portions to a ground-engaging base plate and the other end portion to foot-clamping means and in such manner as to resist twisting of either set of spring ends whereby said springs supplement one another in resisting torsional movement thereof in other than said vertical plane.

13. An amusement device adapted to be worn on the feet and to support the user resiliently in a vertical plane extending centrally and longitudinally of the user's foot, said device comprising a plurality of similar spring means having their oppositely extending ends rigidly but adjustably securable to different longitudinally spaced positions with respect to a ground-engaging base plate and to a foot-engaging plate having means for clamping the same to the user's foot.

14. An amusement device as defined in claim 13 characterized in the provision of means for adjusting the load supporting ability of said spring means over a wide range of user weights.

15. An amusement device as defined in claim 13 characterized in that said load range adjusting means includes means for adjusting the load capacity of the device without substantial change in the size or shape of said spring means.

16. An article of manufacture adapted for use in supporting the weight of a person when attached to a person's foot, said article comprising a similar pair of U-shaped

strips of spring metal mutually cooperable to support a major portion of the weight imposed on one foot of a person wearing said article under vigorous jumping movements, the legs of said strips diverging toward their free ends and one leg of each being provided with means for adjustably clamping these legs together when oppositely arranged to form an S-shaped spring, the other leg of each strip then lying in substantially parallel planes and being provided with means for adjustably clamping the same to a pair of plate means.

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