United States Patent

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[72] Inventors **Josephus B. Thompson, deceased, late of Covington, Ohio, by K. E. Stade, administrator, Covington, Ohio**

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[73] Assignee **Columbia Broadcasting System, Inc. New York, N.Y. a corporation of New York**

[54] **FOOT-OPERATED PERCUSSION MUSICAL INSTRUMENT**
3 Claims, 7 Drawing Figs.

[52] **U.S. Cl.** **84/422**
[51] **Int. Cl.** **G10d 13/00**
[50] **Field of Search** 84/411, 421, 422, 402

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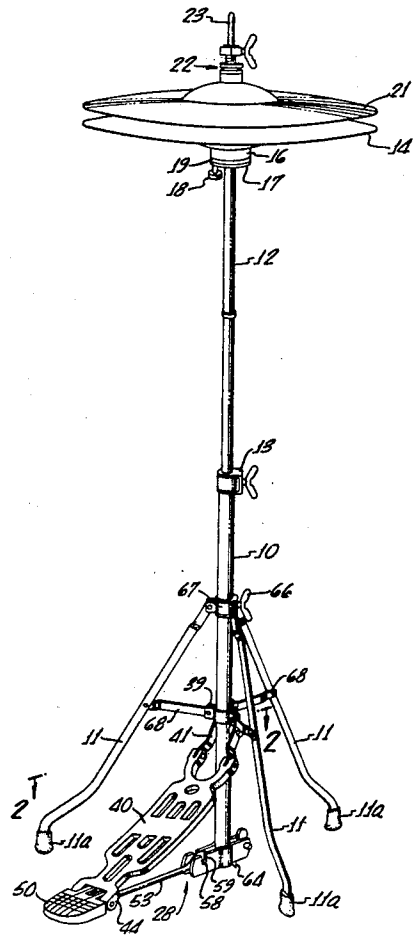
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Primary Examiner—Stephen J. Tomsky
Assistant Examiner—John F. Gonzales
Attorney—Gausewitz & Carr

ABSTRACT: The disclosure relates to a foot-operated percussion musical instrument, and more particularly to such an instrument of the cymbal type and which is conventionally referred to as a "hi-hat". The foot-pedal portion of the hi-hat percussion instrument, and of related percussion instruments such as foot-pedal drum beaters for bass drums, incorporates a heel which is rapidly mounted without the use of screws or any other threaded fasteners. Furthermore, the heel is at all times fully pivotable relative to other portions of the foot pedal, which creates a more flexible operation and insures that the heel will firmly seat upon all types of underlying support surfaces despite irregularities thereon. Such pivotal heel cooperates with a spur element in preventing the instrument from creeping. The hi-hat percussion instrument is further characterized by the use of a coupling or plug element incorporating first and second cooperating setscrews which are respectively adapted to lock in position a threaded pull rod and a crossmember connected to the foot pedal, the setscrews being operated when the pull rod is respectively at first and second predetermined longitudinal positions. The construction is such that a broken pull rod may be rapidly and economically replaced by the drummer, without the necessity for returning the apparatus to the factory.



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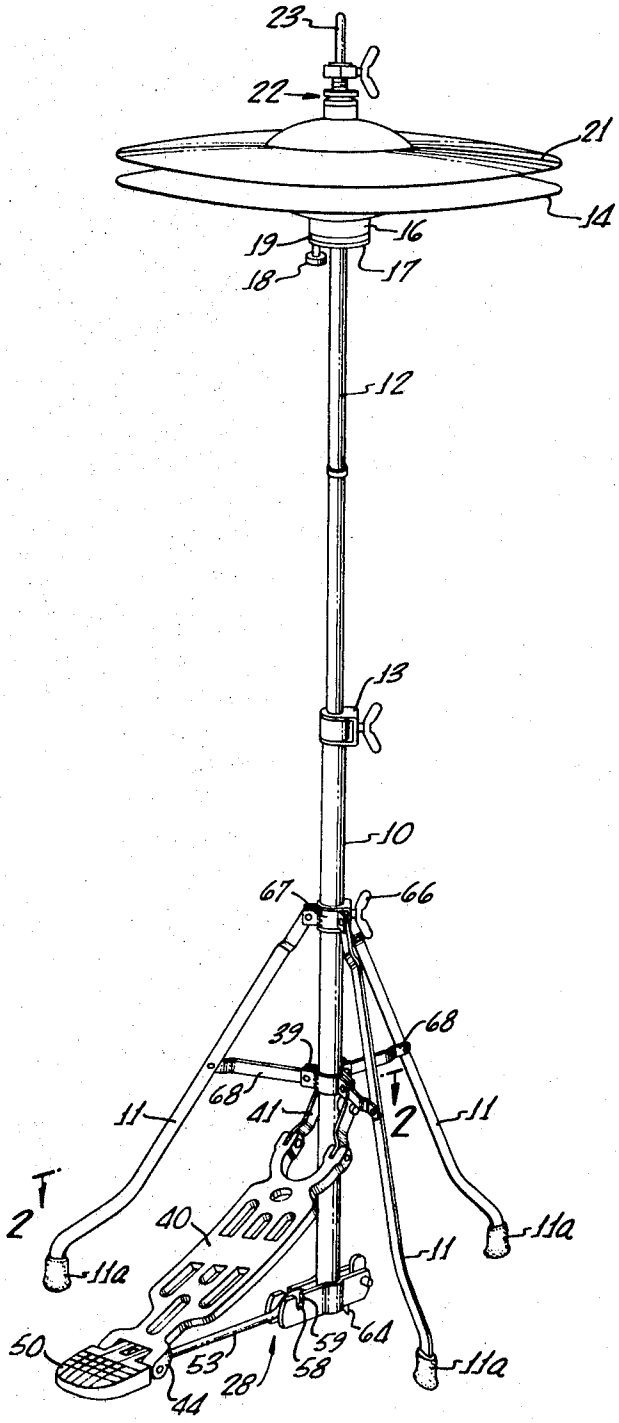


FIG. 1.

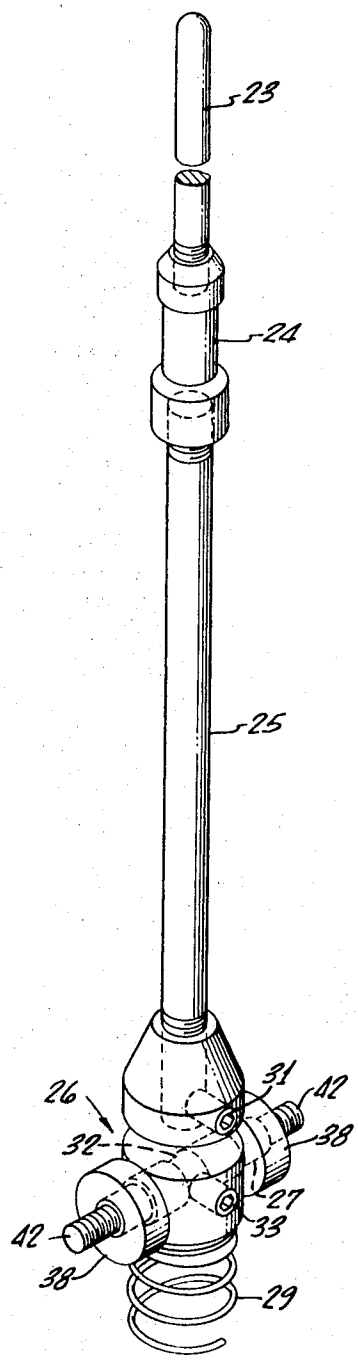


FIG. 6.

INVENTOR.
JOSEPHUS B. THOMPSON

BY Jamieson & Cates

ATTORNEYS.

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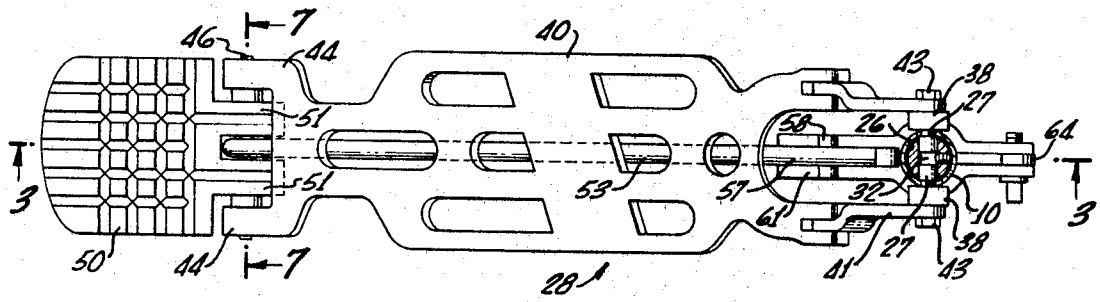


FIG. 2.

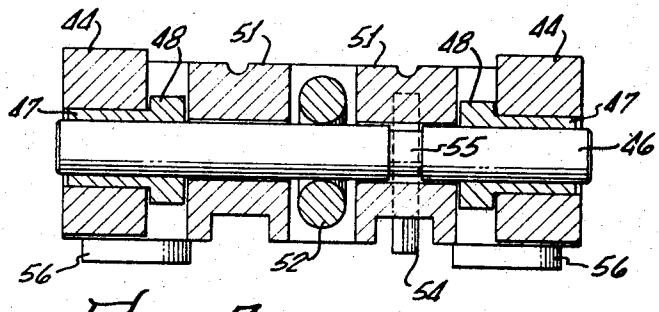


FIG. 7.

FIG. 3.

FIG. 4.

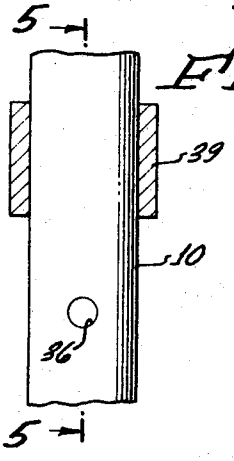
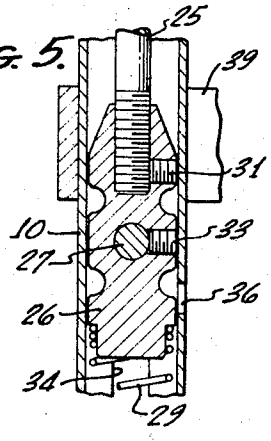


FIG. 5.



INVENTOR.
JOSEPHUS B. THOMPSON
BY Jamieson & Cass
ATTORNEYS.

FOOT-OPERATED PERCUSSION MUSICAL INSTRUMENT

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to the field of foot-operated percussion musical instruments such as foot-operated beaters for bass drums, foot-operated hi-hat apparatus, etc.

2. Description of the Prior Art

The closest prior art known to applicant is illustrated in the Rogers Drums catalog for 1967—68. Such catalog illustrates various foot-pedal drum beaters, for example at pages 36 and 37. The catalog also illustrates various types of hi-hats, for example at pages 34 and 35.

Referring first to the pedal constructions, and particularly those wherein the foot boards were pivotable relative to the heel members, such heel members were nevertheless substantially fixed in angular position relative to a hinge rod which connected to the remainder of the apparatus. The connection was such that any irregularity in the floor would tend to prevent firm seating of the heel element thereon, with consequent tendency of the heel to creep or otherwise malfunction as the beating or pedal action progressed.

In addition, the prior art foot-pedal assemblies required the use of a plurality of threaded fasteners, there being (for example) one threaded fastener on each side of the heel element and an additional threaded fastener to lock the hinge rod in position.

With specific reference to the prior art hi-hat constructions, these frequently incorporated a pull rod which was connected by a movable coupling or plug element to a crossmember, the latter being in turn connected to the foot-pedal element for actuation thereby. The construction was such that breakage of the pull rod, which tended to occur as the result of long-continued straining and fatiguing thereof, made it highly difficult or impossible to disassemble the apparatus for repairs and replacement of parts. It frequently occurred that a drilling operation was needed in order to remove the broken-off threaded end of the pull rod and thereby permit disassembly of the crossmember. Such operations could not normally be performed by the drummers themselves, which made it necessary that skilled workmen (frequently at the factory) be called upon in order to perform the repair function.

SUMMARY OF THE INVENTION

In accordance with the present invention, the heel portion of the foot-pedal assembly is pivotally associated with the footboard thereof, and is also pivotally associated with the hinge rod leading to the base or support. The pivotal connection is effected by introducing a horizontal connector pin through bushings in the foot pedal and thence through an eye element at the end of the hinge rod. Such horizontal pin may be held in position by a locking pin associated therewith, there being no need for threaded connections of any kind.

The pivotal heel of the foot-pedal assembly cooperates with a spur which is mounted at the lower end of the tubular body of the hi-hat apparatus. The relationship is such that vertical adjustment of the tubular body, in relation to the foot portions of the hi-hat, does not prevent firm seating of the heel on the underlying floor.

The pull rod of the hi-hat is threaded into a coupling or plug, the lower end of such plug receiving a transverse horizontal crossmember connected to the foot pedal. A first setscrew is employed to removably lock the threaded lower end of the pull rod to the plug, and a second setscrew is employed to lock the crossmember against axial movement. Such setscrews are adapted to be operated when the pull rod is at first and second predetermined longitudinal positions at which the ends of the setscrews register with an opening in the tube wherein the pull rod reciprocates.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of a hi-hat percussion instrument constructed in accordance with the present invention;

FIG. 2 is an enlarged horizontal section taken on line 2–2 of FIG. 1;

FIG. 3 is a vertical section on line 3–3 of FIG. 2;

FIG. 4 is an enlarged fragmentary sectional view taken on line 4–4 of FIG. 3;

FIG. 5 is a vertical section along line 5–5 of FIG. 4;

FIG. 6 is a perspective view of the pull rod assembly; and

FIG. 7 is an enlarged transverse section on line 7–7 of FIG. 2.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to the drawings, and particularly to FIG. 1, the hi-hat percussion instrument is illustrated to comprise a relatively large diameter tube 10 which is supported in vertical position by three legs 11 having feet 11*a*. Legs 11 are adapted to be collapsed or folded for shipment and storage of the hi-hat. A relatively small diameter tube 12 is telescoped into the upper end of tube 10, the degree of telescoping being controlled by a U-clamp 13 which fixedly positions the tubes 10 and 12 in any desired position relative to each other. Such degree of telescoping determines the position of a lower cymbal 14 which is supported on a felt washer 16 and base plate 17, the latter being fixedly secured at the upper end of tube 12. Not only can the elevation of the lower cymbal be thus adjusted through manipulation of U-clamp 13 and telescoping of the tubes relative to each other, but the inclination of such lower cymbal may be adjusted by regulating a screw 18 which is threaded through the base plate 17 and engages a backup washer 19 for felt washer 16.

An upper cymbal 21 is adjustably mounted, by means of a clutch 22, on an upper pull rod 23. Such pull rod 23 telescopes into the upper or small diameter tube 12, being slidably associated therewith by means of a suitable low-friction bearing or bushing, not shown. At its lower end, pull rod 23 is connected through a coupling 24 with a lower pull rod 25 which is mounted in the large diameter lower tube 10.

The lower end of lower pull rod 25 is connected to a plug or coupling 26 having a cross pin 27 therethrough for connection of the pull rods 23 and 25 (and thus of the upper cymbal 21) with a foot pedal and spur assembly 28. Thus, depression of the foot pedal assembly by the drummer effects lowering of the upper cymbal 21 into percussive engagement with lower cymbal 14. Raising of the upper cymbal and associated elements is effected by means of a helical compression spring 29 which is seated in tube 10 below plug 26.

A first aspect or facet of the present invention relates to the pull rod and coupling assembly, and more particularly to the plug or coupling 26 and the manner of connection thereof with the lower pull rod and with cross pin 27. A second aspect or facet of the present invention relates to the foot pedal and spur assembly 28, and to the manner of cooperation thereof with the legs 11. These two facets of the invention will be discussed separately below.

Referring particularly to FIGS. 4—6, inclusive, which best illustrate the pull rod and coupling assembly, the lower end of lower pull rod 25 is externally threaded and is inserted into an internally-threaded vertical bore in the upper end of plug or coupling 26. A first setscrew 31 is threaded through a threaded bore in plug 26 and bears against the lower end of pull rod 25 to insure against rotation thereof despite long continuance of the percussive action. Setscrew 31 is flush with (or depressed below) the exterior of plug 26, thereby assuring that reciprocation of the plug in lower tube 10 will not be interfered with.

The cross pin 27, which connects to foot pedal and spur assembly 28, is inserted horizontally through a transverse (horizontal) bore in the lower portion of plug 26. The central portion of cross pin 27 is annularly grooved at 32 for reception of the inner end of a second setscrew 33. Setscrew 33 is threaded through a threaded bore in plug 26, at a position directly below the first set screw 31. As in the case of setscrew 31, setscrew 33 is flush with (or depressed below) the surface of the plug.

The ends of cross pin **27** extend through vertical slots **34** (FIG. 3) which are provided in diametrically-opposite sides of lower tube **10**, and which are sufficiently long to permit the desired amount of movement of the cross pin and thus of the pull rod assembly and upper cymbal **21**. Slots **34** not only permit reciprocation of the cross pin, but also determine the rotated position of plug **26** in tube **10**. The rotated position of the plug is caused to be such that both setscrews **31** and **33** lie along a vertical line which intersects the center of an opening **36** (FIGS. **4** and **5**) in tube **10**, and through which a wrench may be inserted for tightening or loosening of the set screws, or for insertion or removal thereof.

Preferably, the set screws are perpendicular to a vertical plane which contains cross pin **27** and rod **25**, and which extends through the slots **34**. Opening **36** and setscrews **31** and **33** lie in a second vertical plane which is perpendicular to such vertical plane containing the cross pin **27** and the rod **25**.

In assembling the rod and coupling assembly, lower rod **25** may be threaded into plug **26**, following which the upper setscrew **31** is inserted and tightened. Thereafter, the plug and rod are inserted downwardly into lower tube **10**, and are rotationally oriented until the ends of the transverse bore for cross pin **27** register with slots **34**. Cross pin **27** is then inserted, following which the opening for lower setscrew **33** is caused to register with opening **36**. The lower setscrew **33** is then inserted through opening **36** and tightened.

Should it be desired to remove the lower pull rod **25** from plug **26**, it is merely necessary to shift the pull rod (by operating the pedal assembly **28**) to such a longitudinal position that the upper setscrew **31** registers with hole **36**. Setscrew **31** is then loosened and removed through opening **36**, following which the lower pull rod **25** is rotated until it is unthreaded from the plug **26**.

In the event of breakage of the lower pull rod **25**, as may occur due to long-continued operation of the apparatus, it is merely necessary to operate the foot pedal and spur assembly **28** until the lower setscrew **33** is registered with opening **36**, following which such lower setscrew is removed to thereby permit removal of cross pin **27**. The cross pin being removed, it is a simple matter to remove the plug **26** from the tube **10**. Once the plug is removed, the broken end of the lower pull rod **25** may be unthreaded from the plug **26** (after removal of setscrew **31**).

The above-indicated helical compression spring **29** is threaded onto the lower end of plug **26**, which is externally threaded, and is accordingly removed and inserted with such plug **26**. The lower end of spring **29** is seated (FIG. **3**) on a suitable closure **37** at the lower end of tube **10**. Closure **37** may be of such construction that the degree of compression of spring **29**, and thus the force exerted thereby, may be regulated in accordance with the desires of the drummer.

In order to absorb the shock exerted by the spring **29** after release of the foot of the drummer from the foot pedal and spur assembly **28**, resilient bumpers in the form of rubber washers **38** (FIGS. **2** and **6**) are mounted on the projecting ends of cross pin **27**. Such washers are adapted to engage the underside of a fixedly mounted spider element **39** which forms part of the collapsible leg assembly of the apparatus. Spider element **39** is located adjacent the upper ends of slots **34**, and is fixedly mounted in position as by being silver soldered or brazed to lower tube **10**.

The above-indicated coupling **24** which connects upper pull rod **23** with lower pull rod **25** is, as shown in FIG. **6**, threadedly associated with both such pull rods. A setscrew, not shown, may be employed to lock the lower pull rod **25** to coupling **24**. However, it is preferred that there be no setscrew at the joint between upper pull rod **23** and the coupling, since such setscrew would interfere with disassembly of the apparatus by the drummer.

The coupling **24** is illustrated to have a diameter somewhat smaller than that of plug or coupling **26**, since coupling **24** reciprocates not only in the relatively large diameter lower tube **10** but also in the smaller diameter upper tube **12**. Plug or coupling **26**, on the other hand, reciprocates only in lower tube **10**. The upper ends of both couplings **24** and **26** may be beveled or chamfered in order to insure against interference with the elements in which they reciprocate.

As above indicated, the foot pedal and spur assembly **28**, which cooperates with the adjustable leg means, constitutes a second facet or aspect of the invention. Such assembly comprises a footboard **40** which is pivotally connected to a pair of pedal links **41** the ends of which are apertured to received externally-threaded end portions **42** of cross pin **27**. Thus, the ends of pedal links **41** are mounted on the opposite ends of the cross pin, adjacent bumper washers **38**, and are held in position by suitable nuts **43** (FIG. **2**) which are threaded on the cross pin.

The lower end of footboard **40** is bifurcated to form apertured bearing portions (protuberant portions) **44** adapted to receive a horizontal pivot pin **46**. As shown in FIG. **7**, bushings **47** are press fit into horizontal apertures or bores in bearing portions **44**, such bushings having relatively large-diameter collars **48** adjacent the interior surfaces of the bearing portions.

The pivot pin **46** is adapted to pivotally connect bearing portions **44** with a heel element **50**. Such heel element has apertured bearing ears or lugs (protuberant portions) **51** which are sufficiently close to each other to fit between the collars **48**, but sufficiently far from each other to receive the annular end or eye **52** of a hinge rod **53**.

One of the bearing lugs **51** has a transverse bore formed therein for reception of a spring pin **54** (FIG. **7**), such pin extending through one side of an annular groove **55** in pivot pin **46**. The spring pin **54** is preferably of tubular construction, having a longitudinal slit therein in order to permit spring action.

The heel member **50** is preferably a die casting having recessed lower portions, and on which rubber feet **56** (FIGS. **3** and **7**) are mounted for nonslipping engagement with an underlying supporting surface.

The described means for connecting footboard **40** to heel element **50** in aligned relationship, and in a hinged or pivotal manner, is characterized by extreme simplicity and economy of manufacture and assembly (there being no threaded fasteners), yet by a high degree of durability. Assembly is effected by merely press-fitting the bushings **47** in the horizontal bores through bearing portions **44** of footboard **40**, then introducing the bearing lugs **51** and eye **52** between the bushings, then inserting the pin **46** through the aligned elements, and then introducing the spring pin **54**. As shown in FIG. **7**, the spring pin **54** fits into the annular groove **55** and insures against withdrawal of the hinge pin **46**. When in such annular groove, the spring pin is tangential to hinge pin **46**.

The described hinge assembly permits the hinge rod **53** and the heel element **50** to pivot relative to each other. Stated otherwise, not only is the footboard **40** pivotable relative to the heel element **50**, but the hinge rod **53** may also pivot relative thereto. Conversely, when the hinge rod **53** is stationary, heel **50** may pivot to such a position that all of the feet **56** rest firmly upon the floor or other support surface. This relationship is of major importance relative to mounting of the apparatus in such manner that it will not creep in response to repeated operation of the foot pedal by the drummer, and as will be described below.

The forward end **57** of hinge rod **53** is bent upwardly and then downwardly, there being a cross pin **58** welded or otherwise rigidly secured in the apex between adjacent bent portions. The ends of cross pin **58** extend laterally and seat in notches **59** which are formed in the upper edges of hinge straps or plates **61**. Such hinge straps **61** are parallel to each other and are rigidly secured to the lower end of tube **10**, for example by soldering. The end of hinge rod **53** remote from heel **50** is inserted between upper and lower rivets **62** and **63**, such insertion being possible when the hinge rod **53** is inclined upwardly during assembly of the apparatus. The rivets **62** and **63** do not prevent a limited amount of upward pivoting of hinge rod **53**.

The hinge straps 61 extend forwardly of tube 10 and provide a mounting for an adjustable spur element 64 which is disposed between the straps. The spur 64 is adapted to press downwardly against the floor or carpeting in order to cooperate with the heel 50 (and with the feet 11*a* at the lower ends of legs 11) in preventing creeping of the apparatus.

Since the heel 50, in accordance with the present invention, can pivot relative to rod 53 at all times, the lower tube 10 and the spur 64 thereon may be vertically adjusted (as will be described) in a manner such that the spur 64 cooperates most effectively with the underlying support surface. Such adjustment does not, because of the pivotal mounting of the heel 50 relative to rod 53, affect in any way the firm seating of heel feet 56 on the support. Thus, there is no upward inclination or other lack of proper seating of the heel 50, despite the adjusted position of the lower tube 10 and spur 64, and despite any irregularities in the support surface.

The spur 64 may be vertically adjusted by releasing a U-clamp 66 (FIG. 1) and then vertically shifting a movable leg slide or spider 67 on the lower tube 10. Such leg slide 67 is pivotally connected to the upper ends of legs 11, whereas intermediate portions of such legs are pivotally connected to leg links 68 with the above-indicated fixedly-mounted spider element 39.

The leg slide 67 is then locked, by U-clamp 66, at such a longitudinal position on tube 10 that the elevation of spur 64 relative to the foot portions 11*a* of legs 11 will be such as to provide an optimum degree of gripping with the support surface. Illustrated in phantom lines in FIG. 3 is a position such that the spur 64 is effectively employed, and cooperates with the heel 50 in preventing creeping of the apparatus. In the phantom-line showing of FIG. 3, the floor is shown at S1.

The leg slide 67 may also be adjusted to such position that the spur and the hinge straps 61 are spaced above the supporting surface as shown in solid lines in FIG. 3. Relative to the solid-line showing of FIG. 3, the floor is shown at S2.

As illustrated in FIG. 3, and regardless of the adjusted position of the leg slide 67 or other elements, the heel 50 is always horizontal (if the floor is horizontal) and cooperates effectively with the spur 64 and/or the foot portions 11*a* of legs 11 in preventing creep.

It is claimed:

1. In a foot-operated percussion device, a foot pedal assembly comprising:

a footboard having at least one protuberant portion at the heel end thereof;

means to connect the toe of said footboard to a component of a percussion device for operation thereof;

a heel element adapted to rest on an underlying support surface, said heel element having at least one protuberant portion disposed to be horizontally and laterally adjacent said protuberant portion of said footboard when said footboard and heel element are in longitudinally aligned positions such that the heel of one foot of the musician may rest on said heel element, and the sole of such foot may rest on said footboard;

an unthreaded horizontal hinge pin extended through horizontal bores in said protuberant portions and transversely of said longitudinally aligned footboard and heel element, said hinge pin having a recess therein;

a hinge rod connected to said hinge pin in perpendicularly-extending relationship relative thereto, said hinge rod being associated, at its end remote from said hinge pin, with a support means; and

a locking member extended through an opening in one of said protuberant portions and into said recess to thereby lock said hinge pin against axial shifting.

2. In a foot-operated percussion device, a foot pedal assembly comprising:

a footboard having at least one protuberant portion at the heel end thereof, said footboard having a bifurcated end portion one section of which is formed by said protuberant portion of said footboard, and the other section of which is laterally spaced a substantial distance from said one section;

means to connect the toe end of said footboard to a component of a percussion device for operation thereof;

a heel element adapted to rest on an underlying support surface, said heel element having one protuberant portion disposed to be horizontally and laterally adjacent said protuberant portion of said footboard when said footboard and heel element are in longitudinally aligned positions such that the heel of one foot of the musician may rest on said heel element, and the sole of such foot may rest on said footboard, said heel element having a second protuberant portion spaced from said first-mentioned protuberant portion thereof, both of said protuberant portions of said heel element being disposed between said sections of said bifurcated end portion of said footboard;

an unthreaded horizontal hinge pin extending transversely of said longitudinally aligned footboard and heel element, said hinge pin extending through horizontal bores in both of said sections of said bifurcated end portion, and through horizontal bores in both of said protuberant portions of said heel element, said hinge pin having a recess therein;

a hinge rod pivotally connected to said hinge pin in perpendicularly-extending relationship relative thereto, the pivotal connection between said hinge rod and hinge pin being by means of an eye formed at one end of said hinge rod and having said hinge pin extended therethrough, said eye being located between said protuberant portions of said heel element, said hinge rod being associated, at its end remote from said hinge pin, with a support means; and

a locking member extended through an opening in one of said protuberant portions and into said recess to thereby lock said hinge pin against axial shifting.

3. The invention as claimed in claim 2, in which bushings are provided around said hinge pin and in said sections of said bifurcated end of said footboard, in which said recess in said hinge pin is an annular groove therein, and in which said locking member is an elongated spring pin adapted to be extended through a portion of said groove in generally tangential relationship relative to said hinge pin.