March 6, 1962 R. F. TUDOS, JR 3,023,633

FOOT-EASE PEDAL-HOLDING DEVICE

Filed Aug. 25, 1960

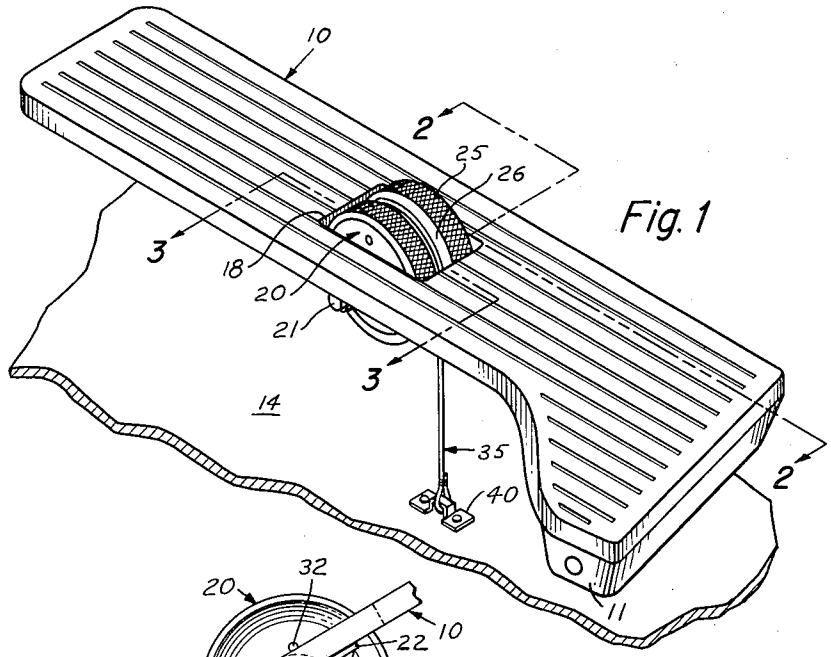


Fig. 1

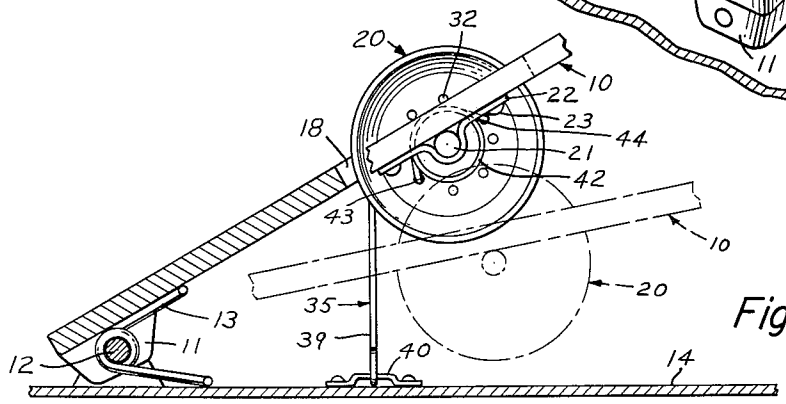


Fig. 2

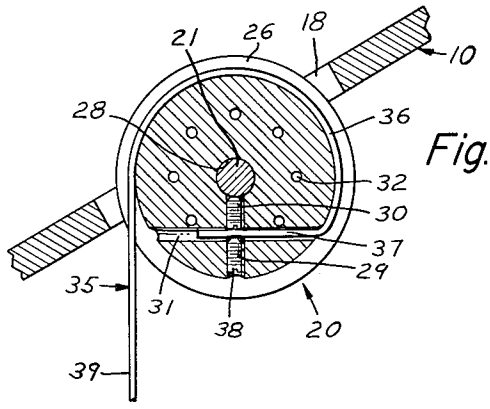


Fig. 3

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3,023,633
Patented Mar. 6, 1962

3,023,633

FOOT-EASE PEDAL-HOLDING DEVICE

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Filed Aug. 25, 1960, Ser. No. 51,805
5 Claims. (Cl. 74—513)

This invention relates generally to a unique improvement for use in conjunction with a pedal.

While the device of the particular invention has been primarily developed and employed for use in conjunction with the accelerator pedal of a motor vehicle, and will be illustrated and described hereinafter with particular reference thereto, it is appreciated that the easy-holding function of the instant apparatus is capable of wide and varied applications, all of which are intended to be comprehended herein.

As is well-known to drivers of motor vehicles, long periods of steady driving, as on present-day superhighways, require that the operator's foot apply constant pressure to and remain immobile on the accelerator pedal, which often results in extreme tiring of the leg, muscle cramps, and other discomfort. This condition presents an even more serious problem in the driving of heavy trucks, and the like, the pressures and extended durations being considerably greater.

Accordingly, it is an object of the present invention to provide a device for use in conjunction with resiliently depressible pedals, which overcomes the difficulties mentioned in the preceding paragraph, and enables an operator to maintain a pedal depressed to the desired extent without applying pressure equal to that exerted by the pedal, but merely by resting the foot in the proper location.

It is another object of the present invention to provide a device having the advantageous characteristics mentioned in the preceding pargaraph which is immediately releasable upon mere disengagement of the operator's foot from the instant device to permit quick and substantially instantaneous upward return of the previously depressed pedal.

It is still another object of the present invention to provide an improvement in pedals of the type described which is extremely simple in construction, entirely reliable in use, durable under even abusive conditions throughout a long useful life, and which can be economically manufactured for sale at a reasonable price.

Other objects of the present invention will become apparent upon reading the following specification and referring to the accompanying drawings, which form a material part of this disclosure.

This invention accordingly consists in the features of construction, combinations of elements, and arrangements of parts, which will be exemplified in the construction hereinafter described, and of which the scope will be indicated by the appended claims.

In the drawings:

FIGURE 1 is a top perspective view showing a floor pedal incorporating a device of the present invention;

FIGURE 2 is a sectional elevational view taken substantially along the line 2—2 of FIGURE 1, and showing the pedal in phantom in a depressed condition; and

FIGURE 3 is a partial sectional view taken substantially along the line 3—3 of FIGURE 1, to illustrate features of internal construction.

Referring now more particularly to the drawings, and specifically to FIGURES 1 and 2 thereof, a foot pedal is there generally designated 10, of an elongate configuration customarily employed in accelerator pedals of motor vehicles. While the device of the instant invention is applicable for use in any upwardly biased pedal, it is shown herein for purposes of illustration and without limiting intent in conjunction with a motor-vehicle

accelerator pedal. The accelerator pedal may be of any type, such as the type having at its rearward, lower end a pair of laterally spaced depending ears 11 which are pivotally connected to a generally horizontal, laterally disposed shaft 12. Thus, the pedal is mounted for up-and-down swinging movement, in the instant case about the rearwardly located axis of shaft 12. Any suitable means may be provided to resiliently bias the pedal 10 upward, and for clarity of illustration, a coil spring 13 is shown about the shaft 12 and having its opposite ends respectively engageable with the floor 14 and underside of the pedal 10 to urge the latter upward.

The pedal 10 is provided centrally, in spaced relation between its side edges, with a through opening or hole 18, in which is located a wheel, generally designated 20. While the wheel 20 may be located other than centrally within the pedal 10, say being on one side of the pedal, the central location is preferred for convenience in use and durability of structure.

It will be observed that the opening or hole 18 is of generally rectangular configuration, being elongate in the direction longitudinally of the pedal 10. The wheel 20 is carried by an axial shaft 21 located beneath the pedal 10 and extending laterally thereof across and beyond opposite sides of the opening 18. Opposite ends of the supporting axle or shaft 21 are rotatably journaled by means of a pair of journal bearings or straps 22, each being located along a respective side of the opening 18 on the underside of the pedal 10 and secured to the pedal by fasteners 23. Thus, the wheel is located, for the most part, beneath the pedal 10, and has an upper, minor region extending upward through the opening 18 beyond the upper surface of the pedal.

The periphery of the wheel 20 is preferably formed with a frictional surface 25, as by knurling, or other suitable means; and, a peripheral annular groove 26 is formed externally in the wheel 20, for a purpose appearing presently.

As best seen in FIGURE 3, the wheel 20 is formed with a central axial bore 28 receiving the journal shaft 21. A radially extending, internally threaded through hole or bore 29 is formed in the wheel 20, extending inward from the peripheral groove 26 and opening into the central bore 28. A setscrew 30 is threadedly engaged in the bore 29 to fix the shaft 21 relative to the wheel 20.

An additional bore 31 is formed in the wheel 20, extending chordally thereacross approximately normal to and intersecting with the radial bore 29 medially between the ends of the latter. The chordal bore 31 opens at its opposite ends into spaced regions of the peripheral groove 26. Also formed in the wheel 20 are a plurality of through holes or bores 32 all extending parallel to the central axial bore 28 and disposed in a circular arrangement about the central bore spaced radially inward from the groove 26.

An elongate flexible element or line 35 has one end portion wound about the wheel 20, received in the peripheral groove 26, with its terminal region 37 inserted into the chordal bore 36 and anchored therein by a setscrew 38 threadedly engaged in the radial bore 29. The flexible elongate element or line 35 is preferably fabricated of steel cable or wire, but may be of any suitably flexible material having sufficient tensile strength.

The other end portion 39 of the elongate element 35 depends from the wheel 20 beneath the pedal 10 and is securely anchored to the floor 14 by suitable fastener means 40. Circumposed about the axle or shaft 21 is a coiled resilient member or spring 42, which has one end portion bent, as at 43 for engagement in a selected one of the holes 32, and has its other end portion 44 bent for bearing engagement with or securement to one of

the fasteners 23. The coil spring 42 serves to resiliently bias the wheel 20 in the clockwise direction, as seen in FIGURES 2 and 3, which tends to further wind the elongate element 35 about the wheel and thus draw the pedal 10 downward toward the floor 14. The strength of spring 42 tending to rotate the wheel 20 may be adjusted by selective insertion of the spring end 43 into one of the wheel holes 32. However, it is essential that the force of spring 42 tending to rotate the wheel 20 and lower the pedal 10 is less than the resiliently biasing upward force imposed on the pedal, as by the spring 13, or other upwardly biasing means. Hence, the pedal 10 is normally urged to its uppermost position, as shown in solid lines in FIGURE 2.

In operation, the pedal 10 is depressed in the conventional manner to the desired position, during which the wheel 20 automatically rotates in one direction under the force of spring 42 to further wind elongate element 35 about the wheel and maintain the depending portion 29 taut at all times. After the pedal 10 has been depressed, say to the phantom position shown in FIGURE 2, it is only necessary for the operator to lightly place his foot upon the peripheral surface 25 of the wheel, relatively little force being required to hold the wheel against rotation, so that the pedal will be easily held in its depressed condition.

Viewed otherwise, the force urging the depressed pedal upward is the differential between that of spring 13 and spring 42. Further, by the diameter of wheel 20, this differential is further reduced, so that mere resting of the operator's foot in engagement with the frictional periphery of the wheel 20 is sufficient to maintain the pedal in the desired depressed position without strain or fatigue.

From the foregoing, it is seen that the present invention provides a foot-ease device for pedals which fully accomplishes its intended objects and is well-adapted to meet practical conditions of manufacture and use.

Although the present invention has been described in some detail by way of illustration and example for purposes of clarity of understanding, it is understood that certain changes and modifications may be made within the spirit of the invention and scope of the appended claims.

What is claimed is:

1. In a motor vehicle having an accelerator pedal mounted for up-and-down movement and biased upward, the improvement comprising a wheel mounted on said pedal for rotation about a generally horizontal axis and presenting a portion of its periphery upward for frictional engagement by an operator's foot, an elongate flexible element having one end wound around and connected to said wheel and having its other end connected to the vehicle at a region below the accelerator pedal and resilient means operatively connected between said accelerator pedal and said wheel for urging the latter in one angular direction to cause take-up of said elongate element, said resilient means being of insufficient strength to overcome the upward resilient biasing on said pedal, whereby said wheel automatically effects take-up of said elongate element upon depression of said pedal to maintain said elongate element taut, and said pedal is adapted to be more easily held depressed by holding said wheel against rotation in the opposite angular direction.

2. An easy-holding device for a pedal mounted on a floor for up-and-down movement and biased upward, said device comprising a wheel, means for mounting said wheel on said pedal for rotation about a generally horizontal axis and presenting a portion of its periphery upward for frictional engagement by an operator's foot, an elongate flexible element having one end connected to and wound about said wheel and having its other end connected to the floor, and resilient means operatively connected between said accelerator pedal and said wheel for urging the latter in one angular direction to cause take-up of said elongate element on said wheel, said resilient means being of insufficient strength to overcome the upward biasing of said pedal, whereby said wheel automatically effects said take-up upon depression of said pedal to maintain said elongate element taut, and said pedal is adapted to be more easily held depressed by holding said wheel against rotation in the opposite angular direction.

3. A device according to claim 2, in which said means for mounting said wheel is located below said pedal with the upper wheel region extending upward beyond said pedal, for convenient depression of said pedal and holding of said wheel with the same foot.

4. A device according to claim 2, said wheel being provided with a peripheral groove receiving the wound portion of said elongate element, to effectively protect said elongate element from contact with the operator's foot.

5. A device according to claim 4, said wheel being formed with a generally radial internally threaded through bore, a screw in the inner end of said bore for securing said wheel to an axle, said wheel being provided with a generally chordal through bore intersecting with said radial bore medially thereof, said one end of said elongate element being inserted into said chordal bore, and said connection between said elongate element and said wheel including a second screw in said radial bore in holding engagement with said elongate element.

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