

March 17, 1953

R. D. PAGE

2,631,473

HAND LEVER ASSEMBLY

Filed Sept. 4, 1951

FIG. 1

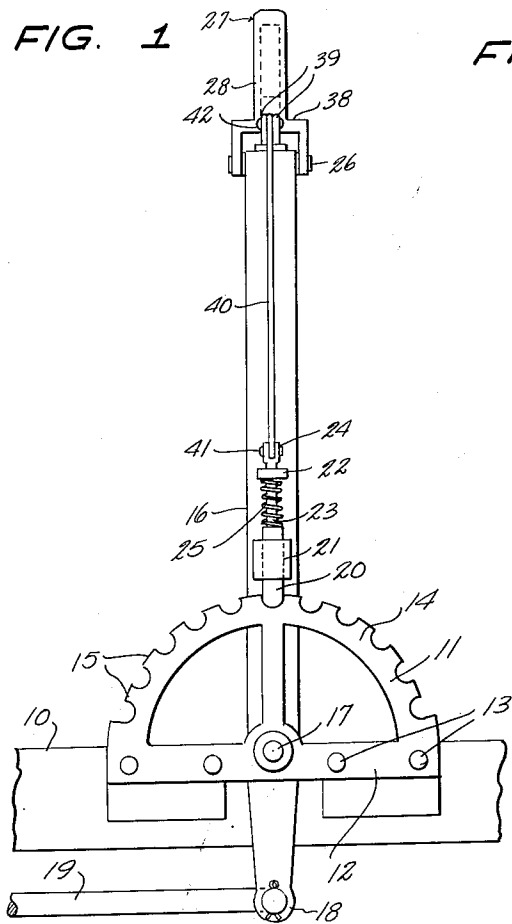


FIG. 2

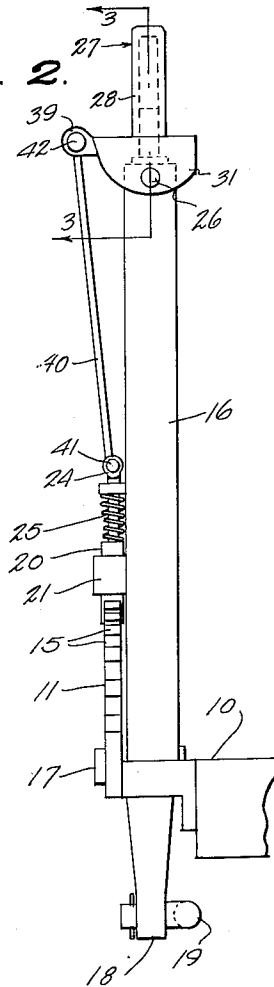
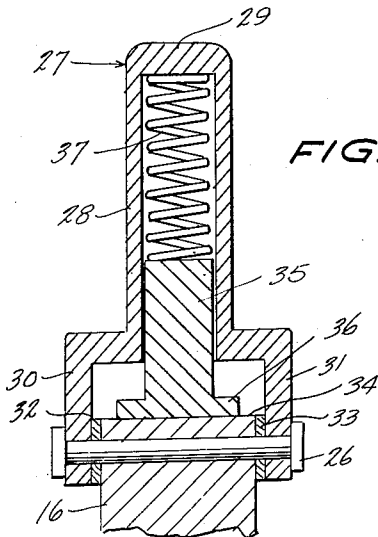


FIG. 3



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2,631,473

HAND LEVER ASSEMBLY

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Application September 4, 1951, Serial No. 244,898

1 Claim. (Cl. 74—536)

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This invention relates to hand lever assemblies and more particularly to a hand lever assembly including a lever, a toothed quadrant, a spring pressed detent carried by the lever and a tiltable handle carried by the lever for releasing the detent from the quadrant.

It is among the objects of the invention to provide an improved hand lever assembly including a toothed quadrant, a lever pivotally mounted at one end and movable along the quadrant, and a detent carried by the lever and engageable with the quadrant to lock the lever in selected positions of adjustment relative to the quadrant, wherein a tiltable handle is mounted on the free end of the lever and connected to the detent for releasing the detent by tilting movement of the handle relative to the lever; wherein the movement of the handle relative to the lever is substantially at right angles to the movement of the lever relative to the quadrant; wherein resilient means are provided to automatically return the handle to its position freeing the detent for re-engagement with the quadrant and to hold the handle in this position against vibrational forces; and which assembly is simple and durable in construction, economical to manufacture, and positive and effective in operation.

Other objects and advantages will become apparent from a consideration of the following description and the appended claim in conjunction with the accompanying drawing wherein:

Figure 1 is a front elevational view of a hand lever assembly illustrative of the invention;

Figure 2 is a side elevational view of the assembly illustrated in Figure 1; and

Figure 3 is a fragmentary cross sectional view on an enlarged scale on the line 3—3 of Figure 2.

With continued reference to the drawing, the numeral 10 indicates a hand lever and quadrant support, such as a portion of the frame of a machine, and the numeral 11 indicates a toothed quadrant mounted on the support 10, the quadrant being illustrated as having a straight side 12 secured to the support by suitable means, such as bolts or rivets 13, and having a semicircular side 14 centered on a center of curvature substantially at the mid-length location of the straight side 12 and provided with teeth 15 spaced apart around the periphery thereof.

A hand lever 16 is pivotally mounted intermediate its length on the quadrant 11 or the support 12 or on both the support and the quadrant by a pivot pin or bolt 17, so that the axis of pivotal movement of the lever relative to the quadrant is substantially coincident with the center of curvature of the curved side 14 of the quadrant.

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The lever has a short end extending from the pivot pin 17 and provided with a terminal eye formation 18 and one end of a link rod 19 is pivotally mounted in the eye formation 18, so that the lever will impart longitudinal movement to the link rod as the lever is moved relative to the quadrant about the pivotal axis of the pivot pin 17.

A detent 20 is slidably mounted on the lever adjacent the curved side of the quadrant by a guideway 21 secured to the lever and this detent is engageable with the teeth 15 of the quadrant to releasably lock the lever in selected positions of adjustment relative to the quadrant.

A spring abutment 22 having an aperture therein is mounted on the lever at a location spaced from the side of the guideway 21 remote from the quadrant and the detent has a portion 23 of reduced diameter extending through the spring abutment 22 and provided with a terminal eye formation 24 which, as illustrated, is in the form of a bifurcated portion providing a pair of spaced apart apertured lugs. An annular spring abutment shoulder is provided at the proximal end of the reduced portion 23 of the detent and a coiled compression spring 25 surrounds the reduced portion of the detent between the annular shoulder and the spring abutment 22 and resiliently urges the detent into engagement with the quadrant teeth 15.

At its end remote from the eye formation 18 the hand lever is provided with a transversely extending aperture and a pivot pin 26 extends through this aperture and is disposed substantially at right angles to the pivot pin 17.

A handle, generally indicated at 27, is pivotally mounted on the lever by the pivot pin 26 and includes a hollow, substantially cylindrical portion 28 open at one end and closed at its other end by an end wall 29.

At the open end of the cylindrical portion 28 thereof the handle is provided with a pair of offset legs 30 and 31 which straddle the adjacent end of the hand lever 16 and are apertured to receive the pivot pin 26 at the corresponding ends of the latter to pivotally mount the handle on the corresponding end of the lever for pivotal movements relative to the handle about an axis substantially at right angles to the axis of pivotal movements of the lever relative to the quadrant. Preferably, bearing washers 32 and 33 surround the pivot pin 26 between the legs 30 and 31 respectively, and the adjacent sides of the hand lever and the pin 26 is headed at the outer sides of the handle legs to retain it in

operative assembly with the handle and the hand lever.

The hand lever is provided on its end carrying the handle 27 with a flat surface 34 substantially perpendicular to the longitudinal center line of the lever and a plunger 35 has at one end a flat surface bearing on the flat surface 34, this plunger extending slidably into the hollow cylindrical portion 28 of the handle. At its end bearing on the lever, the plunger 35 is preferably enlarged, as indicated at 36, to provide an end surface of greater area than the cross sectional area of the portion of the plunger extending into the hollow handle.

A compression spring 37 is disposed in the hollow handle between the end wall 29 and the adjacent end of the plunger 35 and acts between the handle and the plunger to resiliently urge the handle to a position in which it is substantially in longitudinal alignment with the handle.

The legs 30 and 31 are of substantially semi-circular shape, as is particularly illustrated in Figure 2, and are joined to the cylindrical portion 28 of the handle by a flat plate portion 38 of generally rectangular shape. A pair of apertured lugs 39 project outwardly from the edge of the handle portion 38 at the side of the hand lever 16 on which the detent 20 is mounted and a link 40 having eye formations disposed one at each end thereof has one eye formation disposed between the lugs of the eye formation 24 of the detent and its other eye formation disposed between the lugs 39 of the handle. The link 40 is pivotally connected to the detent by a pivot pin or rivet 41 and is pivotally connected to the handle by a pivot pin or rivet 42.

With this arrangement, when the handle is tilted toward the side of the lever remote from the detent 20, a pull will be exerted on the link 40 which will move the detent away from the toothed quadrant against the force of spring 25, so that the handle can be moved relative to the quadrant and when the tilting force on the handle is released the spring 37 acting between the plunger 35 and the closed end of the handle will return the handle to its position of longitudinal alignment relative to the lever releasing the pull on the link 40 and freeing the spring 25 to return the detent to engagement with the teeth of the quadrant to lock the lever at selected positions of adjustment relative to the quadrant.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claim rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of

the claim are, therefore, intended to be embraced therein.

What is claimed is:

In combination with a toothed quadrant having a center of curvature, a lever pivotally mounted intermediate its length adjacent the center of curvature of said quadrant and extending past the latter, and a spring pressed detent carried by the lever and engageable with the teeth of the quadrant to releasably lock the lever in selected positions of adjustment relative to the quadrant, a handle mounted on the free end of said lever for pivoted movement relative to the lever about an axis substantially at right angles to the axis of pivotal movement between the lever and said quadrant, a link connecting said handle to said detent for movement of said detent away from said quadrant when said handle is tilted in one direction relative to said lever, and resilient means interposed between said lever and said handle urging said handle to a position relative to said lever to free said detent for engagement with said quadrant, said handle including a hollow portion closed at one end and a pair of outwardly offset legs extending from the open end of said hollow portion and straddling the adjacent end of said lever, each of said legs having an aperture near its end remote from said hollow portion and said lever having a flat surface on its handle carrying end and an aperture extending transversely there-through adjacent said flat surface, and a pivot pin extending through the apertures in said legs and said lever, and said resilient means comprising a plunger slidably received in the hollow portion of the handle at the open end of said hollow portion and having at one end a flat surface bearing on the adjacent end of said lever, and a compression spring disposed in the hollow portion of said handle between the closed end of said hollow portion and the adjacent end of said plunger.

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