

Sept. 9, 1958

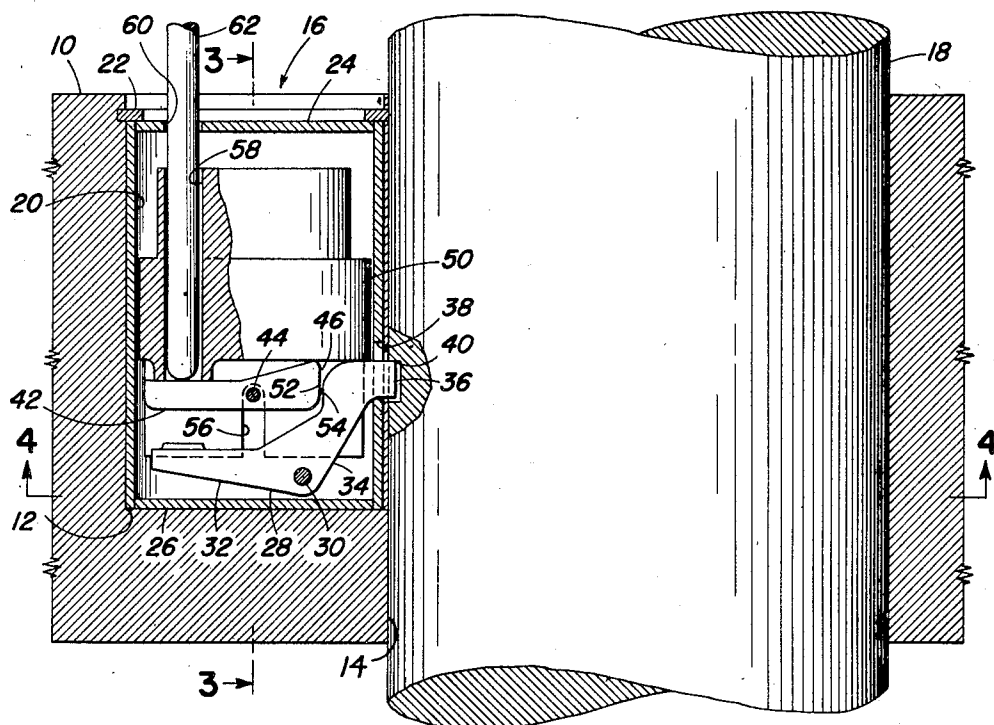
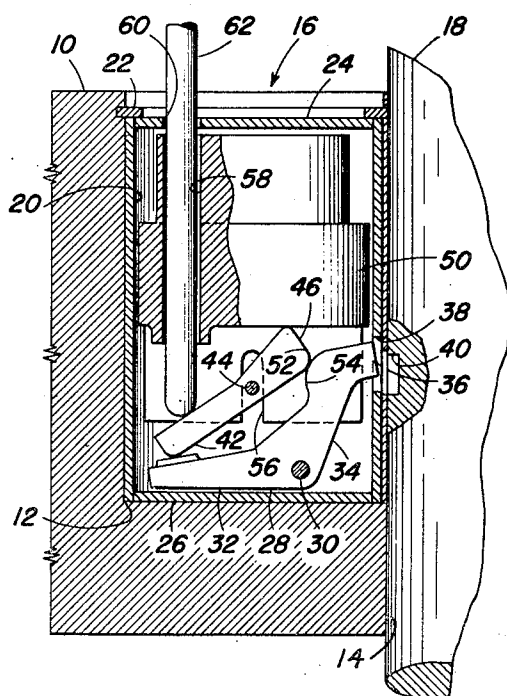
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2,851,287

WEIGHT-OPERATED LATCH

Filed May 23, 1956

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

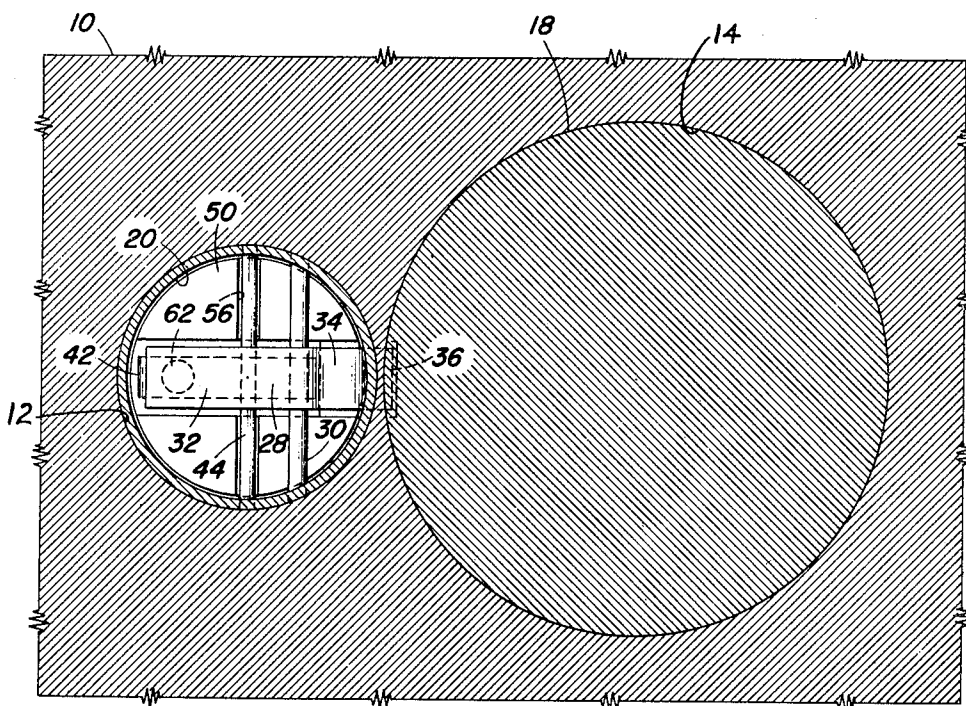


Fig. 4.

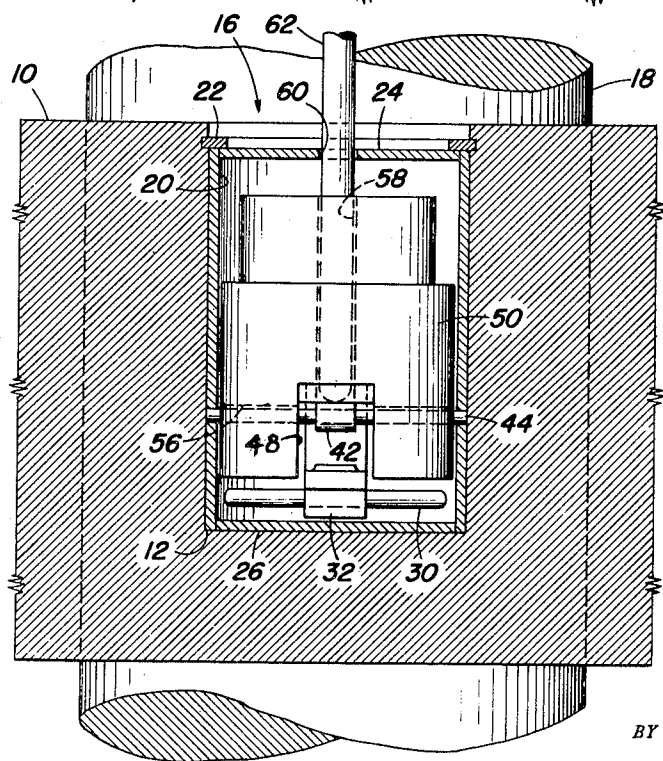


Fig. 3.

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WEIGHT-OPERATED LATCH

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4 Claims. (Cl. 285—88)

This invention relates to latching mechanism and has particular relation to a latch which is weight- or gravity-biased to its latching position.

In accordance with the invention there is provided a housing which has a pair of vertical openings or bores in immediately adjacent relation to one another. In one of these openings is a latching device which includes a locking or latching lever that may be inserted and withdrawn from the other opening so that it may be received in a recess provided in a member positioned in this other opening to releasably retain this member within this opening. This latching mechanism includes a preferably cylindrical sleeve within and adjacent the lower end of which is pivotally mounted an L-shaped latching lever which includes a generally horizontal leg and an upright leg with the upright leg having extending laterally therefrom a finger that may be inserted in the adjacent opening to lock the member therewithin. This latching lever is pivotal about its pivotal axis to and from a latching and unlatching position and an actuating lever which is also pivotally mounted within the sleeve is nested within the locking lever and is pivoted to and from a position where it is effective to prevent movement of the latching lever from its latched to its unlatched position with the actuating lever being operative to move the latching lever to and from its extreme positions. Positioned above this actuating lever is a relatively heavy body member which bears against the lever and urges it to its locking position with relation to the latching lever. The actuating lever and the latching lever have complementary cam surfaces by means of which the latching lever is moved from its unlatched to its latched position as the actuating lever is moved into its locking position with relation to the latching lever. Pivotal movement of the actuating lever from its locking position to the position where it is effective to move the latching lever to its unlatched position is had by means of a rod or bar extending upwardly through a passage provided in the body member and out the upper end of the sleeve with the lower end of this bar bearing against the actuating lever. Thus the weight of the body member maintains the latch mechanism in its latching position and when it is desired to move the latching lever to its unlatched position this rod is moved downward and must be retained in its downward position against the weight of the body member in order to maintain the mechanism in its unlatched position.

It is an object of this invention to provide an improved latch which is weight or gravity biased to its latching position.

Other and further objects of the invention will become apparent to those skilled in the art as the description proceeds.

With the aforementioned objects in view the invention comprises an arrangement, construction and combination of the elements of the inventive organization in such a manner as to attain the results desired as hereinafter more particularly set forth in the following detailed description of an illustrative embodiment, said embodiment being shown by the accompanying drawing wherein:

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Fig. 1 is a generally vertical section through the latching mechanism of the present invention shown in the latched position.

Fig. 2 is a view similar to that of Fig. 1 with the mechanism in the unlatched position.

Fig. 3 is a vertical sectional view taken generally along line 3—3 of Fig. 1 but showing the body and latch members in elevation.

Fig. 4 is a horizontal sectional view of the latching mechanism, as seen when looking upward from a plane indicated by the line 4—4 of Fig. 1.

Referring now to the drawing, wherein like reference characters are used throughout to designate like elements, the latching organization illustratively depicted therein and which represents a preferred embodiment of the present invention includes a housing or frame 10 which is provided with a pair of immediately adjacent bores 12 and 14, a latching mechanism 16 being positioned and retained within the bore 12 and operative to releasably retain an elongated member 18 within the bore 14.

The latching mechanism 16 includes a preferably cylindrical sleeve 20 which is retained within bore 12 by means of a snap ring 22, the sleeve being interposed between the lower end of the bore and the snap ring and preferably closed at its top and bottom by plate members 24 and 26, respectively. In the lower end of the sleeve 20 is disposed an L-shaped locking or latching lever 28 which is pivotally mounted upon a horizontal pin 30 which is in turn secured to the sleeve. This locking lever includes a horizontal leg 32 and an upright leg 34 from the upper end of which extends a laterally disposed finger 36 received within and passing through an opening 38 in the wall of sleeve 20. The lever 28 may be pivoted about a pin 30 to and from a latching position where finger 26 extends laterally from the sleeve 20 into the bore 14 where it may be received in a suitable recess 40 in the elongated member 18 to prevent removal of this member from the bore 14 and a position where this finger does not extend laterally from the sleeve, the former position being shown in Fig. 1 and the latter position being shown in Fig. 2.

Actuation of locking lever 28 to and from its latching and unlatching position is had by means of an actuating lever 42 which may be said to be nested within the lever 28 and is pivotally mounted upon a pin 44 which is horizontally disposed and is connected to the sleeve 20. When the lever 42 is in the position shown in Fig. 1 it is effective to lock lever 28 in its latched position since a nose portion 46 of the lever 42 prevents rearward movement of the upper end of the upright leg 34 of the latching lever, while when the lever 42 is in its position shown in Fig. 2, its opposite end acts against that end of lever 28 remote from the pin 30, pivoting the latching lever to its unlatched position as shown. The levers 28 and 42 are received within a transversely extending recess 48 provided in the lower end of a body member 50 which is snugly but slidably mounted within the sleeve 20 so that it is capable of limiting vertical movement within the sleeve. This body member is relatively heavy and bears against the upper end of the nose portion 46 of lever 42 to urge this lever to its locking position with relation to the lever 28. In order that the latching lever 28 will be moved from its unlatched to its latched position in response to pivotal movement of the actuating lever 42 from its Fig. 2 to its Fig. 1 position the nose portion 46 of lever 42 and the rearward portion of the upright leg 34 of lever 32 form coacting cam surfaces 52 and 54, respectively, which are effective to cam the lever 28 from its unlatched to its latched position as the lever 42 moves counterclockwise as viewed in Fig. 1 about the pin 44. The body member 50 is provided with a slot 56 through which the pin 44 extends, this slot being verti-

cally elongated to permit the body member to move vertically within the housing 20 to the extent required by movement of the lever 42 about the pin 44 between its two extreme positions. The weight of the body member 50 is sufficient to move the lever 28 from its unlatched to its latched position so that there is no possibility of the latch mechanism being inoperative for failure of a spring or the like.

In order to move the lever 28 from its latched to its unlatched position the body member 50 and the plate 24 are provided with aligned passages 58 and 60, respectively, through which extends a rod 62 the lower end of which bears against that end of lever 42 remote from the nose portion 46 so that upon depressing the rod 62 the lever 42 is rotated counterclockwise about the pin 44 to raise the body member 50 and to move the nose portion 46 out of locking relation to the upright leg 34 of lever 38, the remote end of the lever 42 then engaging the corresponding end of leg 32 of the lever 28 and causing this lever to move to its unlatched position.

Thus with the present invention assurance is had that the latch will remain in its latched position preventing accidental release and removal of the element that is to be retained in a given position, the latch mechanism being extremely simple and yet positive in its operation.

While I have illustrated and described a preferred embodiment of my novel organization it is to be understood that such is merely illustrative and not restrictive and that variations and modifications may be made therein without departing from the function and scope of the invention. I therefore do not wish to be limited to the precise details set forth but desire to avail myself of such changes as fall within the purview of my invention.

What is claimed is:

1. A weight-operated latch comprising a vertically disposed sleeve, a relatively heavy body member snugly but slidably received within said sleeve so as to permit limited vertical movement therewithin, said body member having a transversely extending slot therein and said sleeve having an opening in its side wall communicating with said slot, a locking lever disposed in said slot and pivotally connected to said sleeve for pivotal movement to and from a position where one end of the lever extends laterally from said sleeve through said opening and a position where it is contained within said sleeve with the weight of the body member being effective to urge said lever to the first-mentioned position, an actuating rod extending through a passage in the body member and out through the upper end of the sleeve, said rod being operative upon being depressed to pivot said lever about its axis from its first-mentioned to its second-mentioned position.

2. A latch, weight-biased to the latching position, comprising in combination a vertically disposed sleeve, a relatively heavy body member disposed within said sleeve and vertically movable therewithin, a locking lever located generally beneath said body member and pivoted to said sleeve for rotation about its pivotal axis to a latching position where a portion of the lever extends through an opening in the side wall of the sleeve for receipt in a suitable keeper means and an unlatching position where the lever does not extend laterally from the sleeve, a second lever pivoted to said sleeve and juxtaposed to the locking lever, said second lever being urged by the weight of the body member to a predetermined locking position where it is effective to prevent movement of the locking lever from its latching to its unlatching position, an actuating rod extending through the body member and engaging the second lever, said rod being effective upon depression to move the second lever out of its locking position with respect to the locking lever and move the latter to its unlatching position, said locking and second levers having coacting camming surfaces disposed to cam the locking lever to its latching position in response to

said second lever returning to said predetermined position under the influence of the body member.

3. In an organization of the type described a generally vertically disposed housing adapted to be secured to one of a pair of members, a latching lever pivotally mounted within said housing about a horizontal axis and pivotable between a latching position where a portion of the lever extends laterally from the housing for receipt within the other of the pair of members and an unlatching position where the lever does not extend from the housing, a locking and actuating lever pivotally mounted within said sleeve about an axis parallel with the pivotal axis of the latching lever and pivotal between a first position where it engages the latching lever after having moved it to its unlatching position and a second position where it prevents movement of the latching lever from its latching position, these two levers having complementary engaging cam surfaces disposed so that the latching lever is moved from its unlatching to its latching position in response to the actuating lever moving from its first to its second position, a relatively heavy body member snugly but slidably received within said housing and bearing against the locking and actuating lever to urge it to its second position, an operating rod extending downward through the housing and accessible from the top of the housing, said rod bearing against said locking and actuating lever and being operative upon depression to move this lever from its second to its first position.

4. In a latch mechanism the combination of a housing, a first or latching lever disposed in said housing and including a generally horizontal leg and an upright leg, said lever being pivotally connected to the housing at the juncture of the legs and adjacent the side wall of the housing and rotatable about its pivotal axis between first and second extreme positions, a finger extending from the upright leg of the lever and arranged so that when the lever is in one of its extreme pivotal positions the finger extends laterally from the housing while when it is in the other extreme pivotal position it does not extend laterally from the housing, a second lever pivotally mounted within the sleeve about an axis which parallels that of the latching lever and which lies intermediate the ends of this second lever, this second lever being generally nested within the locking lever so that one end overlies the distal end of the latching lever and the other end is disposed inwardly and juxtaposed to the upright leg of the locking lever, said second lever being pivotal between a first position where it engages the distal end of the locking lever to pivot the latter to its unlatching position and a second position where it engages the upper leg of the locking lever and effectively locks it in its latching position, the upright leg of the locking lever and the juxtaposed end of the second lever having coacting camming surfaces operative to cause the latching lever to move to its latching position in response to the second lever moving from its first to its second position, a relatively heavy body member disposed within the sleeve and vertically movable therewithin, said body member engaging the second lever and urging it to its second position, an actuating rod extending downward through the sleeve and having one end engaging the end of the second lever, the other end of said rod extending upward through the top of the sleeve so that upon depressing said rod the second lever is moved to said first position and the latching lever is moved to its unlatching position.

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