Feb. 6, 1962 D. FISCHBEIN 3,020,001

LOCK ATTACHMENT FOR A SPRING TYPE COUNTERBALANCER

Filed Feb. 5, 1958

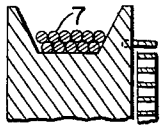


FIG. 4

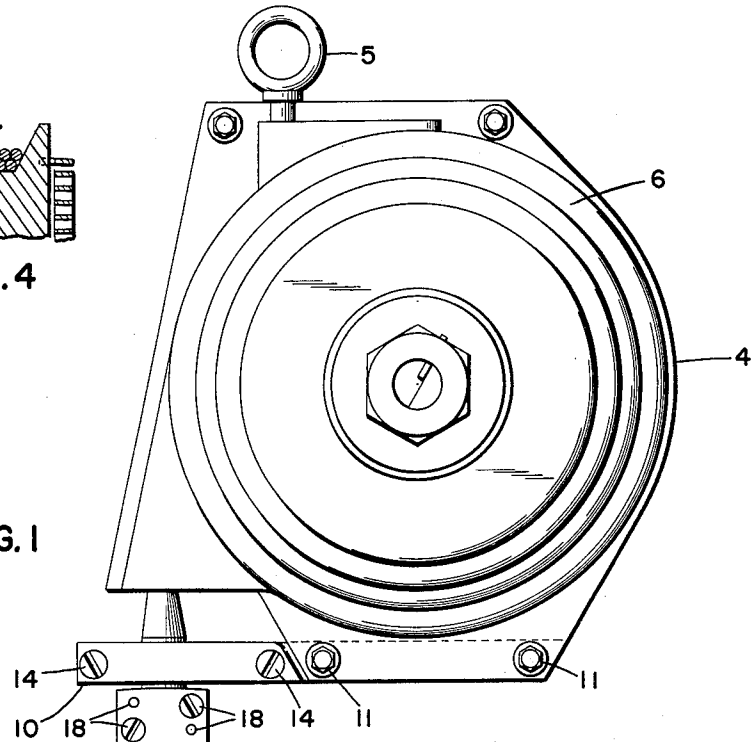


FIG. 1

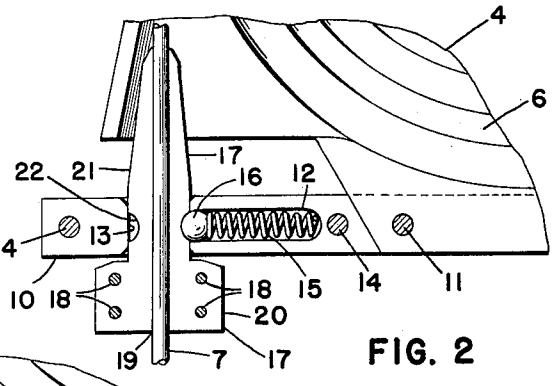


FIG. 2

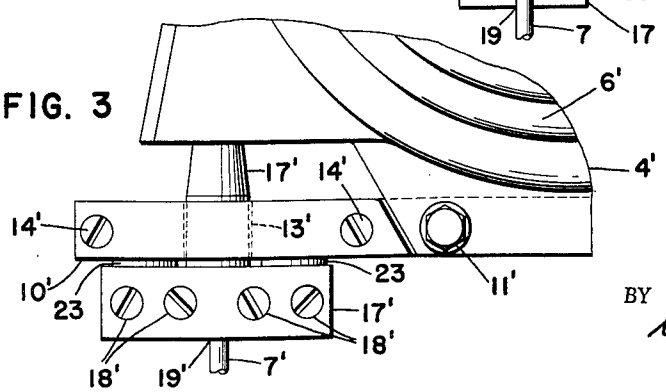


FIG. 3

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3,020,001

Patented Feb. 6, 1962

3,020,001
LOCK ATTACHMENT FOR A SPRING TYPE COUNTERBALANCER

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Filed Feb. 5, 1958, Ser. No. 713,462
1 Claim. (Cl. 242—107.2)

This invention relates broadly to counterbalancers; more particularly to counterbalancers of the spring type commonly employed in an overhead installation for use in combination with and interposed between hand held and operated units such as electric bag closers and the like, and stationary or movable overhead support means; and specifically, to a novel and highly efficient means for locking the suspended unit in its retracted position.

The principal object of this invention is to provide locking means in combination with a spring type counterbalancer whereby a unit suspended therefrom is positively but releasably held in retracted position until manually separated from said locking means by the operator when the suspended unit is moved towards engagement with its work.

Another object of this invention is to provide positive locking means in combination with a spring type counterbalancer, whereby said locking means permits adjustment of the counterbalancer at a comfortable tension at working levels of the suspended unit rather than requiring the operator to advance the said suspended unit to its work against the greatest tension of the counterbalancer main spring, as might be required according to the ratio of the weight of the suspended unit relative to the spring tension required to hold the same in retracted position above the work area.

A still further object of this invention is to provide a locking means in combination with a spring type counterbalancer wherein said locking means is in the form of an attachment, applicable to the frame or spring housing of counterbalancers of the type described.

A still further object of the invention is to provide a simple, efficient and inexpensive to manufacture lock means commercially available for spring type counterbalancers, wherein its components on the housing and cooperating members on the leash are readily installed without special tools.

These and other objects of the invention will become apparent from the following specification and claim, taken in conjunction with the appended drawings which form a part of this application and in which like characters indicate like parts throughout the several views.

To the above end, generally stated, the invention consists of the following devices and combustion of devices hereinafter described and defined in the claim.

Referring to the drawings:

FIG. 1 is a side elevational view showing one form of the invention attached to a conventional spring type counterbalancing unit;

FIG. 2 is an enlarged sectional view of the invention fragmentarily showing a portion of the counterbalancer housing;

FIG. 3 is a view silimar to FIG. 2 not in section, and illustrating a modified form thereof; and

FIG. 4 is a fragmentary sectional view of the spool and spring mechanism.

The numeral 4 is broadly directed to a conventional, commercially available spring type counterbalancing unit having an eye bolt 5 for the purpose of suspending the unit 4 from overhead supporting means, not shown. Of the other parts of this conventional unit important to the instant invention, it is important to note the spring housing 6 and the leach 7 that is wound on a spring loaded drum contained within the spring housing 6.

The various uses and adaptations of spring type counterbalancers are well known; however, for the purppose of this application it will be well to explain briefly as follows:

Heretofore when a counterbalancing unit of the type described has been employed to suspend and offset the inherent weight of a machine, it has been necessary to adjust the main spring tension of the counterbalancer to a high degree of tension in order to overcome the weight of the machine suspended therefrom when the same is retracted from its work. Obviously and similarly, when the device is being advanced to its work, it is tiresome on the operator and cumbersome to continuously have to overcome heavy spring tension. Conversely, by the use of the novel lock attachment described and defined herein, it is possible to establish a spring tension in the counterbalancing unit that will adequately support the suspended unit at its work without making it necessary to employ a spring tension capable of holding the suspended unit in a retracted position or of raising it from its work. The embodiment of the instant invention with a conventional commercial device makes it possible to adjust to the light tension and thence in the retracting operation, a guiding assist from the operator will permit the suspended unit of equipment referred to by the numeral 8 to be raised into locked position therewith. The supporting arm of said unit is fragmentarily shown attached to the grommet 9 of the leash 7. It will be understood that these last noted connections between the elements of the counterbalancer and the hand manipulated tool or unit will vary materially, depending upon the equipment involved in any given installation.

Referring now in detail to the invention, a horizontally, disposed bar 10 is rigidly attached to the underside of the spring housing 6 by a pair of nut-equipped bolts 11. It will be underestood that, in view of the fact that the instant invention is in most cases supplied as an attachment for already commercially available equipment, the bar 10 will be provided with bores for the attaching bolts 11 that are aligned with means provided on said equipment, thus making it unnecessary to drill and tap the spring housing 6 for attaching the bar 10 thereto.

The bar 10 is provided with an elongated horizontally disposed axial bore 12 located in its inner end portion that is in communication with a vertically disposed transverse bore 13 of larger diameter, provided for a purpose that will presently become apparent. For the purpose of construction and assembly, it is important to note that the bar 10, outwardly of the housing 6, as shown, comprises two identical sections that are assembled by means of a pair of screw-threaded studs 14.

The bore 12 affords a housing for a coiled spring 15 that cooperates with a ball 16, see FIG. 2.

As shown in FIGS. 1 and 2, a cooperating guide and lock member 17 is tightly clamped to the outer end of the leash 7 adjacent its grommet 9. This guide and lock member 17 is formed of a pair of identical sections that are held rigidly in assembled relation by means of four screw-threaded studs 18. An axial bore 19 extends through the member 17 to afford a passageway for the leash 7 and is of slightly smaller diameter than said leash. It will thus be seen that the guide and lock member 17 may be assembled at the desired position on the leash 7 and thence locked in said position by tightening of the studs 18. The guide and lock member 17 is an integral unit having a substantially square or oblong base section 20 and an upstanding central post or stud 21, the lower end portion of which is perpendicular and of such diameter as to provide a working fit with the transverse bore 13 in the bar 10, the upper end portion thereof being upwardly tapered to thus afford means for guiding and positioning the members of the assembly into interlocked position. A relatively deep annular groove 22 is formed in the per-

pendicular lower end portion of the post **21** to afford a race for the spring loaded ball **16**.

It will thus be seen that when the suspended unit **8**, attached to the grommet **9** of the leash **7**, is retracted by the winding of the main spring of the counterbalancer **4**, the fixed and movable elements **10** and **17**, respectively, will move into engagement, the one with the other and the unit **8** held securely in retracted position by the engagement of the spring loaded ball **16** with the groove **22** in the post **21**. Obviously, a downward pull of the unit **8** by the operator will release the locked engagement of said elements and the unit **8** may be advanced to its work area by the operator against a minimum of tension on the main spring of the counterbalancer.

As before stated, the inventive concept involved here is the fact that spring tension need only be of such extent as to offset the weight of the suspended unit at work levels, thus overcoming the present difficulty of working against such tension that will raise and support said unit when retracted.

As a modified form of the invention, as shown in FIG. 3, it is possible to embed in the horizontal bar **10'**, one or more magnets **23** of adequate strength that are capable of supporting the suspended unit **8** in its retracted position. This modification obviously eliminates the necessity of the use of the engagement between the spring loaded ball **16** having engagement with the race in the guide and lock member **17**. Said magnets being a part of the stationary horizontal bar **10'** have an attraction for the metal guide and lock members **17'** and thus hold the suspended unit, not shown in FIG. 3, in retracted engagement until the pull of the magnets is released by manual force exerted by the operator when it is desired to advance the suspended unit into its work area.

While there are herein disclosed but a limited number of embodiments of the structure, process and product of the invention herein presented, it is possible to produce still other embodiments without departing from the inventive concept herein disclosed, and it is desired, therefore, that only such limitations be imposed on the appended claim as are stated herein or required by the prior art.

What I claim is:

A guide and locking mechanism for spring type counterbalancing units comprising in combination a housing, a spool mounted in said housing for rotation about a horizontal axis and a leash wound on said spool for extensible or retractable movements relative to the housing, a horizontally disposed stationary member rigidly secured adjacent the underside of the housing and a vertically disposed leash passageway formed in the outer end portion thereof affording a guide for said leash, a horizontally disposed bore in said stationary member affording a housing for a coiled spring and a ball outwardly of said spring and projected thereby, said vertically disposed passageway formed in the outer end portion of said stationary member affording a seat, a movable member adjustably secured to the leash at the outer end portion thereof, said movable member having a base and an upstanding post section, said post section at its lower end portion being dimensioned to engage the vertical bore in the stationary member with a close working fit, a longitudinal bore extending through the base section and the post section of the movable member to afford a leash passageway and means for clamping the movable member on the leash at a predetermined position adjacent the free outer end portion thereof, an annular groove formed in the lower end portion of the post section of the movable member affording a race for the spring projected ball whereby when said leash is in its retracted position the engagement of the ball with the race will lock the leash in its predetermined position.

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