Nov. 18, 1958 W. S. SMITH ET AL 2,860,822

RETRACTABLE LADDER

Filed Sept. 19, 1956

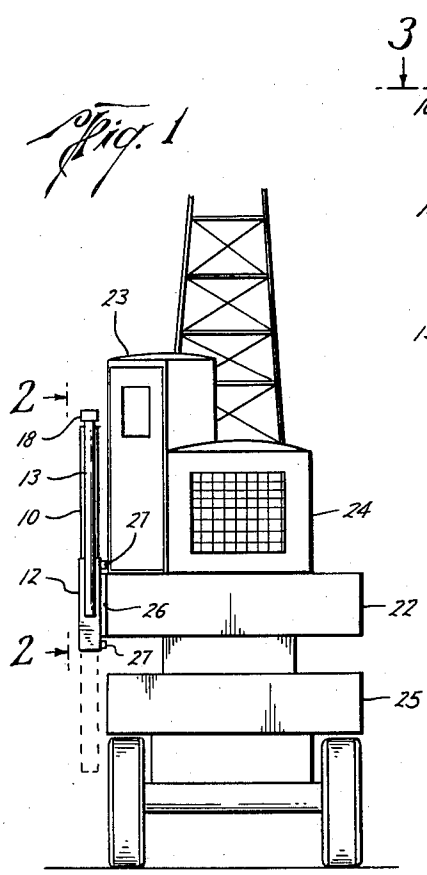


Fig. 1

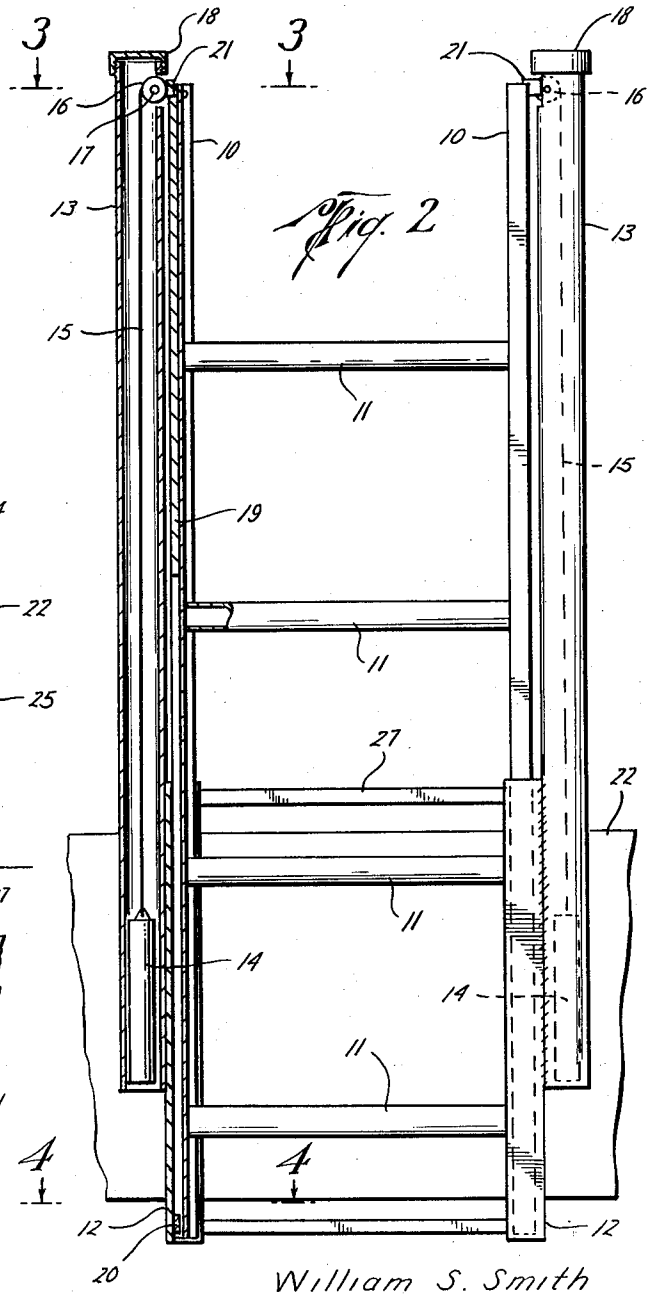


Fig. 2

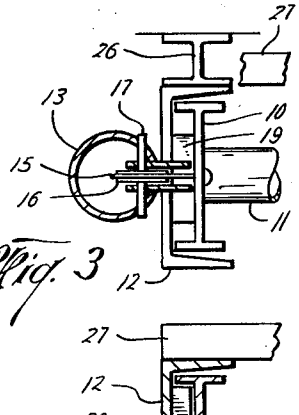


Fig. 3

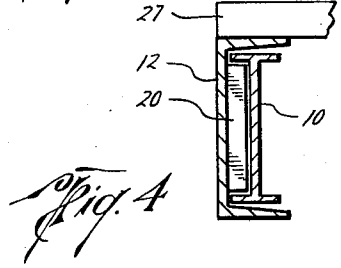


Fig. 4

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United States Patent Office 2,860,822 Patented Nov. 18, 1958

2,860,822

RETRACTABLE LADDER

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Application September 19, 1956, Serial No. 610,765

1 Claim. (Cl. 228—17.3)

This invention relates to improvements in retractable ladders.

The use of automotive cranes in various types of industries is rapidly being expanded. This type of equipment is generally provided with swinging cabs; that is, the cab revolves on a horizontal plane over the chassis of the crane, with a boom extending in front of the cab for reaching loads located in various directions from the chassis of the crane. Frequently, no steps or other convenient means for an operator to ascend from the ground to the cab are provided, since an ordinary ladder would necessarily have to extend below the level of the floor of the cab, and if left there would be torn away by the carriage or chassis of the crane when the cab is turned around over the chassis. Consequently, the method used by an operator to ascend to the cab might be by climbing on any available object or by raising his foot to the floor of the crane and pulling himself thereonto, and, of course, similar difficulty is encountered when descending to the ground. Since it is not uncommon for the floor of the crane to be in excess of four feet above the ground, injuries can and do result during the ascending into or descending from the cab, and accordingly, a more convenient means of accomplishing this than has been available in the past, is desirable.

It is an object of this invention to provide an improved retractable ladder.

Another object of the invention is to provide a ladder of this type which is capable of safely and conveniently supporting the weight of a person while ascending to or descending from the floor of a crane or other vehicle.

Still another object of the invention is to provide a retractable ladder which will normally be retained in an elevated position during movement of the vehicle to which it may be attached, and after each use the ladder will automatically return to its elevated position.

These and other objects and advantages of this invention will become apparent from the following description of a preferred embodiment thereof, and from the accompanying drawing illustrating the invention, in which

Figure 1 is an end view of a crane with a ladder embodying our invention;

Figure 2 is a front view of the ladder taken on line 2—2 of Figure 1;

Figure 3 is a sectional view taken on line 3—3 of Figure 2; and,

Figure 4 is a sectional view taken on line 4—4 of Figure 2.

Referring to the drawing in more detail, a ladder having stiles **10** and rungs **11** is adapted to reciprocate vertically in channels or guides **12**. Tubular members **13** for housing counterbalancing weights **14** and for use as handposts are located adjacent the channels or ladder guides, and for compactness are preferably welded or otherwise secured to the guides. While tubular members of approximately two inches inside diameter are preferably used in the manufacture of ladders made in accordance with

our invention, other means such as C beams or channel irons for housing the counterbalancing weights and for serving as handposts might be employed. The counterbalancing weights, which are heavier than the ladder so that the ladder will automatically be returned to its elevated position after use, have secured to one end thereof cables **15** passing over sheaves **16**, with the other end of the cable being secured to the ladder. If desired, of course, sash chain or cord might be used in place of cables, but we prefer to use stainless steel cable of approximately one-eighth inch in diameter for supporting the ladder and the counterbalancing weights. Also, instead of counterbalancing weights, other suitable means such as springs for raising the ladder might be employed.

As indicated in the drawing, the sheaves which are located near the upper end of the handposts **13** are retained in position by pins or bolts **17** which pass thru the handposts and the sheaves. These pins or bolts may be retained in their normal position by welding or by the use of nuts to prevent their accidental removal. Caps **18** are provided over the handposts to serve as covers therefor and as guards over the sheaves for safer operation of the ladder. Reinforcing bars or stops **19** are rigidly secured to the stiles and are adapted to be engaged by stops **20** at the lower end of the guides **12** when the ladder is in its lowered or extended position, and by stops **21** when the ladder is in its retracted or raised position.

The ladder which I have described herein when used in connection with a crane is preferably attached to the floor **22** of the cab **23** of the crane **24**, or at a location where easy access may be had to the entrance of the cab, and at an elevation such that it will not, when in its retracted or elevated position, be damaged when the cab is rotated over the carriage **25** of the crane, and to allow more room for footing, brackets or spacers **26** may be provided between the guides and the crane. The ladder, handposts and guides may, of course be fabricated from any suitable material, but we prefer to use aluminum or an alloy thereof for its lightness and weather-resisting qualities. However, the handposts and guides might well be made of steel and the ladder proper made of wood. Suitable braces **27** which are secured to either the guides or handposts are provided to retain the ladder intact when it is desired to have it pivotally supported.

In operation, when a person wishes to ascend the ladder from the ground, he merely pulls the ladder downwardly until the bottom of the reinforcing bar or stops **19** engage the stops **20**, thereby placing the ladder in position to be ascended. After the ladder has been ascended and the weight of the person removed therefrom, the ladder will automatically be returned to its retracted or elevated position by means of the counterbalancing weights which are heavier than said ladder; and, vice versa, when he desires to descend the ladder, he merely lowers the retractable section of the ladder and descends by stepping on the rungs in the usual manner, grasping the handposts for support. After he has descended and removes his weight from the ladder it will automatically return to its elevated position.

While our ladder has been described as being particularly suitable for use in connection with cranes, its use is not intended to be limited thereto, as it may advantageously be employed in connection with other vehicles such as vans, trucks, freight trailers, and wherever the use of a retractable ladder is desired. The ladder, for example, may be attached to the inside of the door of a truck or trailer so that when the door is opened the ladder is readily accessible for ascending or descending, and while we have described the design which we have found to be very satisfactory, it is to be understood that variations and modifications thereof might be made

without departing from the spirit and scope of the invention, and therefore only such limitations should be imposed as are indicated in the appended claim.

We claim:

In a retractable ladder, the combination comprising a pair of U-shaped guide members, a ladder vertically slidably mounted in said guide members, a tubular handpost mounted to the outside of each of said guide members and extending upwardly from said guide members, a sheave mounted on the upward part of each of said handposts, a counterweight in each of said handposts, and means connecting said ladder with said counterweights and being guided by said sheaves.

References Cited in the file of this patent

UNITED STATES PATENTS

519,184	Holbrook	May 1, 1894
550,076	Katzin	Nov. 19, 1895
676,474	Saino	June 18, 1901
782,034	Johnston	Feb. 7, 1907
1,087,434	Bone	Feb. 17, 1914
1,808,492	Bocchino	June 2, 1931
1,826,448	Bocchino	Oct. 6, 1931
2,199,182	Leonard	Apr. 30, 1940