Nov. 4, 1952 R. H. HEROD 2,616,609

TOWER LADDER SAFETY DEVICE

Filed Dec. 29, 1950

Fig. 1

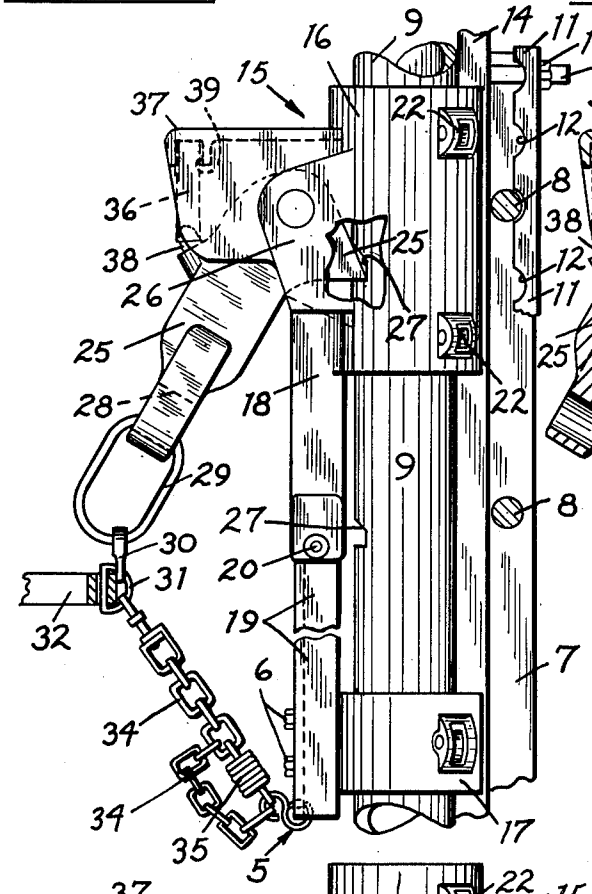
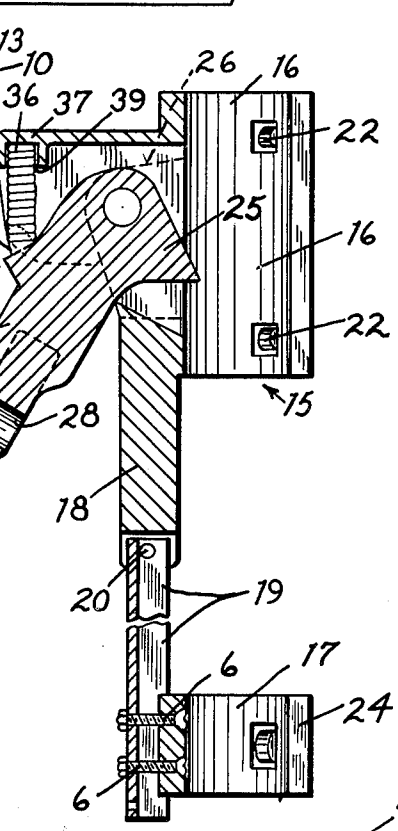


Fig. 2



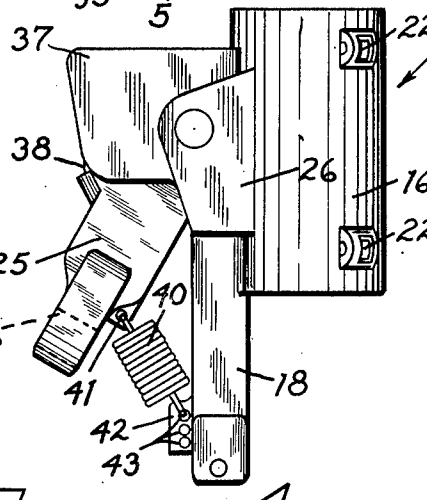


Fig. 4

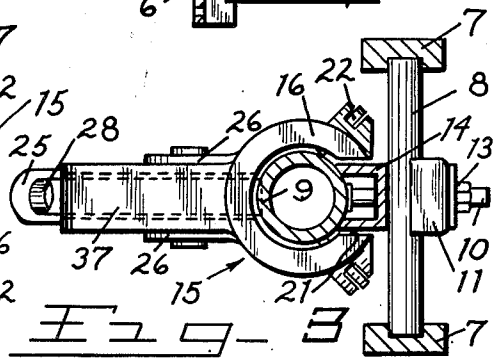


Fig. 3

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TOWER LADDER SAFETY DEVICE

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Application December 29, 1950, Serial No. 203,417

2 Claims. (Cl. 228—67)

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This invention relates to tower ladder safety devices of the type disclosed in my Patent No. 2,538,904 and co-pending applications Serial No. 173,458, filed July 12, 1950, and Serial No. 183,811, filed September 8, 1950, and of which latter application this present application is a continuation-in-part.

One of the primary objects of the present invention is to provide a tower ladder safety device which, while having all of the advantages of the tower ladder safety devices disclosed in my aforesaid co-pending applications, has the further advantage of being able to withstand hard usage to a degree considerably greater than is the case with the aforementioned tower ladder safety devices.

In accordance with the present invention, an improved tension spring assembly for the detent is provided for ensuring quick action on the part of the detent in the event the user starts to fall, to thereby arrest the fall and prevent serious injury to the user.

Further, in accordance with this invention, the spring tension assembly for the detent is housed in a manner to protect the assembly from damage as might otherwise result from rough and careless handling of the safety device.

Also, the present invention is characterized by a novel spring tension assembly for the detent which materially enhances the safety factors of the device.

The invention, together with its objects and advantages, will be best understood and appreciated when the following description thereof is read with reference to the accompanying drawing, wherein are illustrated practical embodiments of the invention, and in which:

Figure 1 is a side elevational view of a tower ladder safety device, illustrating its application, and with certain parts fragmentarily shown and other parts broken away for more clearly disclosing the invention.

Figure 2 is a longitudinal sectional view through the sleeve assembly forming a salient part of the present invention for more clearly illustrating the improved housed spring tension arrangement for the detent.

Figure 3 is a top plan view of the structure shown in Figure 1; and

Figure 4 is a side elevational view of the main bearing part of the sleeve assembly and illustrating a slightly modified form of the invention.

As is characteristic of the tower ladder safety devices disclosed in my aforementioned co-pending applications, the safety device of this

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invention also includes a tube 9 which carries peripherally, studs or posts 10. The studs or posts 10 are positively associated with the tube 9 in any suitable manner, as for example, by being either welded thereto or screw threadedly engaged therewith.

Tube 9 is provided with a channel bar 14 which coacts with a clamping plate 11 for securing the tube 9 in positive engagement with a ladder indicated generally by the reference numeral 7. In this connection it will be noted that the channel bar 14 and clamping plate 11 are suitably apertured to accommodate the studs 10, and channel bar 14 and clamping plate 11 are secured in positive engagement with the rungs 8 of the ladder through the medium of the studs 10 and nuts or other suitable securing means 13 engaged therewith in a conventional and obvious manner. It will also be noted that clamping plate 11 is provided with notches or recesses 12 for selective engagement with the ladder rungs 8 for positively holding the tube 9 against lateral displacement.

Mounted on the tube 9 for movement therealong is a sleeve assembly designated generally by the reference numeral 15. In general, this sleeve assembly, like to the sleeve assemblies of the tower ladder safety devices of my co-pending applications, consists of a main bearing part 16 and an auxiliary bearing part 17. Parts 16 and 17 are connected by bars 18 and 19, hingedly connected together at their approximate ends as indicated at 20.

The main bearing part 16 consists of an elongated sleeve generally cylindrical in form and preferably formed integrally with part 18. Bearing part or sleeve 16 is provided with an opening 21 for accommodating the guide channel 14, as shown to advantage in Figure 3. Also, sleeve 16 is provided with upper and lower bearing rollers that have surface contact with the tube 9 for reducing friction.

The auxiliary or lower bearing part 17 is preferably detachably secured to the part 19 by bolts 6 and consists of a band or collar which is generally of circular contour and is provided with an opening 24 that accommodates the guide channel 14. This auxiliary or lower bearing part 17 is likewise provided with rollers having surface contact with the tube 9 for reducing friction.

The sleeve assembly also includes a detent 25 which is pivotally mounted between ears 26 which issue from the main bearing part 16. The inner end of the detent is adapted for engagement in any one of a series of notches 27 formed in the

outer periphery of the tube 9. The outer end of the detent is enlarged and provided with an opening 28 for the reception of a link 29. The link 29 carries a snap fastener 30 which is adapted for engagement with the D ring 31 of a safety belt 32 (fragmentarily shown in Figure 1).

The safety belt 32 is connected to the sleeve assembly by a chain 34, one end of the chain being swivelly engaged with the D ring 31 while the opopsite end is engaged to the lower bar 19. Chain 34 is equipped with a spring 35, one end of the spring being engaged with an intermediate link of the chain, and the opposite end of the spring, together with the corresponding end of the chain 34 being secured to the lower bar 19 as indicated generally at 5 (see Figure 1). Spring 35 serves to take up slack in the chain and assure freer movement of the climber.

The safety device, and particularly the sleeve assembly 15 of this invention, is characterized over the safety device of my previously mentioned applications by the provision of an expansion spring 36 acting on the detent 25 to maintain the same constantly under tension to ensure quick action in engaging one of the notches 27 in the event of a fall by the climber; and also by the provision of a protecting housing 37 formed integrally with the main bearing part 16 and issuing therefrom and from the ears 26, as clearly shown in the drawing.

To accommodate the spring 36 the detent 25 is formed with a shoulder portion having integrally therewith an anchoring stud or pin 38. One end of the coil spring 36 is convoluted about the stud 38 and impinges the shoulder portion of the detent 25. The other end of the spring 36 is accommodated within a suitable socket 39 formed internally of the housing 37, as shown to advantage in Figure 2.

It will be apparent that spring 36 is normally compressed between the wall of the housing 37 and the shouldered portion of the detent 25 and inherently tends to expand and as a consequence act on the detent 25 for effecting a quick engagement of the detent with the notches 27 as and for the purposes above stated.

The spring 36 may be used as the sole tensioning means acting on the detent 25 for the purposes above stated and as shown in Figures 1 to 3 inclusive or, the spring may be used in conjunction with a contractible spring 40 as shown in Figure 4. The spring 40 is connected at one end as shown at 41 with the underside of the detent 25, and at its opposite end is adjustably connected to the bar 18 as by having the latter provided with a lug 42 equipped with a series of perforations 43 and with a selected one of which the mentioned end of the spring 40 is engageable for effecting an adjustable yet positive connection between the spring 40 and the member 18.

In the event spring 36 becomes lost, misplaced, or for any other reason fails to perform its intended function, spring 40 will ensure quick action in engaging the detent with one of the notches 27 in the event of a fall by the climber. Thus the employment of the spring 40, when desired, is an additional safety factor and when used in the assembly will not interfere with the effective action of spring 36 when that latter is in good working position and condition.

It has been found that by the employment of an expansion spring such as the spring 36, and the substantial enclosing of the same, as by the housing 37 of this invention, the effective life of the spring is materially lengthened and the likelihood of the spring becoming displaced or broken incidental to rough usage and handling of the tower ladder safety device is so reduced as to be substantially non-existent.

While I have herein described perferred forms of my invention, I am nevertheless aware that changes may be made therein within the scope of the appended claims.

What I claim is:

1. A tower ladder safety device comprising a support carried by the ladder, a sleeve assembly slidably engageable with the support including a main bearing part, a substantially completely housed spring pressed detent and an auxiliary bearing part below the main bearing part and attached thereto, and means engaged with said detent and auxiliary bearing part assembly for connection to a person ascending or descending the ladder, the detent being automatically movable into locking engagement with the support in the event of displacement of the person from the ladder.

2. A tower ladder safety device, the combination of a ladder equipped with a support carried by the ladder rungs, a sleeve assembly including a main part with attached housed detent and an auxiliary part connected to the main part below the latter in fixed spaced vertical relation thereto, the parts being slidably mounted on said support, the connection between the main part and auxiliary part being constructed to allow relative movement in response to curvatures in the support, said assembly including connecting means engaged with said detent and with said auxiliary part and engaged with the safety belt of the climber to sustain the climber in the event of casual displacement of the climber from the ladder and to automatically urge the assembly upwardly with the ascent of the climber on the ladder.

RAY HARLEN HEROD.

REFERENCES CITED

The following references are of record in the file of this patent:

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Number	Name	Date
1,630,484	Fritts	May 31, 1927
2,538,904	Herod	Jan. 23, 1951