Jan. 11, 1944. V. P. BAILEY 2,338,833

FIRE RESCUE DEVICE

Filed Sept. 23, 1942 2 Sheets-Sheet 1

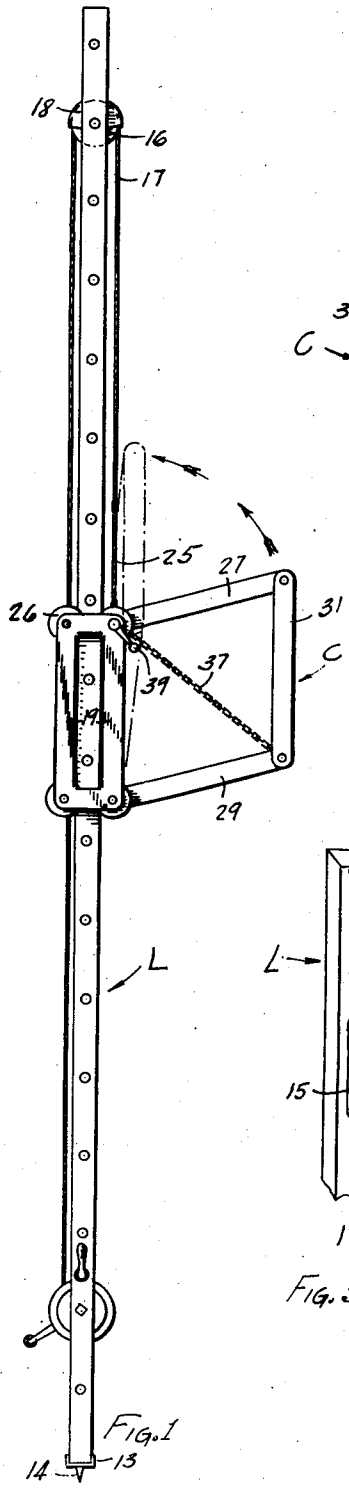


FIG. 1

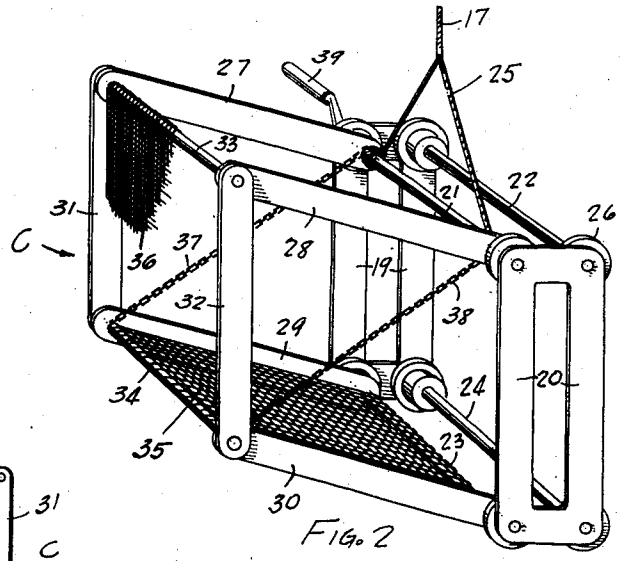


FIG. 2

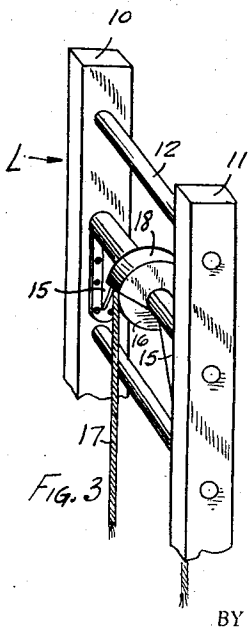


FIG. 3

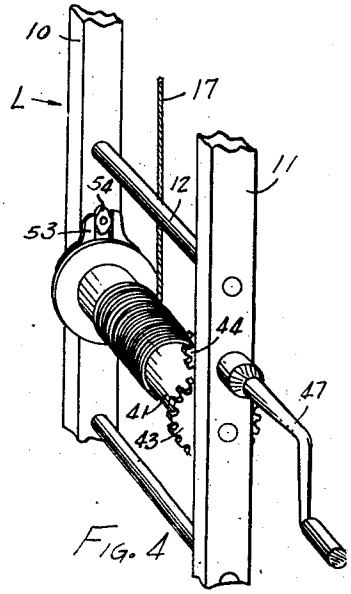


FIG. 4

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FIRE RESCUE DEVICE

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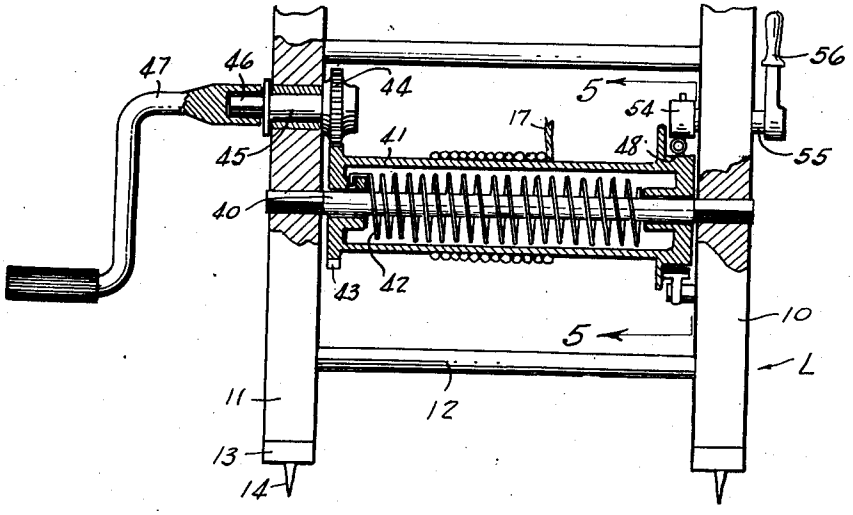


FIG. 6

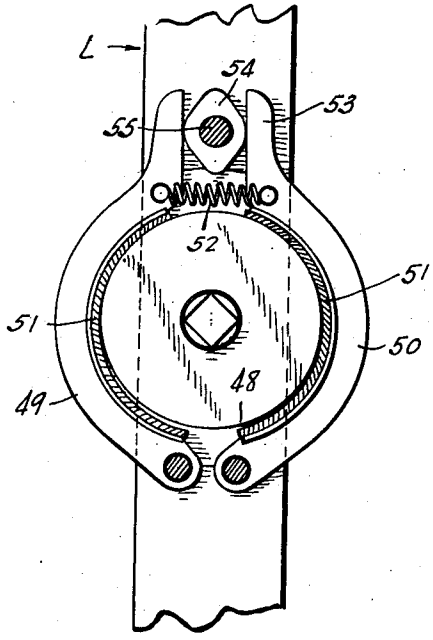


FIG. 5

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FIRE RESCUE DEVICE

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4 Claims. (Cl. 227—33)

This invention relates to fire rescue devices such as are intended to be employed in the rescuing of people and the salvaging of property from burning buildings and is concerned primarily with the provision of a device which is adapted for use with the now known and widely used "fire ladders."

Under present-day conditions one or more fire companies ordinarily hurry to the scene of a fire and bring with them the usual apparatus which includes the "fire ladders" up which the fireman ascends to the upper stories of a building and also any rescue equipment which may be available. So far as is now known, this equipment includes a "blanket" into which a person may jump or lines which are used to lower him. Obviously, if a person is overcome by smoke, or partially so, he is in no condition to jump into the "blanket," and the lowering of such a person by a line is equally hazardous and carried out only with extreme difficulty and delay. Likewise, property is damaged if it is "thrown out," and the delay entailed in lowering property makes it possible to salvage only a very small part of it, if any at all.

With these conditions in mind, this invention has in view, as its foremost objective, the provision of a fire rescue device which is peculiarly adapted for cooperation with the now known conventional "fire ladders" with very little change in the construction of these ladders to adapt them for cooperation with the device.

More in detail, the invention has, as an object, the provision of a rescue device of the character aforesaid which comprises a carriage that is adapted to run up and down a "fire ladder," together with mechanism for causing such movements. In attaining this objective, a supporting frame is provided with rollers which are arranged for travel on the side pieces of a ladder. A collapsible carriage extends laterally from this frame, preferably towards the building against which the ladder is placed, and means is provided for opening this carriage to the extent required by the particular conditions under which it is used.

Important features, objects and advantages of the invention are associated with the manner in which this carriage is constructed and assembled on the frame.

Another highly important object of the invention is the provision, in a rescue device of the type aforesaid, of mechanism for raising and lowering the carriage. In accordance with this invention, one rung of the ladder adjacent to the top is suitably braced and provided with a sheave over which a line is adapted to pass. One end of this line is anchored to the frame carrying the carriage while the other end is secured to a take-up drum. This take-up drum replaces one of the lower rungs of the ladder.

Another objective is the provision, in a rescue device of the character above noted, of a spring actuated take-up drum which normally is effective to maintain the carriage in its uppermost or raised position. The carriage is lowered against the force of this spring, and this resistance may be supplemented by braking mechanism that is associated with the drum. Manually operable means is also provided for causing rotation of the drum when occasion demands.

Various other more detailed objects and advantages of the invention will in part become apparent, and in part be hereinafter stated as the description of the invention proceeds.

The invention, therefore, comprises a fire rescue device which is adapted for use with a conventional "fire ladder" with only slight changes in the construction of the ladder necessary. The device consists of a roller frame adapted for travel on the ladder. A collapsible carriage extends laterally from the frame and mechanism is provided for controlling the extent of collapse of the carriage. An upper rung of the ladder is braced and provided with a sheave over which a line passes. One end of this line is anchored to the frame while the other end is secured to a spring actuated brake controlled take-up drum.

For a full and more complete understanding of the invention, reference may be had to the following description and accompanying drawings wherein:

Figure 1 is a view in side elevation of a fire ladder with the rescue device of this invention assembled therewith,

Figure 2 is an enlarged detailed perspective of the carriage and its supporting frame,

Figure 3 is another detailed perspective of the upper end of the ladder bringing out the manner in which it is braced and the sheave assembled thereon,

Figure 4 is still another detailed perspective of the lower end of the ladder bringing out the manner in which the take-up drum is incorporated into the structure,

Figure 5 is an enlarged side view, partly in section and partly in elevation of the drum, and

Figure 6 is a detailed showing, partly in sec-

tion and partly in elevation, of the take-up drum and associated instrumentalities.

Referring now to the drawings, wherein like reference characters denote corresponding parts, and first more particularly to Figure 1, a conventional "fire ladder" is designated generally L. This ladder comprises the usual side pieces 10 and 11 and the rungs 12. It will be recognized that the ladder L is intended to be placed at an angle against a burning building, and to positively insure against slipping of the foot of the ladder each of the side pieces 10 and 11 may be provided with a removable boot 13 carrying a spike 14 that is adapted to become embedded in the surface on which the ladder L rests.

As is clearly brought out in Figure 3, one of the rungs 12 proximate the upper end is afforded additional support by the braces shown at 15. A pulley or sheave 16 is mounted for free rotation on this rung. A line 17 passes over the sheave 16 and is retained thereon by the retainer 18.

Referring now more particularly to Figure 2, a travelling frame is shown as comprising substantially rectangularly shaped sides 19 and 20 which assume positions on the outside of the ladder side pieces 10 and 11. A pair of shafts 21 and 22 receive the ladder L between them and are connected at their respective ends to the upper portions of the sides 19 and 20. Another pair of shafts 23 and 24 similarly receive the ladder L between them and these shafts 23 and 24 also have their respective ends secured to the sides 19 and 20 at the lower ends thereof. One end of the line 17 is anchored to the upper end of this frame by the V construction shown at 25, the ends of this connection being fastened to the shaft 21. Rollers 26 are rotatably carried on the shafts 21, 22, 23 and 24 and these rollers travel on the ladder side pieces 10 and 11 in an obvious manner.

A collapsible carriage extends laterally from one side of this frame and is referred to in its entirety by the reference character C. This carriage C comprises top bars 27 and 28 that have their inner ends pivotally mounted on the shaft 21; bottom bars 29 and 30 that have their inner ends pivotally mounted on the shaft 23; and vertical bars 31 and 32 that have their ends pivotally secured to the outer ends of bars 27, 28, 29 and 30 by shafts 33 and 34. A floor or bottom for the carriage C is represented at 35 and may take any suitable form. As illustrated, a heavy wire screen may be employed for this purpose.

As above pointed out, the carriage C will project from the ladder toward the building. Thus the inner side of the carriage C, as defined by bars 31 and 32 and shafts 33 and 34, may be provided with a suitable protective covering such as a screen 36 which may be covered with asbestos. Thus the occupant of the carriage C, or any property therein, is protected from the heat of the burning building.

Chains 37 and 38 are shown as extending diagonally across the carriage C, joining the shafts 21 and 34. It is evident that the length of these chains 37 and 38 determine the extent of collapse of the carriage C. The shaft 21 is provided with a crank handle 39 and suitable ratchet mechanism (not illustrated) and by rotating this crank handle 39 the chains 37 and 38 may be taken up or unrolled from the shaft 21.

Referring now more particularly to Figures 4, 5 and 6, the take-up drum and associated mechanism will be described: a cross rod 40 replaces one of the rungs 12 proximate to the lower end of the ladder L. This rod 40 has its ends nonrotatably secured in the ladder side pieces 10 and 11, as shown in Figure 6. A take-up drum 41 is journalled for free rtoation on this rod 40. One end of the line 17 is secured to this drum 41 and the line 17 is adapted to be wound thereon or unwound therefrom as the case may be.

The drum 41 is hollow and housed therein is a coiled spring 42. One end of this spring is anchored in the rod 40 while the other end is secured to the drum 41. This spring 42 exerts a tendency to rotate the drum 41 and wind the line 17 thereon.

At one end the drum 41 carries a gear 43 which may be integral therewith, as illustrated. Meshing with the gear 43 is a pinion 44 that is drivably carried at one end of a stub shaft 45. The stub shaft 45 is journalled in the ladder side piece 11 and a non-circular stub 46 projects from the side piece 11. A crank handle 47 is adapted to be detachably and operably fitted over this stub 46 to manually rotate the drum 41 when occasion demands.

A brake drum 48 is formed, preferably integrally, on the other end of the drum 41. A pair of brake shoes 49 and 50 encircle the brake drum 48, as shown in Figure 5, and one end of each of these shoes is rotatably anchored to the ladder side piece 10. Brake lining represented at 51 is interposed between the brake drum and shoes and a tension spring 52 normally urges the shoes into engagement with the drum to supply braking effects and hold the take-up drum 41 against rotation.

Each of the shoes 49 and 50 terminates in a cam portion 53 and a cam 54 is interposed between these cam portions. The cam 54 is drivably carried on a shaft 55 that is journalled in the ladder side piece 10. A handle 56 may be availed of to turn the shaft 55 to operate the cam 54 and spread the brake shoes to release the drum for rotation when desired.

The present invention recognizes that in many instances fire ladders are assembled in sections to reach desired heights. The rescue device hereby provided can be made to operate on any section of such a ladder. In some cases two or more sections may each be provided with such a device in which event provision will be made for transferring the contents of the carriage C on one ladder section to the carriage on the next lower section.

While the operation of the above described device is believed to be obvious, it may be briefly outlined by noting that the braking mechanism ordinarily holds the drum 41 against rotation. If there be no load in the carriage C when the handle 56 is operated to release the brake, the spring 42 will rotate the drum 41 and move the carriage C into its uppermost or raised position. The brake may again be applied while the carriage is being loaded. Upon again releasing the brake, the carriage C, due to the gravity action of the contents thereof, will be lowered against the force of the spring 42. The resistance of the spring 42 may be supplemented by partially applying the brake to a required degree.

When occasion demands, the crank handle 47 may be applied to the stub 46 and the lowering operation manually controlled. Under some conditions it may be desirable to hoist a load in the carriage C and this can be done through the medium of the crank handle 47. Any desired ratio of mechanical advantage may be obtained

by properly designing the gear **43** and the pinion **44**.

While a preferred specific embodiment of the invention is hereinbefore set forth, it is to be clearly understood that the invention is not to be limited to the exact construction illustrated and described because various modifications of these details may be made in putting the invention into practise, within the purview of the appended claims.

I claim:

1. In a fire rescue device of the character described, a frame including rollers adapted to travel on the side pieces of a ladder, a collapsible carriage outstanding from and carried by said frame, and means for controlling the extent of collapse of said carriage.

2. A fire rescue device of the character described comprising a ladder including side pieces and rungs, one of said rungs adjacent one end of said ladder being braced, a sheave on said braced rung, a line passing over said sheave, a frame enclosing said ladder and including rollers adapted to travel on said side pieces, one end of said line being connected to said frame, a collapsible carriage carried by and outstanding from said frame, means for controlling the extent to which said carriage may be opened, a take-up drum included in said ladder proximate the end remote from said sheave, said line having its other end secured to said drum, and means for controlling rotation of said drum to govern movement of said carriage.

3. A fire rescue device of the character described comprising a ladder including side pieces and rungs, one of said rungs adjacent one end of said ladder being braced, a sheave on said braced rung, a line passing over said sheave, a frame enclosing said ladder and including rollers adapted to travel on said side pieces, one end of said line being connected to said frame, a collapsible carriage carried by and outstanding from said frame, means for controlling the extent to which said carriage may be opened, a take-up drum included in said ladder proximate the end remote from said sheave, said line having its other end secured to said drum, spring means tending to rotate said drum in one direction, and braking instrumentalities associated with said drum for controlling rotation thereof.

4. A fire rescue device of the character described comprising a ladder including side pieces and rungs, one of said rungs adjacent one end of said ladder being braced, a sheave on said braced rung, a line passing over said sheave, a frame enclosing said ladder and including rollers adapted to travel on said side pieces, one end of said line being connected to said frame, a collapsible carriage carried by and outstanding from said frame, means for controlling the extent to which said carriage may be opened, a take-up drum included in said ladder proximate the end remote from said sheave, said line having its other end secured to said drum, a coiled spring within said drum having one end secured to said ladder, said spring tending to rotate said drum in one direction, a gear carried by said drum, a stub shaft journalled in one of said side pieces, a pinion on said shaft and meshing with said gear, means on said stub shaft for establishing a detachable connection with a crank handle, and braking instrumentalities associated with said drum.

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