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2,538,904

TOWER LADDER SAFETY DEVICE

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Fig. 1.

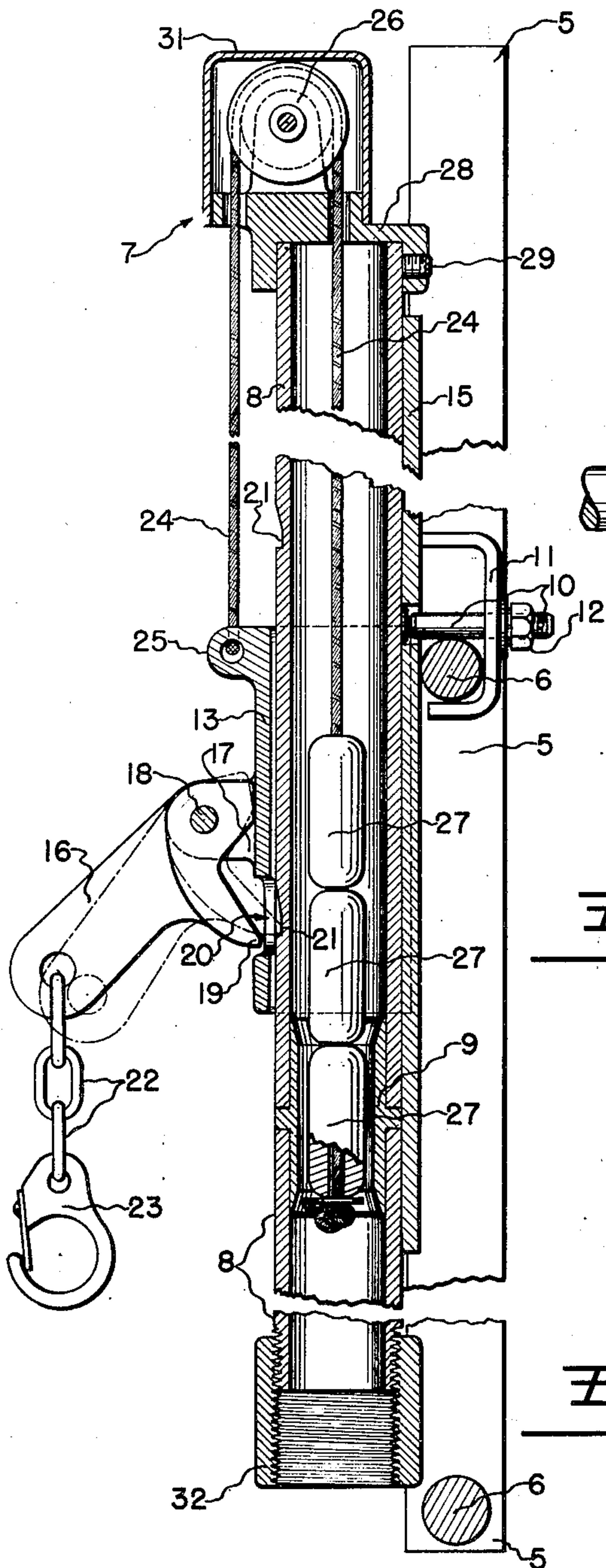


Fig. 2.

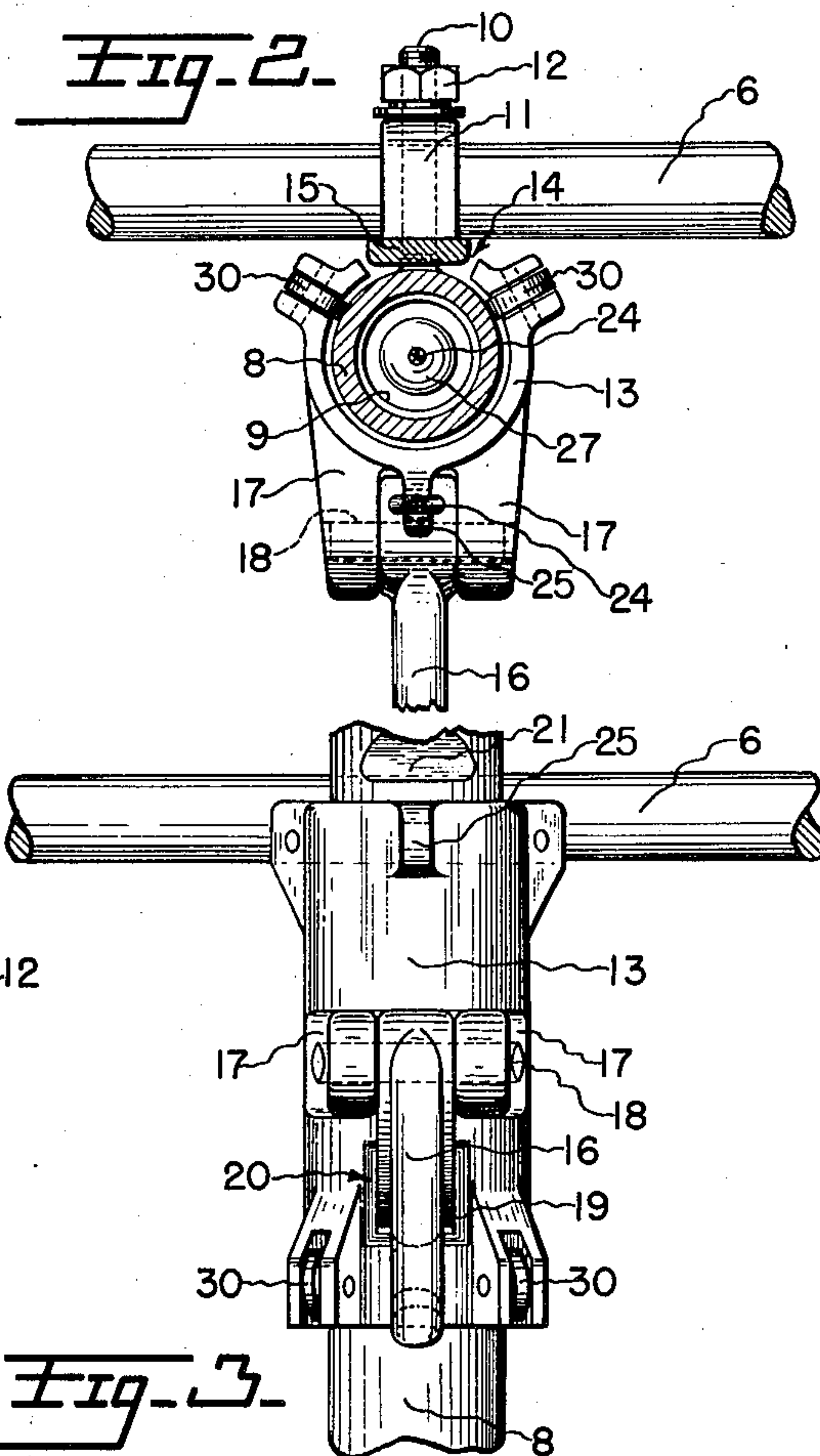


Fig. 3.

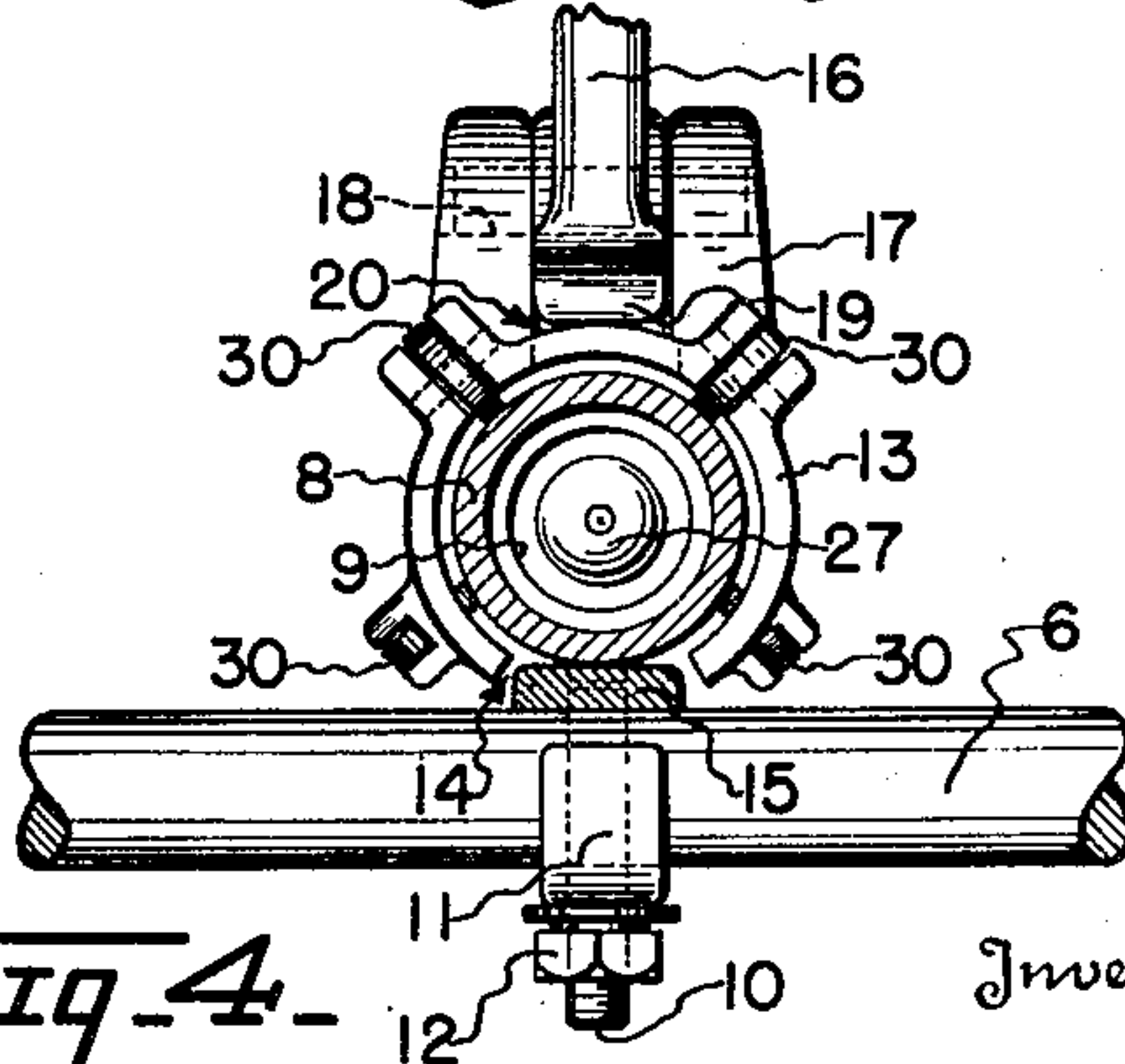


Fig. 4.

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UNITED STATES PATENT OFFICE

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TOWER LADDER SAFETY DEVICE

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5 Claims. (Cl. 228—67)

1

The present invention is a tower ladder safety device, being a continuation-in-part of my application filed October 27, 1947, Serial No. 782,435, now abandoned.

As in my previously filed application, this device is especially adapted for use by persons ascending and descending ladders attached to derricks, tanks, towers, and the like, to avoid possibility of falling from the ladder if the climber loses his grip or foothold.

It is within the objects of this invention to provide a safety catch assembly carried by a ladder a movable part of which is attached to the person of the user, said part being counterbalanced to freely move up and down the ladder with its wearer; the movable part being equipped with an auxiliary relatively movable part for positive engagement with a fixed part of the assembly in the event of accidental displacement of the wearer while ascending or descending a ladder to limit the extent of fall of the wearer to a negligible minimum.

Another object of this invention is to provide a safety device which also is usable to defrost a ladder in advance of ascending it.

Other objects of the invention will be apparent from the following description of the present preferred form of the invention, wherein:

Figure 1 is a fragmentary, vertical, sectional view of a tower ladder safety device, illustrating its application on a ladder, the safety detent being shown both in full and dotted lines to show its unlocked and locked position respectively;

Figure 2 is a fragmentary, transverse, sectional view of the assembly, illustrating its application to a ladder rung locking from the top of the ladder;

Figure 3 is a fragmentary side elevational view of the assembly, showing particularly the assembly sleeve and manner of mounting the locking detent or pawl thereof; and

Figure 4 is a detail fragmentary, transverse, sectional view of the assembly, illustrating its application, as seen from the bottom of a ladder.

To illustrate the application of this invention I have shown in the drawings a ladder 5 of standard construction which includes rungs 6.

The safety device, constituting the present invention, consists of a safety catch assembly, generally designated 7, the assembly including a tube which is clamped on the ladder and a counterbalanced sleeve which slides on the tube, the sleeve being engageable with the person ascending or descending the ladder. The tube, designated 8, is of any desired length, preferably

2

composed of sections the adjacent ends of which are spliced together by unions 9. Threaded studs, as shown at 10, extend at intervals from the outer periphery of the tube. Each of the studs carries a clamp 11 which is secured to the ladder rung by a nut 12 in a manner more fully hereinafter described.

The sleeve of the safety catch assembly, designated 13, is split, as shown at 14, to provide a space for the accommodation of a tube carried guide bar 15. The guide bar is provided with openings which complement the studs 10. The innermost wall of each clamp 11 is adapted to engage the outer face of the guide bar 15, as shown in Figure 1. The sleeve 13 also includes a pivotally mounted pawl or detent 16, the pawl being mounted between lugs 17 which extend from the outer wall of the sleeve and carry a pin 18 upon which the pawl of detent is mounted. The lower inner end of the detent is formed to provide a tooth 19 which is adapted for engagement through an opening 20 in the sleeve 13 and with any one of a plurality of notches or recesses at 21 formed in the outer periphery of the tube 8. The free end of the detent or pawl 16 is provided with an opening which is adapted for the reception of one end of a chain or cable 22, the opposite end of the latter carrying a snap fastener 23 which is adapted to engage a complementary part on a safety belt carried by a person ascending or descending a ladder.

For the purpose of counterbalancing the sleeve 13 I provide a cable 24 one end of which engages an ear 25 formed by extending a portion of the upper outer wall of the sleeve. The cable is trained over a grooved roller or sheave 26 and has its opposite end mounted within the tube 8 and equipped with a plurality of weights 27. The weights 27 are rounded on their opposite ends to facilitate movement through the tube and are of an aggregate weight in excess of the sleeve 13 and its associated parts. In view of the variation in weight between the weights 27 and the sleeve and its associated parts the sleeve will be normally maintained above the waistline of the person on the ladder. The roller or sheave 26 is mounted on a bracket 28 carried by and detachably engaged with the top of the tube 8 by a set screw 29. The sleeve 13 carries an upper and lower, front and rear, set of bearing wheels 30 to facilitate up and down movement of the sleeve on the tube 8. The roller 26 and the cable trained thereover are protected from the elements by a housing 31, the latter being slidably engaged

over and in frictional engagement with the bracket 28.

The lower end of the tube 8 carries a coupling 32 which is adapted to place the tube in communication with a source of heat such, for instance, as an exhaust pipe in order to permit the passage of heat upwardly through the tube. Since the tube is clamped into engagement with the ladder rungs, approximately midway the ends of the ladder, the rungs may be expeditiously defrosted before a person ascends the ladder.

In use of this device after the safety catch assembly has been clamped on the ladder, as shown in the drawings and described above, and the snap fastener 23 of the detent engaged with the safety belt of the climber, the ascent may be begun. As a person climbs the rungs of the ladder, straddling the tube 8, which is of relatively small diameter, the sleeve 13 automatically moves upwardly with the person by reason of the counterbalanced weights 27. If in ascending or descending the ladder, the person slips, pressure is immediately exerted on the chain 22, causing the toothed end of the detent 16 to be urged into the proximate notch 21 of the tube, thereby locking the sleeve from movement and limiting the extent of the fall of the person to a negligible minimum. After the person has righted himself on the ladder, the detent may be disengaged from the notch in the tube, in an obvious manner, and the ascent or descent continued.

It is to be understood that various changes may be made in this invention within the scope of the claims hereto appended.

I claim:

1. A tower ladder safety device comprising, in combination with a ladder, a safety catch assembly anchored to the ladder including a tube fixed to the ladder, a sleeve slidably mounted on the tube, a detent movably carried by the sleeve and equipped with a flexible element adapted for engagement with a person ascending or descending the ladder, a counterweight slidably mounted in said tube and engaged with the sleeve to effect automatic upward sliding movement of the sleeve on the tube with the corresponding upward movement of the person on the ladder, the detent being engageable through the sleeve and with the tube in the event of slippage of the person on the ladder.

2. A tower ladder safety device comprising, in combination with a ladder, a safety catch assembly anchored to the ladder including a tube fixed to the rungs of the ladder midway the ends of the rungs, a sleeve slidably mounted on the tube, a detent movably carried by the sleeve and equipped with a flexible element adapted for engagement with a person ascending or descending the ladder, the sleeve automatically sliding upwardly on the tube with the corresponding upward movement of the person on the ladder, the

detent being engageable through the sleeve and with the tube in the event of slippage of the person on the ladder, and a coupling on the bottom of the tube for engagement with a source of heat.

3. A tower ladder safety device including a ladder engaging tube, a sleeve slidably mounted on the tube, counterbalance means for the sleeve mounted in the tube, a connection between the counterbalance means and the sleeve, and a detent pivotally mounted on said sleeve and equipped with a flexible element adapted for engagement with a person on the ladder, the detent being movable into engagement with the tube to lock the sleeve from movement in the event of slippage of the person on the ladder.

4. A tower ladder safety device, including a ladder engaging tube, a counterbalanced sleeve slidably mounted on the tube, the sleeve being split to provide a space, a guide bar mounted on the tube and in the sleeve space to hold the sleeve from rotation, and a detent pivotally mounted on the sleeve and equipped with a flexible element adapted to be engaged with a person on the ladder, the detent being movable into engagement with the tube to lock the sleeve from movement in the event of slippage of the person on the ladder.

5. A tower ladder safety device comprising, in combination with a ladder, a safety catch assembly anchored on the ladder including a tubular member secured to the rungs of the ladder, the assembly also including a sleeve slidable on the tubular member and equipped with means engageable with a person ascending or descending the ladder, the assembly further including a weight slidable within the tube and in flexible connection with the sleeve to effect automatic upward movement of the sleeve on the tube when the person ascends the ladder, and the assembly still further including a detent on the sleeve, movable with said person engaging means, into locking engagement with the tubular member in the event of displacement of the person from the ladder rungs.

RAY HARLEN HEROD.

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