Oct. 3, 1950 A. V. JENSEN 2,524,351

GEARED LIFTING DEVICE

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Fig. 1.

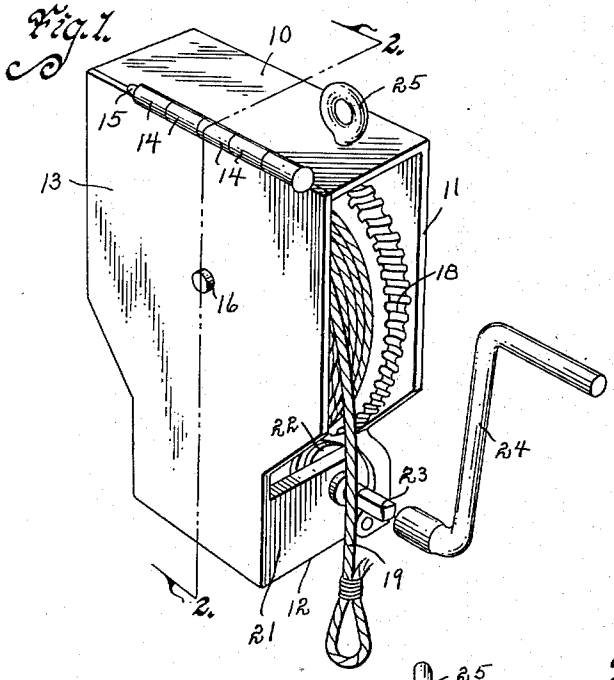


Fig. 2.

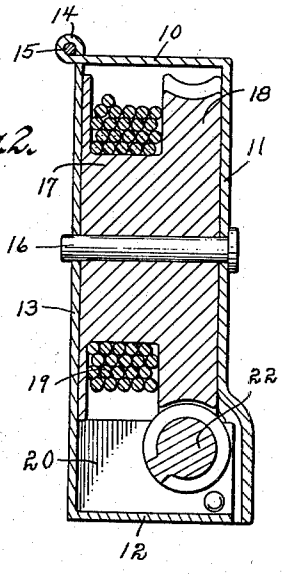


Fig. 3.

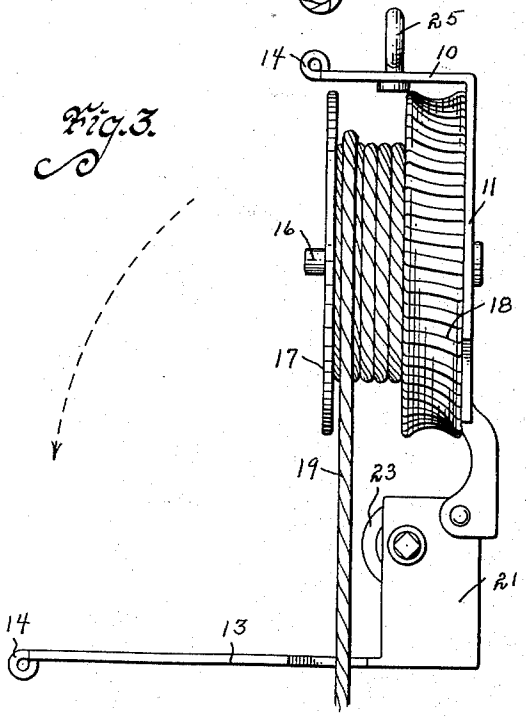
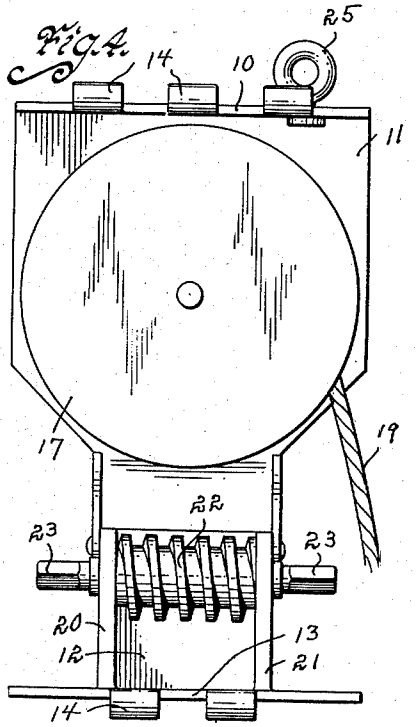


Fig. 4.



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GEARED LIFTING DEVICE

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4 Claims. (Cl. 254—170)

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This invention relates to lifting means of the cable or rope type and more specifically to a lift utilizing reduction gears for increased leverage and thence great weight lifting capabilities.

Cable or rope lifts are very old, the most common of which is the ordinary block and tackle. However, such lifts have many objections, i. e., they are incapable of elevating the object to be lifted to a position adjacent the ceiling beam or like to which the lift is secured, they will not safely and positively maintain an object at a predetermined elevation, they are heavy and cumbersome, and lastly they are not readily adjustable with and to the object to be lifted at time of attachment. Therefore, the principal object of my invention is to provide a lifting means that is capable of maximum height lift, is easily and quickly operated, positive in action and light in weight.

A further object of this invention is to provide a geared lift that is economical in manufacture and durable in use.

A still further object of my invention is to provide a compact one unit lift that has only one cable drum.

These and other objects will be apparent to those skilled in the art.

My invention consists in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Fig. 1 is a perspective view of my device ready for use,

Fig. 2 is a cross-sectional view of the device taken on line 2—2 of Fig. 1,

Fig. 3 is a side view of the device in open condition, and

Fig. 4 is an end face view of my lift in open unmeshed condition.

Referring to the drawings I have used the numeral 10 to designate the top portion, and the numeral 11 to designate the end portion of the right one-half of the housing frame. The numeral 12 designates the bottom portion and the numeral 13 designates the end portion of the left one-half of the housing frame. These two halves form in general the housing frame of the device, open at each side at its upper portion. The bottom portion of the left one-half of the frame is hinged to the bottom of the end of the right one-half of the frame, as shown in the drawings. The upper marginal portion of the end of the left one-half of the frame may be detachably secured

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to the top of the right one-half of the frame by any suitable means.

In the drawings I show meshing loops 14 formed on the left end 13 and top 10 and a pin 15 detachably extending therethrough. By this arrangement a box frame housing is provided that may be quickly and easily opened (when the pin 15 is removed), as shown in Fig. 3, or closed and maintained in such closed position (by the insertion of the pin 15) as shown in Fig. 1. The numeral 16 designates a shaft extending through the right end 11 and capable of also extending through the left end 13 when the left one-half of the frame is in closed position. The numeral 17 designates a cable drum on the shaft 16. Integrally formed on the drum and to the right side thereof is a large worm toothed gear wheel 18. These teeth extend substantially transverse of and on the wheel periphery as is the character of such worm wheel gears. The numeral 19 designates a cable or rope having at least its inner end portion secured to and wound around the drum 17. The free end of this cable is designed to be attached to the object to be lifted or pulled. The numerals 20 and 21 designate two short walls rising from the marginal side edges, respectively, of the bottom 12. Journaled in and extending between these two spaced apart bearing walls is the cylindrical shaped worm gear 22. This worm gear is of standard character and is considered as the driving gear as distinguished from the wheel 18 which is considered as the driven worm gear. The worm gear 22 extends transversely of the wheel gear 18 and meshes therewith when the box frame housing is in closed condition, as shown in Fig. 2. As is well known, when the wheel gear 18 is in mesh with a worm gear 22, it can not be made to rotate the worm gear 22 and therefore when the worm gear 22 is at rest, the wheel gear 18 (and cable drum) will be positively locked against rotation in any direction. The rotation of the worm gear 22 will, however, rotate the gear wheel 18, slowly but with great gear leverage. Formed on each end of the worm gear and protruding to the two sides of the frame, respectively, is a square stub shaft 23. Either of these stub shafts is capable of taking the hand crank 24. The numeral 25 designates an eye on the top 10 for securing the device to a support.

The practical operation of the device is as follows:

The device is suitably secured to a support such as a ceiling beam or like. The box frame is opened (which disconnects the two gears from each other) and the cable is easily and quickly

run to and fastened to the object to be moved. As the drum and gear wheel can run free, this is possible, and for the same reason any undesirable slack in the cable between the object and the frame may be easily and quickly wound back around the drum. At this time the frame is closed and locked, thereby meshing the worm gear **22** with the gear wheel. By rotating the worm gear in one direction the cable will be slowly wound onto the drum thereby drawing the object toward the box frame. By rotating the worm gear in the opposite direction the cable will slowly unwind from the drum. Whenever the worm gear is at rest and in mesh with the gear wheel the drum will be locked against rotation. As only one drum is employed and is located at maximum elevation relative to the device the object can be raised to a height substantially that of the device itself. This is highly important when it is desired to raise an object to a ceiling for fastening thereto.

Some changes may be made in the construction and arrangement of my geared lifting device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. In a device of the class described, a box frame comprising two portions hinged together, a means for detachably locking said two hinged portions together in closed condition, a shaft on one of said hinged portions, a drum on said shaft, an elongated member windable on said drum, a worm toothed gear wheel connected to said drum and on said shaft, a worm gear rotatably mounted on the other said hinged portion capable of meshing with said gear wheel when said two hinged portions are in closed condition and free of the teeth of said wheel gear when said two hinged portions are in open condition, and a means for facilitating the manual rotation of said worm gear.

2. In a device of the class described, a base frame portion designed to be secured to a supporting means, a shaft on said base frame portion, a drum on said shaft, a cable windable on said drum, a worm gear wheel connected to said drum and on said shaft, a second frame portion hinged to said first frame portion and capable of being moved to an open condition relative to said first frame portion or to a closed condition relative to said first frame portion, a means for locking said second frame in closed condition at times, a worm gear rotatably mounted on said second frame portion and engaging said worm gear wheel when said second frame is in a closed condition, and a crank arm capable of connecting with one end of said worm gear.

3. In a device of the class described, a base frame portion designed to be secured to a supporting means, a shaft on said base frame portion, a drum on said shaft, a cable windable on said drum, a worm gear wheel connected to said drum and on said shaft, a second frame portion hinged to said first frame portion and capable of being moved to an open condition relative to said first frame portion or to a closed condition relative to said first frame portion, a means for locking said second frame in closed condition at times, a worm gear rotatably mounted on said second frame portion and engaging said worm gear wheel when said second frame is in a closed condition, and a crank arm capable of connecting with either end of said worm gear.

4. In a device of the class described, a base frame portion designed to be secured to a supporting means, a shaft on said base frame portion, a drum on said shaft, a cable windable on said drum, a worm gear wheel connected to said drum and on said shaft, a bearing member hinged to said basic frame portion, a worm gear rotatably mounted on said bearing member capable of engaging said worm gear wheel when said bearing member is swung in one direction and capable of disengaging with the teeth of said worm gear wheel when said bearing member is swung in the other direction, and a means to facilitate the manual rotation of said worm gear.

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No references cited.