July 18, 1961 G. K. TURNER 2,992,811

LOAD HANDLING DEVICE

Filed July 18, 1957 2 Sheets-Sheet 1

Fig. 1.

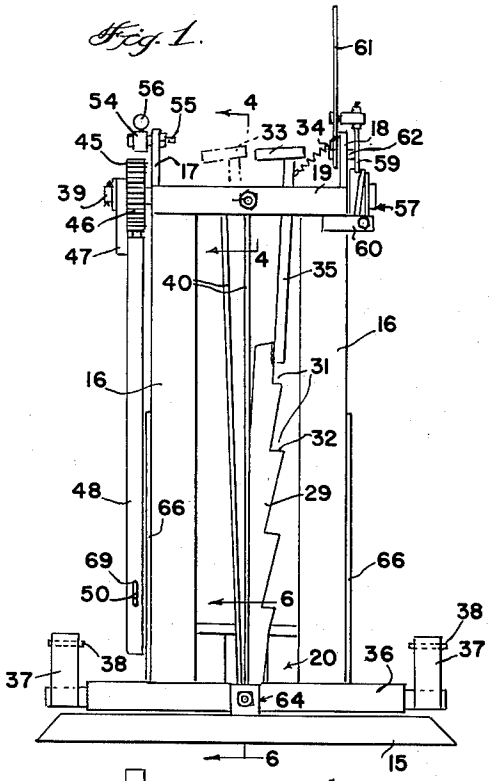
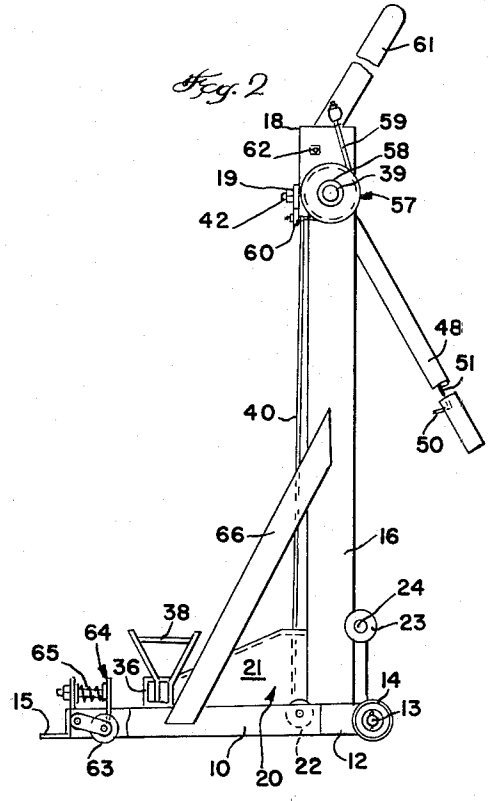


Fig. 2.



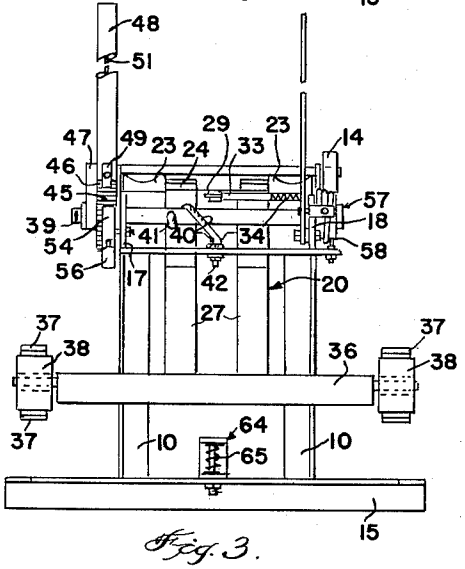
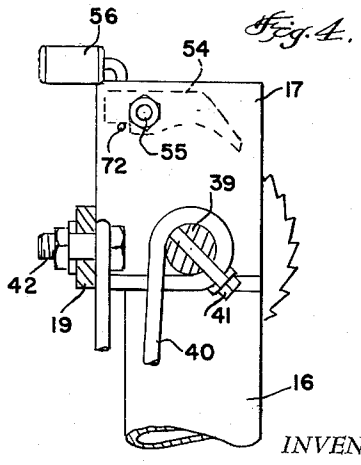


Fig. 3.

Fig. 4.



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Fig. 5.

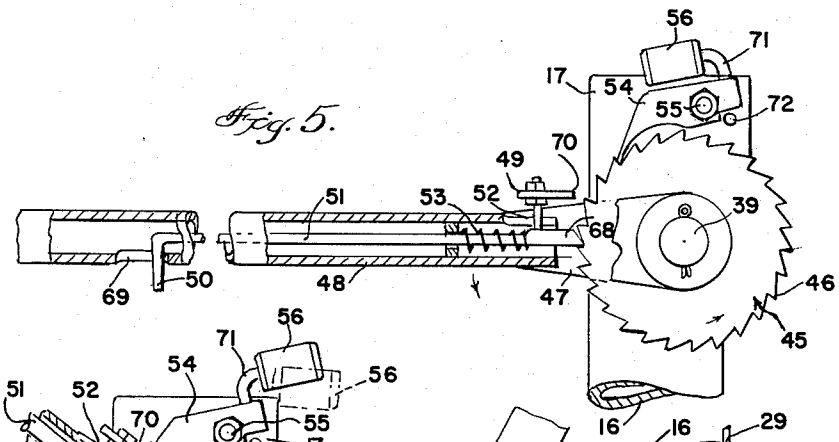
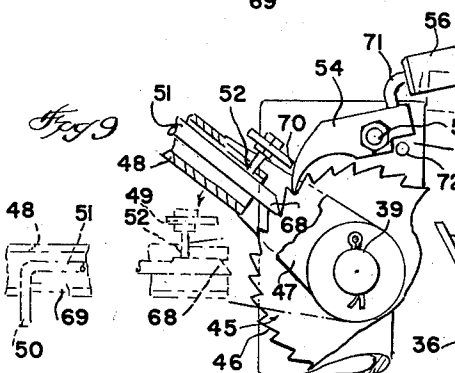


Fig. 9



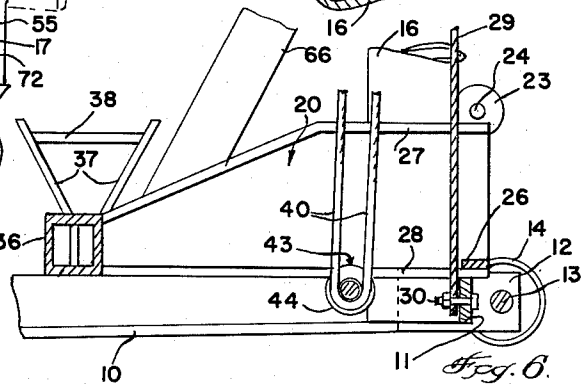


Fig. 6.

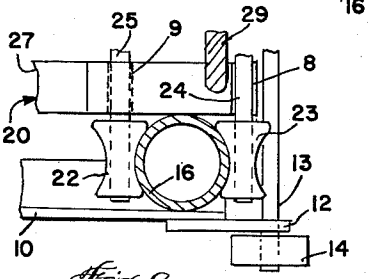
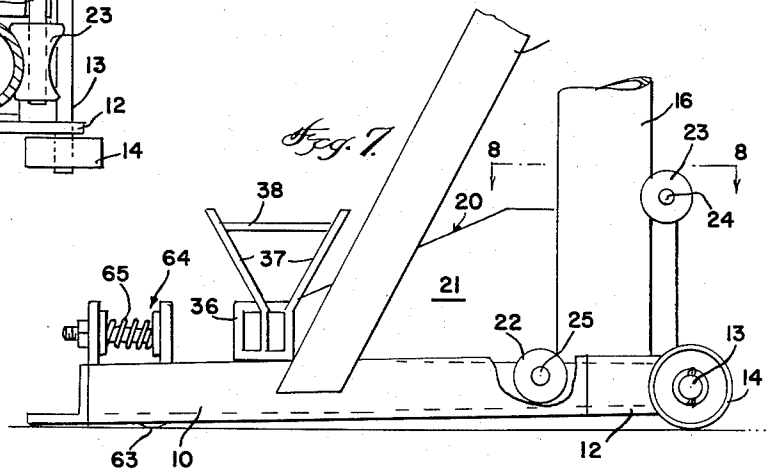


Fig. 8

Fig. 7.



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2,992,811

LOAD HANDLING DEVICE

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Filed July 18, 1957, Ser. No. 672,677
2 Claims. (Cl. 254—4)

This invention relates to a load handling device or a jack.

The object of the invention is to provide a load handling device which can be manually operated to raise or lower articles or members to a desired elevation or height.

Another object of the invention is to provide a load handling device which is portable and wherein the load handling device or jack of the present invention can be used for lifting heavy objects such as a portion of a vehicle, and wherein there is provided a brake means for maintaining the movable carriage of the jack immobile in its various adjusted positions, and whereby there is provided a novel manually operable means for actuating or operating the jack.

A further object of the invention is to provide a load handling device which is extremely simple and inexpensive to manufacture.

Other objects and advantages will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are used to designate like parts throughout the same.

FIGURE 1 is a front elevational view of the load handling device, constructed according to the present invention.

FIGURE 2 is a side elevational view of the load handling device.

FIGURE 3 is a top plan view of the load handling device or jack.

FIGURE 4 is a sectional view taken on the line 4—4 of FIGURE 1.

FIGURE 5 is a fragmentary sectional view showing the ratchet and operating mechanism therefor.

FIGURE 6 is a sectional view taken on the line 6—6 of FIGURE 1.

FIGURE 7 is a fragmentary side elevational view illustrating certain constructional details of the apparatus.

FIGURE 8 is a sectional view taken on the line 8—8 of FIGURE 7.

FIGURE 9 is a fragmentary sectional view illustrating the plunger, ratchet and pawl and counterweight.

Referring in detail to the drawings, the numeral 10 designates each of a pair of L-shaped horizontally disposed beams, and extending between the rear portions of the beams 10 and secured thereto is a crosspiece 11. Extending rearwardly from each of the beams 10 and secured thereto or formed integral therewith, is an ear 12, and the pair of ears 12 serve to support a horizontally disposed axle 13, there being a pair of spaced apart wheels 14 mounted on the axle 13.

Arranged transversely with respect to the front ends of the beams 10 and secured thereto is a horizontally disposed L-shaped bar 15. Extending upwardly from the beams 10 and secured thereto is a pair of spaced parallel vertically disposed hollow tubular posts which are each indicated by the numeral 16. Secured to the upper ends of the posts 16 are plates or support members 17 and 18, FIGURE 1, and a horizontally disposed cross member 19 extends between the pair of support members 17 and 18 and is secured thereto in any suitable manner, as for example by welding.

The numeral 20 indicates a vertically movable carriage which includes a pair of spaced parallel vertically disposed side plates 21, and rollers 22 and 23 are connected to the carriage 20. The rollers 22 and 23 are each provided with intermediate grooved portions as shown in

FIGURE 8, and these rollers are adapted to engage the tubular posts 16 so as to maintain the carriage 20 in its proper position as it moves up and down. The rollers 23 may be supported on an axle 24 which may be secured as by welding to the carriage 20, and the rollers 22 may be supported on shanks 25. The members 24 and 25 engage portions such as the portions 8 and 9 of the carriage 20, FIGURE 8.

Extending between the rear portions of the plates 21 and secured thereto is a horizontally disposed end piece 26, FIGURE 6. Extending inwardly from the upper and lower edges of the side plates 21 and secured thereto or formed integral therewith, are flanges 27 and 28.

There is further provided a locking lever 29 which has its lower end pivotally connected to the crosspiece 11 by means of a pivot pin or bolt 30, FIGURE 6, and the lever 29 is provided with a plurality of spaced apart notches or recesses 31 which define shoulders 32 therebetween for selective engagement with a flange such as the flange 28 of one of the plates 21 so that the carriage 20 can be maintained immobile in its various adjusted positions. A hand grip 33 is secured to the upper end of a shank 35 which extends upwardly from the lever 29, FIGURE 1, and a coil spring 34 has one end connected to the shank 35, while the other end of the coil spring 34 is connected to the support member 18, the coil spring 34 serving to normally maintain the lever 29 in locking relationship with respect to the carriage 20. However, by gripping the member 33, the parts can be moved from the solid line position shown in FIGURE 1 to the broken line position so that the shoulders 32 will clear the flange such as the flange 28 whereby the carriage 20 will be free to move up or down.

Extending transversely across the front of the plates 21 of the carriage 20 and secured thereto, is a horizontally disposed channel member 36, FIGURE 6. Extending upwardly from the channel member 36 and secured thereto are arms 37, and the arms 37 serve to support a pair of spaced parallel horizontally disposed straps 38. The straps 38 are adapted to engage beneath a load being lifted such as a portion of an automobile or other vehicle, so that when the jack of the present invention is actuated, the vehicle or other load can be readily raised to the desired elevation.

Extending between the pair of support members 17 and 18 is a horizontally disposed shaft 39, FIGURE 4, and a cable 40 has one end connected to the shaft 39 by means of a suitable securing element such as a bolt 41. The other end of the cable 40 is connected to the member 19 by means of a bolt 42, and the lower portion of the cable 40 is arranged in engagement with an intermediate recessed portion 44 of a cylindrical rod or roller 43, the rod 43 being secured to the carriage 20. Thus, by rotating the shaft 39 in the proper direction, the cable 40 can be wrapped around or trained around the shaft 39 so that the rod 43 will move upwardly and this in turn will cause upward movement of the carriage 20 to which it is secured.

Mounted on an end of the shaft 39 is a ratchet 45 which is provided with a plurality of teeth 46, FIGURE 5. A link or arm 47 extends outwardly from the shaft 39, and a handle 48 is connected to the link 47. The handle 48 is hollow, and arranged adjacent the inner end of the handle 48 is a movable plunger 68 which is adapted to selectively engage the teeth 46 of the ratchet 45. A manually operable means is provided for actuating the plunger 68, and this means comprises a hand grip 50 which projects through a slot 69 in the handle 48, and a rod 51 leads from the hand grip 50 to the plunger 68, there being a coil spring 53 circumposed on the rod 51 and arranged adjacent the plunger 68. A pin 52 extends upwardly from the plunger 68 and a dog 49 is connected

to the upper end of the pin 52, the dog 49 being provided with a lip 70. A movable pawl 54 is pivotally connected to the support member 17 by means of a pivot pin or bolt 55, and a movable counterweight 56 is connected to a pin 71 which extends upwardly from the pawl 54. A stop member or pin 72 is provided for limiting pivotal movement of the pawl 54.

There is further provided a brake mechanism which is indicated generally by the numeral 57, and the brake mechanism 57 includes a grooved wheel 58 which is connected to an end of the shaft 39. A brake cable 59 is arranged in frictional engagement with the outer grooved periphery of the wheel 58, and one end of the cable 59 is connected to a stationary finger 60, while the other end of the cable 59 is connected to a manually operable brake lever 61, the lever 61 being pivotally connected to the support member 18 by means of a pin or bolt 62.

There is further provided a front wheel or roller 63 which is supported by a bracket 64, and the bracket 64 is provided with a spring mounting 65, the wheel 63 cooperating with the wheels 14 to provide that the jack will be portable so that it can be readily rolled or moved from place to place as desired.

As shown in FIGURE 2, inclined braces 66 extend between the posts 16 and beams 10 and these braces are secured in place in any suitable manner, as for example by welding.

From the foregoing, it is apparent that there has been provided a jack or load handling device which can be used for handling or lifting different types of loads, as for example the straps or bases 38 can be arranged in engagement with a portion of an automobile which is being worked on. Then, by manually moving the handle 48, the plunger 68 will cause rotation of the ratchet 45 and this in turn will cause rotation of the shaft 39. As the shaft 39 rotates in the proper direction, the cable 40 will become wrapped therearound so that this movement of the cable 40 will cause movement of the rod 43. Since the rod 43 is connected to the movable carriage 20, it will be seen that movement of the handle 48 will result in movement of the carriage 20 and since the straps 38 are secured to the arms 37, and the arms 37 are secured to the channel 36 on the front of the carriage 20, it will be seen that an automobile or other object can be readily lifted by moving the handle 48.

The rollers 22 and 23 engage the tubular posts 16 so as to maintain the carriage 20 in its proper position as it moves up and down, and the jack can be readily moved from place to place by means of the wheels or rollers 14 and 63. The roller 63 is resiliently supported so that the spring 65 provides a shock absorber. When the lever 29 is in the solid line position shown in FIGURE 1, it can be arranged so that one of the shoulders 32 engages a flange such as the flange 27 so that the carriage 20 will not accidentally move downwardly, and the lever 29 is maintained in locking position by means of the coil spring 34. However, by manually gripping the member 33, the lever 29 can be pivoted about an axis extending through the pin 30 so as to permit the shoulders 32 to clear the flange 27 or 28 whereby the carriage 20 is free to move up or down.

The pawl 54 can be moved into and out of engagement with the teeth 46 of the ratchet 45, and the counterweight 56 can be manually moved to and from the various positions shown in the drawings. Similarly, by gripping the lever 61, and moving the member 61, the cable 59 can be tightened on the grooved wheel 58 so that a braking effect can be provided in order to insure that the carriage 20 moves down gradually and does not move down too quickly.

The brake mechanism 57 is of the friction-type, and the pawl 54 is counterbalanced by means of the member or weight 56 so that it can be moved into or out of engagement with the ratchet 45. The jack uses a windlass as a lift, and the parts are ruggedly constructed so that they will withstand rough usage. In the event that a cable such as the cable 40 breaks, it can be quickly and easily replaced.

The floor jack of the present invention will lift a heavy load with speed and ease, and due to the provision of the braking mechanism, the load can be lowered gently and steadily and can be stopped at any point. Also, the load can be jacked back down after it has been raised by merely working the handle up and down and this is an advantage over hydraulic types of jacks and this is accomplished by the simple counterbalanced pawl 54 and plunger rod 51 in the handle 48.

The handle 48 can be operated when standing behind the jack in the conventional way or when standing in front of the jack since the handle is free to revolve around the ratchet wheel clear up to the pawl from either front or rear and this is a considerable advantage when using the jack for certain applications such as mounting heavy truck tires.

The hoist of the present invention can be moved up or down and released for fast descent by using the braking system which combines the windlass and the braking cable 59 which insures a positive safe control from the operator's position. A safety catch or bar 29 is provided as a safety precaution, and when the counterbalance pawl 54 is in forward position, a means is provided for holding the weight of the load.

In operation, assuming that the person is facing the ratchet wheel 45, as for example as shown in FIGURES 5 and 9, then the handle 48 is raised to the left in a clockwise direction so that the plunger 68 in the handle ratchets on the teeth 46 of the wheel 45. The handle 48 is raised as high as it will go and then is moved downward and it will be seen that the pawl 54 will engage the teeth 46 of the wheel 45 to hold the load. Next, the counterweight 56 can be swung from the position shown in FIGURE 5 to the position shown in FIGURE 9 and the handle 48 can be lowered enough to permit the counterweight 56 to withdraw the nose of the pawl 54 from the notch in the wheel 45. Then, the handle 48 is slowly raised and the lip 70 of the dog 49 will force the nose of the pawl 54 into the notches in the wheel 45, as for example as shown in FIGURE 9, as the wheel and shaft rotate in a clockwise direction due to the pull of the load. When the handle is raised as far as it will go, the pawl 54 forces the plunger 68 out of the notches in the wheel 45. The plunger 68 can be held in disengaged position by the finger grip 50 on the handle 48 so that the handle can be lowered one or more notches around the wheel 45 then the plunger 68 is released, and then this cycle of operation is repeated. As long as any considerable load is on the cable 40, it is almost impossible to withdraw the plunger 68 from the notches or teeth 46 in the wheel 45, but as soon as the pawl 54 stops the rotation of the wheel the only force to be overcome is the tension of the spring 53 which actuates the plunger 68.

The principle of the present invention can be utilized in a vehicle bumper jack.

The bar 15 may consist of a piece of angle metal which forms the front member of the base or jack. The shaft 39 operates in holes or openings in the support members. The shaft extensions 25 may be parts of the rod 43.

While I have shown a preferred form of my invention, I reserve all rights to such modifications as properly fall within the scope of the invention as claimed.

I claim:

1. In a hoist, a frame, a pair of upstanding support members adjacent the upper portion of the frame, a horizontally disposed shaft supported by said support members, a cable connected to said shaft, a ratchet mounted on said shaft and said ratchet being provided with a plurality of teeth, a link journaled on said shaft, a handle

affixed to said link and said handle being hollow, a spring pressed plunger arranged adjacent the inner end of the handle for selectively engaging the teeth of the ratchet, a manually operable rod extending through said hollow handle and said rod being affixed to said plunger, a pin connected to said plunger, a dog connected to the upper end of said pin and said dog including a lip, a pawl pivotally connected to one of said support members for selectively engaging the teeth of said ratchet, and said pawl adapted to be engaged by said lip of said dog, a pin connected to said pawl, and a movable counter weight connected to the pin on said pawl.

2. In a hoist, a frame, a pair of upstanding support members adjacent the upper portion of the frame, a horizontally disposed shaft supported by said support members, a cable connected to said shaft, a ratchet mounted on said shaft and said ratchet being provided with a plurality of teeth, a link journaled on said shaft, a handle affixed to said link and said handle being hollow, a spring pressed plunger arranged adjacent the inner end of the handle for selectively engaging the teeth of the ratchet, a manually operable rod extending through said hollow handle and said rod being affixed to said plunger,

a pin connected to said plunger, a dog connected to the upper end of said pin and said dog including a lip, a pawl pivotally connected to one of said support members for selectively engaging the teeth of said ratchet, and said pawl adapted to be engaged by said lip of said dog, a pin connected to said pawl, and a movable counter weight connected to the pin on said pawl, and a stop member connected to a support member for limiting pivotal movement of the pawl.

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