A. H. McDOUGALL.

SAFETY LIMIT STOP FOR VERTICAL SCREW JACKS.

APPLICATION FILED JAN. 27, 1919.

1,366,402. Patented Jan. 25, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

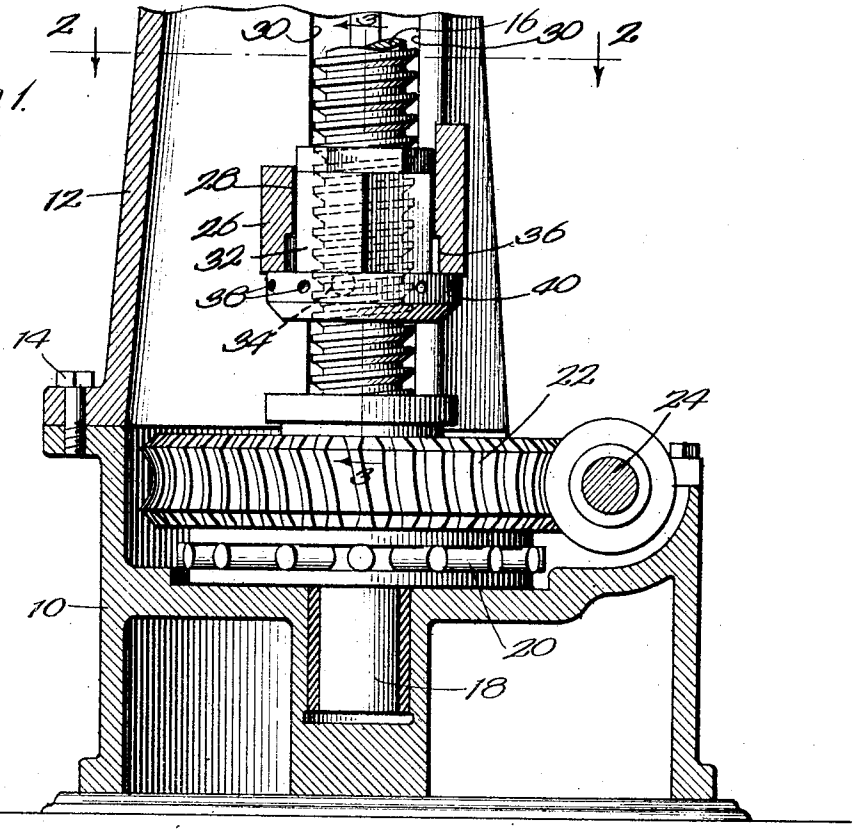
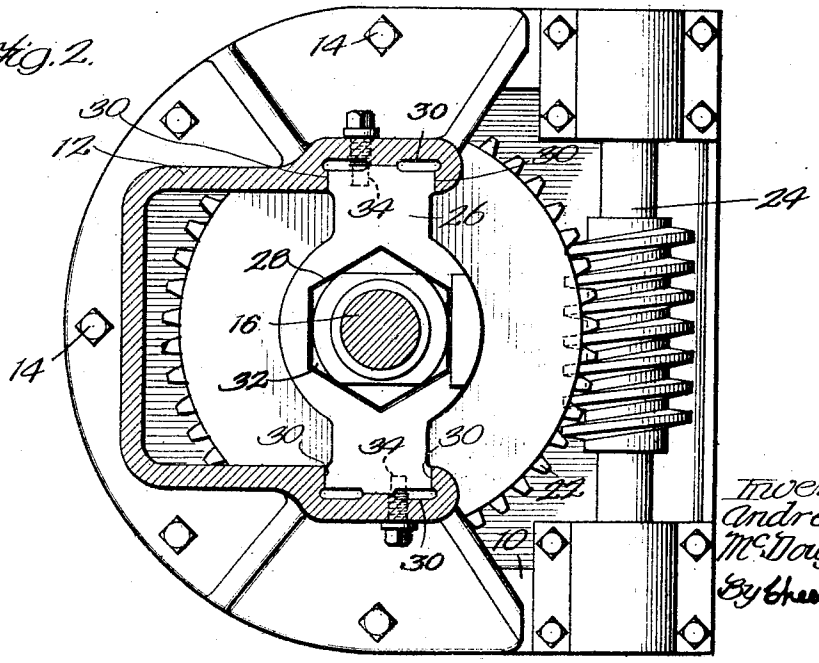


Fig. 2.



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Fig. 3.

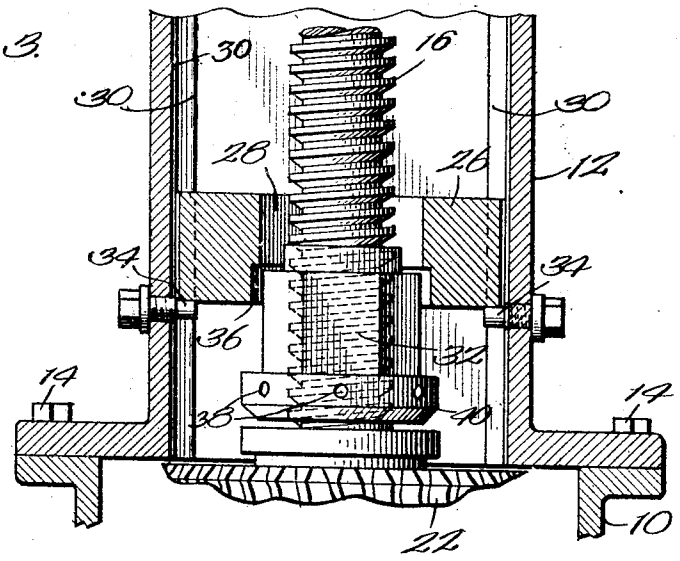


Fig. 4.

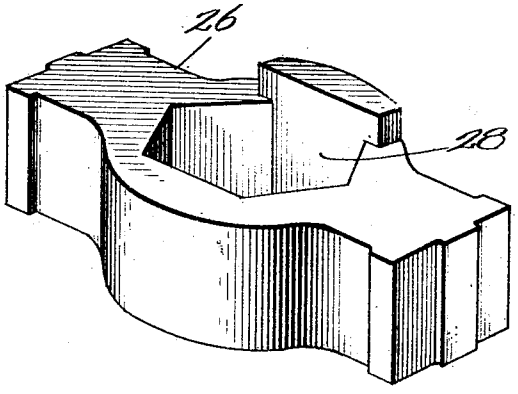
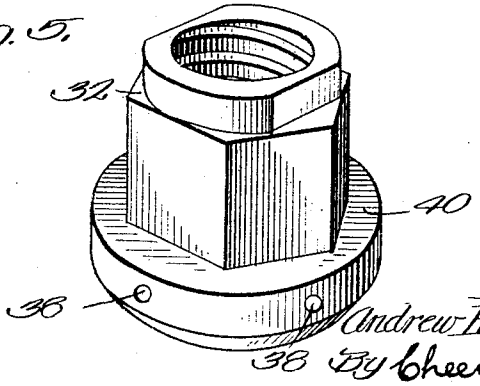


Fig. 5.



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UNITED STATES PATENT OFFICE.

ANDREW H. McDOUGALL, OF HARVEY, ILLINOIS, ASSIGNOR TO WHITING FOUNDRY EQUIPMENT COMPANY, OF HARVEY, ILLINOIS, A CORPORATION OF ILLINOIS.

SAFETY LIMIT-STOP FOR VERTICAL SCREW-JACKS.

1,366,402. Specification of Letters Patent. **Patented Jan. 25, 1921.**

Application filed January 27, 1919. Serial No. 273,236.

To all whom it may concern:

Be it known that I, ANDREW H. McDOUGALL, a citizen of the United States, residing at Harvey, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Safety Limit-Stops for Vertical Screw-Jacks, of which the following is a specification.

This invention relates to screw jacks for lifting heavy objects, and is particularly applicable to such devices now commonly used for lifting heavy locomotives from railroad tracks for repairs or other purposes.

The object of the invention is to provide means whereby, when the load supporting member operated by the jack proper reaches a stationary support, either temporarily during its movement or permanently in its lowest position, the control of the screw upon the load carrying member will be automatically removed or disconnected without stopping the screw or breaking the apparatus; that is to say, the lifting screw then automatically ceases to carry the load supporting member farther down with consequent danger of injury to the machine.

The invention consists in a device capable of carrying out the foregoing objects, which can be easily and cheaply made and installed, which is satisfactory in operation, and is not readily liable to get out of order. It further consists in the features and details of construction more fully described and claimed hereafter.

Referring to the drawings, in which similar numerals indicate the same parts throughout the several views,

Figure 1 is a vertical view, largely in section, illustrating the mechanism of this invention in its preferred form.

Fig. 2 is a plan view taken on the line 2—2, of Fig. 1.

Fig. 3 is a vertical sectional view of certain parts taken on the line 3—3 of Fig. 1.

Fig. 4 is a perspective view of the load carrying member.

Fig. 5 is a perspective view of the operating nut which normally interfits with the load carrying member.

The particular embodiment of the device of this invention, illustrated in Fig. 1, is carried in the base casting 10, from which rises the frame member 12, detachably secured thereto in any suitable manner, as for instance by bolts or screws 14. Suitably journaled in the base casting 10 is the vertically extending screw threaded shaft 16 supported in suitable bearings 18 and 20, well understood in the art and forming no part of this invention, and therefore not described in detail. This screw is as is well understood in the art, provided with a worm wheel 22, driven by a worm 24 in communication with any suitable source of power, not shown, so that when the power is applied the screw shaft 16 may be rotated in either direction at the will of the operator.

On screw shaft 16 is a load carrying block or member 26, provided in its center with a non-circular opening 28, in the particular case here illustrated a hexagonal opening of greater size than the screw 16, and having its ends entering, guided and traveling in suitably formed recesses 30 in the frame 12 which are, as shown, parallel to the screw 16. The load to be carried may be applied directly to this block 26, but is more often applied through the agency of beams or girders, not shown, whose ends are temporarily placed upon the block 26 between the screw 16 and the guides 30.

Interposed between the worm wheel 22 and the load carrying member 26 is an operating nut 32, shaped as shown, to conform to but slip into the non-circular opening 28 in the load carrying member 26. This nut is, as shown, threaded upon screw 16 and never leaves the screw-threads during the operation of the device.

It is obvious that when nut 32 is in engagement with hexagonal opening 28 in the load carrying member 26, rotation of screw 16 necessarily moves block 26 in one direction or the other and that enforced stopping of the load carrying member or block 26 during such rotation would result in a breakage of the connected parts were the nut 32 integral with or otherwise permanently attached to block 26 as in the prior art. To insure against such an accident due to the operator allowing screw 16 to be rotated after the load carrying member 26 has reached its extreme lower working position, stops 34 are provided in the frame to be engaged by the load carrying member 26 at a point above what otherwise would be the lowermost position of the load carrying member and the lower side of the block 26 is cut away in a circular recess 36 of such a depth and diameter that when the nut 32

reaches its extreme lower position the nut ceases to engage the walls of the hexagonal opening 28 in the load carrying member 26.

This recess 36 is provided merely to permit as low a movement as possible of block 26 consistent with proper strength of parts.

The result of this construction is that when the parts reach the position shown in Fig. 3, with the load carrying member 26 on the supports 34 so that the load carrying member can move no lower and the nut 32 has reached its lowermost limit of travel on the screw 16, the nut ceases to engage the load carrying member 26 and consequently no damage can be done.

When, now, the operator reverses the motion of screw 16, he takes hold of nut 32 either by hand or by a suitable tool entering opening 38, provided for the purpose, and holds the nut stationary so far as rotation is concerned until the screw 16 has driven the nut up into the carrier member 26, where the nut, particularly through the agency of the flange 40, begins to bear upon and lift the load carrying member 26, whereupon further rotation of the screw 16 causes the nut 32 to lift the load carrying member in the usual obvious manner.

In the drawings the stops 34 are shown as a permanent stop mechanism at the extreme lower point of travel of the load carrying member, but the safety device operates in exactly the same way in case the downward movemenet of the load carrying member 26 is intentionally or otherwise permanently checked in any point of its downward travel.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In apparatus of the class described, the combination with a vertically mounted load carrying screw-threaded shaft, a nut propelled by and constantly engaging the screw-threads of said shaft, and a load carrier member adjacent to said shaft adapted to be detachably non-rotatively engaged by said nut, for the purposes set forth.

2. In apparatus of the class described, the combination with a vertically mounted load carrying screw-threaded shaft, a nut propelled by and constantly engaging the screw-threads of said shaft, a load carrier member adjacent to said shaft adapted to be detachably non-rotatably engaged by said nut, and a stop mechanism for supporting the load carrying member at a point sufficiently distant from the end of the load carrying shaft so as to permit the nut being disengaged from the load carrying member without stopping the rotation of the shaft, and to then be rotated by the shaft while out of engagement with said load carrying member.

In witness whereof I have hereunto subscribed my name in the presence of two witnesses.

ANDREW H. McDOUGALL.

Witnesses:

DWIGHT B. CHEEVER,

M. S. ROSENZWEIG.