March 26, 1929. S. SELDEN 1,706,710

SELF LOWERING JACK

Filed June 1, 1926

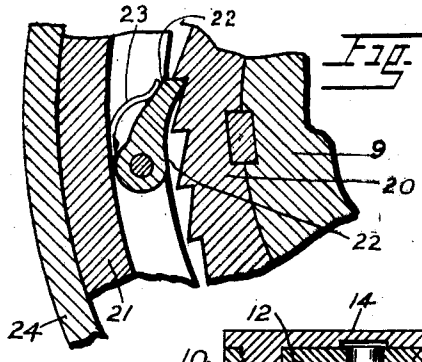


Fig. 5.

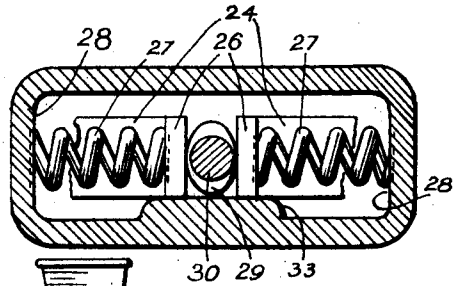


Fig. 3.

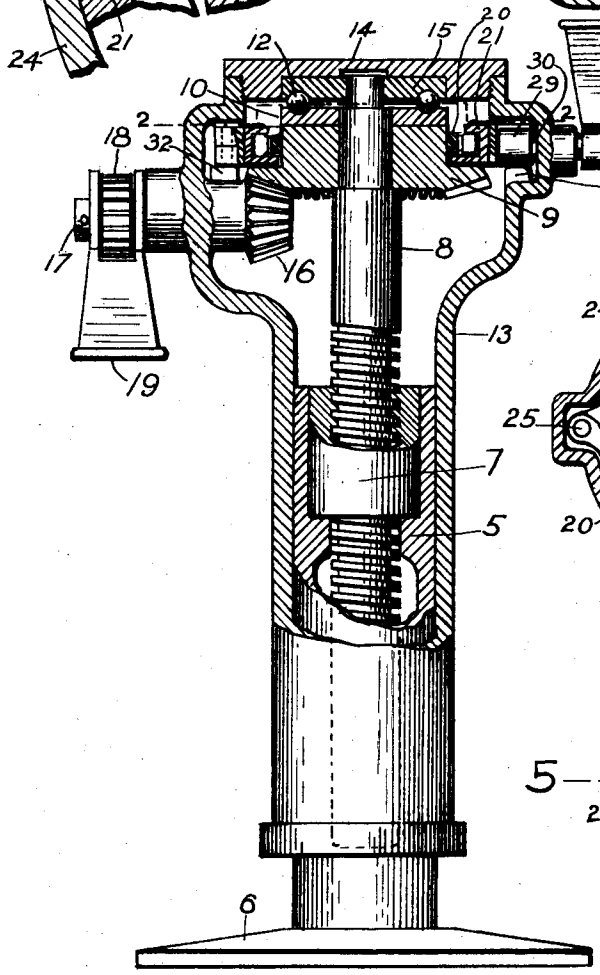
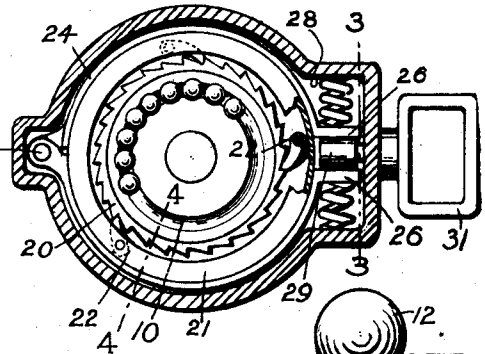


Fig. 1.

Fig. 2.



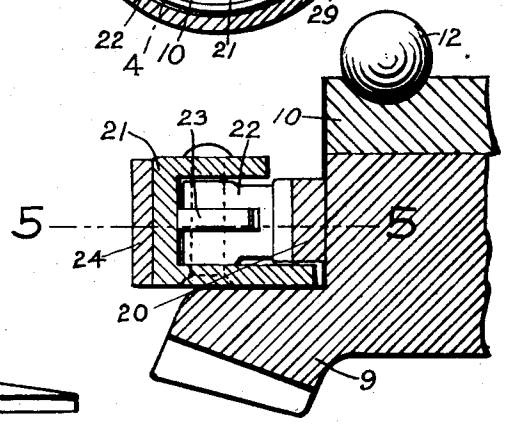


Fig. 4.

INVENTOR.

S. Selden.

BY

ATTORNEY.

Patented Mar. 26, 1929. 1,706,710

UNITED STATES PATENT OFFICE.

SAMUEL SELDEN, OF HUNTINGTON PARK, CALIFORNIA, ASSIGNOR OF ONE-HALF TO CHARLES SELDEN, OF BALTIMORE, MARYLAND.

SELF-LOWERING JACK.

Application filed June 1, 1926. Serial No. 112,882.

My invention relates to lifting jacks of the self-lowering type and its main object is to provide a mechanism of very simple but highly practical and efficient construction by which the operation of the jack either in lifting or in lowering a load is readily controlled.

Another object of the invention is to provide in a self-lowering jack, a controlling mechanism that may be governed by means of the same lever used in operating the jack to lift the load. A further object is to provide a controlling mechanism having a powerful and dependable restraining action upon the lifting screw of the jack so as to positively prevent breakage or accidental yielding under heavy pressure and still another object is to provide a controlling mechanism of the above stated characteristics which is applicable to lifting jacks of both the "vertical" and "inverted" types.

With the above and other objects in view, as will fully appear in the course of the following description, my invention consists in the construction, arrangement and combinations of parts shown in the accompanying drawing.

The drawing illustrates a preferred embodiment of the invention but it is to be understood that changes in the specific construction and the general arrangement of the parts may be made without departing from the spirit of the invention as defined in the hereunto appended claims.

The drawings show the embodiment of the invention in association with a lifting jack of the "vertical" type and it will be evident to those versed in the art that it is likewise applicable to jacks of the "inverted" type without material changes in the arrangement of the parts included in the invention.

In the drawings in the several views of which like parts are similarly designated,

Figure 1, represents a sectional elevation of a vertical lifting jack to which my invention has been applied;

Figure 2, a section in a horizontal plane taken on the line 2—2 Figure 1;

Figure 3, an enlarged fragmentary section along the line 3—3 Figure 2;

Figure 4, an enlarged fragmentary section in a vertical plane on the line 4—4 Figure 2; and

Figure 5, a section taken on the line 5—5 Figure 4.

Referring further to the drawings, the reference numeral 5 designates the standard of the lifting jack, supported on a foot plate 6 and provided at its upper end with a fixed nut 7. The standard is hollow to admit the lower portion of the lifting screw 8 which cooperates with the nut to lift the load by rotation about its vertical axis.

The threads of both the screw and the nut are, as is usual in jacks of the self-lowering type, coarse and steeply pitched to compel the screw to move downwardly under the influence of its load when it is released by the restraining appliance to which the present invention particularly appertains.

The screw-stem 8 carries at its upper extremity in fixed relation thereto, a beveled gear wheel 9, the upper portion of which comprises a grooved wear-plate 10 forming the lower member of a ball-bearing 12 which supports the lifting shell 13 of the jack.

This lifting shell, the major portion of which is slidably fitted upon the standard, has at its upper end, above the standard, an enlarged chamber for the operating and controlling mechanisms hereinafter to be described, and it is closed by a screw plug 14 provided with a grooved wear-plate 15 which constitutes the upper member of the ball-bearing hereinbefore referred to.

A pinion 16 on a shaft 17 supported in a bearing on the lifting shell, meshes with the gear wheel 9, and the shaft carries outside of the shell, the usual ratchet 18, for its operative connection with a socket-piece 19 into which, in practice, the operating lever is inserted.

Mounted on the beveled gear wheel in rigid connection therewith, is a ratchet wheel 20, and surrounding this ratchet wheel is a relatively loose brake drum 21 of channel section which is supported on a bearing surface of the gear wheel below the ratchet wheel.

The lower flange of the brake-drum fits upon the hub of the gear wheel, and its upper flange projects to the upper edge of the ratchet wheel.

Pivotally mounted in the channel of the brake-drum, are a plurality of pawls 22

which are yieldingly held in engagement with the teeth of the ratchet wheel by means of springs 23.

A brake-band 24, frictionally engaging with the circumferential surface of the brake-drum, is composed of two sections hinged together by means of ears 25 which are disposed in a recess of the lifting shell to hold the band against rotation.

The sections of the band have at their free ends opposed lugs 26 engaged by helical springs 27 which at their outer ends bear upon shoulders 28 of the lifting shell.

Between the lugs of the brake-band is arranged a cam 29 on a shaft 30 which is rotatably supported in a bearing of the lifting shell.

The shaft carries upon its portion exteriorly of the shell, a socket piece 31 similar in part to that associated with the pinion shaft 17. A boss 32 on the lifting shell supports the hinge-portion of the brake-band and a similar boss 33 aids in supporting the lugs 26 and the springs 27.

Having thus described my invention, its operation is as follows:

A load superimposed upon the lifting shell is raised by an oscillatory movement of a lever inserted in the socket 19, which thru the medium of the ratchet 18, imparts an intermittent rotary motion to the pinion 16.

The pinion rotates the gear-wheel 9 which thereby causes the screw to turn in the relatively stationary nut 7. The consequent upward movement of the screw communicated through the medium of the ball bearing to the lifting shell, raises the load.

During this entire operation, the brake drum is held against rotation by the gripping action of the brake band under the influence of the springs 27 and the pawls on the inside of the drum ride freely across the teeth of the ratchet wheel.

It will be apparent that retrograde motion of the screw by the weight of the load on the lifting shell is constantly opposed by the pawls on the relatively fixed brake-drum and that only when the drum is released to turn with the ratchet wheel, the screw is permitted to move downwardly for the purpose of lowering the load.

This object is attained by moving the free ends of the brake-band further apart against the pressure of the springs 27, which may be accomplished by a partial rotation of the cam through the medium of a lever inserted in the socket 31.

When the brake-drum is thus released, leaving it free to rotate with the beveled gear wheel, the weight of the load on the lifting shell will compel it to move downwardly owing to the steep pitch of the thread on the screw. The downward motion of the load is under constant control of the operator who by proper manipulation of the lever can at any time stop the movement of the operating mechanism by moving the cam to its normal position in which the brake drum is tightly gripped by the spring-pressed brake band.

The same lever may be used in lifting and in lowering the load and both operations are readily accomplished without any adjustment other than moving the lever from one socket to the other.

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

1. A self-lowering lifting jack comprising a stationary element, a relatively movable element, mechanism for the operative movement of the latter, including a rotary gear member, a ratchet wheel on the gear member, a rotary brake-drum, a pawl on the drum cooperative with the ratchet wheel, to establish the rotative continuity of the drum and the gear member in one direction only, a spring-urged brake-band adapted to restrain the rotary movement of the drum by frictional contact therewith, a rotary cam controlling the action of the brake-band upon the drum, and a lever socket connected with the cam for its rotary adjustment by a lever inserted in the socket.

2. A self-lowering lifting jack comprising a stationary element, a relatively movable element, mechanism for the operative movement of the latter, including a rotary gear member, a ratchet wheel on the gear member, a rotary brake-drum of channel section, pawls in the channel of the brake drum, cooperating with the ratchet wheel to establish the rotative continuity of the drum and the gear member in one direction only, a spring-urged brake band adapted to restrain the rotary movement of the drum by frictional contact therewith, and adjustable means to control the action of the brake band upon the drum.

3. A self-lowering lifting jack comprising a stationary element, a relatively movable element, mechanism for the operative movement of the latter, including a rotary gear member, a ratchet wheel on the gear member, a rotary brake drum of channel section, bolts extending between the sides of the channel of the brake drum, pawls pivoted on the bolts, cooperating with the ratchet wheel to establish the rotative continuity of the drum and the gear member in one direction only, a spring-urged brake band adapted to restrain the rotary movement of the drum by frictional contact therewith, and adjustable means to control the action of the brake band upon the drum.

In testimony whereof I have hereunto affixed my signature.

SAMUEL SELDEN.