J. A. ANGLADA.

ELECTRIC LIFTING JACK.

APPLICATION FILED JULY 14, 1919.

1,414,683.

Patented May 2, 1922.

3 SHEETS—SHEET 1.

FIG. 1

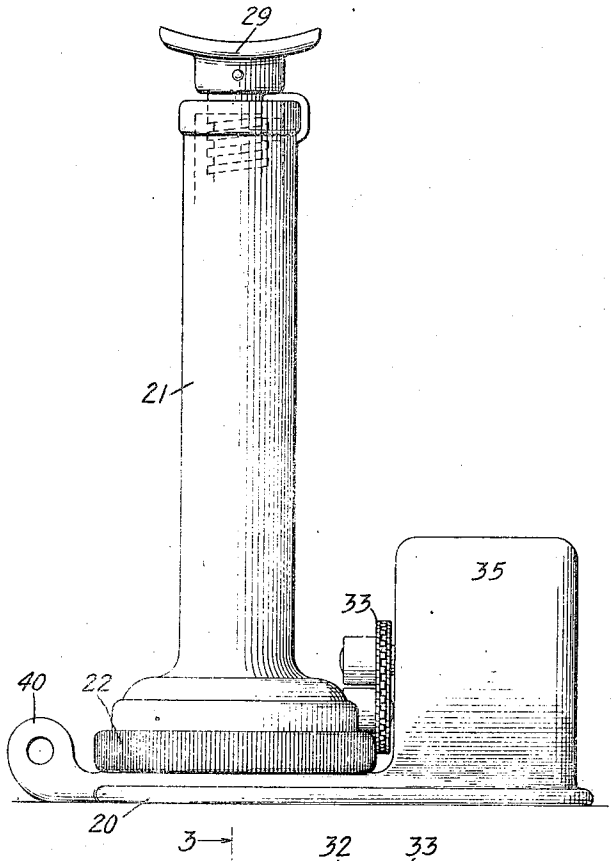
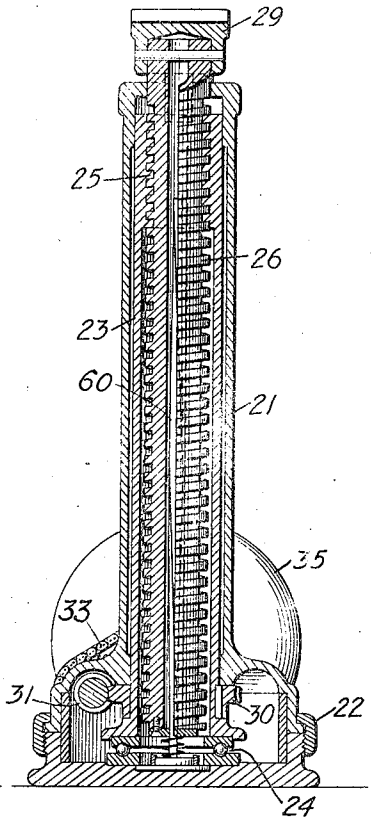


FIG. 3



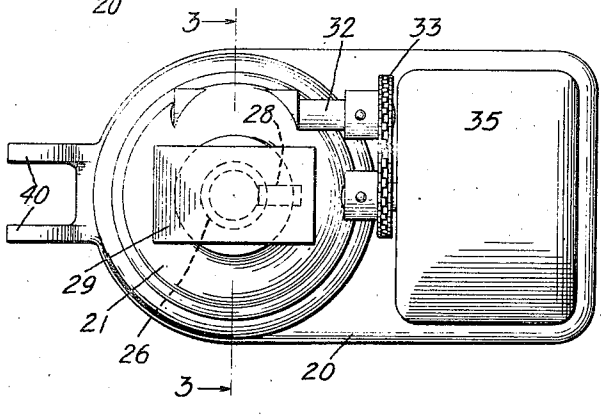


FIG. 2

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3 SHEETS—SHEET 2.

FIG. 4

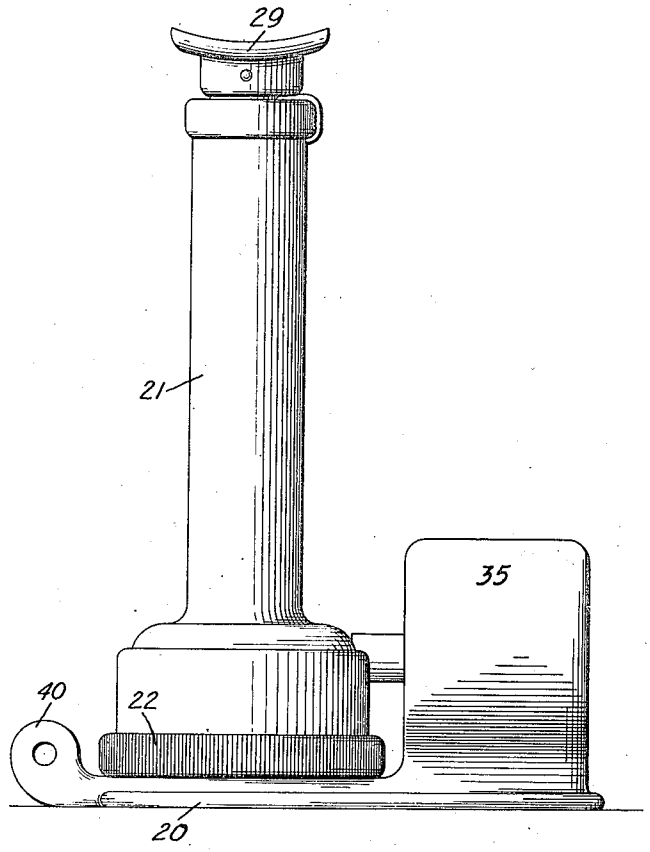
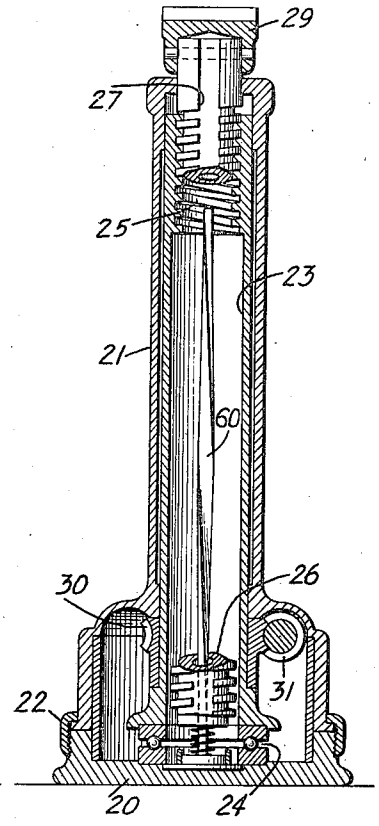


FIG. 6



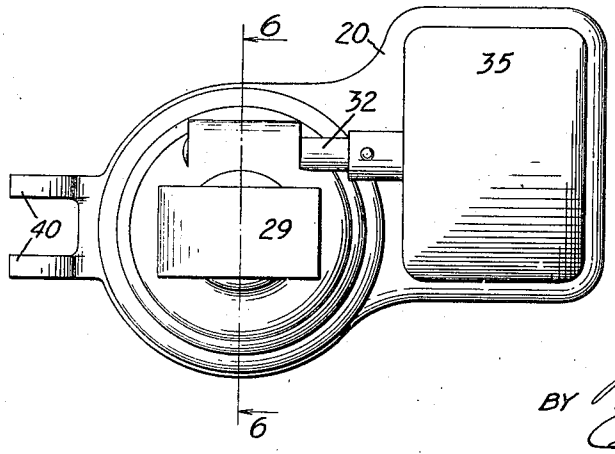


FIG. 5

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3 SHEETS—SHEET 3.

FIG. 7

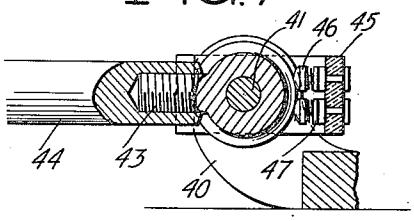


FIG. 9

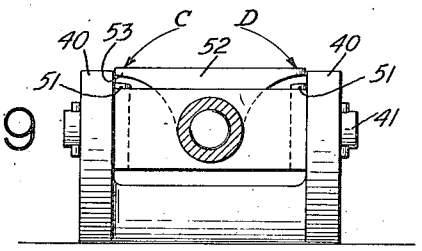


FIG. 8

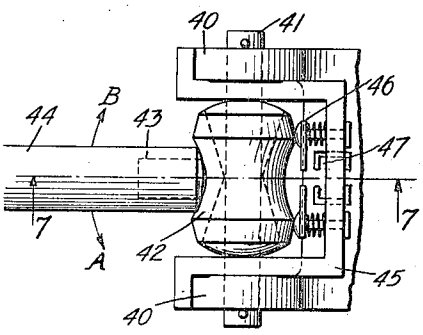


FIG. 10

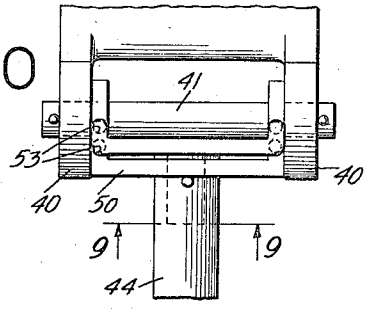


FIG. 11

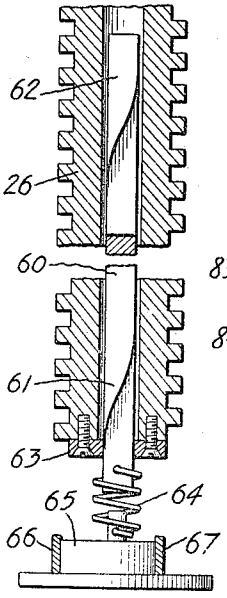
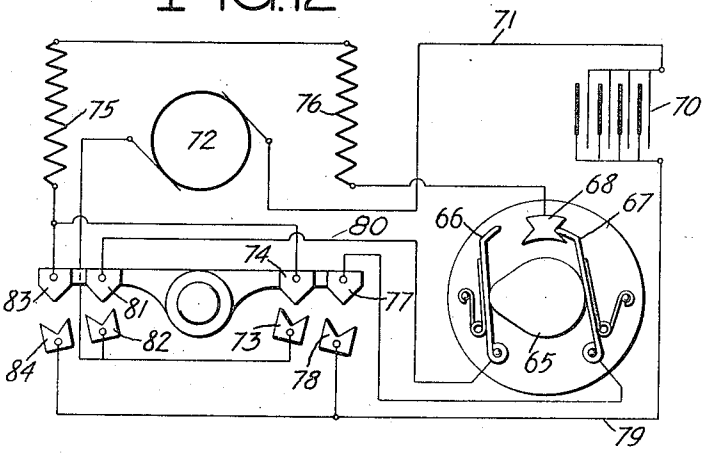


FIG. 12



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UNITED STATES PATENT OFFICE.

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ELECTRIC LIFTING JACK.

1,414,683. Specification of Letters Patent. Patented May 2, 1922.

Application filed July 14, 1919. Serial No. 310,652.

To all whom it may concern:

Be it known that I, JOSEPH A. ANGLADA, a citizen of the United States, and a resident of Jenkintown, county of Montgomery, and State of Pennsylvania, have invented certain new and useful Improvements in Electric Lifting Jacks, of which the following, together with the accompanying drawings, is a specification.

My invention relates to lifting jacks actuated by electric motors and more particularly to light portable jacks such as may be used for lifting automobiles, and its object is to provide a simple, inexpensive and efficient device of this character. Another object is to provide as a part of the device, a handle by means of which it may be positioned and its motor controlled. Another object is to provide an arrangement for automatically stopping the motor when the lifting element of the jack reaches the ends of its travel.

These and other objects of the invention will appear in the following specification in which I will describe the invention, the novel features of which will be set forth in appended claims.

Referring to the drawings:

Figure 1 is a side elevation of a lifting jack which is made according to and embodies this invention with the positioning and control handle removed.

Figure 2 is a plan view of the same device.

Figure 3 is a sectional end elevation of the form of jack shown in Figures 1 and 2, the section being taken on the line 3—3 of Figure 2.

Figure 4 is a side elevation of another form of construction which also embodies this invention.

Figure 5 is a plan view of the device shown in Figure 4.

Figure 6 is a sectional end elevation of the jack of Figures 4 and 5, the section being taken on the line 6—6 of Figure 5.

Figure 7 is a sectional side elevation of the lower end of a positioning and control handle together with its operating parts, the section being taken on the line 7—7 of Figure 8.

Figure 8 is a plan view of the parts shown in Figure 7.

Figure 9 is a sectional end elevation of the lower end of another form of positioning and control handle and its cooperating parts. The section in this figure is taken on the line 9—9 of Figure 10.

Figure 10 is a plan view of the parts shown in Figure 9.

Figure 11 is a sectional elevation on a larger scale of a part of the lifting screw and the parts which cooperate therewith to limit its movement.

Figure 12 is a wiring diagram showing a way in which the parts may be connected electrically.

Like characters of reference designate corresponding parts in all of the figures of the drawings.

20 designates a base upon which the various parts are mounted. 21 is an outer casing secured to the base by a collar 22. Rotatively supported within the casing is a hollow driving member 23, the lower end of which rests upon an anti-friction bearing 24. The upper part of this member is constructed to form internal threads 25 through which passes the lifting screw 26. This screw is provided with a longitudinal groove 27 in which a key 28 in the upper part of the casing 21 fits to prevent the rotation of the screw. 29 is a load engaging member at the upper end of the lifting screw.

Affixed to the driving member 23 near the lower part thereof is a worm wheel 30. A worm 31 in engagement with this worm wheel has its shaft 32 either connected by a chain and sprocket mechanism 33 with the shaft of an electric motor 35 as shown in Figures 1, 2 and 3, or connected directly therewith as shown in Figures 4, 5 and 6.

In either construction there are ears 40 projecting from the base at the side thereof opposite the motor. 41 is a pin through these ears which in the arrangement shown in Figures 7 and 8 also passes through a spool 42 through which is a hole the center of which is the same diameter as that of the pin, but which flares outwardly toward both ends. A threaded lug 43 projects from the spool, into which is screwed the end of the positioning and control handle 44.

Between the ears 40 and the ends of the spool is a frame 45 of insulating material on which are mounted four movable contacts 46 and four cooperating stationary contacts 47. The handle may be used to position the jack, and may be moved up and down about the pin 41 without effecting the

electrical connection, but when it is moved to one side or the other as indicated by the arrows A and B in Figure 8, it will rock the spool against one or the other pair of the movable contacts to start the motor rotating in one direction or the other in a way which will be fully described hereinafter.

Another arrangement for the positioning and control lever 44 is shown in Figures 9 and 10 in which the pin 41 passes through a bracket 50 of insulating material on which are four stationary contacts 51. On the end of the handle 44 is a rocker 52 on which are the movable contacts 53. In this case the contacts are opened and closed by rotating the handle 44 as indicated by the arrows C and D in Figure 9.

The lifting screw is hollow and within it is a flat strip 60 which is twisted near its ends as at 61, 62. A washer 63 affixed to the lower end of the screw 26 has a slot in it through which the strip 60 passes. At the lower end of the strip is a spring 64 which connects it with a cam 65. This is arranged to be rotated between two pivoted spring pressed contacts 66, 67 which are adapted to engage a stationary contact 68.

Now by referring to the wiring diagram, I will describe the operation of this device. The handle 44 is pivoted to the base of the jack so that the jack may be pushed or pulled into desired position without being tipped over. Then the handle may be manipulated to actuate the contacts. These are arranged to close the motor circuit as follows: Let us assume that the jack is in its lowermost position and it is desired to raise it. The contacts shown at the right of Figure 12 are moved to be closed so that current passes from battery 70 through a conductor 71, through the motor armature 72, to and through contacts 73 and 74, to and through the motor fields 75 and 76, to the stationary contact 68 of the automatic stop switch, through the pivoted contact 67, contacts 77 78 and conductor 79 back to the battery.

As soon as the screw has been lifted a little the washer 63 on the bottom of it will turn the strip 60 and cam 65 to allow pivoted contact 66 to close against stationary contact 68. This will have no effect upon the circuits because the conductor 80 which is connected to it leads to a contact 81 which is now dead.

When the screw reaches the upper limit of its movement, the washer 63 will engage the curved part 62 of strip 60 and rotate cam 65 to move the pivoted contact 67 off from stationary contact 68. This of course interrupts the motor circuit and brings the parts to rest.

By means of the handle 44 contacts 81, 83 may be moved onto contacts 82, 84 respectively. Now by tracing the circuits it will be seen that they go through the automatic stop switch contacts 66, 68 and that the current passes through the motor fields 76, 75 in the opposite direction to that which it did before. This will cause the motor to move the screw downwardly and this movement will eventually cause the pivoted contact 66 to be moved off from the stationary contact 68 to stop the motor at the end of the downward movement of the lifting screw.

It is of course to be understood that the contacts 73, 74, 77, 78 and 81—84 of the wiring diagram correspond with those designated by 46, 47 in Figures 7 and 8, and those designated by 51, 53 in Figures 9 and 10.

While I have described this invention as applied to light portable jacks, it is in no way limited to such use as the same principles are equally applicable to lifting jacks of the heaviest form. The modifications illustrated and described are merely illustrative, and I do not intend to limit myself to any specific form or mechanism, and in fact, I intend no limitations other than those imposed by the appended claims.

What I claim is:

1. A lifting jack comprising a pair of relatively movable members, an electric motor connected to impart such relative movement thereto, circuits for the motor and a positioning handle connected with one of said members and arranged to control the motor circuits.

2. A lifting jack comprising a pair of relatively movable members, an electric motor connected to impart such relative movement thereto, circuits for the motor and a positioning handle connected with one of said members and arranged to control the motor circuits, and a switch in the motor circuits actuated by the relative movement of said members arranged to stop the motor automatically at the ends of said movement.

3. A lifting jack comprising an outer casing a lifting screw, an electric motor and intermediate mechanism between the motor and the screw for causing the rotation of the motor to move the screw longitudinally, circuits for the motor and a positioning handle connected with said outer casing and arranged to control the motor circuit.

4. A lifting jack comprising an outer casing a lifting screw, an electric motor and intermediate mechanism, comprising worm gearing, between the motor and the screw for causing the rotation of the motor to move the screw longitudinally, circuits for the motor, and a positioning handle pivotally connected with said outer casing near the lower part thereof, and arranged to control the motor circuit.

5. A lifting jack comprising an outer casing, a lifting screw, an electric motor and intermediate mechanism between the motor

and the screw for causing the rotation of the motor to move the screw longitudinally, circuits for the motor, and a positioning handle connected with said outer casing arranged to control the motor circuits, and a switch in said motor circuits and means actuated by the longitudinal movement of the lifting screw for actuating the switch to stop the motor automatically at the ends of the movement of the screw.

6. A lifting jack comprising an outer casing, a lifting screw, an electric motor and intermediate mechanism, comprising worm gearing, between the motor and the screw for causing the rotation of the motor to move the screw longitudinally, circuits for the motor, and a positioning handle pivotally connected with said outer casing near the lower part thereof arranged to control the motor circuits, and a switch within said casing and in said motor circuits and means actuated by the longitudinal movement of the lifting screw for actuating the switch to stop the motor automatically at the ends of the movement of the screw.

7. A lifting jack comprising an outer casing and a relatively movable member, a motor rigidly mounted with the outer casing and arranged to impart said relative movement to said member, a positioning and control handle movably connected with the casing, and means actuated by the movement of the handle relative to the casing for controlling the motor.

8. A lifting jack comprising an outer casing and a relatively movable member, a motor rigidly mounted with the outer casing and arranged to impart said relative movement to said member, a positioning and control handle movably connected with the casing, means actuated by the movement of the handle relative to the casing for controlling the motor, and means actuated by the movement of said member relative to the casing arranged to stop the motor automatically at the ends of said movement.

In witness whereof, I have hereunto set my hand this 11th day of July, 1919.

JOSEPH A. ANGLADA.