

No. 635,824.

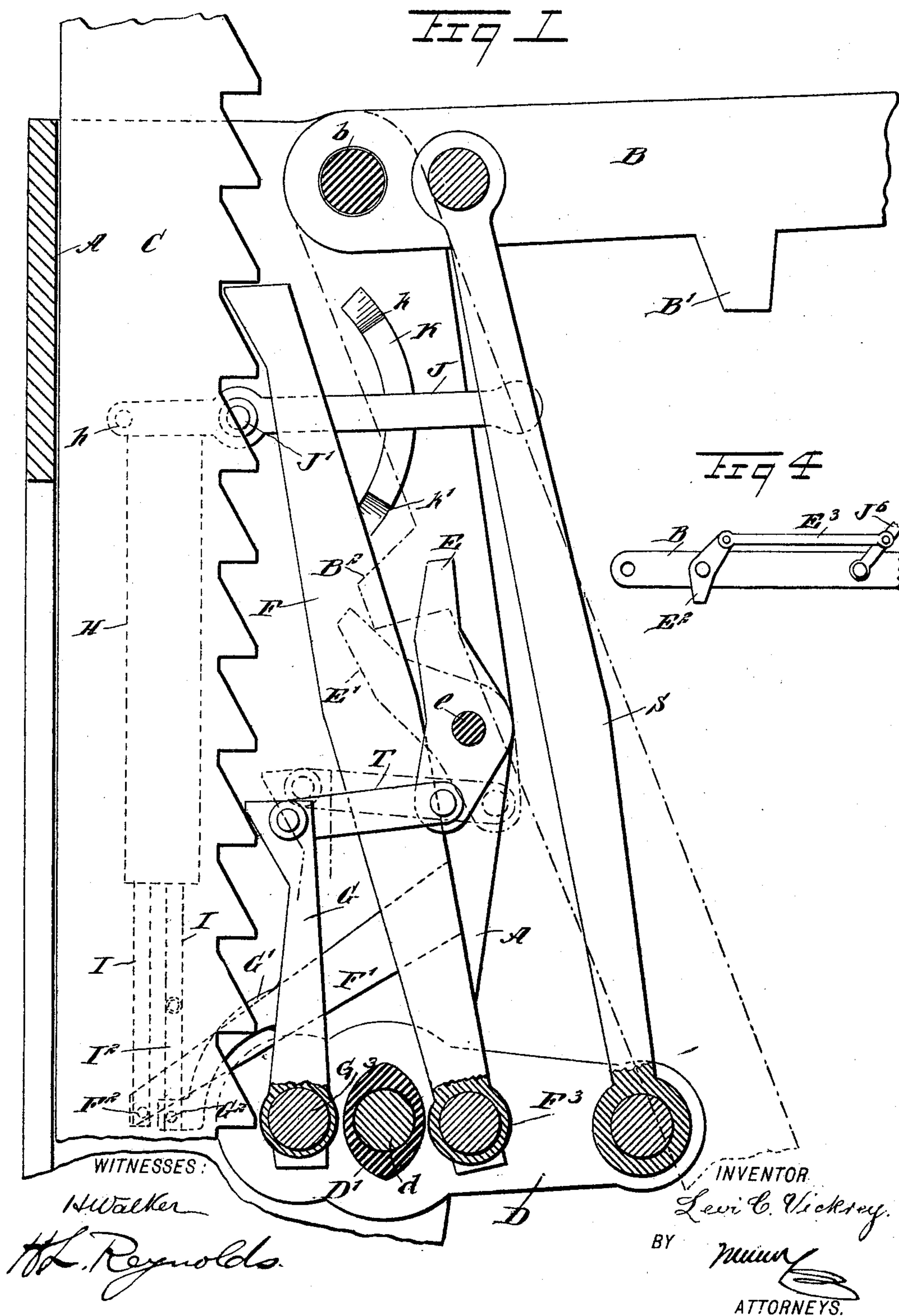
Patented Oct. 31, 1899.

L. C. VICKREY.
LIFTING JACK.

(Application filed Oct. 13, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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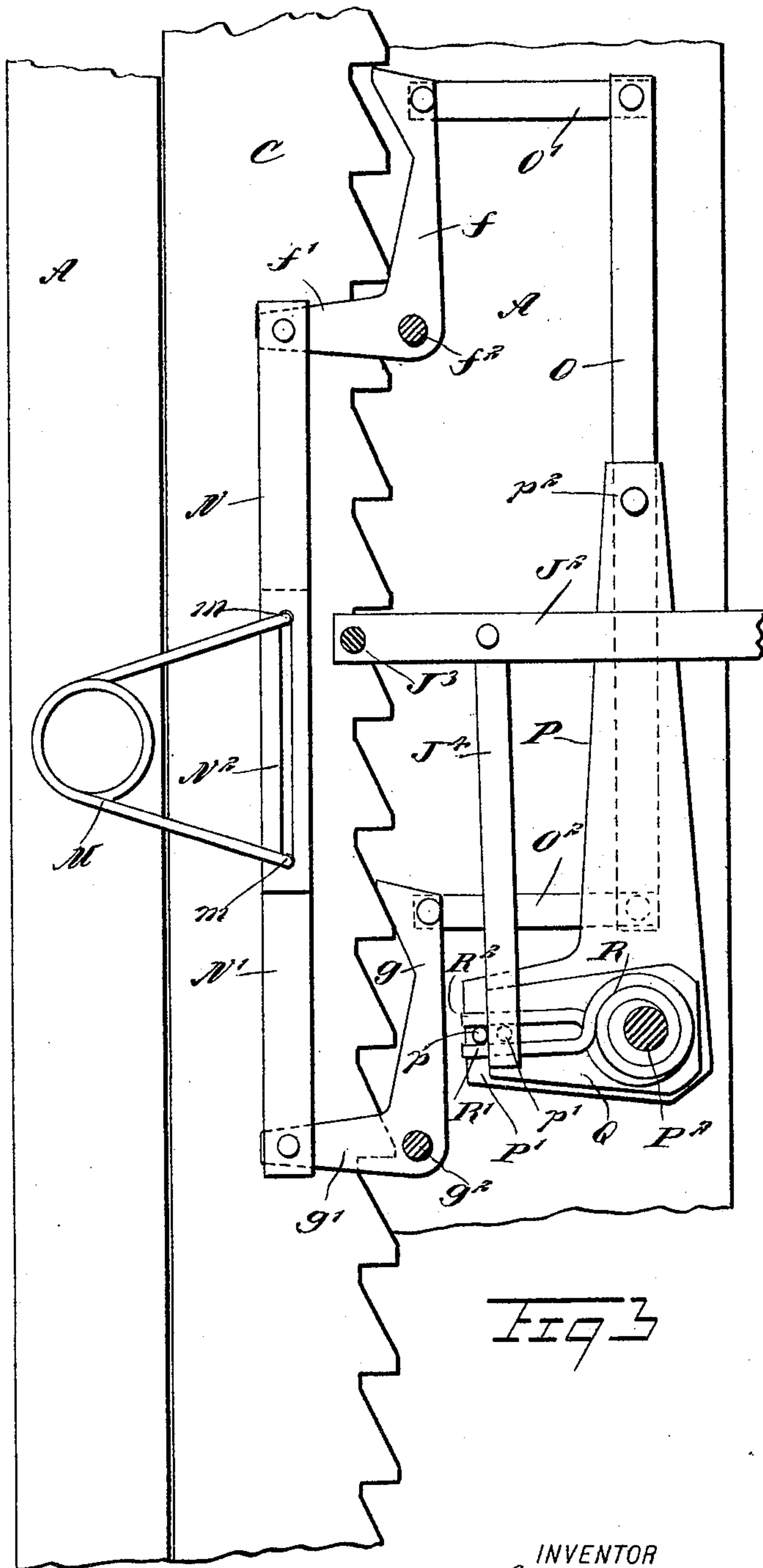
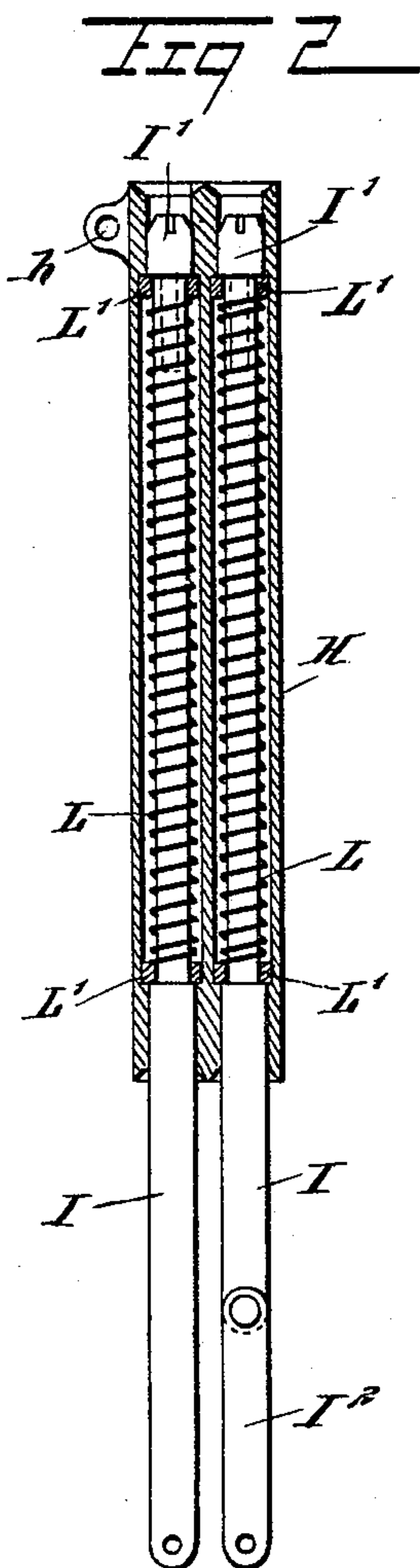


Fig 3

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LEVI C. VICKREY, OF SOUTH BEND, WASHINGTON.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 635,824, dated October 31, 1899.

Application filed October 13, 1898. Serial No. 693,418. (No model.)

To all whom it may concern:

Be it known that I, LEVI C. VICKREY, of South Bend, in the county of Pacific and State of Washington, have invented a new and Improved Lifting-Jack, of which the following is a full, clear, and exact description.

My invention relates to an improvement in lifting-jacks of that class which are operated by a step-by-step movement of pawls communicated from a lever, said jack ordinarily having a toothed lift-bar or ram.

My invention comprises the novel features hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a partly-sectional side elevation of the operating mechanism of the jack. Fig. 2 is a partly-sectional side view of spring mechanism which controls the jack-pawls. Fig. 3 is a side elevation of the working parts of a jack having a construction slightly different from the one shown in Fig. 1, but involving the same principles; and Fig. 4 is a fragmentary side view of a main lever for the jack, showing pawls thereon.

The object of my invention is to provide means for controlling the pawls upon lifting-jacks, so that they may be readily shifted to lift the ram or to lower the same or, when desired, to entirely free the pawls from the ram. The construction shown in Fig. 1 will be first described.

A standard or frame A of any suitable construction is used, upon which the mechanism is mounted and within which the lift-bar or ram C moves, the lift-bar or ram, as herein shown, being provided with a series of teeth upon one edge. Upon the frame or standard A an operating-lever B is pivoted on a pivot-pin *b*, and lower down upon the frame or standard is a lever D, which directly carries the pawls and which swings upon a pivot *d*, the lever D being connected with the operating-lever B by means of a link S. This lever is double, a part lying on each side of the ram and the pawls. In Fig. 1 one side has been removed to more clearly show other parts. The two side bars are connected by a tubular web D', which surrounds the pivot-pin.

Two pawls F and G are pivoted to the lever

D at opposite sides of its pivot *d*. The pins F³ and G³, upon which said links are pivoted, are preferably placed at the same distance from the center or pivot of the lever D. The arrangement may, however, be varied, if desired. This arrangement of double pawls pivoted upon a vibrating lever enables the ram to be lifted by the upstroke of the operating-lever as well as by the downstroke.

The pawls F and G are provided with side extending arms F' and G', to which springs are attached and by which they are controlled. In the construction shown in the drawings the ends of the arms lie close together, and the arm G' is connected by a short link I² with one of the rods I, to which the springs mentioned are attached. The other arm F' is directly connected with the other rod I. This part of the mechanism is shown in detail in Fig. 2, and, as therein shown, consists of two cylinders H, within which are placed spiral springs L, surrounding the rods I, the rods being of such diameter as to reciprocate freely in the cylinders. At each end of the spring L is placed a collar L', which bears against a shoulder on the inside of the cylinder and prevents the spring from being withdrawn. The springs are coiled open—that is, so that when freed from restraint their ends are farther apart than in the position shown in Fig. 2. They are therefore under an initial tension.

It will be noted that the rods I being free to slide in the cylinders H are connected thereto only by the springs, so that whenever direct power is applied either to the cylinder or rods the action upon the other is a spring or yielding pressure.

The cylinders H are provided with an ear *h* or other suitable means by which a shifting lever J may be connected thereto, said lever being pivoted by a pin J' to the standard or frame A. A rack or other suitable locking device K is provided, by which the lever may be locked in either of its extreme positions. This rack, as shown in the drawings, is curved and has notches *k* and *k'* at its ends, adapted to engage the lever J and prevent its swinging toward the center. It is held after adjustment in either position by the action of the springs. In Fig. 1 the lever J is shown in its central position. In this position a lock

is not needed, as the action of each spring is equal and opposite that of the other.

Pivoted to the frame or standard A by a pin *e* is a trip-lever E, connected at one end by a link T with the lower pawl G. The operating-lever B has a lug or projection B' on its under side so located that when the lever is thrown down to its extreme lower position the lug B' will engage the upper part of the trip-lever D. This position of the parts is shown by dotted lines in Fig. 1, the extreme lower position of the lug being indicated at B² and the corresponding position of the trip-lever at E'.

The operation of this device is as follows:
 15 When it is desired to use the jack for lifting, the controlling-lever J is thrown into its upper position or into engagement with the notch *k* of the rack K. This compresses the springs L and causes them to push upon the arms F' and G' of the pawls, and thus hold the pawls toward the ram C. In this case when the operating-lever B is raised or lowered the pawls will also engage the teeth upon the ram and raise the same. If it is desired
 25 to back or to lower the load, the controlling-lever J is thrown into the middle position, or the position shown in Fig. 1. Commencing with the parts in the position shown in Fig. 1, if the operating-lever B be lowered the ram C is lowered upon the pawl F, and said pawl is held by the load, so that it will not be thrown out of engagement with the teeth of the ram. In the descent of the pawl F the arm F' also descends and pulls the spring connected therewith downward, and at the same
 35 time the pawl G, being upon the opposite side of the center or pivot *d*, is raised. This causes the spring connected with the frame to push downward upon the arm G', and thus to throw the pawl G toward the ram and into engagement with a tooth thereof. When the operating-lever B has descended to a sufficient distance, the pawl G will engage a tooth upon the ram and slightly raise it. The downward
 45 movement of the pawl F has caused the spring which is connected with the arm F' to pull upward on said arm, so that when the load is transferred to the pawl G the pawl F is thrown out of engagement with the teeth of the ram.
 50 The operating-lever B is then permitted to rise, which allows the pawl G and the ram carried thereby to descend, and as soon as the pawl G has reached the middle position the tension of the spring upon the arm G' is upward and tends to free the pawl from the rack. This same movement raises the pawl F until when it passes the middle position the tension of the spring upon the arm F' is downward, acting to throw the pawl into engagement with the ram. The action of the springs upon the pawls is the same whether one or both pawls move. By this means the ram may be gradually lowered to any degree, and when it is desired to suddenly release the
 65 ram and permit it to drop this may be accomplished by continuing the downward movement of the operating-lever B until the lug

B' thereof engages the trip-lever E, and thus frees the pawl G. By throwing the controlling-lever J to its lowest position or into engagement with the notch *k'* the springs L are caused to pull upward upon both arms F' and G' in all positions of the operating-lever B, thus holding both pawls clear of the ram.

The construction shown in Fig. 3 is one which employs the same principles, but slightly different mechanism. In this case the two pawls *f* and *g* instead of being located at approximately the same level are located one above the other. Each of these pawls is provided with side extending arms *f'* and *g'*, corresponding with the similar arms F' G' upon the pawls shown in Fig. 1. Instead of placing the two springs alongside of each other, as was done by reason of the nearness of the two pawls F and G, the spring in the device shown in Fig. 3 is placed between the two pawls. The arms *f'* and *g'* of the pawls are connected by the two links N and N' and interposed spring M, the links N and N' having registering slots N² in their inner ends. The spring M is shown as a coil-spring having its ends bent laterally at *m* and entering slot N² in both links N and N'. Any other form of spring which may be similarly attached to the parts may be used. The normal length of the links is maintained by the spring which acts to hold the slots in both links in exact registry, but will yield to allow the ends of the links to be separated or brought together when sufficient force is applied. To each of the pawls *f* and *g* are connected links O' and O², which at their other ends are connected with a bar O, pivoted by a pin *p*² to a bell-crank lever P, journaled upon a pin P², mounted in the frame A. Upon the same pin P² is mounted an arm Q, and about said pin is placed a spirally-coiled spring R, having the two ends thereof parallel and upon the same side of the pivot-pin. The arm Q and the arm P' of the bell-crank lever are provided, respectively, with pins *p'* and *p*, the latter being upon the bell-crank lever P. The pin *p'* upon the arm Q is also connected with a link J⁴, pivotally connected with the controlling-lever J², the latter being pivoted upon a pin J³, mounted upon the frame or standard A. The pins *p* and *p'* lie between the ends R' and R² of the spring R. This forms a yielding connection between the controlling-lever J² and the bell-crank lever P or in substance a yielding connection between the controlling-lever and the pawls. The pivot-pins *f*² and *g*² of the pawls are carried by a bar or plate, which is not shown in the figure, as it lies in front of the plane of view, said bar being given a vertical reciprocating movement to operate the jack by any suitable power connection. The operation of this device is substantially the same as that described for the device shown in Fig. 1. The central position of the controlling-lever J² is the one to be used when the ram is to be lowered. The upper position is the one which

clears the pawls from the ram, and the lower position is the one which holds the pawls to the ram or the one to be used in lifting with the jack. The spring R should be stronger than the spring M and capable of overcoming the resistance thereof.

In Fig. 4 the trip-dog is formed as a lever or bar E^2 , pivoted on the operating-lever B, and may be thrown down, so as to engage the trip-lever E, or upward, so as to clear it. This lever E^2 may be operated by direct hand engagement or by means of a link E^3 and controlling-lever J^6 , the latter being pivoted upon the operating-lever B. An essential feature of this jack is the provision of a spring or springs connected with two pawls and adjustable, so that they may be caused to act upon the pawls in either direction, which is equivalent to changing the location of the spring-support. This is done in the construction shown in Figs. 1 and 2. In Fig. 3 the same result is obtained by using a second spring which is stronger than the first and throwing it into action, so as to neutralize the effect of the first spring in one direction or the other.

It is obvious that various modifications of this construction may be used. I do not therefore wish to be limited to the exact construction shown in the drawings.

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

1. In a lifting-jack the combination of a standard or frame, a toothed lift-bar or ram, an operating-lever, two pawls adapted to engage the teeth of the ram, a spring acting upon both pawls to hold them in engagement with the ram, and an adjustable controlling-lever and spring connections from the controlling-lever to the pawls whereby the action of the spring between the pawls may be neutralized, substantially as described.

2. In a lifting-jack, the combination with a standard, or frame, a toothed lift-bar or ram,

a lever pivoted to the standard and having pawls pivoted thereon at opposite sides of its pivot and adapted to engage the teeth upon the ram, and a spring between the pawls acting to hold them in engagement with the ram, of a shifting pawl-controlling lever and a spring connection therefrom to both pawls whereby the action of the first-named spring may be neutralized.

3. In a lifting-jack, the combination with a standard or frame, a toothed lift-bar or ram, a lever pivoted to the standard or frame, and having pawls pivoted thereon at opposite sides of its pivot and adapted to engage the teeth upon the ram, of a shifting or pawl-controlling lever, a spring connection from said lever to both pawls, and a trip-lever connected with one of the pawls and adapted to be engaged by the operating-lever when in one extreme position.

4. In a lifting-jack, the combination with a standard or frame, a toothed lift-bar or ram, an operating-lever and a pawl-lever, both pivoted to the frame, connections between the two levers, and pawls upon opposite ends of the pawl-lever and engaging the lift-bar or ram, of springs connected to the pawls, and a shifting lever connected with the springs and controlling their action upon the pawls.

5. In a lifting-jack, the combination with a standard or frame, a toothed lift-bar or ram, an operating-lever and a pawl-lever, both pivoted to the frame, connections between the two levers, and two pawls upon opposite ends of the pawl-lever and engaging the lift-bar or ram, of spring connections to the pawls, and a trip-lever connected to one of the pawls and adapted to be engaged by the operating-lever when in one extreme position.

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Witnesses:

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