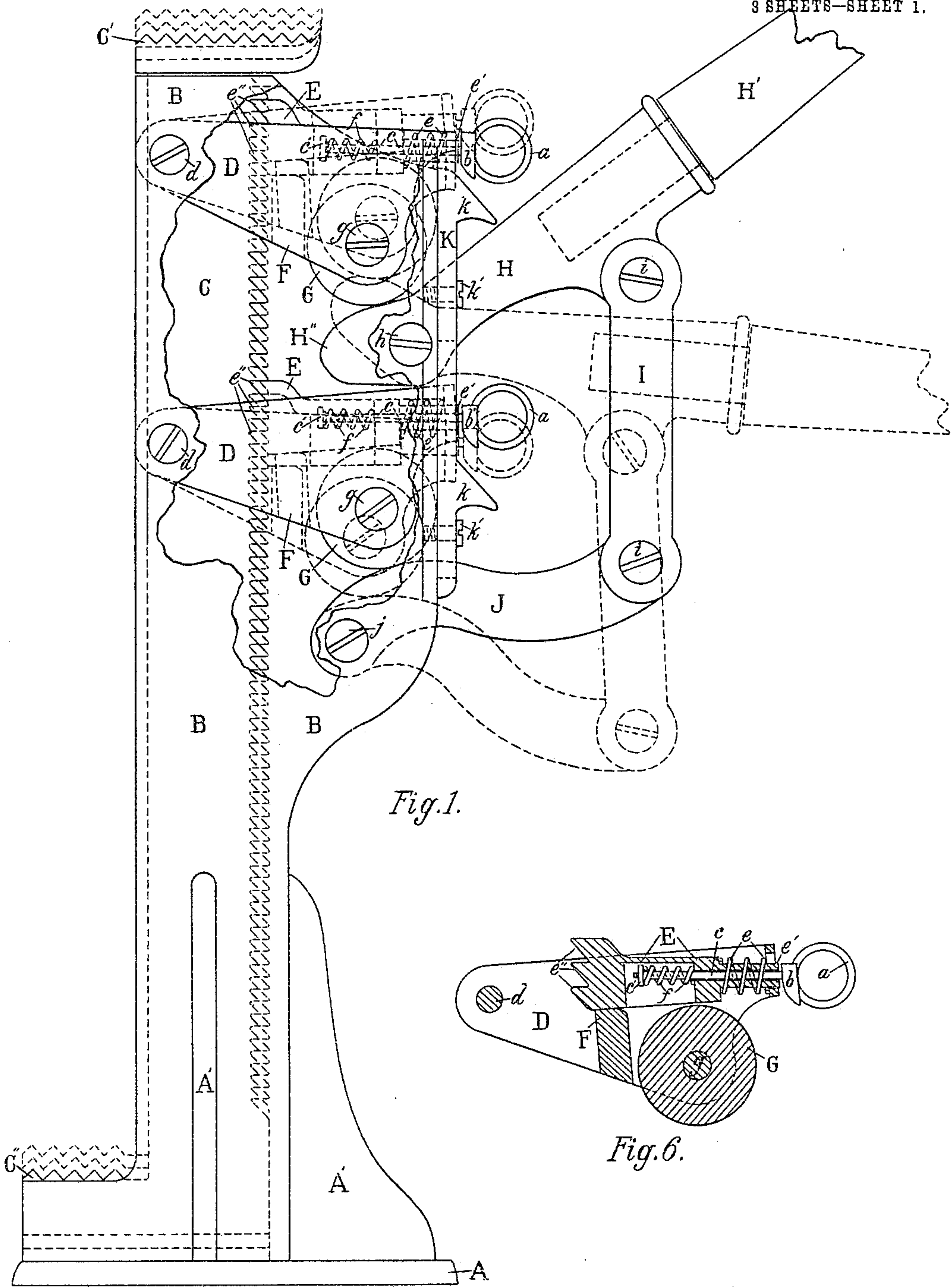


N. WEILER.
LIFTING JACK.

APPLICATION FILED SEPT. 9, 1904.

3 SHEETS—SHEET 1.



WITNESSES:

Paul A. Vierson
[Signature]

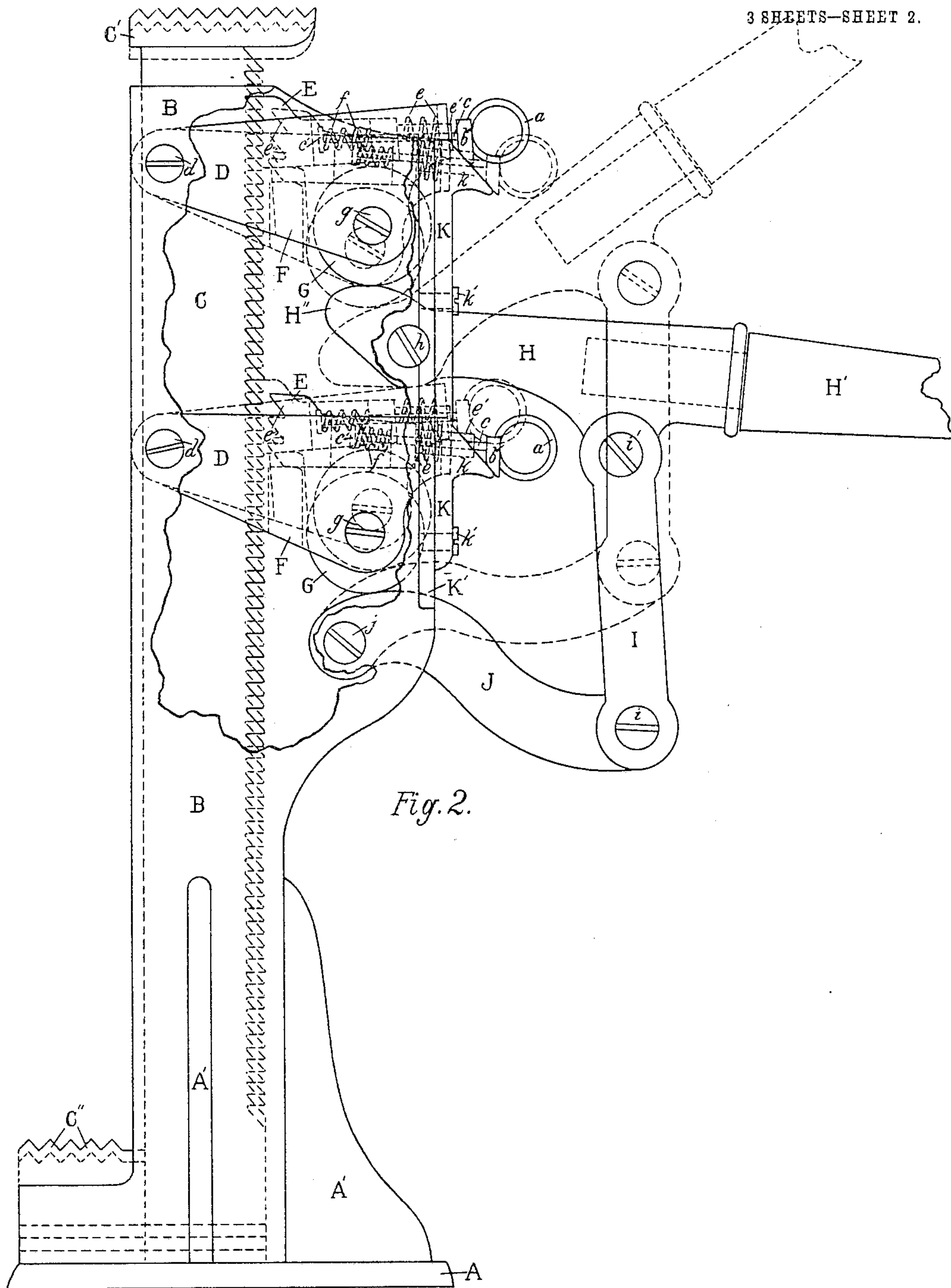
INVENTOR

N. Weiler
BY
H. C. Gardiner
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3 SHEETS—SHEET 2.



WITNESSES:

Paul A. Vierseu
Alexander Smith

INVENTOR

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UNITED STATES PATENT OFFICE.

NICK WEILER, OF SIOUX CITY, IOWA.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 793,167, dated June 27, 1905.

Application filed September 9, 1904. Serial No. 223,917.

To all whom it may concern:

Be it known that I, NICK WEILER, a citizen of the United States, residing at Sioux City, in the county of Woodbury and State of Iowa, have invented a new and useful Improvement in Lifting-Jacks; and I do declare the following to be a full, clear, and exact description of the same, so as to enable others skilled in the art to which it appertains to make and use said invention, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to lifting-jacks, and particularly to that kind which raises or lowers the load by a step-by-step movement, the mechanism being operated in one direction to raise the load, while means are provided to reverse the movement when the load is lowered.

The invention consists in the novelty of construction, arrangement, and combination of the various elements, as will be pointed out in the claims.

I have fully illustrated my invention in the accompanying drawings, in which—

Figure 1 is a view in side elevation, the mechanism being adjusted to raise the load, a portion of the frame being broken away to show the operation of the parts, the dotted lines showing the different positions which the parts assume. Fig. 2 is a like view illustrating the position of the parts when lowering the load. Fig. 3 is a view in front elevation. Fig. 4 is a front view of the upper part of jack with the operating levers and bars removed. Fig. 5 is a plan view of jack, and Fig. 6 is a detail view of section of pawl-carriage and pawl.

My invention consists in general of a frame inclosing a bar having teeth on one side, levers pivotally connected with the frame, pawls operated by springs and supported in pawl-carriages which are pivoted at one end in the frame and operated by the levers, and an adjustable bar attached to the frame for reversing the movement of the pawls.

Like parts are designated by similar letters of reference throughout the several views.

A designates the base of the frame, B the frame or general body of the jack, while A'

A' designate braces supporting the frame and formed with the frame and base.

C is the upright movable bar, racked or toothed on its front face, the inside of the frame forming a suitable passage or guide way for the bar, whose top C' is broadened to receive the weights to be lifted. A foot or projection C'' is formed near its lower end to receive the weights which are too low to be engaged by the top.

D D are pawl-carriages the sides of which are connected by the shelves F, on which rest the inner ends of the pawls E, the inner ends of the carriages being fulcrumed to the sides of the frame by the bolts d. At the outer ends of the pawl-carriages are rollers G, pivotally situated on the axes g, which also connect the opposite sides of the pawl-carriages. The rollers extend below the sides of the carriages and rest upon the fulcrumed levers presently described. The pawls are situated between the sides of their respective carriages, the outer ends e' being reduced and rounded and adapted to rest in annular openings in the outer ends of the carriages. The inner ends are somewhat enlarged and each have three teeth e'' for engagement with the racked bar C. Near the central part of each pawl the bottom portion is recessed or cut out, and the pawl between the recessed part and the outer end is annularly cored for the reception of a bolt e. A coil-spring e encircles the rounded part of the pawl, resting between the outer end of the carriage and the shoulder of the pawl formed by the reduction of the rounded part. The pawls being forced into engagement with the racked bar by the normal pressure of the springs e upon the inner surfaces of the outer ends of the carriages, when a reciprocating movement is imparted to the operating-levers the pawl-carriages and pawls are alternately elevated, pushing the rack upward. When it is desired to lower the load, the operation of the pawls is reversed by the action of the springs f, coiled about the bolts e, extending from the recessed parts of the pawls through the cores to the outer ends. Each of the springs f rests between the side of the cut-out part and

a nut c' on the inner or free ends of the bolts, which are always free from contact with the side of the cut-out part. The springs f are inoperative except during the reversing process and are of shorter diameter and stronger than the springs e .

The following means are provided for the operation of the pawls: The operating-lever H, having a handle H' , is fulcrumed to the frame of the jack by the bolt h , the inner end of the lever having a cam projection H'' , upon which rests the roller of the upper pawl-carriage. The curved lever J is fulcrumed to the frame underneath the lower pawl-carriage by means of the bolt j , the said lever curving upwardly at the inner end, upon which the roller of the carriage rests, which gives the lever an eccentric movement with reference to the roller. The outer end of the lever J is pivotally connected with the lower end of a vertical bar I by the bolt i , and said bar at its upper end is pivotally connected to the operating-bar H at about midway the length of said bar by the bolt i' . When the handle of the operating-lever is lowered to the position indicated by the dotted lines in Fig. 1, the thick part of the cam is brought under the roller of the upper carriage, thus elevating the carriage and pawl, and the pawl being held in engagement with the rack by the spring e the rack is forced upward. At the same time the inner end of the lever J is brought under the roller of the lower carriage, permitting this carriage to drop down, freeing the lower pawl of the load and allowing it to pass the teeth of the rack. When the handle of the lever is raised, the narrow part of the cam is under the upper roller, permitting the upper carriage to drop and the upper pawl to pass the teeth of the rack, while the curve of the lever J is brought under the lower roller, thus elevating the lower carriage and pawl and in turn raising the rack, the spring e in the lower pawl holding this pawl in engagement. Thus the reciprocating movement of the operating-lever alternately raises and lowers the pawl-carriages and causes the pawls to elevate the rack by alternately engaging its teeth.

When it is desired to reverse the action of the pawls, the following means are utilized: A narrow vertical bar K, having triangular projections k , is secured to the left side of the front face of the frame by means of the bolts k' , a thin plate K' separating the bar from the face of the frame. The bolts k' freely enter the slots l and l' in the bar K and permit a limited vertical movement of the bar. The upper slot l' being of irregular shape, the bar is retained in its raised position by adjustment of the slot to the upper bolt. Horizontal bars b , secured at one end to the bolts c , extend at right angles to the bar K, and the triangular-shaped heads b' , attached to the bars b , are adapted to come in contact with

and rest upon the triangular projections k when the vertical bar is raised. It is evident that if the pawls are alternately thrown outward at each stroke of the operating-lever the toothed rack is lowered instead of raised by the same process. To insure this movement, the pawls must be held from engagement with the rack until they pass the teeth and then forced into engagement therewith. After the bar K is raised and secured in the position shown in Fig. 2 the bar-heads b are each alternately in contact with the inclined faces of the projections k , and when the pawls are released by the action of the levers and the carriages drop down their weight rests upon said projections, which causes the bar-heads to slide along their inclined faces and forces outward the bolts c , compressing the springs e , while the pressure of the springs f overcomes that of the springs e and directs the pawls outward, holding them from engagement. When the pawl-carriages are again raised and the bar-heads are freed of the weight on the inclined projections of the vertical bar, the springs f are released. The springs e relax and at the proper moment direct the pawls into engagement. It will thus be seen that the elevation of the vertical bar K brings into operation the normally passive springs f and completely reverses the action of the pawls.

The rings a are secured to the outer ends of the bolts c in order that the pawls may be adjusted with the fingers should it ever become necessary. When it is desired to lower the load all at once, it may be done when the bar K is raised and both pawls are in engagement by first turning the ring a in the lower pawl and tightening the springs f , then with the fingers releasing the upper pawl and lowering the handle of the lever H. It will be seen that the ratchet or cog movement here shown may be applied with equal facility to a circular or ratchet wheel and is not limited to any particular device.

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

1. The combination of an upright movable bar having teeth on one side thereof, a frame forming a guide or passage way for said bar, pawl-carriages fulcrumed to said frame, rollers supported on axes underneath said carriages, pawls movable in said carriages and adapted for engagement with the teeth of said bar, springs in said carriages adapted for normally holding said pawls in engagement, and levers fulcrumed to the frame beneath said rollers adapted to alternately elevate said carriages and pawls whereby the toothed bar is raised, substantially as set forth.

2. The combination of an upright movable bar having teeth on one side thereof, a frame forming a guide or passage way for said bar, two pawl-carriages fulcrumed at the inner

ends to said frame one above the other, rollers underneath said carriages on which the weight of the carriages is adapted to rest, pawls movable in each of said carriages adapted for engagement with said bar, springs in said carriages to normally hold said pawls in engagement, a lever fulcrumed to said frame beneath the upper carriage, a cam projection on said lever on which the roller of the upper carriage is adapted to rest, a curved lever fulcrumed beneath the lower carriage on which the roller of said carriage is adapted to rest, and a bar pivotally connecting the outer end of said curved lever with said first lever, substantially as described.

3. The combination with an upright movable bar having teeth on one side thereof, a frame supporting said bar, of pawl-carriages fulcrumed to said frame, rollers on which said carriages are adapted to rest, pawls movable in said carriages and adapted for engagement with said bar, springs in said carriages for normally holding said pawls in engagement, and means applied to said rollers for alternately elevating said carriages and pawls whereby said bar is raised, substantially as described.

4. The combination with a frame, an upright movable bar having teeth on one side thereof, of pawl-carriages fulcrumed to the frame, rollers in said carriages on which the carriages are adapted to rest, pawls E supported in said carriages and adapted for engagement with said bar, springs *e* for holding said pawls in engagement, and levers fulcrumed to the frame and applied to the rollers for alternately elevating said carriages and pawls, substantially as specified.

5. The combination of an upright movable bar having teeth on one side thereof, a frame supporting said bar, two pawl-carriages D the inner ends of which are fulcrumed to the frame one above the other, rollers in said carriages on which the carriages are adapted to rest, pawls E supported in said carriages and adapted for engagement with said bar, springs *e* to normally hold said pawls in engagement, levers H and J fulcrumed to the frame underneath said carriages and pivotally connected by the bar I, and a cam projection H' on the end of said lever H, substantially as described.

6. The combination of an upright movable bar having teeth on one side thereof, a frame supporting said bar, pawl-carriages fulcrumed to said frame, rollers underneath said carriages, pawls movable in said carriages and adapted for engagement with said bar, springs for normally holding said pawls in engagement, levers fulcrumed to said frame and adapted to be applied to said rollers for alternately elevating said carriages and pawls, and means for overcoming the pressure of said springs and alternately throwing said pawls outward at each stroke of said levers and holding said pawls from engagement while the bar

passes the teeth of said pawls, substantially as described.

7. The combination of a frame, an upright movable bar having teeth on one side thereof, pawl-carriages fulcrumed to said frame, rollers underneath said carriages, pawls movable in said carriages and adapted to engage said bar, said pawls being recessed on one side and cored from the recessed parts to the outer ends, springs for normally holding said pawls in engagement with said bar, bolts extending through said cores from the recessed parts of said pawls to the outer ends thereof and having nuts on the inner or free ends, coil-springs on the inner ends of said bolts between said nuts and the opposite sides of said recessed parts, said springs being stronger than the first-mentioned springs, levers fulcrumed to the frame and adapted to be applied to said rollers for alternately elevating said carriages and pawls, and means for withdrawing the bolts in said pawls and compressing the coil-springs therein as said carriages descend, substantially as specified.

8. The combination of a frame, an upright movable bar having teeth on one side thereof, pawl-carriages fulcrumed to the frame, rollers underneath said carriages supporting the same, pawls movable in said carriages and adapted to engage said bar, said pawls being recessed on one side and cored from the recessed parts to the outer ends, springs to normally hold said pawls in engagement, bolts extending through said cores from the recessed parts to the outer ends of said pawls and having nuts on the inner or free ends thereof, coil-springs on the inner ends of said bolts between said nuts and the opposite sides of said recessed parts, said springs being stronger than said first-mentioned springs, levers fulcrumed to the frame and adapted to be applied to said rollers for alternately elevating said pawl-carriages and pawls, horizontal bars secured at one end to the outer ends of said bolts and extending at right angles therefrom, heads secured to the free ends of said bars having inclined faces on the under surface thereof, a vertical bar movably secured to the frame and having inclined projections thereon on which the inclined faces of said horizontal bars are adapted to rest, means for raising and securing said vertical bar so that the weight of said carriages rests on said projections when the carriages descend, substantially as described.

9. The combination of a frame, an upright movable bar having teeth on one side thereof, pawl-carriages D fulcrumed to said frame, pawls E supported in said carriages and adapted to engage said bar, springs *e* for normally holding said pawls in engagement, bolts *e* extending through the cores of said pawls, springs *f* on the inner or free ends of said bolts, rings *a* secured to the outer ends of said bolts, bars *b* secured at one end to said bolts

and extending horizontally therefrom, heads b' secured to the outer ends of said bars; a vertical bar K having slots l and l' therein and the inclined projections k thereon, bolts 5 secured to said frame and freely entering said slots, and means for alternately elevating said carriages and pawls, substantially as specified.

10 10. In a lifting-jack, the pawl-carriages D fulcrumed to the frame of the jack, rollers on which said carriages are adapted to rest, pawls E supported in said carriages, springs for normally holding said pawls in engagement, bolts c extending through said pawls and coil-springs f situated thereon, means for over- 15 coming the pressure of said springs and alternately throwing said pawls outward and holding them from engagement, and levers ful-

crumed to the frame and adapted to be applied to said rollers for alternately elevating said carriages and pawls, substantially as described. 20

11. The combination of a ratchet, pawl-carriages pivotally connected therewith, pawls movable in said carriages and rollers in said carriages on which the carriages are adapted to rest, with levers having an eccentric movement with reference to said rollers, substantially as specified. 25

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

NICK WEILER.

Witnesses:

W. F. LOHR,

H. C. GARDINER.