

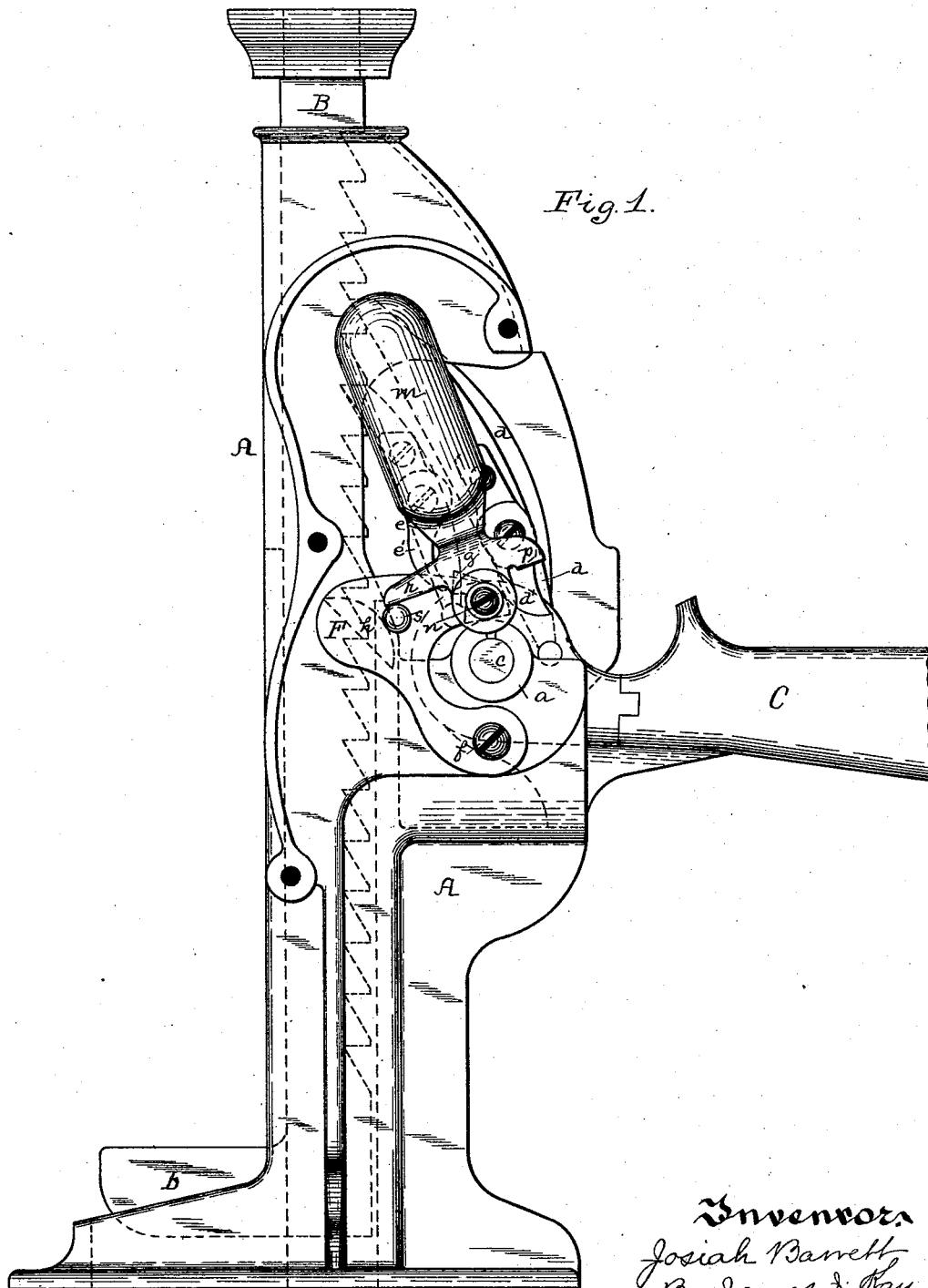
(No Model.)

3 Sheets—Sheet 1.

J. BARRETT.
LIFTING JACK.

No. 455,993.

Patented July 14, 1891.



Witnesses:
J. H. Cooke.
Robt. D. Tatten

Inventor.
Josiah Barrett
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Attorney

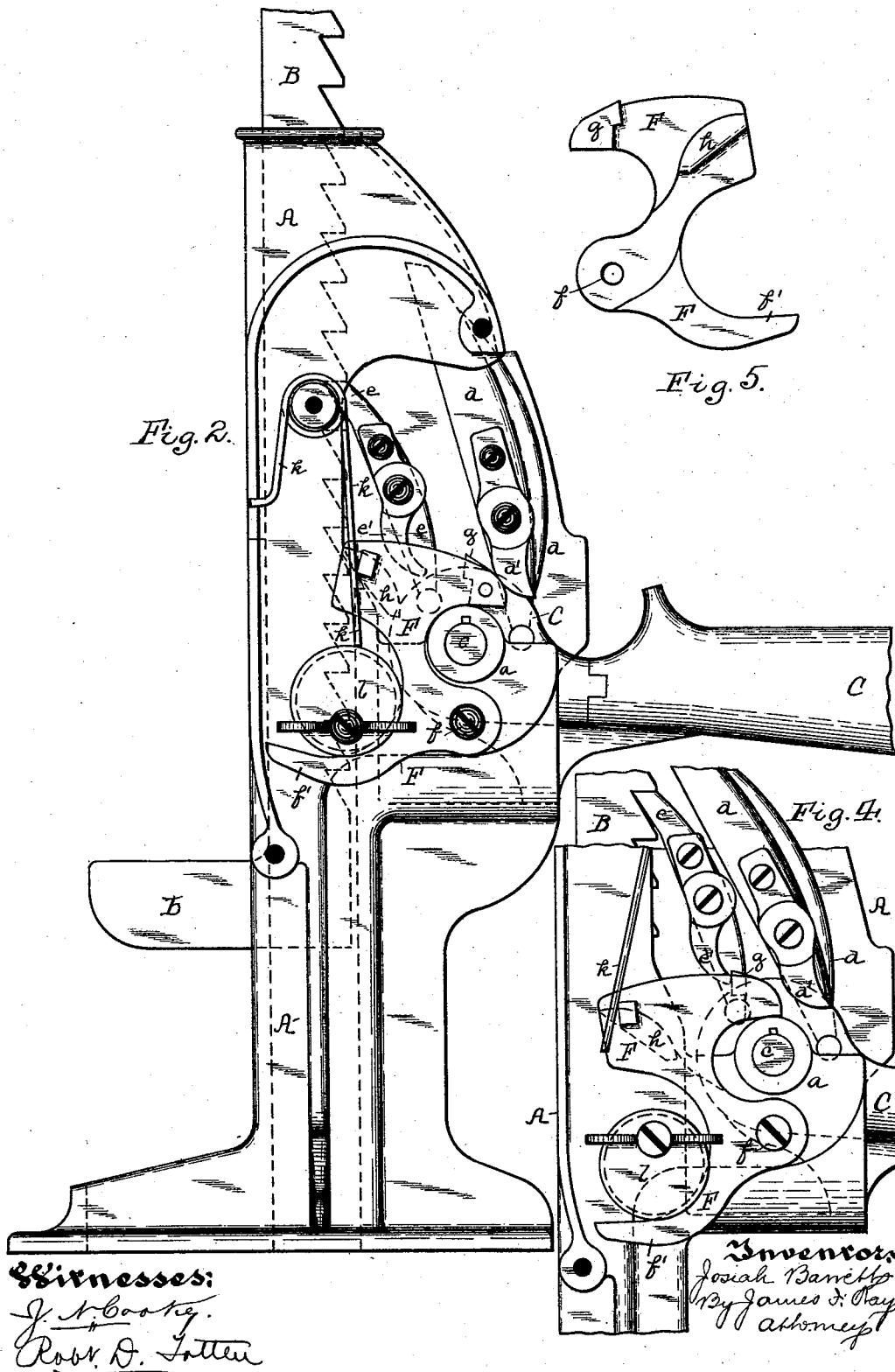
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3 Sheets—Sheet 2

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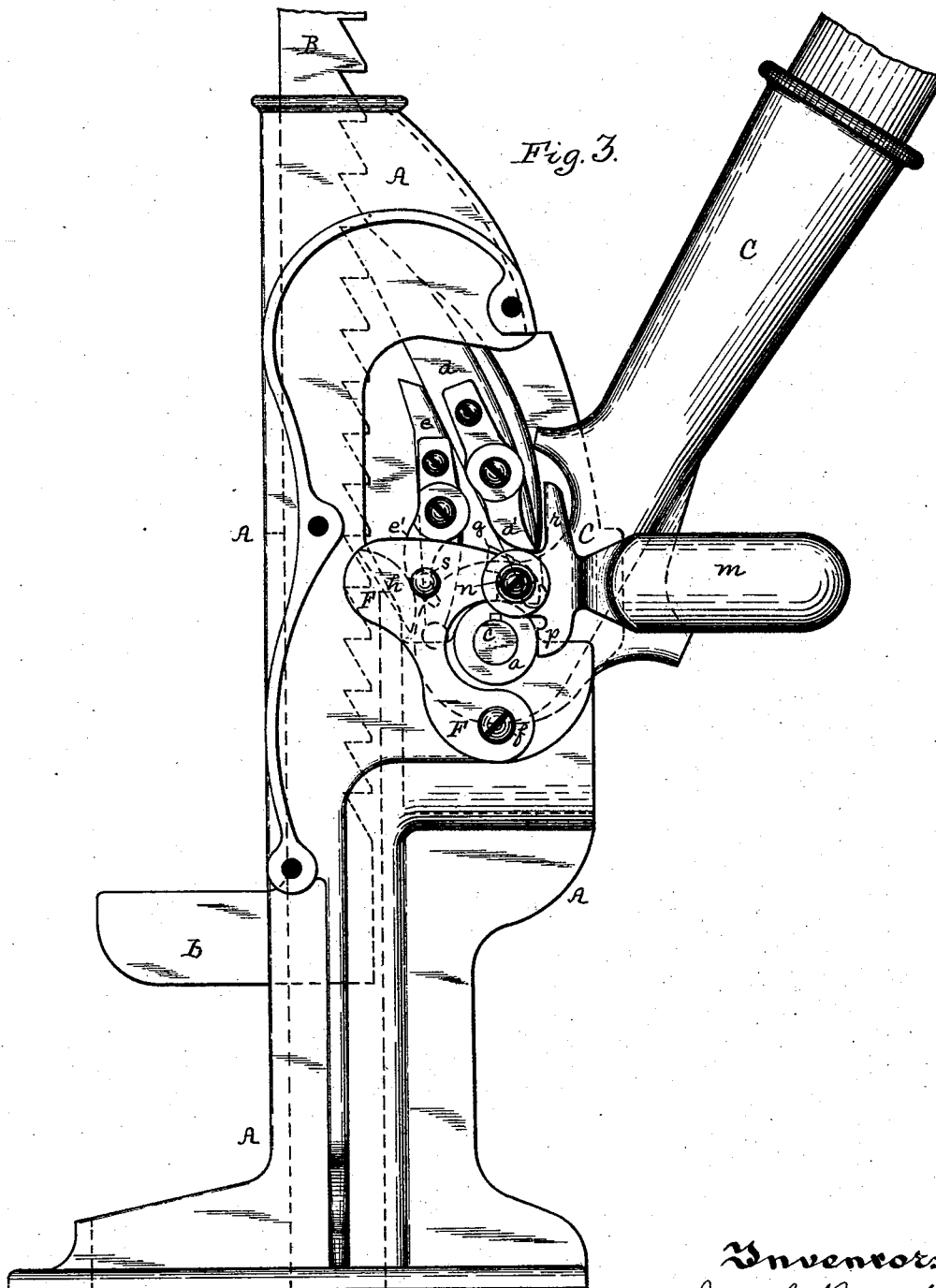
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3 Sheets—Sheet 3.

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LIFTING JACK.

No. 455,993.

Patented July 14, 1891.



Witnesses:
J. H. Cook,
Ross D. Totten

Inventor
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UNITED STATES PATENT OFFICE.

JOSIAH BARRETT, OF ALLEGHENY, ASSIGNOR TO THE DUFF MANUFACTURING COMPANY, OF PITTSBURG, PENNSYLVANIA.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 455,993, dated July 14, 1891.

Application filed February 13, 1891. Serial No. 381,275. (No model.)

To all whom it may concern:

Be it known that I, JOSIAH BARRETT, a resident of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Lifting-Jacks; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to what might generally be termed "lifting-jacks"—that is, to power mechanism in which a step-by-step movement back and forth is obtained, said mechanism being actively operated in one direction to move or raise a load and passively operative in the other direction to control the movements of a load, such as in lowering a load lifted by the jack. By such terms it is of course to be understood that the invention includes any device embodying its principle, whether the power is exerted in a vertical, horizontal, or other line.

My invention relates to the same general class of jacks as set forth in Letters Patent No. 312,316, granted to me February 17, 1885, and has practically the same objects in view.

It consists, generally stated, in a jack having a bar provided with teeth on one side thereof and hand or operating lever pivoted therein, two pawls pivoted to the lever and engaging with the toothed bar, fingers rigid with said pawls, and a yielding tripping-plate having lugs thereon adapted to engage with the fingers of the pawls and by the pressure thereof to withdraw the pawls from engagement with the toothed bar, so that while the jack can operate in substantially the same way as described in said Patent No. 312,316 in raising the load, where it is desired to lower the load the tripping-plate is brought into position for engagement with the fingers of the pawls and as one or the other pawl is drawn downwardly its finger will press against the tripping-plate, which plate will then yield until that pawl is relieved of the weight of the load by the other pawl, when the pressure exerted by the tripping-plate through said finger will draw the pawl away from this toothed bar and hold it from the same until it is raised into position to again engage therewith. The particular points of the invention

desired to be covered will be hereinafter set forth and claimed.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a side view, partly broken away, illustrating the jack and showing the position of the parts when the jack is arranged for raising a load, showing a weighted lever operating the yielding tripping-plate. Fig. 2 is a like view showing the position of the parts when arranged for lowering the load, showing the upper or outer pawl withdrawn, and also showing the power applied to the tripping-plate by a spring. Fig. 3 is a like view showing the inner or lower pawl withdrawn, and showing the power applied to the tripping-plate by the weighted lever. Fig. 4 is a detail view showing the position of the parts of Fig. 2, and Fig. 5 is a back view of the tripping-plate.

Like letters indicate like parts.

The general body of the jack and toothed bar in the preferred form thereof correspond to those shown in said Patent No. 312,316, and need not be particularly described herein, the frame or stand A being generally rectangular in cross-section and having a like passage or guideway therein for the lifting-bar B, said toothed or lifting bar having the foot *b*, which fits within the ordinary slot formed in the forward face of the jack. The bar B has the teeth formed only on one side thereof, so that the two pawls will engage with this one ratchet or toothed face.

The frame or stand A of the jack has formed therein the socket or bearing *a* for the reception of the inner end of the operating or hand lever C, and pivoted to this hand-lever are the pawls *d e*, these pawls being preferably arranged as described in said patent—that is, being pivoted on each side of the fulcrum-pin *c* of the hand-lever. The inner pawl *e* is pivoted forward of the fulcrum-pin, and hence is adapted to engage with and raise the toothed bar when the hand-lever C is lowered, and the outer pawl *d* is pivoted back of the fulcrum-pin *c* and is of greater length than the pawl *e*, so that it engages with the toothed bar

above the same and is adapted to engage with and raise said toothed bar when the hand-lever C is raised. The pawl *e* has rigidly secured thereto the finger *e'*, which preferably extends downwardly therefrom, and the pawl *d* has a like finger *d'* rigidly secured thereto and preferably extending downwardly therefrom, these two fingers being adapted to engage with the tripping-plate F. The exact shape of the fingers is not particular. The tripping-plate is mounted in any suitable way upon the jack-frame A, being shown in the drawings as pivoted to the same at *f*, though it is evident that it may be mounted to slide therein, as shown in said Patent No. 312,316. Said tripping-plate has the two lugs *g* *h*, which are formed on the inner side thereof, and are shown in dotted lines in the figures of the drawings, and are in such position that when it is desired to lower the toothed bar and the tripping-plate is brought into its operative position the lugs of the plate will be adapted to engage with the rigid fingers of the pawls when said pawls respectively are lowered.

The tripping-plate can be operated by any suitable power, either by a spring, as shown at *k*, Figs. 2 and 4, or by a weight, as shown in Figs. 1 and 3. In either case the tripping-plate is yielding, so that when one of the fingers on the pawls engages therewith, as the pawl is in engagement with the toothed bar and the finger is rigid therewith, the tripping-plate will itself yield until the other pawl takes the load and frees that pawl, when the pressure applied to the tripping-plate through the spring or weight will be transmitted through the finger to the pawl and draw it away from engagement with the toothed bar.

Where a spring is used, as shown in Figs. 2 and 4, it is necessary to employ some suitable mechanism for holding the tripping-plate F out of engagement with the fingers of the pawls when the jack is raising the load; and for this purpose I have illustrated an eccentric *l*, adapted to engage with an arm *f'* on the tripping-plate, and when turned to hold the tripping-plate back from engagement with said fingers *d' e'*, but when turned in the opposite direction leaving said tripping-plate free to contact with and yield to the pressure of said fingers, as above described. This same eccentric may be employed when a weight is used to apply the pressure to the tripping-plate; and the construction of the jack when so arranged will be easily understood. This spring-operated yielding tripping-plate forms the subject-matter of application for patent filed by me April 30, 1890, No. 391,066, which is in part a division of this application.

When, however, a weight is employed to apply the pressure to the tripping-plate, I prefer to arrange it as shown in Figs. 1 and 3, the weight *m* being pivoted at the upper end of the tripping-plate, as at *n*, and said pivoted weight having one lug *p* adapted to press against the bearing *a* of the hand-lever C, so that when the weight is brought into the po-

sition shown in full lines in Fig. 3, as the lug *p* bears against the bearing *a*, the pressure of the weight will be exerted to draw the tripping-plate F backward and bring its lugs *g* and *h* into contact with the fingers *d' e'*. When, however, it is desired to raise the toothed bar, the weighted lever *m* can be swung on its pivot *n* until the lug or finger *r* of the lever bears against a pin *s* on the tripping-plate, and by such movement the lever is thrown past a perpendicular, as shown in Fig. 1, and will then act by its pressure on the pin *s* to hold the tripping-plate out of contact with the fingers *d' e'*.

It is evident that, if desired, I may employ the weight *m*, mounted in substantially the way above described, together with a tripping-plate having the finger *f'*, and an eccentric *l*, and by said finger and eccentric may draw back the lifting-plate in the same manner as described in connection with the spring *k*, (shown in Fig. 2,) and so overcoming the necessity of mounting the weight, so that it can be swung past a perpendicular, as above described.

The operation of the jack is substantially the same whether the weight shown in Figs. 1 and 3 or the spring shown in Figs. 2 and 4 is employed. When it is desired to lift the load, I either throw over the weight *m*, so that it bears against the pin *s*, as shown in Fig. 1, or I turn the eccentric so that it engages with the finger *f'* of the tripping-plate and compresses the spring and draws the lugs of the tripping-plate away from the fingers of the pawls. In either case the pawls will by their own weight rest in contact with the notched face of the lifting-bar, and as the hand-lever C is raised it will, through the pawl *d*, raise the lifting-bar, the pawl *e* then descending and slipping over the notched face of the bar, and when the hand-lever is lowered the pawl *e* will engage with the bar and raise the same, while the pawl *d* descends, slipping over the notched face of the bar. This is continued, the one or the other pawl engaging with and lifting the bar B until the load is raised to the desired height.

When it is desired to reverse the motion of the bar B, either to lower the load or, where the jack is worked horizontally, to permit the lifting-bar to be gradually pressed back while its motion is controlled, I either draw back the weight *m* into the position shown in Fig. 3 or turn the eccentric *l* so as to leave the same free to be carried into position to engage with the fingers *d' e'* of the pawls *d e*. When in such position, as the hand-lever C is lowered the lifting-bar will be sustained by the pawl *d* until the finger *d'* comes against the shoulder *g* of the tripping-plate F, in which case the tripping-plate will yield until the pawl *e* engages with the lifting-bar and acts to sustain the weight, when, as soon as the pawl *d* is free, the pressure upon the tripping-plate will, through the finger *d'*, force the pawl *d* outwardly, so drawing it away

from the tripping-plate. As the hand-lever C is raised the lifting-bar will be lowered by the pawl *e*, which is in engagement therewith, this being continued until the finger *d'* passes from the shoulder *g* of the tripping-plate, leaving the pawl *d* free to fall into contact with the lifting-bar, and as the operator continues to raise the lever *c* the finger *e'* of the pawl *e* will come in contact with the shoulder *h* of the tripping-plate, causing said plate to yield until the pawl *d* has taken the weight of the lifting-bar, when, as soon as the pawl *e* is freed from said bar, the tripping-plate will, by its pressure on the finger *e'*, draw away the pawl *e* of the lifting-bar, holding it away from the same until upon the lowering of the hand-lever the finger *e'* is raised clear of the shoulder *d*, when the pawl *e* will fall against the lifting-bar in position to engage therewith and receive the load from the pawl *d*; and the finger *d'* of that pawl will again come in contact with the shoulder *d*, and, as soon as that pawl is free, lift it away from the lifting-bar, as above described, this being continued until the load is lowered as far as desired.

It will thus be seen that by the employment of a yielding tripping-plate and rigid fingers on the lifting-pawls a very simple form of jack is obtained, and one which is not liable to get out of order, and it contains but few parts.

As above referred to, in the term "lifting-jack" I include any mechanism in which one main part or element thereof has a step-by-step movement which is actively operative in one direction to move or raise a load and passively operative in the opposite direction either to lower the load or to control its movement, whether the same acts vertically, horizontally, or in any other direction.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a jack, the combination of a bar having teeth on one side thereof, a pivotal lever, two pawls pivoted to said lever and having fingers rigid therewith, and a yielding tripping-plate having lugs thereon adapted to engage with said fingers and through the same draw the pawls from engagement with the toothed bar, substantially as and for the purposes set forth.

2. In a jack, the combination of a bar having teeth on one side thereof, a pivotal lever, two pawls pivoted to said lever and having fingers rigid therewith, and a yielding tripping-plate pivoted to the jack-frame and having lugs thereon adapted to engage with said fingers, substantially as and for the purposes set forth.

3. In a lifting-jack, the combination of a bar having teeth on one side thereof, a pivotal lever, two pawls pivoted to said lever and having fingers rigid therewith, a yielding tripping-plate having lugs thereon adapted to engage with said fingers, and a pivoted weight engaging with said tripping-plate, substantially as and for the purposes set forth.

4. In a jack, the combination of a bar having teeth on one side thereof, a pivotal lever, pawls pivoted to said lever and having fingers rigid therewith, a yielding tripping-plate having lugs thereon adapted to engage with said fingers, and the weight *m*, pivoted to said tripping-plate and having the lug *p* engaging with the stationary frame, substantially as and for the purposes set forth.

5. In a jack, the combination of a bar having teeth on one side thereof, a pivotal lever, two pawls pivoted to said lever and having fingers rigid therewith, the tripping-plate *F*, and the weight *m*, pivoted to said plate and having the lug *r*, adapted to press upon the tripping-plate, substantially as and for the purposes set forth.

6. In a jack, the combination of a bar having teeth on one side thereof, a pivotal lever, a pawl pivoted to said lever and having a finger rigid therewith, and a yielding tripping-plate mounted on the frame and having a lug adapted to contact with said finger and through the same draw the pawl from engagement with the toothed bar, substantially as and for the purposes set forth.

In testimony whereof I, the said JOSIAH BARRETT, have hereunto set my hand.

JOSIAH BARRETT.

Witnesses:

J. N. COOKE,
ROBT. D. TOTTEN.