

No. 635,105.

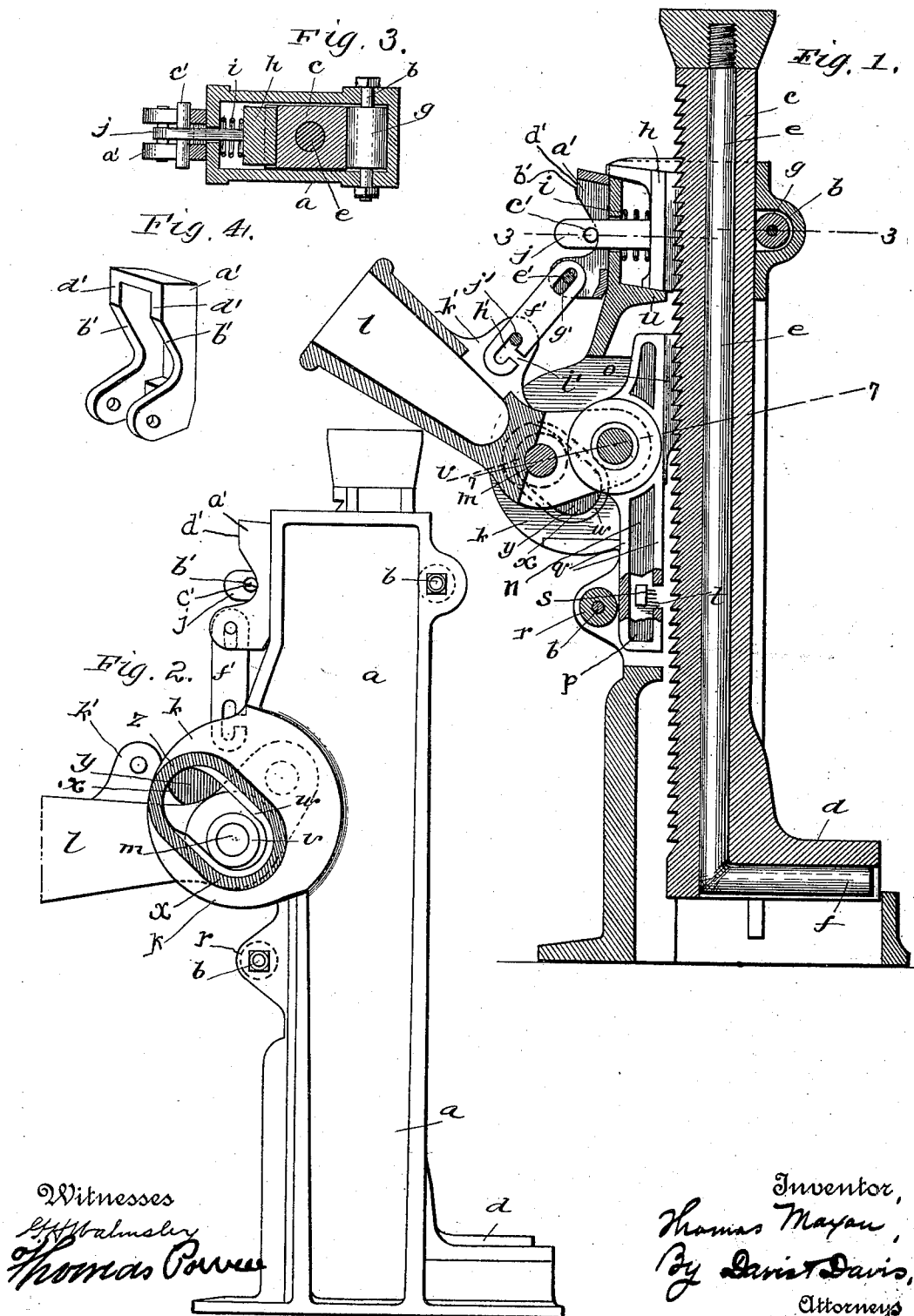
Patented Oct. 17, 1899.

T. MAXON.
LIFTING JACK.

(Application filed June 8, 1899.)

(No Model.)

2 Sheets—Sheet 1.



No. 635,105.

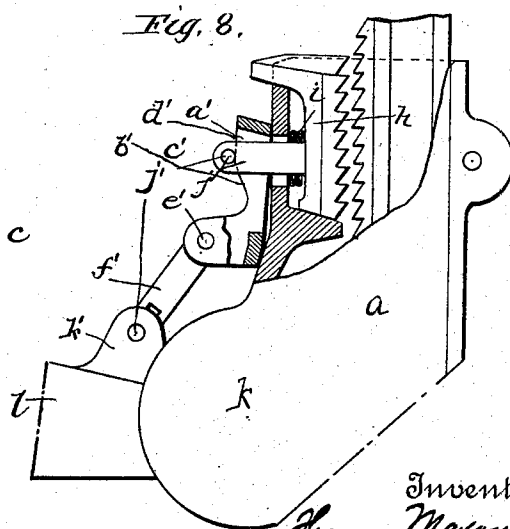
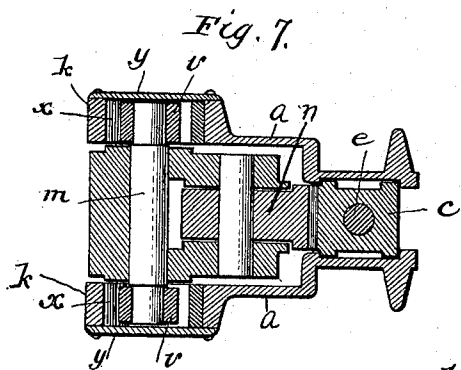
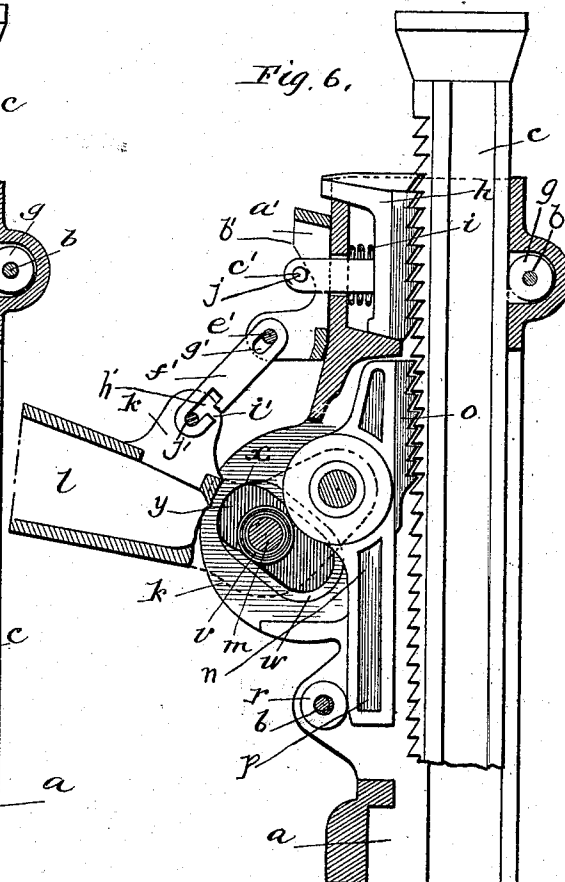
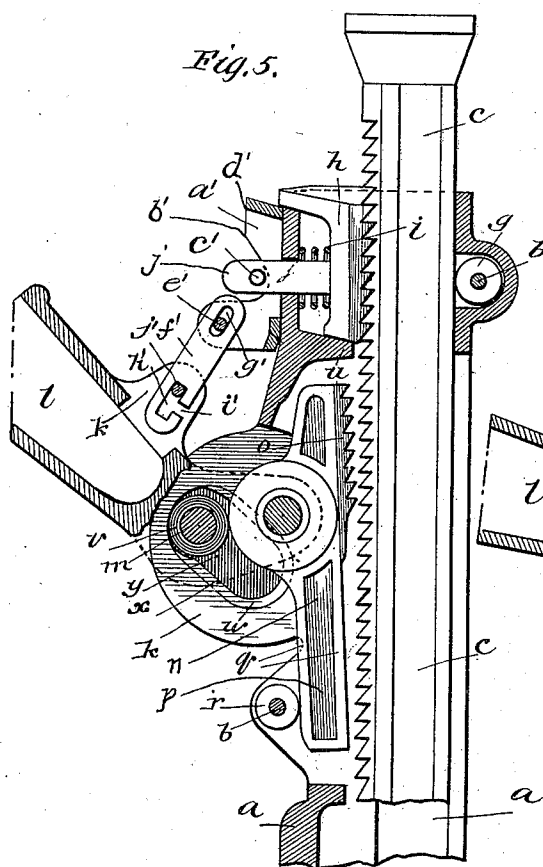
Patented Oct. 17, 1899.

T. MAXON.
LIFTING JACK.

(Application filed June 8, 1899.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses
S. H. Halmesly
Thomas Corwell

Inventor,
Thomas Maxon,
By David Davis,
Attorneys

UNITED STATES PATENT OFFICE.

THOMAS MAXON, OF DAYTON, OHIO.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 635,105, dated October 17, 1899.

Application filed June 8, 1899. Serial No. 719,827. (No model.)

To all whom it may concern:

Be it known that I, THOMAS MAXON, a citizen of the United States, residing at Dayton, in the county of Montgomery, State of Ohio, have invented certain new and useful Improvements in Lifting-Jacks; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention is designed to provide a strong and durable lifting-jack of that class wherein the load is adapted to be let down, when occasion may require, gradually by a step-by-step movement, as more fully herein-after set forth.

Referring to the drawings, Figure 1 represents a vertical sectional view, a part only of the lifting-pawl being shown in section at its lower end; Fig. 2, a side elevation with one of the flanges surrounding the fulcrum-slots in section; Fig. 3, a horizontal section on the line 3 3 of Fig. 1; Fig. 4, a detail perspective of the cam device for operating the retaining-pawl when gradually lowering the load; Figs. 5 and 6, vertical sectional views with the lower portions of the standard and lifting-bar broken away, these views showing the devices in the various positions assumed in letting down the load gradually step by step; Fig. 7, a section on the line 7 7 of Fig. 1, and Fig. 8 a detail of the cam device and releasing-pawl in one of the positions they assume in letting down the load gradually.

Referring to the drawings by letters, *a* designates the hollow standard, in which works the lifting-bar *c*, which is provided with the usual ratchet-teeth on its rear edge and is cast with a lifting foot or toe *d* at its lower end. The lifting-bar is cored out throughout its length, so as to equalize the iron at all points, and fitted nicely in said vertical passage is a steel bolt *e*, which is provided with a foot-piece *f* at its lower end which extends forward to the outer end of the foot *d* and lies in a channel or recess formed in the under side thereof, said bolt being drawn taut by a suitable nut at its upper end. This bolt

greatly strengthens the bar, as well as the lifting-foot, this latter feature being important.

Journaled in the casing or standard, near the upper end thereof, upon a pin *b* is a horizontal roller *g*, against which bears the front edge of the lifting-bar, whereby friction is avoided at that point. A retaining-pawl *h* is mounted in a recess in the upper end of the casing and is kept normally pressed against the lifting-bar by a spring *i*, which surrounds the operating-pin *j*, which latter extends out to an opening in the rear wall of the casing, whereby the pawl may be released from the lifting-bar by hand or by other means herein-after described.

At a point a suitable distance below the retaining-pawl the respective parts of the casing are provided with rearward-extending integral brackets *k*, which are separated from each other a sufficient distance to receive the end of the operating-lever *l*, the extreme inner end of the operating-lever beyond the fulcrum-pin *m* being bent inward and upward and being bifurcated for the reception of the pivoted lifting-pawl *n*, which is provided at its upper end, above its pivotal connection with the lever, with a series of teeth *o*, these teeth being made of case-hardened steel and fastened to the inner face of the pawl. The pawl works vertically in an opening in the rear wall of the casing and is provided with a depending tailpiece *p*, which is provided with vertical flanges *q* on its side faces for the purpose of lightening and strengthening it. The tail portion of the pawl is prevented from swinging outward by means of a case-hardened-steel roller *r*, journaled upon a horizontal pin or bolt carried by the standard, and one of the inner walls of the casing is provided with a lug *s*, which assists in vertically guiding the pawl, preventing it swinging inward against the ratchet-teeth on the lifting-bar, said lug lying between the flanges *q*, one of the flanges being cut away at *t* to permit the pawl to be inserted in its place between the walls of the casing. The upper end of the pawl, when the pawl is at the upper limit of its stroke, abuts against the stop *u*, which is a part of the casing. The fulcrum-pin *m* is made of steel and is rigidly fixed in the lever, its projecting ends carry-

ing case-hardened-steel rollers *v*, which work in U-shaped case-hardened-steel bushings *w*, fitted in flanged slots *x*, formed in the brackets *k*, said slots inclining upward and rearward. The slots are covered by means of removable plates *y*, fastened to the flanges *z* around the slots.

The operation of lifting is obvious. Upon each downward stroke of the lever the lifting-pawl engages the lifting-bar and raises the same, the retaining-pawl being forced outward by a cam action of the lifting-teeth on the bar and automatically springing into engagement again when the upward movement of the lifting-bar ceases. To drop the bar, it is simply necessary to withdraw the retaining-pawl by hand or otherwise, the lifting-pawl being disengaged from the lifting-bar by drawing the operating-lever outward until rollers *v* enter the outer or upper extremity of the slots *x*, the tail portion of the pawl bearing against roller *r*, this roller serving as a pivot, as shown most clearly in Fig. 5. The slots *x* are slightly enlarged or turned slightly backward at their upper extremities to facilitate this movement, the rollers passing into this enlarged or angular extremity of the slots, as shown in said Fig. 5. In the operation of lifting the rollers do not move into the bent or enlarged portions of the slots, but simply roll back and forth upon the bushings.

It will be observed that the rollers not only serve to reduce the friction of the pawl in its vertical movements, but also serve as a pivot when the upper part of the pawl which carries the lifting-teeth is swung outward out of engagement with the lifting-bar, and it will also be observed that the bushings *w* take up all the wear in the slots and may be renewed when worn. In fact, it will be observed that all the parts which are likely to become worn by the severe strain and friction that jacks of this sort are subjected to are removable and renewable.

The devices for letting down the load step by step are very simple, consisting of a cam-wedge *a'*, embracing the pin *j* and adapted when drawn down to have its cam edges *b'* bear against the projecting portions of a transverse pin *c'*, carried by said pin *j*, and thereby withdraw the retaining-pawl from the lifting-bar and hold it out, the inclined cam edges *b'* terminating at their upper ends in straight portions *d'* in order to hold the pawl positively out of engagement. Between the walls of the lower end of the cam-wedge is pivotally swung upon a pin *e'* a swinging link *f'*, which is adapted to swing loosely inward and outward and has a limited vertical movement by reason of the slot *g'* where pin *e'* passes through it. This link is provided at its lower end with a longitudinal slot *h'*, this slot having the entrance-opening *i'*, whereby the link may be engaged with and disengaged from horizontal pin *j*, fixed rigidly in a pair of upwardly-extending ears *k'* upon the lever

70 *l*. When the letting-down devices are not in use, the cam rests normally on pin *c'*, and the link *f'* swings loosely from the cam, its lower end lying between the brackets *k*.

To let down the load step by step, it is simply necessary to draw down or depress the operating-lever until the cam disengages the retaining-pawl, care being taken to first see that the lifting-pawl is raised to the limit of its upward stroke, the pawl in Fig. 5 being shown in the act of being lifted preparatory to withdrawing the retaining-pawl. When the retaining-pawl is out, the weight will be thrown upon the lifting-pawl and through it to the operating-lever. The operator then allows the lever to be raised by the downward pressure of the load. Then when the load has descended a distance of one or more teeth, according to the size of the teeth and the adjustment of the parts, the lost motion caused by the slots in the link *f'* will have been taken up and the link will push up the cam and disengage the retaining-pawl, permitting the same to spring into engagement with the lifting-bar. To repeat, the operator draws out the operating-lever far enough to disengage the lifting-pawl from the lifting-bar, as shown in Fig. 5, then depresses the lever, allowing it to swing inward, so that the lifting-pawl will again engage the lifting-bar just below stop *u*, as shown in Fig. 5. Then by continuing to depress the lever the retaining-pawl will be drawn out and held out of engagement until the lifting-bar is lowered the desired distance, whereupon it is again automatically tripped by the continued upward movement of the lever, the weight being again thrown upon the operating-lever through the medium of the lifting-pawl.

I claim—

1. In a lifting-jack, the combination of a standard, a lifting-bar, a retaining-pawl, a lifting-pawl provided with teeth at its upper end, said pawl being provided with a depending tail portion, a bearing part, as a roller, carried by the standard and adapted to receive the outward thrust of the tail portion, and an operating-lever pivotally supported on the standard and pivotally connected to the lifting-pawl near its upper end and adapted to swing inward and outward as it is vibrated vertically, whereby when the toothed upper portion of the pawl is disengaged from the lifting-bar by swinging outward the upper end of the pawl the lower end of the pawl will work on said bearing part as a pivot, as and for the purposes set forth.

2. The combination of a standard, a lifting-bar working therein, a retaining-pawl, a lifting-pawl provided with a depending tail part and vertical separated side flanges *q*, a roller *r* and the lug *s*, arranged as described, for guiding the pawl vertically and preventing it swinging outward from the lifting-bar at its lower end and an operating-lever pivotally supported on the standard and pivoted to said lifting-pawl and being capable of moving out-

ward and backward at its fulcrum-point, whereby upon disengaging the teeth of the lifting-pawl the tail part thereof will work on the roller as a pivot.

5 3. The combination of a standard or casing, a lifting-bar working therein, said casing having its rear walls extended to form brackets, these brackets being slotted upward and backward, the extreme upper ends of said slots being
10 extended backward slightly, a lever carrying a fulcrum-pin provided with rollers working in said slots, a lifting-pawl carried by said lever and adapted to have its teeth disengaged from the lifting-bar by the ful-
15 crum-rollers passing into the bent upper ends of said slots.

4. The combination of a standard, a lifting-bar, a retaining-pawl supported on the stand-
ard, a lever journaled on the standard and
20 carrying a lifting-pawl, a device on the stand-
ard adapted when drawn down upon to with-
draw the retaining-pawl and hold it out of en-
gagement, and a device connecting said de-
vice to the operating-lever and having longi-
25 tudinal lost motion, whereby when the lever
is depressed the retaining-pawl will be auto-
matically withdrawn and held out of engage-
ment and when the lever is raised the retain-
ing-pawl will be released automatically and
30 reengage the lifting-bar, thereby enabling the
lifting-bar to be lowered step by step by a ver-
tical vibration of the lever.

5. The combination of a standard, a lifting-bar, a retaining-pawl supported on the stand-
ard, a lever journaled on the standard below
35 the retaining-pawl, a lifting-pawl carried by
the lever, a device carried by the standard
and adapted when drawn down upon to auto-
matically withdraw and temporarily hold out
40 of engagement the retaining-pawl, and a de-
tachable connection between said device and
the lever this connection having lost motion
between the lever and said device whereby
45 the depression of the lever will automatically
withdraw the retaining-pawl and hold it out
of engagement and the upward movement of
the lever will automatically release the retain-
ing-pawl at a predetermined point, for the pur-
pose set forth.

50 6. The combination of a standard, a lifting-
bar, a lever journaled on the standard, the
fulcrum of said lever being adapted to move
outward from said standard, a lifting-pawl
carried by the lever and adapted to be disen-
55 gaged from the lifting-bar when the lever is
moved outward, a retaining-pawl supported
on the standard, a spring normally holding

this pawl in engagement, a device on the
standard adapted when drawn down upon to
engage and automatically withdraw the re- 60
taining-pawl and hold it out of engagement
temporarily, and a link device connecting the
lever to said device and having longitudinal
lost motion, so that when the lever is depressed
it will draw down upon said device and with- 65
draw the retaining-pawl and when the lever
is raised it will automatically release the re-
taining-pawl at a predetermined point, for the
purpose set forth.

7. The combination of a standard, a lifting- 70
bar, a retaining-pawl, supported on the stand-
ard, a lever journaled on the standard, and
carrying a lifting-pawl, a sliding cam adapted
when drawn down to release the retaining-
pawl and hold it temporarily out of engage- 75
ment, and a link connecting said cam to the
lever, said link having longitudinal lost mo-
tion, for the purpose set forth.

8. The combination of a standard, a lifting- 80
bar, a retaining-pawl, a cam device for with-
drawing the same, a lever carrying the lift-
ing-pawl and journaled upon the standard,
and a device connecting the lever to the cam
whereby when the lever is depressed the cam
will withdraw the retaining-pawl and when 85
raised will release the retaining-pawl at a pre-
determined point in its upward movement.

9. The combination of a standard, a lifting-
bar, a lever carrying a lifting-pawl and jour-
naled upon the standard so as to move inward 90
and outward as it is vertically vibrated, a
spring-actuated retaining-pawl, a cam device
adapted when drawn down to withdraw said
retaining-pawl, and a detachable connection
between the cam device and the lever, for the 95
purposes set forth.

10. The combination of a standard, a lift-
ing-bar, a retaining-pawl supported on the
standard, a lever journaled on the standard
and carrying a lifting-pawl, a sliding cam 100
adapted when drawn down to release the re-
taining-pawl and hold it out of engagement,
and a link connecting said cam to the lever,
said link being detachable and having a lon-
gitudinal motion independent of the lever and 105
cam.

In testimony whereof I hereunto affix my
signature, in the presence of two witnesses,
this 5th day of June, 1899.

THOMAS MAXON.

Witnesses:

THOS. A. WIATT,
H. J. WILCOXEN.