

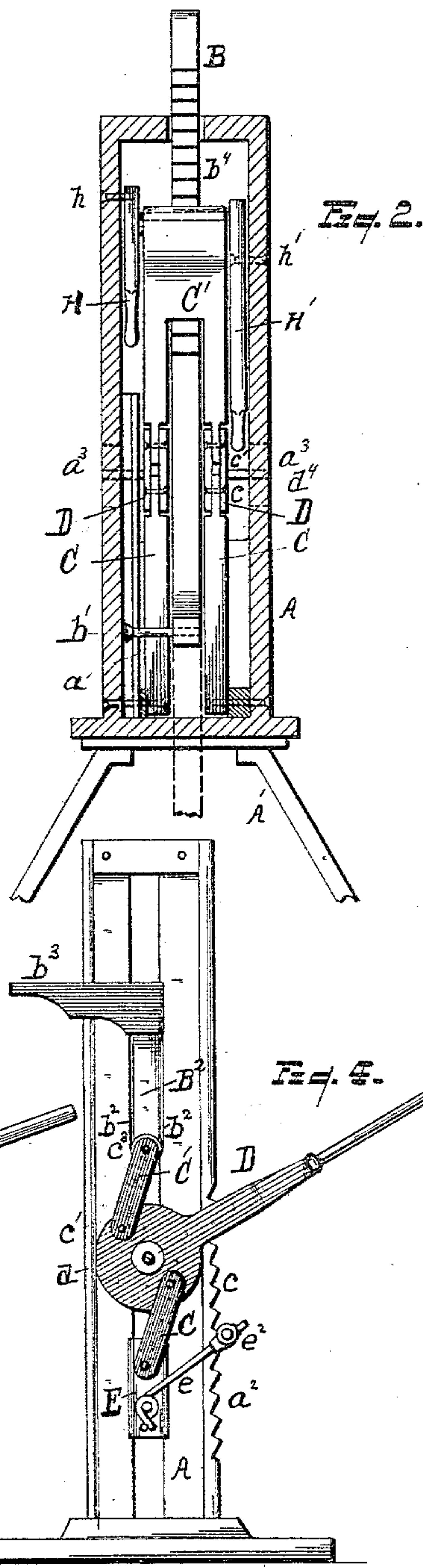
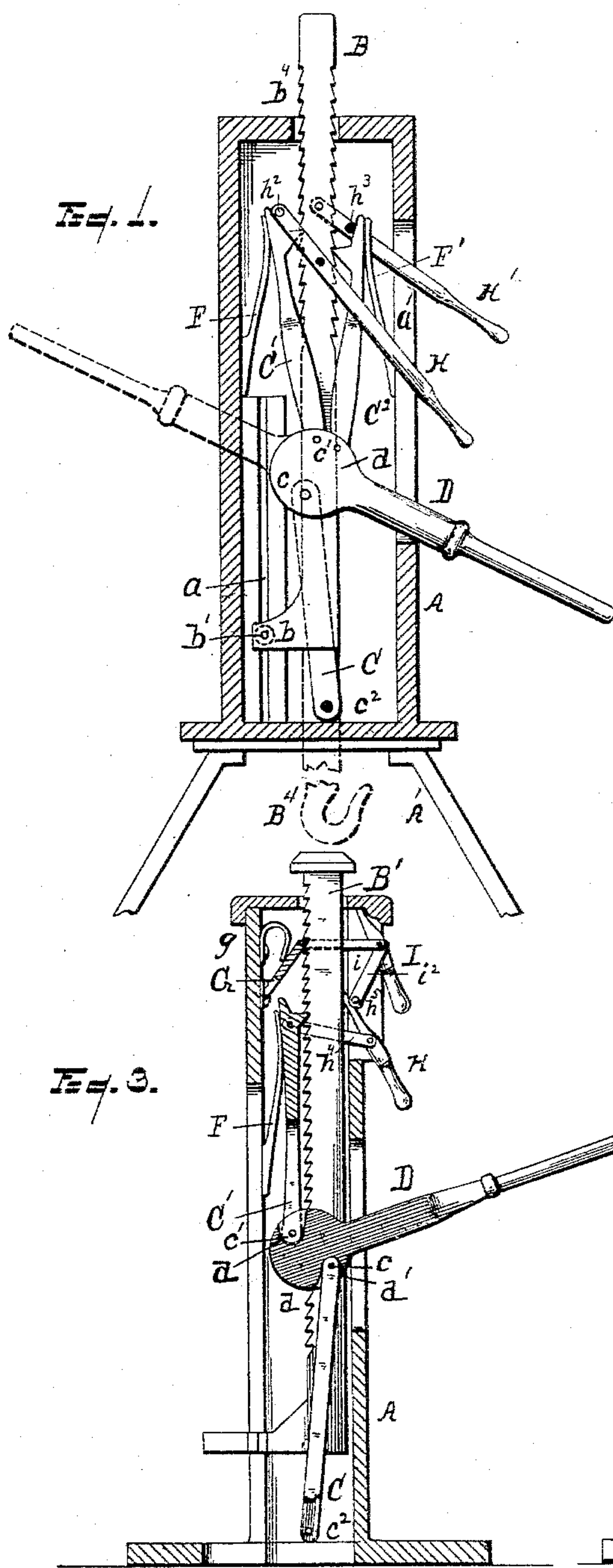
(No Model.)

B. F. NELSON.

LIFTING JACK.

No. 388,067.

Patented Aug. 21, 1888.



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B. FRANKLIN NELSON, OF DETROIT, MICHIGAN, ASSIGNOR OF TWO-THIRDS TO EDWARD BRENNAN AND MURTAGH P. BRENNAN, BOTH OF SAME PLACE.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 338,067, dated August 21, 1888.

Application filed September 26, 1887. Serial No. 250,706. (No model.)

To all whom it may concern:

Be it known that I, B. FRANKLIN NELSON, a citizen of the United States, residing at Detroit, county of Wayne, and State of Michigan, have invented certain new and useful Improvements in Lifting-Jacks; and I declare the following to be a full, clear, and exact description of the same, 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, which form a part of this specification.

My invention relates to certain new and useful improvements in jacks for hoisting and various other purposes.

My object is to provide a jack of this class which shall have a very high degree of power in its application, yet which shall be simple and economical in its construction and readily operative.

My invention consists, therefore, in the construction, arrangement, and combinations of devices and appliances, as more fully hereinafter described, and more particularly pointed out in the claims.

In the drawings, forming a part of this application, Figure 1 is a side elevation of mechanism embodying my invention with a portion of the case or frame broken away. Fig. 2 is an elevation of the same at right angles to Fig. 1, also showing a portion of the case broken away. Figs. 3 and 4 illustrate modifications of my invention.

I carry out my invention as follows:

A represents any suitable case or frame.

B represents a sliding bar operated by toggle-lever mechanism, and which may be guided in any proper manner in its reciprocation in the case A—as, for instance, its lower end may terminate in a foot, *b*, provided with a guide pin or stud, *b'*, movable in a recess, *a*, of the case; or the sliding bar may be provided with flanges, as at *b''*, Fig. 4, extending over adjacent edges of the case; or the said sliding bar may extend through the base of the case, as shown in dotted lines, Fig. 1. I do not limit myself to any particular manner of guiding said bar. So, also, the said bar may be ter-

minated above or below the base of the case, as may be desired.

The upper end of the sliding bar may be provided with an arm, *b''*, where the device is to be employed for certain purposes—as, for instance, for a wagon-jack, the arm serving as a means of engagement; or the upper end of the sliding bar may extend upward through the case and be provided with any other desired means of engagement located toward either the upper or lower end of the bar, as may best suit the purpose for which it is to be employed.

C and C' represent, respectively, a link-support for the operating-lever and a loose connection between the operating-lever and the sliding bar B, forming, essentially, the arms of a toggle-lever mechanism, said arms being movably attached at their adjacent ends to an operating-lever, D, in any suitable manner, as shown at *c c'*, so that when the operating-lever is manipulated the said arms C and C' may be forced into line, and vice versa.

The lower arms, C C', may be pivotally engaged either to a fixed portion of the frame, as at *c''*, or to a movable block or bar, E. So, also, the upper ends of the arm C' may be pivotally engaged with the sliding bar, as shown at *c''*, Fig. 4; or said arms may have a rack-and-pawl engagement with the sliding bar, the bar being constructed with rack-teeth *b''*, and the said upper arms of the toggle-lever being constructed at their upper ends so as to form pawls, respectively, adapted to engage the teeth of the bar. Both methods of engaging the toggle-arms with the sliding bar are contemplated as coming within the scope of my invention.

Where they are engaged pivotally with the sliding bar, the movement of the latter will obviously be limited to the uplift of a single throw of the operating-lever D; but when the engagement is by rack and pawl the movement of the sliding bar may obviously be repeated by successive uplifts of as many throws of the operating-lever as may be desired, the pawl-arms of the toggle-lever mechanism in this case taking fresh hold of the sliding bar

with each successive thrust of the operating-lever. These toggle-pawl arms may be held against the teeth of the sliding bar, so as to insure a fresh hold with each manipulation of the operating-lever by suitable springs, $F F'$. The sliding bar may be provided with rack-teeth upon one or both sides, as may be preferred.

Where it is toothed upon both sides, an additional toggle-pawl arm, C^2 , is engaged with the operating-lever, the arrangement being such that the corresponding arms C' and C^2 may engage the rack-teeth alternately, so that an uplift will be occasioned by the thrust of the operating-lever in either or both directions. My invention contemplates either a single or double construction of the rack-and-pawl engagement.

Where the upper toggle-arm is pivotally engaged with the sliding bar it may be made double; but where it has a rack-and-pawl engagement I prefer to make it in a single piece, as shown in Fig. 2, the lower end thereof being bifurcated to permit the passage of the sliding bar. The head d of the operating-lever, where a toothed bar is employed, is also bifurcated, as shown in Fig. 2, to permit the passage of the bar between its sides. In this construction the power of the operating-lever may be more directly communicated to the sliding bar in a vertical line therewith, a matter of considerable importance, as thereby the power applied to the operating-lever is utilized to the fullest possible extent to raise the bar with whatever weight may be engaged therewith.

To hold the sliding bar in any given position and to save and maintain all the uplift imparted thereto by every throw of the operating-lever, an additional pawl or dog, G , may be employed, although where the double-toggle pawl-arms $C' C^2$ are employed the one will hold the sliding bar and sustain the weight while the other is taking fresh hold. When the weight is considerable, however, an additional dog may be employed. Such a mechanism is shown in Fig. 3. At the rear of the dog a spring, g , may be located to keep the same in proper engagement with the bar.

To release the toggle pawl-arm and the dog from engagement with the sliding bar, any suitable means may be employed—as, for instance, releasing-levers H and H' may be employed, their outer extremities preferably extending in the same direction through an elongated slot, a' , in the case, so as to be more readily operated. Toward their inner ends they are respectively engaged pivotally upon the sides of the case, as shown at $h h'$, the said levers being preferably located upon opposite sides of the sliding bar, the one being pivoted to the case intermediate of its ends, as at h' , the other at its end, as at h , and arranged to simultaneously disengage the pawls to permit the descent of the rack-bar. To engage the pawls, the releasing-levers may be provided with studs $h^2 h^3$, suitably located to engage the

pawls in a manner to secure their release. Where a dog, G , is employed, a releasing-lever, I , may be employed and connected with the dog by arms i , the inner end of said lever impinging against the inner surface of the case when the lever is operated, thereby effecting release of the dog. Instead of having a stud to engage the pawl, the lever H may be pivotally engaged therewith by a connecting-arm, h^4 , as shown in Fig. 3, and the inner end of said lever H caused to impinge against a cross-rod, h^5 , upon which supporting-arms i^2 are hung, said arms at their upper ends having a pivotal engagement with the releasing-lever I . By this construction it will be evident that the pawl C' and the dog G may be separately or simultaneously released from the sliding bar, as may be desired.

I do not limit myself to the manner of connecting the head of the operating-lever with the toggle-arms, but prefer to recess the said head to receive the corresponding ends of said arms, as shown in Fig. 3 at $d d'$, as thereby the weight may be relieved from the eccentric connections $c c'$ and communicated to the head of the lever. So, also, the base of the toggle-arm C may be so located as to communicate the strain directly upon the base of the frame, as shown at c^2 .

By employing a toggle pawl-arm on only one side the sliding bar, as shown in Fig. 3, the eccentric connections of the upper and lower arms with the head of the operating-lever may be so located, as shown at $c c'$, that when the operating-lever is applied the said two eccentric connections may be forced into one and the same vertical line. In this manner greatest power may be secured.

The lever may be extended in both directions from its head if desired, as shown in Fig. 1.

A jack of this description may be used in lifting cars, also for pulling stumps, in which case the case or frame A may be mounted upon a tripod or other proper support, A' , the sliding bar being extended through said frame A for ready engagement with the stump and provided with a hook or ring, B^4 . In its simpler form the device, as shown in Fig. 4, may be used as a wagon-jack. By constructing the head of the operating-lever of considerable diameter the eccentric connections $c c'$ may be correspondingly removed from the center toward the periphery of the head, and thus the uplift be made of any desired practical distance to accomplish its purpose.

Where the range of its operation is variable, as when adapted for a wagon-jack, the block or bar E may be made adjustable in the frame, so as to be readily set for operation either higher or lower, as the height of the vehicle-axle may require. Any desired means of adjusting the bar E may be employed, and also for holding said bar in any desired position—as, for instance, the said bar may be provided with a spring dog, or arm e , constructed to engage rack-teeth a^2 upon the frame. The operating-lever being fulcrumed upon the eccen-

tric connections $c c'$, its head will have a sliding movement, and may be guided in any desired manner—as, for instance, the frame may be provided with an elongated slot, a^3 , in which an arbor, d^4 , engaged in the head of the lever, may be extended.

It will be understood that the form shown in Fig. 3 may be mounted upon a tripod or support and its sliding bar be extended through the base of the case to adapt it for a stump-puller.

It will be evident, also, from an examination of Fig. 3, as hereinbefore described, that the sliding bar B' can be very gradually and easily lowered whenever desired to permit the descent of a heavy weight—as, for instance, in lowering a car upon its trucks.

Should the dog G and the pawl-arm C' both be simultaneously released from the bar B' , the latter would of course drop suddenly with a shock. When, however, the operating-lever D is at the limit of its downward stroke, the dog G may be disengaged from the bar, the pawl-arm C' being still engaged therewith. Under these circumstances the operator may readily control the upward movement of the operating-lever as he may desire, thereby permitting said pawl-arm to descend in a corresponding manner, and the sliding bar B' will also descend in the same proportion until the operating-lever has reached the limit of its upward stroke. Now, by permitting the dog G to re-engage the sliding bar and disengaging the pawl-arm C' therefrom the operating-lever may be thrown to the limit of its downward stroke without acting upon said bar. When the operating-lever is again in this lower position, the pawl-arm is re-engaged with the bar, and the dog again disengaged and the operation of gently and gradually lowering the bar repeated, and so on, as far as may be desired. The facility of accomplishing this lowering of the sliding bar in this manner forms an important feature of my invention, as it can thus be raised or lowered gradually without any jar or difficulty.

What I claim is—

1. In combination, a case or frame, a vertically-sliding bar in said case or frame, a lever-head mounted in said case or frame, a vertically-adjustable support secured in said case or frame, means for locking the adjustable support in different adjustments, and a link, and a bar-operating connection, each connected eccentrically at one end to the lever-head, their opposite ends being in engagement with the sliding bar and the support, respectively, substantially as set forth.

2. In combination, a case or frame, a vertically-sliding bar mounted in the case or frame, a vertically-adjustable support, a spring-stop, e , adapted to lock the support in different adjustments, a lever-head mounted in the case or frame between the sliding bar and the adjustable support, and connections which are connected at one end to the lever-head, and their opposite ends being in engagement with

the sliding bar and the adjustable support, respectively, substantially as set forth.

3. In combination, a case or frame, a vertically-sliding bar mounted in said case or frame, and provided with ratchet teeth or notches, a lever-head mounted in the case or frame, a link eccentrically connected at one end with the lever-head and connected at its opposite end with a suitable support, a pawl eccentrically connected at one end with the lever-head and resting in engagement with the ratchet-teeth or notches at its opposite end, a retaining-pawl in engagement with the sliding bar, springs for holding the pawls in engagement with the sliding bar, and levers for throwing the pawls out of engagement with the sliding bar, substantially as set forth.

4. In combination, a case or frame, a vertically-sliding bar mounted in the case or frame, and provided with ratchet teeth or notches at its edges, a lever-head mounted in the case or frame, a link-support for the lever-head, the said link-support being connected with the lever-head eccentrically, two pawls eccentrically connected with the lever-head and in engagement with the opposite edges of the sliding bar, the one to act as a retaining-pawl and the other as an operating-pawl, springs for holding the pawls in engagement with the ratchet-toothed bar, and levers for throwing the pawls out of engagement with the ratchet-toothed bar at pleasure, substantially as set forth.

5. In combination, a case or frame, a vertically-movable ratchet-toothed bar mounted in the frame, a lever-head mounted in the frame and embracing the opposite ends of the ratchet-toothed bar, a link-support for the lever-head, a pair of pawls connected eccentrically with the lever-head, springs to hold the pawls in engagement with the ratchet-toothed bar, levers for throwing the pawls out of engagement with the ratchet-toothed bar at pleasure, and a guide connected with the ratchet-toothed bar and extending into a guide-groove to steady the said ratchet-toothed bar, substantially as set forth.

6. In combination, a case or frame, a vertically-notched bar mounted in the frame, a lever-head mounted in the frame, a link-support for the lever-head, a pawl eccentrically connected with the lever-head and in engagement with the notched sliding bar, and a lever pivoted to the case or frame and provided with a projection adapted to engage the pawl and throw it out of engagement with the notched bar, substantially as set forth.

7. In combination, a case or frame, a vertically-sliding bar mounted therein and provided with ratchet teeth or notches, a lever-head, a link connected eccentrically at one end with the lever-head and connected at the other end with a suitable support, and a pawl eccentrically connected at one end with the lever-head and resting in engagement with said ratchet or notches at its opposite end, substantially as described.

8. In combination, a casing or frame, a ver-
tically-sliding bar mounted therein and pro-
vided with ratchet teeth or notches, a lever-
head mounted in said casing or frame sub-
stantially in line with the vertical axis of said
5 sliding bar, a link connected eccentrically at
one end with the lever-head and connected at
its opposite end with a suitable support, and
a pawl eccentrically connected at one end with
10 the lever-head and resting in engagement with
said ratchet-teeth or notches at its opposite

end, whereby the points of connection of said
link and pawl with said lever-head may be
brought substantially in line with the vertical
axis of the sliding bar, substantially as set 15
forth.

In testimony whereof I sign this specifica-
tion in the presence of two witnesses.

B. FRANKLIN NELSON.

Witnesses:

N. S. WRIGHT,
G. H. HIGGS.