

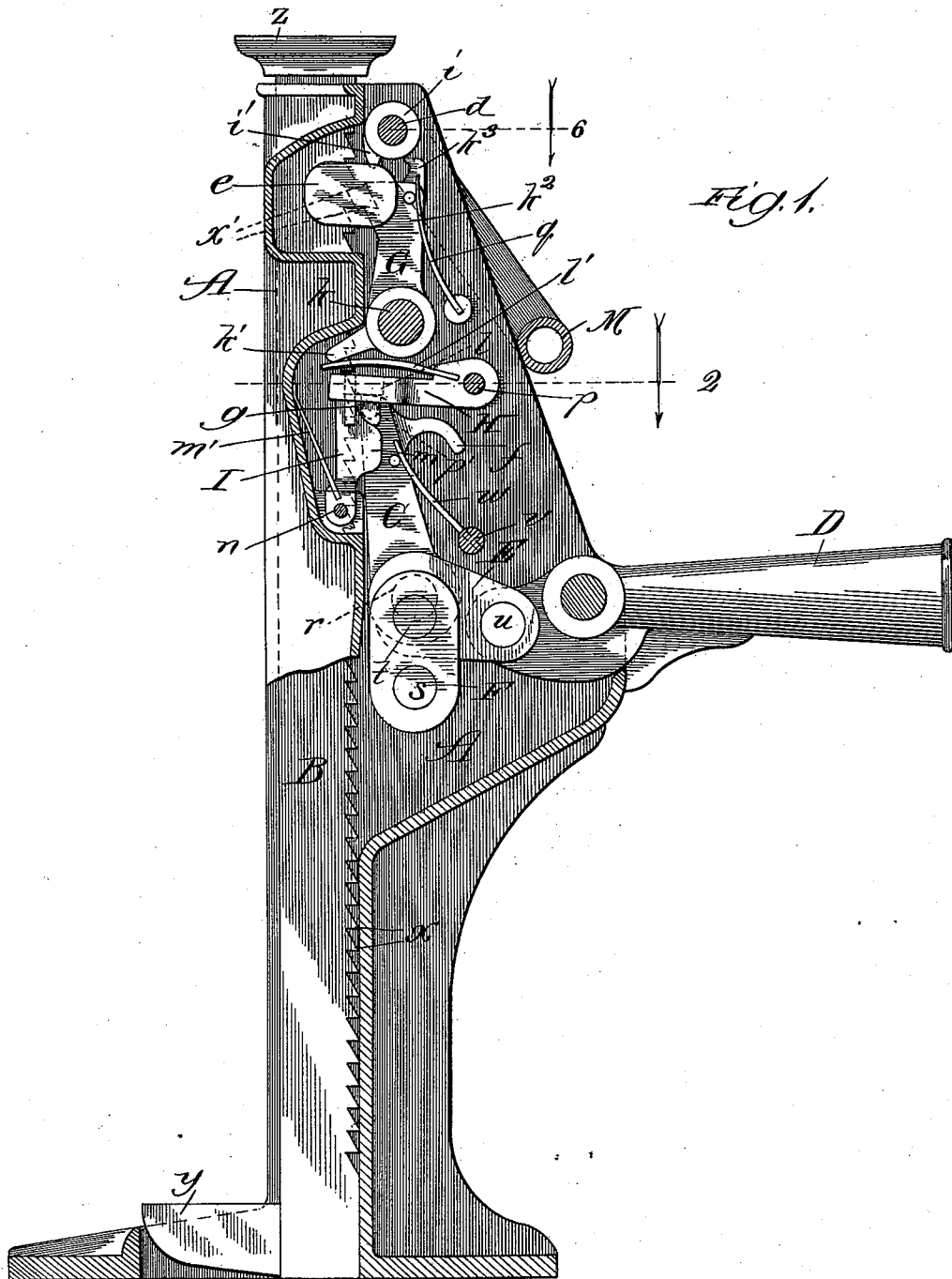
(No Model.)

3 Sheets—Sheet 1.

M. M. MOORE.
LIFTING JACK.

No. 564,445.

Patented July 21, 1896.



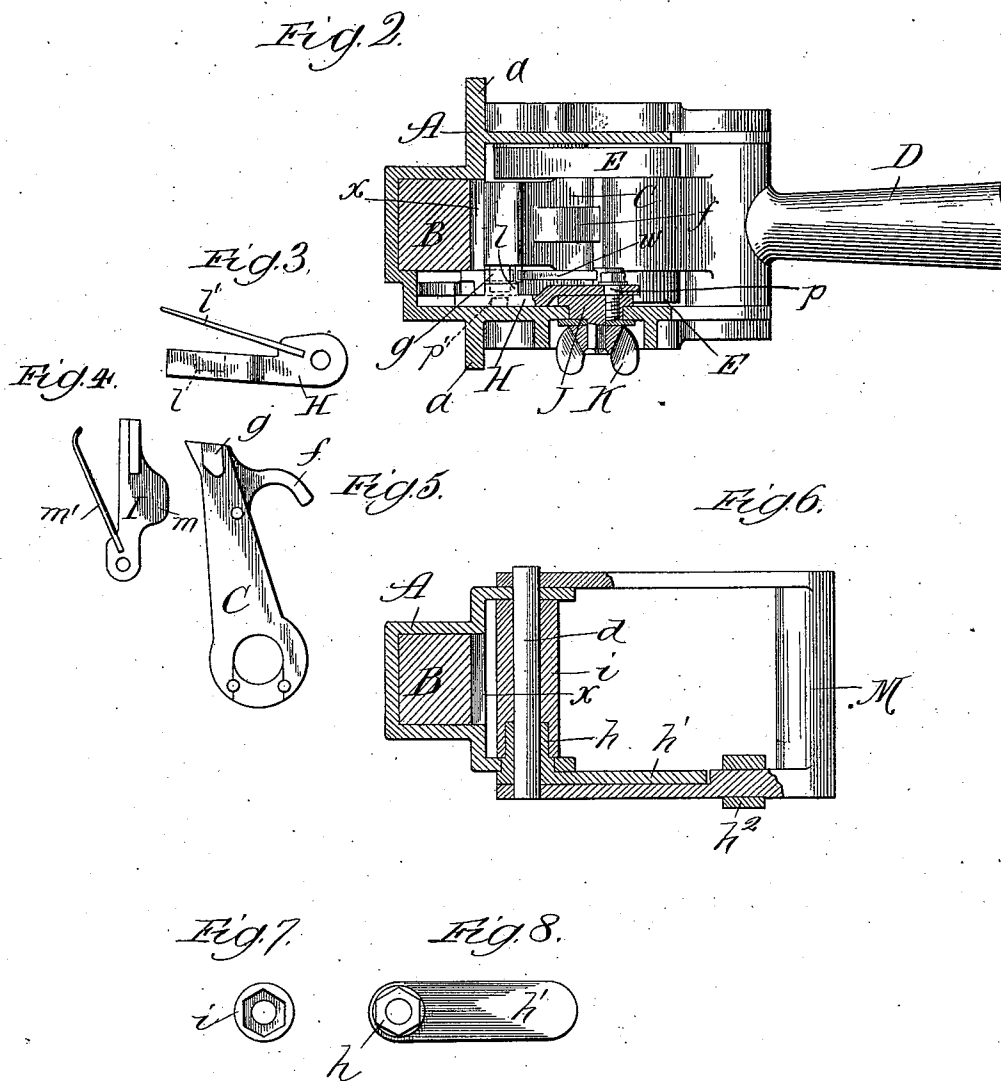
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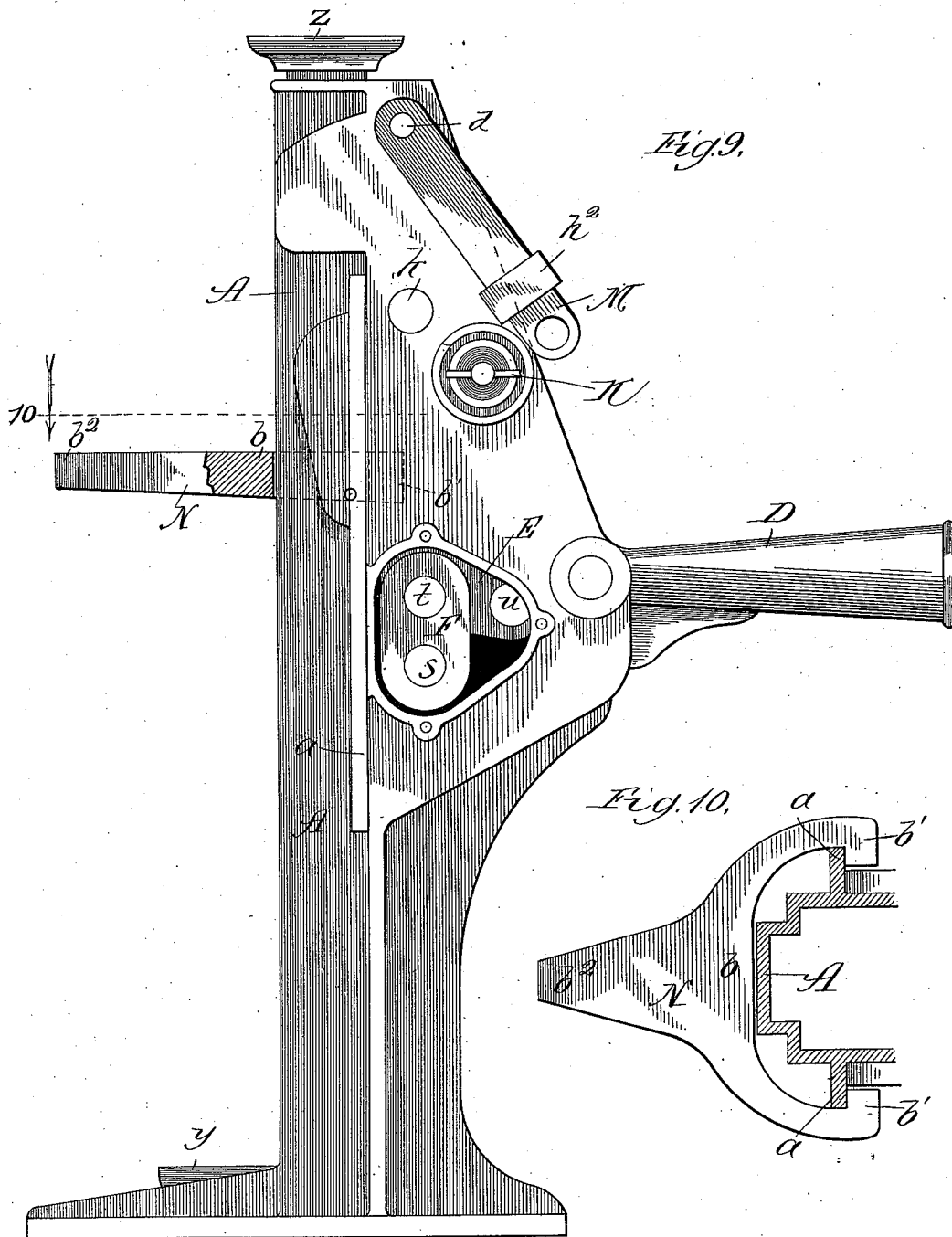
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LIFTING JACK.

No. 564,445.

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UNITED STATES PATENT OFFICE.

MOSES M. MOORE, OF CHICAGO, ILLINOIS.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 564,445, dated July 21, 1896.

Application filed October 1, 1895. Serial No. 564,271. (No model.)

To all whom it may concern:

Be it known that I, MOSES M. MOORE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Lifting-Jacks, of which the following is a specification.

My present invention is in the nature of an improvement upon the lifting-jack invented by Walter S. McKinney and forming the subject-matter of an application for Letters Patent filed in the United States Patent Office February 27, 1895, and bearing Serial No. 539,913.

My object is to provide a greatly simplified mechanism for the gradual lowering of the lifting-bar in said jack and also to improve in matters of detail the mechanism provided for the sudden dropping of said lifting-bar.

My further object is to provide an attachment for lifting-jacks whereby, for instance, a car-wheel may be held in place upon the rail while one part of the truck is raised from its resting place to allow of the removal of the brasses from the journal-box.

To the above ends my improvement consists in the combination of parts and details of construction hereinafter set forth.

In the accompanying drawings, Figure 1 is a view in broken sectional elevation of a lifting-jack provided with a portion of my improvements and showing the device in operation to gradually lower the lifting-bar; Fig. 2, a section taken on line 2 of Fig. 1 and viewed in the direction of the arrow; Fig. 3, a detached view of the loosely-mounted arm carrying a spring which serves to trip the retaining device; Fig. 4, a detached view of the loosely-mounted spring-held arm, affording a cam which serves to guide the lever-operated pawl in the operation of gradually lowering the lifting-bar; Fig. 5, a detached view of the lever-operated pawl which serves to engage the lifting-bar in raising it; Fig. 6, a section taken on line 6 of Fig. 1, showing my combined handle and tripping device; Figs. 7 and 8, details of construction of the same; Fig. 9, a view of a jack provided with an attachment for bearing down on the wheel when a car-truck is to be raised; and Fig. 10, a section taken on line 10 of Fig. 9 and viewed as

indicated by the arrow, showing the mode of fastening the attachment to the jack.

A is the standard, which serves to carry the operative parts, and B the lifting-bar, provided with a head *z*, foot *y*, and ratchet-teeth *x*, and arranged to slide in the standard in the usual manner.

A pawl C, normally in engagement with the lifting-bar B, under the action of a spring *w*, which is secured to the standard by a pin *v*, is operated indirectly from the hand-lever D through the medium of a compound-lever system.

The hand-lever D is provided at each side of its lower end with a laterally-projecting lug *u*, on each of which is pivoted a link E. The links E are in turn provided with laterally-projecting lugs *t*, which carry links F, pivotally mounted toward their lower ends upon a shaft *s* in the standard. The links E are joined together by a cross-pin *r*, which is not in line with the lugs *t*, their relation being shown by the full and dotted lines in Fig. 1.

The toggle-lever system above described is fully set forth and claimed in the application above referred to. Its operation is briefly, as follows: When the hand-lever D is moved in the upward direction, it flexes the toggle-lever consisting of the side projections *u* and links E, and through the latter flexes the toggle-lever consisting of the links F and pawl C, whereby the latter is drawn in a downward direction to engage a tooth *x* of the lifting-bar B. Downward movement of the hand-lever D extends the said toggle-levers, whereby the pawl C raises the lifting-bar.

G is a retaining device consisting of a bell-crank lever pivotally mounted on a cross-shaft *k* and having one arm *k'*, and another arm *k''*, which is in turn provided with a projection *k'''* and teeth *x'* for engaging the ratchet-bar. The retaining device G is held normally in engagement with the lifting-bar by a spring *q*, though it may be so held in engagement therewith by the action of gravity upon a counterweight *e*, and for use on lifting-jacks where the gradual lowering device is not essential I prefer such a construction. In some instances I so provide that either both forms may be used in the same jack.

H is a more or less horizontally-disposed

arm mounted upon an eccentric-pin p , carried by a short rocking disk or shaft J, journaled in the standard and readily rotated by means of a suitable rigidly-attached thumb-piece K, as shown clearly in Fig. 2.

I is a vertically-disposed arm pivoted to the standard at n , and affording a cam-surface m , and provided with a spring m' , under whose action the arm is forced forward to assume a perpendicular, but against which the arm may be forced back and secured during the raising of the lifting-bar, by means of a suitable locking device l on the arm H.

The arm k' on the bell-crank lever G affords a lever to receive the action of the spring l' , which serves, under conditions hereinafter stated, to unlock the retaining device G to permit of the gradual lowering of the lifting-bar B.

To serve as a handle for lifting the jack and also as a means for tripping the retaining device, I provide the following construction: A pin d extends laterally through the standard near its top and projects beyond the sides thereof. Upon this pin loosely fits a sleeve i , having a projection or finger i' , and suitably recessed at one end to receive an angular head h , made annular to fit loosely on the pin d , and projecting through an enlarged opening in the standard (at which part the head is of circular cross-section) and carrying a lever-arm h' . Upon the projecting ends of the pin d is loosely mounted a yoke-handle M, provided with a sliding collar h^2 , by means of which the lever-arm h' may be rigidly secured to the handle to swing therewith. The projection h^3 on the bell-crank lever G is in the path of the finger i' on the sleeve i , whereby when the arm h' is secured to the yoke-handle M by means of the sliding collar h^2 and the yoke is swung upward the retaining device is swung clear of the teeth on the ratchet-bar.

The arm H is kept from falling below the horizontal at any time by a pin p' , projecting inward from the standard upon which it rests near its free end, while the lug l , which serves as a locking means to hold the vertically-disposed arm I clear from interference when the eccentric p is at its extreme backward throw, is also adapted to be engaged by a lug g on the pawl C when the eccentric is at the forward end of its throw, as in its position for gradually lowering the lifting-bar.

N is an attachment which may be used in combination with the jack to hold the car-wheel on the track when the truck is raised to allow the brass of the journal to be slipped out, as well as for other purposes. The attachment N comprises a bifurcated head b , adapted to bear against the back of the standard and having clamping-prongs b' and an extended portion b^2 , adapted to bear upon the flange of a car-wheel. The standard A is provided at its sides with flanges a , which, with

the back face of the standard, furnish the bearing-surfaces upon which the attachment N slides for vertical adjustment thereon.

The operation is as follows: To raise the lifting-bar, the eccentric p is moved to its position nearest the lifting-bar. In the movement the lug l engages the arm I, forcing it back and carrying the cam-surface m away from the pawl C. The effect is to leave both the pawl C and the retaining device G, under the action of their springs, free to engage the lifting-bar B. Obviously, now the lifting-bar will be raised when the hand-lever D is moved down, while the lifting-bar will be held by the retaining device G during the return movement of the lever. To lower the lifting-bar gradually, the eccentric p is moved to its extreme forward throw, as shown in Fig. 1. This allows the arm I to be forced forward by its spring m' , so that the cam-surface m will contact with and guide the lug g on the pawl C in its movement. When the hand-lever D is in its raised position, the retaining device G is in engagement with the lifting-bar, while the pawl C is held out of engagement by the cam m . As the hand-lever D moves down the projection g on the pawl C bears up under the boss l on the arm H. The effect is gradually to increase the tension in the spring l' , and by the time the pawl C finally engages the lifting-bar, after having been carried over one tooth by the cam, the tension in the spring l' exceeds that in the spring g , and when the weight of the lifting-bar is transmitted through the pawl C the retaining device at once rocks forward under its superior resilience. The hand-lever D may then be raised to allow the bar to descend. The consequent downward rocking of the arm H relieves the tension in the spring l' , until its action is overcome by that of the spring g , when the retaining device is again forced into engagement with the lifting-bar. The operation can then be repeated.

To allow the lifting-bar to drop, the pawl C is pulled forward by the handle f and held in that position against the resistance of the spring w . Any suitable catch may be provided, if desired, to hold the pawl C in this position, and thus leave the hand free after the pawl has been drawn forward. The sliding collar h^2 is then moved down to make the arm h' rigid with the handle M. If the handle M be now raised, the finger i' on the sleeve i engages the projection h^3 on the retaining device, when a sudden jerk will free the latter from the bar, allowing it to drop. If the sliding collar h^2 be moved back to its former position, the yoke-handle is free to be moved to a vertical position to serve to lift or carry the jack.

When the jack is to be used in relieving a car-wheel of its weight to allow the bushing to be removed from the axle-box, it is desirable to use the attachment B to keep the

wheel from rising with the truck. To this end the attachment is adjusted to cause the projecting portion b^2 to bear down upon the outer flange of the car-wheel just above the point where the tread portion is in contact with the rail.

It is evident that many minor changes within the spirit of my invention may be made. Hence I do not limit myself in all particulars to the exact construction here shown. For instance, it is sometimes desirable to make the retaining device in two independent parts, providing one with teeth whose height correspond to those on the lifting-bar, while the other has teeth of half the height. This would allow finer adjustment in the height of the lifting-bar; also, while I prefer such an adjustment of the springs and parts of the gradual lowering mechanism that, when it is in use, the lifting-bar shall be lowered to the extent of one notch at each upward movement of the hand-lever, yet they may be so adjusted as to allow the bar to be lowered more rapidly, if desired.

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

1. In a lifting-jack, the combination with a standard, a ratchet lifting-bar, a pawl normally in engagement with the lifting-bar, lever mechanism for raising the lifting-bar through the medium of the pawl, and a pivoted retaining device normally in engagement with the lifting-bar, of mechanism for permitting the dropping of the lifting-bar, consisting of means for withdrawing said pawl from engagement with said lifting-bar, an accessible bell-crank lever engaging with the retaining device to retract it, and a yoke-handle adapted to be joined to said bell-crank lever to trip the retaining device, and to be swung to a vertical position for use in lifting and transporting the jack, substantially as described.

2. In combination with a lifting-jack, comprising a standard, a ratchet lifting-bar, a spring-actuated pawl normally in engagement with the lifting-bar, lever mechanism for raising the lifting-bar through the medium of the pawl, and a retaining device in the form of a bell-crank lever normally in engagement with the lifting-bar for holding the latter in its raised position, mechanism for gradually lowering the lifting-bar by the operation of the hand-lever, consisting of a deflector, operating to cause the pawl in its upward movement to clear a tooth of the lifting-bar and engage another, and a spring adapted to engage an arm of the retaining device and be compressed by the said pawl during its upward movement thereby retracting the retaining device and freeing the lifting-bar to permit it to be carried down to the ex-

tent at least of one notch each time the pawl is lowered, substantially as described.

3. In combination with a lifting-jack, comprising a standard, a ratchet lifting-bar, a spring-actuated pawl normally in engagement with the lifting-bar, lever mechanism for raising the lifting-bar through the medium of the pawl, and a retaining device in the form of a bell-crank lever normally in engagement with the lifting-bar for holding the latter in its raised position, mechanism for gradually lowering the lifting-bar by the operation of the hand-lever, consisting of a deflector I, operating to guide the pawl to clear a tooth in its upward movement and engage another, and a pivoted arm H to be engaged by the pawl in its said upward movement and provided with a spring l' adapted to engage the arm k' on the retaining device to trip the said retaining device during the upward movement of the pawl, thereby permitting the lifting-bar to be carried downward to the extent at least of one notch each time the pawl is lowered, substantially as described.

4. In combination with a lifting-jack, comprising a standard, a ratchet lifting-bar, a spring-actuated pawl normally in engagement with the lifting-bar, lever mechanism for raising the lifting-bar through the medium of the pawl, and a retaining device in the form of a bell-crank lever normally in engagement with the lifting-bar for holding the latter in its raised position, mechanism for gradually lowering the lifting-bar by the operation of the hand-lever, consisting of a deflector I, operating to guide the pawl to clear a tooth in its upward movement and engage another, and an arm H, eccentrically mounted upon a rotatable disk J, and adapted to be engaged by the pawl in its said upward movement, said arm being provided with a spring l' adapted to engage the arm k' on the retaining device to trip the said retaining device during the upward movement of the pawl, thereby permitting the lifting-bar to be carried downward to the extent at least of one notch each time the pawl is lowered, substantially as described.

5. In a lifting-jack, the combination with the standard, lifting-bar, and means on the standard for actuating the lifting-bar, said bar being constructed to engage the under side of a car-axle journal-box, of an adjustable attachment N on said standard, comprising a bifurcated head b having engaging prongs b' , and an extended portion b^2 , constructed and arranged to operate substantially as and for the purpose set forth.

MOSES M. MOORE.

In presence of—
M. J. FROST,
J. H. LEE.