No. 629,020. Patented July 18, 1899.

E. T. TREFETHEN.

DOUBLE ACTION JACK.

(Application filed May 19, 1899.)

(No Model.)

Fig. 1.

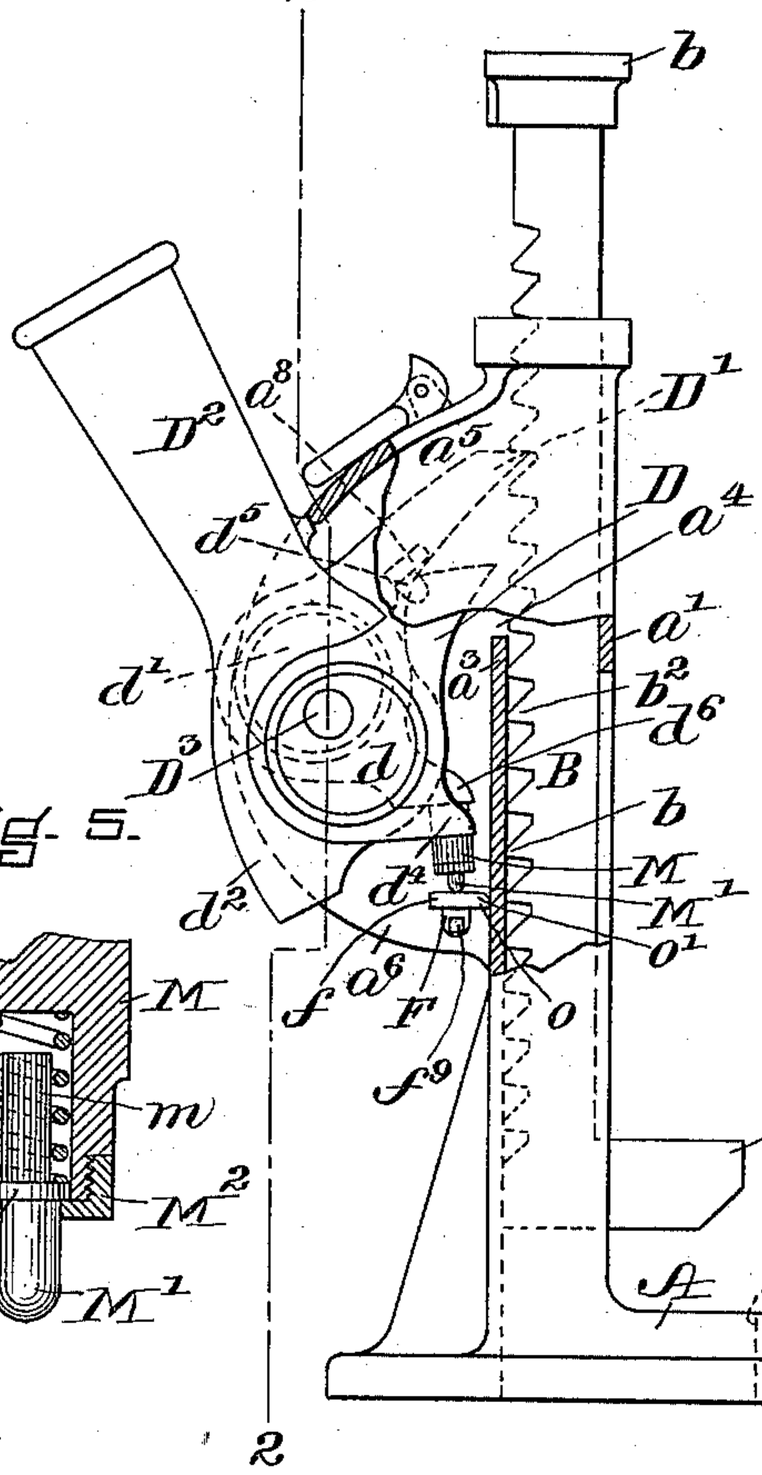


Fig. 2.

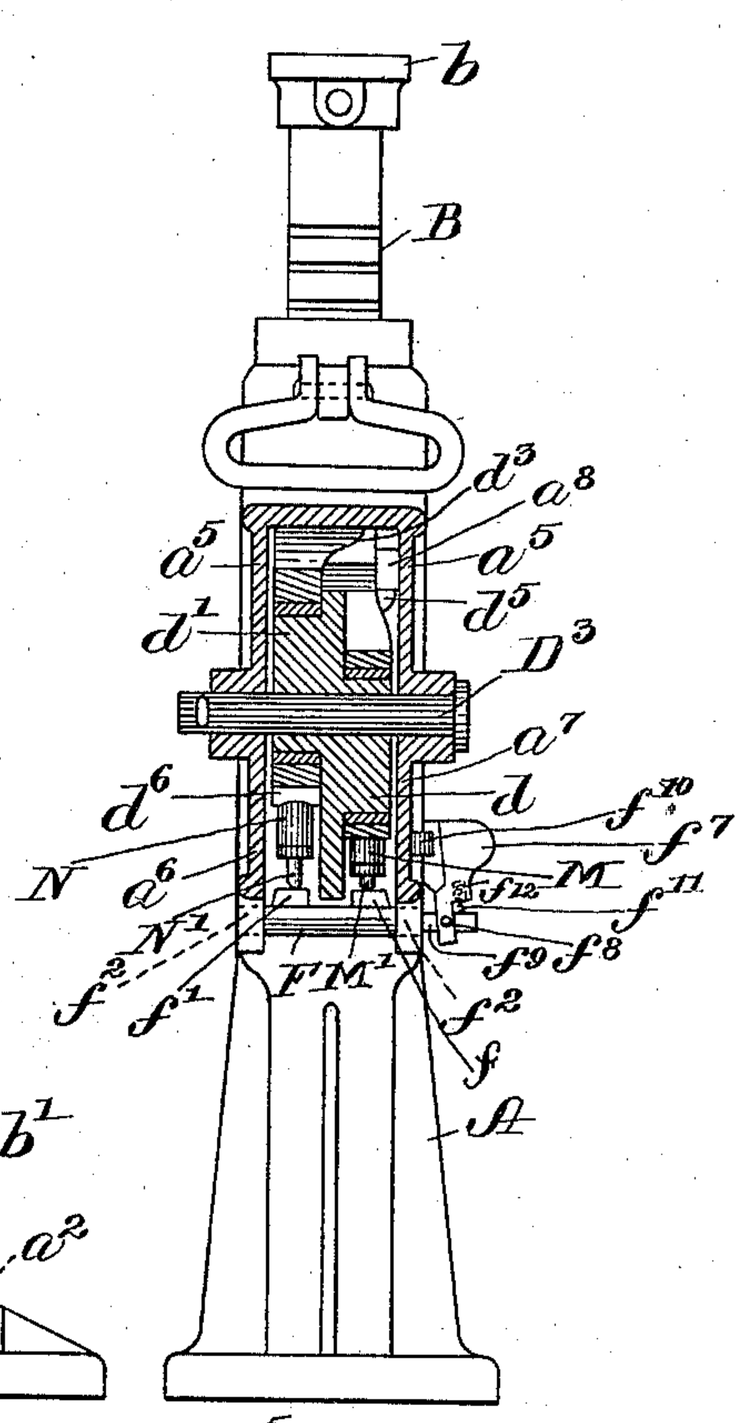


Fig. 5.

Fig. 3.

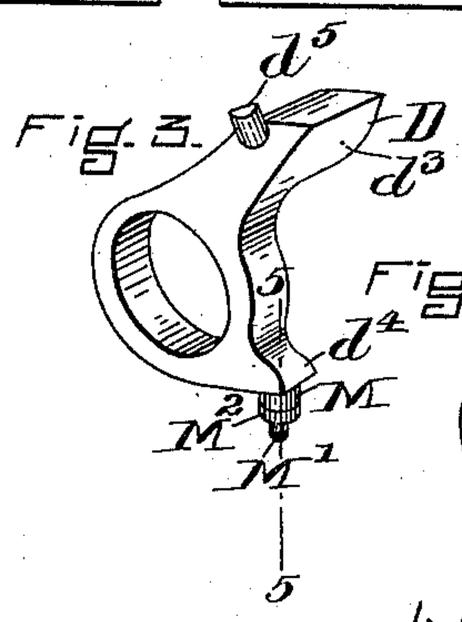
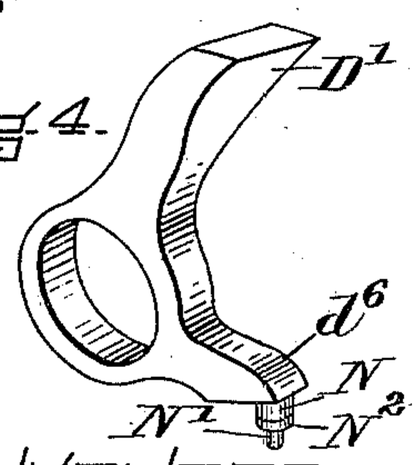


Fig. 4.



WITNESSES.

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UNITED STATES PATENT OFFICE.

ERVIN T. TREFETHEN, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ARTHUR O. NORTON, OF COATICOOK, CANADA.

DOUBLE-ACTION JACK.

SPECIFICATION forming part of Letters Patent No. 629,020, dated July 18, 1899.

Application filed May 19, 1899. Serial No. 717,425. (No model.)

To all whom it may concern:

Be it known that I, ERVIN T. TREFETHEN, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Double-Action Jacks, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a side elevation, partly in section, showing the lifting-bar raised and the abutments under the pins, the parts now being in position for automatically lowering the lifting-bar. Fig. 2 is a section on line 2 2 of Fig. 1. Figs. 3 and 4 are perspective views of the pawls. Fig. 5 is a detail at line 5 5 of Fig. 3, showing the boss with its inclosed spring, the sliding pin, and cap.

The object of my invention is to improve in certain minor but nevertheless important details the jack patented in United States Letters Patent No. 613,949, granted to myself, as assignor of one-half to Arthur O. Norton, on November 8, 1898.

The features of my present invention are the following: First, I now mount the spring-controlled pawls in the inner ends or lugs d^4 d^6 of the pawls shown in said Patent No. 613,949, instead of mounting them in the position-controlling frame F and so make the weight of the spring and pin and spring and pin retaining boss (which is new) perform the new function of a counterweight for each pawl, said weight tending to keep the upper working end of each pawl in toward the notched side of the lifting-bar. Secondly, I now make the position-controlling frame with solid abutments, which during the automatic lowering operation are brought into the path of the spring-backed pins carried by the pawls. In said Patent No. 613,949 such abutments were chambered to receive the springs and pins and the inner butt-ends of the pawls worked on the pins carried by the position-controlling frame. This construction, while entirely practical, is not so desirable as the present, because while the lugs or butt-ends d^4 and d^6 of the patent construction are counterweights to a certain extent the present addition of the springs, pins, and retaining-bosses materially increases the counterweighting of the pawls. Moreover, the upper ends of the solid abutments on the position-controlling frame are now made wider than before, so as to give a proper bearing against which the pins carried by the pawls strike during the lowering operation, and they are curved downwardly on their inner horizontal corners, so that they may be pressed readily in under the downwardly-projecting pins carried by the pawls when the position-controlling frame is turned to bring the abutments into the paths of the pins, the abutments also projecting inwardly toward the jack-frame sufficiently to engage the jack-frame when in the paths of the pins, the jack-frame then serving as a stop to limit the inward movement of the solid abutments so that they cannot be pushed inwardly from their practically vertical position underneath the paths of the spring-controlled pins.

Except for the matters above noted my improved jack is the same as that of my said Patent No. 613,949.

In the accompanying drawings, illustrating the principle of my invention and the best mode now known to me of applying that principle, A is the jack-standard, and B the lifting-bar. Standard A is formed with a lengthwise-extending recess a to receive lifting-bar B, the recess being bridged across at a' to inclose the lifting-bar and form an inclosing guideway therefor. The lifting-bar is provided with the usual head b and angularly-projecting foot b', which bottoms, preferably, in the angularly-extending portion a^2 of the recess a. The lifting-bar is provided on its inner face with teeth b^2. The inner wall a^3 of standard A extends only part way from the bottom of the standard toward the top thereof, so as to have an opening at a^4 between the side walls a^5 of the standard for engagement of the pawls D and D′ with teeth b^2. In the rearwardly-extending wings a^6 and a^7 of standard A the pawls D and D′ are loosely mounted on cams d and d', fast on opposite sides of the inner end portion d^2 of the handle D^2. Cams d and d' are reversely mounted, cam d extending forwardly and cam d' extending rearwardly of the journal D^3, which passes through the wings and the in-

termediate portions of the cams and handle. Pawl D is provided toward its free end with a lateral projection d^3, which extends under the free end portion of pawl D′, and pawl D is also provided about opposite the journal D^3 with a rearwardly-projecting lug d^4, which is provided with a downwardly-projecting boss M, (see Figs. 3 and 5,) that is centrally chambered from its outer end inwardly and receives the head m of the projecting pin M′, the shank of which plays through a hole in the cap M^2, covering the outer end of the boss. A spring M^3 is interposed between the head n and the inner opposite end of the chamber M^5 and holds the pin normally projecting from the boss M. The pin M′ comes in contact with the abutment f when the position-controlling frame is turned for the lowering operation, as explained below. Near the forward end of the pawl D a lug d^5 is provided, this lug being adapted to engage the stop-rib a^8, which projects from the inner face of wing a^7. Pawl D′ is formed at its rear portion with a rearwardly-projecting lug d^6, which is provided with a downwardly-projecting boss N, that is centrally chambered from its outer end inwardly and receives the head of the projecting pin N′, the shank of which plays through a hole in the cap N^2, covering the outer end of the boss N. A spring keeps the pin N′ normally projecting from the boss N. The construction is similar to that of the boss M, pin M′, cap M^2, and spring M^3 shown in Fig. 5. The pin N′ comes in contact with the abutment f' when the position-controlling frame is turned for the lowering operation, as explained below.

The frame F is provided with end journals f^2 f^2, which are mounted in the wings of the standard, and the frame is also provided with laterally-projecting abutments f and f'. One journal f^2 is extended beyond the outer side wall of one of the wings of the standard and supports a lock-block f^7, which is journaled at f^8 on the extension f^9 of the journal f^2, so as to be moved from and toward the outer face of the opposed wing of the standard, where there are a pair of abutments f^{10}, between which the free ends of the lock-block f^7 is confined when it is desired to keep the abutments f and f' upright—that is, in operative position in respect to the cam-lugs d^4 and d^6. The lock-block is conveniently held in this position by the stress of a spring f^{11}, mounted in its recess f^{12} and bearing against an opposed surface of the extension f^9. The upper horizontal corners o of the abutments f and f' are curved, so that when they are swung into the paths of the downwardly-projecting pins carried by the pawls they may be readily moved thereunder, and the abutments are made so thick that when under the projecting pins their rear sides o' contact with and are supported by the rear of the casing.

The operation of my new jack is as follows: The lifting-bar being down and the position-controlling frame being turned to carry abutments out of contact with the pins, the free ends of both pawls gravitate toward the toothed side of the lifting-bar. An upward movement of handle D^2 carries pawl D′ upwardly into contact with one of the teeth, and the same movement of the handle retracts pawl D, so that this pawl just rests on the apex of a tooth and is ready to drop under the face of that tooth when the handle shall be lifted a little higher. Continued upward movement of the handle compels pawl D′ to lift the bar sufficiently to permit pawl D to pass the apex and engage the under face of the tooth on which it rests. A complete downward movement of the handle now causes pawl D to lift the bar B, and as this pawl D is pushed upward by its own cam d the cam d' of pawl D′ retracts pawl D′ and causes it to pass over the apex of and drop under the face of the next lower tooth. The pawls D and D′ lift alternately and are alternately brought into position for lifting, one of the pawls being pushed upwardly at each upstroke of the handle, one being pushed upwardly at each downstroke of the handle, and one being always under a tooth. To lower the lifting-bar, the position-controlling frame F is swung into position to bring its abutments f and f' under the pins M′ and N′. Supposing handle D^2 to be in its highest position, as shown in Fig. 1, abutment f is brought against pin M′ and pawl D, the spring M^3 of pin M′ being compressed and its tension then lifting the free end of pawl D clear of the teeth on bar B. Pawl D′ is now in engagement with a tooth on the lifting-bar B. Downward movement of the handle retracts pawl D′ from the tooth and moves the free end of pawl D into engagement with a tooth, the forward movement of the pawl D carrying its pin M′ out of engagement with abutment f and the rearward movement of pawl D′ carrying its pin N′ against abutment f', thereby compressing the spring of that pin and causing the spring, when the free end of pawl D′ is out of the way of the teeth, to move the free end of pawl D′ back out of position to engage the teeth. The lifting-bar is thereby lowered.

It will be observed that in the present jack the pawls carry the springs, which, with the pins, vibrate with the pawls. The position-controlling frame, which is the pawl-tripping device, is rigid. The rearwardly-projecting counterweighted extensions of the pawls vibrate to carry the pins (which are mere buffer-heads for the springs) alternately against the abutments, the rigid pawl-controller or crank-shaft remaining rigid and stationary when turned into operative position for the automatic lowering operation.

What I claim is—

In a jack, the combination of a standard having a guideway for the lifting-bar; a toothed lifting-bar in said guideway; a handle fulcrumed on the standard and provided on opposite sides with reverse-cams; a pawl mount-

ed on each cam and alternately movable into and out of engagement with teeth on the lifting-bar; said pawls having rearwardly-extending lugs provided each with a recess on its under side; a pin and a spring therefor mounted in said recess, the pin projecting downwardly from said recess to contact with the rigid frame; a rigid rocker-frame journaled in said standard and formed with projecting abutments opposite said pins which alternately contact with said abutments during the lowering operation to release one pawl from a tooth of the lifting-bar while the other pawl is moving under another tooth of the lifting-bar, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

ERVIN T. TREFETHEN.

Witnesses:
EDWARD S. BEACH,
E. A. ALLEN.