

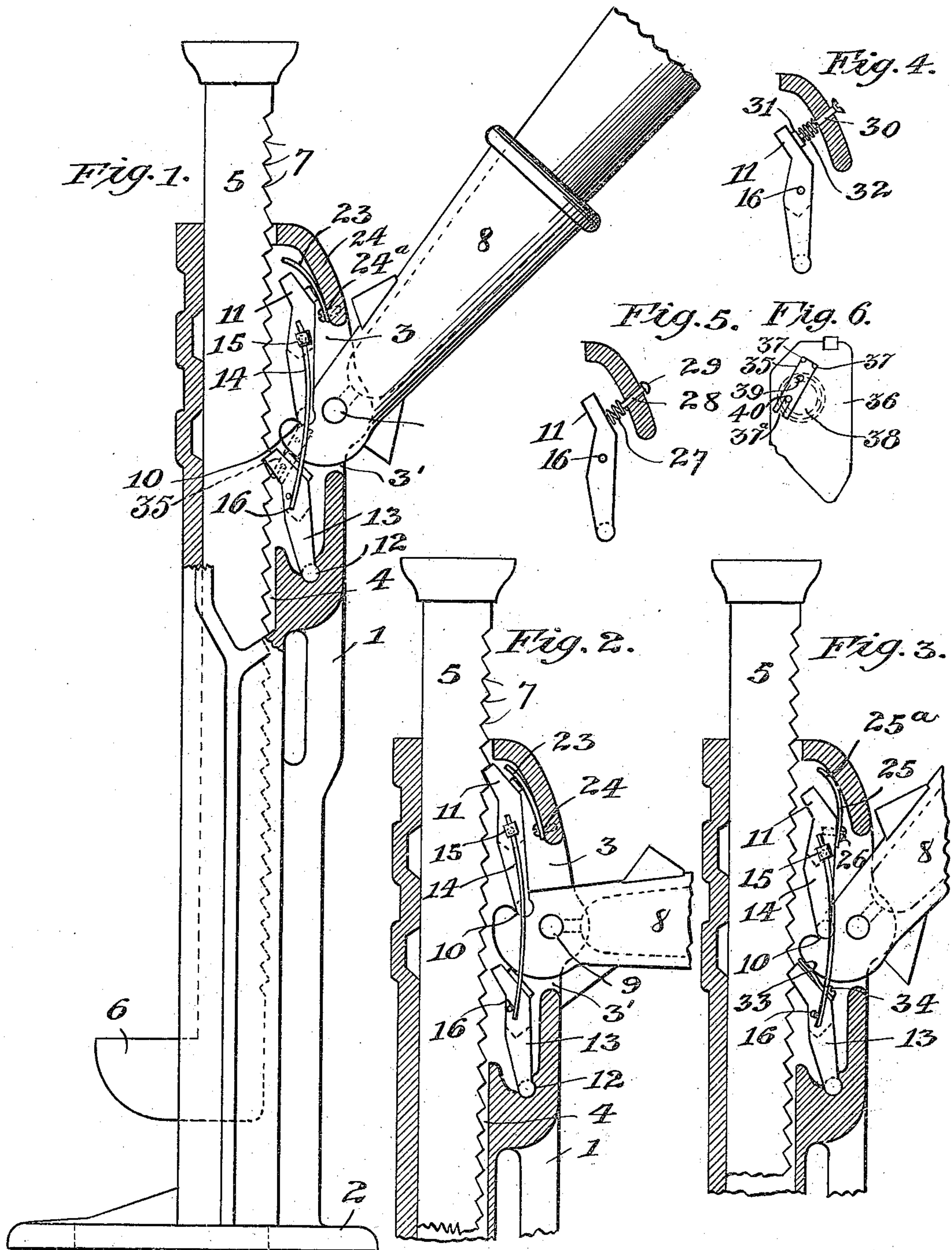
W. B. TEMPLETON.

JACK.

APPLICATION FILED JULY 24, 1907.

961,909.

Patented June 21, 1910.



Witnesses,
S. E. Mann,
S. N. Ford

Inventor,
Walter B. Templeton
By Offield, Fowler & Smith
Attys.

UNITED STATES PATENT OFFICE.

WALTER B. TEMPLETON, OF CHICAGO, ILLINOIS.

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Application filed July 24, 1907. Serial No. 385,348.

To all whom it may concern:

Be it known that I, WALTER B. TEMPLETON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Jacks, of which the following is a specification.

This invention relates to improvements in jacks of that character which are designed for lifting or forcibly moving heavy bodies through the medium of a leverage mechanism, referring more particularly to an improvement in the construction of a jack constituting the subject-matter of Letters Patent No. 794,901, granted to me on the 18th day of July, 1905.

Among the salient objects of the invention are to provide in a jack of the character referred to, a spring-actuated and spring-guided pawl mechanism; to provide a spring which will not only guide and actuate the pawls, but will cover and protect from wear a surface heretofore engaged by the pawls during their movement into engagement with the ratchet-bar; and to provide a simple and inexpensive spring which may be readily attached to the jack and replaced by a new one whenever necessary, thus serving to lengthen the life of the jack.

To the above ends the invention consists in the matters hereinafter described and more particularly pointed out in the appended claims, and the invention will be readily understood from the following description by reference to the accompanying drawings forming a part hereof, in which,—

Figure 1 is a side elevation, partly in section, of a jack embodying my invention, showing the lifting pawl in its lowered or disengaged position. Fig. 2 is a fragmentary view, similar to Fig. 1, showing the lifting pawl in its upper or engaged position. Fig. 3 is a fragmentary view similar to Fig. 2, illustrating applications of the pawl-controlling springs to the backs of the pawls. Figs. 4 and 5 are detail fragmentary views illustrating other forms of pawl-controlling springs. Fig. 6 is a detail inside face view of one of the side plates, showing means for tensioning the reversing spring.

Referring to the drawings, 1 designates the standard or main frame with the integrally formed base 2, and having in its upper end the chamber 3. Said frame is provided with a vertical way or socket 4 ex-

tending entirely through the frame from end to end, and within which is mounted to reciprocate a ratchet-bar 5, the said socket or way 4 being made open at the front side of the standard from the base upwardly throughout the principal length of the standard to accommodate the toe or lifting lug 6. The ratchet-bar 5 is provided with ratchet-notches 7. A slot-like opening 3' is formed in the rear side of the chamber portion of the main frame to accommodate the end of the main actuating lever 8, the end of which occupies said slot, and a pivot-bolt 9 is arranged to extend transversely through the main frame and through the lever. At its upper side, at a point between the pivot 9 and the ratchet-bar, the main actuating lever is provided with a transverse recess or socket 10 within which is seated the lower end of the lifting pawl 11, which is arranged to incline forwardly at its upper end and engage the teeth of the ratchet-bar 5. The pawl 11 is relatively broad both at its lower and upper ends so as to be held accurately against lateral oscillation and to engage practically the full width of the rear side of the ratchet bar.

In the lower portion of the chamber 3 is formed a transverse socket or recess 12, within which is seated the lower end of a second and dogging or holding pawl 13, which is also arranged to incline upwardly and forwardly, and to engage the teeth of the ratchet-bar. This pawl is likewise desirably made relatively broad and flat and for similar purposes. The inner end of the main lever 8 is formed on a curve eccentric to the pivotal axis of the latter, so that as the handle of the lever is raised, the inner end thereof, acting upon the pawl 13, forces the latter outwardly against the ratchet-bar.

14 designates a reversing spring, consisting of a spring strip or wire the upper end of which is connected to the upper pawl 11 through sliding engagement with an eye-lug 15 on said pawl, while its lower end is turned at right angles inwardly and extended through an aperture 16 formed through the pawl so as to have pivotal connection with the latter. The spring is so formed as to normally tend to assume a straight or approximately straight shape, and means, such as are fully shown and described in my former Letters Patent above referred to, are provided for placing tension upon the central portion of the spring

between the two pawls in such a manner as to flex said central portion forwardly so that the spring tends to throw both pawls into bearing with the ratchet-bar, or, on the other hand, to flex the central portion of the spring rearwardly so that both ends thereof tend to throw the pawls out of engagement with the ratchet-bar. This spring-tensioning means, briefly described, consists, as best shown in the detail view, Fig. 6, of an arm 35 pivotally mounted upon the inner face of a side plate 36 of the jack casing, which arm is provided at one end with a pair of inwardly projecting lugs 37 adapted to embrace the spring 14 at a point midway of the length of the latter and provided at its opposite end with a fork or slot 37^a. Seated in the side plate 36 is a turn-button 38, which is located at one side of the pivot stud 39 of the arm 35 and carries upon its inner face a stud 40 adapted to extend within and engage the fork or slot 37^a of the said arm, the arrangement being such that a partial rotation of the turn-button in one direction or the other serves to oscillate the arm on its pivotal axis, so as to flex the spring forwardly or backwardly.

In a jack constructed as described the upper or lifting pawl 11 is positively guided and forced into engagement with the ratchet-bar during its upward movement by means of the upwardly and forwardly inclined overhanging wall 24 of the main frame. Heretofore the back side of the overhanging guiding end of the pawl has been arranged to bear directly against the inclined surface of the wall referred to, with the result that in time the pawl and opposing surface became so worn that the certainty of action of the pawl was impaired. Moreover it has heretofore been necessary to form the pawl very accurately and to dress the overhanging guiding surface with corresponding accuracy in order to secure proper operation of the parts, and such accuracy of organization, of course, entails a relatively high cost of manufacture.

It is the object of the present invention to overcome the foregoing objections and at the same time provide a device serving the functions both of a wearing plate and a spring, insuring greater certainty of action of the jack. To this end, in accordance with the present invention, spring-actuated means are interposed between the back of the pawl and the inner side of the overhanging wall 24, which spring means may take a variety of forms as hereinafter described and as shown in the several figures of the drawings. In Figs. 1 and 2, this spring means is shown as consisting of a simple curved leaf spring 23, which is made of relatively wide plate metal and is rigidly but detachably secured at its lower end to the inner wall of the main frame just above

slot 3, conveniently by means of a screw 24^a, and in such a manner that the main body portion and upper end of the spring normally projects inwardly and away from the wall of the frame, as shown in Fig. 1. The shape and arrangement of the yielding end of the spring are such that as the pawl approaches the upper limit of movement the spring is forced back into substantial engagement with the overhanging wall, as shown in Fig. 2, whereupon the spring becomes in effect a wearing plate which acts to positively guide the pawl into engagement in precisely the same manner as though the spring were not present. Upon the return action of the pawl, however, the spring follows the pawl as the latter is retracted and maintains the pawl in more certain engagement with the ratchet-bar until the pawl has passed beyond the range of movement of the spring. It will also be noted that as the pawl is lifted or advanced to engage the ratchet-notch, it encounters the projecting end of the spring and is by the latter directed to engage the notch at its full depth in the first instance, instead of first engaging the outer portion of the ratchet-tooth and being thereafter gradually forced into the notch by the inclined surface. This difference of operation is important since it obviates the wear upon the tooth and end of the pawl due to the wiping of the latter across the former after they have been brought into engagement. The spring, therefore, minimizes the wear upon these parts and especially preserves the teeth of the ratchet-bar against being worn into a more oblique and therefore less safe shape. The fact that the spring is detachable, of course, enables it to be renewed as frequently as it becomes worn, and by reason of the fact that it compensates for inaccuracy of fit as well as for wear between engaging parts, it is not necessary to dress the interior of the casing forming the inclined wall with the same accuracy, and the cost of manufacture is therefore lessened. A still further useful function which the spring wearing plate 23 serves is to automatically take up wear occurring between the front side of the ratchet bar and the wall of the casing slidably engaged thereby, as well as the nose of the pawl, thereby preventing the ratchet-bar from slipping off the nose of the pawl when under load, and insuring the full engagement of the pawl with the ratchet.

Instead of attaching the spring to the pawl-guiding portion of the frame, the spring may be attached to the back of the pawl. This construction is illustrated in Fig. 3, wherein a flat leaf spring 25 having an inwardly curved upper end 25^a is attached at its lower end as by a screw 26 to the back of the pawl; the upper curved end of the spring in this case riding over the

guiding wall of the casing and elastically forcing the nose of the pawl into the notches of the ratchet-bar. This arrangement is simply the converse of the arrangement wherein the spring is secured to the frame, and operates upon the same principle.

Figs. 4 and 5 are fragmentary views illustrating the application of a round or elliptical coiled spring in place of the leaf springs previously described. Fig. 5 shows a simple coiled spring 27 bearing directly upon the back of the pawl, and it is secured to the overhanging portion of the frame by any suitable means or in any suitable manner, the spring as herein shown having an integral stem or shank 28 passing through an aperture in the frame, and provided at its outer end with a confining head 29. In Fig. 4 is shown a spring-controlled head in the form of a bolt or rivet shank 30 slidingly engaging an aperture in the frame and provided on its inner end with a flat head or shoe 31 contacting the back of the pawl. Surrounding the bolt 30 and confined between the shoe 31 and the inner wall of the frame is a coiled spring 32 normally pressing the bolt and its shoe against the pawl and forcing the nose of the latter into engagement with the ratchet-bar.

Fig. 3 also represents an extension of the principle of the invention to the lower or dogging pawl 13; 33 representing a leaf spring attached to the back of the upper portion of said pawl as by a screw 34; said spring serving to elastically force the pawl into engagement with the ratchet-bar when the lever is raised under the cam action of the lower end of the lever, in a manner clearly illustrated in the drawings.

I am aware that it has heretofore been proposed to guide the nose of a pawl into engagement with the tooth of a ratchet by means of a spring engaging the back of the pawl as the latter is raised or lowered to take hold of the ratchet. The device of my invention is distinguished from such a device in that it is not primarily the pawl guide, but constitutes rather a resilient or elastic removable wearing plate or strip which co-operates with a ratchet-guiding surface on the casing, saving wear upon the latter and the necessity of finely and accurately finishing the same.

I claim:

1. In a jack, the combination with a casing formed with an integral rigid pawl-guiding surface, and a ratchet-bar, of a lever fulcrumed in said casing, a pawl fulcrumed on the inner end of said lever with its upper free end lying opposite said pawl-

guiding surface, and a resilient wearing-plate interposed between the back of the pawl and said pawl-guiding surface and co-operating with the latter in guiding and forcing the nose of the pawl into engagement with the ratchet bar.

2. In a jack, the combination with a casing formed at its upper end with an integral overhanging wall constituting a rigid pawl-guiding surface, and a ratchet bar, of a lever fulcrumed in said casing, a pawl fulcrumed on the inner end of said lever with its upper free end lying opposite to said pawl-guiding surface, and a resilient wearing plate secured at its lower end to said pawl-guiding surface between the latter and the back of the pawl and coöperating with said pawl-guiding surface in guiding and forcing the nose of the pawl into engagement with the ratchet bar.

3. In a jack, the combination with a ratchet bar and its casing, of a dogging pawl pivoted in said casing, a lever pivoted in said casing above said dogging pawl, the inner end of said lever being formed with a cam surface, and a spring constituting a yieldable pawl-setting device interposed between the back of said pawl and the cam surface of said lever.

4. In a jack, the combination with a ratchet-bar and its casing, of a dogging pawl pivoted in said casing, a lever pivoted in said casing above said dogging pawl, the inner end of said lever being formed with a cam surface, and a leaf spring constituting a yieldable pawl-setting device secured to the back of said pawl and adapted to be slidingly engaged on its outer side by the cam surfaces of said lever as the latter is raised.

5. In a jack, the combination with a ratchet-bar and its casing, of a lever pivoted in said casing, upper and lower pawls pivoted in said lever and casing, respectively, a continuously acting spring adapted to be tensioned so as to urge both of said pawls away from said ratchet-bar when the latter is being lowered, a pawl-guiding surface on said casing for said upper pawl adapted to guide the latter toward the ratchet-bar, a cam surface on the inner end of said lever adapted to force said lower pawl toward the ratchet-bar when the lever is raised, and springs interposed between the backs of said pawls and their respective controlling surfaces and constituting yieldable pawl-setting devices.

WALTER B. TEMPLETON.

Witnesses:

SAMUEL N. POND,

FREDERICK C. GOODWIN.