

No. 652,685.

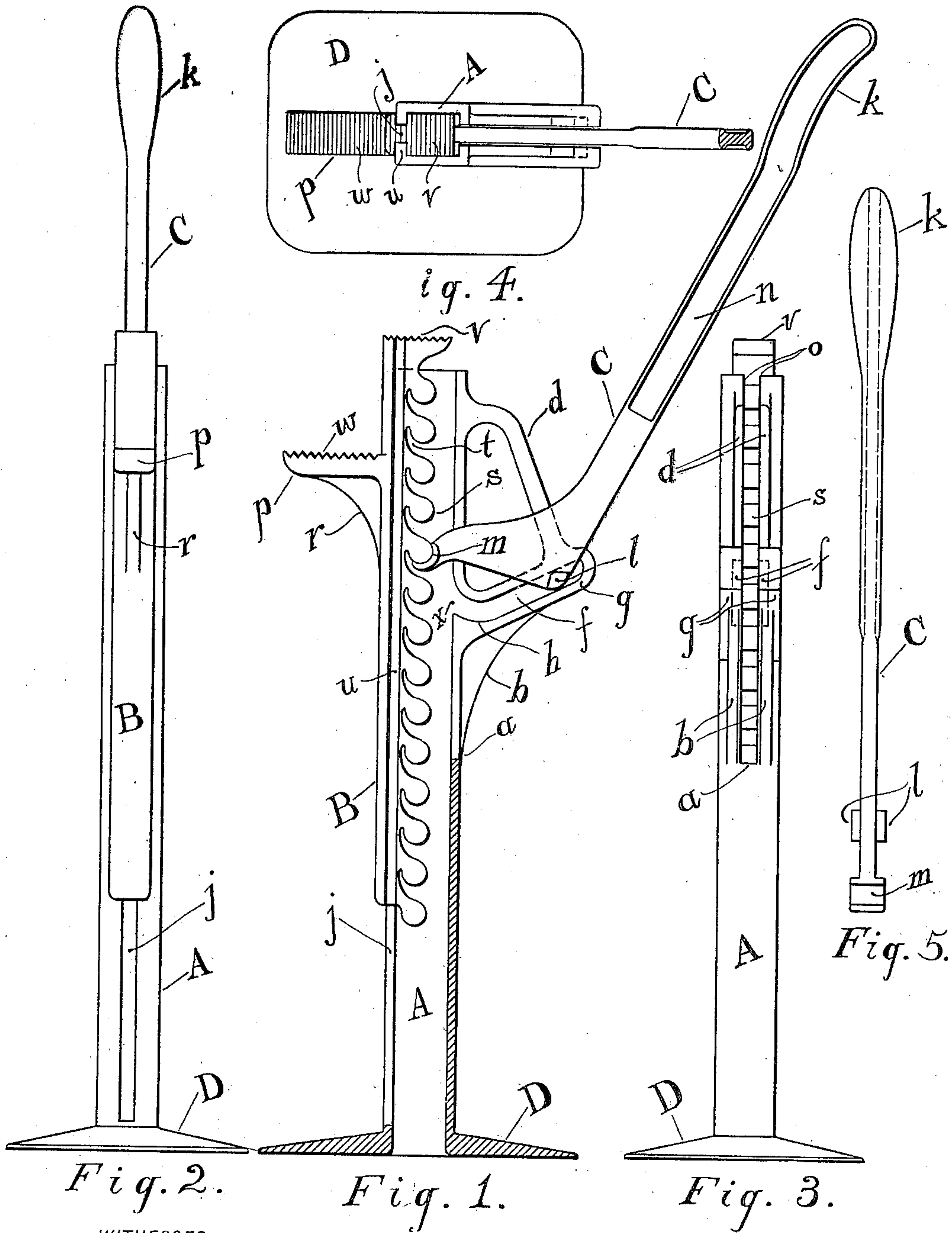
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W. K. PALMER.

LIFTING JACK.

(Application filed Apr. 8, 1899.)

(No Model.)



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# UNITED STATES PATENT OFFICE.

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## LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 652,685, dated June 26, 1900.

Application filed April 8, 1899. Serial No. 712,293. (No model.)

*To all whom it may concern:*

Be it known that I, WALTER K. PALMER, a citizen of the United States of America, residing at Lawrence, in the county of Douglas and State of Kansas, have invented certain new and useful Improvements in Lifting-Jacks, of which the following is a specification.

My invention relates to improvements in lifting-jacks commonly employed for raising and holding in position the axles of buggies, wagons, &c., but which are suited to lifting and holding in position any object which it is desired to raise and hold. In these lifting-jacks a lever operates to move a piece carrying a step or rest for the axles or objects to be raised, which piece slides in or on a suitable frame or standard or is suitably connected thereto.

The objects of my improvements are to provide, first, a sliding piece carrying a step or rest for the axle or object to be raised, which slide can be slipped quickly to any height necessary to accommodate the axles of any vehicle; secondly, a simple mechanism whereby this slide can then be raised farther through a certain distance predetermined, by means of the lever, and there locked securely, so that no amount of weight can cause it to slip downward until the lever is moved again; and, thirdly, to provide a combination of mechanism which shall accomplish said purpose in such a way that only three separate and distinct pieces shall be needed in the construction of the jack and such that these three parts can readily be made from cast metal without the necessity of employing any pins or bolts for the bearings or pivots or any bolts or connecting-pieces to hold the three parts in their proper relations to each other, with the result that no machine-toolwork shall be necessary upon the three parts of the jack when they are cast in metal. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the jack, showing the standard A in section and the slide B and the lever C in full in their proper relation in position within the hollow standard. Fig. 2 is a view of the jack complete, taken from the left of the position in which

it is represented in Fig. 1. Fig. 3 is a view from the right, showing the jack not sectioned, but with the lever C removed for the purpose of showing the details of the standard A and slide B more fully. Fig. 4 is a plan view; and Fig. 5 is a view of the lever C, shown apart from the other pieces.

The same letter is used for the same piece wherever it occurs throughout the several views of the drawings.

The frame of the jack consists of the standard A, together with its broad flat base D, upon which the jack stands. The standard is hollow throughout its entire length and is rectangular in cross-section, as shown in Fig. 4. The thickness of the walls of this hollow standard is preferably uniform, as shown in Figs. 1 and 4. The standard is provided with a slot or opening *j* of uniform width from its top down almost to the base D. This slot or opening *j* in the flat face of the standard thus provides a pair of guides within and upon which the bar B, carrying the step *p*, can slide, the groove *u* on either side of the bar B fitting the rectangular projecting edge formed by the slot cut into the flat face of standard A. In the opposite face another slot or opening *o* is cut from the top of the standard down to a point marked *a* in Figs. 1 and 3. This slot or opening *o* is of uniform width and passes through the grip-handle *d* and the projecting ear *g*, leaving this handle and ear double, with a slot of uniform width between the two parts, in which the hand-lever C operates. These projecting ears have formed on their inner faces, respectively, a rectangular groove *f* of uniform width and depth, which groove has at its upper extremity a suitable curvature to just fit the contour of the double projecting heel *l* of the lever C when the latter is drawn back to its highest position, and at its lowest part another suitably-curved portion *h* is formed, it being designed to provide a seat for this curved heel *l* of the lever C when the lever is pushed down. This pair of inclined grooves serves as a slide for the projecting portions of heel *l* of lever C. The inclination of this pair of rectangular grooves is determined at the proper angle to cause a line joining the center of the circular curved end *m* of the lever C with the center of the heel *l* to form an acute angle



with the bearing-surfaces of the pair of grooves when the lever is pushed to its lowest position. Thus with an acute angle so formed no amount of downward pressure from the weight upon bar B can cause the lever to slip back out of place; but, on the other hand, the weight upon this bar B will tend instead to compel the lever to remain in position and hold the weight more securely until the handle of the lever is raised.

The letter *d* indicates a handle for lifting and carrying the jack, formed as shown in Figs. 1 and 3 and being in two halves, as already explained.

A pair of uniform thin ribs or brackets *b*, Figs. 1 and 3, are provided under the pair of projecting ears to assist in supporting the weight produced by the lever.

The bar B consists of a piece of metal designed substantially as shown in the drawings and is provided with a rectangular groove on either face extending its entire length and arranged to fit the rectangular guides provided in the design of the standard, as already explained. The portion of this bar B which comes within the hollow standard has formed upon it a succession of equally-spaced cylindrically-formed teeth, of which one is marked *s* in Figs. 1 and 3. These teeth are of the same circular outline as the circularly-curved end *m* of the lever C, so that this curved end of the lever will fit any one of these teeth in whatever position it may be applied. The teeth are of sufficient breadth to provide a good bearing-surface for the action of the curved end of lever C, the teeth being of a width equal to the width of this curved end of the lever and of just the same diameter as the curve of this end of the lever. The teeth are spaced at sufficient intervals and provided with such suitably-curved spaces between them that the lever can be depressed to its lowest position when in contact with a tooth without interfering with or encountering the next lowest tooth.

The bar B carries on its outer face a suitable step *p*, strengthened by a rib *r* and provided with ridges or corrugations *w*, upon which is rested the axle or whatever is to be raised by the action of the jack. Similar corrugations or ridges are provided at *v* at the upper end of the bar B, thus forming another step, which may be used if the other is not high enough.

The lever C is of uniform thickness throughout a portion, at least, of its length, it carrying the curved end *m*, designed to fit the curved teeth of bar B, and carrying also the curved heel *l*, projecting from each face sufficiently to slide in the rectangular grooves *f* of the ears *g*. This heel *l* in outline is in the form of a sector of a circle, as shown in Fig. 1, so that in all positions of the lever it occupies the width of the grooves *f* and at the same time provides a smooth bearing and sliding surface to slide upon the flat inclined bottom of grooves *f*. The end *m* and heel *l*

are set at just the right position with respect to the lever proper, so that when the handle of the lever is depressed the desired distance heel *l* will just fit in the seat *b*, arranged for it, while the curved end *m* retains its contact with and hold upon the curved tooth. A suitably-formed end is provided on the handle for grasping by the hand and is I-shaped in cross-section. This I-shaped section is continued a portion of the way along the length of the lever or until the place is reached where the lever must be of uniform thickness to pass between the two parts of projection *g*.

The operation of the above-described mechanism is as follows: Before bar B is put in place the lever C is slipped into position, the heel *l* being passed downward through the rectangular cavity in the standard, followed by the end *m*, until the opening to groove *f* is reached, when the handle is drawn up, thus slipping heel *l* into its place in these grooves. Heel *l* is drawn up to its highest position, when it just fits the curved ends of the grooves and where end *m* rests against the walls of the standard at *x*, entirely out of the path of the teeth on bar B. Bar B is now slipped in place to the desired height, when lever C is depressed and the end *m* engages the nearest tooth, raising it and locking it in position, as already shown. To adjust the step to a different height, the lever-handle is drawn back until *m* rests at *x*, thus disengaging the lever from the tooth, when the bar B is slipped to the proper height to bring either step desired to a position just under the object to be raised. The lever is then depressed and the end *m* engages the nearest tooth and raises the bar and step through a fixed height and locks the mechanism securely.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a hollow standard having ears thereon, the ears provided with inclined grooves which open into the hollow standard, said grooves having at their lower ends a seat, of a bar provided with rounded teeth and having slidable connection with the hollow standard, and a lever having a heel at one end projecting from each face thereof sufficiently far to slide in the inclined grooves of the ears, the lever provided with a socket at one end adapted to receive a tooth, the heel and socket set at just the right angle with respect to the handle end of the latter so that when the latter is depressed the desired distance the heel will just fit in the seat, while the socket retains its contact and hold upon the rounded tooth.

2. The combination with a hollow standard having ears thereon, said ears provided with inclined grooves which form a seat and opening at their lower ends into the hollow portion of the standard, and a bar having sliding connection with the standard, this bar



provided with transverse cylindrical teeth, of  
a lever having a sector-shaped heel at one  
point projecting from each face thereof suf-  
ficiently far to slide in the inclined grooves  
5 of the ears, the dimensions of the heel being  
such that it occupies the width of the grooves  
in all positions, the lever being provided with  
a socket at one end adapted to receive and  
turn with respect to a tooth, the heel and  
10 socket set at just the right angle with respect  
to the handle end of the lever so that when  
the latter is depressed the desired distance,  
the heel will just fit in the seat while the  
socket retains its contact and hold upon the  
15 curved tooth, and the open-ended grooves  
permitting the ready insertion and removal  
of the lever.

3. A lifting-jack comprising three sepa-  
rable parts, to wit: a standard having a cen-  
20 tral groove therein and provided with ears in  
which inclining grooves are formed, said  
grooves having at their lower ends a seat and

opening upwardly into the central groove of  
the standard, a toothed bar having cylin-  
drical teeth and slidable connection in the 25  
groove of the standard, and a lever having  
slidable connection in the inclined grooves,  
said lever provided with a heel and a con-  
caved end, the latter to engage the cylin-  
drical teeth, the distance between the heel 30  
and the extreme concaved end being less than  
the distance between the teeth and the outer  
end of the grooves, whereby the several parts  
may be assembled by first dropping the heel  
of the lever into the upper end of the stand- 35  
ard-groove and thence moving it into the in-  
clined grooves in the ears, then moving the  
heel upward to the outer ends of said grooves,  
and by then placing the bar in the standard-  
groove.

WALTER K. PALMER.

In presence of—

W. F. MARCH,  
PAUL LANDIS.