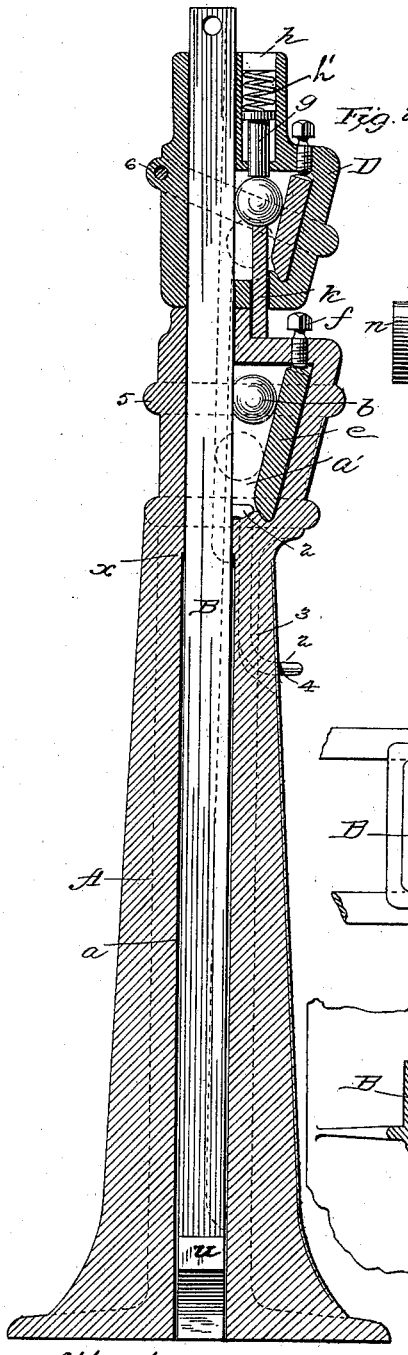
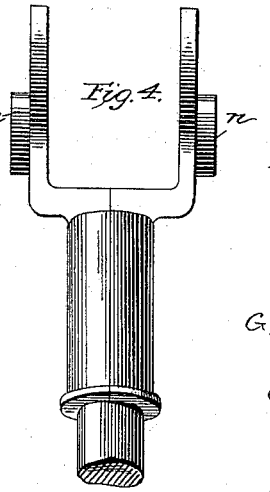
(No Model.)

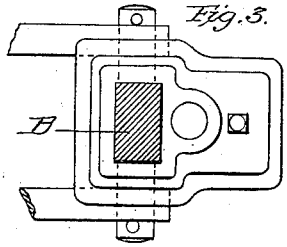
L. J. CRECELIUS.

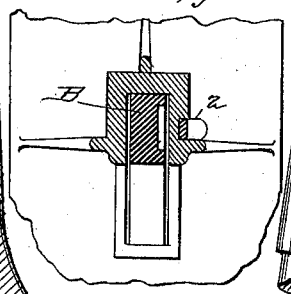
LIFTING JACK.

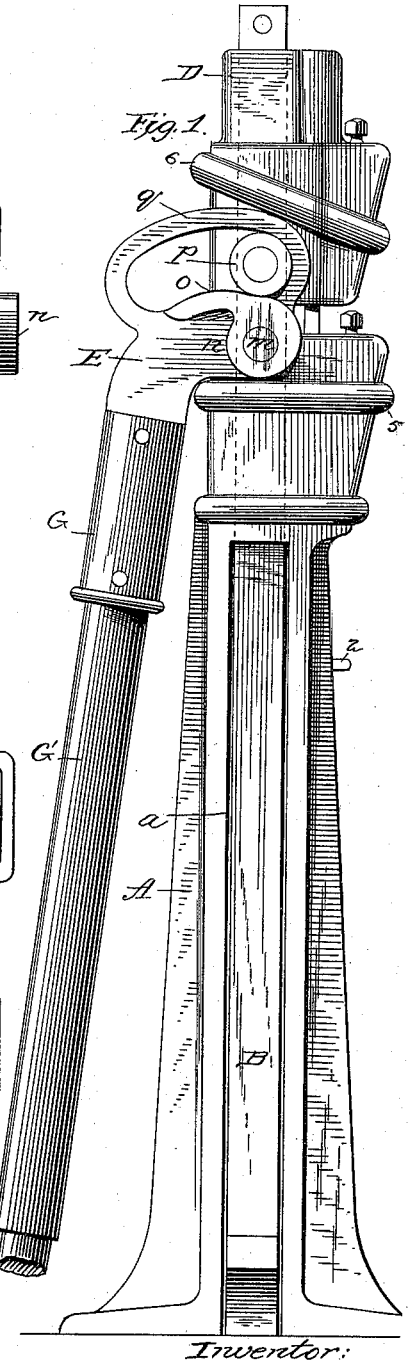
No. 383,709. Patented May 29, 1888.











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UNITED STATES PATENT OFFICE.

LOUIS J. CRECELIUS, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO ANDREW WARREN, OF SAME PLACE.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 383,709, dated May 29, 1888.

Application filed November 25, 1887. Serial No. 256,133. (No model.)

To all whom it may concern:

Be it known that I, LOUIS J. CRECELIUS, of the city of St. Louis, in the State of Missouri, have invented a new and useful Improvement in Lifting-Jacks; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention is an improved lifting-jack. The entire jack, as hereinafter shown, is designed more especially for the smaller class of jacks, such as those commonly used as track-lifters and for work of similar character; but parts of the invention are well fitted for jacks of larger size, and are shown in another application filed by me in the United States Patent Office of even date herewith.

The invention is made to reduce the number of parts in these implements, to simplify their structure, and thus render them cheaper and more durable. I have also sought to render the action of the lifting-lever uniform, so that the same power is required for a given weight throughout the whole movement of the lever, and to increase the effectiveness of the lever without complication of parts.

The form in which I have embodied my invention is shown in the accompanying drawings, in which—

Figure 1 represents a side elevation of my lifting-jack; Fig. 2, a central vertical section from front to rear; Fig. 3, a top view of the jack; Fig. 4, a plan view of the forked lifting-lever. Fig. 5 is a horizontal section through the standard, showing the bar or finger-piece for releasing the grip-roller.

In the drawings, A represents the standard, which may be made of cast-iron or of any other material, if desired, and preferably with a rectangular base to adapt it to fit between railway-ties. It has a central vertical channel, *a*, for the ordinary lifting-bar, B, which fits and slides therein when not held by the gripping mechanism. Near the upper end of the standard and opening into the channel is a chamber, *a'*, having a rear face inclined backward at the top. In this chamber is a roller, *b*, preferably cylindrical and of hardened steel, and when the parts are in place this roller bears on one side against the rear inclined wall and on the other directly against the face of the lifting-bar. When said bar is lifted, the roller moves freely up on the inclined wall; but when the bar tends to return (the standard being in its proper vertical position) the roller is pressed by the incline in the ordinary manner against the bar and holds it by a secure grip. The face of the chamber against which the roller bears might be formed in the casting itself, either of the cast metal or of a plate of steel set therein; but in order to provide a hardened-steel face, and one also which may be renewed, I form the chamber sufficiently deep to receive a steel plate, *e*. Preferably, as shown, there is a small groove made in the lower part of the chamber at the foot of the rear wall, into which the lower end of the plate fits while it is held by a set-screw, *f*, above. The lifting-head D has a similar chamber with like hardened-steel plate and roller impinging against the lifting-bar. Above this chamber a pin, *g*, is set in a suitable cavity in the head and provided with a spring, *h'*, held above by a plug, *h*, and pressing the pin down through a hole in the bottom of the cavity to bear upon the roller and hold it closely to its work. This causes it to act promptly and without lost motion at each movement of the head when lifting. To release the roller when the head descends, I have provided a stud, *k*, projecting upward in line with the roller. It is set in the top of the standard and projects through the bottom of the chamber, and is so arranged in position and length that when the head is down on the top of the standard the roller is lifted and released from the nip between the face of the lifting-bar and the rear plate.

The lifting-lever E is pivoted at *m* on the top of the standard. It is preferably made forked, as shown in Fig. 4, and has thus two bearings—one on each side—to lift squarely on the head and prevent binding. The ears *n* of the forks form the bearings of the lever, and their peripheries are extended at *o* to form cam-faces, on which rest the friction-rollers *p*, which turn on studs upon the head. As the lever E is lifted, the higher part of the cam-face *o* on each side is brought against the friction-rollers, and the head is lifted, carrying with it the lifting-bar, through the action of the gripping mechanism in the head. The curve on the cam-faces is uniform and conforms

in its rise and movement to the shifting position of the cam-lever, so that the operator constantly exerts the same power. The construction also reduces the friction to a minimum.

The action of the cam is wedge-like, so that the power exerted to raise the head is the combined power of a wedge and a lever. This renders the use of a short lever practicable; but I have provided means by which the lever may be extended, if required, to be of greater length. This I accomplish my making the handle of gas-pipe, riveted to the castings which form the jaws. In the gas-pipe handle G, I insert a handle-extension, G′, which may be retained in the handle by any suitable stop, and is pushed in when not required for use, as it is desirable to have the instrument in compact form, and when closed the lever does not extend beyond the standard. The handle of the cam-lever might be reversed in position, or the cam reversed, so that it would lift by depression; but I prefer the arrangement shown, as thereby the operator is enabled to exert a power greater than his weight.

Over the friction-rollers of the head a loop, *q*, of the cam-lever is extended, curved to conform to the working-face of the cams. This affords positive and certain means for bringing the head down promptly.

The friction-rollers on the lifting-head may be on any suitable projections or shoulders on the head, the whole head being formed in one piece.

In operating the jack it will be obvious that both gripping mechanisms must be released in order that the lifting-bar may fall freely. The gripping-roller in the head is automatically lifted out of the nip between the rear face of its chamber and the bar when the head is brought down to the standard. A similar but movable releasing device is provided for the lower or holding grip. This consists of a releasing bar or rod which slides in a recess in the rear face of the standard. The wall of the standard is slotted through at the bottom of this recess to allow the end of the bar 2, (shown detached in Fig. 5,) which is bent out after insertion at right angles, as shown at 4, to project through. Outside it may be bent in any required direction, so as to be operated either by the hand or foot of the workman. The upper end of the bar projects through the bottom of the standard-chamber in line with the roller, and the slot is long enough to allow the bar to be raised to lift the roller out of the nip. In order to let the lifting-bar down it is necessary only to hold it, and whatever weight it may carry, by the cam-lever, then to raise the lower roller by lifting the bar 2, and while this is up to lower the head to the standard, which releases the upper roller and lets the lifting-bar fall. Instead of the bar 2, a lever or similar device may be used. It is simply a lifter adapted to be worked by the hand or foot of the operator.

The lifting-bar has the ordinary offset, *u*, at the lower end projecting through a slot in the standard, from the channel in which the bar moves. It also has a taper from top to bottom on the side next to the rollers. This I prefer to make in the form of a channel in width adapted to receive the rollers, which thus are made to bear against the bottom of the channel. This taper increases the grip of the rollers and makes them effective even when oil or grease happens to get on the surface of bar or roller. It has another effect, in connection with the fixed inclined rear wall, of importance when considered in connection with the wear of the implement. When the lifting-bar is made of uniform thickness, the position of the roller on the inclined wall in sustaining the weight is always the same, and the wear is thus concentrated on one point. This point of the plate becomes worn and hollowed, and this tends to soon render the grip ineffective when the plain bar is used; but with the tapered bar the position of the roller will change as the bar is lifted or lowered. Thus when the bar is down and the thickest part opposite the roller, the roller is in the upper part of the inclined chamber, as shown in full lines, Fig. 2, in gripping; but when the bar is up and the thinner part is opposite the roller the roller will be in the lower part of the chamber during the grip and the position of the roller will vary as to the plate with the position of the bar in respect to elevation. Thus the grip and the wear upon the rear plate are distributed on every part and the plate or rear wall wears uniformly and evenly; but I do not herein broadly claim the tapering bar, it being broadly claimed in the other aforesaid application.

The channel in the standard, as shown in the vertical section, is made from the point *x* a little below the grip-chambers a trifle larger than the lifting-bar. This obviates the expense of fitting, which is required only from this point upward, and also avoids any difficulty arising from slight springing or warping of the standard in the manufacture.

The sectional view, Fig. 2, shows in dotted lines the position of the roller in the standard-chamber when the lifting-bar is raised. The roller follows the face of the bar and bears against it, and when the bar is lifted the roller is in the lower part of the chamber unless raised therefrom by the roller-lifting device. The standard and head are shown as cast with ribs 5 and 6 about the roller-chambers. They are located to resist the lateral strain in the gripping and may be of wrought-iron embedded in the casting.

Having thus described my invention, I claim—

1. In a lifting-jack, a chambered head having a channel for the lifting-bar, said chamber being formed with a rear inclined wall and opening directly into the channel, a roller in said chamber, and a spring-pin in a recess in the head bearing upon the roller, substantially as described.

2. In a lifting-jack having a standard pro-

vided with a holding-grip and a head provided also with a grip, a lifting-bar and a lifting-lever pivoted on the standard and provided with a cam-surface fitted to bear against a projection on the head and thus to lift the head as the lever rises, substantially as described.

3. In combination, the standard and its grip, the lifting-bar, a head also having a grip, and a lever pivoted on the standard and provided with a cam-surface fitted to bear against a projection on the head to lift the head as the lever rises, and a loop over the projection, substantially as described.

4. In a lifting-jack and in combination, a channeled standard having a chamber formed with an inclined rear fixed wall, a gripping-roller and a lifting-bar tapering from the upper end downwardly, and a suitable lifting-head and lever, all substantially as described.

5. In a lifting-jack having a standard provided with a holding-grip and a head provided with a grip, a grooved and tapered lifting-bar and suitable operating means for lifting said bar, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LOUIS J. CRECELIUS.

Witnesses:
ANDREW WARREN,
C. D. GREENE, Jr.