J. A. ADELL.

JACK FOR AUTOMOBILES AND THE LIKE.

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1,394,263. Patented Oct. 18, 1921.

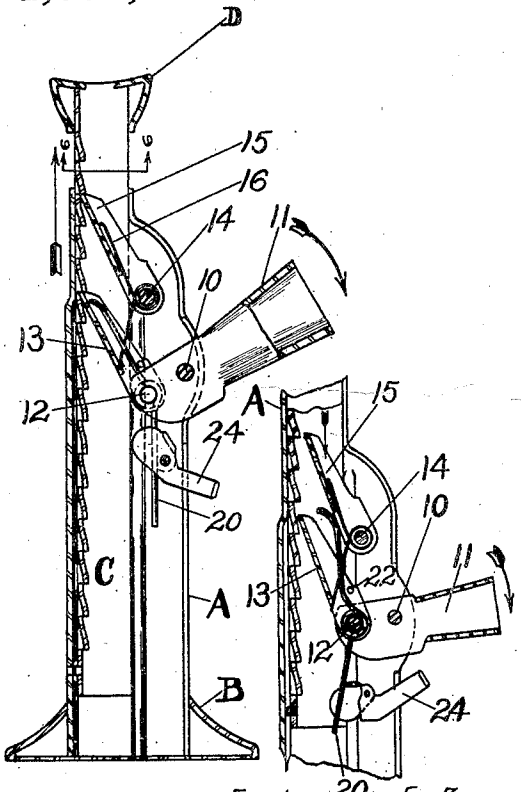


Fig. 1.

Fig. 3

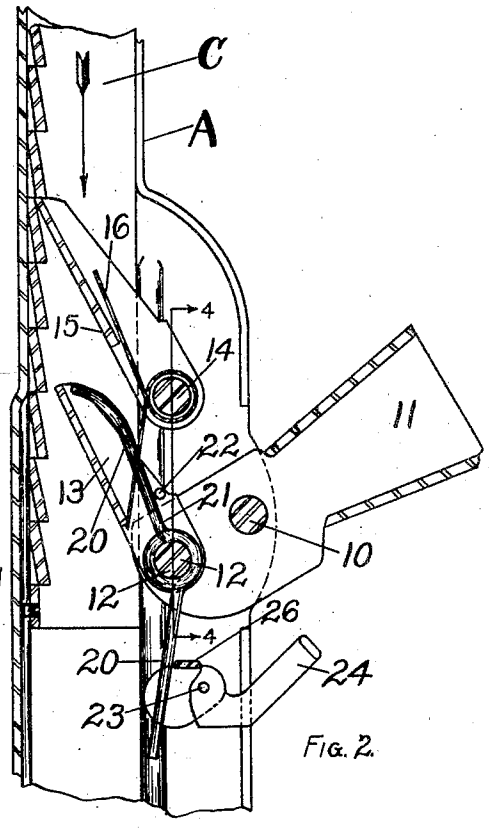


Fig. 2.

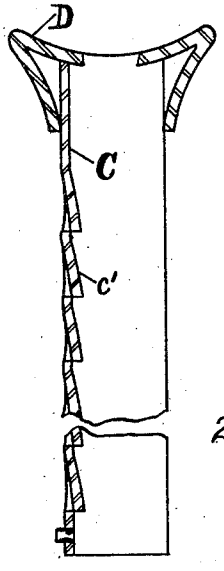


Fig. 7.

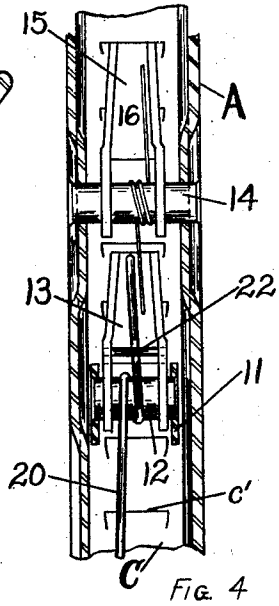


Fig. 4

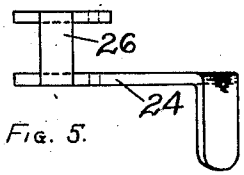


Fig. 5.

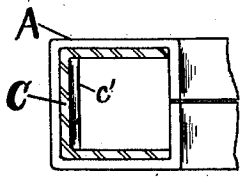


Fig. 6

INVENTOR

JOHN A. ADELL.

BY Southgate & Southgate.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOHN A. ADELL, OF ORANGE, MASSACHUSETTS, ASSIGNOR TO THE ADELL MANUFACTURING COMPANY, INC., OF ORANGE, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

JACK FOR AUTOMOBILES AND THE LIKE.

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To all whom it may concern:

Be it known that I, JOHN A. ADELL, a citizen of the United States, residing at Orange, in the county of Franklin and State of Massachusetts, have invented a new and useful Jack for Automobiles and the like, of which the following is a specification.

This invention relates to a jack particularly designed for use in lifting and lowering automobile axles but capable of general use.

The principal objects of the invention are to simplify and improve the jack which is the subject of the Patent No. 1,183,841 to Edward A. Adell, and especially to still further reduce and simplify the pawl motion therefor and the sheet metal rack, and reduce the number of parts.

The invention also involves improvements in the details of construction of the various parts of the jack and the combinations thereof.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a central vertical section of a preferred form of the jack showing the parts in position for raising the rack;

Fig. 2 is a similar view showing the parts in position for lowering the rack;

Fig. 3 is a similar view showing the handle lowered almost to its lowest position;

Fig. 4 is a sectional view on the line 4—4 of Fig. 2;

Fig. 5 is a plan of the controlling lever;

Fig. 6 is a sectional view on the line 6—6 of Fig. 1, and

Fig. 7 is a longitudinal central section of the rack.

The invention is shown as embodied in a construction having a main outer casing A and a base B for supporting the same. In this casing is a rack C having teeth c' on one side thereof and provided with a rest D at the top for receiving the axle or other body to be lifted. The details of these parts will be described hereinafter.

For the purpose of operating the rack the following mechanism is provided. Pivoted on a stud 10 is a lever 11 which can be provided with a wooden or other extension or handle for operating it. The lever extends through a slot in an enlargement formed on the front of the casing. At its inner end it is provided with a stud 12 to which is pivotally connected a pawl 13 for engaging the teeth c' of the rack.

This pawl is arranged to move up and down as the lever is oscillated about the stud 10. Almost directly above the stud 12 is a stud 14 mounted on the casing and pivoted thereon is a second pawl 15 also adapted to engage the teeth c'. These pawls preferably are made of sheet metal stamped out to a trough shape with the flat or closed side at the rear and with an opening through the closed side at the bottom. A spring 16 wound around the stud 14 extends at one end through the opening in the rear of the pawl 15 and engages the top of the rear wall of said pawl so as normally to hold this pawl against the rack in the position shown for example in Fig. 1. The other end of this spring 16 engages the front of the pawl 13 and normally forces that toward the teeth also.

For the purpose of changing the action of the pawls a heavier spring 20 is provided located entirely within the casing. This spring is wound around the stud 12, being pivoted loosely thereon, and normally has free play in the casing. This spring extends upwardly into a position to engage the rear of the pawl 15. It has a bend 21 adapted to engage a cross pin 22 on the lower pawl 13.

Pivoted on a stud 23 supported in the casing is a trip lever 24. This is made of a single piece of sheet metal and has an operative integral cross bar 26. When this lever is in the position shown in Fig. 1 it puts no pressure on the spring 20 but allows it to remain freely in position, but when the lever is turned up to the position shown in Fig. 2 it presses the top of the spring forward against the rear of the pawl 15. In this position it forces the pawl 15 away from the rack, as shown in Fig. 3, when at the top of its stroke.

The operation of the device is as follows: With the parts in the position shown in Fig. 1, the spring 20 as stated is loose and does not affect the pawls, consequently the spring 16 is free to force both pawls toward the rack with a light pressure. Now when the lower end of the operating lever moves down to the position shown in Fig. 1 the spring 16 has forced the end of the pawl 15 in between two of the teeth c' thus holding the rack in

that position during the descent of the pawl 13. During this downward motion of this pawl the tooth with which it was in engagement forces it out toward the front and it comes down freely until it springs over the bottom of that tooth, which it is free to do. This entire action is controlled by the spring 16.

Now upon the upward motion of the lower end of the lever the pawl 13 of course engages a tooth and moves the whole rack up. During this motion the pawl 15 can do nothing except be forced out by the tooth which it has been engaging and then, when it reaches the bottom of it, swing in by the force of the spring 16. It then holds that tooth while the pawl 13 descends as the lever is turned in the opposite direction. During this entire motion the spring 20 moves up and down without performing any function and the entire lifting action is performed by the lower pawl.

Now in order to lower the rack the trip lever 24 is turned down to the position shown in Fig. 2. The effect of this is to move its cross bar 26 down to engage the lower part of the spring 20 and put it under tension. This forces the upper inclined end of the spring 20 forward and it comes against the rear of the upper pawl 15 when the lever handle is lowered (Fig. 3). This moves this pawl resiliently forward away from the rack at the end of the down strokes of the handle. Then the rack is held up simply by the lower pawl 13. If then the handle is raised, and the inner end of the lever 11 is lowered, the pawl 13 will simply work down carrying the rack with it without affecting the pawl 15. When the pawl 13 moves down nearly to the bottom the upper portion of the bend in the spring 20 operates the cross pin 22 to draw the pawl 13 away from the rack. But before this, the upper inclined end of the spring 20 has drawn down out of contact with the pawl 15 and its spring 16 has forced it against the rack to hold it against further descent at that time.

Upon the rise of the inner end of the lever 11 the pawl 13 is forced up with it, still out of contact with the rack. When the pawl reaches nearly the top of its stroke the upper inclined end of the spring 20 will engage the bottom surface on the pawl 15 and force that pawl out of engagement with the tooth of the rack. This also releases the spring 20 from the cross pin 22. Thus, by this time, the end of the pawl 13 has moved in far enough to engage the bottom of a tooth. This occurs at the top of each upward movement of the pawl 13.

Now when the pawl 13 is drawn down, the rack moves down with it at first and the upper pawl 15 gradually approaches the rack while the pawl 13 is moved down, but soon the pawl 13 is forced forward by the action of the spring 20 against the pin 22 so as to disengage it from the tooth of the rack which it has been supporting. Then the rack drops on the pawl 15 which by that time has projected into its path and the parts are ready to perform this operation over again.

In this way it will be seen that very simple pawl mechanism is required for performing these results and that it is so constructed that the pawls work together and coöperate with each other, thus reducing the number of parts required even in said Edward A. Adell's old construction, and permitting their being mounted at the front of the rack. In this way the use of the mechanism projecting at the side of the casing and rack is entirely avoided.

I will now describe the construction of the rack. The casing A consists of a single piece of sheet metal bent up into form by dies and having a seam at which the edges come together, preferably located at the center of the front thereof, that is the side from which the handle lever 11 projects. In order to hold this together at the bottom the base B is provided also consisting of a single piece of sheet metal having a hole in it for receiving the shank of the casing proper preferably as in said patent.

This rack is also made of a piece of sheet metal and its teeth c' are made by cutting slits through one flat surface thereof parallel with each other and bending them in to the form illustrated in Fig. 7. The main part of the rack C is formed of a piece of sheet metal bent to form the three sides of a four-sided figure. The other side is entirely open and as this is the front side it permits the pawls to enter it and be housed within it most of the time, thus economizing in space. The rest D at the top is also shown as made of a piece of sheet metal and is connected with the member C.

With this construction it will be seen that the parts are easily made in dies of a material which is strong and durable and especially light in weight for its strength and compact. The construction of the parts is very simple so that the whole device can be manufactured cheaply. The jack is not likely to get out of order in practice, and takes up very little room in use and when packed for shipment. It can be carried around very readily on account of its light weight.

Although I have illustrated and described only a preferred embodiment of my invention and shown it as applied to the construction shown in said patent, I am aware of the fact that many modifications can be made in the construction and arrangement of the parts and that it can be used for other purposes without departing from the scope of the invention as expressed in the claims.

Therefore I do not wish to be limited to all the details of construction shown, or to the particular use mentioned, but what I do claim is:—

1. In a jack, the combination with a casing, a rack movable up and down in the casing, and a handle lever for operating the rack, of an operating pawl pivoted to the end of said operating lever, a second pawl pivoted at a stationary point, a single spring coiled around the pivot of the second pawl, each end forcing one of said pawls toward the rack, and a stronger spring pivoted on the pivot of the first named pawl and movable with the handle lever for pushing the operating pawl from the rack as it descends and allowing the first named spring to move it against the rack as it ascends.

2. In a jack, the combination with a casing, a rack and an operating lever, of a pawl pivoted to said operating lever, a second pawl pivoted beyond the operating lever, yielding means for forcing both pawls toward the rack, a stronger spring arranged parallel with the first pawl and movable up and down with the lever for normally holding the first pawl back away from the rack in opposition to said yielding means, the second pawl having a surface for engaging the other end of said stronger spring on the other side of its pivot when the second pawl is held in engagement with a rack tooth and allowing the first pawl to swing into engagement with the rack without opposition from the stronger spring, said stronger spring extending past the operating lever in the casing to a point on the other side of the operating lever, and a trip lever pivoted to the casing on said other side of the operating lever and movable to two positions in one of which it leaves the stronger spring inoperative.

3. In a jack, the combination of a casing, a rack slidable up and down in the casing, and an operating lever therefor, with a pawl pivoted to the end of the operating lever in the casing, a second pawl pivoted above said pawl in the casing, yielding means for forcing both of said pawls toward the rack, and a spring pivoted freely on the operating lever in the casing for moving both pawls away from the rack when it is being lowered, whereby the upper pawl will hold the rack and prevent its descending the distance of more than one tooth.

4. In a jack, the combination with a casing, a rack movable up and down in the casing, and a handle lever for operating the rack, of a pawl pivoted to the end of said operating lever, a second pawl pivoted at a stationary point above said operating lever, yielding means for forcing both pawls toward the rack, a spring carried by the handle lever for pulling the lower pawl away from the rack as it descends and allowing it to move against the rack as it again ascends, and means whereby after the lower pawl reaches its topmost position and starts to descend the upper pawl is forced back against the rack but said spring pulls the lower pawl away from the rack teeth whereby the rack is held against further descent at that time.

5. In a jack, the combination with a casing, a rack movable up and down in the casing, and a handle lever for operating the rack, of an operating pawl pivoted to the end of said operating lever and having a cross pin, a second pawl pivoted at a stationary point, a spring for forcing the operating pawl toward the rack, and a stronger spring having a bend for engaging the cross pin on the operating pawl and pushing it away from the rack as it descends and having an inclined end for engaging the second pawl and releasing the spring from the pin, thus allowing the first named spring to move the operating pawl against the rack as the pawl reaches the top of its up stroke.

6. In a jack, the combination of a casing, and pawls therein, of a rack which said pawls engage, said rack consisting of sheet metal bent up into the form of a hollow square column, with its front side open into which open side the pawls project, the rear face of said column being provided with a plurality of horizontal slits, the same being bent in to leave flat bottomed teeth with slanting tops.

In testimony whereof I have hereunto affixed my signature.

JOHN A. ADELL.