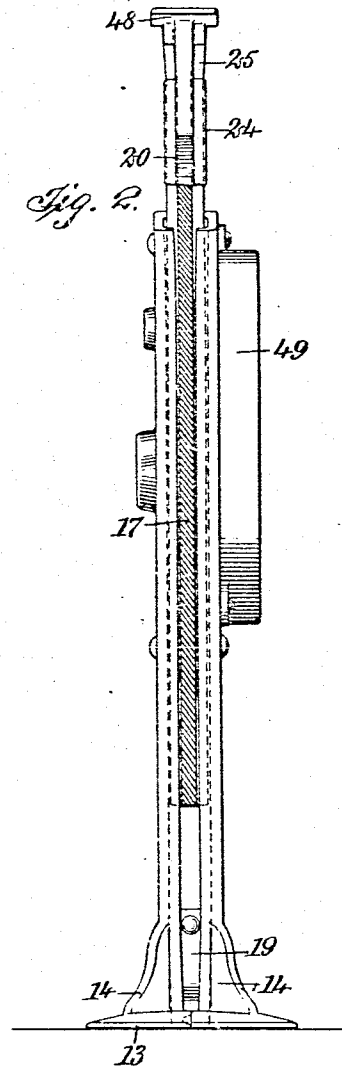
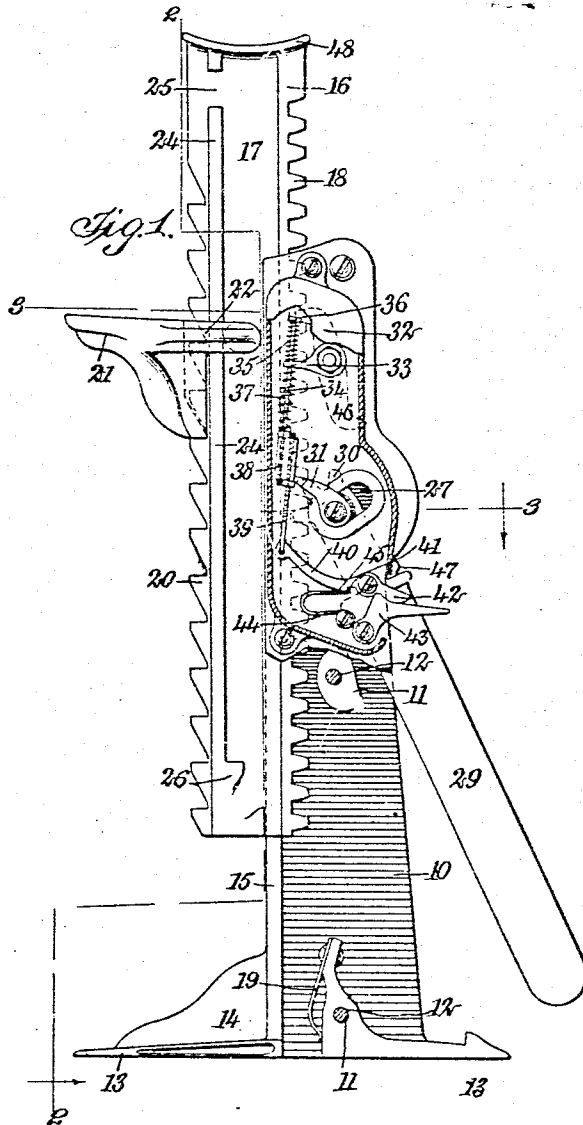


G. R. BOOTH
LIFTING JACK.
APPLICATION FILED JAN. 29, 1909.

948,843.

Patented Feb. 8, 1910.

2 SHEETS—SHEET 1



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Fig. 3.

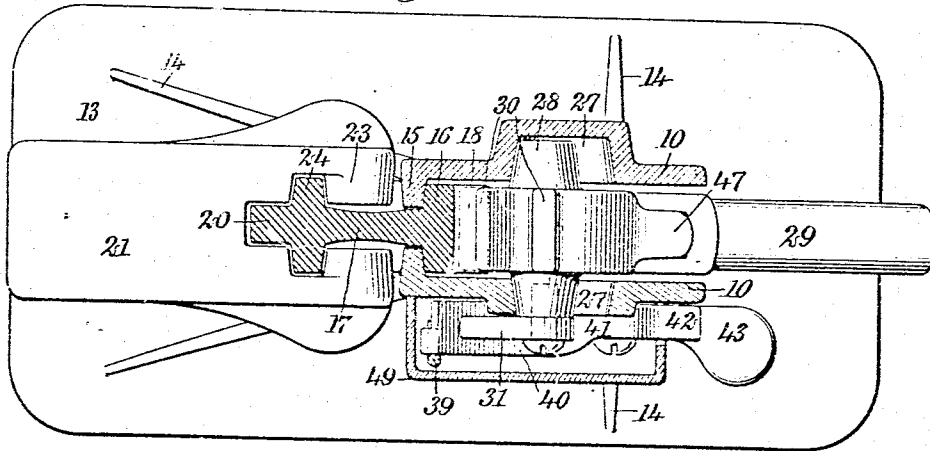


Fig. 4.

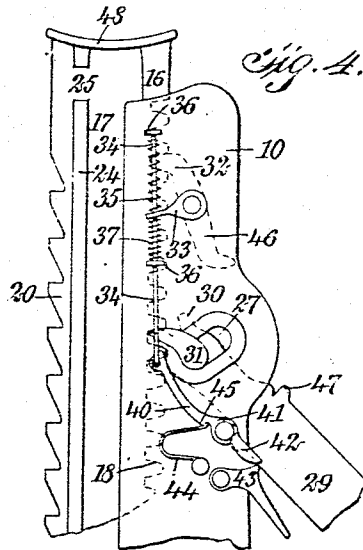
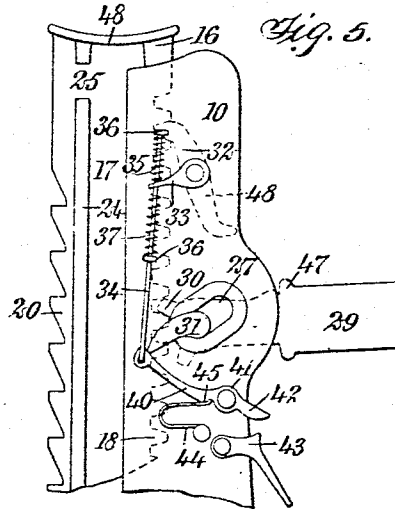


Fig. 5.



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UNITED STATES PATENT OFFICE.

GLEN RUSSELL BOOTH, OF CHANA, ILLINOIS.

LIFTING-JACK.

948,843.

Specification of Letters Patent.

Patented Feb. 8, 1910.

Application filed January 29, 1909. Serial No. 475,036.

To all whom it may concern:

Be it known that I, GLEN RUSSELL BOOTH, a citizen of the United States, and a resident of Chana, in the county of Ogle and State of Illinois, have invented a new and Improved Lifting-Jack, of which the following is a full, clear, and exact description.

My invention relates to lifting jacks, and has for its object to provide one with all the parts so proportioned and disposed that it is compact, strong while of light construction, easy to operate and the parts of which, when at rest, will rattle very little, if at all.

Another object is to provide a lifting jack which may be operated by a lever to lower the load slowly as well as to lift it, the direction of movement of the load being controlled by a reverse lever.

Another object is to provide a lifting jack, which when lowering a load, and the instant the load is removed from the jack, the lift-bar will automatically slide downward, within the standards, in normal position, thus saving time that would otherwise be spent in working the lift-bar down to its normal position, by the lever.

Still another object is to provide means which will automatically disengage the lever from the lifting bar, at the same time the lever is lifted high enough to engage the tail piece of the pawl allowing the lifting bar to fall suddenly.

Still other objects of my invention will appear in the following complete description.

In this specification I will describe the preferred form of my invention, but it will be understood that I do not limit myself thereto as I consider myself entitled to all forms and embodiments of the invention which may be held to fall within the scope of the appended claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures, in which—

Figure 1 is a side elevation of the invention with one side of the standard removed, and parts being in section; Fig. 2 is a sectional view on the line 2—2 of Fig. 1; Fig. 3 is a sectional view on the line 3—3 of Fig. 1; and Figs. 4 and 5 are fragmentary views showing the operation of the cam on the

operating lever relatively to the lever which commands the means for controlling the pawl.

By referring to the drawings, it will be seen that the standard is composed of two members 10, which are disposed side by side, with inner lugs 11 which meet, there being bolts 12 disposed through the lugs 11 to hold the members 10 of the standard together. The bottom of the members 10 has flanges 13, which form a firm foundation for the standard and ribs 14 which are spaced apart connect the members 10 with the flanges 13 to afford additional strength. The front of the members 10 have inwardly disposed flanges 15 within which is disposed an inner flanged end 16 on the lifting bar 17. On this inner flanged end there are rack teeth 18 extending from near the top of the lifting bar 17 to its bottom. That portion of the lifting bar 17 disposed between the flanges 15, tapers from its top to its bottom and the space between the flanges 15 is wider at their top than at their bottom so that when the lifting bar 17 is lowered it will fit snugly the flanges 15 to prevent any possible rattling. There is also secured to the bottom lugs 11 a spring 19 which is disposed in the path of the rack teeth 18 on the lifting bar 17, so that when the lifting bar 17 is lowered, it will be pushed yieldingly forwardly by the contact of the rack teeth 18 with the spring 19. On the forward side of the lifting bar 17 there are rack teeth 20 which are engaged by a load supporting block 21, the load supporting block 21 having arms 22 with inwardly disposed flanges 23 thereon, the inwardly disposed flanges 23 being disposed beyond lateral flanges 24 disposed beyond the rack teeth 20. There are openings 25 in the flanges 24 through which the flanges 23 may pass to permit of the removal of the load supporting block 21. Near the bottom of the lifting bar 17 there are laterally disposed stops 26 which limit the downward movement of the load supporting block 21.

In each of the members 10 of the standard there are rearwardly and upwardly extending slots 27 in which is disposed a pivot 28, the pivot 28 being secured to an operating lever 29. The operating lever 29 has gear teeth 30 at its inner terminal, these gear teeth 30 being preferably three in number so that at all times two of the teeth may en-

gage the rack teeth 18 on the lifting bar 17. One side of the pivot 28 extends through the slot in the member 10 and beyond the member 10 there is secured to the pivot 28 a cam 31. Above the slots 27 there is pivoted a pawl 32, the pawl 32 having an arm 33 secured thereto, there being an orifice in this arm 33 in which is disposed a rod 34, a spring 35 being disposed on the rod 34 above the arm 33 and being held in place by a nut 36 and a second spring 37 being disposed on the rod 34 below the arm 33, the spring 37 being held between the arm 33 and a union member 38, the rod 34 being screwed into the union member 38 to adjust the spring 37, the spring 35 being adjusted by means of the nut 36. To this union member 38 there is also screwed a rod 39, the rod 39 being adjustable with reference to the union member 38 by screwing it in the said union member 38. To this rod 39 is pivoted an arm 40 of a lever 41, the lever 41 also having a rearwardly extending arm 42 with which the reversing lever 43 is adapted to engage. A leaf spring 44 is provided, the leaf spring having its free terminal engaging the arm 40 of the lever 41 and being held in place by a lug 45. The pawl 32 has a tail piece 46. There is a lug 47 on the operating lever 29, the lug 47 being adapted to engage the tail piece 46 of the pawl 32. It will be understood that in the operation of my lifting jack it is immaterial how it is disposed, inasmuch as the pawl 32 is held relatively to the teeth 18 on the lifting bar 17 by the springs 35 and 37 and not by gravity.

In the construction shown in Figs. 4 and 5 of the drawings the rod 34 is extended below the spring 37 and is connected directly with the arm 10 of the lever 41, there being a nut 36 on the rod 34 to press the spring 37 upwardly in the same way that the nut 36 is provided to press the spring 35 downwardly.

The springs 35 and 37 having been adjusted the lifting jack is operated as follows: The reversing lever 43, the position of which indicates the direction in which the lifting bar will move when the operating lever 29 is reciprocated, is moved upwardly; it engages the arm 42 of the lever 41 forcing it upwardly the arm 40 being moved downwardly at the same time removing it from the path of the cam 31 which moves downwardly on the reciprocation of the operating lever 29. At the same time the arm 40 draws downwardly the rod 39 and causes the spring 35 to be compressed between the nut 36 and the arm 33 on the pawl 32. This causes the arm 33 to be held yieldingly downwardly, moving the pawl 32 at the same time into yielding engagement with the rack teeth 18 on the lifting bar 17. With the arm 40 and the pawl 32 in this position, when the operating lever 29 is reciprocated the teeth 30 thereon will engage the rack teeth 18 when the operating lever 29 is moved downwardly, thereby lifting the lifting bar 17 upwardly, the pawl 32 slipping over the teeth 18 to be disposed in a new position relatively to the lifting bar 17 to support it and when the operating lever is lifted upwardly its pivot 28 travels in the slots 27 thereby disengaging the teeth 30 from the rack teeth 18 in the lifting bar 17 and permitting the operating lever 29 to be lifted relatively to the other parts without disturbing the position of the lifting bar 17 relatively to the members 10 of the standard. As the reciprocation of the operating lever 29 is continued, it will continue to lift the lifting bar 17 relatively to the members 10 of the standard, the lifting bar being supported by the pawl 32 at every upward movement of the operating lever 29 and the teeth 30 of the operating lever becoming disengaged from the rack teeth 18 by the travel of the pivot 28 on the operating lever 29 in the slots 27. When desired to slowly lower the lifting bar 17 the reversing lever 43 is moved downwardly, thereby indicating the direction of travel of the lifting bar. When the reversing lever 43 is thus disposed the spring 44 pushes the arm 40 of the lever 41 upwardly which moves upwardly the rod 39, thereby releasing the tension of the spring 35 and compressing the spring 37 which tends to force the arm 33 upwardly, but as there is a load on the lifting bar 17, one of the rack teeth 18 holds the pawl 32 in engagement with it and prevents the arm 33 from moving upwardly to free the pawl 32 from the rack teeth 18. When the parts are thus disposed and the operating lever 29 is moved downwardly a short distance the teeth 30 will lift the lifting bar 17 sufficiently to permit of the disengagement of the pawl 32 with the rack teeth 18. The lifting bar 17 is then supported only by the operating lever 29 and when the operating lever 29 is moved upwardly the cam 31 will press downwardly the arm 40, thereby freeing the spring 37 of tension and compressing the spring 35 which will move yieldingly downward the arm 33, thereby moving the pawl 32 into engagement again with the teeth 18 of the lifting bar 17. In this way the lifting bar 17 is permitted to descend a short distance on each cycle of the operating lever 29. When lowering a load by the above operation of the jack, and the moment the load or weight is removed from the lift-bar, the operating lever 29 is moved upwardly, the leaf spring 44 forces upwardly the arm 40 of the lever 41 which presses upwardly the rod 39 and causes the spring 37 to be compressed and thereby releases the pawl 32 from engagement with the rack teeth 18 on the lift-bar 17; at the same time the cam 31 on the operating lever

29 will engage the arm 40 of the lever 41, which will cause the pivot 28 to travel in the slots 27, thereby freeing the teeth 39 from the rack teeth 18 and permitting the lift bar 17 to descend instantly in normal position within the standard. When it is desired to permit the lifting bar 17 to descend quickly, the operating lever 29 is moved upwardly until the lug 47 comes into engagement with the tail piece 46 of the pawl 32 which pushes the tail piece 46 inwardly, thereby removing the pawl 32 from engagement with the rack teeth 18 of the lifting bar 17, and as by the upward movement of the operating lever 29 its pivot 28 travels upwardly in the slots 27, the teeth 39 are removed from engagement with the rack teeth 18 and the lifting bar 17 is permitted to descend freely. The upper portion 48 of the lifting bar 17 is curved to permit it to engage an axle of an automobile. The mechanism at the outside of one of the members 10 of the standard is inclosed by a box 49 which is screwed to the member.

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

1. In a lifting jack, a standard, a lifting bar having rack teeth slidably mounted on the standard, a pawl, means adapted to hold the pawl yieldingly in a plurality of predetermined positions, a lever, one arm of which is secured to the said means, an operating lever adapted for engaging the rack teeth for moving the lifting bar relatively to the standard, a cam on the operating lever, which is adapted for engaging the said lever when the operating lever is reciprocated, and means for throwing the lever out of position for engagement with the cam.

2. In a lifting jack, a standard, a lifting bar having rack teeth slidably mounted on the standard, a pawl mounted on the standard adapted for engaging the rack teeth, an arm secured to the pawl, yielding means adapted for holding the arm in a plurality of predetermined positions, a lever, one arm of which is secured to the yielding means, an operating lever adapted for moving the lifting bar relatively to the standard, a cam on the operating lever which is adapted for engaging the said lever when the operating lever is reciprocated, and means for throwing the lever out of position for engagement with the cam on the operating lever.

3. In a lifting jack, a standard, a lifting bar having rack teeth slidably mounted on the standard, a pawl adapted for engaging the rack teeth, an arm secured to the pawl, there being an orifice in the arm, a rod disposed in the orifice, springs disposed on the rod above and below the arm adapted for pressing against it, a lever, one arm of which is secured to the rod, an operating

lever adapted for moving the lifting bar relatively to the standard, a cam on the operating lever which is adapted for engaging the said lever when the operating lever is reciprocated, and means for throwing the lever out of position for engagement with the means on the operating lever.

4. In a lifting jack, a standard, a lifting bar having rack teeth slidably mounted on the standard, a pawl adapted for engaging the rack teeth, an arm secured to the pawl, there being an orifice in the arm, a rod disposed in the orifice, springs on the rod adapted for pressing against the arm from above and below, a lever, one arm of which is secured to the rod, an operating lever adapted for moving the lifting bar relatively to the standard, means on the operating lever which are adapted for engaging the said lever when the operating lever is reciprocated, and means for throwing the lever out of position for engagement with the means on the operating lever.

5. In a lifting jack, a standard, a lifting bar having rack teeth slidably mounted on the standard, a pawl adapted for engaging the rack teeth, an arm secured to the pawl, yielding means adapted for holding the arm in a plurality of predetermined positions, a lever, one arm of which is secured to the yielding means, an operating lever having a pivot disposed in slots in the standard adapted for moving the lifting bar relatively to the standard, a cam on the operating lever which is adapted for engaging the said lever when the operating lever is reciprocated, and means for throwing the lever out of position for engagement with the means on the operating lever.

6. In a lifting jack, a standard, a lifting bar having rack teeth slidably mounted on the standard, a pawl adapted for engaging the rack teeth, means for moving the pawl relatively to the lifting bar, means holding the said means in a plurality of positions, an operating lever having a pivot disposed in slots in the standard adapted for moving the lifting bar relatively to the standard, a cam on the operating lever which is adapted for engaging the second mentioned means for holding the first mentioned means in a plurality of positions, and means for throwing the second mentioned means out of engagement with the cam on the operating lever.

7. In a lifting jack, a standard, a lifting bar having rack teeth slidably mounted on the standard, a pawl adapted for engaging the rack teeth, means for holding the pawl yieldingly in a plurality of positions, a lever, an arm of which is secured to the said means, an operating lever which is adapted for engaging the lifting bar for moving it relatively to the standard, a cam on the operating lever which is adapted for engag-

ing the said lever, a spring adapted for pressing the said lever in the direction of the cam on the operating lever, and means for throwing the lever into a position where it cannot be engaged by the cam on the operating lever.

8. In a lifting jack, a standard, a lifting bar having rack teeth slidably mounted on the standard, a pawl adapted for engaging the rack teeth, means for holding the pawl yieldingly in a plurality of positions, a lever, one arm of which is secured to the said means, an operating lever having a pivot disposed in slots in the standard which is adapted for engaging the lifting bar for moving it relatively to the standard, a cam on the operating lever which is adapted for engaging the said lever, a spring adapted for pressing the said lever yieldingly in the direction of the cam on the operating lever.

9. In a lifting jack, a standard, a lifting bar having rack teeth slidably mounted on the standard, a pawl adapted for engaging the rack teeth, means for holding the pawl yieldingly in a plurality of predetermined positions relatively to the lifting bar, a lever, one arm of which is secured to the said means, an operating lever pivoted to travel in slots, a cam on the operating lever which is adapted for engaging an arm of the lever, means for holding the arm yieldingly in the direction of the cam, and means for holding the arm in a position out of reach of the cam.

10. In a lifting jack, a standard, a lifting bar having rack teeth slidably mounted on the standard, a pawl adapted for engaging the rack teeth, means for holding the pawl yieldingly in a plurality of predetermined positions relatively to the lifting bar, a lever, one arm of which is secured to the said means, an operating lever pivoted to travel in slots, a cam on the operating lever which is adapted for engaging an arm of the lever, means for holding the arm yieldingly in the direction of the cam, means for holding the arm in a position out of reach of the cam, and a tail piece on the pawl which is adapted to be engaged by the operating lever when it is raised out of engagement with the lifting bar to free the pawl from the lifting bar and permit it to descend.

11. In a lifting jack, a standard, a lifting bar having rack teeth slidably mounted on the standard, a pawl adapted for engaging the rack teeth, an arm secured to the pawl, there being an orifice in the arm, a rod disposed in the orifice, springs on the rod

adapted to hold the arm in a plurality of predetermined positions, a lever, one arm of which is secured to the rod, an operating lever adapted for moving the lifting bar relatively to the standard, means on the operating lever which are adapted for engaging the said lever when the operating lever is reciprocated, and a tail piece on the pawl which is adapted to be engaged by the operating lever when it is lifted upwardly out of engagement with the lifting bar thereby freeing the pawl from the lifting bar and permitting the lifting bar to descend.

12. In a lifting jack, a standard, a lifting bar slidably mounted in a slot in the standard, that portion of the lifting bar disposed in the slot tapering from its top to its bottom and the width of the slot being wider at its top than at its bottom to make a close fit between the lifting bar and the standard when the lifting bar is disposed in a predetermined position within the standard to avoid rattling, and yielding means on the standard which are adapted for pressing against the lifting bar for holding it firmly in position.

13. In a lifting jack, a standard, a lifting bar slidably mounted on the standard, means to support the lifting bar on the standard, there being lateral flanges on the lifting bar having openings therein, a slide on the top of the lifting bar extending beyond the flanges and a supporting block having inwardly disposed flanges beyond the flanges on the lifting bar, the flanges on the supporting block being adapted to pass through the openings in the flanges on the lifting bar, and means to hold the supporting block relatively to the lifting bar.

14. In a lifting jack, a standard, a lifting bar having rack teeth slidably mounted on the standard, a pawl adapted to engage the rack teeth, a rod, springs mounted thereon, means actuated by the springs adapted to move the pawl, an operating lever having a pivot disposed for traveling in slots in the standard, which is adapted for engaging the lifting bar, a lever one arm of which is secured to the rod, and a cam on the operating lever adapted for engaging the lever.

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

GLEN RUSSELL BOOTH.

Witnesses:

RAY McCAY,

J. W. HOFFMASTER.