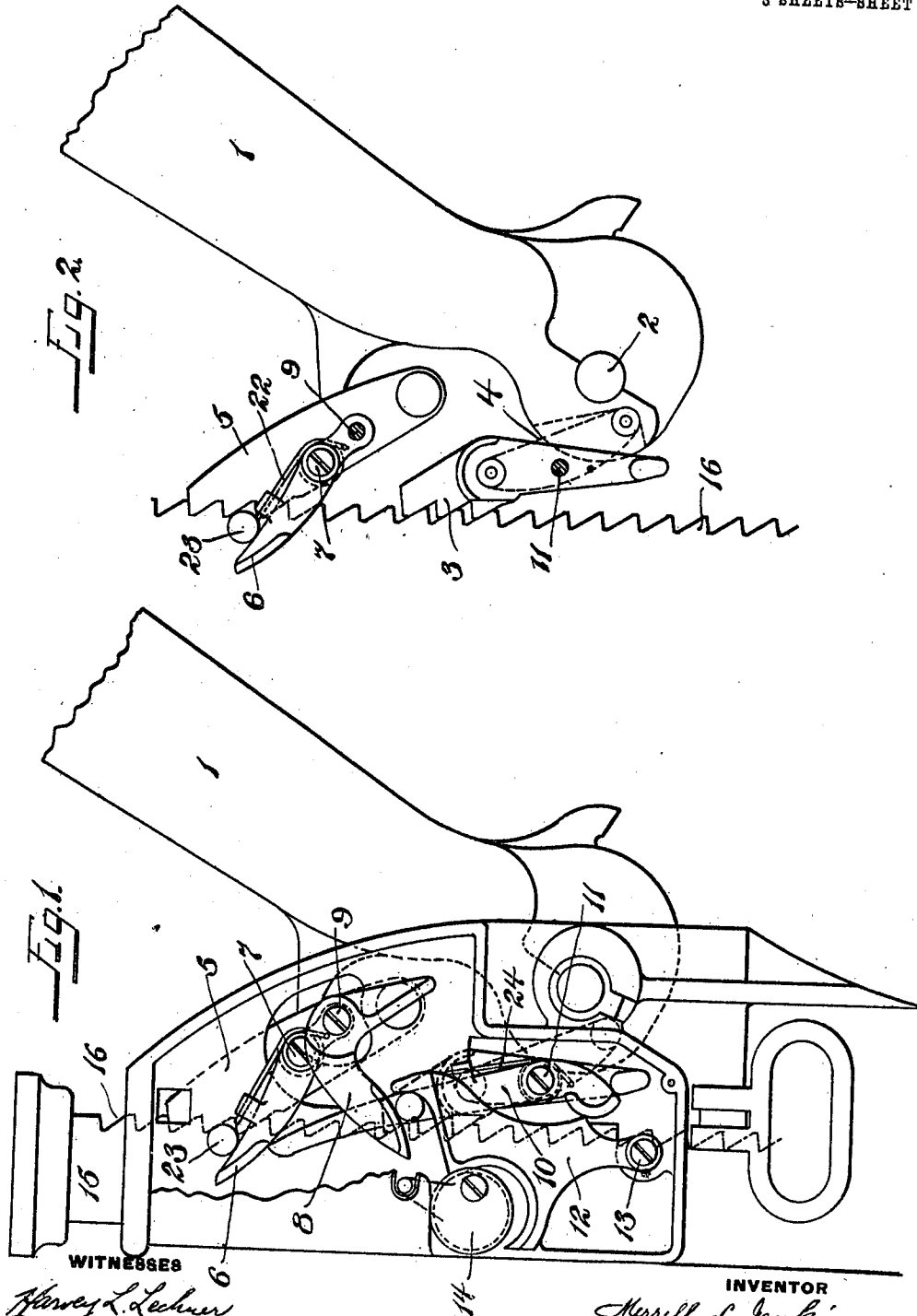


M. L. JENKINS.
LIFTING JACK.
APPLICATION FILED OCT. 1, 1908.

978,453.

Patented Dec. 13, 1910.

3 SHEETS-SHEET 1.

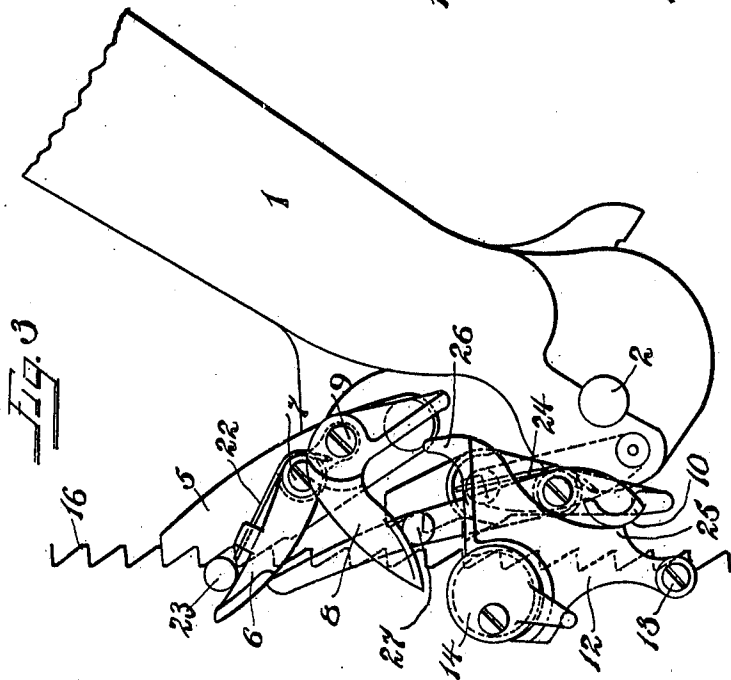
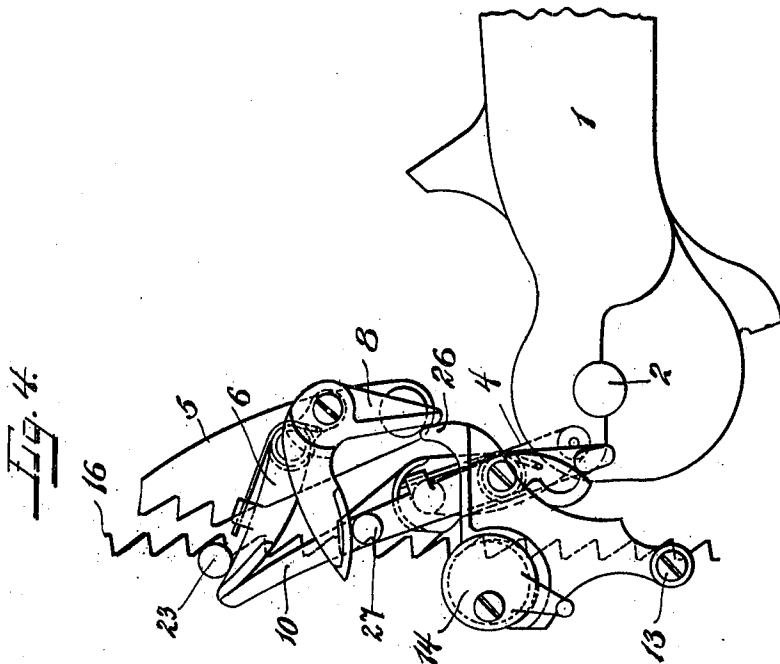


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3 SHEETS—SHEET 2.



WITNESSES

Harvey L. Lechman
J. C. Bradley

INVENTOR

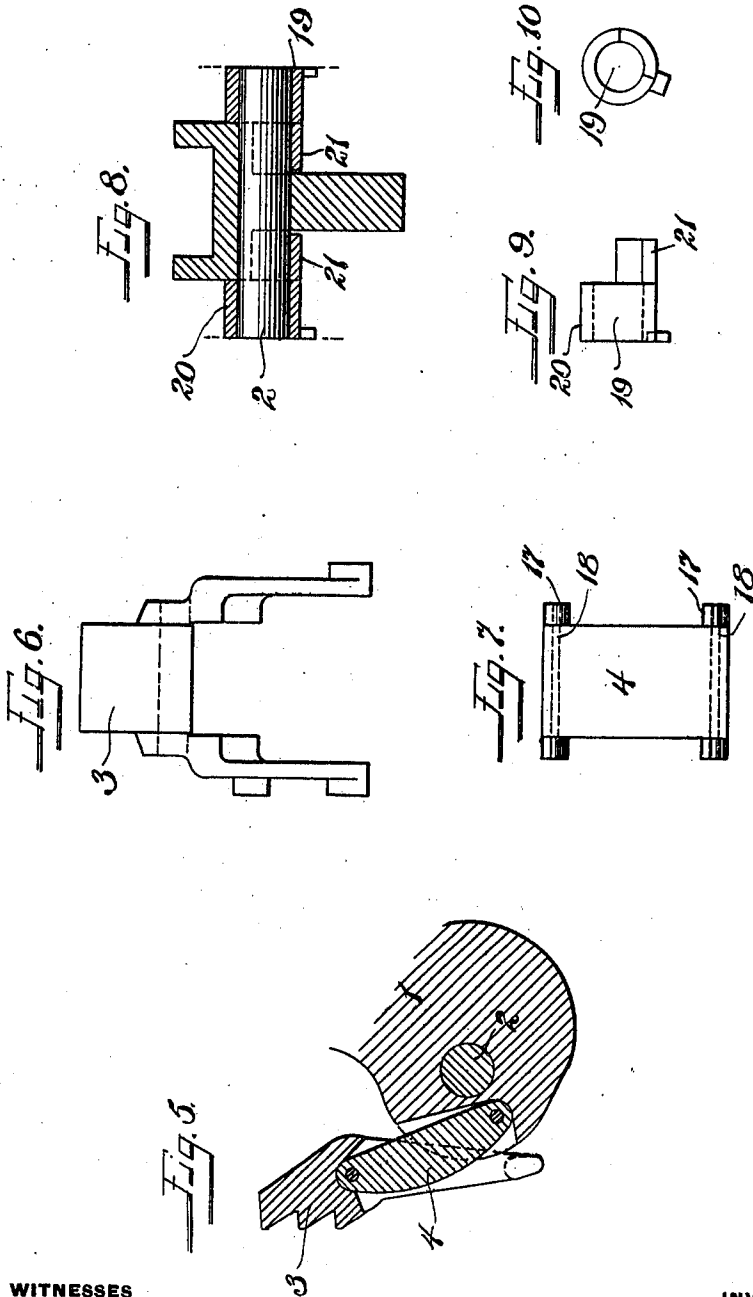
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3 SHEETS-SHEET 3.



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UNITED STATES PATENT OFFICE.

MERRILL L. JENKINS, OF HARVEY, ILLINOIS, ASSIGNOR TO BUDA FOUNDRY & MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

LIFTING-JACK.

978,453.

Specification of Letters Patent.

Patented Dec. 13, 1910.

Application filed October 1, 1908. Serial No. 455,672.

To all whom it may concern:

Be it known that I, MERRILL L. JENKINS, a citizen of the United States, residing at Harvey, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lifting-Jacks, of which the following is a specification.

The invention relates to lifting jacks of the pawl and ratchet type and has for its principal objects; the provision of a jack of this type wherein the pawls cooperate directly with the rack or ratchet on the lifting bar of greater strength and capacity than the jacks of this character as heretofore constructed; the provision of an improved pawl construction and improved means for supporting and operating the lifting pawl; and the provision of improved means for supporting the actuating lever of the jack. One embodiment of the invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a side elevation of the operating mechanism, the parts being in lifting position,

Figure 2 is a diagrammatic side view similar to that of Figure 1 and with the parts in the same position, but with the reversing plate and two of the auxiliary pawls or levers removed to show the mounting of the lifting and holding pawls,

Figure 3 is a diagrammatic side view of the operating mechanism with the parts reversed for lowering a load, and with the actuating handle in its upper position,

Figure 4 is a view similar to that of Figure 3, but with the actuating handle in its lower position,

Figure 5 is a longitudinal section through the end of the actuating handle, the lifting pawl, and the connecting link,

Figures 6 and 7 are rear views of the lifting pawl and connecting link respectively,

Figure 8 is a section through the actuating handle and the supporting bushings for the fulcrum pin, and

Figures 9 and 10 are side and end elevations respectively of the bushing employed with the fulcrum pin.

Referring first to the general arrangement of parts as shown in Figs. 1 and 2, the principal parts may be enumerated as follows. 1 is the actuating handle carried by the fulcrum pin 2, 3 is the lifting pawl, 4 is a link or strut by means of which the lifting pawl is pivotally supported upon the end of

the actuating handle, 5 is the holding pawl pivoted to the frame of the jack, 6 is an auxiliary lever pivoted to the holding pawl at 7, 8 is another auxiliary operating lever pivotally mounted at 9 upon the lever 6, 10 is still another auxiliary operating lever pivotally mounted at 11 upon the lifting pawl 3, 12 is a reversing plate for cooperating with the levers 8 and 10, which plate is pivoted to the frame at 13, 14 is a reversing eccentric for moving the reversing plate, and 15 is the lifting bar provided with the rack 16 with which the lifting and holding pawls cooperate.

As shown in Figure 2 each of the pawls 3 and 5 is provided with a plurality of engaging teeth, the purpose being to increase the capacity of the jack by distributing the load over a number of teeth. In order to provide an improved support for the lifting pawl and one which will permit the pawl to oscillate with the line of its teeth in substantial parallelism with the line of the teeth of the lifting bar, the arrangement shown in Figures 2, 5, 6 and 7 is provided. As here shown the pawl is pivoted to the end of the actuating lever by means of the strut or link 4 instead of being directly pivoted to such handle as heretofore has been the practice. With this arrangement the pawl can oscillate about the lower end of the link 4 and still be maintained in a substantially vertical position at all times, so that all of the teeth of the pawl are brought into engagement with the teeth of the lifting bar at the same time. The pawl 3 and the actuating handle 1 are provided with rounded recesses for receiving the rounded bearing ends of the link 4 as indicated in Fig. 5, and the side walls of these members are perforated opposite the rounded ends of the link. The link 4 is provided at each end with disks 17 adapted to fit the perforations in the side walls of the pawl and actuating lever, and these disks are held in position by transverse rivets 18. It will be noted that the strain upon the link 4 is almost entirely a compressive strain, so that very little strain is imposed upon the disks 17 and comparatively slight fastening means are necessary therefor.

The means for supporting the fulcrum pin 2 and preventing its bending constitutes another feature of my invention and is indicated most clearly in Figs. 2, 8, 9 and 10.

From these views it will be seen that the section of the actuating handle at the fulcrum pin is substantially a T and that a portion of the fulcrum hole lies within the head of the T and a portion within the flange of the T. A large bearing area is thus secured upon the top of the pin 2, and in order to support the lower side of the pin in an unusually secure manner, the peculiarly formed bushings 19 are provided, which bushings are mounted in the sides of the jack frame. By references to Figs. 8, 9 and 10 it will be seen that each bushing comprises a cylindrical portion 20 supported by the jack frame, and a projecting lower segment 21, which segment 21 extends along the lower side of the fulcrum pin to a point close to the vertical flange of the actuating handle, and serves to support the pin 2 at a point beneath the head of the T section. It will be seen that by this arrangement the fulcrum pin is securely supported against bending and a large bearing surface on the top of the pin is secured combined with a very rigid handle section.

The features as heretofore described constitute the principal departures in my construction from the prior art, certain of the general features of construction and arrangement as hereinafter described being old in the art and not claimed in this application. Those features therefore which are old, will only be described with sufficient detail to indicate the method of cooperation with those features of the device wherein the invention particularly resides. Referring to Fig. 2 it will be seen that the pawl 6 is provided with a spring 22, which spring at one end engages a lug upon the pawl 6 and at the other end fits into a hole in the holding pawl, the intermediate portion of the spring being coiled around a projecting lug upon which the pawl 6 is seated. The outer end of the lever 6 takes against a pin 23 projecting from the jack casing and the tension upon the spring is such that normally the pawl 5 is held in the position indicated in Figs. 1 and 2. The lever 8 which is mounted upon the lower end of the lever 6 is without effect in the operation of the jack during the lifting operation illustrated in Figs. 1 and 2. Pivoted upon the lower portion of the lifting pawl 3 is the lever 10, which lever 10 bears at its upper end against the lower side of the lever 6. This lever is seated upon a projecting lug upon the pawl 3, and is provided with a spring 24 which engages a lug upon the lever at one end and at its other end is turned into a recess in the holding pawl 3, the central portion of the spring being coiled around the lug upon which the lever is supported and tensioned in such manner that the lifting pawl is normally pressed into operative engagement with the lifting rack, and the upper

end of the lever 10 is held in yielding engagement with the lever 6. Both of the pawls are thus held yielding in engagement with the rack 16 during the lifting operation, and upon the actuation of the handle such rack is lifted step-by-step.

In order to lower the load the operating eccentric 14 is swung to the position indicated in Figs. 3 and 4, which operation moves the reversing plate 12 to the right so that the portion 25 on the reversing plate forces the lower end of the lever 10 slightly to the right, and the nose 26 is brought to a position adjacent the end of the lever 8. The movement of the lower end of the lever 10 to the right reverses the tension in the spring 24, and when the actuating handle is in the position indicated in Fig. 3 and the load rests upon the holding pawl 5, the lifting pawl is sprung out to the position indicated in Figure 3, at which time the lifting pawl is in position to be moved up to take a fresh grip upon the rack 16. If now the actuating handle is lowered the projecting pin 27 secured to the side of the lever 10 engages the end of the lever 8 and swings the opposite end of this lever 8 to the left until it engages the nose 26 on the reversing plate. This engagement stops the rotation of the lever 8 about the pivot 9 and a further movement upward of the pin 27 necessarily moves the pivot 9 to the right, thus swinging the lever 6 about its pivot 7 and reversing the tension on the spring 22, so that the tendency of this spring is to throw the holding pawl out of engagement with the teeth of the rack. The pawl 5 cannot be disengaged from the rack however, until the lifting pawl engages the rack as indicated in Figure 4, and lifts it slightly at which time the spring 22 operates to throw the pawl 5 to the position shown in Figure 4. If now the handle 1 is raised to the position of Figure 3, the rack is lowered with the pawl 3 and the recession of the pin 27 to the position shown in Fig. 3 permits the spring 22 to assume its former position, at which time it throws the pawl 5 into engagement with the rack 16. As soon as this occurs and the weight of the rack is shifted to the pawl 5, the pawl 3 springs out to the position indicated in Fig. 3.

Having thus described my invention and illustrated its use, what I claim as new and desire to secure by Letters Patent is the following:—

1. The combination in a lifting jack, of a ratchet, a lifting pawl cooperating therewith, an actuating lever, a strut pivotally supported on the actuating lever and having its upper end in pivotal engagement with the pawl, a spring held lever carried by the pawl, and means for actuating such lever.

2. The combination in a lifting jack, of a ratchet, a lifting pawl cooperating therewith

and provided with a bearing recess, an actuating lever provided with a bearing recess, a link having rounded ends engaging the recesses in the pawl and lever and serving as a pivotal support for the pawl, a controlling lever for the pawl carried thereby, and means for actuating such lever.

3. The combination in a lifting jack, of an actuating lever, a ratchet, a lifting pawl cooperating therewith and provided with a bearing recess, a strut having a bearing end engaging the recess in the pawl and pivoted to the lever, a spring held lever carried by the pawl, and means for actuating such lever.

4. The combination in a lifting jack, of a ratchet, a lifting pawl provided with a plurality of teeth cooperating therewith, an actuating lever, a strut pivotally supported on the actuating lever and having its upper end in pivotal engagement with the pawl, a spring held lever carried by the pawl, and means controlled by the movement of the actuating lever for operating such spring held lever.

5. The combination in a lifting jack, of a ratchet, an actuating lever provided with perforated side plates integral therewith and a rocking surface therebetween, a lifting member having its lower end bearing against the rocking surface and a pair of holding disks separate from the said member fitting the perforations in the side plates and secured to the opposite sides of the said member.

6. The combination in a lifting jack, of a ratchet, an actuating lever provided with perforated side plates integral therewith and a rocking surface therebetween, a lifting member having its lower end bearing against the rocking surface, a pair of holding disks fitting the perforations in the side plates and a pin securing the disks to the opposite sides of the member.

7. The combination in a lifting jack, of a ratchet, an actuating lever provided with a bearing surface, a lifting member having its lower end provided with a surface bearing against the said first bearing surface, perforated side plates integral with one of the parts carrying one of such surfaces, and holding disks separate from the said member fitting the perforations and secured to the opposite sides of the other part carrying the other surface.

8. The combination in a lifting jack, of a ratchet, an actuating lever having perforated side plates and a bearing surface

therebetween, a lifting pawl having perforated side plates and a bearing surface therebetween, a link fitting between the side plates and provided with bearing ends engaging the bearing surfaces of the lever and pawl, disks fitting the said perforations and bearing against the sides of the link, and means securing the disks to the link.

9. The combination in a lifting jack, of a ratchet, an actuating lever having perforated side plates and a bearing surface therebetween, a lifting pawl having perforated side plates and a bearing surface therebetween, a link fitting between the side plates and provided with bearing ends engaging the bearing surfaces of the lever and the pawl, and holding means separate from the link secured to the sides thereof and extending into the perforations in the side plates for maintaining the parts in position on the reverse stroke of the lever.

10. The combination in a lifting jack, of a ratchet, an actuating lever having perforated side plates and a bearing surface therebetween, a lifting pawl having perforated side plates and a bearing surface therebetween, a link fitting between the side plates and provided with bearing ends engaging the bearing surfaces of the lever and the pawl, and holding disks separate from the link secured to opposite sides thereof and extending into the perforations in the side plates.

11. The combination in a lifting jack, of an actuating lever having its end widened laterally above the fulcrum pin hole and narrowed into a rib below such hole, a fulcrum pin extending through the hole, and bushings for supporting the pin mounted in the jack frame and extended to support the pin beneath the widened portions of the end.

12. The combination in a lifting jack, of an actuating lever having its end approximately T shaped in cross section and provided with a transverse fulcrum pin hole lying with its lower edge partially below the head of the T, a fulcrum pin extending through such hole, and bushings for supporting the pin mounted in the jack frame, and having segments extended to support the pin beneath the head of the T.

In testimony whereof I have hereunder signed my name in the presence of the subscribed witnesses.

MERRILL L. JENKINS.

Witnesses:

WM. PRESCOTT HUNT, Jr.,
L. M. VILES.