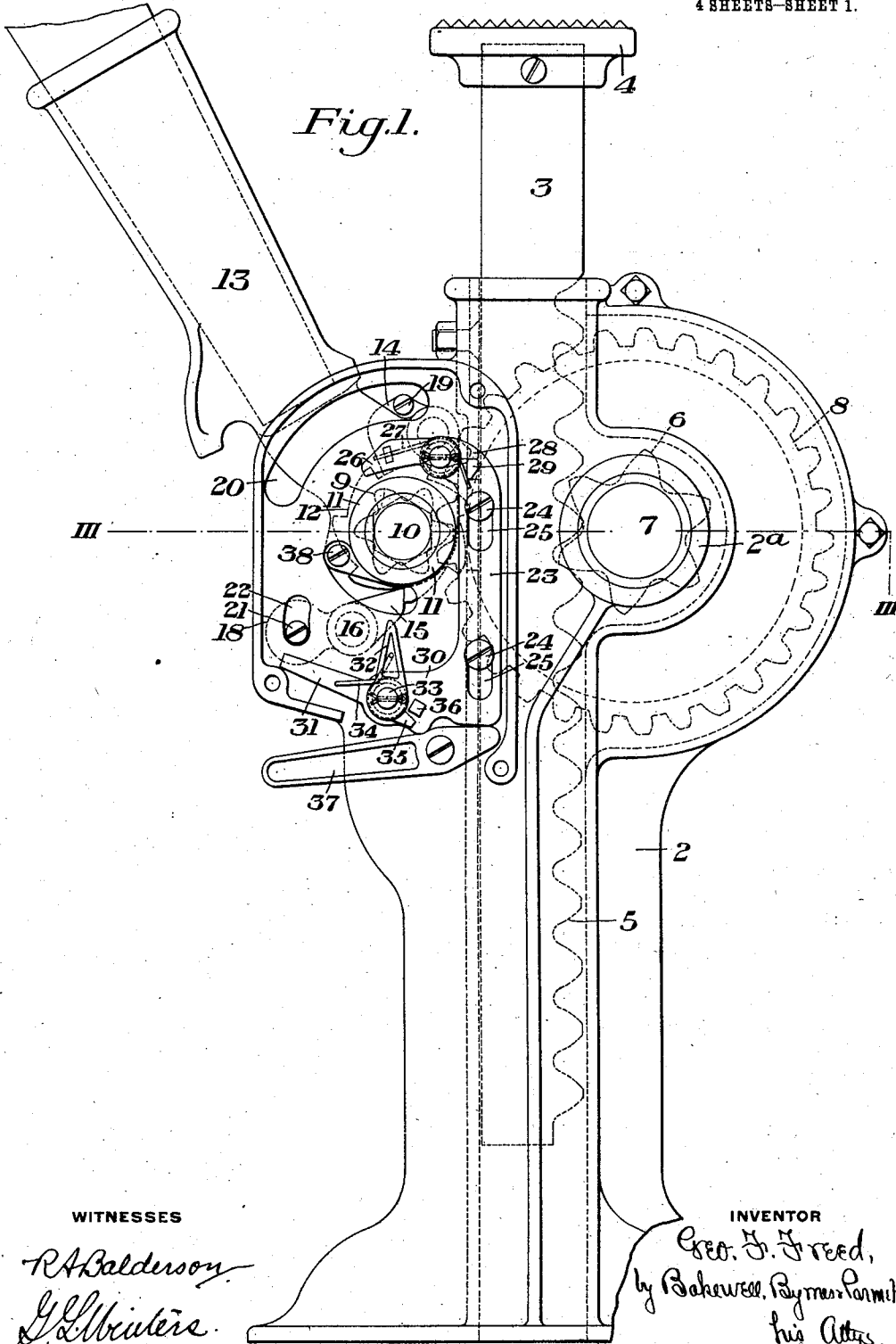


G. F. FREED.
LIFTING JACK.
APPLICATION FILED JUNE 21, 1909.

1,010,489.

Patented Dec. 5, 1911.

4 SHEETS—SHEET 1.



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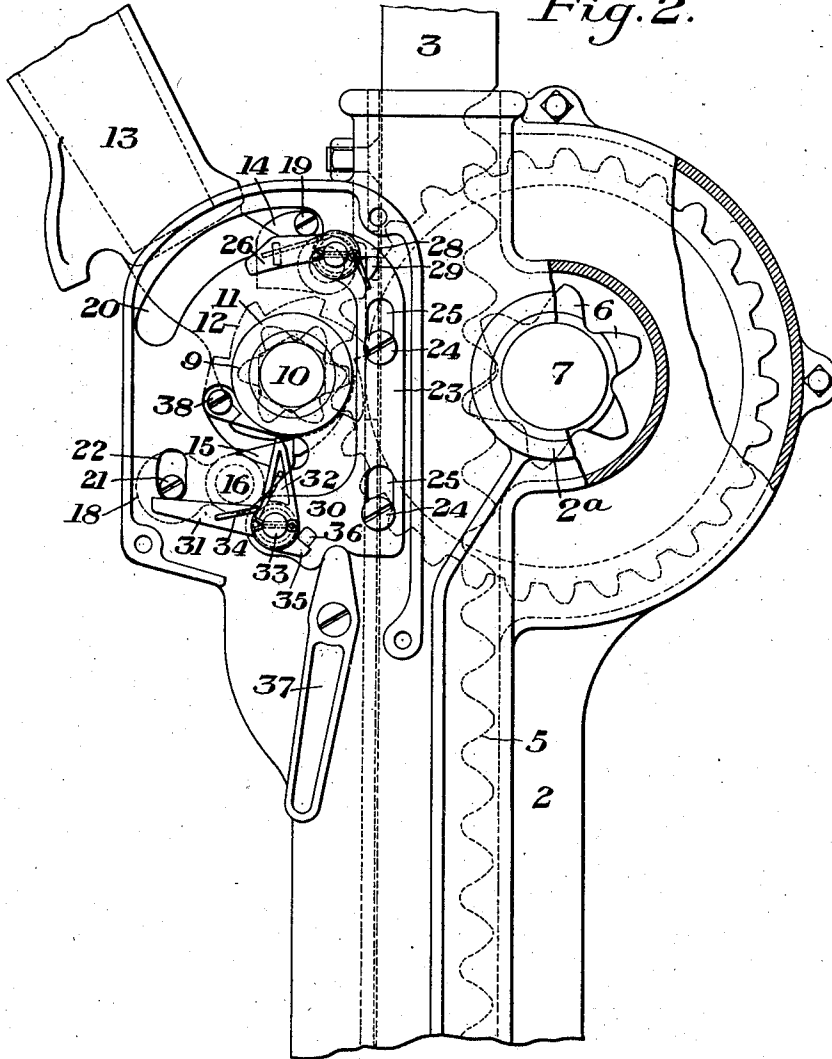
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4 SHEETS—SHEET 2.

Fig. 2.



WITNESSES

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4 SHEETS--SHEET 3.

A detailed technical cross-section drawing of a mechanical assembly, likely a valve or pump component, enclosed within a circular frame. The assembly features a central vertical shaft (1) passing through a series of components. At the top, a nut and washer (2) are shown. Below this, a large, hatched block (3) is visible. To the left, a horizontal pipe or duct (13) is connected to a chamber (18) which contains a piston or plunger (12). This chamber is part of a larger housing (11) that also includes a smaller internal chamber (10) and a valve mechanism (21, 31). On the right side, another horizontal pipe (8) is connected to a chamber (6) containing a piston (5). The entire assembly is supported by a base (2) with a hatched section (2a). Various other parts are labeled with numbers: 4, 7, 9, and 23. The drawing uses hatching to indicate different materials or cross-sections of the components.

Fig. 1 is a perspective view of a wedge-shaped body 15. It features a cylindrical protrusion 18 on its front face and a smaller cylindrical protrusion 21 on its side.

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4 SHEETS—SHEET 4.

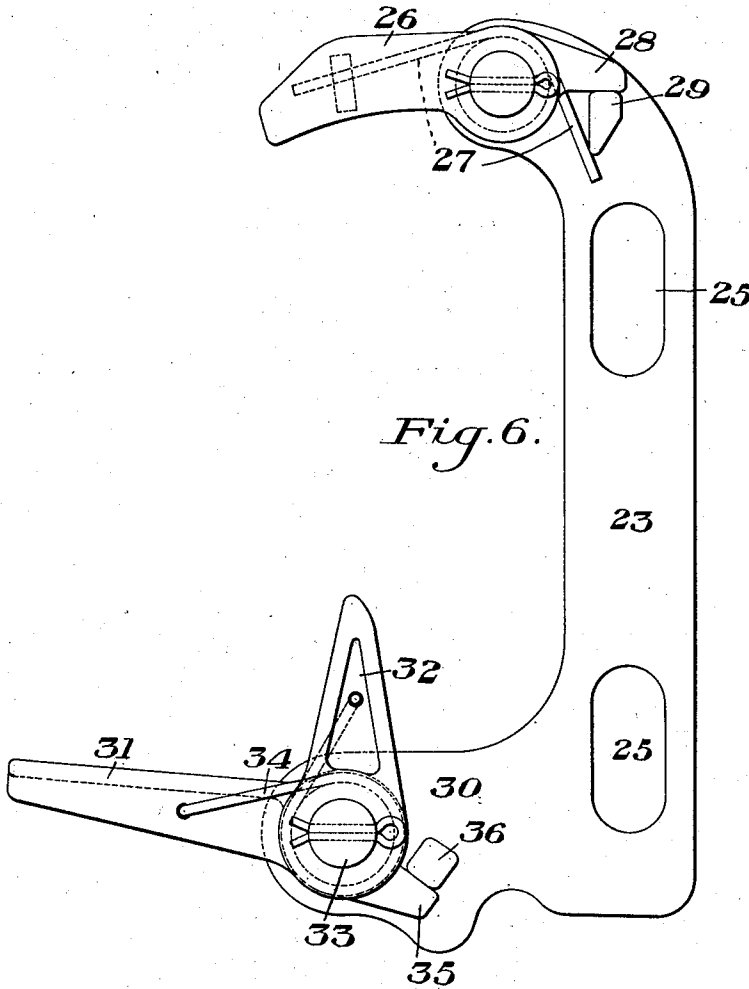


Fig. 6.

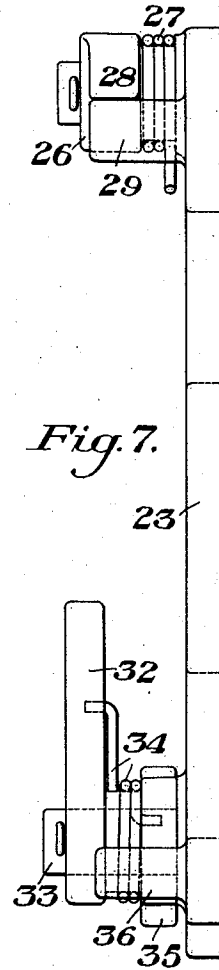


Fig. 7.

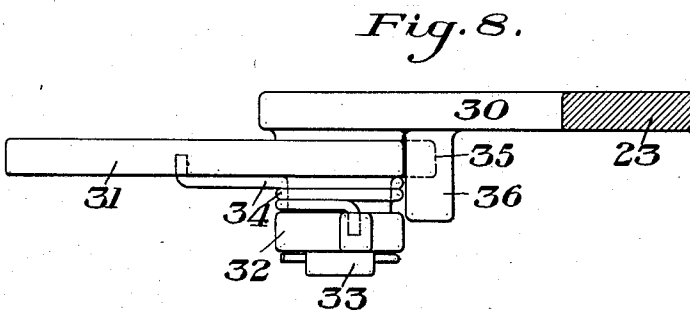


Fig. 8.

WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE F. FREED, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO THE DUFF MANUFACTURING COMPANY, OF PITTSBURGH, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

LIFTING-JACK.

1,010,489.

Specification of Letters Patent.

Patented Dec. 5, 1911.

Application filed June 21, 1909. Serial No. 503,310.

To all whom it may concern:

Be it known that I, GEORGE F. FREED, of Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Improvement in Lifting-Jacks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, with the face plate removed, showing a lifting jack embodying my invention, the parts being in the proper position for lifting a load; Fig. 2 is a similar view of a portion of the jack, partly broken away, with the parts in proper position for lowering the load; Fig. 3 is a section on the line III—III of Fig. 1; Figs. 4 and 5 are detail perspective views of the two pawls; and Figs. 6, 7 and 8 are detail views of the shifting block.

My invention has relation to lifting jacks, and is designed to provide a simple and powerful form of jack of this character.

A further object is to provide a novel arrangement of the operating mechanism, including the pawls, together with a shifting device, whereby the pawls may be set in the proper position for either raising or lowering a load, the pawls being simple gravity pawls, and the only springs required being for the purpose of throwing them out of action at the proper times.

The precise nature of my invention will be best understood by reference to the accompanying drawings, in which I have shown the preferred embodiment thereof, and which will now be described, it being premised, however, that various changes may be made in the details of construction and arrangement of the parts by those skilled in the art without departing from the spirit and scope of my invention as defined in the appended claims.

In these drawings, the numeral 2 designates the frame of the jack, and 3 is the lifting bar carrying the head 4. The bar 3 is arranged to move up and down in a suitable guide-way in the frame 2, and is provided at one edge with the rack teeth 5, which are engaged by the teeth of a pinion 6 formed on or secured to a transverse shaft 7 which is journaled in suitable bearings 2^a at opposite sides of the frame, as best shown in Fig. 3. Rigidly secured to the shaft 7 at one side of the pinion 6 is a gear wheel

8 of relatively large diameter whose teeth are engaged by the teeth of a pinion 9 on a shaft 10 which is arranged parallel to the shaft 7 and is journaled in bearings 11 in the frame 2. 12 is a ratchet wheel, which is also rigidly secured to the shaft 10.

13 is a lever socket, which is fulcrumed on the shaft 10, and to which is pivoted the upper pawl 14.

15 is the lower pawl, which is pivoted at 16 to the frame 2.

The upper pawl 14 is a gravity pawl, resting by its weight upon the ratchet wheel 12; and the pawl 15 is counterweighted at 18 so as to be also held by gravity in contact with the lower portion of said ratchet wheel. The pawl 14 has the projecting pin or stud 19, which is adapted to work through the slot 20 as the lever socket is actuated; and the pawl 15 has a similar stud 21 which works through the slot 22.

23 is a pawl shifting member or block, which is mounted for vertical movement on the pins or screws 24 which engage oblong slots 25 in the vertical arm of the shifting member. Pivoted to the upper end portion of the shifting member is a dog 26 having connected thereto a spring 27 and provided with a tail projection 28 adapted to contact with the stop 29 on said member. Pivoted to an arm 30 at the lower end of the shifting member is a lever 31, and also a dog 32. This lever and dog are pivoted upon the pin or stud 33, and a spring 34 is coiled about the pin or stud intermediate the lever and dog, one end of the spring being connected to the lever and the opposite end to the dog. The lever has a tail projection 35, which is adapted to contact with a stop projection 36 on the portion 30 of the shifting member.

In Fig. 1 the parts are shown in the proper position for raising a load, the shifting member or block being in its lowest position. Said block is moved to its other position for the purpose of lowering the load, as shown in Fig. 2, by means of the pivoted lever 37.

The operation is as follows:—The parts being in the position shown in Fig. 1, both pawls 14 and 15 act as simple gravity pawls. The lower pawl 15 is holding the load, and as the actuating lever is moved downwardly from the position shown in Fig. 1, the pawl 14 engages the ratchet 12 to turn the shaft

10 and thereby the pinion 9, the gear wheel 8, the shaft 7 and the pinion 6, thus elevating the lifting bar 3. In the mean time the lower pawl 15 rides idly over the teeth of the ratchet. Upon the upstroke of the actuating lever, the lower pawl 15 holds the load while the upper pawl 14 moves back for a new hold. When it is desired to lower the load, the lever 37 is moved from the position shown in Fig. 1 to the position shown in Fig. 2, thereby raising the lifting block or member. This causes the dog 26 to engage the pin or stud 19 of the pawl 14, thereby raising said pawl out of engagement with the teeth of the ratchet wheel, as shown in Fig. 2. As the actuating lever is now moved downwardly, the pin or stud 19 rides along the upper surface of the dog 26 and passes off the end of said dog, thus allowing the pawl 14 to drop into engagement with the ratchet to take the load. In the meantime a pin 38 carried by the inner end portion of the lever socket 13, engages the dog 32 and moves said dog backwardly, thereby increasing the tension of the spring 34. This moves the end of the lever arm 31 upwardly into contact with the pin or stud 21 of the pawl 15, thereby disengaging said pawl from the teeth of the ratchet wheel. This allows the ratchet wheel to turn backwardly until caught and held by the upper pawl 14, which now comes into action. On the upstroke of the actuating lever, the pin 38 moves away from the dog 32, and the pawl 15 reengages the teeth of the ratchet by gravity. The pin or stud 19 also rides back over the dog 26, and the pawl 14 is thereby raised out of engagement with the teeth of the ratchet.

It will be readily seen that the jack above described is particularly adapted for heavy work, although it may be made in any size desired, since a very powerful leverage action is obtained by means of the small pinion 9 and the large gear wheel 8. In the operation of raising the load, the pawls, as above described, act simply as gravity pawls; and the only work required by the springs 27 and 34 is to overcome the gravity of the pawls and cause their disengagement from the teeth of the ratchet wheel in lowering the load. The entire construction is a very simple and positive one, and a simple movement of the lever 37 is all that is required to change the position of the pawls, to secure either a lifting or a lowering action.

What I claim is:

1. In a lifting jack, a lifting bar, a transverse shaft having a pinion whose teeth engage the teeth on the lifting bar, a gear wheel also secured to said shaft, a second transverse shaft, a pinion on the last named

shaft engaging the teeth of the gear wheel, a ratchet wheel also secured to the last named shaft, an actuating lever fulcrumed on said shaft, a lifting pawl carried by said lever, a holding pawl for the ratchet, and a shifting device for changing the action of said pawls to lower a load step by step on the lifting bar; substantially as described.

2. In a lifting jack, a lifting bar, gearing for actuating said bar, including a transverse shaft, a ratchet wheel secured to said shaft, a lever fulcrumed on said shaft and carrying a lifting pawl, a holding pawl for the ratchet wheel, said pawls operating by gravity, a shifting member, and devices carried by said shifting member adapted to engage said pawls to cause their gravity action to be overcome at certain times in lowering the load; substantially as described.

3. In a lifting jack, an actuating shaft carrying a ratchet wheel, an actuating lever, a lifting pawl pivoted to the lever, a holding pawl for the ratchet wheel, a movable shifting member, dogs pivotally mounted on said member, springs arranged to act on said dogs, and means for shifting said member to cause said dogs to effect the disengagement of the pawls at the proper time in lowering a load; substantially as described.

4. In a lifting jack, an actuating shaft carrying a ratchet wheel, an actuating lever, a gravity lifting pawl pivoted to the lever, a gravity holding pawl for the ratchet wheel, a movable shifting member, spring-pressed dogs carried by the shifting member, means for shifting said member to cause said dogs to effect the disengagement of the pawls at the proper time in lowering the load, and means carried by the actuating lever for operating one of said dogs; substantially as described.

5. In a lifting jack, an actuating shaft, a ratchet secured to said shaft, an actuating lever, a gravity pawl pivoted to said lever and having a projecting pin or stud, a gravity holding pawl also having a projecting pin or stud, a movable shifting member, a spring-pressed dog carried by the shifting member and adapted to engage the pin or stud on the lifting pawl, a spring-pressed dog also carried by the shifting member and arranged to be engaged by the actuating lever, and a pawl lever connected to the last named dog and arranged to engage the pin or stud on the holding pawl; substantially as described.

In testimony whereof, I have hereunto set my hand.

GEORGE F. FREED.

Witnesses:

GEO. B. BLEMING,
GEO. H. PARMELEE.