(No Model.)

I. FRANK.

LIFTING JACK.

No. 511,767. Patented Jan. 2, 1894.

Fig. 1.

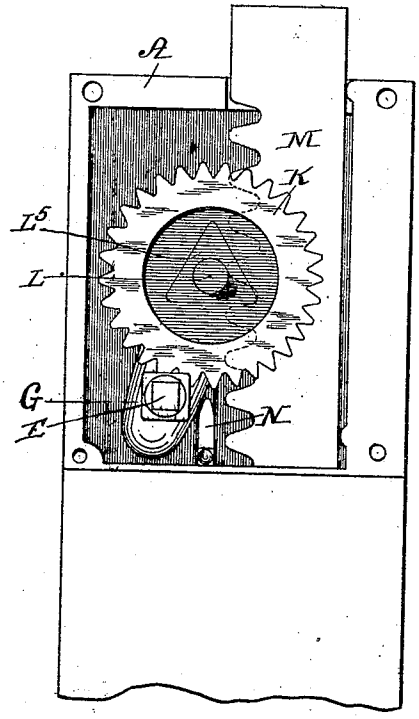


Fig. 2.

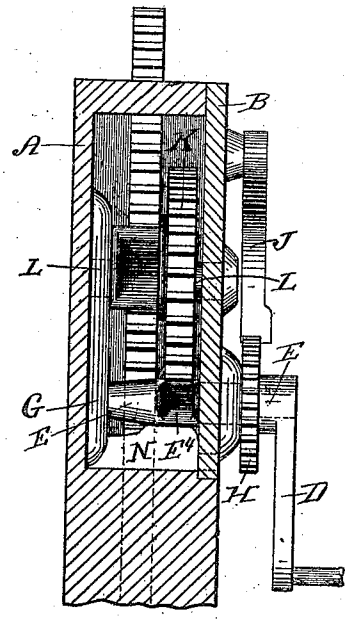


Fig. 3.

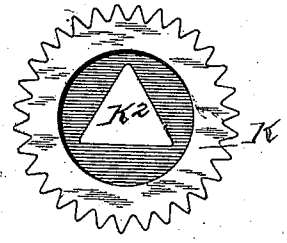


Fig. 4.

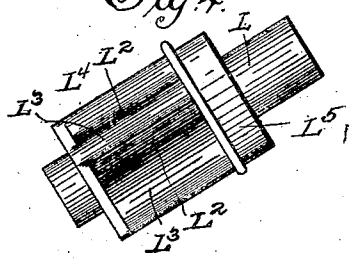
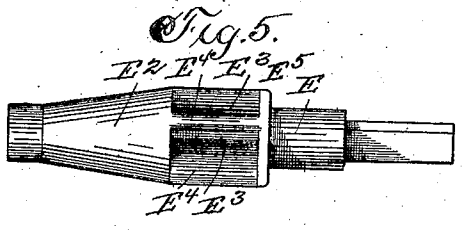


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

ISAIAH FRANK, OF CRESTON, IOWA.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 511,767, dated January 2, 1894.

Application filed March 28, 1892. Serial No. 426,751. (No model.)

To all whom it may concern:

Be it known that I, ISAIAH FRANK, a citizen of the United States, and a resident of Creston, in the county of Union and State of Iowa, have invented a new and useful Lifting-Jack, of which the following is a specification.

My invention relates to that class of manually operated devices known as lifting jacks, and has for its object the provision of means simple and compact, and capable of being disposed within a casing in such a manner as that all of the moving and intergearing parts are completely and entirely inclosed within said casing, the arrangement being of such a character however as that ready access may be had to the interior of the casing for purposes of repair and readjustment.

My object generally is to provide means of the above character by which the manual power applied to operate the mechanism is increased in intensity, whereby a great load may be raised with comparatively small effort, which load may be arrested and held at any desired point.

My invention consists in a reciprocated rack bar mounted within an inclosing casing and adapted to protrude through one end thereof in certain stages of operation, a manually operated winch carrying a toothed wheel engaged by a pawl, which toothed wheel and pawl are located on the exterior of the casing and thus readily accessible for use during all stages of operation, the shaft of said winch extending to the interior of the casing and provided with sockets forming teeth, which teeth gear with a removable gear wheel mounted upon the shaft of a socketed spur wheel, which sockets of the spur wheel provide teeth meshing with the teeth of the rack bar, whereby when power is applied to the winch said power is increased in intensity through the intermediate gearing mechanism.

Reference may now be had to the accompanying drawings, in which—

Figure 1 is a side elevation of a lifting jack, the cover of the casing being removed to show the positions of the interior working mechanism. Fig. 2 is a vertical longitudinal sectional view. Fig. 3 is a detail view of the intermediate gear wheel. Fig. 4 is a detail view of the spur wheel. Fig. 5 is a like view of the driven shaft having teeth formed thereon which teeth engage the gear wheel.

A, designates the casing, which casing, as shown, is provided with a removable front cover piece B, which cover piece B serves also as a support for certain of the shafts of the mechanism.

D, designates a winch removably secured to a horizontal shaft E, which latter passes through the cover piece B, being journaled therein, and at its interior end being journaled in the bearing piece G. Mounted upon said drive shaft E and on the outer side of the casing is a toothed wheel H, which toothed wheel is engaged by the depending pawl J, whenever the said wheel tends to rotate in a direction reversely to the direction of movement of the winch D, except in the case where the pawl is disengaged to lower the load.

The drive shaft E, as shown more clearly in Fig. 5, is provided with the enlargement E^2, so socketed at E^3 as to form the teeth E^4, and thus provide a pinion E^5, strong in character and construction.

K, designates a gear wheel, which as shown more clearly in Fig. 3, has a central triangular perforation K^2.

L, is a shaft journaled at one end in the cover B, and at the other end in the bearing piece G, said shaft L having an enlargement formed thereon which is socketed at L^2 to form the engaging teeth L^3, of the spur wheel L^4, and also the triangular shoulder L^5, over which shoulder the gear wheel K is engaged by passing the shaft L through the central triangular opening K^2, so that said gear wheel K is firmly mounted upon the said shaft L in such position as to gear with the teeth E^4. The teeth L^3 of the spur wheel L^4 gear with the teeth of the rack bar M, the upper end of which latter engages and supports the load. I also provide a ledge or stop N, which is so positioned, as that, in the event of a breakage of any of the parts under the stress of the load, the teeth of the gear wheel K may be engaged by said stop N, which latter is beveled at its upper edge to adapt the same for this purpose.

It will now be apparent from the foregoing description, that by operating the winch the shaft E is rotated, the teeth E^4 imparting a

movement of rotation to the large gear wheel K, which latter in turn rotates the spur wheel L^4, the teeth L^3 of which engage the rack bar and impart a vertical movement thereto, thus raising the load, the pawl J traveling over the toothed wheel H in such a manner as that when the power is released from the winch B said pawl engages said wheel and locks the parts in a stationary position. It will be observed also that those parts upon which the maximum stress is brought to bear are of maximum resisting strength, and that also all of the parts are so relatively adjusted as to be readily removable from the interior of the casing and from each other.

Having thus described my invention, what I claim as new therein, and desire to secure by Letters Patent of the United States therefor, is—

A lifting jack having an inclosing casing, a drive shaft mounted in said casing, which shaft is extended to a point on the exterior of said casing, a manually-operated crank mounted on said drive-shaft, a toothed wheel H also mounted on the same, a pawl J adapted to engage the teeth of said wheel, a driven shaft mounted in said casing and provided with teeth engaging with a rack-bar, a gear wheel between the drive shaft and the driven shaft, whereby the applied power is increased in intensity, and a fixed stop or ledge located adjacent to one of the gear wheels, whereby the load is supported notwithstanding breakage of any of the parts.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

ISAIAH FRANK.

In presence of—
WM. D. JONES,
H. M. FRY.