(No Model.)

F. I. JOYCE.

LIFTING JACK.

No. 548,443. Patented Oct. 22, 1895.

Fig. 1

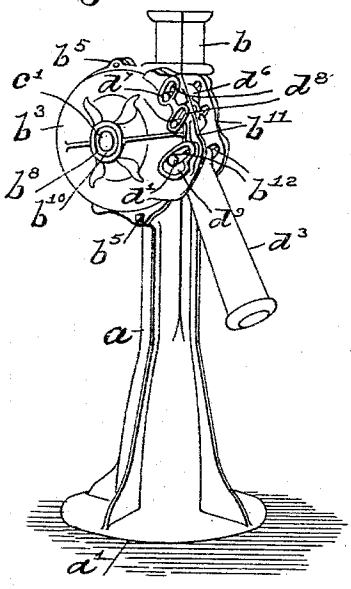

Fig. 2.

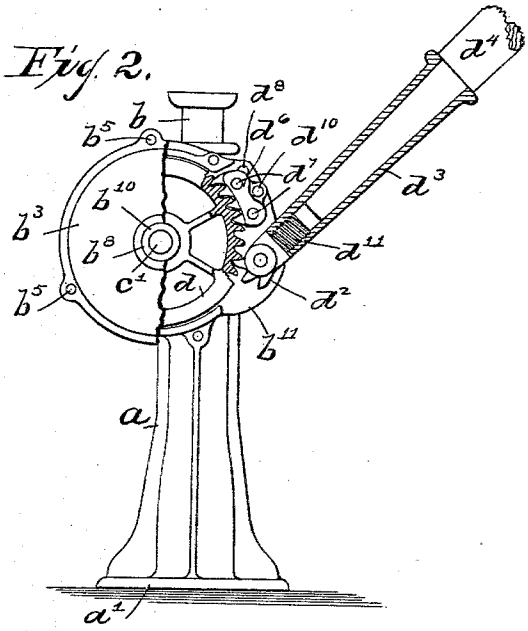

Fig. 3.

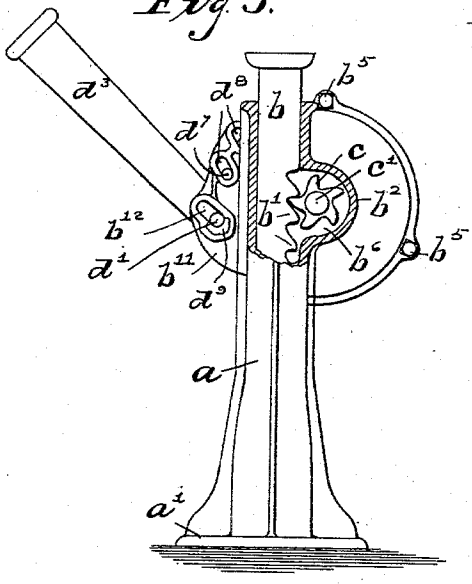

Fig. 4.

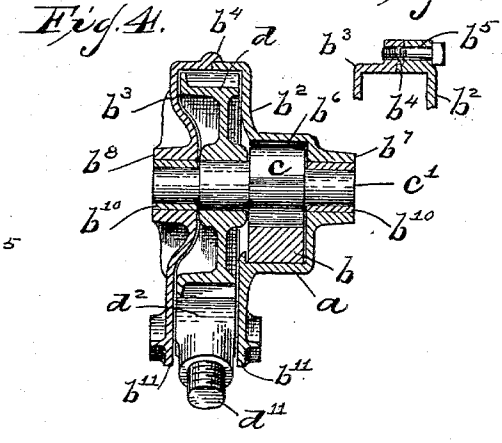

Fig. 5.

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FRANK I. JOYCE, OF DAYTON, OHIO.

LIFTING-JACK.

SPECIFICATION forming part of Letters Patent No. 548,443, dated October 22, 1895.

Application filed March 25, 1895. Serial No. 543,048. (No model.)

To all whom it may concern:

Be it known that I, FRANK I. JOYCE, a citizen of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Lifting-Jacks, of which the following is a specification.

My invention relates to improvements in lifting-jacks, and especially to that class known as "lever-jacks."

The object of my invention is to provide what may be termed a "geared lever-jack," of simple and strong construction, and one in which the power is multiplied, so that by the use of a lever of ordinary length an extremely heavy load may be lifted.

My invention consists in the various constructions and combinations of parts hereinafter described, and set forth in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a device embodying my invention. Fig. 2 is a side elevation of the same, with some of the parts broken away and shown in section. Fig. 3 is a side elevation, partly in section, the view being taken in the opposite direction from that of Fig. 2. Fig. 4 is a transverse sectional view. Fig. 5 is a detail view of the gear-casing.

Like parts are represented by similar letters of reference in the several views.

In the said drawings, a a represent the main frame or casing, having a base a', which may be of any usual and desirable construction.

b is a lifting-bar, which is adapted to slide vertically in the frame a and is provided on one side with teeth b'.

Cast integral with the main frame or casing a is a housing b^2, to which is secured a cover b^3, the housing and the cover being provided with overlapping parts, as shown at b^4, and bolted or otherwise secured together at suitable intervals, as shown at b^5, suitable lugs or ears being provided on the periphery of the housing and cover for this purpose. The housing b^2 is reduced at a point opposite the bar b to form a chamber b^6, at one end of which is formed a bearing b^7, a similar bearing b^8 being constructed in the cover b^3.

The frame, housing, and cover thus described are preferably cast from malleable iron, and in the bearings b^7 b^8 are placed hardened-steel bushings b^{10}.

Arranged within the chamber b^6 and adapted to engage with the teeth b' of the bar b is a pinion c, which is formed, preferably, of steel and integral with a shaft c', which is shouldered down and journaled in the steel bushings in the respective bearings b^7 b^8.

Within the housing b^2 and completely inclosed by said housing and its cover is a toothed wheel d, secured to the shaft c'. The sides of the housing b^2 are extended in front, as shown at b^{11}, and are provided with angularly-arranged slotted openings b^{12}, adapted to receive trunnions d', which are formed on the side of a toothed segment d^2. This toothed segment d^2 is also preferably formed integral with its trunnions and of steel, its teeth being adapted to engage with the teeth of the wheel d. The geared segment is preferably provided with a reduced screw-threaded projection d^{11}, adapted to be screwed into a sleeve d^3, preferably of malleable iron, which forms a socket for a lever d^4.

The teeth in the wheel d, segment d^2, bar b, and pinion c are all formed in the nature of ratchet-teeth—that is to say, they are beveled or inclined on one side, thus permitting the use of a smaller number of teeth in the pinion and of greater strength than when constructed as regular gear-teeth.

Above the toothed segment d^2 and also supported in the extended sides b^{11} is a toothed pawl d^5, having on each side projections d^7, which engage in inclined slotted openings d^8 in the sides b^{11}. The slotted openings b^{12}, in which the trunnions of the toothed segment d^2, operate are preferably provided with steel bearing-seats d^9, in which said trunnions turn when the toothed segment is in gear with the toothed wheel.

It will be seen from the above construction that when the lever d^4 is vibrated the toothed segment d^2, engaging with the wheel d, will cause said wheel to revolve, thus raising the bar b. The toothed pawl d^6, by reason of the inclined openings in which it is supported, will permit the gear to revolve in one direction, but will engage therewith and prevent it revolving in the other direction. As the lever d^4 is raised the toothed segment d^2 will

ratchet on the toothed wheel d by reason of the slotted openings b^{12}; but when moved in the opposite direction the trunnions will engage in the bearings at the ends of said slotted openings, causing the teeth to engage so as to elevate the bar.

A lug d^{10} is preferably provided on the pawl d^6, to which a chain or other suitable device may be attached by which the pawl may be withdrawn from said wheel by raising the same in the inclined slotted openings d^8, and thus permit the bar to be lowered by turning the wheel in the opposite direction.

From the above description it will be seen that I have provided a jack which is extremely strong and at the same time simple in its construction. It has all the advantages of the ordinary lever-jack, with the increased power resulting from the relative sizes of the toothed wheel and pinion.

A jack as thus described is especially adapted for railway work for raising cars from their trucks, &c., though it is obvious that it is capable of use in place of any ordinary lever-jack where great power is required.

Having thus described my invention, I claim—

1. The combination with a lifting jack, of a frame, a housing at the side of said frame having an opening with projecting flanges as described, said flanges being provided with slotted openings, a pawl and toothed segment respectively supported in said slotted openings, a toothed wheel in said housing, a pinion connected to said wheel, a bar in said frame having teeth to engage with said pinion, and a lever detachably connected to said toothed segment, substantially as and for the purpose specified.

2. In a lever jack, the combination with a toothed wheel as described, of a toothed segment having trunnions thereon and a screw-threaded projection as described, said segment, trunnions, and projection being cast integral, and a screwthreaded socket secured to said projection and adapted to receive a lever, substantially as specified.

In testimony whereof I have hereunto set my hand this 21st day of March, A. D. 1895.

FRANK I. JOYCE.

Witnesses:
GEO. W. FRANK,
JOHN L. H. FRANK.