(No Model.)

C. H. HOPKINS & G. W. KNIGHT.

JACK SCREW.

No. 371,068. Patented Oct. 4, 1887.

Fig. 1.

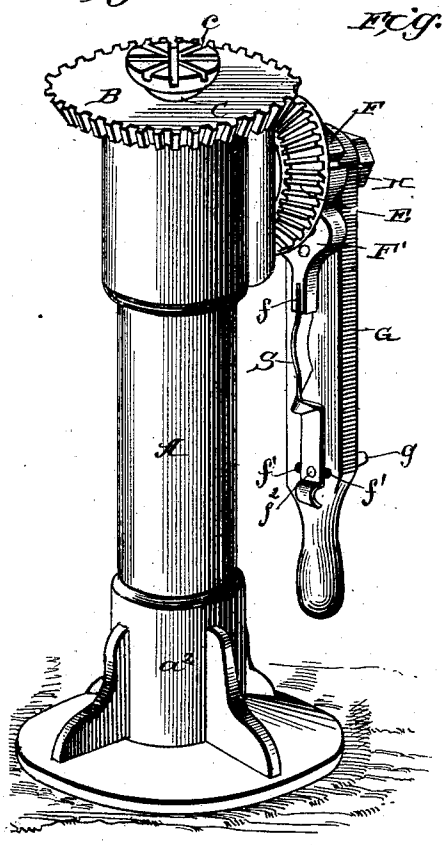


Fig. 3.

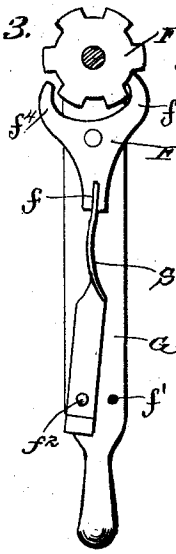


Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

CHARLES H. HOPKINS AND GEORGE W. KNIGHT, OF LYNDONVILLE, VERMONT.

JACK-SCREW.

SPECIFICATION forming part of Letters Patent No. 371,068, dated October 4, 1887.

Application filed June 9, 1887. Serial No. 240,790. (No model.)

To all whom it may concern:

Be it known that we, CHARLES H. HOPKINS and GEORGE W. KNIGHT, citizens of the United States, residing at Lyndonville, in the county of Caledonia and State of Vermont, have invented a new and useful Improvement in Jack-Screws, of which the following is a specification.

Our invention relates to an improvement in jack-screws; and it consists in the construction and arrangement of the parts of the same, which will be more fully hereinafter described, and pointed out in the claims.

The object of our invention is to provide a jack-screw which is simple and effective in its construction and operation, strong and durable, easily handled and readily understood, positive in its result, and cheaply manufactured. We attain this object by the construction of jack-screw illustrated in the accompanying drawings, wherein like letters of reference indicate similar parts in the several views, and in which—

Figure 1 is a perspective view of our improved jack-screw. Fig. 2 is a vertical sectional view of the same. Fig. 3 is an elevation of the inner side of the operating-handle, showing the spring-actuated double-acting pawl and ratchet shown in connection therewith.

A indicates a suitable standard, which is constructed hollow and has a base-rest, a^2. As shown in Fig. 1, a nut, B, in the form of a bevel-gear, is mounted on the top portion of this standard A, and has a screw, C, passing therethrough, which projects downwardly into the internal portion of the said standard A. The head *c* of the screw C projects slightly above the upper surface of the nut or beveled gear B, for the purpose of bringing the weight of the object to be raised directly upon the head *c* of the said screw, and not interfere with the perfect operation and revolution of the beveled gear or nut B.

Mounted in a boss formed at one side of the standard A is a stub-shaft, D, upon the inner portion of which, adjacent to the said boss, a small bevel-gear, E, is mounted, and engages with the bevel gear or nut B on the top of the standard A.

Immediately outside of the small beveled gear E a ratchet-wheel, F, is mounted and formed integrally with the said wheel E, and is adapted to be engaged by a double integral pawl, F′, pivotally mounted in connection with the handle G, mounted on the said shaft D on the outer side of the ratchet-wheel F. A clamping-nut, H, is inserted on the end of the shaft D, to retain the parts in their relative operative position.

The handle G has a torsion-spring, S, connected thereto, the upper end of which engages with the slot *f*, formed in the lower end of the double pawl F′. The lower end of this spring is provided with a stud or pin, f^2, which is adapted to be inserted in either one of two apertures, *f′ f′*, formed near the two outer edges of the handle G. The length of said spring from its upper end to the stud f^2 is slightly greater than the distance from the inner end of the socket *f* to either of the holes *f′*, whereby when said stud is inserted in either of said sockets the spring will be forced out of direct alignment with the pawl F′, and will incline it in an opposite direction; hence, when the said stud or pin f^2, as fully shown in Figs. 2 and 3, is inserted in the aperture *f′* on the left of the handle G, the finger f^3 of the double pawl is adapted to engage with the ratchet F. When the said stud or pin is inserted in the opposite aperture, the finger f^4 of the said double pawl is thrown in connection with the ratchet F, and the finger f^3 thrown out of connection therewith. Thus it will be seen that the said pawl F′ can be arranged to work in either direction, as may be desired.

The handle G is adapted to be operated by hand by means of the wrist-pin *g*, formed therewith. A suitable driving mechanism can be connected thereto, as will be obvious.

The operation of our improved jack-screw will be as follows: The handle G being operated, the double pawl F′, thrown into motion thereby, engages with the ratchet-wheel F, which revolves the beveled gear E, said wheel E revolving the wheel B, which raises the screw without disconnecting itself from the bevel-wheel E. This is accomplished by means of the weight of the object being lifted being brought to bear on the head *c* of the screw C,

and the wheel B turning causes the said screw to rise, as will be readily understood. By this means the main operating mechanism of the jack-screw is allowed to remain stationary as regards elevation, while the screw itself is gradually raised without turning. By means of our form of construction of lifting jack-screws a great power is brought to bear upon the screw with but a small force, and by means of the double action of the pawl heretofore described the motion of this screw may be readily reversed when necessary.

The novelty and utility of our improved device being apparent, it need not further be enlarged upon herein.

It is obvious that many minor changes in the construction and arrangement of the various parts may be made and substituted for those herein shown and described without departing in the least from the nature and principle of our invention.

We are aware that previous to our invention it has been proposed to construct a screw-jack wherein a dog was employed for engaging the pinion to effect its rotation in either direction. We are also aware that it is not new to employ a latch which can be so turned as to hold the operating-lever out of engagement with the ratchet-wheel. We are also aware that it is not new to employ a double acting pawl controlled by an independent bent spring. Our invention will be readily distinguished from the foregoing in that the pawl-controlling spring is connected to said pawl, and is adapted to be secured to the ratchet-lever in a series of different positions. An important feature consists in the fact that the spring is slightly longer than the point where it is to be attached on the lever, so that said spring will exert a tension to properly maintain the connection and prevent accidental disengagement.

Having thus described our invention, we claim—

1. The combination of the standard A, internally screw-threaded, the bevel-gear B, mounted on the upper end of the standard, the screw C, passing therethrough and into the internal part of the standard, the shaft D, formed integral with a portion of the standard and projecting horizontally therefrom, the bevel-gear mounted on the said shaft and meshing with the gear B, the ratchet-wheel F, formed integral with the gear E, the lever G, having the apertures f' f'' near its opposite edges at its outer end, the double-acting pawl having the teeth f^3 f^4, adapted to engage the ratchet-wheel F and provided with the slot f in its lower end, the said pawl being pivoted on the lever G, and the torsional spring S, having one end secured in the said slot f, and its other end extending slightly beyond said apertures and provided with the pin f^2, adapted to engage the said apertures f'' in the lever, substantially as specified.

2. In a jack-screw, the combination, with the standard A, a screw, C, therein, a bevel-gear, B, seated in the upper end of said standard and provided with an internal screw-thread engaging the thread on said screw-shaft D, a bevel-gear, E, mounted on said shaft D of said standard, at right angles to said gear B and engaging therewith, a ratchet-wheel, F, integral with said gear E, and a handle, G, loosely mounted on said stub-shaft, of a double pawl, F', pivoted on said handle and provided with a slot, f, in its outer end, and a torsion-spring, S, one end of which enters said slot f, and the other end of which is provided with a laterally-projecting pin, f^2, adapted to enter holes f' in said handle, said pin being normally farther from the pivot of said pawl than said holes, as and for the purpose set forth.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

CHARLES H. HOPKINS.
GEORGE W. KNIGHT.

Witnesses:
HOMER C. WILSON,
GEO. C. CAHOON.