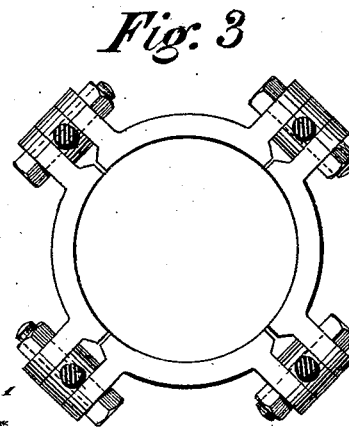
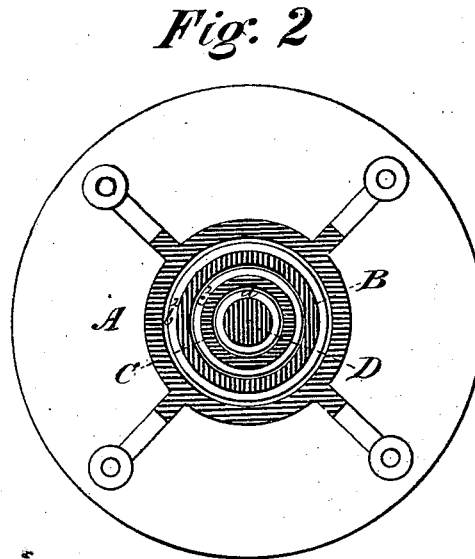
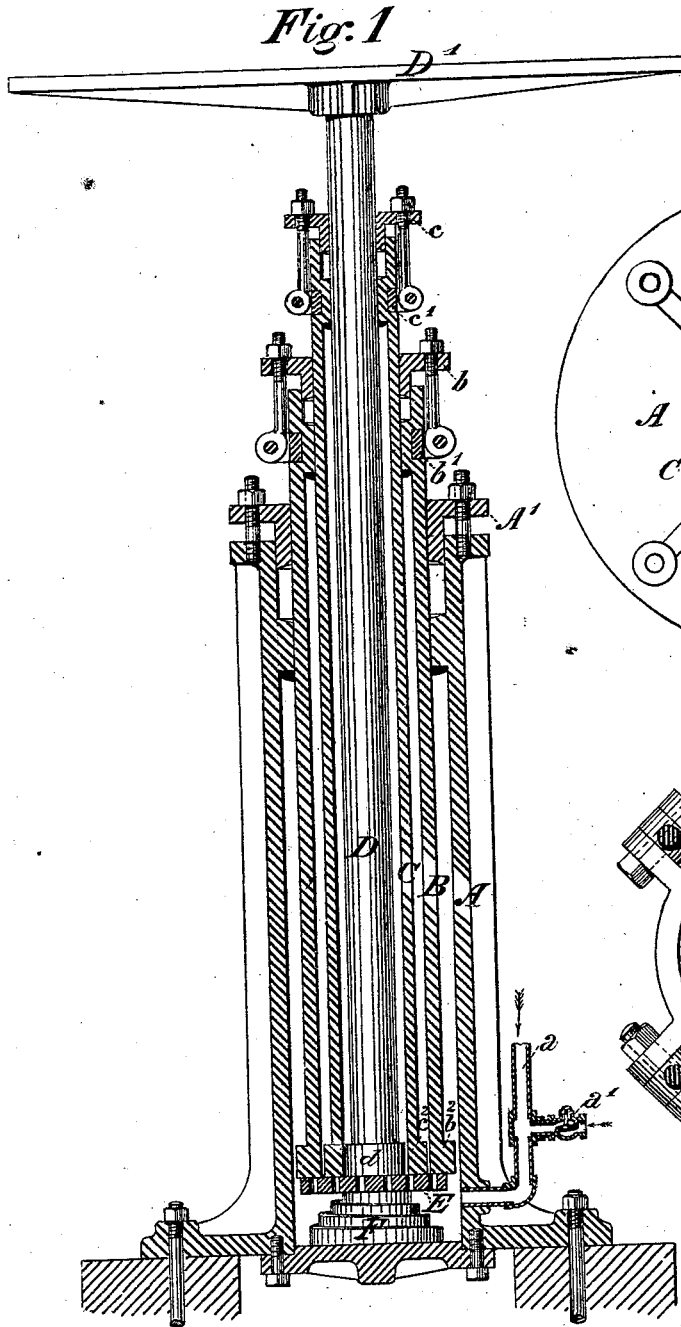


W. B. Le VAN.
Hydraulic-Elevator.

Patented Feb. 16, 1875.

No. 159,829.



Witnesses:

L. Shackleton
W. B. Le Van

Inventor:

W. Barnet Le Van
by Edward A. Bell.
attys.

UNITED STATES PATENT OFFICE.

WILLIAM BARNET LE VAN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN HYDRAULIC ELEVATORS.

Specification forming part of Letters Patent No. 159,829, dated February 16, 1875; application filed March 25, 1874.

To all whom it may concern:

Be it known that I, WILLIAM BARNET LE VAN, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Hydraulic Elevators, of which the following is a specification:

The object of my invention is to provide a safe, simple, and economical telescopic hydraulic apparatus for raising and lowering objects, and to afford proper means for preventing jarring or concussion in the working of the same; to which ends my improvements consist in combining, with a cylindrical outer casing or barrel, a series of hollow columns or rams capable of moving one within the other, and having permanent collars attached to limit their motion. A convenient device is provided for securing the glands of the stuffing-boxes, as also a spring and perforated plate in the bottom of the outer casing, all as hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a vertical central section through a hydraulic elevator embodying my improvements; Fig. 2, a transverse section of the same; and Fig. 3, a top view, on an enlarged scale, of the collar used for securing the glands of the stuffing-boxes.

The outer casing or barrel A is secured on a proper foundation, into which water is forced by an ordinary force-pump through the pipe *a*. A hollow column or ram, B, is made to move within the outer casing A, and a similar column, C, of smaller diameter, moves within the ram B. A solid ram, D, moves within the ram C, being the last of a series, and carries the platform D'. The outer casing A is provided with a stuffing-box for the necessary packing, and a gland, A', which is secured in the ordinary manner by means of standing bolts and nuts. The hollow rams B and C are also provided with stuffing-boxes and glands *b* and *c* corresponding therewith. The bolts for securing these glands are held in the jaws of collars *b*¹ and *c*¹, recessed in and bolted to the rams.

The collars may be made in two or more segments, and the standing bolts for the stuffing-boxes can be secured by the same bolts used for bolting the collars to the rams.

To insure an equal distribution of the metal of the hollow rams the recesses for the collars *b*¹ and *c*¹ are formed where the bottoms of the stuffing-boxes require a reduction of the inside diameters of the rams, thus providing an increased thickness of metal to be recessed.

To limit the movement of the rams or columns, permanent collars *b*², *c*², and *d* are provided at their lower ends, such collars, respectively, being nearly as large as the inside diameter of the outer casing, or of the rams in which they move.

An important advantage gained by this arrangement is the cushioning action produced by the water, which will be confined, to a certain extent, between the collars and the bottoms of the stuffing-boxes when either of the rams is about to complete its upward movement.

A perforated plate, E, in the bottom of the outer casing, supports the rams when in a state of rest, and receives them when they are lowered; and to prevent jar or concussion a spring, F, is placed under the plate E.

A small valve, *a*', is placed in the water-supply pipe, opening inward, for the purpose of admitting air to prevent concussion, which might result from a partial vacuum being created by suddenly allowing the water to escape when the rams are lowered.

I am aware that telescopic hydraulic elevators have been heretofore known, and do not, therefore, broadly claim such device.

I claim as my invention—

1. In a telescopic hydraulic elevator, the combination of a hollow column or ram, recessed at or near its upper end, so as to be of substantially uniform thickness, with a clamp-collar composed of two or more segments, resting in the recess of the ram, and united by bolts, which carry the bolts or studs of the gland or follower, substantially as set forth.

2. The combination, in a telescopic hydraulic elevator, of an outer casing, A, a series of columns or rams, and a perforated plate, E, and spring F, substantially as set forth.

W. BARNET LE VAN.

Witnesses:

FRANCIS D. PASTORIUS,
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