

(No Model.)

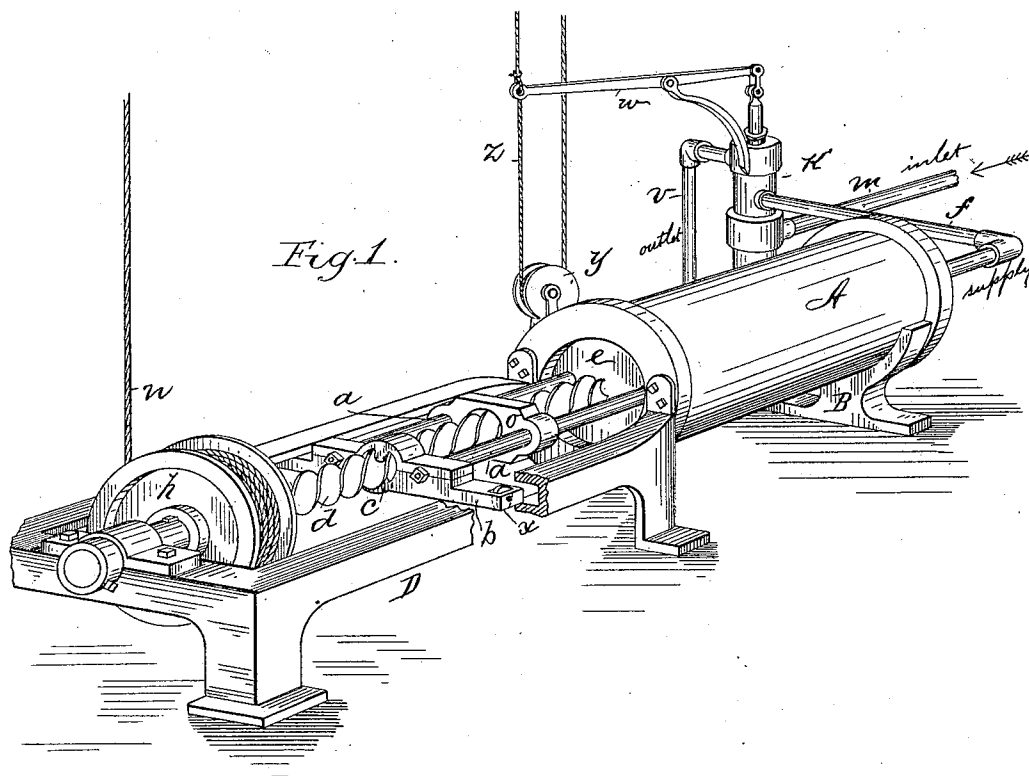
2 Sheets—Sheet 1.

J. GIBBINS.

HYDRAULIC ELEVATOR ENGINE.

No. 337,056.

Patented Mar. 2, 1886.



WITNESSES:

Henry A. Chapin
W. F. Rice

INVENTOR

James Gibbins

BY

Henry A. Chapin
ATTORNEY

(No Model.)

2 Sheets—Sheet 2.

J. GIBBINS.

HYDRAULIC ELEVATOR ENGINE.

No. 337,056.

Patented Mar. 2, 1886.

Fig 3

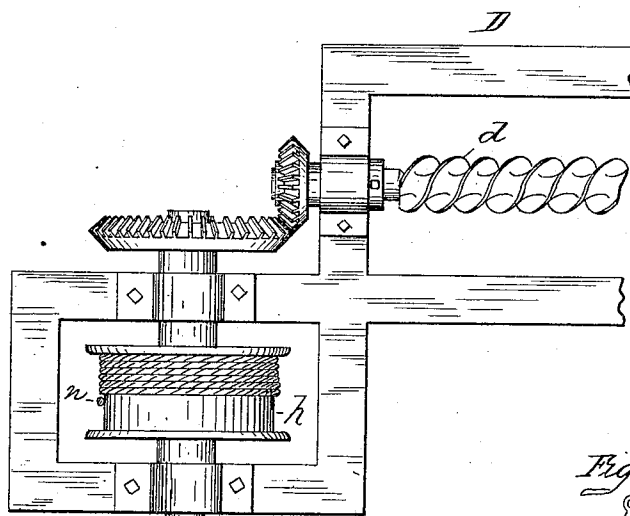
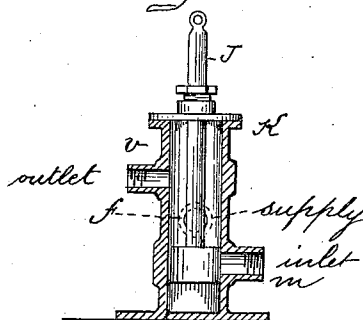


Fig 2



WITNESSES:

Harry A. Chapin
S. A. Grant

INVENTOR

James Gibbins

BY

Harry A. Chapin
ATTORNEY

UNITED STATES PATENT OFFICE.

JAMES GIBBINS, OF SPRINGFIELD, MASSACHUSETTS.

HYDRAULIC ELEVATOR-ENGINE.

SPECIFICATION forming part of Letters Patent No. 337,056, dated March 2, 1886.

Application filed August 31, 1885. Serial No. 175,776. (No model.)

To all whom it may concern:

Be it known that I, JAMES GIBBINS, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Hydraulic Elevator-Engines, of which the following is a specification.

This invention relates to improvements in hydraulic elevator-engines, the object being to provide an improved machine of this class wherein the piston which is actuated by the water-pressure acts directly on a screw-shaft to rotate the latter and impart the requisite motion to the cable-winding mechanism, whereby the elevator-cage is raised and lowered.

The drawings forming part of this specification illustrate in perspective view in Figure 1 a hydraulic elevator-engine constructed according to my invention. Fig. 2 is a view of a valve, showing its cylinder in section, which is used in connection with the engine. Fig. 3 is a plan view of a modified connection between the engine and the winding-drum.

In the drawings, A is the cylinder of the engine, of suitable metallic construction, supported at one end on a standard, B, and having its front end securely bolted to the frame D of rectangular form. The rear end of the cylinder A has the usual head secured thereon, but its opposite end is left open, as shown. A suitable piston-head, *e*, is fitted into the cylinder, to which are rigidly secured the two piston-rods *a a*, and to the ends of the latter the cross-head *b* is attached, in which is made, or to which is suitably secured, the nut *c*, midway between the aforesaid two piston-rods, and between the cross-head *b* and the cylinder the perforated cross-bar *o* is secured on the said piston-rods, which acts as a guide and support for one end of the screw-shaft *d*, the hole through said guide being substantially of the diameter of the shaft *d*. The said cross-head *b* has suitable ways for its ends in the hollow side rails of frame D, one of which is broken away in the drawings to show this feature of construction, and the ends of the cross-head, which operate within said hollow side rails, are provided with the friction-rolls *x*; or they may be made without the latter, if preferred. Said rolls, however, contribute to the ease of action of the ends of the cross-head in its ways.

It is obvious that any suitable cross-head connection with the frame D may be employed in place of that shown in the drawings, as that particular one is not essential to the proper operation of the engine.

The above-mentioned shaft *d* has a "quick" screw formed on that portion of it which extends rearward from the winding-pulley *h*, its rear end reaching nearly to the end of the cylinder A, and its opposite end being properly fitted into a bearing on the end of frame D, whereby it can have no endwise motion, and said pulley *h* is firmly keyed thereto, as shown. The screwed portion of shaft *d* passes through the nut *c* in the cross-head *b*, and through the guiding cross-bar *o* on the piston-rods *a a*.

The winding-pulley *h* is of the usual flanged class, to adapt it to operate with the cable *n*, which serves the ordinary purpose of a connection between the engine and the elevator-cage. The said winding-connection of pulley and cable is shown in the drawings to be made directly with the screw-shaft; but in practice, when the engine is employed for lifting heavy weights, the winding-pulley is connected with the screw-shaft in a manner well known to mechanics by a gear fixed on a separate drum-shaft engaging with a suitable pinion on said shaft, as shown in Fig. 3. Water is let into and out of the cylinder A behind the piston-head *e* through the pipe *f*, (marked "supply" in the drawings,) said pipe being connected to an ordinary three-way piston-valve, K, whose construction is illustrated in Fig. 2, the latter receiving water through the pipe *m* and discharging it through the pipe *v*, (marked "outlet.") A lever, *w*, connected with the piston J of valve K, is connected with the usual shipper-cord, *z*, the latter passing round the roller *y*, which is suitably attached to or near to the engine.

The operation of the said engine is as follows: It will be understood that when lever *w* is operated by the cord *z* to bring the piston-head of valve K before the end of the inlet-pipe *m* within the cylinder of said valve, no water will enter the latter; but when said piston-head is moved above the junction of pipes *m* and *f* with said valve, water enters the latter through pipe *m* and flows unobstructedly through pipe *f* into cylinder A, pipe *f* being connected with the latter through its head;

and the piston-head *e*, the rods *a a*, and cross-head *b* are moved by the force of the water toward pulley *h*, causing the screw-shaft *d*, with which nut *c* engages, to be rotated, together with pulley *h*, winding the cable *n* onto the latter and causing any cage with which the cable may be connected to be raised. Lowering the valve-piston to cover the end of the pipe *f* at the valve causes the piston *e* and shaft *d* to come to a stop, and lowering the valve-piston still further, to cover the end of pipe *m* and open more or less the end of pipe *f* in the valve-cylinder, causes the water to flow from cylinder *A* by the action of the screw-shaft *d*, which is then permitted to turn, owing to the lack of water-pressure in the cylinder *A*, and the weight of said elevator-cage, which hangs on pulley *h* and rotates the latter, thereby moving piston *e* rearward and forcing the water from the cylinder *A* with a rapidity proportionate to its means of escape from valve *K* through pipe *v*.

It is obvious that the length of cylinder *A* and the screw-shaft *d* may in practice be made proportionate to the service which the engine may be required for.

The cross-bar *o* may be omitted, if desired, from the machine, but with it increased steadiness is imparted to the screw-shaft *d*.

What I claim as my invention is—

1. A hydraulic elevator-engine consisting of a cylinder receiving and discharging water at one end, a piston-head for said cylinder, having two parallel piston-rods, a cross-head secured to the ends of the latter, having therein a screw-nut, a screw-shaft passing

through said nut and having suitable cable-winding mechanism connected therewith, substantially as described, and a suitable frame supporting said cross-head and providing a bearing for one end of said screw-shaft, combined and operating substantially as set forth.

2. A hydraulic elevator-engine consisting of a cylinder receiving and discharging water at one end, a piston-head for said cylinder, having two parallel piston-rods, a cross-head secured to the ends of the latter, having therein a screw-nut, a perforated cross-bar secured to said rods between the cross-head and the piston-head, a screw-shaft passing through said nut and cross-bar and having suitable cable-winding mechanism connected therewith, substantially as described, and a suitable frame supporting said cross-head, and providing a bearing for one end of said screw-shaft, combined and operating substantially as described.

3. A hydraulic engine consisting of a screw-shaft hung in a suitable frame, and having cable-winding mechanism, substantially as described, connected therewith, a screw-nut adapted to be held rigidly and to be given a reciprocating motion on said screw-shaft, a cylinder receiving and discharging water at one end, and a piston operating in said cylinder and having a suitable connection with said screw-nut, combined and operating substantially as described.

JAMES GIBBINS.

Witnesses:

H. A. CHAPIN,
WM. H. CHAPIN.