

(No Model.)

H. G. MORRIS.  
Hydraulic Hoisting Engine.

No. 234,053.

Patented Nov. 2, 1880.

FIG. 1.

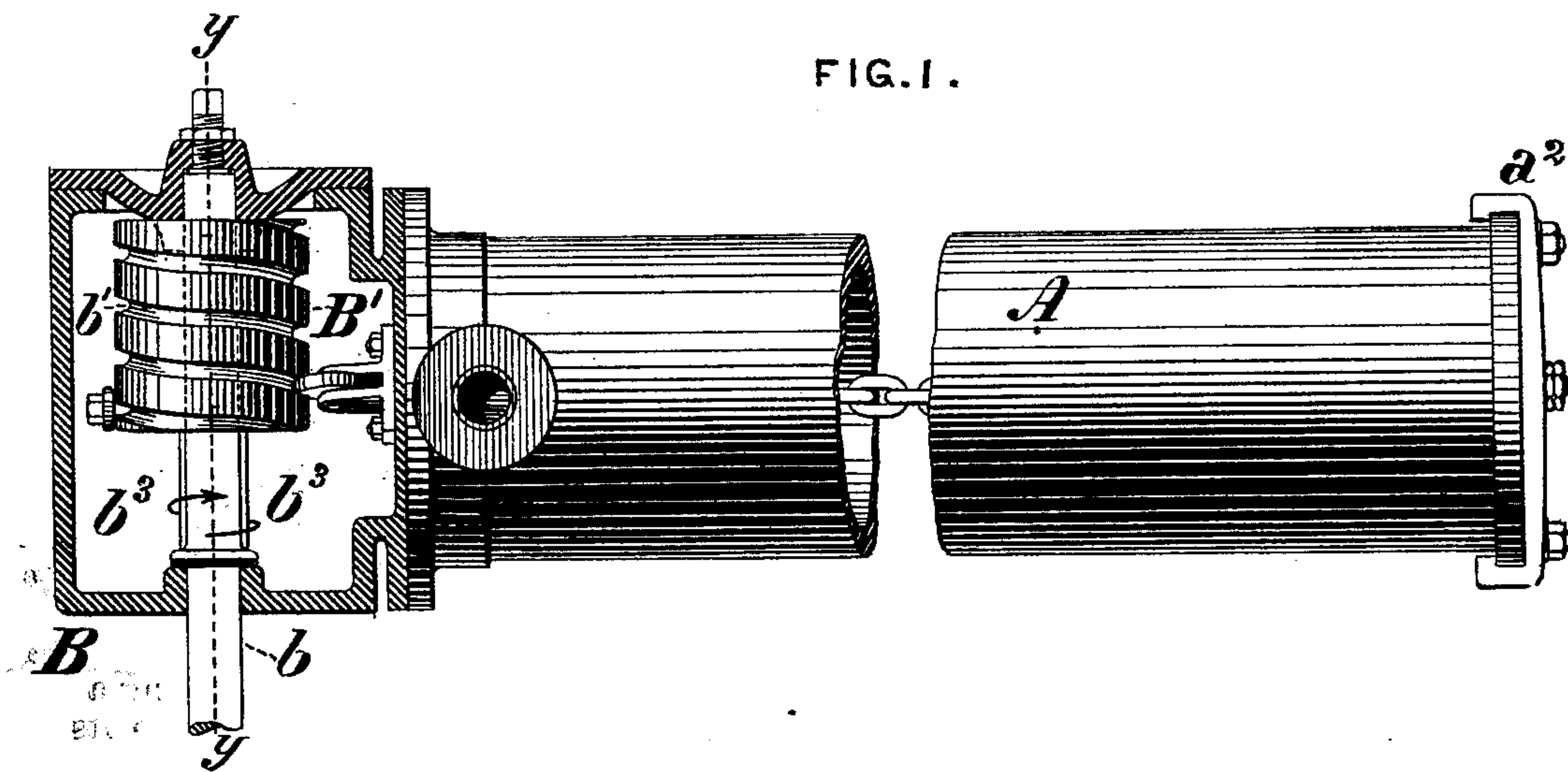


FIG. 2.

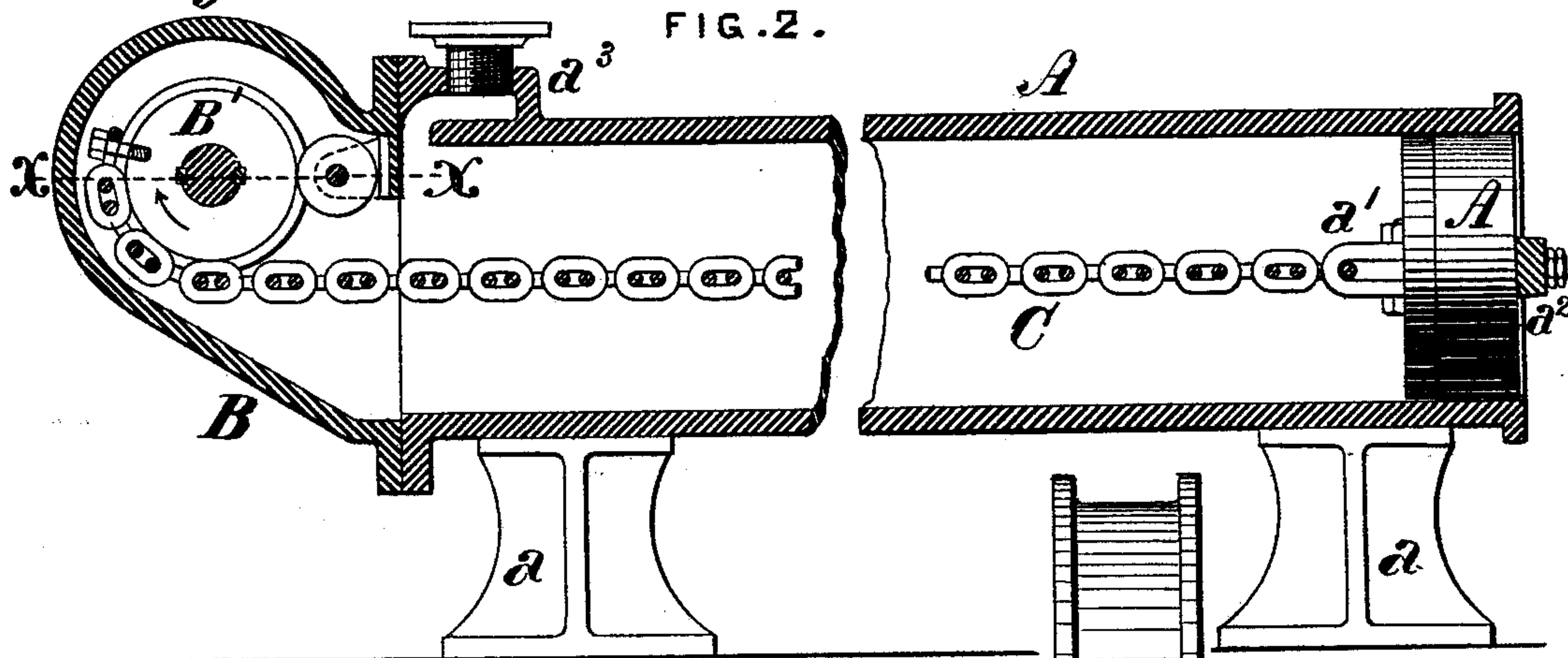
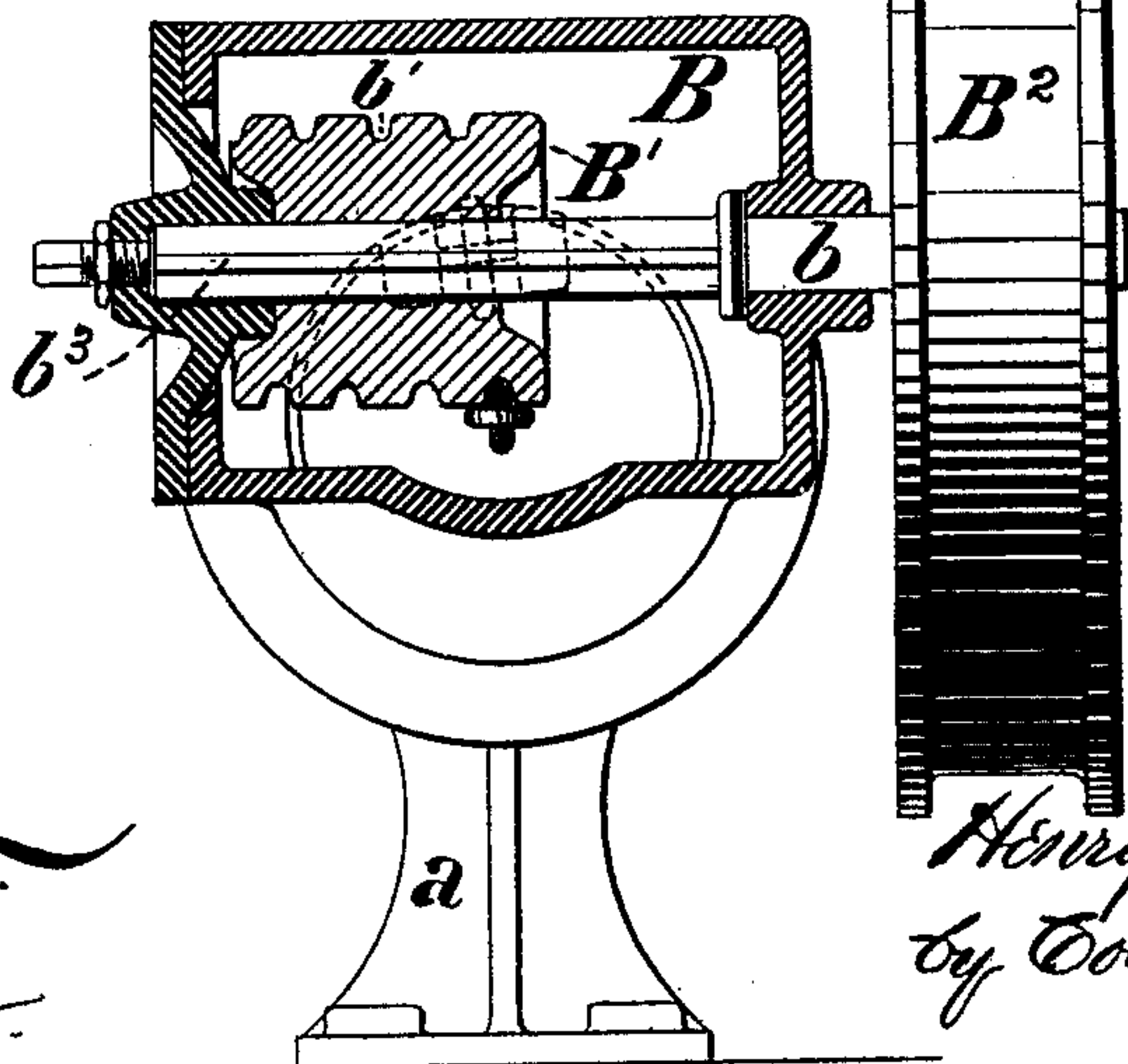


FIG. 3.



WITNESSES.

*Geo. B. Collier.*  
*D. L. Collier.*

INVENTOR.

*Henry G. Morris,*  
*by Collier & Bell,*  
*attys.*



# UNITED STATES PATENT OFFICE.

HENRY G. MORRIS, OF PHILADELPHIA, PENNSYLVANIA.

## HYDRAULIC HOISTING-ENGINE.

SPECIFICATION forming part of Letters Patent No. 234,053, dated November 2, 1880.

Application filed July 21, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY G. MORRIS, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Hydraulic Hoisting-Engines, of which improvements the following is a specification.

My invention relates to that class of hydraulic hoisting-engines or "hydraulic lifts" in which the pressure of the operating-fluid is applied to move a piston longitudinally within a cylinder, said piston imparting, through suitable connections, rotary motion to a shaft carrying a hoisting-drum. As ordinarily constructed, such engines have been provided with a piston-rod and cross-head connected by chains with the shaft of the hoisting-drum, the cross-head having a traverse exterior to the cylinder equal to the stroke of the piston.

It is the object of my invention to simplify the construction and reduce the cost and dimensions of apparatus of this description, to which ends my improvements consist in the combination, with a cylinder and a piston movable therein, of a winding-drum mounted upon a shaft fitting in bearings in a drum-chamber communicating with said cylinder, a flexible connection by which the winding-drum and piston are attached directly one to the other, and a device for enabling the transmission of motive power from the piston to the drum-shaft, and vice versa, to be effected directly in the axial line of the cylinder continuously during operation.

The improvements claimed are hereinafter more fully set forth.

In the accompanying drawings, Figure 1 is a plan or top view of a hydraulic hoisting-engine embodying my improvements, with the drum-chamber in section at the line  $xx$  of Fig. 2; Fig. 2, a vertical longitudinal central section, and Fig. 3 a vertical transverse section through the drum-chamber at the line  $yy$  of Fig. 1.

To carry out my invention I provide a cylinder, A, which is open at both ends, bored out truly throughout its length, and supported upon legs or standards  $a$ . A transverse bar or stop,  $a^2$ , which limits the traverse of the piston in that direction, is secured upon one end of the cylinder A, and the other end is

closed by a drum-chamber, B, to which it is firmly bolted and with which it makes a water-tight joint. A nozzle,  $a^3$ , is formed upon the cylinder adjacent to the drum-chamber, for the attachment of a suitable valve by which the operating-fluid is admitted to and discharged from the cylinder. A piston, A', provided with suitable packing to make a water-tight joint with the cylinder, is fitted so as to move freely therein, said piston having a central lug, eye, or clevis,  $a'$ , secured to inner side. A winding-drum, B', is mounted upon a shaft,  $b$ , fitted in bearings in the drum-chamber B at right angles to the axial line of the cylinder, and at a vertical distance from said line equal, as nearly as may be, to the radius of the drum B', plus one-half the width of a flexible connection consisting of a chain, C, or wire rope, by which the drum is attached directly to the piston A'. A hoisting-drum, B<sup>2</sup>, the diameter of which relatively to that of the winding-drum B' is made conformable to the desired amount of traverse of the elevator-cage, is secured upon the shaft  $b$  exterior and adjacent to the drum-chamber B, and receives the rope or chain by which the elevator-cage is operated.

To insure the normal working of the apparatus, it is essential that the winding-drum and piston should be so connected as that side strain shall be avoided in the transmission of power from one to the other, or, in other words, that said transmission shall be effected in a right line coincident with the axis of the cylinder. To this end the drum B' is fitted upon keys or feathers  $b^3$  on the shaft  $b$ , so as to be susceptible of longitudinal movement thereon while rotating therewith, and has a helical groove,  $b'$ , the lead of which is continuously in the same direction, formed upon its periphery, within which groove fits a roller,  $c$ , mounted in bearings formed upon or secured to the inside of the drum-chamber.

A pin or stud projecting into the groove  $b'$  may be used to perform the function of the roller  $c$ —to wit, to move the drum longitudinally upon its shaft; but I deem the roller preferable in the respect that it entails less frictional resistance. By the action of the roller  $c$  upon the groove  $b'$  the drum B' is moved to and fro upon the shaft  $b$  coincidently



and in correspondence with the movements of the piston A', so that at all points in the stroke of the latter in either direction the transmission of power from the piston to the drum, and vice versa, is directly effected in a right line coinciding with the axis of the cylinder.

In operation, the piston being at the extremity of its traverse nearest the drum-chamber and the chain C being wound upon the drum B', on the admission of water through the nozzle  $a^3$  the piston is forced, by the pressure thereof, toward the opposite end of the cylinder, unwinding the chain from the drum and imparting rotary motion to the latter and to the shaft  $b$  and hoisting-drum B<sup>2</sup>.

By proper manipulation of the valve communicating with the nozzle  $a^3$  the cage may be held stationary or permitted to descend by its own weight, in the latter case drawing back the piston A', and rewinding the chain upon the drum B'.

By the employment of my invention the usual piston-rod and its stuffing-box, cross-

head, and connections are dispensed with, and the space occupied is materially reduced, as the length of the apparatus exterior to the working cylinder is simply that taken up by the drum-chamber, instead of being, as in the ordinary construction, equal to the entire stroke of the piston added to the length of the clearances and connections.

I claim as my invention and desire to secure by Letters Patent—

The combination, in a hydraulic hoisting-engine, of a cylinder and a piston movable therein, a winding-drum mounted upon and rotatable with a shaft fitting in bearings in a drum-chamber communicating with said cylinder, a flexible connection uniting said drum with the piston, and a device for moving said drum longitudinally upon its shaft during the rotation thereof, substantially as set forth.

HENRY G. MORRIS.

Witnesses:

J. SNOWDEN BELL,  
GEO. A. VAILLANT.