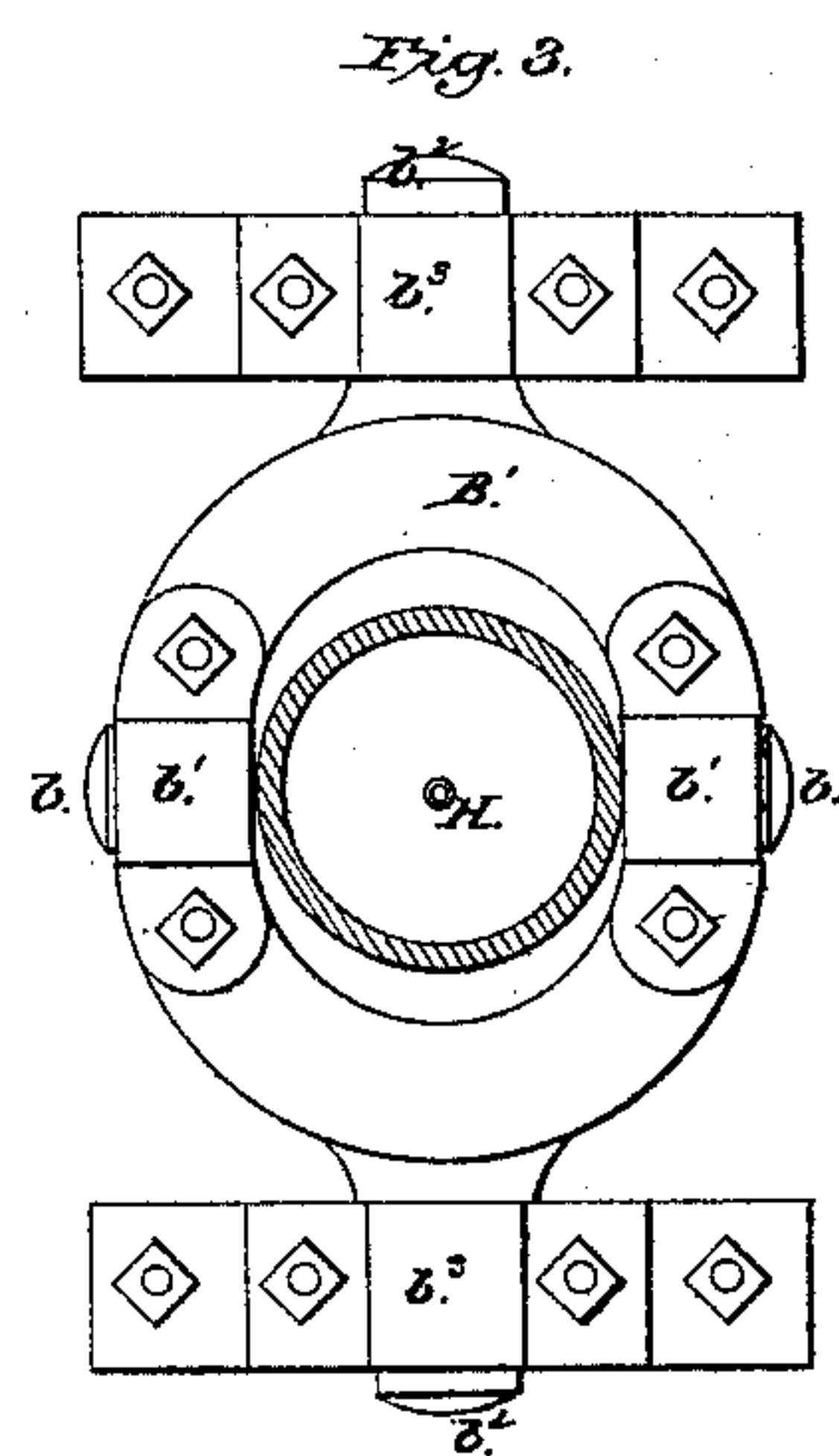
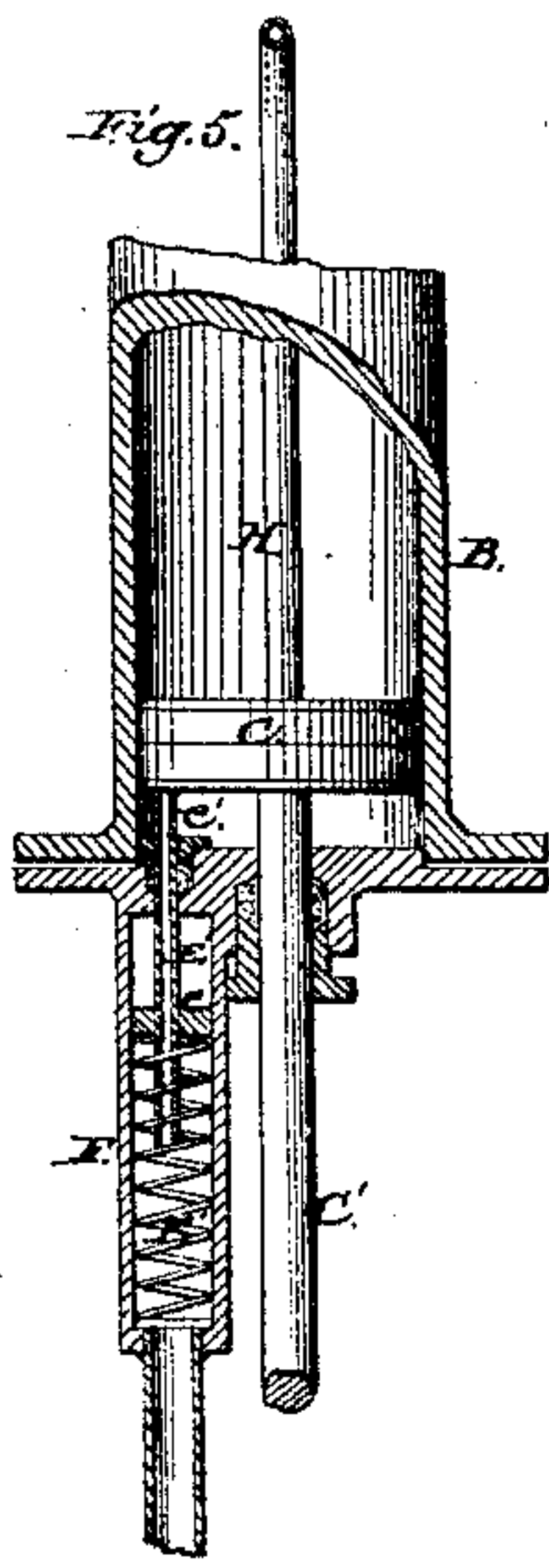
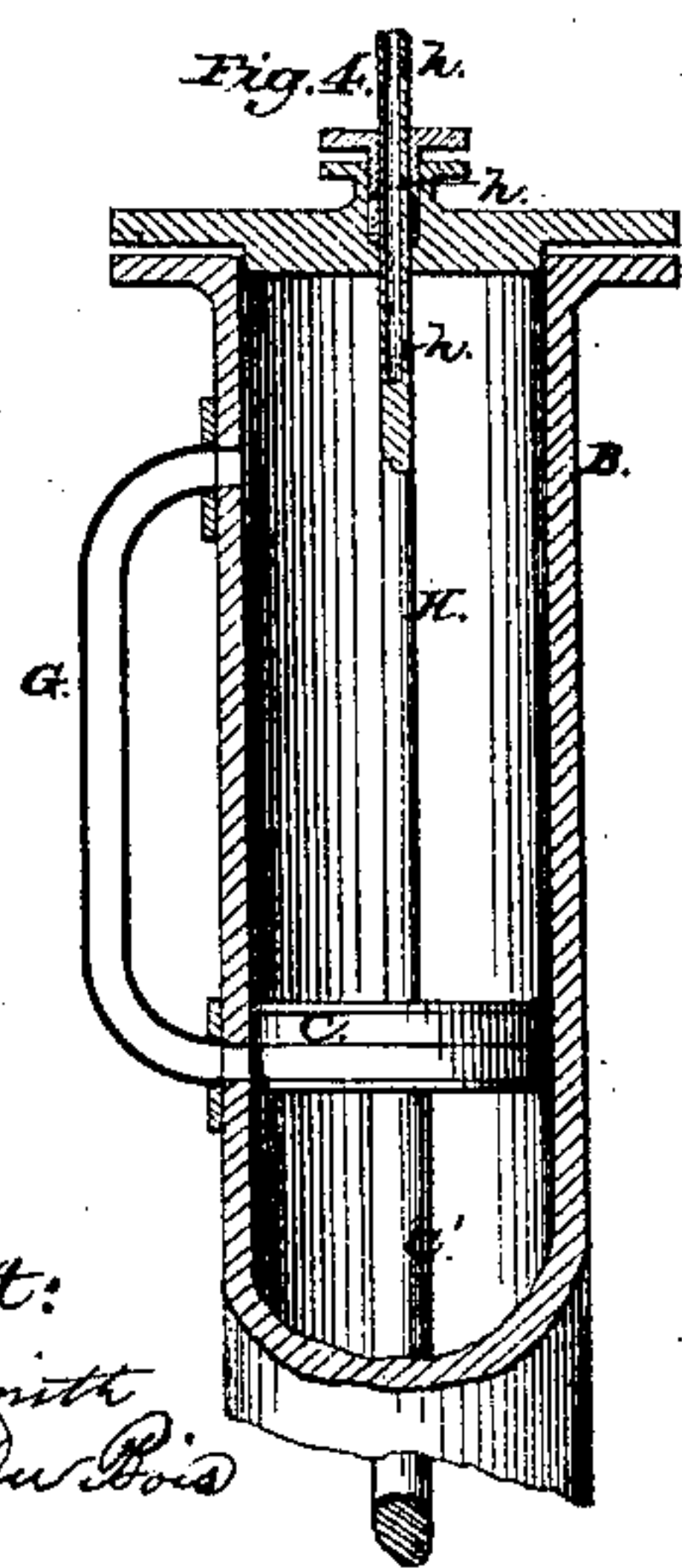
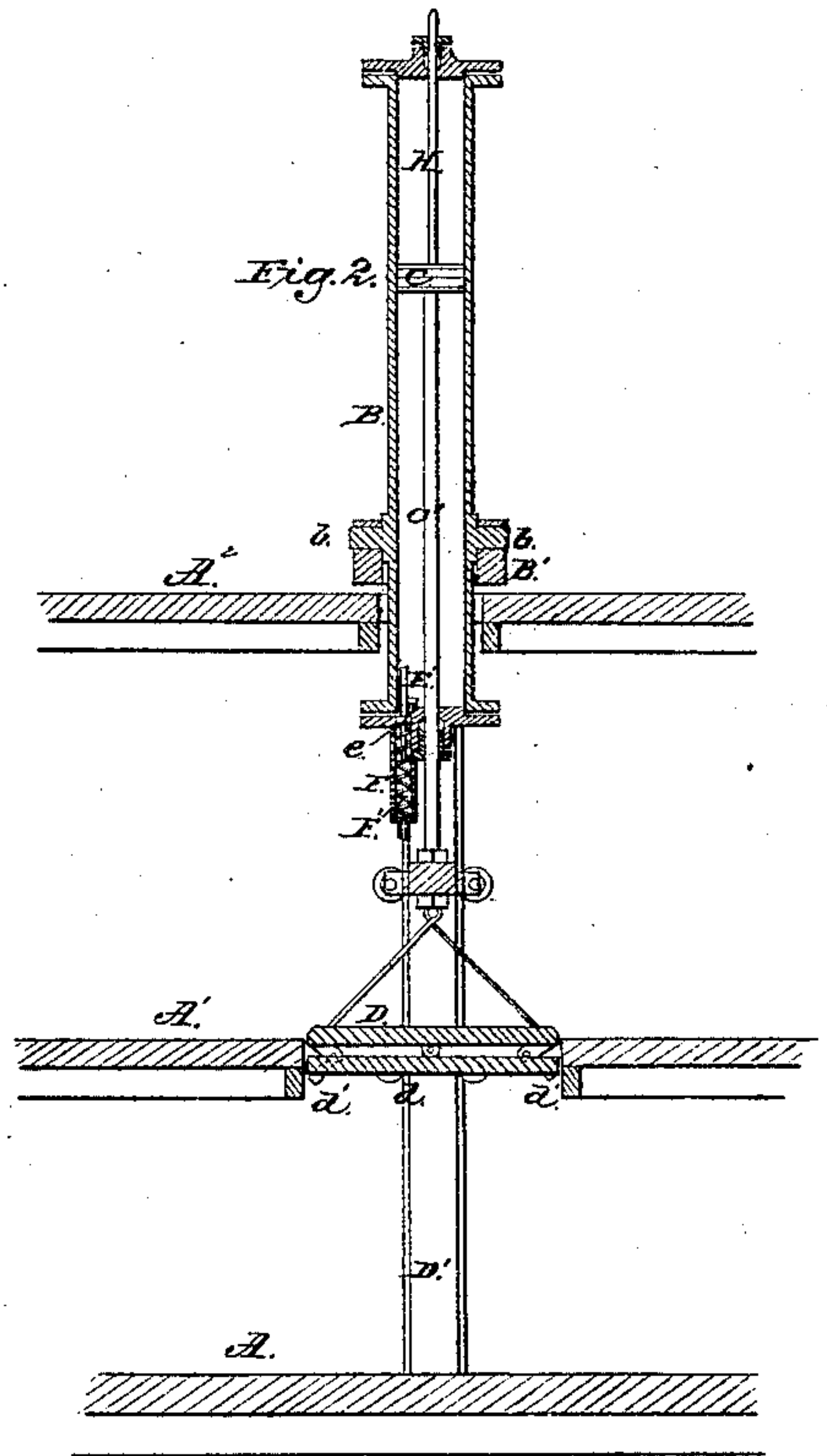
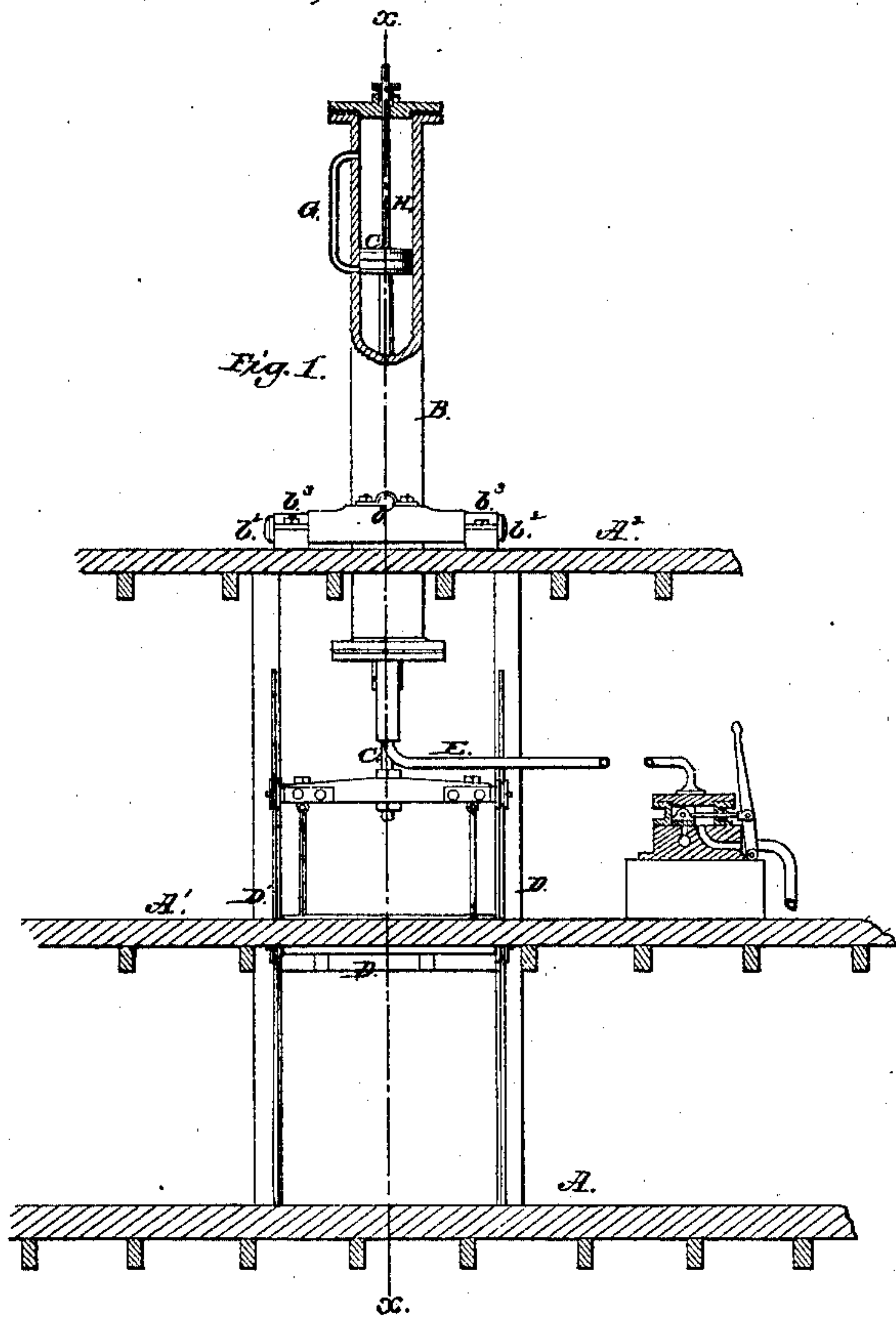


J. S. Neal,
Elevator,

No 41,446,

Patented Feb. 2, 1864.



Attest:
Charles Smith
Charles Du Bois

Inventor:
J. S. Neal
By Messrs. [Signature] Attorneys

UNITED STATES PATENT OFFICE.

JOHN S. NEAL, OF MADISON, INDIANA.

IMPROVEMENT IN STEAM-HOISTING APPARATUS.

Specification forming part of Letters Patent No. 41,446, dated February 2, 1864.

To all whom it may concern:

Be it known that I, JOHN S. NEAL, of Madison, in the county of Jefferson and State of Indiana, have invented a new and Improved Steam-Hoisting Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 may represent a vertical section of a vessel or other structure, illustrating the application of my invention. Fig. 2 is a vertical section in the line $x x$, Fig. 1. Fig. 3 is plan of my invention illustrating the manner of attaching or securing it to the deck of a vessel. Figs. 4 and 5 are sectional elevations of the cylinder and other parts of the apparatus, to be hereinafter described.

Similar letters of reference indicate corresponding parts in the several views.

This invention relates to a simple and efficient hoisting apparatus to be worked by steam, adapted to be placed within a vessel, mill, or other structure, in which weighty substances are to be elevated or lowered, and constituting a medium by which merchandise or other articles may be transmitted from one deck or floor to another with great expedition.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe its construction and a way of carrying it into effect.

In the accompanying drawings, A may represent the hold, A' the intermediate deck, and A² the upper deck, of a steam-vessel designed either for war or for mercantile purposes.

B represents a cylinder, which passes through an aperture of somewhat larger dimensions in the upper deck, A², and rests upon an elliptical bearing, B', in which latter are formed boxes $b' b'$, for the reception of arms $b b$, projecting from the cylinder B. The elliptical bearing B' is provided with arms $b^2 b^2$, which fit loosely within boxes $b^3 b^3$, secured to the deck A².

The above appliances for securing the cylinder B within the upper deck form a universal joint, and serve to adapt said cylinder to maintain a vertical position when the several decks of the vessel have their relative positions changed in consequence of the strain to

which the vessel may be subjected in a gale, or while rolling.

C represents a piston working within the cylinder B and moving a rod, C', to the lower end of which is attached a platform, D, upon which the articles to be elevated or lowered are placed, said platform moving between and being guided by uprights D D'.

E represents a pipe which conveys steam from the steam-boiler to the interior of the cylinder B through a smaller pipe, E', which works through a stuffing-box in the lower head of the main cylinder, and is pressed upward by a spiral spring, F', confined within a cylinder, F, at the upper end of the pipe E, and bearing against a collar or disk, e , upon the sliding pipe E'. The collar e constitutes also a guide for the lower end of the pipe E'. The pipe E' may be provided near its upper end with a small aperture, e' , for permitting steam to enter the cylinder B below the piston C, and elevate the latter when it is resting upon and closing the upper end of said pipe E'.

G represents a bent tube, which communicates at its respective ends with the interior of the cylinder B at different points with respect to the height thereof and adapts the steam to retain the platform D in an elevated position in the manner to be explained.

H represents a hollow rod attached at its lower end to the piston C and working through a stuffing-box in the upper end of the cylinder B. In the side of said rod, and near the upper end thereof, are a series of perforations, $h h h$, through which air may be expelled by the piston C when rising and which admit of the emission of steam when existing in excess above said piston C, as will be presently explained.

Operation: As shown in Fig. 1, it is designed to employ in connection with my invention a suitable valve and chest for opening and closing the steam and exhaust ports. Steam, being admitted into the pipe E, ascends into the tube F and pipe E', from which latter it enters the cylinder B through the aperture e' , as the upper end of said pipe E' is closed by the piston C, when the platform is in its lower position. The piston having been started by the steam which passes through the aperture e' , and raised thereby until the disk e comes in contact with the bottom of the cylinder B, the steam will enter the latter more rapidly

through the opening in the upper end of the pipe E', and carry the piston to a point a little above the lower end of the bent tube G. The steam then enters this tube and is discharged through the upper end thereof above the piston C, so as to so far equalize the pressure upon the latter that it will remain in a stationary position. The air in the cylinder B is expelled through the aperture in the upper piston head until the hollow rod fills said aperture, after which it continues to pass out through the apertures *h* in said rod, and, as the piston ascends, these egress-apertures are gradually shut off by passing through the upper head of the cylinder B, until one only remains within the same, and this may serve to allow the steam to leak slowly from the cylinder in order to prevent the too great accumulation of steam above the piston C.

The parts are to be so arranged that when the piston C has reached a point a little beyond the lower end of the tube or pipe G the platform D will be on a level with the upper deck, A. The platform may be lowered—either with or without freight—by opening the exhaust-port of the steam-chest. The piston then begins to descend gradually, the steam passing through the pipe E', and thence into the pipe E, and when the piston arrives at the upper end of the said pipe E the spiral spring F yields to the requisite extent, and thus the pipe E', together with the steam which may remain in the lower end of the cylinder, forms a cushion, by which the descent of the piston and platform is gradually arrested without violence.

The opening in the deck A' may be closed while the apparatus is not in operation by the platform D, which may be retained therein in any suitable manner.

While the above-described apparatus is chiefly designed to be employed in vessels, it is apparent that it may be used with great advantage in mills, mercantile houses, &c.

The platform D may be mounted upon trun-

nions *d*, as illustrated in Fig. 2, and provided on either side with a trigger, *d'*, which, by striking a suitable cam when the platform reaches its highest position, will permit the platform to tip automatically for the purpose of discharging rolling freight.

By adapting the platform to tip automatically in the manner explained the labor of one hand is dispensed with in handling barrels or other rolling freight.

When freight of a different character is being raised or lowered, the cam for tripping the platform may be withdrawn, so that the latter will be rigidly held; or, if preferred, the pivoted part of the platform may be removed or dispensed with.

The entire apparatus is of simple and cheap construction, very effective in action, not liable to derangement, and may be operated with very little labor.

My improvement may be employed with two steam-cylinders and two platforms working at the two adjacent hatches of a vessel.

Having thus described my invention, the following is what I claim as new and desire to secure by Letters Patent:

1. A steam-hoisting apparatus arrested automatically at either termination of its stroke substantially in the manner explained.
2. The combination, with the cylinder B and piston C, of the sliding pipe E' and spring F', operating substantially as and for the purposes explained.
3. The conducting-pipe G, operating in connection with the piston C and cylinder B, substantially as and for the purposes set forth.
4. The hollow rod H, operating in the manner explained to regulate and control the escape of air or steam from the upper end of the cylinder B.

J. S. NEAL.

Witnesses:

OCTAVIUS KNIGHT,
CHARLES D. SMITH.