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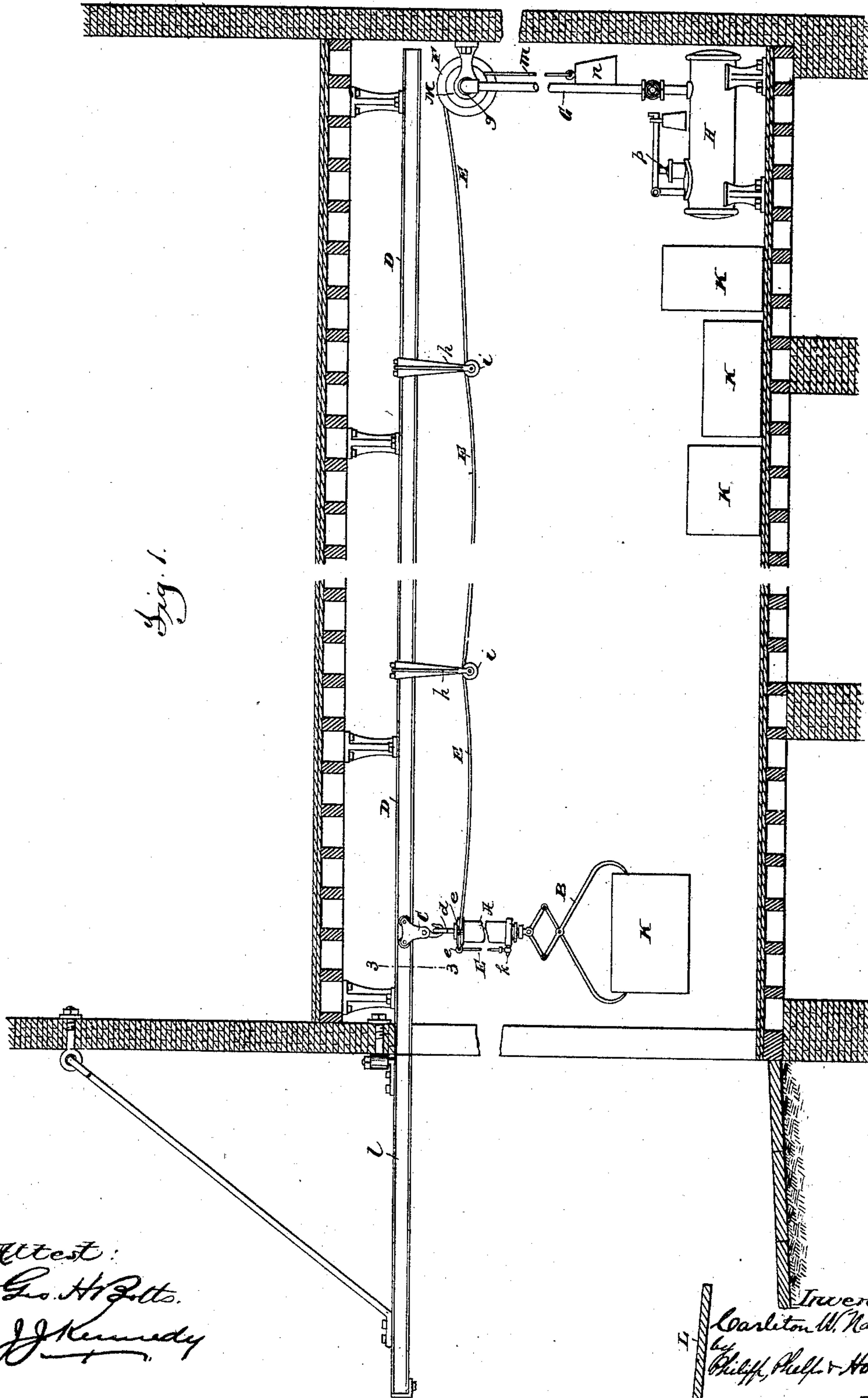
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C. W. NASON.

## HOISTING AND CONVEYING APPARATUS.

No. 448,823.

Patented Mar. 24, 1891.



Attest:  
Geo. H. Potts.  
J. Kennedy

*Inventor*  
*Carlton W. Mason*  
*by*  
*Philip, Phelps & Hooy*  
*Attys.*

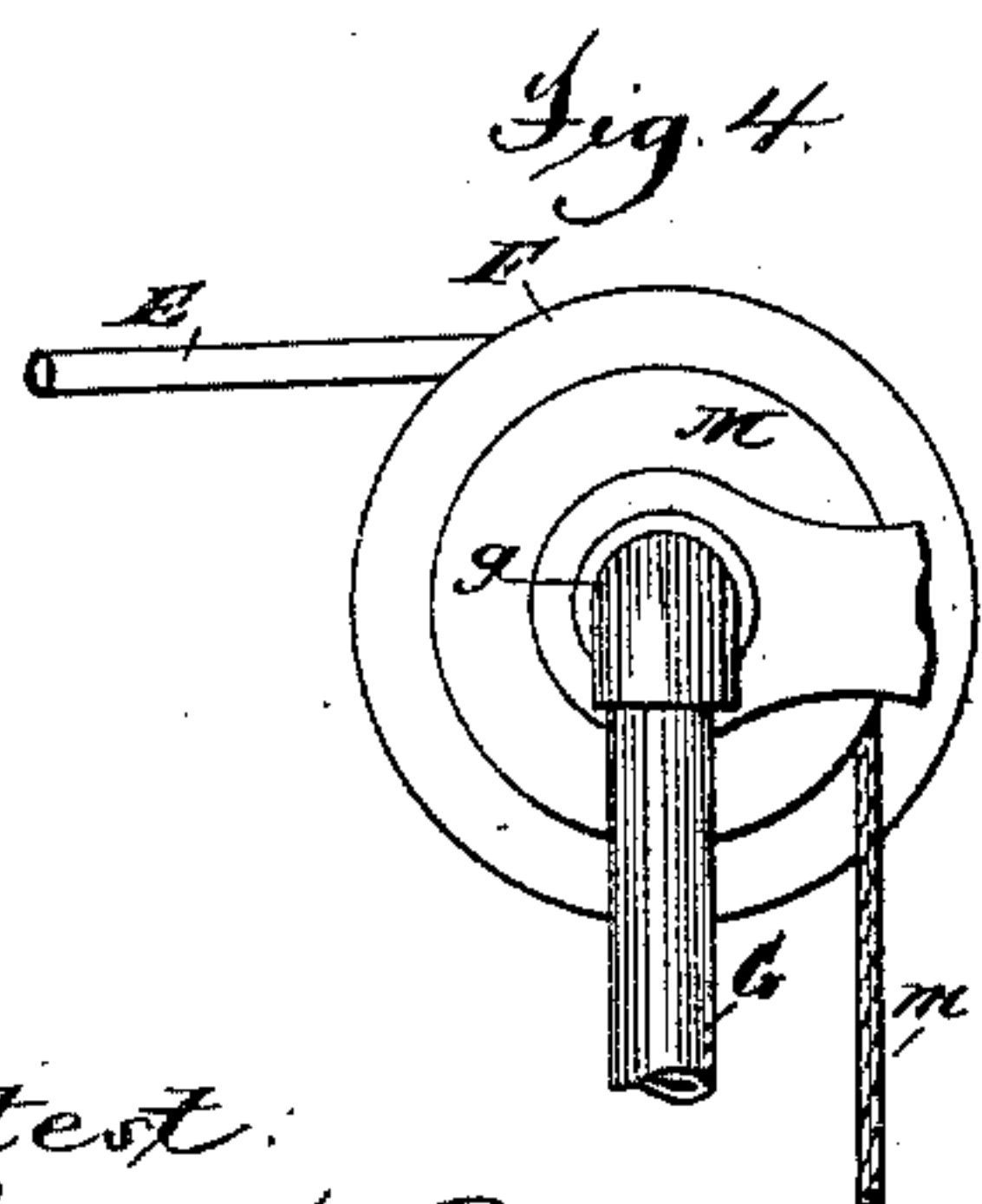
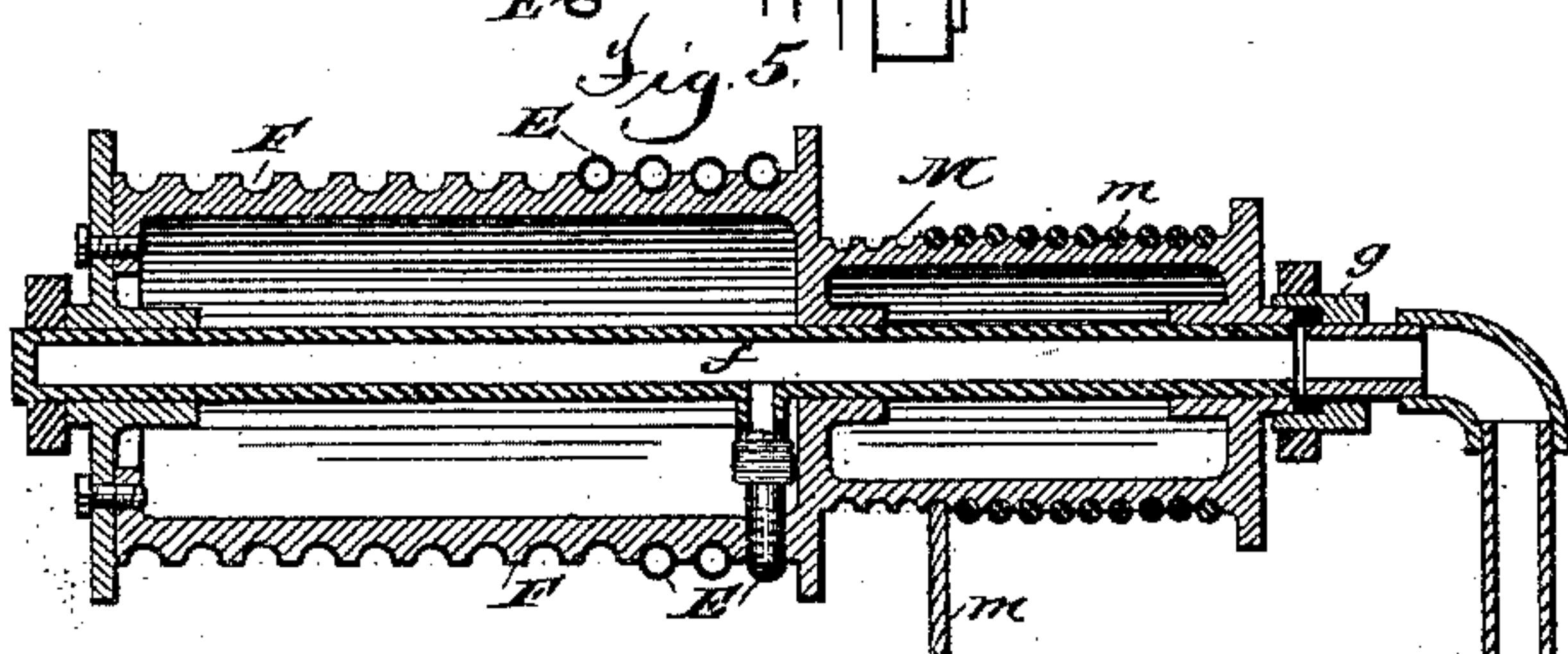
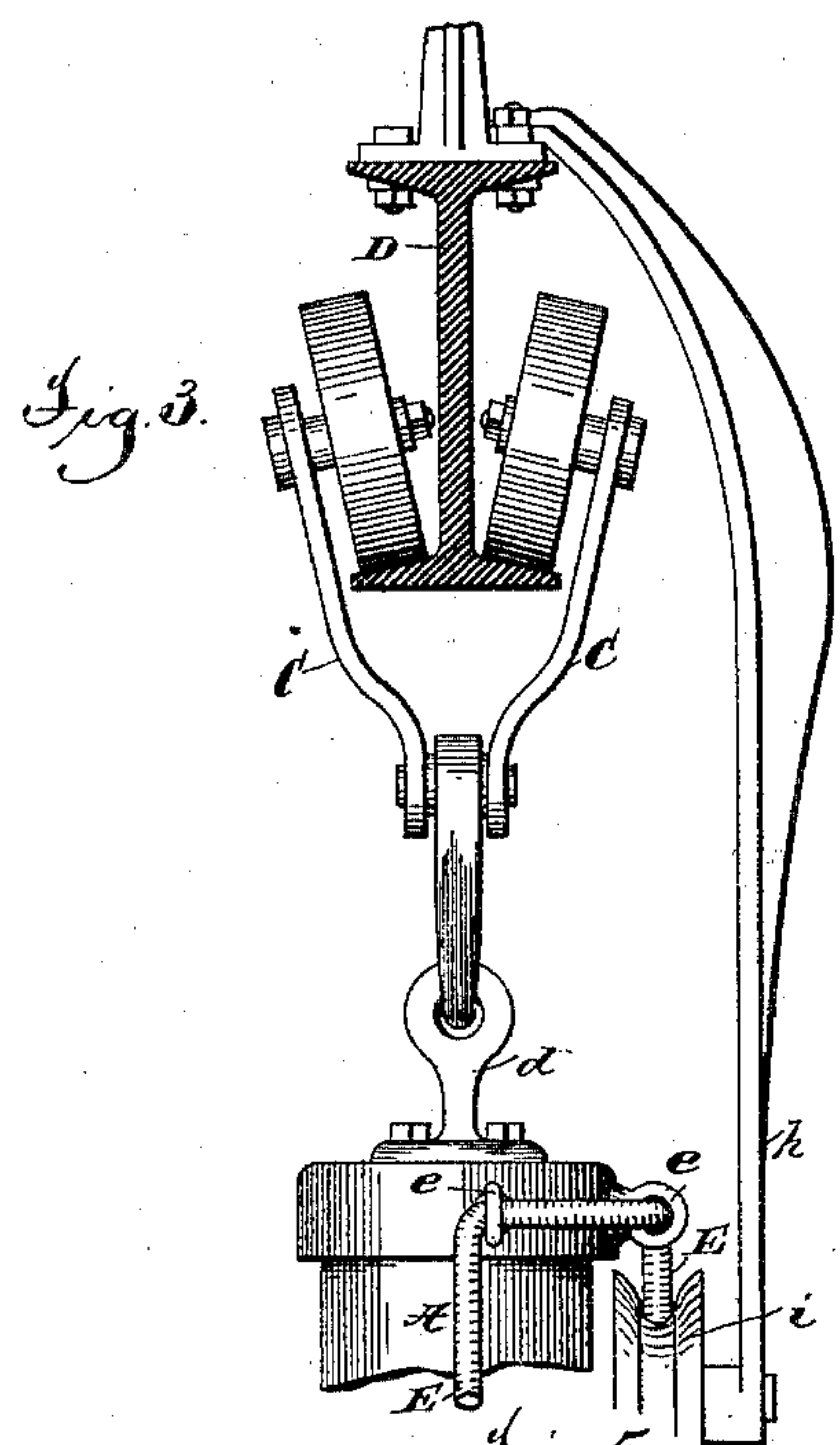
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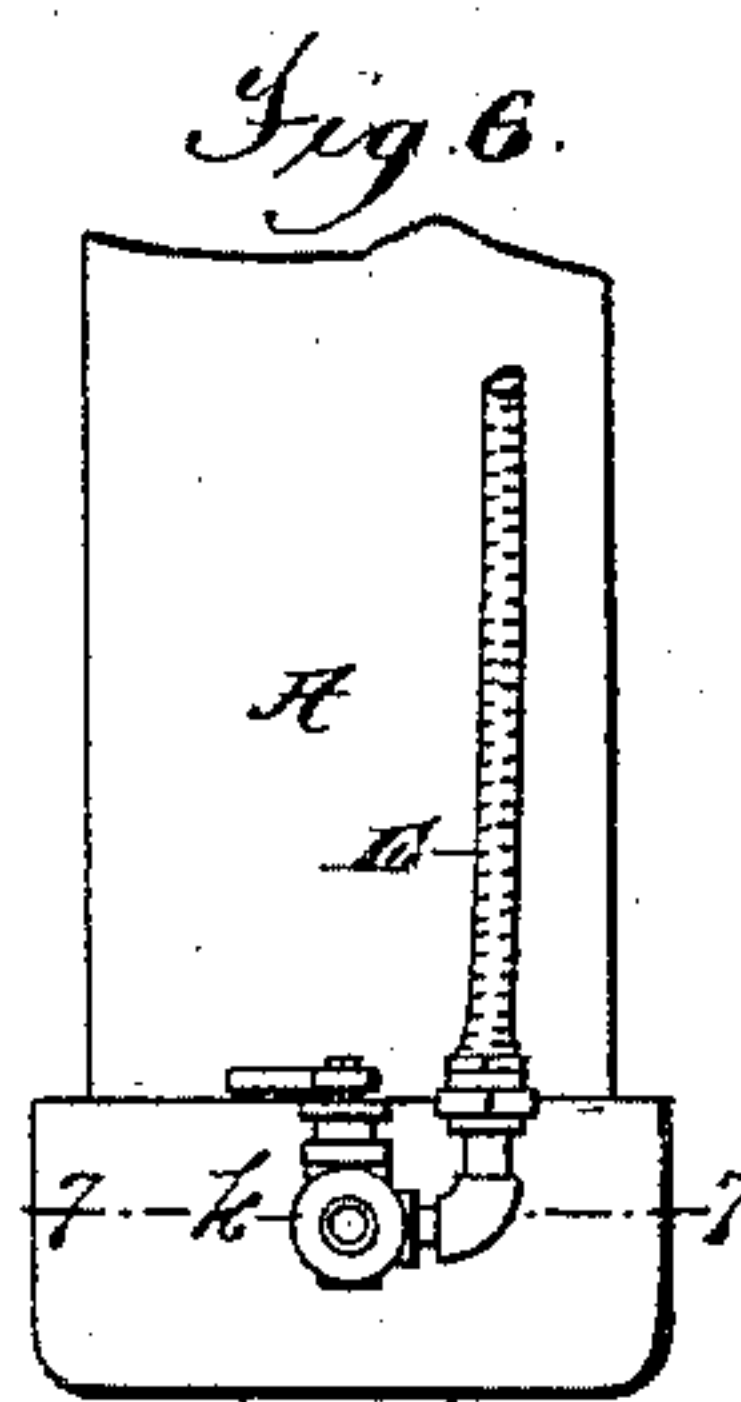
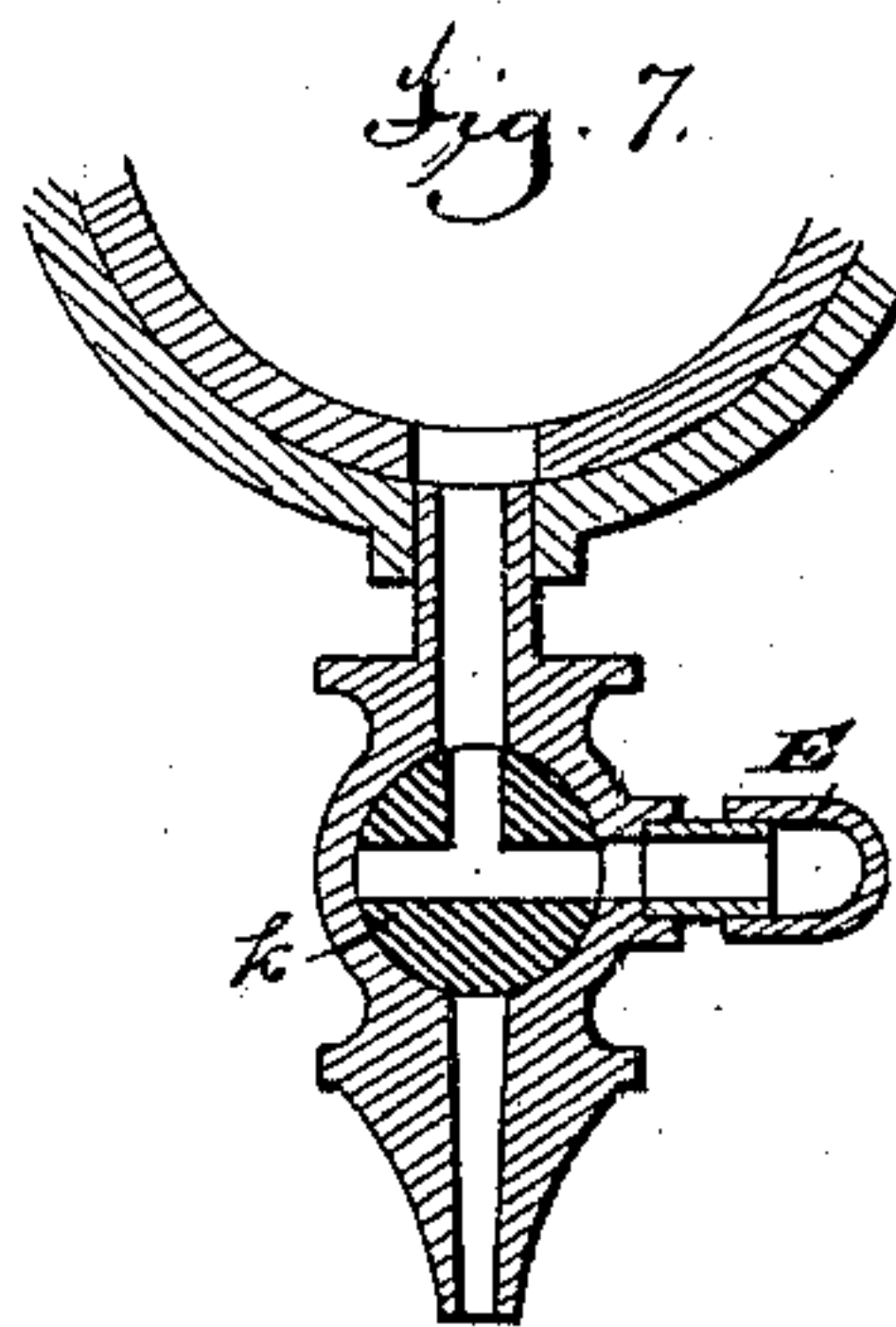
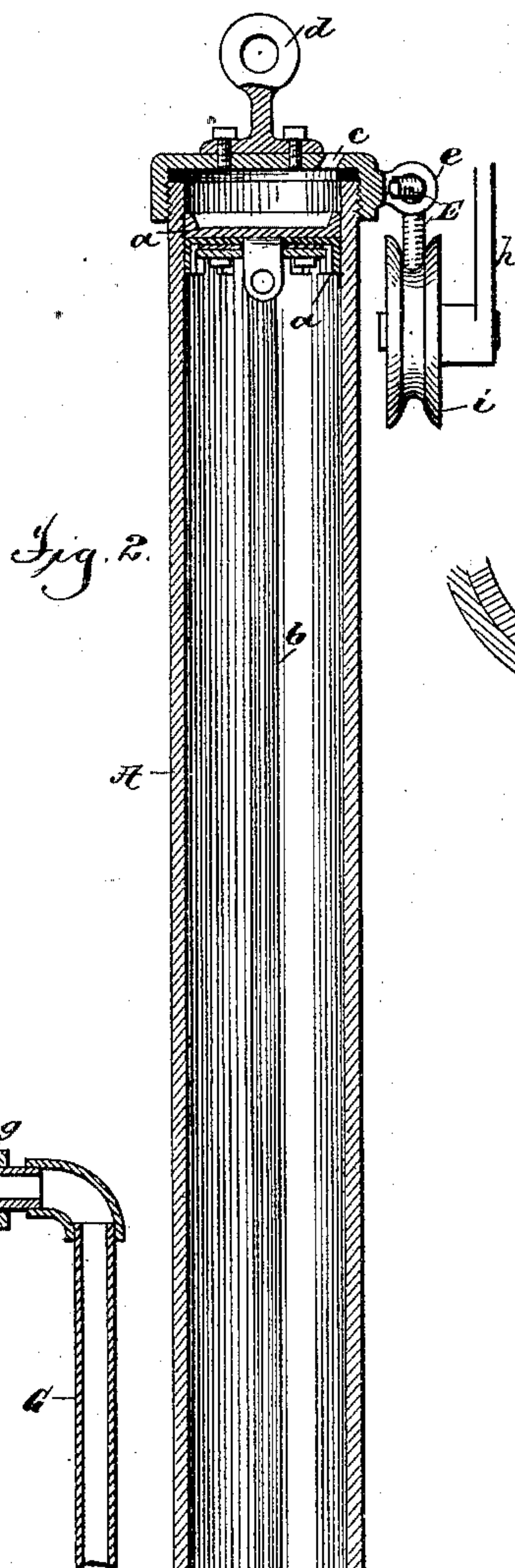
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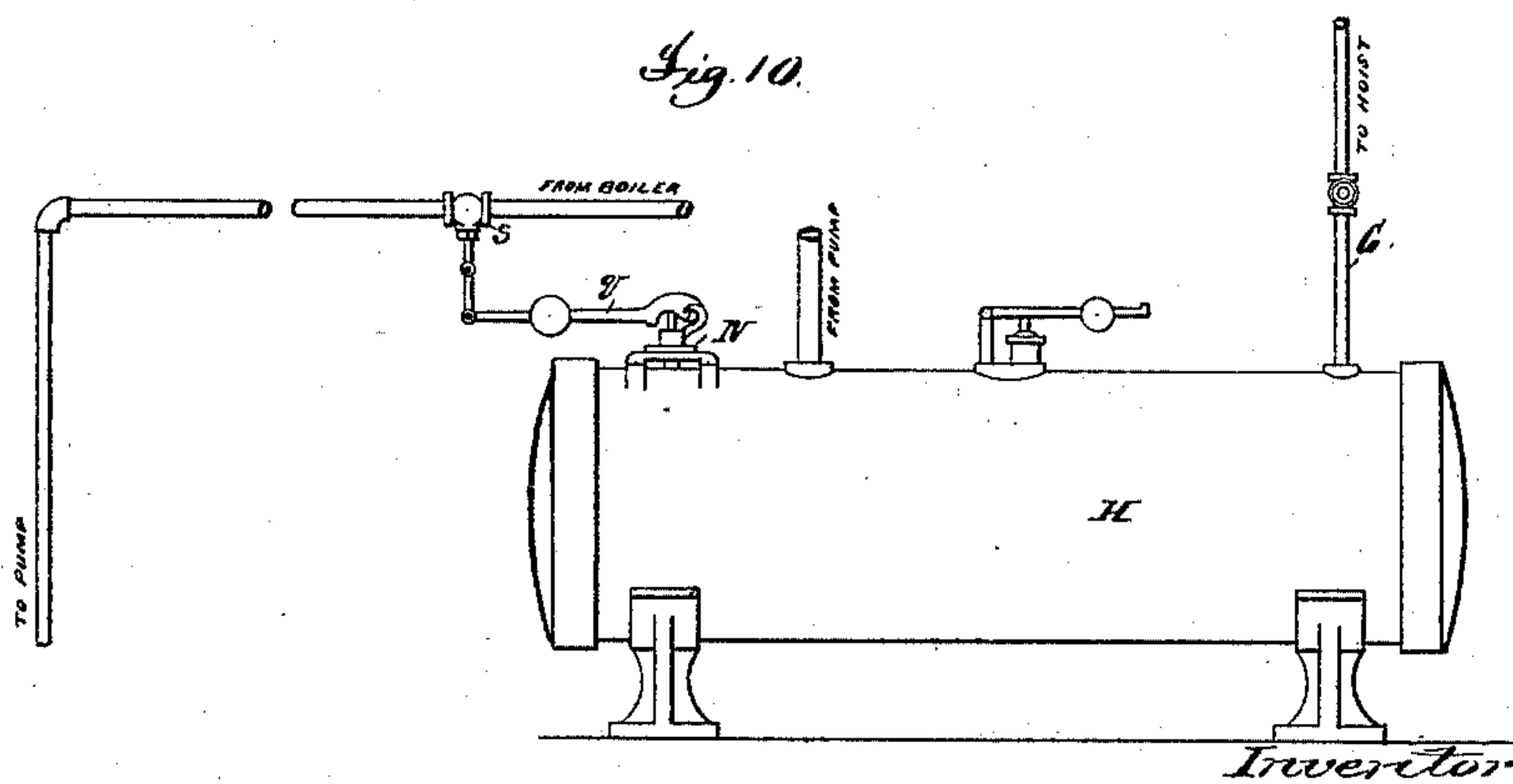
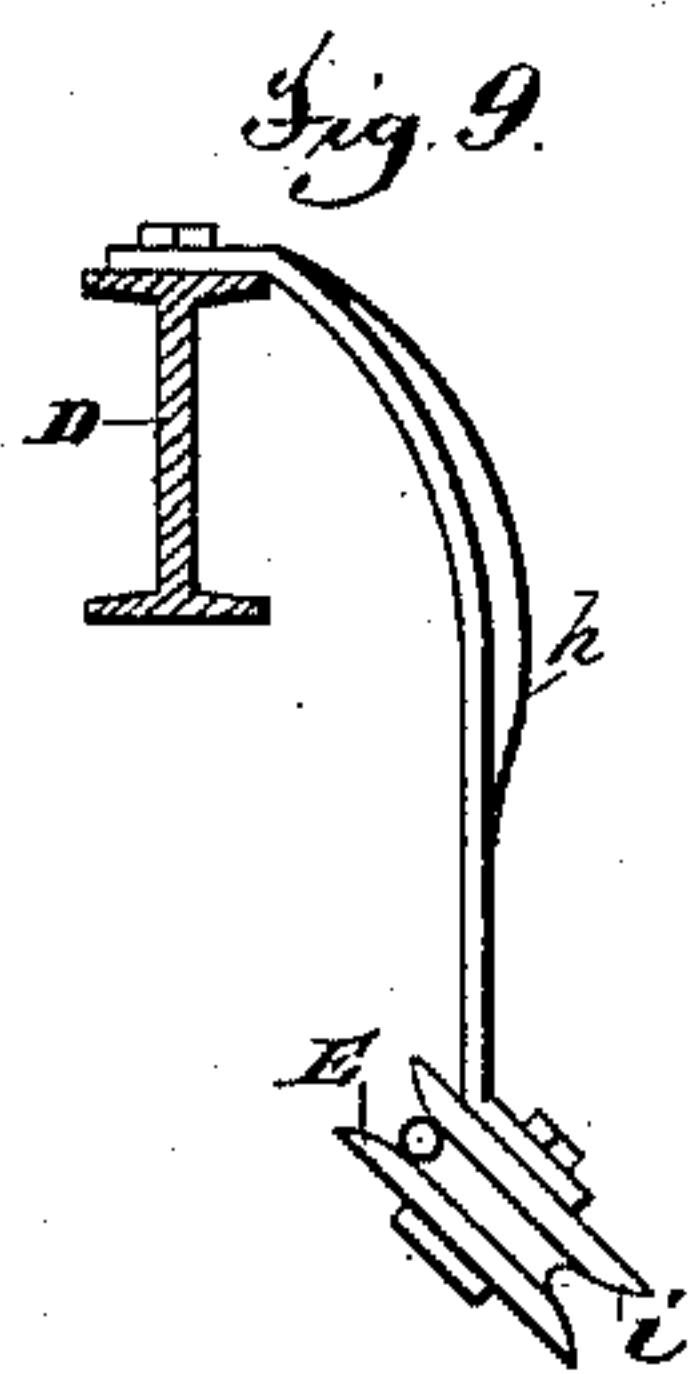
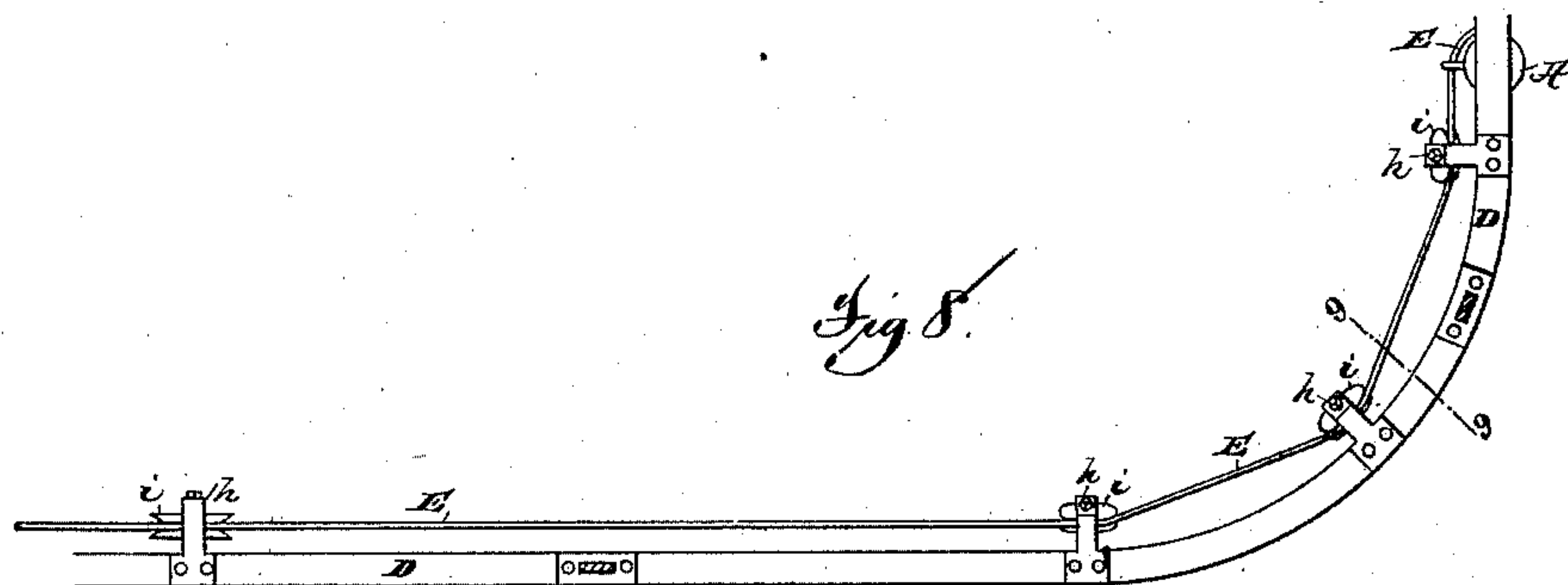
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# UNITED STATES PATENT OFFICE.

CARLETON W. NASON, OF NEW YORK, N. Y.

## HOISTING AND CONVEYING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 448,823, dated March 24, 1891.

Application filed June 28, 1887. Serial No. 242,726. (No model.)

*To all whom it may concern:*

Be it known that I, CARLETON W. NASON, a citizen of the United States, residing at New York, county of New York, and State of New York, have invented certain new and useful Improvements in Hoisting and Conveying Apparatus, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to a hoisting and conveying apparatus which is especially designed and adapted for use in warehouses, depots, and other places where it is necessary to handle and transfer heavy packages or articles of merchandise and the like.

It is the object of the invention to provide a simple and inexpensive apparatus for this purpose which can be easily applied and used in almost any situation, which will be safe and reliable in its operation, which can be easily and quickly controlled and manipulated, and which can be used with equal facility upon light or heavy packages or articles.

As a full understanding of the invention and the manner of using the same can be best given by describing the apparatus in full in connection with an illustration of the manner in which it will be used, all preliminary description will be omitted and a full description given, reference being had to the accompanying drawings, in which—

Figure 1 is a vertical sectional view of a portion of a depot or warehouse, showing the same provided with a hoisting and conveying apparatus embodying the present invention. Fig. 2 is an enlarged longitudinal section of the hoisting apparatus proper. Fig. 3 is an enlarged section taken on the line 3 3 of Fig. 1, looking to the right. Fig. 4 is an enlarged end view of the drum upon which the flexible air-tube is wound, as will be hereinafter explained. Fig. 5 is a longitudinal section of the drum and its connections. Fig. 6 is a side view of the lower portion of the hoisting apparatus proper. Fig. 7 is a horizontal section of the same, taken on the line 7 7 of Figs. 2 and 6. Figs. 8 and 9 illustrate the manner in which the apparatus can be arranged to run upon a curved track, Fig. 9 being a section taken upon the line 9 9 of Fig. 8, and Fig. 10

is a view showing connections for automatically regulating the power of the apparatus.

Referring to said figures, it is to be understood that the hoisting apparatus proper consists of a cylinder A, having a freely-moving piston *a*, the rod *b* of which passes through a stuffing-box in the lower end of the cylinder, and is provided with any suitable form of grapple B for taking the package or article which is to be operated upon. As herein shown, the grapple is of the ordinary ice-tongs pattern; but it may be of any other suitable form, or it may be a simple rope-sling. The upper end of the cylinder A may be open, but will preferably be closed, except a minute opening *c* to allow the air to pass freely in and out to prevent a vacuum as the piston is moved at its ordinary working velocity. If, however, the load is at any time taken suddenly off the piston, as by the falling of a package from the grapple, the air in the upper end of the cylinder will by reason of the small size of the opening *c* be prevented from escaping quickly, and will thus afford a cushion for the piston to prevent it from being thrown violently against the upper end of the cylinder by the expansion of the air beneath it. The piston *a* can be of any suitable form, but will preferably be of the cup-shaped pattern shown, so that the pressure of the liquid or fluid beneath it will have the effect of maintaining a tight joint between the piston and its cylinder. The cylinder A is provided at its upper end with a hook or eye *d*, by which it can be suspended, so as to swing freely from a carriage C, which is arranged to run upon an overhead track D, extending between the points from one to the other of which it is desired to transfer packages or articles. The carriage C and its track D may be of any desired pattern, the form shown being given merely for the purpose of illustration. Connected to the lower end of the cylinder A is a small flexible tube E, which for convenience is passed through eyes or guides *e* at the upper end of the cylinder, and is wound around a drum F, located at some convenient point, the end of the tube which is wound upon the drum being connected to the hollow shaft *f* of the drum, as shown in Fig. 5. The shaft *f* of the drum is connected by



means of a suitable packing or stuffing-box *g* with a pipe *G*, which in turn communicates with a tank *H*, in which a volume of air is maintained under suitable pressure by any ordinary air-compressing apparatus. The pipe *E*, where it enters the cylinder *A*, is provided with a suitable valve or cock *k*, by which the air from the tank *H* can be shut off from or allowed to enter the cylinder beneath the piston. The cock *k* will preferably be a three-way cock, as shown in Fig. 7, so that in addition to controlling the entrance of the air to the cylinder it can be operated to allow the air already in the cylinder to escape. The purpose of this will be made clear when the operation of the apparatus is described. Instead of employing a single three-way cock, separate cocks may be used to control the admission and escape of the air.

The manner of using the apparatus thus constructed is as follows: In describing this operation it will be assumed that the apparatus is to be used, as illustrated in the present case, for transferring packages of freight from a warehouse or depot to a truck, or vice versa. In such case the track *D* may be provided with an extension *l*, and this extension may, if desired, be hinged so as to be swung to one side against the building when not in use. The tank *H*, being filled with air at a proper pressure of, say, one hundred pounds to the square inch, and the cock *k* being turned so as to prevent the air from entering the cylinder *A*, the cylinder and its carriage *C* will be run along the track *D* until the former is over the package *K*, which it is desired to load. The grapple *B* will then be placed over the package in the usual manner. The cylinder *A*, being suspended from the carriage by a loose connection, can readily be swung to one side or the other, so as to allow the grapple to be made fast to a package that is not directly beneath the apparatus. The cock *k* will then be turned so as to allow the air from the tank *H* to enter the cylinder *A* beneath the piston *a*. The pressure of the air thus exerted on the piston will cause it to ascend in the cylinder so as to grapple and hoist the package with it. It will thus be seen that by the use of a very small cylinder—say four inches in diameter—with air at a pressure of, say, one hundred pounds, which pressure is not difficult to maintain, a package of ten or twelve hundred pounds weight can readily be hoisted. The package having been hoisted in this manner to the proper height, which can be controlled by manipulating the cock *k* so as to stop the piston at any point, the carriage *C* can easily be run along the track *D* until the package has been carried outward over the platform *L* of a truck or to any other desired point. By then turning the cock *k* so as to allow the air to escape slowly from the cylinder the package will be lowered gently onto the truck. As the hoisting apparatus is moved along the track the tube *E* will be unwound from the

drum *F*, and if the apparatus is moved so as to unwind a considerable length of the tube it will be preferable to provide hangers *h* at suitable intervals along the track, having grooved pulleys *i*, which will support the tube and prevent it from sagging and being in the way. In order to rewind the tube upon the drum when the apparatus is again moved inward to take a second package, the drum will preferably be provided with a retractile by which the tube will be automatically rewound upon the drum when the apparatus is moved inward. In its preferred form this retractile consists of an extension *M*, around which will be wound a cord *m*, provided with a weight *n*, as shown. By this means as the tube is unwound from the drum *F* the cord *m* will be wound upon the drum *M*, and as the hoisting apparatus is moved inward the weight *n* will operate to unwind the cord *m* and turn the drum *F* in the reverse direction so as to rewind the tube *E* upon it.

It is to be remarked that the drum *M* may, if desired or found necessary, be of conical form, so that the weight *m* will exert an increasing power as the length of the tube unwound from the drum increases, and vice versa. It is to be remarked, however, that if preferred a spring may be substituted for the cord and weight *m n* without departing from the invention.

The apparatus which has been thus described is, as will readily be seen, adapted for use in almost any large store, warehouse, or depot, and affords facilities for handling packages in a safe and rapid manner. Almost all large stores, warehouses, and depots are provided with power so that the operating of a small air-compressor sufficient to maintain a volume of air under pressure in the tank *H* will not be a difficult or expensive matter. The track *D* can readily be arranged so as to extend to all portions of the floor of the building, and thus packages can be taken from parts of the floor and hoisted and carried over intervening packages where it would be extremely difficult, if not impossible, to get at them with an ordinary hand-truck.

The track *D* can, if necessary, be curved, as shown in Fig. 8. In such case the pulleys *i* at the curve can be set at an incline, as shown in Fig. 9, so as to take and support the tube *E* and prevent it from being drawn out of their grooves.

The apparatus can be used equally well to handle light or heavy packages, as in the case of a light package it will only be necessary to so operate the cock *k* as to admit a smaller amount of air to the cylinder *A*, the air thus admitted expanding in the cylinder in inverse ratio to the weight of the packages.

The tank *H* will be provided with a safety or relief valve *p*, as indicated in Fig. 1, which will prevent the pressure in the tank from rising above what is desired. The tank may, if desired, also be provided with an automatic



pressure-regulator N, the lever *q* of which is connected to the valve *s* or other means—such as a belt-shifter—which controls the movements of the air-compressor, as shown in Fig. 10. By this means whenever the pressure in the tank falls below the required point the pressure-regulator N will operate the valve or other device *s* to start the compressor, and as soon as the proper pressure is restored the regulator will operate the valve or other device *s* in the reverse direction to stop the compressor. The pressure-regulator which is shown in the present case is of an ordinary form, which has been selected merely for the purpose of illustration. Any other form of automatic pressure-regulator may be used equally well, if preferred.

Air has been referred to herein as the fluid which is used for operating the piston of the cylinder A, because such a fluid possesses many advantages and is greatly to be preferred to a liquid; but a liquid may be used with good results, and is to be considered as included within the scope of the invention.

What I claim is—

1. In a hoisting and conveying apparatus, the combination, with an overhead track and a carriage adapted to run thereon, of the cylinder and piston suspended from the carriage and provided with means for attachment to a package or article, the flexible tube E for supplying fluid to the cylinder, and the drum F for receiving the tube, substantially as described.

2. In a hoisting and conveying apparatus, the combination, with the track, the carriage,

and the cylinder and piston suspended from the carriage, of the flexible tube, the drum for receiving the same, and a retractile for rewinding the tube, substantially as described.

3. In a hoisting and conveying apparatus, the combination, with the track and the carriage adapted to run thereon, of the cylinder and piston suspended from the carriage, the flexible tube connected to the cylinder to admit a fluid thereto, and pulleys arranged adjacent to the track to receive and support said tube, substantially as described.

4. In a hoisting and conveying apparatus, the combination, with a curved track and a carriage adapted to run thereon, of a cylinder and piston suspended from said carriage, the flexible tube connected to the cylinder to admit a fluid thereto, and inclined pulleys arranged adjacent to said track to receive and support the tube, substantially as described.

5. A traveling hoisting-cylinder and a source of fluid-supply, in combination with a flexible pipe and a reel for supporting said pipe, substantially as described.

6. A traveling hoisting-cylinder and a source of fluid-supply, in combination with a flexible pipe and an automatically-winding reel, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

CARLETON W. NASON.

Witnesses:

J. J. KENNEDY,  
GEORGE H. BOTTS.