(No Model.) 2 Sheets—Sheet 1.

J. P. MANTON.

POWER CAPSTAN.

No. 300,382. Patented June 17, 1884.

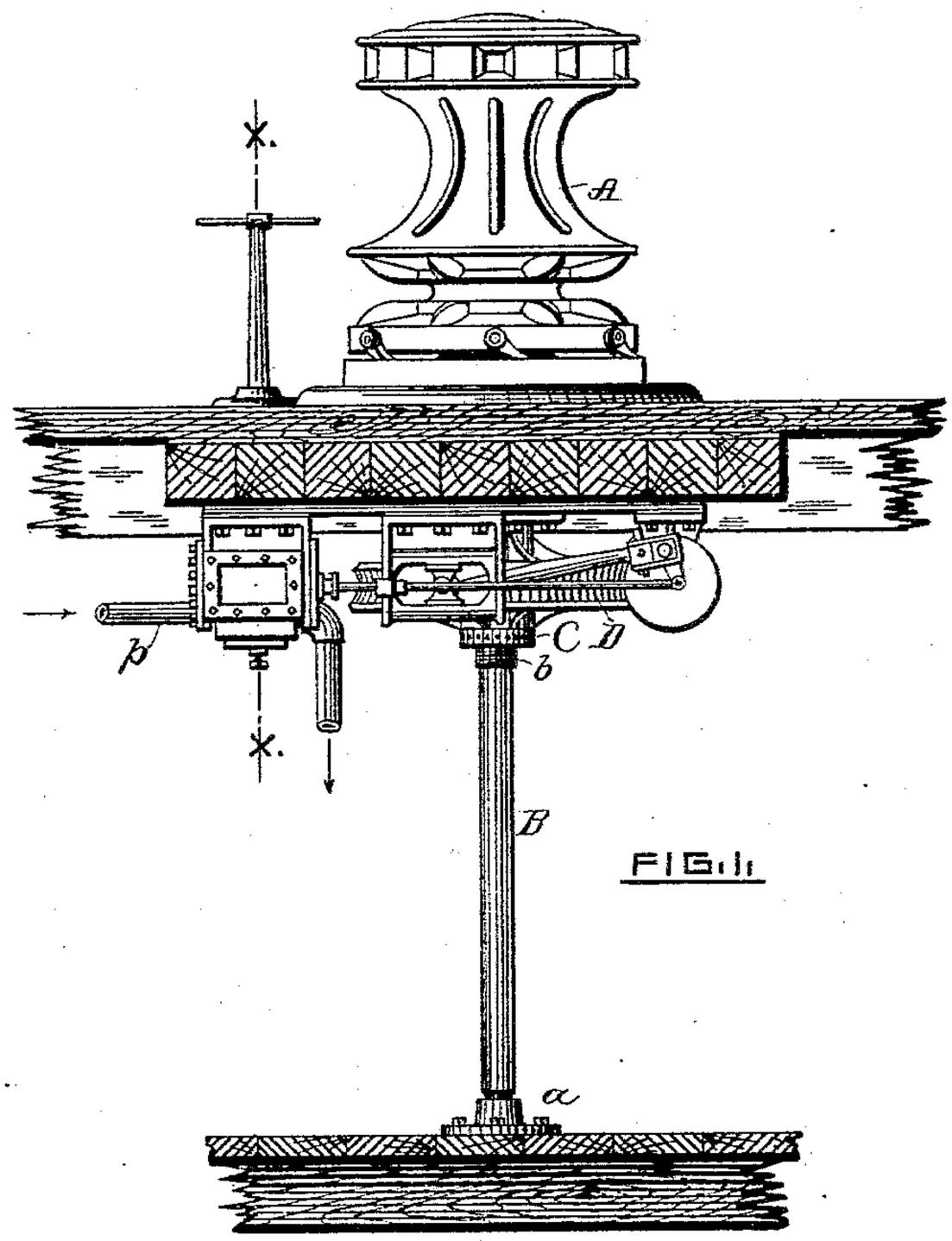

FIG. 1.

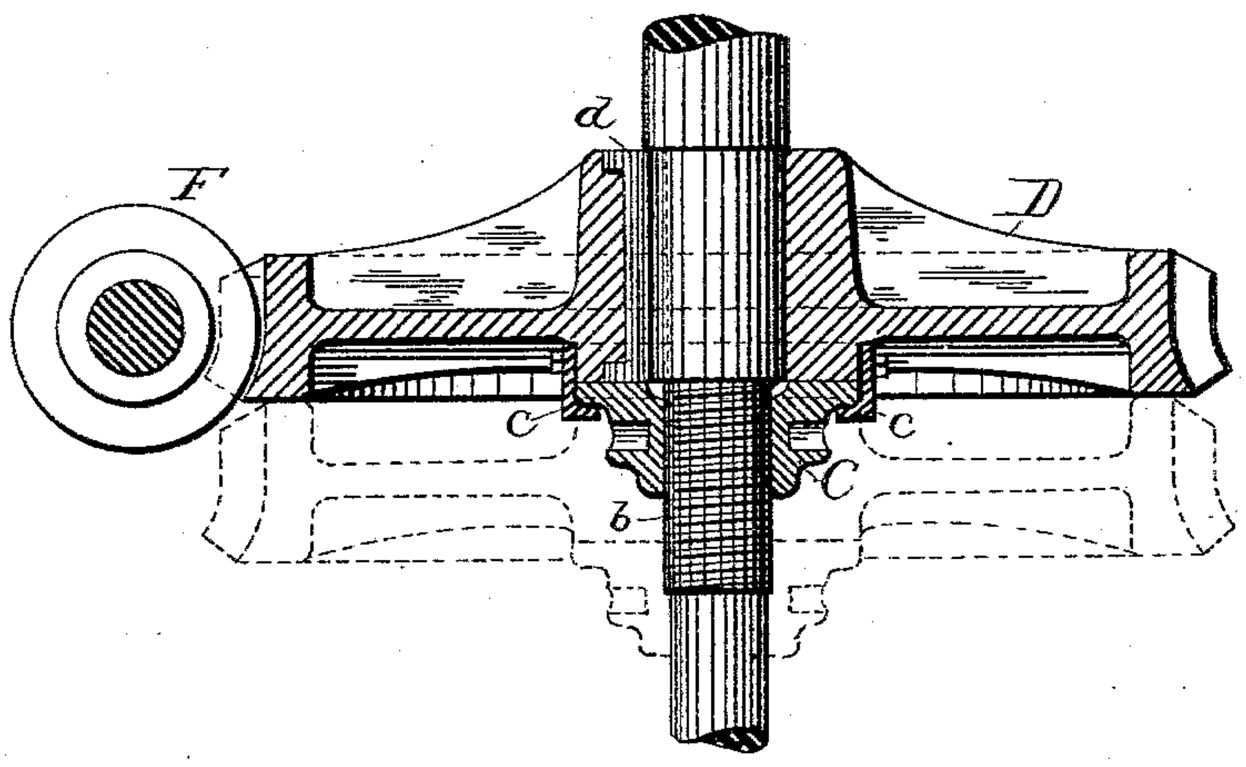

FIG. 2.

WITNESSES.

Wm. M. Stockbridge

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Joseph P. Manton

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(No Model.) 2 Sheets—Sheet 2.

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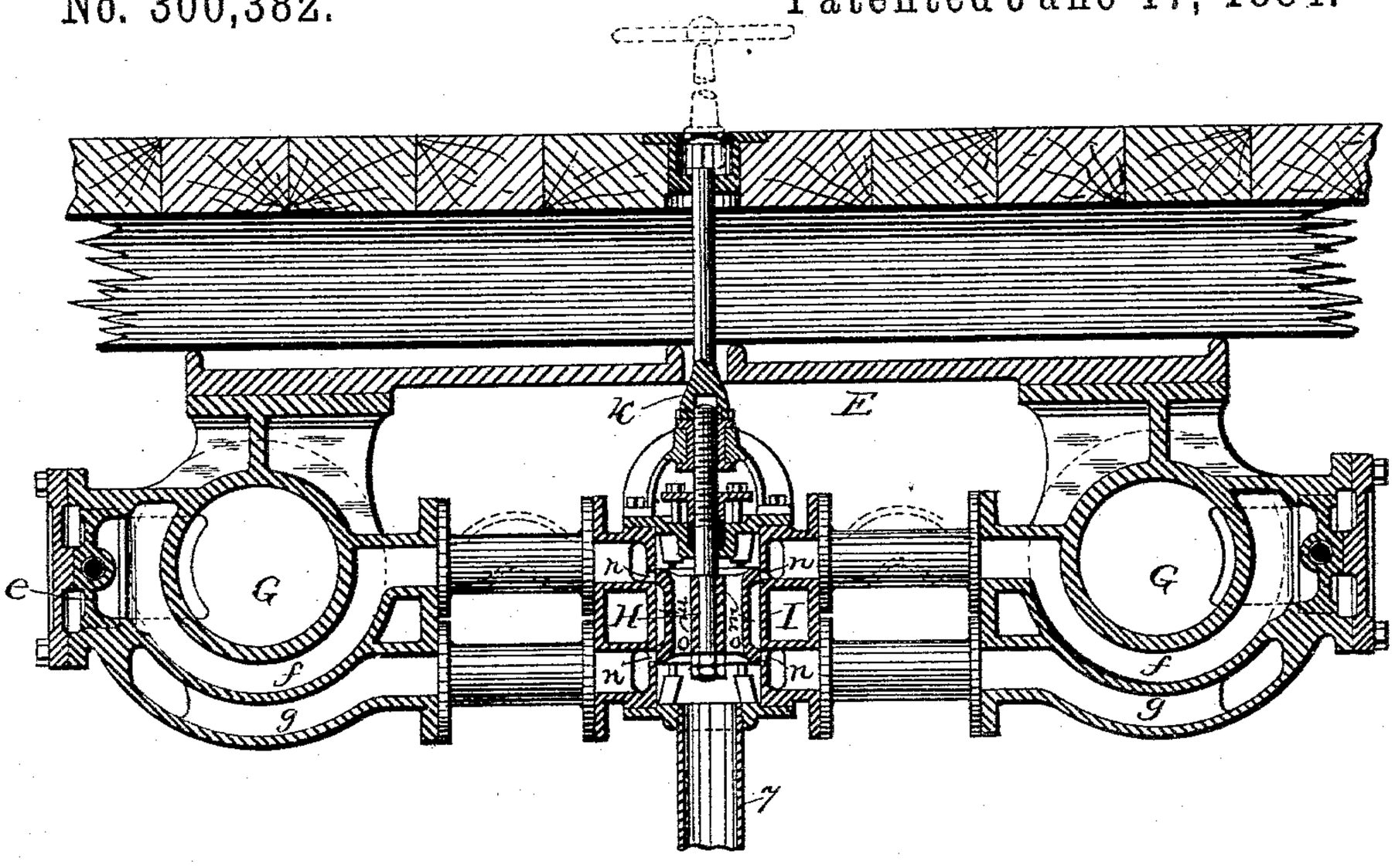

FIG. 3.

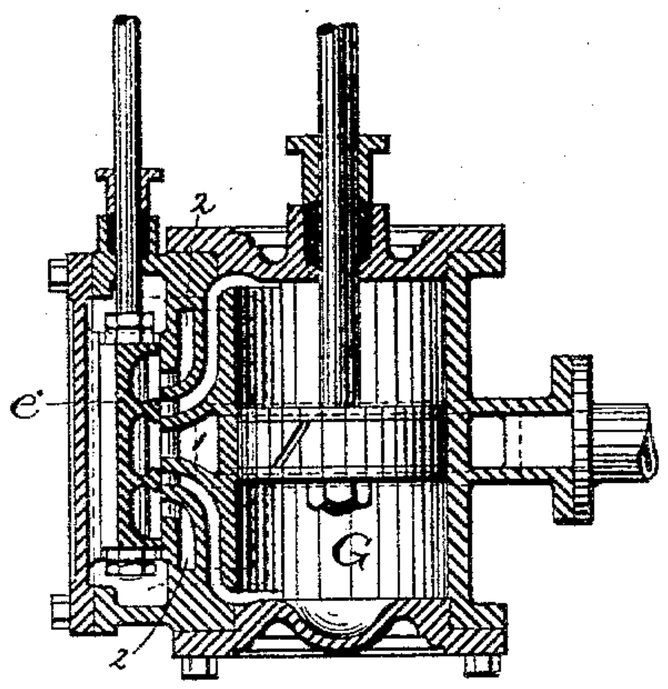

FIG. 4.

WITNESSES:

Wm. M. Stockbridge

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Joseph P. Manton

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UNITED STATES PATENT OFFICE.

JOSEPH P. MANTON, OF PROVIDENCE, RHODE ISLAND.

POWER-CAPSTAN.

SPECIFICATION forming part of Letters Patent No. 300,382, dated June 17, 1884.

Application filed January 25, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH P. MANTON, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Power-Capstans; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in that class of hoisting apparatus in which the hoisting is performed by means of a capstan or windlass operated by steam, gas, compressed air engine, or other motive power; and the object is to construct and operate such hoisting apparatus in a more simple and economical manner than has been done heretofore, and also to furnish a convenient and simple means for reversing such engines.

To this end my invention consists in combining with a capstan a pair of engines directly connected therewith and operated through the medium of a reversing or differential valve arranged between said engines in such manner that the engines can be easily and quickly reversed, and this without the use of the expensive link-gear ordinarily employed; and it also consists in placing the worm-wheel loosely upon the spindle, but adapted to be locked to the same by means of feathers, so that when the worm-wheel is thrown out of gear with the worm it will adapt the capstan to be operated by manual power.

It further consists in the construction and arrangement of certain details, as will be more fully described hereinafter, and more specifically pointed out in the claims, reference being had to the accompanying drawings and the letters of reference marked thereon.

Like letters indicate like parts in the different figures of the drawings, in which—

Figure 1 represents a side elevation of a capstan in position and with the engines connected. Fig. 2 is an enlarged sectional view of the worm-wheel on the spindle and the worm. Fig. 3 is an enlarged cross-section of the engines and reversing-valve connected together. Fig. 4 is a longitudinal section of the engine-cylinder, showing the position of the piston and valve.

In the drawings, A represents a capstan of any of the well-known constructions arranged on the main deck of a vessel, and with its spindle B placed in a suitable step, *a*. The spindle is provided with a suitable screw-thread, *b*, upon which a nut, C, fits, to be moved up and down on said thread. The nut is secured to the worm-wheel D by a recessed collar, *c*, and when said nut is moved it carries the worm-wheel with it out of or into gear with the worm. Whenever it is desired to operate the capstan by manual labor instead of steam or other motive power, the nut and wheel are lowered. A feather, *d*, prevents the worm-wheel from turning on the spindle.

The engines are placed on a bed-plate, E, which is secured to the under side of the main deck, and the cranks are placed at right angles to each other. Upon the crank-shaft is placed the worm F, which meshes with the worm-wheel D and imparts motion to the capstan. The engines are of the reciprocating kind, and are provided with slide-valves *e*, which admit and exhaust the steam or other motive agent to and from the cylinders G G. The valves are operated by the usual eccentric and connections from the crank-shaft. The valves have central and end cavities. These cavities communicate with the ports 1 and 2 of the cylinders, and by means of the passages *f* and *g* with the reversing-valve H. This valve is of the cylindrical kind and placed in a casing, I, having branches that connect with the pipes *f* and *g*. The valve-stem passes through a suitable stuffing-box, and is provided with a screw-thread, with which a nut engages, and it is operated by a stem or wrench, *k*, having a hand wheel or crank on the upper side of the main deck. The steam is first admitted to the annular space *m* of the reversing-valve H, and as this is brought in communication with the passages *f* or *g* by moving it up or down, the engines will move in one or the other direction. The steam is admitted through the narrow openings *n* in the valve-casing, so as to require but a small movement of the valve. The steam is exhausted through the longitudinal openings *o* in the valve when it is placed in its lower position, and when in its upper position through the openings *n*. The steam-pipe *p* is connected with the boiler and passes

the steam to the annular space *m* of the valve, from which it is conveyed to the cylinders of the engines.

The pipes *f* and *g* may be bent or curved, as indicated by the broken lines in Fig. 3, to allow for expansion and contraction.

The reversing or differential valve takes the place of the ordinary stop-valve, and at the same time performs the functions of the link-connections usually employed, and produces a very sensitive and efficient reversing device, which at the same time has fewer parts and is less expensive than the link-gear.

By making the worm-wheel detachable, so that it can be thrown out of gear with the worm, the device can be operated by manual instead of steam or other power. If desired, the engines may be operated by hydraulic power.

The operation is as follows: The connections having been properly made, steam is admitted to the annular space *m* of the reversing-valve H, which is then moved, for example, upward by the stem *k*, when the openings *n* will allow the steam to pass into the passage *f*, leading to the central cavity, 1, of the valve. The steam then passes through the steam-port into the cylinder and enters behind the piston therein and forces it forward. The exhaust-steam at the same time escapes through the steam-port at the opposite end of the cylinder, and through one or the other of the end cavities in the valve into passage *g*, and out through the exhaust-pipe 7 to a condenser or the atmosphere.

When it is desired to reverse the engines, the valve H is forced downward and steam is admitted through the passage *g* to the valve-cavities 2 2.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with a capstan, of a worm-gear adjustably secured to the capstan-spindle, and a nut directly connected with said gear for throwing the worm-gear into and out of mesh with the worm, substantially as specified.

2. The combination of a worm-wheel having a recessed collar secured to it, and a nut which engages with said collar and with a screw-thread on the spindle, whereby said worm-wheel can be moved up and down, to throw it in and out of gear with the worm, substantially as set forth.

3. The combination, with a pair of engines having ports and passages, as described, of a reversing-valve connected by pipes with said passages, and means for operating said valve from the deck, substantially as specified.

4. In a power-capstan having worm-wheel secured adjustably to a spindle, the combination of a pair of engines, a reversing-valve adapted to admit and exhaust steam to and from the engine-cylinders, and means for operating said valve from the deck above the engines, substantially as set forth.

In testimony that I claim the foregoing I hereto affix my signature in the presence of two witnesses.

JOS. P. MANTON.

Witnesses:
V. D. STOCKBRIDGE,
WM. A. ROSENBAUM.