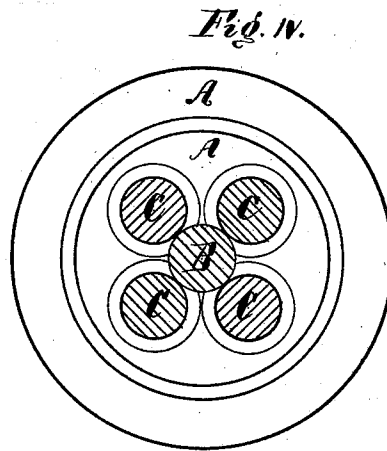
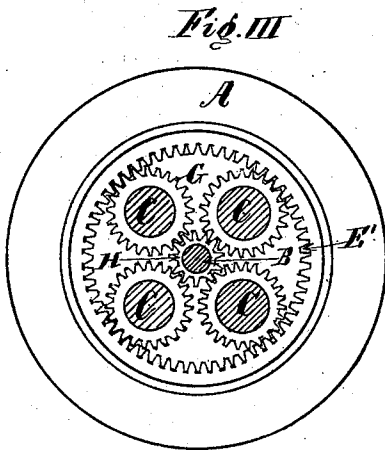
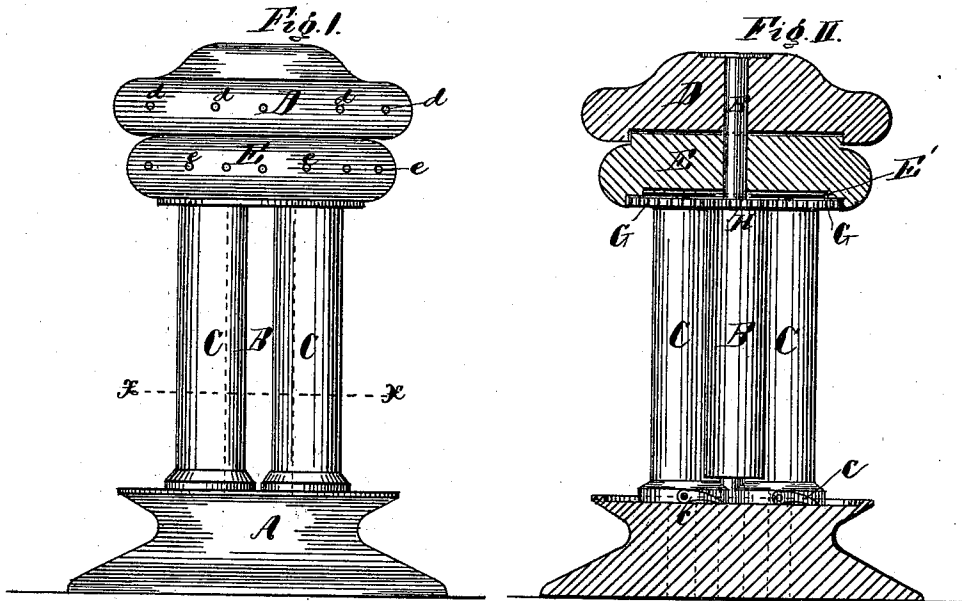


J. H. DAVID.
CAPSTANS.

No. 176,934.

Patented May 2, 1876.



Witnesses:
Richard C. Grier,
Franklin Barrett.

Inventor:
James H. David,
By Henry C. Grier,
his Atty.

UNITED STATES PATENT OFFICE.

JAMES H. DAVID, OF DAMARISCOTTA, MAINE.

IMPROVEMENT IN CAPSTANS.

Specification forming-part of Letters Patent No. **176,934**, dated May 2, 1876; application filed April 17, 1876.

To all whom it may concern:

Be it known that I, JAMES H. DAVID, of Damariscotta, in the county of Lincoln and State of Maine, have invented a new and useful Improvement in Capstans, of which the following is a specification:

The object of this invention is to produce a capstan which may be used in either direction with equal facility, and which shall be geared to run fast or slow, and be operated with either the fast or the slow motion by simply changing the capstan-bars into the appropriate holes provided for them in the head of the capstan. The object of this invention is also to provide a capstan which shall have vertical sides, so as to prevent the rope or cable which is being wound up from running down on the larger part, and then slipping or "surging" up onto the smaller part, (as is usually the case,) and thereby loosing the work already done, and also causing undue strain upon the rope or cable and all its connections.

The nature of the invention consists in constructing the capstan of one central spindle, surrounded by several—say four, more or less—other spindles, which form the sides of the capstan, on which the rope or cable is to be wound. The central spindle is connected with the others by means of suitable cog-gearing, so that the whole shall be operated harmoniously together.

The invention will be readily understood by reference to the accompanying drawings, of which—

Figure 1 is a side elevation of the improved capstan. Fig. 2 is a central vertical section of the same. Fig. 3 is a horizontal section taken through the cogged gearing that connects the heads of the different spindles. Fig. 4 is a horizontal section taken on the line *x x* of Fig. 1.

The base-plate A has journal-bearings provided in its top face, for the several spindles B C. Each of the outside spindles C has two pawls, *c*, attached to opposite sides of it, at or near the lower end, and arranged to be turned over in either direction, so as to engage a suitable rack provided in the top face of the base-plate concentric with the roller or spindle to which it belongs. These pawls

are designed to hold the capstan in any position and in either direction while it is being wound up, in the usual manner. The lower end of the central spindle B does not quite extend down to the top of the base-plate, as is shown in Fig. 2, so as to allow room for the operation of the lower ends of the pawls *c*. The top of the capstan is finished with two heads, D E, both of which are pierced with mortises, which are respectively referred to by the letters *d e*, and which are used for the reception of the capstan-bars, that are designed to operate the capstan in the usual manner. The mortises *e* in the lower head (shown in Fig. 1) are sloped upward toward the periphery of the head, so that when the bars or levers are placed in that set of mortises, their outer ends would occupy about the same vertical position that they would when placed in the mortises *d* in the upper head D. The top head D is fixed to the central spindle B, while the said spindle passes loosely up through the lower head E. An annular plate, E', fastened in the lower part of the head E, furnishes bearings for the journals *e'* of the spindles or rollers C. An annular plate, F, is fixed to the bottom face of the lower head E, close out to its periphery, and has inside cogged gearings, which engage cogged wheels G, attached to the top ends of the spindles or rollers C, and these wheels G, in turn, engage the central cogged wheel H, which is attached to the central spindle B.

With these parts connected as above described, and as shown in Figs. 2 and 3, it is obvious that both of the heads and all of the spindles or rollers will be operated simultaneously. If the operating-levers be placed in the top head D, the motion will be transmitted to the other movable parts through the small cogged wheel H, and the motion of the outer spindles C will be slow, with corresponding increase of power; but if the levers be placed in the lower head E, the motion will be transmitted to the other moving parts through the annular gearing F, which will give a high speed with a corresponding diminution of power.

The spindles B C are made cylindrical in form, and the outer ones rest against the periphery of the central one throughout their

entire length, so that the united strength of all the rollers is obtained, and the outside face of the capstan, formed by the exterior faces of the spindles B, will also be vertical, and consequently there will be no surging of the rope or cable as it is being wound up.

Having thus described my invention, I claim—

The capstan formed of a set of vertical roll-

ers or spindles, B C, with a double head, D E, and operated at different speeds by means of the cogged gearings F G H, substantially as described and set forth.

JAMES H. DAVID.

Witnesses:

RUFUS F. GEUTHNER,
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