No. 756,851. PATENTED APR. 12, 1904.

G. HARTWEG.

CAPSTAN.

APPLICATION FILED JULY 3, 1903.

NO MODEL.

Fig. 1.

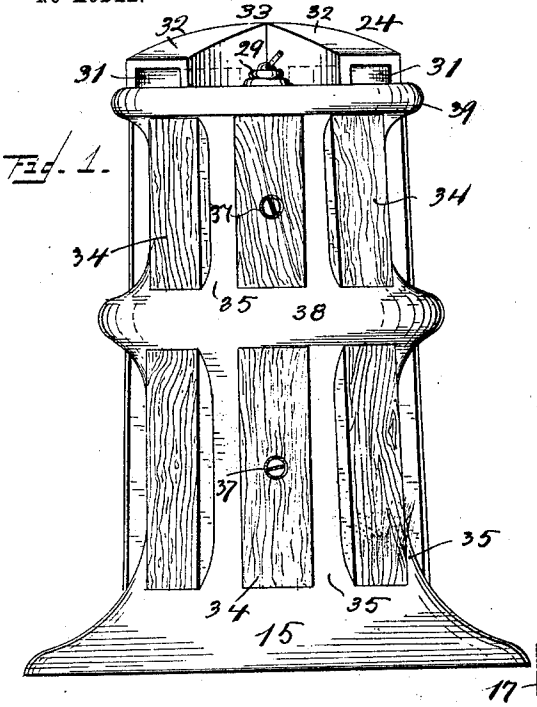


Fig. 2.

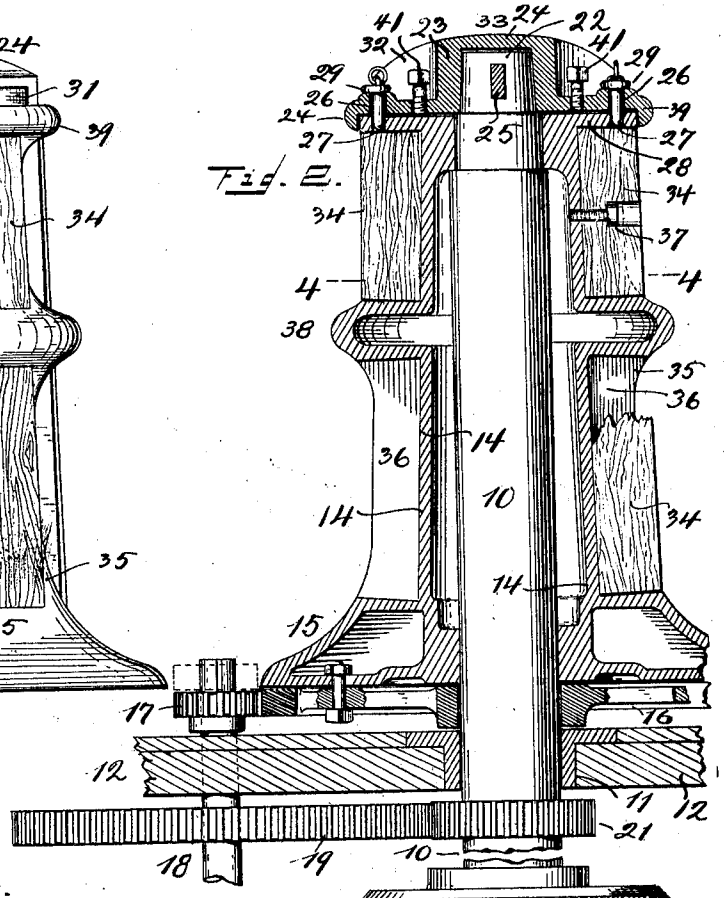


Fig. 3.

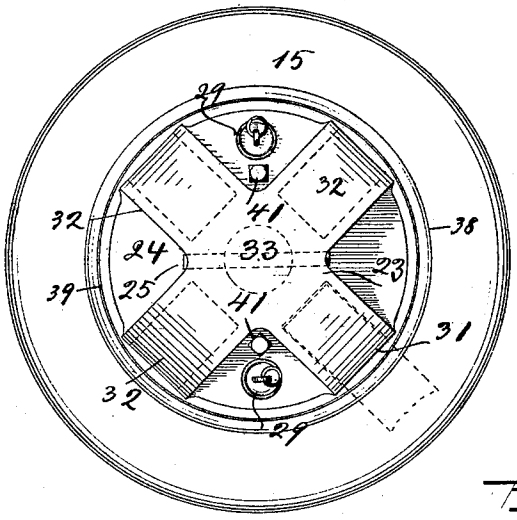


Fig. 4.

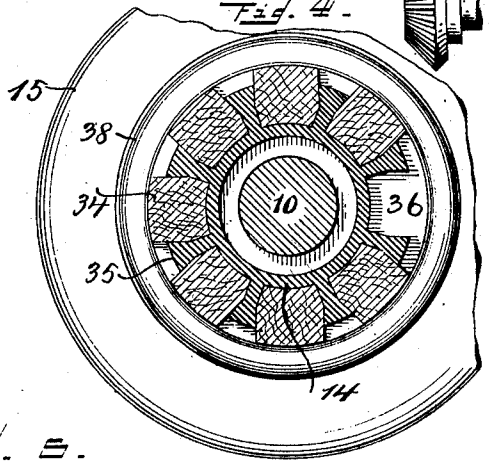
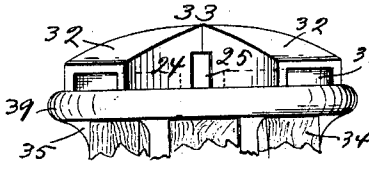


Fig. 5.



Witnesses

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No. 756,851. Patented April 12, 1904.

UNITED STATES PATENT OFFICE.

GOTTLIEB HARTWEG, OF DISTRICT OF HIGHLANDS, KENTUCKY.

CAPSTAN.

SPECIFICATION forming part of Letters Patent No. 756,851, dated April 12, 1904.

Application filed July 3, 1903. Serial No. 164,135. (No model.)

To all whom it may concern:

Be it known that I, GOTTLIEB HARTWEG, a citizen of the United States, residing in the District of Highlands, in the county of Campbell and State of Kentucky, have invented certain new and useful Improvements in Capstans; and I do declare the following to be a clear, full, and exact description thereof, attention being called to the accompanying drawings, with the reference characters marked thereon, which form also a part of this specification.

This invention relates to improvements in capstans, which are devices used on board of vessels for various purposes—as, for instance, for shifting the position of the vessels to or from shore or with reference to another vessel which may be in tow, heaving anchor, &c. They are mostly used in connection with ropes, cables, hawsers, and sometimes chains, one end of either one of which is secured to the capstan, after which this latter is caused to rotate so as to wind up the rope or chain, thereby exerting a pulling action whereby the intended object is accomplished. The rotation may be by steam or hand power, and capstans are mostly arranged to be operated either way. As to material, they are usually made of either wood or iron, either one of which has objections. As to the wood, it is the rapid wear due to the hard usage and exposure to moisture and weather. As to the iron, it is the fact that the outer surface of the barrel or drum soon wears smooth, thus causing, especially in cold and frosty weather, the rope to slip, rendering it difficult to obtain a holding purchase. This objectionable feature which causes the rope to slip does not obtain in the wooden capstan, which latter, however, as before stated, has not the wearing qualities, resistance, and stability of one of iron.

The leading feature of my invention is therefore to make use of both materials in a manner which takes advantage of the good qualities of each and avoids their objections. Thus the iron is used by reason of its strength, stability, and wearing resistance, while the wood is used because it works better in conjunction with ropes, cables, &c., where the same come in contact with it.

Other features of my invention relate to the construction of such a composite capstan in particular and to such which are also applicable to capstans in general.

In the following specification and particularly pointed in the claims at the end thereof is found a full description of the invention, together with its manner of use, parts, and construction, which latter is also illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my improved capstan. Fig. 2 is a vertical section of the same. Fig. 3 is a top view of it. Fig. 4 is a horizontal section of it on line 4 4 of Fig. 2. Fig. 5 is an elevation of the upper end and similar to Fig. 1, but showing it as taken at right angles to the said figure.

In the drawings, 10 is the usual capstan-spindle, suitably mounted in bearings 11, attached to the deck 12 of the vessel, one deck only being shown, and rotated in any suitable way—as, for instance, by a customary power-driven pair of bevel-wheels 13. Loosely mounted on this spindle is the capstan drum or barrel 14, which is of iron. Its lower end is diametrically increased, forming an enlarged base 15, which receives a driving-wheel 16, bolted to the under side of this base. It has no direct connection with the capstan-spindle, but meshes into a pinion 17 on a shaft 18, on which is also the so-called "speed-wheel" 19, driven from a pinion 21 on the spindle. The upper end 22 of this latter is tapered and receives the hub 23 of the capstan-head 24, which is fitted to it with a similar taper. Both are held to each other for rotation by a key 25, seated in a keyway passing crosswise through both. The base of this head has holes 26, which are adapted to register with similar holes 27 in a flange 28 at the upper end of barrel 14, so that in case pins 29 are dropped in so as to simultaneously occupy both holes barrel and head are locked together for joined rotation. The capstan may now be rotated by the driving-wheel 16 as driven from pinion 17 and wheels 19 and 21 from spindle 10, pins 29 having been lifted out, or it may be rotated

from the spindle by means of head 24, pins 29 being inserted and engaging the capstan-barrel. In this latter case pinion 17 is disengaged from driving-wheel 16 to prevent interference with the lower gear-train. Finally, the capstan may be rotated by hand by means of levers or capstan-bars inserted into sockets 31, provided by suitable enlargements 32 on the upper side of the capstan-head and arranged radially around the hub 23 of the same. The upper side of the iron forming the inclosure of these sockets is increased in height toward the center of the head, so as to form a convex top 33, as shown, the object being to avoid any corners, edges, or projections on which a rope might catch while being manipulated over and around the capstan. Obstruction by projection of the heads of pins 29 is prevented by arranging them in recesses between enlargements 32.

No novelty is claimed for the mechanical means involved for rotating the capstan in either one of the ways described. In order to avoid the objections which a smooth-worn iron surface on the outside of barrel 14 would present by preventing a rope to obtain ready frictional holding purchase and causing it to slip, I provide around this outside wooden members 34, called "whelps," which are inserted between base 15 and flange 28 and which prevent the rope from coming in contact with the iron by projecting above the same. In this manner the advantage of a wooden contact for the rope is obtained without, however, impairing the stability of the capstan by the exclusive use of such wood, since the principal part remains of iron. To stiffen this latter part, I provide ribs 35, arranged vertically between base 15 and flange 28 and projecting radially from barrel 14. The recesses 36 between them are then occupied by these whelps 34. They remain readily in place, since no tendency exists causing them to leave their position. They may, however, be held by screws 37, one of which is sufficient for each. Whenever their outer sides are worn down and even with these ribs, the whelps may be taken out and readily renewed, there being practically no wear on the iron part of the capstan. The heads of screws 37 countersink sufficiently to prevent interference with the rope. Capstans may be single or double—that is, may be arranged so that one or two ropes may be used on them. On the one here shown two ropes may be used at the same time, for which purpose the face of the capstan is vertically divided by a projecting ledge 38, which keeps the two ropes apart. In such case there are simply an upper and a lower set of ribs 35, recesses 36, and whelps 34. In case of a single capstan this ledge is simply omitted; but the height of the capstan is also correspondingly less—that is to say, capstan-head 24 and flange 28 would be about where ledge 38 is now shown in the drawings, and the whelps would be held between base 15 and flange 28, whereas in the case shown the lower set is held between base 15 and this ledge 38, and the upper set is held between this ledge and flange 28. As will be seen, the seat of key 25 and this latter pass crosswise through the hub of the capstan-head, thus leaving the top 33 of this latter intact and impervious to moisture and rain. This is a considerable improvement over heads having a vertically-arranged key and key-seat extending clear through at the top, thus permitting water to gain access to the interior of the capstan. The intact top 33 prevents this, while a bead 39, overlapping the edge of flange 28, keeps also the water out at the side. The horizontal arrangement of the key also permits its ready removal in case the capstan is to be taken apart for repairs or any other reasons, since either end of the key may be readily reached by means of a drift.

The disengagement of the head from the tapering spindle is sometimes difficult. This I overcome by providing set-screws 41, seated in head 24 and so located that they may bear against the upper end of barrel 14. During the normal use of the capstan they are without function. When to be taken apart, however, for repairs or any other reason, they serve to loosen the head from the tapering end of the capstan-spindle by being rotated in a manner which causes them to impinge against the upper end of barrel 14.

Having described my invention, I claim as new—

1. In a capstan, the combination of an iron barrel, a capstan-head, a supporting-spindle and wooden whelps carried on the iron barrel arranged with spaces between them and projecting above the face of the barrel.

2. In a capstan, the combination of an iron barrel having vertical recesses in its side, a supporting-spindle and wooden whelps carried in the recesses of the iron barrel, which they fully occupy as to length and width, but not as to depth so as to project above the face of the barrel.

3. In a capstan, the combination of an iron barrel having a base and a top flange, both laterally projecting vertical ribs between them, a supporting-spindle and wooden whelps carried between these ribs.

4. In a capstan, the combination of a capstan-barrel, an operating-spindle, a capstan-head seated at the upper end of the same and a key passing horrizontally through both, to hold them together.

5. In a capstan, the combination of a capstan-barrel, an operating-spindle on which it is mounted and which has a tapering upper end, a capstan-head having a tapering recess on its under side adapted to be occupied by the tapering end of the spindle and a key pass-

ing horizontally through head and spindle to hold them together.

6. In a capstan, the combination of a capstan-barrel, an operating-spindle on which it is mounted and which has a tapering upper end, a capstan-head having a tapering recess on its under side adapted to be occupied by the tapering end of the spindle, a key passing horizontally through head and spindle to hold them together and set-screws carried in the capstan-head and adapted to operate against the capstan-barrel for the purpose described.

7. In a capstan, the combination of a capstan-barrel a capstan-head, a spindle on which both are mounted and enlargements 32 on the upper side of the head which contain laterally open sockets.

8. In a capstan, the combination of a capstan-barrel, a capstan-head having an imperforate, convex top, an operating-spindle on which both are mounted and a laterally-inserted key to hold the head to the spindle.

9. In a capstan, the combination of a capstan-barrel, a capstan-head, a spindle on which both are mounted and enlargements 32 on the upper side of the head which contain laterally open sockets, the height of these enlargements increasing toward the center of the head and forming a convex top.

10. In a capstan, the combination of a capstan-barrel, a capstan-head, an operating-spindle on which both are mounted, pins adapted to be inserted into and occupy simultaneously openings in this head and barrel, to connect both for joint rotation and accessible from the top and recesses in the head which the upper ends of these pins occupy to prevent them from projecting above said top.

In testimony whereof I hereunto set my signature in the presence of two witnesses.

GOTTLIEB HARTWEG.

Witnesses:

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ALBERT A. MOEBUS.