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**Improved Capstan for Ships.**

The accompanying figures illustrate an improvement in capstans, for which a patent was issued to J. B. Holmes, on the 3d of March last. A capstan is somewhat similar to a single windlass, placed upon a vertical instead of a horizontal shaft or spindle. It is generally employed as a raising or moving machine, by winding up a drag chain, hawser or cable around its vertical barrel, and paying it off as regularly as it is wound on, to raise or move a heavy body. It is a most convenient and useful machine, and its application on shipboard and for moving heavy bodies is familiar to most persons. The general application of any machine—its common use—renders every improvement on it, however small, of great moment, because it affects a vast number of persons and interests. The barrels of windlasses are made with a series of elevations and depressions, the former called welps, for the purpose of holding the chain as it is wound on. Owing to the manner in which these elevations and depressions have been formed hitherto on the barrels of windlasses, the chain did not slide freely on them towards the middle as fast as it was wound up, and as a consequence one turn was liable to overlap another. The simple improvement in this capstan obviates this, and some other defects in their construction.

Fig. 1 is a perspective view; fig. 2 a vertical section, and fig. 3 a horizontal section taken at the center of the barrel head and capstan head. The bottom plate, A, of the capstan is secured firmly to the deck; B is the stationary shaft on which the barrel, C, moves; D is the cap piece firmly attached to the barrel. The upper ring of the capstan has notches for the reception of a sliding clutch, S. A plate, F, is keyed fast to shaft B to sustain the spindles or centers of the gear wheels and pinions in the cap, consisting of multiplying gearing, b, a, O, for the fast or slow motion of the capstan. The head, H, of the capstan turns freely on the shaft B. The handspikes are inserted into the holes or openings in it, and when these are turned round, the barrel C is revolved. The sliding clutch, S, is fitted into head H. When this clutch is so moved that a projection on it takes into one of the recesses of the cap-piece D, the head, H, and the cap-piece, D, then clutch together, and the barrel, C, is rotated by direct action. By moving the clutch, S, a little further inward, the projection on the clutch takes into a recess in plate G, as shown in fig. 3; the head, H, when moved round thus communicates motion through pinion O—fast on this plate—to the wheels, thus setting in motion the multiplied gearing, as required.

The barrel, C, is formed with welps, or ridges, W. These are made narrowest at the middle, leaving spaces of greatest width there between them; the welps are also made the whole length of the barrel. By thus constructing them, the chain slides freely and easily towards the middle of the barrel as

fast as it is wound upon it. The welps are also made high to catch the uneven parts of the chain, which enables it to be held by one or two turns around the barrel, thus allowing a very short barrel to be used. It also dispenses with the use of feeding strips to keep the chain on the small part of the

barrel, and it prevents the chain from riding, (one part overlies another,) as it is wound at the upper portion of the barrel and run off below.

For more information, see note at the end of the description of the succeeding machine, which is an improvement by the same inventor.

**IMPROVED CAPSTAN FOR SHIPS.**

Fig. 1

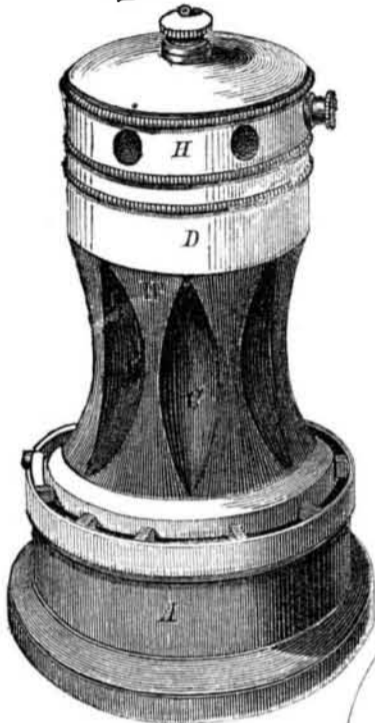


Fig. 2

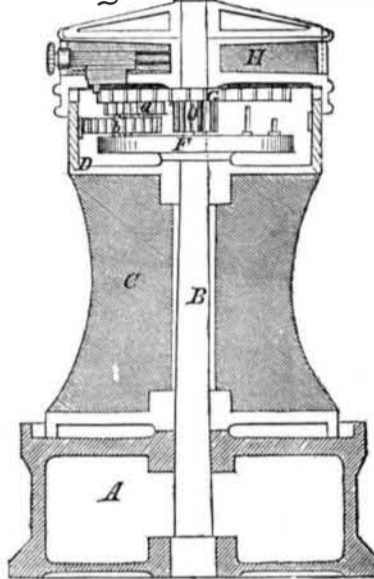
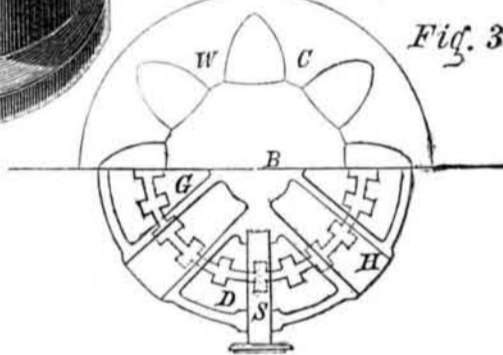
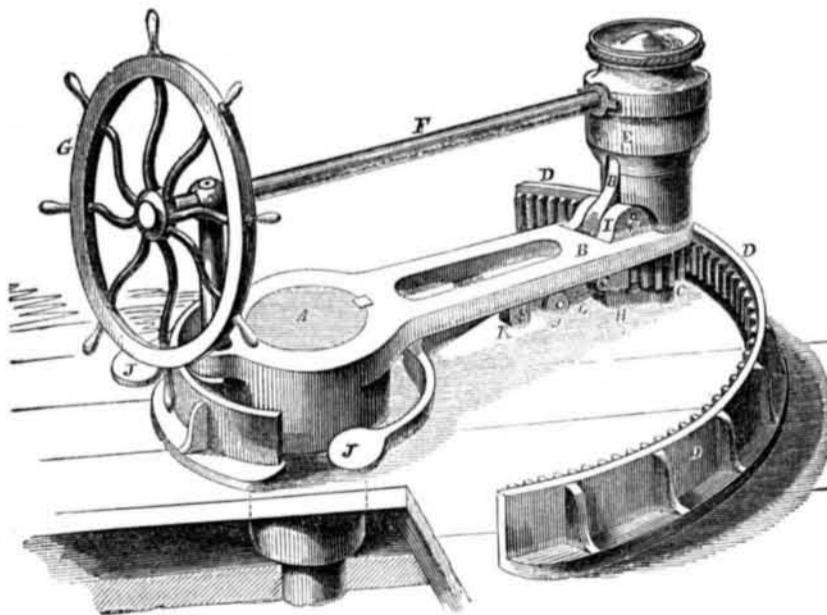


Fig. 3



**HOLMES' SHIP STEERING APPARATUS.**



The ends to be accomplished by the great varieties of steering devices used on shipboard are quite peculiar. It is necessary in "tacking" or "going about," to change the position of the helm quite rapidly from an intermediate position to one extremity of its motion, and in some cases it is desirable to shift the helm with great alacrity from one extreme of its position to the other. While these necessities preclude the obtaining of any extremely great multiplication of "purchase" by the introduction of worm wheels or the like, a great force is de-

manded to turn the rudder of a large ship and especially to steady and retain the same when its broad surface is acted on by a heavy sea.

Mr. John B. Holmes, of this city, is the inventor of the improvement illustrated by the accompanying perspective view, which is secured by letters patent dated March 3d, of the present year. It combines a suitable means of moving or changing the position of the helm or tiller with a kind of brake for bringing to bear a considerable amount of friction to aid in holding it. The wheel which gives

motion to the helm is turned in the ordinary manner by the hand, while the brake which holds it, or aids in holding it in any position, is worked in a very simple manner by the foot.

A represents the head of the rudder; B the tiller or helm, and G the steering wheel. On the extremity of B is carried an upright shaft, at the bottom of which is a short gear wheel, C, meshing into the curved rack, D, which latter is bolted firmly to the deck. The upright shaft is connected to the shaft, F, of the steering wheel by bevel gears concealed within the housing, E, so that any revolution given by the helmsman to the wheel, G, results in revolving the wheel, C, and consequently in turning the rudder. The number of revolutions of the steering wheel required to produce a certain amount of angular motion in the rudder, or in other words, the "purchase" of the man at the wheel in turning the rudder, depends on the relative proportions of the parts, but is intended always to be such as will allow of a pretty rapid turning of the ship.

The means referred to of braking and thus of holding or checking the motion of the wheel by friction are as follows:—The upright shaft which carries the gear wheel, C, is carried at each extremity, not in the housing, E, but in the lever, H, which latter is free to revolve on the bolt represented, which passes through the lugs, I. This lever, H, is connected by a link, L, to the lever, J, which latter is hinged at K, to the under side of B, and can be worked by the foot in such a manner as to turn H slightly on its center, I. The longer portion of the lever, J, is divided as represented, so that it may be operated from either side of the shaft, F. The gear wheels are ordinarily in but a fair contact each with its corresponding gear, but on applying the foot to J, the lever, H, is moved, and the bevel wheels in E, as also the gearing, C and D, are pressed together with great force, and the increased friction tends to hold the whole firmly, or to allow it to work only with considerable difficulty. Instead of forcing the pinion, C, into closer locking contact with the fixed racks, D, the link, L, may be made by a simple and obvious modification of the parts to press directly against D, but the arrangement represented is preferred because it not only aids the helmsman in retaining the command of the helm and holding the wheel with ease in any desired position, but takes up any lost motion or backlash which is usually an objection to the employment of gearing in such situations, and compels the whole to work smoothly and silently, or to remain without any play whenever the wheel, G, is held firmly, however violent and intermittent may be the action of the waves.

The curved rim, M, fixed to the deck on the side of the rudder head opposite to the curved rack, D, is also an important feature of the invention, as it serves by the aid of the friction roller represented between it and the rudder head, to relieve the latter from all the side strain which would otherwise be thrown on it by the device described. Without this provision the effect of the foot applied to J would result in causing violent friction and wear in the rudder post, at the point where the rudder head emerges from the deck, but with this guard all tendency thereto is entirely removed.

It will be observed that this device gives full liberty to the rudder to rise slightly, as it sometimes inclines to do, in a heavy sea, and is in every respect strong and serviceable.

It is now in successful use on two large ships, the *Caravan* and the *Pomona*.

Further information may be obtained by addressing the agent, Mr. John R. Pratt, 67 South street, or 60 and 62 Attorney street, this city.