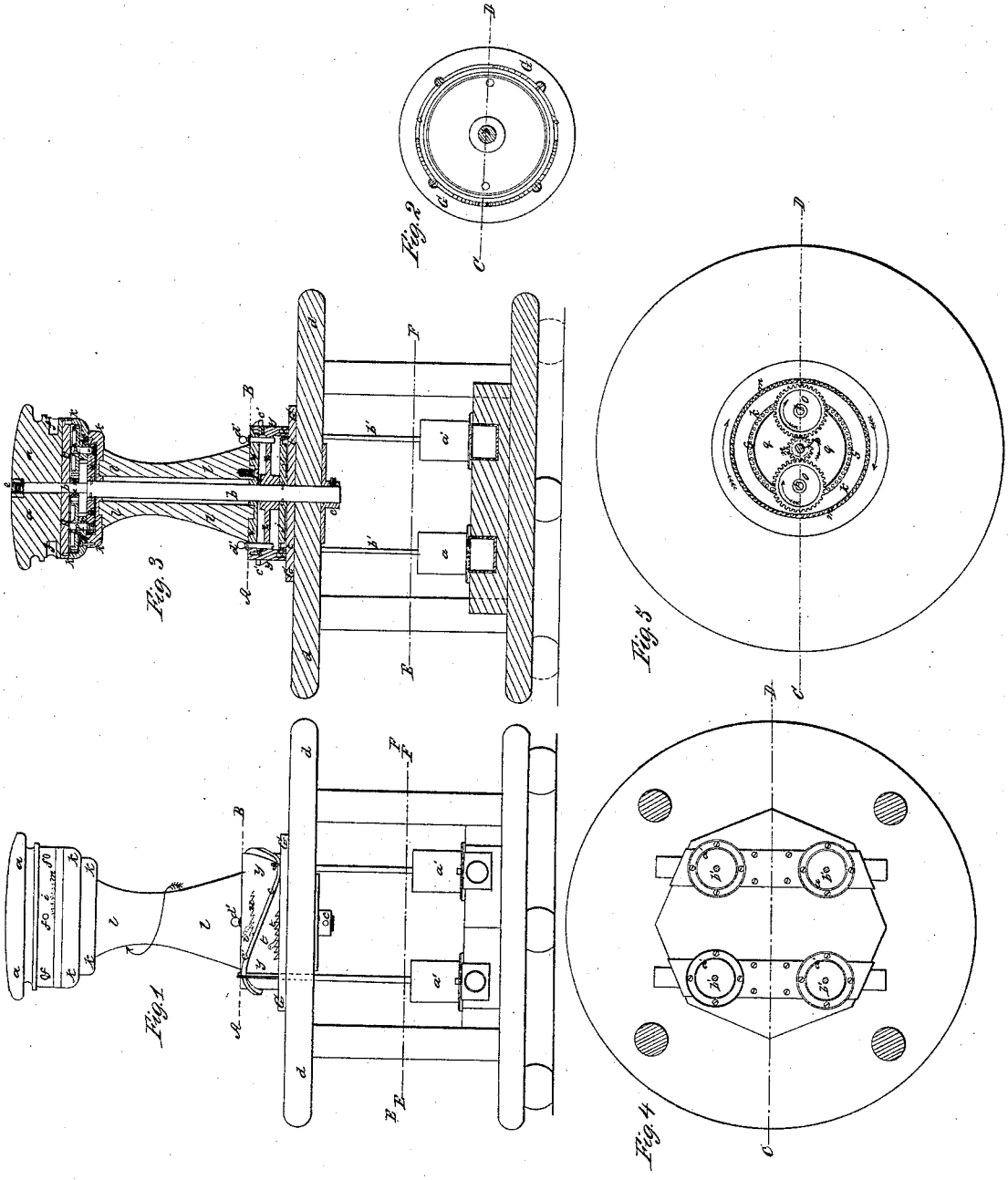
J. E. Andrews,

Capstan,

No. 6,396, Patented Apr. 24, 1849.



UNITED STATES PATENT OFFICE.

JOS. E. ANDREWS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO EDWIN ALLYN.

VARIABLE-POWER CAPSTAN.

Specification of Letters Patent No. 6,396, dated April 24, 1849.

To all whom it may concern:

Be it known that I, JOSEPH E. ANDREWS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Ship's Capstans, and that the following description, taken in connection with the accompanying drawings hereinafter referred to, forms a full and exact specification of the same, wherein I have set forth the nature and principles of my said improvements by which my invention may be distinguished from others of a similar class, together with such parts as I claim, and desire to have secured to me by Letters Patent.

In the accompanying plate of drawings, which exhibit my improvements in capstans, they are represented in connection with a pumping apparatus, in order to show their application to some one of the various uses to which capstans are applied on ship-board, but in my claim I shall confine myself exclusively to the machinery directly connected with, and indispensable to the successful operation of the capstan.

The figures of the accompanying plate of drawings represent my invention.

Figure 1 is a front elevation. Fig. 2 is a horizontal section taken in the plane of the line, A B, Figs. 1 and 3. Fig. 3 is a central vertical section taken in the plane of the line, C D, Figs. 2, 4 and 5. Fig. 4 is a horizontal section taken in the plane of the line, E F, Figs. 1 and 3, and Fig. 5 is a top view, the drum-head, *a a*, being removed.

The object aimed at, and attained by my improvement is, by a simple mechanical arrangement, which shall require no connecting and disconnecting of gears, &c., to adapt the capstan to the double use of overcoming a slight resistance by a quick and direct action upon the same, and a great resistance by a slower and more powerful and cautious action upon it, through the intervention of a combination of gears, to bring which into play, it is only necessary to move the drum head, *a a*, backward, and for the seamen working at the levers or capstan-bars, to travel in a contrary direction to that in which they would move for the more rapid movement above referred to, the barrel of the capstan in both instances moving in the same direction.

I am aware that the quick and slow motions of the capstan barrel, have been before produced, but the change from one to the other has been accomplished by the insertion or withdrawal of connecting pins through various parts or the shipping or unshipping of gears, which cannot be readily done by inexperienced seamen, or by experienced one when the strain is on the barrel; whereas, to effect the change by my improvements, it is only necessary to reverse the movement of the drum head, as above suggested.

b b, Figs. 2, 3 and 5, is the spindle or axis on which all the parts turn, there being a confining nut, *c*, under the upper deck, *d d*, (through which the spindle extends,) and another confining nut, *e*, fitted in the top of the drum head, *a*, *a*, as shown in Fig. 3. Said spindle is also firmly connected to the sustaining or bearing plate, *j j*, which turns with the spindle, and rests on the deck plate, G G. The drum head is constructed of the usual shape, having proper mortises, *f f*, for the insertion of the capstan bars, and on its under side a circular metallic plate, *g g*, near the edge of which a groove is formed as shown at *h h*, Fig. 3, for the insertion of a proper number of pawls, *i i*, shown by red lines in Fig. 1. This drum head sets on the top of the hollow metallic cap, *k k k k*, Figs. 1, 3 and 5 firmly fixed on the upper end of the capstan barrel, *l l l l*. Said barrel has on its under side a bearing plate, *x x*, which rests on a proper shoulder or ledge, formed around the interior of the cylindrical casing, *y y*, as shown in Fig. 3, said casing having a journal plate, *z z*, which connects it with the spindle, *b b*, on the bearing plate, *j j*, on which it rests. On the top and near the outer edge of this cap, directly under the groove, *h h*, in which the pawls, *i i*, are fitted, a circular series of ratchet teeth is formed, as shown at *m m*, Fig. 5, and by red lines in Fig. 1.

The pawls, *i i*, connected to the drum head, *a a*, is before described, fall upon the ratchet teeth at *m m*, and when said head is turned in one direction, engage with them, and carry the cap, *k k k k*, and consequently the barrel, *l l l l*, around in the usual way, for overcoming rapidly a slight resistance. When the drum head, *a a*, however, moves in the other direction, the pawls, *i i*, pass over the ratchet teeth at *m m*, loosely, and, as before suggested, the gearing for overcoming a greater resistance by a more powerful action on the barrel, *l l l l*, is brought into play. This gearing is ar-

ranged as follows: A small pinion, *n*, Figs. 3 and 5, is firmly secured to the under side of the circular metallic plate, *g g*, of the drum head, *a a*, and said pinion engages with two or more gear wheels, *o o*, arranged around it, which turn on the vertical pins, *p p*, set in the circular plate, *q q*. This plate, *q q*, is fitted on the spindle, *b b*, so as to turn with it, being placed in the lower part of the hollow cap, *k k k k*, in order to leave sufficient space between the bottom of said cap and the under side of the drum head plate, *g g*, for the working of the gearing. On the under side of each of the gear wheels, *o o*, and firmly attached to it is a pinion, *r r*, the teeth of which engage with a series of interior cogs (or wires fitted to operate as such,) around the inside of the cap, *k k k k*, as shown at *s s* &c., Figs. 3 and 5. The sustaining plate, *j j*, of the spindle, *b b*, has proper pawls fitted in grooves around its edges, which engage with a circle of ratchet teeth formed in the top of the deck plate, G G, as shown at *t t* in Fig. 3, and by blue lines in Fig. 1.

The barrel, *l*, *l*, *l*, *l*, of the capstan, as before suggested, always turns in one direction, which is indicated by the arrows in the several figures, being prevented from turning in the opposite direction by pawls arranged around the bearing plate, *x x*, which engage with ratchet teeth, formed on the ledge of the casing, *y y*, (on which ledge said plate rests), as shown in Fig. 3, at *u u*, and by red lines in Fig. 1. The pawls at *t t*, on the bearing plate, *j j*, of the spindle, it will be seen, will prevent it from moving in the opposite direction from that in which the barrel moves, so that for the direct and quick action of the capstan, the drum head, *a a*, spindle, *b b*, capstan barrel, *l l l l*, and the gearing in the cap, *k k k k*, and the circular plate, *q q*, on which said gearing is sustained, all turn together with the spindle; the pawls, *i i*, on the drum-head engaging with the teeth, *m m*. But when the drum-head is turned in the opposite direction, the spindle, *b b*, and consequently the plate, *q q*, which is connected to it as above described, and on which the gearing is sustained, are prevented by the pawls at *t t* from turning, and the pinion, *n*, on the under side of the drum head, turns the gear wheels, *o o*, and the pinions, *r r*, on their centers, in the direction shown by the arrows in Fig. 5; and as said pinions, *r r*, engage with the teeth at *s s*, in the hollow cap, *k k k*, of the barrel, they will cause it to revolve in the same direction as before, but at a diminished rate, but with an increased power proportionate to the diameters, and numbers of the teeth, of the wheels and pinions.

The pumping apparatus, above referred to, is represented as beneath the deck, *d d*, the several pump-barrels being shown at *a'*, *a'*, *a'*, &c., and the piston rods at *b'*, *b'*, *b'*, &c., which are worked up and down by a right angular stud from the top of each, which fits, or bears on the upper side of the cam ledge, *c' c'*, curved eccentrically for the purpose, on the exterior of the casing, *y y*, as shown in Figs. 1, 2 and 3; the connection between the windlass and pumping apparatus being effected through the medium of the vertical pins, *d' d'*, which fits into holes formed in the bearing plate, *x x*, of the barrel, *l l l l*, and the journal plate, *z z*, of the said casing. The pawls at *e' e'*, being arranged with teeth on the deck plate, G G, to prevent back motion.

The whole arrangement will be sufficiently understood by inspection of the drawings; and as my claims embrace no portion thereof, I shall not describe it more in detail.

Having thus described my improvements in capstans, I shall state my claims as follows.

What I claim as my invention, and desire to have secured to me by Letters Patent, is—

A capstain constructed as hereinabove specified, so as to be susceptible of producing a quick and direct action, to overcome a slight resistance, and a slow and more powerful action, to overcome a great resistance, by merely turning the drum head around in the opposite directions while the barrel of the capstain always moves in the same direction; and the same being accomplished without any shipping or unshipping of gears, and by a system of ratchets, pawls and gear wheels, pinions, &c., all arranged so as to turn with the capstan for the direct and quick action; but for the slow and more powerful action, to turn the capstan barrel in the same direction, by reversing the motion of the drum head—said parts being combined, and operating, substantially, as hereinabove set forth.

Boston, Jany. 24th, 1849.

JOS. E. ANDREWS.

Witnesses:

EZRA LINCOLN,

JOSEPH GAVETT.