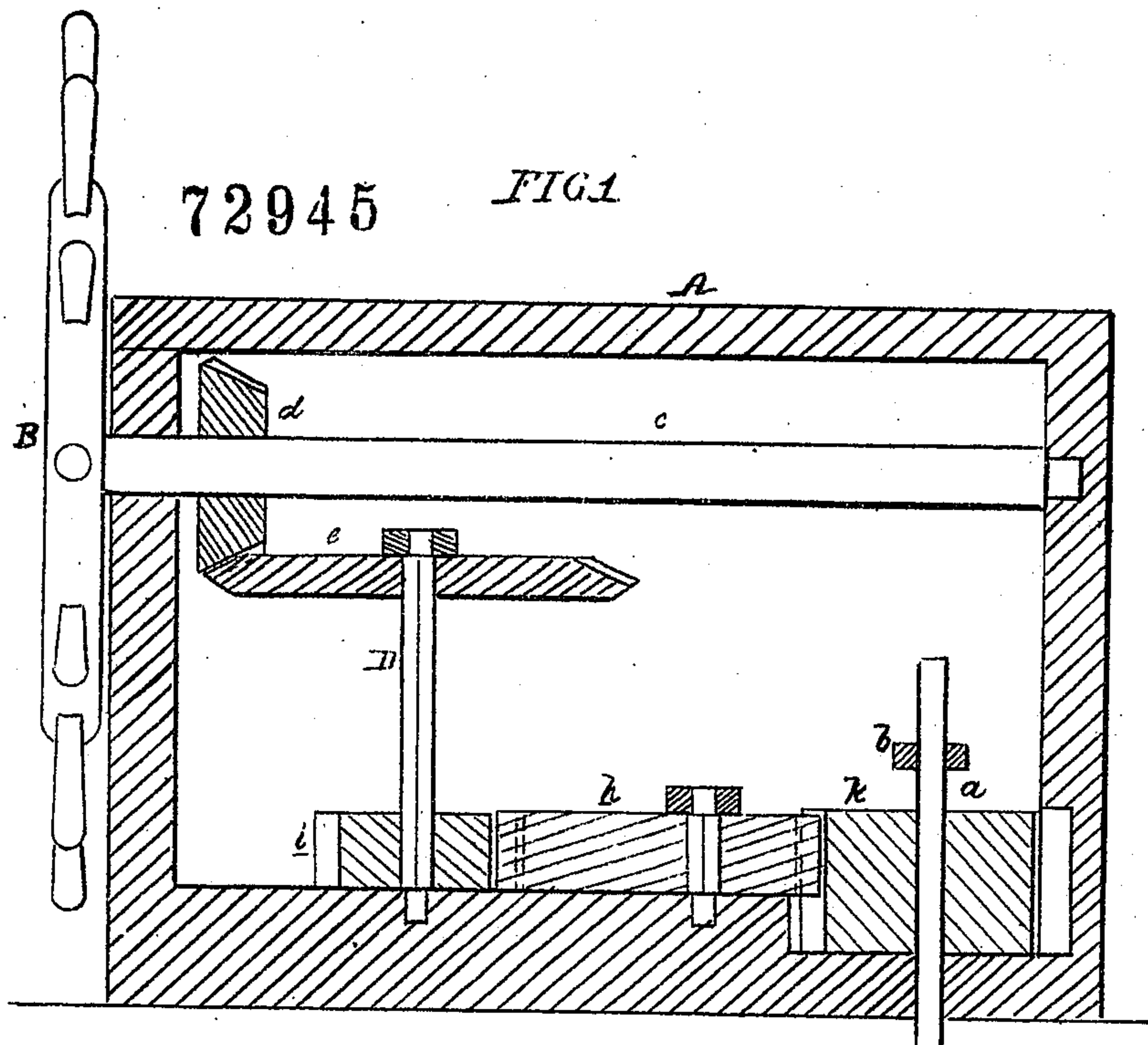
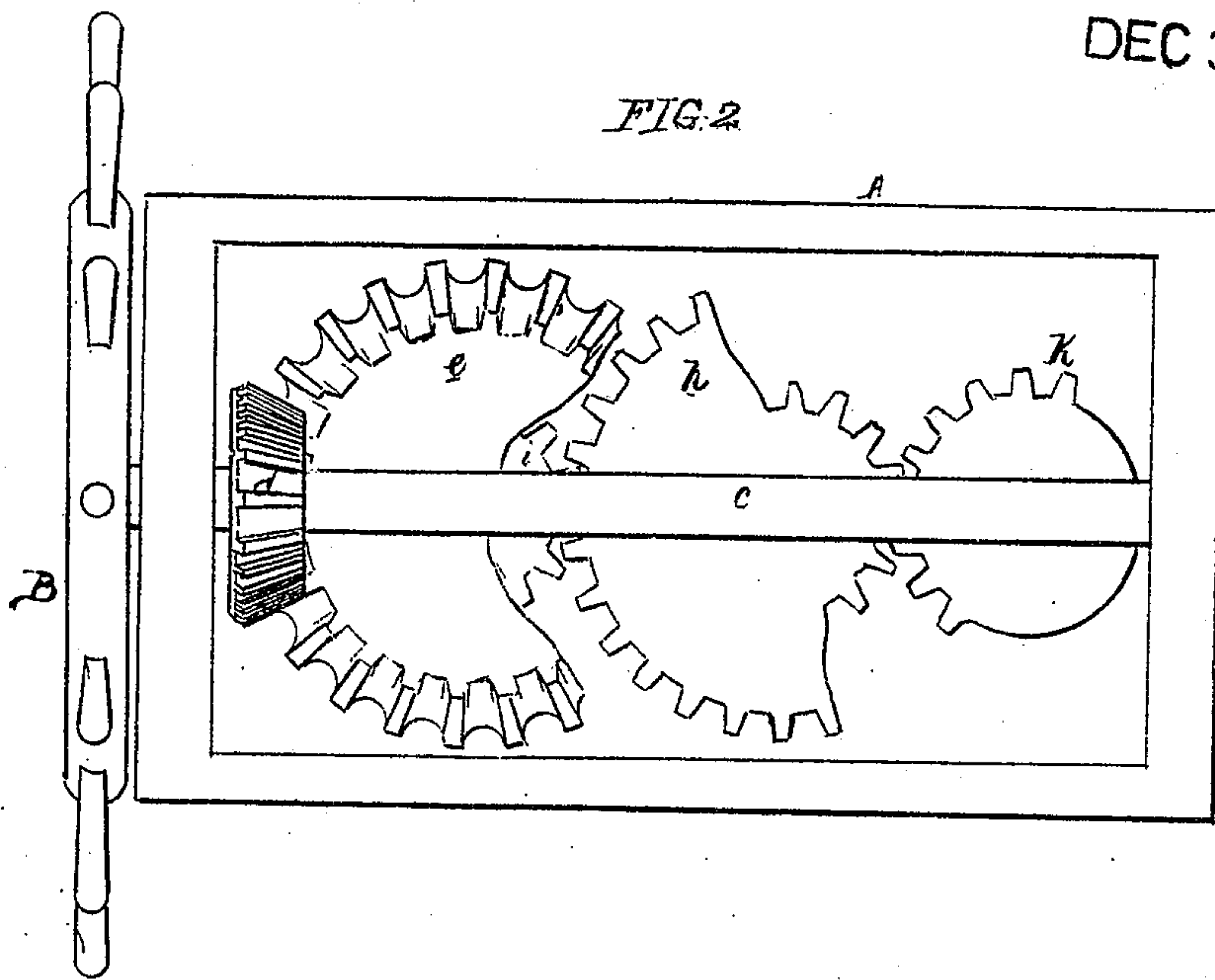


*J.H. Weaver—Improved Steering Apparatus.*



PATENTED  
DEC 31 1867



WITNESSES } *Wm. Albert Steel*  
*John Parker*

*J.H. Weaver*  
*By his attorney*  
*H. Housh*

# UNITED STATES PATENT OFFICE.

JACOB H. WEAVER, OF MAURICETOWN, NEW JERSEY, ASSIGNOR TO HIMSELF AND GEORGE WEBB, OF PHILADELPHIA, PENNSYLVANIA.

## IMPROVED STEERING APPARATUS.

Specification forming part of Letters Patent No. 72,945, dated December 31, 1867; antedated December 24, 1867.

*To all whom it may concern:*

Be it known that I, J. H. WEAVER, of Mauricetown, Cumberland county, New Jersey, have invented an Improved Steering Apparatus; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention consists in certain devices, fully described hereinafter, for facilitating the turning of the rudders of vessels, and for preventing injury to the gearing should the rudder be elevated from any cause.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a sectional elevation of my improved steering apparatus, and Fig. 2 a plan view.

A is an oblong case, which is secured to the deck of a vessel, and through the bottom of which, near the rear end, passes the rudder-post *a*, the upper end of the latter turning in a cross-piece, *b*, secured to the opposite sides of the case. A horizontal shaft, *c*, passes through the case and through the front end of the same, and has on its outer end a hand-wheel, B; and with a bevel-pinion, *d*, secured to the shaft *c* gears a bevel-wheel, *e*, on a vertical shaft, D, turning in bearings within the case.

Near the lower end of the shaft D is a pinion, *i*, the teeth of which are adapted to those on one edge of a horizontal toothed segment, *h*, the axis of which turns in suitable bearings, the segment having two toothed edges, forming parts of circles of different diameters, the center of each of which is the axis of the segment.

Near the upper end of the rudder-post is a pinion or toothed segment, *k*, which gears with the smaller periphery of the segment *h*, and is nearly double the thickness of the latter, the upper surfaces of the two segments, when the rudder rests properly in its bearings, being nearly level with each other.

A rotary motion imparted to the shaft *c* will be conveyed, through the medium of the cog-

wheels and segments above described, to the rudder without the necessity of moving the wheel B to such an extent as is required when the usual windlass, blocks, and tackle are employed.

By the use, in connection with the gearing of a segment, *h*, of the form described, the force applied to the hand-wheel is transmitted through such a leverage to the rudder that the latter may be readily turned with much less exertion on the part of the steersman than is required when the usual tackle or gearing is employed, while the turning of the hand-wheel in consequence of force applied to move the rudder is rendered much more difficult.

Owing to the thickness of the segment *k* and the manner in which it is geared with the segment *h*, the two segments will not be thrown out of gear, nor will the apparatus be injured or disarranged should the rudder be elevated in consequence of its heel striking a bar, or from any other cause.

Although I prefer to use the case A in order that the apparatus may be better protected, the different shafts may turn in bearings on an open frame-work bolted to the deck.

Without confining myself to the exact construction and arrangement of parts herein described, I claim as my invention and desire to secure by Letters Patent—

1. The rudder-post *a*, with its toothed segment or pinion *k*, and the toothed segment *h*, in combination with the hand-wheel shaft *c*, its pinion *d*, and the shaft D, wheel *e*, and pinion *i*, or their equivalents, the whole being constructed and operating substantially as described.

2. The segment or pinion *k*, secured to the rudder-post, when of greater thickness than the wheel or segment with which it gears, for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JACOB H. WEAVER.

Witnesses:

CHARLES E. FOSTER,  
W. J. R. DELANY.