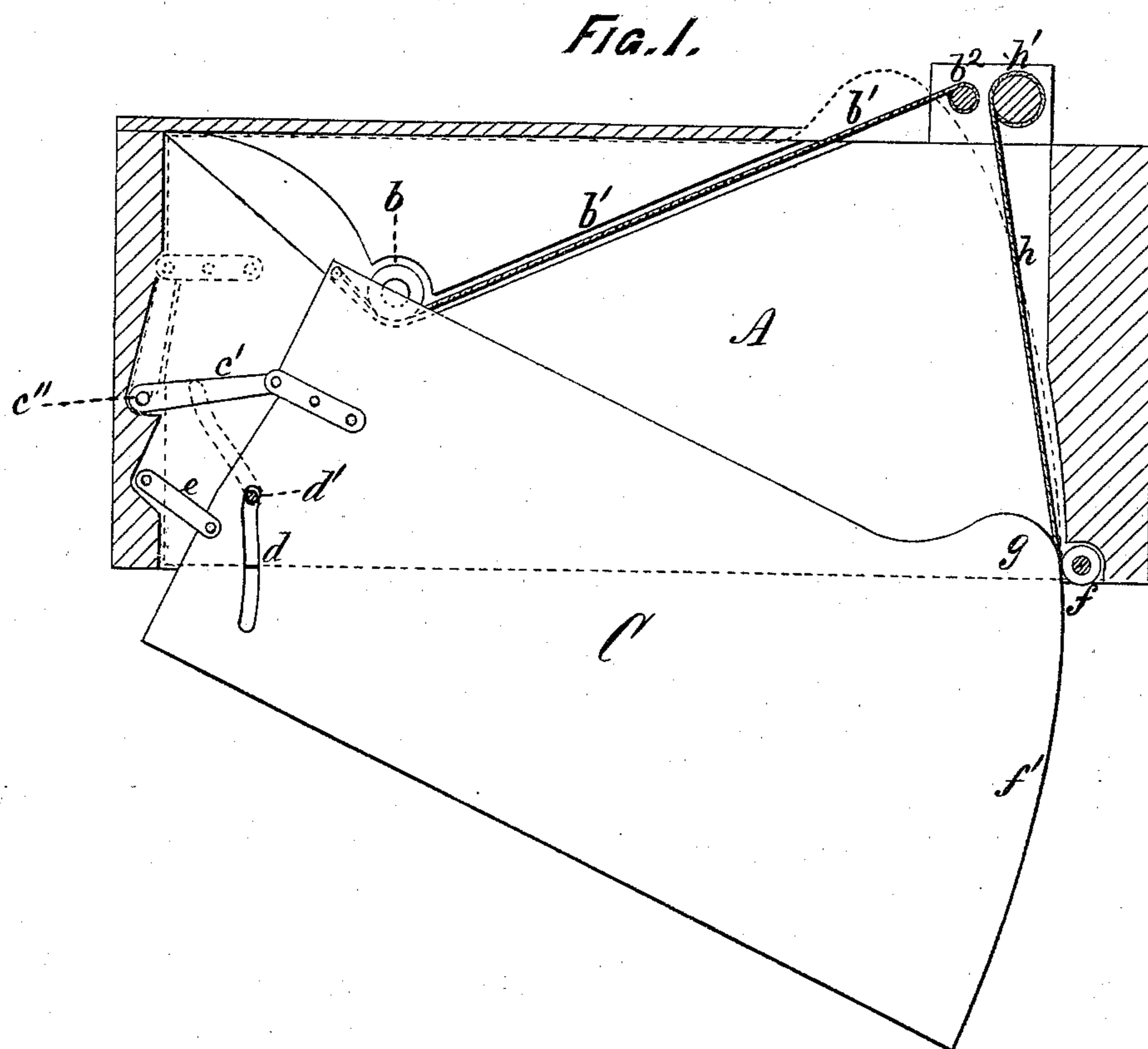


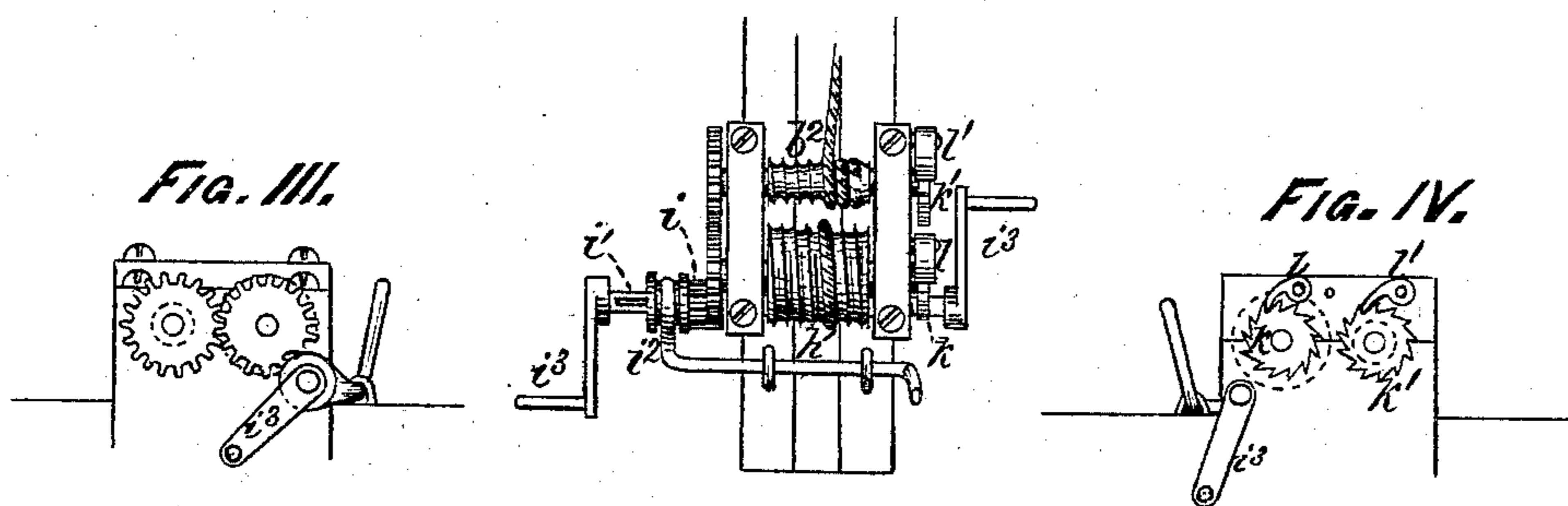
**J. T. HATFIELD.**  
**Centre-Boards for Vessels.**

No. 151,022.

Patented May 19, 1874.



*Fig. II.*



*Witnesses.*

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# UNITED STATES PATENT OFFICE.

JAMES T. HATFIELD, OF HOBOKEN, NEW JERSEY.

## IMPROVEMENT IN CENTER-BOARDS FOR VESSELS.

Specification forming part of Letters Patent No. **151,022**, dated May 19, 1874; application filed October 30, 1873.

*To all whom it may concern:*

Be it known that I, JAMES T. HATFIELD, of Hoboken, New Jersey, have invented certain Improvements in Center-Boards for Sailing-Vessels, of which the following is a specification:

My invention embraces a peculiarly-constructed center-board for sailing-vessels, and also apparatus for controlling it, and has four prominent advantages over the swinging center-boards now used: First, an increased area of exposure when the center-board is lowered by reason of the dropping of the forward end of the board; secondly, positively-acting mechanism for controlling the position of the board, capable of being operated without changing the course of the vessel; thirdly, mechanism for taking up the slack of the hoist-rope as the board rises; and, fourthly, in combination with such mechanism, devices for holding the board at prescribed points.

The accompanying drawings are as follows:

Figure 1 is a longitudinal section of the trunk, showing an elevation of the center-board and the mechanism for operating it; Fig. 2, a plan of the down-haul and hoisting-drums with their gearing and the shifting-clutch; Fig. 3, an elevation of the drum-gearing; Fig. 4, an elevation, showing the drum-ratchets and pawls.

The trunk A is countersunk to receive the pulley *b*, and grooved to admit the down-haul *b*<sup>1</sup>. The latter may be either a rope or a chain, and the pulley *b* will be made to fit it accordingly. The down-haul *b*<sup>1</sup> is secured to the upper forward corner of the center-board C. The center-board is pivoted upon the end of the swinging arm *c'*, the latter having its axis *c''* in the forward post of the trunk. The center-board is guided in its movements by means of the slot *d*, which engages the fixed pin *d'*.

Another mode of prescribing the movement of the board is by means of the shorter arm *e*, connecting the forward end of the board with the forward part of the trunk, and placed below the longer arm *c'*, in conjunction with which it acts. It will be seen that by using two arms of different lengths the guide-slot may be dispensed with, if desired. Still another mode of regulating the movement of the board, when only the upper arm *c'* is used, is

by means of the friction-roller *f* placed at the lower end of the after trunk-post. The after end of the board *f'* is in that case curved so as to ride continuously against the roller *f* as the board moves up or down. The board is provided with a thief, *g*, which prolongs the after curve *f'* so as to maintain the bearing against the roller *f* when the board is fully lowered. In large vessels the thief *g* is generally dispensed with, and in such cases, I adopt one of the other modes of holding and guiding the board. The hoist rope or chain *h* is secured to the after end of the board, and fastened to the drum *h'*. The latter is geared to a smaller drum, *b*<sup>2</sup>, to which the down-haul *b*<sup>1</sup> is fastened. The two drums are simultaneously rotated by the pinion *i* on the crank-shaft *i*<sup>1</sup>. The pinion *i* is loosely keyed to its shaft, and provided with a shifting-clutch, *i*<sup>2</sup>. The drum-shafts carry ratchet-wheels *k* and *k'*, which are respectively engaged by the pawls *l* and *l'*, by means of which the drums may be prevented from rotating in either or both directions.

The operation of my invention is as follows: When the board is to be lowered the crank *i*<sup>3</sup> is turned so as to wind up the down-haul upon the drum *b*<sup>2</sup>, and at the same time give off the hoist-rope *h*. The force applied to the crank is transmitted by the down-haul to the upper forward corner of the board, which is forcibly pulled backward and downward in the direction of the pulley *b*. The forward end of the board drops as the arm *c'*, to which it is pivoted, swings over, and the after end of the board drops more rapidly, and farther, in obedience to the influence of the guiding-mechanism—that is, the shorter arm, or the slot and pin.

It will be seen that the influence of gravity in lowering the board is not alone depended on, the down-haul and the guiding devices being positive in their operation. In raising the board the motion of the crank is reversed, and thus the hoist-rope is wound upon the drum *h'*, while the down-haul is given off.

The board may be fixed at any elevation by dropping both pawls upon the ratchet-wheels, or may be left free to move either up or down by releasing either one of the pawls, respectively.

It will be observed that motion of the board either up or down causes rotation of the drums, which are geared together, so that the down-haul and the hoist-rope are never slack, either one, respectively, being wound up as the other is unwound. This is important as a means of preventing fouling by jamming of either rope between the center-board and the trunk.

I am aware that rollers have been used to lessen the friction of the center-board upon the trunk, and I do not, therefore, make any claim to the roller *f*, excepting as an element of the guiding-mechanism described.

I am aware that guide slots and pins have been used heretofore, and that center-boards have been suspended upon a single swinging arm; but these two devices have not been combined, nor has the swinging arm been heretofore combined with a shorter arm, nor has a center-board been heretofore combined with any devices for automatically effecting prescribed variations in the relative depressions of its opposite ends when in use.

I claim as my invention—

1. The combination of a center-board with guiding mechanism, substantially such as described, by the operation of which prescribed variations in the relative depression of the opposite ends of the center-board, when in use, are automatically effected, substantially as set forth.

2. The combination of the center-board C, suspended substantially in the manner described, with the down-haul *b*<sup>1</sup>, operating substantially as described.

3. The combination of the center-board C, suspended substantially as described, with the hoist-rope *h*, the down-haul *b*<sup>1</sup>, and the conjunctively-operating drums *b*<sup>2</sup> and *h*<sup>1</sup>, substantially as described, and for the purpose set forth.

JAMES T. HATFIELD.

Witnesses:

GEO. L. FARR,  
EDWARD FLOOD.