No. 864,240. PATENTED AUG. 27, 1907.

F. GARDNER.

CONTROLLING DEVICE FOR RUDDERS.

APPLICATION FILED MAY 9, 1907.

2 SHEETS—SHEET 1.

FIG. 1.

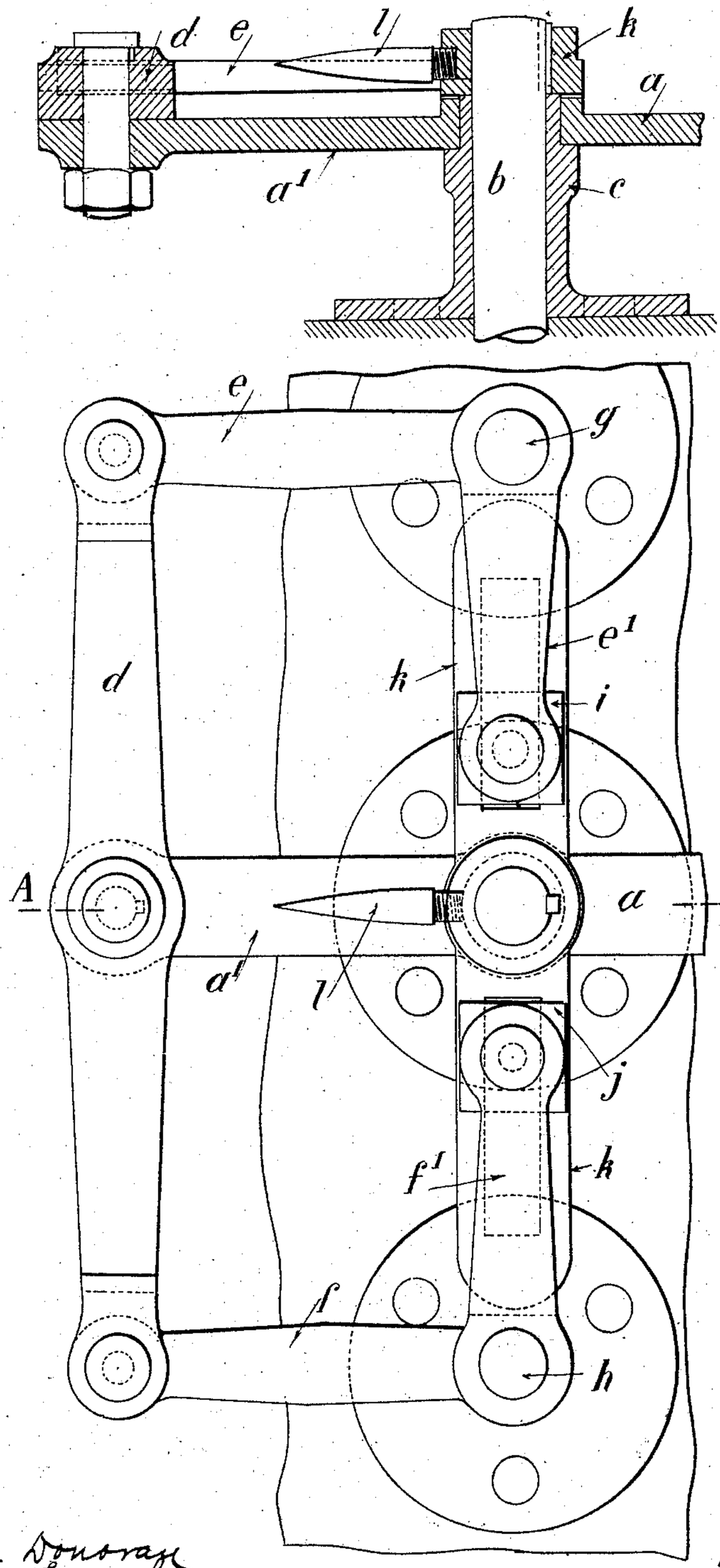


FIG. 2.

Witnesses
Kathryn Donovan
Carlos Franck

Inventor:
Frank Gardner
by Attorneys
his Attorneys

No. 864,240. PATENTED AUG. 27, 1907.

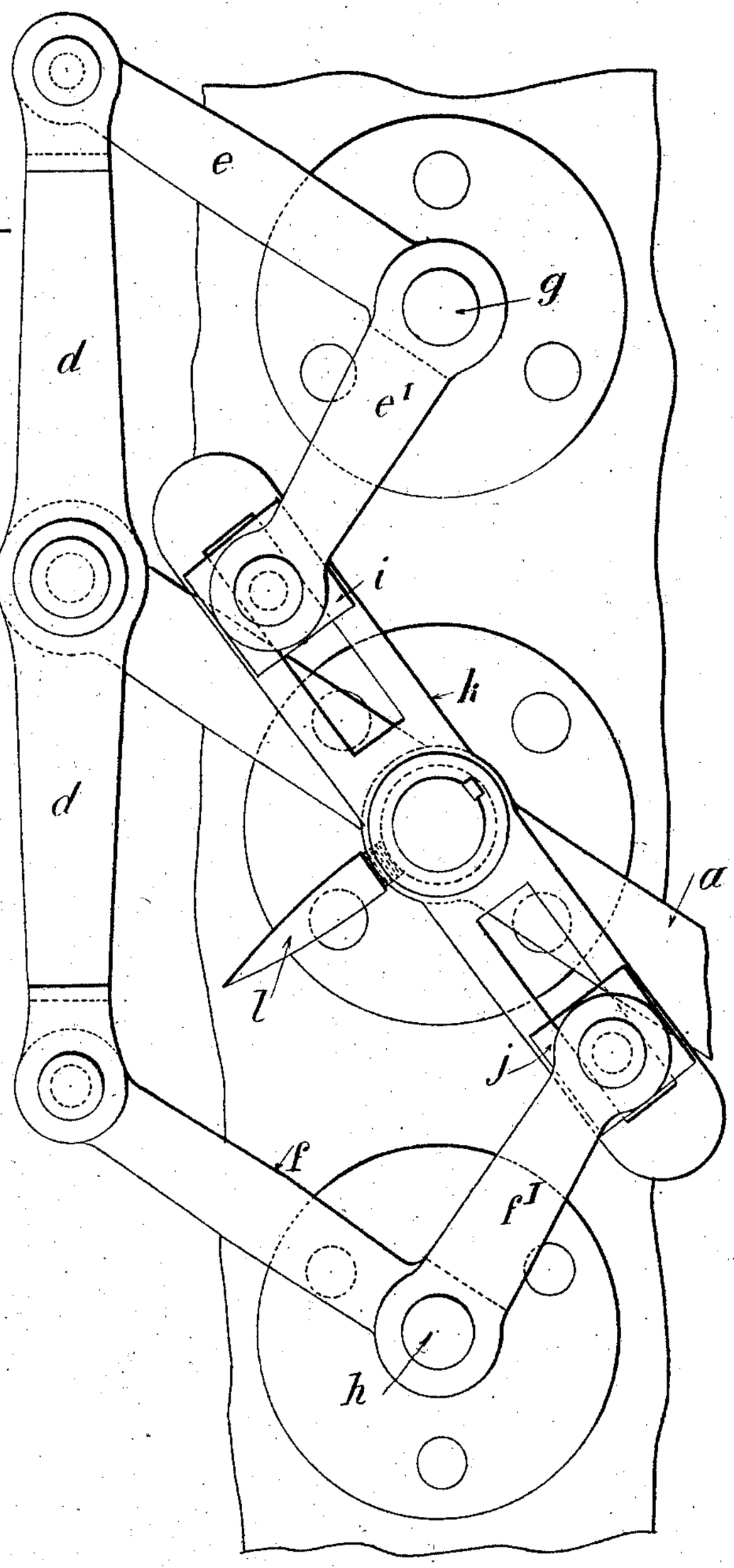
F. GARDNER.

CONTROLLING DEVICE FOR RUDDERS.

APPLICATION FILED MAY 9, 1907.

2 SHEETS—SHEET 2.

FIG. 3.



Witnesses:-
Kathryn Donovan
b Camden Francis

Inventor:
Frank Gardner
by Attorney
his Attorney

UNITED STATES PATENT OFFICE.

FRANK GARDNER, OF PARIS, FRANCE.

CONTROLLING DEVICE FOR RUDDERS.

No. 864,240. Specification of Letters Patent. Patented Aug. 27, 1907.

Application filed May 9, 1907. Serial No. 372,667.

To all whom it may concern:

Be it known that I, FRANK GARDNER, a citizen of the United States of America, residing at 16 Avenue Raphaël, Paris, in the Republic of France, have invented new and useful Improvements in Controlling Devices for Rudders, of which the following is a specification.

This invention has for its object a device for controlling a rudder constituted by a series of articulated levers acting indirectly on the rudder head and intended to increase the sensitivity of control, to oppose with great resistance the efforts of the water tending to displace the rudder, and to insure the practically certain immovability of the rudder should the chains of the tiller break.

In the annexed drawings which illustrate the invention Figure 1 is a vertical section of the device, following the line A A of Fig. 2.—Fig. 2 is a plan showing the device when the rudder is parallel to the longitudinal axis of the boat and Fig. 3 is a corresponding plan when the rudder is inclined at an angle of 45°.

With this arrangement the tiller *a* of the rudder instead of being directly secured to the head *b* of the rudder, as is usual, is carried by a fixed support *c* and turns freely around the head of the rudder. This tiller *a* is prolonged beyond the head of the rudder and its small arm *a'* is articulated to the middle of a cross-bar *d* which is itself articulated at each of its ends to one of the arms of two bell-crank levers *e*, *e'*, *f*, *f'* pivoted respectively to fixed supports *g* and *h*. The arms *e'* and *f'* of the bell-crank levers actuate by means of the slides *i* and *j*, the cross-piece *k* keyed on the upper end of the rudder head.

It will be understood that all movement to the left or right of the tiller *a* causes a movement of the cross-bar *d;* through the intermediary of the two-bell crank levers, the cross-piece *k* is actuated at two symmetrical points with relation to its axis which causes a coupling tending to turn it and therewith the rudder.

It will be seen from the preceding that a determined angular displacement of the tiller *a* of the rudder causes at the head *b* an angular displacement of greater amplitude which permits the rudder to obey more rapidly the impulses received. Inversely the efforts of the water tending to move the rudder, especially in the case of oblique positions of the same, are prevented by the arrangement itself, as may be seen from Fig. 3; when the thrust comes to the cross-piece *k*, the system without being absolutely irreversible will tend in effect to rest immovable. It results from this arrangement that should the chains of the tiller break the rudder will remain in its position or will be caused by the thrust of the water to straighten out to the line of motion of the vessel where it will be thereafter immovable as at this position, the efforts of the cross-piece *k* acting practically normally on the arms *e'* and *f'* of the bell-crank levers, the irreversibility of the system is practically absolute.

There may be fixed on the cross-piece *k* perpendicularly to its direction a rigid needle *l* which will always indicate the set of the rudder.

The inventor reserves a right to all applications of his transmission device, outside the controlling of rudders.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

A controlling device for rudders comprising in combination a tiller *a*, a support *c* on which the tiller is loosely mounted, a small extension *a'* of the tiller, a cross-bar *d* the middle of which is articulated to the free end of the extension *a'*, two bell-crank levers *e*, *e'* and *f f'* pivoted respectively to fixed supports and having one of their arms *e* and *f* pivoted respectively to the ends of the cross-bar *d*, slides *i* and *j* mounted respectively at the ends of the arms *e'* and *f'* of the bell-crank levers, and a cross-piece engaging the slides *i* and *j* and keyed on the upper end of the rudder head, substantially as described and for the purpose set forth.

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

FRANK GARDNER.

Witnesses:
ANTOINE LAVOIX,
LOUIS MOSES.