S. B. RALSTON.

APPARATUS FOR GRAPHICALLY ASCERTAINING THE STABILITY AND TRIM OF SHIPS UNDER ASSUMED LOADS.

APPLICATION FILED MAR. 11, 1920.

1,426,103.

Patented Aug. 15, 1922.

2 SHEETS—SHEET 1.

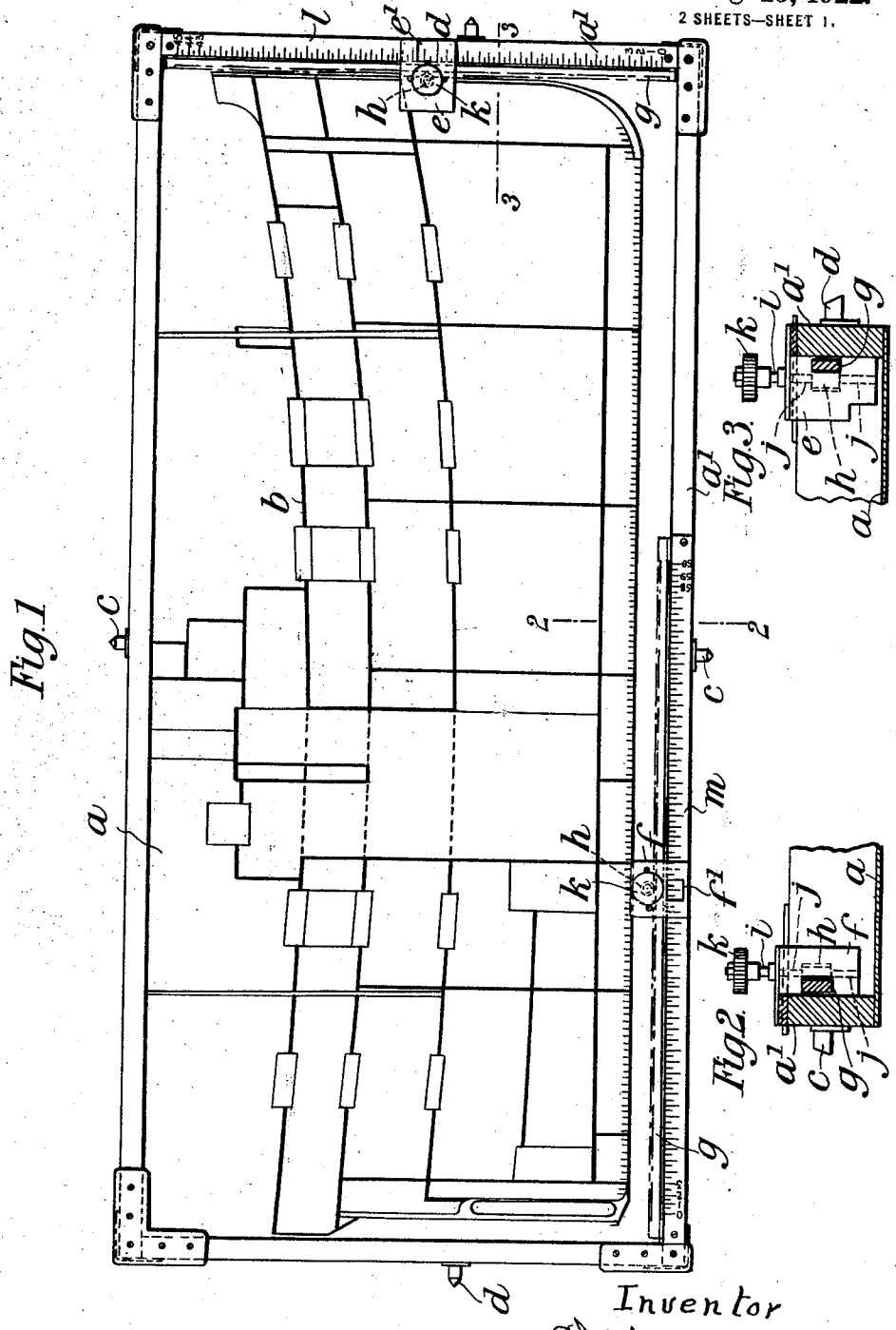


Fig. 1

Fig. 3

Fig. 2

Inventor
Shirley B. Ralston
George St. Brumbaugh
Atty.

S. B. RALSTON.

APPARATUS FOR GRAPHICALLY ASCERTAINING THE STABILITY AND TRIM OF SHIPS UNDER ASSUMED LOADS.

APPLICATION FILED MAR. 11, 1920.

1,426,103.

Patented Aug. 15, 1922.

2 SHEETS—SHEET 2.

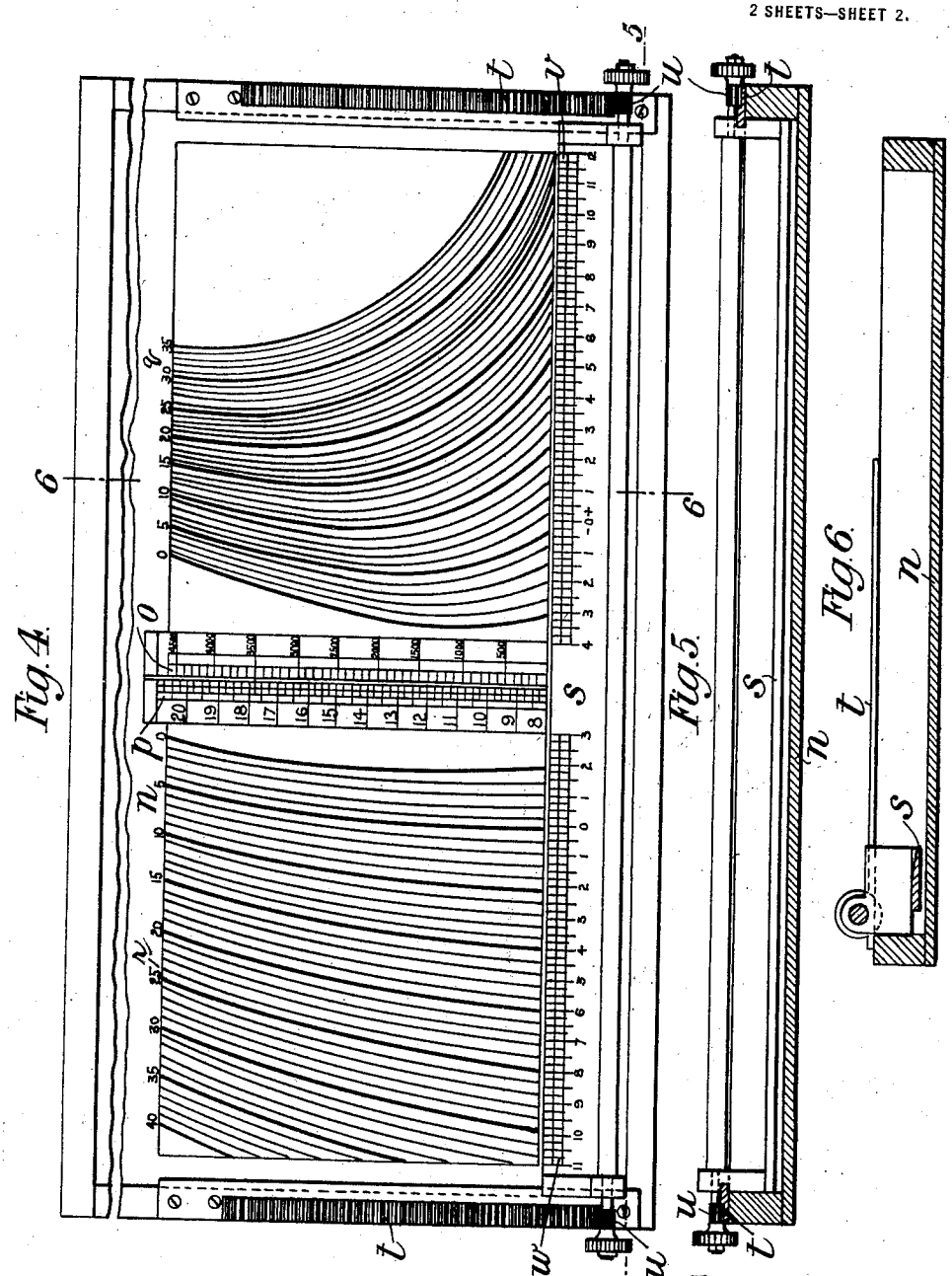


Fig. 4.

Fig. 5.

Fig. 6.

Inventor

Shirley B. Ralston

By

George A. Burnett

Atty.

UNITED STATES PATENT OFFICE.

SHIRLEY BROOKS RALSTON, OF GLASGOW, SCOTLAND.

APPARATUS FOR GRAPHICALLY ASCERTAINING THE STABILITY AND TRIM OF SHIPS UNDER ASSUMED LOADS.

1,426,103. Specification of Letters Patent. Patented Aug. 15, 1922.

Application filed March 11, 1920. Serial No. 364,983.

To all whom it may concern:

Be it known that I, SHIRLEY BROOKS RALSTON, a subject of the King of Great Britain, residing at Rosyth, Glenburn Road, Bearsden, Glasgow, Scotland, have invented new and useful Improvements in Apparatus for Graphically Ascertaining the Stability and Trim of Ships Under Assumed Loads, of which the following is a specification.

My invention relates to improvements in apparatus of the kind described in the specification of my former British Patent No. 11561 of 1910 for graphically ascertaining the stability and trim of ships under assumed loads.

Apparatus as described in my aforesaid former specification comprises a table bearing a longitudinal profile diagram of the ship in respect of which the calculations are to be made and designed to be supported alternately on longitudinal and transverse horizontal pivots, in combination with a counter-balancing platform or slide of known weight designed to be moved longitudinally on the table and furnished with a weighted counter-balancing arm movable transversely upon it.

The platform is marked with a "deadweight scale plan" and a G. M. or metacentric height scale and the counter balancing arm is marked with a G. M. scale corresponding with that upon the platform. Loose weights representing cargo or other load are also provided for use on the table.

Whilst the apparatus constructed as above described gives good results in practice yet a certain inconvenience is experienced in its manipulation owing to the fact that an appreciable area of the diagram is obscured by the platform.

The object of the present invention is to obviate this disadvantage and to this end I dispense with the longitudinally movable platform and substitute therefor a pair of weights adapted to be adjusted in position respectively along the transverse and longitudinal edge or rim of the table. For example, the movable weights may be caused to move by rack and pinion over transverse and longitudinal scales provided upon the table.

In conjunction with the table and movable weights there is also provided a board having marked upon it deadweight and draft scales and G. M. and trim curves and furnished with a longitudinally arranged and transversely adjustable bar marked with G. M. and trim scales. This bar can be adjusted in position in any convenient way, say by racks and pinions.

To enable the invention to be fully understood I will describe it by reference to the accompanying drawings, in which:—

Figure 1 is a plan view of the apparatus made according to the invention.

Figure 2 is a section on the line 2—2 Figure 1.

Figure 3 is a section on the line 3—3 Figure 1.

Figure 4 is a plan view of the scale board.

Figure 5 is a section on the line 5—5 Figure 4, and

Figure 6 is a section on the line 6—6 Figure 4.

Referring first to Figures 1 to 3, a indicates the table which has marked upon it the longitudinal profile diagram b of the ship in respect of which the calculations are to be made. As described in the specification of my former patent aforesaid, c, c and d, d are the knife edged trunnions by means of which the said table a can be mounted upon suitable supports (not shown) so as to turn on transverse and longitudinal axes, respectively. e and f are the two weights which are designed to be traversed along the transverse and longitudinal upstanding rims or edges a^1 of the table, respectively, this being effected, in the construction illustrated in the drawing, by means of the racks g, provided on the inside faces of the said rims, and pinions h gearing with the said racks and carried by upright pins i mounted in bearings j in the sliding weights e and f and furnished with milled heads k by means of which they can be turned. l is the transverse or G. M. scale which is fitted to the side of the table over which the weight e moves, and m is the trim scale which is provided on the longitudinal edge of the said table, and over which the weight f is traversed. To enable a reading to be taken by either of these scales each of the weights e and f is furnished with a window or opening e^1 and f^1, respectively, the inner edge of each being bevelled and marked with an arrow directed to the divisions on the scale.

n, Figures 4, 5 and 6, represents the scale board, which has marked upon it the deadweight and draft scales *o* and *p* and also G. M. curves *q* and trim curves *r*. The board is also fitted with the scale bar *s* which extends longitudinally across the said board, and is moved transversely thereof through the medium of the racks *t* and pinions *u*, and which bar is marked with the G. M. scale *v* and the trim scale *w*.

The apparatus is used as follows, that is to say, the loose weights are placed upon the profile diagram on the table in the proper positions to represent the assumed load or deadweight and, to ascertain the stability of the ship, the table is supported upon the transverse pivots *d* and the G. M. weight *e* adjusted in position until the table balances in the horizontal plane. The figure on the scale or register *l* indicating the position of the G. M. weight is then noted and the G. M. scale bar *s* adjusted on the scale board *n* until it coincides with the indication on the scale *o* of the assumed load. The point at which the G. M. scale of the bar *s* is intersected by the G. M. curve bearing the figure obtained by the adjustment of the G. M. weight on the table *a* gives the G. M. required.

A similar manipulation of the longitudinal weight *f* and pivots *c* enables the trim to be ascertained.

Claims:

1. An apparatus for graphically ascertaining the stability and trim of ships under assumed loads, comprising a diagram table, supporting means arranged along the longitudinal and transverse edges of said table, weights movably mounted upon said supporting means and means for sliding said weights thereon.

2. In apparatus of the kind herein described the combination with a diagram table having graduated longitudinal and transverse edges, of racks and pinions mounted along said respective edges, and a pair of weights adapted to be traversed through the medium of said racks and pinions, along said longitudinal and transverse edges respectively.

3. Apparatus of the kind herein referred to comprising a table provided with a longitudinal profile diagram of a ship and having its longitudinal and transverse edges marked with the trim and G. M. scales, supporting means arranged along said longitudinal and transverse edges and a pair of weights slidable thereon and adapted to be adjusted in position along said scales.

SHIRLEY BROOKS RALSTON.