



J. FRASER & C. JUMEAUX.  
 APPARATUS FOR RECORDING DEVIATIONS IN THE COURSE OF A VESSEL.  
 APPLICATION FILED OCT. 5, 1907.

939,999.

Patented Nov. 16, 1909.  
 4 SHEETS—SHEET 2.

FIG. 3.

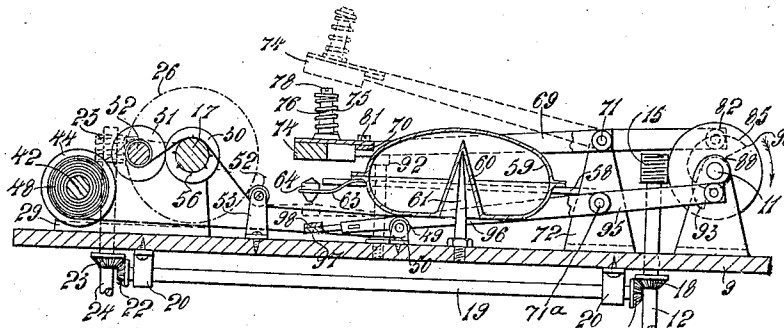


FIG. 4.

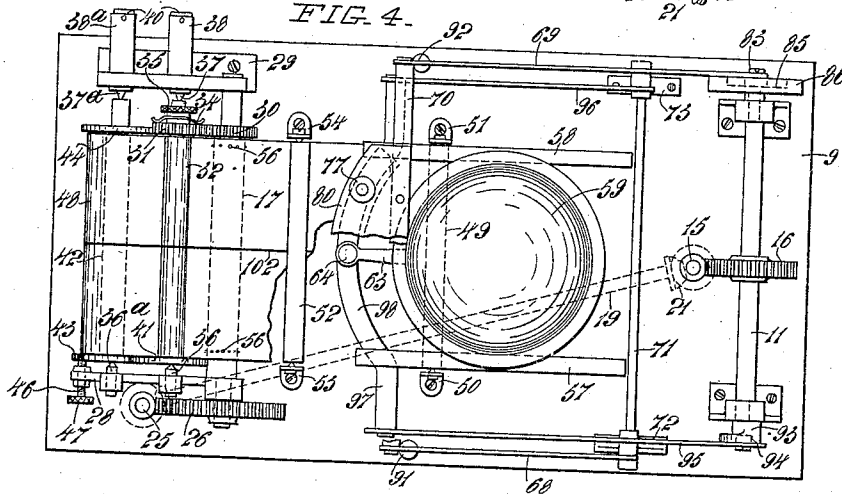


FIG. 5.

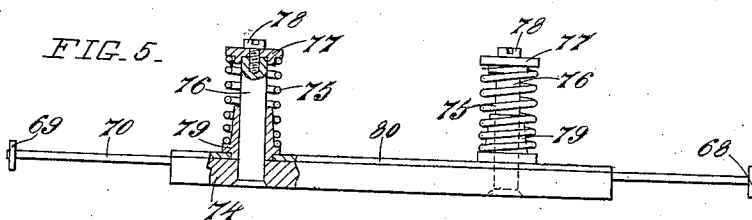
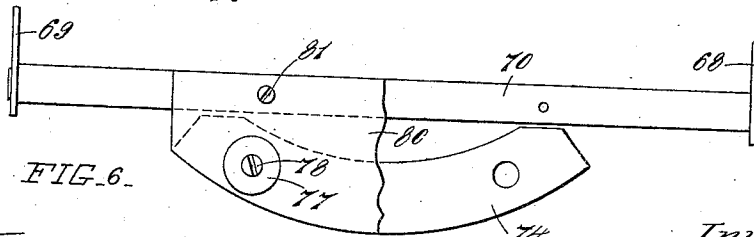


FIG. 6.



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FIG. 7.

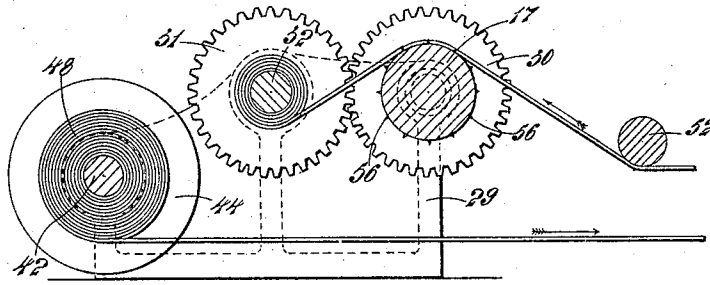


FIG. 8.

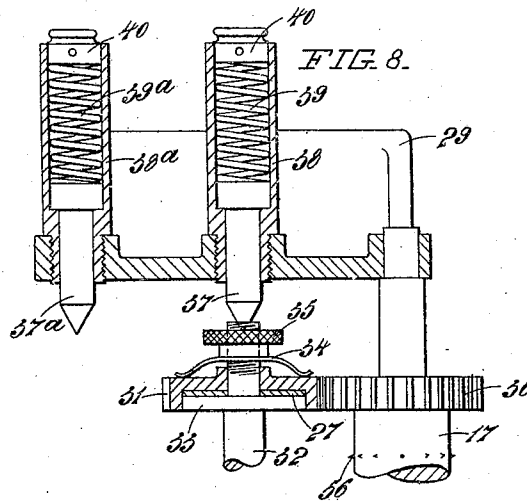


FIG. 9.

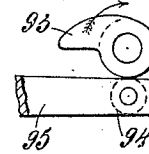


FIG. 10.

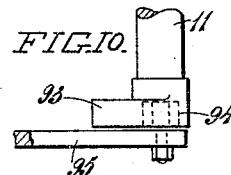


FIG. 11.

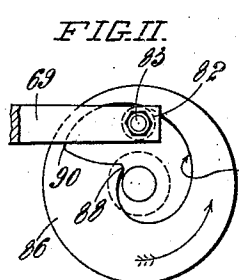


FIG. 13.

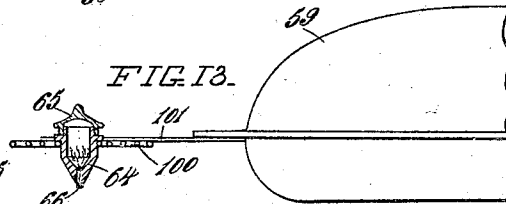


FIG. 12.

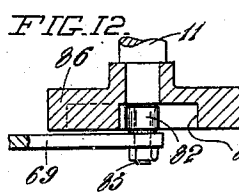
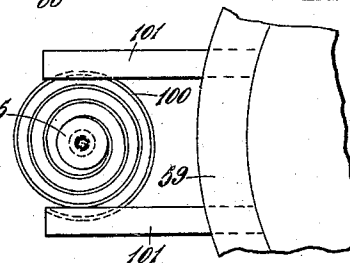


FIG. 14.



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4 SHEETS—SHEET 4.

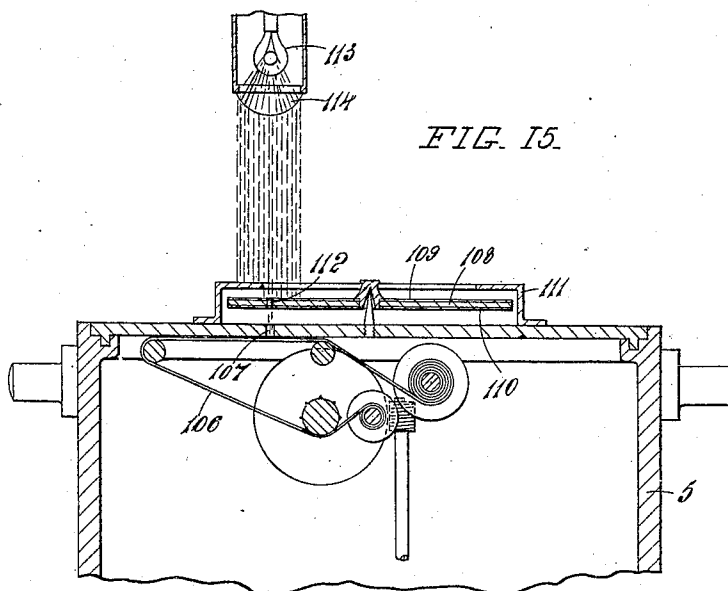


FIG. 15.

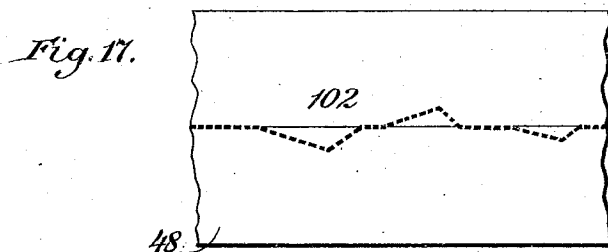


Fig. 17.

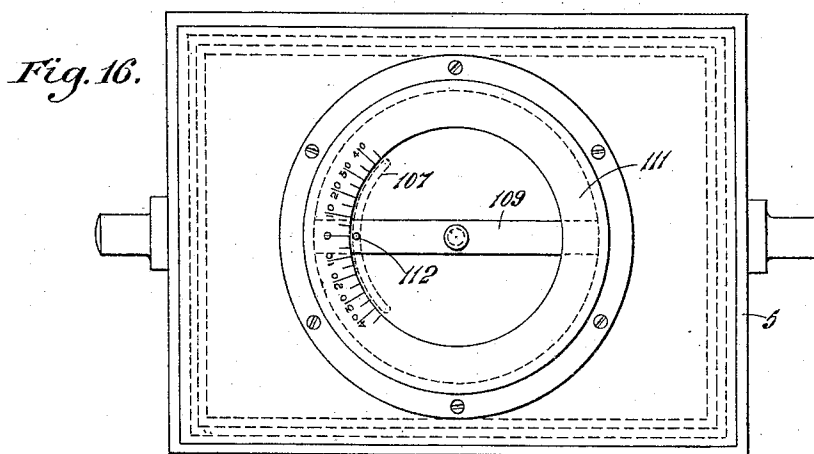


Fig. 16.

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# UNITED STATES PATENT OFFICE.

JOSEPH FRASER AND CHARLES JUMEAUX, OF AUCKLAND, NEW ZEALAND, ASSIGNORS  
OF ONE-THIRD TO SAMUEL EDGAR FRASER, OF WAIHI, NEW ZEALAND.

APPARATUS FOR RECORDING DEVIATIONS IN THE COURSE OF A VESSEL.

939,999.

Specification of Letters Patent.

Patented Nov. 16, 1909.

Application filed October 5, 1907. Serial No. 396,090.

*To all whom it may concern:*

Be it known that we, JOSEPH FRASER and CHARLES JUMEAUX, subjects of His Majesty the King of Great Britain and Ireland, residing at Phoenix Foundry, Stanley street, Auckland, in the Provincial District of Auckland, in the Colony of New Zealand, have invented certain new and useful Improvements in Apparatus for Recording Deviations in the Course of a Vessel, of which the following is a specification.

This invention provides apparatus for recording deviations made by a vessel from its true course, and whereby the captain of the vessel can ascertain such deviations without leaving his cabin.

Our invention consists of apparatus, to be hereafter described, whereby the deviations of a vessel to starboard or port from its true course are recorded upon a ribbon of paper. We employ a magnetic needle in connection with our apparatus and in order that the accuracy thereof may not be interfered with, it is essential that the needle or any attachment thereof should not be in continuous contact with any fixed object, except its central pivot. We attain these objects by our mechanism, which is illustrated in the accompanying drawing wherein:—

Figure 1 is a sectional elevation, and Fig. 2 a plan in diagrammatic form of a general arrangement of the apparatus; Fig. 3 is a sectional elevation, and Fig. 4 a plan of the apparatus; Fig. 5 is a front elevation, and Fig. 6 a plan of a striker; Fig. 7 a sectional elevation of paper feed rollers; Fig. 8 a plan of bearings of paper ribbon feed-rollers; Fig. 9 an elevation; and Fig. 10 a plan of a cam and its operative parts; Fig. 11 an elevation, and Fig. 12 a sectional plan of another cam and its operative parts; Fig. 13 an elevation, and Fig. 14 a plan of an inking device, Fig. 15 a sectional elevation, Fig. 16 a plan of apparatus used with sensitized paper and Fig. 17 illustrates a portion of a blank having a record thereon.

Referring, firstly, more particularly to Figs. 1 and 2, the apparatus is contained in a portable box, 1 provided with bearers, 2, secured therein and made of brass, wood or other non-magnetic material. A gimbal, 3, is pivoted at its sides upon trunnions, 4, to the bearers, and a casing, 5, is pivoted upon trunnions, 6, to the ends of the gimbal.

The casing (5) is continued downward,

and contains a battery, 7, and an electric motor, 8, some distance below a platform 9, whereon the mechanism is mounted, in order to prevent magnetic waves set by the motor from influencing the needle. The rotation of the motor shaft, 10, is communicated to a shaft, 11, by a vertical shaft, 12, operated by a worm pinion, 13, upon shaft 10, and gearing with a worm wheel, 14, upon the aforesaid shaft 12, gearing with a worm wheel, 16, upon the shaft 11. A paper ribbon-feed-roller 17, is driven by a miter wheel, 18 (upon shaft 12) gearing with a miter wheel 21, upon a shaft 19, mounted in bearings, 20, and fixed to the platform 9 and having at its other end another miter wheel, 22, gearing with a miter wheel 23, fixed upon a vertical shaft, 24, the latter being provided with a worm, 25, gearing with a worm wheel, 26, secured upon the roller 17.

Referring now more particularly to Figs. 3, 4 and 5, the roller 17 is mounted in brackets, 28, and 29, and has secured upon it a toothed wheel, 30, gearing with a correspondingly-sized toothed wheel, 31, freely mounted upon another roller 32, which has a collar, 33, fitting into a recess formed on the wheel 31 (see Fig. 8). Friction between the collar and the wheel is obtained by a washer 27 of soft material (such as cork or leather) and by a spring, 34, in compression between the wheel 31 and a nut, 35, screwed upon the end of the roller, which is carried upon a fixed pointed pivot 36, and another pointed pivot, 37, slidable telescopically in a casing, 38, fixed to the bracket, 29. A spring, 39 (see Figs. 4 and 8) in compression between the end of the pivot, 37, and a cap, 40, screwed or otherwise fastened to the casing, normally projects the end of the pivot from the casing. The roller has a flange, 41, integral with its end. Another roller, 42, having integral flanges, 43, and 44 is mounted similarly to roller 32, between a pivot 36<sup>a</sup> and a pivot 37<sup>a</sup> which is slidable within the casing 38<sup>a</sup> under operation of the spring 39<sup>a</sup> the roller being controlled by a friction brake consisting of a screw 46, screwed through the bracket 28, and bearing upon the periphery of the flange 43 the screw being turnable by a milled head, 47.

A ribbon, 48, of paper is coiled upon the roller 42, passes around a guide roller, 49 (see Figs. 3 and 4) pivoted in bearings, 50 and 51, secured to the platform, 9, and after

passing below a guide roller 52 (see Fig. 7) pivoted in bearings 53 and 54, passes over the roller 17, and has its end secured by gunning or otherwise to the roller 32.

5 Pointed pins 56, projecting from the roller 17, perforate the paper ribbon to obtain a grip upon the paper and mark divisions thereon.

The magnetic needles (see Figs. 3 and 4) 10 comprise two magnetic bars 57 and 58, which are fixed diametrically opposite each other upon a boss 59, having a recess, 60, the apex of which is above the center of gravity of the parts and is adapted to receive the point 15 of a pivot pin, 61, secured to the platform 9.

An inking device (see Figs. 3 and 4, and also Figs. 13 and 14 illustrating a modification hereinafter described) is attached to the boss 59, by a light spring, 63, and comprises 20 a vessel 64, secured to the end of the spring and having a cap 65. A wick, 66, passes through a hole in the bottom of the vessel. Ink introduced into the vessel percolates through the wick. The ink used for damp- 25 ing pads for rubber stamps is suitable for this purpose.

Levers 68 and 69 (see Figs. 3 to 6 inclusive) united at their ends by a cross bar 70, are pivoted upon a shaft, 71 mounted in 30 bearings 72 and 73. The bar 70 carries a striker comprising a weight 74, suspended upon coil springs 75, by pins, 76, secured to the weight and passing through the springs. Caps 77, secured to the springs by screws 78, 35 rest upon the top of the springs. Sockets, 79, forming guides for the pins 76, are fixed to a plate 80, which is fixed, by screws 81, to the bar, 70.

The lever 69 (see Figs. 3 4 11 and 12) is 40 extended rearwardly and has lateral roller 82 mounted upon a stud 83. This roller is engaged by an internal periphery 85 of a recessed cam 86. When the cam, which is fixed to the shaft 11, is rotated in the direction 45 shown by the arrow the roller 82 is brought, by the periphery 85, toward the center of the cam, until the point 88, is reached, when the roller is suddenly released and rises toward the corner 90, the fall of 50 the striker being arrested by the before-mentioned levers 68 and 69, falling upon stops 91 and 92 fixed to platform 9 (see Figs. 3 and 4). Another cam 93 (see Figs. 3, 4, 9 55 and 10) secured upon the other end of the shaft 11, contacts with a roller, 94, pivoted upon the end of a lever 95, which, with a corresponding lever 96, is pivoted upon a shaft 71<sup>a</sup>, as shown in Fig. 4. A bar, 97, 60 unites the ends of the levers, 95 and 96, and carries a pad 98.

The weight, 74, the bar, 97, and pad 98, are curved to correspond to the travel of the inking device 64.

Figs. 13 and 14 illustrate a modification 65 and therein the inking device is shown as

supported upon a coil spring, 100, attached to bars 101, secured to the boss 59. To place the apparatus in operative position, the box is placed so that a center line 102 (see Fig. 4) marked upon the paper ribbon is below 70 the inking device, which (under the influence of the magnets 57 and 58) points toward the north. The motor is started, to wind the paper ribbon from roller 42, and upon roller 32, at an even rate of speed. 75 The cams 86 and 93 being also rotated by the motor, the pad 98 and the striker are raised to the positions shown by dotted lines in Fig. 3, the pad slightly raising the paper. The striker then descends and the plate 80 80 is arrested by the levers 68 and 69 falling upon the stops 91 and 92, while weight 74 compresses its springs and strikes the top of the inking device thereby imprinting a dot of ink, supplied by the wick, 66, upon the 85 paper. The weight immediately thereafter rises and the pad simultaneously falls, leaving the needle free to move. The cycle of operations is repeated as often as desired, and so long as the vessel remains upon its 90 true course a series of dots will be imprinted along the center line of the paper but when the vessel swerves from its true course the box swings with the vessel, but the inking device, being prevented from swerving by 95 the needle continuing to point due north, will print dots to the left or right, as the case may be, of the center line, or line extending lengthwise of the paper and parallel with both side edges thereof. Extent of the 100 distance of the dots, to the right or left of the center line, will give a rough indication that the vessel has deviated from its true course. It is immaterial to the working of the apparatus that while the ship's compass 105 is pointing directly west, for example, the center line has to be placed north and south, to start with, because if the vessel is steering west and deviates from that course, the center line will deviate also and the inking device will then make marks to the right or 110 left of the center line. At every change in the course of the vessel the apparatus is adjusted to make the center line point due north and south. This follows as the needle 115 will always, of course, point north and south. The adjustment is effected by hand, by an officer, who merely turns the apparatus around, on whatever support it may happen 120 to be, so that the north and south points of the compass lie north and south with the needle.

Referring now to Figs. 15 and 16, which illustrate a modification, a ribbon, 106, of 125 sensitized paper is traversed below a curved slot, 107, in the top of the casing 5, which, in this case, is made light-proof. The needle comprises a disk, 108, carrying magnetized bars, 109 and 110, extending across—the one 130 above and the other below the disk. A cap

111, surrounds the disk as a protection there-  
to, and having its inner surface coated with  
lamp black obstructs the access of light  
which might otherwise find its way through  
5 slot 107. Small registering holes 112,  
through the disk 108 and bars 109 and 110,  
admits a ray of light from a lamp, 113, hav-  
ing a lens 114, through holes 112, and thence  
10 through the slot 107. As the paper (which  
is sensitized to light) travels, the ray of  
light acts thereon, and, upon removing and  
developing the paper, a line will appear,  
showing any deviations the vessel may have  
taken from its true course.

15 What we do claim and desire to secure by  
Letters Patent of the United States is:—

1. The combination, with a magnetic needle  
and a gimbal supporting medium there-  
for, of an inking device, a spring connecting  
20 the inking device with the needle, a striker  
above the inking device, a pad below the  
inking device, means for operating the  
striker, and means for moving a ribbon of  
paper between the inking device and the  
25 pad.

2. In apparatus of the class described, an  
inking device and a striker, one of said parts  
being movable around a vertical axis, said  
striker comprising levers pivoted to oscil-  
30 late vertically, a weight upon the ends of  
the levers and springs supporting the said  
weight. In combination with stops where-  
on the levers fall, and means for oscillating  
the levers.

35 3. The combination with a magnetic needle  
and a gimbal supporting medium therefor,  
of an inking vessel having a hole in its bot-  
tom, a cap applied to the vessel, a wick pass-

ing through the hole aforesaid, means for  
moving a ribbon of paper near to said wick 40  
and comprising a roller upon which a paper  
ribbon may be coiled, a roller for receiving  
paper, a tooth wheel mounted on the second  
named roller, frictional means between said  
roller and the tooth wheel, a second tooth 45  
wheel gearing with the first tooth wheel, a  
roller to which the second tooth wheel is  
fixed, pins projecting radially from the last  
mentioned roller, means for guiding papers  
to the rollers, means for temporarily sup- 50  
porting the paper while passing between  
the rollers, and means for striking the ink-  
ing device while the paper is so supported.

4. In apparatus of the class described, an  
inking device mounted for movement about 55  
a vertical axis, a striker adapted to strike  
the inking device in any position, means to  
rock said striker, a movable platen, means  
for rocking said platen to and from the ink-  
ing device, and means for moving a paper 60  
ribbon between said inking device and  
platen.

5. In an apparatus of the class described,  
an inking device mounted for movement  
about a vertical axis, and comprising a coiled 65  
spring, an inking reservoir carried by the  
free end of said spring and a wick leading  
from said reservoir.

In testimony whereof we have signed our  
names to this specification in the presence of 70  
two witnesses.

JOSEPH FRASER.  
CHARLES JUMEAUX.

Witnesses:

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HAROLD L. GOODE.