D. CARROLL.

Ship's Log.

No. 197,995. Patented Dec. 11, 1877.

Fig: 1

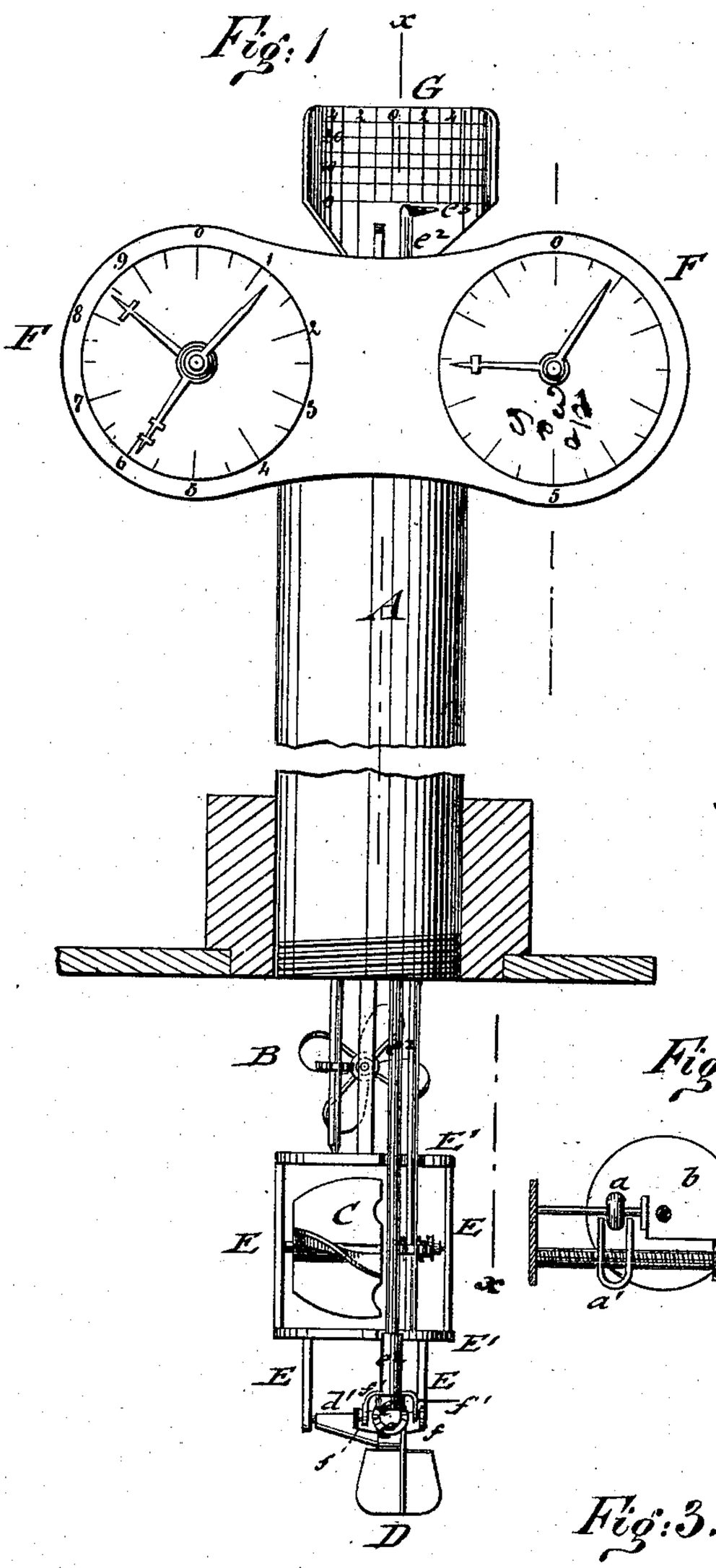


Fig: 2.

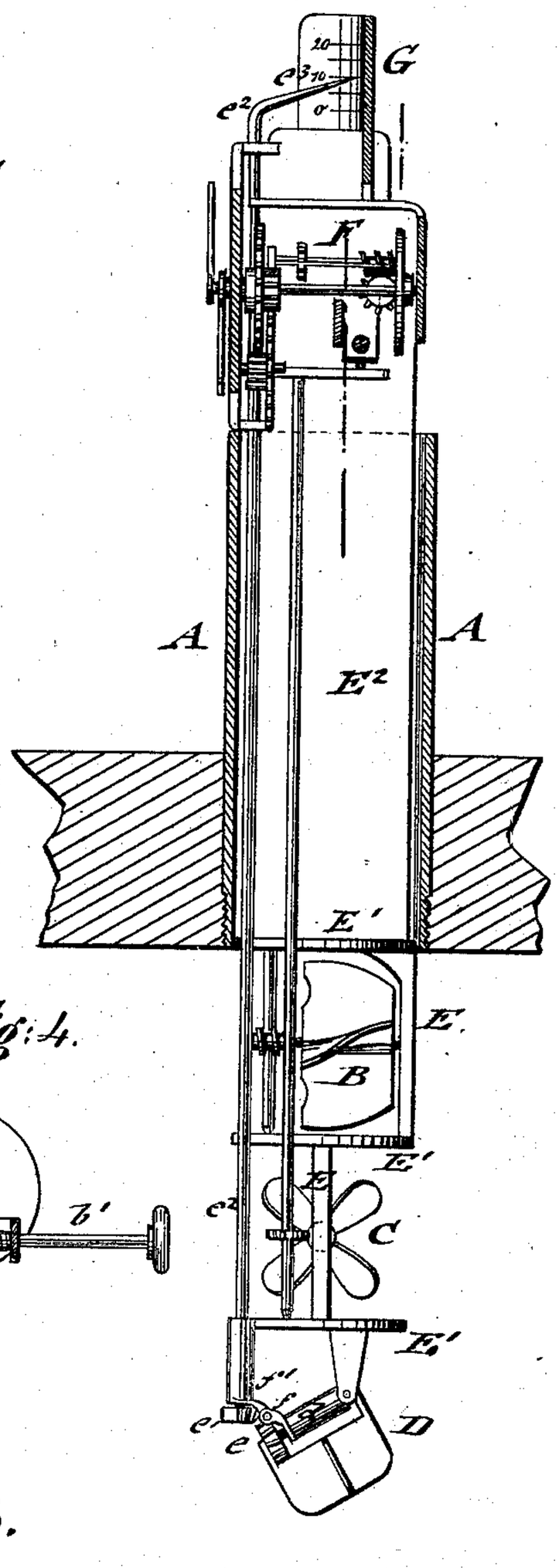
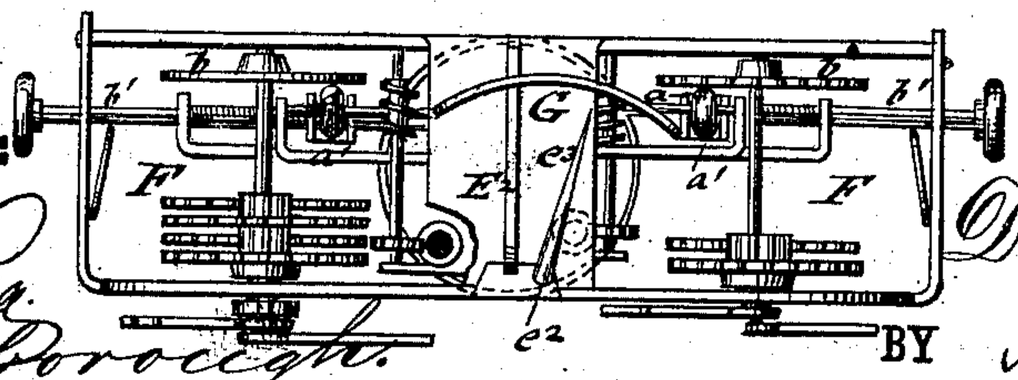


Fig: 4.

Fig: 3.



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UNITED STATES PATENT OFFICE.

DAVID CARROLL, OF SPRING CREEK, PENNSYLVANIA.

IMPROVEMENT IN SHIPS' LOGS.

Specification forming part of Letters Patent No. **197,995**, dated December 11, 1877; application filed September 14, 1877.

To all whom it may concern:

Be it known that I, DAVID CARROLL, of Spring Creek, county of Warren, and State of Pennsylvania, have invented a new and Improved Nautical Log, of which the following is a specification:

In the accompanying drawing, Figure 1 represents a rear elevation of my improved nautical log; Fig. 2, a vertical transverse section of the same, taken on line *x x*, Fig. 1, parallel to the longitudinal axis of the vessel to which the log is applied; Fig. 3, a top view of the log; and Fig. 4 shows a detail view of the adjusting-screw for regulating the motion of the registering-hands.

Similar letters of reference indicate corresponding parts.

This invention relates to an improved nautical log, which indicates automatically, on suitable registers, the forward and drifting motion of the vessel, also the speed of the same, so as to form, in connection with the time, a true record of the progress and speed of the vessel.

The invention consists of a tube passing down through the bottom of the vessel and form ng a well-hole below, in which two revolving wheels or screws are arranged, of which the upper is placed parallel to the longitudinal axis of the vessel, the lower at right angles to the same. The revolutions of the screws are indicated by suitable transmitting-gearing and registering apparatus inside of the vessel. Below the screws is arranged a longitudinally and laterally swinging speed-indicator, that works a pointer along a graduated plate.

Referring to the drawings, A represents a tube with outer screw-thread at lower end, which passes through the bottom of the vessel, and is screwed into the same. The tube reaches up to the first deck, and forms thus a well, through which the working parts of the log are lowered until they extend below the bottom of the vessel. In case of iron or other vessels where the well-tube cannot be screwed in, the same may be secured by flanged bolts and suitable packing, or in other reliable manner.

The operating parts consist of an upper water-wheel or screw, B, whose shaft is arranged parallel to the longitudinal axis of the vessel, of a second water-wheel or screw, C, below the former, with the shaft at right angles to the axis of the vessel, and of a speed-indicator, D, below the second wheel. The wheels and indicator turn in supporting-posts E of horizontal disks E^1, which form the downward extension of a central support or frame, E^2, extending from the bottom of the vessel upward through the well, as shown in Figs. 1 and 2. The wheels C and D gear, by worm-wheels of their shafts, with intermeshing bevel-wheels of upright shafts, which at their upper ends connect, by suitable worm-gearing, with separate registering apparatus F, of which one is worked by the upper, the other by the lower, wheel. The upper wheel is revolved by the action of the water during the forward motion of the vessel, while the leeway-wheel is worked by the action of the water when the vessel is drifting. The registering-dial of the latter has two hands, which run up to hundred miles, when the captain has to tally, the hands serving to indicate either way the vessel is drifting by going forward or backward. The registering-dial of the upper wheel has three hands, and is arranged to indicate one thousand miles. The registering apparatus may be arranged at some distance from the well-hole, as the upper transmitting worm-gear admits the working of the same in any direction from the well-hole.

Each registering apparatus F is provided with a transmitting friction-pulley, *a*, and disk *b*, in connection with an adjusting-screw, *b'*, and traversing-nut *a'*, which admits the changing of the friction-pulley to greater or less distance from the center of the disk, and thereby the regulating of the motion of the hands, so that they indicate the exact distance made by the vessel, causing the hands either to run faster or slower, as required.

The speed-indicator D is constructed of four blades, which intersect each other at right angles. The indicator is hung for lateral motion to an inclined shaft, *d*, which is, by rectangular arms *d'*, pivoted to the posts E of the lowermost plate or disk E^1. The rear part of shaft *d* gears, by a segmental pinion, *e*, with a mutilated pinion, e^1, of a vertical shaft, e^2, that carries at its upper end a pointer, e^3, which passes along an arc-shaped and graduated plate, G. The swinging shaft *d* is furthermore pivoted by a forked rear portion, *f*, to fixed

side arms f' of the shaft e^2, so that this two-fold connection of the indicator, which is also arranged with return-springs, renders the mechanism capable of indicating the speed for forward or backward motion of the vessel, as well as for the drift motion of the same. The forward motion is indicated by the raising of the pointer on a vertical scale of plate G, and the draft motion on a lateral scale of the same. The faster the vessel goes the higher the pointer is raised, and the faster it drifts the more the pointer is turned sidewise, by means of the segment-gear. Thus a reliable record of the progress of the vessel and of the speed of the same may be obtained at any moment, and in more convenient manner than by the devices at present in general use.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A nautical log constructed of water-wheels or screws extending below the bottom of the vessel, and being placed at right angles to each other, and of suitable transmitting and registering devices inside of the vessel, for indicating the forward and drift motions of the vessel, substantially in the manner described, and for the purpose specified.

2. The nautical log constructed of water-wheels or screws arranged below the bottom of the vessel, one in the direction of the axis of the vessel, the other at right angles thereto, and of a speed-indicator arranged for forward and drift motion below the screws, in connection with suitable registering apparatuses and graduated scale, substantially as specified.

3. The combination of the longitudinally and laterally swinging and spring-acted speed-indicator, formed of four rectangular blades, with the segment and forked gear of a vertical transmitting-shaft having pointer at end, and with an arc-shaped graduating-plate having a vertical and lateral scale, substantially as and for the purpose specified.

DAVID CARROLL.

Witnesses:
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