(No Model.)

A. KURREICK.

HYDROSTATIC SHIP'S LOG.

No. 308,502. Patented Nov. 25, 1884.

Fig: 1

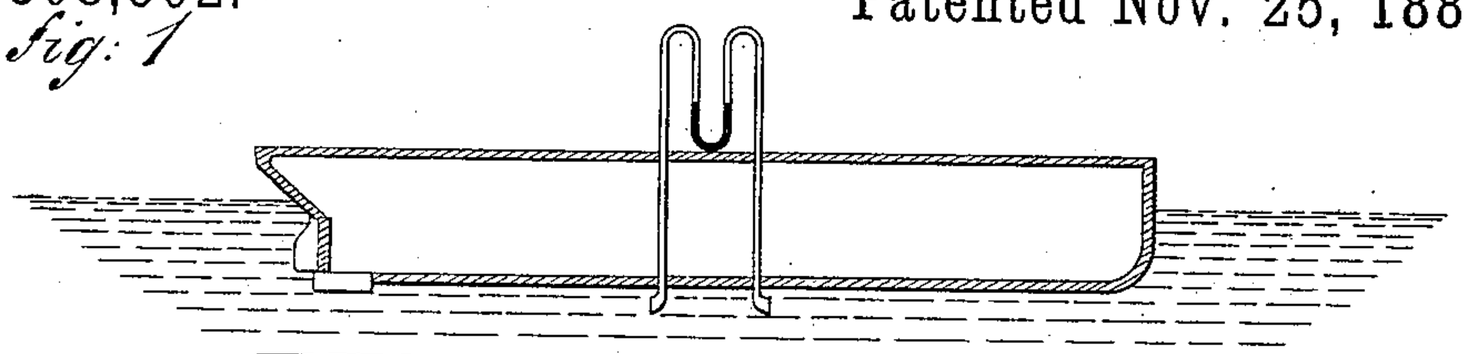


Fig: 3.

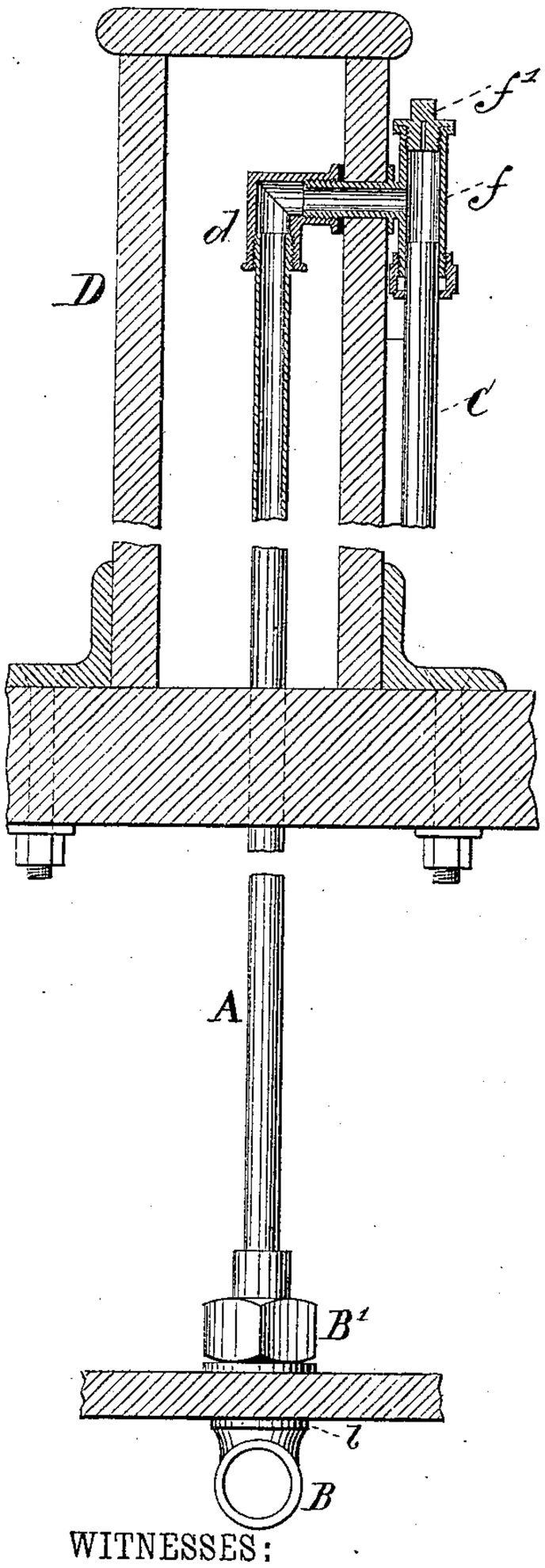


Fig: 2.

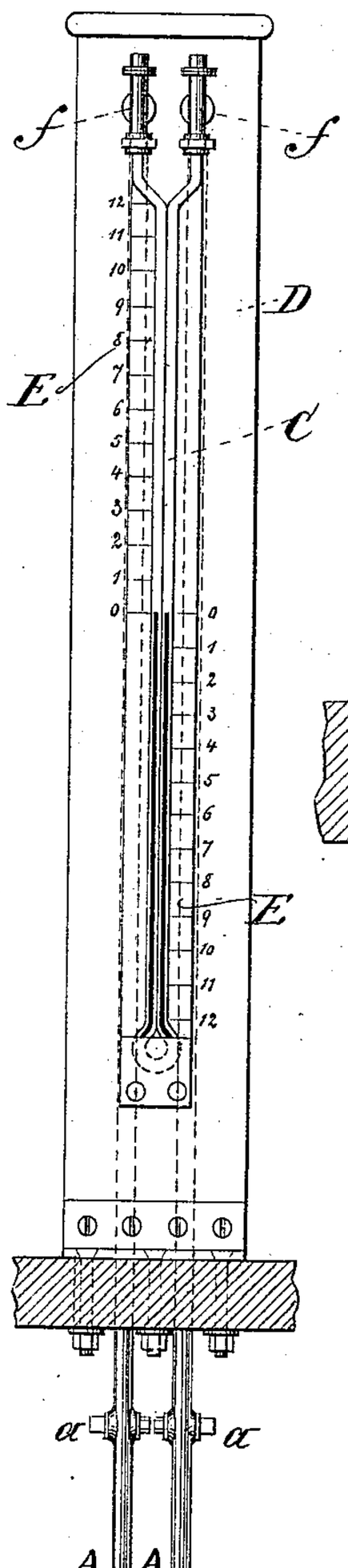
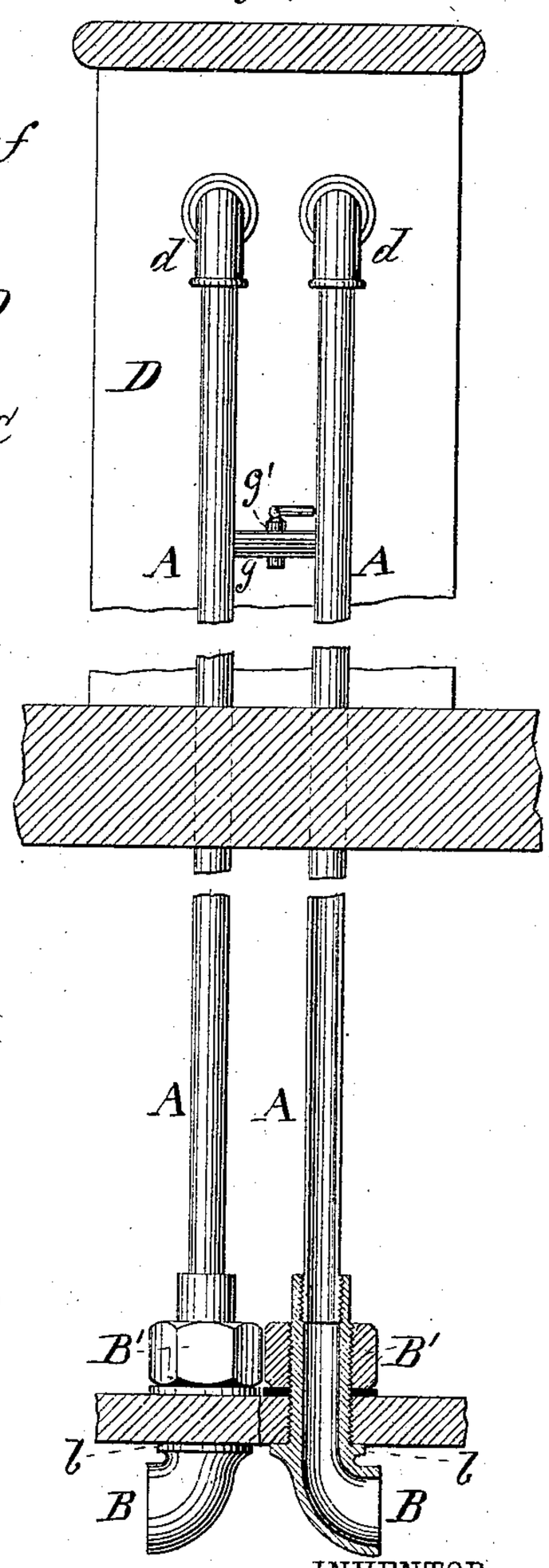


Fig: 4.



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HYDROSTATIC SHIP'S LOG.

SPECIFICATION forming part of Letters Patent No. 308,502, dated November 25, 1884.

Application filed May 17, 1884. (No model.)

To all whom it may concern:

Be it known that I, ADOLPH KURREICK, of the city, county, and State of New York, have invented certain new and useful Improvements in Hydrostatic Ships' Logs, of which the following is a specification.

This invention has reference to an improved hydrostatic ship's log by which the velocity of the vessel is automatically announced by the falling and rising of a column of mercury in a U-shaped glass tube arranged on the deck of the vessel, so that the troublesome measuring with the log-line heretofore in general use is dispensed with.

The invention consists of two vertical tubes extending from the deck downward through the bottom of the vessel, the lower ends having bent scoop-shaped ends parallel to the axis of the vessel, said enlarged ends extending in opposite direction to each other. The upper ends of said tubes are connected to a U-shaped glass tube that is partly filled with mercury, and a scale arranged back of the glass tube along both legs of the same.

In the accompanying drawings, Figure 1 represents a diagram of a vessel with my improved hydrostatic log. Fig. 2 is a front elevation of the log drawn on a larger scale. Fig. 3 is a vertical transverse section; and Fig. 4 a rear elevation of the same, partly in section.

Similar letters of reference indicate corresponding parts.

In the drawings, A A represent two vertical stand-pipes, which are arranged at a suitable point on the deck of a vessel and extended through the deck and hull of the same into the water.

To the lower ends of the vertical stand-pipes A A are attached by suitable couplings the bent and enlarged ends B, which extend in the direction of the longitudinal axis of the vessel, but in opposite direction to each other. The enlarged ends B are preferably made of scoop or funnel shape, so as to facilitate the induction of water into the same. The stand-pipes A A are secured to the hull by exterior shoulders, *b b*, and screw-nuts B′ at the inside of the hull. The stand-pipes A A are provided with stop-cocks *a a* near the lower ends, and are connected at their upper ends by elbows *d* and T-pipes *f*, with a downwardly-extending glass pipe, C, as shown in Fig. 3. The upper ends of the T-pipes *f* are closed by plugs *f′*, which are screwed into said pipes. The bent lower part of the U-shaped glass pipe C is filled with mercury by removing the plugs *f′ f′*, and the space above the mercury and the glass pipe and above the stop-cocks in the stand-pipes filled with water. The stand-pipes A A are inclosed above deck by a protecting-casing, D, at the front part of which the glass pipe C is supported. The front part of the casing D is graduated, beginning with zero at the level of the mercury and extending downward along one leg and upward along the other leg of the glass pipe C, as shown in Fig. 2. On opening the stop-cocks *a a* the water enters into the lower part of the stand-pipes A A, so that one continuous column of liquid and air is obtained in the stand-pipes and bent glass tube C. When the vessel is not in motion, the pressure on both sides of the column in the stand-pipes and glass tube is the same, so that the mercury is at the zero-point of the scales. As soon as the vessel is moved forward the pressure of the water is increased in that stand-pipe the funnel-shaped end of which is in the direction of motion, so that the column of water is raised, and consequently the level of the mercury in that leg of the bent glass tube C next adjoining said stand-pipe lowered, and raised in the other leg of the tube C until the weight of the mercury raised in the second part counterbalances the increased pressure at the lower end of the induction stand-pipe. When the vessel is moved in opposite direction, the same operation takes place, but in opposite direction. As the pressure of the column of water in the induction stand-pipe increases according to the velocity of the vessel, said velocity can be stated every moment by the different levels of the column of mercury on the scales back of the same. The pipes A A and the legs of the U-shaped pipe C have to be arranged closely together, so as to avoid the influence of the rocking motion of the vessel. The height of the stand-pipes A A and glass pipe C has to be such that the pressure exerted by the maximum velocity of the vessel on the continuous column of water and mercury in said pipes cannot force the mercury from the glass pipe into the stand-

pipes. Two scales, E and E′—one for the lower, the other for the upper, level of the column of mercury—are employed, so as to compensate for the difference of levels caused by the expansion and contraction of the mercury owing to the changes of temperature. When the vessel is in a normal position of rest, the level of the mercury would not usually register with the zero-points of the scales, but rise either above or fall below the same, according to the temperatures. By reading off the position of the mercury on both scales the mean of the two readings gives the velocity of the vessel. If it be not desired to compensate the difference of temperatures in the manner described, it may also be accomplished by modifying the pressure on the column of water in the stand-pipes, which is accomplished by a lateral connecting-pipe, *g*, having a stop-cock, *g′*, at the upper end of the pipes A A, back of the glass tube C, as shown in Fig. 4. By partly opening the stop-cock *g′* the pressure in the stand-pipes may be reduced, and thereby the correct velocity read off directly on the scales. As this requires, however, a delicate adjustment of the stop-cock *g′* in connection with the varying temperatures, I prefer the former method for compensating the effect of the difference in temperature in the mercury.

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

1. A hydrostatic ship's log having two pipes with elbows at their upper and lower ends, extending through the deck and bottom of the vessel, the lower elbows having flaring mouths, and provided with shoulders and screw-nuts for clamping the pipes to the ship's bottom, and a double tube with two columns of mercury, and a scale for each column, substantially as described.

2. The combination of two stand-pipes, A A, having bent funnel-shaped terminals B B outside of the hull, said terminals extending in the direction of the longitudinal axis of the vessel and in opposite direction to each other, a U-shaped glass pipe, C, partly filled with mercury, and connected by elbows *d d* and T-pipes *f f* with the upper ends of the stand-pipes, the T-pipes having screw-plugs *f′ f′*, and of stop-cocks *a a*, near the lower ends of the pipes A A, substantially as set forth.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

ADOLPH KURREICK.

Witnesses:
PAUL GOEPEL,
SIDNEY MANN.