2 Sheets—Sheet 1.

D. IFFLAND.

SPEED AND CURRENT INDICATOR.

No. 190,045. Patented April 24, 1877.

Fig. 1.

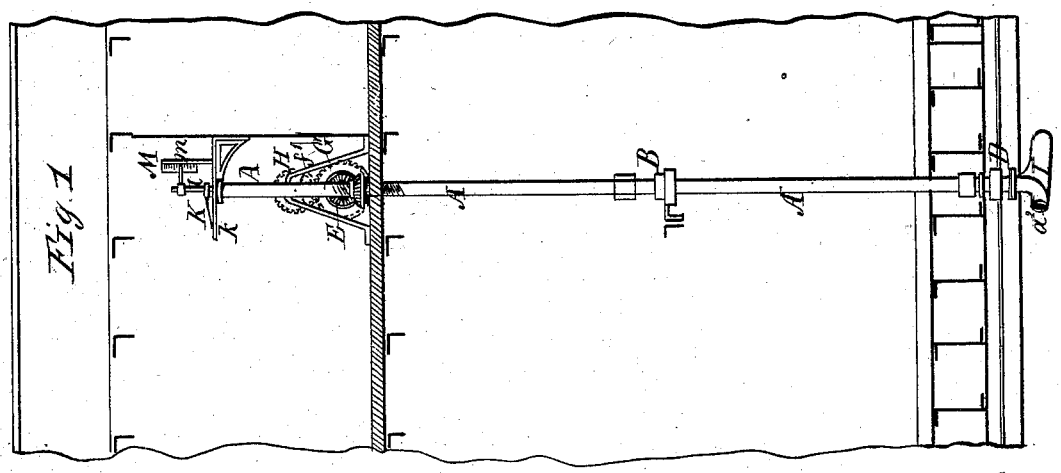
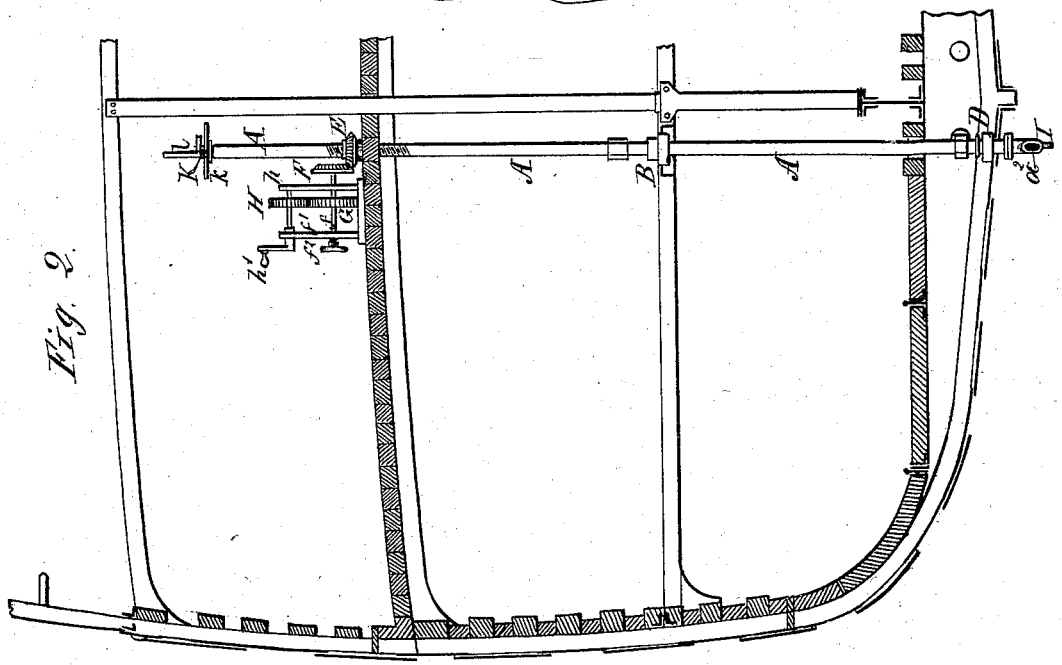


Fig. 2.



Witnesses
Alfred L. Leonard
Henri Guillaume

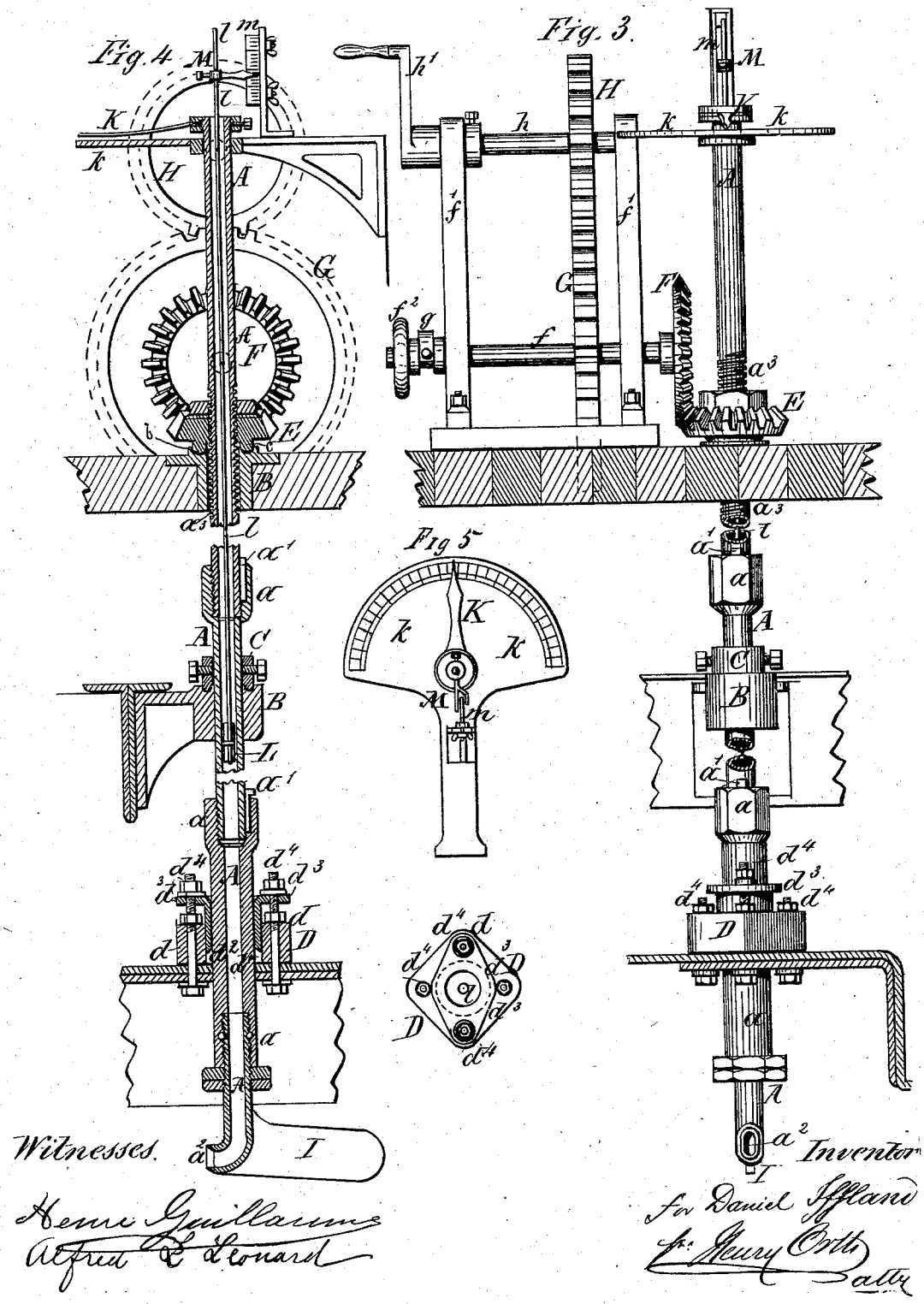
Inventor
for Daniel Iffland
per Henry Orth

2 Sheets—Sheet 2.

D. IFFLAND.

SPEED AND CURRENT INDICATOR.

No. 190,045. Patented April 24, 1877.



UNITED STATES PATENT OFFICE.

DANIEL IFFLAND, OF HAMBURG, GERMANY, ASSIGNOR OF ONE-HALF HIS RIGHT TO ERNST HADENFELD, OF SAME PLACE.

IMPROVEMENT IN SPEED AND CURRENT INDICATORS.

Specification forming part of Letters Patent No. **190,045**, dated April 24, 1877; application filed January 16, 1877.

To all whom it may concern:

Be it known that I, DANIEL IFFLAND, of the city of Hamburg, in the Empire of Germany, have invented certain new and useful Improvements in a Side Current Detecter and Speed-Indicator for Vessels, of which the following is a specification:

The primary object of my invention consists in an apparatus for ascertaining, when on high sea, the presence of contrary currents acting upon the longitudinal axis or side of a vessel, at right angles to its line of motion, the power exerted by said currents, and the consequent sideward deviation or drift of the vessel.

The invention further consists in constructing the apparatus in such a manner as to adapt it as a speed-indicator at the same time.

The course of vessels—that is to say, the direction in which they are running to reach a predetermined point—is ascertained and regulated by comparing the position of its longitudinal axis with that of the magnetic needle of a compass. These means are sufficient as long as only such forces are exerting their power upon the vessel as will propel it forward in a line with that of its longitudinal axis, as, for example, the screw-propeller or side wheels of steamers; but, as is often the case on high sea, where contrary currents exert their power diametrically opposite or at right angles to the power exerted upon its longitudinal axis, which, although influencing the course of the vessel considerably, and are not perceptible upon the surface of the water, do, however, not affect the position of its longitudinal axis relatively to that of the magnetic needle, or, in other words, the position of the longitudinal axis relatively to that of the magnetic needle in the forward course of the vessel is not changed when under the action of its propelling-power, although drifting sideward out of its course under the impulse of these contrary currents.

No means are at hand to ascertain the existence of these currents, and the consequent drift of the vessel, to enable the mariner to regulate its course accordingly.

To ascertain the presence of these currents, and their power exerted upon the vessel, is the primary object of my invention, while at the same time, by a peculiar arrangement of the apparatus, as hereinafter described, the speed of the vessel may also be ascertained.

But that my invention may be fully understood, I will proceed to describe the same by aid of the accompanying two sheets of drawings, in which—

Figures 1 and 2 are longitudinal and transverse sections of a vessel, showing the general arrangement of the apparatus, and Figs. 3 and 4 are, respectively, a vertical elevation and transverse section of the same, and Figs. 4 and 5 are detail views.

The apparatus consists, essentially, of a tube or a series of tubes, traversing vertically through the vessel and projecting below the keel thereof, and carrying at that point a fixed rudder or wing, and at its upper extremity a horizontal fixed index, traveling over a suitably-graduated scale, the tubes, or the series of connected tubes, being so arranged as to rotate under the action of the rudder or wing when the latter is affected by any side current, the indicator or pointer indicating upon the scale the extent of the deviation of the rudder and the consequent drift of the vessel.

A represents a hollow tube or pipe, or a series of such, connected together by means of screw-couplings *a*, which are prevented from turning or unscrewing by the wedges a^1. The pipe or tube A, where it passes through the deck or decks of a vessel, is held up or prevented from sinking through by means of the sleeves B, bolted or otherwise secured to the flooring, and which fit the tube or pipe A loosely. The upper surface of these sleeves are provided with an annular groove, *b*, in which fits a corresponding projection, *c*, on the under surface of the boss C, which latter is held on tube A by set-screws c'.

Instead of the projection *c* on the boss C, the under surface of the latter may also be

grooved, and anti-friction balls placed between the two, or the surfaces of the sleeve and boss may have vertical projections to form bearings for anti-friction rollers, or any other suitable means may be employed to facilate the rotation of the pipe A and hold it in its proper position.

The pipe A, at its lower extremity, is bent to form a quarter-circle, or nearly so, its mouth a^2 being turned toward the bow of the vessel, the rudder I being rigidly affixed to said lower extremity on a line parallel with the horizontal axis of the bent portion, and in rear thereof. The action of the rudder I will keep the mouth of the pipe A in its proper position during the forward movement of the vessel, and so long as said rudder or wing I is not actuated by contrary currents, as will be readily understood.

At the bottom of the vessel the pipe passes through a stuffing-box, D, consisting of an outer sleeve, d, which forms an annular chamber or recess, d^1, around the pipe, and a seat for a suitable packer, and for the reception of the sleeve d^2, which fits loosely around the pipe A, the packing being inserted between the two sleeves. The outer sleeve is bolted to the bottom of the vessel, and the inner sleeve held thereon by set-screws d^3, as shown by Fig. 5.

The pipe A is screw-threaded at a^3 to fit a corresponding thread within the hub of a pinion E, the under face of which is provided with an annular projection, e, fitting in the groove b of the supporting-sleeve B, or it may be supported upon the sleeve B by anti-friction balls, or anti-friction rollers, as above described.

This pinion gears with another pinion, F, mounted upon a shaft, f, in a suitable frame, f^1, said shaft carrying a gear-wheel, G, meshing with a pinion, H, on shaft h, located above shaft f in the frame f^1. The shaft h carries at its outer extremity a crank, h^1. This mechanism is employed to raise and lower the pipe A, to shelter the rudder I when the vessel enters shallow water, by raising it under the bottom of the vessel, by the side of the keel, and to lower the same again when entering deep water.

The upper end of the pipe A may also be provided with a worm-thread meshing with a pinion the shaft of which is provided with a hand-wheel, whereby the pipe may be raised or lowered, the shaft carrying the hand-wheel being made to slide in its bearings, or by other suitable means, to throw the pinion in and out of gear, and a suitable stop may be provided to hold the hand-wheel and prevent it from revolving when the pipe A has been raised up, or any other suitable mechanism may be employed to effect this purpose, though I prefer the mechanism above described.

To avoid too great a friction, and the consequent obstruction against the rotation of the pipe A, I mount the shaft f so as to slide in its bearings. Said shaft f carries a hand-wheel, f^2, at its outer extremity, and a spring, g, affixed to the sleeve of the hand-wheel, and entering the recess formed by the hand-wheel, and the bearing g' serves to hold the pinion F out of gear with the pinion E, or a latch or clutch may be employed for this purpose.

The pipe A, which projects some distance above the deck, carries at its upper extremity an index or pointer, K, mounted thereon parallel with the rudder or wing I, said pointer traveling or rotating with the pipe A over a suitably-graduated scale, to indicate any deflection of the rudder or wing I by side currents, the amount or extent of the deflection, and the consequent drift of the vessel.

To ascertain the speed of the vessel I employ a float, L, attached or rigidly connected to a rod, l, both being adapted to rise and fall freely within the pipe, under the impulse of the water rising within the pipe A, the normal position of the float being at a point with that of the level of the water when the vessel is at rest.

It is well known that the faster a current of water is made to pass upon a vertical tube bent at right angles, or nearly so, and open at both ends, the higher the water will rise within. Hence, the greater the speed of a vessel the higher will the water rise within the pipe A, carrying with it the float and its connecting-rod, which latter carries at its upper end a forked index, M, traveling over a suitably-graduated vertical scale, m. I form the pointer M in the shape of a fork to embrace the scale m, and by this means prevent the pointer, rod, and float from turning or rotating with the pipe A.

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

1. A combined side current detecter and speed-indicator for vessels, consisting of a hollow or tubular connection, open at both ends, between an index traveling over a suitably-graduated horizontal scale on one of the decks of the vessel, and a rudder or wing below the keel of said vessel, the hollow connection being adapted to rotate under the action of the rudder, and a rigid connection between a float within said tubular connection and an index traveling over a suitably-graduated vertical scale, all combined, constructed, and arranged to operate substantially as described.

2. The sleeve B and bosses C, having annular groove b and annular projection c, or their equivalents, the set-screws c', and the pipe A, all combined, constructed, and operating substantially as described, for the purpose specified.

3. The pipe A, having a screw-thread at or near its upper extremity, the bevel-pinion E, having its hub threaded to fit the thread on pipe A and mounted thereon, the bevel-pinion F, and gear-wheel G, mounted on shaft *f*, the pinion H, mounted on shaft *h*, and the crank *h'*, all combined, constructed, and operating substantially as and for the purpose specified.

4. The bevel-pinion E, having the inner periphery of its hub threaded, and its lower face provided with an annular projection, *e*, in combination with the grooved sleeve B and the threaded pipe A, all constructed and operating substantially as and for the purposes specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

DANIEL IFFLAND.

Witnesses:
HUGO SIMON,
GUIDO SCHMIDT.