No. 669,999. Patented Mar. 19, 1901.

A. MENSING.

ELECTRIC SIGNALING APPARATUS.

(Application filed May 25, 1900.)

(No Model.)

Fig. 3.

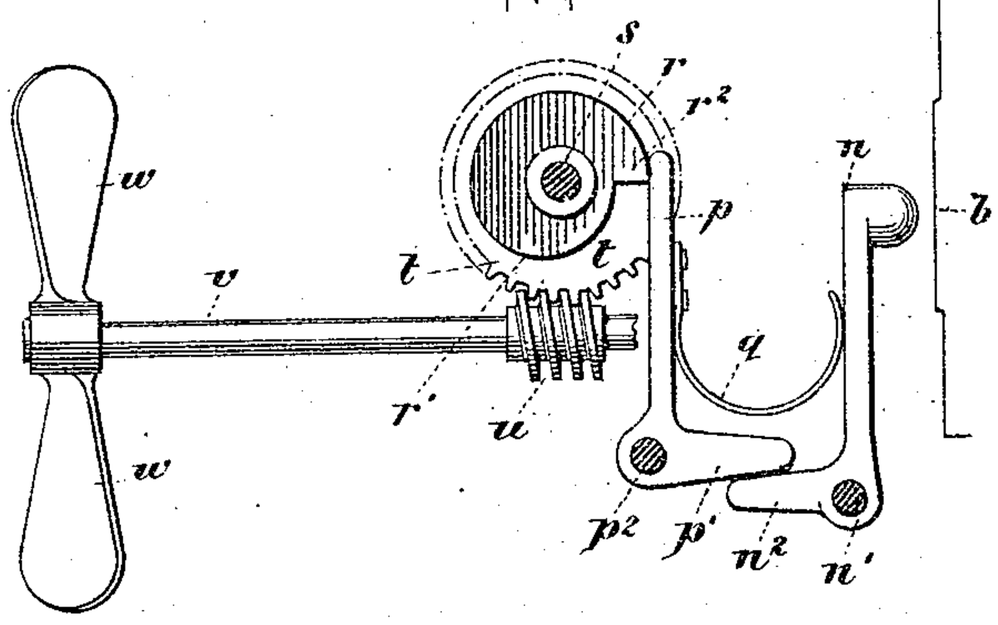


Fig. 1.

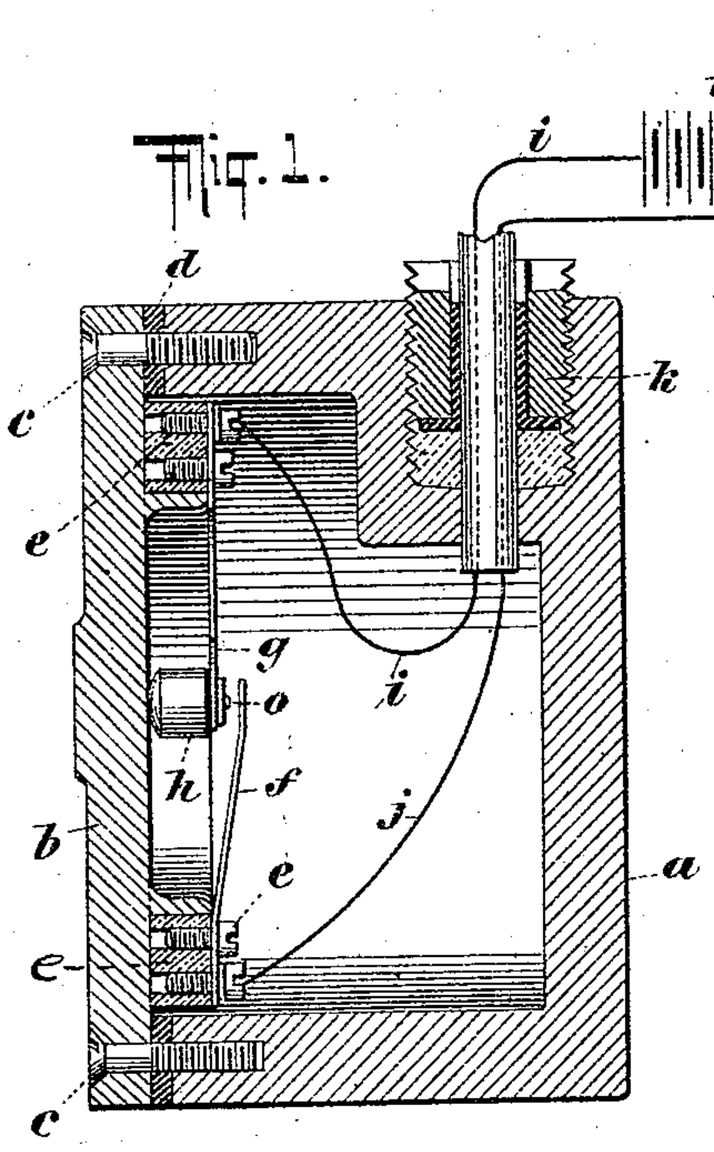
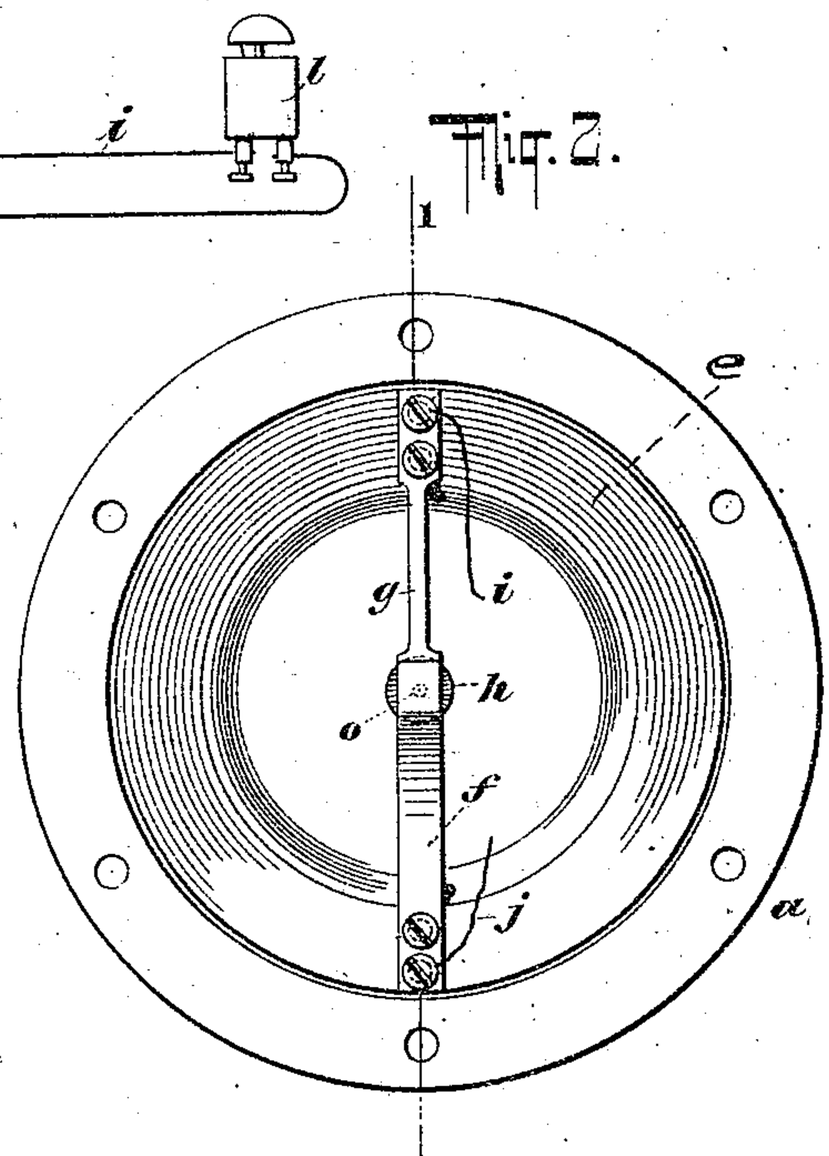


Fig. 2.



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ELECTRIC SIGNALING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 669,999, dated March 19, 1901.

Application filed May 25, 1900. Serial No. 17,920. (No model.)

To all whom it may concern:

Be it known that I, ADOLF MENSING, a subject of the Emperor of Germany, residing at Berlin, Germany, have invented a certain new and useful Improvement in Electric Signaling Apparatus, of which the following is a specification.

My invention relates to electrical signaling apparatus, and has for its special object to produce a signaling apparatus which may be employed in submarine work and in mines and for other purposes.

To this end a particular feature of the invention is a circuit-closer comprising an air and water tight casing and a movable circuit-terminal adapted to be moved to close the circuit by a jar or blow on the outside of the casing.

In the accompanying drawings I have illustrated two apparatuses embodying my invention, with the understanding, however, that my invention is not limited to these two apparatuses, which are merely shown by way of example. These two apparatuses are but illustrations of the many forms in which my invention may be clothed, the salient features of the invention being pointed out in the claims at the end of this specification.

In the drawings, Figure 1 is a sectional elevation, partly in diagram, of one form of my invention. Fig. 2 is a view of the rear face of the front plate of the circuit-closing apparatus, and Fig. 3 shows an apparatus embodying a special adaptation of my invention to be employed for measuring the velocity of the flow of submarine currents and the like.

In the drawings, *a* indicates a suitable water and air tight casing or box, which in the present instance is provided with a removable front or face-plate *b*, capable of transmitting the energy of a blow. This face-plate is shown as secured to the box or casing by screws *c* with the intervening packing *d*. Mounted upon the inside face of the face-plate is a suitable ring *e* of insulating material. This ring carries a suitable contact *f* and a spring-contact *g*, upon which is carried a block *h* of some heavy material, which block is insulated from its supporting spring-contact *g*. The circuit-wires *i j* pass through a packing ring or plug *k* in the side of the box or casing *a* and are sealed water and air tight therein. The conductors *i j* are suitably connected with a bell *l* or other annunciator or alarm device, the battery *m* being interpolated in one of the wires, as *i*. The wires *i* and *j* are or may be suitably insulated. It will be observed that if a blow be struck against the face-plate *b* the energy of the blow will be transmitted to the block *h*, which is in contact therewith, and the said block will be projected rearwardly against the tension of its spring *g* to bring a contact-point *o*, carried by the said spring-contact, against the opposing contact *f*, and thereby close the circuit momentarily and ring the bell. When the impetus given to the block *h* by the blow has been spent, the spring *g* restores the block *h* to its initial position. (Shown in Fig. 1.) It will be observed that the block *h* need not be of the form and character shown; but I intend to include within the term "block" any solid body capable of oscillating under the impact of a blow delivered against a side of the inclosing casing of the apparatus, the said inclosing casing consisting in the present instance of the casing *a* and the face-plate *b*. In apparatus which is entirely stationary the spring *g* may be dispensed with and a flexible metallic carrier for the block *h* substituted.

The apparatus which I have just described is capable of many valuable uses. The circuit-closing portion of the apparatus being hermetically inclosed the apparatus may be employed under water and in mines or other places where an explosive gas may exist, which explosive gas would be ignited by the sparks sometimes passing between the terminals of an ordinary circuit-closer.

In Fig. 3 I have shown an apparatus especially adapted for ascertaining the velocity of submarine currents, which, as is well known, frequently flow at a different rate and even in a different direction from the surface-currents. In this figure the face-plate is diagrammatically indicated at *b*. In front of this face-plate is a suitable hammer *n*, pivotally mounted at *n'* and provided with the trip or extension n^2. This trip or extension n^2 receives the arm *p'* of a bell-crank lever *p*, which is pivotally mounted at p^2 and provided with a suitable spring *q*, which bearing against the hammer *n* tends to force the hammer toward the face-plate *b*. The bell-crank lever *p*

is adapted to rest against the face of the drop-cam r, carried upon a suitable arbor s, which arbor also carries a gear-wheel t, which meshes with a worm u on the shaft v, carrying suitable vanes w.

The operation is as follows: When the apparatus is lowered in the water, the current-flow will cause the shaft v to be rotated, thereby rotating the cam r. It is to be supposed that at this time the bell-crank lever p rests against the low portion r' of the drop-cam, and as the cam continues to revolve the high portion r^2 will come against the lever, thereby swinging the lever to the right and drawing back the hammer n. At the instant that the bell-crank lever p drops from the high portion of the cam to the low portion thereof the spring q, whose tension produced the drop of the lever, will likewise throw the hammer n against the face-plate b of the circuit-closer casing, whereby the block h will, under the impact of the blow, be driven rearwardly to close the circuit, as described. By properly arranging and proportioning the parts the apparatus will deliver a number of blows in a minute proportional to the speed of the current-flow, so that by counting the number of closures of the circuit in a minute the speed of current-flow may be directly determined. If desired, the apparatus can operate in an equally satisfactory manner on a normally closed circuit, opening the same when the blow is struck.

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

1. In an electrical alarm apparatus, the combination of a closed casing having an exposed side adapted to receive a blow, circuit-terminals maintaining a normally open circuit, and a block located within the casing in such proximity to one side thereof as to receive the impact of a blow delivered thereto and effecting by its movement a closure of the circuit.

2. In an electrical alarm apparatus, the combination of a hermetically-closed casing having an exposed side adapted to receive a blow, circuit-terminals mounted therein normally open-circuited, a block carried by one of the circuit-terminals within the casing and normally in operative proximity to the exposed side of the casing and adapted to receive the impact of a blow delivered against that side of the casing and to close the circuit by its movement.

3. In an electrical alarm apparatus, the combination of a closed casing having an exposed side adapted to receive a blow, circuit-terminals therein, a block in operative proximity with one of the circuit-terminals and in contact with the exposed side of the casing and adapted to receive the impact of a blow delivered against the said side and to manipulate the circuit when moving under the impact of the blow.

4. In an electrical alarm apparatus, the combination of a plurality of circuit-terminals, one of the said circuit-terminals being springy, a casing enveloping the said circuit-terminals, the springy circuit-terminal being mounted upon one side of the casing, a block carried by the said springy circuit-terminal and exerting pressure which is received by the side of the casing upon which the springy circuit-terminal is mounted, whereby a blow delivered against the said side of the casing will cause the block to oscillate and manipulate the circuit.

5. In an electrical alarm apparatus, the combination of a closed casing having an exposed side adapted to receive a blow with means for effecting the opening and closing of a circuit comprised in part by a block mounted in the casing so as to oscillate freely therein and in operative proximity with the exposed side of the casing, whereby a blow delivered against the casing will effect a movement of the block and a manipulation of the circuit.

6. In an electrical alarm apparatus, the combination of a closed casing having an exposed side adapted to receive a blow, circuit-terminals therein, an oscillating block adapted to effect the opening and closing of the circuit at the circuit-terminals in operative relation with the exposed side of the casing to receive the impact of a blow delivered against the casing and circuit connections, substantially as described.

7. In an alarm apparatus, the combination of a closed casing having an exposed side adapted to receive a blow, circuit-terminals therein, an oscillating block in operative proximity with the exposed side of the casing to receive the impact of a blow delivered against the casing and adapted to effect the opening and closing of the circuit at the circuit-terminals and a suitably-actuated means for delivering a blow against said exposed side.

8. In a signaling device, the combination with suitable circuit connections of a closed casing, circuit-terminals carried thereby normally and electrically separated and a freely-oscillating block in operative relation with the said circuit-terminals and with an exposed side of the casing and adapted to be oscillated by the impact of a blow delivered against the said side of the casing.

9. In a signaling device, the combination of a casing, a spring located therein, a freely-oscillating block carried thereby and exerting its tension toward the side of the casing and circuit manipulating means under the control of the block, the block being adapted to be oscillated by the impact of a blow delivered against the side of the casing.

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