(No Model.) 2 Sheets—Sheet 1.

J. C. RICKETSON.

ELECTRIC SIGNAL FOR ENGINE SHAFTS.

No. 404,866. Patented June 11, 1889.

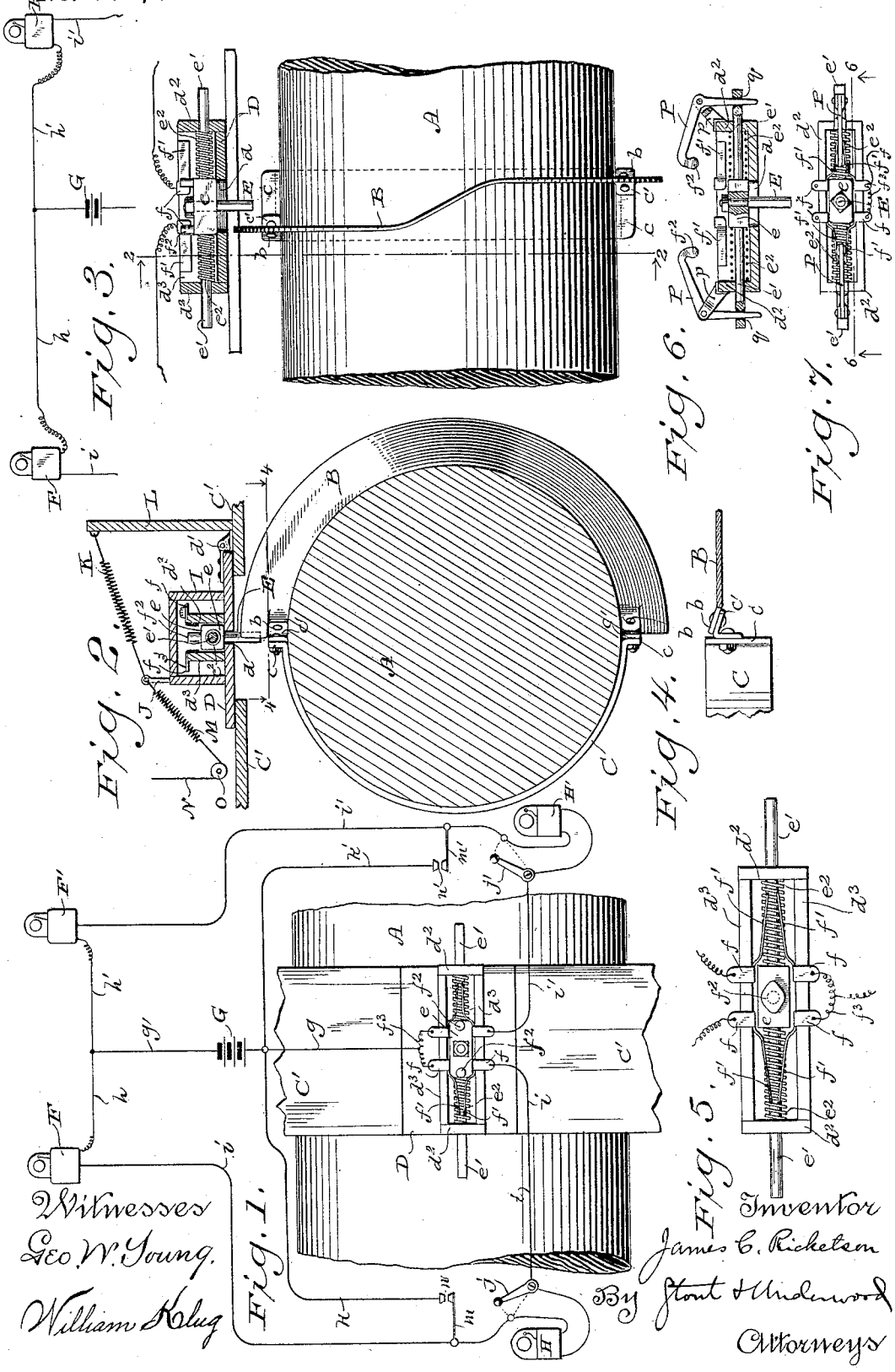


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Witnesses
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(No Model.) 2 Sheets—Sheet 2.

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Fig. 9.

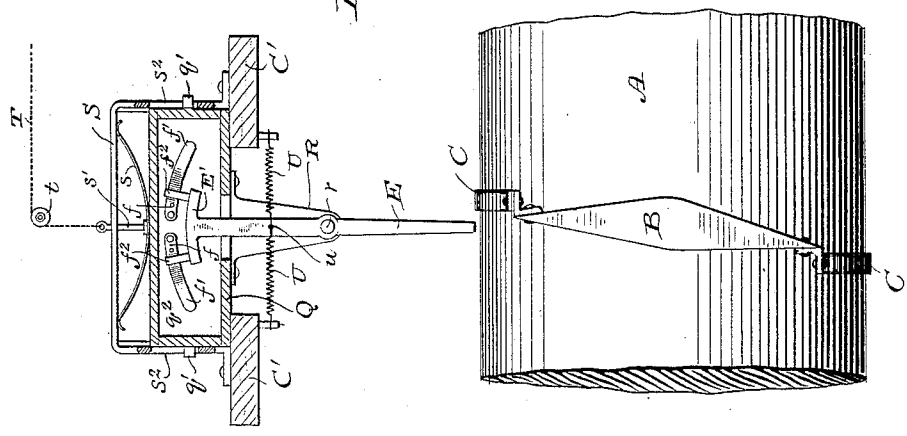
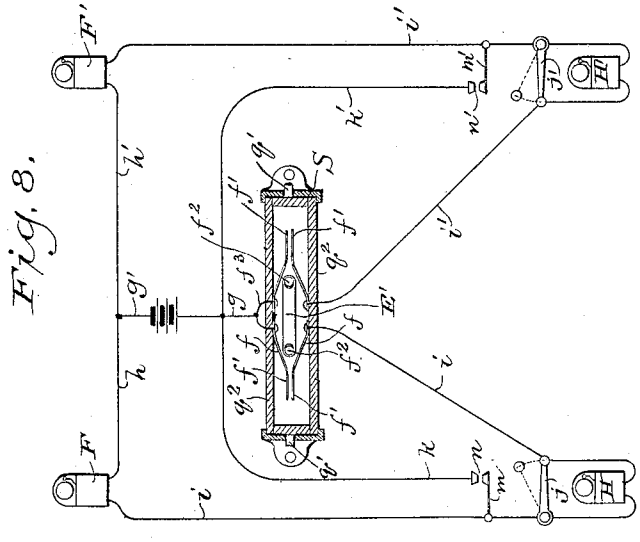


Fig. 8.



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UNITED STATES PATENT OFFICE.

JAMES C. RICKETSON, OF MILWAUKEE, WISCONSIN.

ELECTRIC SIGNAL FOR ENGINE-SHAFTS.

SPECIFICATION forming part of Letters Patent No. 404,866, dated June 11, 1889.

Application filed October 4, 1888. Serial No. 287,162. (No model.)

To all whom it may concern:

Be it known that I, JAMES C. RICKETSON, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Electric Signals for Engine-Shafts; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to electric signals for engine-shafts, and will be fully described hereinafter.

In the drawings, Figure 1 is a plan view of my device, representing by diagram its circuits and manner of use. Fig. 2 is a central vertical section on line 2 2 of Fig. 3 through a shaft fitted with a cam and through my said device, showing a casing on the latter and means for lifting it out of the way of contact with said cam when not needed and for restoring it to a position insuring its action with the said cam at the proper time. Fig. 3 is a side elevation of my device, but with the casing removed. Fig. 4 is a detail section on the line 4 4 of Fig. 2. Fig. 5 is a detail plan view of a modification. Figs. 6 and 7 are detail views of another modification, the former figure being a section taken on the line 6 6 of the latter figure, which is a plan view. Fig. 8 is a diagram view of the circuits; and Fig. 9, a side elevation, partly in section, of still another form of my present invention.

My present invention has especial reference to devices for indicating at any point distant from the shaft of a marine engine the direction in which said shaft is revolving, as well as its rate of speed, and is, in part, an improvement on the devices set forth in my prior application for patent filed August 31, 1885, Serial No. 175,744, but is applicable to any reversible shafting.

A represents the shaft of a marine engine, which has secured to it a cam B, whose opposite side edges are alternately operative, depending upon which direction the shaft is revolving. This cam is preferably secured to the shaft by the band or strap C, having suitable flanges or lugs *c* bolted to like flanges or lugs *b* on the cam, or to an interposed angle-plate *c'*, as shown in the detail view, Fig. 4.

Above the shaft A are suitable beams or other supports C' C', on which rests the bottom plate D of my device, provided with a central transverse slot *d* for the passage therethrough of the pin E, which comes in contact with the described cam B, and this bottom plate D is hinged at *d'* to one of the supports C'. This pin E extends down through a sliding block *e*, from the ends of which project guide-pins *e' e'*, extending through perforations in the end plates d^2 d^2, which rise from the bottom plate D and are connected by the side plates d^3 d^3, and said guide-pins *e'* are surrounded by spiral springs e^2, fastened to the block *e* and bearing against the inner surfaces of the end plates d^2. The side plates d^3 and the sliding block *e* are of wood or similar insulating material, and to the said side plates are connected the metallic strips *f*, having spring contact ends *f'* extending above the guide-pins *e'*, while the block *e* is provided with one or more metallic contact-pins f^2, (two being shown in Figs. 1 and 3 and one being shown in Fig. 5,) the contact pin or pins f^2 being designed to come between a pair of the spring contact ends *f'* as the block *e* is moved either way by the action of the cam B of the shaft against the depending pin E of said block.

The metallic strips *f f*, that are secured to one of the side plates d^3, are connected together by a strip of metal or wire f^3, and from this point a wire *g* extends to a battery G, and from said battery other wires *g' h h'* connect with the bells, annunciators, or other signals F F', supposed to be in the pilot-house or other point distant from the shaft A. From the signal F a wire *i* leads to one of the metallic strips *f* on the other side plate d^3, and a like wire *i'* connects the signal F' with the other metallic strip *f* on the same side plate d^3, and on the said wires *i* and *i'* in the engine-room are located the bells H and H', the former being normally in circuit with the signal F and the latter normally in circuit with the signal F'. When it is desired to disconnect the bells H H' from their circuits, it is only necessary to turn the switches *j j'* so as to make short circuits on the wires *i* and *i'*, cutting out the bells H H', as shown in Fig. 8. Again, sometimes the engineer may desire to signal the captain when the latter is in the pilot-house, and for this pur-

pose I have added the wires k and k', connected to the battery-wire g, and wires or strips m m', (connected, respectively, to wires i and i',) having suitable push-buttons n n' or analogous devices for making contact with the said wires k and k'.

The operation of my device will be readily understood from the foregoing description.

When the shaft is revolving in one direction, one side of its cam will come in contact with the depending pin E, which will travel alongside said cam, and consequently move the block e with it, carrying one of the contact-pins f^2 on said block between one pair of opposing spring contact ends f' f', and thereby closing a circuit and actuating the signal F, (or F',) which is in that circuit, and at the same time (if the switch j or j' is open, as in Fig. 1) will ring the engine-room bell H, (or H',) which is in the same circuit, and thus the captain in the pilot-house (as well as the engineer) will at once know in which direction the shaft is revolving, (as well as its rate of speed by reason of the interval between the ringing of the bells or movement of the signals,) the bells being preferably of different sound for obvious reasons, and so, when the shaft revolves in the other direction, the block e and contact-pin f^2 will be carried in the opposite direction to that just described, and the other circuit will be closed and the other bells or signals rung or actuated. Inasmuch as it is only at certain times (as when entering or leaving port or making landings) that my device is needed, I have shown in Fig. 2 how it can be withdrawn from operative position and reinstated therein. I is an outer casing surrounding the inner casing d^2 d^2 d^3 d^3 of my device and secured to the bottom plate D, which latter, as described, is hinged to one of its supports C', and from the opposite side of said casing there rises a rod J, having an eye from whence a strong spring K extends up to an upright or beam L, as shown, the spring being strong enough to draw up the whole device and keep it normally at such a height as will bring the pin E above and out of contact with the cam B. To the same rod J is attached one end of another spring M, whose other end is secured to a cord N, passing under a pulley O, and thence up and over other suitable pulleys (not shown) to any point within reach of the engineer, who has only to draw on said cord to restore the device to its operative position and then make fast his end of the cord to retain it in such position as long as desired. In this connection the spring M is especially useful, as otherwise a pull on the cord N might only bring the pin E down on top of the cam, where it would be held in inoperative position by the force of the spring K; but the spring M will overcome such force and bring the pin E down alongside the cam B in position to be moved thereby.

In Figs. 6 and 7 I show another form of my device, wherein, instead of mounting the contact-pins f^2 on top of the block e, I have shown them at one end of bell-crank levers P, pivoted to fulcra p, rising from the end plates d^2, the other arms of said bell-crank levers passing through eyes q, formed in the ends of the guide-pins e', so that as the pin E is moved by the cam B in either direction the guide-pin e' on that side will be forced out from its adjacent end plate d^2, carrying along with it the connected lower end of the bell-crank lever P on that side and forcing the contact-pin f^2 on the end of the other arm of said bell-crank lever between the adjacent spring ends f' f', thus making electrical contact and actuating the signal in the circuit thereby closed.

In Fig. 9 I show still another modification of my device. The cam B is practically the same as in the other figures, except that instead of a single strip bent, I show a double cam; but the effect is just the same. In this figure I have sought to provide for the use of my device in such instances where it might not be practicable to support my device in close proximity to the shaft. In such cases the contact-pin E would necessarily be so much longer than before that the use of a sliding block would be practically impossible, and hence I pivot my long pin E centrally, as at r, to a bracket or hanger R, depending from the slotted bottom plate Q, which latter forms part of a movable casing adapted to slide vertically in a frame S, and held down to place by a spring s, from which a rod s' rises and passes through a hole in the top of the frame S, and thence is connected by cord T, passing over suitable pulleys, as t, to within reach of the engineer, the normal position of this form of my device being just opposite to that of the other forms shown with relation to the cam, a pull on the cord T in this instance serving to raise the pin E out of operative position instead of forcing it into such position, as in the other forms. The casing Q has lugs or guide-pins q' on its ends, moving in slots s^2 in the ends of the frame S, and the side pieces q^2 of the said casing are of wood or other insulating material to receive the metallic strips f f, whose ends f' f' lie in pairs at each side in the path of the contact-pins f^2 f^2, rising from the segmental head E' of the long rocking contact-pin E, and as said pin is rocked over on its pivot r by the action of the cam B on the lower end of said pin one of the contact-pins f^2 will be forced between the pair of adjacent spring contact ends f' f' at one side of the casing, thereby closing a circuit and actuating the distant signal in said circuit, as before shown and described. The segment-head E' may be insulated in any preferred way from its pins f^2, or the cams and their supporting band or strap may be insulated from the shaft, as preferred. In order to restore the pin E to a vertical operative position after it has been drawn to one side, as described, I connect it by springs U U, extending from a lug u on

said pin to any suitable stationary points—as, for instance, the supports C′, to which the frame S is secured.

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

1. The combination, with a revolving shaft having a two-sided or double cam attached thereto, of a pair of distant signals, a movable pin depending normally in the path of motion of said cam, a contact pin or pins connected or arranged in relation to said movable pin to move therewith, and a casing bearing metallic strips terminating in spring contact ends arranged in pairs in the paths of motion of said contact pin or pins and electrically connected to said distant signals, substantially as set forth.

2. The combination, with a revolving shaft having a two-sided or double cam attached thereto, of a pair of distant signals, a movable pin depending normally in the path of motion of said cam, a contact pin or pins connected or arranged in relation to said movable pin to move therewith, a casing bearing metallic strips terminating in spring contact ends arranged in pairs in the paths of motion of said contact pin or pins and electrically connected to said distant signals, and electric bells and switches located at points remote from the distant signals, one of said bells and switches being in the same circuit with one of the said distant signals and the other bell and switch in the same circuit with the other distant signal, substantially as set forth.

3. The combination, with a revolving shaft having a cam attached thereto, of a casing hinged to a suitable support and carrying a movable pin depending normally in the path of motion of said cam, a spring extending from said casing to a point above the same for raising said casing and withdrawing the movable pin from operative position, and another spring attached to said casing and to a cord for drawing down the casing against the force of the first-named spring and restoring the movable pin to operative position in the path of motion of the cam, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

JAMES C. RICKETSON.

Witnesses:
H. G. UNDERWOOD,
WILLIAM KLUG.