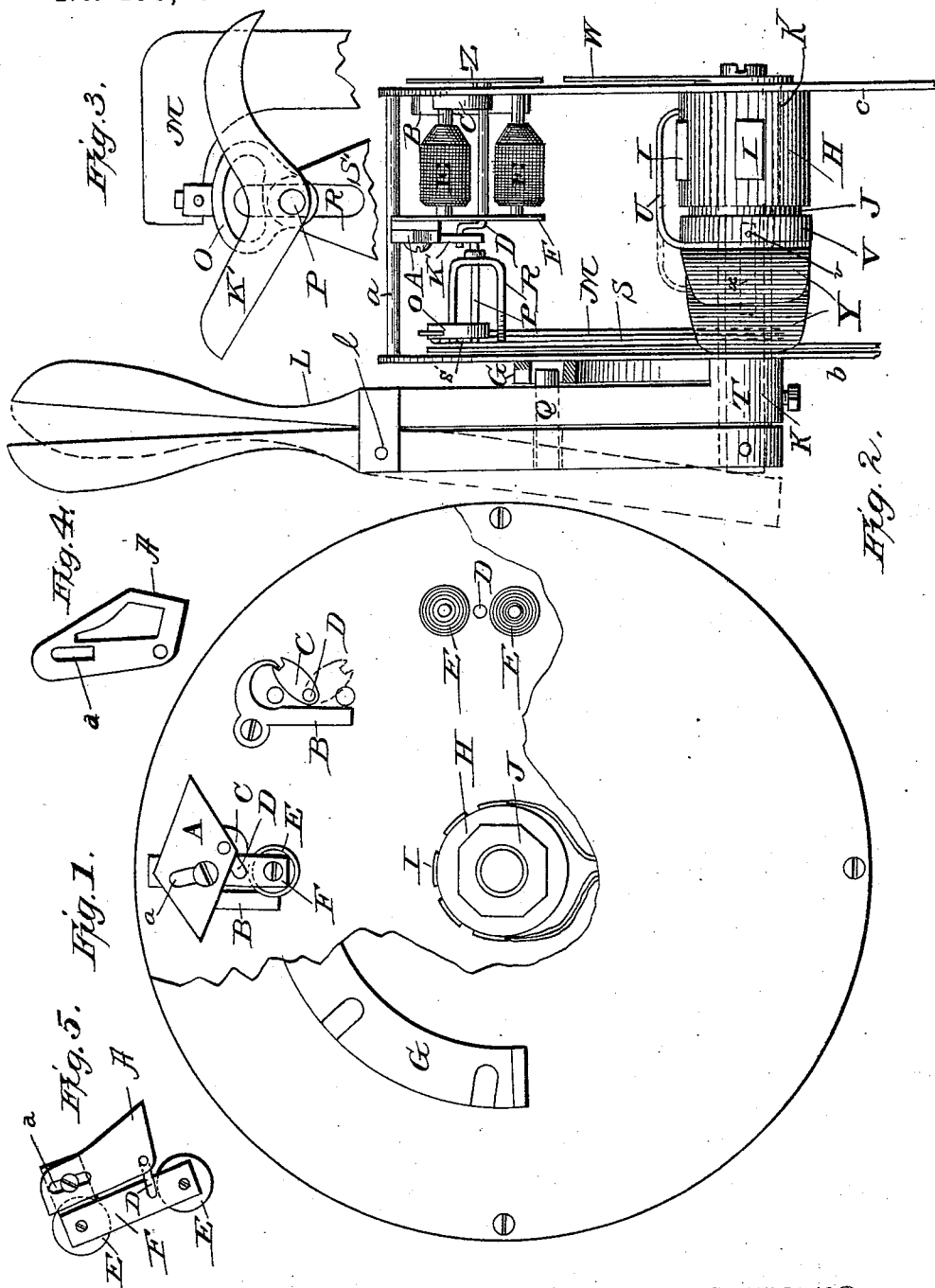


D. D. WASS.
ELECTRIC SIGNAL FOR STEAM VESSELS.

No. 455,138.

Patented June 30, 1891.



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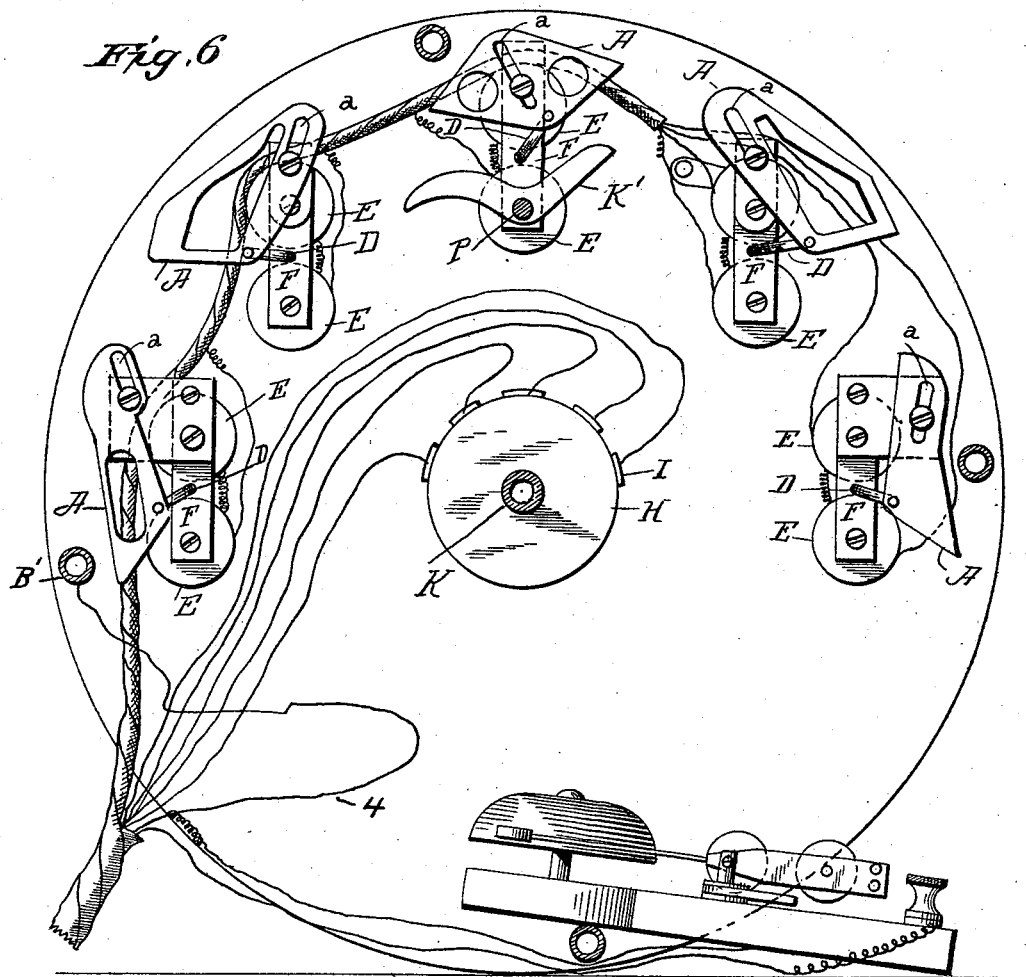
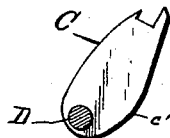


Fig. 7.



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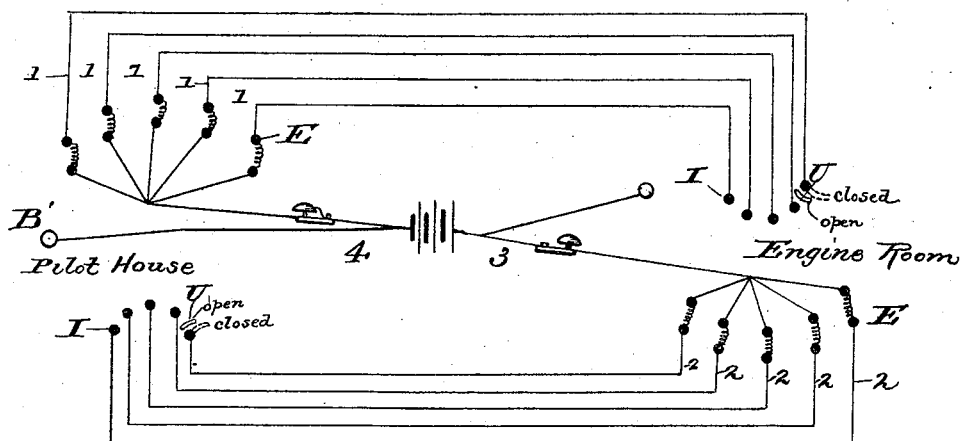


Fig. 10.

Fig. 8

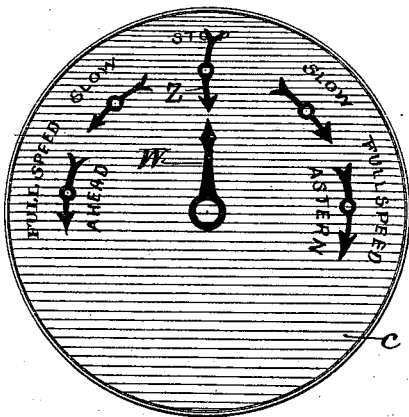
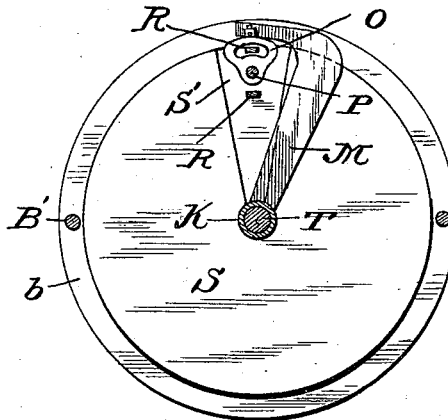


Fig. 9



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UNITED STATES PATENT OFFICE.

DYSON D. WASS, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF
TO EDWIN W. TUCKER, OF SAME PLACE.

ELECTRIC SIGNAL FOR STEAM-VESSELS.

SPECIFICATION forming part of Letters Patent No. 455,138, dated June 30, 1891.

Application filed January 5, 1891. Serial No. 376,816. (No model.)

To all whom it may concern:

Be it known that I, DYSON D. WASS, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Electric Signals for Steam-Vessels; and I do hereby declare the following to be a full, clear, and exact description of said invention, such as will enable others skilled in the art to which it most nearly appertains to make, use, and practice the same.

My invention has relation to certain new and useful improvements in electrical signals for steam-vessels and the like, which consists in the arrangement of parts and details of construction, as will be hereinafter more fully described, and pointed out in the claims.

The object of my invention is to have a rapid, correct, and simultaneous understanding between the pilots and the engineers of steam-vessels, so that the direction which the vessel is to go may be instantly indicated by sight as well as sound, thereby preventing and obviating any mistake which may be caused by misunderstanding of sound-signals alone, which sometimes results in disastrous consequences.

The invention consists in the combination, with an electric alarm, of two or more electric indicators or combined indicators and levers, one of which I locate in the pilot-house and others in as many different parts of the vessel as may be deemed necessary, each of which is properly connected to the one located in the engine-room, so that when the pilot moves his lever-indicator communication will simultaneously be had with the engine-room and serve to set the alarm in motion for the purpose of notifying or calling the engineer's attention and at the same time move the arrows attached to the dials in order to show the direction the engine is to go and at what speed. By this device, as hereinafter more fully shown, the pilot has the entire control of the vessel and is instantly able to accurately convey to the engineer his wants.

For a more comprehensive understanding of my invention reference must be had to the accompanying drawings, wherein similar let-

ters of reference are used to denote corresponding parts.

Figure 1 is a rear view of the indicator with a part of the plate broken away, disclosing at the top of the plate the weighted cam, the pole-piece, the magnets, the crank, the catch, and the armature, to the right thereof simply the catch, the crank, and the armature, the other parts being removed to facilitate clear illustration, and still further to the right simply the magnets and crank are illustrated. Fig. 2 is a view in cross-section showing the different parts in their relative positions. Fig. 3 is a detail view of the rigid attachment S' of the circular plate, showing the yoke carried thereby and the shaft passing through said yoke, as well as the arm M and its link and the cam K', carried by the shaft. Fig. 4 is a detail view of the weighted cam. Fig. 5 is a detail view of the magnets E E and their pole, also illustrating the weighted cam, the cam in this instance being secured to an extension from the pole-piece. Fig. 6 is a rear view of the device, showing the back plate b removed, illustrating clearly the position and contour of the weighted cams, (in their raised position,) and also illustrating the different wires. Fig. 7 is a detail view of the catch. Fig. 8 is a front view in elevation. Fig. 9 is an elevation of the inside of plate b, with plate c removed, showing the construction carried by shaft T and the mechanism operated thereby; and Fig. 10 is a diagrammatic view showing the manner of connecting the wires.

Referring to the drawings, the letters b and c indicate, respectively, the rear and front circular plates. Passing centrally through these plates is a hollow shaft K, the end of which that projects beyond the front dial-plate c carrying a pointer W. The hollow shaft also carries an insulated block H, located thereon between the two plates and bearing against the inner side of the front plate, against which it is held firmly by means of a nut J. This block, it will be noticed, has embodied in its periphery a series of contact-points I, the function of which will appear more fully hereinafter. Bearing against nut J is an insulated block V, having secured thereto one end of a mov-

able contact-point U, the other end of said contact-point resting normally upon the surface of the insulated block H and out of contact with points I. The block V has secured thereto the inner end of a shaft T, which works in hollow shaft K and passes out through the rear plate b. Interposed between block V and the inner face of the rear plate is a spring Y. This spring may be composed of as many leaves as may be desired in order to secure the proper amount of tension, two of such leaves being shown in the drawings.

The letter L indicates a lever consisting of two members or arms pivoted together at the point l. The lower end of the inner arm is secured to the shaft K, while the corresponding end of the outer arm is secured to shaft T. The outer arm also carries a pin Q, which works through a hole in the inner lever and enters any of the series of notches in a quadrant G, secured to the face of rear plate b. It is obvious that when the upper ends of the two members are brought together, as indicated by dotted lines, Fig. 2, the inner shaft is drawn outwardly and carries therewith the insulated block V. In order to properly guide the block in its movement, I provide the same with a pin v, which enters a slot x in the shaft K. Shaft K also carries a circular friction-plate S, which is located upon the inner side of plate b. I have shown in the drawings the friction-plate provided with a rigidly-attached strip S'. This piece, however, is not essential to the successful working of my device, as the feature now about to be described could extend just as well directly from the plate. The part referred to is a yoke R. (Shown clearly in Fig. 2 and in the detail view, Fig. 3.) Turning in bearings in the yoke and in the rigid piece S' is a shaft P, the outer end of which carries a link O, while the inner end carries a cam K', the conformation of which being clearly shown in Fig. 3.

The letters E E indicate sets of electro-magnets arranged at suitable intervals apart, there being a set of such magnets for each stationary contact-point upon block H. These magnets are connected by pole-pieces F, and journaled in the pole-piece and in the front plate c is a crank-shaft D, the rear end of said shaft engaging a weighted cam A. This cam is provided with an elongated slot a, which receives a screw extending from the pole-piece. The crank-shaft has also mounted thereon a catch C, provided with a notched upper end, which is adapted to be engaged by a vertically-hanging armature B. Upon the extreme end of the crank-shaft, which projects through the front plate, is carried an arrow Z.

While in Fig. 1 I have only shown the complete mechanism at the point corresponding to the word "Stop" on the front plate—that is to say, the weighted cam, the electro-magnets, the crank-shaft, the catch, and the armature—still it is obvious that this construction

is duplicated at all the other points, with the exception that the contour of the under edge of the weighted cams is necessarily changed, as will appear more fully hereinafter and as shown in Fig. 6.

From each set of electro-magnets in one device—say the one located in the pilot-house—a wire leads to a corresponding contact-point on the block H of the indicator in the engine-room, while from each set of electro-magnets of the latter wires lead to the several contact-points of the block H in the pilot-house. This is indicated clearly in Fig. 10 of the drawings, in which the insulated block and electro-magnets in two corresponding devices are indicated. In this figure also, for the sake of clearer illustration, I have indicated the wires leading from the electro-magnets of the device in the pilot-house to the contact-points of the insulated block of the device in the engine-room by the numeral 1, and, vice versa, the wires leading from the electro-magnets of the instrument in the engine-room to the contact-points of the insulated block of the instrument in the pilot-house by the numeral 2, while one of the main-battery wires I have indicated by the numeral 3 and the other by the numeral 4.

In each indicator a gong or alarm is arranged, the hammer of said gong or alarm being operated by means of electro-magnets acting upon an armature to which said hammer is attached.

For an understanding of the circuit reference should be had to the diagrammatic view. If the main-battery line running toward the insulated block of the instrument in the pilot-house is followed, it will be noticed that it leads to the binding-post or transverse post B'. (Shown in Figs. 6 and 9.) This conveys the electric current to the back plate b, and when the handles are pressed together the movable contact-point is made to bear upon any of the fixed contact-points corresponding to the arrow it is desired to operate upon the duplicate device. As the handles are thus pressed together the spring Y is made to bear firmly against the friction-plate S, and the current conducted to the back plate by the main-battery wire 4 passes through said friction-plate, through the spring, and then through the two contacting points, from which it is conveyed by the corresponding wire 2 to one of five wires, which are connected severally with electro-magnets on the duplicate signaling device, at which point an arrow is dropped. The current then passes over the return-battery wire, one wire being used for the five electro-magnets, through the bell, and back to the battery. The operation is duplicated on the return signal. At the same time the movable contact-point bears upon the fixed contact and completes the circuit, as above described. The wire leading from the fixed contact-point conveys the current of electricity over said wire to the

corresponding electro-magnets of the other indicator. If we suppose now that the captain or pilot desires to start the vessel at slow speed ahead, he first brings the upper ends of the handles together, which has the effect of drawing rearwardly shaft T, which, being connected with the insulated block V, draws the same in a like direction, and with it the movable contact-point U. The moment the latter touches the fixed contact-point the electrical circuit, as just described, is completed, and as a consequence the gong or alarm in the engine-room is sounded, thereby attracting the engineer's attention. At the same time this contact is made the electrical circuit is completed to the "stop" point of the indicator in the engine-room, but, inasmuch as the arrow at that point is already pointed downward, of course can have no effect upon the same. When the handles have been pressed together sufficiently to bring the end of the contact-point U clear of the fixed point, the ringing instantly ceases, owing to the current having been broken. At the same time it will be noticed that the leaves of the spring Y are pressed firmly against friction-plate S by the rear movement of the block V, so as to render it impossible for said plate to turn by a slight force. The action of the spring Y in bearing firmly against plate S results in a positive contact with the back plate b, so that there is no danger of the circuit being broken during the transmission of the signal or while the movable contact-point is traversing the stationary point. It is for this reason, also, that the friction-plate S is made circular, as otherwise simply a lever would be necessary for carrying the yoke R. The next step in the operation is to turn the handles to the left until the pin Q reaches the notch in the quadrant corresponding to the "slow" point. Of course, as the levers are turned the central pointer W is turned and made to point to the arrow at which a stop is made. At the first slight turn of the lever, however, the inner member of the lever turns the hollow shaft, and the arm M carried thereby is consequently given a slight movement. This will move link O, carried by arm M, and link O in turn will partly rotate shaft P, so as to throw one end of cam K', carried by said shaft, upward. During this slight movement of the parts spring Y is pressing sufficiently hard against friction-plate S as to prevent any movement, and said plate therefore remains passive until one side of link O strikes against yoke R. When this occurs, which is after the initial upthrowing of the cam K', the friction-plate and the rest of the parts move in unison, cam K' first acting upon the undersurface of weighted cam A and raising the same, so as to partly rotate crank D, and thus bring catch C upward, so as to engage the hooked end of the armature. When the lever has reached the notch upon the quadrant corresponding to the "slow" point, the pin engages said notch, pressure upon the handles is released, and the movable contact-point crosses the corresponding fixed contact-point to its normal position. In its passage the moment it contacts with the fixed point the electrical connection is re-established and a current will be passed over the wires leading from said fixed point and connecting at its other end with the magnets corresponding to the "slow" point upon the indicator in the engine-room. At this moment the pointer or indicator in the engine-room is thrown downward, this being accomplished by the energized magnets E E in said engine-room at the "slow" point drawing the lower end of the armature toward them. This necessarily has the effect of throwing the upper hooked end of said armature laterally in the opposite direction, which, of course, disengages the hook from the catch C, which turns the crank-shaft, so as to throw the index-finger at this point toward the center. The next step is for the engineer to answer the signal, so as to inform the captain that the order has been observed and is properly understood. This he does by following exactly the same course pursued by the captain—that is to say, he first presses the handles together, which carries the movable contact-point over the stationary point. This will sound the alarm. He then turns the lever, which first has the effect of resetting the "stop" arrow. When the notch is reached corresponding to the "slow" point, the engineer's central index will point to the "slow" arrow, the pin Q is allowed to engage said notch, and as soon as pressure on the handles is released the movable contact crosses the stationary contact-point corresponding thereto, and in doing so establishes electrical connection with the magnets at the "slow" point on the captain's dial. The moment this is done the armature is attracted, and, as in the case with the index in the engineer's dial, the arrow will drop and point toward the center. From this it will be seen that the engineer is notified, in the first place, by the ringing of the bell and the proper order given by the dropping of the arrow, and that the captain, on the other hand, is notified that his order has been observed by the ringing of the gong in his indicator and the dropping of the arrow indicating the order given, while the center finger in each points in the correct direction. In this manner all danger of mistake is entirely obviated. It is, of course, to be understood that the handles or levers are to remain in their adjusted position until it is desired to give or answer another order.

We will now suppose that it is desired to give the signal "slow speed astern." The levers of both indicators being in the position last placed, the captain or pilot presses the handle of his device together. This brings the movable point in contact with the fixed point at that position and immediately sounds the alarm in the engine-room. The "slow

ahead" arrow in the engine-room already pointing toward the center will not be affected by the completion of the current. The captain next turns the lever slightly, which, by means of the arm M, link O, and shaft P, will raise cam K' until it contacts with weighted cam A. The link O is now in position, however, to engage the upper portion of yoke R, and as the turning of the lever is completed the cam K' has the effect of resetting the "slow" arrow on the "ahead" side of the dial. When the lever reaches the "stop" arrow, the weighted cam at that point, being already reset, will not be affected by cam K', the same being true in regard to the arrow at the "slow" point on the "astern" side, which remains in its upright position. When the lever has reached the "full speed" point, the captain releases pressure upon the handles, when the bell in the engine-room is sounded and the corresponding arrow dropped. The engineer now answers in exactly the same manner before explained.

It often happens that the pilot desires to call the engineer's attention, or vice versa. It is obvious that my invention provides for this, inasmuch as at whatever position the levers may be adjusted the arrows Z in both indicators are down, and by pressing the handles together without moving the lever laterally the movable contact-point may be made to traverse the stationary contact-point at such position, and thus sound the alarm without disturbing the arrows, which, as above explained, are already pointing downward. By the ringing of the bell the captain or engineer, as the case may be, will understand that one or the other desires to send a message through a speaking-tube or otherwise.

It is here deemed advisable to call attention to several important features of the invention. It will be noticed that I provide a crank-shaft D with an attached weighted cam A, which latter keeps a constant pressure against the catch and holds the arrows Z in a positive position, so that by the jar consequent to the firing of guns on men-of-war said catch can only vibrate the width of the slot in its top and cannot be released. It will also be noticed that in my construction I employ two shafts, the inner sliding inside the outer. The sliding contact-spring is fastened to the inner sliding shaft and by the direct action of the outer member of the lever is drawn across the stationary contact-points, completing the circuit. Now this arrangement is very valuable, for in this sliding movement it keeps the contact-surface always bright and clear, so that there is no possible chance for any dirt or non-conductor to remain on them, as the spring is drawn clear across each time. It will be noticed from the drawing that the shape or contour is different in the several weighted cams A. This is necessary in order that the shape may be made to conform to the cam K', carried by the shaft P and acting upon the different

points. The crank-shafts D are set concentric with the central shaft, so that the arrows will all point to the center and meet the pointer W, which indicates the given signal.

The armatures are all set parallel to a perpendicular center line, the axis of each being the crank-shaft D, and the object of having the electro-magnets and armatures hung in a vertical position is so that they shall all be the same distance from the electro-magnets, so that the same current of electricity will operate all of the armatures.

Reverting to the different shapes of the under surfaces of the weighted cams, it is to be stated that it is due, first, to the tangent formed by the lever working on a circle or curved line and the weights falling in perpendicular line, and, second, the center cam and the one on each side must be replaced by moving the lever in either direction, which lever moves from a given center. To make this positive I make the friction-plate yoke and link so as to throw the surface of cam K' in position, so as to reset the center weighted cam A' either way, and then make the under surface of the other weighted cams to conform to it, the last one on each side resetting only in one direction. This will have to be worked out according to the number of signals placed on the dial. The outside or upper surface of the weighted cams is shaped so as to clear a given diameter of dial. There is also a feature in connection with the catch C which requires elaboration. It will be noticed that its under surface is provided with a bulge or swell c', which, when the catch is dropped, will contact with the shaft of the lower electro-magnet, and in this manner the rotation of crank-shaft D is limited, so as to allow the arrows to turn only so far.

The dial may be made of glass or of other transparent material with the different speeds marked thereon, and the same may be lighted by lamps or electricity, in order that the same may be visible at night.

Having thus described my invention, what I claim as new, and desire to secure protection in by Letters Patent of the United States, is—

1. In an electric indicator, the combination, with a series of variable signal-transmitters for communicating orders or information from one place to another, of the connection of the pointer W and the series of arrows Z with the double-pivoted handle L, which moves the pointer W, in connection with the movable contact-point U, the shaft T, the spring Y, against the friction-plate S, and the arm M, substantially as hereinbefore described.

2. The double-pivoted handle L, in combination with an alarm-bell, in an electric indicator having a series of signal-transmitters, and the hollow slotted shaft K, in connection with the shaft T, the insulated block V, carrying the contact-spring U, the spring Y, the insulated block H, with its contact-points I, and electro-magnets E, completing the cir-

cuit when the handles are pressed together, substantially as hereinbefore described.

3. In an electric indicator, the combination, with a series of variable signal-transmitters, of a compound rotatable handle, the pivoted member carrying a horizontally-extending locking pin or bolt, and at its lower end a rotatable and longitudinally-movable shaft having a contact making and breaking arm connected therewith, said shaft being carried rearward in order to make and break the circuit when the upper ends of the handles are pressed together, substantially as set forth.

4. In an electric indicating system for steamships and the like, a plurality of duplicate indicating devices, each consisting of a dial having indicating-arrows thereon, an electric signaling-circuit from one indicator to the other, and means in each indicator for resetting the dropped arrows and at the same operation making and breaking the circuit and causing an arrow in one indicator to be operated and a duplicate arrow in the other indicator to be subsequently operated, substantially as set forth.

5. In an electric indicator for ships and the like, a resetting device consisting of a series of vertically-movable circularly-arranged cams to which the indicating-arrows are attached, said cams having their inner edges of different contours, and a cam working on a circle or curved line and adapted to raise the terminal vertically-movable cams when acted thereon in one direction and to raise the intermediate cams when acted thereon in either direction, substantially as set forth.

6. In an electric indicator for steamships and the like, a resetting device consisting of a series of vertically-movable circularly-arranged cams to which the indicating-arrows are attached, said cams having their inner edges of different contours, a cam working on a circle or curved line, and means for raising one end of said last-named cam before starting on its circular course into engagement with any of the vertically-movable cams, whereby the terminals of the last-mentioned cams, as soon as the circular movement begins, are raised when acted upon in one direction and the intermediate cams when acted upon in either direction, substantially as set forth.

7. In an electric indicator for ships and the like, a resetting device consisting of a series of vertically-movable circularly-arranged cams, said cams having their inner edges of different contours, electro-magnets for each cam, a crank-shaft having its inner end connected to the cam and its outer end carrying an arrow, a notched catch rigidly mounted upon said crank-shaft, an armature having its upper end hooked and adapted to normally engage the notch of the catch and to be released therefrom when its lower end is attracted toward the electro-magnets, and a cam working on a circle or curved line adapted

to raise the terminal vertically-movable cams when acting thereon in one direction, so as to turn the crank-shaft and throw the catch back into its normal engagement with the armature and to raise the intermediate cams when acting thereon in either direction, substantially as set forth.

8. In an electric indicator for ships and the like, the combination of electro-magnets, a crank-shaft carrying on its outer end an arrow, a notched catch rigidly secured thereto, an armature provided with a hooked upper end adapted to normally engage the notch of the catch and as its lower end is attracted toward the magnets to release said catch, and a weighted cam separate from the catch upon the inner end of the crank-shaft, adapted to exert a constant pressure against the catch and hold the arrow in position against jarring and the like, substantially as set forth.

9. In an electric indicator for steamships and the like, the combination, with an insulated block or disk having a series of fixed contact-points in its periphery, of a movable contact-point and means for drawing said movable contact-point across the fixed points, whereby the circuit is completed and dirt or non-conducting matter prevented from accumulating by reason of the friction between the contacting surfaces, substantially as set forth.

10. In an electric indicator for ships and the like, the combination of an insulated block having a series of fixed contact-points in its periphery, a hollow shaft carrying a pointer upon one extremity, a shaft sliding within the hollow shaft, and a movable contact-point carried by said sliding shaft held in different positions by a notched quadrant, said handle consisting of two members, the inner member attached to the hollow shaft and the outer member to the inner shaft and so constructed that when the upper ends are pressed together the outer member will draw the inner shaft outwardly and its attached contact-point across the fixed contact and when moved laterally to rotate the two shafts in unison and turn the pointer carried by the hollow shaft, substantially as set forth.

11. In an electric indicating system for steam-vessels and the like, the combination of a friction-plate, a yoke extending therefrom, a shaft passing through said yoke, a link upon the inner end of the shaft, a cam upon the outer end thereof, a series of vertically-movable cams, each one of the series having its under edge of different contour, a shaft having springs mounted thereon and bearing against the friction-plate, an arm having its upper end connected to the link and its lower end keyed to the shaft, and a lever adapted to compress the spring against the friction-plate and to turn the shaft carrying said spring, substantially as set forth.

12. In an electric indicating system for steam-vessels and the like, the combination

of a series of variable signal-transmitters, an electric circuit, the main-battery wire thereof connecting with the back plate of the indicator, a friction-plate, springs bearing against the same, a make-and-break contact-arm connecting with the springs, and means for compressing the springs against the friction-plate, whereby a positive contact with the

back plate is secured, substantially as set forth.

In testimony whereof I affix my signature in presence of witnesses.

DYSON D. WASS.

Witnesses:

N. A. ACKER,
EDWIN W. TUCKER.