C. J. HENSCHEL.

MARINE TELEGRAPH.

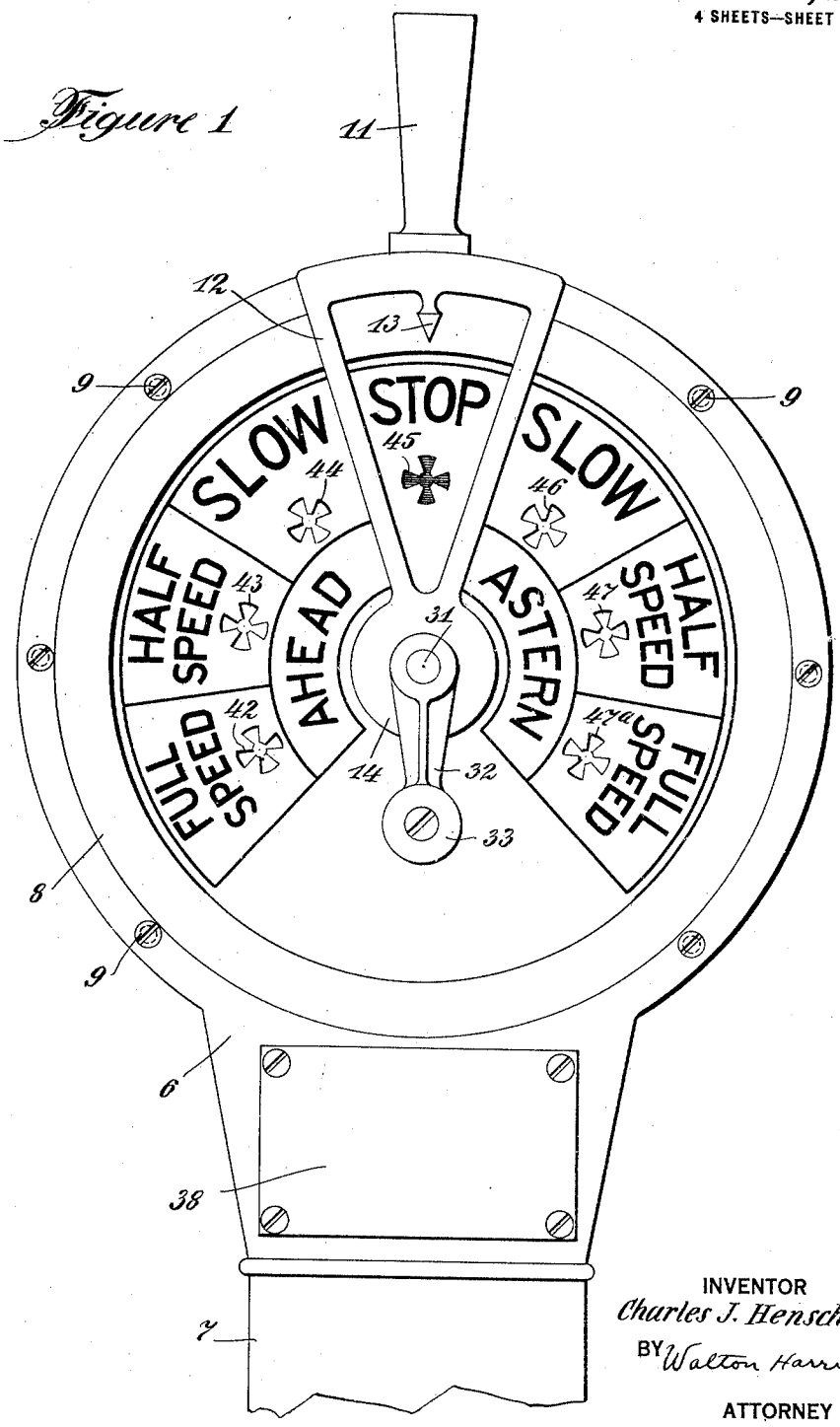
APPLICATION FILED MAR. 28, 1919.

1,367,258.

Patented Feb. 1, 1921.

4 SHEETS—SHEET 1.

Figure 1



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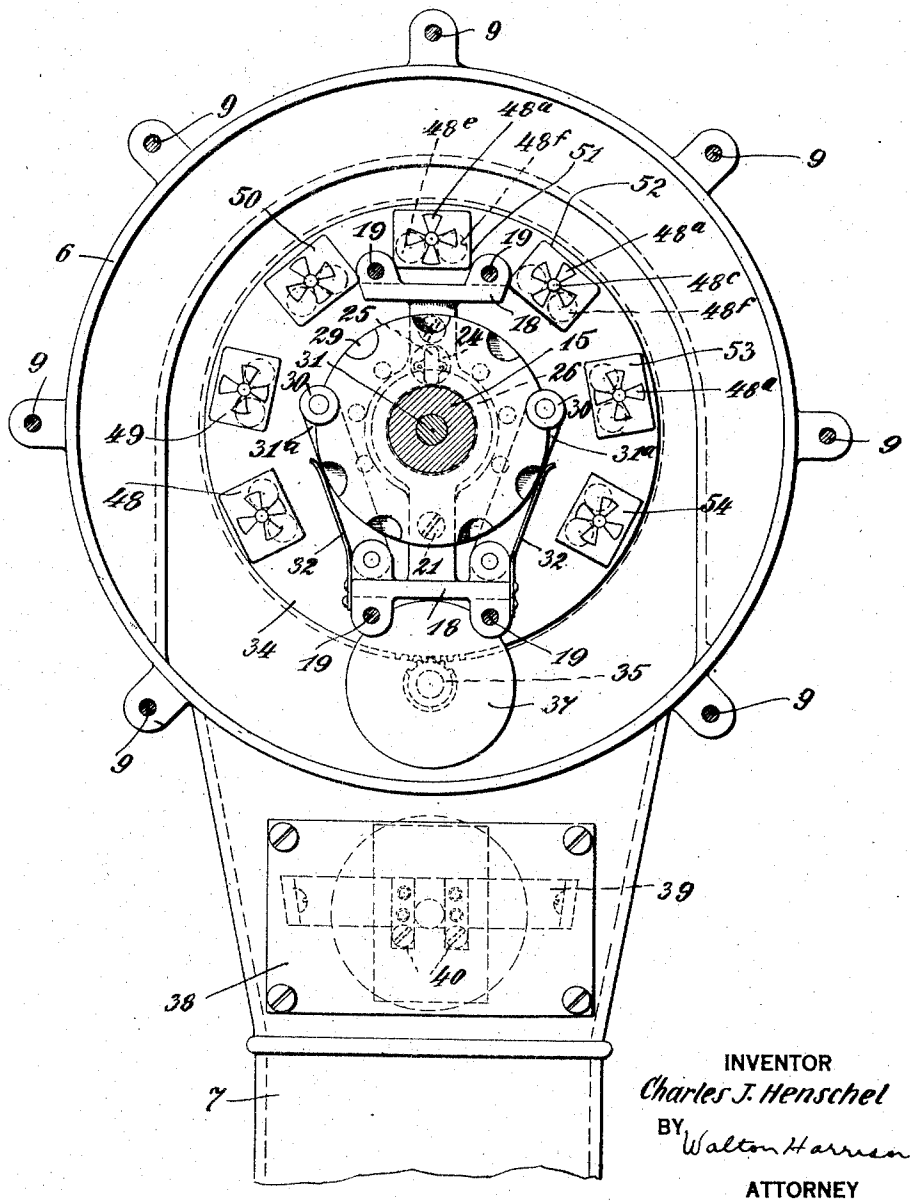
4 SHEETS—SHEET 2.

Figure 2.



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4 SHEETS—SHEET 3.

Figure 3.

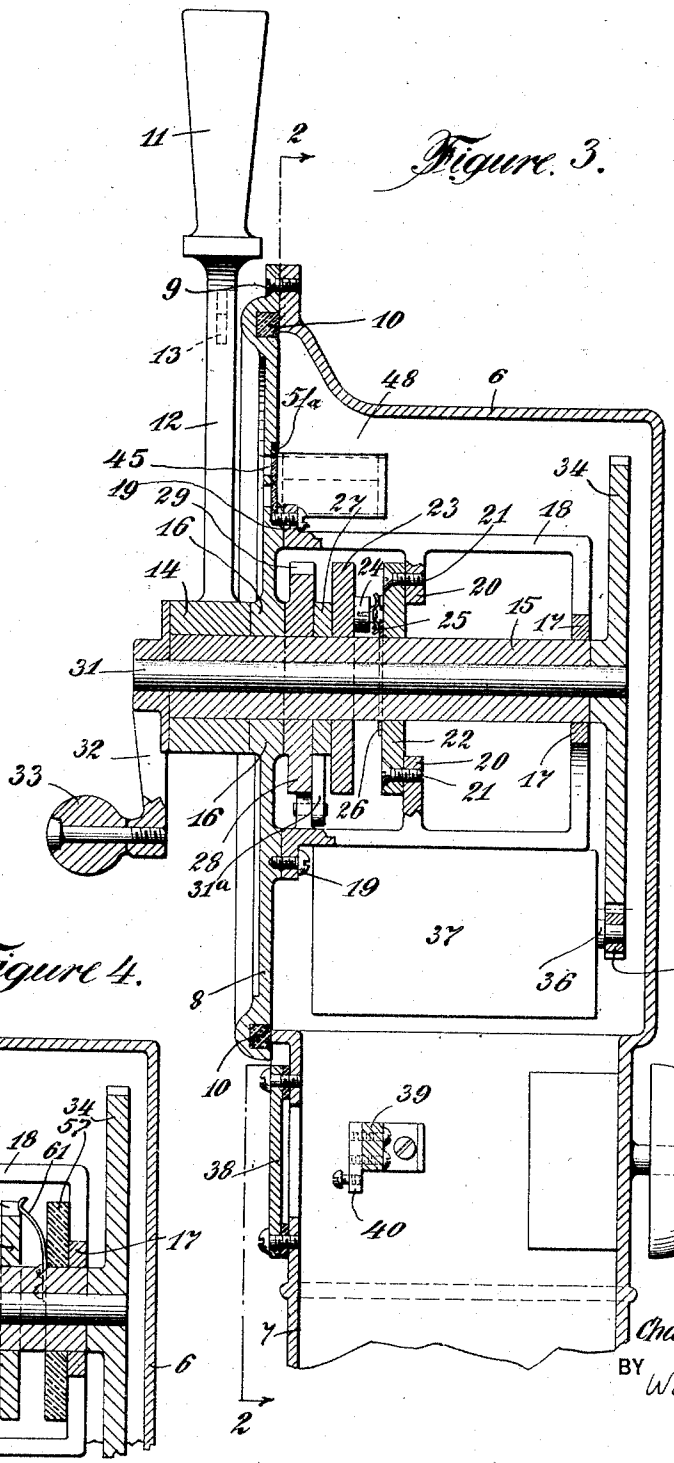

Figure 4.

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4 SHEETS—SHEET 4.

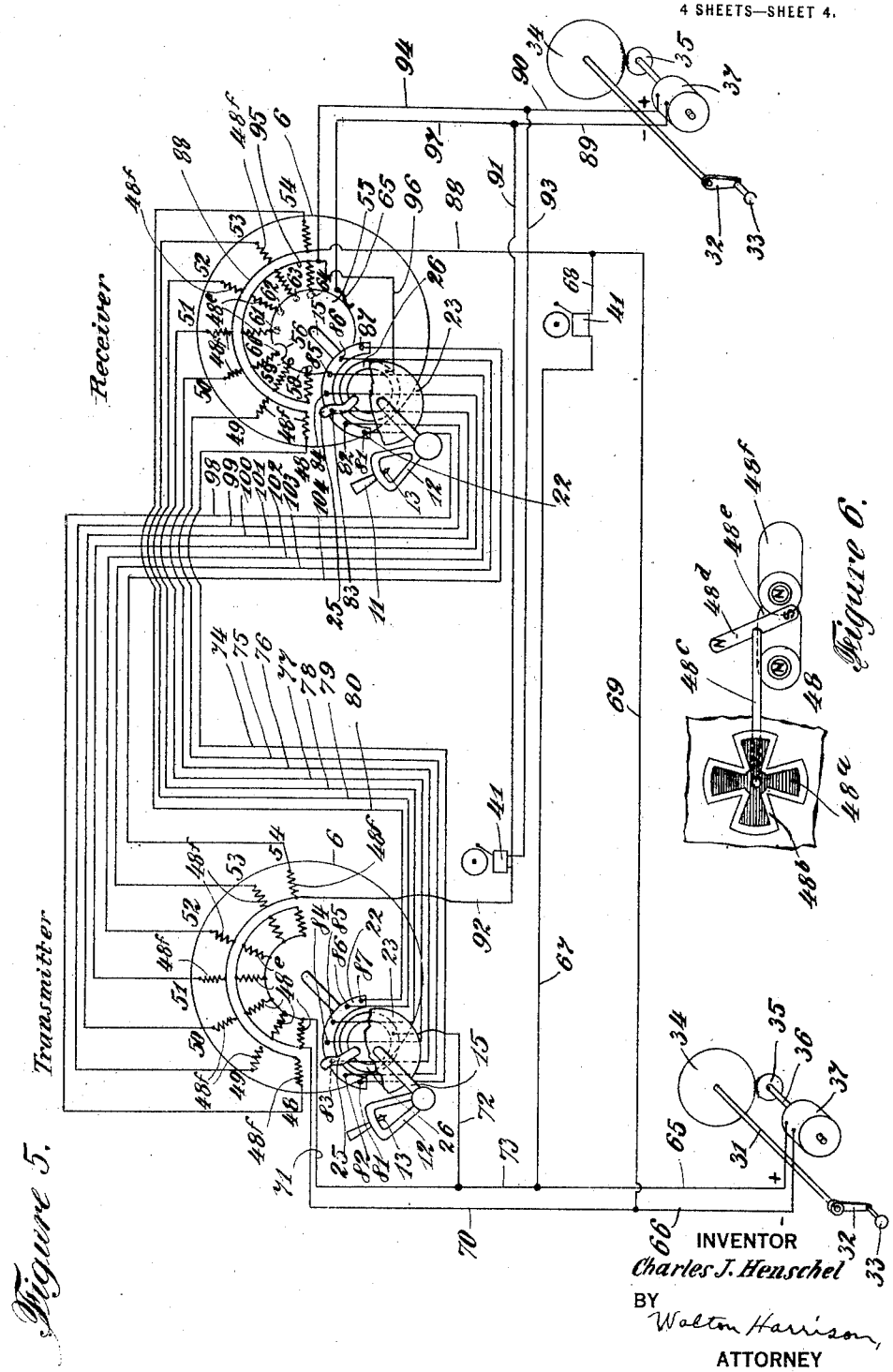

Figure 5.

Figure 6.

UNITED STATES PATENT OFFICE.

CHARLES J. HENSCHEL, OF BROOKLYN, NEW YORK.

MARINE TELEGRAPH.

1,367,258. Specification of Letters Patent. Patented Feb. 1, 1921.

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To all whom it may concern:

Be it known that I, CHARLES J. HENSCHEL, a citizen of the United States, residing at Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Marine Telegraphs, of which the following is a full, clear, and concise description.

My invention relates to marine telegraphs of the kind used upon shipboard for enabling an officer located in some selected portion of the vessel—say standing upon the bridge—to transmit certain conventional signals to a person located in a different part of the vessel; for instance to the engineer, in the engine room.

By my invention I seek to produce a marine telegraph in which the power employed in transmission of the signals is made by electric currents, generated altogether by muscular efforts of the operator, so as to render the device independent of all outside sources of electric power, the mechanism being so arranged, however, as to avoid undue waste losses in transmission, so that no great muscular effort by the operator is required.

My invention further contemplates a marine telegraph employing a number of electric circuits each of which is normally dead in the sense that when my device is for the moment not in active use no part of any electric circuit is active, or is subjected to a difference of potential, or is energized by a flow of current.

In addition, my invention contemplates a marine telegraph having a number of drops located at the transmitting station, each adapted to be set and restored electrically, and a number of drops located at the receiving station, each adapted to be set and restored electrically, the electrical connections and mechanism associated therewith being so arranged that the operator at the transmitting station, before setting any particular drop at the receiving station, must first restore to normal condition all drops at the transmitting station; and the operator at the receiving station, in order to answer the signal, must restore all drops at the receiving station except one, which is directly associated with the particular signal to be answered.

Finally my invention comprehends a number of separate improvements in marine telegraph apparatus for the purpose of improving the general efficiency thereof.

Reference is made to the accompanying drawings forming a part of this specification, and in which like letters indicate like parts throughout the several figures.

Figure 1 is a fragmentary front elevation of the mechanism at the transmitting station.

Fig. 2 is a section on the line 2—2 of Fig. 3, looking in the direction indicated by the arrows.

Fig. 3 is a substantially central vertical section through the mechanism shown in Fig. 1.

Fig. 4 is a fragmentary section, showing the back portion of the mechanism of the indicator used at the receiving station.

Fig. 5 is a diagram of the wiring and electrical connections associated therewith.

Fig. 6 is a diagrammatic perspective of one of the drops employed, these drops being connected with the wiring as indicated in Fig. 5.

The transmitter casing is shown at 6 and is mounted upon a hollow supporting column 7. The casing is provided with a removable face plate 8 held in position by screws 9.

A gasket 10 is carried by the face plate, and renders the casing water-tight, as may be understood from Fig. 3.

The face plate 8 is provided with a number of legends, as follows, Ahead, Astern, Stop, Slow, Half Speed and Full Speed, the three last mentioned being duplicated as shown. These legends may be made with luminous paint, or otherwise rendered conspicuous as desired.

A handle 11 is mounted upon a V-shaped arm 12, through which the legends may be read. This arm carries a pointer 13, and extends outwardly from a hub 14, which is secured rigidly upon one end of a tubular shaft 15, as may be understood from Fig. 3. The tubular shaft 15 is rocked within predetermined limits by movements of the handle 11, but has no other motion. A bearing 16, integral with the face plate 8, serves as a support for the tubular shaft 15, which extends through it.

The tubular shaft 15 also extends through

a bearing 17, carried by and integral with a spider 18. This spider is by screws 19 secured to the face plate.

The spider 18 carries an annulus 20 extending inwardly toward the tubular shaft 15, and secured upon this annulus by aid of screws 21 is a contact disk 22.

Mounted rigidly upon the tubular shaft 15 is a disk 23, carrying an insulator 24, and secured upon this insulator is a contact spring 25. This contact spring slidably engages a contact ring 26, with which it is always in contact, and from which it distributes current to certain stationary contact buttons, as hereinafter described.

A washer 27 encircles the tubular shaft 15, and engages the disk 23. The washer 27 also engages a centering wheel 28, which is mounted rigidly upon the tubular shaft 15 and is provided with notches 29.

A pair of rollers 30 are carried by a pair of arms 31[a] which are journaled to swing and are engaged by springs 32. The springs, by pressing the arms 31 toward each other, tend to force the rollers 30 into the notches 29.

These notches are so spaced and arranged that the rollers 30, by occupying the notches one pair at a time, have a tendency to hold the centering wheel in definite predetermined positions. That is to say, as the handle 11 is swung angularly by hand, the operator feels a resistance which varies step by step, caused by the action of the rollers 30 upon the centering wheel.

The operator therefore has only to stop the motion of the handle where he finds it the easiest to stop, in order to leave it in such position that the pointer 13 will indicate positively and precisely some particular legend.

Extending through the tubular shaft 15 is a small shaft 31. Mounted rigidly upon the outer end of this shaft is a crank 32, carrying a handle 33. A gear wheel 34 is mounted rigidly upon the opposite end of the shaft 31, and meshes with a pinion 35. This pinion is mounted upon a shaft 36, which is the armature shaft of a direct current magneto 37. Thus the magneto is actuated by turning the crank 32 by means of the handle 33.

The handle 11 and arm 12 have nothing to do with actuating the magneto but are employed in controlling the distribution of the electric currents generated thereby.

A door is provided at 38, and adjacent this door is a terminal strip 39. Upon this terminal strip are mounted binding posts, one of which appears at 40. Back of the terminal strip is an electric bell 41.

The casing face is provided with peep holes 42, 43, 44, 45, 46, 47 and 47[a], in this instance seven in number, and associated with an equal number of drops 48, 49, 50, 51, 52, 53 and 54. These drops each have the same construction, which may be understood from Fig. 6. A shutter 48[a], having in this instance the proximate form of a Maltese cross, is disposed adjacent a background, 48[b] relative to which it presents a contrasting appearance. This shutter may be coated with luminous paint, or otherwise illuminated as desired. It is mounted upon a rocking shaft 48[c], which also carries a permanently magnetic armature 48[d]. Located upon opposite sides of the armature 48[d] are two magnets 48[e], 48[f] so arranged that in practice the drop is set by energizing the magnet 48[f], and is restored to its normal condition by energizing the magnet 48[e].

Referring more particularly to Fig. 5, the apparatus at the left hand side of the figure constitutes the transmitter and the mechanism at the right hand side comprises the receiver as indicated by legends. Adjacent each drop is a glass plate 51[a] carried by the casing face and sunken thereinto, for excluding the entrance of water.

Except for immaterial variations in the form of the casing and its location, the transmitter has some part corresponding to each part of the receiver. The receiver, however, has a few additional parts not found in the transmitter, and these are shown structurally in Fig. 4, and indicated diagrammatically in Fig. 5, at the right hand side.

I will now describe these additional parts. A contact disk 55 is mounted rigidly upon the revoluble tubular shaft 15, and is provided with a notch 56. Disposed adjacent the disk 55 is a stationary disk 57 made of insulating material and mounted upon this disk are contact members 58, 59, 60, 61, 62, 63, and 64, each having the form of a leaf spring, the one numbered 61 being shown in Fig. 4. The parts are so assembled and arranged that the contact springs normally engage the disk 55; but the notch 56, in passing each contact spring or in stopping adjacent the same, disconnects it from the disk 55, as shown in Fig. 4.

A contact spring 65 is in permanent engagement with the contact disk 55, as indicated at the right of Fig. 5.

Connected with the magneto 37 at the transmitting station are two wires 65, 66. From the wire 65 a wire 67 leads to the bell 41 at the receiving station. A wire 68 is connected to this bell and to a wire 69, which leads back to the transmitting station, and is there connected to the wire 68. A wire 70 is connected to the junction of the two wires 66, 69, and connected to this wire 70, and in parallel to each other with reference thereto, are all of the restoring magnets 48[e], used in the several drops 48, 49, 50, 51, 52, 53, 54 at the transmitting station. These magnets are also connected to a wire 71, relatively to which they are in parallel to each other.

Connected to the wire 71 is a wire 72, leading to the contact ring 26. A wire 73 is connected to the wires 71, 72, at the junction thereof, and is also connected to the wires 65 and 67 at their junction.

A number of wires 74, 75, 76, 77, 78, 79, 80 lead from the transmitting station to the receiving station, for the purpose of enabling the operator at the transmitting station to control the drops at the receiving station. At the transmitting station these wires are connected to the respective contact buttons of the disk 22, numbered 81, 82, 83, 84, 85, 86 and 87. These wires are at the receiving station connected to the respective setting magnets 48^f of the drops 48, 49, 50, 51, 52, 53 and 54. The magnets just mentioned are also connected to a wire 88, with reference to which they are in parallel. The wire 88 is connected to the wires 68 and 69, at the junction thereof.

Connected to the magneto 37 at the receiving station are two wires 89 and 90. A wire 91 leads from the wire 89 to the bell 41 of the transmitting station. Connected with this bell and with the wire 91 is a wire 92, to which all of the magnets 48^f, used at the transmitting station for setting the drops at said station, are connected in parallel. From the bell 41 of the transmitting station a wire 93 leads back to the receiving station, and is there connected to the wire 90. The wires 90 and 93 at their junction are connected to a wire 94, which leads to a wire 95. Connected with this wire 95, and in parallel to each other with reference thereto, are all of the magnets 48^e used for restoring the drops 48, 49, 50, 51, 52, 53 and 54 at the receiving station. A wire 96 is connected to the wires 94 and 95, and leads therefrom to the contact ring 26 at the receiving station. A wire 97 is connected to the wires 89 and 91, and leads therefrom to the contact spring 65.

Seven wires 98, 99, 100, 101, 102, 103, and 104 are connected to the contact buttons 81, 82, 83, 84, 85, 86 and 87 of the contact ring 22 at the receiving station, and lead therefrom back to the transmitting station, where they are connected to the respective setting magnets 48^f of the drops.

The operation of my device is as follows:

Assume that the vessel is stationary, that at each of the two stations the handle 11 occupies its middle or neutral position, and that at each station the only drop registering an affirmative indication is the one associated with the legend Stop, as may be understood from Fig. 1.

Assume further, that the officer at the transmitting station wants to send a signal for the vessel to move slowly ahead.

For this purpose he grasps the handle 11 and moves it in a contra-clockwise direction according to Fig. 5, so that the pointer 13 is brought into registery with the legend Slow and with the peep hole 44, as well as into general association with the legend Ahead. This brings the contact spring 25 into engagement with the contact button 83.

Up to this point none of the drops are affected.

The operator now grasps the handle 33 and turns it briskly, so as to actuate the magneto 37 of the transmitting station. Direct currents are thus generated, and they flow through a circuit which may be traced as follows: magneto 37, wires 65, 73 and 71, thence in parallel through all of the magnets 48^e used for restoring the drops 48, 49, 51, 52, 53 and 54 at the transmitting station, wires 70 and 66, back to the magneto 37. This energizes the magnets 48^e just mentioned, restores the drop 50 to its normal condition, and has practically no effect upon the other drops at this station further than to render it impossible for any of them to make any indication except the normal or negative indication. Thus at the transmitting station all visual signals show positively and affirmatively that the line of communication has been cleared, and that all drops at the transmitting station are in condition to register new indications.

Another circuit energized by the magneto at the transmitting station is as follows: magneto 37, wires 65 and 67 to the bell 41 at the receiving station, and wires 68, 69 and 66 back to the magneto 37 at the transmitting station. This rings the bell 41 at the receiving station.

A third circuit energized by the magneto at the transmitting station may be traced as follows: magneto 37, wires 65, 73 and 72, contact ring 26, contact spring 25, contact button 83, wire 76 to the setting magnet 48^f of drop 50 at the receiving station, wires 88, 69 and 66 back to the magneto.

This circuit causes the drop 50 at the receiving station to make an affirmative or positive indication.

The operator at the receiving station, hearing the sound of his bell 41 and noting the indication made by his drop 50 understands that the vessel is to go ahead slowly. He desires however to make known the fact that he understands the signal. He also wishes to clear the drops at the receiving station of all residual effects of indications made previously.

The operator at the receiving station thereupon grasps the handle 11 of his instrument, and turns it to the left or in a contra-clockwise direction, as shown at the right in Fig. 5, so that the pointer 13 reaches the position associated with the particular indication received. This brings the contact spring 25 into engagement with the contact buttton 83. It also brings the contact disk 55 into such position that this disk is

disconnected from the contact spring 60, owing to the presence of the notch 56, as may be understood from Fig. 5. This done, the operator grasps his handle 33 and by turning it briskly causes the magneto 37 at the receiving station to generate direct currents.

The following circuit may now be traced: magneto 37 at the receiving station, wires 90 and 93 to the bell 41 at the transmitting station, wires 91 and 89 back to magneto. This rings the bell 41 at the transmitting station.

Another circuit may be traced, as follows: magneto 37 of the receiving station, wires 90 and 94 to wire 95, thence in parallel through the restoring magnets 48^e of the drops 58, 59, 61, 62, 63 and 64, contact disk 55, contact spring 65 and wires 97 and 89 back to magneto 37. This clears all of the drops at the receiving station except the one numbered 50, which is the one displaying the particular signal to which an answer is being given. This single drop remains unaffected because, owing to the position of the notch 56 of the contact disk 55, no circuit is completed through the restoring winding of this drop.

Another circuit may be traced, as follows: magneto 37 of the receiving station, wires 90, 94 and 96, contact ring 26 of the receiver contact spring 25, contact button 83, wire 100 to transmitting station, setting magnet 48^f of drop 50 at the transmitting station, wires 92, 91 and 89 back to magneto. Thus the drop 50 at the transmitting station registers an indication for apprising the operator at the transmitting station that his signal is understood.

The apparatus remains in this condition until another signal is to be transmitted, whereupon the entire cycle of operations is repeated.

Each time the operator at the transmitting station wishes to transmit a signal he grasps the handle 11 and shifts the arm 12 until the pointer 13 designates the particular legend associated with the signal to be transmitted, and then energizes his magneto. Each time this is done the operator at the receiving station grasps his handle 11, moves the arm 12 into a position associated with the signal, and then energizes his magneto.

Each particular signal sent from the transmitting station to the receiving station involves the energizing of some one of the wires 74, 75, 76, 77, 78, 79, 80. Each time a signal is answered involves the energizing of some one of the wires 98, 99, 100, 101, 102, 103, or 104.

I do not limit myself to the precise mechanism here shown, nor in every instance to the use of curents generated by magnetos or even to the use of direct currents, the scope of my invention being commensurate with my claims.

I claim:

1. The combination of a plurality of electrically operated indicating members located at a receiving station, selective contact mechanism located at a transmitting station and separately connected with said indicating members for the purpose of enabling said contact mechanism to selectively control any one of said indicating mechanism chosen at the will of the operator, a plurality of electrically operated indicating members located at the transmitting station, means for selectively setting some predetermined one of said last mentioned indicating mechanism from the receiving station, and generating mechanism, actuated solely by muscular effort of the operator and connected with said last mentioned indicating mechanism for restoring the same, said generating mechanism being also connected with said contact mechanism for energizing said contact mechanism and the electrically operated indicating members controlled thereby.

2. The combination of a plurality of drops located at a transmitting station, a plurality of drops located at a receiving station, all of said drops at both stations being electrically controlled for the purpose of setting and restoring them, selective contact mechanism located at the transmitting station and connected with the drops at the receiving station for enabling the operator at the transmitting station to set any predetermined one of the drops at the receiving station, selective contact mechanism located at the receiving station and connected with the drops at the transmitting station for enabling the operator at the receiving station to set any predetermined one of the drops at the transmitting station, selective mechanism located at the transmitting station and connected with said selective contact mechanism at the receiving station, for the purpose of restoring all drops at the transmitting station, and selective contact mechanism located at the receiving station and connected with the selective contact mechanism at the receiving station, in order to restore all of the drops at the receiving station except one.

3. The combination of a plurality of indicating mechanisms located at a receiving station and each adapted to be electrically set and restored, a plurality of indicating mechanisms located at a transmitting station and each adapted to be electrically set and restored, selective contact mechanism located at the transmitting station and connected with the indicating mechanism at the receiving station for the purpose of setting them one at a time, selective contact mechanism located at the receiving station and

connected with the indicating mechanisms located at the transmitting station for the purpose of setting them one at a time, and mechanism controllable from the transmitting station for restoring all of the indicating mechanisms at the transmitting station each time said last mentioned selective contact mechanism is actuated.

4. The combination of a plurality of indicating mechanisms located at a receiving station and each adapted to be electrically set and restored, a plurality of indicating mechanisms located at a transmitting station and each adapted to be electrically set and restored, selective contact mechanism located at the transmitting station and connected with the indicating mechanisms at the receiving station for the purpose of setting them one at a time, selective contact mechanism located at the receiving station and connected with the indicating mechanisms located at the transmitting station for the purpose of setting them one at a time, electric mechanism located at the transmitting station and actuated in connection with the selective contact mechanism at that station for restoring the indicating mechanisms at the transmitting station, and electric mechanism located at the receiving station and actuated in connection with the selective contact mechanism at that station for restoring all of the indicating mechanisms at the receiving station except one.

5. In a marine telegraph the combination of a plurality of electrically operated indicating members located at a receiving station, selective contact mechanism located at a transmitting station and connected with each of said indicating members at said receiving station, electric generating mechanism connected with said contact mechanism and actuated solely by muscular effort of the operator for supplying currents through said contact mechanism to said indicating members, electrically operated indicating mechanism located at the transmitting station and controllable from the receiving station for enabling the operator at the receiving station to indicate that he understands the signal, and mechanism actuated with said electric generating mechanism at the transmitting station and controllable by the said currents generated thereby for restoring to normal condition said electrically operated indicating mechanisms at the transmitting station.

CHARLES J. HENSCHEL.