Feb. 13, 1934. A. CHRISTEN 1,947,332

DEVICE FOR INDICATING DIRECTION OF ROTATION OF PROPELLER

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Fig. 1.

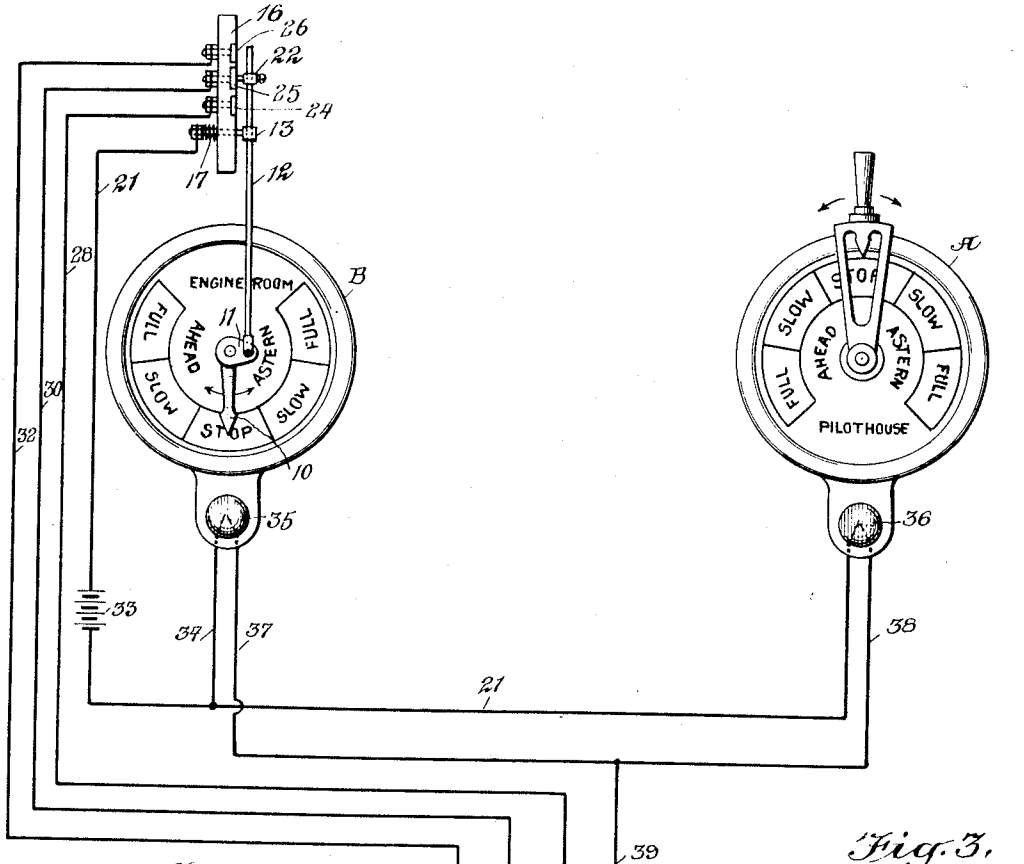



Fig. 2.

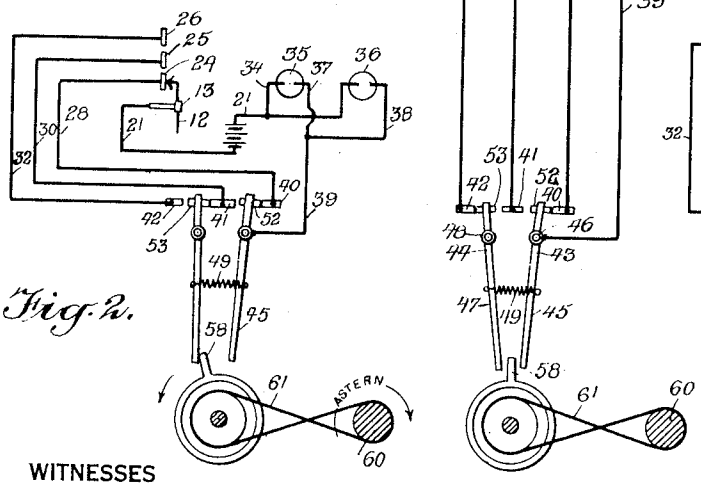
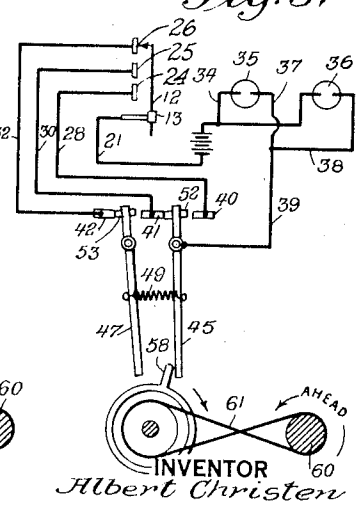



Fig. 3.




WITNESSES

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Fig. 4.

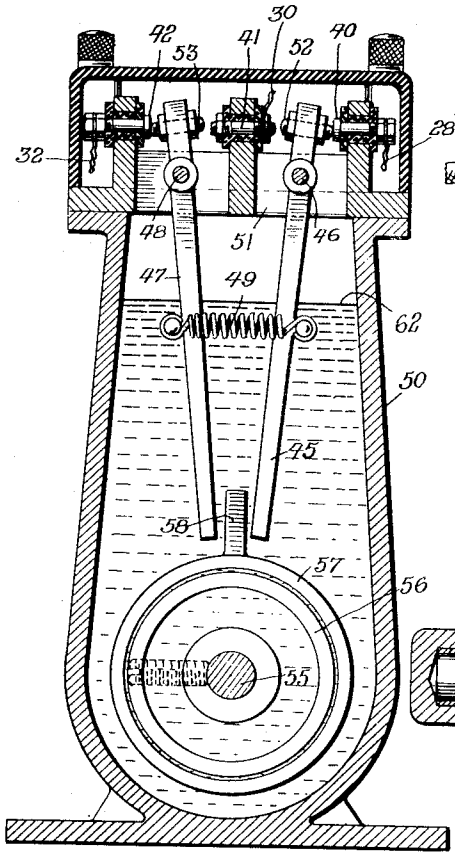



Fig. 5.

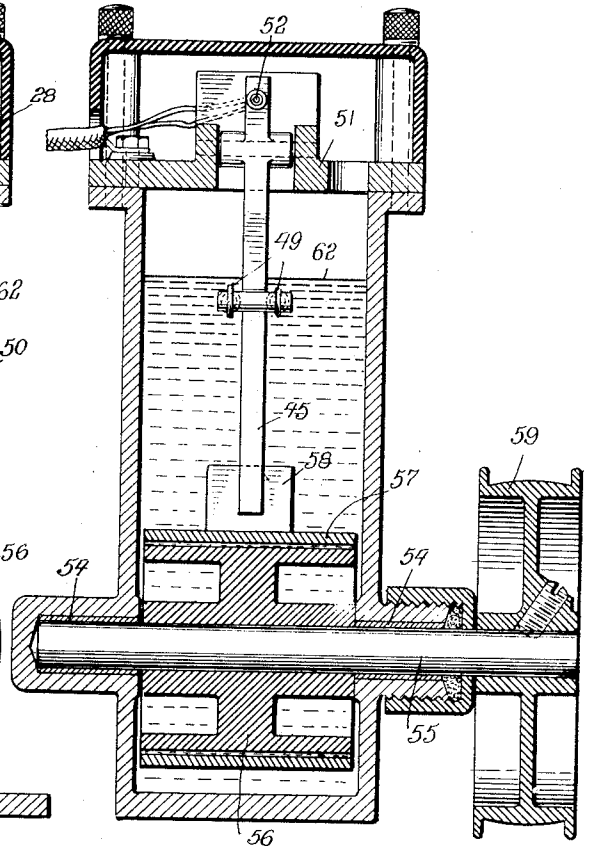



Fig. 6.

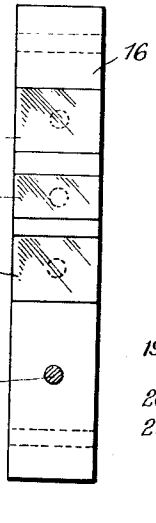
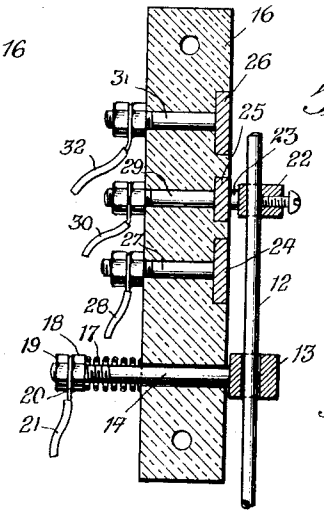



Fig. 7.




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# UNITED STATES PATENT OFFICE

1,947,332

## DEVICE FOR INDICATING DIRECTION OF ROTATION OF PROPELLER

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Application June 11, 1931. Serial No. 543,717

3 Claims. (Cl. 200—6)

An object of the invention is to provide a device for indicating the rotation of a shaft, which is of particular value as a means for indicating the rotation of a propeller shaft on a ship, which thereby serves to prevent accidents due to the failure of an engineer to follow orders which have been communicated from the bridge. The device is provided with means for signalling when the propeller is not moving in accordance with the orders which have been transmitted.

Another object of the invention is to provide means for operating a signal when the engineer has not followed orders with reference to the operation of the engine and the propeller driven thereby.

Still another object of the invention is to provide means in connection with a signal means from a bridge to the engine room of a ship, which will operate a signal until the engineer has followed the orders given through the said signalling means. Preferably two signals are provided, one on the bridge and the other in the engine room, and both these signals will be automatically operated until the engineer has followed the orders given with reference to the operation of the engine and the propeller shaft.

A further object of the invention is to connect the device with a marine telegraph in the engine room and also with the propeller shaft to operate a signal when the propeller is not operating in accordance with the orders on the marine telegraph.

Additional objects of the invention will appear in the following specification in which the preferred form of the invention is described.

In the drawings similar reference characters refer to similar parts in all the views, of which

Figure 1 is a diagrammatic view illustrating the operation of the device,

Figure 2 is another diagrammatic view illustrating the circuits when the marine telegraph has been operated to order the engineer to drive the ship ahead and the engine is operating to drive the ship astern,

Figure 3 is a view similar to the diagrammatic view illustrated in Figure 2, but illustrating the circuits when the marine telegraph has been operated to order the engineer to drive the ship astern and the engine is turning the propeller shaft to drive the ship ahead,

Figure 4 is an enlarged sectional view illustrating the manner in which the switch mechanism is operated by the propeller shaft,

Figure 5 is a side sectional elevation of Figure 4,

Figure 6 is an enlarged face view illustrating the marine telegraph device in the engine room, and

Figure 7 is a sectional side elevation of Figure 6.

By referring to the drawings, it will be seen that there are two marine telegraph devices of the ordinary construction which are connected in the well-known manner, one of these marine telegraph devices being indicated at A, this device being in the pilot house or on the bridge, and the second marine telegraph device, indicated at B, being located in the engine room, these devices being arranged and being connected in the customary manner.

The marine telegraph device B is provided with the usual pointer 10, which, as shown in Figure 1 of the drawings, is at the order "stop", it being understood that this pointer 10 may be moved to the left to the position marked "ahead", or to the right to the position marked "astern". The arm 11 is secured for rotating with the pointer 10 and connected with this arm 11 there is a rod 12, which is preferably insulated from the arm 11 and which extends through a sleeve 13 mounted on a pin 14 disposed in an aperture 15 in an insulating block 16. The pin 14 is preferably provided with a spring 17 which engages a nut 18 meshing with a thread on the pin 14, the spring 17 pressing against the insulating block 16 for holding the pin 14 in position. Another nut 19 meshes with the thread on the pin 14 and a conductor 20, forming a part of the circuit 21, being secured between the nuts 18 and 19.

Mounted on the rod 12 there is a conductor 22 having a contact 23 adapted to contact with the contact members 24, 25, and 26, which are spaced apart. The contact member 24 is connected by a pin 27 with a circuit 28, the contact member 25 is connected by a pin 29 with a circuit 30 and the contact member 26 is connected by a pin 31 with a circuit 32. It will be understood by referring to Figure 1 of the drawings, that when the pointer 10 is disposed downwardly at the position "stop" on the device B, the contact member 23 will be disposed at the contact member 25, and it will further be understood that when the pointer 10 is moved to the left to the position "ahead", it will move the rod 12 downwardly to position the contact member 23 at the contact 24, and that when the pointer 10 is moved to the right to the position "astern", it will move the rod 12 upwardly to position the contact member 23 at the contact 26.

In the circuit 21 there is a battery 33, or other

source of potential, and the circuit 21 leads to a wire 34 at a signalling device 35 on the device B, the circuit 21 also leading to a signalling device 36 on the device A, a wire 37 leading from the signalling device 35 and a wire 38 leading from the signalling device 36 to a wire 39.

The circuit 28 leads to a contact member 40, the circuit 30 leads to a contact member 41, and the circuit 32 leads to a contact member 42. There are two switching means 43 and 44, the switching means 43 consisting of an arm 45 pivoted at 46 and the switching means 44 consisting of an arm 47 pivoted at 48, the arms 45 and 47 being connected by a spring 49, and the switching means 43 and 44 being disposed in a casing 50 which is shown in Figures 4 and 5 of the drawings. The pivots 46 and 48 have electrical engagement with each other through the head 51 and it will, therefore, be seen that the wire 39 connects with the two switching means 43 and 44. The upper end of the arm 45 of the switching means 43 has a contact member 52 disposed between the contact members 40 and 41 and the upper end of the arm 47 has a contact member 53 disposed between the contact members 41 and 42.

Journaled in bearings 54 in the casing 50 there is a shaft 55, a drum 56 being disposed in the casing 50 and being secured for rotating with the shaft 55, and there being mounted for rotating on the drum 56 a sleeve 57 which has frictional engagement with the drum 56 to be rocked thereby, although it will be understood that when the sleeve 57 has been rocked, the shaft 55 with its drum 56 may rotate without further movement of the sleeve 57. Secured to the sleeve 57 there is an arm 58 which is disposed between the lower terminals of the arms 45 and 47 of the switching means 43 and 44. The shaft 55 beyond the casing has a pulley 59 which is connected with the propeller shaft 60 by means of a belt 61. As shown in Figures 1, 2 and 3, preferably this belt is crossed.

With the parts in the positions illustrated in Figure 1 of the drawings, neither of the signalling devices 35 and 36 will be operated, inasmuch as the contact 23 is at the contact 25, the contact 52 is at the contact 40 leading to the circuit 28 and the contact 53 is at the contact 42 leading to the circuit 32, which communicates with the contacts 24 and 26 respectively.

Should the pointer 10 on the marine telegraph device B be moved to the position "astern", the rod 12 will be moved upwardly moving contact 23 from engagement with contact 24, as shown in Fig. 2, so that the contact 23 will engage with the contact 26 and the circuit 21 will be closed through the wires 34, 37, 38 and 39 to the switching means 43, which communicates electrically with the switching means 44, and through the circuit 32 to the contact 26. This will operate the signalling devices 35 and 36 and they will remain in operation until the propeller shaft rotates to drive the ship astern, when the switching means 44 will be engaged by the arm 58 and be moved to the position indicated in Figure 2 of the drawings, when the circuit will be opened between the contact 53 and the contact 42.

If the pointer 10 of the marine telegraph device B is moved to the position "ahead", it will move the rod 12 downwardly so that the contact 23 will engage with the contact 24 and a circuit will be closed through the signalling devices 35 and 36, the wire 39 to the switching means 43 and the circuit 28 to the contact 24. This circuit will remain closed to operate the signalling means 35 and 36 until the propeller shaft rotates to drive the ship ahead, as shown in Figure 3, when the circuit will be opened between the contacts 40 and 52.

Should the marine telegraph device B be operated where the pointer 10 is moved to the right or "astern", and should the engineer operate the engine to drive the ship "ahead", the contact 23 will be at the contact 26 and a circuit will be closed through the signalling means 35 and 36 from the circuit 21 to the wire 39 to the switching means 43 and 44, and the circuit 32 to the contact 26. This circuit will remain closed until the engineer has obeyed the order given at the marine telegraph device.

When an order has been given to drive the ship ahead, which will move the contact 23 into engagement with the contact 24, a circuit will be closed through the signalling means 35 and 36 through the wire 39 to the switching means 43 and 44, and this circuit will remain closed until the engine has been operated to drive the ship ahead.

Should the engineer, through an error, operate the engine to drive the propeller shaft astern, the signalling means will remain in operation until the error has been corrected. This is obvious from Fig. 2, because with contact 23 in engagement with contact 24 in consequence of the device B being operated to indicate to the engineer to drive "ahead", the engineer in driving the propeller shaft 60 "astern", causes the arm 47 to be actuated instead of the arm 45 and the signals 35 and 36 will therefore remain "on", indicating that the engineer is not obeying the order.

It will be understood from the above, and from the description which has been given, that when the engine is not running, the signalling means will operate if the pointer 10 on the marine telegraph device is moved to the position "ahead" or to the position "astern". It will also be understood that when the pointer 10 is at the position "stop" on the device B, the signalling means 35 and 36 will be operated if the engine is running to rotate the propeller shaft to drive the ship ahead or astern, and that the signalling means will continue to operate until the orders have been obeyed.

Further, it will be understood that when the pointer 10, at the device B, is moved to the position "ahead", and the engine is running to rotate the propeller shaft to drive the ship ahead, the signalling means 35 and 36 will not operate, but if the engine is running to rotate the propeller shaft to drive the ship astern, the signalling means will operate.

In addition, it will be understood that if the pointer 10, at the device B, is moved to the positon "astern" and the engne is running to rotate the propeller shaft to drive the ship astern, the signalling means 35 and 36 will not be operated, but if the engine should be operated to rotate the propeller shaft to drive the ship ahead, the signalling means 35 and 36 will be operated to warn the engineer and the deck officer of the error which has been made.

Furthermore, it will be clearly understood that the signalling means 36 will operate in the pilot house or on the bridge simultaneously with the operation of the signalling means 35 in the engine room, and not only will the engineer be warned of the error which has been made, but the deck officer or quartermaster in the pilot

house or on the bridge will also be advised as to the error.

Preferably the casing 50 contains oil, the level of which is approximately at the line 62.

What is claimed is:

1. A switch including two spaced switch members electrically connected with each other and each pivotally mounted between its ends, three fixed contacts, two of said contacts being disposed respectively adjacent said members for engagement thereby, and the third contact being disposed between said members for engagement thereby, resilient means connecting said members which engages them respectively with said two contacts, and rockable means disposed for operatively engaging either one of said members to move it into engagement with said third contact independently of the other member.

2. A switch including two spaced switch members electrically connected with each other and each pivotally mounted between its ends, three fixed contacts, two of said contacts being disposed respectively adjacent the upper ends of said members for engagement thereby, and the third contact being disposed between said members for engagement thereby, resilient means connecting said members between the pivots and the other ends thereof which engages them respectively with said two contacts, and rockable means disposed for operatively engaging either one of said members to move it into engagement with said third contact independently of the other member.

3. A switch including two spaced switch members electrically connected with each other and each pivotally mounted between its ends, three fixed contacts, two of said contacts being disposed respectively adjacent said members for engagement thereby, and the third contact being disposed between said members for engagement thereby, resilient means connecting said members which engages them respectively with said two contacts, a rotary element, a rocker, and frictional means by which the rocker is rocked by said rotary element, said rocker being disposed for operatively engaging either one of said members to move it into engagement with said third contact independently of the other member.

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