Jan. 30, 1945. P. A. HEIST 2,368,300

ENGINE ROOM SIGNAL DEVICE

Filed April 2, 1943 4 Sheets-Sheet 1

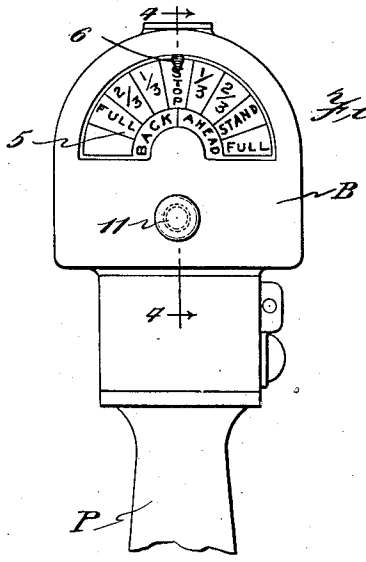

Fig. 1.

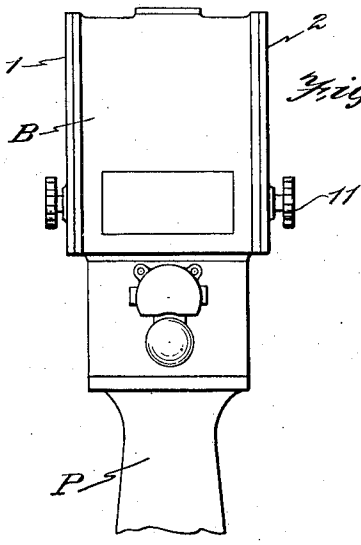

Fig. 2.

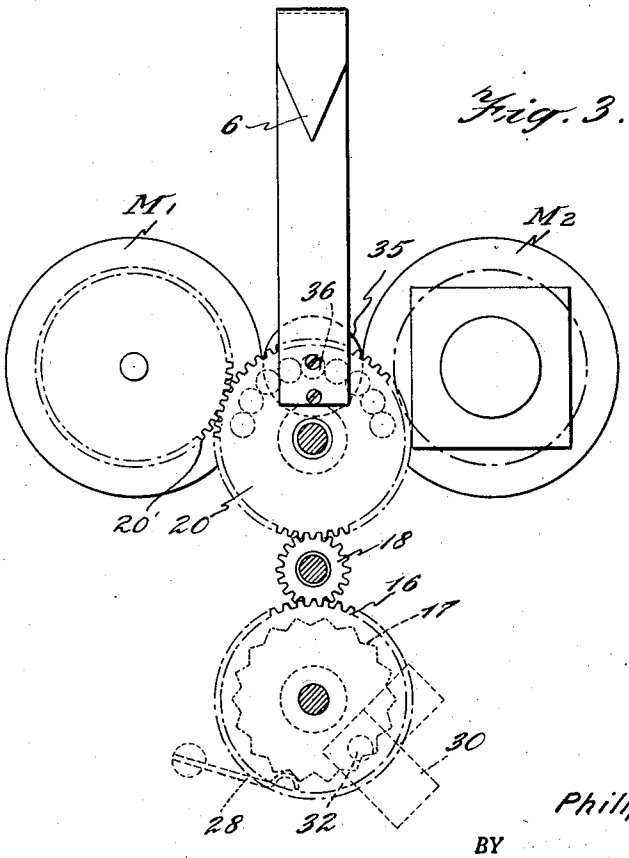

Fig. 3.

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ENGINE ROOM SIGNAL DEVICE

Filed April 2, 1943 4 Sheets-Sheet 2

Fig. 4.

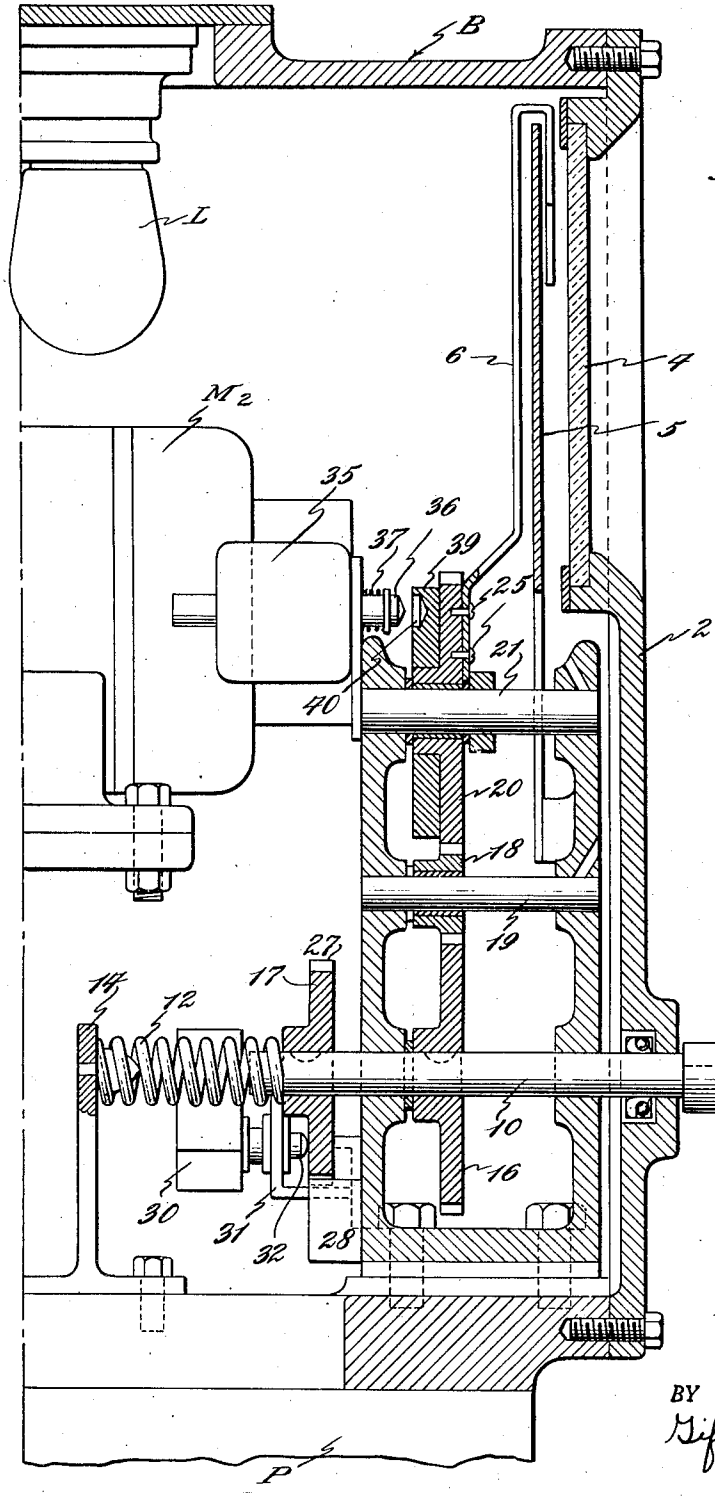
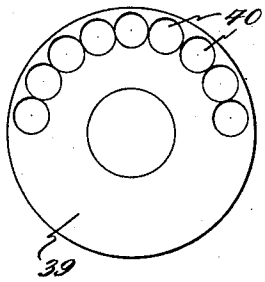


Fig. 5.



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ENGINE ROOM SIGNAL DEVICE

Filed April 2, 1943 4 Sheets-Sheet 3

Fig. 8.

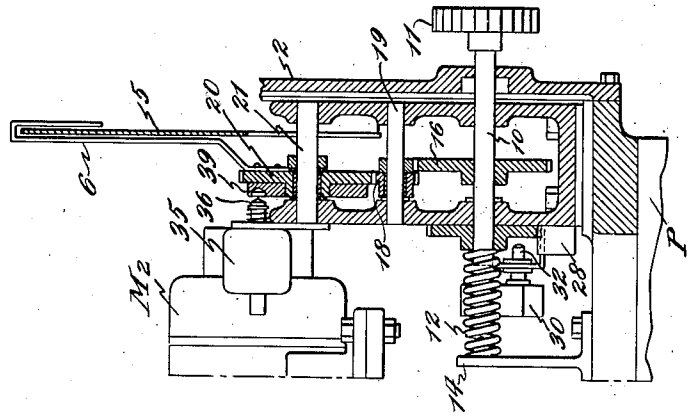


Fig. 7.

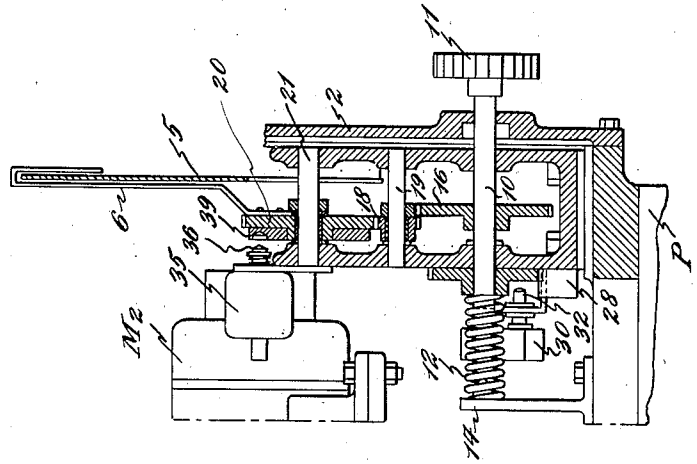
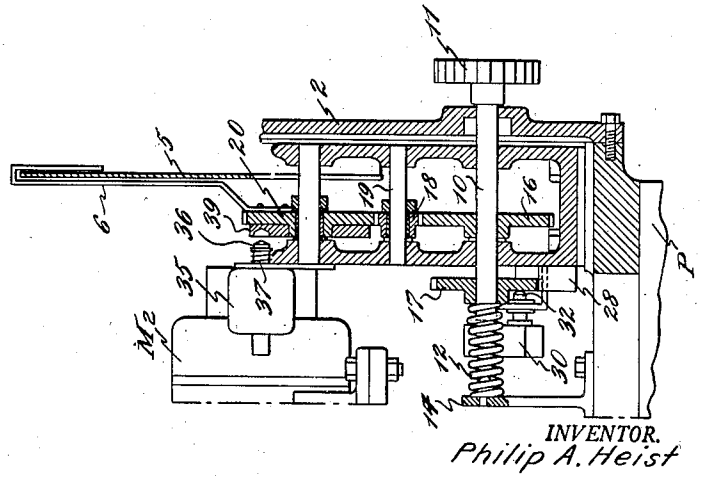


Fig. 6.



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Filed April 2, 1943 4 Sheets-Sheet 4

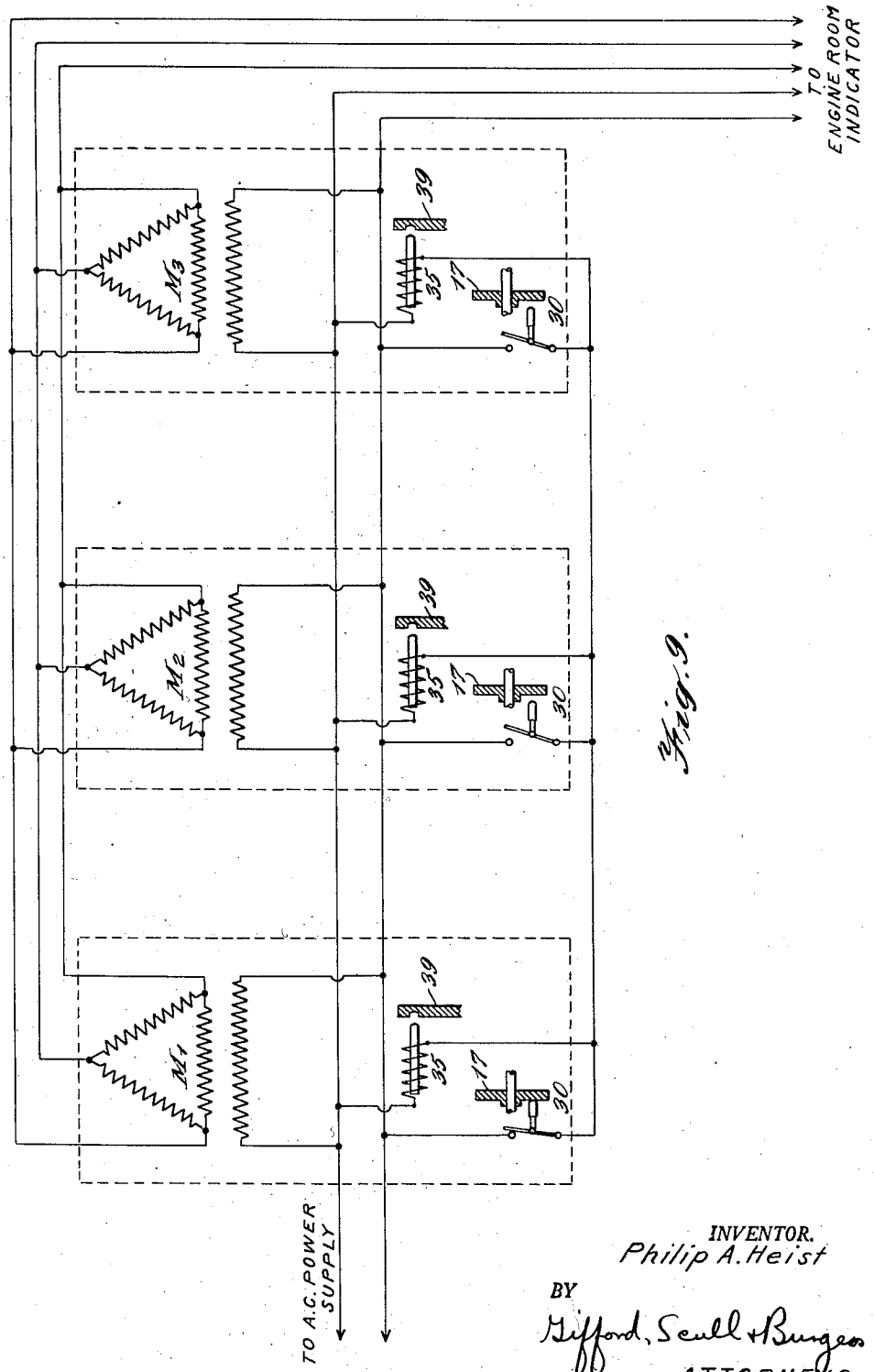

Fig. 9.

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Patented Jan. 30, 1945

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UNITED STATES PATENT OFFICE

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ENGINE ROOM SIGNAL DEVICE

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Application April 2, 1943, Serial No. 481,583

4 Claims. (Cl. 177—337)

This invention relates to a signal mechanism for transmitting messages from the bridge of a ship to the engine room. On ocean going boats, it is customary to have at least one engine room receiver and a plurality of deck transmitters so that the deck officers may send their signals from various parts of the boat as may be required. It is an object of this invention to produce a signal so constructed that the last message to be sent from any sending station will be indicated not only at that station and in the engine room, but at all sending stations.

Looking at the drawings,

Fig. 1 is a front elevation of a sending station, such as any one of those positioned above deck.

Fig. 2 is a side elevation of said sending station.

Fig. 3 is a diagrammatic view of some of the internal mechanism of said sending devices.

Fig. 4 is a section through 4—4 of Fig. 1.

Fig. 5 is an elevation detail showing one of the elements of the device.

Figs. 6, 7, and 8 are vertical sections through 4—4 of Fig. 1, each showing the mechanism in a different operating position.

Fig. 9 is a diagram showing the electric circuits for connecting up three sending stations to an engine room receiver.

Transmitting stations of the kind referred to herein are usually mounted on pedestals, such as that shown at P. They include a water-tight box B, with a front and back cover 1 and 2, each of which has a glass panel 4 to permit observation of the dial 5 and indicator 6 within the box. The dial 5 is marked off to show different speeds forward and backward (Fig. 1), and the receiving instrument in the engine room has similar markings. The moving hand is an overhanging pointer 6 designed to move over the face of the dial. Usually these transmitters are made with a double face and a double mechanism within each box so that they may be viewed from either front or back. The mechanism, however, is exactly the same and it is only necessary to describe one part.

Projecting through the case 2 is a shaft 10 on which is mounted a knurled hand knob 11. This shaft is longitudinally movable on its bearings against the action of the spring 12, which normally tends to push the shaft outwardly. One end of the spring 12 is mounted on support 14, and the other end on the left end of shaft 10, as viewed in Fig. 4. In this figure, the shaft 10 has been moved to the left against the pressure of the spring 12. In Figs. 7 and 8, the shaft 10 is shown moved into its outermost position by the action of the spring. To the shaft 10 is keyed a gear 16 and a circular ratchet wheel 17. Gear 16 is in mesh with an idler pinion 18 mounted on stub shaft 19. This in turn meshes with gear 20 which is mounted to rotate on shaft 21. To the front face of the gear 20 is attached the pointer 6 by means of screws 25. A self-synchronous motor M_1 (see Fig. 3), such as that sold under the trade name "Selsyn," is geared to the gear 20. It should be noted that in Fig. 4 the motor M_2 is the motor for the other set of mechanism which is housed within the same box B. Synchronous motor M_1 has gear 20' mounted on its shaft. This gear meshes with gear 20 which, in turn, meshes with gear 18 which is in mesh with gear 16 mounted on shaft 10. This string of gearing serves to connect the manually operable shaft 10 with the motor M_1.

The elements so far described are so related that when shaft 10 is pressed inwardly into the position shown in Fig. 4, the gear 16 meshes with pinion 18 and movement of the shaft 10 is transmitted to the pointer 6 and to the self-synchronous motor M_1. This movement is supplied by the person manipulating the indicator, who turns the knob 11 until the pointer shows the desired speed and direction. Ratchet wheel 17 is equipped with teeth 27 which engage with cantilever spring 28 to prevent accidental movement of the mechanism. This wheel and spring will hold the mechanism in any position that it is put by manual operation.

A plunger switch 30 is mounted on a suitable supporting frame 31 and has a plunger 32 designed to be pressed inwardly by the face of the ratchet gear 17 when the shaft 10 is moved inwardly. Inward movement of the plunger 32 serves to close the switch 30. A spring loaded sucking solenoid 35 has a plunger 36 designed to be moved to the right or outwardly, as seen in Fig. 4, by coil spring 37. A circular plate 39 secured to the back of the gear 20 is shown in elevation in Fig. 5. This plate 39 has a series of depressions 40 arranged circumferentially near the periphery of the plate and extending around about 180° of the plate, as shown in Fig. 5. These depressions are designed to receive the plunger 36 of the sucking solenoid and when this plunger is located in one of these depressions it serves to lock the mechanism and at the same time definitely locate it. Current to the sucking solenoid 35 is controlled by switch 30. When switch 30 is closed, current flows through the solenoid 35, withdrawing the pin 36 from one of the depressions 40 in the plate 39.

An inspection of Fig. 9 shows that the self-synchronous motors marked M_1, M_2, and M_3 are connected in parallel with the power supply and with each other. The switches 30 are connected in parallel to the sucking solenoids 35 so that when switch 30 of any indicator is closed, all the sucking solenoids in the various indicators are actuated and the plungers of all the solenoids are withdrawn from the depressions 40 in the plates 39. Thus, when any transmitter is put in operation by pressing the shaft 10 inwardly, the first thing that happens is that all the sucking solenoids withdraw the locking pins so that the mechanisms of all transmitters and receivers are free to move. Upon rotation of the shaft 10 it has already been pointed out that the connecting self-synchronous motor of that particular unit is mechanically rotated and, because of the characteristics of the self-synchronous motors and the fact they are all connected in parallel, then every synchronous motor in each and every one of the devices will move in the same direction and the same amount. Upon release of the knob 11 and movement of the shaft 10 outwardly, the switch 30 is opened and current is cut off from all the various solenoids 35 and under the action of the springs 37 the plunger of each solenoid is urged toward the plate 39 attached to gear 20, with the result that the plunger, which is tapered, will, in entering the closest depression 40, serve to position the gear 20 to correct for small maladjustment. The result is that the pointers on each and every indicator will all point to the same reading on the scale and the mechanisms throughout will all be locked in position and cannot be moved again until the knob 11 on some indicator is pushed inwardly.

These indicating devices are usually equipped with electric light bulbs L which serve to illuminate the dials 5.

Figs. 6, 7, and 8 show three indicating devices. The one shown in Fig. 6 is the one which is being used as a transmitter. Those shown in Figs. 7 and 8 are stations which are not in use, but the pointers of which will change to the same position that the pointer 6 of the transmitter of Fig. 6 is manually placed in. It is seen from an inspection of these figures that the shaft 10 in Fig. 6 is moved to the left so that the switch 30 is closed. This actuates the solenoids 35 of all three indicators and in that way unlocks the mechanism, not only of the indicator shown in Fig. 6, but also the mechanisms of those indicators shown in Figs. 7 and 8 so that, when the self-synchronous motor of indicator 6 is moved, it will move the self-synchronous motors of the indicators shown in Figs. 7 and 8 a corresponding distance and upon release of the knob 11 all the solenoids 35 will become ineffective and under the urge of the solenoid coil springs the plungers of the solenoids will engage the depressions 40 in the plate 39 to lock all the mechanisms in their new position.

While I have shown the invention as embodied in a specific form, it is to be understood that various changes in details may be made without departing from the scope of the invention as defined by the appended claims.

I claim:

1. In an engine room indicator system, a plurality of deck indicators, each comprising a dial, a pointer, a self-synchronous motor, a locking solenoid, a solenoid control switch electrically connected to every solenoid in the system so that upon closing of said switch each solenoid in each indicator will be activated to unlock the pointer and motor of the indicator, and manual means for simultaneously operating said switch, motor, and pointer.

2. In an indicator system, a plurality of electrically connected indicators, each comprising a dial, a pointer, a self-synchronous motor, an electrically operated locking device and a control switch electrically connected to the locking device of each indicator in the system so that upon operation of said switch each locking device in each indicator will be actuated to unlock the pointer and motor of the indicator.

3. In an indicator system, a plurality of electrically connected indicators, each comprising a dial, a pointer, a self-synchronous motor, an electrically operated locking device, a control switch electrically connected to the locking device of each indicator in the system so that upon operation of said switch each locking device in each indicator will be actuated to unlock the pointer and motor of the indicator, and manual means for operating said switch, motor and pointer.

4. In an indicator system, a plurality of electrically connected indicators, each comprising a dial, a pointer, a self-synchronous motor, an electrically operated locking device, a control switch electrically connected to the locking device of each indicator in the system so that upon operation of said switch each locking device in each indicator will be actuated to unlock the pointer and motor of the indicator, and manual means for simultaneously operating said switch, motor and pointer.

PHILIP A. HEIST.