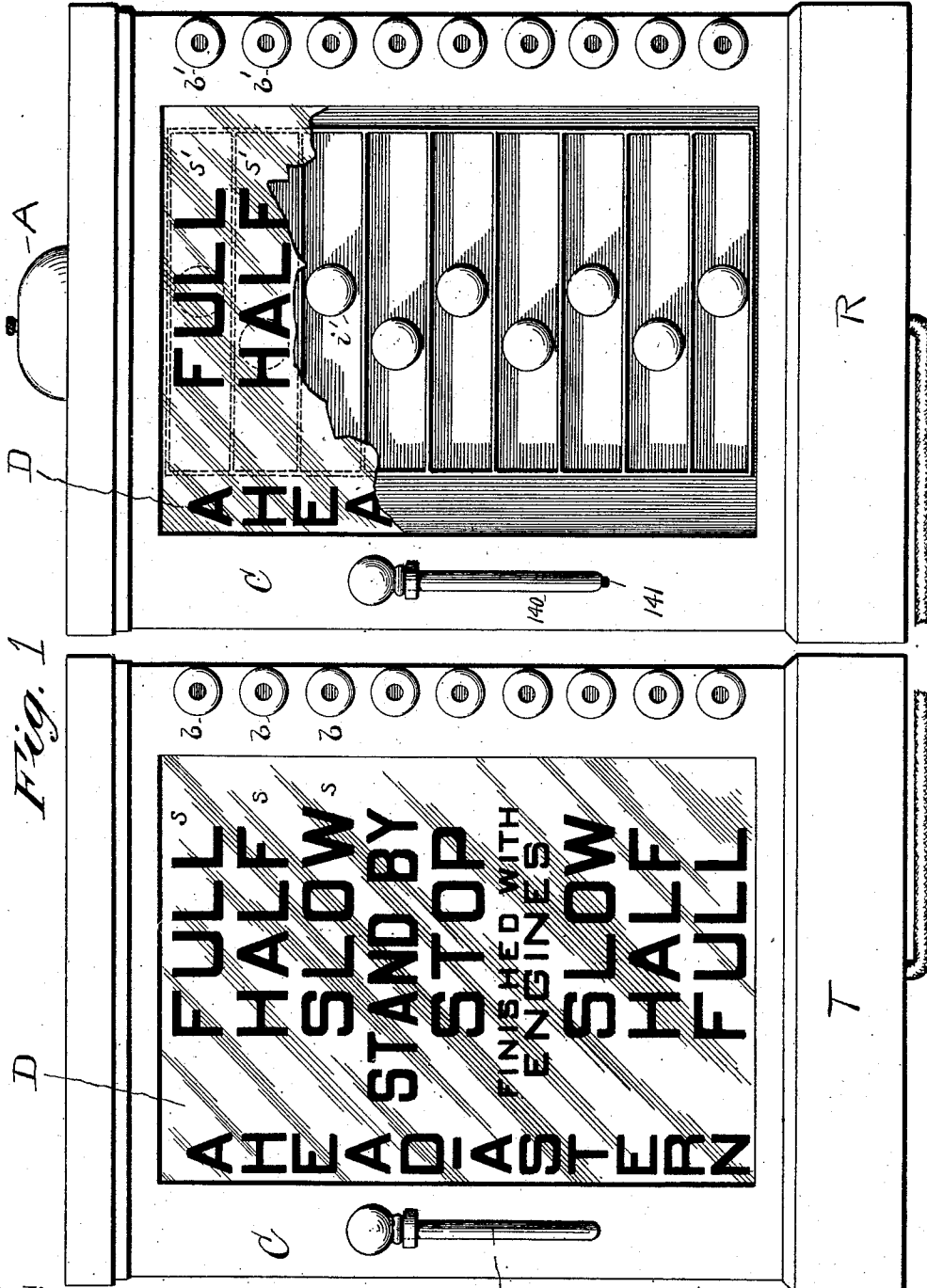


S. P. THRASHER.
ELECTRIC SIGNALING APPARATUS.
APPLICATION FILED JUNE 3, 1909.

994,218.

Patented June 6, 1911.

3 SHEETS-SHEET 1.



Witnesses
L. S. Grotter
J. J. Greenwald

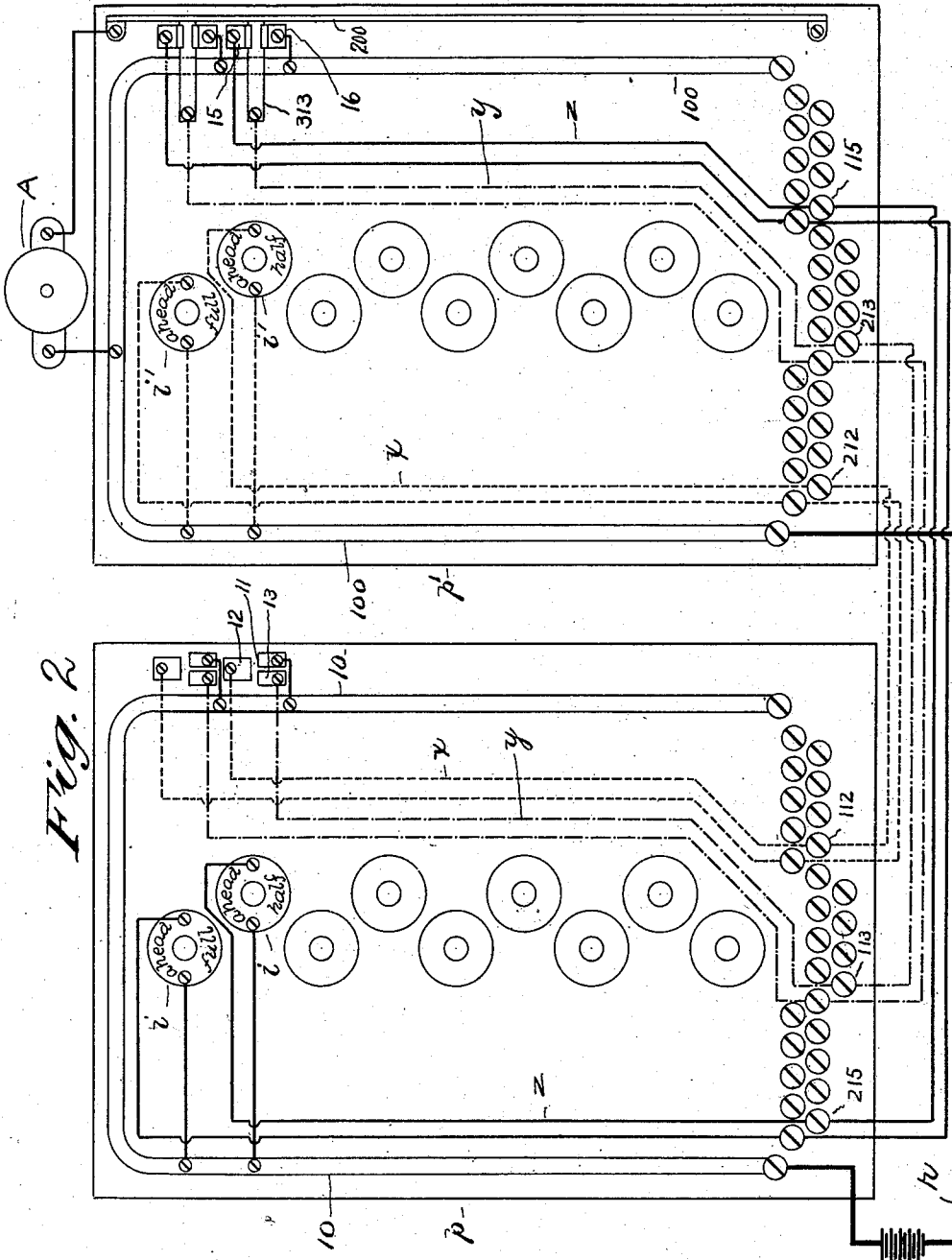
Inventor:
Samuel P. Thrasher
By H. B. Kent & Co.

S. P. THRASHER.
ELECTRIC SIGNALING APPARATUS.
APPLICATION FILED JUNE 3, 1909.

994,218.

Patented June 6, 1911.

3 SHEETS—SHEET 2.



Witnesses:
S. P. Grotta
J. H. Ketchum

Inventor:
Samuel P. Thrasher

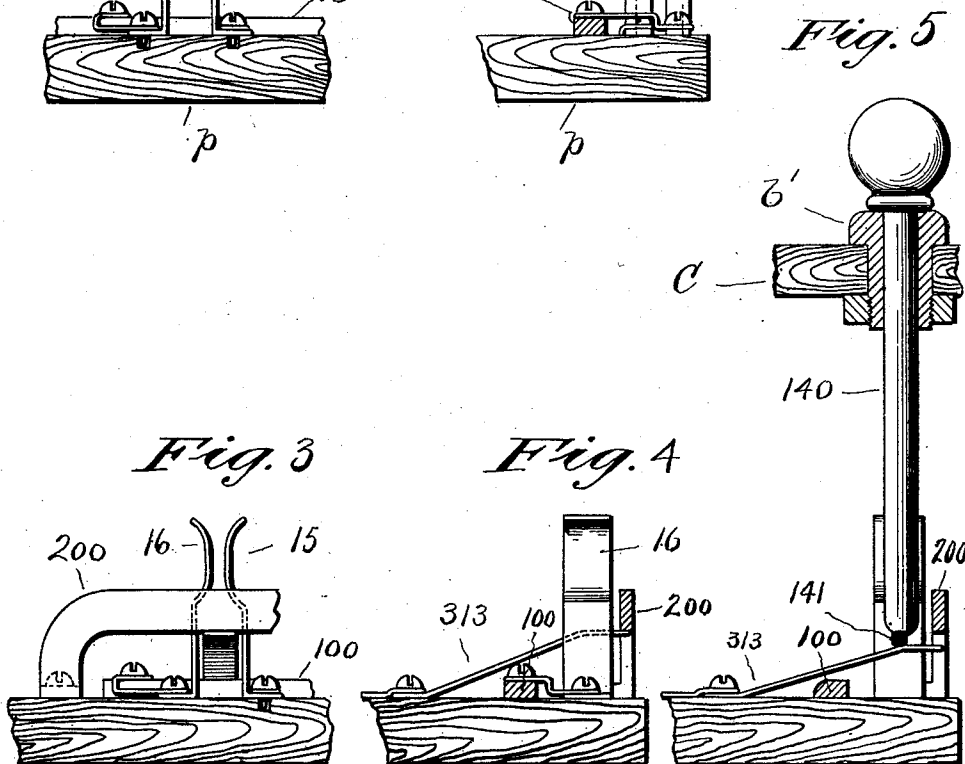
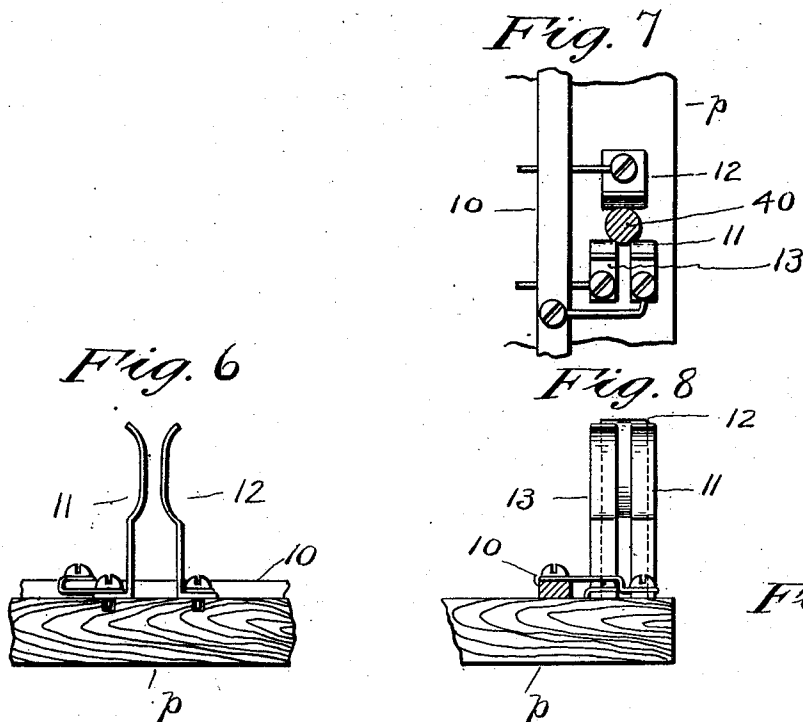
J. H. Ketchum, his attorney

S. P. THRASHER.
ELECTRIC SIGNALING APPARATUS.
APPLICATION FILED JUNE 3, 1909.

994,218.

Patented June 6, 1911.

3 SHEETS—SHEET 3.



Witnesses:

S. S. Grotta.
W. J. J. J. J.

Inventor:

Samuel P. Thrasher.
W. J. J. J. J.

UNITED STATES PATENT OFFICE.

SAMUEL P. THRASHER, OF HARTFORD, CONNECTICUT.

ELECTRIC SIGNALING APPARATUS.

994,218.

Specification of Letters Patent.

Patented June 6, 1911.

Application filed June 3, 1909. Serial No. 499,848.

To all whom it may concern:

Be it known that I, SAMUEL P. THRASHER, a citizen of the United States, and a resident of Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Electric Signaling Apparatus, of which the following is a specification.

This invention relates to electric signaling apparatus of the type designed to transmit orders or signals from one point to another remote point, provision being made for returning a signal in order that the sender may know that the order or signal which he sent has been received and understood.

The invention resulted from the demand for apparatus of this general character for the handling and controlling ships and is illustrated and will be described as installed for this use. Apparatus of this character is useful for other purposes than this, however, and my invention is susceptible of such other uses as well as a ship telegraph apparatus. When apparatus of this character is used on shipboard one instrument is usually located on the bridge, in the pilot house or in any other place from which the master or pilot of the ship controls its movements, and the other instrument is located in the engine room.

In the following description I will refer to the instrument located on the bridge or similar station as the transmitter and the instrument in the engine room as the receiver, though both of these instruments in accordance with my invention are intended to receive and to transmit information. The various orders on each instrument will be designated as stations. If desired there can be a transmitter at more than one point, these transmitters being in series.

My invention is characterized by an extreme simplicity in construction and operation and an entire absence of movable parts within the instruments, either manually operated, electrically operated, such as magnets, solenoids, etc., or mechanical movements controlled by electrical circuits.

In the drawings—Figure 1 represents my apparatus installed ready for use. Fig. 2 is a diagrammatic illustration of the circuits and operating parts of my apparatus. Fig. 3 is a detail elevation showing the control

of the bell circuit. Fig. 4 is a detail elevation looking from the right of Fig. 3. Fig. 5 is a detail elevation similar to Fig. 4 but showing in addition thereto the signaling plug and its manner of use. Fig. 6 is a detail elevation of the terminals at the stations of the transmitter. Fig. 7 is a plan view thereof. Fig. 8 is a side view thereof looking from the left of Fig. 6.

I will first describe the general arrangement and operation of my apparatus and then describe the circuits and operating parts more in detail.

The transmitter and receiver are alike in the following respects. Each comprises a casing, on the front of which there appear the various orders by which the ship is controlled both for ahead and astern movement. I arrange the ahead orders in the upper part of the dial and the astern orders in the lower part. A common set of orders is illustrated. The "stop" order is in the center of the dial, the "stand by" immediately above and "finished with engine" immediately below the "stop" order. The "slow" "half" and "full" speed orders ahead and astern are arranged above and below the center of the dial respectively in the order here given. Each station on each instrument has a fixed indicator of its own, for instance an incandescent light.

At the receiver there is an audible signal common to all of the stations; that is to say when an order from any station on the transmitter is sent to its corresponding station on the receiver the bell will ring. This bell is of the continuously ringing type; that is to say when its circuit is closed at the transmitter it continues ringing until its circuit is broken at the receiver. There is an independent set of circuits from each order on the transmitter to its corresponding order on the receiver so that when an order is sent from one station on the transmitter no other order is indicated at any station on either the transmitter or the receiver, and the same is true of the answering signal from the receiver to the transmitter. Opposite each station there is a bushing to receive and direct two contact plugs, the one at the transmitter being called the signaling-plug and the one at the receiver the answering-plug. This answering-plug is provided at its tip with a pin of insulating material.

The circuits between the various orders on the transmitter and their corresponding orders on the receiver are alike. One circuit, whose terminals are at the transmitter, includes the indicator at the receiver. A second circuit having its terminals at the transmitter includes the audible signal at the receiver. These two sets of terminals are so arranged that the circuit is closed at each set when the signaling-plug is inserted. A third circuit, whose terminals are at the receiver, includes the indicator at the transmitter. At the receiver there is a spring-contact which normally closes the bell circuit but by means of which this circuit can be broken.

In order to describe the operation of this apparatus generally let it be supposed that the master desires to send to the engine room the order "half speed ahead." He inserts his signaling-plug into the bushing opposite this station on the transmitter, thereby closing the indicator circuit, lighting the lamp behind the corresponding station at the receiver and also closing the bell circuit which starts the bell ringing. The bell calls the engineer's attention to the fact that the standing order has been changed and a new order given. He goes to the receiver and notes the order which is indicated, takes his answering-plug and inserts it in the bushing opposite said station, first completing the circuit for the indicator at the transmitter, which lights the lamp back of the order which has been transmitted, and then the insulated pin strikes the spring-contact in the bell circuit and breaks the circuit, causing the bell to stop ringing. In order to stop the ringing of the bell the engineer must insert his answering-plug in the bushing opposite the station indicated for that is the only bell circuit which is closed at the transmitter. In consequence the engineer knows that so long as the bell continues to ring he has not taken or returned the correct order. Also if the engineer does not get his answering-plug into the bushing opposite the indicated station he will not indicate the correct order to the master. The engineer receives two signals, each of which is independent of the other, and should either circuit be broken the other signal will attract his attention. For instance, if the indicator circuit be broken the ringing of the bell attracts his attention and by trying the various stations with his answering-plug he can tell what order has been given by noting the station at which his plug breaks the bell circuit.

Referring now to the drawings the apparatus will be described in detail.

T denotes the transmitter and R the receiver, each comprising casings C and dials D; s the various stations on the transmitter dial and s' the various stations on the re-

ceiver dial; b the various bushings on the transmitter dial and b' the various bushings on the receiver dial; i the indicators at the transmitter and i' the indicators at the receiver.

A is the audible signal at the receiver and as illustrated it takes the form of a bell.

The circuit terminals and indicators are mounted on panel-boards p p' which are mounted in the casings of the instruments.

Referring now more particularly to Figs. 2, 3 and 4; on the panel-board p is the bus-bar 10; on the panel-board p' is the bus-bar 100. The two bus-bars are connected by the return wire r , indicated by a heavy solid line, into which a source of electric current such as a battery may be introduced.

For the sake of simplicity I will describe the circuits from but one station, for instance, "half speed ahead."

x denotes the circuit for the indicator at the receiver (represented by a dotted line); y denotes the circuit for the audible signal at the receiver (represented by a dot-and-dash line); z denotes the circuit for the indicator at the transmitter (represented by a solid line).

On the transmitter panel-board p opposite each station are located the terminals for the two circuits which control the indicator and bell for the corresponding stations at the receiver. There are three of these terminals at each station; 11—12 are those of the indicator circuit and 11—13 those of the bell circuit, and they are so arranged that the signaling-plug closes both of these circuits. When the master desires to send his signal he inserts his signaling-plug 40 into the bushing opposite the station "half speed ahead"; this closes the circuits x y between the terminals 11—12, 13. By following the circuit x , which is indicated by a dotted line, it will be seen that the wire leads from terminal 12 to binding post 112 on the panel-board p , thence to a binding post 212 on the panel-board p' , thence to the indicator i' back of the "half speed ahead" order on the receiver, thence to the bus-bar 100 to the return r to bus-bar 10 and to contact 11. Following the circuit y it is seen that the wire leads from the terminal 13 to the binding post 113 on the panel-board p , thence to the binding post 213 on the panel-board p' , thence to a finger 313 which normally lies against the under side of the bell-bus 200, thence to the bell A back to the bus-bar 100 through the return r to the bus-bar 10 and thence to the terminal 11. The lamp back of the corresponding receiver station is lighted and the bell rings. When the engineer gets his signal he inserts his answering-plug 140 in the bushing opposite the station "half speed ahead", closing the contact between the terminals 15—16; this closes the circuit of the indicator lamp

at the transmitter and by following the circuit z , indicated by solid line, it will be seen that it leads from terminal 15 to a binding post 115 on the panel-board p' , thence to a binding post 215 on the panel-board p , thence to the indicator i thence to the bus-bar 10, back through the return wire r to the bus-bar 100, thence to a point where the bus-bar is connected with the terminal 16. Thus when the engineer first inserts his answering-plug into the bushing opposite the "half speed ahead" station he closes this circuit and lights the lamp back of the corresponding station at the transmitter; pushing his plug farther into the bushing brings the insulated tip 141 into contact with the spring-finger 313, pressing it down out of contact with the bell-bus 200, breaking the bell circuit.

It will be seen from the foregoing description that my apparatus has all of the essential features which are required of apparatus of this character; that it is of unusually simple construction, entirely free from moving parts of any kind which are liable to get out of order and so throw the entire apparatus out of commission; that each set of corresponding stations on the two instruments are entirely independent of the other sets of stations; and that each signal is operated by an independent circuit.

I claim:—

1. A signaling apparatus comprising a transmitter and a receiver situated at remote points and each having a plurality of corresponding stations; a fixed indicator for each station; a pair of terminals at each station of the transmitter each pair being independent of the other pairs; an electric circuit extending from each pair of said terminals to and including the indicator of the corresponding station on said receiver and adapted to operate said indicator when said circuit is closed; a pair of terminals at each station of the receiver each pair being independent of the other pairs; an electric circuit extending from each pair of said terminals to and including the indicator of the corresponding station on said transmitter and adapted to operate said indicators when said circuit is closed.

2. A signaling apparatus comprising a transmitter and a receiver situated at remote points; a plurality of corresponding stations on each; a fixed indicator at each station at said receiver; an audible signal at said receiver; a pair of independent circuits originating at each station of the transmitter, one of which includes the indicator at the corresponding station of the receiver, the other including said audible signal; terminals for said circuits at each station independent of those at the other station; means for closing said terminals; a fixed indicator at each station of the transmitter; a pair of terminals

at each station of the receiver independent of those at the other stations thereon; a circuit originating at each pair of said terminals and including the indicator at the corresponding station of the transmitter; and means for closing said circuit.

3. A signaling apparatus comprising a transmitter and a receiver situated at remote points; corresponding stations on each; a fixed indicator at each station at said receiver; an audible signal at said receiver; a pair of independent circuits originating at each station of the transmitter, one of which includes the indicator at the corresponding station of the receiver, the other including said audible signal; terminals for said circuits; means for closing said terminals; a fixed indicator at each station of the transmitter; a circuit originating at each station of the receiver and including the indicator at the corresponding station of the transmitter; means for closing said circuit; and a circuit breaker in said audible signal circuit located at said receiver and adapted to be operated by said circuit closing means.

4. A signaling apparatus comprising a transmitter and a receiver situated at remote points; corresponding stations on each; a fixed indicator at each station at said receiver; an audible signal at said receiver; a pair of independent circuits originating at each station of the transmitter, one of which includes the indicator at the corresponding station of the receiver, the other including said audible signal; terminals for said circuits; means for closing said terminals; a fixed indicator at each station of the transmitter; a circuit originating at each station of the receiver and including the indicator at the corresponding station of the transmitter; means for closing said circuit; and a circuit breaker in said audible signal circuit located at said receiver and adapted to be operated by said circuit closing means after said transmitter-indicator-circuit has been closed.

5. A signaling apparatus comprising a transmitter and a receiver situated at remote points; corresponding stations on each; a fixed indicator at each station at said receiver; an audible signal at said receiver; a pair of independent circuits originating at each station of the transmitter, one of which includes the indicator at the corresponding station of the receiver; the other including said audible signal; a bell-bus-bar in said bell circuit at the receiver; a spring finger at each station of said receiver normally resting against said bell-bus; terminals for said circuits at each station of the transmitter; a signaling-plug for closing said circuits; a fixed indicator at each station of the transmitter; a circuit originating at each station of the receiver and including said indicator; an answering-plug for closing said

circuit; and an insulated tip thereon adapted to engage said spring finger and break said bell circuit.

6. In a signaling-apparatus a transmitter
5 and a receiver, each comprising a casing, a dial, corresponding order stations on each dial, bushings through said casings opposite each station, panel-boards in each casing; an electric lamp arranged back of the dial
10 behind each station of both the transmitter and the receiver; an audible signal at the receiver; a circuit originating opposite each station on the transmitter and including the lamp back of the corresponding stations of
15 the receiver; a second circuit originating opposite each station on the transmitter and including said bell; terminals for said circuits located on said panel-board opposite each station of the transmitter and in aline-
20 ment with each bushing; a circuit originat-

ing at each station of the receiver and including the lamp back of the corresponding stations of the transmitter; terminals for said circuit secured to said panel-board opposite each station of the receiver and in
25 alinement with each bushing; a removable signaling-plug supported and guided in said bushings of the transmitter and adapted to close the lamp and bell circuits at the re-
30 ceiver; a removable answering-plug supported and guided in said bushings to close the circuit of the lamps at the indicator station one at a time; and an insulated pin on said plug adapted to break said bell circuit at the receiver, substantially as described.

SAMUEL P. THRASHER.

Witnesses:

H. E. HART,

D. I. KREIMENDAHL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
