G. H. CAUGHREAN.

SIGNALING APPARATUS.

APPLICATION FILED JAN. 3, 1910.

978,695.

Patented Dec. 13, 1910.

Fig. 2.

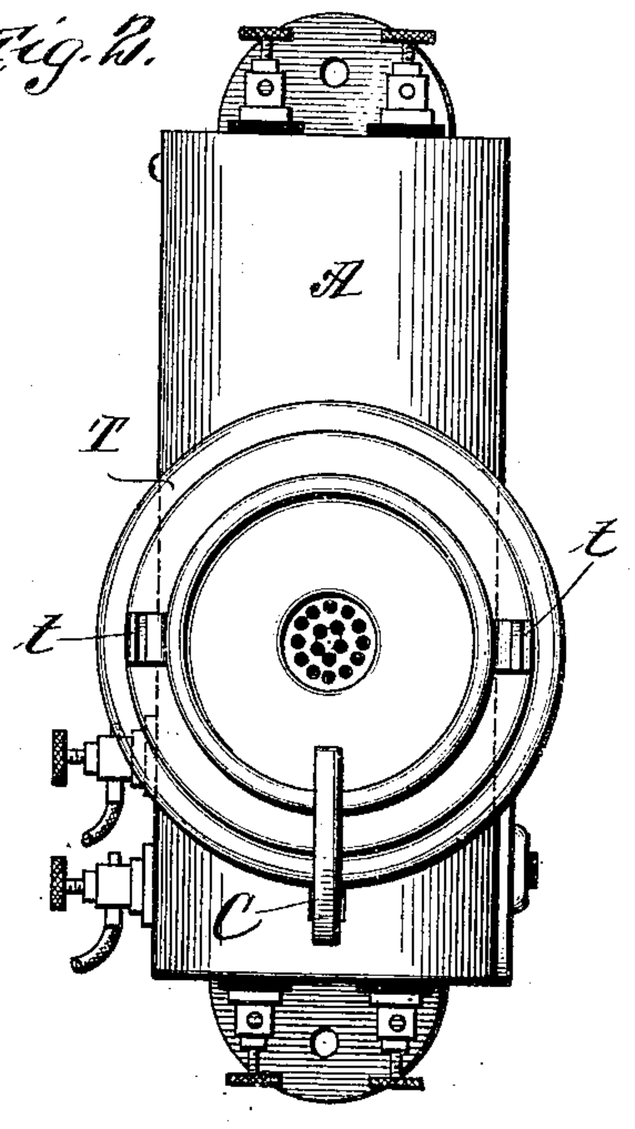


Fig. 1.

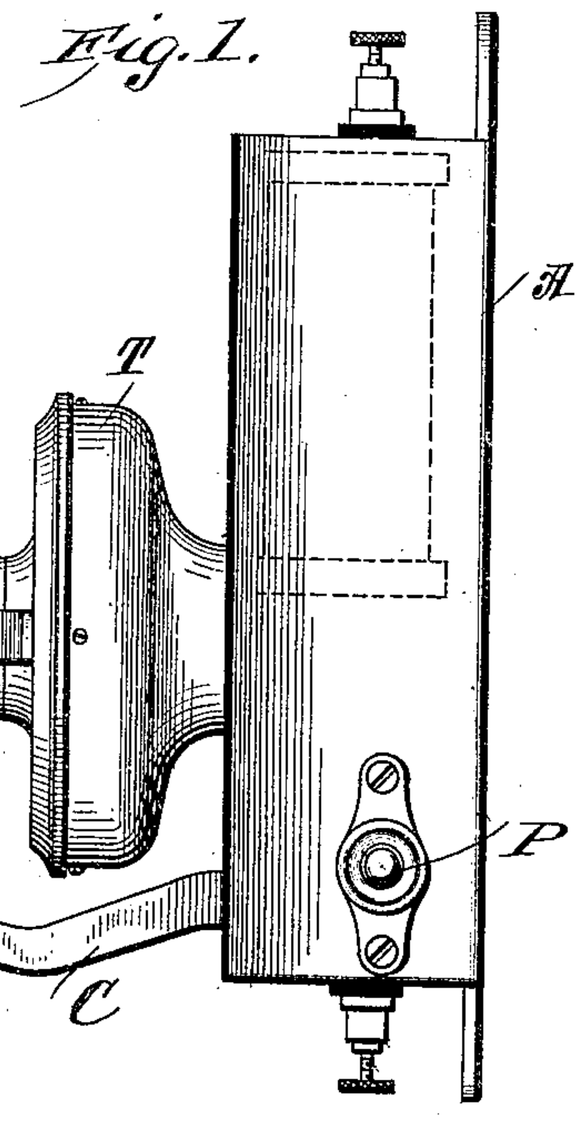
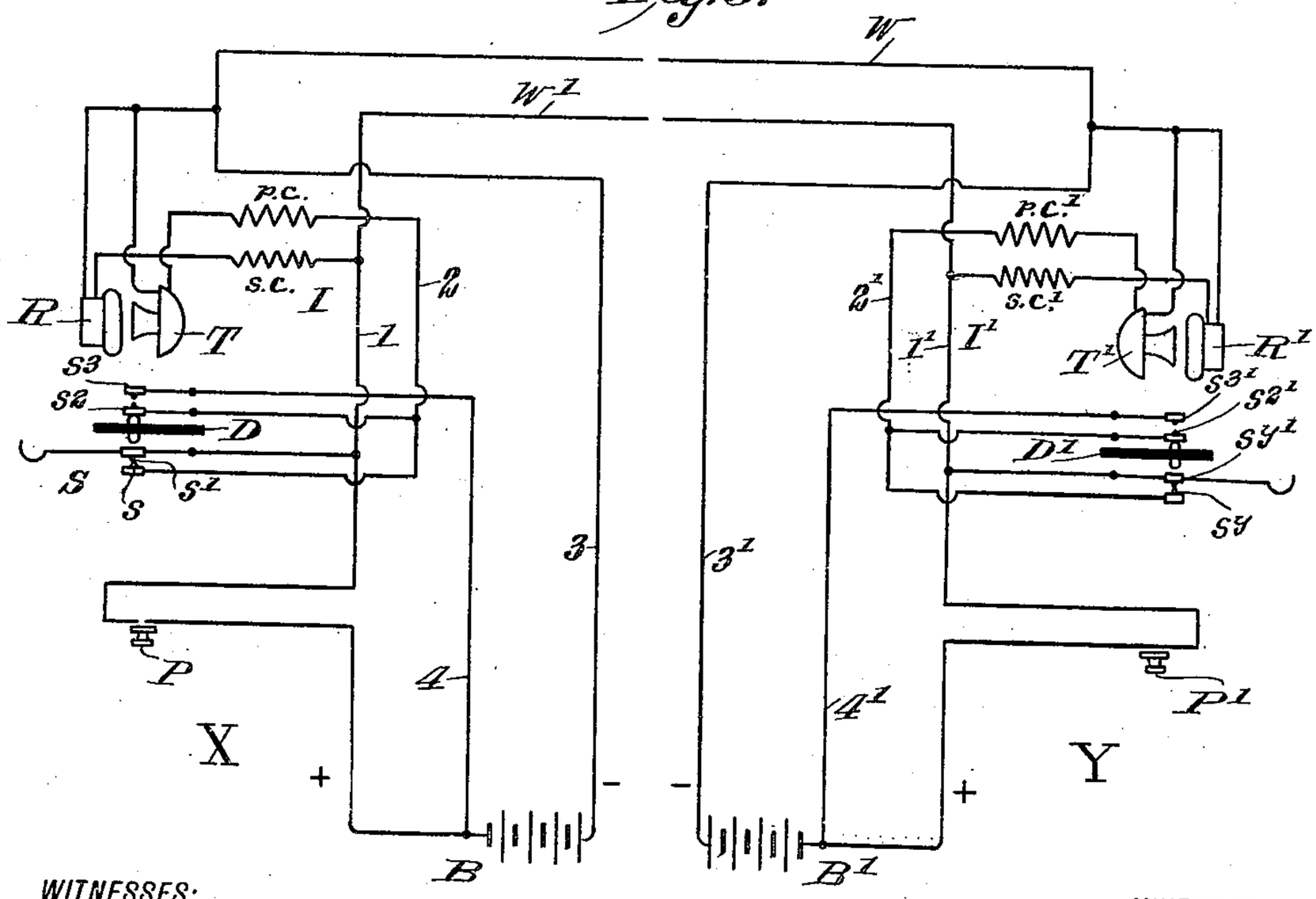


Fig. 3.



WITNESSES:

E. M. Callaghan

L. F. Stanley

INVENTOR

GEORGE H. CAUGHREAN

BY Munn & Co.

ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORGE H. CAUGHREAN, OF KETCHIKAN, DISTRICT OF ALASKA, ASSIGNOR OF ONE-SIXTH TO ADDIS J. DUNTON AND ONE-SIXTH TO HARRY T. DOBSON, OF KETCHIKAN, DISTRICT OF ALASKA.

SIGNALING APPARATUS.

978,695. Specification of Letters Patent. Patented Dec. 13, 1910.

Application filed January 3, 1910. Serial No. 536,001.

To all whom it may concern:

Be it known that I, GEORGE H. CAUGHREAN, a citizen of the United States, and a resident of Ketchikan and District of Alaska, have made certain new and useful Improvements in Signaling Apparatus, of which the following is a specification.

My invention relates to improvements in means for transmitting signals, and it consists in the combinations, constructions and arrangements herein described and claimed.

The main object of my invention is to provide an electrical apparatus which will do away with the bells in common use by so placing a receiver and a transmitter, that the one acts on the other to produce a whistling or howling sound which can be used for the signal.

A further object of my invention is to provide a novel arrangement by which the receiver is held close to the mouth piece of a transmitter so that a signal can be sent at any time.

A further object of my invention is to provide a telephone circuit in which the signal bell may be dispensed with, the receiver and transmitter being used as stated above for the signal and means for establishing communication with a distant station after the signals have been sent.

Other objects and advantages will appear in the following specification and the novel features of the device will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings in which—

Figure 1 is a side view of the transmitter casing showing the relative position of the receiver and transmitter. Fig. 2 is a front view showing the receiver removed, and Fig. 3 is a diagrammatic view of the circuit connections when the signaling device is to be used in a telephone system.

Referring now to Fig. 1, I have shown therein a casing A which contains an induction coil I, see Fig. 3, and a switch S. Pivotally secured to the casing which bears the transmitter T, is the switch arm C which passes underneath the transmitter and is provided on its end with a socket *c* adapted to support the receiver R which is of the watch-case type as shown in the figure. In order to prevent the receiver from moving laterally when in position I provide the spring arms *t* on either side of the mouthpiece of the transmitter, these arms projecting forwardly from the transmitter casing. The arrangement of the switch is shown best in Fig. 3. With the transmitter on the switch hook C, the latter is in electrical connection with a contact *s*. When the receiver is taken off from the hook the contacts s^2 and s^3 are closed by means of the movement of the insulating member D. At the side of the casing is a push button P which is used for signaling purposes.

In order to illustrate the novelty of my invention I will explain its use in a telephone system.

In Fig. 3 there are shown two stations X and Y. At station X is a battery B and the apparatus described above consisting of transmitter T, receiver R, induction coil I, switch S, and push button P, while at the station Y, is a similar arrangement consisting of battery B′, receiver R′, induction coil I′, transmitter T′, switch S′ and push button P′. The receiver R is connected on one side to the line wire W and on the other to the secondary *sc*, the opposite end of the secondary being connected to the line wire W′. The transmitter has also one side connected to the line wire W while the other side is connected to the primary *pc* of the coil I. The opposite end of the primary is connected to the spring contacts *s* and s^2 of the switch S. The upper spring contact s^3 is connected with one side of the battery B, the other side of the battery being connected to the line wire W. The line wire W′ is connected with the contact *s′* and may be connected with the battery B by means of the push button P. At station Y the corresponding parts are connected up in a similar manner. With the apparatus set up as shown, it will be apparent that both of the batteries B and B′ are cut off at s^2 and P, since these contacts are both normally open at s^2 and at P when the receiver is on the switch hook. Now when the push button P is pressed, current will flow from battery B through P, 1, *s′*, *s*, 2, *pc*, T, W, 3, to battery and a shunt circuit will be from 1, through the secondary *sc*, R, W, 3, to the battery. It will be observed that with the receiver in the field of the transmitter at the first flow of current the diaphragms will be started. This will have a mutual inductive effect thereby varying the current. The variation of the current will cause in turn a movement of the

diaphragm. Thus a constant vibration will be set up and a whistle or a howling sound will be the result. This whistle or howl will not occur unless the two diaphragms are in each other's field. Another circuit is formed through the line wire W′, 1′, *sy′* *sy*, 2′, *pc′*, T′, W, 3, B, while another circuit is from the wire W′, through the secondary coil *sc′*, receiver T′, and wire W back to battery B through the wire 3. It will thus be seen that the instruments at the station Y being in the same relation as those at the station X will be caused to sound a whistle. Now when the receivers are taken off from their hooks the contacts s^2—s^3 and $s^{2\prime}$—$s^{3\prime}$ are closed and the lower contacts of the switch are broken. Current now flows from the battery B through 4, s^3, s^2, 2, *pc*, W, 3, to battery. A similar circuit is established through the transmitter T′ at the other end of the line. It will be observed that the receivers R and R′ are now connected in series through the secondaries of the induction coils by means of the line wires W and W′. Thus any variation of the current caused by the movement of the diaphragms of the transmitters will cause a corresponding increase or decrease of current in the secondaries and hence a movement of the diaphragms of the receivers. Conversation may now be carried on and after conversation has ended the receivers may be hung up and the line will then be restored to normal.

I may use the transmitter and receiver in the above described arrangement for telegraphic purposes since at each pressure of the push button there will be a whistle given out. This it will be observed is of the same nature as the signals in wireless telegraphy in that there is a single sound instead of the double sound as in the ordinary telegraph. The apparatus is therefore particularly desirable for instructing beginners in the use of the wireless code.

It is obvious that other circuits than that shown above might be devised in which the primary and secondary of an induction coil are connected with the transmitter and the receiver respectively, the diaphragm of each instrument being in the field of the other instrument so that as the current through the coils is varied the diaphragms will be caused to vibrate by the mutual action to produce a sound.

I claim:

1. In a signaling apparatus, a plurality of stations, each station being provided with a battery, a receiver, a transmitter normally in the field of the receiver, an induction coil, electrical connections between said parts, said receiver and transmitter being adapted to react on each other for varying the currents in the coil, thereby producing a singing sound, a push button for making and breaking the current through the transmitter, and a switch hook for holding said receiver in its normal position and adapted, when the receiver is removed, to complete a talking circuit between the stations.

2. In a signaling apparatus, a plurality of stations, each station being provided with a battery, a receiver, a transmitter normally in the field of the receiver, an induction coil, electrical connections between the primary of the coil and the transmitter, electrical connections between the secondary of the coil and the receiver, said receiver and transmitter being adapted to react on each other for varying the currents in the coil, thereby producing a singing sound, a push button for making and breaking the current through the transmitter, and a switch hook for holding said receiver in its normal position and adapted, when the receiver is removed, to complete a talking circuit between the stations.

GEO. H. CAUGHREAN.

Witnesses:

L. A. STANLEY,

SOLON C. KEMON.