A. J. DUNTON.

SIGNALING DEVICE FOR TELEPHONE SYSTEMS.

APPLICATION FILED JULY 7, 1910.

995,849.

Patented June 20, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

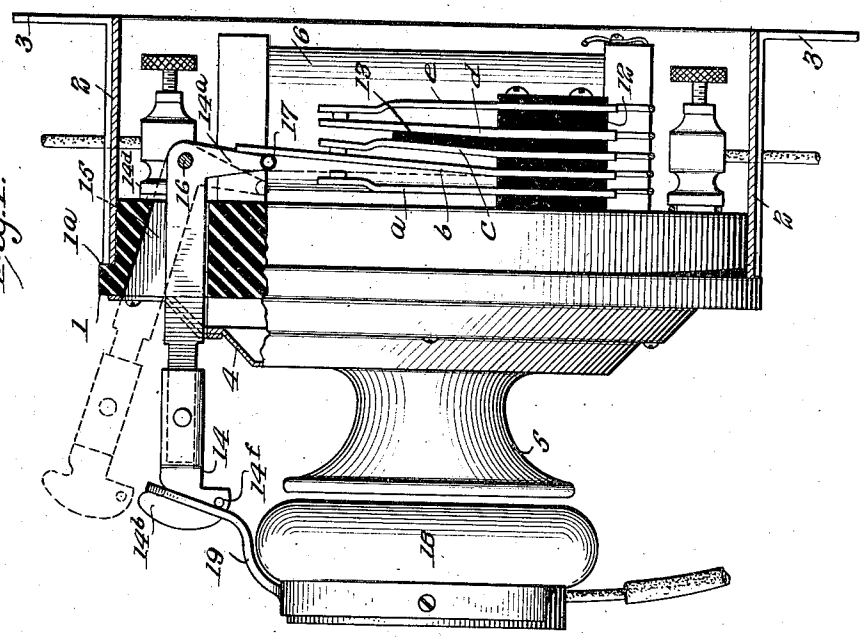
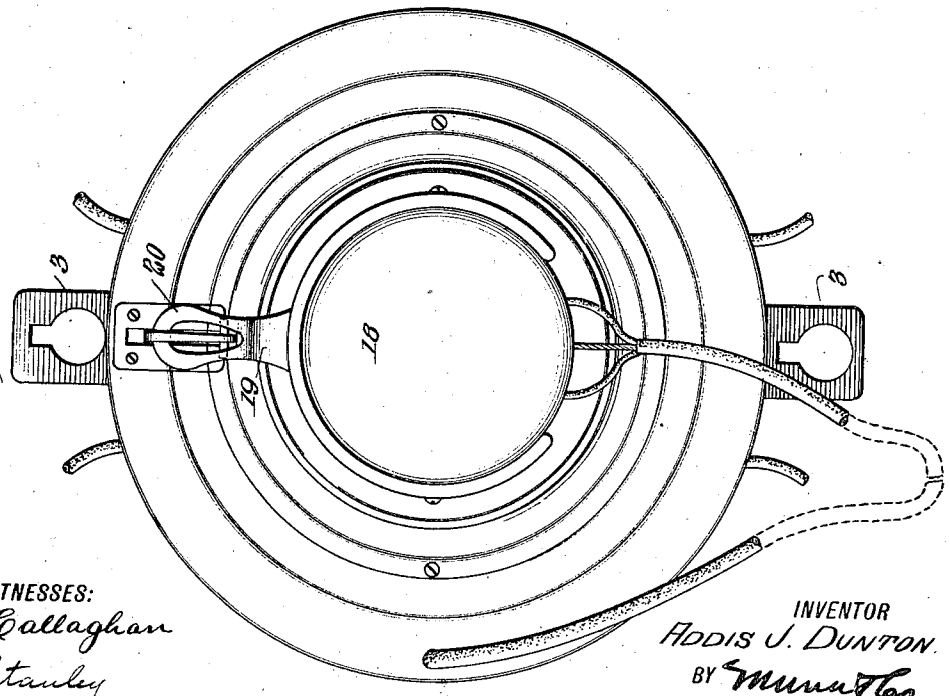


Fig. 2.



WITNESSES:

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3 SHEETS—SHEET 2.

Fig. 3.

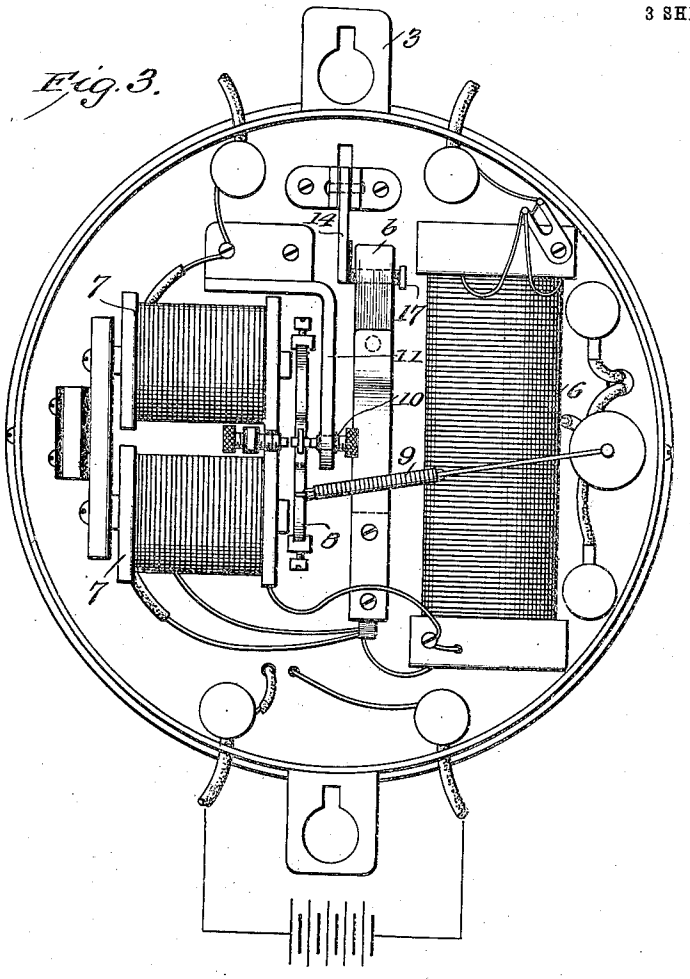
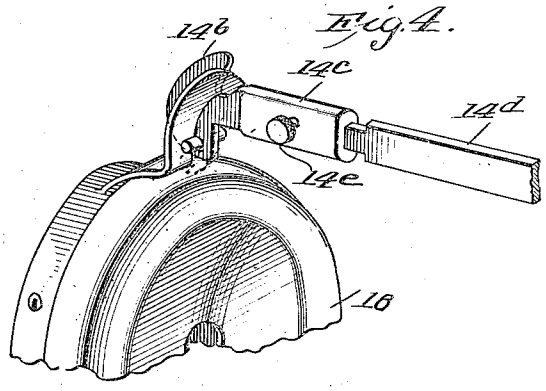


Fig. 4.



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3 SHEETS—SHEET 3.

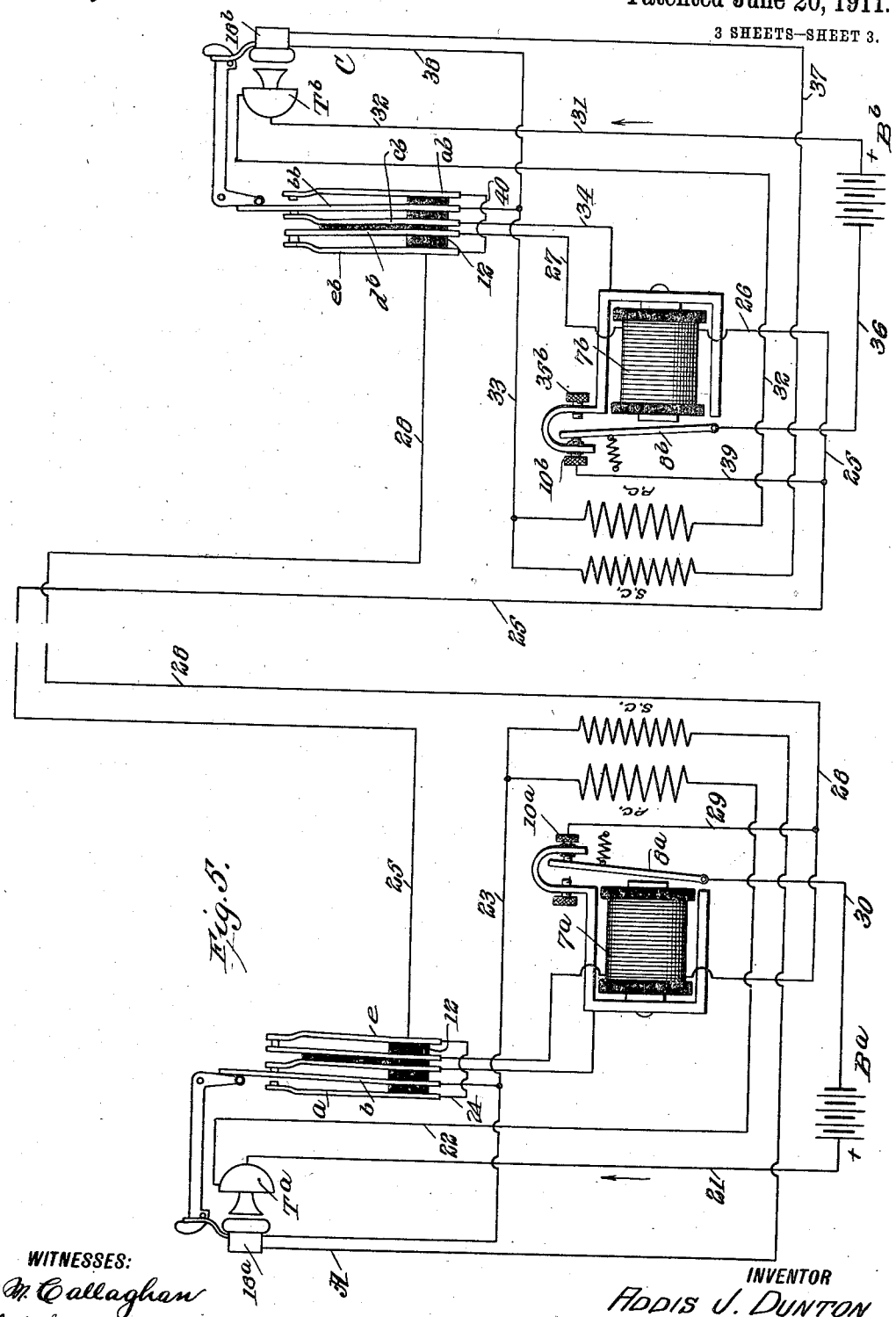

Fig. 3.

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UNITED STATES PATENT OFFICE.

ADDIS J. DUNTON, OF KETCHIKAN, DISTRICT OF ALASKA.

SIGNALING DEVICE FOR TELEPHONE SYSTEMS.

995,849. Specification of Letters Patent. Patented June 20, 1911.

Application filed July 7, 1910. Serial No. 570,787.

To all whom it may concern:

Be it known that I, ADDIS J. DUNTON, a citizen of the United States, and a resident of Ketchikan, in the District of Alaska, have made certain new and useful Improvements in Signaling Devices for Telephone Systems, of which the following is a specification.

My invention relates to improvements in means for signaling, without the use of the ordinary signaling bells, and it consists in the combinations, construction and arrangement of the parts herein described and claimed.

The invention is somewhat similar in its nature to that disclosed in the patent to George H. Caughrean No. 978,695, December 13, 1910, but differs in certain novel features, which will be hereinafter described, and which will be particularly pointed out in the appended claims.

The main object of my invention is to provide a signaling system in which the signals may be sent to a considerable distance, as far as the line is likely to be used for talking purposes.

A further object of my invention is to provide a signaling system with simple apparatus, including a relay for producing audible signals.

A further object of my invention is to provide a signaling device in which the signals may be varied in intensity or pitch as desired, so that if a telephone is placed upon the desk of the user, the intensity of sound from the signal may be decreased, so as not to cause annoyance to others in the room, or if the telephone is put in an adjoining room, it may be made to send out a loud signal, so as to insure its being heard.

Other objects and advantages will appear in the following specification.

My invention is illustrated in the accompanying drawings, forming part of this application, in which similar reference characters denote like parts in the several views and in which—

Figure 1 is a side view partly in section, showing the relation between the transmitter and the receiver, Fig. 2 is a front view of the parts shown in Fig. 1, Fig. 3 is a rear view of the device, the rear protecting plate having been removed, Fig. 4 is a perspective view of a portion of a switch hook, showing the manner of suspending the receiver, and Fig. 5 is a diagrammatic view showing the circuit connections for two stations.

In carrying out my invention, I provide a telephone set of the form shown in Figs. 1, 2 and 3, this form being best adapted for use in my improved signaling system.

As will be seen from Fig. 1, the set comprises a base 1 of insulating material, which is provided with a shoulder 1^a, to receive a casing 2, the latter being preferably of metal, and being provided with the flanges 3, by means of which the device may be suspended from the wall or any other convenient place. On the exterior portion of the base 1, I arrange a holder 4 for a transmitter, the mouth piece 5 of which is shown in the figure. This transmitter may be of any approved type, the specific form of which forms no part of my invention.

Secured to the base 1 on the inside of the casing 2 is an induction coil 6. A relay 7 (see Fig. 3) is also secured to the base and is provided with an armature 8, which is held by a spring 9 in a normally retracted position. In this position it engages a contact screw 10, which is carried by an arm 11. The contact screw 10, however, is insulated from the arm as is shown in the drawings.

Secured to the base 1 is a series of spring contacts *a*, *b*, *c*, *d*, and *e*, respectively, these contacts being suitably insulated from each other by insulation such as that shown at 12. One of these insulating portions 13 extends upwardly between the arms *c* and *d*. This portion of the insulation is flexible and bends with the springs, so as to follow their movement. As will be seen from the drawings, the spring *b* is prolonged, and is engaged by the short arm 14^a of a hook switch 14. The latter projects through an opening 15 in the base 1 and is pivotally mounted at 16. The arm 14^a has an insulated roller 17 adapted to engage the spring *b* to move the latter. As will be seen from Fig. 3, the arm 14 is suitably insulated so that the spring *b* will not engage it electrically.

The construction of the switch hook is clearly shown in Figs. 1 and 4. It consists of a hook 14^b secured to a hollow sleeve 14^c into which the arm 14^d of the bell-crank lever projects. The sleeve 14^c is provided with a set screw 14^e, so that the hook may be extended to bring the receiver further away from, or nearer to the transmitter.

The receiver 18 is of the ordinary watch

case type and is provided with a holding member 19, which is fashioned at its end in a loop 20, arranged to take over the hook 14^b. A pair of pins 14^f carried by the hook hold the receiver in a position parallel to the plane of the mouth piece.

The instruments are connected up as shown in Fig. 5. The explanation of the circuit connections will best appear in the statement of the operation of the device. The figure shows the condition of the instruments in the normal condition of the line. Let us suppose now that the party at station A desires to call the party at station C. He simply removes the receiver 18^a from the switch hook. Current will now flow from the battery B^a by the following path: 21, transmitter T^a, 22, primary of induction coil, 23, *b*, *a* (the spring *b* having moved toward *a* when the receiver was removed) 24, *e*, line wire 25, 26, relay 7^b, 27, spring d^b, spring e^b, line wire 28, 29, screw 10^a, armature 8^a, and back to battery B^a by means of the conductor 30. It will be noticed that this circuit just traced does not cause a movement of the relay 7^a. The circuit just traced causes the relay 7^b to pull up its armature, thereupon the following circuit is established: From battery B^b, through 31, transmitter T^b, 32, primary coil of the induction coil at station C, 33, spring b^b, spring c^b, 34, through the frame of the relay 7^b, contact screw 35^b, armature 8^b and by conductor 36 to the battery. The receiver 18^b is in a shunt circuit, which includes a secondary coil at the station C, the conductor 37, the receiver 18^b and the conductor 38, which joins the conductor 33. When the receiver is held before the transmitter *i. e.*, when these instruments are in their mutual fields, the variation of the current will cause a sound which varies from a low buzzing noise to a shrill whistle or howl, and this will continue as long as the receiver at station A is held off from the hook. As has been stated before, the distance of the receiver from the transmitter may be varied so that this sound may be increased or diminished, or made high or low, as described. There will be no sound at the sending station, since, as stated before, the relay 7^a does not pull up.

When the called subscriber answers he removes his receiver from the hook. The talking circuit is then established between the two stations as follows: From B^a, through 21, T^a, 22, primary coil of station A, 23, *b*, *a*, 24, 25, 39, 10^b, 8^b, 36, battery B^b, 31, T^b, 32, primary coil of station C, 33, b^b, a^b, 40, e^b, line wire 28, 29, 10^a, 8^a, 30 and back to battery B^a. It will thus be seen that when the talking circuit is established, the relays are cut out. There will, therefore, be no whistling sound as long as the receivers are held off from the hooks. When one receiver is replaced, the whistling sound of the other station will begin, thus notifying the other station that one subscriber has quit talking. When both subscribers hang up their receivers, the line is restored to its normal condition. It will be observed that when both relays deënergized battery current is cut off entirely, and, hence, there is no waste of current.

This system does away entirely with the use of bells or other signaling apparatus and works well over long distances, since it is apparent that it will work over any distance or upon any circuit which will cause the actuation of the relay to throw in the local circuit through the transmitter at any particular station.

I claim:

1. In a telephone signaling system, a plurality of substations, line wires connecting said substations, a transmitter and a receiver at each substation, said transmitter and receiver being normally placed in proximity in their mutual fields, and means actuated by the removal of the receiver at one of the substations for causing a whistling sound at the second substation, said means including the transmitter and the receiver at the second substation.

2. In a telephone signaling system, substations, a pair of line wires connecting said substations, a relay at each substation, a transmitter and a receiver at each substation normally placed in proximity in their mutual fields, the transmitters of each substation being in a local circuit controlled by its relay, and a switch at each substation for controlling the relay at the other substation.

3. In a telephone signaling system, a plurality of substations, line wires connecting said substations, a transmitter and a receiver at each substation, said transmitter and receiver being normally placed in close proximity in their mutual fields, and means including a relay at each station and the transmitter and receiver of the same station for causing an audible signal at that station when the receiver of the other station is removed from its hook.

4. In a telephone signaling system, a pair of substations, a pair of line wires connecting said substations, a transmitter and a receiver at each substation, said transmitter and receiver being normally placed in close proximity in their mutual fields, means including a relay at each station and the transmitter and receiver of the same station for causing an audible signal at that station when the receiver of the other station is removed from its hook, and means for varying the intensity of the signal.

5. In a telephone signaling system, a pair of stations, each station including a local battery, a transmitter in circuit with said battery, a receiver normally in close prox-

imity to said transmitter, a switch hook for suspending said receiver, a switch adapted to be actuated by the removal of said receiver, an induction coil, and circuit connections between said stations, the removal of the receiver at one station causing the actuation of the relay at the other station for closing the circuit through the transmitter at the second station, and thereby causing an audible signal.

6. In a telephone system, a pair of stations, a receiver and a transmitter at each station, said receiver and transmitter being normally placed in close proximity in their mutual fields, a battery at each station, means for causing a flow of current through the transmitter of one station when the receiver of the other station is lifted from its hook, and means for completing a talking circuit between the two stations when both receivers are lifted from their hooks, said means including the receivers and transmitters of each of said stations.

7. In a telephone system, a pair of stations, a receiver and a transmitter at each station, said receiver and transmitter being normally in their mutual fields, a battery at each station, means for causing a flow of current through the transmitter of one station when the receiver of the other station is lifted from its hook, and means for completing a talking circuit between the two stations when both receivers are lifted from their hooks.

8. In a telephone signaling system, a telephone set comprising a casing, a transmitter carried thereby, a switch in said casing, a receiver, an adjustable switch hook for suspending said receiver at varying distances from said transmitter, and means carried by said switch hook for maintaining the receiver in positions parallel to its original position.

9. In a telephone signaling system, a telephone set comprising a casing, a transmitter carried thereby, a switch and a relay in said casing, a receiver, and a switch hook for actuating said switch and for suspending said receiver in front of said transmitter, said switch hook comprising a telescopic member provided with a set screw for extending the hook to suspend the receiver at varying distances, and means carried by the hook for maintaining the receiver in the same relative position at various distances from the transmitter.

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Witnesses:
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