T. W. RALPH.

TELEPHONE DETECTOR DEVICE.

APPLICATION FILED NOV. 16, 1908.

940,359.

Patented Nov. 16, 1909.

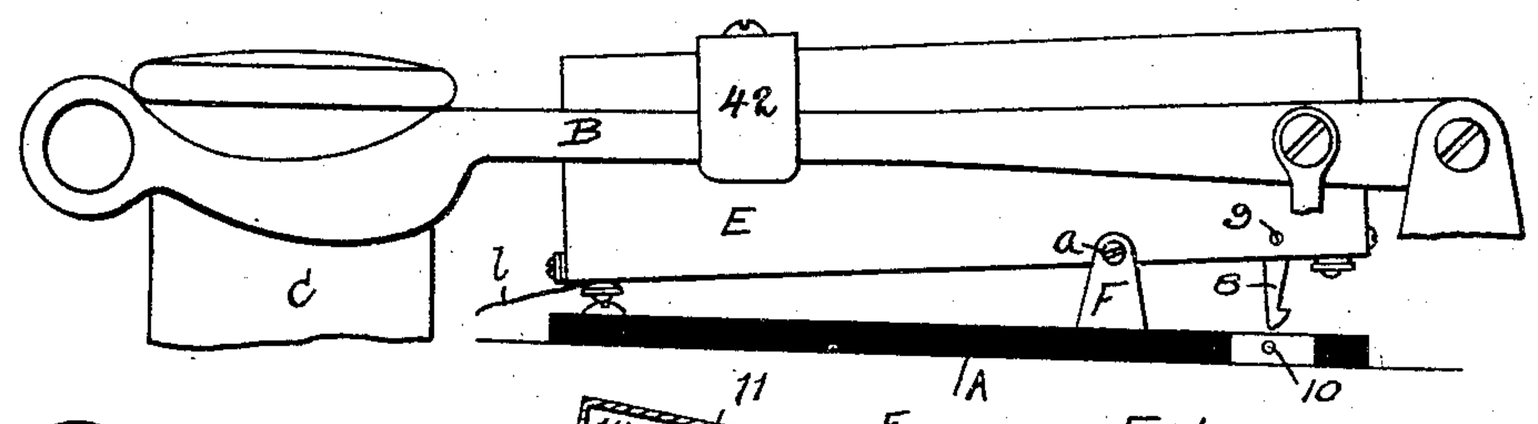

Fig. 1.

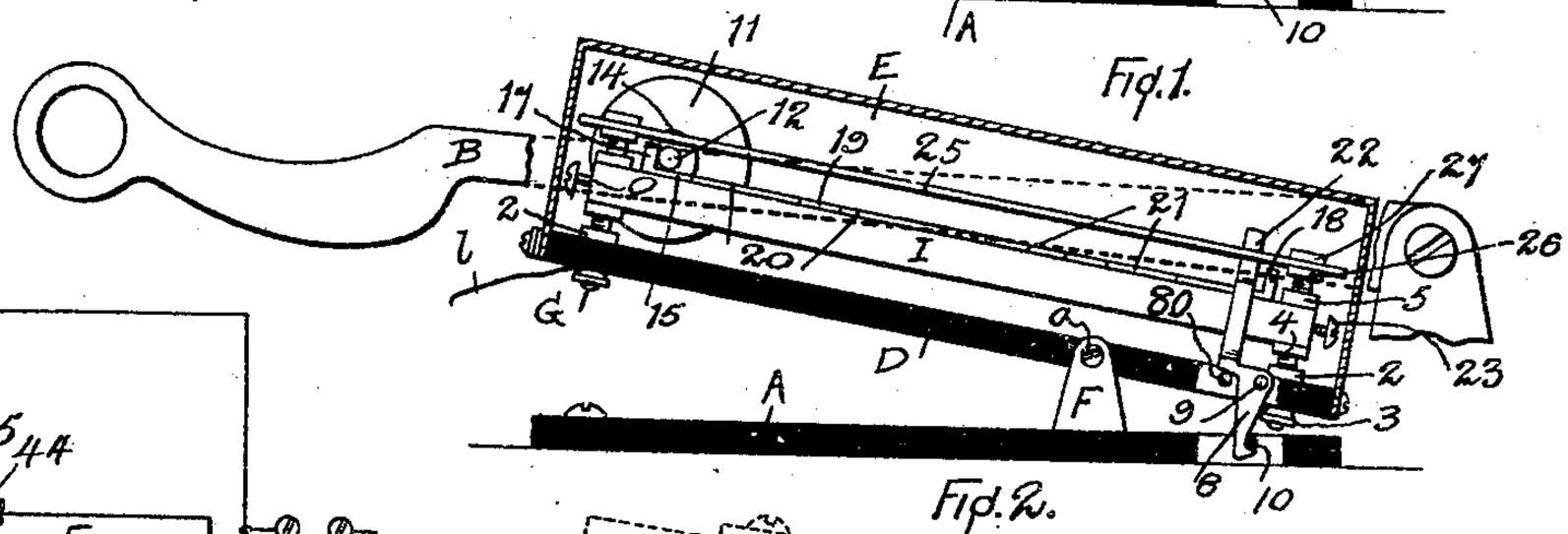

Fig. 2.

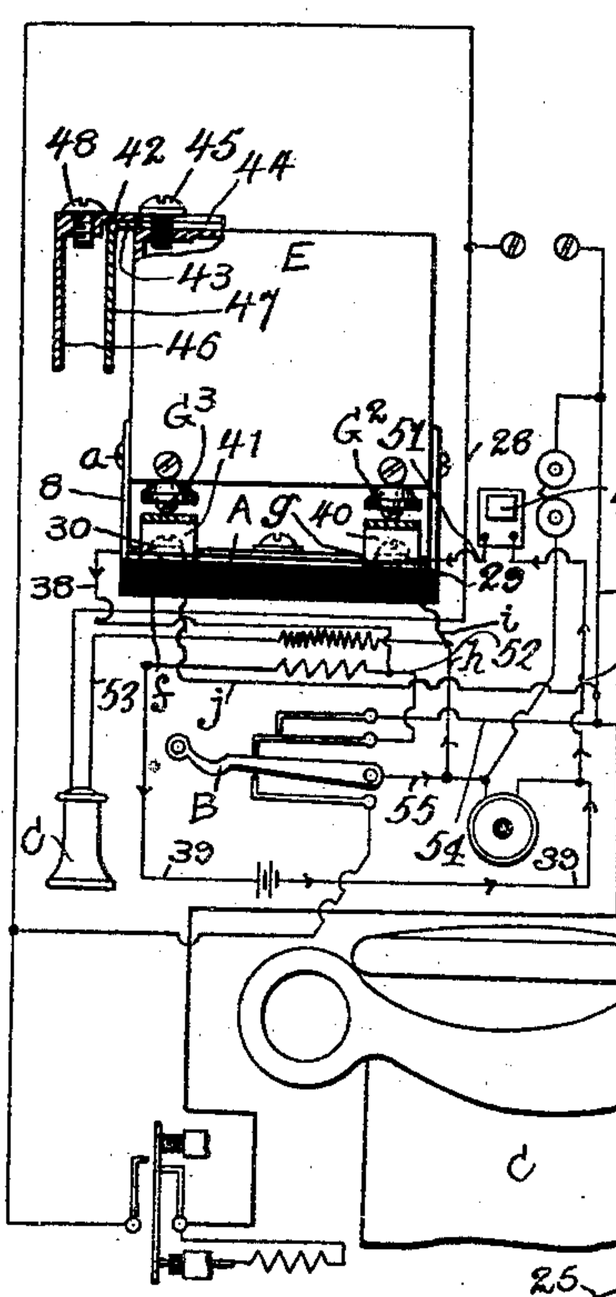

Fig. 4.

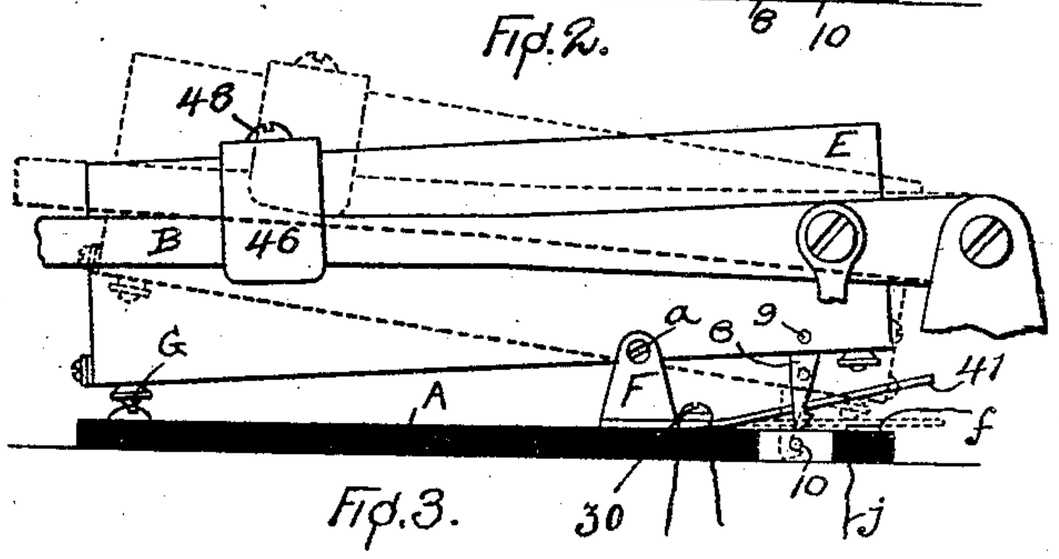

Fig. 3.

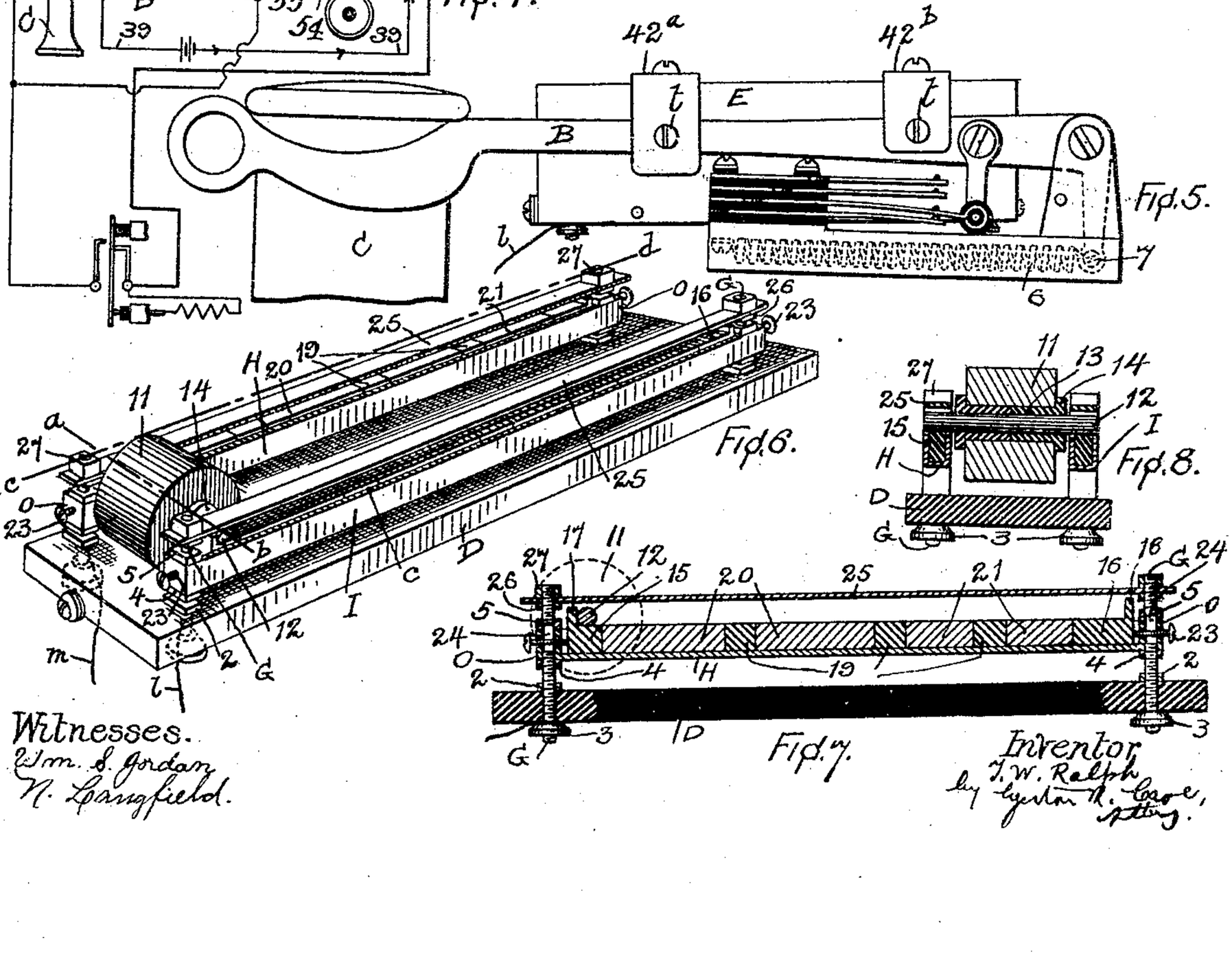

Fig. 5.

Fig. 6.

Fig. 8.

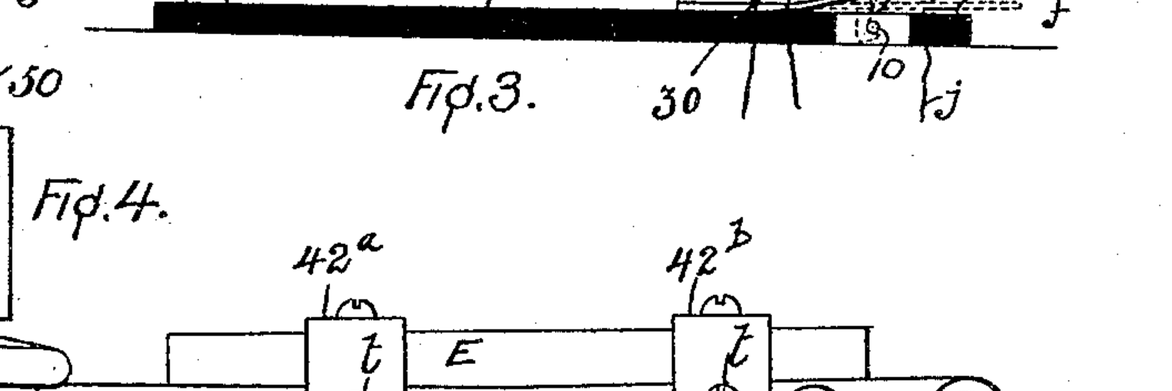

Fig. 7.

Witnesses.
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UNITED STATES PATENT OFFICE.

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TELEPHONE DETECTOR DEVICE.

940,359. Specification of Letters Patent. **Patented Nov. 16, 1909.**

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To all whom it may concern:

Be it known that I, THEODORE WESLEY RALPH, a subject of the King of Great Britain, residing in the town of North Augusta, in the county of Grenville, in the Province of Ontario, Canada, general merchant, have invented certain new and useful Improvements in Telephone Detector Devices, of which the following is a specification.

My invention relates to improvements in telephone detector devices, and the object of my invention is to provide each telephone used in connection with rural telephone lines with means whereby the telephone user can at once detect if anybody is listening to the conversation he may be carrying on with another person; and the construction of my preferred form of invention, and certain alternative features thereof, will be hereinafter particularly described, and the parts I claim as new will be pointed out in the accompanying claims.

Figure 1 is a side elevation of my preferred form of device in its normal position, showing the same associated with the hook-switch, part only of which is shown. Fig. 2 is a side elevation of my device, with the outer casing shown in section, showing the position of the same when the receiver is removed from the hook and the hook allowed to move into its highest position. Fig. 3 is a side elevation of my device showing a positive means for insuring the opening of the circuit when the device assumes its normal position. Fig. 4 is an end elevation of the device shown in Fig. 3, showing the device suitably wired to the primary circuit. This view also shows a vertical section through the adjustable clamp for the device. Fig. 5 is a side elevation of an alternative form of device, showing the same attached to the arm of the hook-switch, which is also shown in side elevation. Fig. 6 is a perspective view of my device with the casing removed. Fig. 7 is a longitudinal vertical section on the line *c*—*d*, Fig. 6, and Fig. 8 is a vertical cross-section on the line *a*—*b*, Fig. 6.

In the drawings, like characters of reference indicate corresponding parts in each figure.

On rural telephone lines it is well known that it is a common practice for the different subscribers to listen to the conversation of others. For various reasons this practice is a very disagreeable one, and it is the object of my invention to equip each telephone with my device so that those talking over the line can at once detect if other subscribers in the same system listen to the conversation. As my device will be constructed so as to repeat the signals that must be given to call any given subscriber to his telephone, it will at once be understood that by means of my device a subscriber will be able to know the name of the subscriber whose telephone has been operated to listen to the conversation. Thus it will be seen that my device will perform a double function: that of indicating when a person cuts in on the line to listen, and at the same time provide the parties talking with data whereby they will know the name of the listening subscriber.

Although my invention is more particularly for use in connection with bridging telephones on rural lines, still it will be understood by one skilled in this art that the same may be used in connection with a limited number of telephones connected in series.

Although I have shown my device as wired to a circuit provided with an induction coil, still it will be also understood by one skilled in this art that under certain conditions the use of an induction coil is not necessary.

In the following part of this specification I shall describe a suitable device performing the function before set forth, but it must be clearly understood that my claims are not confined to the construction shown and described.

The preferred form of my device shown in Figs. 1 to 4 is provided with a base A, preferably made of insulating material, which is supported inside the telephone in position convenient to the switch-hook B which carries the telephone receiver C. D is a base preferably made of insulating material, and same carries a removable casing E which incloses the parts hereinafter particularly described. By means of the bracket F carried by the base A, the base D, and the parts carried thereby have tilting movement around the pins *a* carried in the upper ends of the said bracket. Suitably supported in the base D are four posts G which support the tracks H and I. As these tracks are identical in construction, the description of the construction of one of them will do for

both. The ends of each track are pierced as shown at O so that the posts G may pass therethrough. The said tracks are supported in such a manner on the said posts as to permit them to be adjusted so as to make them both occupy the same plane. Associated with each binding post are lock-nuts 2 and 3 to support the binding posts firmly in the base D. 4 and 5 are lock-nuts by means of which the said tracks are adjusted. Upon referring to Figs. 7 and 8, it will be seen that said tracks are substantially U-shaped in cross-section, and are thus constructed so that they will retain the conducting and non-conducting material by means of which the circuit is opened and closed through the coaction therewith of a member moving thereover.

The normal position of my device is shown in full lines in Figs. 1, 3, 5, 6, and 7. Now when the receiver C is removed from the switch-hook, the spring 6 in the base 7 of the switch-hook bracket throws the switch-hook into the position shown in full and dotted lines in Fig. 2. By any suitable means, the preferred construction of which will be hereinafter described, the device is tilted around the pins *a* by this movement of the switch-hook into the position shown in Fig. 2, and is locked in this position by means of the gravity latch 8, pivoted one on each side of the base D by a pin 9, which engages a pin 10 carried by the side of the base A. 11 is a roller operating between the tracks H and I, and having movement upon strips of insulating and conducting material carried by the said tracks, by means of its axle 12, made of good conducting material. The axle 12 is preferably insulated from the roller 11 by means of the bushing 13, made of any insulating material. The bushing 13 is provided with flared heads 14 which are large enough to effectually prevent the roller 11 from coming in contact with the inner side of the tracks H and I. Because of the inclined position of the tracks H and I, as before set forth, the roller 11 will roll down the tracks, and as it is preferably made of metal, it will only take a few seconds to reach the limit of its run. 15 and 16 are blocks of insulating material held in the tracks H and I and provided with backs 17 and 18 respectively. 19 are a plurality of blocks of insulating material carried by the said tracks, by means of which the strips of conducting material 20 and 21 are insulated from each other at their ends. In its normal position, the axle 12 rests upon the blocks 15 and against their backs 17. When the roller 11 reaches the limit of its run, the axle 12 will strike against the upper portion 22 of the gravity latches 8, and so unlock the device from the base A. Should the receiver be placed upon the switch-hook and the same thereby move to normal position, the device will, so soon as it is unlatched, move into normal position shown in full lines in Figs. 1 and 3, by reason of its weight, as it is not balanced on its pins *a*. So soon as the device has returned to normal position, the tracks H and I will occupy the position shown in Fig. 7, and as a consequence the roller 11 will roll back to normal position (see Fig. 6).

By referring to Figs. 6 and 7, it will be seen that for illustrating purposes merely, the strips of conducting material 20 have been made both of substantially the same length and longer than the strips 21, which are both substantially of the same length. The blocks of insulating material 19 between the said different strips are substantially the same length. The strips of conducting material carried by the tracks H and I, and the insulating blocks supporting the same, are of course constructed to be readily removed from the said tracks so that the signals given by the device can be altered to suit. When the strips and blocks are placed in position in the said tracks, they are held in position by means of the set-screws 23 which pass through the ends O and through the posts G and screw against the blocks 15 and 16. In order to allow of the adjustment of the tracks H and I, the posts G are provided with slots 24 so as to provide for the movement of the set-screws 23 during adjustment of the tracks. In order to prevent the displacement of the roller 11 in case the device should be turned upside down, I associate with each track a roller-guard 25 which is supported upon the posts G, and held thereon by means of the lock-nuts 26 and 27. Upon referring to Figs. 7 and 8, it will be seen that the axle 12 does not come in contact with the roller guards 25. The upper edges *c* of the tracks H and I are below the upper surfaces of the blocks of conducting and insulating material carried by the said tracks, so that the axle 12 will not come in contact with the said tracks.

In my preferred form of invention, the current enters the device through the wire *l* and when the axle 12 rests upon one of the pairs of strips of conducting material carried by the tracks H and I, the current passes through these conducting parts out of the device by the wire *m*. These wires *l* and *m*, correspond to the wires 38 and 51 (see Fig. 4).

29 is a binding post carried by the base A, and the same secures the spring 40 to the said base.

30 is a binding post carried by the base A, and the same secures a spring 41 to the said base. At certain times, the posts G^2 and G^3 are in contact with the springs 40 and 41 respectively.

28 is the line-wire.

38 is a wire connecting the binding post 30 with the battery circuit 39. By means of the wire 51 connected to the binding post 29 through the buzzer 41ª, and the wire 50 connecting said buzzer with the battery circuit 39, and the axle 12 of the rolling contact when the same is in contact with one of the pairs of strips of conducting material carried by the tracks H and I, the primary circuit is completed through the device. A bell may be used in place of a buzzer.

f and *g* are contact strips carried by the base A. The wiring *i* connects the contact strip *g* with the wire *h* in circuit with the line-wire, and *j* is a wire connecting the contact-strip *f* with the line wire *s*.

After any suitable manner the device is placed in the primary and secondary circuits, and suitable wiring is shown in Fig. 4 for that purpose. So soon as the receiver has been taken off the switch-hook, the device is tilted into the position shown by dotted lines, Fig. 3. The moving of the device into this position causes the roller 12 to leave the blocks 15 and run down the inclined tracks H and I. During its movement down the said tracks, the axle of the said roller rolls over the strips of conducting material, and the blocks of insulating material separating the same, thus alternately closing and opening the circuit and so indicating to the person speaking that somebody has come in on the line.

When the device is moved into the position shown by dotted lines Fig. 3, the posts G^2 and G^3 are moved into contact with the springs 40 and 41, thus through the medium of the roller 11 and its axle 12 operating upon the pairs of strips of conducting material carried by the tracks H and I completing the primary circuit through the device. This position of the device also brings the springs 40 and 41 into contact with the strips *f* and *g*, thus completing the secondary circuit through the device.

The telephone with which my device is supposed to be associated is called by two long rings followed by two short rings, and therefore it will be understood that the signals given by this device will cause disturbances in the circuit of such duration that the telephone cutting in on the line can at once be placed. In the battery circuit, the current passes from the cells in the direction indicated by arrow along the wires 39 and 50, through the buzzer 41ª and wire 51 to the binding post 29; through the axle 12; through the contact strips the same is momentarily in contact with, and out through the binding post 30 and by the wire 38 to the wire 52 and through the primary coil to the wire 39 back to the battery. In the talking circuit, the impulses pass from the secondary coil into the receiver C through the wire 53, and from the said receiver into the line-wire 28, returning to the telephone through the wire *s* to the wire 54 and through the switch-hook and out therefrom through the wire 55, returning to the secondary coil by the wire *h*. From the described circuits, it will be clearly understood how the disturbances occurring in the primary circuit are reproduced in the other telephones on the line wire. It will be understood that any disturbance in the primary circuit is greatly magnified in the secondary, thereby insuring that the signals given by the device in the primary circuit will be very distinct in the secondary circuit.

When the device has been unlatched, and is allowed to move into normal position, it will be seen upon reference to full lines of Fig. 3, that the posts G^2 and G^3 will be moved out of contact with the springs 40 and 41, and the strips *f* and *g*, and so positively open the circuits. In case the roller 11 during its return to normal position should bind between the tracks H and I so that its axle 12 is stalled upon two strips of conducting material, thus keeping the circuit closed, I make use of the springs 40 and 41 (see Figs. 3 and 4) so as to insure opening of the circuit. Upon inspecting Fig. 3 it will be readily understood that so soon as the roller 11 has unlatched the gravity latches 22, the device will move into the position shown in full lines, in Fig. 3, provided the switch-hook be returned to normal position, thus positioning the tracks H and I so that the roller will return to normal position. Upon the return to normal position of the device, the posts G^2 and G^3 are moved out of contact with the springs 40 and 41 and these springs will move out of contact with the strips *f* and *g*, thus opening the primary and secondary circuits.

42 is the outer member of a clamp and 43 the inner member thereof. The inner ends of these clamps are provided with slots 44 down through which pass the clamping screw 45 screwing through the top of the casing E. By the construction just described it will be understood that the members of the said clamp can be adjusted in relationship to the casing. The depending sides 46 and 47 of the clamps 42 and 43 straddle the switch-hook B, and the adjusting screw 48 screwing through the clamp 42 rests on the upper edge of the switch-hook B. From the description just given it will be understood that so soon as the receiver C is removed from the switch-hook B, the device must of necessity be tilted into the position shown in Fig. 2. By means of the adjusting screw 48, the angle of inclination of the device can be regulated, as will be understood.

Upon referring to Fig. 5, I show my device clamped directly to the switch-hook B, thus enabling me to dispense entirely with the base A and its connected parts, and also

the gravity-latches 8. By means of the clamps 42ª and 42ᵇ, constructed as is the clamp before described, the form of my device shown in Fig. 5 is clamped direct to the switch-hook B.

t are set-screws passing through the clamps 42ª and 42ᵇ whereby the device is clamped in position. As the switch-hook in normal position will retain the tracks H and I in the position shown in Fig. 7, it will be understood that the roller 11 will occupy the position in Fig. 7, when the telephone is out of use. Immediately the receiver C is removed from the switch-hook, the switch-hook will carry the device into position shown in Fig. 2, in which position it will be held until the switch-hook is brought back to normal position. I prefer however to use the gravity-latch, or other equivalent means with the device, because it will be understood that the device will give the full signal even though the switch-hook be immediately returned to normal position after having been raised up through the removal of the receiver C. When the gravity-latches or other equivalent means are not used, only part of the signal will be given in case the switch-hook should be returned to normal position immediately after having been moved upward.

80 is a pin secured in the side of the base D adjacent each gravity-latch H so as to hold these latches in position to engage readily with the pins 10. By means of the lock nuts 4 and 5 it will be readily understood that the tracks H and I can be accurately adjusted so as to place the tread of the said tracks in the same plane and thus insure the free movement of the roller 11. For the purposes of illustrating my invention clearly I have not darkened the bases A and D in the vicinity of the gravity-latches. It will of course be understood that the bases A and D may be made of conducting material, such as metal, and of course in that event the tracks H and I would have to be mounted thereon in such a manner as not to interfere with the working of the device.

When my invention is used in connection with a limited number of telephones connected in series, I will not necessarily have to use a buzzer or an equivalent device. Although I preferably use a bell or buzzer, or an equivalent device in the circuit so that any disturbances in the primary circuit may be greatly magnified in the secondary, still I do not confine myself to necessarily using the same as the use thereof is not absolutely essential. When the device is in normal position, the same does not interfere in any way with the ordinary use of the telephone.

What I claim as my invention is:

1. A device of the class described comprising a base; two tracks supported by said base and each provided with strips of current-conducting material separated by blocks of insulating material; a roller operating between said tracks, and an axle for said roller insulated therefrom and designed to operate over the top of the strips and blocks of said conducting and non-conducting material when the device is tilted, as set forth and for the purpose specified.

2. A device of the class described comprising a base; two tracks supported by said base and each provided with strips of current-conducting-material separated by blocks of insulating material, and a roller operating upon said strips and blocks of conducting and non-conducting material when the device is tilted, and a guard for each track preventing the displacement of said roller, as set forth and for the purpose specified.

3. A device of the class described comprising a base; posts held in said base; two tracks each carried by two of said posts at their ends; strips of current-conducting material separated by blocks of insulating material, carried by each of said tracks, and a roller operating upon said strips and blocks of conducting and non-conducting material when the device is tilted, as set forth and for the purpose specified.

4. A device of the class described comprising a base; posts held in said base; two tracks each carried by two of said posts at their ends; means whereby the said tracks can be adjusted in position, strips of current-conducting material separated by blocks of insulating material, carried by each of said tracks, and a roller operating upon said strips and blocks of conducting and non-conducting material when the device is tilted, as set forth and for the purpose specified.

5. A device of the class described comprising a base; posts held in said base; two tracks each carried by two of said posts at their ends; means whereby the said tracks can be adjusted in position; strips of current-conducting material separated by blocks of insulating material, carried by each of said tracks; a roller operating upon said strips and blocks of conducting and non-conducting material when the device is tilted, and a guard carried at each end by said posts and above each of said tracks as set forth and for the purpose specified.

6. A device of the class described comprising a base; two tracks supported by said base and each provided with strips of current-conducting-material separated by blocks of insulating material; a roller operating upon said strips and blocks of conducting and non-conducting material when the device is tilted; a base upon which said first-mentioned base has tilting movement, and means for locking the first-mentioned base and the parts carried thereby when the

tracks have been tilted out of normal position, as set forth and for the purpose specified.

7. A device of the class described comprising a base; posts held in said base and provided with slots; two tracks, each carried by two of said posts at their ends; means whereby the said tracks can be adjusted in position; strips of current-conducting material separated by blocks of insulating material, carried by each of said tracks; said screws passing through the end of said tracks and through the slots in said posts and designed to press against the end blocks of insulating material so as to keep the same and the said other blocks and strips in place; a rolling contact adapted to travel between the said tracks and upon said strips and blocks of conducting and non-conducting material when the device is tilted, as set forth and for the purpose specified.

8. A device of the class described comprising a base; posts held in said base; two tracks, each carried by two of said posts at their ends; means carried by said posts to allow for the adjustment of said tracks; strips of current-conducting material separated by blocks of insulating material, carried by each of said tracks; a rolling contact adapted to travel between the said tracks and upon said strips and blocks of conducting and non-conducting material when the device is tilted; a second-mentioned base; means carried by said second-mentioned base whereby said first-mentioned base is pivoted thereto; a gravity-latch pivoted to the side of the first-mentioned base and extending downward adjacent the side of the second-mentioned base, and having its upper end in the pathway of said rolling contact and a pin carried by said second-mentioned base held in the pathway of the lower end of said gravity-latch so that at certain times the first-mentioned base together with the parts carried thereby will be locked in tilted position until the said traveling contact comes in contact with the upper portion of said gravity-latch and unlocks same from the said pin, thereby permitting the said tracks and their associated parts to move back to normal position.

9. The combination with a device of the class described comprising a base, a way pivoted off center to said base, and composed of pieces of electric-current-conducting material separated by pieces of insulating material, and a rolling contact designed to come in contact with the said conducting and non-conducting material, of means operated by gravity and designed to lock the said device in a tilted position, and which means is at certain periods operated by said rolling contact to unlock the device so as to permit it to return to normal position.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses.

THEODORE WESLEY RALPH.

Witnesses:
MANDLY T. EARL,
WILLIAM S. RALPH.