

(No Model.)

2 Sheets—Sheet 1.

S. C. DREW.

MEANS FOR PREVENTING INDUCTION ON ELECTRICAL CONDUCTORS.

No. 371,557.

Patented Oct. 18, 1887.

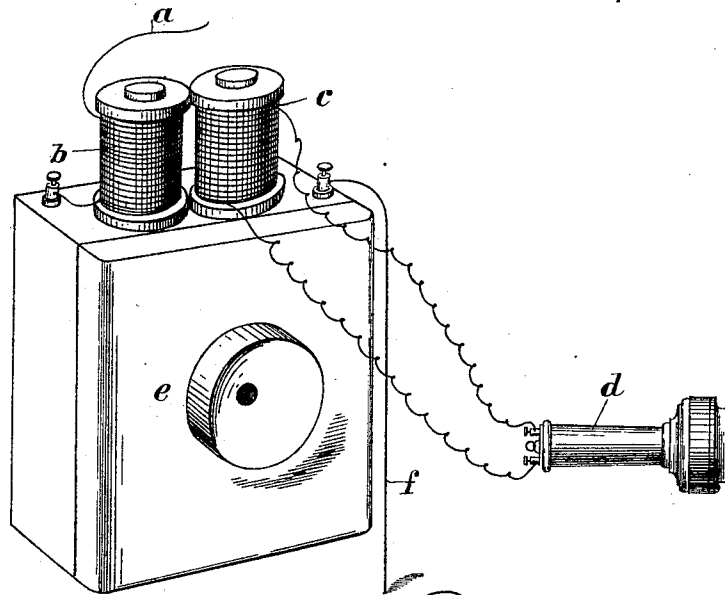


Fig. 1.

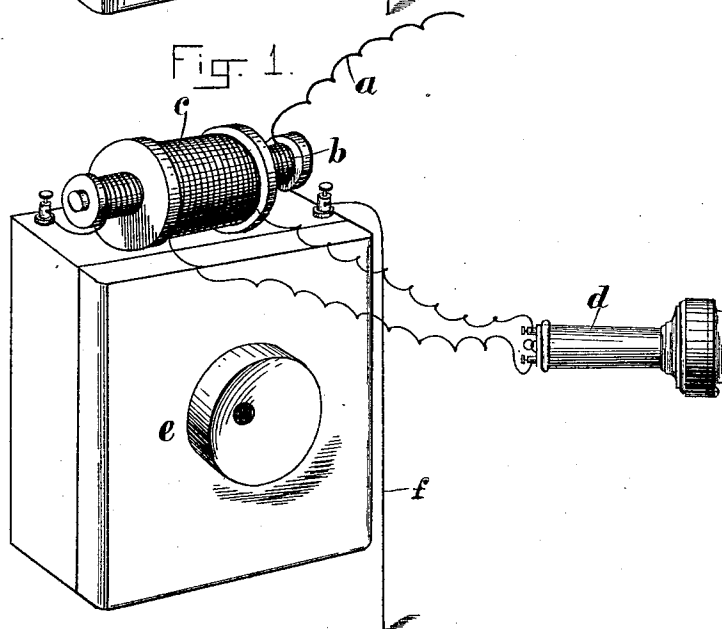


Fig. 2.

WITNESSES:
C. S. Gooding -
Estella Barry.

INVENTOR:
Stephen C. Drew

(No Model.)

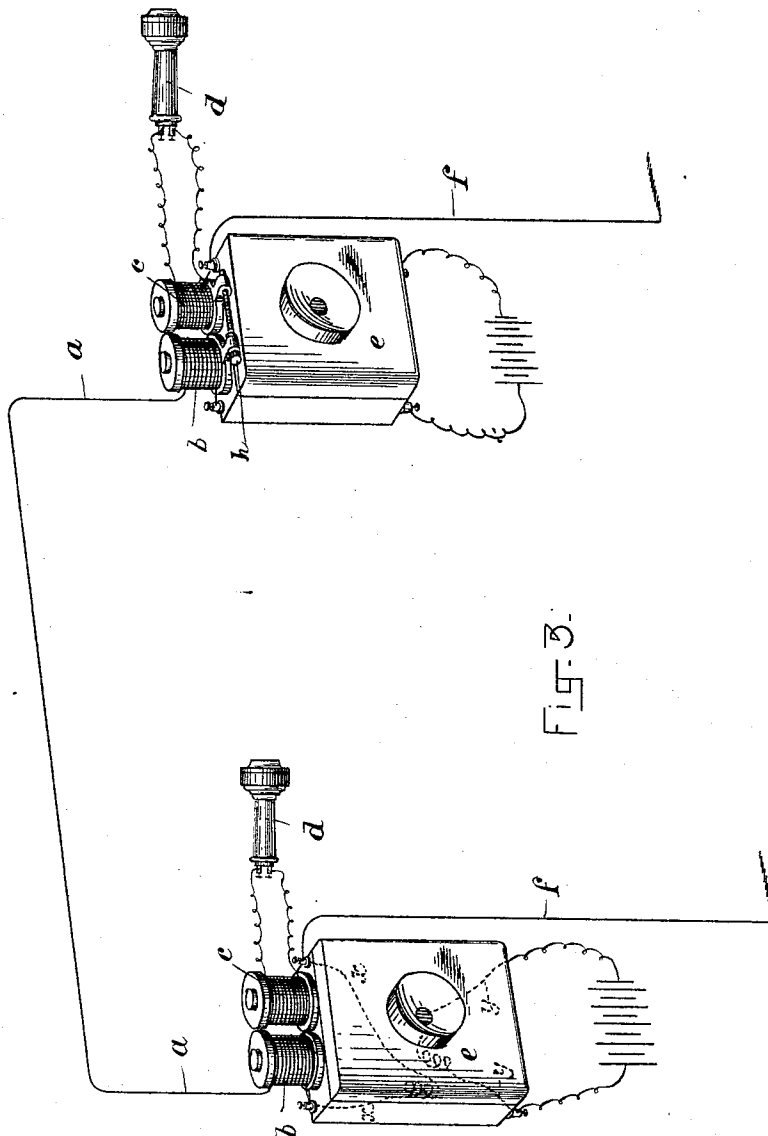
2 Sheets—Sheet 2.

S. C. DREW.

MEANS FOR PREVENTING INDUCTION ON ELECTRICAL CONDUCTORS.

No. 371,557.

Patented Oct. 18, 1887.



WITNESSES:
C. S. Gooding.
Oetella Barry.

INVENTOR:
Stephen C. Drew

UNITED STATES PATENT OFFICE.

STEPHEN C. DREW, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE
AMERICAN TELEPHONE IMPROVEMENT COMPANY, OF MAINE.

MEANS FOR PREVENTING INDUCTION ON ELECTRICAL CONDUCTORS.

SPECIFICATION forming part of Letters Patent No. 371,557, dated October 18, 1887.

Application filed August 7, 1886. Serial No. 210,255. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN C. DREW, a citizen of the United States, residing at Boston, in the county of Suffolk and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Means for Preventing Induction on Electrical Conductors; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is the suppression of induction on electrical conductors.

My invention is intended to be applied more especially to telephones. When it is applied to telephones, I design it to be placed near the transmitter. I do not undertake to prevent the passage of induced currents along the wires, but to stop them at or near the receiver. Any kind of wire, naked or insulated, may be used with my invention, and either in single lines or cables.

I find that the main current from the transmitter is of greater strength than any of the induced currents to which telephone-wires are subject. Acting on this fact, I separate the main current from the induced currents by placing at the receiving-station a primary and secondary coil, together forming an induction-coil, having the primary coil in circuit with the main line, the current from the sending-station passing through it to the ground, while the receiver is in circuit with the secondary coil and receives a message by induction from the primary coil. The induced currents from other wires, being of less strength than the current on the main line, have not the power to induce upon the secondary coil, and so are not heard in the receiver.

The coils used by me are to be placed, preferably, immediately above the transmitter, although their precise location is a matter of no special importance. These coils may be of the ordinary kind, consisting of small insulated copper wire wound upon spools, and preferably provided with soft-iron cores, although the cores may be omitted; but by their use the tone is much increased. One of these coils is put in circuit with the conductor leading from the transmitter at the other end of the line, so that the battery-current passes through it. Close

beside this first-mentioned coil, or end to end with it, is placed a second coil, these two coils forming together an induction-coil. The second coil is connected with the telephone. The vibrations passing over the wire leading from the transmitter will pass by induction to the second coil, while the induced currents which may have affected the conductor will be completely shut off by the intervening space between the two coils, and will not at all affect the coil which is connected with the telephone. The coils may be made capable of adjustment with reference to their distance from each other, so as to have them as near together as possible, and yet sufficiently far apart to stop the induced currents. Ordinarily they should be placed as near to each other as possible, so that the rims of the spools touch when they are placed side by side, and when they are placed end to end the ends of the spools and metal cores should nearly touch. Instead of the two coils forming together an induction-coil, as above described, an induction-coil of the ordinary form may be used, consisting of an inner primary coil of a comparatively few turns of wire, with a secondary coil outside the primary coil having a greater number of turns of finer wire and with a central iron core.

I place my coils in such relation to one another that the currents of electricity in the line-wire act on the receiver by direct induction from the primary coil to the secondary. Where I use two coils placed side by side, or end to end, it is essential that the cores of the said coils should be entirely separated one from the other; and it is also essential that the coils should be so near each other that the primary will induce directly on the secondary coil. Where I use the coils in the ordinary form of an induction-coil—that is, the primary within the secondary—the primary coil and its core together induce upon the secondary, so that the induction in the secondary is a combination of magnetic and electrical induction.

In the use of my invention in a telephone-line the current from the transmitter will pass directly through the primary coil and be employed in talking while the message will be received by the secondary coil by induction from the primary coil, as already stated. I design using my invention either with the or-

dinary earth-circuit or with the metallic circuit.

In the drawings I have shown, in Figure 1, one form of my invention applied to a telephone and transmitter, and in Fig. 2 the other described form with the portion of a transmitter to which it is attached. Fig. 3 shows a complete telephonic circuit with my invention connected therewith.

10 *a* is a conductor through which the current passes.

b is a primary induction-coil.

c is a secondary induction-coil.

d is a telephone.

15 *e* is a transmitter.

f is a conductor leading to ground from the secondary coil *x*.

h is a screw, by means of which the two coils may be adjusted with reference to their distance from each other. *y* is the primary circuit of the telephone.

What I claim, and desire to secure by Letters Patent, is—

1. In a telephonic circuit, the combination, 25 with a telephone having primary and secondary circuits, of the induction-coil *b c*, the coil *b*

being placed in the above secondary circuit, substantially as and for the purpose set forth.

2. In a telephonic circuit, the combination, with a telephone having primary and secondary circuits, of the induction-coil *b c*, the coil *b* being placed in the above secondary circuit, and the secondary circuit being made adjustable, so that it can be placed at a greater or less distance from the primary coil, substantially as and for the purpose described. 35

3. A line and apparatus for telephonic communication, comprising a main line ground at either end and including in its circuit at each station the primary coil of one induction-coil and the secondary coil of another induction-coil, combined with a receiving-telephone and short local circuit therefor, including the secondary coil of the first-mentioned induction-coil, and a local circuit, including a battery, microphone, and primary coil of the other induction-coil, the whole combined and arranged substantially as and for the purpose specified. 40

STEPHEN C. DREW.

Witnesses:

ESTELLA BARRY,
GEO. L. REHM.