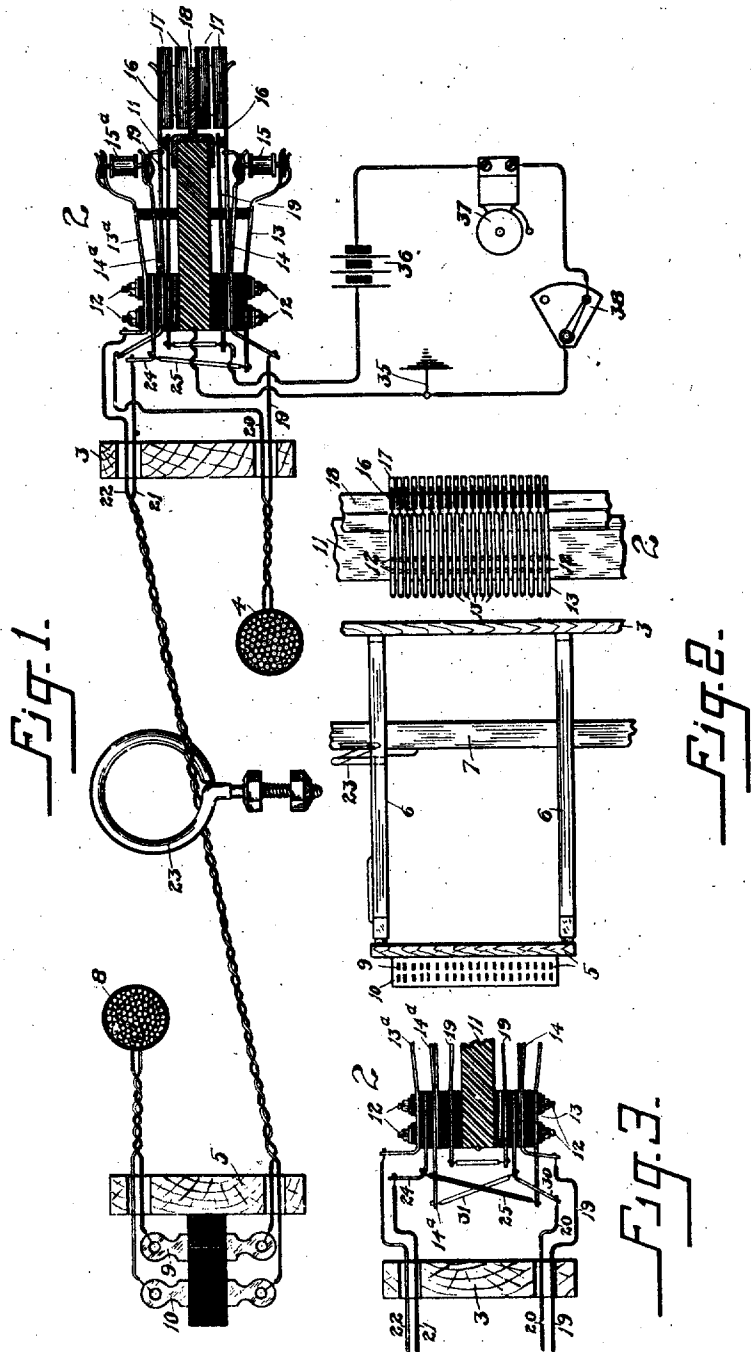


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 APPARATUS FOR TELEPHONE INSTALLATIONS.
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Witnesses.
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UNITED STATES PATENT OFFICE.

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APPARATUS FOR TELEPHONE INSTALLATIONS.

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To all whom it may concern:

Be it known that I, CHARLES A. SIMPSON, a citizen of the United States, residing in Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Apparatus for Telephone Installations, of which the following is a specification.

My invention relates to improvements in that portion of a telephone installation known as a distributing frame and particularly to that part of the frame known as the arrester strips, and it consists, generally speaking, in the provision of efficient means whereby the cross connections in the distributing frame may be conveniently made.

In modern large telephone exchanges a distributing frame is always provided to which the street cables are connected on one side and the switchboard cables on the other; then by means of short, twisted pairs of wires known as jumper wires or jumpers any switchboard end of a circuit may be connected with any street end to thereby form a complete circuit. The terminals of such lines on one side of the frame are usually in the form of arrester strips which carry the protective devices or arresters of various kinds for the protection of the telephone line circuits. These strips comprise a flat mounting plate which is electrically connected with ground and upon the two sides of which bunched sets of spring strips are mounted flatwise, the opposite sets being included in the two sides respectively of the same line and the arresters being held in place by springs. Such an arrester strip is disclosed in the patent to Kaisling, granted December 30, 1902, No. 717,212. With this arrangement the line wires from either the switchboard or street cables are permanently secured to the corresponding springs of the opposite sets and the cooperating springs are secured to the cross-connecting wires. With former arrangements it was thus necessary to secure the end of one of the jumper wires of each twisted pair to the terminal of the proper spring on one side of the strip and the other wire of the pair to the corresponding spring on the other side of the plate. This is inconvenient, particularly in view of the fact that these connections are soldered and must be made by means of a soldering iron.

In my improvements I bring the corre-

sponding terminals out to one side of the strip whereby the connections are readily made at said side thus making it unnecessary to reach into the other side of the strip among the various wires and connections every time it is desired to change a connection. In carrying out my invention I place in the bunched set of arrester springs an auxiliary or dead strip which projects to the rear to form a terminal similar to that of the springs, and permanently connect said strip with the proper spring on the other side of the plate by means of a cross-connecting wire or similar conductor soldered to each, this being readily done in the shop before the arrester strip is installed. In practice it is only necessary to connect the jumper or other wires to the two terminals on the same side of the arrester strip in order to make the complete connection with the lines, and which is easily done since both terminals are accessible.

The invention is illustrated in the accompanying drawing in which the same reference letters designate like parts in the various views and in which:

Figure 1 is a diagram of the distributing frame provided with arrester strips of my invention; Fig. 2 is a side view of said arrester frame and Fig. 3 is a plan view of a modification of the arrester strip shown in Fig. 1.

Referring to Fig. 1 and Fig. 2, 2 indicates the complete arrester strip which is mounted at one side of the distributing frame in front of the jumper strip 3 in the rear of which the cable 4 is located. The corresponding terminal strip 5 is placed at the other side of the frame and the two, that is the terminal strip and the jumper strip, are connected together by the horizontal braces 6 shown in Fig. 2. The whole frame is supported by the usual vertical member 7 also shown in Fig. 2. A cable 8 is located inside of the terminal strip 5 and its conductors are brought out to the terminals 9 and 10 insulated from each other and carried by the said strip 5. This cable 8 may be either the cable leading to the switchboard or the cable leading into the street. The wires of this cable are permanently connected as by soldering with the ends of said terminals 9 and 10. The arrester strip comprises a mounting plate 11 suitably secured to the distributing frame and upon the opposite

sides of which the arrester springs are located, the opposed sets of springs being clamped together and upon the plate by bolts 12 which pass through the plate and through the sets. The two outer springs 13, 14 and 13^a, 14^a of these sets carry the usual sneak current, arresters 15, 15^a in their free ends; the third springs 16 hold the lightning arresters 17 between their free ends and extension 18 of the mounting plate 11, while the fourth springs 19 are normally insulated but are adapted to be pressed into contact with the plate 11 by either the springs 14, 14^a or 16 when they are not restrained by their respective arresters. The detail construction of such an arrester strip is more fully shown and described in the patent to Kaisling, above referred to.

The wires of the cable 4, which may be either the street cable or the switchboard cable, are taken out in pairs since they represent the two sides of the telephone line and are connected to the second springs 14 and 14^a of the opposite sets. For instance, the wires 19 and 20 are connected respectively to springs 14 and 14^a, the circuit being thence extended through the sneak current arresters 15 and 15^a and thence to outer springs 13 and 13^a. The connection of the wires 19 and 20 to the said springs is permanent and does not require to be changed after the installation is made.

In order now to be able to connect the two ends of the telephone lines in any manner it is necessary to have means for readily connecting the terminals 9 and 10 of the terminal strip 5 with the outer springs of the opposed sets of springs on the arrester strip 2. This is done through the medium of jumper wires such as at 21 and 22 which are usually a twisted pair of wires, one end of the pair being readily soldered to the ends of terminals 9 and 10 as shown, and thence continuing through a jumper ring 23 suitably mounted on the distributing frame and thence through the jumper strip 3 to the terminals of springs 13 and 13^a of the arrester strip 2. In order to avoid the necessity of connecting the jumper wire 21 to the spring 13 direct, an auxiliary or dead spring 24 is included in the bunch of springs upon the outer side of the plate 11, and is permanently connected with the terminal of the spring 13 upon the other side of the plate, preferably by means of the wire conductor 25 which may be conveniently soldered at its opposite ends to the said terminals 13 and 24 before the arrester strip is taken from the shop. Now when it is the desire to connect the springs 13 and 13^a with the respective jumper wires 21 and 22 it is only necessary to solder said wires to the terminals 24 and 13^a which are upon the same side of the arrester strip 2 and are accessible for such purposes.

In Fig. 2 the side view of the arrester strip is shown from which it is evident that the sets of arrester springs are placed close together side by side upon the mounting plate 11, and from which it is seen that the disposition of the connecting terminals upon one side of the plate greatly facilitates the connecting and disconnecting of the jumper wires at that side of the frame.

The plate 11 in Fig. 1 is shown grounded as at 35 while a battery 36, alarm 37 and switch 38 are adapted to be included in a local circuit by the closing of springs 19 against the plate No. 11.

In Fig. 3 an additional auxiliary or dead strip 30 is provided in connection with the set of springs upon the opposite side of the plate 11 and which is connected by means of a terminal conductor 31 with the spring 14^a of the opposite set, whereby the cable conductors 19 and 20 may both be connected with the respective springs upon the same side of the arrester strip 2 as in the case of the jumper wires, only upon the other side. This arrangement of the line connection, it will be understood, is not so essential as that described with reference to Fig. 1, as the cable wires are seldom, if ever, changed after once being connected to their respective terminals.

From the foregoing it is evident that the invention renders the making of connections on the distributing frame extremely simple and that the arrangement of the extra or dead strips in the sets of springs is an efficient and economical method of accomplishing the desired result. It is apparent that various changes and modifications may be made in the specific details of the invention without departing from the scope or principle of the same, hence I do not desire to be limited in all respects to those shown and described. But

Having thus described my invention what I claim and desire to secure by Letters Patent is:

1. In a telephone installation, the combination with a mounting plate, of sets of arrester springs mounted on each side of said plate opposite one another, the opposed sets serving the respective sides of the same telephone line, terminals for the springs to enable the same to be connected in the electric circuits, auxiliary terminals on each side of the said plate, and exposed cross-connecting conductors leading from said auxiliary terminals to springs of the opposite set, substantially as described.

2. In a telephone installation, the combination with a mounting plate, of bunched sets of arrester holding spring strips mounted upon the opposite sides of the plate, the opposed sets being used in the respective sides of the same line, an auxiliary or dead strip included in each set on one side of the

plate, said springs and auxiliary strips having projecting terminals to which the wires of the circuits may be connected, the projecting terminal of said auxiliary strip in each set being electrically connected to the desired spring of the opposite set, whereby the similar circuit connections with springs of the opposite sets may be made on the same side of the plate as said auxiliary strips, substantially as described.

3. In apparatus for a telephone installation, the combination with a mounting plate, of bunched sets of arrester-holding springs mounted upon opposite sides of the said plate, the sets that are opposite being for the respective sides of the same line, said springs having projecting terminals to which the wires of the circuits are adapted to be connected, an auxiliary strip in each set on one side of the plate, said auxiliary strip also having a projecting terminal, and a wire or like conductor connected between said auxiliary strip and a spring of the opposite set, whereby to permit the ready connection of the latter spring, on the other side of the mounting plate, substantially as described.

4. In a telephone installation, the combination with a mounting plate, of sets of arrester springs on opposite sides of said plate, the opposite springs serving the different sides of the same telephone line, an auxiliary terminal mounted upon one side of said plate and having a conductor cross-connected to the terminal of an arrester spring on the opposite side of said plate, whereby the two limbs of the telephone line may be connected with on the same side of said mounting plate, said cross-connecting conductor being exposed and unassociated with the means for retaining said springs in position, substantially as described.

5. In a telephone installation, the combination with a mounting plate, of sets of arrester springs on opposite sides of said plate,

the opposite springs serving different sides of the same telephone line, auxiliary terminals mounted upon the opposite sides of said plate and having conductors cross-connected to the terminals of arrester springs on the opposite sides of said plate, whereby the two limbs of the telephone line may be connected with on the same side of said mounting plate, said cross-connecting conductors being exposed and unassociated with the means for retaining said springs in position, substantially as described.

6. In a telephone installation, the combination with a mounting plate, of sets of arrester springs secured to the opposite sides of said plate, the opposite springs serving the different sides of the same telephone line, said springs extending beyond the edge of said mounting plate, an auxiliary terminal mounted similarly to said springs and also extending beyond the edge of said plate, and a conductor passing beyond the edge of said plate connecting said auxiliary terminal with one of the springs upon the opposite side of said plate, substantially as described.

7. In a telephone installation, the combination with a mounting plate, of sets of arrester springs secured to the opposite sides of said plate, the opposite springs serving the different sides of the same telephone line, said springs extending beyond the edge of said mounting plate, an auxiliary terminal mounted similarly to said springs and also extending beyond the edge of said plate, and a conductor connecting the extended end of said auxiliary terminal with the extended end of one of the springs upon the opposite side of said plate, substantially as described.

In witness whereof, I hereunto subscribe my name in the presence of two witnesses.

CHARLES A. SIMPSON.

Witnesses:

ROBERT LEWIS AMES,
EDITH F. GRIER.