H. KOCH.

TELEPHONE SWITCH SEPARATOR.

APPLICATION FILED OCT. 20, 1919.

1,372,437.

Patented Mar. 22, 1921.

Fig. 1.

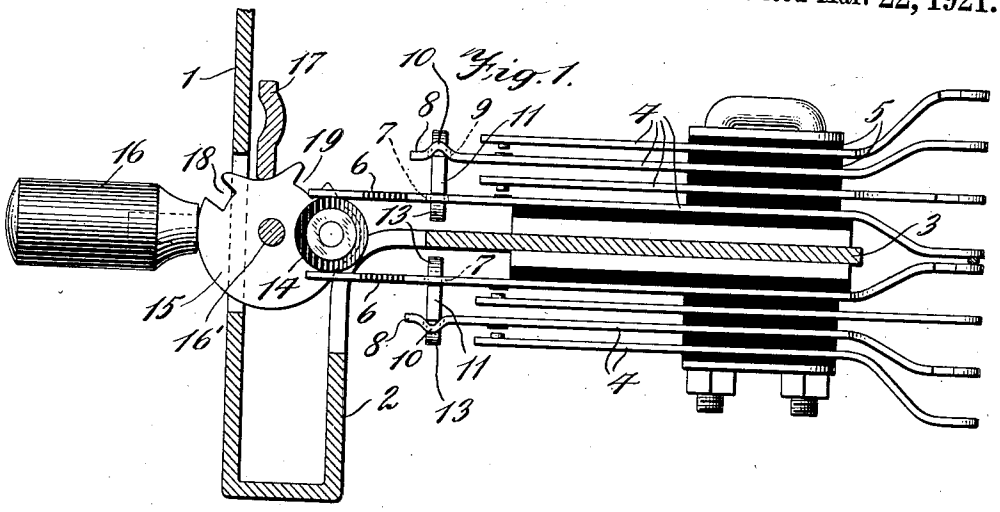


Fig. 2.

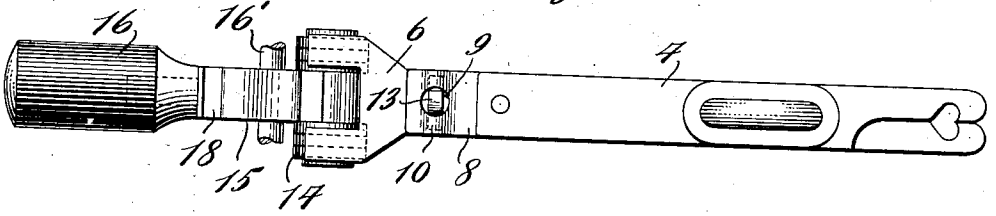


Fig. 3.

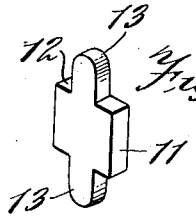


Fig. 4.

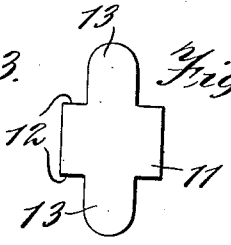


Fig. 5.

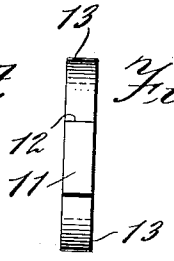


Fig. 7.

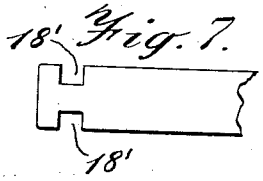


Fig. 8.

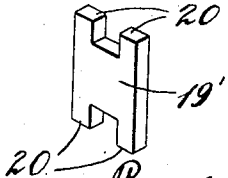
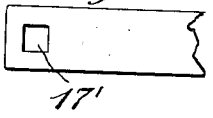


Fig. 6.



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UNITED STATES PATENT OFFICE.

HENRY KOCH, OF JAMAICA, NEW YORK, ASSIGNOR TO DICTOGRAPH PRODUCTS CORPORATION, A CORPORATION OF VIRGINIA.

TELEPHONE-SWITCH SEPARATOR.

1,372,437. Specification of Letters Patent. Patented Mar. 22, 1921.

Application filed October 20, 1919. Serial No. 331,956.

To all whom it may concern:

Be it known that I, HENRY KOCH, a citizen of the United States, residing at Jamaica, in the county of Queens and State of New York, have invented certain new and useful Improvements in Telephone-Switch Separators, of which the following is a full, clear, and exact description.

This invention relates to telephonic apparatus and particularly to constructions comprising telephone switches in which spacers are used between the spring contact members thereof.

Such spacers have heretofore been made of suitable insulating material such as hard rubber, or fiber, and are cylindrical in shape with a smaller cylinder-shaped axial lug at each end. They have been made on screw machines which fact together with loss entailed through breakage renders the method rather expensive and slow.

An object of my invention is to provide a spacer for the same purpose, which can be more easily and quickly made, which is of lower cost of manufacture, and which can be substituted for the spacer now commonly used without material change in the design of the switches.

The invention consists in the details of construction, which will now be described with reference to the accompanying drawing in which:

Figure 1 is an elevation partly in section showing a switch unit of a switchboard and having my improved spacer embodied therein;

Fig. 2 is a top plan of the same;

Fig. 3 is a perspective view of my preferred form of spacer;

Fig. 4 is a front view of the same;

Fig. 5 is a side view of the same;

Fig. 6 is a top plan view of a modification of the strips but using the preferred form of spacer shown in Figs. 3 to 5;

Fig. 7 is a top plan view of another modification showing a form of strip which may be used, and

Fig. 8 is a perspective view of the spacer which is to be used with strip shown in Fig. 7.

The key plate of a switchboard is provided with a face plate 1, having a doubled back extension 2, which finally extends horizontally to form a supporting member 3 for the switches. Supported above and below this member 3 are a plurality of switches, two of which are shown. The switches comprise a plurality of spring strips 4 supported with interposed insulation 5 upon supporting member 3. The strips immediately above and below the supporting member 3 have extensions 6 by means of which the switches receive their movement from the operating cam as will be hereinafter described. These extensions have openings 7 therethrough to receive the lugs of the spacers. Certain others of the strips have extensions 8 which are provided with openings 9 alined with openings 7 and for also receiving lugs on the spacers. A transverse crimp is formed in each extension 8, having its crest intersecting the opening 9, and forming a seat for the reception of the edge of a spacer.

One form of spacer is shown in detail in Figs. 3 to 5 and is preferably manufactured by stamping from sheets of suitable insulating material such as hard rubber or fiber, enabling quantity production at a low cost. It comprises a flat body portion 11 having parallel edges 12 from which project integral axial lugs 13. When the spacer is in position in the switches its lugs are disposed in the alined openings in the strips and one edge is disposed in the crimp to prevent turning or displacement of the spacer. The seat is conveniently formed by the crimp, but obviously any other suitable construction of seat in the extension of the strip may be used. It will thus be seen that movement of either strip having the extension 6 away from the supporting member 3 will impart a concomitant movement to the strip having the extension 8.

The extensions 6 receive their movement from roller 14 eccentrically carried by pivoted cam or disk 15, which in turn is operated by a handle 16 projecting forwardly of the face plate. The disks or cams 15 are conveniently mounted for pivotal move-

ment on a common shaft or rod 16′ carried by the key plate, and are held in either of two operative positions by means of a common pawl or bail 17 which drops into notches 18 or 19 depending on whether the disk is turned to operate the lower or upper switch.

In Fig. 6 is shown a modified form of strip which may be used with the spacer, which is illustrated in Figs. 3 to 5. This strip is provided with a non-circular aperture 17′ in its extension, such as a square or rectangular aperture, which receives the square or rectangular lug of the flat spacer illustrated in Figs. 3 to 5, the coöperating shapes of lug and aperture, holding the spacer in position and preventing it from turning.

In Fig. 7 is illustrated a still further modification of strip which may be used and which comprises a flat strip having edge notches 18′ in its extension. A modified form of spacer, illustrated in Fig. 8 is used with the strip of the form shown in Fig. 7. This modified spacer is flat and also preferably manufactured by stamping from sheet material. It comprises a body portion 19′ having spaced lugs 20 extending from opposite edges thereof. The spaced lugs 20 are adapted to be received by the notches 18′ in the strip illustrated in Fig. 7, which notches 18′ hold the spacer upright in proper spacing position and also prevent it from turning from a transverse position.

It is obvious that various other modfications of strips and spacers may be made in the construction illustrated in the drawings and above particularly described within the principle and scope of my invention.

I claim:

1. In circuit controlling devices for telephone apparatus, the combination of a plurality of spaced spring strips, certain of the strips having alined openings therethrough, and one of said certain strips having a seat therein, a flat spacer between said certain strips having lugs in said alined openings and an edge in said seat, and operating means for imparting movement to one of said strips with openings.

2. In circuit controlling devices for telephone apparatus, the combination of a plurality of spaced spring strips, two of said strips having extensions with alined openings, therethrough, and one of said extensions having a seat adjacent the opening in that member, a flat spacer disposed between said two strips and having lugs in said openings and a portion in said seat, and operating means for imparting movement to one of the strips with the extensions.

3. In circuit controlling devices for telephone apparatus, the combination of a plurality of spaced spring strips, two of said strips having extensions with openings therethrough, and one of said extensions also having a seat, and a flat spacer disposed between said strips with extensions and having lugs extending into said openings and a portion into said seat, and operating means for imparting movement to one of the strips with extensions.

4. In circuit controlling devices for telephone apparatus, the combination of a plurality of spaced spring strips, two of said strips having extensions with openings therethrough, a flat spacer disposed between said extensions and having lugs extending into said openings, said spacer and one of said extensions having additional coacting means for holding them in a definite relation and operating means for imparting movement to one of the strips with extensions.

5. In circuit controlling devices for telephone apparatus, the combination of a plurality of spaced spring strips, two of said strips having extensions with openings therethrough, one of said extensions having a seat intersecting the opening therein, a flat spacer disposed between said extensions and having a lug projecting from opposite edges thereof into said openings and having one edge disposed in said seat, and operating means for imparting movement to one of the strips with an extension.

6. In circuit controlling devices for telephone apparatus, the combination of a plurality of spaced spring strips, two of said strips having extensions with openings therethrough, one of said extensions having a transverse crimp therein with the crest passing across the opening in that strip, a flat spacer having lugs extending from opposite edges, one into each of said openings, and an edge into said crimp, and operating means for imparting movement to one of the strips with an extension.

7. In circuit controlling devices for telephone apparatus, the combination of a plurality of spaced spring strips, two of said strips having openings therethrough, one of said strips with an opening having a crimp therein with the crest passing across the opening, a spacer having lugs extending from opposite edges one into each of said openings and a portion into said crimp, and operating means for imparting movement to one of the strips with an opening.

8. In circuit controlling devices for telephone apparatus, the combination of a plurality of spaced spring strips, certain of the strips having openings therein, and one of the strips with an opening having a seat therein, a spacer disposed between said strips with openings having lugs extending from the edges, one into each of said openings and a portion into said seat, and operating means for imparting movement to one of the strips with an opening.

9. In circuit controlling devices for telephone apparatus, the combination of a plu-

rality of spaced spring strips, two of the strips having openings therein, a spacer disposed between said strips with openings, and having lugs extending from two of its edges, one into each of said openings, said strip and spacer having additional co-acting means for holding the spacer in a definite relation with respect to the strips, and operating means for imparting movement to one of said strips with an opening.

In witness whereof, I hereunto subscribe my signature.

HENRY KOCH.