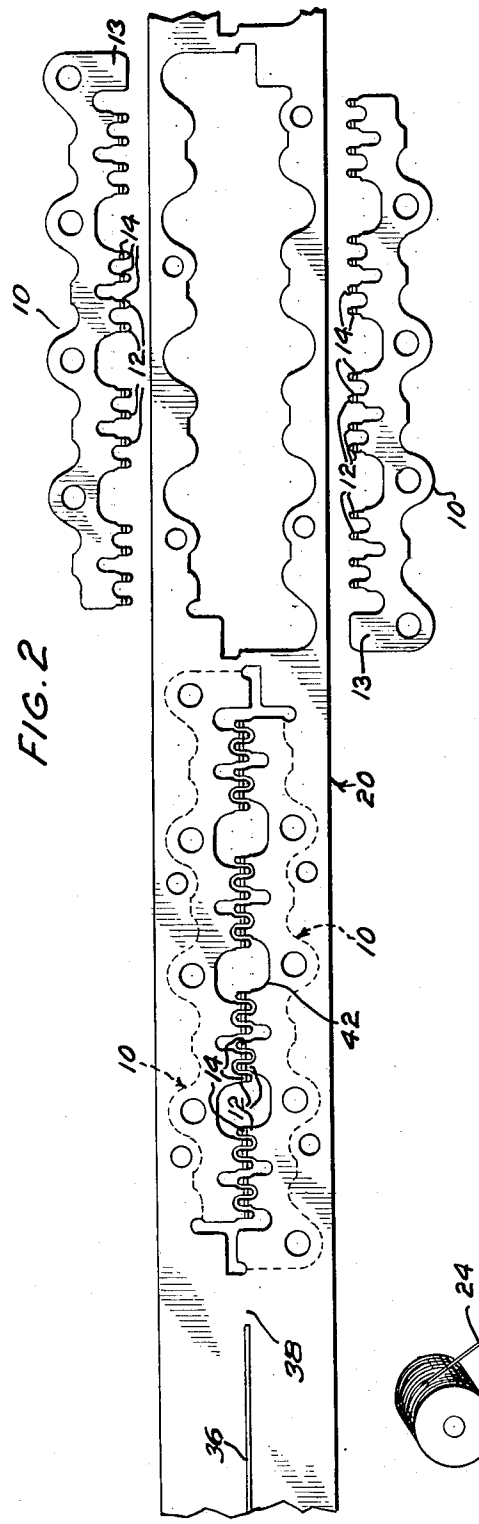
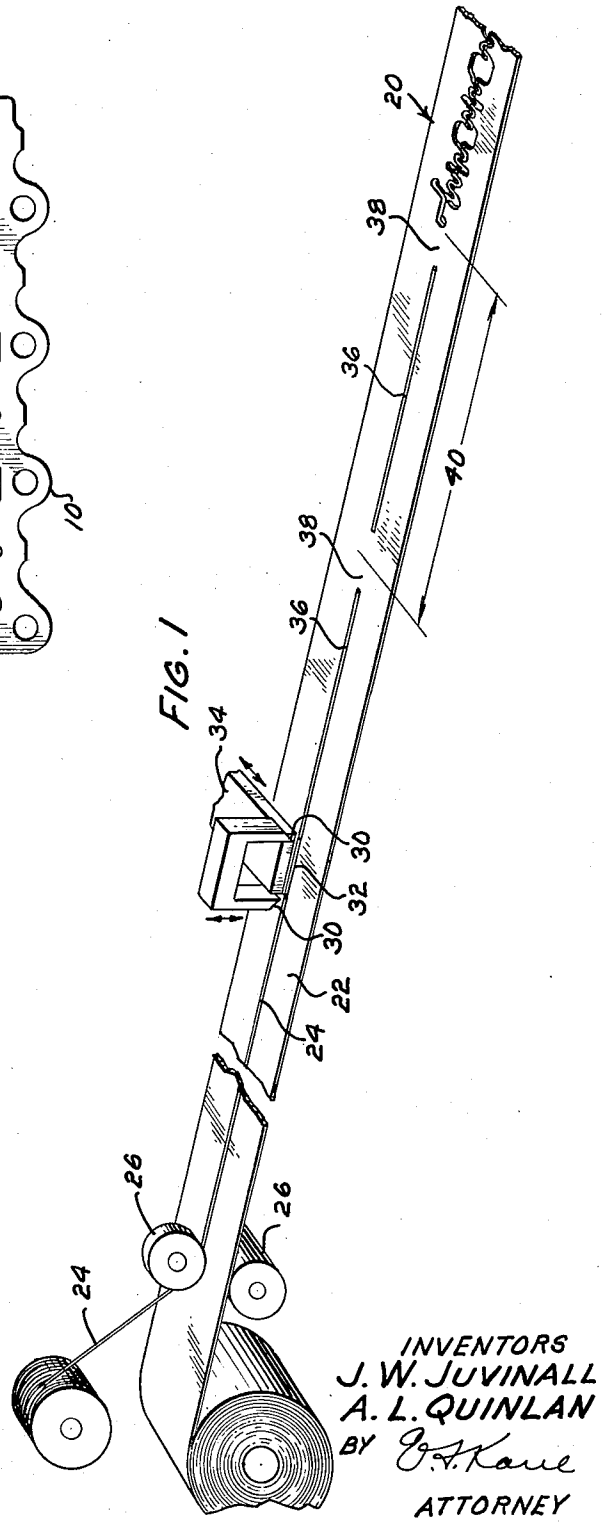
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METHOD OF MAKING SWITCH PARTS

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METHOD OF MAKING SWITCH PARTS

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This invention relates to the method of making switch parts and more particularly to the method of making an elongated switch part having spaced along one longitudinal edge thereof a row of laterally projecting fingers, on some of which are welded contacts of precious metal.

In one method of making switch parts, as practiced heretofore, the switch part, having an elongated shape with a row of transversely extending fingers along a longitudinal edge thereof, was stamped from sheet metal and then contacts of precious metal were individually welded onto some of the fingers. This method, while satisfactory, is relatively expensive in that it entails a double handling of the switch part—first, during the punching of the part from the strip stock, and, second, during the welding of the contacts to the part, and, also, because of the slowness of the contact welding operation.

An object of this invention is to provide an efficient and effective method of making switch parts and more particularly a method of making such parts having contact elements of precious metal welded thereto.

Further objects and advantages of the invention will be apparent by reference to the following detailed description thereof and the accompanying drawings illustrating a preferred embodiment thereof in which:

Fig. 1 is a diagrammatic perspective view showing how the strip is formed from which the switch parts are made, and

Fig. 2 is a plan view of a portion of the strip showing a pair of switch parts partially formed therein and a completed pair of switch parts formed therefrom.

The switch part 10, which is used in automatic telephone switching apparatus, comprises an elongated flat metal member having a plurality of recesses extending inwardly from one edge thereof to form a row of transversely extending lugs or fingers arranged along the longitudinal edge of the part and comprising contact bearing fingers 12 and a test lug 13. The fingers 12 are relatively narrow and are separated from each other by a distance exceeding the width of the fingers and have contacts 14 comprising short sections of a contact tape of precious metal welded to one side of the ends thereof. The test lug 13 is used when making tests of the switch, after it is assembled, and is adapted to be engaged by detachable leads from testing equipment.

The switch parts are so designed that two of them may be placed in opposing and nested relation with the fingers of one switch part inter-

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fitting with the fingers of the other and with the contacts thereon arranged in a straight line.

Successive pairs of switch parts arranged in opposed and nested relation are adapted to be punched from a stock strip 20, which comprises a flat strip or tape 22 of base metal, to one side of which a strand or ribbon 24 of contact material of precious metal is welded parallel to one edge and substantially along the centerline of the tape. The contact ribbon 24 and the base tape 22 may be continuously welded together by passing them through a pair of cylindrical or roller welding electrodes 26 to form the stock strip 20, as indicated in Fig. 1. The strip stock may be rolled into large rolls or coils, from which the switch parts 10 are subsequently made, or, as indicated in Fig. 1, the strip stock may be fed directly into an apparatus for making the switch parts, as, for example, a punch press. In the punch press, a pair of knives or cutting tools 30, spaced apart a predetermined distance, are actuated to sever a short length or section 32 of the contact tape from the adjacent portions thereof and this section 32 is removed from the stock by a tool 34 transversely actuated to shave it from the stock. The stock strip 20 may be guided by suitable guides engaging said one edge and advanced a predetermined distance by any suitable feeding means and the tools again actuated to remove another section 32 of the contact ribbon 24 from the tape 22, leaving a length of contact ribbon 36 separated from the adjacent lengths of contact ribbon by spaces 38—38. The successive removal of sections 32 of the contact ribbon 24 from the strip stock forms, in effect, a series of interconnected blanks 40, each blank having a length or section 36 of contact tape welded thereto along its centerline for the major portion of its length and from which blank a pair of nested switch parts 10 may be punched.

The switch parts 10 are punched from the strip stock in two steps with a progressive die, a central slug, having an outline as indicated at 42 (Fig. 2), being punched from the strip to form the internested finger portions of the switch parts during the first step, and the completed switch parts 10 being punched from the strip stock in the second step. The internested fingers 12 of the switch members 10, as formed by the first step in the stamping operation, extend transversely beyond the centerline of the strip 20 sufficiently to include the full width of the strand of contact metal 36 and the section 36 of the contact metal extends longitudinally a distance sufficient to cover all of the fingers 12 of the pair of nested switch parts.

The test fingers or lugs 13 of the pair of internested switch parts are positioned longitudinally beyond the ends of the section 36 of the contact metal and are stamped from the portions 38 of the stock strip 20 from which the strand 24 has been removed.

The tape 22 may be made from nickel silver or other suitable metal and the contact forming strand 24 may be made of any precious metal, but preferably is a bi-metallic ribbon consisting of a layer of palladium bonded in superposed relation on a layer of nickel. The shaving off from the tape 22 of the sections 38 of the precious metal strand 24, in addition to removing the extra material from the area of the strip from which the test lugs 13 of the switch parts are stamped, also permits the convenient recovery of this portion of the precious metal scrap resulting from the above described method of making the switch parts 10.

From the foregoing, it will be seen that by continuously welding a strand of noble contact-forming metal a predetermined distance from and parallel to one edge of a base metal tape and removing portions of the strand from predetermined spaced portions of the tape and stamping the pairs of internested switch members therefrom, an efficient method of making the switch parts may be practiced in which the switch parts are stamped from the strip stock in their finished form, with the contact points welded to the proper switch fingers thereof.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. A method of making switch parts comprising continuously welding a ribbon of contact forming metal to a flat metal tape to form a composite strip, removing predetermined portions of said ribbon from predetermined spaced portions of said composite strip, and punching switch parts from said composite strip and in predetermined relation to the portions of ribbon thereon to form contacts on the switch parts along only a portion of a predetermined centerline thereof.

2. A method of making switch members which comprises continuously roll welding a narrow ribbon of contact-forming metal to a flat metal tape to form a composite strip, severing a section of the welded ribbon of contact-forming metal from the remainder of the ribbon and then shearing the severed section from the composite strip at predetermined spaced portions of said composite strip to form a stock strip having a row of spaced-apart lengths of contact metal thereon, and successively blanking said switch members from said stock strip and in predetermined relation to said lengths of contact metal to form contacts on the switch members along only a portion of a predetermined centerline thereof.

3. A method of making switch members from an elongated tape of base metal having a ribbon of noble contact-forming metal continuously welded thereto comprising the steps of severing

a portion of the ribbon of contact metal from the remainder of the ribbon and then shearing the severed portion from the tape at predetermined intervals along said tape to form a strip of interconnected blanks having a section of noble contact metal extending longitudinally through a portion of each of said blanks, and punching switch members from said interconnected blanks in predetermined relation to said sections of contact metal to form contacts on the switch members along only a portion of a predetermined centerline thereof.

4. A method of making switch members having a longitudinal row of laterally extending fingers with noble metal contacts welded on some of them comprising welding a contact-forming strand of noble metal to a base metal tape along a predetermined centerline, severing a predetermined length of said welded contact strand of noble metal from the remainder of the strand and then shearing said severed length of strand from said base metal tape at predetermined intervals on said tape to form a strip having a plurality of predetermined lengths of contact metal bonded thereto in spaced relation to each other, and punching from said strip at each of said lengths of contact metal, pairs of switch members with their fingers internesting along said predetermined centerline and with some of the fingers of the internested switch members disposed longitudinally beyond the ends of said lengths of contact metal.

5. A method of making switch members having a longitudinal row of transverse fingers with contact points bonded on some of them from a metal tape having a strand of contact forming metal welded to it parallel to one edge, which comprises removing sections of predetermined length of said strand of contact metal from said tape at predetermined intervals on said tape to form a strip of interconnected blanks having in each blank a section of strand extending longitudinally through an intermediate portion thereof, and stamping from said interconnected blanks pairs of switch members arranged on opposite sides of said section of strand with their fingers interfitting with each other along the sections of strand and having some of the fingers positioned longitudinally beyond the ends of said sections of contact-forming strand.

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