be used will, of course, depend on the dimensions of the lines in question. For very small diameter lines only a few contact fingers are possible by virtue of the small physical dimensions. It is, however, always desirable to keep the number of contacts large so as to obtain stability of contact performance, and more important still to ensure, as nearly as possible, continuity of the skin current sheet and freedom from excitation of the back end of the line.

As a guide, a line of 1 inch diameter (25 mm) will usually have some 30 fingers, correspondingly more being used for larger diameters.

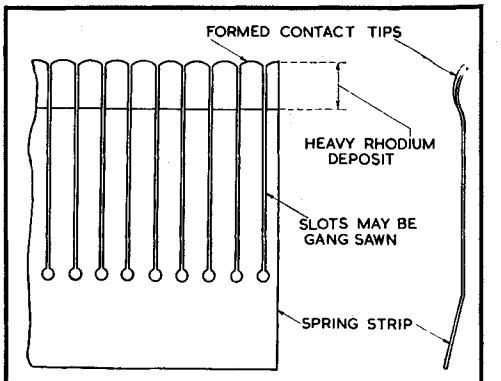

Fig. 4—Method of fabricating sliding members from strip material

Quantity Production

In the less critical type of apparatus, and where quantities demand a simplified manufacturing technique, it is now common practice to fabricate sliding shorts from strips of spring material, pre-slotted, formed, electroplated, polished, and finally wrapped round and soldered to a solid back plate.

The general principle is self-explanatory and is illustrated in Fig. 4. The fact that the diameter on which the spring strip is wrapped may be such that there is not an integral number of fingers round the circumference is of little importance, provided that the fingers are small in width, as a gap between the ends of the strip of half-a-finger width has little or no effect on performance.

The advantages of this method of construction are obvious, as the forming, slotting, plating and polishing processes are carried out while the material is in the flat state, thus simplifying handling problems.

It is customary to silver plate the strip all over its surface, but to restrict rhodium plating to the spring fingers only, and to restrict the heavy rhodium to the spring finger contact areas.

Electrodeposition of Ruthenium

Very little work has been carried out on the electrodeposition of ruthenium although it is known that deposits have been obtained from dilute solutions of ruthenium nitroso salts. An investigation recently completed at the Atomic Energy Research Establishment, Harwell, by A. C. Littlejohn (A.E.R.E. C/R 1892, 1956) shows that, under certain conditions, uniform deposits of ruthenium may be obtained on copper cathodes from solutions of ruthenium nitroso trichloride in dilute hydrochloric acid.

Numerous runs were carried out, using a platinum anode, at constant potential, but it was found in all cases that once an initial coating of ruthenium had been deposited at low current density, the current gradually increased to very high values and brittle deposits were obtained. Constant potential electrolysis was therefore dropped in favour of constant current electrolysis. In these experiments current densities up to 20 mA/cm^2 were used, and the deposits were considerably improved.

Conditions finally recommended for successful deposition include a solution of 5×10^{-3} M $Ru(NO)Cl_3$ + 0.5N HCl, and a current density between 2 and 5 mA/cm^2.