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DENTURE MATERIAL.

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This invention relates more particularly to the preparation of wires or plates for use in dentures and is concerned with that phase which is encountered in altering the shape of a wire, plate or the like to cause it to fit a given dental arrangement. The invention has a broader aspect, but is of special utility and value in connection with the dental art.

This invention is predicated upon the observation and discovery that metal in the form of wire, or plates, or the like, possessing an inherent resiliency, that is, the quality of partially springing back when the bending or deforming tool or implement is released, can be rendered inactive with respect to this elastic quality, provided it is covered with a softer metal. Thus it has been found that piano wire if coated with a tin sheath or covered with copper or other soft metal and then bent to a desired shape, will retain that shape without exercise of an elastic tendency to alter said shape, even after the coating or sheath is removed. The same thing is true of plates. Thus certain alloys of platinum-gold plate exhibit the elastic tendency when deformed by the usual tools or appliances; but when the plate is coated with copper or other soft metals it can be bent into any desired shape and it will retain that shape accurately even after the coating is removed. It is believed that the discovery deals with facts thus far unknown to science, and any explanation of the phenomenon is therefore difficult to formulate. The new invention, however, lends itself to application in various arts, but particularly in the art relating to mechanical dental work of various kinds. Thus in the art dealing with dentures, wires and clasps are constantly used, and it is essential that such shaping or deformation of the metal as the dental expert applies should be as nearly permanent as possible, and that the metal when bent to a given or intended shape should not, by springing back to its initial shape, resist the efforts of the manipulator or defeat his objects.

In the case of dental plates, the difficulties due to the resiliency of the metal have been such that elastic platinum-gold, although a desirable material for this purpose, has not been made use of for the preparation of dental plates because it was impossible to shape this metal in such a way that it would take and retain an accurate, definite and pre-determined shape. The same tendency to exercise resilient effects has therefore caused difficulties in the making of perfect fitting clasps as anchors on teeth for removable bridges and plates. All of these difficulties are overcome by the present invention by means of which resilient wires and plate gold and other resilient material becomes usefully available.

In carrying out the present invention in connection with a dental plate, for example, plate gold or an alloy of gold, platinum and copper, and usually from .010 to .020 of an inch thickness, is electroplated or otherwise covered with copper. From a plaster or similar impression of the part of the mouth to be dealt with, there is prepared first a zinc die and then a lead counter die. The plated platinum-gold is placed between these dies and when the lead die has descended upon the zinc die, the intervening platinum gold sheath with its copper coating will accurately assume the exact form and shape of the die, and as the dies are separated the plate will retain the shape which the dies give to it. The copper can then be peeled off or removed by treatment with nitric acid, which does not affect the gold, so that the gold comes out of the bath with a smooth surface. The edges of the plate can then be accurately cut out to fit that part of the mouth for which the plate is intended. Throughout all of these operations the shape of the plate will not be altered by reason of any inherent resilient tendency of the metal, and the final shaped metal plate will fit the mouth with precision. In the case of wire, provision is first made for a coating of its surface with a tube or plating of copper or other softer metal, whereupon the wire is bent into the desired shape which it then retains without bringing into play resilient effects even after the coating is removed. Copper is probably the best material to use for the coating in dental work. Aluminum might be used, but is not so uniformly satisfactory as copper because in the necessary annealing of the aluminum-covered plate the aluminum might melt before the platinum-gold has received the proper heat. If aluminum is used as a coating material, its removal is effected by the use of hydrochloric acid. If tin is used its removal will be effected by the use of nitric acid.

The protecting cover or coating, irrespective of the particular soft metal used for that purpose will, in addition to the func-

tions described, preserve and protect the interior precious metal from being damaged by instruments, tools, and pliers and the like, used in the shaping or forming operation.

There are obviously many methods of varying the details of the invention without departing from the spirit thereof, but it is the intention of the present application to claim the invention in its broader aspect as including all variations and equivalents.

I claim:

A metal structure for use in dentistry, consisting of a resilient alloyed gold member with an electroplating of copper covering substantially the entire surface of said member, said structure being deformed in the united condition of the two metals to conform to a dental condition.

In testimony whereof I have hereunto set my hand.

JULIUS ADERER.