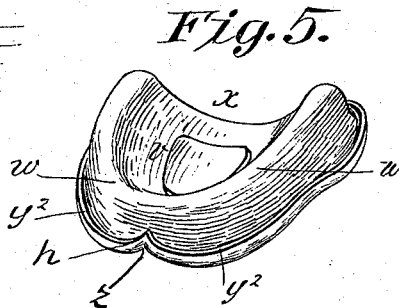
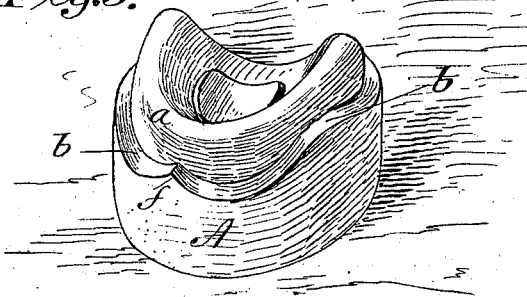
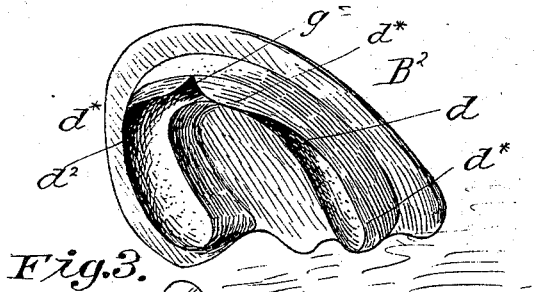
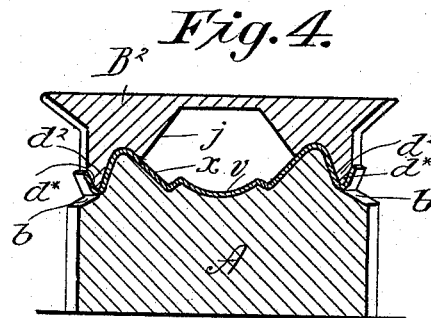
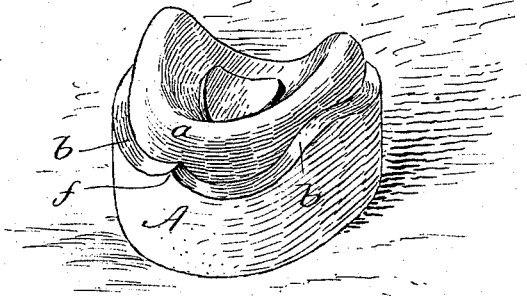
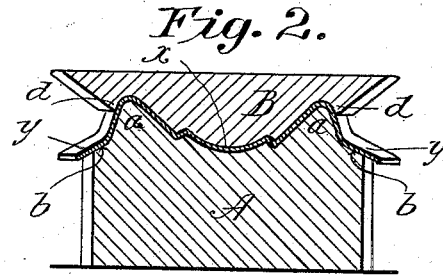
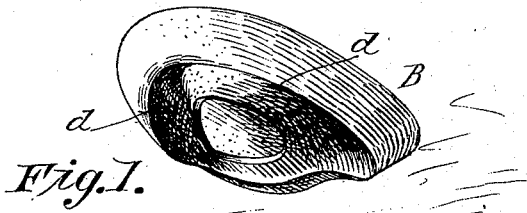


(No Model.)

G. W. TRAPHAGEN.  
METHOD OF FORMING DENTAL PLATES.

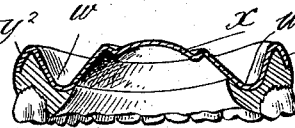
No. 526,332.

Patented Sept. 18, 1894.



*Fig. 6.*

Witnesses:  
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# UNITED STATES PATENT OFFICE.

GEORGE W. TRAPHAGEN, OF NORTHAMPTON, MASSACHUSETTS, ASSIGNOR  
TO CHARLES E. CHILDS, LUCIUS S. DAVIS, PHINEAS P. NICHOLS, AND  
JOHN E. RILEY, OF SAME PLACE.

## METHOD OF FORMING DENTAL PLATES.

SPECIFICATION forming part of Letters Patent No. 526,332, dated September 18, 1894.

Application filed April 7, 1894. Serial No. 506,716. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. TRAPHAGEN, a citizen of the United States, residing at Northampton, in the county of Hampshire and State of Massachusetts, have invented new and useful Improvements in the Manufacture of Dental Plates, of which the following is a specification.

This invention relates to the manufacture of dental plates having an integrally formed angularly turned marginal flange to afford means for the anchorage of the rubber, or other plastic material, which supports the teeth.

The invention involves the method and means employed for producing a plate having a surface corresponding to the roof of the mouth and gums and provided with such a marginal flange, as stated, all particularly whereby the said flange may be upturned with facility and uniformity, and without injuring, or distorting, the given contour or modeling of the mouth-engaging face of the plate.

Reference is to be had to the drawings, in which—

Figure 1 is a perspective view of the pair of dies first employed for striking up, or molding the plate,—Fig. 2 being a cross sectional view of the dies as in their coacting relations, and operative upon the plate. Fig. 3 is a perspective view of the second set of dies which are used after the plate has been brought to its proper form, superficially, and one member of which serves as a former for the upturning of the flange. Fig. 4 is a vertical cross section of the dies and plate. Fig. 5 is a perspective view of the plate completed, showing the side at which the teeth are supported, while Fig. 6 is a cross sectional view of the plate with the plastic and teeth attached.

After having taken the impression of the mouth and gums, a set of metallic dies, A and B, are produced in substantially the usual way. A thin sheet of aluminum, or other metal, from which the plate, *x*, is to be made, is, by a mallet or other implement, swaged or beaten down to conform to the surface contour of the die, A, so that the surface of the plate which is contiguous to the surface of

said die will approximately fit the roof of the mouth and gums. The capacity for such fit is perfected by the utilization of the second die, B, of this set, under pressure.

It will be noticed as peculiar and novel that in the die, A, the external surface of the U formed rib-like part, *a*, which produces the gum receiving groove, is quite high, or deep, especially and unusually so at its outer surface, with an outwardly beveled base, *b*, and that the marginal portions of the plate, *x*, lie down alongside such external surface and terminate in the downwardly and outwardly extended lip, *y*. It will be also noticed that the upper die, B, has its U-formed edge, *d*, to overlie rib, *a*, of die, A, of comparatively small depth while the similar die, A, for the set, A, B<sup>2</sup>, has this corresponding edge, *d*<sup>2</sup>, in the form of a very much deeper rib to extend down almost to, and range parallel with, the outwardly beveled ledge, *b*, at the base of the outer wall of the rib, *a*, of die, A. This die, A, may be the same, or identical with the main die, A, of the first set, it having said base ledge at the front median point formed with the apex, *f*, while to correspond with this feature the deep, thin rib of what may be termed the former die, B<sup>2</sup>, has the angular recess, *g*. Now, the upper die member, B, having been substituted by the former-die member, B<sup>2</sup>, over and upon the partially formed plate, the marginal part of the thin metal,—that is the lip, *y*,—overlying the beveled base flange, *b*, is return-bent to produce the hook flange, *y*<sup>2</sup>, (see Fig. 4) by using a burnisher tool, or other readily suggested implement, or means. The flange of the plate is given a contour, substantially as seen in Fig. 5, the compound curves at either front side meeting to produce the depression, *z*, at the gum-side,—for the engagement with a certain muscle in the front of the mouth between the gum and upper lip,—and to also produce the hook-like apex, *h*, for the increased security of the anchorage of the rubber in its engagement with the flange-bounded plastic receiving rib, *w*. It will be seen in Figs. 3 and 4 that the central portion of the former die, B<sup>2</sup>, which overlies the part, *v*, of the plate which fits the roof of the mouth, is cored out

as at *j*, so that, while the plate is firmly and closely held on the rib, *a*, of die, A, there is no liability of the plate becoming distorted or warped. The former die, B<sup>2</sup>, may be produced by molding metal directly onto the die, A, the same being held in a suitable flask, and the surface thereof smoked, or otherwise prepared, to prevent adhesion. The rib, *d*<sup>2</sup>, of die, A, is externally thinned and beveled mechanically, as seen at *d*<sup>\*</sup>, and also recessed, as seen at *g*, by the employment of a file, or otherwise.

A plate formed as shown and produced in the manner substantially as described possesses many advantages which are in part due to the method and means employed for its production, while the dentist will, above all, appreciate the ease and practicability with which he may attain the most satisfactory results.

Heretofore when marginal flanges have been soldered onto the plate, the plate has become burned and also the impression contour has not been closely preserved.

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

1. For the manufacture of dental plates, the combination with die, A, having a contour corresponding to the roof of the mouth and comprising the rib, *a*, corresponding to the

gums, of die, B<sup>2</sup>, having a die surface formed to fit about rib, *a*, and provided with a rib, *d*<sup>2</sup>, to extend over the outer face of said rib, *a*, and having an even lower former edge against which the margins of the plate may be return-bent, substantially as described.

2. The combination with the die, A, having the rib, *a*, corresponding to the contour of the gums and having at the base of said rib the outlying beveled ledge, *b*, formed with the front median apex, *f*, of the former die, B<sup>2</sup>, having a surface to correspond to said rib, *a*, and having outside thereof the depending flange, *d*, which is beveled and which, at its front, has the recess, *g*, substantially as described.

3. The method of producing the marginally and integrally flanged dental plate herein described, which consists in reproducing dies corresponding to the mouth impression, imparting to a plate of sheet metal, by employment of said dies, a corresponding superficial contour, and bending back non-inclosed marginal portions of the sheet metal, while the plate blank is clamped between the dies, to conform to the outer surface of one of said dies, substantially as described.

GEORGE W. TRAPHAGEN.

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