UNITED STATES PATENT OFFICE.

J. W. MOFFITT, OF HARRISBURG, PENNSYLVANIA.

IMPROVEMENT IN ARTIFICIAL TEETH.

Specification forming part of Letters Patent No. **30,684**, dated November 20, 1860.

To all whom it may concern:

Be it known that I, J. W. MOFFITT, of Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented and Improved Manufacture of Artificial Teeth and Gums; and I do hereby declare that the following is a full and exact description of the same.

The nature of my invention consists in the combination of the different materials substantially in the proportions and manner hereinafter specified and described, whereby I am enabled to produce artificial teeth and gums in the condition which I term "non-sectional block-work," or a full set of the same for either jaw in one homogeneous, solid, and continuous block upon the plate with scarcely any appreciable shortening or shrinkage in the length or form of the curve of the set.

To enable others to understand and practice my invention or discovery, I will proceed to give, first, a list of the materials used; secondly, the proportions thereof required to constitute the several primary compounds; and, thirdly, the manner of applying and combining them together upon the plate.

First. The materials used are Delaware spar, silex, kaolin clay, white flint-glass, French china, glass of borax, salts of tartar, titanium, and platina sponge. In selecting and preparing these materials I proceed as follows: I select the spar so as to have it free from iron or other impurities, heat it in the muffle of a furnace to a bright red, then plunge it into cold water, and afterward grind it fine in a mortar. The silex selected should be of the crystallized character, and is treated in the same manner as the spar. The flint-glass should be selected from the hardest kinds. The French china is obtained from the French china-ware. The clay, salts of tartar, titanium, and platina sponge should also be pure.

Secondly. Of these materials I take, for making what I call "No. 1 body of the teeth," Delaware spar, thirteen ounces; silex, three ounces; kaolin clay, ten grains; white flint-glass, one pennyweight and six grains; French china, one pennyweight and six grains; flux, fifteen grains; titanium, say from twenty to sixty grains, as the required color of the body may render proper. Each of these materials must be carefully ground to a fine powder, accurately weighed by Troy weight, and intimately mixed together in a mortar, the titanium being first put in and the other materials added gradually, and all intimately mixed together therewith. For what I call "No. 2 body of the teeth" I take of "body No. 1" one ounce, (Troy;) flint-glass, from sixteen to twenty grains, (Troy,) first grinding the glass very fine and then intimately mixing it in a mortar with the other matter and grinding them together into an impalpable powder. For "No. 1 blue enamel" I take of Delaware spar four ounces; flux and flint-glass, twenty-four grains each; platina sponge, say from twelve to sixty grains, as the color desired may require, and mix them intimately together. For "No. 2 blue enamel" I take of "blue enamel No. 1" one ounce; flux and flint-glass, each, three grains, and mix them intimately together. For yellow enamel I take of "blue enamel No. 1" two ounces; titanium, say from fourteen to twenty grains, and mix them intimately together. Each of the enamel compounds must be accurately weighed by Troy weights and ground to an impalpable powder. For the flux I take of glass of borax, four pennyweights; salts of tartar, three pennyweights; Delaware spar, two ounces, and grind each very fine in a mortar, and then intimately mix them together. This compound is then packed into a suitable crucible lined with a batter of kaolin clay and closed, (by luting into its mouth with some of the same batter a piece of fire-clay slab,) dried, and finally put into a strong fire for fifteen or twenty minutes. The compound, having been thus fused, is then cooled, the crucible broken from it, and, if the mass be found clear and free from stains, it is then ground very fine and kept for use as flux.

Thirdly. I will now proceed to describe the manner in which I apply and combine these different primary compounds together upon the plate, so as to produce the improved manufacture specified. A platina plate having been prepared and adapted to fit the mouth of the subject, as heretofore, and also fitted with platina supporting-pins in any suitable manner, and a matrix having also been provided (as for carving ordinary block-work) and applied to the plate. I take the material "No. 1 for the body of the teeth," and mix it with water to a thick paste, and after oiling the matrix pack it into the same, tapping the matrix with the finger to drive out any confined air in the usual manner, after which I cut away the mass at the cutting-edge part of the teeth to half

their intended thickness, and as far up toward the gum part as the teeth are intended to reach. The space thus left by the cutting is then filled in with some of the same body ground to impalpable fineness. The piece is now ready for carving, and after the completion of which I apply the enamels, the same being respectively mixed to the consistency of cream, as usual, in the following manner: The yellow enamel is applied, first, at the necks of the teeth; then the "No. 1 blue enamel" is applied, so as to overlap the yellow and come down over the cutting-edges of the teeth. The carving and enameling having thus been completed, the piece is ready for the baking, which is accomplished by placing it upon a slide, the plate being embedded in kaolin clay or its equivalent, and introducing it slowly into the muffle of a heated furnace. After it has come to the point of fusion, which requires from fifteen to twenty minutes, it should be withdrawn and allowed to cool in the air, and should there be found any imperfections in the body or teeth, they are remedied by applying "No. 2 body" to those imperfections which may be in the body, and "No. 2 blue enamel" to those of the teeth, and baking as before. After the piece has again cooled any of the usual easy-flowing gum-enamels is applied to the gum, and the piece again placed upon a slide, with the teeth up, being careful to have it perfectly level and to introduce it slowly into the muffle of the furnace, to allow the heat to come upon it gradually, and until the said gum-enamel flows. It is then finally cooled down in a warm muffle, after which the plate may be finished in the ordinary manner, and inserted into the mouth of the subject, it having undergone scarcely any appreciable permanent change in either the length or form of the curve, which is the chief object sought to be attained by the invention, inasmuch as the production of a composition of matter for artificial teeth and gums formed together in a homogeneous, solid, and continuous block upon the plate, as described, has never before been effected because of the tendency of the compositions heretofore used to shrinkage, and hence the practice of making the teeth and gums for a full set in the objectionable "sectional blocks," objectionable principally because of the difficulty of keeping the joinings free from the secretions of the mouth and small particles of food.

I am aware that porcelain teeth have been first molded separately, united to the plate in the ordinary manner, and then the gum formed by means of a more fusible cement being fused around the teeth; but the want of uniformity in the expansibility and contractility from changes of temperature produces a perpetual strain in the piece, and therefore renders the different parts of the same liable to scale off from the plate or to separate from each other, especially in using.

I am also aware that most of the materials and processes herein specified and described have been used in the manufacturing of porcelain teeth and gums; but having fully described my invention and pointed out its superior utility,

What I claim as new, and desire to secure by Letters Patent, is—

As an improved article of manufacture, the artificial teeth and gums, made as described.

J. W. MOFFITT.

Witnesses:

BENJ. MORISON,

JAMES MCCAHEN.