

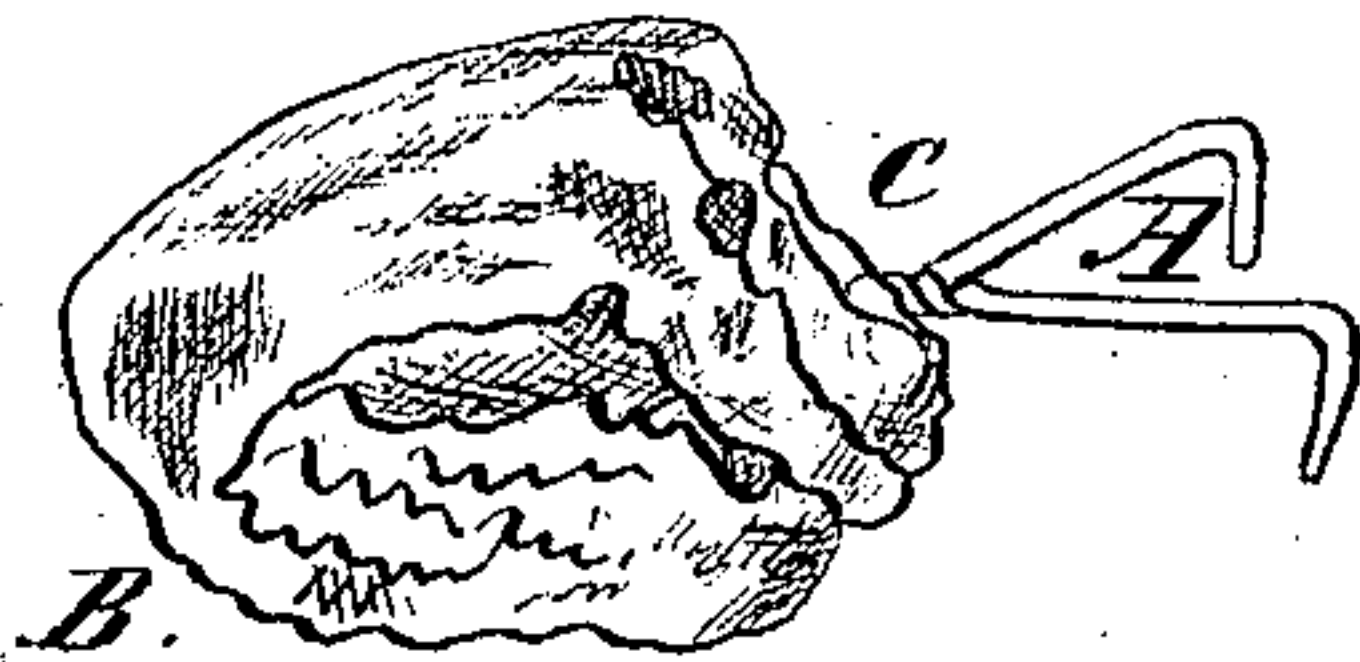
*J. Johnson,*

*Plate for Artificial Teeth.*

*N<sup>o</sup> 43,588.*

*Patented July 19, 1864.*

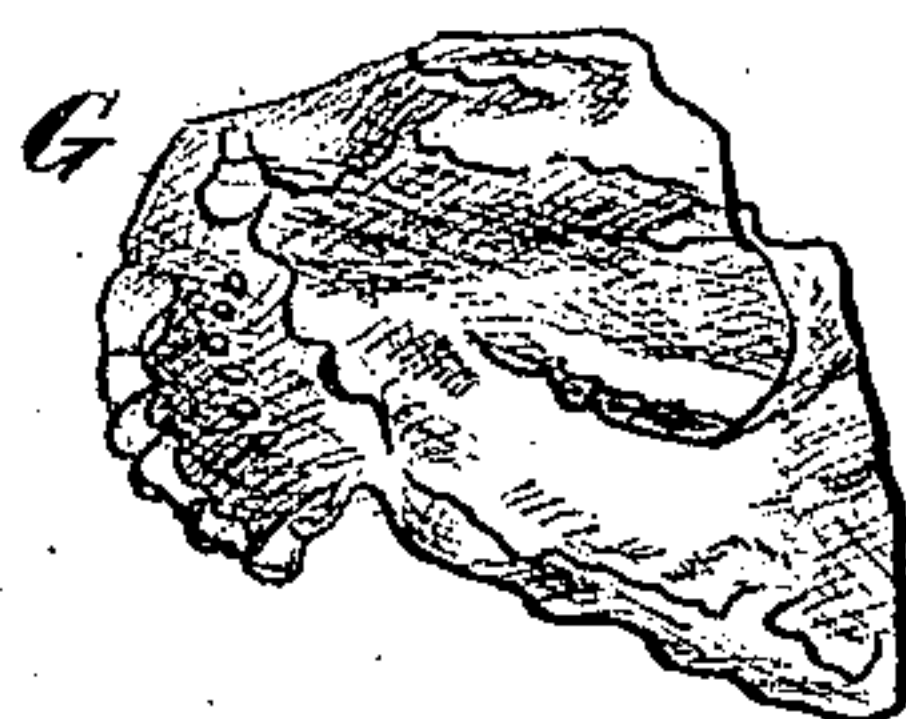
*Fig: 1.*



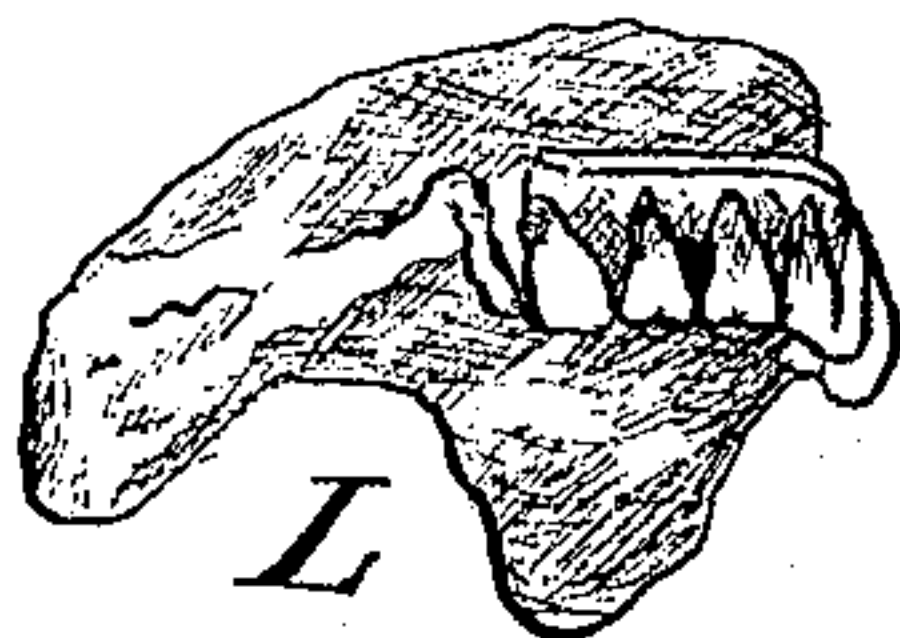
*Fig: 2.*



*Fig: 3.*



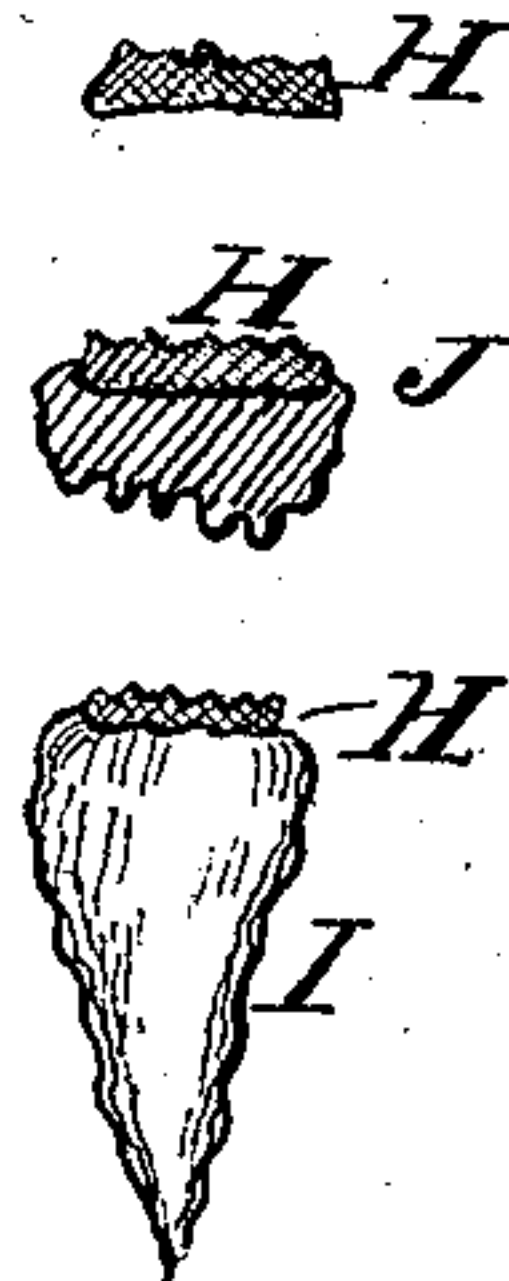
*Fig: 5.*



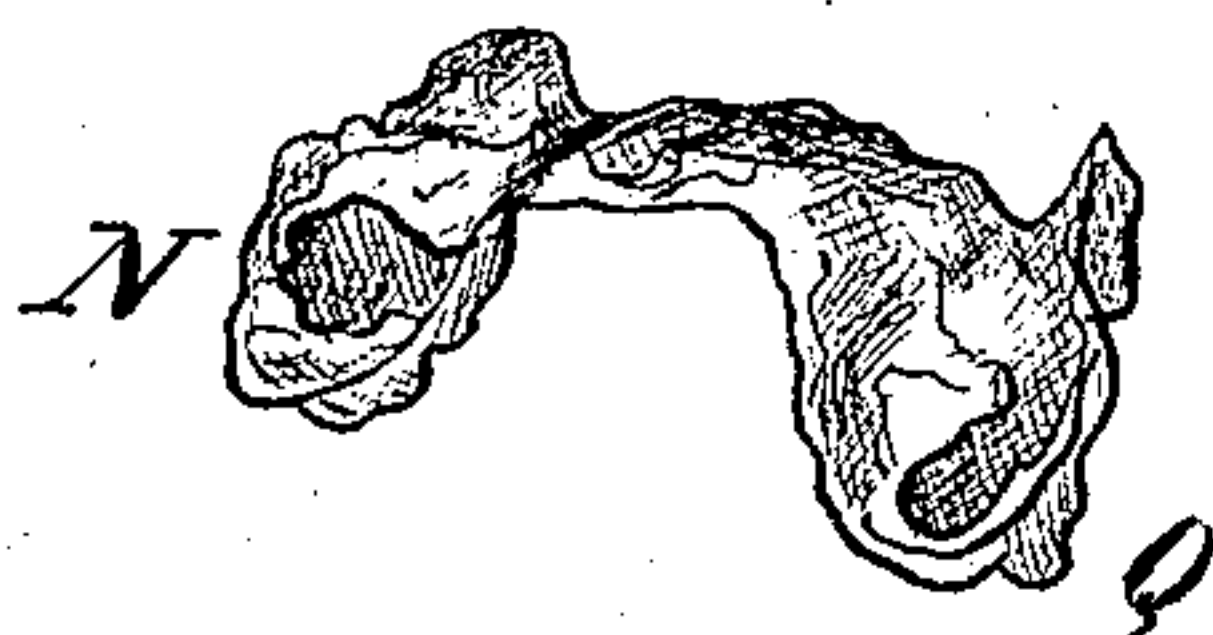
*Fig: 6.*



*Fig: 7.*



*Fig: 4.*



*Witnesses:*

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# UNITED STATES PATENT OFFICE.

JOHN JOHNSON, OF SACO, MAINE.

## IMPROVEMENT IN DENTISTRY.

Specification forming part of Letters Patent No. 43,588, dated July 19, 1864.

*To all whom it may concern:*

Be it known that I, JOHN JOHNSON, of Saco, in the county of York and State of Maine, have invented an Improvement in Dentistry; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters and figures marked thereon.

My improvements relate to the mode of making the metallic case or plate to which the teeth are attached; to the mode of attaching porcelain or metallic teeth to the case; to the form of the base of the teeth; to the attachment of metallic pins, or their equivalents, to the base of the teeth; to the formation of both case and teeth of one piece of metal; also, the hollow metallic teeth, forming a shield or covering for sensitive or decayed teeth; also, the combination of metallic pins, plates, or other conducting fastenings with a vulcanite or other non-conducting case; also, the coating of glaze, or japan in its application to the case and teeth made as herein described.

The main feature of my invention consists in the use of electro-metallurgy for the production of partial or complete sets of teeth, or for the cases or plates for the same.

I first obtain an impression of the gums and palate in the usual manner, with any suitable plastic substance, thus forming a matrix or mold, from which is obtained a figure or model in relief in plaster-of-paris, gutta-percha, wax, or other suitable substance, in the manner commonly known and practiced by dentists.

If the model is of plaster, it is first rendered non-absorbent of liquids by the application of varnish or other suitable coating. The surface is now rendered a conductor of electricity by the application of plumbago or other conducting material to such parts of the model as are intended to receive an electro-deposit of metal. I then take a resist-varnish and carefully outline on the black-leaded surface the exact shape of the intended metallic plate, which is to be deposited from suitable solutions of silver or other metal. All other parts of the model outside of this line are then varnished to prevent the deposition of metal. A conducting-wire, A, is then attached to the model B, Figure I, and carefully black-leaded at the junction C, in order that the metallic

surface may be continuous and electricity pass freely from the wire to the model. This wire is now connected with the negative pole or zinc plate of the battery (Smee's battery being preferred for this purpose) and the model placed in the depositing-trough, the platina plate of the battery having connected therewith a silver positive pole.

The trough is supplied with the argento-cyanid of potassium solution and the deposit of silver immediately commences upon the mold. From one to two days are required to produce the requisite thickness of metal, and on removal from the trough we have a "case" of the exact shape of the gum and jaw, but as yet without teeth. The model and case are now carefully cleaned, and a previously-molded wax form, having the shape of the molars and all the other required teeth, is carefully adjusted to it, a little heat being applied to the model to cause the wax to adhere to the silver plate or case. The position of this wax attachment to the first deposited plate is shown at D, Fig. II, E representing the plaster mold, and F the first deposited case, the space between D and F being the position of the wax model of the teeth. After removing all finger-marks and superfluous wax, the wax teeth and model are black-leaded and the whole again submitted to the action of the battery. The wax teeth are soon coated with silver and the case or plate receives a new deposit of metal, the plate and metallic teeth forming one continuous and perfect piece of work, consisting of an entire set of teeth and plate, which are strong, light, well fitted to the jaw, and of the requisite stiffness.

In the above description I have referred to a solution of silver for making a silver plate, but any other metallic solution may be used that is deemed desirable.

The wax may be allowed to remain within the metallic teeth, or it may be melted and poured out from a small aperture, which is then closed with solder.

In some instances I make the molar teeth only upon the plate or case, as above described, the usual front teeth being attached, either singly or in blocks, either by electro-deposition or by soldering, riveting, or by other modes of fastening. (See Fig. VI.) If it be necessary to strengthen these upbuilt mo-



lar or other teeth, pins or strips of metal are affixed in or upon the plate and extended into the wax-formed teeth. The deposited metal makes a perfect junction of these parts without materially increasing the weight of the finished set of teeth.

This process of building up the teeth is only temporarily suspended by withdrawing the plate from the depositing-trough. In some cases I therefore place, at and near the base of the teeth, small metallic substances, such as filings, small strips of metal, or bronze powder, and return it to the trough. This being repeated at intervals increases the thickness at the base of the teeth at their junction with the plate, where the greatest strength is required.

When porcelain teeth are to be set by electro-deposit, either upon a struck-up case or upon a case formed by electro-deposition, as above set forth, the bases or the back side of the teeth are rendered conductors of electricity by means of a metallic coat affixed or made a part of the teeth by the ordinary process of gilding or silvering upon porcelain ware, or by such other mode of application as may be suitable.

Detached teeth or blocks may be held to the case by the deposit of metal that takes place upon the common platina pin at the back of the tooth. The pins, as at G, Fig. III, should be kept bright previous to immersion in the trough.

Another mode of preparing the tooth or blocks of teeth for attachment to the plate is by giving the base of the teeth or blocks a corrugated, rough, or dovetailed form, or by forming apertures in the teeth. The deposit of the metal in these cavities or irregular-shaped parts insures the firm and solid attachment of the teeth to the plate.

The modes of fastening above described may be used separately or in conjunction, according to the circumstances of the case. In attaching blocks or single teeth to an electro-deposited plate or case, the teeth are either corrugated, undercut, gilded, or pierced with apertures, and are then put in position before the plate has acquired the full thickness. It is then returned to the depositing-trough, where it remains until the requisite thickness and stiffness are attained.

I also construct an entire or partial set of teeth and plate in the manner hereinbefore described, and of any base metal. When made of copper or other metal, the salts of which are injurious, I electroplate upon them a coating of gold, silver, iridium, aluminum, or other noble metal, or I protect the copper from the chemical action of the saliva by any suitable japan or glaze.

In metallic plates and teeth formed as herein described I embed small disks or rough plates H, Fig. VII, at the top of the molars I, where they are subject to attrition. The lower part of the disk is the broadest, as shown in the sections, so that they may be embraced and

held fast at their bases by the deposited metal J, the interior being of wax or other suitable substance. In some instances I introduce granulated hard substances instead of the disks, thus forming a rough surface, alternately hard and soft, as in natural teeth.

I have described the hollow metallic teeth set upon a solid plate. In some instances I make the plate with apertures or openings N, Fig. IV, corresponding with the position in the jaw of natural decayed or sensitive teeth. The hollow tooth Q being built above these openings, forms a shield or protection to the natural tooth, and is of value for temporary use.

It is obvious that the plate or case may be made by electro-deposit in the matrix or first impression of the jaws and gums; but I prefer to make the deposit on the second impression or model, as herein stated, as in case of breakage or loss during the manipulations the original mold is safe and in condition for making a duplicate model.

By the means herein described a perfectly accurate fit is obtained, insuring ease to the wearer, and combining strength with lightness.

It sometimes occurs that a plate or case that fits well to the gums and palate is not well adapted for distinct articulation, there being too much space above the tongue. I therefore fill this space to a proper thickness with wax, molded to the required form on its exterior or lower surface. I then black-lead it, and deposit a thin metallic coat upon it. The wax is then melted and flows out through a small orifice, which is then closed with a drop of solder. This plate may be continuous with the lower plate, D, Fig. II, that supports the base of the teeth, or it may be attached to the plate or case F.

In Fig. V a set of front teeth, made of porcelain, are represented, guarded, and held in position at the end of the blocks by the metallic shoulder L. This is formed in the same manner as the teeth before named—that is, the proper shape for the supporting shoulder L is built up with wax and metal deposited upon it to a sufficient thickness to insure the requisite strength.

I claim—

1. As a new article of manufacture, a metallic plate or case, to which is attached by electro-deposited metal one or more porcelain teeth or blocks of teeth, substantially as herein set forth and described.

2. The plate or case formed as herein described, and prepared for the attachment of the porcelain teeth, in combination with the attached teeth.

3. The combination of the electro-deposited molar teeth with the embedded grinding-plates forming their upper surface.

4. The hollow electro-deposited teeth, constituting a shield or protection to decayed or diseased natural teeth.

5. A metallic plate or case, whether struck up or electro-deposited, in combination with a full or partial set of electro-deposited teeth, formed or constructed substantially as herein specified.

6. The mode of holding teeth or blocks of teeth to the plate by means of the metallic deposit within or upon their corrugated or undercut bases, or in apertures formed in the teeth or blocks.

7. As a new article of manufacture, porcelain teeth or blocks of teeth having gilded or electroplated bases or backs, forming a conducting surface, for the purpose herein specified.

JOHN JOHNSON. [L. S.]

In presence of—

ENOCH LOWELL,  
JNO. ELDEN.