FIG. 199.

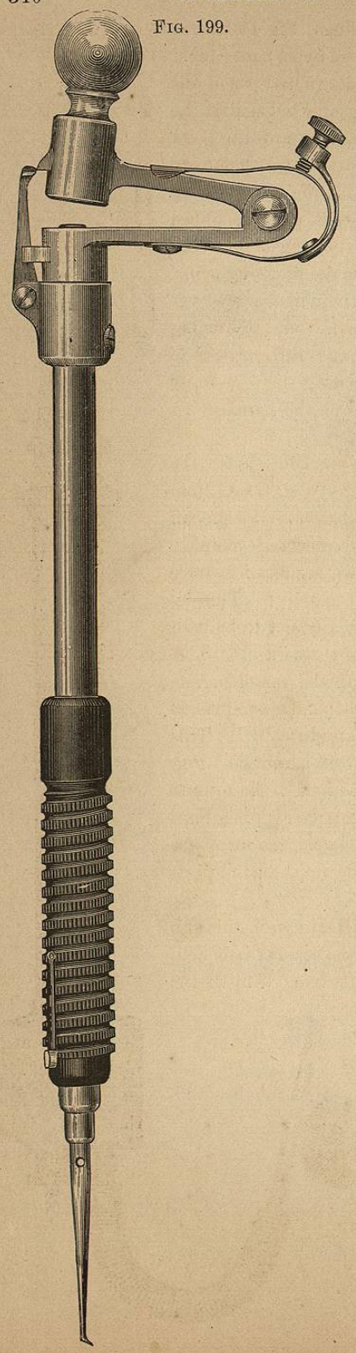
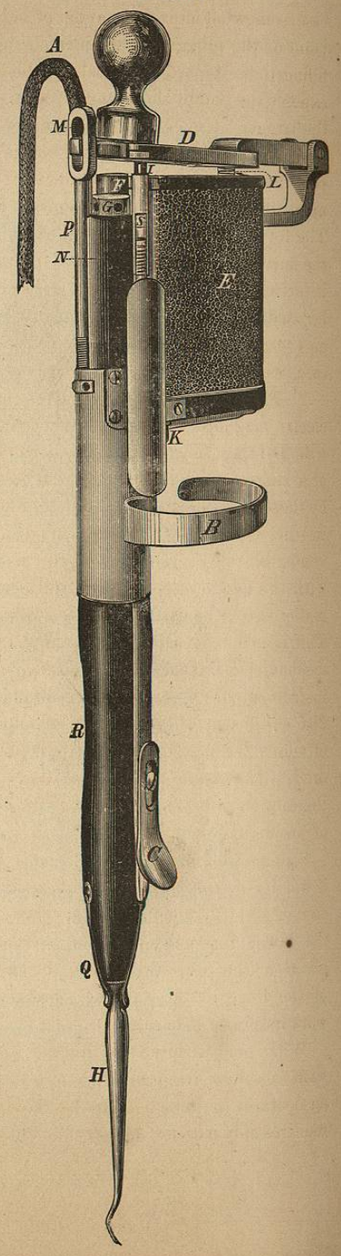


FIG. 200.—ELECTRO-MAGNETIC MALLET.



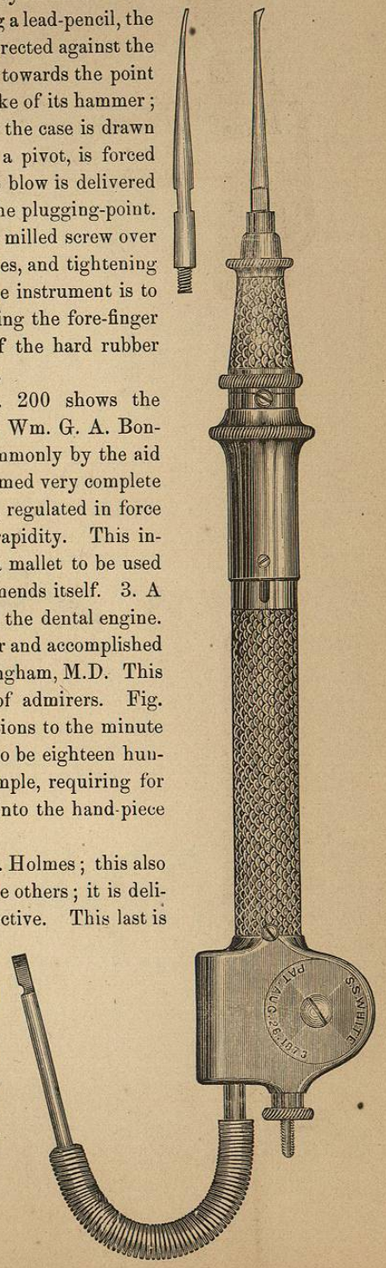
mallet, working by means of internal springs; Fig. 199 shows such an instrument. In use, it is grasped by its hard rubber case, somewhat after the manner of holding a lead-pencil, the point of the plugging instrument being directed against the filling to be impacted. Pushing the case towards the point exposes the end of the plunger to the stroke of its hammer; the trigger-latch holds the hammer while the case is drawn from it, until the latch, which works on a pivot, is forced past the lug, when the full strength of the blow is delivered upon the plunger, which transmits it to the plugging-point. The force of the blow is regulated by the milled screw over the spring; loosening the screw diminishes, and tightening it increases, the force. When desired, the instrument is to be used as a hand-plugger simply by placing the fore-finger on the spring-button at the lower end of the hard rubber case, which acts as a stop to the plunger.

2. **Electro-magnetic Mallet.**—Fig. 200 shows the electro-magnetic mallet, an invention by Wm. G. A. Bonwill, D.D.S. The instrument is run commonly by the aid of a Bunsen four-cell battery. It is deemed very complete by those familiar with its use. Its blows, regulated in force to suit, are given with a lightning-like rapidity. This inventor has also given to the profession a mallet to be used with the dental engine which fully commends itself. 3. A mallet also to be used in connection with the dental engine. This is an invention by the veteran teacher and accomplished mechanician and chemist, Thomas Buckingham, M.D. This instrument has secured a large number of admirers. Fig. 201 exhibits it. The number of impactions to the minute of which the machine is capable is said to be eighteen hundred. The use of it is exceedingly simple, requiring for the motion only that the bit be slipped into the hand-piece of an engine.

Still another mallet is the device of Dr. Holmes; this also is worthy of equal commendation with the others; it is delicate in construction and in every way effective. This last is the latest instrument of its meaning given to the profession up to the date of the issue of this volume; practical workers praise it highly.

With gold adapted to the end, and with absolute freedom from moisture, an operator possessed of requisite skill requires only patience to carry the build-

FIG. 201.—BUCKINGHAM MALLET.

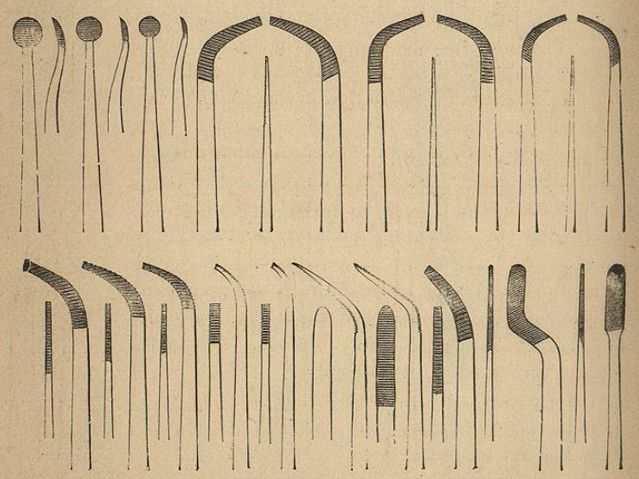


ing process to any extent. It is to be suggested, however, that if at any stage in the performance the mass in process of building is found to move, nothing better is to be done, as a rule, than begin again from the foundation. Still another suggestion considers the possibility of flooding. If this threaten at any point of the procedure, the half-accomplished work is to be at once burnished, to be recommenced, when dryness is secured, where left off. To re-secure a proper surface, it is only necessary to scratch the gold and wash with ether. The use of the dam obviates commonly this accident.

Finishing a Plug.—From the consideration of the introduction of a plug, we pass to the processes of finishing. These consist in condensing the surface thoroughly, in filing the mass into such shape and relation as accord with articulation and other requirements, and in giving the gold a jewelry polish.

To accomplish these ends, an operator needs condensers, files, disks, burnishers, hard and rotten-stone, rouge, strips of tape or of wash-leather, pieces of wood, etc.,—that is to say, he will find useful any means which conduce to the ends. As condensing instruments are concerned, they find representation in pluggers with the serrations filed off. Much pressure, however, being brought oftentimes to bear upon such instruments, especially where the mallet is not used, the manufacturer in preparing them considers the requirements, and by so much enlarges the size of the shank over that of the pluggers.

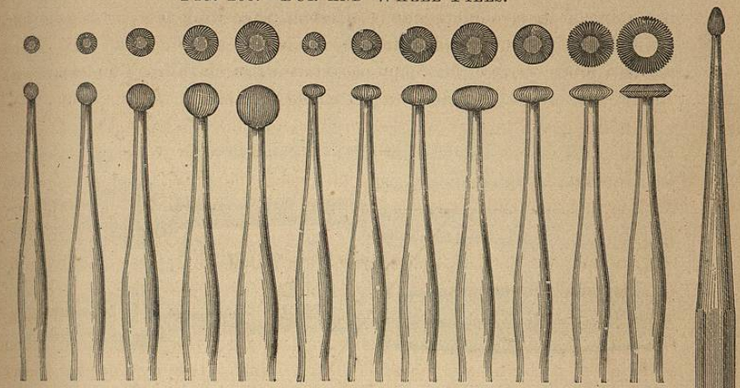
Fig. 202.—Finishing Files.



Files used in finishing are prepared in the greatest possible variety. The separating files, figured on a foregoing page, are indispensable for use on the front teeth. Fig. 202 represents forms of files that are found useful in almost

every position. Fig. 203 exhibits files prepared in the bur form. These latter have application in the cutting down of crown plugs, and accomplish

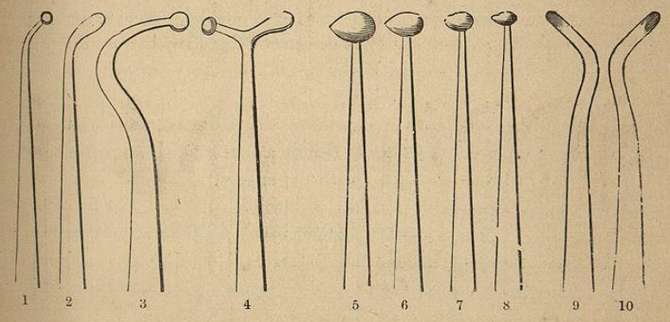
Fig. 203.—Bur and Wheel Files.



their work with a nicety and finish which seem to prove them perfect; the figure shows also the handle. These bur files, of which there are every possible variety, when worked by the engine, are revolved with a velocity which enables them quickly to cut into shape the hardest-made plug, Dr. Bonwill claiming for his instrument a rotatory power of ten thousand to the minute.

Burnishing instruments are also found of many patterns, the designs corresponding with requirements. Fig. 204 represents a set of these instru-

Fig. 204.—Set of Burnishers.

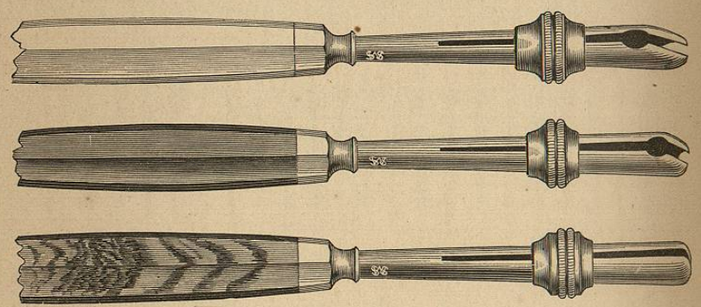


ments, for hand use, which will be recognized by the experienced to comprise all the forms for which there is real necessity. Indeed, it would be quite possible to do without Nos. 1, 3, 5, and 7: such a set costing, however, not

over six dollars, the outlay for the whole is soon found to be covered by the extra convenience. No burnishing instrument except that made from the very finest steel is worth possessing. The use of a burnisher is both to condense and polish the face of a filling. It is used in connection with the file, the plug mass being alternately filed and planished. The forms figured are prepared for use by both hand and engine.

Among other instruments found convenient, if not absolutely necessary, in the process of finishing plugs, are porte polishers. Fig. 205 represents a set

Fig. 205.—Porte Polishers.



of three. These carriers, made for the hand, enable the operator to fix splints of wood, upon which he carries pumice- or rotten-stone, at any angle found convenient in working. The use of pumice-stone so applied represents the finest file, and is found of the highest import in securing a proper surface. A hand porte polisher of satisfactory yet inexpensive character is made by soldering together at right angles two tubes of silver or of tin of a size fitted to support a handle of wood and a splint. As a polisher, an arrangement invented by Dr. Bonwill, to connect with the engine, having a reciprocal motion, is quite the perfection of instrumentation. Circular heads of wood revolved by the engine after the manner of a common bur, save much time and trouble.

Corundum disks, and other appliances of that material, are invaluable for plug-finishing purposes. Fig. 206 exhibits a set of finishing-points devised by Dr. A. L. Northrop, to be used with the engine.

Hard stone, Arkansas, Hindostan, and Scotch, are to be had mounted on engine mandrels. These serve a valuable purpose. They are represented in Fig. 207, and their use is understood at a glance.

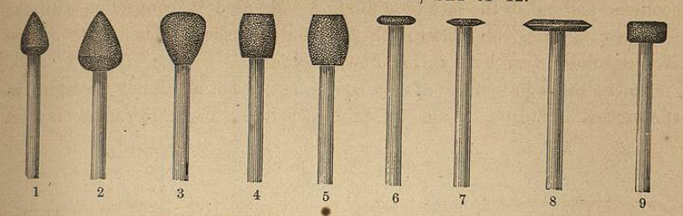
Tape, covered with corundum, or used by wetting and attaching pumice-stone to the surface, is required in many cases of finishing.

Corrugated disks, used for carrying powders, is another means yielding convenience to the practitioner. Fig. 208 shows such a disk.

Wood polishing-points, above referred to, illustrated in Fig. 209, are neces-

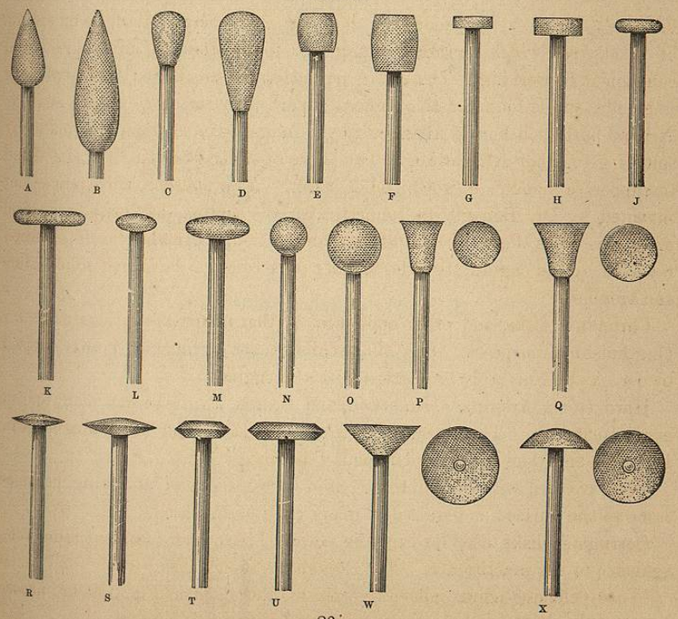
sary to the fine finish of a filling. Pumice, emery, rouge, and rotten-stone are used with them.

Fig. 206.—Corundum Points, Set of 12.



A cavity being filled with gold, it is felt a necessity to secure a surface of sufficient polish to resist the absorption of moisture before the removal of the napkin or dam. This is effected with the burnisher, a polish being at once taken, provided the gold has been solidly packed; should polish not be taken, then the operator is to go over the surface again and again

Fig. 207.



with the condenser, using either hand-pressure or, preferably, the mallet. The manipulations of burnishing and condensing in alternation are to be repeated until the protecting polish is secured.

FIG. 208.

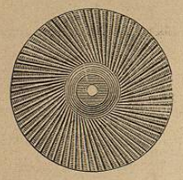
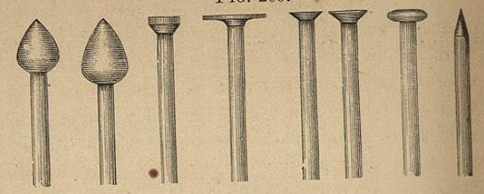


FIG. 209.



Condensation of a filling is most conveniently obtained through aid of a mallet. The blows struck are at first to be very light, that thus unequal consolidation be avoided; it is best that at the commencement the instrument be directed about the circumference of the plug, the centre being gradually approached, the operator thus avoiding the drawing of the metal from the parietes,—an important matter, as a very little experience does not fail to show. Having made such condensation of the surface, it is to be followed by the burnisher or file, as seems indicated. It is always important to avoid overhanging of the walls by the gold; this implies that a cavity be not overfull. In crown fillings, such over-fullness is a not uncommon fault. Where it is seen to exist, a bur file is to follow the burnisher. The face of a crown plug should, when finished, be concave, corresponding with the aspect of the surface of which it forms a part. In securing such relation of parts, the filling will always be found of more resisting surface if the cutting down has been done little by little, the burnisher being used very frequently as such cutting goes on. Final finish is given to a plug by the alternate use of the burnisher and the porte polisher, pumice or Arkansas stone being first used, and after this rotten-stone, crocus, or rouge. Through such means the surface of a plug may be made as solid and polished as though it were of molten metal.

In finishing approximal fillings, wherever situated, it is felt to be desirable to give such plane to the surface as shall render it self-cleansing; this is secured most simply by making the metal correspond reasonably with the V-shaped cuts which have been advised: in the anterior teeth this is effected with all convenience by the use of a convex separating file, as seen in Fig. 119. Treating posterior teeth, an operator will select from his case any files that are suitable and easy of manipulation; among the forms exhibited in Fig. 120 he will be likely to find himself suited. Cuts made in the V-shape are not entirely void of objection. It is not infrequently the case that particles of food, instead of passing quickly and cleanly over such a surface, tend to pack in the interspace, thus being a source of discomfort to the patient, and at times provocative of a species of chronic ulitis. Such jamming is, however, oftentimes the result of the manner of filing,—a matter which soon comes to be corrected by a growing experience. In place of such packing of the ingesta being an objection, it is with force argued by many that it is a positive good, compelling, through the discomfort induced, that attention to cleanliness which is the object of the space.

An approximal plug filed into the required relation, the polishing and finishing follow as with the crown plug. Strips or points of wood, corundum tape, or strips of wash-leather wet and dipped into pulverized pumice, or twists of ordinary candle-wick used in a similar manner, are found valuable adjuncts, securing a fineness of surface which cannot, without a much greater amount of labor, be had through the instrumentality of partly-worn files. Strips are used by simply drawing them back and forth over a surface to be smoothed. Rotten-stone and rouge or the peroxide of tin are employed upon strips and points for the finish; the former is to have the preference.

In dressing contour fillings, regard is not to be denied to self-cleansing properties as related with the planes. Such plugs are to be filed into a shape corresponding with the natural irregularities of the tooth. That they may render prolonged service, they must have such relation as shall enable them to bear the strain endured by the original parts. The process of finishing is the same in principle as that employed in ordinary cases. In shaping the articulating face it is necessary, however, that special regard be given to the contact of the opposing tooth or teeth,—a matter which frequently demands much time and care. In shaping contour fillings, it is generally found convenient to use the Arkansas or similar stone, rubbing thus from the gold every scratch or indentation. Finish, it is to be remembered, is the expression of stability and force in a contour filling, as it is only a solid and reliable filling that is capable of taking a fine finish.

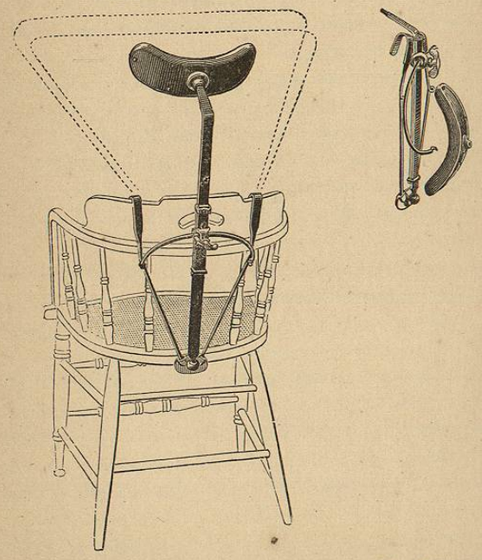
In concluding the subject of filling the decayed crowns of teeth with gold, the student is reminded that the principles which govern are, that all difficult cavities are to be converted into those of simple form; and that space is always to be secured, either by the file, chisel, or pressure, that shall afford the required room for manipulation. It is to be added that a fault, as the preservative virtue of gold is concerned, exists in a tendency to re-decay, which shows itself at the neck wall of a cavity; that is, at that boundary which immediately adjoins the gum. A gold plug being satisfactorily good, with the exception of the defect alluded to, it is now accepted as good practice to cut away the secondary caries and to fill the newly-made cavity with copper amalgam: Sullivan's being here peculiarly indicated. Explanation of the benefit existing in the relation of the two materials is suggested as follows by Dr. Register: "The combination is to be supposed to form a galvanoplastic which decomposes irritating acids, which would otherwise attack the lime-salts of the tooth. A primary battery of acids attached to a secondary one of metals will deplete itself in charging the latter, and then will, in

part, flow back until drawn off and used by interruption; and this flow continues back and forth each time, becoming less and less, until the current ceases and an equilibrium is established." Gutta-percha is a reliable agent in the direction of the same indication. If a patient can be watched, preference is to be given it. (See chapter on *Dental Therapeusis.*)

It is to be suggested in way of addendum that plugs made of cohesive gold may be defective, as the whole mass is concerned, by reason of a marginal defect not sufficiently great to admit at the imperfect spot the point of a cambric needle. This is ever to be borne in mind during the process of packing; it is always to have consideration when comparing the relative values of the two forms of gold, cohesive and non-cohesive, as a filling material.

The Operating-chair.—The chair upon which a patient sits while having teeth filled is to be of such height that it shall bring the head on a level with the breast of an operator. To this end there is great variety in construction. Where economy is to be consulted rather than elegance, a head-rest, the invention of C. C. White, D.D.S., is found most useful. This rest makes its own fastening to almost any chair, sofa, lounge, or settee. It has full movement in all directions on a scale for a tall person or for a child, and is securely fastened by turning a single thumb-screw. The accompanying cut represents the instrument applied to a common office-chair. The dotted lines show its

FIG. 210.—WHITE'S HEAD-REST.



movement. Weight, 4½ pounds. Chairs of much elegance in construction, designed both for ornamentation and use, are to be seen in the catalogues of the dental depots.

Conveniences.—Upon an operator's tray there should always be found pellets of bibulous paper and twists of absorbing cotton, a bottle of Monsel's solution, either of the persulphate or chloride of iron, with a view of controlling trifling hemorrhages, a bottle of creasote, sticks of soft pine, cologne, brandy, tannic acid, atropia mixture to quiet pain, oil of cloves, and chloroform for the same end, ether for the purpose of provoking speedy salivation, belladonna and morphia with a view of controlling or arresting a too free flow of oral fluid, ammonia as an excitant or for blistering purposes, rubber rings, floss silk, a small cupping-glass, undeliquesced chloride of zinc, alcohol, a tongue-depressor, and a magnifying mirror.