(No Model.)

J. H. GARTRELL.

APPARATUS FOR SWAGING DENTAL PLATES.

No. 605,223. Patented June 7, 1898.

Fig. 1.

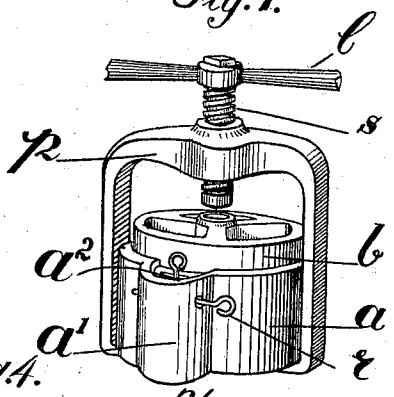


Fig. 4.

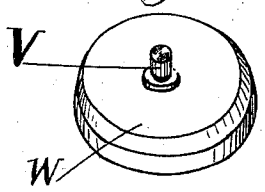


Fig. 5.



Fig. 6.

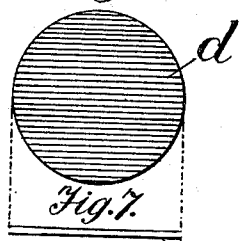


Fig. 7.

Fig. 3.

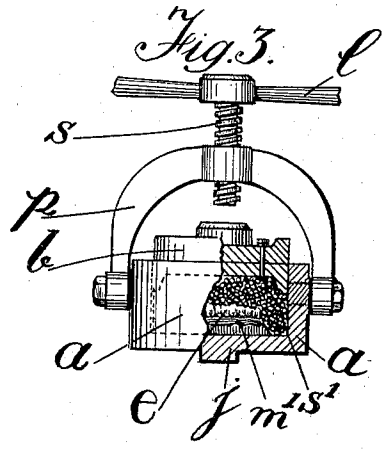
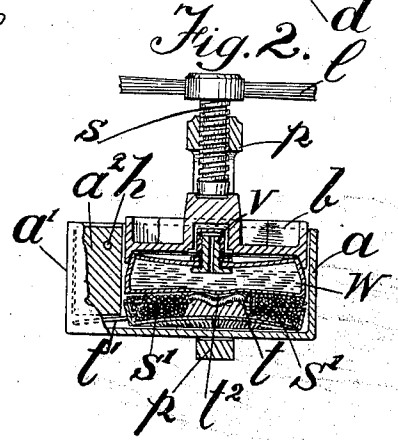


Fig. 2.



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APPARATUS FOR SWAGING DENTAL PLATES.

SPECIFICATION forming part of Letters Patent No. 605,223, dated June 7, 1898.

Application filed December 31, 1897. Serial No. 665,205. (No model.)

To all whom it may concern:

Be it known that I, JOHN HUTCHENS GARTRELL, dentist, a subject of the Queen of Great Britain and Ireland, and a resident of 47 Chapel street, Penzance, in the county of Cornwall, England, have invented certain new and useful Improvements in Apparatus for Swaging Dental Plates, of which the following is a specification.

My invention has for its object an improved swaging or pressing apparatus to be used for all dental swaging or pressing operations, such as for pressing sheet-tin or its alloys, or gold, platinum, or other metal or alloy, or vulcanite to fit a model of the mouth, or for swaging tin trial and base plates on fusible metal models, or for swaging a badly-fitting vulcanite set to fit a correct plaster model of the mouth, &c., and for swaging sheet metal generally.

In carrying my invention into practical effect I make a hollow cylindrical casting of iron or other suitable metal, such as gun-metal, having one end forming the bottom thereof closed. The inside of this casting is turned to receive a metal plunger. The model of the mouth having the dental plate or the like partially fitted thereon is placed inside the bottom of this cylindrical casting. Fine gunshot (preferably No. 10 or No. 12) or very small steel balls about one-sixteenth of an inch in diameter are then poured into the said casting until the model and plate are surrounded and covered and the cylinder is nearly full and the metal plunger is placed on the top of the shot. The apparatus is then placed in a suitable screw-press, the screw of which is operated by a double-ended hand-lever. When this hand-lever is rotated, the screw descends and coming in contact with the plunger causes the latter to exert such a pressure upon the fine shot or steel balls as to cause them to press evenly in all directions upon the dental or like plate, thus swaging it to a perfect impression of the model. I also in some cases interpose between the work and the shot or steel balls a disk of rubber or the like substance about three-sixteenths of an inch in thickness and of such diameter as to exactly fit the inside of the cylinder, the object of this being to prevent any of the shot or steel balls finding their way between the dental plate or the like and the model. When treating the harder or thicker metal plates, this rubber or the like disk may be withdrawn after the initial stage of the swaging or pressing is completed and the swaging then finished with the shot or steel balls alone. When treating the softer metal plates, such as tin and its alloys, the swaging may be completed without removing the rubber disk.

When it is desired to use the apparatus for lining a plaster impression of the mouth with tin, so that the plaster or other model when cast from this impression may have a working surface of sheet-tin, the tray containing the plaster impression is placed on the bottom of the cylinder, a suitable recess in the cylinder receiving the handle of such tray and this recess being afterward closed by a suitable plug or partition. Shot is now poured in around the impression but not into it, and the sheet-tin, having already been swaged to fit a fusible metal model taken from the plaster impression, is now placed in the impression, into which it will approximately fit. A rubber cushion filled with water is now placed in the cylinder and the plunger then placed in position on the top thereof. Upon pressure being applied by turning the screw the water-cushion will force the sheet-tin to fit accurately into the impression. In this last case the shot supports the impression or mold on the outside, thus replacing the usual plaster-of-paris. If preferred, however, the tin may be swaged to fit the impression with the use of fine shot only, the water-cushion being omitted and the cylinder nearly filled with shot in its stead.

The apparatus may also be used to swage a dental plate with the bands and wires attached to it or a plate with the artificial teeth upon it, no injury being done to either the bands or teeth. In such cases the plate is placed on a model and both these are placed in the cylinder, into which shot or steel balls are then poured until the work is well covered. No rubber disk is necessary, and when pressure is applied by means of the plunger and screw-press, as previously described, the pressure of the shot or steel balls being equal in every direction, an accurate fit of the model will be obtained.

When swaging an ill-fitting vulcanite set to a correct plaster model, the model with the set of teeth upon it is placed in the cylinder, shot is poured in until the work is well cov-

ered, and the plunger and press are adjusted. The whole apparatus is then placed in boiling water for a sufficient length of time to soften the vulcanite. Pressure is then produced by turning the screw, as previously described, and the vulcanite plate will be pressed into an accurate fit of the model.

For swaging the softer metals, as tin and its alloys, lead shot may be successfully used; but when heavy swaging is required, such as for No. 6 gage gold plate, very small steel balls are preferable, as lead shot under heavy pressure are liable to bruise each other out of shape and become impacted, so that the pressure is not then evenly distributed.

I will now proceed to describe my invention in connection with the accompanying drawings, in which the same letters of reference indicate like parts in the various figures.

Figure 1 is a perspective view of one form of my apparatus. Fig. 2 is a vertical sectional view of the apparatus shown in Fig. 1, showing work in position to be treated. Fig. 3 is a modified form of my apparatus, partly in section, showing the work in position to be treated. Fig. 4 is a perspective view of a rubber water-cushion. Fig. 5 is a view of a detail. Figs. 6 and 7 are a plan and side view, respectively, of a rubber disk.

a is a hollow cylindrical casting, of iron or other suitable metal, one end of which, forming the bottom thereof, is closed. The inside of this casting *a* is turned to receive a plunger *b*. The cylinder shown in Figs. 1 and 2 is also fitted with a recess *a'*, capable of being closed by a plug or partition a^2, for a purpose hereinafter explained.

When the work has been arranged in the cylinder *a*, the plunger *b* is placed in position and the apparatus placed in the screw-press *p*. The required pressure for the swaging can then be applied by means of rotating the lever *l*, and thus lowering the screw *s* into contact with the plunger *b*, and thus transmitting the necessary pressure to the work. When it is required to remove the work from the cylinder, the screw *s* is raised by rotating the lever *l* in the opposite direction, when the plunger *b* can be removed and the work taken out of the cylinder *a*.

Fig. 2 shows the apparatus in use for lining a plaster impression of the mouth with tin, as previously referred to. The tray *t*, having the plaster impression *m* thereon, is placed in the bottom of the cylinder *a*. The handle *t'* of this tray *t* passes into the recess *a'*, provided to receive it, and the mouth of this recess is then closed by means of a closely-fitting plug a^2, which latter is secured in position by the rod *r*, which passes through the walls of the recess *a'* and also through a hole *h* in the central flange *f*, Fig. 5, of the plug. This plug a^2 preserves the evenly-rounded inside surface of the cylinder *a*. Shot *s'* are then poured into the cylinder *a* to a sufficient height to support the outside of the mold *m*, but not so high that any of it can enter the impression. A piece of sheet-tin t^2 that has been previously swaged to a model of the mouth, so that it approximately fits the impression, is then placed in position. The water-cushion *w* is then placed in the cylinder, the plunger *b* being placed on top and the necessary pressure applied by means of the lever *l* and screw *s*, the tin plate being thus swaged to a correct fit of the impression, so that a plaster model having a tin working surface can be cast therefrom. If preferred, the water-cushion *w* can be omitted and its place in the cylinder taken by shot.

A perspective view of a suitable water-cushion *w*, fitted with a suitable valve *v* for filling and emptying purposes, is shown at Fig. 4.

Fig. 3 shows a somewhat modified form of my apparatus, the bottom of the cylinder *a* being provided with a projection or rib *j* for fitting into a groove or vise in order to hold the apparatus steady and the arms of the screw-press *p* being pivoted to the cylinder.

In the cylinder is shown a model of the mouth *m'*, having a plate *e* with artificial teeth upon it placed thereon. The cylinder is nearly filled with shot *s'*, the teeth being well covered therewith, and the plunger *b* is then placed on the top of the cylinder. When pressure is now applied to the plunger, the dental plate *e* will be swaged or pressed to correctly fit the model, and the teeth will remain uninjured, owing to the shot pressing evenly in all directions.

Figs. 6 and 7 represent a rubber disk *d* about three-sixteenths of an inch in thickness and of the same diameter as the inside of the cylinder *a*, to be used for interposing between the shot or steel balls and the work when necessary, as previously described.

What I claim is—

1. Dental swaging apparatus consisting of the cylinder *a* having a recess *a'* closed by a plug a^2 held in position by the rod *r*, the plunger *b* and screw-press *p* as described.

2. A dental swaging apparatus comprising the cylinder *a* having a recess *a'* in one side thereof, the tray in the bottom of the cylinder having a handle projecting into said recess, the plug adapted to close said recess, the plunger, the water-cushion adapted to be placed between the plunger and the article to be pressed and the metal balls adapted to encircle the article to be pressed, substantially as described.

3. A dental swaging apparatus comprising the cylinder *a* having a recess in the side thereof, the plug a^2 having a rounded face and a sustaining-rib *f*, the plunger and the screw for applying pressure thereto, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

JOHN HUTCHENS GARTRELL.

Witnesses:

EDGAR ARTHUR WILLEY,

TRELEON HAMLYN.