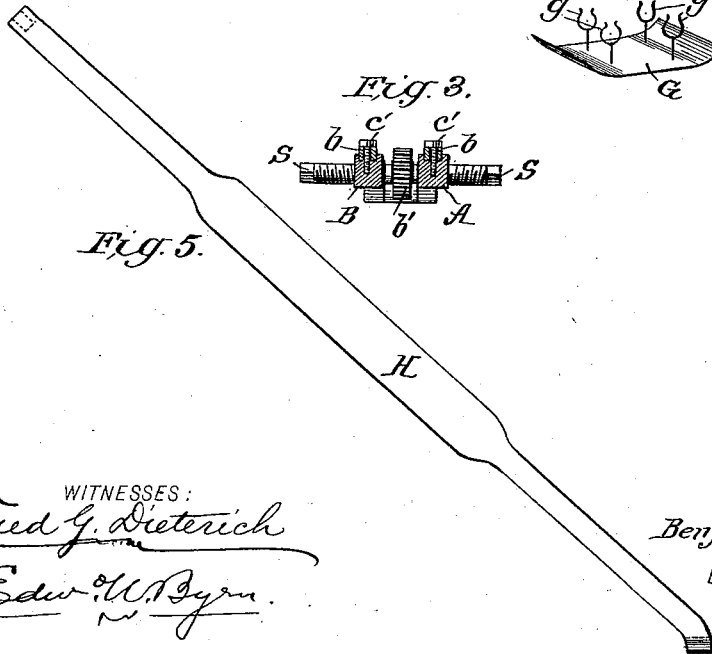
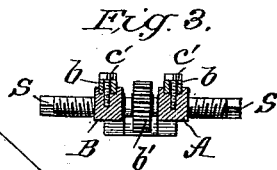
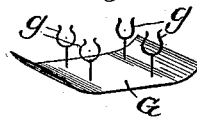
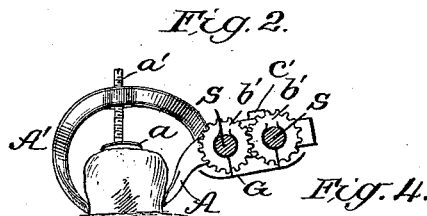
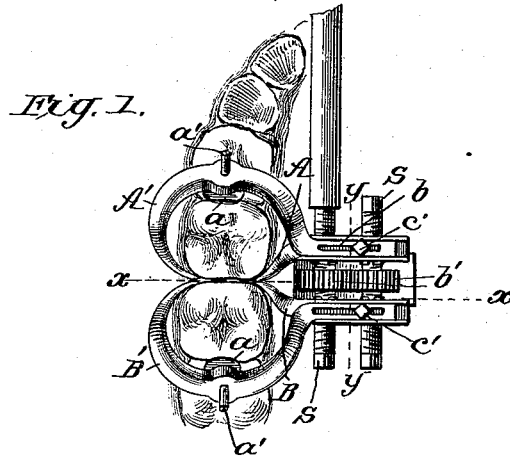


(No Model.)

B. SIMONS.
DENTAL SEPARATOR.

No. 487,973.

Patented Dec. 13, 1892.



WITNESSES:
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UNITED STATES PATENT OFFICE.

BENJAMIN SIMONS, OF CHARLESTON, SOUTH CAROLINA.

DENTAL SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 487,973, dated December 13, 1892.

Application filed June 6, 1892. Serial No. 435,775. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN SIMONS, residing at Charleston, in the county of Charleston and State of South Carolina, have invented a new and useful Improvement in Teeth-Separators, of which the following is a specification.

The object of my invention is to provide a device for forcibly separating any two adjacent teeth in the gum of a person undergoing dental treatment for the purpose of giving access to cavities which cannot be conveniently reached by the ordinary tools.

It consists of two pairs of gripping-claws, which are adapted to clutch against the two adjacent teeth to be separated, and two right and left screw-shafts geared together by cog-wheels, which right and left screw-shafts are tapped through the shanks of the claws and when rotated tend to forcibly separate the adjacent teeth, as hereinafter fully described.

Figure 1 is a plan view of the teeth-separator applied to a set of teeth. Fig. 2 is a section through line *xx* of Fig. 1. Fig. 3 is a section through line *yy* of Fig. 1; and Figs. 4 and 5 are details, respectively, of a guard-plate and a wrench used with the separator.

A A' and B B' are the two pairs of gripping-claws, whose points are made hook-shaped and are adapted to penetrate to a position well in between the teeth. The upper claw A' and B' of each pair is arched over the crown of the teeth, and to prevent their points from descending into and lacerating the gums they have adjustable stop-plates *a*, whose screw-threaded shanks *a'* are tapped through the enlarged arch of the claws A' and B' and are provided with a nick or squared end for turning. These stop-plates are adjusted higher or lower to suit long or short teeth, and thus define the positions of the points of the claws in relation to the gums. The upper claws A' and B' are rigidly clamped to the outside claws A and B by slots *b* and screw-bolts *c'*, which permit the two claws of each pair to slide over each other before being tightened by their bolts, so as to adjust the points of the inner claws toward the points of the outer claws for larger or smaller teeth. To rigidly connect the two shanks of each pair of claws so that they will act as one under lateral

strain, the shanks of the lower and outer claws are grooved or channeled longitudinally and the shanks of the upper or inner claws lie in these grooves, so that when the pairs are tightened by the screw-bolts which unite them their shanks cannot turn or move pivotally upon each other when lateral strain is applied and the tightening-screws are relieved of all lateral strain.

Tapped through the lower shanks of both pairs of claws are two parallel screw-shafts S S, whose opposite ends are provided with right and left threads. These shafts have each rigidly attached at its middle portion a small pinion or cog wheel *b*, which wheels mesh with each other, so that both shafts turn together. When these shafts are rotated in one direction, they draw the pairs of claws together, and when turned in the reverse direction they separate the pairs of claws, and this latter motion is the one that is utilized to separate two adjacent teeth. As the two screw-shafts revolve in opposite directions, owing to their connection by gear-wheels, it is necessary, in order that the screw-threads on both shafts should act in unison, that the right and left threads on one shaft should be reversed in pitch to those of the other shaft. The two screw-shafts also have a necessary co-ordinated relation to the shanks in moving the latter in parallel position, it being obvious that if there were but one screw-shaft only the outer ends or shanks of the claws would be separated and no separating strain would be brought on the teeth. To rotate the shafts, their ends are squared to receive a wrench, or their ends may be nicked to receive a screw-driver.

I am aware that separating-claws have been provided with right and left screw-shafts, one inside the teeth and the other outside; but this arrangement is very inconvenient to the operator, and the inner screw-shaft is with great difficulty accessible for turning. By having the two shafts on the same side and above the teeth and geared together one movement adjusts them both. A parallel separation of the claws is obtained and with much greater comfort to the patient and convenience to the operator.

G is a guard-plate having upwardly-pro-

jecting and forked spring-clasps *g*, that are adapted to be forced up against and made to embrace the shafts *S S*. This guard-plate forms a protection to the tongue or lip.

5 H is a wrench, one end of which has a square hole, like a watch-key, for turning the shafts *S*, and the other end is formed into a screw-driver's edge to engage with the nick in the screw-stem *a'*.

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

1. The combination, with a pair of teeth-clutching claws, of a pair of right and left screw-shafts arranged side by side and tapped through the claws and geared together, substantially as shown and described.

2. The combination, with the tooth-separator having upper and lower clutching-jaws, with the upper clutching-claw arched to pass over the crown of the tooth, of a stop-plate

having a screw-stem tapped through the arched portion of the claw and adapted to rest upon the top of the tooth and adjust the claw to the length of the tooth, substantially as shown and described. 25

3. The pair of claws having their shanks locked by matched grooves or channels, combined with a tightening-screw, substantially as shown and described. 30

4. The pair of claws having their shanks made adjustable longitudinally over each other, combined with a fastening-screw and means for adjusting the pairs from or toward each other, substantially as shown and described. 35

5. The detachable guard *G*, in combination with the screw-shafts *S S*, as described.

BENJAMIN SIMONS.

Witnesses:

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