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TEMPORARY WALL FOR USE IN CONJUNCTION
WITH THE FILLING OF DENTAL CAVITIES
Filed Oct. 14, 1950

2,629,930

FIG. 2.

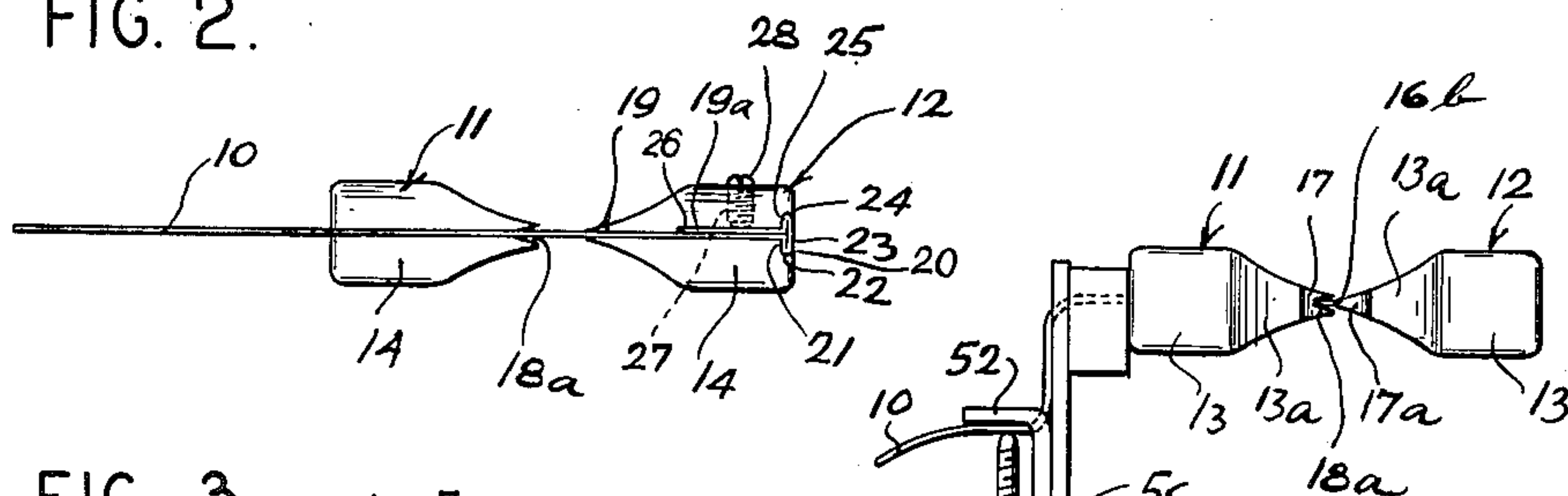


FIG. 3.

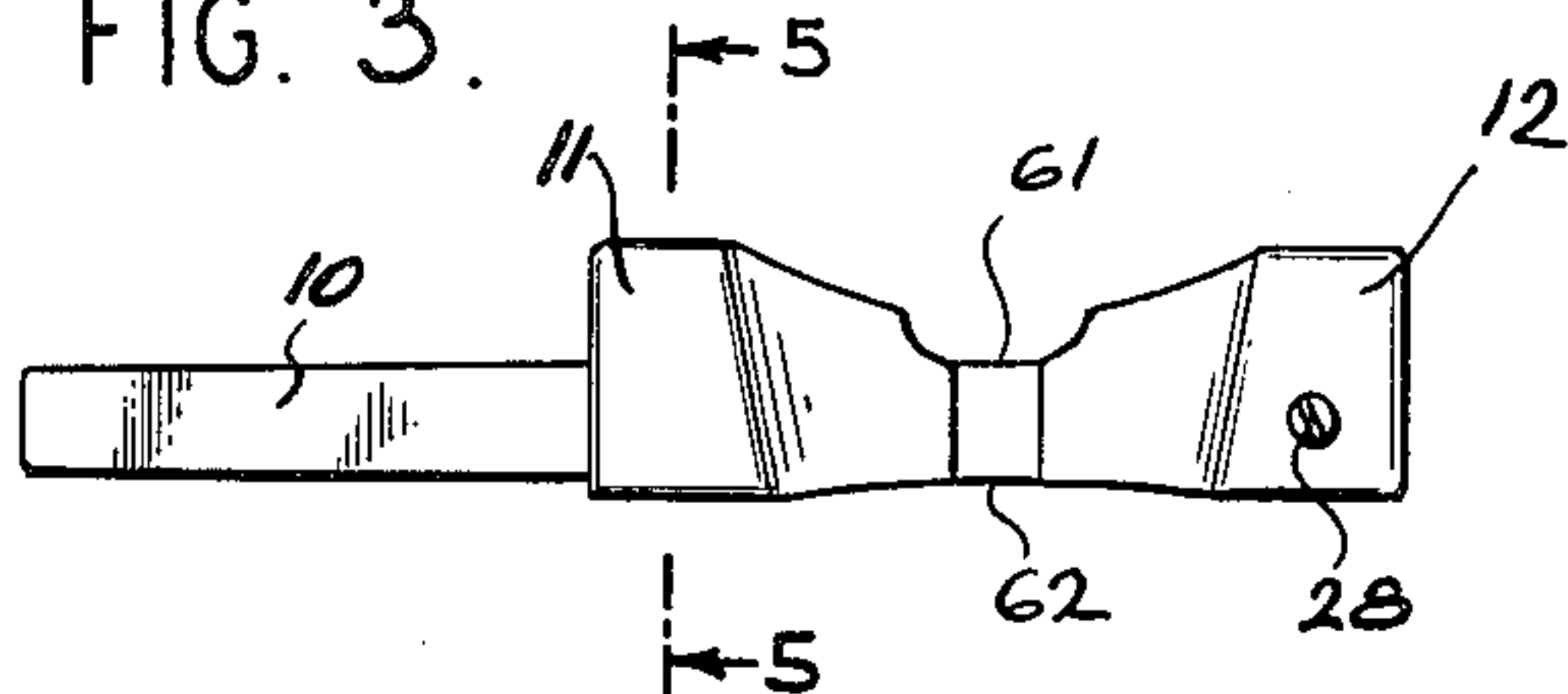


FIG. 4.

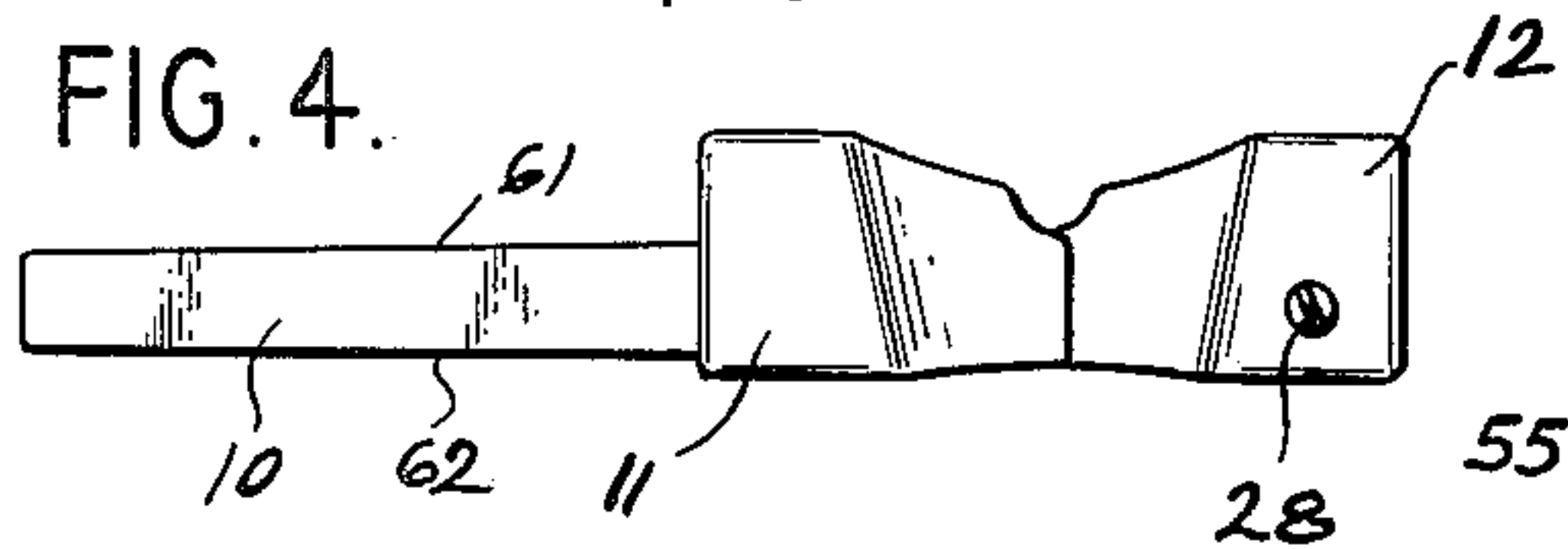


FIG. 1.

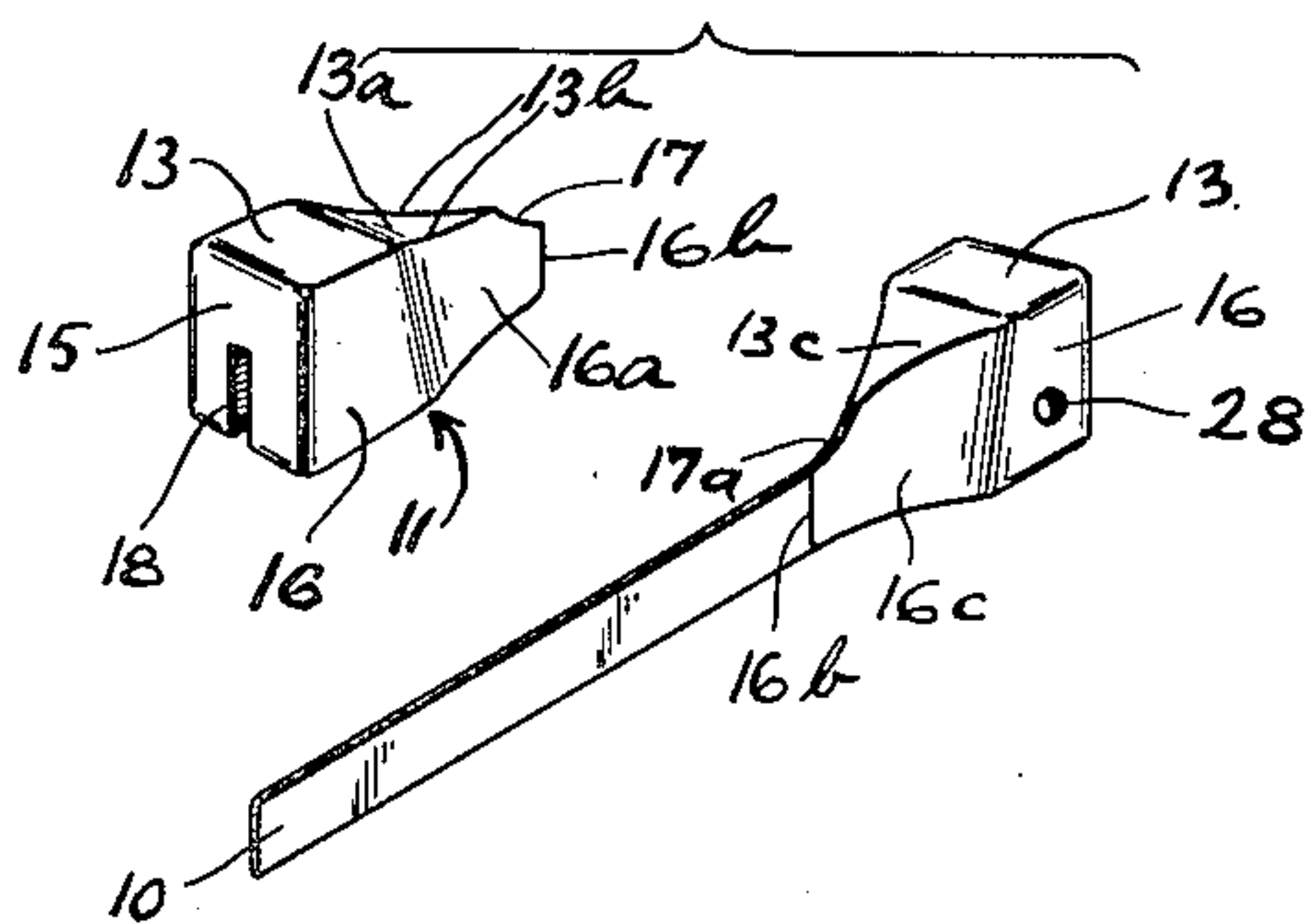


FIG. 5.

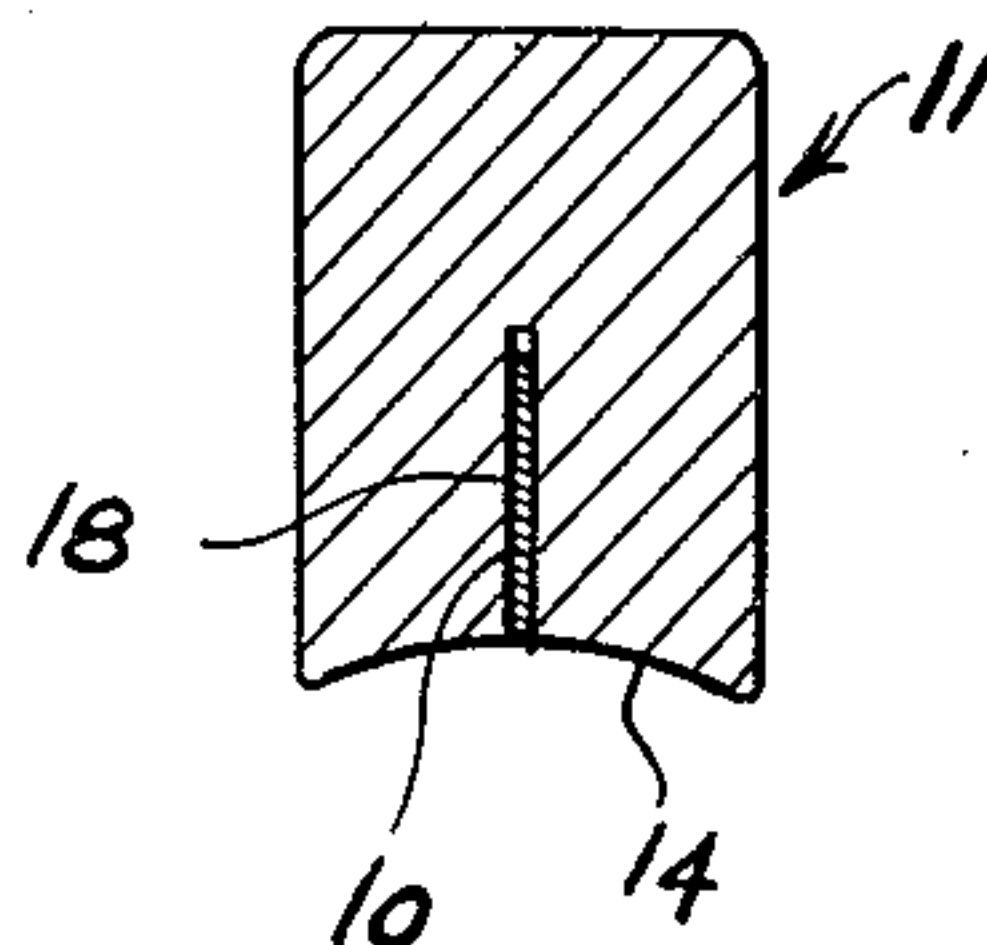
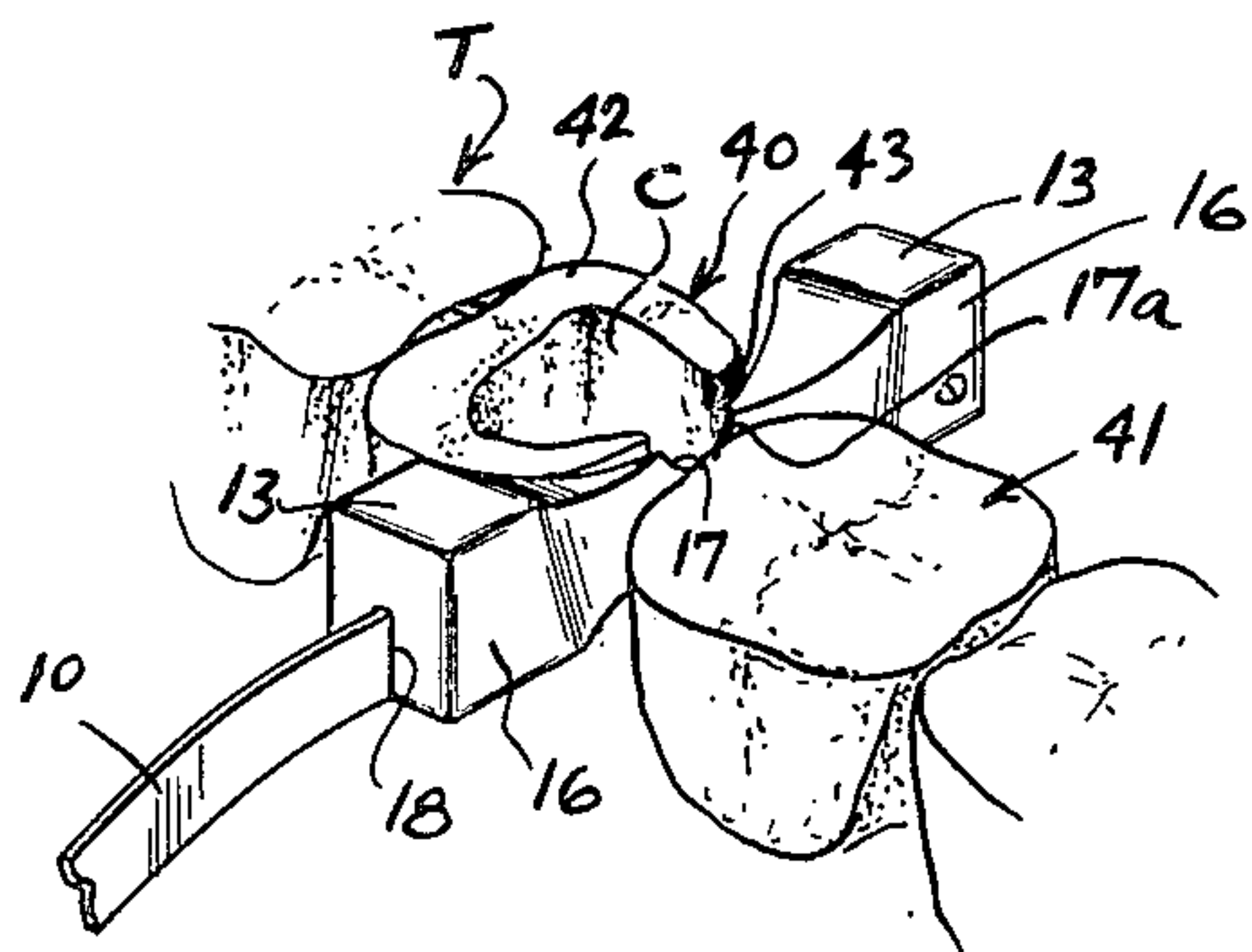


FIG. 6.



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TEMPORARY WALL FOR USE IN CONJUNCTION WITH THE FILLING OF DENTAL CAVITIES

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8 Claims. (Cl. 32—63)

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This invention relates to an improved device for use in conjunction with the filling of teeth, this device acting as a means for restoring the area of contact between abutting teeth when a cavity in one of these abutting teeth at the place of contact is filled.

The device is especially adapted for use in conjunction with the filling of bicuspid and molars of human beings. These teeth are relatively square in cross section and have fairly extensive areas of contact between adjacent teeth. Frequently, it is necessary to fill a cavity in a bicuspid or molar, which cavity extends through the occlusive surface of the tooth and also through a side or lateral surface of the tooth in such a manner as to destroy or lessen the area of contact between the decayed tooth and an adjacent tooth.

In filling such a cavity, it is frequently desirable to satisfy three requirements. First, a temporary retaining wall should be placed between the decayed lateral surface of the tooth to be filled and the adjacent lateral surface of the adjacent tooth, this temporary wall to be retained in said position until the cavity is filled and the filling material hardens. Second, this wall should have a suitable opening through which the filling material may flow into abutment with said adjacent lateral surface, so that when this filling material hardens, a suitable area of contact between the two teeth is built up. Third, the wall should be so constructed that it may be readily removed after the filling of the cavity has been completed.

My improved device meets these requirements. I provide a matrix retaining strip which is removably held in a standard matrix holder. I provide two wedges, one of which is fixed to an end of said strip and the other of which is removably mounted on said strip and longitudinally slidable thereon. This strip may be inserted between the decayed lateral tooth surface and the adjacent lateral tooth surface, with the two teeth positioned intermediate these wedges. The matrix holder may be operated so as to draw in this strip and thereby move the movable wedge toward the fixed wedge until the tips of the wedges are wedged between the adjacent teeth.

These wedges, in cooperation with the matrix strip, form a temporary retaining wall between the two teeth. The tips of the wedges are respectively notched so as to provide a gap. Filling material in the cavity is retained by the wall, except that some of the material flows through the gap in the wall into abutment with said adjacent lateral tooth surface. After the filling material hardens, the matrix holder may be dis-

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assembled from the strip, and the movable wedge may be removed from said strip. Then the strip may be readily moved longitudinally so as to be withdrawn from between the teeth.

The device is economical to manufacture and convenient to use. Other objects and advantages of my invention will become apparent from the following description when taken in connection with the annexed drawings, in which preferred embodiments are disclosed.

In the drawings,

Fig. 1 is an exploded perspective view showing one of the wedges fixed to the matrix strip and showing the movable wedge separated from said strip;

Fig. 2 is a bottom plan view showing the two wedges mounted on the matrix strip;

Fig. 3 is a side elevation showing the parts in the same relative positions as in Fig. 2;

Fig. 4 is a view similar to Fig. 3, but showing the slotted ends of the respective wedges in overlapping position;

Fig. 5 is a section on line 5—5 of Fig. 3;

Fig. 6 is a perspective view showing the improved device in operative position between two teeth with the matrix strip being shown broken away and with no holder being shown attached to the matrix strip. However, it is understood that a matrix holder is attached to the matrix strip in order to hold the wedges in this operating position; and

Fig. 7 is a top plan view showing the wedges mounted on the matrix strip and also showing a standard matrix holder attached to said matrix strip, said matrix holder having been so operated as to drive the movable wedge toward the fixed wedge to the position of this figure.

As is shown in detail in the drawings, my improved device comprises a matrix strip 10 and a pair of wedges 11 and 12 which are adapted to be interfitted with said strip 10.

Matrix strip 10 is made of metal and is flexible and is similar to the conventional matrix strip which is frequently used as a tooth-encircling band and for other well-known purposes.

Wedge 11 is preferably made of metal in one piece. Said wedge 11 has a bottom face 14, a rear face 15, a top face 13 and respective side faces 16. In the preferred construction shown in the drawings, side faces 16 are respectively substantially perpendicular to bottom face 14, and face 14 is substantially perpendicular to rear face 15.

At the rear portion of wedge 11, respective faces 16 and faces 13 and 15 are substantially

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planar, and said rear portion of wedge 11 has substantially the shape of a rectangular parallelepiped. However, bottom face 14 is optionally and preferably slightly concave to form a shallow trough. At the front portion of wedge 11, side face portions 16a slope toward each other and are slightly concave. The respective front or leading edges 16b of faces 16 are substantially parallel to each other and to the rear edges of said faces 16 and are spaced apart a distance somewhat greater than the thickness of strip 10. The height of these respective leading edges 16b is approximately equal to the width of strip 10.

Also at the front portion of wedge 11, top face portion 13a slopes downwardly, and its side edges 13b slope toward each other so that said top face portion 13a is approximately triangular. This top face portion 13a is curved downwardly at its front end to form a notch surface 17 which in longitudinal section has approximately the shape of a one-fourth arc of a circle.

I provide a slot 18 in wedge 11. The longitudinal axis of this slot 18 is aligned with the longitudinal axis of wedge 11, and the transverse axis of slot 18 is substantially perpendicular to wedge faces 13 and 14. Slot 18 opens upon the respective ends of wedge 11 and upon face 14.

Wedge 11 is adapted to be removably mounted upon strip 10 with said strip 10 positioned within slot 18 and extending beyond the respective ends of wedge 11. Slot 18 is wide enough so that wedge 11 is readily slidable on strip 10. Slot 18 is preferably sufficiently high so that strip 10 does not extend below face 14 when wedge 11 is mounted upon said strip 10.

Wedge 12 is generally similar to wedge 11, it being understood that like numerals refer to like parts. However, the construction of wedge 12 is optionally and preferably slightly different from that of wedge 11 in order to enable said wedge 12 to be fixedly secured to strip 10 and also to permit telescoping of the tips of the two wedges 11 and 12.

As is clearly shown in Fig. 2, bottom slot 19 of wedge 12 is widened along its rear portion 19a, and said slot portion 19a communicates with a rear transverse slot 20. One end of strip 10 is bent to form a substantially T-shaped head portion having a transverse arm 21 which is connected to said strip 10, a longitudinal leg 22 which is connected to said arm 21, a transverse rear arm 23 which is connected to said leg 22, a second longitudinal leg 24 which is connected to said arm 23, a further transverse arm 25 which is connected to said leg 24 and a leg 26 which is connected to said arm 25 and one face of which abuts one face of strip 10.

Wedge 12 is assembled with strip 10 with said strip 10 extending through slot 19, leg 26 positioned within slot portion 19a and head portion 21, 22, 23, 24, 25 positioned within slot 20 to serve as end stop means for retaining said wedge 12 on said strip 10. A transverse threaded bore 27 is formed in wedge 12, which bore 27 extends through one side 16 and communicates with slot portion 19a. Set screw 28 may be screwed into this bore 27 into abutment with leg 26 so as releasably to lock wedge 12 on strip 10.

Optionally, any suitable means may be provided for fixing wedge 12 to one end of strip 10.

As is clearly shown in Figs. 2 and 7, front portion side faces 16c of wedge 12 converge to a greater extent than corresponding parts 16a of wedge 11, so that front portion upper face 13c and notch surface 17a of wedge 12 are very slightly

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narrower than corresponding parts 13a and 17 of wedge 11. Also, as is clearly shown in Figs. 2 and 7, the side walls of slot 18 of wedge 11 diverge outwardly at the front end of said wedge 11 to form a mouth 18a into which the tip of wedge 12 is adapted to fit when wedge 11 is moved along strip 10.

Optionally, any other suitable means for overlapping or telescoping the tapered ends of wedges 11 and 12 may be provided.

The improved device comprising wedges 11 and 12 and matrix strip 10 is adapted to be used with a conventional matrix holder of any suitable type, one of which is shown at 50 in Fig. 7. One end of strip 10 may be drawn through a suitable aperture in matrix holder base 51 and placed in abutment with transverse leg 52 of U-shaped bracket 53. This bracket 53 has a longitudinal arm 56 which slidably abuts base 51. Screw shank 54 is turnably supported near its head end in suitable bearing means 55 which are attached to base 51. This shank 54 extends turnably through a threaded bore in transverse leg 57 of bracket 56. Screw head 58 may be turned so as releasably to fix strip 10 between wall 52 and the tip of shank 54.

A knurled knob 59 is mounted between head 58 and bearing means 55 with shank 54 extending turnably through a threaded bore in said knob 59. Knob 59 abuts bearing means 55. By turning knob 59 in one direction, shank 54 and bracket 53 may be moved longitudinally in the direction of bearing means 55, so as to draw strip 10 through the aperture in base 51. When knob 59 is turned in the opposite direction, the direction of movement of bracket 53 and strip 10 is reversed.

It is therefore apparent that matrix holder 50 serves merely as means for drawing in strip 10 in order to move wedge 11 toward wedge 12, and for letting out strip 10 so that wedge 11 may be released. Any conventional holder 50 may be used, and further description thereof is deemed unnecessary. Matrix holder 50 is not illustrated in Figs. 1-6 but is assumed to be in place in the following description.

The operation of the device is illustrated in conjunction with a set of teeth T shown in Fig. 6. In particular, tooth 40 is shown as having a cavity C which extends through the occlusal surface 42 of said tooth 40 and through a side or lateral surface 43 of said tooth 40. This side surface 43 is adjacent tooth 41.

These teeth 40 and 41 are shown as molars, although the device is also adapted to be used in filling cavities in bicuspid. In general, my device is particularly suitable for use in filling a cavity in a bicuspid or molar, especially when this cavity extends through a side surface which is adjacent a neighboring tooth.

Taking teeth 40 and 41 as illustrative of molars or bicuspid, side surface 43 of tooth 40 normally has a substantial area of contact with tooth 41, which area of contact is illustrated as destroyed or partly destroyed by cavity C. The use of my device makes it possible to restore this area of contact between teeth 40 and 41 when cavity C is filled.

After cavity C has been suitably prepared, strip 10, which already has wedge 12 mounted thereon in the manner shown in Fig. 1, is placed between teeth 40 and 41, preferably in a position wherein the tip of wedge 12 is proximate to teeth 40 and 41.

Wedge 11 is then placed upon strip 10 in the

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manner described above. Teeth 40 and 41 are positioned intermediate wedges 11 and 12, as is shown in Fig. 6. The free end of strip 10 is engaged with matrix holder 50 in the manner described above, and this matrix holder 50 is operated to draw in strip 10 and move wedge 11 toward wedge 12.

Holder knob 59 is operated until the respective tips of wedges 11 and 12 are firmly wedged between teeth 40 and 41 in the manner shown in Fig. 6. In this position of the parts of the device, a wall is formed which blocks the opening of cavity C in tooth surface 43. This wall comprises respective faces 16a of wedge 11 and 16c of wedge 12 and may optionally include a portion of one face of strip 10. This wall has a notch opening which includes notch surfaces 17 and 17a and may optionally include a portion of the top edge 61 of strip 10.

In this wedged position of the device, the tip portions of the respective bottom surfaces 14 of wedges 11 and 12 preferably abut the gum (not shown) in which teeth 40 and 41 are embedded. Surfaces 14 are preferably concave in order to conform to the shape of the gum usually encountered. The lower edge 62 of strip 10 preferably is flush with surfaces 14 and therefore abuts, but does not cut into, the gum. As a result, my device can be used in conjunction with the filling of cavity C even if it extends to the gum.

Cavity C may then be filled in the usual manner with material which is first flowable and then hardens or sets. While this material is still flowable, it is contained by wall 16a, 10, 16c, except that some of the material flows through notch 17, 61, 17a and is contained by the adjacent side surface of tooth 41. As a result, when the filling material hardens, it fills cavity C and also extends laterally in abutment with tooth 41 so as substantially to restore the original area of contact between teeth 40 and 41. The exact size and shape of this restored area of contact depends upon the size, shape and relative positions of teeth 40 and 41, as well as upon the size and shape of wedges 11 and 12.

In the case of some pairs of teeth 40 and 41, wedges 11 and 12 reach their final wedged positions with the tips thereof in substantial abutment, as in Fig. 7. In that case, the wall blocking cavity C comprises respective wedge surfaces 16a and 16c, and the notch in this wall comprises notch surfaces 17 and 17a.

In the case of other pairs of teeth 40 and 41, wedges 11 and 12 fail to meet in their wedged position, as is shown in Figs. 2 and 3. In this case, the wall for cavity C includes that portion of strip 10 which is positioned between the tips of wedges 11 and 12, and the notch includes the upper edge portion 61 of said portion of strip 10.

In the case of certain pairs of teeth 40 and 41, wedges 11 and 12 overlap in their wedged positions, as is shown in Fig. 4, and this decreases the size of notch 17, 17a. In this position, the tip of wedge 12 is positioned within slot portion 18a of wedge 11.

In order to disassemble the device, after cavity C has been filled and the material has hardened across notch 17, 61, 17a, holder knob 59 is operated so as to withdraw matrix holder 50 from strip 10. Wedge 11 is moved longitudinally along strip 10 away from wedge 12 and is then removed from strip 10. Wedge 12 and strip 10 are then moved longitudinally so as to move wedge 12 away from teeth 40 and 41 and remove strip 10

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from between said teeth 40 and 41. Preferably, top and bottom strip edges 61 and 62 converge slightly toward each other for a short distance from the tip of wedge 12 toward the other end of strip 10, so as to facilitate the movement of withdrawal of said strip 10 between the gum and the filling portion which has been shaped by notch 17, 17a.

It is to be noted that the wedging of wedges 11 and 12 between teeth 40 and 41 may spread these teeth 40 and 41 slightly apart. When wedges 11 and 12 are removed, the filling portion shaped by notch 17, 17a makes firm contact with tooth 41.

I have described a preferred embodiment of my invention, and I have indicated various changes, additions and omissions which can be made therein. Various other changes, additions and omissions may be made without departing from the scope and spirit of my invention.

I claim:

1. A device for use as a temporary wall for blocking a cavity opening in a lateral surface of a tooth, which lateral surface faces an adjacent tooth, said device comprising a longitudinally extending matrix strip which is adapted to be placed between said teeth with the faces of said strip respectively proximate to said lateral surface and to said adjacent tooth, and a pair of wedges, each of said wedges extending longitudinally and having sides which converge longitudinally toward each other at one end thereof to form a tip, each of said wedges having a slot in its lower face which extends the entire length thereof and which also extends transversely to define a lower portion of said wedge located below the top of said slot and an upper portion of said wedge located above the top of said slot, said wedges being adapted to be mounted on said strip by inserting said strip in said slots, with said lower portions of said wedges positioned proximate to the gum of said teeth and with said tips facing each other and respectively positioned forwardly and rearwardly of said teeth and with said upper portions positioned above the upper edge of said strip, at least one of said wedges being longitudinally movable with respect to said strip whereby said wedges are adapted to be wedged between said teeth to form said temporary wall for blocking said cavity opening in said lateral surface, said temporary wall including the tip-end portions of said upper portions of said wedges which are positioned and opposite said cavity opening in said lateral surface, said temporary wall having a notch positioned opposite and confined to the area of said cavity opening in said lateral surface, said notch resulting from the top surfaces of said wedges respectively converging sharply toward the upper edge of said strip within said tip-end portions of said upper portions of said wedges.

2. A device in accordance with claim 1, in which at least one of said wedges is removable from said strip.

3. A device in accordance with claim 1, in which one of said wedges is fixed on said strip and the longitudinally movable wedge is removable therefrom, the longitudinal edges of said strip converging slightly from the tip end of said fixed edge toward said other wedge.

4. A device in accordance with claim 1, in which the walls of the slot in one of said wedges diverge outwardly at the tip end of said wedge, said slot being adapted to receive the tip of the other wedge whereby to overlap said wedges.

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5. A device for use as a temporary wall for blocking a cavity opening in a lateral surface of a tooth, which lateral surface faces an adjacent tooth, said device comprising a longitudinally extending matrix strip which is adapted to be placed between said teeth with the faces of said strip respectively proximate to said lateral surface and to said adjacent tooth, and a pair of wedges, each of said wedges having a tip which has longitudinally converging sides, said wedges being adapted to be mounted on said strip with said strip extending longitudinally through the lower portion thereof and with the respective lateral axes of said wedges perpendicular to the faces of said strip and with said lower portions positioned proximate to the gum of said teeth and with said tips facing each other and respectively positioned forwardly and rearwardly of said teeth, at least one of said wedges being longitudinally movable with respect to said strip whereby said wedges are adapted to be wedged between said teeth to form said temporary wall for blocking said cavity opening in said lateral surface, said temporary wall including the tip-end portions of said wedges which are positioned above said strip and opposite said cavity opening in said lateral surface, said temporary wall having a notch positioned opposite and confined to the area of said cavity opening in said lateral surface, said notch resulting from the top surfaces of said wedges respectively converging sharply toward the upper edge of said strip within said tip-end portions of said wedges.

6. A device in accordance with claim 5, in which at least one of said wedges is removable from said strip.

7. A device for use as a temporary wall for blocking a cavity opening in a lateral surface of a tooth, which lateral surface faces an adjacent tooth, said device comprising a longitudinally

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extending matrix strip which is adapted to be placed between said teeth with the faces of said strip respectively proximate to said lateral surface and to said adjacent tooth, and a pair of wedges, each of said wedges having a through-and-through longitudinal slot which also extends transversely to define a lower portion of said wedge located below the top of said slot and an upper portion of said wedge located above the top of said slot, said wedges being adapted to be mounted on said strip with said strip extending through said slots and between said wedges and with the tips of said wedges opposing each other, at least one of said wedges being longitudinally slidable on said strip, said wedges being thereby adapted to be wedged between said teeth with their lower portions proximate to the tooth gum to form together with said strip said temporary wall for blocking said cavity opening in said lateral surface, the tips of said wedges being cooperatively shaped to form an opening in said wall when said wedges are brought into wall-forming position, said opening communicating with said cavity, said wall otherwise blocking said cavity opening in said lateral surface.

8. A device in accordance with claim 7, in which one of said wedges is fixed on said strip and the longitudinally movable wedge is removable therefrom.

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REFERENCES CITED

The following references are of record in the file of this patent:

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