July 4, 1944. I. E. SIQVELAND 2,352,808

AMALGAM CARRIER

Filed Aug. 2, 1941 2 Sheets-Sheet 1

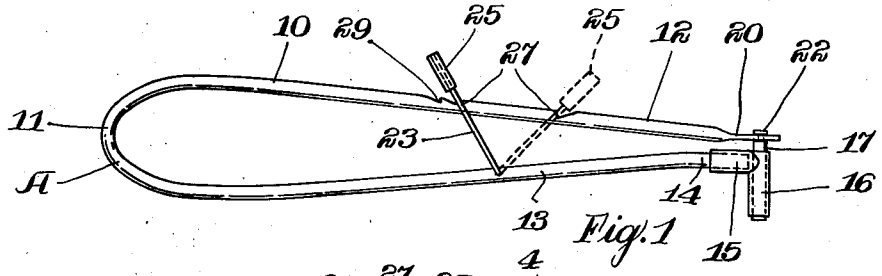


Fig. 1

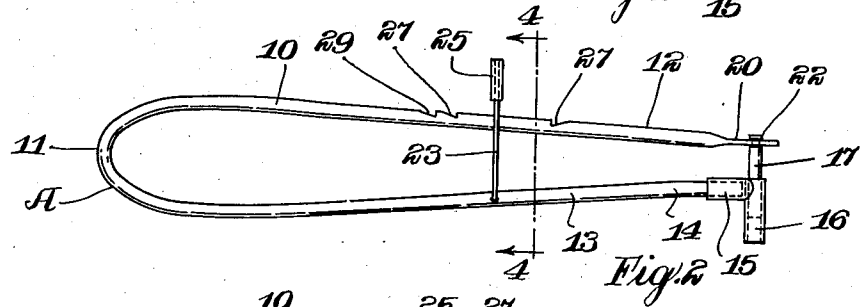


Fig. 2

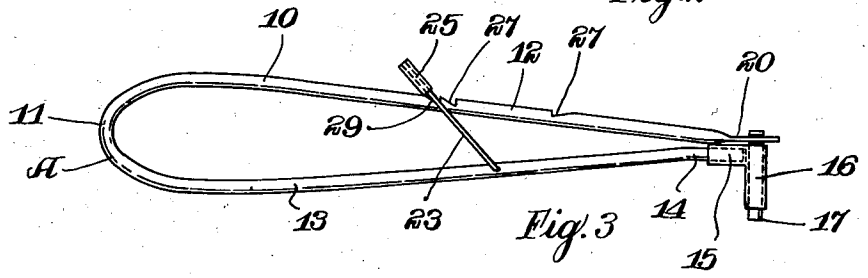


Fig. 3

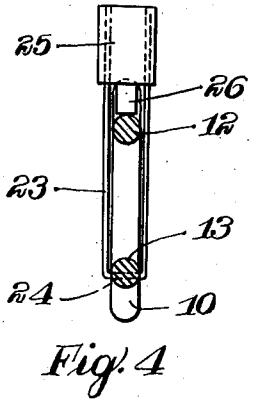


Fig. 4

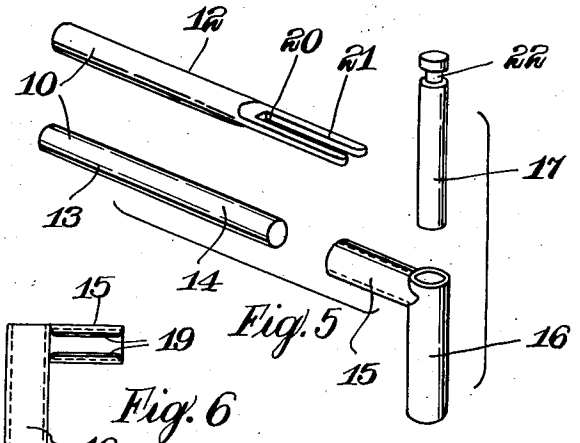


Fig. 5

Fig. 6

INVENTOR
Ivar E. Siqveland
BY Robert M. Dunning
ATTORNEY

July 4, 1944. I. E. SIQVELAND 2,352,808

AMALGAM CARRIER

Filed Aug. 2, 1941 2 Sheets-Sheet 2

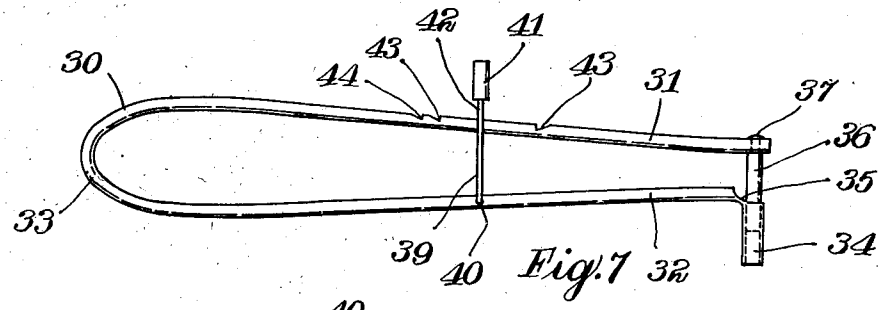


Fig. 7

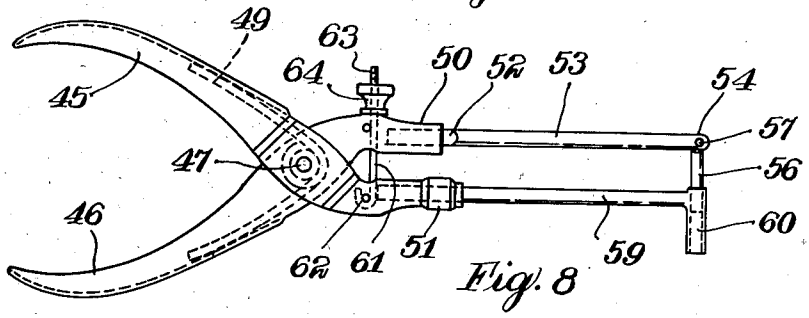


Fig. 8

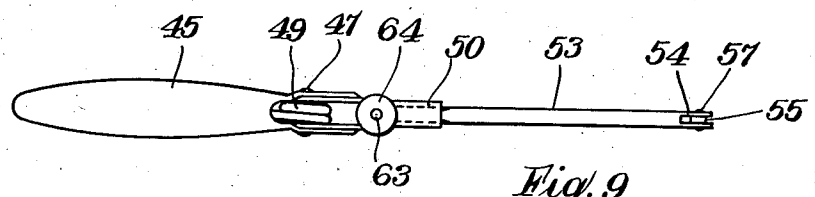


Fig. 9

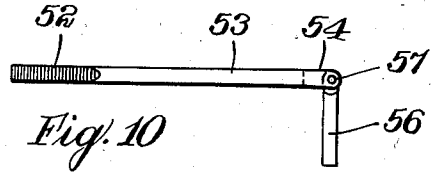


Fig. 10

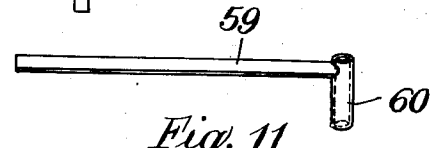


Fig. 11

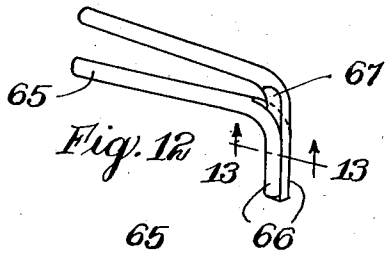


Fig. 12

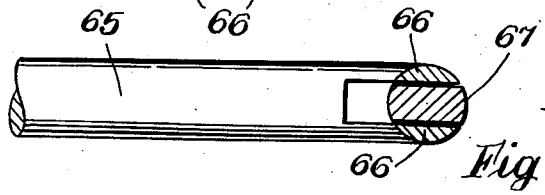


Fig. 13

INVENTOR
Ivar E. Siqveland
BY
Robert M. Dunning
ATTORNEY

Patented July 4, 1944 2,352,808

UNITED STATES PATENT OFFICE

2,352,808

AMALGAM CARRIER

Ivar E. Siqveland, St. Paul, Minn.

Application August 2, 1941, Serial No. 405,201

4 Claims. (Cl. 32—66)

My invention relates to an improvement in amalgam carrier wherein it is desired to provide a means of supporting amalgam for insertion into a cavity to fill the cavity.

There are two methods commonly used of inserting amalgam into cavities. The first and most common method is to carry the amalgam into the mouth, open a small flat bladed instrument and to drop the amalgam into place in the cavity. This method is rendered difficult by the fact that the amalgam easily falls from the blade, and the slightest irregular movement of the hand while carrying the amalgam into place will prematurely drop the amalgam from the blade. A second method sometimes used is to place the amalgam into a holder of somewhat the general shape of a pencil, having a plunger therein by means of which the amalgam can be extruded from the holder. With the instruments now in common use it is difficult to fill cavities located on certain surfaces of the teeth because of the shape of the holder. Furthermore such instruments are somewhat difficult to clean, and unless cleaned promptly after use they require considerable labor in removing the excess remnants of hardened amalgam left thereupon.

The object of the present invention is to provide an amalgam carrier of extremely simple design by means of which the amalgam can be carried into proper position and extruded into the cavity in any desired amount. The carrier is so designed as to permit extrusion of the amalgam in almost any direction so that virtually any cavity may be filled regardless of the position of the cavity in the tooth. In order to accomplish this result, the cylinder in which the amalgam is carried extends angularly from the handle of the device, so that by turning the handle in various positions, the cylinder may be directed toward a cavity in virtually any part of any teeth.

It is an object of the present invention to provide an extremely simple carrier which includes an extremely small number of parts and which accordingly can be manufactured at a low cost. In the preferred form of my invention my carrier comprises merely a loop-shaped handle formed of spring material, such as spring steel, and is provided with adjacent ends normally spaced apart. One of these loop ends is designed to support an amalgam carrying cylinder, while the other of the loop ends is designed to support a plunger operable in the cylinder. By manipulation of the handle to decrease the size of the loop, the plunger can be operated to extrude amalgam from the cylinder.

A feature of the preferred forms of my invention lies in the provision of a replaceable cylinder and plunger so that various sizes of plungers and cylinders may be used to best fit the cavity to be filled. For large cavities it is usually preferred to use a cylinder of large diameter, while for smaller cavities a smaller cylinder will suffice. Thus approximately the proper amount of amalgam can be ejected into the cavities to properly fill the same.

A further feature of my invention lies in the provision of an amalgam carrier which embodies a cylinder and plunger which is so arranged that the plunger may be used for tamping down the amalgam when placed in the cavity. In one position of the plunger this plunger is extended entirely through the cylinder to project beyond the end of the same, and to therefore act as a tamping or hammering means for forcing the amalgam firmly into the cavity.

A further feature of my invention lies in the provision of a finger actuated mechanism which may be used to draw together the opposed sides of the loop handle previously described. Notches are provided in the handle so as to hold the plunger in a certain desired relation to the handle when the plunger is to be used as a tamping means.

These and other objects and novel features of my invention will be more clearly and fully set forth in the following specification and claims.

In the drawings forming a part of my specification:

Figure 1 is a side elevation view of an amalgam carrier showing my new construction.

Figure 2 is a view similar to Figure 1, showing the carrier in amalgam carrying position.

Figure 3 is a view similar to Figures 1 and 2 showing the plunger extending completely through the cylinder in position for use as an amalgam tamping device.

Figure 4 is a sectional view through the handle, the position of the section being indicated by the line 4—4 of Figure 2.

Figure 5 is a perspective view of the handle ends, the plunger, and the amalgam carrying cylinder in unassembled relation.

Figure 6 is a side elevation view of the amalgam carrier.

Figure 7 is an elevation view of a modified form of carrier construction.

Figure 8 is an elevation view of another modified form of amalgam carrier.

Figure 9 is a top plan view of the carrier illustrated in Figure 8.

Figure 10 is a side elevation view of the plunger used in conjunction with the carrier illustrated in Figures 8 and 9.

Figure 11 is a perspective view of the amalgam carrying cylinder.

Figure 12 is a perspective view of a modified form of plunger and plunger guiding mechanism.

Figure 13 is a sectional view on the line 13—13 of Figure 12.

The amalgam carrier A and its associated parts are illustrated in Figures 1 through 6 of the drawings. The carrier A includes a handle 10 which is generally of loop shape and which is formed of a single strip or bar of resilient material, such as spring steel, or the like, or any other suitable material. The handle 10 is formed by this single strip which is folded intermediate its ends at 11 and which includes a pair of opposed arms 12 and 13. The arm 13 is provided with an end portion 14 designed to engage within the spring socket 15 secured to the plunger cylinder 16. The plunger cylinder 16 extends at substantially right angles to the axis of the end 14 of the handle member 13, and is designed to support the plunger 17. The spring socket 15, as best illustrated in Figure 6 of the drawings, comprises a split sleeve forming a pair of spring lips 19 which engage the portion 14 of the handle member 13 under spring tension.

The end of the handle member 12 is flattened, as indicated at 20, and a longitudinally extending slot 21 in this flattened end 20 forms a bifurcated arm designed to engage the plunger 17. The plunger 17 is provided with a circumferential slot 22 near the upper extremity thereof which engages the flattened portion 20 of the handle. The diameter of the plunger 17 at the base of the slot 22 is of proper dimensions to fit within the slot 21, while the remainder of the plunger is of too great diameter to fit in this slot. Thus the slot 22 provides a means of preventing longitudinal movement of the plunger with respect to the flattened end 20, but permits movement of this plunger longitudinally of the slot 21.

A substantially U-shaped wire loop 23 has its closed end 24 extending through the loop arm 13 of the handle 10, and the ends of this U-shaped loop 23 are embraced within a flattened tubular operating member 25. A latch element 26 also enclosed within the flattened tubular member 25 projects therefrom toward the handle 12 and engages the surface of this handle member. The engagement of the latching element 26 with the surface of the handle portion 12 of the handle 10 limits the movement of the arms in their separation. By exerting pressure against the operating element 25, the U-shaped loop 23 may be pivoted in either direction. As indicated in Figure 1 of the drawings, this movement acts to draw the handle portions 12 and 13 toward one another against natural tension of the handle to urge these ends apart. As the handle elements 12 and 13 are moved together, the plunger 17 is forced into the cylinder 16, thus extruding any amalgam within the carrier out of the same. A pair of notches 27 are formed in the handle element 12, so as to engage the latch member 26 to indicate when the plunger 17 has extruded all of the amalgam from the cylinder. A third notch 29 engages the latch member 26 when the loop 23 is pivoted to a greater extent so as to hold the plunger 17 projecting beyond the cylinder 16 to act as a tamping means for the amalgam.

The operation of the amalgam carrier thus described is believed obvious from the foregoing explanation. With the plunger 17 in the position illustrated in Figure 5 of the drawings, the cylinder 16 is filled with amalgam to the extent which the plunger 17 will permit. The carrier is then placed with the cylinder 16 adjacent the cavity to be filled, and pressure is exerted against the actuating member 25 on the loop 23. The latch member 26 bears against the upper surface of the handle member 12, pulling this handle member toward the opposite handle member 13. Such pressure acts to move the plunger 17 in the cylinder 16 to extract any desired amount of amalgam therefrom. When the cylinder 16 has been depleted of its supply of amalgam, the latch member 26 engages into one of the notches 27, indicating that the cylinder is empty. By pivoting the loop 23 into the position illustrated in Figure 3, the end of the plunger may be used as a tamping means to press or force the amalgam into the cavity. As the plunger 17 and the cylinder 16 are only frictionally supported on the ends of the handle 10, the proper size plunger and cylinder may be used to properly fill the cavity. A larger cylinder and plunger may be used for large cavities and smaller cylinders and smaller plungers may be used for smaller cavities.

In Figure 7 of the drawings, I disclose a similar form of construction in which the cylinder and plunger are not replaceable. In this form of construction the handle 30 is formed of a loop or strip of material bent into a loop providing a pair of opposed loop arms or handle arm portions 31 and 32, which are connected by a central bend 33. A hollow tubular cylinder 34 is integrally secured to the arm 32 by a slightly resilient connecting portion 35 to permit slight changes in angularity to take place. A plunger 36 is riveted or otherwise affixed at 37 to the handle element 31 and this plunger 36 is designed to reciprocate within the cylinder 34. The U-shaped loop 39 is pivoted at 40 to the handle element 32 and the ends of the loop 39 are embraced within a hollow flat tubular element 41. A latching element 42 projects from the actuating device 41 and is designed to engage the upper surface of the handle element 31. A pair of notches 43 are provided in this upper surface of the handle element 31 into which the latching or engaging elements 42 may drop when the plunger 36 has forced all of the amalgam from the cylinder 34. An additional notch 44 is provided into which the latch element 42 engages upon further pivoting of the loop 39 in one direction, so as to hold the plunger 36 projecting beyond the cylinder 34 so that this plunger end may be used for tamping purposes.

In Figures 8 and 9 of the drawings I disclose another form of construction which is somewhat more complicated and cumbersome than the construction previously described. In this construction, I employ a pair of tong like levers 45 and 46 which are closed and are pivotally connected at 47. A spring 49 engages between the levers 45 and 46 to urge the handle ends of these levers normally apart. In place of tong jaws on the levers 45 and 46 I provide sockets 50 and 51, the socket 50 is square in cross section or is of other multi-sided shape, so as to receive the squared end 52 of an arm 53. The end 54 of the arm 53 is bifurcated, as best illustrated in Figure 9 of the drawings, to receive the flattened end 55 of the

plunger 56. The plunger 56 is pivotally connected at 57 to the arm 53.

The socket 51 is designed to frictionally engage the arm 59 which supports the cylinder 60, extending at substantially right angles from the arm. The cylinder 60 is hollow to receive the plunger 56 and amalgam may be forced from the cylinder 60 by this plunger 56.

To limit the separation of the sockets 50 and 51, I provide a hook-shaped connecting element 61 which engages about a cross bar 62 on the socket 51 of the handle 45, and which extends through the socket end 50 of the handle 46. The hook-shaped element is threaded at 63 to receive an adjusting nut 64, by means of which the separation of the jaw or socket ends of the handles 45 and 46 may be regulated.

In Figures 12 and 13 of the drawings I disclose a slightly different form of construction in which the amalgam is carried between a pair of side guides, rather than within a cylinder. The arm 65 is bifurcated at its end to provide a pair of side guides 66. The flattened plunger 67 reciprocates between the guides 66 so as to force any amalgam carried therebetween into the cavity.

In accordance with the patent statutes, I have described the principles of construction and operation of my amalgam carrier and while I have endeavored to set forth the best embodiments thereof, I desire to have it understood that these are only illustrative of a means of carrying out my invention, and that obvious changes may be made within the scope of the following claims without departing from the spirit of my invention.

I claim:

1. An amalgam carrier comprising a pair of handle elements connected together, a cylinder, a hollow resilient socket on said cylinder designed to frictionally receive and substantially enclose one end of one of said handle elements, a plunger removably secured adjacent one of the other of said handle elements, said plunger being reciprocable in said cylinder, and said cylinder and plunger being simultaneously removable as a unit from the respective arms.

2. An amalgam carrier comprising a substantially U-shaped handle, amalgam carrying means on one end of said handle, a plunger on the other of said handles cooperable with said amalgam carrying means to force amalgam therefrom, a loop on one side of said handle engageable over the other side of said handle and operable when pivoted to draw said handle ends together, the other side of said handle including notch means engageable with said loop to hold said carrier in predetermined relationship.

3. An amalgam carrier comprising a U-shaped handle having a hollow cylinder secured to one end thereof and angularly with relation thereto, a plunger secured to the other end of said handle, said plunger being slidable in said hollow cylinder and being of a length to project therethrough, operating means pivoted to one side of said handle and engageable over the other side of said handle to limit separation of the sides of said handle, and a series of notches in said other side of said handle arranged to be successively engaged by said operating member to hold said plunger in predetermined relation with respect to said cylinder.

4. An amalgam carrier comprising a substantially U-shaped handle, a hollow cylinder secured to one end of said handle to extend angularly therefrom, a plunger secured to the other end of said handle to engage in said hollow cylinder, an operating member pivotally secured to one side of said U-shaped handle and engageable over the other side thereof to limit separation of the sides of said handle, said operating member being pivotal to draw the sides of the handle together, and a series of shoulders in the side of said handle over which said operating element engages to engage said operating member to lock the sides of said handle together.

IVAR E. SIQVELAND.