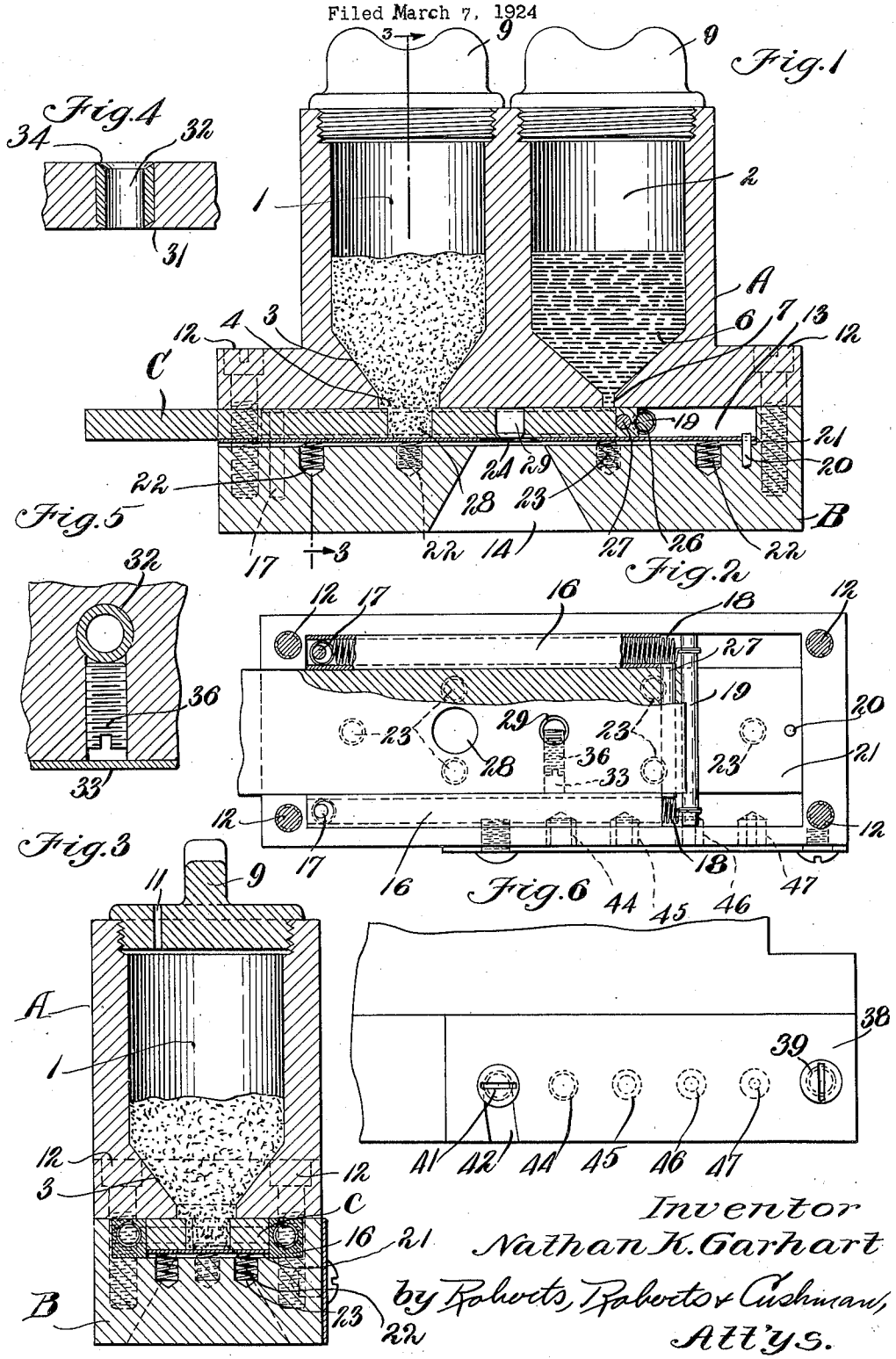
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DEVICE FOR DISPENSING DENTAL ALLOYS AND THE LIKE

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DEVICE FOR DISPENSING DENTAL ALLOYS AND THE LIKE.

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This invention relates to a device for measuring and proportioning materials, and more especially to automatic means for dispensing tooth filling substances such as mercury and an alloy. While the invention is not to be thereby construed as limited to the specific materials or absolute quantities which are required for dental purposes, it will be described as applied to such use, which is typical of its general constructions and functions.

In the preparation of dental alloys for the filling of teeth, it is important that the operator shall be able to obtain a suitable total amount of the ingredients which he requires and at the same time that these ingredients shall be furnished in the proper proportions to "set" or harden after they have been tamped or molded into the tooth or tooth structure. It is also of importance that they shall be kept free from any contamination until used and that they shall be brought together in the vessel in which they are to be mixed, without possibility of losing any of either measured portion.

It is an object of the invention to provide a device which will effect these results, which may be easily and quickly operated, and which will not waste or lose or mix the several materials when not in use.

A device which is especially adapted to the preparation of dental alloys, but which is a typical embodiment, is illustrated by the accompanying drawings, in which:—

Fig. 1 is a longitudinal section of the completely assembled device;

Fig. 2 is a plan view of the same with the upper container portion removed and with other parts broken away;

Fig. 3 is a section of the device in the plane 3—3 of Fig. 1;

Fig. 4 is a detail section of a measuring and discharge aperture;

Fig. 5 is a horizontal section of an adjusting device for regulating the size of the measuring and discharge aperture; and

Fig. 6 is a side view of the device showing a storage chamber for extra adjustment rings.

The particular embodiment of the invention illustrated in the drawings comprises an upper container portion A which is rectangular in cross-section and has end flanges for attachment to base B by screws 12. The container A is provided with an amalgam reservoir 1 having a conical bottom 3 and a vertical outlet 4 properly proportioned to permit of a constant or maximum desired discharge of amalgam as later to be described. Container A is also provided with a mercury chamber 2 which has a similar conical bottom 6 and a vertical outlet 7 properly proportioned for the maximum required discharge of mercury. The storage reservoirs or chambers are closed at the top by screw caps 9 which have small vent holes 11 therein.

The base is a rectangular block having in its upper face a relatively broad shallow rectangular slot 13 which extends to the edge of the block at one end, a vertical conical aperture 14 through its center, and sockets 23 in the bottom of slot 13. Along each longitudinal side of slot 13 is placed an elongate rectangular housing 16, attached at one end by a pin 17 and extending about three-quarters of the length of the slot. Each housing contains a spring 18 extended slightly beyond the housing and fastened by the pin 17 at its inner end. The free ends of the tension springs 18 are anchored to a connecting rod 19.

Intermediate the housings and serving to space them apart is a thin flexible steel strip 21 fastened at one end to the bottom of slot 13 by pin 20 and resting upon a plurality of coiled springs 22 which press upwardly against it from the sockets 23. Strip 21 is provided with an aperture 24 intermediate said springs 22 adapted to register with the top of the aperture 14 which passes through section B.

In the space bounded by the strip 21 and the housings 16 in guideway 13, there is a slide C which serves as a carrier. This carrier comprises a rectangular plate which is longer than slot 13, and of such thickness as to fit flush with the upper face of base B due to the pressure of light springs 22. Part A fits tightly upon the upper face of base B and snugly against slide C. The carrier C butts against the connecting rod 19 at its inner end and is provided with a groove 26 to receive the connector. Passing hori-

zontally through the end of carrier C and projecting slightly beyond the sides thereof is a pin 27 adapted to engage the ends of housings 16 to limit the outward movement of the carrier.

The carrier C is provided with cylindrical apertures 28 and 29, the former positioned to register with outlet 4 of chamber 1 when in the normal position shown in Figs. 1 and 2, aperture 29 being then positioned to register with apertures 24 and 14. When carrier C is pushed inwardly to its other extreme position aperture 29 registers with outlet 7 of chamber 2 and aperture 28 registers with apertures 24 and 14. When not directly above the outlet apertures 24 and 14, the apertures 28 and 29 are closed by the strip 21 at their lower ends, this thin flexible spring-pressed strip serving to prevent leakage at all points except its own outlet aperture 24.

Aperture 29 is provided with an annular projection 31 at its base and is adapted to retain any one of a number of measuring or proportioning tubes 32 having different bores whereby the measured quantity may be varied as desired. A slight bevel 34 is preferably provided at the upper end of each tube 32 which is even with the top surface of carrier C. A tapped opening 33 enters aperture 29 from the side of carrier C permitting the adjustable insertion of a machine-screw 36 thereinto or against the ring 32.

On the outer side or end of base B is provided a cover plate 38 fastened thereto by pivot screw 39 and by thumb-screw 41 in the slot 42. Beneath this cover plate sockets are provided to receive extra measuring rings 44, 45, 46, 47 similar to ring 32 already described but of varying internal diameters and capacities.

Adjustment of the capacity of aperture 29 may be made by advancing or retracting the screw 36. Further adjustment may be made by removing screws 12, lifting off part A, raising slide C, and inserting in pocket 29 one of the extra measuring rings 44, 45, 46, 47. Slide C is then lowered, part A replaced and fastened to base B by screws 12 and the apparatus is ready for use.

The dispensing device is thus easily assembled or adjusted. The parts are simple and may be made without difficulty either by molding or machining. The springs 18 are positively prevented from becoming displaced or caught and upon retraction they draw the loose cross-bar 19 evenly against the carrier plate C while the latter is positioned and prevented from leaving the guideway by the fixed pin 27.

When carrier C is in the normal position as shown in Figs. 1 and 2, pocket 28 is under outlet 4 and is filled with amalgam from reservoir 1 by gravity. In this position, the bottom of aperture 28 is tightly closed by the flexible follower plate 21 which is pressed upward by springs 22 at a plurality of points surrounding the aperture. This pressure also holds slide C firmly against the under side of section A so that the top of aperture 28 registers snugly with outlet 4. By pressing carrier C inwardly (thus pushing forward the connector 19 against the tension of spring 18) pocket 28 is continuously closed by plate 21 until it comes above the aperture 24 which permits the amalgam to fall therethrough and through the opening 14 in base B into a container (not shown). In this position aperture 29 will be immediately below the outlet 7 and mercury from reservoir 2 will fill it by gravity. By releasing the carrier C it will be returned to its original position by retraction of the actuating springs 18. Aperture 29 will also be continuously closed by flexible plate 21, similar to aperture 28, until it comes over apertures 24 and 14 when it will discharge its mercury therethrough into the same vessel as the amalgam.

Thus by a single complete stroke of carrier C the proper mixture and proper amount of material is discharged from the same outlet. The device may be entirely operated with one hand and set down afterward without further adjustment of any kind and without possibility of contaminating or mixing the contents. A definitely measured and cleanly separated portion of each ingredient is contributed to the mixture and completely discharged thereinto without loss of material in the mechanism.

I claim:

1. A device for dispensing dental alloys and the like having a reservoir provided with an outlet and having a guideway extending transversely of the outlet, a slide movable longitudinally of said guideway to close said outlet when in one position and to uncover the outlet in another position, said guideway being wider than the slide to provide space at the side thereof, a spring in said space for actuating the slide, and an elongate removable member in said space serving as a guide for both the slide and the spring.

2. A device for dispensing dental alloys and the like having a reservoir provided with an outlet and having a guideway extending transversely of the outlet, a slide movable longitudinally of said guideway to close said outlet when in one position and to uncover the outlet in another position, said guideway being wider than the slide to provide spaces at the sides thereof, tension springs in said spaces, an elongate removable housing surrounding said springs and substantially filling the spaces transversely of the guideway thereby serving as guides for the slide, a spring connector extending

transversely of said slide at one end thereof, said springs being anchored to said connector at one end and at the other end to a stationary part of the device, and a spring-pressed follower plate associated with a plurality of springs, engaging and pressing said slide against said outlet, said plate being thin and flexible to conform to the surface of said slide thereby to prevent leakage of material from said outlet.

Signed by me at Boston, Massachusetts this 3rd day of March 1924.

NATHAN K. GARHART.