Oct. 28, 1941. O. H. PIEPER 2,261,036

UNITARY DENTAL APPARATUS

Filed Aug. 4, 1939

Fig. 1

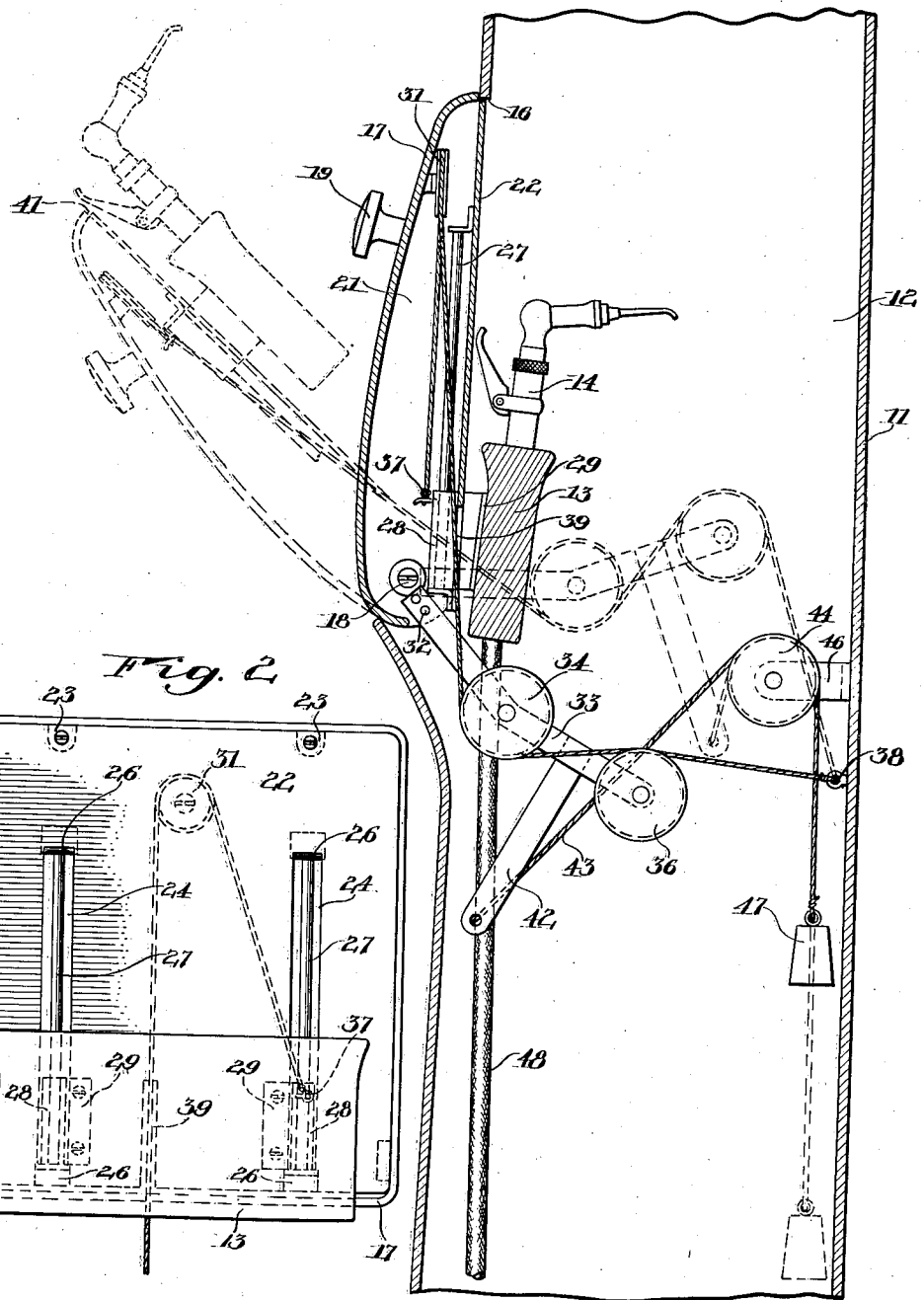

Fig. 2

INVENTOR.
Oscar H. Pieper
BY
Cumpston & Shepard
his ATTORNEYS

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UNITARY DENTAL APPARATUS

Oscar H. Pieper, Rochester, N. Y.

Application August 4, 1939, Serial No. 288,416

9 Claims. (Cl. 32—22)

My invention relates to dental apparatus, and more particularly to a dental stand or unit adapted to support various instruments or appliances adjacent the dental chair and within easy reach of the dentist.

The present invention is an improvement on the dental apparatus shown in my copending application Serial No. 192,125, filed February 23, 1938, entitled Unitary dental apparatus.

An object of my invention is to provide a compact and simplified dental stand or unit adapted to house or support various dental instruments and which may be produced at a reasonable cost.

Another object of my invention is to provide, in combination with means for housing various dental instruments and protecting them from dust and dirt, improved means for rendering the instruments readily and conveniently accessible when the dentist desires to use them.

My invention further contemplates an improved and simplified means, of the type described in the above mentioned copending application adapted to project the instruments into a convenient position, when desired, to make them readily accessible to the dentist.

Other objects and advantages of my invention will be more particularly set forth in the claims and will appear from the following description, when taken in connection with the accompanying drawing, in which:

Fig. 1 is a vertical sectional elevation of a portion of a dental stand or unit showing in solid lines the position of the dental instruments when housed within the unit, and in dotted lines the position of the instruments when rendered conveniently accessible for use by the dentist; and

Fig. 2 is a plan view of the inside of the door or closure showing the instrument carrier mounted thereon.

In the preferred embodiment of my invention disclosed herein, the dental unit includes and the support or enclosure for the instruments comprises a hollow supporting column or standard 11 which has a suitable base (not shown). The general construction of the unit is more clearly shown in the above mentioned copending application. The standard or column constitutes a part of the dental unit and may support, in addition to the instruments, a fountain cuspidor bowl, a drinking fountain, and other appurtenances and conveniences for the dentist and his patients.

The supporting column 11 is, for the most part, hollow to provide a recess or compartment 12 for housing and protecting various instruments or dental appliances which are assembled in juxtaposition in the compartment. The instruments are normally maintained within the compartment and are supported by a suitable carrier or instrument holder which is provided with mechanism for automatically moving the carrier into a position to render the instruments accessible for use when the dentist so desires. Preferably the instruments are mounted in a carrier or instrument holder, generally indicated by the numeral 13.

While I have shown only a single instrument mounted in the carrier, it will be appreciated that a number of instruments may be mounted in the same carrier. The instrument 14, shown in the drawing, is a water syringe. In addition to this other dental hand instruments, such, for example, as a cautery, a pulp tester, and a small electric lamp may be mounted in and supported by the carrier.

The supporting column 11 is provided with an opening 16 adapted to be closed by a door or closure 17. Preferably the closure is hinged about its lower edge so as to swing from the closed solid line position to the open dotted line position shown in Fig. 1. Hinging of the closure may be accomplished by providing the supporting column and the closure with suitable bosses and pivot pins, as indicated at 18, the arrangement being such as to limit the opening of the closure preferably to the inclined position shown in dotted lines. The closure may be further provided with a hand piece 19 adjacent its upper portion by which the closure may be conveniently swung to open or closed position.

Preferably the closure is somewhat hollow or dish shaped and provided with raised margins, as shown at 21, for a purpose which will later appear. A plate 22 held in position on the closure by screws 23 (Fig. 2) extends substantially flush with the margins of the closure for the purpose of enclosing and hiding a portion of the operating mechanism for the carrier. The plate 22, as shown in Fig. 2, is provided with a pair of elongated slots 24 and mounted on the inner wall of the plate 22 by means of suitable brackets 26 are a pair of rods or guide members 27. The guide rods 27 are mounted so that they register with the slots 24 and are adapted to receive members 28 which are rigidly secured to the carrier by screws, as shown at 29. The material of the members 28 is bent or turned around the guide rods and secured in position so as to form sleeves to enable the members 28, together with the carrier, to slide on the guide rods. It will thus be apparent that the carrier, together with the instruments, may be moved on the closure from the solid line position to the dotted line position shown in Fig. 1.

For the purpose of automatically presenting the instruments so that they are conveniently accessible to the dentist when the closure is opened, I have provided novel and simplified means for automatically projecting the instruments forwardly on the closure simultaneously with and as

a result of the movement of the closure from the solid line to the dotted line position shown in Fig. 1.

Mounted on the inner wall of the closure preferably near its upper edge is a pulley **31**. Secured to the lower edge of the closure by riveting or in any other suitable manner, as shown at **32**, is an arm **33** which preferably extends inwardly and downwardly into the supporting column. The arm is preferably bent as shown and about midway of its length is provided with a pulley **34**. Secured preferably to the inner end of the arm **33** is another pulley **36**. A flexible cord or line has one end operatively connected to the carrier, preferably by securing it to the member **28** at any convenient point, as shown at **37**, and the other end secured to the inner wall of the supporting column, as shown at **38**. The intermediate portions of the flexible line pass over the pulley **31** downwardly through the hollow of the closure and outward into the supporting column through a guide slot **39**, formed in the plate **22** (see Fig. 2), and then beneath the pulley **34** and over the pulley **36**.

It will now be apparent, when the closure is moved from the solid line position, shown in Fig. 1, to the dotted line position shown in that figure, that the arm **33** will swing up to the dotted line position shown. This movement of the arm **33** acts to draw in the flexible line so that the element **28**, together with the carrier and the instruments, are moved forwardly on or toward the upper edge of the closure. Thus when the closure is in its open position the ends of the instruments are projected to and preferably beyond the edge **41** of the closure. In this position the instruments may be conveniently grasped by the dentist and withdrawn from the carrier for use. When the dentist has finished using the instruments, the closure may be moved to the solid line closed position shown in Fig. 1, and the instruments will be automatically retracted or drawn rearwardly on and toward the bottom of the closure so that the closure may be closed and the instruments housed in the supporting column against access thereto by dust and dirt.

It will be apparent that the operating mechanism for the carrier is mounted partly within the hollow of the closure and partly in the supporting column. The operating parts are thus substantially hidden from view and the closure opening is not obstructed by any of the operating parts. If desired, the pulley system may be varied by locating two or more pulleys within the hollow of the closure. The arrangement shown produces rapid actuation and a relatively large movement of the carrier which is desirable in order to avoid any possibility of the instruments striking the margin of the closure opening. Moreover, as will be observed from the drawing, the arrangement of the pulleys is such as to produce little or no movement of the carrier during the first portion of the movement of the closure, followed by an increasing velocity of movement of the carrier as the closure approaches its fully open position.

If desired, although not necessary to my invention, there may be operatively connected to the operating mechanism a counterweight system for the purpose of aiding the operator in opening and closing the closure and for the purpose of making more positive the actuation of the carrier. For this purpose the arm **33** is provided with a depending arm **42** to the end of which one end of a flexible cord or line **43** is secured. The flexible line **43** is passed over a pulley **44** mounted in a bracket **46** supported from the inner wall of the supporting column and has secured to its opposite end a counterweight **47**. It will be apparent that the counterweight acts to aid the opening and closing movements of the closure and make the actuation of the carrier more positive.

Each of the instruments, as is well known in the art to which this invention applies, has a cord **48** secured thereto which extends through a bore provided in the carrier. The cords are preferably flexible and serve to enclose current carrying wires or flexible tubes for conveying hot water, cold water or air to the instruments. Further, as is well known in the art to which this invention applies, each of the flexible cords **48** is provided with retracting means which may be of any suitable type as, for example, a spring tensioned reel or a pulley and counterweight system, as shown in the above mentioned copending application.

It will now be apparent that when the closure is opened the instruments are automatically projected into a convenient position to be grasped and pulled by the dentist to a position, against the force of the retracting means, such that they may be conveniently used. As soon as the dentist is finished with a particular instrument the retracting means will draw the instrument back into its carrier. As soon as the dentist is finished using all of his instruments he may move the closure to the solid line position shown in Fig. 1 and the carrier, together with the instruments, is automatically retracted to the solid line position shown in Fig. 1.

While I have shown and described the preferred form of my invention, it will be apparent that various modifications and changes may be made therein, particularly in the form and relation of parts, without departing from the spirit of my invention as set forth in the appended claims.

I claim:

1. A dental unit wherein an opening in a hollow frame has a closure pivotally supported on said frame and wherein an instrument carrier supported on and movable with said closure has operating means for projecting the carrier forwardly on the closure simultaneously with and as a result of the opening movement of the closure so that the instruments are projected substantially to or beyond the closure margin in a position to be conveniently grasped, said operating means including an arm rigidly connected to the closure, pulley means carried by said arm, pulley means carried by said closure, and a flexible line operatively connected to the carrier extending over both of said pulley means and connected to the frame, and a counterweight connected to the arm for aiding the opening movement of the closure.

2. A dental unit wherein an opening in a hollow frame has a closure pivotally supported on said frame and wherein an instrument carrier supported on and movable with said closure has operating means for projecting the carrier forwardly on the closure simultaneously with and as a result of the opening movement of the closure so that the instruments are projected substantially to or beyond the closure margin in a position to be conveniently grasped, said operating means including an arm rigidly connected to the closure, pulley means carried by

said arm, pulley means carried by said closure, and a flexible line operatively connected to the carrier extending over both of said pulley means and connected to the frame, a second flexible line connected to said arm, a pulley supported from the frame over which said second flexible line connection extends, and a counterweight secured to one end of said second flexible line.

3. A dental unit wherein an opening in a hollow frame has a closure pivotally supported on said frame and wherein an instrument carrier supported on and movable with said closure has operating means for projecting the carrier forwardly on the closure simultaneously with and as a result of the opening movement of the closure so that the instruments are projected substantially to or beyond the closure margin in a position to be conveniently grasped, said operating means including an arm rigidly connected to the closure and extending downwardly therefrom when the closure is closed, a pair of pulleys mounted on said arm, a pulley carried by said closure, and a flexible line having one end connected to the carrier extending over all three of said pulleys and connected to the frame at a point well below the upper edge of the closure when in closed position.

4. A dental unit wherein an opening in a hollow frame has a closure movably supported on said frame and wherein an instrument carrier supported on and movable with said closure has operating means for projecting the carrier forwardly on the closure simultaneously with and as a result of the opening movement of the closure so that the instruments are projected substantially to or beyond the forward margin of the closure in a position to be conveniently grasped, said structure being characterized by the facts that the operating means includes at least two pulleys one of which is mounted within the outline of the closure, a member connected to and movable with the closure for supporting the other of said pulleys inside the hollow frame, and a flexible line having one end connected to said carrier, and its other end connected to the inside of the hollow frame and extending over said pulleys.

5. A dental unit wherein an opening in a hollow frame has a closure movably supported on said frame and wherein an instrument carrier supported on and movable with said closure has operating means for projecting the carrier forwardly on the closure simultaneously with and as a result of the opening movement of the closure so that the instruments are projected substantially to or beyond the forward margin of the closure margin in a position to be conveniently grasped, said structure being characterized by the facts that the operating means includes at least two pulleys one of which is carried by the closure, a member connected to and movable with the closure and extending inside the hollow frame and by which the other pulley is carried, and a flexible line having one end connected to said carrier, and its other end connected to the inside of the hollow frame and extending over said pulleys.

6. A dental unit wherein an opening in a hollow frame has a closure movably supported on said frame and wherein an instrument carrier supported on and movable with said closure has operating means for projecting the carrier forwardly on the closure simultaneously with and as a result of the opening movement of the closure so that the instruments are projected substantially to or beyond the closure margin in a position to be conveniently grasped, said structure being characterized by the facts that the operating means includes at least two pulleys one of which is carried by the closure, an arm rigidly connected to the closure adjacent the lower edge thereof and extending into the hollow frame and by which the other pulley is carried, and a flexible line having one end connected to said carrier, and its other end connected to the inside of the hollow frame below the upper edge of the closure when the closure is in a closed position and extending over said pulleys.

7. A dental unit wherein an opening in a hollow frame has a closure movably supported on said frame and wherein an instrument carrier supported on and movable with said closure has operating means for projecting the carrier forwardly on the closure simultaneously with and as a result of the opening movement of the closure so that the instruments are projected substantially to or beyond the forward margin of the closure in a position to be conveniently grasped, said structure being characterized by the facts that the closure has an arm secured thereto and movable therewith and extending into the hollow frame, a flexible line having one end connected to the carrier and its other end connected to the inside of the hollow frame, and means mounted on said arm and closure over which the line extends for utilizing the movement of said arm to produce said forward movement as the closure is opened.

8. A dental unit comprising a hollow frame having an opening in a wall thereof, a hollow closure for said opening, an instrument carrier carried by said closure and movable thereon, means for moving the carrier forwardly on the closure simultaneously with and as a result of the opening movement of the closure, said means comprising a pulley located within the hollow of the closure and beneath the instrument carrier, pulley means within the hollow frame, and a flexible line having one end connected to the carrier, its other end connected to the frame on the inside thereof, and its intermediate portions extending over said pulley and said pulley means.

9. A dental unit wherein an opening in a hollow frame has a closure movably supported on said frame and wherein an instrument carrier supported on and movable with said closure has operating means for projecting the carrier forwardly on the closure simultaneously with and as a result of the opening movement of the closure so that the instruments are projected substantially to or beyond the forward margin of the closure in a position to be conveniently grasped, said structure being characterized by the facts that the closure has an extension projecting into the hollow frame and the operating means includes flexible means one end of which is connected to the carrier and the other end of which is connected to the frame on the inside thereof, and elements supported by said closure and said closure extension and movable with the closure over which the intermediate portions of the flexible means pass for actuating the flexible means as the closure is opened to thereby cause said projection of the carrier.

OSCAR H. PIEPER.