(No Model.)

# A. S. RICHMOND.

## DENTAL APPARATUS.

No. 492,434. Patented Feb. 28, 1893.

Fig. 1.

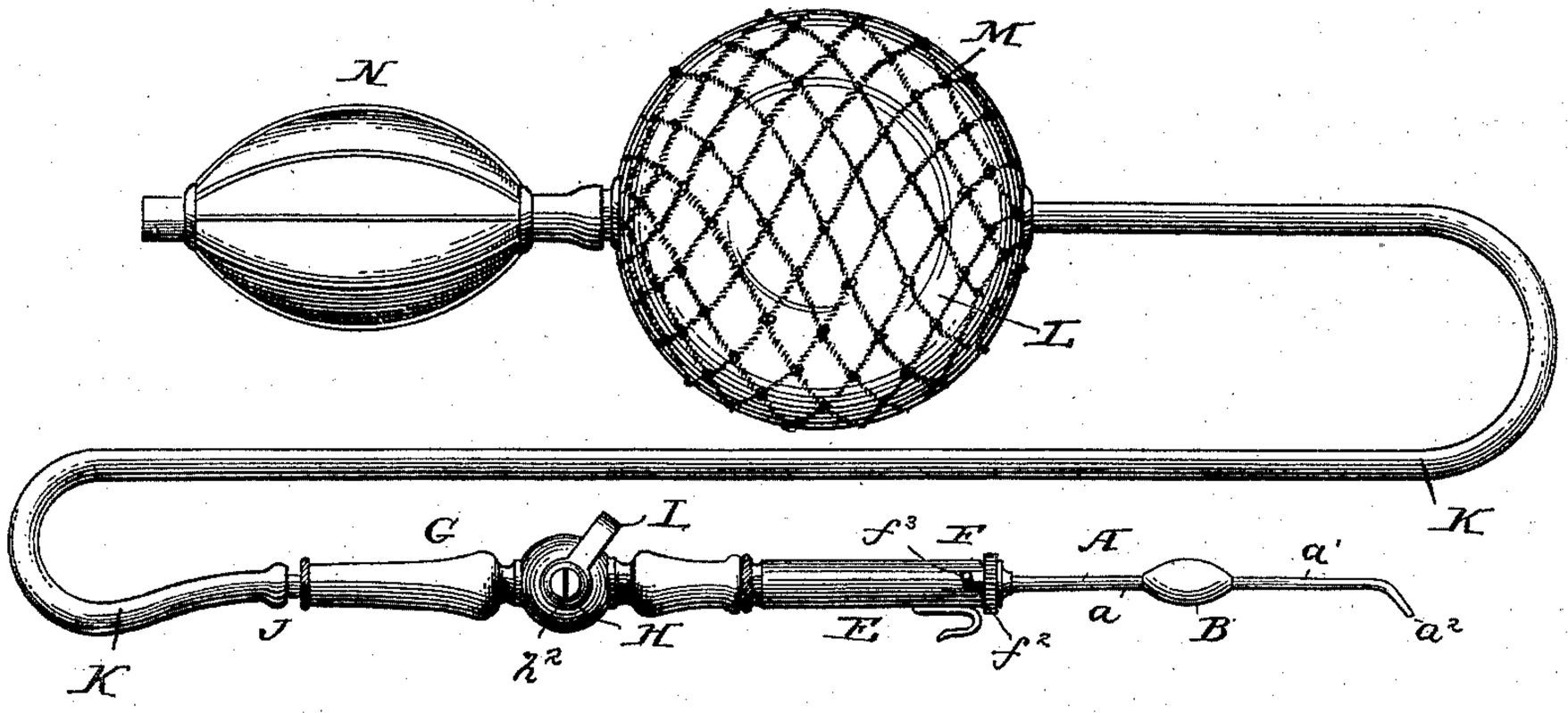



Fig. 2.

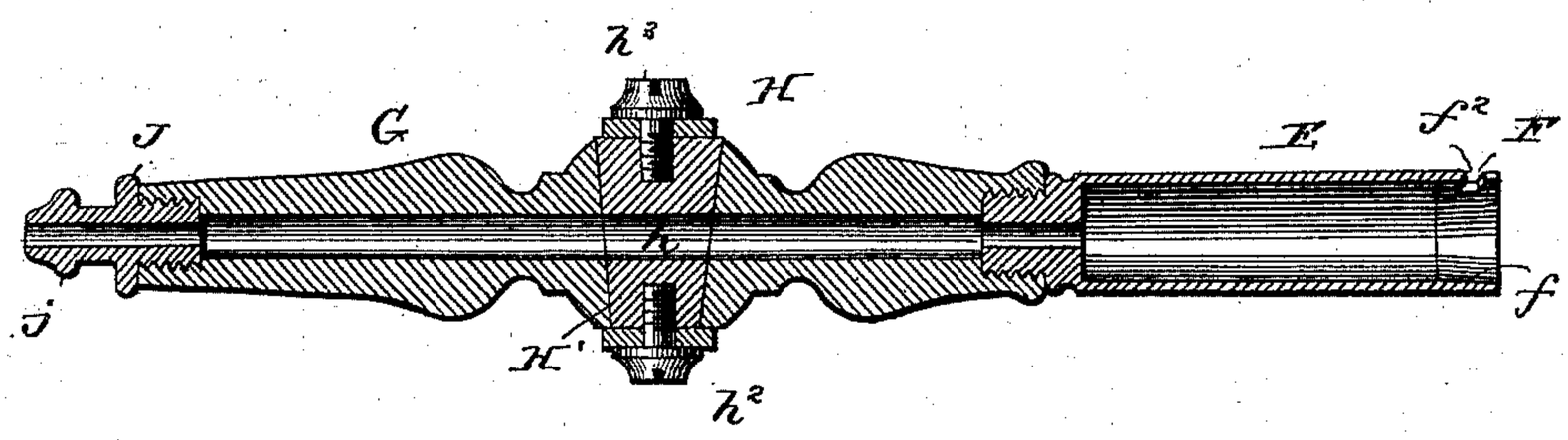



Fig. 3.

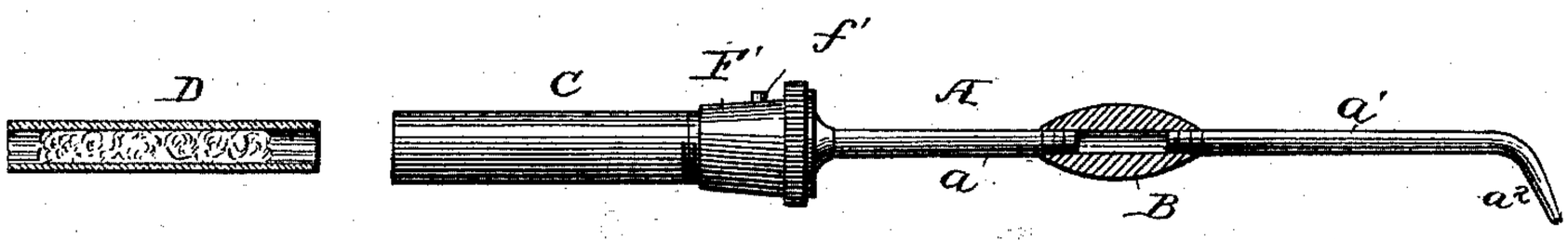
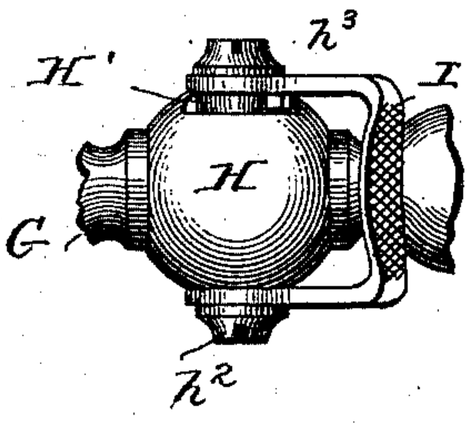



Fig. 4.

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# UNITED STATES PATENT OFFICE.

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## DENTAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 492,434, dated February 28, 1893.

Application filed December 15, 1892. Serial No. 455,276. (No model.)

*To all whom it may concern:*

Be it known that I, ALVAN STEWART RICHMOND, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Dental Apparatus, of which the following is a specification.

My invention relates to dental apparatus designed more especially for use in the application or introduction of heated air or gases, either medicated or not, to the tooth which is under treatment, for obtunding sensitive cavities in teeth in their preparation for filling, and for similar or analogous uses, and it relates more particularly to an improvement on the dental apparatus described and claimed in my patent of January 3, 1893, No. 489,235.

It has for its object to improve and simplify this class of apparatus, and to provide means whereby the heated air or gas may be more delicately and readily applied.

It has also for its object to provide means whereby the air or gas may be readily and easily medicated with different medicaments, or may be used without medicaments.

To these ends my invention consists in a device constructed, arranged, and having the mode of operation, substantially as hereinafter more particularly pointed out.

Referring to the accompanying drawings, Figure 1, is a general plan view of the device embodying my invention. Fig. 2, is an enlarged sectional view showing the valve and its connection and the cylinder. Fig. 3, is an enlarged view showing the tube with its heater, together with the inclosing cylinder, and means for medicating the air or gases. Fig. 4, is an enlarged detail view of a preferred form of valve.

The advantages of obtunding the sensitive portion of a tooth by subjecting it to a jet of warm or hot air before being operated upon, or subjecting it to the action of some therapeutic agent alone, or in connection with hot air or gas, are well known to those skilled in the art and need not be recited herein, and it is the object of my present invention to supply a device which is simple and effective, and which may be used either with the heated air or gas alone, or may be quickly and readily adjusted and adapted for use in connection with some medicament, and in both instances to be able to regulate and control the flow of the gas. Further to provide means whereby an exceedingly light and highly inflammable gas may be used without danger.

In carrying out my invention, I have shown a preferred embodiment having a tube A, which is preferably made in sections $a$, $a'$, the free end of one of the sections as $a^2$, being bent for the purpose of conveniently directing the blast to the desired point. These sections of the tube are secured in any desired manner to a bulb, bushing or swell B, which is preferably made of copper, as I find that this material will receive and retain its heat and impart it to the air a longer time, than any other substance. It will be seen that by making the tube in sections, different forms of tube may be used, by simply removing one, and replacing it with the form desired.

To the end of one of the sections as $a$, I secure a cylinder as C, which is preferably of metal, and adapted to fit this cylinder is a tube D, preferably of glass, which is adapted for the reception of the medicament, and while this medicament may be applied in any desired way, I find it preferable to use cotton or similar absorbent material placed within the tube, forming a loose body or packing through which the air is forced, and it will be readily seen that by having a number of tubes, these may be differently medicated, and any one desired can be readily inserted into the cylinder C, according to the purposes for which the apparatus is to be used, and if no medicament is desired, the tube D, can be removed and the cylinder alone be used. This cylinder C, is arranged to fit into an outer cylinder E, which is also preferably of metal, and these cylinders are provided with a bayonet joint coupling device, in order that they may be quickly and easily connected and disconnected. Further in order that some medicaments may be used which are highly explosive or volatile, it is necessary that this joint should be gas tight, so that there will be no danger of igniting the gas while heating the device, which is usually done in an alcohol lamp, and for this purpose I make the coupling device F, with tapering parts. Thus the inner end of the cylinder E, is preferably

tapered a short distance as shown at *f*, while the plug F′, connected to the cylinder C, is also tapered, and is provided with a stud or projection *f′*, taking into the slot $f^2$, in the cylinder E. Further to insure a tight fitting joint, I make the extension $f^3$, of the slot at an angle to the longitudinal axis of the cylinder. It will thus be seen that the two cylinders can be readily connected or disconnected, and that an air or gas tight joint can be obtained by simply rotating one or other of the cylinders slightly, and withdrawing it or inserting into the other as the case may be. The plug F′, preferably has an extended surface, which should be accurately fitted to the socket in the cylinder E.

Connected to the cylinder E, is an extension or handle G, which may be of any suitable material, preferably some non-conducting substance, and this handle is provided with a regulating cock H, which is shown in the present instance as a tapering plug cock H′, having an opening *h*, through it, secured in position by the set screw $h^2$, and in order that the cock may be conveniently moved, I provide a handle or bail I, which is held in position by the set screw $h^2$, and set screw $h^3$, and one end of the bail forms a bearing on the handle, by means of which the cock can be accurately adjusted by tightening or loosening the set screw $h^2$. The cylinder E may be connected to the handle G, in any suitable way, but preferably by screwing the same therein. Also connected to the handle is a coupling J, one end of which is screwed into the handle, while the other is provided with a projecting boss *j*, and connected to this coupling is an elastic tube K, the other end of which is connected to the resistance bulb L, which is preferably provided with a netting M, to prevent undue and dangerous explosion, and connected to which is the force bulb N.

With this construction, the operation of the device will be readily understood from what has been stated above, and it will be seen that the resistance bulb can be filled with air and held under pressure, and its passage through the device controlled by the valve H, which is in a convenient position to be moved by the hand of the operator, and as it passes through the cylinders and tube, it becomes heated and operates to remove the moisture from the tooth. When, however, it is desired that the air shall be medicated, the inner cylinder can quickly be removed from the outer cylinder, and a medicated tube D, placed within the inner tube, and the parts restored to their normal condition and the joint made gas-tight, so that if, for instance, an inflammable gas like chloroform or ether is used as a medicament, there will be no danger of explosion from leaking gas while the device is being applied.

The whole apparatus it will be seen is simple, convenient, compact and not liable to get out of order, while it is capable of many and varied uses in dental operations, and can be readily and quickly adjusted to suit these various uses.

While I have thus described and illustrated the preferred embodiment of my invention, it will be understood by those skilled in the art that the details of construction may be varied without departing from the principles thereof, and I do not limit myself to the precise construction and arrangement shown.

What I claim is—

1. A portable dental instrument of the class described, comprising a force bulb, a resistance chamber, a tube connected to the latter, a handle provided with a regulating valve, the cylinders detachably connected, the detachable tube for the cylinder, and the sectional delivery tube connected to the heater, substantially as described.

2. In a portable dental instrument of the class described, the combination of the inner and outer cylinders, to one of which is connected an air pressure device and valve, and to the other of which is connected a delivery tube, the cylinders being united by a beveled bayonet coupling device, substantially as described.

3. In a dental apparatus of the class described, the combination with the outer cylinder and the inner cylinder, of a gas tight coupling for the cylinders, and a removable medicament holding tube arranged to fit the inner cylinder, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALVAN STEWART RICHMOND.

Witnesses:
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CHARLES E. GRAVES.