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MEANS FOR THE PRODUCTION AND INHALATION OF TOBACCO FUMES

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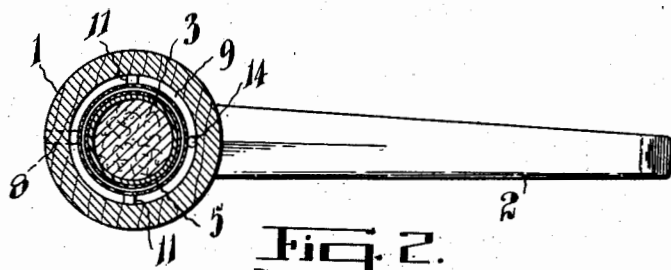


Fig. 2.

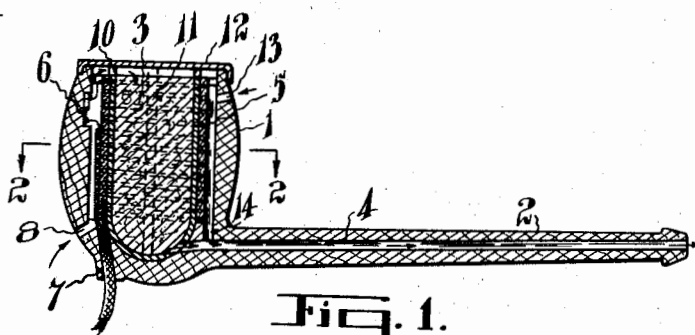


Fig. 1.

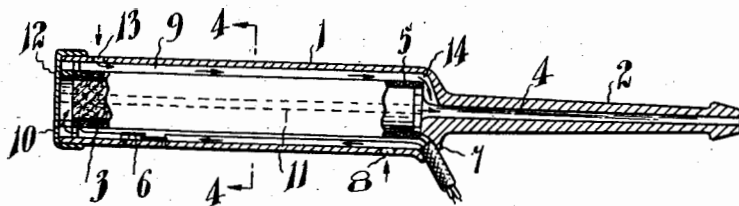


Fig. 3.

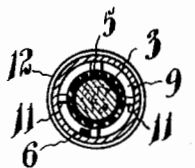


Fig. 4.

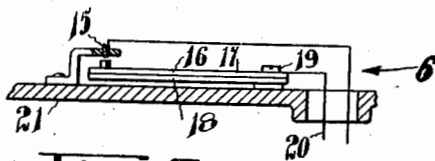


Fig. 5.

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UNITED STATES PATENT OFFICE

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MEANS FOR THE PRODUCTION AND INHALATION OF TOBACCO FUMES

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12 Claims. (Cl. 131—12)

My invention relates to improvements in means for the inhalation of tobacco fumes, and particularly to a form of tobacco pipe or cigarette holder for volatilizing the active principles of tobacco for inhalation, the volatilization being effected by controlled heat of predetermined degree, rather than by ignition and combustion as generally practiced heretofore.

Prior to this invention tobacco smoking has been practiced for the past four hundred years in substantially the same manner as that employed originally by the American Indian, namely:—by igniting a quantity of tobacco in a pipe or tube and inhaling or puffing through the air passages of the mouth, nose and lungs the hot smoke and gases produced in the combustion of the same. By this means the burning portion of tobacco provides sufficient heat in the closely adjoining unburned portion to liberate by distillation the volatile active principles; and these, in the form of smoke and vapour, together with the gaseous products of combustion, are carried by suction into the mouth and air passages.

The active principles, or alkaloids, of tobacco are four in number, namely: nicotine, nicotimine, nicotine and nicotelline, of which the first is perhaps the most potent. All four are volatile, and are known to have narcotic properties. They are generally recognized as the ingredients in tobacco which provide such universal fascination for its devotees. On the contrary the other elements in the tobacco smoke, of which there are a great many produced by combustion and consequent high temperature distillation, have no desirable effects. Among these undesirable products may be mentioned carbon monoxide, hydrogen sulphide, pyridine, ammonia, furfural, carbonic acid and prussic acid. These not only increase the toxicity of the tobacco fumes, but they are known to have a definitely irritant action on the air passages, resulting in bronchitis and cough. The tarry ingredients in the smoke are even believed to predispose to cancer of the lip and tongue, which are more frequently observed in smokers.

Aside from the deleterious effects of tobacco smoke on the subject who smokes, the liberated smoke is often a source of annoyance, discomfort and even physical injury to the non-smoker, who of necessity may be intimately associated with the smoker, as for instance in the case of the tobacco smoking mother and her young child.

The careless dropping of lighted matches and cigarette butts, which to the heavy smoker be-

comes a subconscious act, is also a prolific cause of fires with resultant loss of life and property.

In the past numerous devices have been invented with the object of entrapping or filtering out the undesirable by-products of combustion in tobacco pipes; but none of these has proved sufficiently practicable to obtain general adoption.

The main object of my present invention is to prevent to a great extent the formation of the undesirable elements in the smoke at their source, by providing a means of liberating the active principles of tobacco by controlled heat, sufficient in degree to volatilize the nicotine and other allied ingredients, but not sufficient to produce combustion of the remaining organic matter; and to adapt the application of said means in the form of a fireless substitute for the ordinary tobacco pipe and cigarette holder.

Another object of my invention is to eliminate to a great extent the discomfort and annoyance caused to non-smokers by liberated tobacco smoke in closed buildings and conveyances.

A further object of the invention is to reduce the fire hazard by eliminating to a great extent the use of fire and matches in the use of tobacco.

With these objects in view, as well as others that will become apparent from the following disclosure and appended claims, reference will be had to the accompanying drawing, forming a part thereof, and in which—

Fig. 1 is a side elevational view, in section, of my invention as applied to an ordinary tobacco pipe.

Fig. 2 is a sectional view of the bowl of the pipe along the line 2—2 as indicated in Fig. 1, showing construction not visible in Fig. 1.

Fig. 3 is a side elevational view of my invention as applied to an ordinary cigarette holder.

Fig. 4 is a sectional view of the bowl of the cigarette holder along the line 4—4 as indicated in Fig. 3, showing construction not visible in Fig. 3, and similar to that shown in Fig. 2.

Fig. 5 is an enlarged view, partly in section, of the thermostatic switch indicated by the numeral 6 in Fig. 1 and Fig. 3 showing the working parts of same in detail.

Similar numerals refer to similar parts throughout the several views.

Referring to the drawing:

In Fig. 1 and Fig. 3 the numeral 1 designates the outer shell of the bowl of an ordinary tobacco pipe or cigarette holder, as the case may be, and 2 designates the stem or mouth-piece of the same, which is provided with a central suction tube 4, which communicates with the bowl, 55

or heating chamber, 3 which serves as a receptacle for the tobacco or cigarette. Numeral 5 designates a metallic resistance coil adapted for the transmission of a suitable electric current for the production of heat, which may be wound on a tube of porcelain or other suitable insulating and heat resisting material, and is contained in an insulated chamber 9 the central cavity of the said tube providing the aforesaid bowl or heating chamber. Numeral 6 designates a thermostatic switch which is serially connected with the said coil, and is adjusted to control or regulate within a predetermined degree of variation the heat produced. No. 7 designates the electric terminals of the heating circuit which may be adapted for connection with a suitable source of electrical energy either by flexible cord as indicated or by a fixed plug and detachable cord connector secured to the base of the tobacco pipe or cigarette holder. The insulated chamber 9 is divided into two portions by the partitions 11 which extend the full length of the coil 5, on either side of the bowl 3. No. 8 designates an air inlet communicating with one portion of the chamber 9, which in turn has an outlet 10 communicating with the bowl 3. No. 12 designates a closely fitting removable cover cap for the bowl 3, which may be hinged to the same or otherwise held in position. No. 13 designates another air inlet which communicates with the other portion or subdivision of the chamber 9, which in turn has an outlet 14 communicating with the suction tube 4 near its connection to base of the bowl 3.

The thermostatic switch, as shown in Fig. 5, is of the type in general use for the heat control of small heating appliances, and consists essentially of a thermosensitive bimetallic element 16, brass on one side 17 and iron on the other side 18. A non-corrosive metallic terminal contact point 15 is adjusted for contact with a metallic insert of like material positioned directly opposite in the bimetallic element, whereby make and break of the electric current is effected within a predetermined range of temperature variation as a result of the uneven expansion of the constituents of the bimetallic element. One end of this element is secured in fixed position by the screw 19 to which is attached the wire terminal 20, the other wire terminal being connected at 15 as shown. No. 21 designates an insulating plate to prevent short circuiting in the switch.

In the following description of the operation of my invention the attainment of my objectives is obviously shown:

The bowl 3 of the pipe or cigarette holder is filled with tobacco or a cigarette, as the case may be. The cover cap 12 is then placed in position over the top or distal end, and an electric connection is made with a suitable source of electrical energy through the agency of the terminal 7. The metallic coil 5, which is adapted to transmit a suitable wattage of electrical current, then develops heat, which is maintained within a predetermined range of temperature by the action of the thermostatic switch 6. The heat thus produced is transmitted by conduction to the tobacco contained in the bowl 3, resulting in the volatilization of the nicotine and allied ingredients of the tobacco. In practice a temperature approximating the boiling point of nicotine between 200° and 225° centigrade, is found to be sufficient to produce this result without producing the combustion of the tobacco proper. If, then, suction is applied to the mouthpiece, after the ordinary manner of tobacco smoking, the volatile content

of the bowl or heating chamber 3 is drawn into the mouth and air passages of the respiratory tract, while at the same time new air is drawn through the inlets 8 and 13 into the subdivisions of the insulated chamber 9. The air entering at inlet 8 passes in the direction of the arrows over that portion of the heating coil 5 in one of the subdivisions of the chamber 9 where it is preheated, and enters the bowl 3 through the outlet 10. This preheated air then passes along through the heated tobacco or cigarette, resulting in a more even distribution of heat through the same than would be otherwise possible, and consequently liberating more completely the volatile ingredients. The air entering at inlet 13 passes in the direction of the arrows over that portion of the heating coil 5 in the other subdivision of the chamber 9 where it is preheated, and enters the suction tube 4 at the outlet 14 to serve as a means of diluting the tobacco fumes before entering the respiratory tract. The preheating of this latter air current serves to minimize condensation of the fumes in the stem 2.

In order to regulate the degree of concentration of the tobacco fumes the relative flow of air through the two inlets, 8 and 13, may be regulated by partially closing either inlet with the fingers or by means of small adjustable dampers; or the relative size of these inlets may be fixed to suit the requirements of the average tobacco user.

When the volatile elements in the tobacco have been thus exhausted the cover cap 12 may be taken off, the residue removed, and a fresh supply inserted in the heating chamber.

The pronounced advantages and possibilities of practical adaption of this invention are readily apparent. The selective action of thermostatically controlled heat, whereby the active principles of tobacco in volatile form are liberated for inhalation without combustion is of prime importance for the reasons previously mentioned. By the installation of a system of special electric wiring to each seat in public halls and conveyances, as for instance in theatres, motor buses and railway trains, the use of this invention could be made the means of preventing mutual discomfort of tobacco habitues and non-smokers; since by this invention the habitual user of tobacco could practice his accustomed indulgence without material discomfort to others, while the elimination of fire and matches would be a great factor in public safety.

Another pronounced advantage of the practice of this invention is the material economy effected in the consumption of tobacco. The tobacco is fully utilized until all the volatile ingredients are exhausted, there being no discarded portions as is the case with cigar and cigarette smoking. Likewise, in momentary intervals when the device is not in use the tobacco does not continue to be consumed as is the case with the burning cigar or cigarette; but instead, the volatile ingredients are retained in a closed chamber and utilized only as required. By this invention a given quantity of tobacco can be made to produce the effect of a much larger quantity smoked in the ordinary way.

While the practice of this invention is shown and described as adapted to the construction of the ordinary tobacco pipe or cigarette holder, this is merely the preferred form of the invention as applied to existing practices. It is readily conceivable that various modifications of the invention are feasible to meet varying require-

ments without departing from the basic principles of the same. To illustrate: A stationary unit, embodying the essential features of this invention, might be located at the centre of a table, and to this central unit a plurality of flexible tubes with individual mouthpieces could be attached, so as to meet the requirements of all those seated about the table, thus eliminating the necessity for movable electric connections.

10 What I claim as my invention is:

1. Means for the production and inhalation of tobacco fumes comprising a receptacle for tobacco; an air conduit whereby air may be drawn through the receptacle for inhalation; electric means for conductively heating the tobacco in the receptacle; and automatic means adapted for controlling the electric heating means to maintain the tobacco at a temperature sufficient to liberate volatile constituents but below the temperature for initiating combustion.

2. Means for the production and inhalation of tobacco fumes comprising a receptacle for tobacco; an air conduit whereby air may be drawn through the receptacle for inhalation; and electric means for heating the tobacco in the receptacle including a resistance element adapted to transmit heat conductively through the wall of the receptacle to the tobacco.

3. Means for the production and inhalation of tobacco fumes comprising a receptacle for tobacco; an air conduit whereby air may be drawn through the receptacle for inhalation; and electric means for heating the tobacco in the receptacle including a resistance element adapted to transmit heat conductively through the wall of the receptacle to the tobacco, the air conduit including a portion leading to the inlet end of the receptacle and positioned to be heated by the resistance element.

4. Means for the production and inhalation of tobacco fumes comprising a receptacle for tobacco; an air conduit whereby air may be drawn through the receptacle for inhalation; electric means for heating the tobacco in the receptacle including a resistance element adapted to transmit heat conductively through the wall of the receptacle to the tobacco, the air conduit including a portion leading to the inlet end of the receptacle and positioned to be heated by the resistance element; and a second air conduit also positioned to be heated by the resistance element, communicating with the atmosphere at one end and at its other end with that part of the first mentioned conduit through which pass air and fumes from the receptacle.

5. Means for the production and inhalation of tobacco fumes comprising a receptacle for tobacco; an air conduit whereby air may be drawn through the receptacle for inhalation; electric means for heating the tobacco in the receptacle, the air conduit including a portion leading to the inlet end of the receptacle and positioned to be heated by the heating means; and automatic means adapted for controlling the electric heating means to maintain the tobacco at a temperature sufficient to liberate volatile constituents but below the temperature for initiating combustion of the tobacco.

6. Means for the production and inhalation of tobacco fumes comprising a receptacle for tobacco; an air conduit whereby air may be drawn through the receptacle for inhalation; electric means for heating the tobacco in the receptacle, the air conduit including a portion leading to the inlet end of the receptacle and positioned to be

heated by the heating means; and a second conduit also positioned to be heated by the heating means, communicating with the atmosphere at one end and at its other end with that part of the first mentioned conduit through which pass air and fumes from the receptacle.

7. Means for the production and inhalation of tobacco fumes comprising a receptacle for tobacco; means adapted for the passage of air through the said receptacle and for communication with the human respiratory tract; means for preheating the air before it passes through the receptacle and for applying heat by conduction to the tobacco; means for controlling the heat to maintain the tobacco at a predetermined temperature, sufficient in degree to liberate the volatile constituents of the tobacco but below the temperature for initiating combustion of the tobacco; and means for modifying the concentration of the volatile products prior to exit from the device.

8. Means for the production and inhalation of tobacco fumes comprising a receptacle for tobacco; means adapted for the passage of air through the said receptacle and for communication with the human respiratory tract; an electric heating element adapted to preheat the air before it passes through the receptacle and to transmit heat by conduction to the tobacco; a thermostatically controlled switch in circuit with the heating element for controlling the heat to maintain the tobacco at a predetermined temperature, sufficient in degree to liberate the volatile constituents of the tobacco but below the temperature for initiating combustion of the tobacco; and means for modifying the concentration of the volatile products by the admixture of preheated air prior to exit from the device.

9. Means for the production and inhalation of tobacco fumes comprising a receptacle for tobacco; a suction tube communicating with the lower end of the receptacle; an air chamber about the said receptacle divided longitudinally by partitions into two parts, one part having an air inlet adjacent its lower end and at its upper end communicating with the upper end of the receptacle, while the other part has also an air inlet and at its lower end communicates with the suction tube; and an electric heating element positioned in said air chamber adapted to heat air passing through the chamber and to transmit heat conductively to the tobacco in the receptacle.

10. Means for the production and inhalation of tobacco fumes comprising a receptacle for tobacco; a suction tube communicating with the lower end of the receptacle; an air chamber about the said receptacle divided longitudinally by partitions into two parts, one part having an air inlet adjacent its lower end and at its upper end communicating with the upper end of the receptacle while the other part has also an air inlet and at its lower end communicates with the suction tube; an electric heating element positioned in said air chamber adapted to heat air passing through the chamber and to transmit heat conductively to the tobacco in the receptacle; and a thermostatically controlled switch in the said chamber and in circuit with the heating element for controlling the heat to maintain the tobacco at a temperature sufficient to liberate volatile constituents but below the temperature for initiating combustion.

11. Means for the production and inhalation of tobacco fumes comprising a receptacle for to-

5 bacco; an air conduit whereby air may be drawn
through the receptacle for inhalation; and elec-
tric means for heating the tobacco in the recep-
tacle including a resistance element transmit-
ting heat conductively through the wall of the
10 receptacle to the tobacco, the air conduit includ-
ing a portion leading to the inlet end of the re-
ceptacle and positioned to be heated by the re-
sistance element, the air conduit also having a
wall part displaceable to give access to the in-
terior of the receptacle.

12. Means for the production and inhalation
of tobacco fumes comprising a receptacle for to-

bacco; means adapted for the passage of air
through the said receptacle and for communica-
tion with the human respiratory tract; means for
preheating the air before it passes through the
receptacle and for applying heat by conduction
to the tobacco; and means for controlling the heat
to maintain the tobacco at a predetermined tem-
perature, sufficient in degree to liberate the vola-
tile constituents of the tobacco but below the tem-
perature for initiating combustion.

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