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SMOKING PIPE

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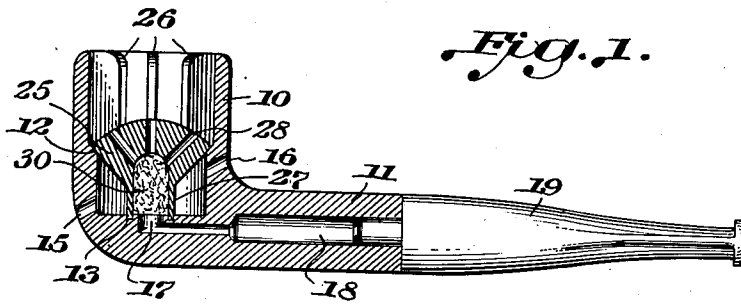


Fig. 1.

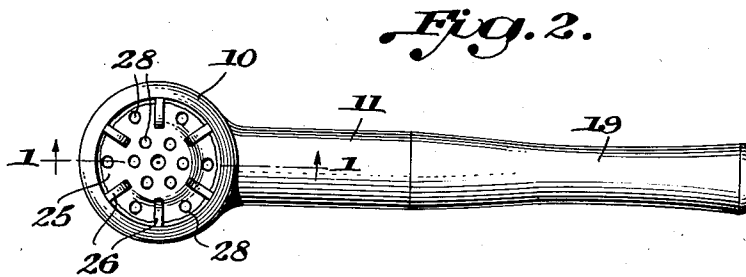


Fig. 2.

Fig. 3.

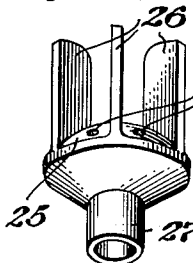


Fig. 5.

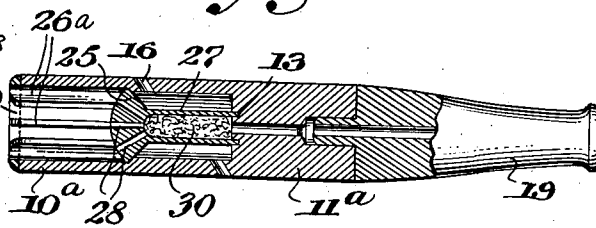
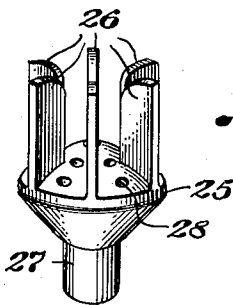


Fig. 4.



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SMOKING PIPE

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4 Claims. (Cl. 131—194)

1

The invention is concerned with a tobacco pipe, in which are included means for controlling the condensation of vapors produced during smoking.

One of the features of the invention is the provision of means for transferring heat from one part of the tobacco charge to another, whereby to control condensation within the tobacco charge.

Another feature of the invention is the provision of means for limiting the condensation within the tobacco charge, together with cooling devices interposed in the path of the smoke for removing heat therefrom and provoking a controlled condensation of vapors externally of the tobacco space.

A further feature of the invention is the provision of a tobacco pipe having heat-conductive devices for transferring heat from the combustion zone toward unburnt portions of the tobacco charge whereby to maintain the latter at a temperature above condensation of moisture therein, together with means for withdrawing heat from the combustion zone and for cooling the smoke after leaving the tobacco space.

With these and other features as objects in view, two illustrative forms of practice are shown in the accompanying drawings, in which:

Figure 1 is a sectional view substantially on line 1—1 of Fig. 2, taken along the axes of the bowl and of the bowl stem extension of a pipe embodying this invention, the mouthpiece being shown in elevation.

Figure 2 is a top view of the same.

Figures 3 and 4 are perspective views of the separator structure employed in Figures 1 and 2.

Figure 5 shows a modified form, with the structure shaped as a cigarette pipe.

In pipe smoking, the initial puffs from a freshly filled and lit pipe are usually mild and full of aroma. As the smoking proceeds, the operation may be divided into three successive stages: (1) an initial stage which produces a mild and aromatic smoke; (2) an interim stage which produces a hot acrid smoke with little aroma; (3) a terminal stage which produces a sultry, offensive smoke with no aroma. In the initial stage, an abundance of oxygen is available at the surface of the burning tobacco for proper combustion of the dry tobacco; and the smoke passes through a dry cold bowl filled with cold tobacco and is cooled in its passage, but an appreciable amount of condensation matters are deposited in the cool portion of the tobacco charge, and charring occurs adjacent the burning zone. During the in-

2

terim stage, the combustion progresses through the charred tobacco and through the tobacco charge which now contains greater and greater amounts of condensed matters, and the quantity of oxygen available is channelized by the draft toward the smoke outlet at the bottom of the bowl so that the greater part of the combustion of tobacco takes place along the center axis of the bowl, wherewith the surrounding mass of tobacco and char absorbs condensed matters and also acts as a heat insulator. The fire causes progressive re-evaporation of the condensed materials. From time to time, the smoker manipulates the tobacco so that this surrounding mass is levelled off, thus bringing the saturated tobacco toward the combustion zone. During the terminal stage, the accumulation of heat toward the center of the bowl, with restrictions on the delivery of oxygen for proper combustion, gives rise to a major charring or carbonization rather than to clear-cut combustion, and this char acts to absorb moisture and other volatiles, being highly hygroscopic and absorbent, wherewith the final stage of smoking represents heating which produces re-evaporation of moisture and products of semi-combustion without the presence of a volume of cold unconsumed tobacco by which these products are eliminated from the smoke.

In the customary use of a conventional pipe, likewise, the loose remnants of tobacco are removed, usually by rapping out this dottle, which is moist from its saturation with condensed vapors. During the combustion, a baked crust or residue forms on the side and bottom of the bowl as a char saturated with ill-smelling condensation products, and can only be eliminated by scraping the bowl with a sharp instrument.

It has been sought to remove condensable vapors by employing condensers or filters, but these devices can only act after the cold underlying parts of the tobacco charge have been brought above condensation temperature, and hence are only effective during the latter portions of each smoking operation. Furthermore, many such devices are inclosed within the wood or hard rubber portions of the pipe, so that they are effectively insulated from being cooled to the desirable temperature for effecting condensation. When metal heat-conductive structures are used, it is usually found that the condensation ceases during the aforesaid interim stage, due to lack of sufficient area of cooling surfaces in ratio to the volume of smoke passing through the stem, and because the condenser is raised to such a tem-

perature during this stage that there is not sufficient temperature difference to cause the necessary condensation.

With the pipe according to the present invention, the oxygen is distributed over the cross-sectional area of the tobacco charge, and means are provided for transferring heat from the combustion zone to the lower parts of the charge, whereby to prevent these lower parts from acting as a condenser for water vapor and the more volatile constituents of the smoke. The smoke therefore passes through a filter and condenser of a heat-conductive material which presents a large area to the volume of smoke for absorbing heat therefrom and is effective for transmitting this heat to an external wall which is exposed to a cooling air current. Thus, the removal of water vapor is not effected by the lower part of the tobacco charge, but by the condenser, and this condenser is maintained cool so that its effect prevails throughout the smoking operation, with the result that the tobacco is maintained dry and free from the vapors which heretofore have successively required re-evaporation as the smoking proceeds. In addition, the present structure provides easily operated and effective means for preventing the accumulation or caking of char upon those portions of the bowl structure which are contacted by the tobacco charge.

The embodiment of the invention illustrated in Figures 1 to 4 comprises a body having the bowl portion 10 and the stem extension 11, which may be of briar. The bowl portion 10 has a cavity extending from the open end, and includes the internal shoulder 12 which is shown as a conical surface. Below the shoulder 12, the lower part of the cavity has a cylindrical wall surface and a substantially flat floor in which is a circular groove or recess 13. An air inlet 15 at a low level, and an air outlet 16 at a high level, extend through the said cylindrical wall surface. The smoke outlet 17 is within the circular floor groove, and leads to the passage 18. A mouthpiece 19 is shown as a conventional bit with a reduced end fitting the passage 18.

Within the bowl portion 10 is located a removable separator having a body 25 with a convex upper surface from which project the partitions 26 which are six in number in this illustrative form. These partitions have outer edges closely fitting the portion of the bowl cavity above the shoulder 12 and extend inwardly toward the bowl axis and thereby divide the bowl space into compartments. The partitions terminate short of the bowl axis. The lower surface of the separator has a conical shape for fitting the shoulder 12, and a reduced central cylindrical extension 27 which is hollow and has its lower end engaged in the circular floor groove 13. The space within the extension 27 is enlarged into the body 25 (Fig. 1) and is illustrated as having a hemispherical upper end surface. Passageways or flues 28 lead through this end surface and communicate with the space above the body 25, it being preferred to have at least one flue opening into each compartment as delimited by the partitions 26, together with a central flue. The separator is of non-combustible material, and preferably is of a metal such as aluminum which conducts heat readily and does not rust.

The space within extension 27 receives a filter member 30, preferably of steel wool, metal screening, spun glass, perforated or corrugated metal, or like heat-resistant and heat-conductive material for collecting bits of tobacco and ash, and for

receiving condensed tar, and being effective to transfer the heat of the smoke to the extension 27, for cooling the smoke.

In service, the pipe is filled with tobacco in the normal way, packing to the user's preference into the central space and in the individual compartments. The tobacco is lit, and smoking accomplished as usual. The central space and compartments tend to act individually and each to receive a proper amount of oxygen; but heating at a partition is transmitted through its volume so that hot spots are relatively cooled and cool spots relatively warmed, whereby a more even combustion occurs and there is less tendency to char a portion of the charge, to permit the char to cool and act as an absorbent, and then to heat it again.

The lower surface of the body 25 and its extension 27 are cooled by air entering at the low air inlet 15 into the jacket space between the external wall surface of the gas-tight extension 27 and the inner wall surface of the bowl, with the heated air escaping through the high air outlet, whereby the filter 30 is cooled by conduction through the wall of the extension 27 so that condensation of tars, etc., is augmented.

After completing the smoking of the charge, any accumulation of cake on the inner wall of the cavity can be scraped away by rotating the separator about the bowl axis, wherewith the separator rides on the shoulder 12 and in the groove 13.

The separator can be removed, and the filter 30 cleaned and replaced when clogging or saturation appears.

In the modified form shown in Fig. 5, the parts and operation are essentially the same, and like reference numerals have been employed. The bowl portion 10^a has a common axis with the stem extension 11^a and the mouthpiece 19. It is customary to have such cigarette pipes with bowl cavities of smaller diameter than those of the conventional pipes as illustrated in Fig. 1; and the partitions 26^a are likewise thinner and of lesser radial dimension. The free or outer ends of these partitions are shown as reinforced by a peripheral ring 40.

The illustrative forms are not restrictive, and the invention may be employed in many ways within the scope of the appended claims.

I claim:

1. A tobacco pipe including a bowl and a stem, in combination with a heat-conductive separator dividing the bowl into an outer tobacco-holding space and an inner cooling portion, the separator having a hollow extension for leading the smoke to the stem, the said cooling portion providing a chamber around the extension, the bowl having air inlet and outlet openings to said chamber, and heat-conductive partitions on said separator and located in the tobacco space to divide the same into compartments, the separator having flue openings from the hollow in said extension to the outer surface of the separator with a flue opening into each of said compartments, said partitions closely conforming to the wall of the tobacco space and extending radially toward and terminating short of the bowl axis.

2. A partition structure for a tobacco pipe having a bowl comprising a thick metal base to be positioned across the tobacco cavity of the bowl, a hollow extension on the base and having a diameter less than that of the base and adapted to be positioned between the base and the bottom of the bowl when the structure is in use, and

5

peripherally spaced and radially arranged metal members connected to the base and extending therefrom into the tobacco space, said members terminating short of the axis of the bowl, said base having apertures opening at one face of said base within said hollow extension, and opening at the other face in the spaces between said metal members.

3. A tobacco pipe including a bowl and a stem, in combination with a heat-conductive separator dividing the bowl cavity into a tobacco-holding space and a cooling portion, the separator having a hollow extension providing a passage for leading the smoke to the stem, the said cooling portion providing a chamber around the extension and separated from the said passage, the bowl having air inlet and outlet openings to said chamber, the separator having flue openings leading from the passage in said extension to the separator surface adjacent the tobacco space, and heat-conductive partitions on said separator and located in the tobacco space for conducting heat upwardly and downwardly from the combustion zone, the downwardly conducted heat being delivered to said separator, said partitions terminating short of the bowl axis.

4. A tobacco pipe including a bowl and a stem, said bowl presenting a cavity having a floor with a recess, said floor having a smoke outlet leading to the stem, a heat-conductive separator dividing the bowl into a tobacco-holding space adjacent the open end of the bowl and a cooling chamber adjacent said floor, the separator having a hollow extension engaged in said recess and providing a passage for leading the smoke

6

to the smoke outlet, said passage being closed off from said cooling chamber, heat-conductive filter material in said extension, the bowl having air inlet and outlet openings to said chamber, the separator having flue openings leading from the passage in said extension to the separator surface adjacent the tobacco-holding space, and heat-conductive members connected to said separator and extending through the tobacco-holding space to the open end of the bowl, said members extending inward from the bowl wall and terminating short of the bowl axis.

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