

No. 726,875.

PATENTED MAY 5, 1903.

C. I. DANGLER.
HEATING AND IGNITING ATTACHMENT FOR STEAM PROPELLED VEHICLES.

APPLICATION FILED MAR. 27, 1902.

NO MODEL.

4 SHEETS—SHEET 1.

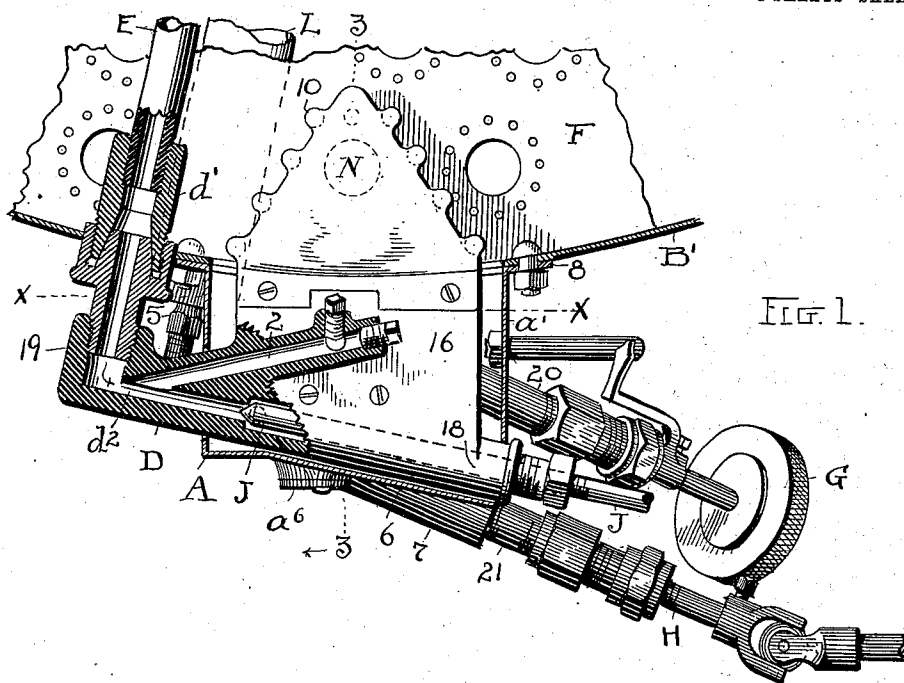


FIG. 1.

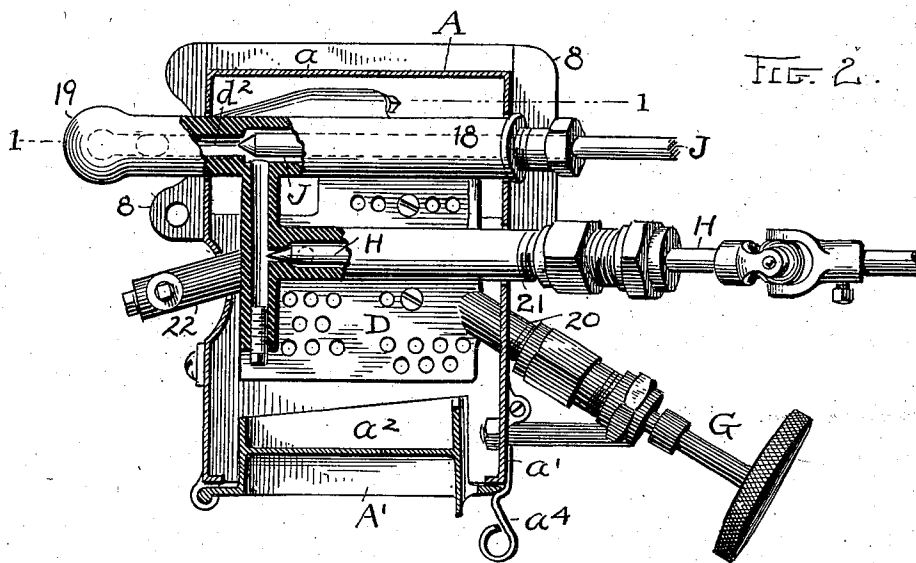


FIG. 2.

ATTEST

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ATTY

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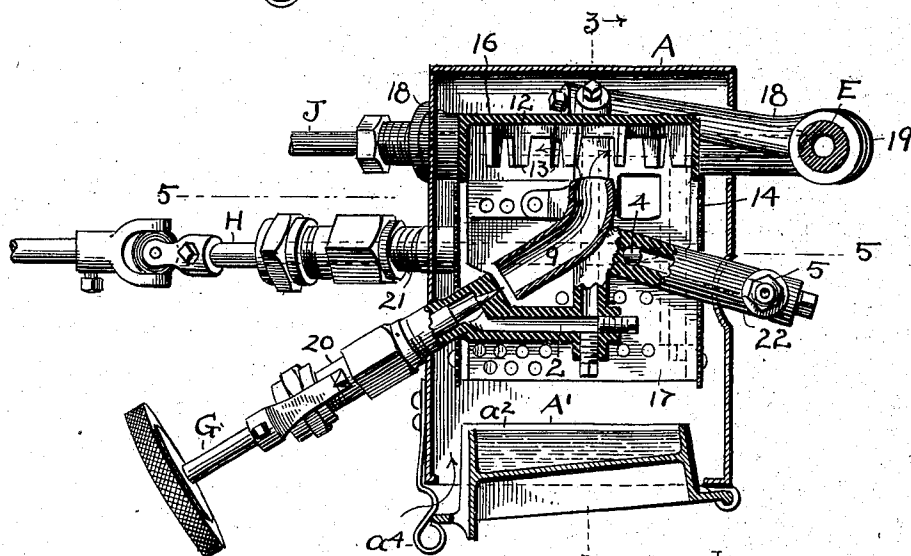
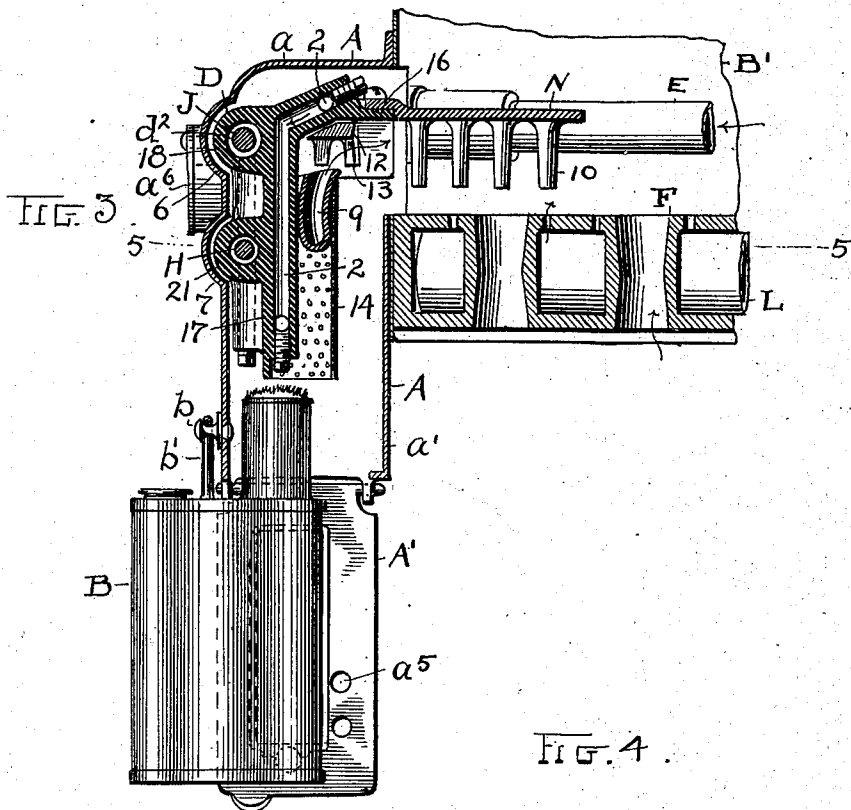
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

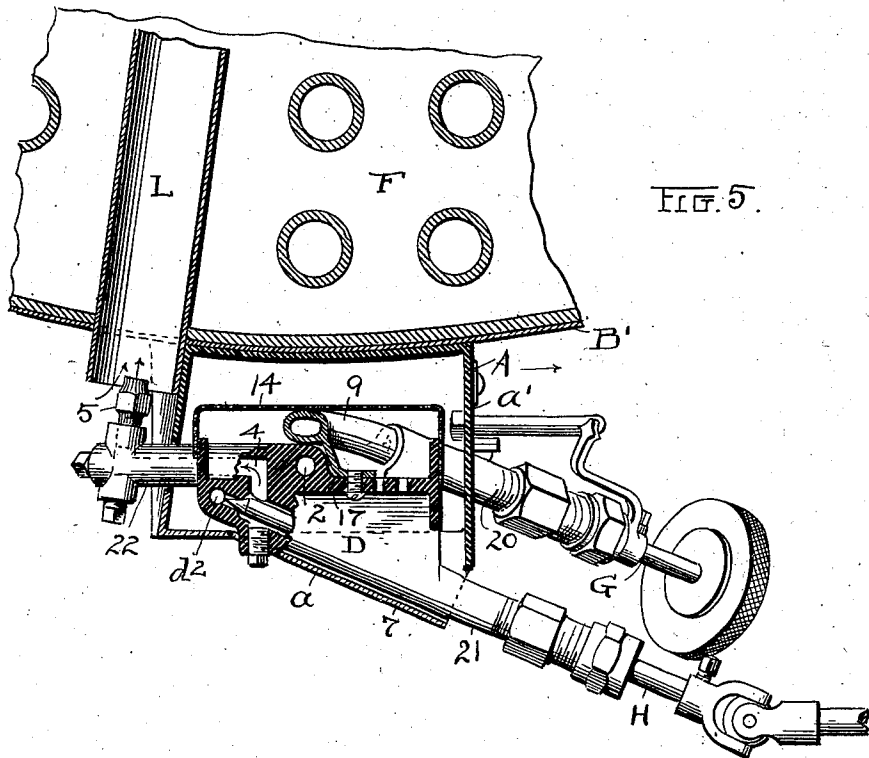


FIG. 5.

FIG. 6.

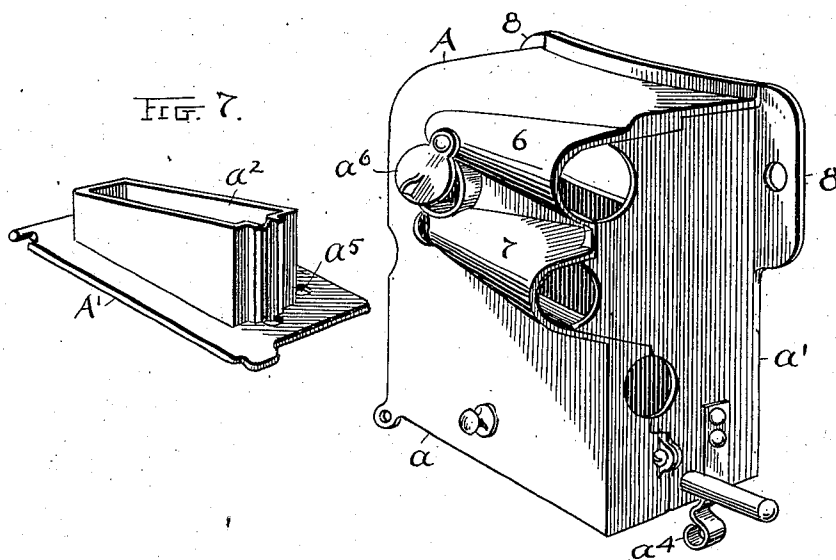


FIG. 7.

ATTEST

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4 SHEETS—SHEET 4.

FIG. 8.

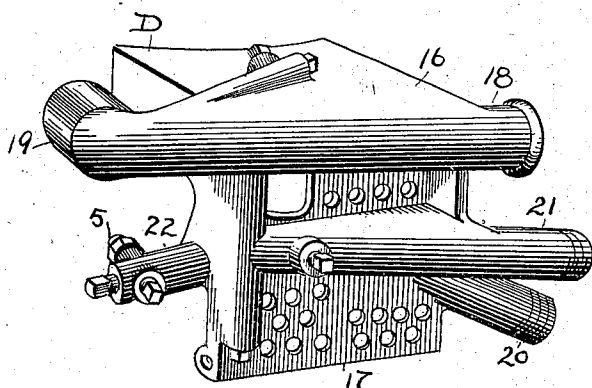


FIG. 9.

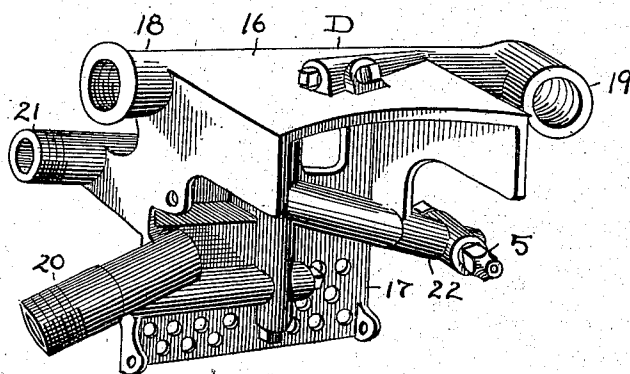
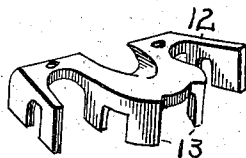


FIG. 10.



ATTEST

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UNITED STATES PATENT OFFICE.

CHARLES I. DANGLER, OF CLEVELAND, OHIO.

HEATING AND IGNITING ATTACHMENT FOR STEAM-PROPELLED VEHICLES,

SPECIFICATION forming part of Letters Patent No. 726,875, dated May 5, 1903.

Application filed March 27, 1902. Serial No. 100,198. (No model.)

To all whom it may concern:

Be it known that I, CHARLES I. DANGLER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Heating and Igniting Attachments for Steam-Propelled Vehicles; and I do declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention has reference to a new and improved heating and igniting attachment for steam-propelled vehicles; and the invention consists in the construction and combination of parts substantially as shown and described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a sectional plan view of my new and improved attachment on a line corresponding substantially to 1 1, Fig. 2; and Fig. 2 is an outside elevation or face view of the attachment with the casing sectioned away at the front to disclose the internal parts. Fig. 3 is a vertical sectional elevation of the attachment on a line corresponding to 3 3, Figs. 1 and 4, and showing an alcohol-lamp in position for initial heating and lighting of the burner. Fig. 4 is a vertical sectional elevation of the attachment on a line at right angles to Fig. 3 and corresponding to line *xx*, Fig. 1. Fig. 5 is a plan section on a line corresponding to line 5 5, Figs. 3 and 4. Fig. 6 is a perspective elevation of the casing which incloses my attachment and constitutes an essential part thereof, as hereinafter fully described; and Fig. 7 is a perspective elevation of the hinged bottom for the said casing. Figs. 8 and 9 are opposite perspective elevations of the attachment-body. Fig. 10 is a perspective top view of the initial flame spreader and protector.

The invention thus shown and described is especially intended as an attachment to be used for initially heating and lighting generators and burners in steam-propelled vehicles. However, the attachment is not definitely limited to this use, but is designed to be in primary heating and lighting relation with the main generator at all times, so as not only to get the same started and in a gen-

erating condition, but to be in readiness for service and, in fact, performing a service at all times after being lighted and while the vehicle is kept under steam, as hereinafter fully described.

Referring to the drawings, A, Fig. 6, represents the casing of the attachment and which in a full-sized device does not necessarily exceed about four inches in height, three in width, and two in depth, front to rear, and the said casing is preferably formed in two parts *a* and *a'*, detachably but firmly connected together, so as to be the same in practice as if the casing were made wholly in one piece. The said casing is closed against air currents or drafts at all points, so that it does not make any material difference inside how severe a wind may be blowing or at what speed the vehicle may be traveling. At its bottom the casing is provided with a hinged door *A'*, in which there is an oil cup or reservoir *a²*, adapted to receive oil for initially heating and lighting in emergencies and when for any reason the alcohol-lamp B (shown in Fig. 3) is not available for such purpose. Usually and preferably, however, the alcohol-lamp is used, because it can be turned up to afford a certain definite volume of heat regardless of breezes or drafts, and therefore serves as a safe and desirable medium for initial heating. However, when this lamp is not available a sufficient quantity of oil may be dropped into reservoir *a²* and ignited for the purpose of starting the burner. It will be noticed that the said reservoir has inclined edges deepest at the front. This is for the purpose of allowing the door *A'* to be dropped sufficiently to afford a supply of air for combustion, as seen in Fig. 4, which also prevents side draft, and hence does not interfere with the burning of the oil in said reservoir when this means of heating must be resorted to. A spring-catch *a⁴* supports the bottom *A'* when said bottom is in its lower or closed position, Fig. 4. When the alcohol-lamp B is used, said bottom is dropped entirely down, as in Fig. 3, and when in closed position the said bottom shuts off the draft from below, excepting such as may be provided for through small openings like *a³*, Figs. 3 and 7. The entire casing is thus closed against drafts or atmospheric dis-

turbances from the outside when all the parts are in working position, and its only material opening then is at its rear and top, Fig. 3, where there is free discharge into the space 5 beneath the boiler B'. A drop cover or door a^6 , Fig. 6, closes a small lighting-opening in the casing through which a match can be inserted for ignition of the gas within.

The burner attachment D is inclosed within 10 in the casing A, excepting certain portions thereof extending out from the same for making the necessary valve and pipe connections. The said part D is preferably cast in one piece throughout and is connected with the oil-supply 15 pipe E, open to the source of oil-supply whatever and wherever it may be located, so that as the oil passes from said source it approaches the said attachment D through the space beneath boiler B' and the main burner 20 F, and the said attachment is affixed to the end of said pipe by the coupling parts d' , Fig. 1. It follows, of course, that all the oil or vapor consumed by the main burner F must pass through the attachment D; but as a matter 25 of fact when the supply-pipe E becomes thoroughly heated the generation of vapor or gas is so complete therein that for the time it does not depend upon the attachment D to promote such generation, yet notwithstanding 30 the said attachment is kept lighted and in a generating condition by its own resources, so that the main generator may be turned off at any time and as often as may be desired without depriving the main burner of a supply 35 of vapor or gas for immediately starting the vehicle again after any stop, whether short or long.

Now, having reference to the means for controlling the flow of oil or vapor through the 40 part D, it will be seen that there are three different valves—G, H, and J, respectively—and the construction and arrangement of said parts will be better understood when it is seen what the functions of these valves are. 45 Thus the valve G may be termed the "initial" or "pilot" light valve—that is, it controls the flow of oil to the initial heating cup or reservoir a^2 , if it be used, and if not it controls the outflow of vapor that has been generated in the attachment by the heating there- 50 of through alcohol-lamp B. Thereafter and in the continued use of the valve G during a run of the vehicle the said valve is set to maintain flame and heat in the attachment sufficient to keep it in a generating condition, 55 so as to be able to start the vehicle at any moment, however long or short a time it may have stopped. The duct 2, leading from duct d^2 , Fig. 1, is constantly open to the supply-pipe 60 E and is exclusively controlled by valve G.

Valve H is a hand-controlled valve from the seat of the driver and enables the driver to turn on more or less vapor to main burner F. In a sense this is the main valve, as it is 65 exclusively employed to determine the quantity of vapor supplied to the main burner, and hence also the volume of heat generated.

Said valve is, however, inward from or after valve J in respect to supply-pipe E and in a measure subordinate thereto under certain 70 conditions—that is, the valve J is an automatically-controlled valve by or through the usual steam-pressed diaphragm, (not shown,) by which its control is effected. If the steam 75 be high, the said valve is supposed to tell this fact by being more or less completely closed, and if the steam be low it is supposed to be wide open, the pressure of steam determining its position automatically. The vapor 80 having passed valve H, it issues through duct 4 and nozzle 5 into mixer-tube L, Fig. 5.

All the valve-stems project out beyond casing A, as do also certain projecting portions of burner attachment D, in which said stems or valves are supported, and the needle form 85 of valve is preferably used. To accommodate certain projecting portions of attachment D, casing A is provided with swells 6 and 7, Fig. 6, and the said casing has ears 8, through which it is fixed in position. 90

Now, referring to the features of construction, it will be noticed that pilot-valve G dis- 95 charges into a mixing-tube 9, Figs. 3 and 4, whence the gas issues beneath the spreader and deflector N, Figs. 1 and 3. This is a separate part, preferably fixed to part D and extending inward beneath boiler B' and over the 100 edge of burner F, through the rear opening in casing A and has fingers or projections about its edges serving as heat-distributors and to prevent the flame from going out by down- 105

As to the direction of travel, the several valve-stems are at or toward the front of the attachment, and the orifice through which 110 the vapor issues into the main burner through mixing-tube L is at the rear thereof, where casing A serves as a perfect guard to keep off drafts and prevent blowing out when the vehicle is in motion.

The vapor issuing from the pilot-orifice and mixer 9 impinges against a spreader 12, having down projections 13, adapted to break and distribute the vapor and flame.

The curved mixer-tube 9 is a separate part 115 fastened by screws to the attachment-body D. A gauze or perforated metal sheet 14 serves as an interior protection to the pilot-valve orifice discharging into tube 9.

In this device it will be seen that casing A 120 has its inner side or wall slightly curved transversely to fit close up against the side of the curved support B, and this cuts off all possible draft between said parts and helps especially to protect the entrance of the vapors 125 to main mixer-tube L, Fig. 5. I might of course place a gauze hood over this entrance; but this is not needed with my present arrangement of parts, whereby the casing A cuts off all drafts created by the forward 130 movement of the vehicle. A further distinguishing and important feature of this structure is that the pilot-light cannot be cut off from the supply by automatically-controlled

valve J. This occurs by reason of duct 2, Fig. 1, being always in open communication with supply-pipe E outside of valve J.

Figs. 8 and 9 show the structural outlines of the attachment-body D, and the peculiarities of construction, as shown, especially adapt said body to the uses of my invention. These peculiarities comprise a solid top 16 and a back 17 at right angles thereto, which together sustain all the other portions of the body. It will be noticed that the channel 18 for the steam-controlled automatic valve J lies directly across the front and top of the body, with a right-angled projection 19 extending beyond the top 16 relatively as shown and internally threaded to receive the supply-pipe connections *d'*. In addition to these features are the projections 20 for the pilot-valve and projection 21 for the main valve, also extending outside of the main casing A, as clearly seen in other figures, whereby all or any of said valves or valve-stems can be removed without disturbing the said casing. It also becomes a matter of very great convenience to have the extension 22 for the main orifice-nipple 5 wholly outside of the casing for removal and cleansing the nipple at any time and by which arrangement no other part of the attachment need be disturbed. The run of the oil or vapor ducts in said body is clearly shown in the other views.

As herein shown, the bottom A' of the casing is hinged on both sections thereof, and the entire top of the casing is a part of the front section, thus protecting against leakage into the casing.

By having the attachment-body D provided with a right-angled projection 19 for connection with the oil or vapor supply pipe I get the advantage of having the coupling or joint *d'* for said parts outside of all other parts and where convenient access is afforded for connecting and disconnecting the attachment while all the other parts remain in operative position.

The alcohol-lamp B may have a bail *b'* suspended on a catch *b*, Fig. 3, to temporarily support said lamp.

The functions of the so-called "initial-flame spreader" 12 are very important. Hitherto there has been trouble by reason of the initial flame often being allowed to run too high, so that it would burn out the top of the casing. Then, also, there was danger that currents would steal through the attachment and blow out the flame. To overcome both of these objections, I have adopted the device seen in Fig. 10, which has downward projections 13 and wings serving as flame-breakers, thus preventing concentration of the entire flame at any one point and interrupting currents or drafts from blowing out the flame. By reason of the usual pressure sustained in the oil-supply the gas enters through conduit 9 as from a blowpipe, and with a hot flame play-

ing about this device 12 it is indispensable to have some such device as this for the purposes recited. The device N, Figs. 1 and 3, participates in these functions and for this reason is substantially V-shaped in plan, thus guarding the inner space by its series of projections 10.

What I claim is—

1. In initial heating and igniting apparatus, the main-burner casing, an attachment-casing having a vertical inside wall bearing against said burner-casing and thereby cutting off all air-currents between them, in combination with a generator in said attachment-casing having its vapor-supply orifice for the main burner on the outside of said attachment-casing and at the rear and in a line therewith and in a position to be shielded by said attachment-casing in the forward movement of the apparatus, substantially as described.

2. A casing for a burner attachment, said casing consisting of two parts, a support on one end of each of said parts, a bottom hinged on said supports having a drip-cup, the free end of which is deeper than the other, and means on said casing for supporting the free end of said bottom substantially as described.

3. The attachment-casing and the hinged bottom thereon and a drip-cup on said bottom the walls at the free end being of greater height than the walls at the hinged end, substantially as described.

4. The attachment-casing and the hinged bottom thereon and a drip-cup on the said bottom the free end of which is deeper than the other end, substantially as described.

5. The attachment-body, the main burner at the side thereof, a flame-distributor on said body extending over and in close proximity to the main burner comprising a horizontal plate provided with depending projections about its edge having their ends free, designed to hold and distribute the flame over the burner, substantially as described.

6. The attachment-body having a pilot-light, a flame-distributor fixed to the top of said attachment-body in close proximity to the orifice of said pilot-light and extending inward from said attachment-body, and provided with a series of depending projections having their ends free and arranged at intervals about its edge, substantially as described.

7. The body-part attachment and the initial-flame distributing and projecting device fixed thereto and provided with a series of depending projections with their lower ends free and arranged in a tortuous line across the same, substantially as described.

Witness my hand to the foregoing specification this 10th day of March, 1902.

CHARLES I. DANGLER.

Witnesses:

R. B. MOSER,
T. M. MADDEN.