

(No Model.)

3 Sheets—Sheet 1.

H. RUPPEL.
VAPOR STOVE.

No. 521,128.

Patented June 5, 1894.

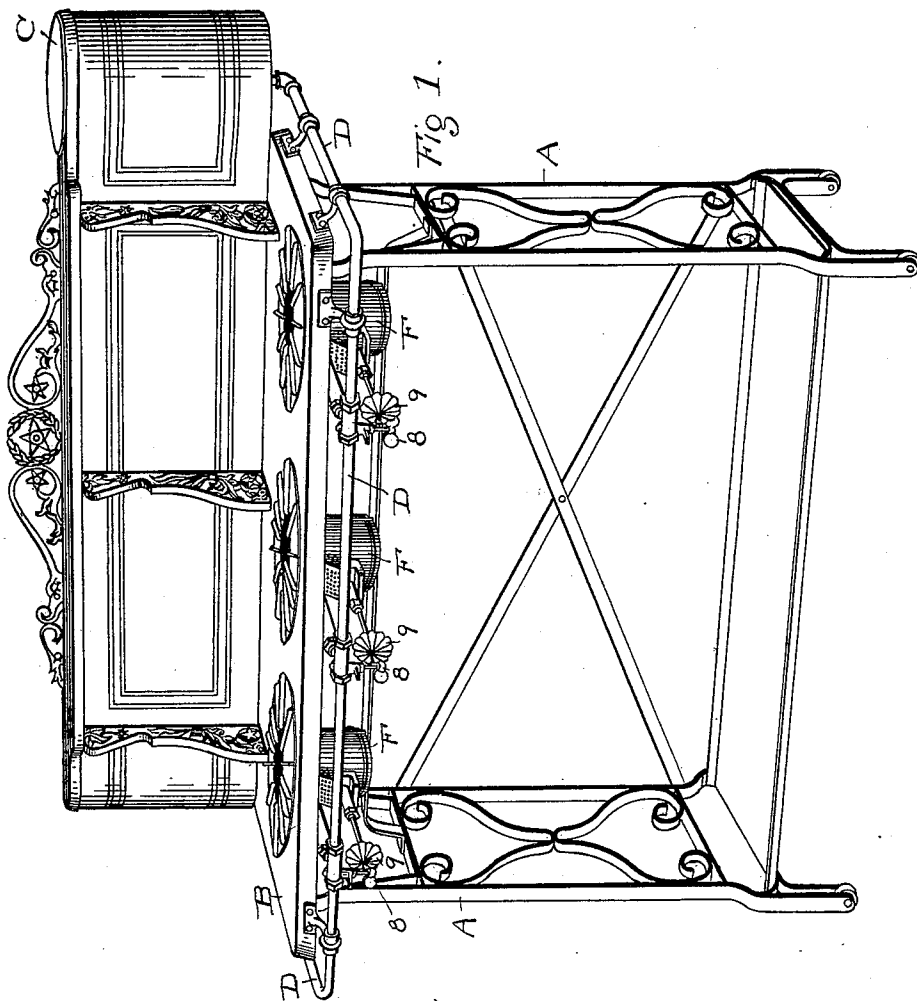
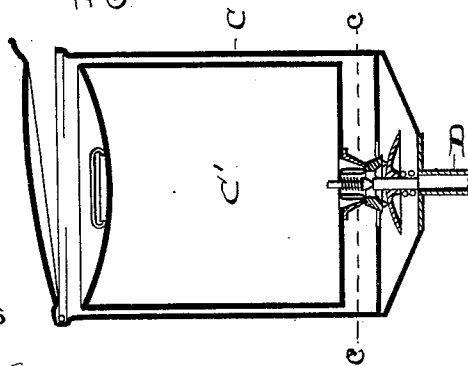


Fig 10.



WITNESSES

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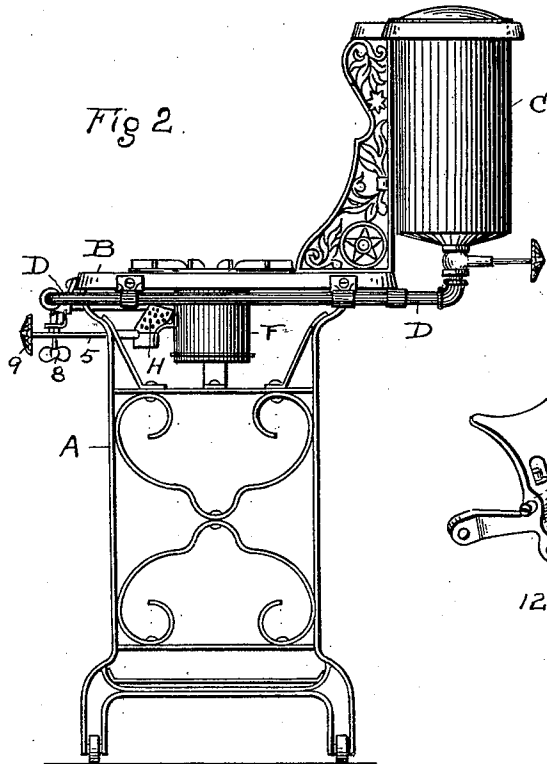


Fig 6.

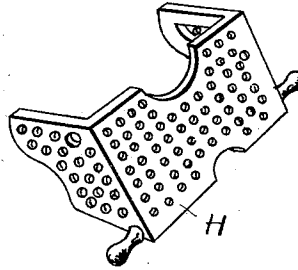


Fig 7.

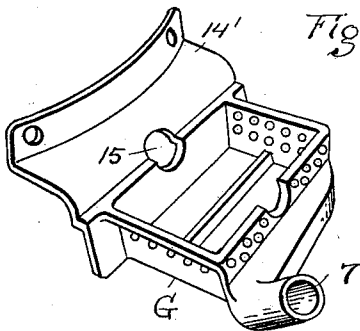
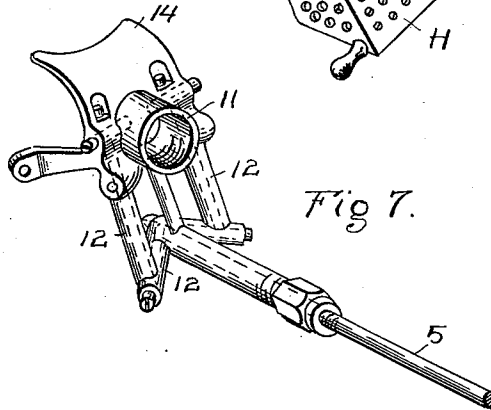
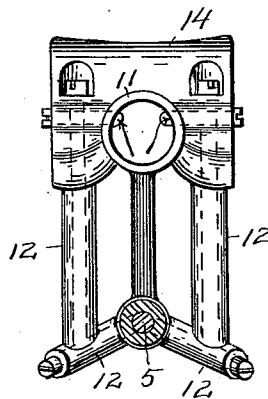


Fig 9.



WITNESSES.

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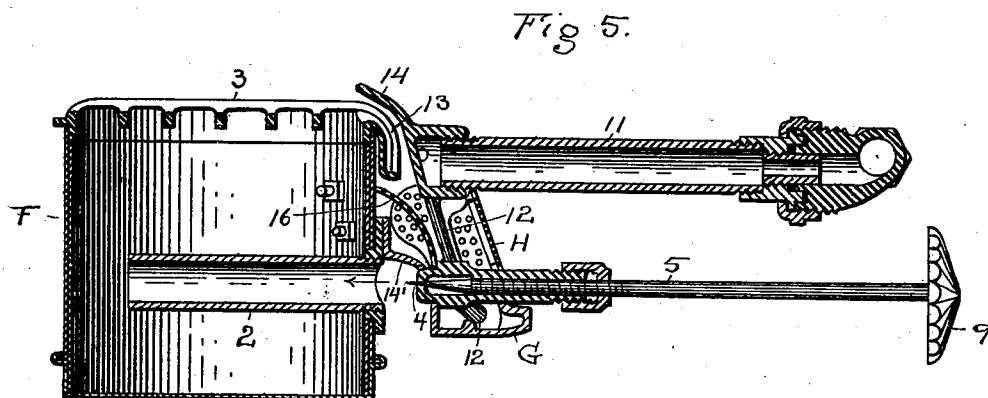
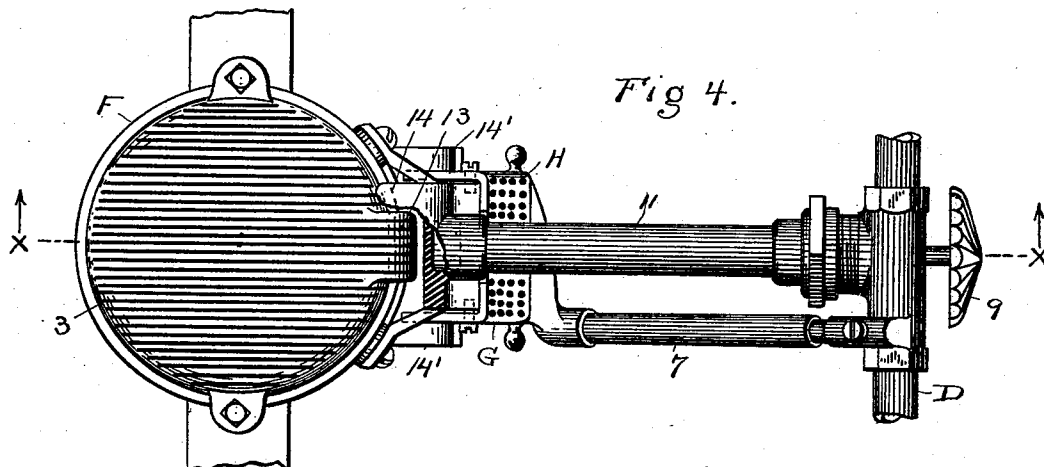
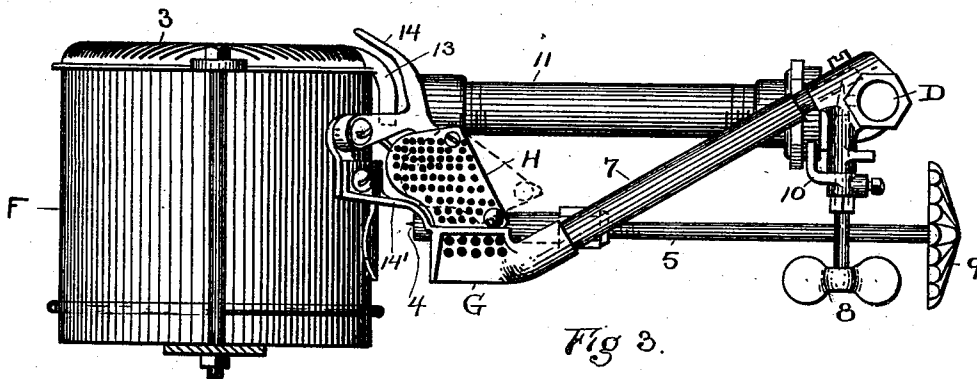
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UNITED STATES PATENT OFFICE.

HENRY RUPPEL, OF CLEVELAND, OHIO.

VAPOR-STOVE.

SPECIFICATION forming part of Letters Patent No. 521,128, dated June 5, 1894.

Application filed October 7, 1893. Serial No. 487,431. (No model.)

To all whom it may concern:

Be it known that I, HENRY RUPPEL, 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 Vapor-Stoves; and I do hereby 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 relates to vapor stoves, and the invention consists of a vapor stove having the construction, combination and operation of parts substantially as shown and described and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective elevation of a vapor stove in which my invention is contained, and Fig. 2 is an end elevation thereof. Fig. 3 is a side elevation of the burner mechanism, and Fig. 4 is a plan view thereof. Fig. 5 is a longitudinal sectional elevation of the burner and its mechanism on line *x, x*, Fig. 3. Figs. 6, 7, 8 and 9 are detail views of parts of the burner, all as hereinafter more fully described. Fig. 10 is a vertical central sectional elevation of the oil tank.

A represents the stove proper, which may be a one, two, three or four burner, according to the size wanted. In so far as the frame alone is concerned I make no claim to novelty, and I may, therefore, construct this frame and the top plate B thereof according to any fashion or design or style that may for the time being be preferred.

C represents the oil or fluid tank, and D the supply pipe which extends from the tank along the end of the burner, and thence along the front thereof to supply oil to the burners as they occur in the series, each burner being an individual burner independent of the others, and all constructed and operating in the same manner. Hence, the description of one of the burners serves for the entire series, if there be two or more. It will be observed that the tank is removable from its holder, which has the supply tube D attached thereto, and when exhausted is lifted out and taken away to the oil supply can to be filled, just as would be done with a lamp. This, however, is incidental and in itself is not new.

A certain amount of pressure has been found absolutely essential to gasoline or like

vapor burner in order to maintain the necessary flow of vapor and to keep up a steady strong flame, and among the ways of producing and maintaining such pressure have been the elevated tank which gave gravity pressure or artificial pressure, such as compressed air, or the pressure of the vapor by gravity in a comparatively long high tube. The objections to each and all of these methods are well-known and need not be enumerated here to show that they should be overcome and remedied.

In the present construction I have overcome the necessity of introducing pressure by outside and expensive or objectionable means and am enabled to maintain all the needed pressure and supply of vapor with air in proper proportions for perfect and satisfactory combustion without any of the means just enumerated. I have, therefore, practically done away with the elevated tank in any of the old styles, and have avoided the introduction of artificial pressure and of other means outside of the burner for maintaining pressure, and this I have accomplished by means of the peculiar construction of burner which I shall now describe.

This burner has at the basis of the principle upon which it is constructed, means for expanding the vapor and air after passing into the burner and consisting in this instance of a mixing chamber or drum F, which is entirely closed excepting as it is penetrated by the air and vapor supply tube —2—, and of course at its top where it is covered by the burner cap —3—. This cap may be of any suitable construction, but is shown here as having a series of transverse slots extending entirely across the cap and of such size and space apart as to best serve their purpose. It will be noticed that the tube —2— passes almost entirely across the drum F, and that the commingled vapor and air therein, after entering in a cool state, is exposed to the radiated heat of the burner and thereby expanded so as to produce an outward pressure through the burner cap. This promotes the steady and even flow of vapor to the flame which is necessary to keep up the supply, and by having a large chamber, as shown, filled with the vapor, the supply is made abundant and the pressure held uniform. It will be understood that the drum F is vapor tight about its sides and bottom except through tube —2—, and

when the burner is under way and in a good generating condition, as it is in a few minutes after initial lighting, the vapor which issues through the needle orifice —4—, controlled by the valve —5—, is injected through the said tube into the drum F. This injection of vapor entrails air, so that the admixture of air and vapor in the drum is such as to produce and sustain a beautiful blue flame and afford that perfect combustion which is so much desired. Obviously, there is a healthy reciprocal action between the draft of the burner which draws and consumes the accumulating vapor and air from the drum and the supply of these elements through tube —2—, but intermediate of these is the expansion of the vapor and air under the effect of the heat radiations from the burner which gives the steady and constant pressure that is necessary to maintain a uniform and ever reliable flame. It will be noticed that the normal conditions of the burner are certain to be maintained by this construction, because every part can be relied upon to do its work uninfluenced by surroundings. Thus, with the valve —5— open to a certain ascertained point and the burner at work a given and even supply of vapor will flow and a uniform quantity of air will pass into the drum with the vapor. Then, once in the drum, the conditions there are unchangeable and the flame cannot help being uniformly fed alike to all parts of the burner cap.

Two channels or ducts are shown for the oil, one leading to the initial burner and the other to the burner proper. The supply pipe D extends across one end and along the front of the stove, and the initial burner cap G has the duct —7— leading thereto and controlled by valve —8— which is shown here as in vertical position behind the head —9— of the valve —5—, so as to be protected from accidental movement. Over the initial lighting cup or pan G is a swinging perforated hood or cover H, which is raised to introduce a match for lighting and is then immediately closed. The initial flame is thus protected from air currents and can be kept burning very low, if desired, or turned out after the burner is started. The valve —8— has a curved arm —10— which engages fixed stops to limit its rotation, so that it cannot be opened beyond a certain point and only enough to serve the purpose. When started by applying a match, the burner can be left indefinitely and with perfect safety. Then if the burner is to be used the valve —5— is turned and the burner is automatically lighted from the initial flame. The pipe —11— connects with the supply pipe D and the ducts —12—, which are exposed to the heat in the initial burner chamber. Of course the details of these parts need not be rigidly adhered to in constructing the burner, but may be changed and varied more or less without departing from the invention. After initial starting and after the burner has

become heated the oil passages are heated sufficiently to produce vaporization of the oil by means of heat from the main burner. To promote this result I form a downward lip —13— on the burner cap opposite the inner end of the pipe —11—, and a shield —14— over said lip, as plainly seen in several figures.

It will be noticed as a distinguishing feature of this stove that the oil is delivered practically direct from the tank to the burner by the most simple construction possible and without the intervention of any mechanism or means whatever to alter or affect the transmission of the oil except the exposure of the oil duct to the heat of the burner and the pipe for mixing the air and vapor. Otherwise the operation is direct and immediate from the oil tank to the burner. There is no intermediate process and mechanism for conversion and commingling; no artificially applied pressure, and no unsightly elevated tank with its attendant dangers and inconveniences. All these things are obviated and overcome and a simple direct structure takes their place.

It will further be noticed that although the oil tank is located somewhat above the level of the point of the oil or vapor delivery of the burner, there is practically no pressure present by reason of this somewhat higher elevation, because the oil is really contained in the inner removable tank C', and the valve mechanism connected with this inner tank is such that only a very limited flow of oil is permitted in the outer tank C at any time, the highest level to which the oil rises in the outer tank being indicated by the line c, c. This makes the operation wholly different from what it would be if a full tank of oil were in open communication and pressure upon the supply pipe D.

The details of the parts associated with the burner and with the initial heating mechanism are shown in Figs. 5 to 8. In Fig. 8 I show an apron —14'— which is cast in the same part with the cup G, and is bolted or otherwise fastened to the drum F, as seen in Figs. 2 and 4. This apron has an opening —15— for the passage of the vapor jet —4—, which carries the jet point outside of the apron. By this construction I avoid any possible lighting from the initial chamber to the vapor jet, and thereby protect the jet orifice and the flow of vapor from ignition. Above this apron is shown a curved perforated plate —16— which protects the rear of the initial lighting chamber. If the initial flame be lighted and unlighted vapor escapes from the burner drum through the burner cap, a portion of the vapor will roll down between the lip —13— and the shield —14— into the ignition chamber and be lighted and thereby light the burner.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A vapor stove in which pressure in the oil supply pipe is avoided, comprising a low-down fluid-supply tank, an expansion chamber having a burner cap and an induction tube extending across the center of said chamber, a shield for the induction tube extending down from the surface of the expansion chamber across the entrance to said tube and apart therefrom to admit air and prevent escape and ignition of vapor from about said entrance, an initial burner arranged wholly outside of said shield and separated from the expansion chamber thereby, the fluid supply pipe leading from the fluid tank, the vapor-controlling valve extending through the said shield immediately in front of the entrance to the induction tube, and a separate valve to control the flow of fluid to the initial burner, the combination being and operating, substantially as described.

2. In a vapor stove, a fluid-supply tank having its outlet substantially on a plane with the top of the stove and adapted to relieve the fluid-supply pipe leading to the burner from the head or pressure of the fluid in the tank, in combination with the burner having an expansion drum or chamber closed at its bottom and sides and provided with an induction tube extending inward across its center from one side nearly to the other and about midway of the height of the chamber, a shield for said induction tube closed against the expansion chamber across its top to prevent upward suction and draft across the mouth of said tube and extending down across the mouth of said tube and apart therefrom to permit a free inflow of air, a fluid supply-pipe leading from the bottom of the said fluid supply tank, and a valve projecting through said shield to control the flow of vapor from said pipe into said induction tube, substantially as set forth.

3. In a vapor stove, an expansion chamber for the burner closed at its bottom and sides and having a burner cap across its top, and a vapor induction tube projecting into said chamber about midway between the bottom and top thereof, a shield or apron overhanging the mouth of said vapor induction tube from above the same and extending down directly in front thereof in a plane substantially parallel to said opening, and an induction valve projecting through said shield or apron, substantially as described.

4. In a vapor stove, an expansion chamber for the burner closed at its bottom and sides and having a burner cap across its top, a vapor induction tube projecting into said chamber about midway between its top and bottom and open at both ends, a starting burner and means to supply the burning fluid thereto, an apron or shield for the induction tube closing against the expansion chamber above the induction tube and extending thence downwardly across the outer opening of said

induction tube and distant therefrom, said apron or shield placed between said induction tube and the initial burner and wholly separating one from the other, substantially as described.

5. The combination of a low-down fluid-supply tank, a main burner, a drum on which said burner is mounted, a vapor induction tube leading into said drum at its side and extending almost across it, an initial burner, a vapor jet or nozzle supported by and above said initial burner and in line with the induction tube, a main fluid-supply tube 11 arranged within the influence of the heat from the main and initial burners and having pipes communicating with the vapor jet or nozzle, a main pipe extending from the tank to the supply tube, a branch pipe leading from the main pipe to the initial burner, a controlling valve therein, and deflectors for conducting the flame of the initial burner to the main burner and for screening the vapor jet, substantially as described.

6. A vapor burner comprising the expansion chamber or drum F, induction tube 2 extending within said drum and almost across it, the main burner cap 3 arranged over the drum, the supplemental burner lip 13 at its side formed integral therewith, vaporizing chamber 11 located within the influence of the heat from the burner, deflector plate 14 for the supplemental burner lip, pipes 12, 12, leading from opposite sides of said vaporizing chamber and communicating with the main supply nozzle, the said nozzle arranged opposite the induction tube, and an initial burner, substantially as and for the purpose set forth.

7. The expansion drum F and main burner 3 thereon having the downward lip 13 at its side formed integral therewith, combined with the pipe 11, shield 14, pipes 12, 12, leading from opposite sides of pipe 11, the main vapor supply jet or nozzle communicating with the said pipe, the initial burner G having opening 15 to receive the main supply nozzle and the apron 14' formed integral with said burner, and a low-down fluid supply tank, substantially as and for the purpose set forth.

8. The vaporizing pipe 11, deflector plate 14, pipes 12, 12, leading from opposite sides of pipe 11 and communicating with the main vapor supply jet or nozzle, and the said nozzle, combined with the expansion drum, main burner cap thereon, the vapor tube 2 arranged in said drum opposite said nozzle, the initial burner, the supplemental burner lip 13 and the low-down fluid supply, substantially as and for the purposes set forth.

Witness my hand to the foregoing specification.

HENRY RUPPEL.

Witnesses:

H. T. FISHER,
R. B. MOSER.