

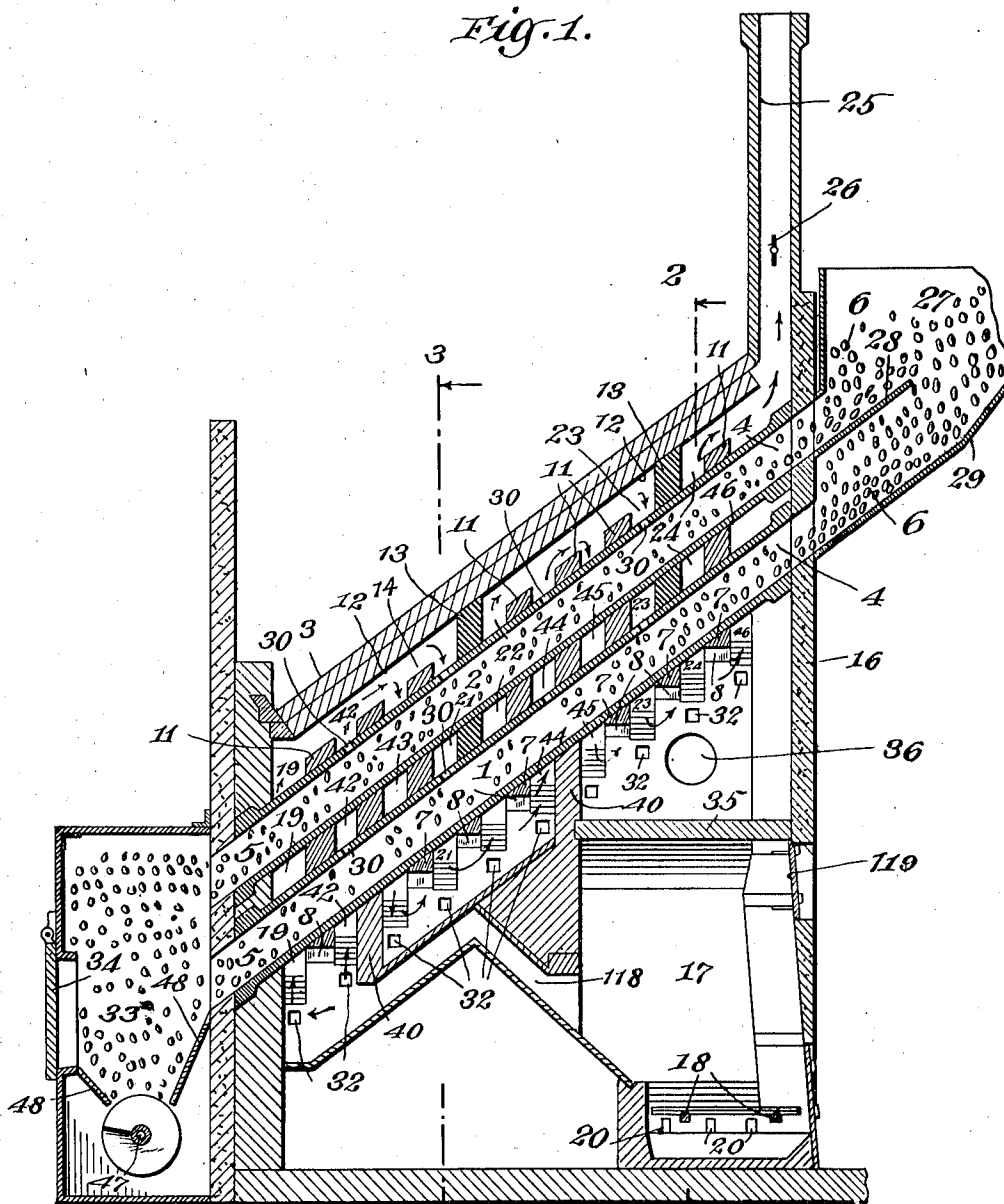
R. A. CARTER, JR.
VOLATILIZER APPARATUS.
APPLICATION FILED JAN. 25, 1911.

1,003,702.

Patented Sept. 19, 1911.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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3 SHEETS—SHEET 2.

Fig. 3.

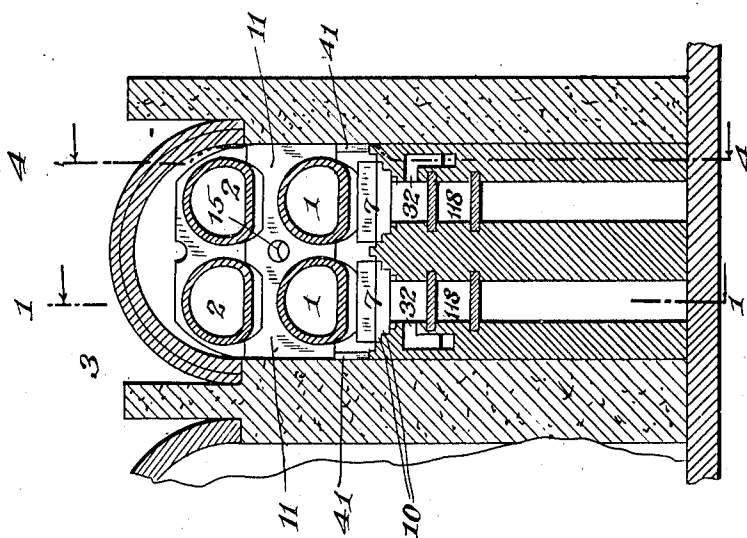
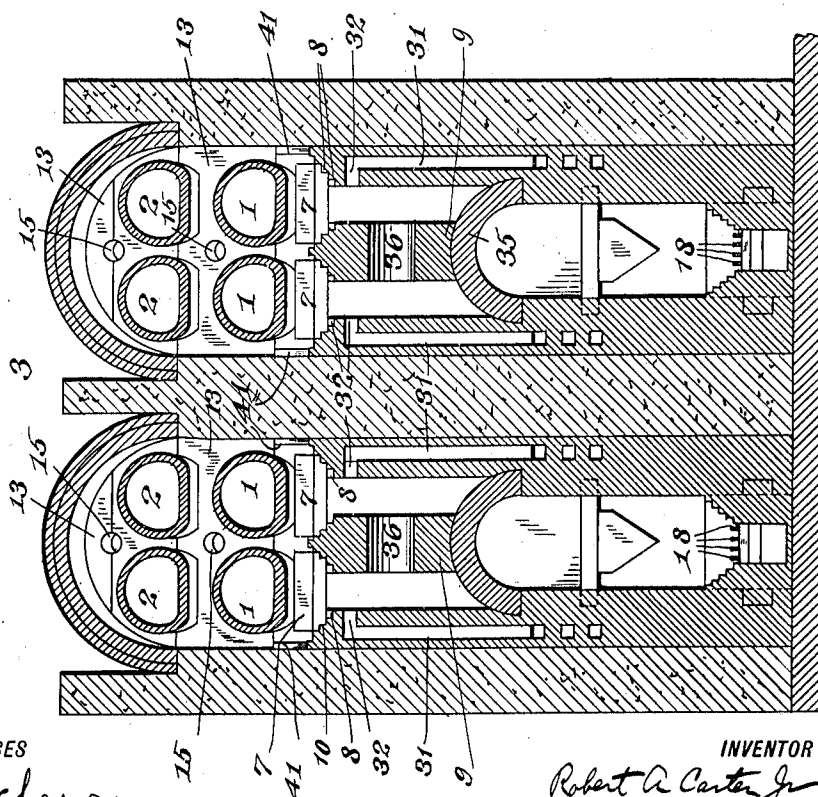


Fig. 2.



WITNESSES

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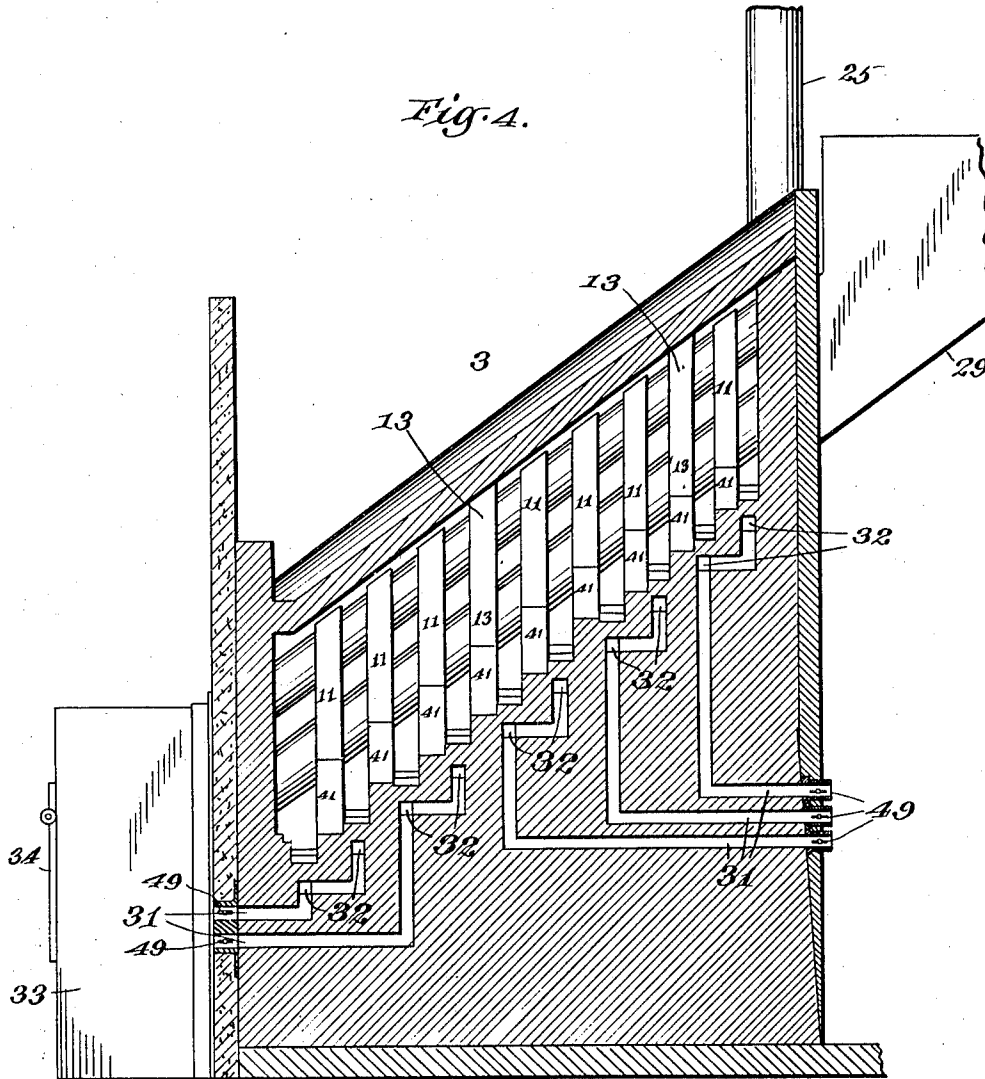
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3 SHEETS-SHEET 3.



WITNESSES

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VOLATILIZER APPARATUS.

1,003,702.

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To all whom it may concern:

Be it known that I, ROBERT A. CARTER, Jr., a citizen of the United States, and a resident of New York city, in the county of Queens and State of New York, have invented certain new and useful Improvements in Volatilizer Apparatus, of which the following is a specification, taken in connection with the accompanying drawings, which form a part of the same.

This invention relates to volatilizers for driving off the volatile matter in briquets and similar articles, so that they are rendered smokeless and odorless.

In the commercial manufacture of briquets wherein finely powdered coal or powdered coke, both of which are waste products, the latter being known commercially as "breeze," is mixed with any suitable binder such as coal tar, coal tar pitch, or oil tar, or oil tar pitch, and properly shaped to form briquets, it has been found in practice that the briquets give off a large quantity of smoke and the binder, in addition to giving off this objectionable volume of smoke, also has a disagreeable odor which materially reduces the sale of the briquets. By my invention I subject the briquets so formed to a continuous process whereby they are treated in my improved volatilizer, the gases or smoke given off in their treatment being utilized to carry on the process, rendering it continuous and extremely economical in that the briquets are fed forward by their own gravity, and, after the volatilizer has been properly heated and brought to the proper temperature, the further primary heat of the volatilizer may be dispensed with, the entire process being then carried on by the gases given off by the briquets themselves, so that after the volatilizer is once started it requires very little attention and automatically treats the briquets and renders them smokeless and odorless.

In the accompanying drawings, in which one form of my improved volatilizer is shown, the same reference numerals refer to similar parts in the several figures.

Figure 1 is a longitudinal vertical section substantially on the line 1—1 of Fig. 3; Fig. 2 is a transverse vertical section substantially on the line 2—2 of Fig. 1; Fig. 3 is a transverse fragmentary view substantially on the line 3—3 of Fig. 1; and Fig. 4 is a longitudinal vertical section substantially on the line 4—4 of Fig. 3.

In my improved volatilizer one or more inclined ovens may be used. Simply for purposes of illustration I have shown my inclined ovens 1, 1 and 2, 2 arranged in pairs, four of the inclined ovens forming a gang, though it is to be understood that my volatilizer may comprise simply one such inclined oven 1 or 2, as the case may be, or any multiple of this number, as may be found convenient or expedient. These inclined ovens 1, 1 and 2, 2 are formed of fire-clay and are arranged in the volatilizer 3, which is formed of fire-brick, so that their front ends 4, 4 will be higher than their rear ends 5, 5. The degree of inclination is such that the briquets 6, 6 are to be made to pass through the volatilizer 3 in a continuous stream by gravity. In practice I have found that excellent results are had when the ovens 1 and 2 are arranged at substantially 37 degrees inclination, though this, of course, may be varied. The different gangs are substantially duplicates of each other and for the sake of brevity merely one gang will be described, it, of course, being understood that any multiple of such gangs may be used.

The fire brick inclined ovens 1, 1 are supported on the fire brick angular blocks 7 (Figs. 1, 2 and 3), some of which are mounted on transverse walls 40, 40 of the volatilizer 3 and others are mounted on other fire brick blocks 8 carried by the volatilizer. These blocks 7 are arranged at different elevations in the volatilizer 3 to correspond with the degree of inclination of the fire brick ovens 1 which rest upon them. As shown in Fig. 1 they are arranged at an elevation with relation to each other so as to give the fire-brick oven 1 substantially a 37° inclination.

Upon shelves 41, 41 formed on the interior of the volatilizer I mount fire brick tiles 11, 11. These tiles partly surround the ovens 1, 1 and support the upper ovens 2, 2. These tiles 11 do not extend up to the roof 12 of the interior flue 14 of the volatilizer 3, Fig. 1. At intervals I mount baffle plates 13, 13 on the fire brick shelves 41, 41 extending them up until they make contact with the roof 12 of the interior flue 14 of the volatilizer 3. Two such baffle plates 13 are shown in Fig. 1, though, of course, it is to be understood that a greater or less number may be used as may be found convenient or expedient. In each one of these baffle

plates 13 I may form small apertures 15 to be used as sight holes. These sight holes permit a small portion of the products of combustion to pass through the baffle plate, but not a sufficient quantity to be objectionable. These sight holes 15 may be omitted, if desired.

At the front 16 of the volatilizer and beneath the upper ends 4, 4 of the different inclined ovens I mount a furnace 17 with grate bars 18, a fuel door 119, and with primary air ports 20, 20. To dry out the volatilizer and to heat it up to the proper temperature so that it can start to volatilize the briquets 6, 6 and thereafter proceed automatically without any primary firing, I make a fire in the furnace 17 of coals, or some other fuel, and permit a certain amount of air to pass through the primary air ports 20, 20 up through the bed of coals so as to form CO. The products of combustion from this furnace 17, including the CO, pass through the flues 118, 118 and into the vertical flues 19, 42 passing around and over the different ovens 1, 1 and 2, 2 near their lower ends 5, 5 and thence up to the roof 12 of the main passage 14 of the volatilizer, and along this roof until they meet the first baffle plate 13, Fig. 1. They are then deflected downward through the passages 21, 43 into the vertical passages 22, 44 back to the roof 12 of the main passage 14 along which they pass until they meet the second baffle plate 13 and are thence again deflected downward into the passages 23, 45 and caused then to pass into the passages 24, 46 out through the stack 25, their passage being regulated by the damper 26 which controls the pressure of the gases and products of combustion within the volatilizer 3, and the oven or ovens.

The briquets 6, 6 are dumped by hand or by any suitable machinery into the hopper 27, some of them falling upon the shelf 28 and being deflected into the upper inclined ovens 2, 2, while the remaining portion of the briquets follow the lower portion 29 of the hopper and are thence caused to pass through the inclined ovens 1, 1. As they pass down these inclined ovens 1, 1 and 2, 2 their flow being entirely due to gravity and dependent upon the inclination of the different ovens, they are, in the beginning of the operation, subjected to the heat of the products of primary combustion from the furnace 17. In the upper part of each of the ovens 1, 1 and 2, 2 openings or ports 30, 30 are arranged at intervals so that the gases driven off during the treatment of the briquets in their downward passage through the inclined ovens 1, 1 and 2, 2 pass up through the ports or apertures 30, 30 and mix with the products of combustion from the furnace 17 and flow with them in the circuitous path previously described, and

thence through the stack 25. In addition to the primary air ports 20, 20 I form secondary air ports 31, 31, Figs. 1 and 4, each secondary air port having preferably two openings 32, 32 in the path of the products of primary combustion which follow their circuitous route over and around the inclined ovens 1, 1 and 2, 2. Through these secondary air ports 31, 31 the necessary air is supplied from the exterior of the volatilizer 3 passing through the openings, or ports 32, 32 to mix with the products of primary combustion from the furnace 17 and later with the gases driven off from the briquets 6, 6 which are being treated. The chemical action may be briefly stated to be that at first carbon monoxid CO is formed by combination of air with the fuel of the fire and later carbon dioxid CO₂, by the combination of the CO with the air passing in through the secondary air ports. After the volatilizer has been started and the process of treating the briquets has been initially begun from the heat derived from the furnace 17, this furnace may be allowed to die down or go out, as it is not necessary for the further treatment of the briquets to be fed to the volatilizer, as the gases given off from them pass through the different ports 30, 30 and mix with the air from the secondary air ports 32, 32 and burn with an intense heat and themselves pass over and around and follow the circuitous path of the products of combustion previously described, and in this manner the waste gases driven off from the briquets is used to fire the volatilizer, and to complete the further treatment of the briquets which pass automatically down the different fire brick ovens 1, 1 and 2, 2 in a continuous stream. It is therefore clear that after the process is once started the briquets are treated automatically with their own waste gases and that all that is essential is to feed the briquets into the hopper 27 and remove the treated briquets at intervals, or continuously, as the case may be, from the boot or reservoir 33 arranged at the end of the inclined ovens 1, 1 and 2, 2. This boot 33 is of course gas tight and is provided with a door 34 through which the treated briquets may be removed at intervals as desired. Preferably, however, some discharging mechanism is provided to continuously, or intermittently, remove the treated briquets from the boot or reservoir 33. Such a discharging mechanism may be a screw 47, the boot or reservoir being provided with guides 48, 48 to guide the treated briquets into the path of the screw. This discharging mechanism whether it be a screw such as 47, or any other form of discharging mechanism, also serves to assist in regulating the passage of the green briquets through the ovens, by removing the treated briquets

from the boot or reservoir, thereby permitting some of those in the ovens to fall into the reservoir making room in the ovens for additional green briquets. Therefore, the rate with which the treated briquets are withdrawn by the discharging mechanism serves to regulate the passage of the green briquets through the ovens and the time that they are treated.

On the upper part of the furnace I preferably form an arch 35. On this arch 35 I mount the support 9 which is provided with an aperture 36 so that the products of combustion may pass freely through the support 9 to equalize the pressure. I also preferably, though not necessarily, provide the secondary air ports 31, 31 with any suitable form of valves 49, 49 to regulate the supply of air passing through them.

Having thus described this invention in connection with an illustrative embodiment thereof to the details of which I do not desire to be limited, what is claimed as new and what it is desired to secure by Letters Patent is set forth in the appended claims.

I claim—

1. A volatilizer comprising a fire brick structure, an inclined perforated oven mounted in the structure, a furnace mounted under the upper end of the oven, a flue connecting the furnace with the rear portion of the fire brick structure, a circuitous passage connected with the flue to insure the products of primary combustion from the furnace passing back and forth over and around the oven, primary air ports connected with the furnace, and secondary air ports independent of the furnace and leading at different points into the circuitous flue or passage within the volatilizer.

2. A volatilizer comprising a fire brick structure having an inclined oven perforated at different points throughout its length, a hopper connected with one end of the oven, a reservoir connected with the lower end of the oven, a furnace located at the front of the volatilizer, a flue leading from the furnace and connected with the rear of the volatilizer, passages connected with said flue and leading around the oven and one or more baffle plates to insure the products of combustion taking a circuitous route over and around the oven before passing out of the stack.

3. A volatilizer comprising a fire brick structure having an inclined perforated oven, a hopper connected with one end of

the oven, a reservoir connected with the lower end of the oven, a furnace and stack located at the front of the volatilizer, primary air ports connected with the furnace, a flue leading from the furnace and connecting with the rear of the volatilizer, one or more secondary air ports connected with the main passage of the volatilizer to permit air into said passage independent of the furnace.

4. A volatilizer comprising a hollow fire brick structure provided with shelves, a plurality of inclined fire brick ovens perforated at different points throughout their length mounted in said fire brick structure, blocks upon which the perforated ovens are mounted, fire brick tiles mounted on the shelves in the volatilizer, one or more additional inclined fire brick ovens carried by said tiles, one or more baffle plates mounted on said shelves to deflect the products of primary and secondary combustion, a furnace, a flue connecting the furnace to the passage leading around the ovens, primary air ports connected with the furnace, and secondary air ports connected with the passage around the oven or ovens.

5. A volatilizer comprising a hollow fire brick structure provided with shelves, a furnace mounted in the volatilizer and provided with an arch, a perforated support mounted on the arch, fire brick blocks mounted on the volatilizer, inclined perforated ovens mounted upon said blocks, baffle plates mounted on the shelves, a flue connected with the furnace and with a circuitous passage over and around the inclined ovens, primary air ports connected with the furnace and secondary air ports connected with the said circuitous passage.

6. A volatilizer comprising an inclined oven provided with a plurality of longitudinal perforations to permit the volatile gases in the briquets to be driven off at substantially the point where they are evolved, a fire brick structure inclosing the oven, a furnace, primary air ports, and a plurality of secondary air ports to convey air at different points along the length of the oven to mix it with the different volatile gases driven off through the different openings in the oven or ovens.

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Witnesses:

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EDGAR S. MURRAY.