H. WELLINGTON.

Gasoline Cooking-Stove.

No. 200,636. Patented Feb. 26, 1878.

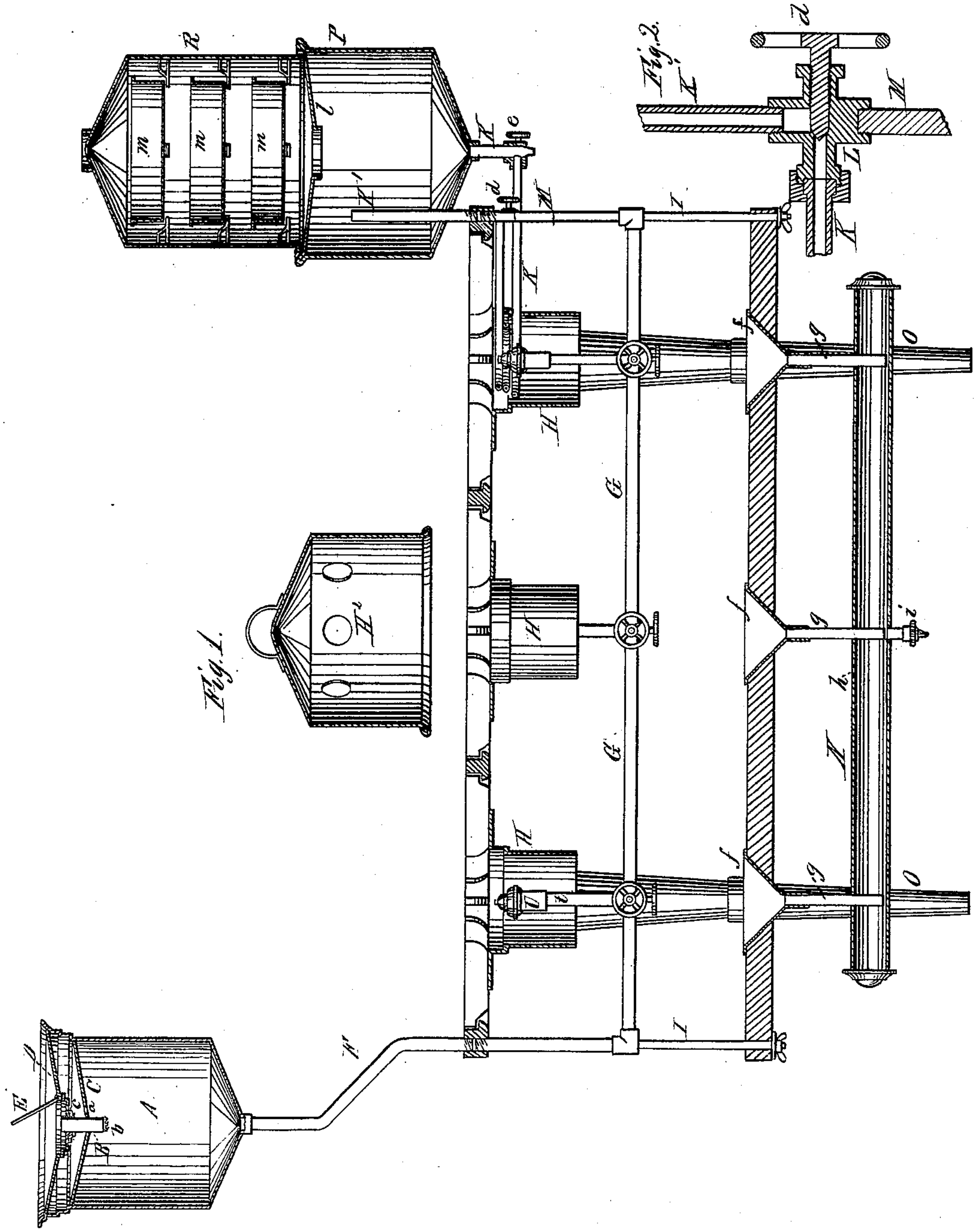

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Fig. 1.

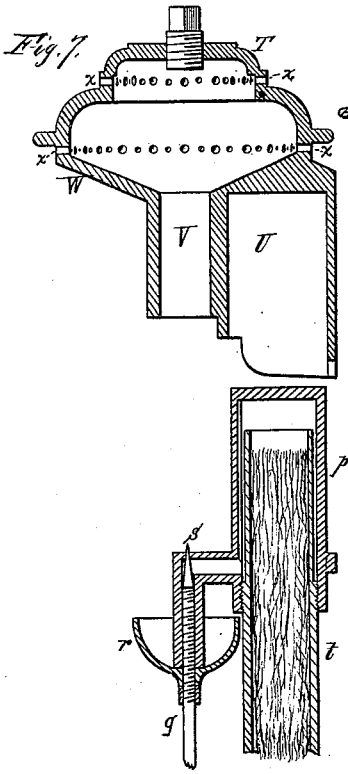


Fig. 3.

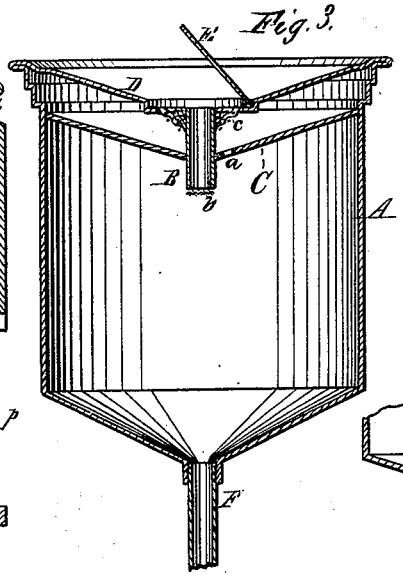


Fig. 6.

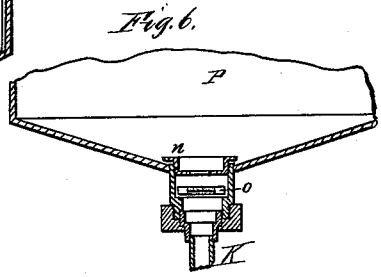


Fig. 4.

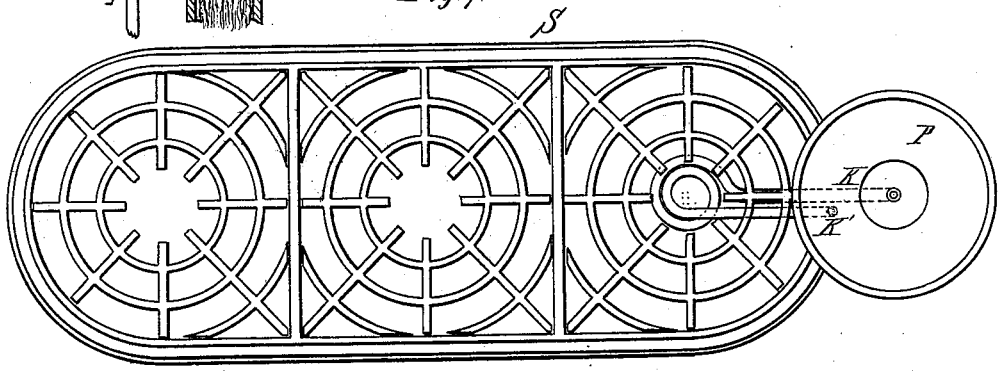
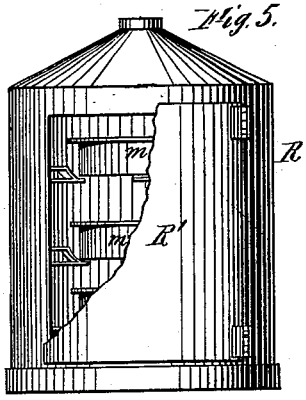


Fig. 5.



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UNITED STATES PATENT OFFICE.

HENRY WELLINGTON, OF GREEN POINT, NEW YORK.

IMPROVEMENT IN GASOLINE COOKING-STOVES.

Specification forming part of Letters Patent No. **200,636**, dated February 26, 1878; application filed January 25, 1878.

To all whom it may concern:

Be it known that I, HENRY WELLINGTON, of Green Point, county of Kings and State of New York, have invented certain new and useful Improvements in Gasoline Cooking-Stoves, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 is a sectional elevation of a stove constructed and arranged in accordance with my several improvements. Fig. 2 is an enlarged sectional view of the connection between the vertical and horizontal circulation-pipes, showing the method of constructing the valve-seat for the "circulation-valve" and of uniting the oil-pipe with the material of said seat. Fig. 3 is an enlarged section and elevation of the oil-tank or supply-reservoir, exhibiting the several improvements upon this portion of the structure. Fig. 4 is a plan or top view of the stove, illustrating particularly the arrangement and location of the water-circulating pipes. Fig. 5 is an elevation of the steam cooking chamber detached from the water-tank, a portion of the door being broken out to show the arrangement of cooking-pans or other utensils in said chamber. Fig. 6 is a section of the lower portion of the water-tank, illustrating in detail the position of the check-valve placed over the mouth of the outlet water-pipe leading to the coil around the burner. Fig. 7 is an axial section of the improved burner, the two parts thereof being separated the better to show their construction, and the whole being arranged in accordance with one of the methods of construction adopted, from which arrangement the other proposed method will be readily understood.

Like letters of reference in all the figures indicate corresponding parts.

The objects of my invention are principally to provide a safeguard against overfilling of the reservoir, which object, at the same time, includes a protection against possible communication of the flame with the contents of said reservoir; to provide an improved chamber beneath the burners, which shall be capable of receiving the drip from the burners or their connections without danger of communication of flame with said drip after it enters the sub-reservoir; to so arrange a water-tank and circulating-pipes in connection with a gasoline-stove as that said tank shall afford a supply of hot water, with auxiliaries necessary to steam cooking, and with attachments necessary to adapt this portion of the structure for successful use and easy manipulation under all circumstances of general domestic operation; to provide a wind-guard for the burner which shall be secured to the removable section of the top plate and detachable therewith, in order that the flame may be protected, as in all similar contrivances, while at the same time the different parts of the burner may be reached without the usual difficulties; to so improve the construction of the burner as to give a larger and better flame than has heretofore been afforded in this class of stoves, while the cost of manufacture of said burner shall be reduced; and to better unite the several essential elements of the stove than has been done in previous constructions.

To accomplish all of this the invention consists in several particular details of construction, and in certain new and useful arrangements or combinations of parts, as will be hereinafter first fully described, and then pointed out in the claims.

The elevated oil-reservoir A, Figs. 1 and 3, is closed at top by two plates, C and D, separated by a little space. The upper plate D is preferably depressed in the center, as plainly shown, and the perforation therein is somewhat larger than the pipe B, which is intended as the main conductor of oil when filling. A narrow ring of wire netting or perforated metal, *c*, unites the pipe B with the perforation in the top plate, and the inner plate C is united with said pipe, which pipe is provided with a perforated cap, *b*. A hinged lid or other suitable cover, E, closes the opening in plate D, and a small perforation, *a*, intended to be left open, is placed in the lower plate.

In filling the reservoir the oil is poured in through pipe B, which, when the reservoir is sufficiently full, ascends in said pipe and flows over its top, thus plainly indicating to the operator the amount of oil in the tank. The portion which flows over pipe B finds its way immediately down through gauze *c*, and finally through perforation *a*. This arrangement renders the danger of overfilling directly attributable to the carelessness of the operator,

and if by any extraordinary accident a too great quantity of oil be discharged from the filling-can after pipe B is full to its top, the overcharge simply flows into the space between the two plates C and D, where, when the cover E is closed, (or even if it be left open,) there is little or no danger of its taking fire. The inclined top compels all the drip from the filling-can to flow down into the reservoir, to facilitate which it is preferable to allow the lid E to fit down upon its seat rather loosely. The operation of the wire-gauze or perforated material to prevent communication of flame therethrough is well known, and need not here be detailed. All communications with the interior of the reservoir being thus protected, it will be practically impossible for the contents of the said reservoir to take fire.

These details of arrangement are specially advantageous in this class of stoves wherein the lighter forms of hydrocarbons are employed, rendering liability to accident extremely improbable. It is by no means intended to be herein admitted that the real danger from use of these light oils is anything like so great as the uninitiated imagine; but the safety attachments are none the less valuable, for, in the hands of an inexperienced operator, the premature combustion of the oil is really only dangerous because of loss of presence of mind by the operator, in consequence of which he might be incapable of extinguishing the flames—a matter very easily accomplished.

In order to catch and hold the oil which may drip from the burners of the stove or from any one of their connections, I place a reservoir beneath the row of burners, (or in the event that only one burner be used, then beneath it,) and arrange suitable conduits leading thereto. In the form chosen to illustrate this portion of the invention, which form is shown in Fig. 1, the arrangement is as follows: N is the sub-reservoir, suspended from the ordinary shelf beneath the burners by means of the funnels *f f f*, the outer rims of which bear upon the perimeters of suitable perforations in said shelf, the lower ends of the funnels uniting with pipes *g g g* extending nearly to the bottom of said reservoir. One of the funnels being located under each burner, they will serve to collect the drip and cause it to be discharged as required. The pipes *g g g* are made to extend nearly the depth of the reservoir, so that their lower mouths will be covered by the oil as soon as any quantity collects, and thus prevent the escape of carbureted air up through the funnels, which escape might otherwise occur, and from which only is any real danger to be apprehended. The top of the sub-reservoir is provided with a pin-hole, as at *h*, to allow escape for air as the oil enters; and any suitable plug, *i*, at or near the bottom, affords a convenient means of emptying said reservoir of its contents. The sub-reservoir is preferably made of sufficient capacity to hold as much oil as does the supply-reservoir A, in order that, if any accident should occur whereby all the material should run out of the latter, it will be safely stored in the former.

Under the arrangement shown, should any of the drip take fire while in the funnel or in its vicinity, the pipe *g* prevents communication of flame with the interior of reservoir N. In addition to the utility of this reservoir N in preventing any accident on account of the drip from the burners, it serves as a means of keeping the lower shelf in a more cleanly condition than heretofore, and also prevents, in a considerable manner, the odor from the dripping oil. Further, if the leakage be considerable, and the oil should take fire while finding its way to the sub-reservoir, the flame would be extinguished at the mouth of pipe *g;* or, in other words, the pipe *g* prevents admission of flame to the reservoir, as above intimated.

It will be observed that the supply-pipe, to which the burners are coupled, is suspended beneath the top plate, and located practically in the axis of the stove. The sub-reservoir occupies a position beneath this pipe, and its conduits are so arranged as to catch the drip from the couplings between the supply and burners, as well as from portions of the burners.

It is found desirable to unite a water-tank with the gasoline-stove in such a manner that it shall not interfere with the use of either one of the burners for the ordinary purposes of cooking, and so as to fulfill numerous other conditions, as will hereinafter appear.

The water-tank P is connected with the two pipes K K′, which are made to form the coil surrounding the burner, as plainly shown in Figs. 1 and 4, and which extend out sufficiently from the portion of the stove immediately over the burner to support the tank in a position also removed from said burner.

Water from the tank passes down through pipe K, thence through the coil, and up through K′, completing the circuit, as in all similar water-heaters. The circulation is controlled by means of the valve *d*, (shown enlarged at Fig. 2,) and water may be conveniently withdrawn from the tank by means of a cock, *e*, connected with pipe K.

There being no pressure within the tank P, as in ordinary range-boilers, it becomes important to prevent the water from being forced out of pipe K with too great violence, as would occur when the burner is lighted if no special provision be made for such prevention.

As at Fig. 6, a cork or other valve, *o*, is seated over the mouth of pipe K, and secured in place by a perforated cap, *n*. While the circulation is downward through pipe K the valve *o* rests upon its seat, and permits the flow of water through its notched sides without interruption. As soon as too great back-pressure is created the valve rises, closes the opening in cap *n*, and thus forms an effectual barrier to the reverse flow of water.

It is preferred to make the valve of less

specific gravity than water, in order that it will be more sensitive to the action thereof; but it could be otherwise made and still fall within the limits of the invention.

By providing this check or its mechanical equivalent, I am enabled to overcome the objections to the use of the side tank with circulating-pipes, and to adapt it for the uses explained.

The tank P, as shown, forms the base upon which the steaming-chamber R is sustained. In this chamber the ordinary operations of steam cooking may be performed, the chamber being provided with suitable supports for cooking utensils *m m*. The top of the tank is provided with a depressed cover having a central perforation, and may thereby be conveniently filled without removing the steamer by simply opening the door and pouring the water in upon the aforesaid cover.

When not required for use, the steamer may be removed and the opening in the top of the tank covered by any suitable cap.

The convenience and utility of both the tank and the steamer, when arranged as above described, are sufficiently obvious to require no particular mention. The arrangement is specially advantageous over that form of tank and steam-chamber designed to be placed directly over the burner, in many respects, but especially in this, that in the latter class the water is liable to be completely evaporated, and the food spoiled in consequence, which is not likely to occur under the use of the coil, inasmuch as a timely warning of a low state of water in the tank is given the operator by the rattling noise of the pipes and tank produced by the circulation of steam and a small quantity of the water. The depressed cover operates to return all the condense-water from the steaming-chamber back into the water-tank.

To support the tank in a substantial manner, it is desirable to connect it with the top plate of the stove, and to accomplish this I unite the pipe K′ firmly with the bottom of the tank, and screw its lower end into a socket cut in the top plate. Beneath this socket is a similar receptacle for that end of the circulating-pipe which is below the top plate, and when the two portions are properly located, no interruption in the circulation can occur. The portion K of the circulating-pipe is united with the tank at or near the center of the bottom, and the two connections thus made render the support for the tank as rigid as is desirable or practicable.

As the most convenient means of sustaining the end of the oil-supply pipe G, I adopt the following: I extend said pipe out toward the tank end of the stove, and connect its extremity, with the coupling M, (which may be a pipe or a solid rod,) to the shell of the circulation cock or valve *d*. This answers all the essential requisites of a good union between the supply-tube and the top plate; but, to avoid any possibility of the escape of oil into the water-pipe, care should be taken to provide a solid metal barrier between the pipes K′ and G. This may be done by making the rod M solid; or if it be made of piping, which is cheapest, the wall of the circulating-valve should be formed so as to oppose the desired barrier, as plainly shown at Fig. 2.

In order to couple the top plate, the legs, the shelf, and the supply-tube in a firm and substantial manner, and thus render the whole structure little liable to be unduly shaken and racked, the legs O O are turned with an annular projection, which falls just above the shelf, and the coupling rods or pipes I I, united with the supply-pipe, are made to draw the shelf up against the projections upon the legs by means of thumb-nuts or other suitable attachments below the shelf, as illustrated in Fig. 1. The supply-pipe being connected with the top plate at each end, the union-pieces I I serve as a very effectual means of stiffening and bracing all parts of the stove.

The guards H H H surround the burners and depend from the stove-top, to which they are attached. They extend down sufficiently to prevent any side drafts of air from interfering with the proper working of the flame, and they also serve to better direct the heat from the burner upwardly upon the utensils placed upon the stove.

The shields or wind-guards are open at bottom, and permit a free circulation of air around the stand-pipe of the burner, which is located at right angles to the supply-pipe, while they (the shields) leave all the valves and attachments in such position as to be readily accessible for lighting and operating the stove, and so that they may be readily inspected at any time without disturbing the said shields.

The shields are, moreover, attached to and depend from the removable sections of the top plate which are over the burners, so that, in the event that it be necessary to remove the burners or to reach them for other purposes, they are easily accessible by simply lifting out the sections of stove-top which carry the shields with them, and thus expose the burner at top and sides.

The cover shown at H^2 is intended to be placed over flat-irons and other articles to better confine the heat over their tops. This is found to work admirably for the purposes intended, especially when employed in connection with the guard H, with which it forms a comparatively closed chamber, and affords strikingly beneficial results.

The burner, shown enlarged at Fig. 7—that is, enlarged beyond other views of the stove parts, but not beyond its actual size—is constructed to afford a largely-increased area of flame over previously-existing forms, and with a view to simplifying its manufacture and reducing the cost thereof.

The cone portion of the burner has heretofore been cast separate from the oil-supply channel, and the body of the burner has been so formed as to require considerable drilling

and fitting to open the requisite passages for the oil. To obviate all this I cast the top or cone T together with the inlet-tube V for mingled air and gas, and with the socket U adapted to receive the end of the oil-chamber *p*. The channels V and U are made cylindrical, by means of which the operation of casting is simplified, as is readily understood. This form of top for the burner makes the support for the cone independent of any pressure which may be created in the vaporizing-chamber *p*, and therefore not liable to be blown off; and the union between the cone and vaporizing-chamber is of such a character as that heat is conducted much better from the former to the latter. To secure the proper location of tube V over the jet-orifice when the cap is placed in position, the socket U has a notch cut in its wall at the lower portion, and this notch engages with a corresponding lug upon the side of the vaporizing-chamber.

The general form of the vaporizing-chamber is cylindrical, by reason of which it may be easily fitted to enter the socket U by turning it off in an ordinary lathe.

The elbow which sustains the needle-valve *g*, and in which the jet-orifice is located, is cast with the vaporizing-chamber, the horizontal-channel in said elbow being connected with said chamber by a properly-located core during the process of casting. This obviates the necessity of drilling such horizontal channel from the outside of the elbow, and afterward plugging up the initial perforation, as has heretofore been done; and this method of forming this section of the burner is preferable to the old methods for many obvious reasons; but it is intended to adopt the old method should occasion require or seem to warrant, the other general construction being adhered to.

The adaptability of this union between the vaporizing-chamber and the cone to conduct heat from the latter to the former renders it practicable to increase the size of the cone considerably beyond former styles, and at the same time dispense with the ordinary heater-plate and the auxiliary jets necessary to convey heat to the same. The increased size of the burner affords an extended flame area, and gives good results over and above former constructions, with practically the same consumption of fuel.

The burner is operated as are all burners of this class, and the gasoline-stove has now become so well known as to require no explanation of the operation and uses of its different parts in this specification.

It may be well to remark, however, that in the use of the water-pipe coil in connection with this class of stove it will be found expedient to cover the opening in said coil by any convenient metallic plate whenever there are no cooking utensils over the coil-heating burner, in order that the full strength of the flame may be utilized for the one purpose.

For the general design of the stove I propose to make separate application for Letters Patent.

In acknowledgement of the state of the art to which this invention relates, I will state that I am well aware of all the patents heretofore issued thereunder, and that I am acquainted with the various styles of stoves placed in practical public use.

I do not, therefore, desire it understood that I lay any claim herein to the metallic top plate supporting a row of burners, to the shelf located under the burners, nor to a burner for gasoline wherein a cone is simply placed over a needle-valve which controls the flow of gas.

I desire also to acknowledge that a drip-cup has heretofore been located beneath a row of gasoline-burners, and intended to catch the drip therefrom.

According to this previous construction the drip-cup is suspended beneath an inclined funnel-shaped shelf, which conveys the drip from the valves of the burners, but not from their couplings with the supply-pipe; and the cup has not been made of sufficient capacity to hold all the oil which might flow from the oil-reservoir in case any one of the valves should be left open. To the mere cup, as thus formed, I lay no claim; but,

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

1. In a reservoir for hydrocarbon oils, the combination, with the ordinary top plate thereof, of a second or auxiliary plate, located beneath the first, a filling-pipe passing through the two, and the wire netting or perforated metallic shields arranged to cover the inlets for oil, substantially as shown and described.

2. In a reservoir for hydrocarbon oils, the combination, with the top plate thereof, of a filling-pipe connected therewith by means of an annular section of wire netting or perforated material, the lower or discharge end of said pipe being similarly provided with perforated material, substantially as and for the purposes set forth.

3. The combination, as before set forth, of the two plates C and D, filling-pipe B, lid or cover E, and the protectors *b c*.

4. In a gasoline cooking-stove in which the supply-pipe is located beneath the burners and occupies a central position with respect to the stove, the combination, with the reservoir located under the burners and supply-pipe, of funnels conducting drip from the burners and supply-pipe down to and through the tubes which unite said funnels with the reservoir, substantially as and for the purposes explained.

5. The combination, as before set forth, of a shelf extending beneath the burners, a drip-reservoir, N, pipes *g*, and funnels *f* detached from said shelf, the reservoir being sustained by the shelf through the medium of the funnels, for the objects named.

6. In combination with the top plate of a

gasoline cooking-stove, a water-tank, supported by said top plate in a position removed from over the burner, said tank being provided with circulating-pipes which surround said burner and form the union between the top plate and reservoir, the several parts being arranged substantially as shown and described.

7. The combination, as before set forth, of the top plate of a gasoline cooking-stove, the water-tank P, circulating-pipes K K′, upon which said reservoir is supported, the burner, and the valve *d* for controlling the circulation of the water, in the manner and for the purposes explained.

8. In combination with a water-tank supported by the top plate of a gasoline-stove through the medium of circulating-pipes, arranged substantially as shown, a valve, *e*, located in one of the supporting-pipes, and adapted to permit the withdrawal of water from said tank, in the manner and for the purposes explained.

9. In combination with a water-tank supported by the top plate of a gasoline-stove through the medium of the circulating-pipes, and in a position removed from over the burner which supplies heat therefor, a steaming-chamber, R, mounted upon said tank, made removable therefrom, and adapted to be operated substantially as shown and described.

10. In combination with a water-tank supported by the top plate of a gasoline-stove through the medium of the circulating-pipes, and in a position removed from over the burner, a perforated cover, depressed toward its center, adapted to conduct water down into the tank and to form the bottom of the steaming-chamber, substantially as shown and described.

11. In combination with a water-tank provided with circulating-pipes and adapted for use in connection with a gasoline-stove, a check-valve located in the discharge-section of said pipes, and arranged, substantially as shown and described, so as to permit the continuous discharge of water from the tank, but to automatically arrest the return motion of the water, for the objects explained.

12. In combination with the valve-seat L of the circulation-valve, the pipe or rod M, serving to sustain the end of the oil-supply pipe, a suitable barrier being placed between said oil-pipe and the water-pipe, substantially as and for the purposes set forth.

13. In a gasoline cooking-stove, the combination of the top plate, the legs provided with shoulders located above the shelf which is under the burners, the oil-supply pipe, and the shelf, the several parts being united and braced together by means of the rods or pipe-sections I I, substantially as shown and described.

14. In combination with the removable section of the top plate of a gasoline-stove, said section being sustained by the frame-work and located over the burner, which is supported upon a centrally-disposed supply-pipe, the depending wind-guard, open at top and bottom, and attached to and made removable with said section, thereby affording easy access to the burner and its valves, substantially as shown and described.

15. In combination with the herein-described wind-guard, which is attached to and depends from the removable section of the top plate, and which is located over the vertically-disposed burner, the cover H^2, serving to form a chamber with said guard, in the manner and for the purposes specified.

16. In a gasoline-burner adapted for heating purposes, the combination of the perforated cone, the cylindrical air and gas conducting tube leading thereto, and the socket adapted to receive the projecting end of the vaporizing-chamber, the three parts being cast in one piece, which is readily detachable from the vaporizing-chamber, the said parts being arranged in reference to each other substantially as shown and described.

17. In a gasoline-burner, the combination, with the cylindrical vaporizing-chamber, of an angular projection cast therewith, and affording the seat and socket for the needle-valve and an unbroken communication between the jet-orifice and the vaporizing-chamber, which chamber enters the socket of the burner, the several parts being arranged substantially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

HENRY WELLINGTON.

Witnesses:

WORTH OSGOOD,

CHARLES R. SEARLE.