

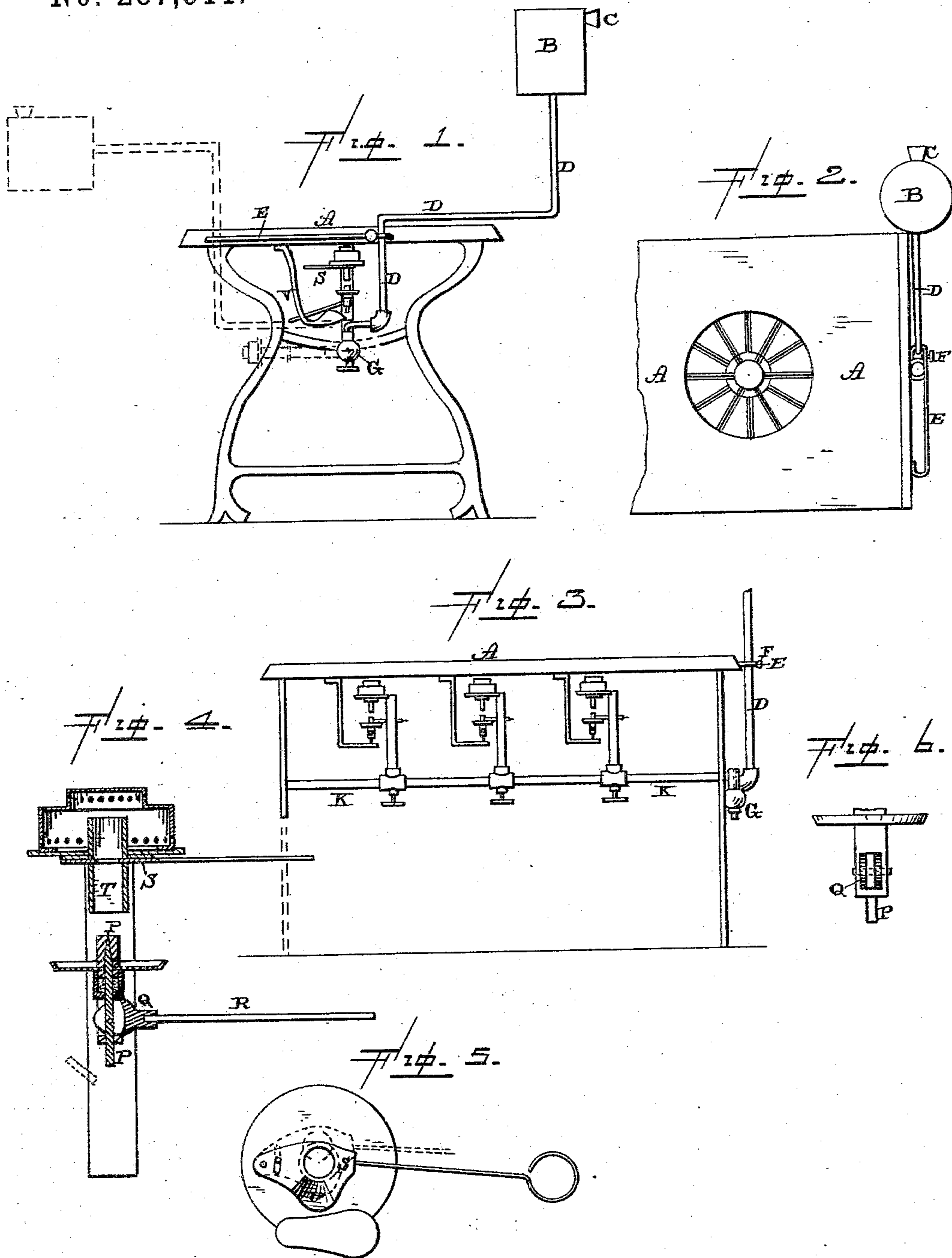
(No Model.)

2 Sheets—Sheet 1.

Z. DAVIS.  
VAPOR BURNER.

No. 287,911.

Patented Nov. 6, 1883.



—Witnesses—

Louis A. Gardner  
J. W. Garner

—Inventor—

Z. Davis  
per  
F. A. Lehmann  
att'y.

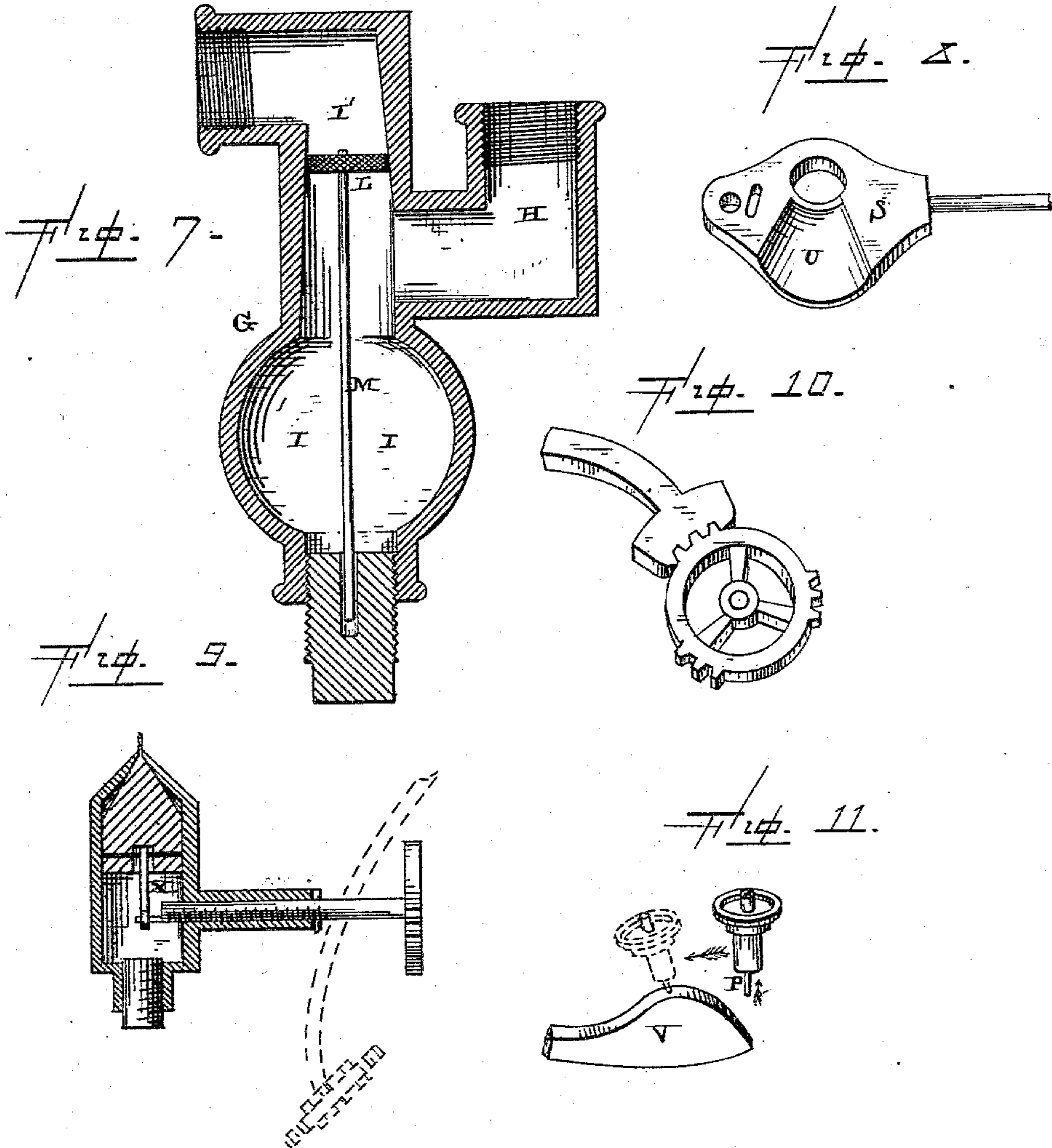
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# UNITED STATES PATENT OFFICE.

ZEBULON DAVIS, OF CANTON, OHIO.

## VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 287,911, dated November 6, 1883.

Application filed April 30, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, ZEBULON DAVIS, of Canton, in the county of Stark and State of Ohio, have invented certain new and useful  
5 Improvements in Vapor-Burners; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference be-  
10 ing had to the accompanying drawings, which form part of this specification.

My invention relates to an improvement in vapor-stoves; and it consists—

15 First, in the combination of the tank or reservoir, a pipe connected thereto, and a horizontal pipe secured rigidly to the reservoir-pipe, and which horizontal pipe has the burners connected thereto, and a mechanism for extinguishing the burners when the pipes are  
20 moved or partially rotated. The object of this part of my invention is to make the reservoir removable and to connect it with the burners, so that whenever the reservoir is moved for the purpose of being filled the  
25 burners are automatically extinguished, so as to prevent explosions.

30 The second part of my invention consists in providing the horizontal pipe to which the burners are attached with suitable bearings in the frame of the stove and connecting this pipe rigidly to the pipe which leads down from the reservoir, so that when the reservoir is moved the pipe having the burners attached thereto will partially rotate or move at the  
35 same time. The object of this part of my invention is to rigidly connect the pipe which leads downward from the reservoir to the horizontal pipe to which the burners are attached in such a manner that the two shall move to-  
40 gether, and thus dispense with any coupling or packed joint between the two parts.

45 The third part of my invention consists in a shut-off or pivoted plate which can be moved so as to intercept the vapor and prevent it from passing into the burner, and which plate has a groove, depression, or cut-away part upon one side, so that the vapor can pass through this cut-away part. The object of  
50 this part of my invention is to provide a cut-off or pivoted plate which can be made to intercept the vapor and prevent its passage into the burner to form an auxiliary heating jet

or flame, and which flame is projected against the top of the stand-pipe for the purpose of maintaining the heat or vaporization in the  
55 parts of the burner, so as to keep it for instant use, and to form a heating-jet when the main flame is not burning.

Another part of my invention consists in a trap or sediment-collector, which will be more  
60 fully described hereinafter.

Figure 1 is an end view of my invention. Fig. 2 is a plan view of one end of the stove. Fig. 3 is a side elevation. Figs. 4, 5, 6, and 8 are  
65 detail views of the burner. Fig. 7 is a vertical section of the trap. Figs. 9, 10, and 11 are modifications of the mechanism shown for automatically extinguishing the burners.

A represents an ordinary vapor-stove of any desired shape, size, or construction that may  
70 be preferred.

The tank or reservoir B is intended to be filled only after it has been turned from a vertical into a horizontal position, as shown in Fig. 1, and is therefore provided with a small  
75 funnel or other similar device, C, as shown. The pipe D, upon which this reservoir is placed, may either be bent in the form here shown or any other that may be preferred, and in order to regulate the distance it shall move there is  
80 a guide, E, secured to one end of the stove, as shown in Fig. 2. This guide is a simple keeper or band of any suitable shape or description, which holds the pipe D in contact with the  
85 end of the stove, and which forms a stop at each end for the pipe, to prevent it from being moved too far. After the tank has been filled, and then adjusted into a vertical position, it is held  
90 in place by means of a small set-screw, spring, catch, or any other suitable device, F, which may be preferred for that purpose. The lower  
95 end of this pipe D terminates in or is connected to the trap G, for the purpose of catching any water, sediment, or other impurities which may be contained in the burning-fluid.

The end of the pipe D is attached to a short branch pipe, H, which extends out from one side of the trap and above the cavity I. This  
100 cavity, it will be seen, forms the lower part of the trap, and is provided with the usual plug for the purpose of cleaning it out whenever so desired.

Extending directly from the top of the cavity, and forming a solid part of the trap in the same

manner as the pipe H, is an outlet-pipe, I', which is connected with the horizontal pipe K, to which the burners are attached.

5 Passing up through the bottom of the trap is the strainer L, which is formed of one or more pieces of wire-gauze or any other suitable straining material, and which has the rod M connected thereto. By means of this rod the strainers can be pushed up or inserted in-  
10 to place, and then withdrawn at any time for the purpose of being cleaned. The rod connected to these strainers is made to extend down far enough to be readily taken hold of by the hand, and in order to prevent the plug  
15 from forcing it too far up, there is a hole or socket bored in the top of the plug, as shown. The cavity is placed below the strainer, as is here shown, for the purpose of catching as much of the sediment and other impurities  
20 contained in the fluid as possible, so that they will settle from their own gravity without clogging the strainer. Should any of them not settle in the cavity, the strainer will arrest them and prevent them from passing on into  
25 the pipe K. By this construction the strainer does not become clogged up so easily nor frequently, and thus saves time and trouble.

The pipes K D are intended to be united rigidly together, so as to form practically one  
30 pipe. The pipe K, instead of being held stationary in the legs of the frame, as heretofore, is here made to partially turn or rotate for the purpose of moving the burners, so as to cause them to be automatically extinguished when  
35 the reservoir is moved for the purpose of being filled. By connecting the pipes K and D together and causing them to rotate or move in such a manner as to extinguish the burners before the reservoir can be filled, nothing is  
40 left to the judgment or discretion of ignorant persons that ignorantly attempt to fill the tank while the burners are in operation. The object of this part of my invention is to place the operation of the burners absolutely beyond  
45 the control of all persons who may have to fill the tank, and thus positively prevent all danger of accidents from this source. To this pipe K are secured any desired number of burners, which burners, being readily se-  
50 cured to the pipe, are, as a matter of course, made to rotate or turn with the pipe when the pipe is partially rotated, or moved when the tank is tilted to one side, as shown in Fig. 1.

55 To the needle P is attached a suitable cam or equivalent device, Q, by means of which the needle is given a short or quick endwise movement for the purpose of turning on or shutting off the vapor. To the outer end of this cam or other de-  
60 vice Q is attached an operating-rod, R, which is made removable from the cam, and this rod or operating-lever then extends outward far enough to be operated by means of the hand, foot, or a device of any kind. The object of  
65 this is to dispense with the wheel which generally extends under or to one side of the filling-cup, and thus prevent the necessity of hav-

ing to pass the hand through burning-vapor, when this cup accidentally overflows, for the purpose of shutting off the vapor. Aside from  
70 the danger and inconvenience of having to pass the hand through the burning-fluid, the hands of the person operating the stove are frequently otherwise engaged, and then he or she has only to touch the rod R with the  
75 foot, when the flow of liquid can at once be stopped. The great advantage of this cam, aside from the convenience of being able to operate the burner without the necessity of  
80 stooping down or using the hands, consists in the short, quick, and direct motion that is given to the needle and the ease with which the flow of the fluid is controlled. This needle  
85 will be packed by means of asbestos or any other imperishable or refractory substance which will not be injured by the heat. The move-  
90 ment of the needle not being necessarily greater than one-sixteenth of an inch, it will readily be seen that the wear of the packing is so very slight it will last for years without allowing  
95 the vapor to leak or the necessity of being renewed.

Pivoted to the under side of the base of the burner is a cut-off or plate, S, which has a  
95 hole formed through it which corresponds with the induction-tube T, through which the vapor and air are conducted into the burner. This plate will preferably have a small slot formed  
100 at one end, and through this slot will project a short pin or stud, which serves as a stop to prevent the cut-off from being moved too far  
105 in either direction. When the cut-off is moved into the position shown in Fig. 5, the vapor passes freely up into the burner; but when this cut-off is moved into the position shown  
110 in dotted lines in Fig. 5 the vapor will be prevented entirely from passing up into the burner, but will be deflected by means of the cut-away portion, recess, or cavity U, which is formed  
115 in one side. This cut-away portion or cavity U connects at its inner end with the hole through the cut-off, and when this cut-off is so moved as to entirely intercept the flow of  
120 vapor into the burner, or only partially so, the vapor is diminished for the purpose of forming an auxiliary heating-flame, for the  
125 purpose of keeping up the heat or vaporization, so as to keep the burner ready for instant use, or to keep warm any object or article when the main flame is not in use. This cut-  
130 away portion U deflects this auxiliary heating-jet directly toward and against the top of the stand-pipe and the bottom of the burner, so as to keep the burning-fluid vaporized and the  
135 burner ready for instant use.

As the burners are to be extinguished when the pipes K and D are partially rotated, there is secured to the under side of the top of the  
130 stove, in any suitable proximity to each burner, an arm, V, of any suitable shape or construction that may be preferred, and against which the lower ends of the needles P or the levers  
135 R, as may be preferred, are made to strike as the burner is being tilted over, and thus force

the needle upward, so as to instantly cut off the flow of vapor. I do not limit myself to any particular form of arm, or as to whether the needle itself or the lever connected thereto shall strike against the pendent arm V, for either may be used, as preferred, the only object being to operate the needle endwise, so as to cut off the vapor and extinguish the burner before the tank is moved into such a position that it can be filled.

I do not limit myself to any precise construction of burner, nor to any method or manner of extinguishing the burner when the pipe is made to partially rotate, for this may be varied in a great many different ways, one of which is shown in Fig. 9. In this case a short rack is formed upon an arm or pendant, which may be secured to any part of the stove-frame, and there will be a wheel provided with teeth attached to the lower end of the needle. As this pipe K is made to partially rotate, the teeth upon the hand-wheel will be made to engage with the rack, and thus rotate the handle and close the needle. In this case the teeth upon the hand-wheel will preferably be made in sections, with blank spaces between, so that after the handle has been rotated so as to shut off the vapor a blank space will be brought up to the teeth on the rack.

When the burner is turned back in position after the tank has been filled, the backward movement of the burner causes the teeth upon the wheel to again engage with the rack and to turn on the vapor, so that by the application of a lighted match the burners will again light. This toothed wheel is intended to be turned only one-half around, all further motion being prevented by a suitable stop. When the burners have been shut off by hand, the blank spaces are brought opposite the teeth on the rack, and then, when the pipe K is turned and the burner is tilted to one side, the wheel does not engage with the rack, and hence the wheels do not engage with the rack either when the burners are being tilted or when they are being moved back into position. By this construction the burners are again turned off, if they are lighted, when the tank is being tilted for the purpose of being filled; but if the burners are closed before the tank is tilted, they remain closed after it is returned to position.

Where the toothed hand-wheel is used, the inner end of the handle has a small projection which acts like a crank, and which has a connecting-rod, X, connected to it. This connecting-rod is fastened directly to the lower end of the needle, so as to impart a direct endwise movement to it. In this case the stuffing-box for the needle can be dispensed with.

Having thus described my invention, I claim—

1. In a vapor-burner, the combination of a tank, a pipe or pipes connected thereto, and which are adapted to move or partially rotate, one or more burners which are movable with the pipe or pipes, and a means for automatically shutting off the flow of vapor from the burners, substantially as shown.

2. The combination of the tank, the vertical pipe connected thereto, the horizontal pipe to which the burners are secured, and the frame of the stove, the two pipes being secured together, so as to form practically one, and adapted to move or partially rotate for the purpose of automatically extinguishing the burner or burners when the tank is turned into position to be filled, substantially as described.

3. The combination of a partially-rotating pipe, to which a burner or burners are connected, and a means for moving the pipe, the burners, and mechanism for operating the needle of each burner, so as to extinguish the flames when the pipe is rotated, substantially as specified.

4. In a vapor-burner, the trap G, having the inlet H, the outlet I', and the cavity I, provided with the screw-plug, and which cavity is placed below both the inlet and outlet, in combination with the removable strainer provided with the rod or handle M, substantially as shown.

5. In a vapor-burner, a cut-off having the recessed or cut-away portion U in its side, for diverting the vapor and forming a subsidiary jet, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

ZEBULON DAVIS.

Witnesses:

F. A. LEHMANN,  
L. F. GARDNER.