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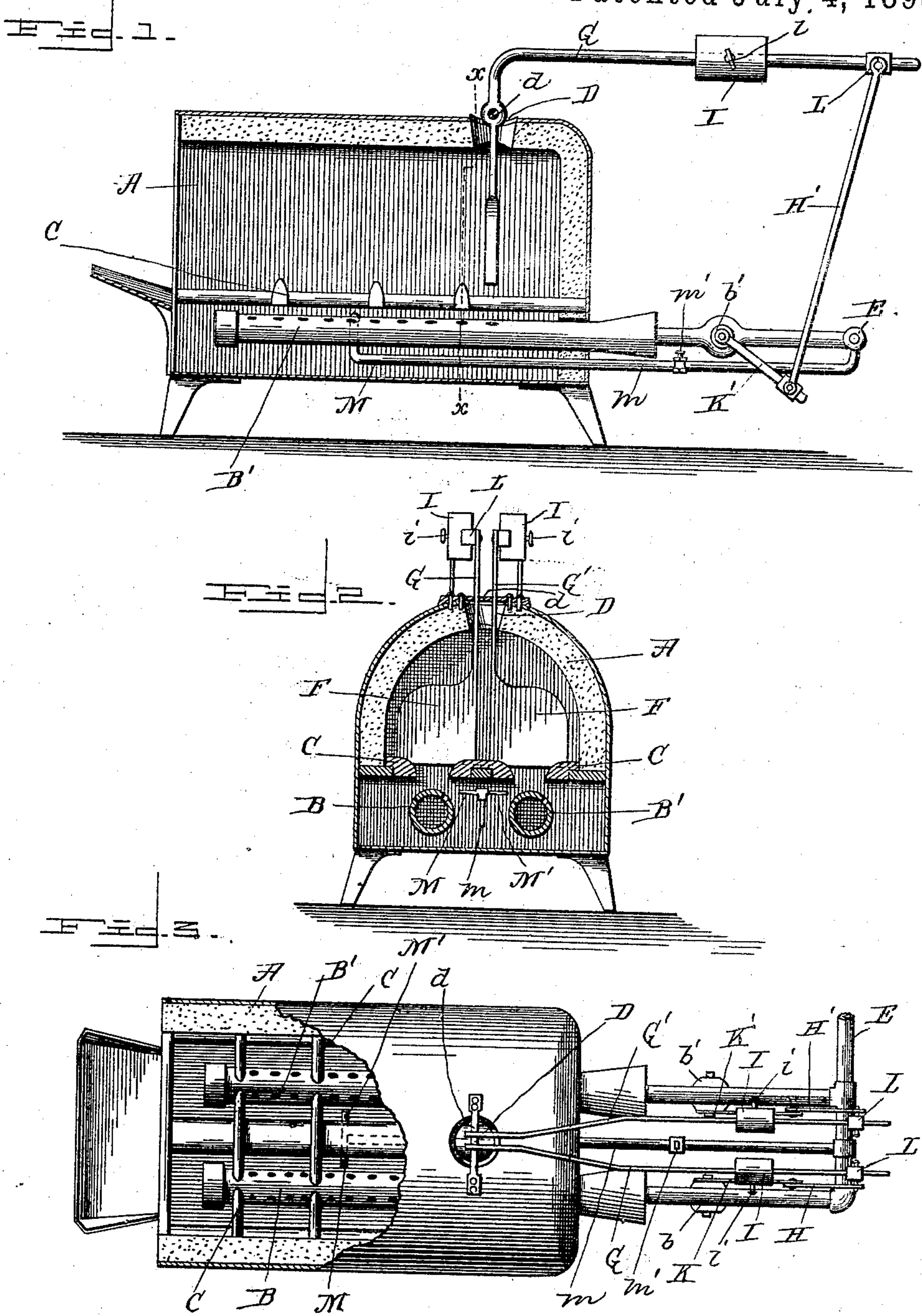
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A. T. WELCH.

VALVE OPERATING DEVICE FOR GAS HEATERS.

No. 500,643.

Patented July 4, 1893.



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Inventor  
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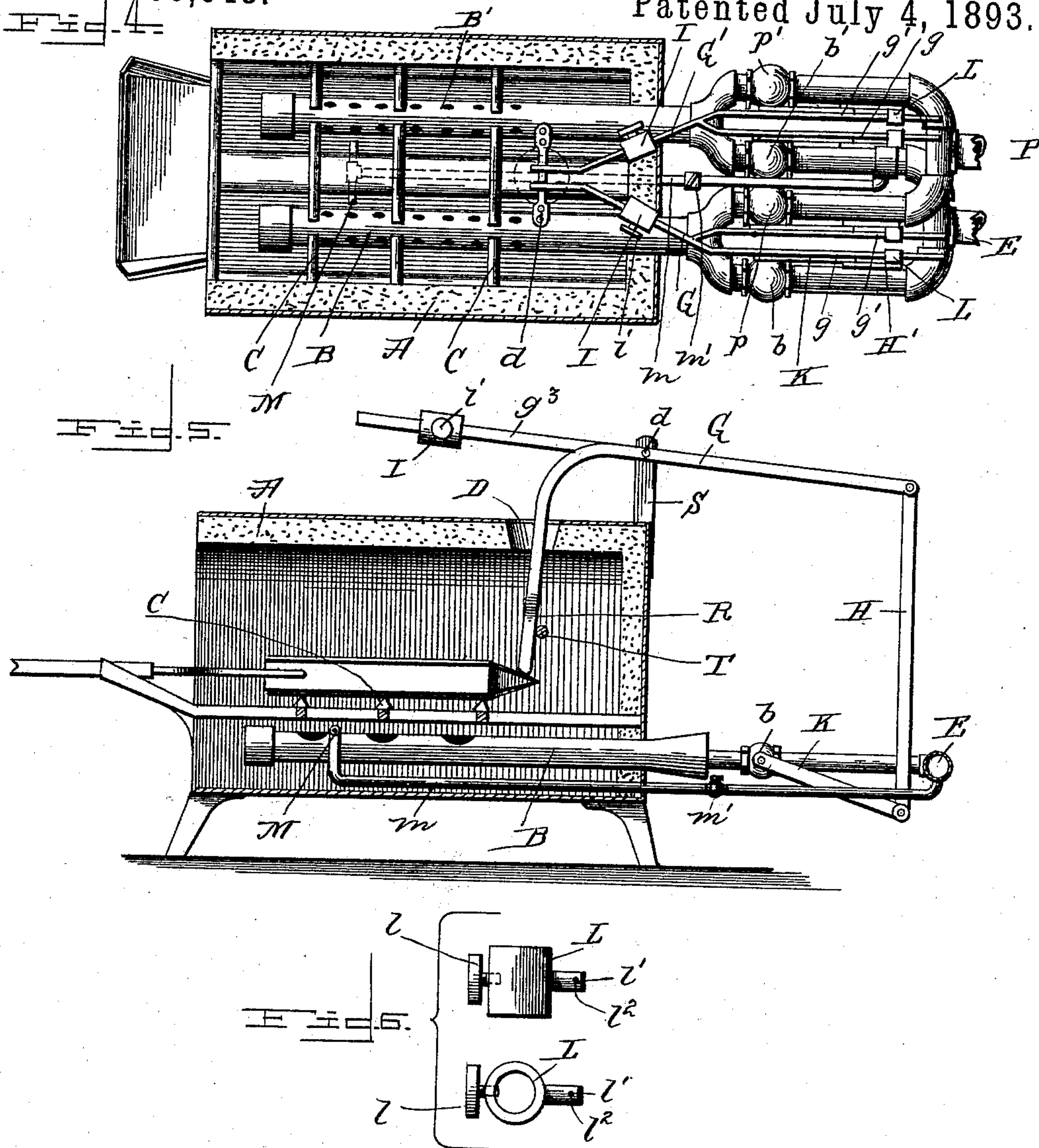
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# UNITED STATES PATENT OFFICE.

ABRAHAM T. WELCH, OF WASHINGTON, DISTRICT OF COLUMBIA.

## VALVE-OPERATING DEVICE FOR GAS-HEATERS.

SPECIFICATION forming part of Letters Patent No. 500,643, dated July 4, 1893.

Application filed June 4, 1892. Serial No. 435,576. (No model.)

*To all whom it may concern:*

Be it known that I, ABRAHAM T. WELCH, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Valve-Operating Devices for Gas-Heaters; 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

The object of the present invention is to provide an improved automatic valve device for gas heaters, for heating tools, and particularly for fire pots for soldering irons, whereby the act of placing the tool in or on the heater will cause the gas to be turned on, or up, and the removal of the tool will shut off the gas, or turn it down, and the heat can be regulated as desired according to the distance that the tool is inserted into the heater, or the position in which it is placed.

Heretofore it has been proposed to employ the weight of the tool to turn on the gas or to turn it up, the removal of the tool causing the gas to be shut off, but such an arrangement does not allow the operator or workman to regulate the heat solely by the act of placing the tool in the heater, without the manipulation of a valve or other device, and my invention consists in providing a lever arm and connections with the gas cock, so arranged that when the tool is placed in position for heating, it will engage with the lever arm and move the same more or less, according to the position of the tool in or on the heater.

The invention is primarily designed for use in connection with fire pots for heating soldering irons, but its application to heaters for other tools will be readily understood.

In the accompanying drawings: Figure 1 is a vertical longitudinal sectional view through a fire pot, showing the application of the invention thereto in its preferred form. Fig. 2 is a vertical transverse sectional view on the line  $x-x$  of Fig. 1. Fig. 3 is a top view, partly in section. Fig. 4 is a plan view illustrating the invention when applied to a fire

pot using an air blast. Fig. 5 illustrates a modified form of the invention; and Fig. 6 shows in detail one of the couplings L. 55

A is a fire pot for soldering irons of a common form; B B' the gas burners therefor with cocks  $b b'$ ; C the rests for the support of the soldering irons; D the outlet in the roof, and E the gas supply pipe. The fire pot has two burners and is arranged for the heating of two irons. 60

Near the inner end of the fire pot there are two pendent iron plates, F F', one for each iron, carried at the end of right angled lever arms G G', which pass up through the opening D and extend back over the gas valves  $b b'$ . These levers are journaled on a rod or wire  $d$  placed across the top of the opening D and fastened to the outer shell of the fire pot. The plates F F' have straight abutting edges and extend down close to the tool bed, and the levers G G' are preferably placed close together at the center, though there may be an opening in the roof for each lever, over each burner. Each of the valves  $b b'$ , has a lever arm K K', and there are connecting rods H H' connecting the outer ends of the levers G G' with the valve arms K K' respectively. Each lever arm G G' carries a weight I, adjustable on the arm, and provided with a set screw  $i$ , for fastening it in position. The couplings L for the connections of the rods H H' with the levers are preferably made as shown by Fig. 6. 75 80 85

L is a sleeve that slides on the lever arm, and  $l$  a set screw for clamping it in place. Extending out from the opposite side of the sleeve, there is a bearing lug  $l'$  which passes through an eye in the end of the rod H; the connecting rod being held in place on the bearing lug by a pin passed through the hole  $l^2$  in the lug. This adjustable coupling allows for regulating the length of the lever arms if desired. 90 95

M M' are igniting burners at the end of a pipe  $m$  which connects with the gas pipe E outside of the valves  $b b'$ , and has a cock  $m'$ . These igniting burners are located in close juxtaposition to the burners B B', and are always burning when the fire pot is in use. 100

In the application of the invention to a fire pot using gas and an air blast, as shown in Fig. 4, the air cocks,  $p p'$ , one for each burner,



are connected to the controlling levers, as well as the gas cocks *b b'*.

P is the air supply pipe. Each lever *G G'*, is forked and has a pair of arms, *g g*, and *g' g'* respectively, one of each pair being connected with the lever arm of the gas cock, and the other with the lever arm of the air cock, for one of the burners. By adjusting the positions of the connecting rods on the respective levers, and thereby the relative lengths of the lever arms for the gas and air cocks, the proportions of air and gas supplied to either one of the burners can be fixed in any ratio desired, according to the richness of the gas and the amount of air required to mix with it to give the best results. In this case the gas burners *B B'* are shown with a pair of large gas orifices to each burner, instead of a number of small outlets.

The foregoing arrangement is particularly useful when the fire pot is used with a machine-made gas, which changes in candle power or richness from time to time, and requires a change in the amount of air. Trouble often rises with ordinary fire pots using such gas, from their going out when the gas and air are not well mixed. In such cases the lighter relights the burner at once. But in adjusting other forms of fire pots, when using gas and an air blast, and in changing the flame from a small to a large one, or vice versa, trouble is experienced in getting the right adjustment of the valves; but with the present invention the valves of both the air and gas pipes open and close together and preserve the same ratio with respect to each other whether the flame be large or small.

The operation of the device will be readily understood. When an iron is placed in the fire pot to be heated the end of it presses against the plate *F* or *F'* according as the iron is placed in the left or the right hand side of the heater, and it is pushed in more or less according to the degree of heat desired. The plate readily yields to a light pressure against it, and swings back until it strikes the rear wall of the fire pot, if full heat is wanted and the tool is pushed in far enough, thereby opening the gas cock to its full extent. If a partial heat only is desired, the tool is pushed in part way only. The jet *M* or *M'* lights the burner as soon as the gas is turned on. Immediately on the withdrawal of the tool the plate swings forward into its normal position, the rear tool ridge *C* limiting the forward movement of the plate, and the lever connections close the gas valve for that burner.

In the modification shown by Fig. 5 instead of the tool pushing against a pendent plate and causing it to swing back, I show a form of the invention that can only be used with tools, which like soldering irons, have a pointed or inclined end. In this case the lever *G* carries at its end a bar or plate *R*, beneath which the point of the tool is pushed, the distance the plate is raised and the amount the

valve is opened depending upon the distance the inclined or sloping end of the tool is pushed in under the plate *R*. In this case the lever *G* is hung on a standard *S* extending up from the back of the fire pot and the weight *I* is carried on a forwardly projecting arm *g*<sup>3</sup>. A rod *T*, passed transversely through the fire pot behind the plate *R*, forms a stop that prevents the plate from being pushed backward. In this arrangement, as the long arm of the lever *G* is depressed when the tool is introduced, the valve arm *K* is normally in an upwardly inclined position.

As a further modification of the invention the operating end of the valve lever may be arranged at the side of the tool, so that when the tool is inserted it will push the lever arm or plate to one side, more or less, according to the amount of the insertion. In this case there would be a fixed post or block on one side of the tool between which post and the end of the lever arm the point of the soldering iron would be inserted as a wedge, moving the lever arm back. Or the valve operating lever may be entirely outside of the fire pot, to be actuated by the handle, not by its weight, which does not admit of a ready adjustment by the act of placing the tool in position, but by a lateral movement of the tool handle against a lever connected with the gas cock, more or less according to the amount the cock is to be opened. Such modifications are suggested as being possible forms of the invention, and I would even further suggest that the same result may be reached by an arrangement which would be a reversal of the arrangement shown by Fig. 5, the end of the operating lever being beneath the end of the pointed tool to be heated and there being a cross bar above, between which and the end of the valve operating lever the end of the tool is inserted, causing the lever arm to be depressed and the gas cock opened, not by the weight of the tool but by the wedging in of the tool end above the lever arm, the amount of the lever action being determined by the distance the tool is inserted. It will be seen that in this case the flow of the gas is controlled at the will of the operator by the act of placing the tool in position, without regard to its weight, thus distinguishing the invention from former devices of the kind where the flow of the gas is obtained solely by the weight of the tool.

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

1. The combination of a gas-heater for tools, an immovable rest or support for the tool and a cock for said gas-heater having the tool engaged portion of its actuating lever above the horizontal plane of said support or rest and arranged out of operative connection therewith, whereby said lever is adapted to be actuated by the tool for regulating the flow of the gas, as set forth.

2. The combination of a gas-heater for tools



having a burner and a cock, and the actuating lever of said cock having an arm projecting in front of the tool as it is placed in position for heating, and an immovable rest or support for the tool, disconnected from said arm, substantially as set forth.

3. The combination of a gas-heater for tools having a burner and a cock, and the actuating lever of said cock having a vertical arm acted upon by the tool as it is placed in position over the burner for heating, and a rest or support for the tool, arranged out of operative connection with said arm, substantially as described.

4. The combination of a gas heater for tools having a burner and a cock, and the actuating lever of said cock having a pendent end-portion acted upon by the inner end of the tool as it is placed in position over the burner for heating, and a rest or support for the tool, arranged out of operative connection with said end-portion, substantially as described.

5. The combination of a gas-heater for tools

having a burner and a cock, and the actuating lever of said cock provided with a vertical plate-like end-portion acted upon by the tool as it is placed in position over the burner for heating, and a rest or support arranged out of operative connection with said plate-like end-portion, substantially, as set forth.

6. The combination of a gas-heater for tools, having a burner and gas and air supply pipes with valves therefor, a lever operating said valves and adapted to be varied in its movement when acted upon by the tool, and adjustable connections with the arms of said valves, and a rest or support for the tool, arranged out of operative connection with said lever, substantially, as described.

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

ABRAHAM T. WELCH.

Witnesses:

G. Y. ATLEE,  
STORY B. LADD.