(No Model.)

# J. IRWIN.

## VAPOR BURNER.

No. 263,047. Patented Aug. 22, 1882.

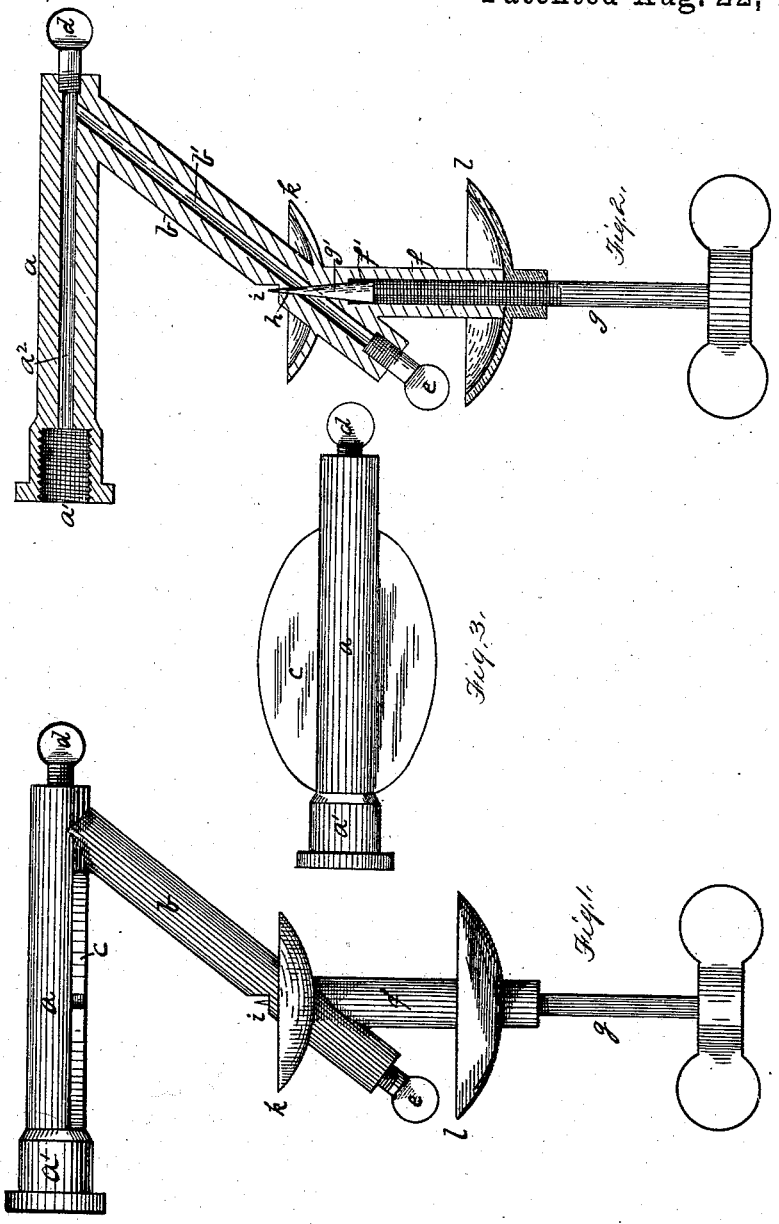

Fig. 2.



Fig. 3.



Fig. 1.

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# UNITED STATES PATENT OFFICE.

JAMES IRWIN, OF WEST BELLEVUE, PENNSYLVANIA.

## VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 263,047, dated August 22, 1882.

Application filed June 10, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES IRWIN, of West Bellevue, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Vapor-Burners; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation of my improved burner. Fig. 2 is a vertical section. Fig. 3 is a plan view.

Like letters of reference indicate like parts in each.

In the drawings, *a* indicates a horizontal pipe having at one end a screw-coupling, *a'*, by which it is attached to the oil-supply pipe, and at the other end a branch pipe, *b*, running diagonally downward and beyond a vertical plane bisecting the middle of the pipe *a*.

On the pipe *a* is a horizontal disk, *c*, which is preferably placed on the under side. The bore $a^2$ of the pipe *a* extends clear through, and at the rear end is closed by a screw-plug, *d*. The bore *b'* of the pipe *b* extends entirely through it, and at the upper end connects with the bore $a^2$ of the pipe *a*, and at the lower end is closed by a screw-plug, *e*.

Extending vertically downward from the pipe *b* is a tube, *f*, having a bore, *f'*, of uniform diameter nearly to its upper end, which bore is screw-threaded and fitted to receive the threaded stem of the regulator *g*. The upper end of the regulator *g* is pointed and conical in shape, as at *g'*. It extends through a hole, *h*, of corresponding shape, which opens out in a recess or notch, *i*, on the upper side of the diagonal pipe *b*. The conical point *g'* extends beyond the end of the hole *h* a short distance, and the regulator *g* is designed to regulate the size of the annular opening between the point *g'* and the sides of the hole *h*. If the regulator *g* is screwed down, the annular opening is enlarged, and if it is screwed up it is reduced or entirely closed at pleasure. Around the pipe *b*, and just below the recess *i*, is a cup, *k*, and around the tube *f* is a second cup, *l*.

The operation of my improved burner is as follows: The cups *k* and *l* are filled with benzine or other highly-inflammable liquid and set on fire. Then the oil is turned into the pipe *a* and passes along the pipe *a* and down the pipe *b* which in the meantime have both become highly heated by the flame and heat from the burning benzine in the cups *k* and *l*. This vaporizes the oil, and the size of the opening *h* having been properly regulated by the screw-stem *g*, the vapor passes out through the hole *h* and burns. Once started the burner continues to vaporize its own oil, and it is unnecessary to refill the cups *k* and *l* until the burner is again lighted. The flame from the burner-hole *h* striking against the disk *c* on the upper pipe, as well as acting upon the diagonal pipe *b*, keeps up the heat in the parts *a* and *b* to a degree that will vaporize the oil passing through them.

The purpose of the plugs *d* and *e* is to enable the tubes *a* and *b* to be cleaned out from any sticky or tarry deposit from the oil. This is an important feature, as this deposit is almost certainly made in this character of device. By taking out the plugs *d* and *e* a straight wire or wire brush may be used for cleaning out the pipes *a* and *b*.

If desired, the cup *l* may be omitted. It is, however, better to have both cups. The diagonal arrangement of the pipe *b* over the cups *k* and *l* exposes the oil therein directly to the action of the heat from the cups and aids in its vaporization, and renders the operation of the burner more rapid and perfect. The diagonal arrangement of the pipe *b* exposes the oil therein directly to the heat from the flame at the burning-point *i*.

My burner is cheap in construction, simple and efficient in operation, easy to cleanse, and requires but little attention when in use.

I form the cup *k* upon or integral with the pipe *b*, so as to increase the conducting-power of the same, in order that the heating of the cup by the flame therein and by the flame from the lower cup, *l*, may be more perfectly transmitted to the pipe *b*. The cup *l* is preferably made of larger diameter than the cup *k*, and the latter serves to spread the flame from the cup *l*, so as to distribute it along the greater length of the pipe *b*. The addition of the lower cup, *l*, increases the efficiency of the burner and brings the latter to the point of vaporization more rapidly than any former burners known to me.

I am aware that in this class of devices the burner-orifice has been formed in a branch pipe located below the inlet-pipe of the vaporizing-chamber, and that an initial heating-cup has been arranged on said branch pipe, and do not herein broadly claim such a combination, for the reason, first, that the arrangement of the pipes composing the vapor-chamber has been such that the proper clearing of the chamber was impossible, or else an increased number of joints had to be made, which increased the liability of the devices to leak; and, secondly, the position of the branch pipe precluded the forming of the initial heating-cup integral therewith; whereas by my improved construction the pipes *a* and *b*, forming the vaporizing-chamber, may be cast in one piece, thereby increasing the heat-conducting capacity and decreasing the number of joints and the liability to leakage, as well as enabling straight or nearly straight bores to be formed, which facilities the cleaning of the vaporizing-chamber. Furthermore, the diagonal position of pendent pipe *b* permits the initial heating-cup *k* to be cast integral with said pipe, thus increasing the heat-conducting capacity of the combined parts.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a vapor-burner, the combination of the horizontal pipe *a* with the diagonally-arranged pendent pipe *b*, said pipes being integral, substantially as and for the purpose specified.

2. In a vapor-burner, the combination of the horizontal pipe *a* with the diagonally-arranged pendent pipe *b*, and with the initial heating-cup *k*, the heating-cup being integral with the pendent pipe, substantially as and for the purpose specified.

3. In a vapor-burner, the combination of the horizontal pipe *a* and diagonally-arranged pendent pipe *b*, having burner-orifice *h*, and a pocket below the burner-orifice closed by screw-plug *e*, and a regulator, *g*, substantially as and for the purpose specified.

4. In a vapor-burner, the combination of the horizontal pipe having the heating-disk integral therewith, and the diagonally-arranged pendent pipe provided with a burner-orifice and having an initial heating-cup surrounding the burner-orifice and integral with said pendent pipe, substantially as and for the purpose specified.

5. The combination, in a vapor-burner, of a horizontal pipe, *a*, pendent pipe *b*, arranged under the horizontal pipe and having a burner-orifice, an initial heating-cup surrounding the burner-orifice and beneath the horizontal pipe, and a secondary heating-cup arranged below the initial heating-cup and pendent pipe, substantially as and for the purpose specified.

6. In a vapor-burner, the combination of two pipes, *a* and *b*, each pipe having a continuous bore from end to end, said pipes joined at an acute angle to form the V-shaped vaporizing-chamber, and removable plugs or caps for closing the ends of said pipes, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand this 7th day of June, A. D. 1882.

JAMES IRWIN.

Witnesses:
T. B. KERR,
JAMES H. PORTE.