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A. A. TREGIDGO.

QUICKSILVER FURNACE.

APPLICATION FILED MAY 14, 1903.

NO MODEL.

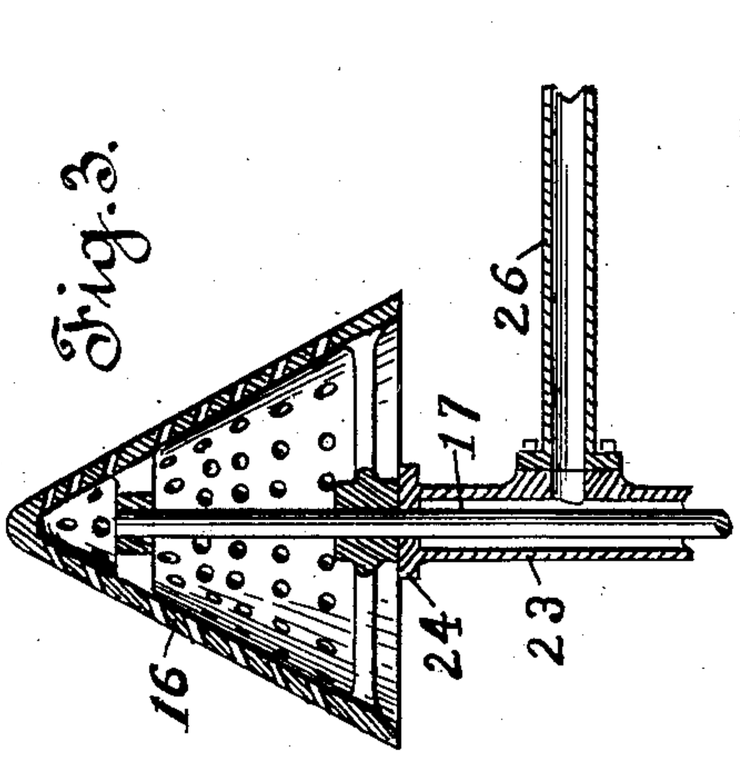

Fig. 3.

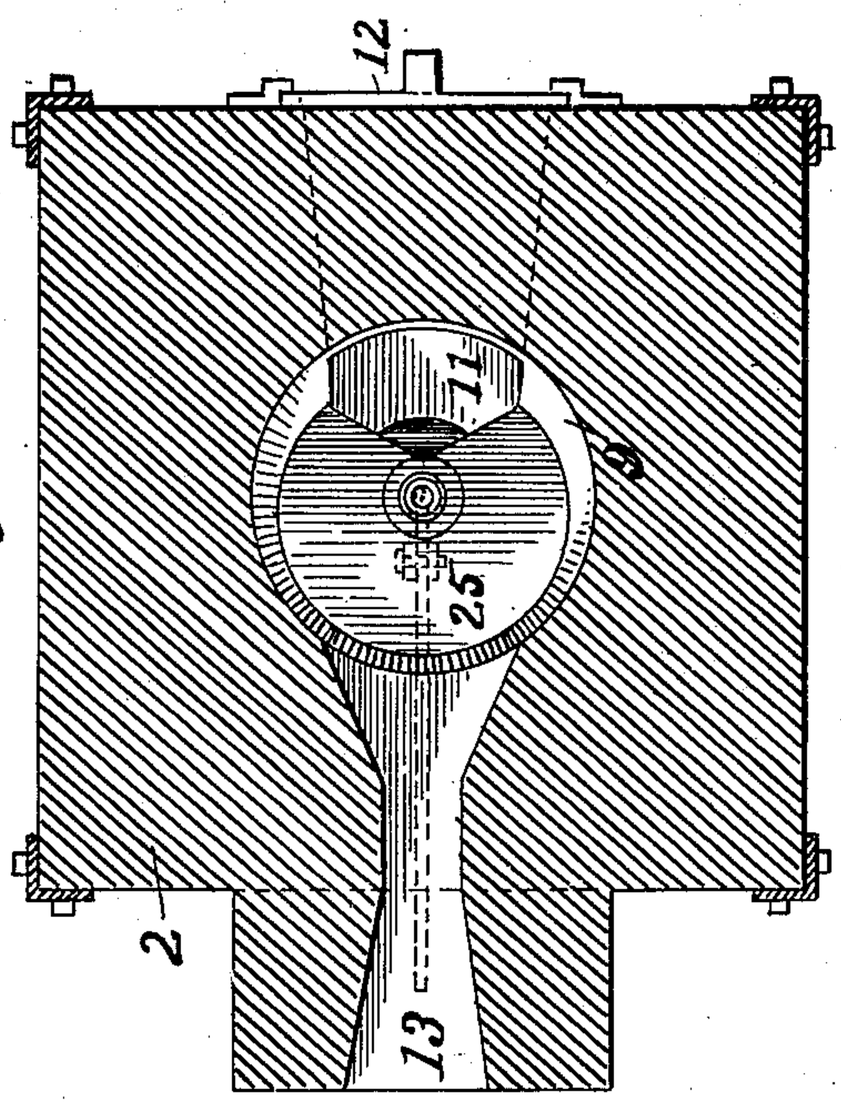

Fig. 2.

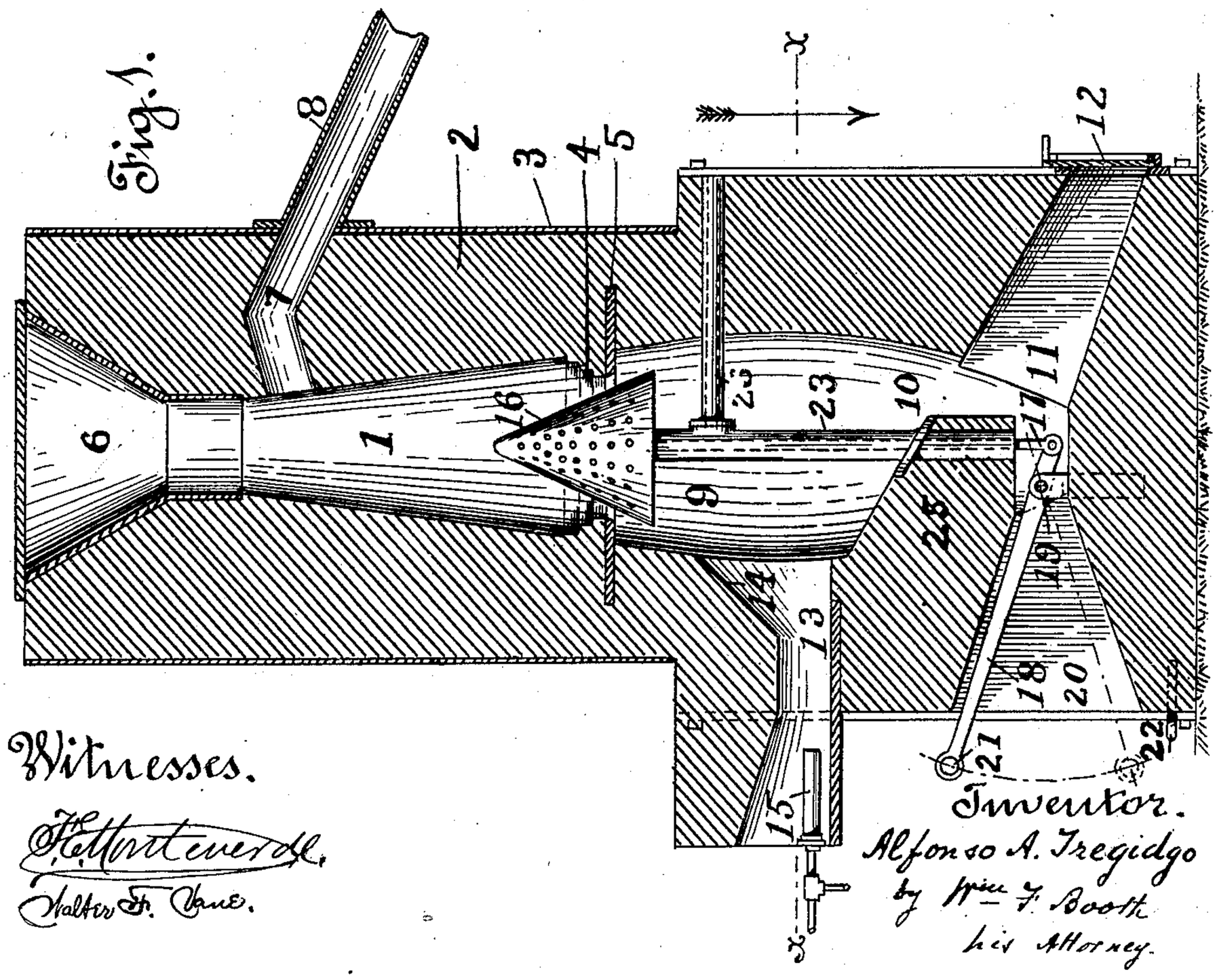

Fig. 1.

Witnesses.

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UNITED STATES PATENT OFFICE.

ALFONSO A. TREGIDGO, OF SAN FRANCISCO, CALIFORNIA.

QUICKSILVER-FURNACE.

SPECIFICATION forming part of Letters Patent No. 735,919, dated August 11, 1903.

Application filed May 14, 1903. Serial No. 157,075. (No model.)

To all whom it may concern:

Be it known that I, ALFONSO A. TREGIDGO, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Quicksilver-Furnaces; and I do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to the class of furnaces for treating quicksilver ore.

The object of my invention is to provide a simple, inexpensive, and effective furnace of this class capable of rapidly, economically, and efficiently handling the ore and especially adapted and intended for use with liquid hydrocarbon fuel.

My invention consists in the novel construction of the furnace, which I shall now describe by reference to the accompanying drawings, in which—

Figure 1 is a vertical section of my furnace. Fig. 2 is a section on line *x x* of Fig. 1. Fig. 3 is an enlarged sectional detail of the cone and its connections.

The shaft 1 is made in the upper portion of the fire-brick shell 2, which has an exterior wrought-iron casing 3. This shaft, as shown in Fig. 1, is of a truncated-cone shape to avoid clogging, and it has a contracted base or throat 4, the under side of which is protected and its edge better defined by a metallic plate 5, let into the fire-brick and forming a conical seat. At the upper end of the shaft is the hopper 6, and issuing from said shaft near its upper end is the vapor-passage 7, continued on the exterior by the pipe 8. The vapor-passage is upwardly inclined at its entrance end, as shown in Fig. 1, and thence is downwardly directed, so that solid matter may not pass into it. Below the base or throat 4 of the shaft is the heat-chamber 9, formed in the fire-brick shell, which chamber swells, as shown in Fig. 1, from its top to about its middle and thence contracts downwardly somewhat more pronouncedly to form the discharge-chamber 10, from the base of which the inclined discharge-passage 11 issues to the exterior and is controlled by a door 12. Through the side of the shell is made heat-opening 13, the inner top wall of which at 14 is inclined upwardly to direct the heat to the throat 4. In this opening is located a suitable hydrocarbon-burner 15.

What I may term the "grate" of the throat 4 consists of a cast-iron hollow cone 16, which lies in the throat and is adapted when lifted to close said throat, said cone finding a seat against the edge of the protecting-plate 5. When the cone is dropped down to the position shown in Fig. 1, it opens the throat or base 4 by providing a circumscribing space through which the ore from which the mercurial vapor has been driven falls to its discharge.

The cone 16 is perforated, the holes being made to incline from the exterior upwardly, as shown in Fig. 3, so that while the heated products and vapors of combustion from the oil-burner and the air carried in through the opening 13 and mixed with and heated by said vapors may pass freely through said cone the ore supported by it in the throat and lying in the shaft above will not drop through or clog said holes. This conical grate 16 may be raised or dropped by any suitable means, though I prefer the construction here shown and which consists of a lifting-rod 17, secured in the cone, as shown in Fig. 3, and thence passing down to and connected with a lever 18, pivoted at 19 in the base of the shell, Fig. 1. The lever 18 extends through the shell in a suitable socket 20 to the exterior, and a means, such as ring 21, is provided at its extremity for securing said lever in its lower position, as by hooking or tying to a ring-bolt 22, whereby the cone is held up. To protect this rod from the ore when falling, as well as to protect it from the heat, I surround it with a pipe or sheath 23, the upper end or head 24 of which serves, as seen in Fig. 3, as a rest for the cone when lowered. The lower end of the sheath passes through and is anchored in an inwardly-projecting deflector portion 25 of the fire-brick shell, which, as shown in Fig. 1, has a downwardly-sloping upper surface in order to prevent the falling ore from lodging upon it. This deflector serves not only as a firm anchorage for the sheath, but as a means for reflecting the heat upwardly and protecting the bottom of the furnace. The sheath serves also by being made considerably larger than the lifting-rod as a passage for a circulation of cool-

ing-air in conjunction with an air-pipe 26, leading from the exterior inwardly through the shell to said sheath, with which it communicates, as shown in Fig. 3.

The operation of the furnace is as follows: The cone being lifted and there held to close the throat or base 4, a charge of ore is supplied to the shaft. The burner is started and the heat passes directly upwardly through the cone into the charge. When sufficiently reduced and the mecurial vapor driven off through the vapor-passage 7, the conical grate is dropped and the reduced ore falls to its discharge. The operation is then repeated.

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

1. In a quicksilver-furnace, a shaft having a contracted base formed with a conical seat, a vertically-movable hollow perforated cone coöperating with said seat to close and open said base to support and to drop the ore, and means for supplying the heat below said cone.

2. In a quicksilver-furnace, a shaft having a contracted base formed with a conical seat, a vertically-movable hollow perforated cone coöperating with said seat to close and open said base to support and to drop the ore, the perforations in said cone inclining upwardly from the exterior, and means for supplying the heat below said cone.

3. In a quicksilver-furnace, a shaft in the upper part of the shell, having a contracted base formed with a conical seat, a heat-chamber below said base and an underlying discharge in the lower part of the shell, a vertically-movable hollow perforated cone coöperating with said conical seat to close and open the base of the shaft to support and to drop the ore, an opening through the shell from the exterior communicating with the heat-chamber below the cone, and a burner in said opening.

4. In a quicksilver-furnace, a shaft in the upper part of the shell, having a contracted base formed with a conical seat, a heat-chamber below said base and an underlying discharge in the lower part of the shell, a vertically-movable hollow perforated cone coöperating with said conical seat to close and open the base of the shaft to support and to drop the ore, an opening through the shell from the exterior communicating with the heat-chamber below the cone, said opening having its upper wall at its inner end inclining upwardly toward the cone, and a burner in said opening.

5. In a quicksilver-furnace, a shaft in the upper part of the shell, having a contracted base formed with a conical seat, a heat-chamber below said base with an underlying discharge-chamber in the lower part of the shell, a vertically-movable hollow perforated cone coöperating with said conical seat to close and open the base of the shaft to support and to drop the ore, an opening through the shell from the exterior communicating with the heat-chamber below the cone, a burner in said opening, and an inwardly-projecting downwardly-sloping portion of the shell between the heat-entrance and the ore-discharge.

6. In a quicksilver-furnace, a shaft having a contracted base formed with a conical seat, a vertically-movable hollow perforated cone coöperating with said seat to close and open said base to support and to drop the ore, a downwardly-extending rod carrying said cone, a lever connected with the rod and passing to the exterior to raise and lower said rod and its attached cone, and means for supplying heat below said cone.

7. In a quicksilver-furnace, a shaft having a contracted base formed with a conical seat, a vertically-movable hollow perforated cone coöperating with said seat to close and open said base to support and to drop the ore, a downwardly-extending rod carrying said cone, a lever connected with the rod and passing to the exterior to raise and lower said rod and its attached cone, a fixed sheath encircling said rod, said sheath being anchored below in the furnace-shell and having a head serving as a rest for the cone when dropped, and means for supplying heat below said cone.

8. A quicksilver-furnace comprising a shell having formed in its upper portion a shaft with a vapor-pipe above and a contracted base with a conical seat, a heat-chamber and a discharge-chamber in the shell below, a vertically-movable hollow perforated cone coöperating with the conical seat to open and close the base of the shaft to support and to drop the ore, an opening through the furnace-shell from the exterior and communicating with the heat-chamber, the inner top wall of the opening being upwardly inclined, a burner in said opening, the furnace-shell having an inwardly-projecting downwardly-inclined portion below said burner-opening, and above the discharge, a hollow pipe or sheath anchored below by the inwardly-projecting portion of the shell, a rod secured to the cone and passing down through the sheath, and a lever attached to lower end of the rod for raising and lowering the cone.

9. A quicksilver-furnace comprising a shell having formed in its upper portion a shaft with a vapor-pipe above and a contracted base with a conical seat, a heat-chamber and a discharge-chamber in the shell below, a vertically-movable hollow perforated cone coöperating with the conical seat to open and close the base of the shaft to support and to drop the ore, an opening through the furnace-shell from the exterior and communicating with the heat-chamber, the inner top wall of the opening being upwardly inclined, a burner in said opening, the furnace-shell having an inwardly-projecting downwardly-inclined portion below said burner-opening, and above the discharge, a hollow pipe or sheath anchored below by the inwardly-projecting por-

tion of the shell, and having a head to support the cone when lowered, an air-pipe from the exterior communicating with said sheath, a rod secured to the cone and passing down through the sheath, and a lever attached to lower end of the rod for raising and lowering the cone.

In witness whereof I have hereunto set my hand.

ALFONSO A. TREGIDGO.

Witnesses:
WALTER F. VANE,
D. B. RICHARDS.