

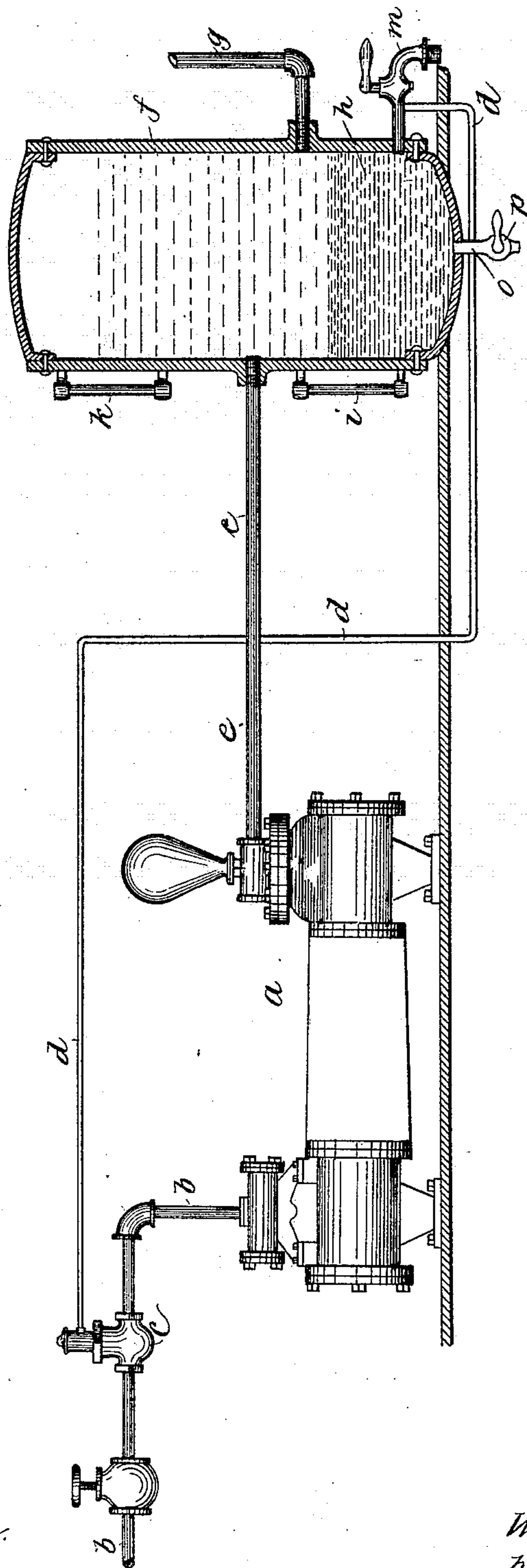
(No Model.)

W. R. ADDICKS.

APPARATUS FOR FORCING OIL OR SIMILAR LIQUIDS.

No. 428,874.

Patented May 27, 1890.



Witnesses,
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UNITED STATES PATENT OFFICE.

WALTER R. ADDICKS, OF BOSTON, MASSACHUSETTS.

APPARATUS FOR FORCING OIL OR SIMILAR LIQUIDS.

SPECIFICATION forming part of Letters Patent No. 428,874, dated May 27, 1890.

Application filed April 13, 1889. Serial No. 307,121. (No model.)

To all whom it may concern:

Be it known that I, WALTER R. ADDICKS, of Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in
5 Apparatus for Forcing Oil or Similar Liquids, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

10 The object of my invention is to produce an apparatus adapted for supplying crude petroleum-oil under uniform pressure for use in the manufacture of gas.

It is necessary for the proper operation of
15 gas-machines that the oil should be supplied under substantially uniform pressure, and in order to obtain this result large elevated tanks are now commonly employed, into which the oil is raised by pumps and from which it is de-
20 livered under substantially uniform pressure by gravity or the head of the raised liquid. Such apparatus is expensive and requires considerable care and watchfulness to prevent danger of overflowing the tanks. The tanks
25 are covered to prevent escape of a large amount of vapor, but have to be provided with a vent-passage in order to admit air, so that the liquid may flow by gravitation.

Regulating devices have been made for governing the action of forcing-pumps in accordance with the pressure of the liquid forced by them, and such devices have been made capable of very close regulation of the pressure, keeping it within a variation of a pound
35 or less; but the mechanism of such devices is delicate, and the material commonly employed in their construction is of such character as to be injuriously affected by the crude oil used in the manufacture of gas, so that it is im-
40 practicable to use such regulating device in the usual manner for governing a pump that forces crude oil for gas-manufacture.

The object of my invention is to provide means by which a pump and regulator may
45 be efficiently used to control the operation of forcing oil into a comparatively small closed tank having no vent, in which pressure is maintained upon the oil by air or gas confined in said tank above the surface of the oil; and
50 the invention consists, mainly, in an apparatus comprising a forcing-pump, an automatic regulating-valve controlling the operation of

said pump in accordance with variations in the pressure of the liquid forced by it, a closed tank or chamber into which the liquid is forced 55 and from which it is delivered, the said tank having its lower portion filled to a definite level with water or other liquid heavier than crude oil or liquid forced by the pump and not capable of mixing therewith, and a duct 60 leading from the lower portion of said tank containing the water to the pressure-regulating valve and operating therein to govern the action of the pump. By this construction the pump-regulator is not exposed to or affected 65 by the liquid forced by the pump, although the water or other liquid in the lower portion of the tank is directly affected by changes in pressure of the pumped liquid, and thereby causes the pump to be effectively controlled, 70 so as to produce a substantially uniform pressure in the tank.

The drawing represents an apparatus for supplying crude oil or similar liquid under uniform pressure. 75

The pump *a*, by which the liquid is forced, may be of usual construction, the part exposed to the liquid being of such material as not to be injuriously affected thereby, and the steam or actuating cylinder of the pump being con- 80 nected with the usual steam-pipe *b*, which is connected with a regulating-valve *c*, which may be of any suitable or usual construction, being connected with a pressure-pipe *d*, and so made that when the pressure in the said 85 pipe rises to a predetermined maximum about the valve *c* is closed and cuts off the steam or actuating-fluid from the pump, and thus stops the operation of the pump, so that the liquid forced by it cannot receive a pressure above 90 the predetermined maximum, but is retained under substantially constant pressure. The liquid is forced by the pump *a* through the delivery-pipe *e* into a closed tank or chamber *f*, the upper portion of which contains air or 95 an elastic fluid, which by its elasticity provides for slight changes in the pressure of the liquid produced by variations in the draft from the said tank, which is provided with an outlet or delivery pipe *g*, leading to the point 100 or points where the liquid is to be used. The lower portion of said tank is filled to a level somewhat below the mouth of the outlet-pipe with a liquid *h*, which may be water, and said

lower portion communicates with the pipe or duct *d*, leading to the regulating-valve *c* of the pump, which valve is thus protected from exposure to the liquid forced by the pump into the chamber *f*. The said chamber *f* is preferably provided with sight-tubes *i* and *k*, communicating with the reservoir above and below the division-lines between the different fluids, so as to indicate the level of the fluids in the said chamber, and the lower portion may be provided with a faucet or valve *m*, by which the liquid *h* may be drawn off when the apparatus is not in use, or by which more of the liquid may be introduced when required. The lower part of the chamber is preferably provided with an outlet *o*, having a valve or stop-cock *p*, so that the contents of the chamber may be blown out, if required, by opening the valve *p* while the pressure is on the chamber. The supply-pipe *e*, leading from the pump to the tank, may have the usual relief-passages, and the tank *f* will accommodate any back-pressure that may be developed in the vaporizers or heaters of the gas-machines when not in operation.

While the apparatus has been described as employed for supplying crude oil under uniform pressure and as having water for the liquid by which the pressure is transmitted to

the pump-regulator, it is obvious that it may be employed with other liquids or fluids, it being essential only that the liquid *h* in the lower part of the reservoir should be of such nature as to operate without injury to the regulator-valve and should be heavier than the fluid forced by the pump and not capable of mixing therewith.

I claim—

An apparatus for forcing liquids, comprising a pump or forcing apparatus, a regulating-valve for controlling the supply of the pump-actuating fluid, a closed tank receiving the pumped liquid and containing a heavier and immiscible liquid at its bottom, and a duct opening communication between the heavier liquid in the tank and the regulating-valve below the level of the pumped liquid and transmitting variations in pressure of the pumped liquid through the heavier liquid to control the regulating-valve, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WALTER R. ADDICKS.

Witnesses:

JOS. P. LIVERMORE,
JAS. J. MALONEY.