

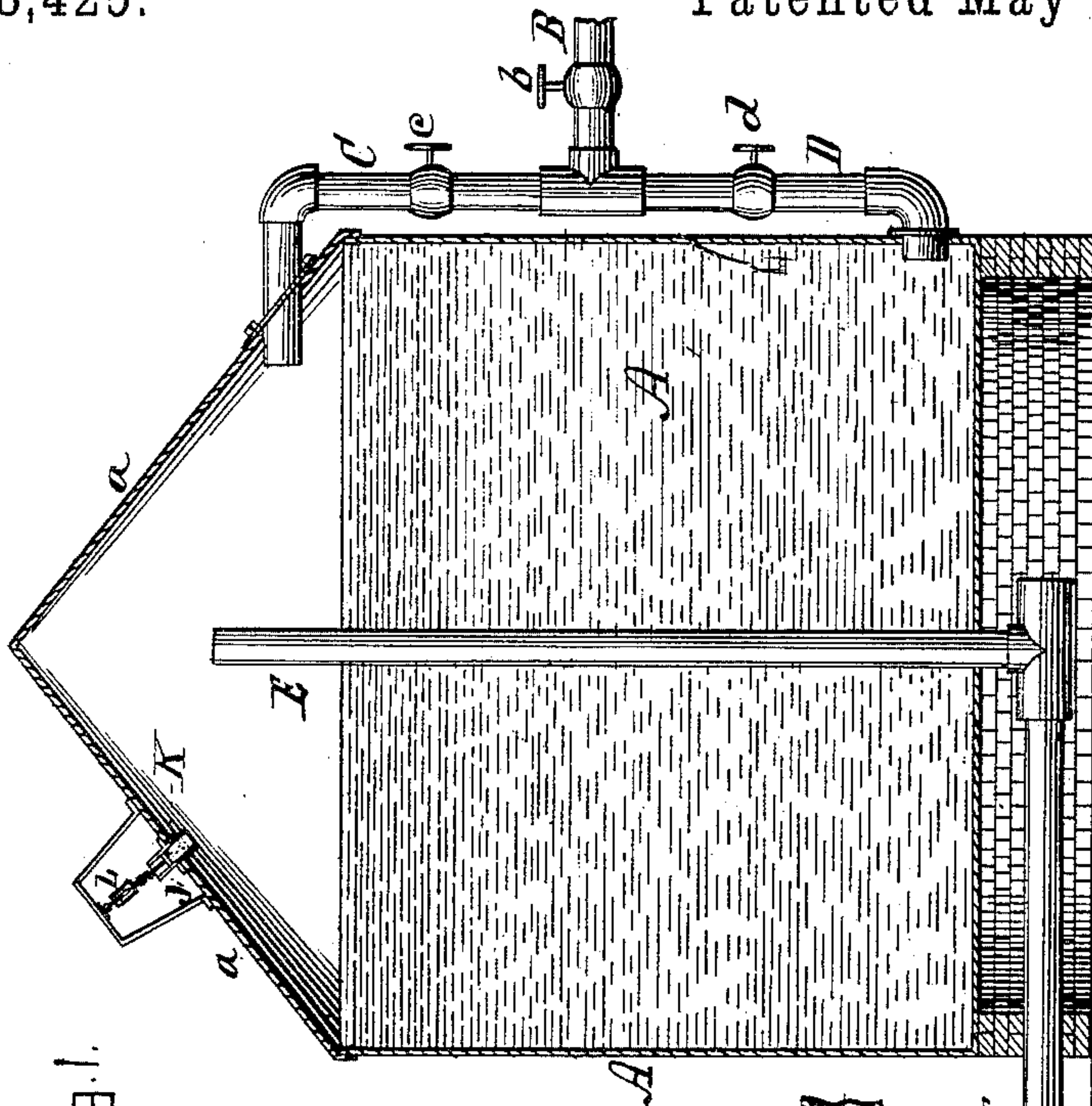
(No Model.)

A. J. GOULD.

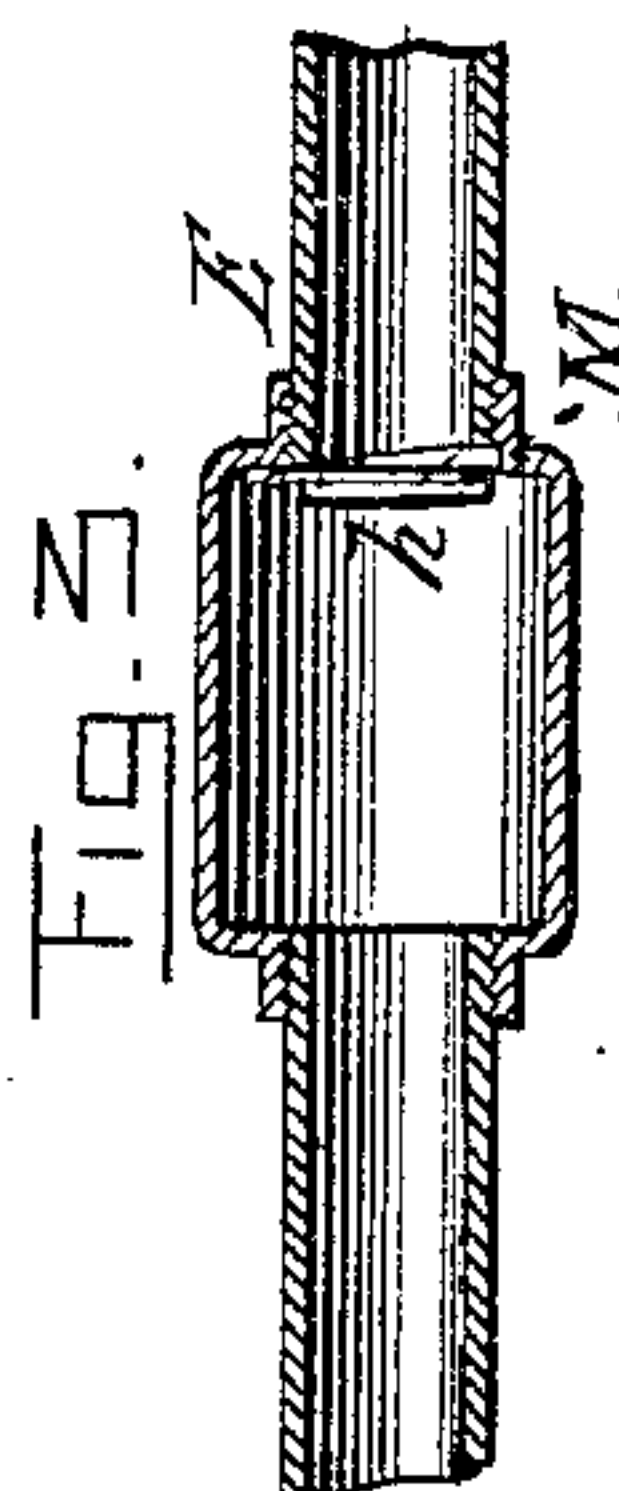
APPARATUS FOR STORING OIL AND UTILIZING THE VAPORS OF THE SAME.

No. 318,425.

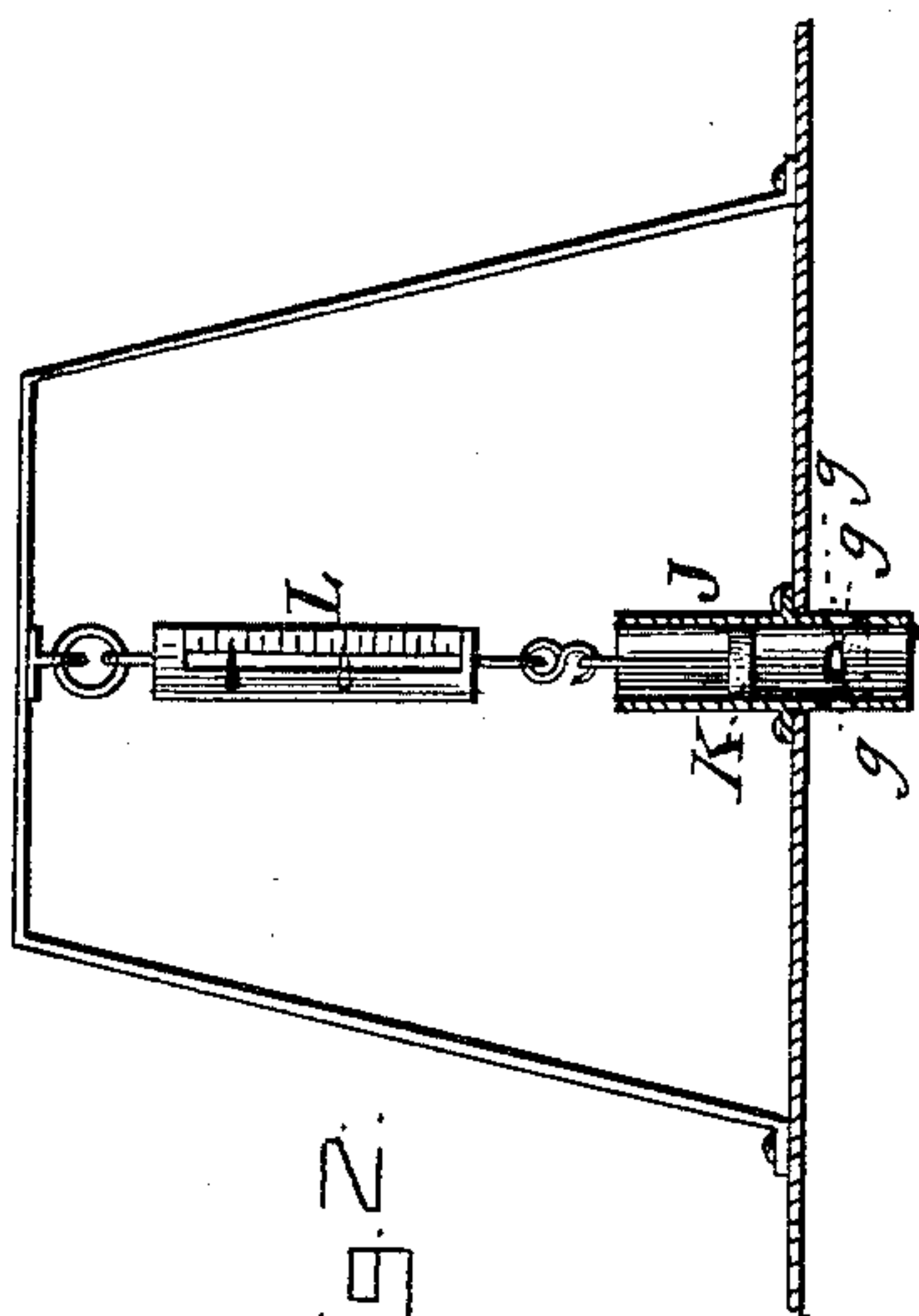
Patented May 19, 1885.



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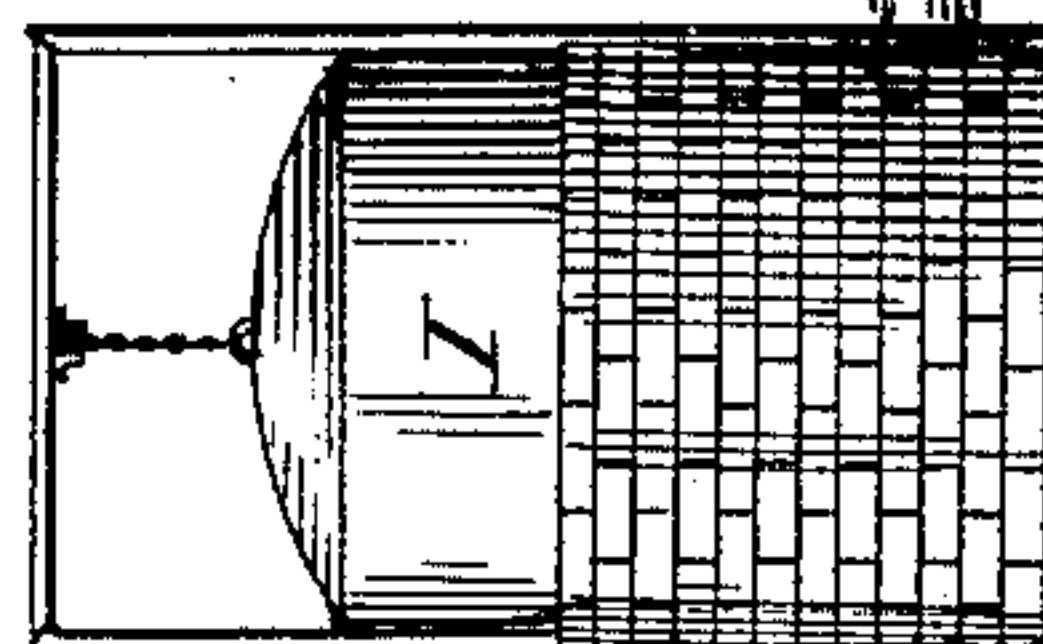
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N. E.

WITNESSES:

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INVENTOR,

Andrew J. Gould,
By his attorney
J. S. Brown.

UNITED STATES PATENT OFFICE.

ANDREW J. GOULD, OF QUINCY, CALIFORNIA.

APPARATUS FOR STORING OIL AND UTILIZING THE VAPORS OF THE SAME.

SPECIFICATION forming part of Letters Patent No. 318,425, dated May 19, 1885.

Application filed October 24, 1884. (No model.)

To all whom it may concern:

Be known that I, ANDREW J. GOULD, of Quincy, in the county of Plumas and State of California, have invented an Improved Apparatus for Storing Oil and Utilizing the Vapors of the Same; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification—

Figure 1 being a vertical section of a tank forming part of my improved apparatus and a side view of the remaining parts; Fig. 2, a section, on an enlarged scale, of a vacuum-indicator and safety device attached to the storage-tank; Fig. 3, a section, on an enlarged scale, of an improved valve for controlling the discharge of vapor from the tank.

Like letters designate corresponding parts in all of the figures.

The leading purpose of my improved apparatus for storing oil and utilizing its vapors is thus to save for use a valuable part of petroleum which is ordinarily wasted, and to so regulate its discharge as to prevent the leakage of the same from the tank, thereby preventing the destruction of the oil by fires originating in leakage, and also to extinguish any fire which may from lightning or any other cause commence burning the oil. Incidental to the main purpose of my invention is the filling of the tank with oil, either entirely by the vapor-discharging apparatus without special means for the purpose or assisting such means at all times.

To accomplish the purposes above set forth I employ a covered air and vapor tight storage-tank, a vapor-discharge pipe or conductor, and a pump which is adapted to positively withdraw the vapor from the tank and to produce a partial vacuum in the tank to as great a degree as may be required. The vapor as it is withdrawn from the tank is either conveyed directly to burners for immediate utilization, or is stored in a suitable gasometer or equivalent receptacle for use as wanted for illuminating or heating.

In the accompanying drawings, A represents the oil-storage tank, closed at the top with an air and vapor tight cover or roof, *a*, and supplied with oil through a supply-pipe, B, the flow through which is permitted, regu-

lated, and cut off by a valve, *b*. The pipe may preferably lead into the tank through two branch pipes, C D, leading, respectively, to the top and bottom of the tank, each being controlled or cut off by a valve, *c* or *d*. Thus the oil may be let into the tank either at the top or bottom, according to circumstances. This construction of the inlet-pipe is convenient, but not important to the purposes of my invention.

From the upper interior part of the tank, above the highest oil-surface line, a vapor-discharge pipe or conductor, E, leads downward and out of the tank and away to any distance from the tank where it may be desired to use the vapors drawn from the tank, and at any desired point along the pipe or conductor a pump, G, is located for drawing the vapors from the tank through the said pipe or conductor with positive force, and from thence forcing the vapors to the place or places where they are to be used through a pipe, H, which may be considered an extension of the vapor-discharge pipe E; or the vapors may be first conducted to a gasometer or suitable receiving-vessel, I, for use at any time desired.

The pump G is adapted to produce any required degree of exhaustion in the tank or outward pressure therefrom when the valve *b*, which controls the inward flow of the oil into the tank, closes the supply-pipe B. With this pump, thus operating, also, the oil may be drawn into the tank through the supply-pipe without any additional or special means for the purpose; or it may assist the pump or other means for forcing oil into the tank.

The exhaustive action of the pump G prevents any leakage of vapors from the tank, even though there may be any place for leakage, by keeping the said pump continually in operation, because of the partial vacuum which it produces or tends to produce in the tank; but if it is not desired to keep the pump constantly in operation it will effectually serve at any time by setting it in operation to extinguish any fire, should the oil or vapor in the tank take fire, either through leakage or from lightning, by its producing a partial vacuum in the tank and drawing out therefrom any vapor or air which would feed the flames. Thus the apparatus affords a complete protec-

tion against fires in the tank and consequent destruction of the oil therein.

In order to regulate the degree of exhaustion produced in the tank by the pump and to indicate the same, I employ a safety device, constructed substantially as follows, for preventing collapse of the tank: An inlet-pipe, J, Fig. 2, is let into the roof or top of the tank, and a tightly-fitting piston, K, works therein by the variation of the inward pressure. The piston is held against the inward pressure of the air, and the degree of inward pressure of the air is indicated by a spring-scale, L, to which the piston is attached. Ordinarily no air is admitted into the tank by the piston K, and simply the degree of inward pressure is indicated by the spring-scale; but a limit is provided, which, when the inward pressure has been reached, air is admitted through the inlet pipe or cylinder J, and prevents further increase, and thereby prevents collapse of the tank. This is effected by extending the inner end of the pipe or cylinder J into the tank somewhat beyond the wall of the same, and making side apertures, *g g*, in the said pipe or cylinder inside of the tank, so that when the piston K is forced inward beyond these apertures, as indicated by dotted lines in Fig. 2, the air enters the tank through the said apertures.

To prevent the return of vapor into the tank through the vapor-discharge pipe E, and yet allow the free discharge of vapor by its own expansion, even when the pump G is not in operation, I employ a check-valve, M, peculiarly arranged, as shown in Fig. 3. When there is no positive action of the pump and no backward pressure, the valve M hangs a little off from its valve-seat *h*, which may overhang slightly, as shown, for the purpose, and the vapor is free to pass outward gradually; but the moment when a backward pressure commences in the pipe the valve is thereby closed against its seat and stops further return of the vapor.

It is to be understood that the pump G is to be worked constantly or at intervals, and with more or less rapidity, according to the use and demand for the vapor. If the purpose is to obtain and use as much vapor as possible, then the pump is run with full force and continually, and the greater the degree of vacuum produced in the tank the more rapid the vaporization of the oil goes on; but if the purpose is simply to prevent the waste of vapor from the tank and to guard against fire, then the pump is run only so long and with such speed as may be required to accomplish the result. In such case the use to be made of the withdrawn vapors is adapted to the supply thus obtained.

I claim as my invention—

1. A storage apparatus for oil, consisting of a closed tank, A, a vapor-discharge pipe or conductor, E, and a pump, G, operating substantially as and for the purpose herein specified.
2. The combination of a closed tank, A, vapor-discharge pipe or conductor E, exhaust-pump G, and check-valve M, substantially as and for the purpose herein specified.
3. The combination of a closed tank, A, supply-pipe B, controlled by a valve, *b*, vapor-discharge pipe E, and exhaust-pump G, substantially as and for the purpose herein specified.
4. The combination of a closed storage-tank, A, vapor-discharge pipe or conductor E, pump G, and vapor-receptacle I, substantially as and for the purpose herein specified.
5. The combination of a closed tank, A, vapor-discharge pipe or conductor E, exhaust-pump G, and inlet safety device J K L, substantially as and for the purpose herein specified.

ANDREW J. GOULD.

Witnesses:

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