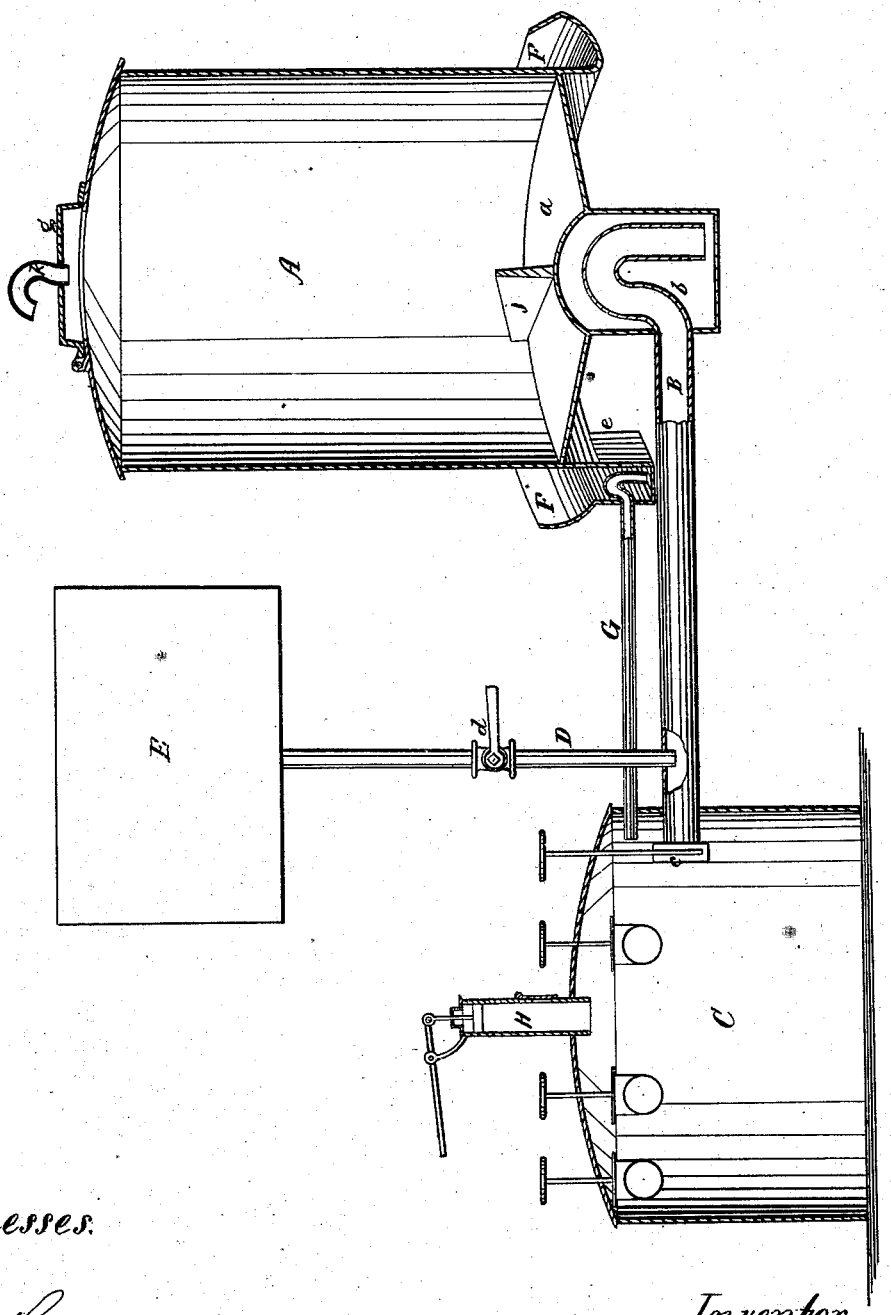
J. H. HAYWARD.

Safety-Tank for Oil.

No. 160,520. Patented March 9, 1875.



Witnesses.

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JOHN H. HAYWARD, OF NEW YORK, N. Y.

IMPROVEMENT IN SAFETY-TANKS FOR OIL.

Specification forming part of Letters Patent No. **160,520**, dated March 9, 1875; application filed July 23, 1874.

To all whom it may concern:

Be it known that I, JOHN H. HAYWARD, of the city of New York, county and State of New York, have invented Improved Safety-Tanks for Storing Inflammable Oil, reference being had to the accompanying drawings, forming part of this specification.

The drawing represents a vertical central section of my apparatus.

The object of my invention is to secure petroleum-oil and other inflammable fluids, when stored in large quantities, against destruction by fire; and consists, first, in the combination, with the tank or tanks in which such fluid is stored, of a safety-reservoir, so connected with the storage-tank that the fluid while burning on the surface may be drawn from the tank into the reservoir without danger of igniting the fluid in the reservoir; second, the combination, with the storage-tank, of a water-tank or other source of water-supply, whereby the storage-tank and the conduit leading from it to the reservoir may be flooded with water, and thereby the flame of burning fluid remaining in the tank after the bulk of it has been drawn off be extinguished; third, the combination, with the exterior of the storage-tank, of a drip-pan, extending around its base, for catching the overflow or drippings of fluid, and preventing their escape and spread about the tank; and, fourth, the combination, with the reservoir and tank, of a vacuum-pump, whereby the transfer of fluid from the tank to the reservoir may be hastened.

A is the storage-tank. It is constructed usually of iron, and may be made of any desired capacity. The bottom *a* is provided with a well or depression, *b*, into which is introduced a pipe or conduit, B, bent within the well into a trap or seal. C is a safety-reservoir, placed at some distance from the tank, and is connected with the tank by the pipe B, which opens into it at or near its top. *c* is a valve of any suitable construction, whereby the end of the pipe B opening into the reservoir may be opened or closed at pleasure by a person at the reservoir.

The pipe B may, if preferred, be extended downward within the safety-reservoir C near to the bottom, thereby forming as effectual a seal against flame at the said end of the said pipe as the trap forms that at the opposite end.

The storage-tank and safety-reservoir must be located relatively to each other, as shown in drawings—that is to say, the bottom of the reservoir must be below that of the tank, and should have capacity below the pipe B to hold the fluid contained in the tank, or as many tanks as may be connected with the reservoir. Preferably this reservoir is sunk into the ground, and entirely covered, so that it shall be exteriorly inaccessible to flame, and secure against fire. It may, if preferred, be placed under water. It may be constructed of masonry, cemented, or of metal, or any other suitable material. Any desired number of storage-tanks may be connected with it.

D is a water-pipe, which opens into the pipe B, and leads to the water-tank E, or any other source of water-supply that has head sufficient to force water through the said pipes into the tank A. It is furnished with a stop-cock or valve, *d*, by which the water may be let on or cut off at pleasure.

F is a drip-pan or receiver, formed externally around the base of the tank A, into which the overflow or drippings of fluid will flow. At one point in this drip-pan is formed a well or depression, *e*, into which any fluid that may be in the pan will flow, and from which it will be conducted to the reservoir C, or some other place of safe storage, by the pipe G, which at the end opening into the well *e* is fashioned to form a seal or trap to prevent the possible entrance of flame.

H is an air-vacuum pump fixed in the reservoir C, whereby the air may be exhausted from the reservoir, and thereby permit the pressure of the atmosphere upon the fluid in the tank A to hasten the transfer of fluid from the tank to the reservoir through the pipe B when the valve *c* is opened. The top of the tank A is preferably secured to the body, having, however, one or more large openings, closed by a hinge-cover, *g*, which, in case of an explosion of vaporized fluid within the tank, will be thrown open without the destruction of the top of the tank, and arranged so that it may, after the explosion, be sprung back and smother the fire. The said cover is

furnished with a vent-pipe, *k*, to permit the escape of vapor from the tank.

In place of forming a well or depression in the bottom of the tank A with the trap or seal inside of the well, the pipe B may lead directly out of or near the bottom of the tank, and be so bent as to form, or otherwise be furnished with, a trap or seal outside the tank; or the end of the said pipe may be carried up through the bottom of the tank, and fashioned so as to form a trap or seal within the tank, dispensing with the well *b*, the essential thing being to so connect the pipe with the tank that the pipe shall remain sealed by the fluid after the mass of it shall have been transferred to the reservoir, so preventing the possibilty of flame passing through the pipe and being communicated to the fluid in the reservoir.

The mode of proceeding in case fluid in the tanks takes fire is obvious. The valve *c* being opened, the fluid while burning on the surface will flow from the bottom of the tank rapidly through the pipe B into the safety-reservoir, away from the fire and out of danger. When the fluid is so far discharged from the tank as to cease flowing, there will still be fluid in the trap or seal, effectually preventing the flame of the burning fluid remaining in the tank from passing through pipe B and igniting the fluid in the reservoirs. As soon as the fluid ceases to flow into the reservoir the valve *c* is to be closed and the valve *d* opened, when water will rush into and flood the tank A and extinguish the flame.

The valve *c* and the valve *d* may be arranged to operate together instantaneously.

j is a flange or projection fixed on the bottom of the tank A, to prevent the rotary motion of the fluid during its discharge, thereby preventing an indraft toward the discharge-pipe; or the same may be accomplished by conical caps, of metal, fixed over the well.

The drip-pan F is important, preventing, as it does, the saturation with the inflammable fluid of the ground, floor, or platform upon which the tank stands, which ordinarily constitutes so great a source of danger.

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

1. A storage-tank, A, for inflammable fluid, and the safety-reservoir C, connected by a conduit or pipe furnished with a trap or seal, as described, leading out of the bottom of the tank into the reservoir, through which the fluid, by its own gravity, will flow from the tank into the reservoir without opening a passage for the communication of flame from one to the other, substantially as and for the purpose specified.

2. The combination, with the storage-tank A and safety-tank C, of the water-reservoir E and its discharge-pipe D, leading into the pipe B, whereby when fluid is on fire in the tank A a body of water may be interposed directly between the burning fluid and the safety-tank C, as described.

3. The drip-pan F, formed upon the external base of the tank A, and a discharge-pipe, constructed, arranged, and operating as and for the purpose specified.

Witness my hand this 21st day of July, 1874.

JOHN H. HAYWARD.

Witnesses:
WM. W. RUSSELL,
B. S. CLARK.