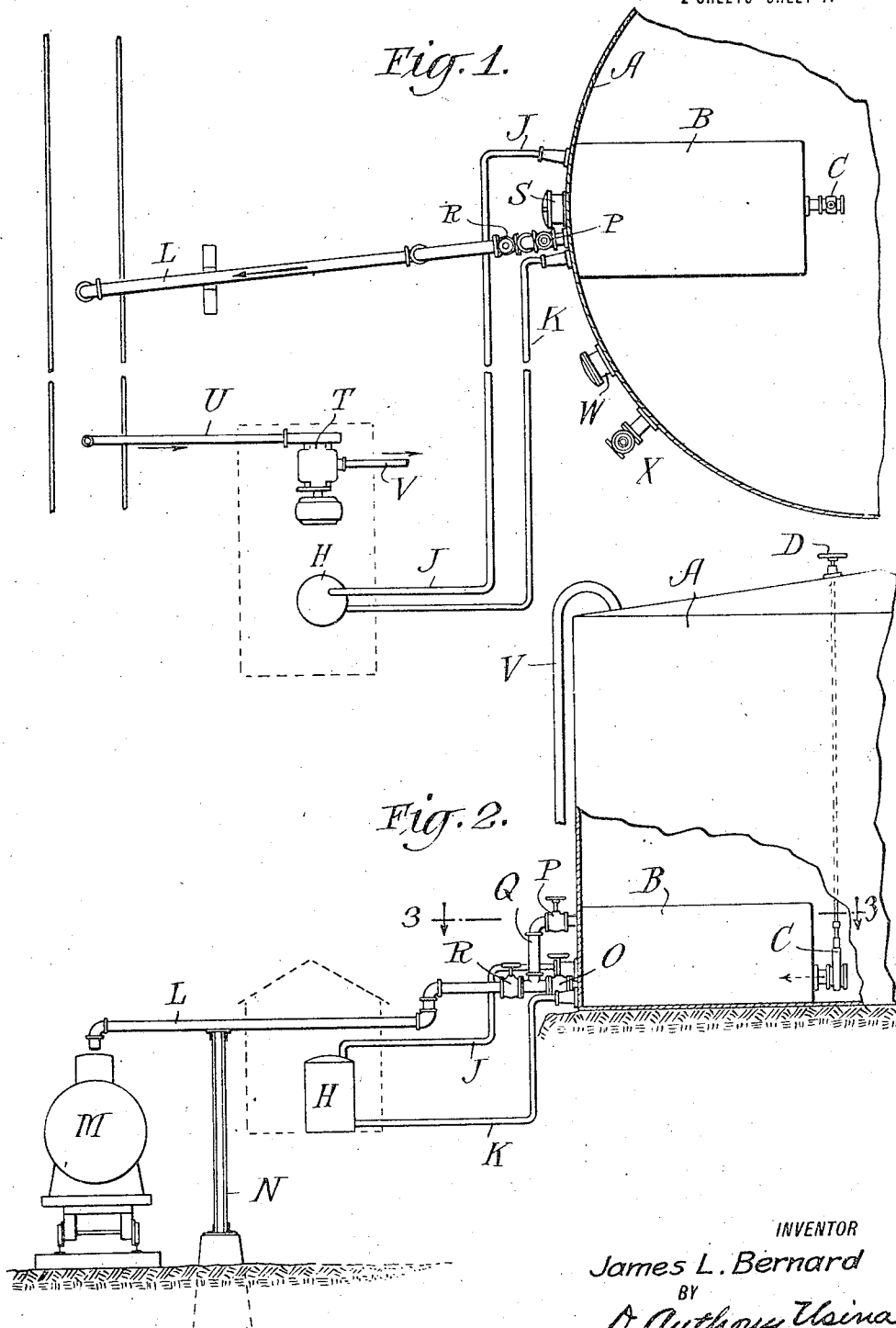


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FUEL OIL STORAGE AND HEATING TANK.
APPLICATION FILED AUG. 22, 1918.

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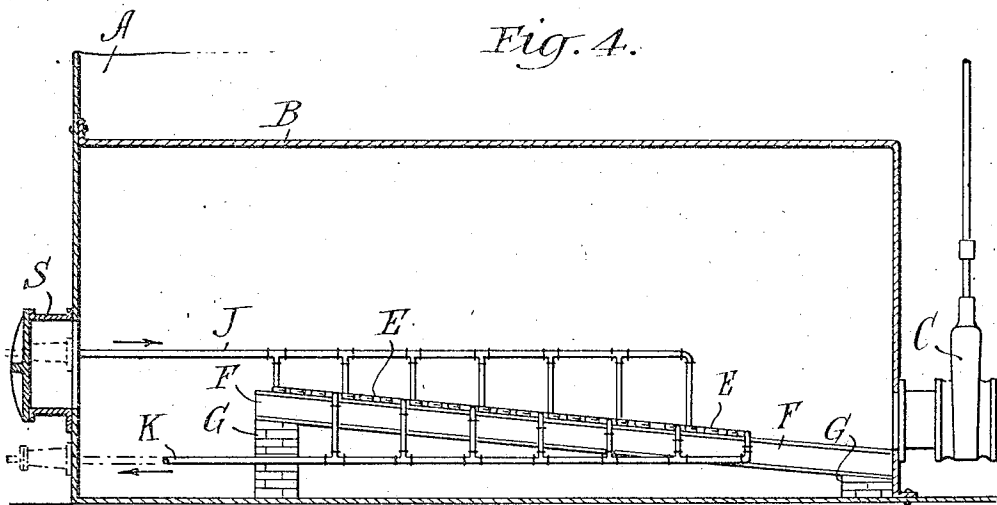
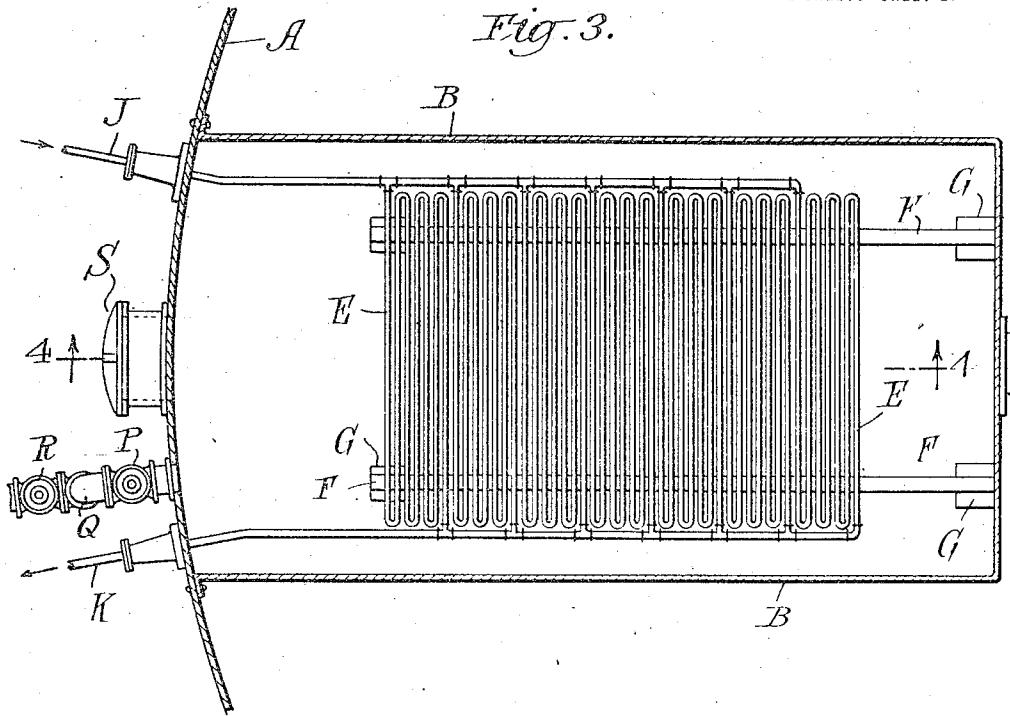
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2 SHEETS—SHEET 1.



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UNITED STATES PATENT OFFICE.

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FUEL-OIL STORAGE AND HEATING TANK.

1,330,779.

Specification of Letters Patent.

Patented Feb. 17, 1920.

Application filed August 22, 1913. Serial No. 251,003.

To all whom it may concern:

Be it known that I, JAMES L. BERNARD, a citizen of the United States, residing in Beaver, Beaver county, Pennsylvania, have invented certain new and useful Improvements in Fuel-Oil Storage and Heating Tanks, of which the following is a specification:

This invention relates to an installation for storing large quantities of fuel oil and particularly to apparatus whereby the temperature of the oil may be raised sufficiently to liquefy the oil so that it will flow freely from the storage tank. In cold weather fuel oil congeals and in order to convey the same through piping it is necessary to raise its temperature in order to cause it to flow with ease. The installation shown herein is of sufficient capacity to hold about a quarter of a million gallons of fuel oil and it is clear that under ordinary methods an extremely large heating plant would be required to bring this entire mass up to a flowing temperature.

One of the objects of this invention is to provide means whereby comparatively small portions of the total mass stored may be heated as required to accelerate the flow of quantities which will be normally required to be discharged from the storage tank. Another object is to construct the heating chamber in such a way that it is accessible from the exterior of the storage tank to enable workmen to enter said chamber when necessary to make repairs or clean out the same. A further object is to provide means for controlling the influx of oil into the heating chamber from a point outside of the storage tank. A still further object is to provide valves for controlling the discharge of oil from the heating chamber so that the outflowing oil may be taken either from a point near the top or near the bottom of said chamber or, when necessary or desirable, may be taken from both points. Another object is to combine the several elements herein shown and described in such a manner as to effectively perform the functions set forth.

In the drawings Figures 1 and 2 are respectively a plan and elevation (each partly in section) showing the general arrangement of a preferred form of installation;

Fig. 3 is a horizontal section on an enlarged scale illustrating the heating cham-

ber and the heating coils thereof, it being a view substantially on line 3—3 of Fig. 2;

Fig. 4 is a vertical section through the heating chamber being viewed on line 4—4 of Fig. 3.

Referring to Figs. 1 and 2 the storage tank A is of great size capable of holding approximately a quarter of a million gallons of fuel oil and is provided with a smaller inner chamber B, the capacity of which is approximately equal to that of one tank car. A gate-valve C controls the communication between the tank A and the chamber B and is operable from the outside of the tank by means of a suitable hand-wheel D. Within the chamber B a heating coil E is supported on beams F, F carried by suitable piers G. Steam or any other suitable heating medium is supplied to the coil of the heater E by a boiler H which is connected thereto by an inlet pipe J and a return pipe K.

The chamber B is connected with a discharge pipe L which may conveniently discharge into a tank car M (Fig. 2), the pipe being suitably supported by a column N. The discharge from the pipe L is controlled by means of valves O and P, the latter valve being located in a branch Q which connects with the upper portion of the heating chamber. A third valve R is provided in the pipe L for controlling the discharge through both of the valves P and O. A manhole fitting S is secured to the tank and permits of access to the interior of the heating chamber to enable workmen to enter therein to make repairs or renew sections of the heating coil when necessary or desirable.

In operation when it is desired to bring the fuel oil to the flowing temperature steam is turned on to supply the heater E and the valve C is opened by means of the handwheel D permitting the oil to flow from the tank A into the heating chamber B. The discharge from the chamber B is preferably through the valves P and R, the valve O normally being closed; however, if the oil does not enter rapidly enough through the valve C to maintain a sufficiently high level within the chamber B the valve O may be opened to insure a steady discharge through the outlet pipe L. It is clear that by manipulating the valve R the discharge through both the valves O and P can be controlled.

The storage tank A is initially filled in

the conventional manner by means of a suitably motor driven pump T connected with a suction pipe U and delivering the oil into the top of the tank through the pipe V. The tank A is provided with a manhole fitting W and a drainage valve X.

The advantages of an installation built as above described will be clear to those familiar with handling fuel oil. It is known that considerable trouble is experienced, particularly in cold weather, in bringing these heavy oils to a liquid state to cause them to flow freely through piping, etc. By providing the small heating chamber as described the quantity of oil to be normally drawn off can be raised to its flowing temperature by means of the heating coils E which require only a comparatively small amount of boiler power where if it were necessary to heat up the entire mass contained in the storage tank A, a much larger boiler installation would be necessary with the consequent increase in the initial cost of the installation and the resulting high cost of operation and maintenance.

A further advantage of this construction is that valve C may be closed from outside of the tank by means of the hand wheel D and the heating chamber emptied so that workmen may enter through the manhole S to make repairs or replacement of the heating coils or to clean out the chamber when necessary.

In cases where large coils are placed directly in the bottom of the storage tank, in order to make repairs it is necessary to empty practically the entire tank and great difficulty is experienced in supplying fresh air to the workmen so they will not be overcome by the fumes in the tank. Whereas with the improved arrangement described,

it is only necessary to empty the comparatively small quantity of oil from the chamber B and supply a correspondingly small quantity of fresh air to the workmen engaged in making repairs therein.

The heat within the chamber B is also communicated to some extent to the surrounding oil so as to increase its fluidity and thus to ease or accelerate its passage into the chamber B.

While I have described with more or less detail the particular embodiments of the invention herein shown it is not to be understood that the invention is limited thereto as various modifications thereof may be made by those skilled in the art without departing from the scope of the invention as defined in the following claims.

What I claim is—

1. In an installation of the class described, an oil storage tank of great capacity, a heating chamber within said tank, a valve controlling the communication between the tank and the heating chamber, and means for controlling the outlet from said heating chamber whereby the oil may be discharged either from the upper or lower portion thereof.

2. In an installation of the class described, a storage tank of great capacity, a chamber of much smaller capacity located within said tank and being provided with a manhole to give access to the interior thereof, a heating coil and a valve operable from outside of the storage tank for controlling the communication between said storage tank and said chamber.

In witness whereof, I have hereunto signed my name.

JAMES L. BERNARD.