No. 749,390. PATENTED JAN. 12, 1904.

L. P. LOWE.

APPARATUS FOR ACCURATELY MEASURING THE FLOW OF OIL IN PIPES.

APPLICATION FILED MAR. 10, 1902.

NO MODEL.

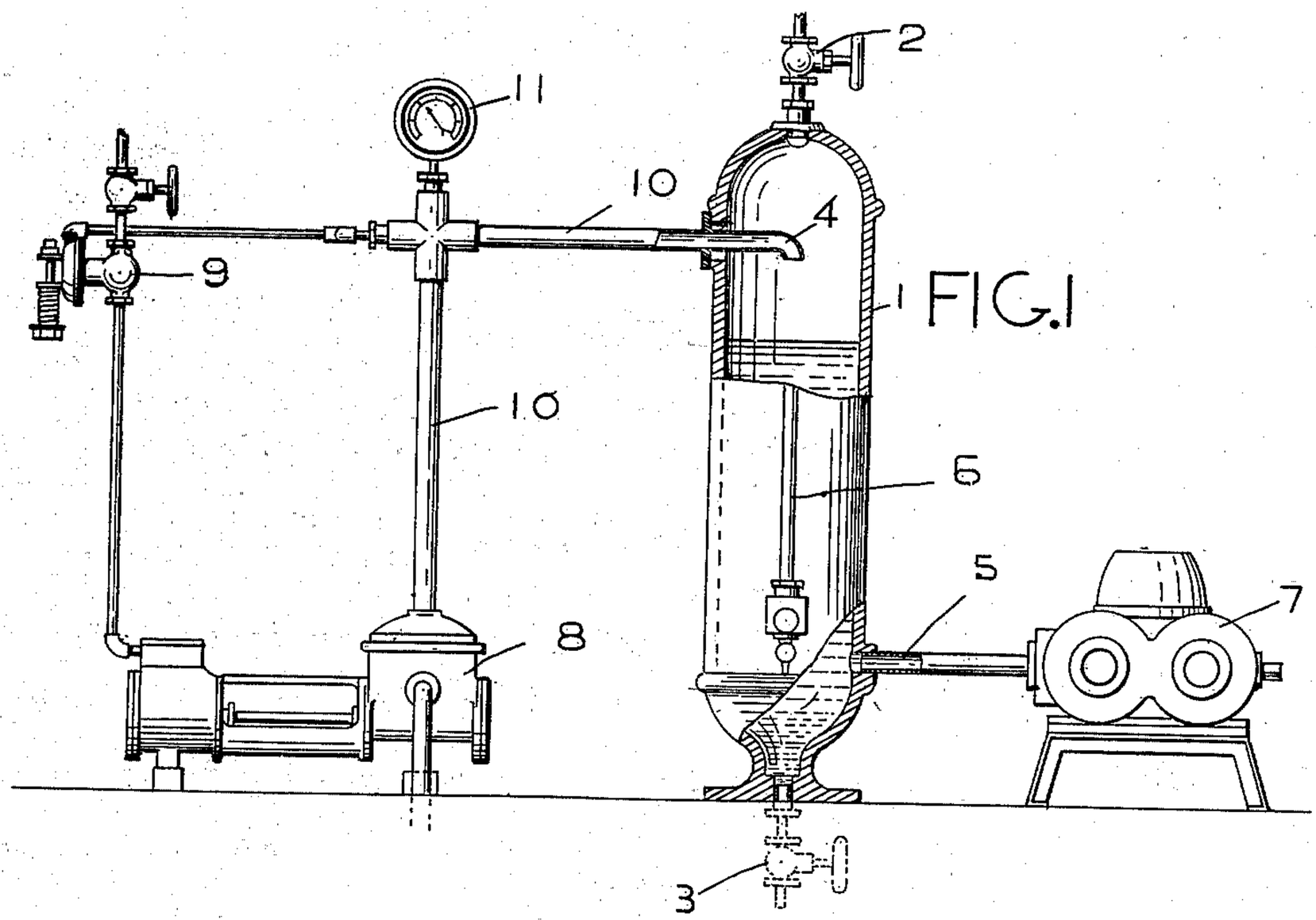

FIG. 1

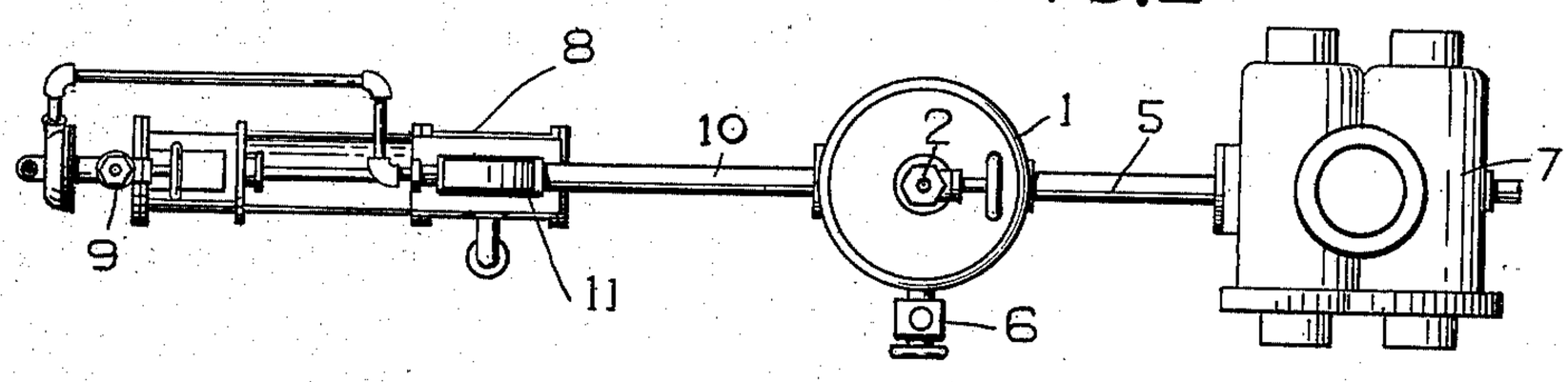

FIG. 2

WITNESSES:

E. W. Howe

S. McLaughlin

INVENTOR

L. P. Lowe.

No. 749,390. Patented January 12, 1904.

UNITED STATES PATENT OFFICE.

LEON P. LOWE, OF SAN FRANCISCO, CALIFORNIA.

APPARATUS FOR ACCURATELY MEASURING THE FLOW OF OIL IN PIPES.

SPECIFICATION forming part of Letters Patent No. 749,390, dated January 12, 1904.

Application filed March 10, 1902. Serial No. 97,595. (No model.)

To all whom it may concern:

Be it known that I, LEON P. LOWE, a citizen of the United States, residing at San Francisco, State of California, have invented a new and useful Improvement in Apparatus for Accurately Measuring the Flow of Oil in Pipes, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of a device embodying novel features, as will be hereinafter set forth and definitely claimed.

When handling petroleum-oils or similar products for ordinary manufacturing purposes wherein it is desired to maintain a constant pressure on the oil pipe-lines—such as in gas-works, steam-generating plants, &c.—it is customary to pump the oil from a storage-tank and deliver it through a meter for measurement before use. It has been found that under these circumstances the registration of oil-meters has been incorrect, owing to the formation of gases occasioned by the liberation of a portion of the highly-volatile hydrocarbons of the oil, these gases accumulating in the measuring-cylinders of the oil-meter in such a manner as to lessen the apparent amount of oil actually passed through same, thus rendering inaccurate the registration of the meter. I have found that the generation of these gases and vapors is largely owing to the frictional disturbance of the oil caused by its passage through the pipe-lines and also by the compression, owing to the relatively high pressures under which the oil is handled. I have found that if these gases and vapors are trapped and collected immediately before the passage of the oil into the meter the measuring-chambers are fully filled with oil and correct registration is accomplished, as desired. To accomplish this result, I have designed an air-trap somewhat resembling in form and application the customary air-chamber heretofore solely used as a cushion to equalize the varying pressure caused by the action of a pump when oil is handled in that manner. I have also devised a means of automatically controlling the speed of an oil-pump delivering oil into my trap, thus maintaining a constant pressure upon the oil-delivery lines.

To accomplish the foregoing, I use the apparatus or modifications of same shown in the accompanying drawings, of which the following is a description.

Figure 1 represents a vertical section of a combination of my trap, an automatically-governed pump, and an oil-meter embodying my invention. Fig. 2 represents a horizontal plan of same.

Similar numerals of reference indicate corresponding parts in the two figures.

1 is a chamber, preferably made of metal, forming the trap described.

2 is an outlet-pipe and valve at upper portion of chamber 1.

3 is a draw-off pipe and valve at bottom of chamber 1.

4 is an oil-inlet connection entering upper portion of chamber 1.

5 is an oil-outlet connection at lower portion of chamber 1.

6 is a sight gage-glass fitted with the usual operating-valves.

7 is a meter, preferably of the kind especially designed for measuring oils.

8 is an ordinary pump, preferably actuated by steam-power, and preferably of the kind especially designed for handling oil.

9 is an automatic pressure-regulator placed on the steam-supply pipe to pump 8 and is actuated by the pressure existing in the chamber 1.

10 is an oil-discharge pipe connecting pump 8 with chamber 1.

11 is a pressure-gage so placed as to conveniently indicate the pressure existing in chamber 1.

The operation of this apparatus is as follows: Oil is admitted to the trap 1 at its upper portion through the supply-opening 4 by any means at the wish of the operator, but preferably by a pump and fixtures, as shown. The oil thus admitted falls to the bottom of the chamber and is allowed to fill same to within a short distance of the supply-opening 4. This is accomplished by properly venting the air-trap at the valve 2, after which it is closed and any gases or vapors contained in the oil are allowed to accumulate under pressure in the upper portion of chamber 1. As oil is used from the chamber 1 it passes in a solid stream through pipe 5 into meter 7, accumulations of

vapors and gases being caught and retained in the upper portion of chamber 1. These accumulations are from time to time drawn off through the vent-valve 2, as desired.

If oil is supplied to the chamber 1 by a pump, as described, it is best operated by being automatically controlled by the regulator 9, which is of any of the various devices in use for that purpose. When so controlled, it is regulated by the pressure maintained in the chamber 1 and on the oil-discharge pipe 10. The discharge-vent 2 can be automatically regulated by the usual float and ball and cock device, if preferred. The draw-off valve 3 is for the purpose of emptying the chamber 1 when it is desired so to do.

The air-trap described can be of any convenient form and construction, and the combination of the same with the pump and meter can be adjusted to meet any requirement, and I do not confine myself to any particular design; but in ordinary operation I prefer the arrangement as shown.

Having thus described my invention, I claim—

1. In combination with a pressure device for forcing oil through pipes, means for accurately measuring the oil comprising a meter, and a device interposed in the pipe between said pressure device and meter and immediately in front of the latter, for removing air and gas arising from the oil, substantially as described.

2. In combination with a pump for forcing oil along a pipe, means for measuring the flow of the oil so forced through the pipe, comprising a meter and a device interposed between said pump and meter and immediately in front of the latter for removing air and gas from the oil, said device including a chamber in which the air and gas so removed are held under pressure, and a connection from said chamber to the pump whereby the pressure in said chamber controls the action of the pump, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

L. P. LOWE.

Witnesses:
ERNEST W. HORNE,
S. MCLAUGHLIN.