R. H. REED.

SAFETY APPARATUS FOR OIL WELLS.

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1,191,229. Patented July 18, 1916.

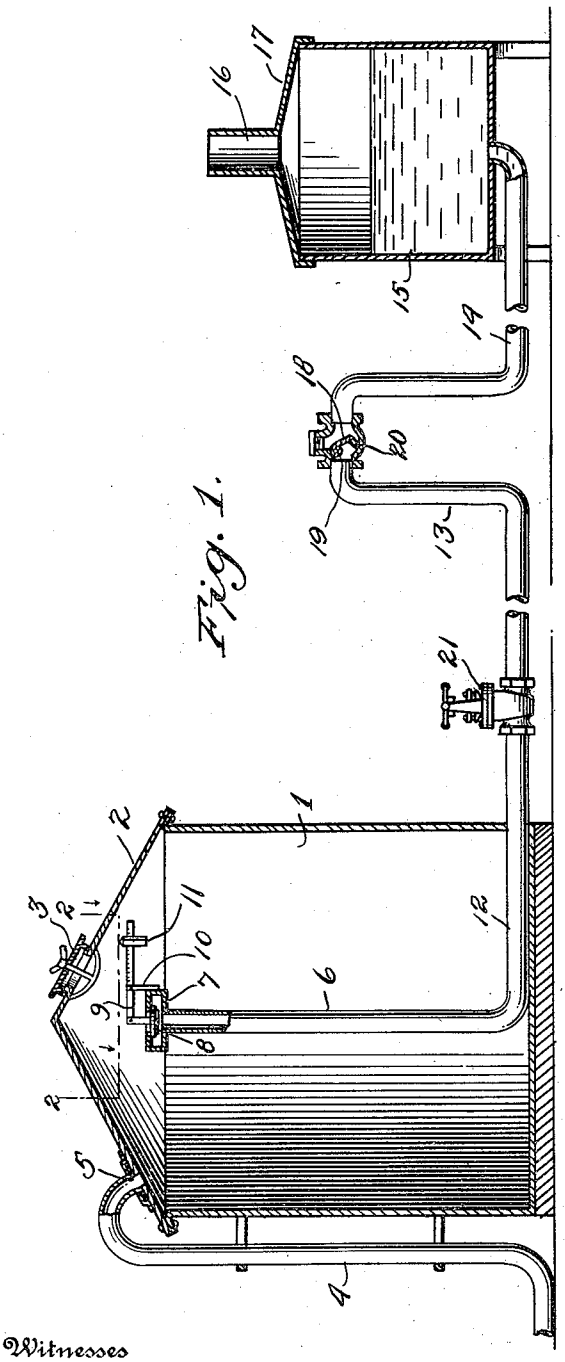


Fig. 1.

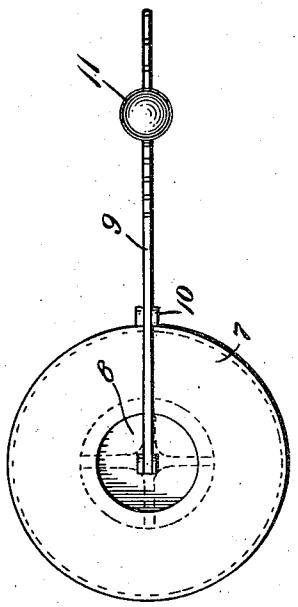


Fig. 2.

Witnesses

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SAFETY APPARATUS FOR OIL-WELLS.

1,191,229. Specification of Letters Patent. Patented July 18, 1916.

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To all whom it may concern:

Be it known that I, ROBERT H. REED, a citizen of the United States, residing at New Wilson, in the county of Carter, State of Oklahoma, have invented certain new and useful Improvements in Safety Apparatus for Oil-Wells; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to certain novel and useful improvements in an apparatus adapted especially for use in controlling the escape of gas from the tank into which the oil flows from a source of supply such as a well.

In carrying out my invention it is my purpose to provide an apparatus of this class to prevent disastrous explosions and fires, such fires and explosions being caused by lightning or through other agencies. As is well known, it frequently happens that the storage tanks supplied from the oil wells or other source are set afire or exploded through various causes, such as lightning igniting the continuous stream of gas which flows from the tank containing the oil. To prevent such accidents I propose to provide an apparatus through the medium of which the gas may be safely withdrawn or discharged from the tank at intervals, such apparatus including means for not only controlling the intermittent discharge of the gas, but also for preventing back fire in the discharge pipe leading from the tank.

Still a further object of my invention is to provide an apparatus of this type embodying a tightly closed storage tank into which the oil is pumped, the gas accumulating from the oil being drawn off and discharged when it has reached a certain degree of pressure.

It is also my purpose to provide a safety apparatus of this character which will embody the desired features of simplicity, efficiency, reliability and safety, and which may be manufactured and installed at a relatively low cost.

With the above recited objects and others of a similar nature in view, my invention consists in the construction, combination and arrangement of parts set forth in and falling within the scope of the appended claim.

In the accompanying drawings: Figure 1 is an assembled view partly in section and partly in elevation of an apparatus embodying my invention. Fig. 2 is a cross sectional view taken on the line 2—2 of Fig. 1.

In the ordinary construction of storage tanks for oil, a pipe leads from the well or other source of supply to and through the conical top of the tank and set at or adjacent the top portion of the tank are openings through which the gas from the oil within the tank is adapted to escape. There are certain disadvantages to such ordinary construction, however, for through lightning or other agencies the gas is frequently ignited, thereby causing dangerous fires and explosions and involving the loss of property of considerable value.

To obviate the above objection, I have designed my present apparatus, which embraces the oil tank 1, provided with a conical top 2. This top is fastened tightly on the body of the tank and is preferably provided with a man hole 3, made air tight by any suitable arrangement of packing. Leading into the top of the tank from the oil well or other source of supply, is a pipe 4, the joint 5 formed by the junction of the pipe with the top of the tank being also made preferably as near air tight as possible. Within the tank is a vertically disposed stand pipe 6, the upper end of which terminates preferably adjacent the top edge of the vertical wall of the tank, and the upper end of this stand pipe is provided with a valve casing 7 within which is arranged a pressure valve 8, the pivoted arm 9 of which is supported from a post 10 fastened to the side of the valve casing, and this arm 9 is further provided with an adjustable weight 11, by means of which the valve may be adjusted or regulated to open at any desired degree of pressure of the gas within the tank. At its lower end the stand pipe 6 merges into a horizontal pipe 12 which extends along the bottom of the tank out through the bottom of the side wall of the tank, this pipe 12 being bent along its length to form an elevated U-shaped elbow 13, said pipe then extending horizontally as at 14 and leading into the water tank 15, which is provided with a discharge pipe 16 in the top 17 thereof, this top being removably mounted upon the water tank 15. Within the horizontally elevated portion of the elbow or bend 13 of the pipe 12, I arrange a butterfly or flap valve 18, hinged at its upper end as at 19, the lower

end of the valve being adapted to seat against a flange 20 in the elbow when in closed position, and this valve is adapted to swing upward and open under the influence of the pressure of the gas flowing from the oil tank out through the pipe 12 to the water tank 15. A stop valve 21 of any suitable design, such as a globe or gate valve, is located in the pipe 12 between the storage tank and the elbow 13 of the pipe, and is adapted to be operated to entirely cut off the flow of gas from the tank to the pipe 12.

From the above description, taken in connection with the accompanying drawings, the construction and operation of my apparatus will be readily apparent. As the oil flows from the well or other source of supply, it enters the storage tank 1 through the pipe 4 and the gases from the oil accumulate in the top of the tank. When the pressure of these gases reaches the degree or point to which the valve 8 has been set, such valve will be forced open against the action of the weight 11 and the gas will pass down the stand pipe 6 through the pipe 12, forcing open the flap valve 18 in the elbow of the pipe and then will pass into the water tank 15 through the water and will be discharged through the discharge pipe 16 in the top of the water tank. I preferably employ this water tank 15 in cases where the pressure of gas flowing from the storage tank is not very great, and said tank may be omitted where the gas is discharged from a heavy pressure well. In case an explosion should occur at the discharge pipe 16 or in the water tank 15, disrupting the tank, any fire which might occur could not back through the elbow 13 to the storage tank, for the valve 18 would be closed by the back pressure and shut off the fire from passing through the pipe 12. Furthermore, it will be noted that when desired or necessary, as in case of an explosion or fire at the discharge end of the pipe 12, the valve 21 may be operated to cut off the discharge of gas from the storage tank through such pipe 12. As the storage tank itself is practically air tight, and as the standpipe 6 is controlled by the pressure valve 8, it will be seen that the gas will not flow continuously from the tank, but will be discharged intermittently or only when the pressure of gas within the tank has reached a predetermined degree, and on the other hand when the pressure of gas within the tank drops below such predetermined degree, the pressure valve will close. By providing for the intermittent discharge of the gas instead of the continuous discharge thereof, I also avoid to a great degree the liability of the device from becoming ignited through lightning or other causes.

While I have herein shown and described one particular embodiment of my invention, I wish it to be understood that I do not confine myself to all the precise details of construction herein set forth by way of illustration, as modification and variation may be made without departing from the spirit of the invention or exceeding the scope of the appended claim.

What I claim is:

The combination with an oil storage tank, and a cover therefor, of means for supplying the oil to the tank, a standpipe disposed in said storage tank, a gas conducting pipe connected to the standpipe and leading from the tank, said gas conducting pipe provided with an elevated elbow intermediate its length, a water tank at the discharge end of the gas conducting pipe and into which gases from the storage tank are discharged, a valve within the elbow of the conducting pipe and disposed in a plane above the water level of the water tank, a second valve in the conducting pipe between the elbow and the storage tank, and an adjustable downwardly opening pressure valve at the top of the standpipe within the tank and controlling the admission of gases from the tank to the standpipe.

In testimony whereof, I affix my signature, in the presence of two witnesses.

ROBERT H. REED.

Witnesses:
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