Feb. 14, 1928. 1,659,452

J. E. WELTON

FLOW DIVERTER FOR OPEN WELLS

Filed Jan. 21, 1927

Fig. 1.

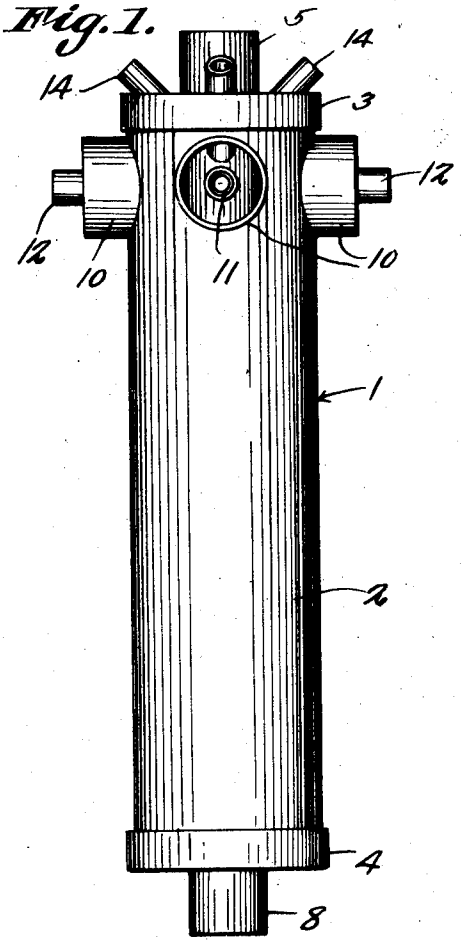
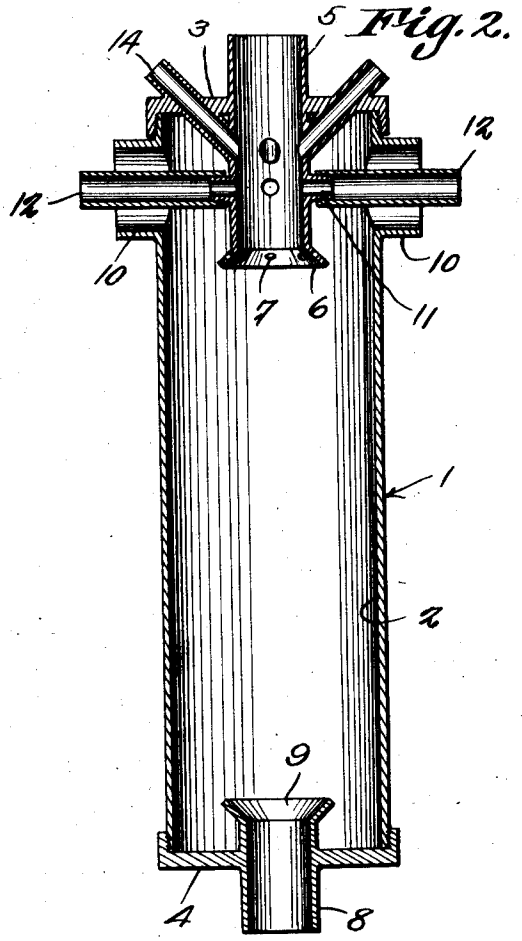


Fig. 2.



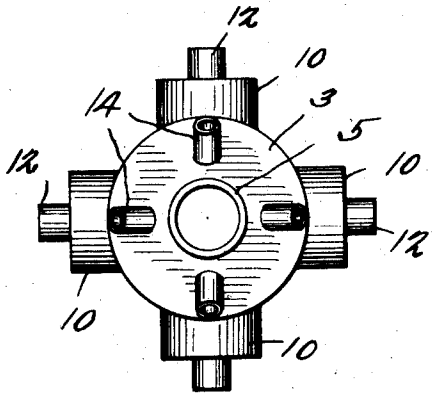


Fig. 3.

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UNITED STATES PATENT OFFICE.

JOHN E. WELTON, OF BOWLING GREEN, OHIO.

FLOW DIVERTER FOR OPEN WELLS.

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In the operation of oil wells, and other wells, gas very often rises to the top of the casing head, and when the casing head is opened at its upper end, the gas, instead of passing out through the lateral outlets of the casing head, rises vertically out of the upper end of the casing, the workmen being overcome by the fumes. This invention aims to provide a means whereby the top of a casing head may be opened, to permit operations of one kind or another to be carried on down in the well, the construction being such that, although the casing head is opened at its upper end, gas cannot escape there.

A preferred form of the invention has been shown in the drawings, but those skilled in the art should notice that a mechanic, working within the scope of what is claimed, may make such changes as may be considered expedient, without departing from the spirit of the invention.

In the drawings:—

Figure 1 shows in side elevation, a device constructed in accordance with the invention; Figure 2 is a longitudinal section; and Figure 3 is a top plan.

The numeral 1 marks a casing head, including a tubular body 2 having a detachable top 3 and a detachable bottom 4. The top 3 has an opening, which may be in the form of a tubular member 5 mounted intermediate its ends in the top 3, the tubular member 5 having a flared lower end 6 provided with perforations 7. The bottom 4 is provided with a sleeve 8, having a flared upper end 9. In the operation of the device, the well tubing, (not shown) is connected to the sleeve 8, and the tubular member 5 is stopped, at its upper end, by a closure (not shown). The body 2 has lateral outlets 10.

If the tubular member 5 is opened, to permit workmen to operate in the well through the sleeve 8, there is a tendency, in the absence of the mechanism herein described, for the gas proceeding from the well, as a by-product, generally, to flow up through the member 5, the workmen about the casing head being overcome, or even killed. In order to prevent this, recourse is had to a mechanism which will now be described.

The tubular member 5 is provided with lateral nipples 11 to which are connected nozzles 12 that extend outwardly, any desired distance, into the outlets 10. Inclined pipes 14 are mounted in the top 3 and in the tubular member 5, and discharge into the tubular member. In practical operation, steam, air, or any other fluid under pressure is discharged into the pipes 14 and flows into the tubular member 5. Any gas that may rise in the tubular member 5 is met by the fluid under pressure, discharged through the pipes 14, the rising gas thus being held in check, and being carried laterally through the nipples 10 and the nozzles 12. Not only is the gas carried away, in this manner, but the nozzles 12 operate like injectors, and aid in drawing away, through the outlets 10, the products of the well, and the gas, which rise in the body 2. The construction of the device is such that the tubular member 5 may be opened at its upper end, as shown in Figure 2, to permit access to the sleeve 8 and the well casing connected therewith, and, at the same time, there will be no upward flow of poisonous gas through the tubular member 5 and into the faces of the workmen. It is to be noted that it is not necessary to provide a fluid pressure which is strong enough to force the upwardly rising gas back and downwardly through the lower end of the tubular member 5. In the operation of this device, the fluid under pressure meets the rising gas within the tubular member 5 and at a point intermediate the ends of the tubular member, and the rising gas, with the fluid under pressure, move laterally through the nipples 11 and the nozzles 12.

What is claimed is:—

The combination with a casing head having a lateral outlet, of a tubular member in the top of the casing head, the tubular member having a fluid-pressure inlet, and a tubular nozzle communicating with the tubular member at a point intermediate the ends of the tubular member, the nozzle being prolonged into the outlet, and being of materially less diameter than the outlet.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

JOHN E. WELTON.