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INJECTOR JET FOR GAS WELLS

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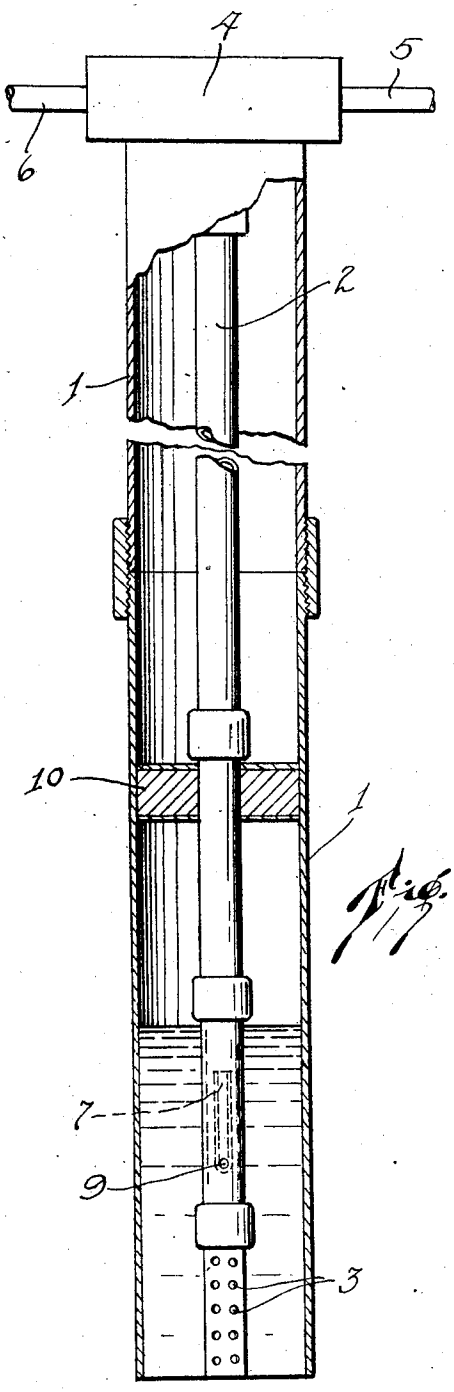


Fig. 1.

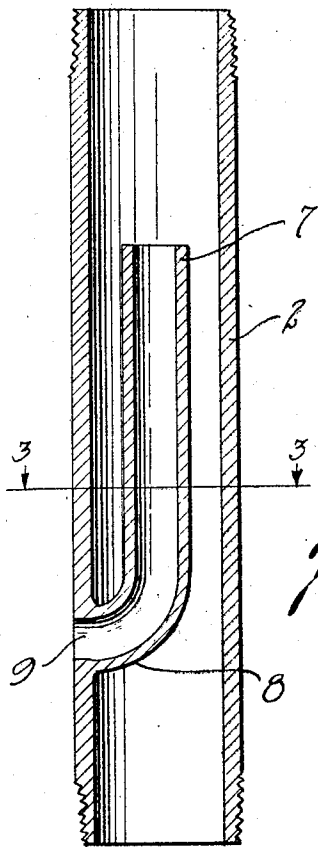


Fig. 2.

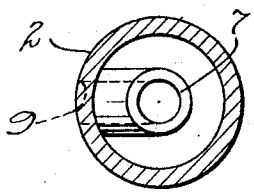


Fig. 3.

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INJECTOR JET FOR GAS WELLS.

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Our invention relates to improvements in gas well apparatus and it consists in the combinations, constructions, and arrangements herein described and claimed.

It very frequently happens that during the operation of gas wells they are "drowned out" on account of the water which accumulates therein, the weight of this water being such as to prevent the gas from finding its way to the gas main. Unless some means is found to overcome this difficulty, the well must be abandoned.

Our invention has for its main object the provision of a simple device by means of which water which accumulates in the well may be forced out automatically by the pressure of the gas itself.

A further object of our invention is to provide an injector jet which may be readily applied to any section of the inner tubing so that the injector jet may operate at the desired point, that is to say at just the distance below the upper surface of the water to give the most efficient results.

A further object of our invention is to provide a device which may be readily installed and at a relatively low cost.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claim.

Our invention is illustrated in the accompanying drawings forming part of this application, in which—

Figure 1 is a sectional view showing a portion of a well provided with our improved injector jet,

Figure 2 is a detail view showing one of the inner tube sections provided with a jet, and

Figure 3 is a section along the line 3—3 of Figure 2.

In carrying out our invention we make use of the usual well casing 1, and the inner tube 2. At the bottom of the latter is a section which is perforated as shown at 3. At the top of the casing and tube we have shown, diagrammatically, a water trap 4, of any suitable construction having a gas main 5 leading therefrom and a discharge pipe 6 for water.

In Figure 1 we have shown the water as being at the level x—x. In the tube section adjacent to this water level is an injector jet of the form shown in Figure 2. It will be observed in Figure 2 that within the tube section 2 is a pipe 7 whose lower end is bent laterally as shown at 8 and which communicates with an opening 9 in the side of the tube. At 10 I have shown a partition through which the tube 2 extends and which is above the water line.

From the foregoing description of the various parts of the device, the operation thereof may be readily understood. Let us assume, as stated, that the water has filled the tube and the casing to the line x—x. Under ordinary conditions this might be sufficient to cause the abandonment of the well, since it might shut off the flow of gas. In the present instance, however, the gas entering the jet through the opening 9, which is constricted, has an injector effect and it breaks the water up into a spray and carries it upwardly to the trap 4, where the water is separated from the gas, the gas entering the main 5 and the water passing out through the discharge pipe 6. Since this is a continuous action, the water is carried out rapidly, thus leaving the well alive, or, in other words, permitting the gas to have access to the mains.

Sometimes it is advisable to install two jets, or even more, these jets being placed one above the other so that their combined effect acts on the water to carry it out in its sprayed condition.

With an injector system, such as that herein described, the water is not only removed from the well constantly, but it creates a condition in which there is a uniform pressure of gas and this, as is well known in the gas producing industry, is of prime importance.

It will be understood that this device may be used in connection with oil wells. Thus, when the flow is sluggish, the use of this device will cause a more constant and uniform flow, thereby increasing production.

We claim:

In a gas well apparatus, an outer casing open at its bottom, an inner tube open from top to bottom and spaced from the casing, said casing and said tube being arranged to

admit a liquid, a partition in said casing above the level of the liquid, said tube passing through said partition and having an opening through the side thereof disposed below the normal level of liquid, and an injector jet consisting of a pipe having its nozzle disposed along the axis of the inner tube and being bent to cover said opening, whereby gas passing through the opening will be injected through said bent pipe along the axis of the inner tube.

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