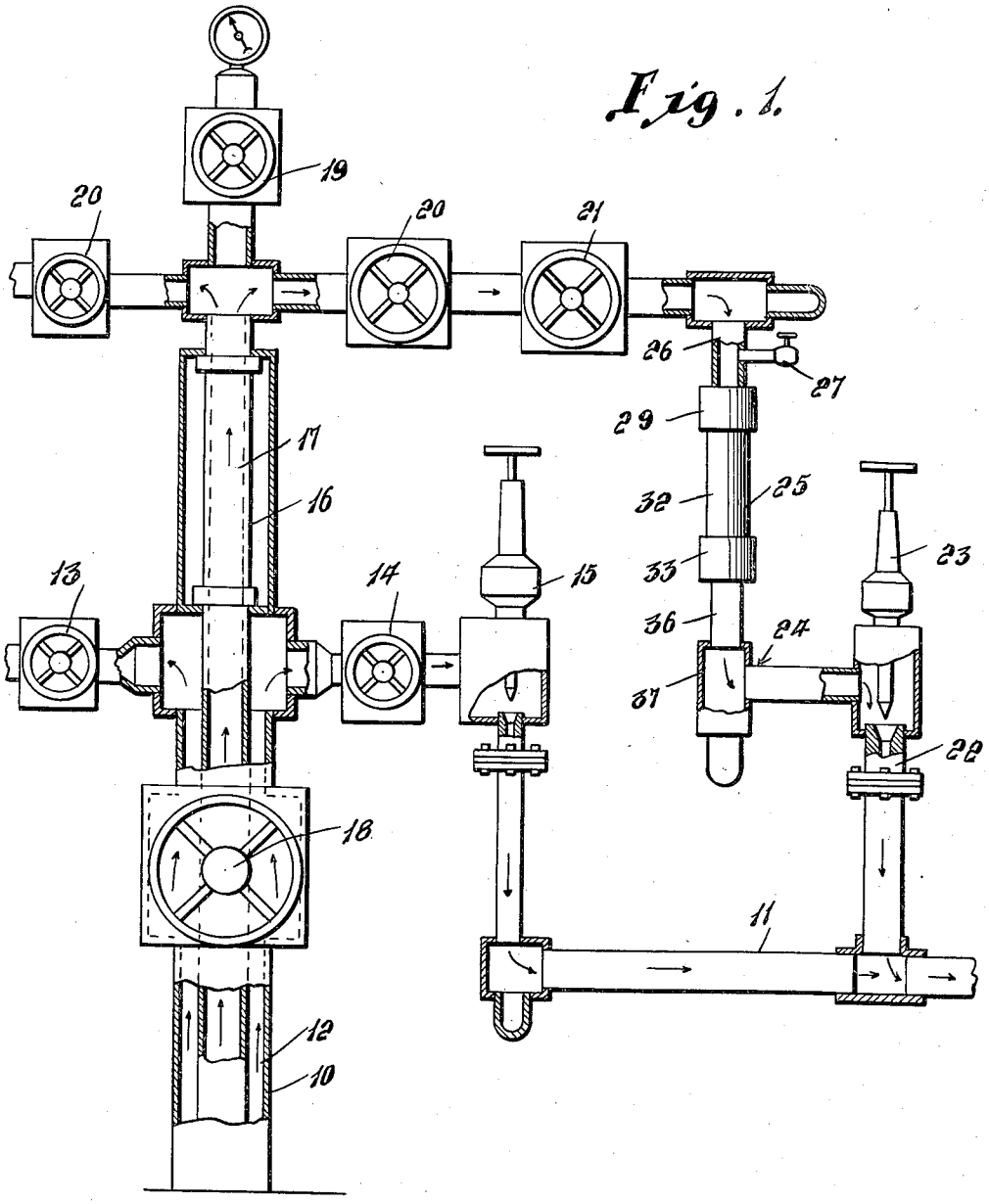
Nov. 29, 1938. C. B. WRIGHT 2,138,719

BLOW-OUT PREVENTER

Filed May 13, 1937 2 Sheets-Sheet 1

Fig. 1.



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BLOW-OUT PREVENTER

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Fig. 2.

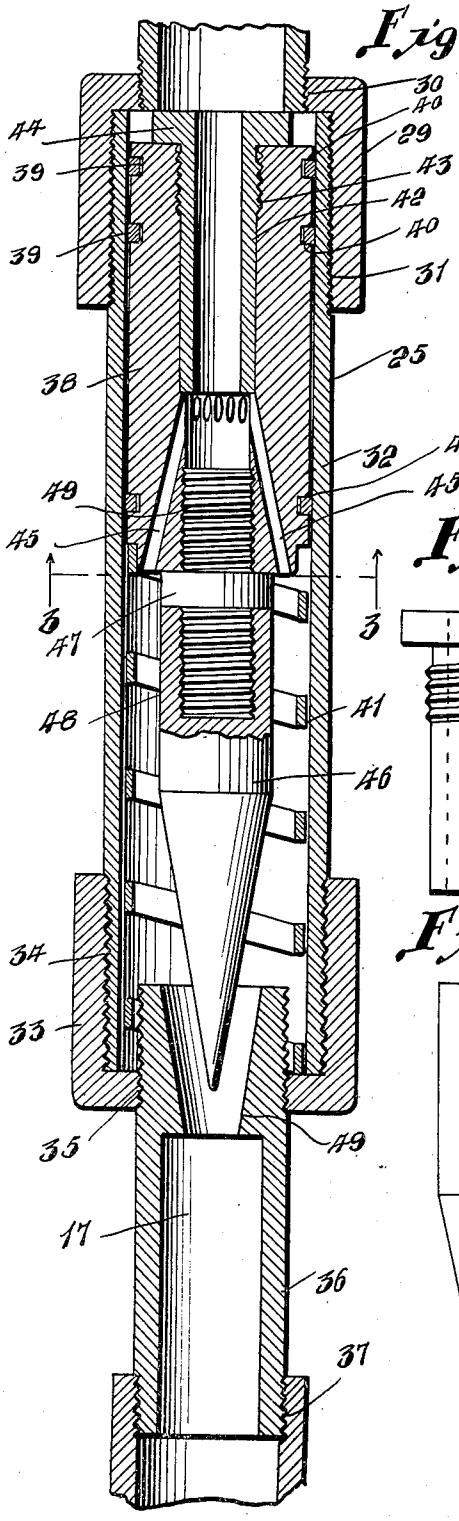


Fig. 3.

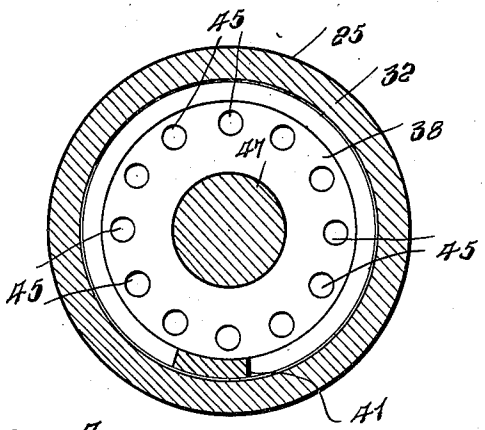


Fig. 4.

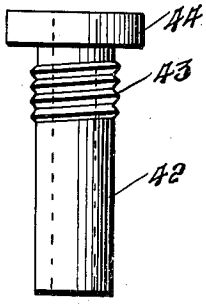


Fig. 5.

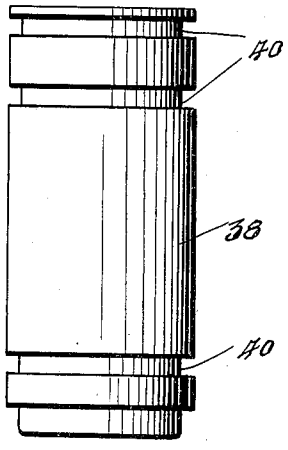


Fig. 7.

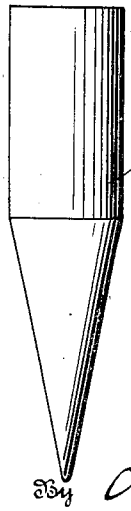
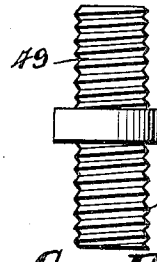


Fig. 6.



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UNITED STATES PATENT OFFICE

2,138,719

BLOW-OUT PREVENTER

Charles Braxton Wright, McFaddin, Tex., assignor of one-half to Charles Bryan Wright, McFaddin, Tex.

Application May 13, 1937, Serial No. 142,510

1 Claim. (Cl. 137—152)

This invention relates to an automatic gas well control and blow-out preventer and provides a novel means that is operable upon a differential in pressure within the tubing or line.

In producing gas or oil from high pressure wells, it has frequently happened that the valve which regulates the flow of gas or fluid passing through the system at the high pressure causes the same to cut out, resulting in the increase of flow beyond the capacity of the well, lowering pressure in the well and thus causing sand and water to enter, which when passing out at the point where the pressure is greatly reduced, causes friction and the cutting out of the tubing and regulating valve, resulting in the loss of the well and endangering the life of workmen in attempting to close the same. As a result of the condition mentioned, many wells have been lost, and even the loss of fields by fluid entering producing fans by pressure being lowered in the well.

The invention enables the control and blow-out preventer to operate automatically beyond the regulated capacity, and provides a construction wherein the choke is interchangeable or regulable as to size, permitting any desired capacity to be used.

The more specific objects and advantages will become apparent from a consideration of the description following taken in connection with accompanying drawings illustrating an operative embodiment.

In said drawings:—

Figure 1 is a view in elevation, partly in section, showing my improvements applied to a well discharge or outlet assembly;

Figure 2 is a vertical sectional view through a control and blow-out preventer alone;

Figure 3 is a cross sectional view taken on the line 3—3 of Figure 2;

Figure 4 is a side elevation of the choke;

Figure 5 is a side elevation of the barrel or piston;

Figure 6 is a side elevation of the stud bolt employed in the control and blow-out preventer, and

Figure 7 is a detailed side elevation of the needle valve for such well control and blow-out preventer.

Referring specifically to the drawings wherein like reference characters designate like or similar parts, 10 designates a well casing of an oil or gas well from which tubing 11 leads to the pipe line, the gas and liquid taking the course designated by the arrows 12 under control of usual valves at 13, 14 and 15. Extending within the casing as usual, is the well tubing 16, the flow of gas in the path indicated by the arrows 17, under control of various valves as at 18, 19, 20 and 21. The tubing 11 has a riser 22 therein containing a conventional regulating valve 23, and a line is established between the riser 22 and the tubing 17 as at 24 in which my automatically operating gas well control and blow-out preventing device is used and which is generally designated 25 and detailed in Figures 2 to 7.

Aside from the said device 25 and its connections in the system, the remainder of the system is conventional.

Said device 25 includes a nipple 26 screwthreaded to tubing branching from the well tubing 17 and which nipple 26 has a pressure release valve 27, connected therein and adapted for manual opening and closing. A collar 29 is screwthreaded at 30 to the nipple and at 31 to a pipe, cylinder or casing 32. A similar collar 33 is screwthreaded to the cylinder 32 at 34 and at 35, it is screwthreaded to a nipple 36 in turn screwthreaded at 37 in the tubing connection 24.

Slidably disposed in the cylinder 32 is a tubular barrel or piston 38. Said barrel preferably has expansive packing rings 39 disposed in peripheral grooves 40 thereof and adapted to wipe the bore of the cylinder 32. An expansive coil spring 41 is located within the cylinder, bearing at one end on the collar 33 and at its other end on the barrel 38.

A choke fitting or tube 42 is detachably screwthreaded at 43, in the bore of the barrel 38. Such nipple has a laterally extending flange 44 at its upper end adapted to overlap and engage the barrel. The nipple extends only partly through the barrel and through the same, the bore of the barrel communicates with diagonal passages 45 for the outlet of the gas into the cylinder, around a needle valve member 46 which is removably suspended from the barrel as through the medium of a stud bolt 47 detachably screwthreaded at 48 to the needle valve 46 and at 49 to the barrel.

Said nipple 36 at the upper portion thereof is provided with a conical valve seat 49 for engagement by the conical valve portion of the needle valve 46, at the desired time.

Attention is called to the fact that in connection with the device, different sizes of choke members 42 will be employed so as to be interchangeable, according to the capacity or quantity of production desired from the well.

Presuming use of the invention, with the well

flowing and the valves opened so that flow transpires in the path shown by the various arrows, with the proper size choke **42** in place parts of the device **25** will remain in the position of Figure 2, with the pressure at the inlet and outlet of such device the same, whereby the valve **46** remains inactive in such position of Figure 2. However, if the regulating valve **23** should be cut out by friction referred to, causing more gas to be produced than the choke **42** will allow, pressure will be reduced on the down throw side of the barrel and valve **46** and at the same time, such valve will have well pressure on its up throw side, causing greater pressure in the barrel proper **38**, forcing the valve **46** onto the seat **49** closing off the well automatically. The spring **41** is of such tension that it prevents the valve **46** closing with the normal passage of gas or fluid when the pressure remains equal on both sides of the plunger or barrel **38**.

For example, if there is a working pressure of fifteen hundred pounds to the square inch in the well and it is wished to produce in the line with three hundred pounds pressure and the well would produce fifty thousand cubic feet of gas per hour without lowering the pressure in the well to the danger point, or below working pressure, the workmen would use a choke **38** to permit passage of this amount of gas and open the regulator valve **23**. If such regulator valve cut out to produce more than capacity of the choke **38**, the pressure would be reduced between the regulator valve **23** and the barrel **38**, causing the valve **46** to automatically close on its seat by the greater pressure on the barrel proper.

Various changes may be resorted to provided they fall within the spirit and scope of the invention.

While I have shown and described herein an embodiment of the present improvement which I believe to be entirely satisfactory and practical for the purpose in view, nevertheless it is to be understood that the several essential parts of the device may be constructed in various other alternative forms and it is accordingly to be understood that in the further development of the device I reserve the privilege of resorting to all such legitimate changes therein as may be fairly embodied within the spirit and scope of the invention as claimed.

I claim as my invention:—

A device of the class described having a cylinder, a barrel operable in the cylinder, said barrel being tubular and having a removable choke in its bore, a valve extending from the barrel, passages in the barrel communicating with the bore thereof and having outlets outwardly of the valve, a collar on the cylinder, a spring engaging the collar and the barrel to maintain the valve normally in open position, and a nipple secured to the collar having a seat engageable by said valve and a stud bolt secured to the barrel and to the valve member.

CHARLES B. WRIGHT.