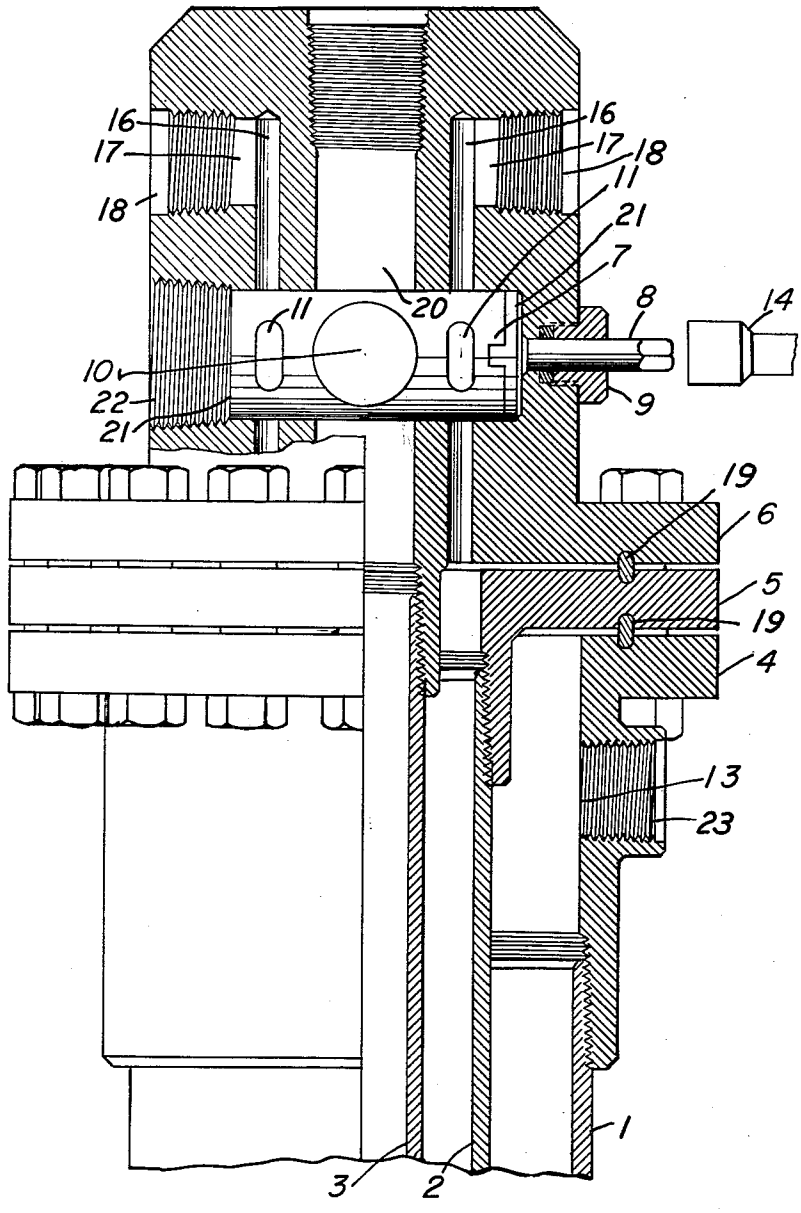
Oct. 16, 1956 W. L. CHURCH 2,766,830

CONTROL HEADS

Filed June 29, 1953



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United States Patent Office

2,766,830

Patented Oct. 16, 1956

2,766,830

CONTROL HEADS

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Application June 29, 1953, Serial No. 364,753

1 Claim. (Cl. 166—86)

This invention relates to a control head for a well producing oil or gas under pressure.

In readying an oil or gas well for production it is necessary to set two or more strings of pipe in a bored hole. The largest of these pipe strings are called casing which primarily serve to protect the bored hole. Generally two strings of casing are set. The larger being primarily used to protect ground waters and are only set to a depth which will accomplish this protection. The smaller size or sizes of casing are set in the bored hole to the depth where oil and gas are to be produced and are primarily used to protect the bored hole to the producing depth. A still smaller size of pipe is set inside the casing and this smallest string of pipe is called tubing and is used for the flow of oil and gas from the producing depth to the surface. It is necessary to join these several strings of pipe at the surface to allow pressure control in each of the several pipes independently. The two most important pipes to control are the inner casing called production casing which is protecting the bored hole to producing depth and the inner tubing string from which the oil and gas fluids are produced.

In an emergency it would be very desirable to have a single valve which would cut off the tubing and the production casing together by a single valve mechanism. This single valve mechanism for controlling pressure in the tubing and production casing simultaneously would be very desirable if for some reason the fluids being produced were out of control, or the well was on fire or in danger of catching on fire.

An object of the invention is to provide a means of connecting several strings of pipe in a bored hole and to provide a means of communication to each string of pipe separately.

It is still another object of this invention to provide means of controlling the pressure flow in two or more strings of pipe in an oil or gas well.

With the above and other objects in view, the invention has relation to certain novel features of operation, and arrangements of parts more particularly defined in the following specification and illustrating in the accompanying drawings, wherein the figure is an elevational view, partly in section.

Referring now more particularly to the drawings, the numeral 1 designates a surface casing in which a producing casing 2 is concentrically mounted and a tubing 3 is concentrically mounted in the casing 2. A tubular member 4 having its upper end outwardly flanged and its lower end being internally threaded, is secured to the upper end of the surface casing 1. A tubular member 5, having internal threads to receive the upper end of the producing casing 2 is provided with an outwardly extended flange at its upper end which aligns with the flanged portion of the member 4. A tubing, as 3, is mounted in the producing string 2 and is maintained in connection with the casings by means of the tubular member 6, which is externally flanged at its lower end

and which has internal threads to receive the external threads of the tubing 3. The flanges of the means 4, 5 and 6 are provided with suitable bolt holes (not shown), through which bolts may be mounted to secure the parts in abutting relation, and suitable packing means, as 19, 19, may be mounted between the various members to seal the connection.

The annulus between the casings 1 and 2 may be vented through the port 13 in the member 4, which may be closed by a suitable plug as 23. Passageways 16, 16 extend longitudinally in the member 6 from the bottom thereof to the outlet ports 17, 17, which may be closed by suitable plugs as 18, 18. The annulus between the tubing 3 and the production casing 2 is controlled, together with fluid moving within the tubing 3, by a multiple orifice plug valve 7, which is rotatably mounted in the member 6, and which transverses the tubing flow port 20, said flow port 20 being in flow connection with the tubing 3.

The valve 7 is preferably cylindrical in shape and the respective ends thereof are seated in suitable bearing chambers as 21, 21, in the sidewalls of the member 6, and said plug valve is maintained therein by any suitable means as by the plug 22.

The port 10 in the plug valve 7 controls the flow of fluids through the passageway in the tubing 3 and the port 11, in the plug valve 7, controls the flow of fluids through the annulus between the tubing 3 and the casing 2, and through the passageways 16, 16. The multiple ported plug valve 7 is actuated by a stem 8, passing through a packing gland 9. The valve 7 is brought from closed position as in the drawing, to full open position by rotation of the stem 8, to bring the ports 10 and 11 into flow alignment with the tubing flow and the passageways 16, 16. A valve stem extension as 14 allows the valve 7 to be actuated from a safe distance. By the rotation of the valve 7, the ports 10, 11, may be brought into alignment with the passageways, 16, 20, and both the flow in the tubing 3 and the flow in the annulus between the production casing 2 and the tubing 3 can be permitted or restricted simultaneously. When moved into the position shown in the drawing, the flow through ports 16 and 20 will be blocked.

While the foregoing is considered a preferred form of the invention, it is by way of illustration only, the broad principle of the invention being defined by the appended claim.

What I claim is:

A flow control head for wells comprising a plurality of externally flanged concentric tubular members, with their respective flanges nested together in fluid excluding relationship, said tubular members being connected to respectively concentric pipe strings extending into a well and forming a closure therefor, a valve housing on the inner tubular member extending upwardly therefrom and having a central bore and additional passageways spaced outwardly from the central bore and opening downwardly into an intermediate pipe string exteriorly of the innermost pipe string, a rotary valve mounted in the valve housing extending transversely through the central bore and additional passageways and having parallel transverse ports alignable and disalignable with said central bore and additional passageways upon rotation of said valve.

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