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ADJUSTABLE BOTTOM HOLE FLOW BEAN

Filed Feb. 3, 1930

Fig. 1.

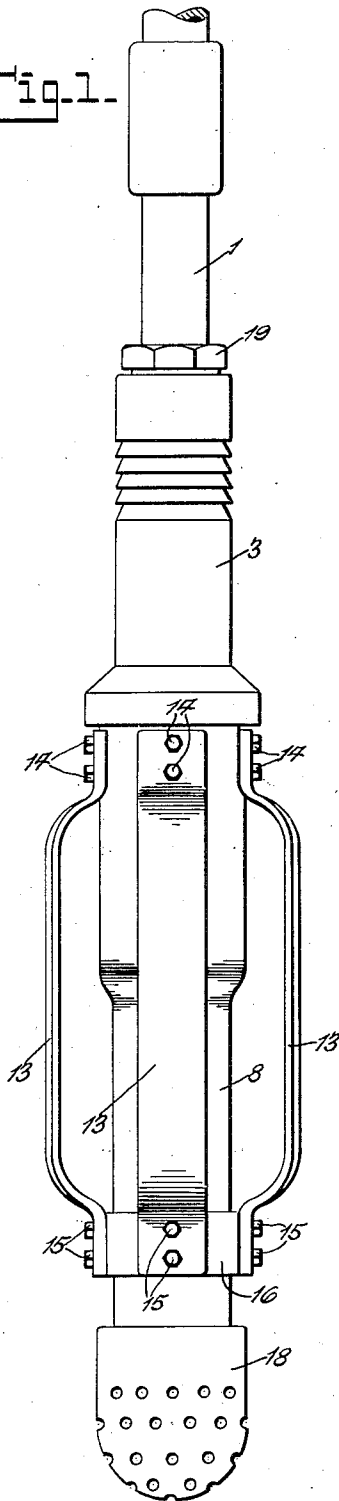
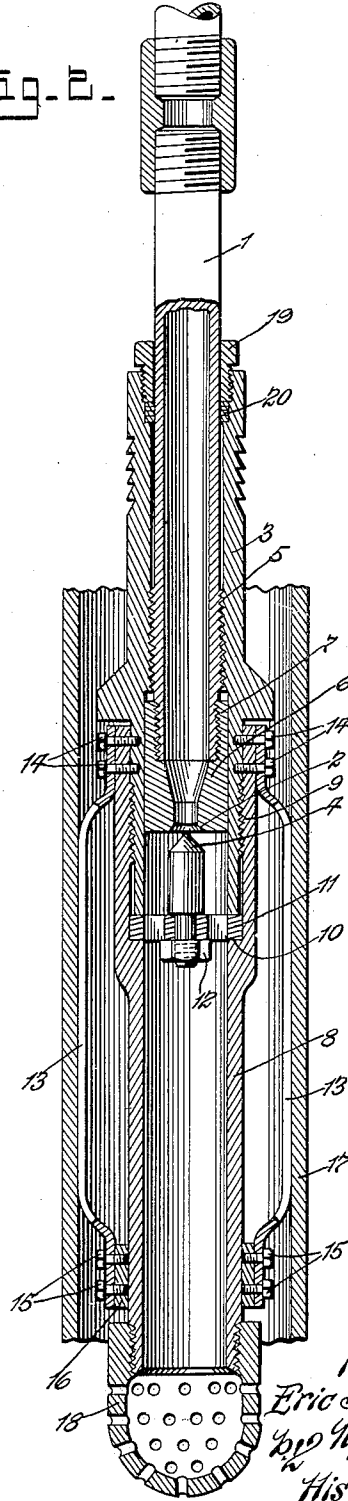


Fig. 2.



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ADJUSTABLE BOTTOM HOLE FLOW BEAN

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This invention relates to apparatus for causing flow of oil wells and particularly to the type of apparatus in which a choke or flow bean is employed in connection with a flow tube.

In each well there is a particular rate of flow which is most desirable, both from the standpoint of efficiency in lift and from the standpoint of preserving the well. One of the objects, therefore, of this invention is to provide choke means for efficiently flowing the well.

Since it has been found that a choke placed at the end of the tubing in the well gives the greatest efficiency, another object of this invention is to provide a bottom hole flow bean that is readily adjustable when the tubing is in position and from the top of the well.

Other objects will appear from the detail description taken in connection with the accompanying drawing in which—

Fig. 1 is a side view of the apparatus.

Fig. 2 is a vertical cross-section through Fig. 1.

Tubing 1 carries at its lower end a valve seat 2. A sleeve element 3 is mounted on the tubing 1 and has attached to it a valve head 4 cooperating with the seat 2. The sleeve element including the stem is adjustable with respect to the tubing and, therefore, to the seat, by means of a coarse threaded connection 5, comprising external threads on the tubing 1 and internal threads on the sleeve 3.

The valve seat 2 is formed on an element 6 securely attached to the end of the tubing 1 by a threaded connection 7 comprising internal threads on the element 6 and external threads on the end of the tubing.

The sleeve 3 carries a bottom tubular member 8 connected to it by a threaded connection 9 comprising external threads on the sleeve 3 and internal threads on the bottom element 8. The element 8 is formed with a shoulder 10 adapted to engage between it and the end of the sleeve 3, a spider 11 carrying the valve head 4. A nut 12 may secure the valve stem to the spider 11.

A plurality of spring elements 13, four as shown in the drawing, are mounted longitudinally of the bottom sleeve element 8.

Each of these spring elements is secured at its upper ends by screws 14 passing through the bottom element 8 and into the sleeve 3. At their bottom ends they are attached by screws 15 to a collar 16 slidable on the bottom sleeve element 8. These spring elements are so arranged as to normally give a diameter larger than the diameter of a well casing 17 into which the device is adapted to be lowered. These spring elements are compressible so that when in place they will accommodate themselves to the casing by means of the sliding engagement of the collar 16 with the bottom element 8. A strainer 18 may be placed on the bottom element 8 at the end of the assembly.

A packing nut 19 and packing gland 20 may be utilized to pack the top of the sleeve with reference to the tubing 1.

It will be seen that by turning the tubing 1 with reference to the sleeve assembly, the valve head 4 will be adjusted vertically with reference to its seat 2 by reason of the threaded connection 5. Such adjustment would, of course be impossible after the tubing is lowered in the well unless means be supplied to engage the sleeve assembly; but by reason of the spring elements 13, the sleeve assembly has a radial engagement with the casing walls, thus securing it against circumferential movement when the tubing is being turned to adjust the valve. But, the arrangement of the spring elements is such as to not interfere with the movement of the tubing with its bottom assembly into position in the well.

The well is enclosed and the choke may be readily adjusted to prevent exhaustion of the rock pressure. The gas from the well is entrained with the liquid thus lightening the column which together with the reduction in rate of flow gives an efficient lift. The choke is readily adjusted from the top of the well thus enabling such adjustment to be made whenever the conditions of flow or pressure in the well justifies or requires it.

While the valve seat has been shown integral with the tubing and the head has been shown integral with the sleeve, it is obvious that their positions may be reversed; that is,

the head may be made integral with the tubing and the seat a part of the sleeve assembly, yet maintaining the same mode of operation.

It is obvious that other changes may be made in the details of construction within the scope of the appended claim without departing from the spirit of this invention.

I claim:

An adjustable bottom hole flow bean including a tubing adapted to be inserted in a well, a fitting secured to the end of the tubing, said fitting having an axial passage therethrough and forming a valve seat, a sleeve about said fitting and in slidable contact therewith, said sleeve engaging external threads on the tubing above the fitting, a tube secured to the sleeve and extending below said sleeve, a valve head carried by a spider secured to the sleeve, and bow-springs mounted on said sleeve for engaging the wall of the well to prevent circumferential movement of the sleeve whereby the relative position of the valve seat and valve head may be adjusted from the top of the well by rotating the tubing, said fitting being of sufficient external diameter to limit the downward movement of the valve head and sleeve.

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