Jan. 25, 1927. 1,615,811

L. M. PEARCE

BACK PRESSURE VALVE

Filed Nov. 5, 1923

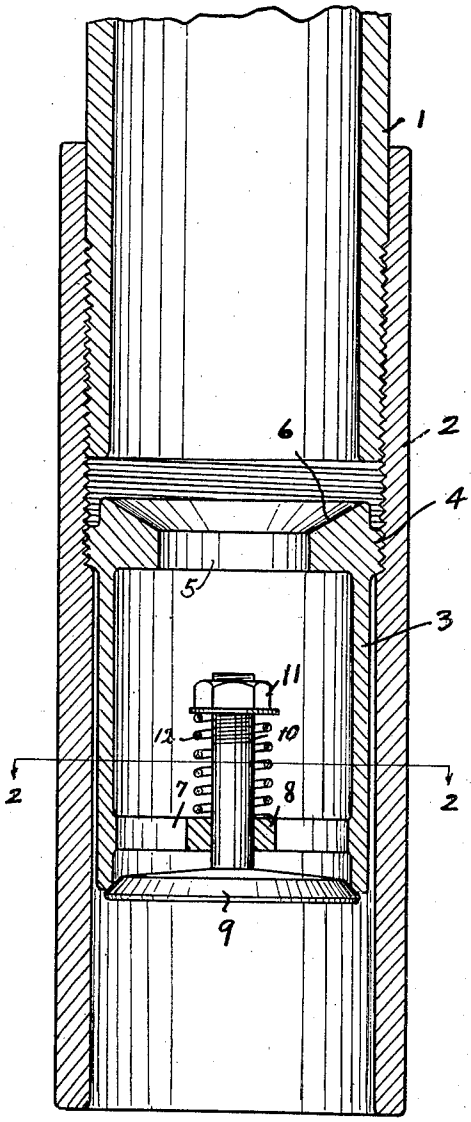


Fig. 1.

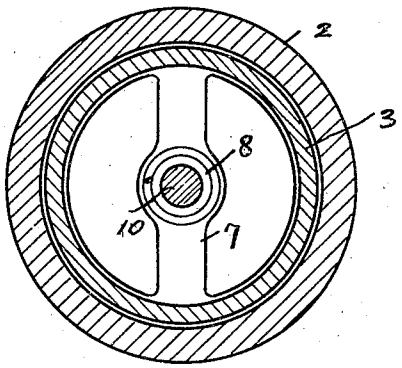


Fig. 2.

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BACK-PRESSURE VALVE.

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This invention relates to new and useful improvements in a back pressure valve.

One object of the invention is to provide, in combination with a set shoe, a back pressure valve of a novel type in said shoe. In setting well screen in a well bore, a set shoe is attached to the lower end of the screen, and associated with said shoe there is a back pressure valve to prevent slush and other fluid from entering the screen through the lower end of the screen. In the preparation of the well for production, a wash pipe is let down and its lower end rests on a suitable seat, provided for it, at the lower end of the screen, and water is forced down through this wash pipe beneath the screen, and the valve is arranged to open to permit this water to pass out of the lower end of the screen, and up on the outside of the screen to wash it so as to free it from clogging matter to permit the free inflow of oil through the screen, said valve closing to prevent the back flow of fluid. It is the object of this invention to provide a novel combination of set sleeve, back pressure valve, and wash pipe seat.

It often happens that after the screen is set and washed, no oil is found, and the hole is often deepened, the work being carried on through the screen. In such cases, the wash pipe seat and valve must be removed from the shoe, to give a clear opening for the bit. The structure herein described is so designed that it can be easily removed by a suitable milling cutter, or other similar tool, and will drop down to the bottom of the bore, and is there side tracked by the drilling tool and so disposed of.

Another object of the invention is to provide a device of the character described that is of very simple construction, can be cheaply manufactured and is very effective in use.

With the above and other objects in view, this invention has particular relation to certain novel features of construction, operation, and arrangement of parts, an example of which is given in this specification, and illustrated in the accompanying drawings, wherein:—

Figure 1 is a vertical sectional view of the device; and,

Figure 2 is a cross sectional view taken on the line 2—2 of Figure 1.

Referring now more particularly to the drawings, wherein like numerals of reference designate similar parts in each of the figures, the numeral 1 designates the screen pipe, and the numeral 2 designates the set shoe which is threaded onto the lower end of the screen and which seats on the bottom of the bore when the screen is set.

Within the set shoe there is a tubular casing 3 whose upper end is formed with an external, annular, outwardly threaded rib 4 which is screwed into the set shoe, and which anchors said casing therein. The casing also has an inwardly extending annular flange 5, at its upper end whose upper face converges downwardly, forming a seat 6 for the lower end of the wash pipe.

Within the casing, near its lower end, there is a spider 7, having a central bearing 8. There is a disc-like valve 9 whose upper surface is substantially convex, adapted to work against, and open or close the lower end of the casing 3. This valve has an upstanding stem 10 which works through the bearing 8 and whose upper end has a head 11. Surrounding this stem, and interposed between the bearing 8 and head 11 there is a coil spring 12 which normally holds the valve in closed position. The casing 3 protects said spring and prevents slush and mud from packing around the same and so embedding it that it will not properly operate.

A wash pipe (not shown) may be seated on the seat 6 and water forced downwardly through it will pass on down through the valve casing 3, and lift the valve and return up around the screen and cleanse the same of clogging material. When the pressure through the wash pipe is cut off, the valve will automatically close to prevent the back flow of fluid up onto the screen.

If it be desired to deepen the bore, the upper end of the casing 3 may be easily cut away by a suitable milling tool and the valve structure will drop to the bottom of the bore, and will be easily side tracked in drilling operations.

What I claim is:

1. A device of the character described adapted to be secured in a set shoe and including a tubular casing having an external, annular, outwardly threaded rib near its upper end forming its only means of anchorage to the set shoe, and whose lower end has an inlet opening, a downwardly opening valve controlling the flow of fluid through said opening and seating against the lower end of said casing when closed and com-

pletely closing the casing from beneath, yieldable means within the casing and protected thereby normally holding the valve closed, all in combination with a wash pipe seat formed integrally with the upper end of the casing and in which the lower end of a wash pipe is adapted to fit and form a close fitting joint therewith so that the flushing fluid passing down through the wash pipe will pass on down through the casing.

2. The combination with a set shoe of a tubular valve casing having an external annular outwardly threaded rib forming means for securing the casing in and spacing it from the set shoe and whose upper end is outwardly flared forming a seat adapted to receive the lower end of a wash pipe and form a close fitting joint therewith so that the flushing fluid passing down through the wash pipe will pass on down through the casing, and whose lower end has an inlet opening, a downwardly opening valve controlling the flow of fluid through said opening and yieldable means enclosed within said casing and protected thereby and normally holding the valve in closed position against the lower end of said casing and completely closing the casing from beneath.

In testimony whereof I have signed my name.

LOUIS M. PEARCE.