

Sept. 16, 1930.

R. H. SCHNEIDER

1,775,833

BACK PRESSURE VALVE MECHANISM

Filed Jan. 25, 1929

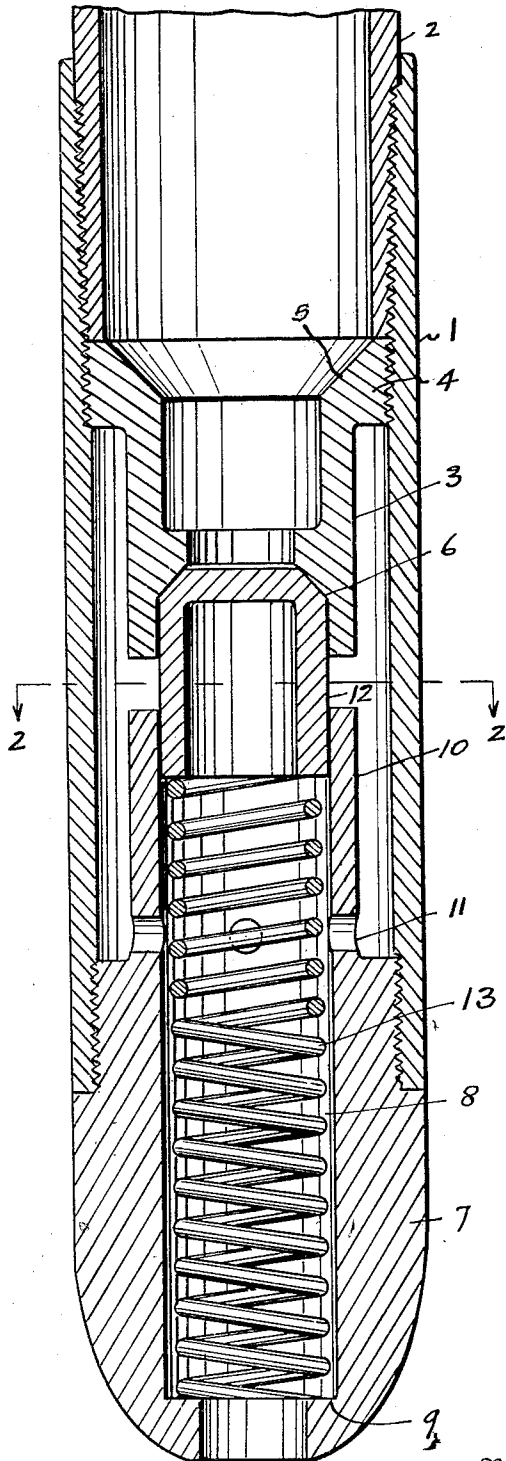


Fig. 1.

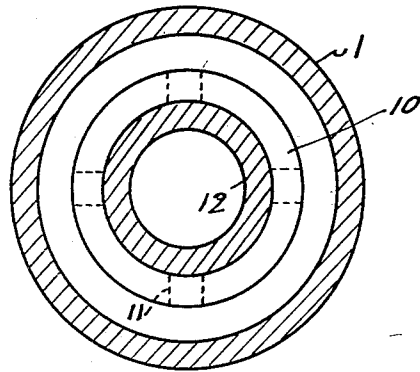


Fig. 2.

Inventor
Russell H. Schneider

By

Hardway & Lathrop
Attorneys

UNITED STATES PATENT OFFICE

RUSSELL H. SCHNEIDER, OF DAYTON, OHIO

BACK-PRESSURE VALVE MECHANISM

Application filed January 25, 1929. Serial No. 335,018.

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

One object of the invention is to provide a novel type of valve mechanism specially designed to be attached to the lower end of a screen set in a well bore and provided for the purpose of preventing the inflow of fluid from the bore beneath into the screen but which will open downwardly to permit water to be forced through the wash pipe and on through the valve and to return up around the screen to wash the screen preparatory to bringing in the well in which the screen is set; and the valve mechanism embodies a novel type of seat and valve of such construction that the valve, when seated, will always form a close fit with the seat to prevent leakage past the valve.

Another object of the invention is to provide a valve mechanism of the character described whose co-acting parts will not readily wear so as to permit leakage of the valve.

A further feature of the invention is to provide a valve mechanism of the character described which is of simple construction, may be cheaply produced and which is very durable.

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 shows a vertical sectional view of the valve mechanism, and

Figure 2 shows a cross sectional view thereof, 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 a tubular valve body which is attached to the lower end of the well screen 2. In this valve body there is a tubular nipple 3 whose upper end has an external, annular, externally threaded flange 4 which is screwed into the valve body, the upper end of this nipple is flared forming a wash pipe seat 5. The lower end of

this nipple has an inside valve seat 6 which is circular in form and whose upper end is tapered, or converges inwardly and upwardly.

Attached to the lower end of the valve body 1 there is a guide plug 7 whose lower end is rounded off and which serves to guide the screen down the well bore in setting the screen. This guide plug has an axial bore 8 extending from end to end thereof and whose lower end is reduced forming an internal annular shoulder 9. The upper end of the guide plug is reduced and thus spaced inwardly from the valve body forming a valve guide 10. The lower end of this guide has the radial perforations 11 and working in said guide there is the inverted cup shaped valve 12 whose upper end is formed to conform to the contour of, and to closely fit within the seat 6. This valve is seated on the coil spring 13 which is located in the bore 8 and rests on the shoulder 9, and this spring normally holds the valve seated against the seat 6. The opposing ends of the nipple 3 and valve guide 10 are spaced apart, as shown, to provide a fluid passageway between them.

In use the valve mechanism is attached to the lower end of a well screen which is then let down into a well bore. Before the well is brought in it is common practice to wash the screen to remove all clogging material therefrom. This is accomplished by lowering a wash pipe down until its lower end rests on the seat 5 and the washing fluid is forced down through said wash pipe and forces the valve 12 open and passes on down and out between the nipple 3 and guide 10 and then in through the perforations 11 and down through the bore 8 and up around the screen.

When the well is washed the wash pipe is withdrawn and the valve 12 seats to prevent the inflow of fluid into the screen from beneath.

The upper end of the valve 12 and the seat 6 cooperating therewith are so formed that there will be a large area of contact between them, so as to minimize leakage between them, and the upper end of the valve being

tapered it will readily enter the valve seat and as the valve enters said seat, in closing, it will displace, or force to one side, any foreign matter that might tend to collect in the seat, and such foreign matter or detritus will not be liable to be engaged between said valve and seat and hold the valve open. The free end of the seat will be gradually cut away, or flared, by the gritty fluid but the inwardly converging, or beveled, portion of the seat will still fit perfectly with the free end of the valve and thus effectively prevent leakage.

A preferred form of the valve mechanism has been shown and described but it is obvious that mechanical changes may be made therein and equivalents substituted for the parts shown within the principle of the invention.

What I claim is:

1. A back pressure valve mechanism including a tubular valve body, a guide plug at the lower end thereof said plug having a fluid passageway therethrough a sleeve like valve guide at the upper end of the plug, a cylindrical valve fitted and slidably mounted in said guide, a yieldable member in the plug on which said valve is mounted, said guide having an opening beneath the valve, an annular valve seat fixed in the valve body and spaced above the valve guide with which said valve cooperates, said seat having a sleeve like guide depending therefrom in which the valve is adapted to fit.

2. A back pressure valve mechanism including a tubular valve body, a guide plug attached to the lower end thereof having an axial bore and an upstanding, tubular, valve guide, provided with an opening, a yieldable member in said bore, a valve in said guide seated on said yieldable member, a valve seat in said body spaced above said guide and with which the valve cooperates, the free end of the valve being beveled and the seat being formed to conform to the contour of and to receive the beveled end of said valve, there being a sleeve depending from said seat in which the valve fits when seated.

In testimony whereof I have signed my name.

RUSSELL H. SCHNEIDER.

55

60

65

CERTIFICATE OF CORRECTION.

Patent No. 1,775,833.

Granted September 16, 1930, to

RUSSELL H. SCHNEIDER.

It is hereby certified that error appears in the above numbered patent requiring correction as follows: In the grant, and in the heading to the printed specification, the residence of the patentee was erroneously written and printed as "Dayton, Ohio", whereas said residence should have been written and printed as Dayton, Texas; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 18th day of November, A. D. 1930.

M. J. Moore,
Acting Commissioner of Patents.

(Seal)