

Jan. 13, 1925.

J. B. RAILSBACK

1,523,286

PACKER

Filed Jan. 2, 1923

Fig. 1.

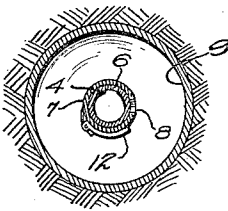
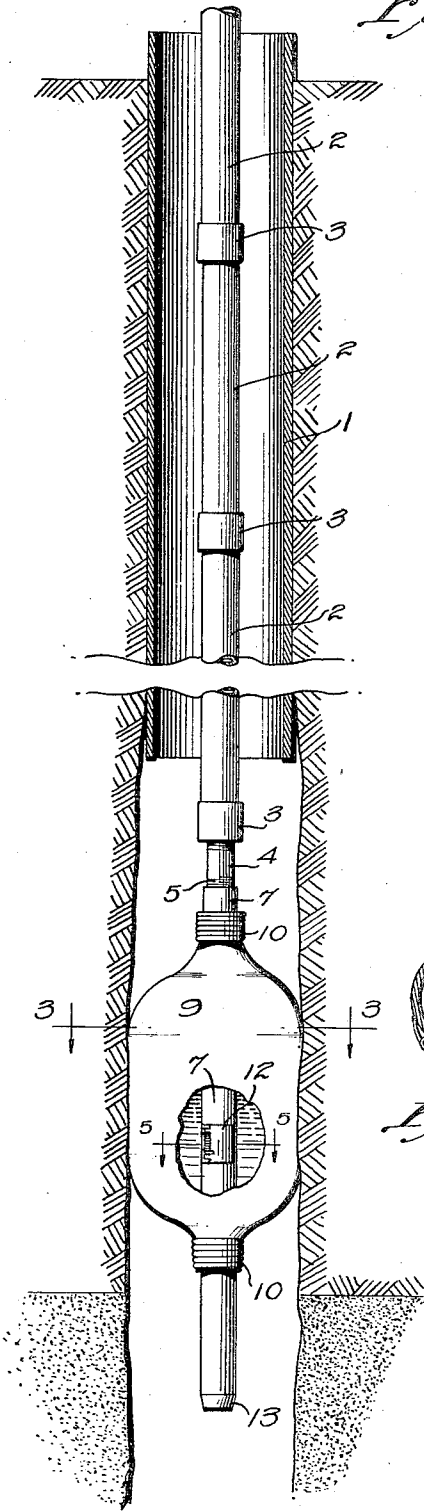


Fig. 3.

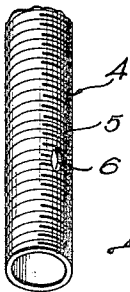


Fig. 4.



Fig. 5.

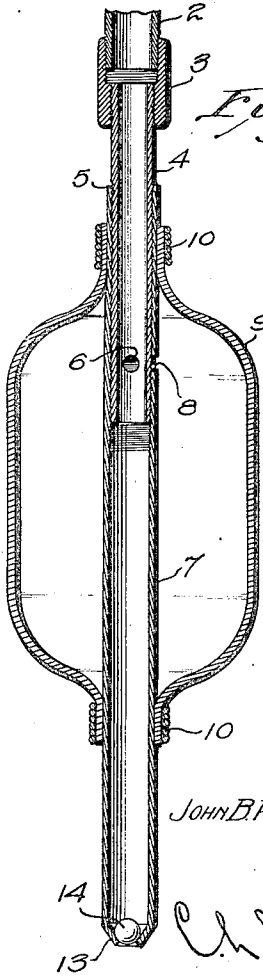


Fig. 2.

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JOHN BINFORD RAILSBACK, OF SHREVEPORT, LOUISIANA.

PACKER.

Application filed January 2, 1923. Serial No. 610,277.

To all whom it may concern:

Be it known that I, JOHN BINFORD RAILSBACK, a citizen of the United States, residing at Shreveport, in the parish of Caddo and State of Louisiana, have invented certain new and useful Improvements in Packers, of which the following is a specification.

This invention relates to well packers or apparatus by means of which a desired strata may be tested and water, oil, and other fluid from adjacent stratas excluded.

It has heretofore been proposed to employ a packer consisting essentially of a continuous pipe, tube, or casing extending into a well, a portion of which is surrounded by a mass of rubber, canvas, hemp or other yielding material which is caused to expand and close a section of the well casing outside the pipe, preventing the passage of oil, gas, or water outside the flow pipe, thereby making it possible to produce from the level below the packer or to test a lower sand, notwithstanding the presence of the higher water or fluid bearing sand.

Packers are also employed for various other purposes, such as to decrease the diameter of a well to permit flowing when the pressure is low and to test out a leaky casing to determine the level of the leak.

The chief objections to the packers now employed are the complicated character of their construction and the difficulty and uncertainty of deflating them to permit removal.

An object of the present invention is the provision of a packer that may be readily and positively deflated for removal and which is of extremely simple construction.

In the present invention, I provide a supporting pipe or tube having a section thereof surrounded by a tight fitting, elastic casing communicating through the core pipe to the interior of the casing by means of a one-way valve through which water or other fluid may be forced to inflate the casing.

When it is desired to test, exhaust, pump or examine a sand at the bottom of the well to determine its value as a producing sand, or to determine the nature, condition, and characteristics of its fluid contents, it is necessary to exclude or shut off the fluid contents of overlying porous strata.

To obtain this result, the core pipe with the elastic casing surrounding it is attached to the bottom of the supporting pipe and lowered into the well until the packer is at

the level of the impervious strata overlying the sand to be tested. Water or other fluid is then forced into the top of the supporting pipe through a one-way valve in the core pipe into the elastic casing which is thereby inflated and caused to fit tightly and snugly against the walls of the well, even though they may be irregular in shape.

The packer being set at the proper level when inflated to prevent the passage of fluid from the upper levels, it is then possible to test, pump, exhaust, or produce from the lower sands at leisure to determine the nature of the fluid, rock pressure and any desired facts concerning the same. To remove the packer, two adjacent sections of the pipe are turned to bring vent holes into communication with each other and the elastic casing is deflated, disengaging the walls of the well and permitting easy removal.

In the accompanying drawings, I have shown one embodiment of the invention. In this showing:

Figure 1 is a vertical sectional view of a well showing the invention applied,

Figure 2 is a vertical sectional view through the packer,

Figure 3 is a detail sectional view on line 3—3 of Figure 1,

Figure 4 is a detail view showing the vent openings, and,

Figure 5 is a horizontal sectional view on line 5—5 of Figure 2.

Referring to the drawings, the reference numeral 1 designates a well casing of the usual construction. A supporting pipe 2 is lowered in the well to support the packer, the supporting pipe being formed in sections in the usual manner which sections are secured to each other by couplings 3. At the bottom of the supporting pipe, a pipe 4 of smaller cross-sectional area is secured. This pipe is externally screw-threaded, as at 5, throughout the greater portion of its length and is provided with an opening 6 (see Figure 4). A core pipe 7 is adapted to receive the lower end of the pipe 4, the core pipe being provided with internal threads and being further provided with an opening 8. An elastic casing 9 is arranged around the core pipe. The elastic casing may be formed of rubber, rubberized fabric, or other similar material, and is adapted to expand, as shown in Figures 1 and 2, when inflated. The ends of the cas-

ing are tightly secured to the core pipe, as at 10, to prevent leakage of fluid within the casing. As shown, the core pipe is provided with a one-way valve 12 by means of which
 5 fluid may be delivered through the core pipe to the interior of the casing. The lower end of the core pipe is provided with a valve seat 13, adapted to receive a ball valve 14.

The operation of the device will be apparent from the foregoing description. The
 10 packer is assembled on the lower end of a well pipe and lowered into the well to the desired point, being arranged in alinement with an impervious strata, above the oil
 15 bearing strata from which fluid is to be withdrawn. Fluid is then forced through the well pipe and passes through the one-way valve 12 into the casing 9, inflating the casing and causing it to engage the wall of
 20 the well. The inwardly opening valve 14 at the bottom of the core pipe prevents the fluid from passing into the well. It will be apparent from an inspection of Figure 1 of the drawings that when the casing 9 is
 25 inflated, communication between the levels of the well above and below the packer is prevented which permits fluid to be withdrawn from the well below the packer without being contaminated by oil, mud, water,
 30 or other fluid in the levels above the packer. This is accomplished by applying suction to the upper end of the pipe 2, which lifts the valve 14 from its seat and permits fluid to pass upwardly through the well pipe. It
 35 will be apparent that the one-way valve prevents the passage of fluid from the elastic casing. When the packer is to be withdrawn, the pipe 4 is turned in the pipe 7 to bring the openings 6 and 8 into registra-
 40 tion, permitting the fluid in the casing to pass into the well pipe. This causes deflation of the casing and the casing disengages the wall of the well. In case of accident, the casing may be deflated by lowering a suitable instrument into the core pipe and puncturing it.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the
 50 same, and that various changes in the shape,

size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described the invention, I
 claim:

1. In a packer, a core pipe, an elastic casing surrounding said core pipe, and a one way valve to permit passage of fluid from said core pipe into said casing. 60

2. In a packer, a core pipe, an elastic casing surrounding said core pipe, and a valve to permit passage of fluid from said core pipe into said casing, said core pipe being provided with a normally closed vent
 65 opening to permit removal of fluid from said casing.

3. In a packer, a pipe through which fluid may be passed, an elastic casing surrounding a portion of said pipe, and
 70 normally closed means for delivering fluid from said pipe to the interior of said casing.

4. In a packer, a core pipe, an elastic casing surrounding said core pipe, means for securing the ends of said casing to said
 75 core pipe, means for delivering fluid from said core pipe to said casing to inflate it, and means for exhausting fluid from said casing through said core pipe to deflate said casing. 80

5. The combination with a well pipe, of a supporting pipe adapted to be secured to the bottom of the well pipe, said supporting pipe being provided with a vent opening, a core pipe adapted to receive said
 85 supporting pipe, said core pipe being provided with a vent opening normally out of registration with the vent opening in said supporting pipe, said supporting pipe being rotatable with respect to said core pipe to
 90 permit said vent openings to register when desired, an elastic casing surrounding said core pipe, and a valve to permit passage of fluid from said core pipe into said casing.

In testimony whereof, I affix my signature in presence of two witnesses.

JOHN BINFORD RAILSBACK.

Witnesses:

J. O. JOHNSTON, Jr.

M. AUDREY VAN SANDT.