W. Y. FUQUA & C. J. JOHNSON.

MECHANISM FOR CASING OFF WATER.

APPLICATION FILED OCT. 18, 1913.

1,124,602.

Patented Jan. 12, 1915.

2 SHEETS—SHEET 1.

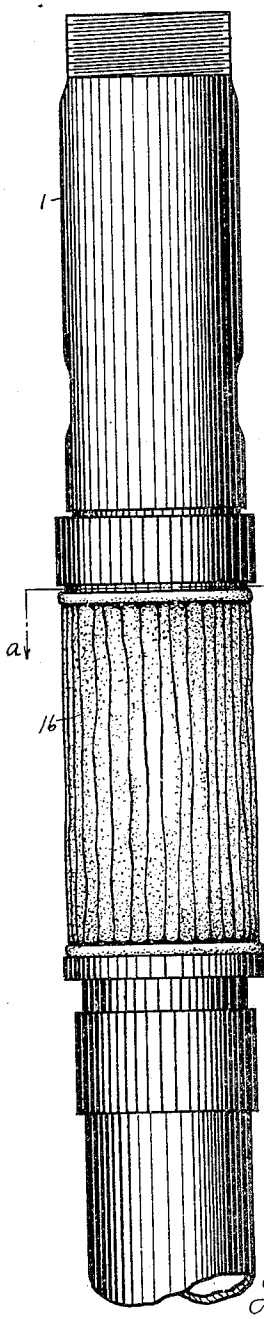


Fig. 1.

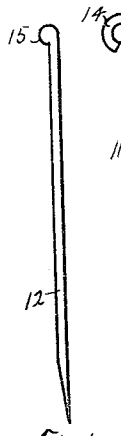


Fig. 6. Fig. 7.

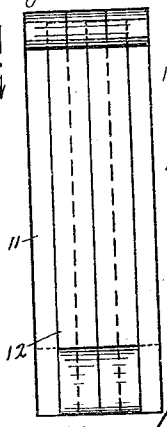


Fig. 8.

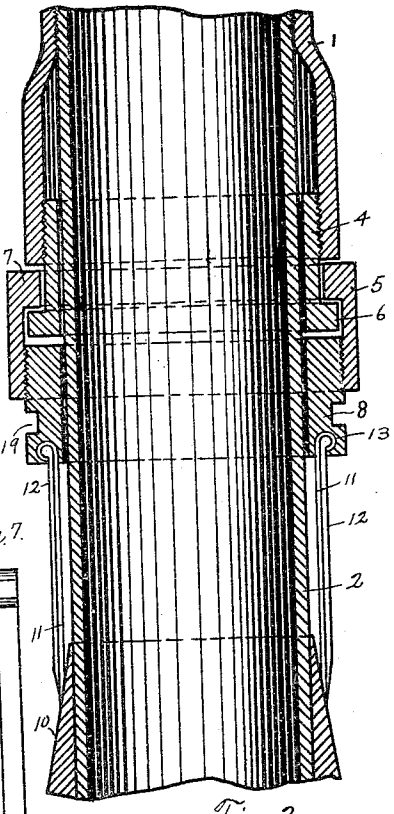


Fig. 3.

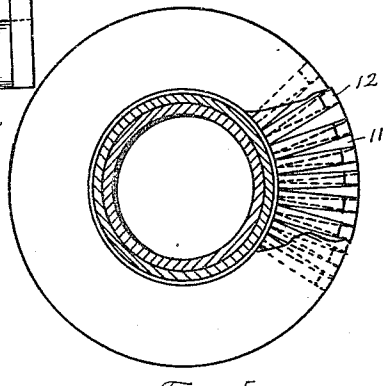


Fig. 5.

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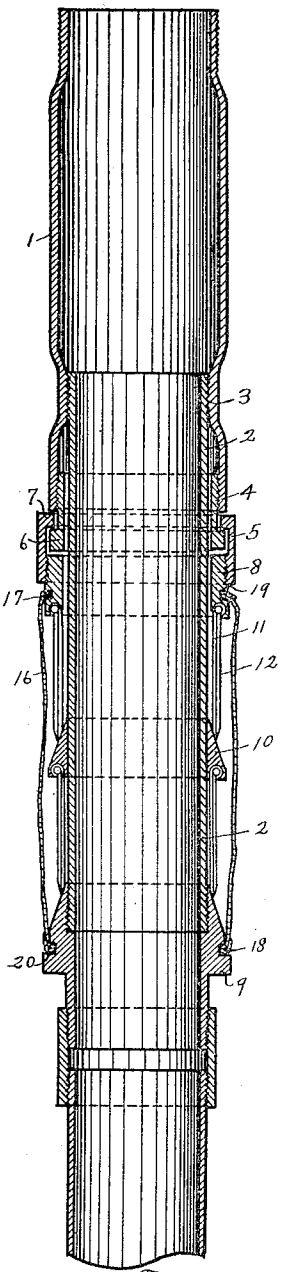


Fig. 2.

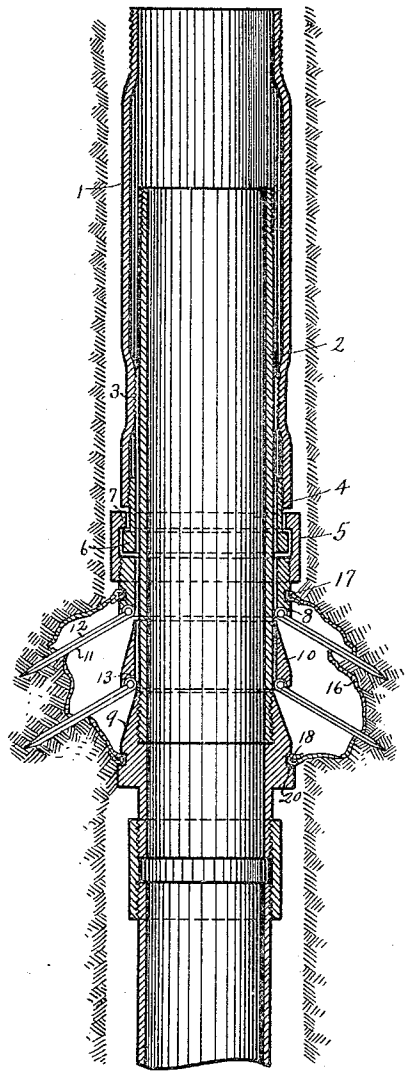


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM Y. FUQUA AND CHARLES J. JOHNSON, OF HOUSTON, TEXAS, ASSIGNORS OF ONE-FOURTH TO FRANK J. HARDEY, OF WHARTON COUNTY, TEXAS, AND ONE-FOURTH TO FRANK J. CLEMENGER, OF HARRIS COUNTY, TEXAS.

MECHANISM FOR CASING OFF WATER.

1,124,602. Specification of Letters Patent. Patented Jan. 12, 1915.

Application filed October 18, 1913. Serial No. 795,857.

To all whom it may concern:

Be it known that we, WILLIAM Y. FUQUA and CHARLES J. JOHNSON, citizens of the United States, residing at Houston, in the county of Harris and State of Texas, have invented certain new and useful Improvements in Mechanism for Casing Off Water, of which the following is a specification.

This invention relates to new and useful improvements in mechanism for casing off water.

The object of the invention is to provide a device of the character described, designed to be used in wells for the purpose of casing off water.

As is well known in boring an oil well a water vein is often encountered, as well as oil and unless the water is cased off it becomes mixed with the oil and otherwise interferes with the boring of the well.

It is the object of this invention to provide a device whereby the water may be entirely cased off from the oil so that it will not become mixed therewith, or escape into the bore and be discharged to the surface.

With the above and other objects in view, the 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 side elevation of the device shown in position to be lowered into the well. Fig. 2 is a sectional side elevation thereof. Fig. 3 is an enlarged fragmentary sectional side elevation thereof. Fig. 4 is a sectional side elevation thereof in the position it will assume when it is in use, in the well. Fig. 5 is a sectional end view, taken on the line *a—a* of Fig. 1 and showing the device expanded, as in use, and showing also a portion of the fabric which surrounds the fingers broken away so as to expose said fingers. Figs. 6 and 7 show edge views of the two forms of fingers employed, and Fig. 8 shows a plan view of a section of the fingers illustrating their arrangement.

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 upper section of the pipe through which the oil is conducted from the bore. Extending up into the section 1, from beneath, is another pipe section 2 considerably smaller in diameter than the section 1. A short distance above the lower end of the section 1 it is slightly flattened on opposite sides and this flattened portion is internally threaded, as at 3, said threads receiving the externally threaded upper end of section 2, so as to hold said sections fixed with relation to each other as the device is being lowered into the well. Two collars 4 and 5 are provided, the lower end of the former having an annular outwardly projecting flange 6 and the upper end of the latter having an annular inwardly projecting flange 7. The upper end of the collar 4 is passed up through the collar 5 until said annular flanges interlock. The upper end of the collar 4 is outwardly threaded and screwed into the internally threaded lower end of pipe section 1. The collar 5 will thus be held against detachment from the upper pipe section but will rotate relative thereto. Surrounding the lower pipe section 2 is a collar 8 whose upper end is externally threaded and is screwed into the internally threaded lower end of the collar 5. Screwed on to the lower end of section 2 is a connecting collar 9 to the lower end of which is attached the sections of pipe beneath. In general contour the upper portion of this collar is frusto-conical in form and surrounding the pipe section 2 between the collars 8 and 9 is the sliding collar 10 also frusto-conical in form. Hinged to the respective collars 8 and 10 and depending therefrom are two series of fingers 11—11 and 12—12, whose lower ends rest against the sloping sides of the collars 9 and 10, respectively, when the device is in position to be lowered into the well.

The lower end of each of the collars 8 and 10 has a deep annular groove, indicated by the numeral 13 and the upper ends of the fingers 11 are curved over, as at 14 and are seated in said grooves, thus forming a hinge between said collars and fingers, and the upper ends of the fingers 12 have beads 15 over which the upper ends 14 of the fingers 11 curve, so that the fingers 11 and 12 are hinged together at their upper ends and it is further to be noted that the fingers 11 are arranged in staggered relation to the fingers 12 so that as the fingers spread out, as hereinafter explained, the fingers of each respective series

will over-lap each other, rendering them practically impervious to fluid passage.

The operative parts of the mechanism will usually be inclosed by a fabric covering 16, although this covering is not indispensable. The upper and lower ends of this covering will usually be held in position by means of the wires 17 and 18 which are seated in the respective grooves 19 and 20, of the respective collars 8 and 9, and to which the respective ends of the fabric are secured.

When a stream of water has been encountered and it is desired to case the same off and stop the flow thereof up into the bore, the device is assembled as shown in Figs. 1 and 2 and is attached to a string of pipe, of sufficient length to bring the casing device to the proper point when the pipe has been lowered into the bore. It should here be observed that the over turned ends 14 of the fingers 11 fit closely in the grooves 13 and considerable pressure is required to move the free ends of the fingers outwardly from the pipe so that the collar 10 is supported in its position, while the device is being lowered, by reason of the fact that the lower ends of the fingers carried thereby rest upon the connecting collar 9.

When the device is at the proper point in the bore the upper section 1 is turned until the threads connecting the sections 1 and 2 at the point 3 are disengaged and the section 1 is then forced downwardly. As said section moves downwardly the lower ends of the fingers 11 and 12 are forced outwardly by the frusto-conical shaped collars 9 and 10, the collar 10 sliding downwardly on the section 2 by reason of the pressure of the fingers against it from above. The collar 10 finally seats on the collar 9 and the collar 8 seats upon the collar 10, as shown in Fig. 4 and when in this position the fingers 11 and 12 are in a radiating position relative to the pipe and their points have penetrated the fabric 16 and project out into the walls of the bore, holding said fabric firmly against the sides of the bore, all of which is shown in Fig. 4, and inasmuch as the fingers 11 and 12 are arranged in a staggered relation, one set of fingers break the joints between the other fingers, as shown in Fig. 5, and thus completely block the bore against fluid passage. As is illustrated in Figs. 4, 6, 7 and 8 the outer ends of the fingers 12 are beveled downwardly and the outer ends of the fingers 11 are beveled upwardly, so that as the fingers pierce the walls of the bore they will be held together as is indicated in Fig. 4.

In the drawings only one slidable collar 10 is shown but in actual use this collar may be dispensed with and only one series of fingers employed, which, in that case, would be spread by the connecting collar 9; or, in case it is so desired, a plurality of sliding collars, as 10, may be employed, each having a series of fingers depending therefrom, but in either case, the operation of the device will be practically the same.

When the mechanism has been set in the bore, as hereinbefore indicated, the water on one side thereof will be entirely cut off and prevented from mingling with the oil on the other side, and the oil may be then pumped out through the pipe and delivered, free from water, to the surface.

What we claim is:—

1. A device of the character described including two pipe sections, one of which telescopes within the other, a plurality of fingers, each of which is pivoted at one end to one end of said sections and having their other ends free, and means carried by the other section and engaging under the free ends of said fingers and forcing said free ends outwardly from the pipe, as the sections are moved toward each other and a covering surrounding said fingers and adapted to be pierced by said fingers, when they are forced outwardly from the pipe.

2. A device of the character described including two pipe sections, one of which telescopes within the other, a plurality of fingers hingedly connected, at one end, to one end of said sections and having their other ends free, and a collar carried by the other section over which the free ends of said fingers pass, as the sections move together and by which said free ends are forced out from the pipe and a flexible covering surrounding said fingers and adapted to be pierced thereby.

3. A device of the character described including two pipe sections, one of which telescopes within the other, a plurality of fingers hingedly connected, at one end, to one of said sections and having their other ends free, a collar carried by the other section over which the free ends of said fingers pass, as the finger-carrying section moves toward said collar and by means of which said free ends are forced out from the pipe, and a flexible covering enveloping said fingers and having its respective ends secured to the respective pipe sections.

4. A device for packing a well bore including an upper and a lower pipe section, the latter of which telescopes within the former, a plurality of fingers hinged at their upper ends to the lower end of the upper pipe section and having their lower ends free and a frusto-conical shaped collar carried by the lower section over which said fingers pass as they move toward the lower pipe section and which forces said free ends outwardly from the pipe, into the wall of the bore thereby blocking the bore.

5. A device of the character described including two pipe sections one of which telescopes within the other, interengaging

means carried by said respective sections and fixing the sections against lengthwise movement relative to each other, a plurality of fingers hinged at one end to one of said sections and having their other ends free and a collar carried by the other section and arranged to pass under the free ends of said fingers and force them outwardly when said interengaging means are disengaged and said finger-carrying section is moved toward said collar.

6. A device of the character described including two pipe sections, one of which telescopes within the other, interengaging means carried by said respective sections and fixing the sections against lengthwise movement relative to each other, a plurality of fingers hinged at one end to one of said sections and having their other ends free, a collar carried by the other section and arranged to pass under the free ends of said fingers and force them outwardly when said interengaging means are disengaged and said finger-carrying section is moved toward said collar, and a flexible covering enveloping said fingers and having its respective ends secured to the respective pipe sections.

7. A device of the character described including an upper pipe section, two collars interlocking together, one of said collars being attached to the lower end of said section, a collar attached to the other of said interlocking collars, a plurality of fingers hinged at one end to said last mentioned collar and having their other ends free, a lower pipe section passing through said collars and telescoping within the upper pipe section and a means carried by the lower section and passing under the free ends of said fingers and forcing said ends outwardly from the pipe as said upper section is forced downwardly on the lower section.

8. A device of the character described including an upper and a lower pipe section, the latter of which telescopes within the former, a plurality of fingers hinged at their upper ends to the lower end of the upper pipe section and having their lower ends free, a collar frusto-conical in form, fixed to said lower pipe section and a collar, frusto-conical in form, slidable upon the lower pipe section and interposed between said fixed collar and the lower end of the upper pipe section, a plurality of fingers hinged at one end to said slidable collar and depending therefrom and having their other ends free, said frusto-conical shaped collars being provided to force said free ends of said fingers outwardly from the pipe as said pipes are forced together.

9. A device of the character described including an upper and a lower pipe section, the latter of which telescopes within the former, a collar, frusto-conical in form fixed to the lower pipe section and a collar, frusto-conical in form, and slidable upon the lower pipe section and arranged between said fixed collar and the lower end of said upper pipe section, two series of fingers, the fingers of one series being hinged at one end to the lower end of the upper pipe section and the fingers of the other series being hinged at one end to said sliding collar, the free ends of said fingers being forced outwardly by said frusto-conical shaped collars as said pipe sections are forced together and a flexible covering enveloping said fingers and having its respective ends secured to the respective pipe sections.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM Y. FUQUA.
CHARLES J. JOHNSON.

Witnesses:
MAY MONTGOMERY,
C. C. BAURLAND.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."