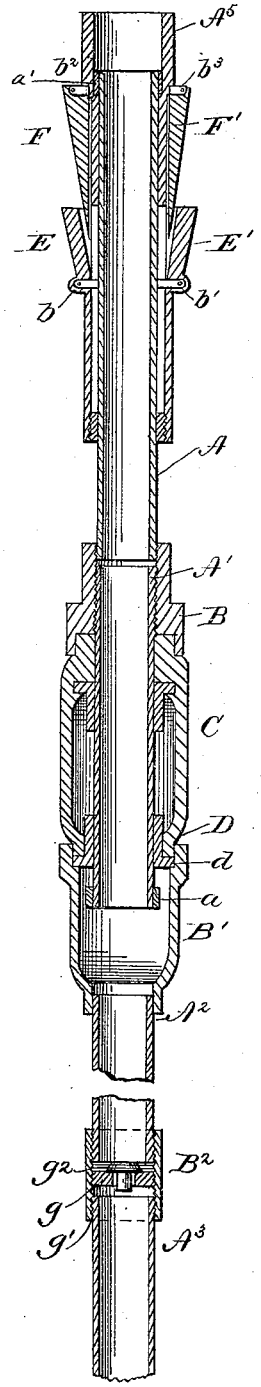
(No Model.)

C. C. CONROY.

PROCESS OF ADAPTING OIL WELLS TO FLOW WITHOUT TUBING ABOVE THE PACKER.

No. 265,582. Patented Oct. 10, 1882.



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CHARLES C. CONROY, OF BOLIVAR, NEW YORK.

PROCESS OF ADAPTING OIL-WELLS TO FLOW WITHOUT TUBING ABOVE THE PACKER.

SPECIFICATION forming part of Letters Patent No. 265,582, dated October 10, 1882.

Application filed April 18, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES C. CONROY, of Bolivar, in the county of Allegany, State of New York, have invented new and useful Improvements in Adapting Oil-Wells to Flow without Tubing above the Packer, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, making part of this specification, said drawing representing a vertical section through the tubing at and below the packer.

The invention relates to a process of adapting oil-wells to flow without the use of tubing above the packer, either as a weight or as a conductor, employing in lieu thereof a mechanical device for holding the packer in position, and a reducer applied to the tubing at or below the packer in the form of an annular bushing to a thimble, relieving the well of pressure in excess of its capacity, thereby making the flow practically continuous, as hereinafter explained.

In the ordinary construction or process of forming oil-wells it has been necessary to "tube" them the entire depth, employing tubing conforming to the capacity or flow of the well. I propose to dispense with the tubing above the ordinary packer, and to employ in lieu thereof a device for fastening the packer in position without the aid of the weight of the usual superimposed tubing, and by the employment of a "reducer" in the pipe or tubing at or below the packer to relieve the well of all pressure in the bore above said packer in excess of the capacity or bore of the reducer, the latter being regulated to conform to the flow or capacity of the well.

In the accompanying drawing, A A′ A^2 A^3 represent sections of tubing, united by thimbles in the usual manner. The sections A and A′ are united by a shouldered sleeve or thimble, B, provided with a screw-thread on its inner face, the sections A A′ being screwed into it.

C is a packer, made of rubber, and in any usual or preferred form, that shown being made in the form of a hollow cylinder or bulb, surrounding the section A′, its upper end resting in the enlarged or shouldered end of the thimble B and its lower end against a flanged collar, D, sliding on the section A′. The annular flange *d* of the collar D has a screw-thread formed on its periphery, adapting it to be screwed into the shouldered end of an enlarged thimble, B′, uniting the sections A′ and A^2 of the tubing, and of sufficient diameter to permit the lower end of the section A′, provided with a collar, *a*, to slide freely up and down in it. The collar *a* prevents the withdrawal of the sliding section A′ through the collar D, while the sliding of the section A′ within the thimble B′ provides for the longitudinal compression of the packer C between the thimble B and the flanged collar D, for causing its lateral expansion against the walls of the well. This packer is similar in construction and operates in a manner similar to some now in use for compelling the well to flow through the tubing, and any usual or preferred form of packer may be substituted for that shown. In the ordinary construction this packer has been held in position against the walls of the well by the weight of the superimposed tubing. This tubing above the packer I propose to dispense with, and for causing the packing C to be expanded and held against the walls of the well or bore I provide the section A with laterally-projecting ears *b b′*, to which are pivoted two pieces, E E′, made in the form of a section of a hollow cylinder or of a hollow frustum of a cone, the two surrounding or partly surrounding the tube section. The pieces E E′ have suitable lugs or ears, through which they are pivoted to ears *b b′*, and said ears may be slotted to allow the pieces E and E′ to move laterally to and from the tube A.

Upon the section A is a sleeve, A^5, said sleeve being adapted to slide on the section A, and being provided with an enlarged bore in its upper end, adapting it to pass over an annular collar, *a′*, screwed on the end of said section A for preventing the withdrawal of the sleeve A^5. The sleeve A^5 has short laterally-projecting arms or ears b^2 b^3 near its upper end, and to these are secured pendent wedges F and F′, with their lower ends entering grooves in the inner faces of the pieces E and E′, as shown. By forcing the sleeve A^5, with its wedges F and F′, downward when the packer C is in position and has been properly expanded against the walls of the well, the semi-cylindrical pieces E and E′ are forced outward until they are made to firmly grasp the walls of the well, and thus

to hold the packing in the required position without the weight of the usual packing-tubing above, and the necessity of employing such tubing for holding the packing in position is obviated.

The sleeve A^5, with its wedges, will be forced down by the weight of the drilling-tools after the tubing and the packing therefor have been located in the desired position.

The sections A^2 and A^3 are united by a thimble, B^2, screw-threaded in its inner face to receive the threaded ends of said sections, and between said sections what I term a "reducer," *g*. This reducer is made in the form of an annular washer, provided with a screw-thread on its outer edge or periphery, adapting it to be screwed into the thimble B^2. The central perforation may be made of any required diameter to suit the flow or capacity of the well, and the reducer is made removable, adapting it to be substituted by another having a different-sized bore or perforation to suit the varying flow of the well, and to relieve the well of the pressure of the column of oil in excess of the diameter of the bore *g'* of the reducer.

The tubing to which the packer and the reducer are applied can be withdrawn for changing the reducer to suit the flow of the well by any of the usual means for withdrawing the tools used in drilling, such as the "Luther" socket or its equivalent.

By the employment of the reducer and of the means described, or an equivalent thereof, for securing the packer, I am enabled to dispense with the usual tubing above said packer, and to produce an even and steady flow of the well, whatever may be its capacity, without the necessity of adapting tubing thereto or of resorting to pumping, as is frequently necessary where the flow becomes reduced materially below the capacity of the tubing employed, in consequence of the pressure of the superincumbent column of oil.

The perforation *g'* in the reducer where the flow of the well is small may be covered by a flap or check valve, as indicated at g^2, for preventing the backward flow of any of the material passing up through the perforation. This will be found valuable where there is water found above or in the rock for preventing its access to and interference with the well.

Having now described my invention and how the same may be carried out in practice, I wish it to be understood that I do not wish to be restricted to the particular form of packer shown, nor to the specific devices described for securing the same in place, as these may be varied without departing from my invention; but

What I claim as new is—

1. The process of adapting an oil-well to flow without tubing the same above the packer, by means of a reducer applied to the tubing at or below the packer, substantially as described.

2. The method of securing the packer for the tubing in place by devices wedging against or grasping the walls of the well, whereby the necessity of the weight of tubing above said packer for securing the latter in place is obviated, substantially as described.

3. The reducer applied to the thimble, in combination with a check-valve applied thereto and operating substantially as described.

In testimony whereof I have hereunto set my hand this 18th day of April, A. D. 1882.

C. C. CONROY.

Witnesses:
H. B. ZEVELY,
R. M. SMITH.