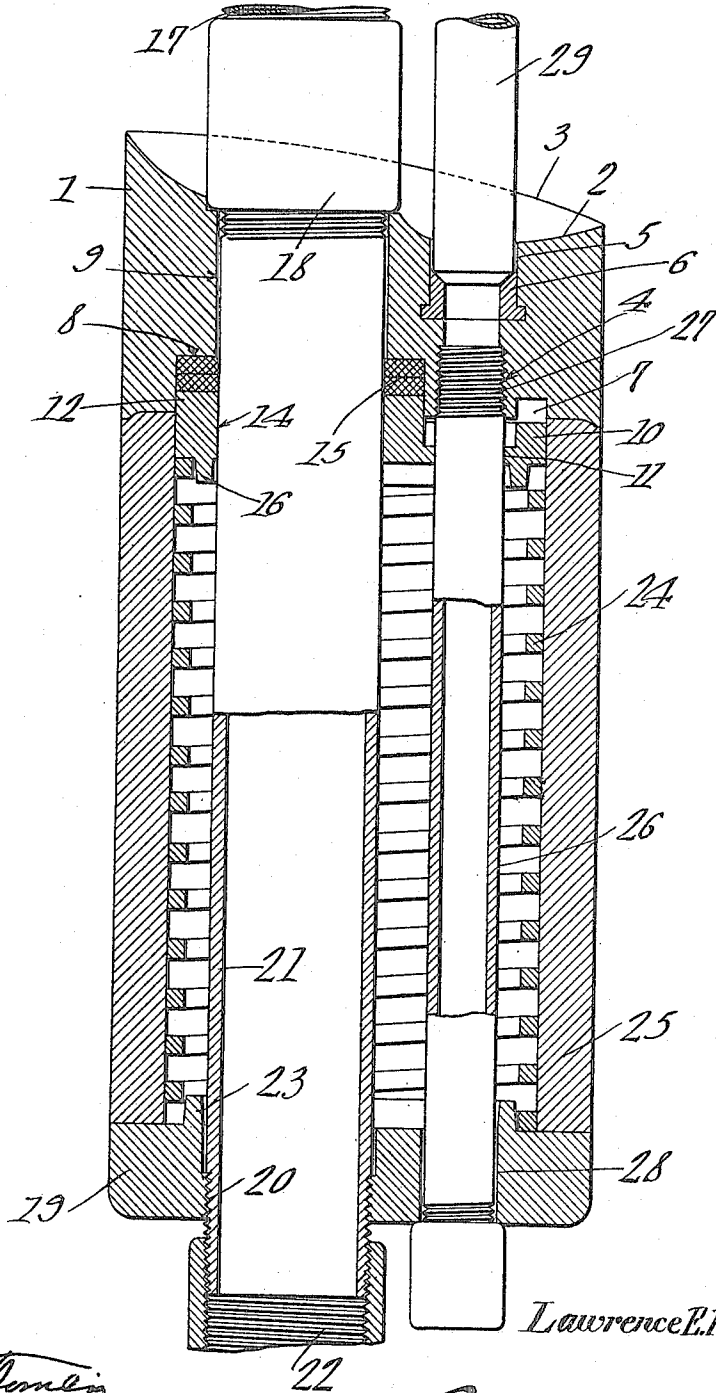


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PUMPING PACKER WITH GAS ESCAPE.  
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1,202,319.

Patented Oct. 24, 1916.



Witnesses

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# UNITED STATES PATENT OFFICE.

LAWRENCE E. ROBINSON, OF COFFEYVILLE, KANSAS.

## PUMPING-PACKER WITH GAS-ESCAPE.

1,202,319.

Specification of Letters Patent.

Patented Oct. 24, 1916.

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*To all whom it may concern:*

Be it known that I, LAWRENCE E. ROBINSON, a citizen of the United States, residing at Coffeyville, in the county of Montgomery and State of Kansas, have invented a new and useful Pumping-Packer with Gas-Escape, of which the following is a specification.

The device forming the subject matter of this application is adapted to be employed for packing an oil well, and the invention aims, primarily, to provide a structure of this type which may be operated by the weight of an auxiliary string of tubing through which gas escapes from the well.

Another object of the invention is to provide a structure of the sort above mentioned in which it is unnecessary to provide two holes in the gasket through which holes pass, ordinarily, the main or oil tubing, and the auxiliary or gas tubing.

It is within the province of the disclosure to improve generally and to enhance the utility of devices of that type to which the present invention appertains.

With the above and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed, without departing from the spirit of the invention.

In the accompanying drawing, the invention is shown in a single vertical sectional figure, wherein sundry parts appear in elevation.

In carrying out the present invention there is provided a head 1 equipped in its upper end with a circumscribing, downwardly concaved groove 2 which slants laterally from one side of the head 1 toward the other, as indicated at 3. In the head 1 and disposed at the lowermost portion of the groove 2 is an opening 4 extended through the head 1 vertically, and enlarged adjacent its upper end, as shown at 5, to receive a compressible seat 6 which ordinarily is fashioned from lead. In the under face of the head 1 there is formed a main recess 7, communicating with an auxiliary recess 8, of

less diameter than the main recess 7 and located slightly to one side of the axis of the main recess 7. In other words, the recesses 7 and 8 are not concentrically disposed. Opening through the head 1 and communicating with the auxiliary recess 8 is a bore 9. The invention comprises a follower 10 mounted to reciprocate vertically in the main recess 7 of the head 1, the follower having an opening 11 disposed in vertical alinement with the opening 4 of the head 1. The follower 10 includes a reduced neck 12 slidably received in the recess 8. Interposed between the end of the neck 12 and the head 1 and mounted in the recess 8 are one or more resilient gaskets 15. The follower 10 is equipped with an opening 14 alined with the bore 9 of the head 1. Depending from the follower 10 is a flange 16.

The numeral 17 indicates a portion of the piping of the well, the same being united by means of a coupling 18 to a main tube 21 mounted to slide freely in the bore 9 of the head 1. The invention comprises a foot 19 and into the foot 19, the main tube 21 is threaded as shown at 20. The numeral 22 denotes an extension or anchor of any desired sort, assembled with the lower end of the main tube 21. The foot 19 is equipped with an upstanding flange 23.

The invention comprises a compression spring 24 surrounding the flanges 23 and 16 and abutting at its upper and lower ends, respectively, against the follower 10 and the foot 19. Surrounding the spring 24 closely is a tubular, resilient packing 25. The invention comprises an auxiliary tube 26, threaded as shown at 27 at its upper end into the lower end of the opening 4 of the head 1, the auxiliary tube 26 being slidably received in an opening 28 formed in the foot 19.

In practical operation, the packer is lowered into the well and then a string of auxiliary tubing indicated at 29, is introduced into the well, the lower end of the string of tubing 29 being received by the inclined groove 2 and being guided into the opening 4 and into abutment with the compressible seat 6. The weight of this string of auxiliary tubing 29 tends to carry the head 1 downwardly, the auxiliary tube 26 which is fixed to the head 1, sliding in the opening 28

of the foot 19. It being understood that the lower end of the main tube 21 is suitably anchored, it will be obvious that the spring 24 by the above mentioned operation is put under compression, the follower 10 being thrust upwardly, and the gaskets 15 being compressed, so that the same will embrace the main tube 21 closely and form a gas tight joint. At the same time, the resilient packing 25 is expanded, so as to contact with the walls of the well and to afford a gas tight closure.

The oil from the well now flows upwardly through the main tube 21 and through the string of pipe indicated at 17. The gas which rises out of the sand at the bottom of the well will flow upwardly through the auxiliary tube 26 and through the string of auxiliary tubing indicated at 29. It is to be noted that a tight fit does not exist between the auxiliary tube 26, and the foot 19, owing to the fact that the auxiliary tube must slide in the opening 28. Although gas from the bottom of the well may thus pass into the interior of the chamber defined by the packing 25, the gas cannot flow upwardly and outwardly around the exterior of the main tube 21, because the gaskets 15 are compressed tightly around the main tube 21, by the action of the spring 24 and the follower 10.

From the foregoing it will be observed that, by the action of the weight of the auxiliary string of tubing shown at 29, the spring 24 is compressed, so as to form a gas tight joint around the tube 21 through the instrumentality of the washers 15, and at the same time, a gas tight joint is formed between the packing 25 and the bore of the well.

It is to be observed that neither the string of auxiliary tubing shown at 29, nor the auxiliary tube 26 passes through the gaskets 15. Therefore, in each gasket, there need be formed but one opening, which opening is adapted to receive the main tube 21. One of the distinguishing characteristics of the present invention, therefore, is that although the invention includes an auxiliary, gas conveying conduit, no opening need be made for this conduit in the gasket or gaskets which surround and coat with the main tube 21.

Having thus described the invention, what is claimed is:—

1. In a device of the class described, a head; a foot; a main tube secured to the foot and slidable in the head; a tubular packing interposed between the foot and the head; a gasket surrounding the tube and restrained by the head; and a spring exerting a terminal pressure against the foot and the gasket.

2. In a device of the class described, a head; a foot; a main tube secured to the

foot and slidable in the head; a tubular packing interposed between the foot and the head; a gasket surrounding the main tube and restrained by the head; a spring exerting a terminal pressure against the foot and the gasket; and an auxiliary tube secured to the head and slidable in the foot, the auxiliary tube opening through both the head and foot.

3. In a device of the class described, a head; a foot; a main tube secured to the foot and slidable in the head; a tubular packing interposed between the foot and the head; a gasket surrounding the tube and restrained by the head; a spring exerting a terminal pressure against the foot and the gasket; an auxiliary tube secured to the head and slidable in the foot, the auxiliary tube opening through both the foot and the head; and a head-supported pipe cooperating with the auxiliary tube, the head-supported pipe constituting a means for moving the head downwardly, thereby to secure a compression of the spring and to render the spring effective as a means for actuating the gasket.

4. In a device of the class described, a head; a foot; a main tube secured to the foot and slidable with respect to the head; a gasket surrounding the main tube; an auxiliary string of piping coacting with the head to move the same; and means operable by the movement of the head under the weight of the auxiliary string of tubing to compress the gasket about the main tube.

5. In a device of the class described, a head; a foot; a main tube secured to the foot and slidable in the head; a packing interposed between the head and the foot; and a string of auxiliary tubing coacting with the head to move the same; and means coacting with the head and with the packing to form a lateral support for the packing when the head is moved by the weight of the string of auxiliary tubing.

6. In a device of the class described, a head; a foot; a main tube secured to the foot and slidable in the head; a tubular packing interposed between the foot and the head; an auxiliary tube secured to the head and slidable in the foot, the auxiliary tube opening through both the head and the foot; a follower slidable on both tubes; a spring interposed between the follower and foot; and a gasket surrounding the main tube and restrained by the head, the gasket being interposed between the follower and the head, and being independent of the auxiliary tube.

7. In a device of the class described, cooperating elements comprising a head and a foot; a main tube secured to the foot slidable in the head; a gasket surrounding the main tube and restrained by the head; an auxiliary tube secured to the head and slid-

able in the foot and opening through both the head and the foot, the auxiliary tube being independent of the gasket; and a spring exerting a terminal pressure against the foot and the gasket; and a packing  
5 coacting with one of said coöperating elements.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

LAWRENCE E. ROBINSON.

Witnesses:

DALLAS W. KNAPP,  
MARGARET M. GERGEN.

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