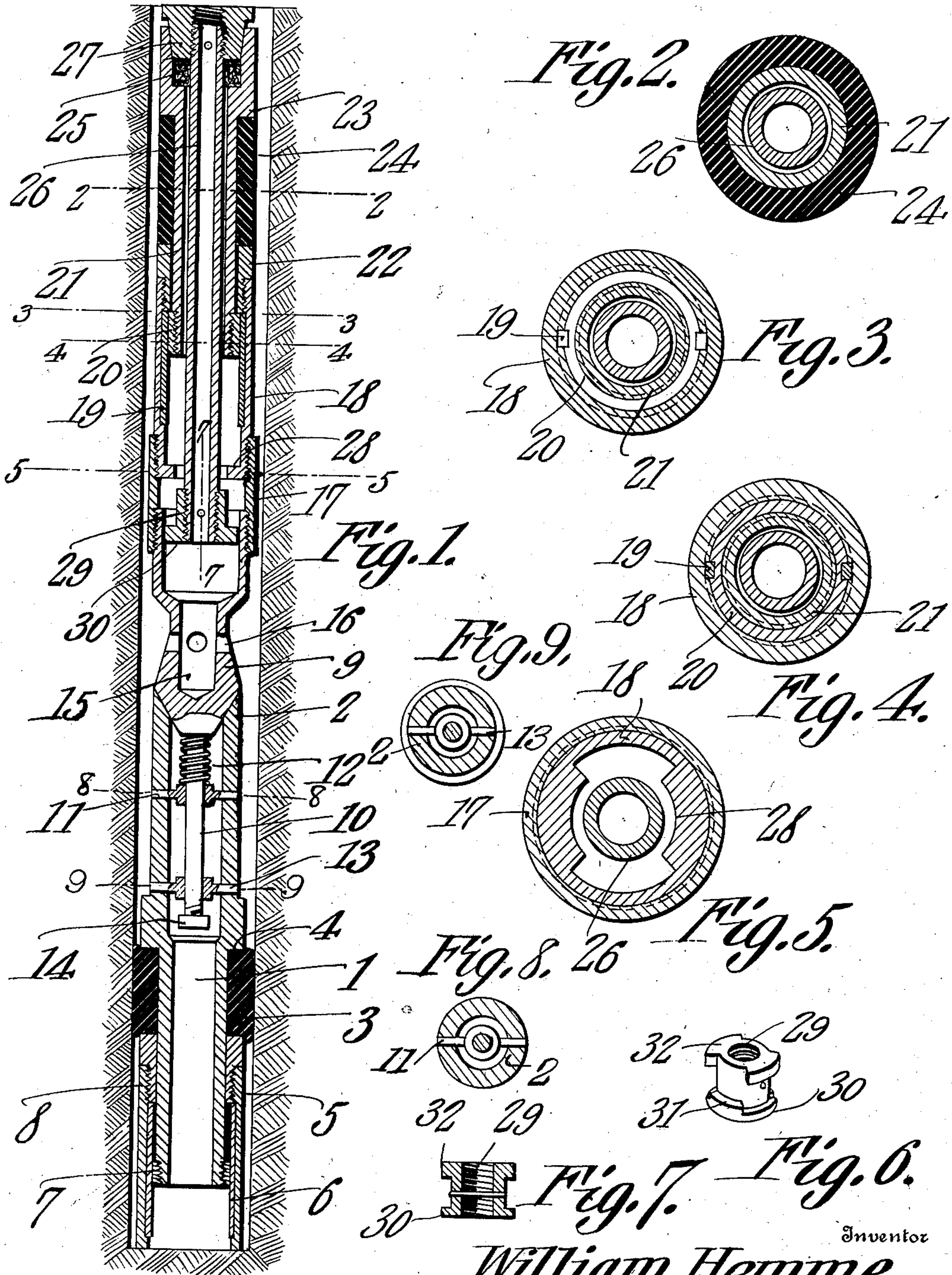


W. HEMME.
WELL PACKER.

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Witnesses

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WILLIAM HEMME, OF ALTOONA, KANSAS.

WELL-PACKER.

976,737.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM HEMME, a citizen of the United States, residing at Altoona, in the county of Wilson and State of Kansas, have invented a new and useful Well-Packer, of which the following is a specification.

This invention has relation to well packers and it consists in the novel construction and arrangement of its parts hereinafter shown and described.

The object of the invention is to provide a packer adapted to be applied to gas or oil wells for the purpose of shutting out water from below and above a point within the well from which the oil or gas is pumped.

A further object of the invention is to provide in a well packer structure an upper and a lower member one of which is provided with a valve and the other a valve seat. The member carrying the valve is provided with laterally disposed apertures. A laterally expansible dam is located upon each member and a sleeve is slidably mounted upon each member and the said sleeves are adapted to expand the said dams when the sleeves are moved toward the inner ends of the said members.

A further object of the invention is to provide means whereby the lower dam is expanded first when the packer is inserted in a well after which the parts are so arranged that they may be manipulated to cause the upper dam to be expanded in the well.

In the accompanying drawings:—Figure 1 is a vertical sectional view of the packer showing the same located in a well. Fig. 2 is a horizontal sectional view of the same cut on the line 2—2 of Fig. 1. Fig. 3 is a horizontal sectional view of the same cut on the line 3—3 of Fig. 1. Fig. 4 is a horizontal sectional view of the same cut on the line 4—4 of Fig. 1. Fig. 5 is a horizontal sectional view of the same cut on the line 5—5 of Fig. 1. Fig. 6 is a vertical sectional view of a portion of the upper member of the packer cut on the line 6—6 of Fig. 1. Fig. 7 is a vertical sectional view of a portion of the well packer cut on the line 7—7 of Fig. 1. Fig. 8 is a horizontal sectional view of the well packer cut on the line 8—8

of Fig. 1. Fig. 9 is a horizontal sectional view of the well packer cut on the line 9—9 of Fig. 1.

The packer comprises a hollow member 1 which is provided at its upper end with a valve seat 2. A tubular dam 3 of rubber or similar material surrounds the intermediate portion of the member 1 and is interposed between a shoulder 4 formed upon the exterior of the said member and the upper end of a sleeve 5 slidably mounted upon the lower portion of the said member 1. The sleeve 5 is restrained against rotation upon the member 1 by means of slides 6 carried by the said sleeve which enter grooves provided in the periphery of a ring 7 screwed upon the lower end of the said member 1. A ring 8 forms the upper portion of the said sleeve 5 and when the sleeve 5 is in its lowermost position upon the member 1, the lower edge of the ring 8 rests upon the upper edge of the ring 7 and thus the parts 1 and 5 are prevented from being detached from each other. A conical valve 9 is located above the seat 2 and said valve is provided with a stem 10 which projects down into the upper portion of the member 1. The said member 1 is provided with guides 11 and 13 through the centers of which the stem 10 passes and a coiled spring 12 surrounds the stem 10 and is interposed between the valve proper 9 and the guide 11 and is under tension with a tendency to hold the valve 9 away from the seat 2. A nut 14 is screwed upon the lower end of the stem 10 and is adapted to limit the upward movement of the said stem.

The valve 9 is hollow as at 15 and is provided with a series of laterally disposed apertures 16 the inner ends of which communicate with the interior of the said valve 9. A pipe section 17 is screwed upon the upper end of the valve 9 and the said section 17 may be of any desired length. A hollow member 18 is screwed in the upper end of the pipe section 17 and is provided upon its inner sides with slides 19 which fit snugly in grooves provided at the opposite sides of a ring 20 screwed upon the lower end of a sleeve 21. A ring 22 is screwed into the upper end of the member 18 and when the said sleeve 21 is in its uppermost position

the ring 20 carried thereby is in contact at its upper edge with the lower edge of the ring 22. Thus means is provided for preventing the sleeve 21 from becoming detached from the member 18. The sleeve 21 is provided upon its exterior side and in the vicinity of its upper end with a shoulder 23 and a flexible dam 24 is interposed between the said shoulder 23 and the upper edge of the ring 22. The dam 24 is also made of rubber or similar material. The sleeve 21 is provided at its upper end with a conical socket 25 which is concentrically positioned with relation to the said sleeve. A pipe 26 passes down through the sleeve 21 and member 18 and is provided at its upper end with a plug 27 adapted at times to fit snugly within the socket 25 provided at the upper end of the sleeve 21. The member 18 is provided at its lower end with inwardly disposed spaced lugs 28, and a locking member 29 is carried at the lower end of the pipe 26. The member 29 is provided at its lower end with an annular flange 30 having at opposite portions of its upper sides shoulders 31 which are adapted to fit snugly in the spaces between the ends of the lugs 28 located at the lower end of the member 18. The intermediate portion of the member 29 is cylindrical and said member 29 is provided at its upper end with outstanding lugs 32 which are of such size as to pass readily through the spaces between the lug 28 at the lower end of the member 18 and the said lugs 32 spaced from each other a sufficient distance to permit the said lugs 28 to pass between them.

When the device is in operation a pipe not shown is connected with the plug 27 in alinement with the pipe 26. As the packer is lowered into a well, the spring 12 holds the valve 9 away from the seat 2 and consequently the water and air in the well may pass up through the member 1 and between the valve 9 and seat 2 and through the aperture 16 into the interior 15 of the valve 9 thence up through the pipe 26 and into the pipe connected to the plug 27. When the lower end of the sleeve 5 comes in contact with the bottom of the well and the device is pushed down the said sleeve 5 slides along the member 1 and the dam 3 is expanded laterally in the manner illustrated in Fig. 1 of the drawings and closes the lower portion of the well. During the operation just above stated the valve 9 is forced down against the seat 2 and while the dam 3 is expanded as stated suction may be applied to the pipe before mentioned which is connected with the plug 27 and thus the water and other liquid in the well above the dam 3 is drawn through the apertures 16 into the interior 15 of the valve 9 and thence up through the pipe 26. When the liquid has

been removed from the upper portion of the well the pipe 26 and plug 27 are turned by means of the pipe which is connected with the plug 27 and extends to the upper end of the well and thus the lugs 32 which previously have been positioned upon the upper sides of the lugs 28 are brought over the spaces between the ends of the lugs 28 and the pipe 26 and plug 27 may fall into the positions shown in Fig. 1. Then by further depressing the plug 27 and the pipe 26 the said plug is forced into close contact with the side walls of the socket 25 and thus the sleeve 21 is moved in a downward direction and the dam 24 is expanded laterally and closes against the sides of the well at a point above the apertures 16. Thus it will be seen that dams are provided both above and below the aperture 16 and that when both of the said dams are in position against the walls of the well water or other liquid is shut out from above and below and by applying suction through the pipes 26 the liquid occurring between the dams is elevated through the packer and the connecting pipes above.

An advantage gained by this construction and assemblage of parts is that notwithstanding the fact that dams 5 and 24 of comparatively soft and pliable material are employed the parts of the packer are so held together as to prevent the said dams from being subjected to a turning strain or action during the operation of setting the same against the sides of the well. Furthermore it will be seen that in the structure the parts are so assembled that the lower dam may be applied first to the sides of the well and consequently the material in the upper part of the well may be removed when the upper dam is applied and thus water or other objectionable liquids are cut out from above and below the ingress apertures 16 of the packer.

Having described the invention what I claim as new and desire to secure by Letters Patent is:—

1. A well packer comprising hollow members carrying at their adjacent ends a valve and a valve seat respectively, expansible dams carried by the members, means carried by the members and adapted to be manipulated to expand the dams, the member having the valve adapted to close the member having the seat and being provided with an aperture leading from its exterior to its interior.

2. A well packer comprising hollow members carrying at their adjacent ends a valve and a valve seat respectively, expansible dams carried by the members, the member having the valve adapted to close the member having the seat and being provided with an aperture leading from its exterior to its

interior, means passing through one of the members and adapted to be manipulated to expand the dam upon the other member, said means also being adapted to be manipulated to expand the dam upon that member through which it passes.

In testimony that I claim the foregoing

as my own, I have hereto affixed my signature in the presence of two witnesses.

WILLIAM HEMME.

Witnesses:

W. F. LAY,

J. F. GUNTRY.