J. P. GORDON.

Packer for Shutting off Water from Oil Wells.

No. 167,400. Patented Sept. 7, 1875.

Fig. 1

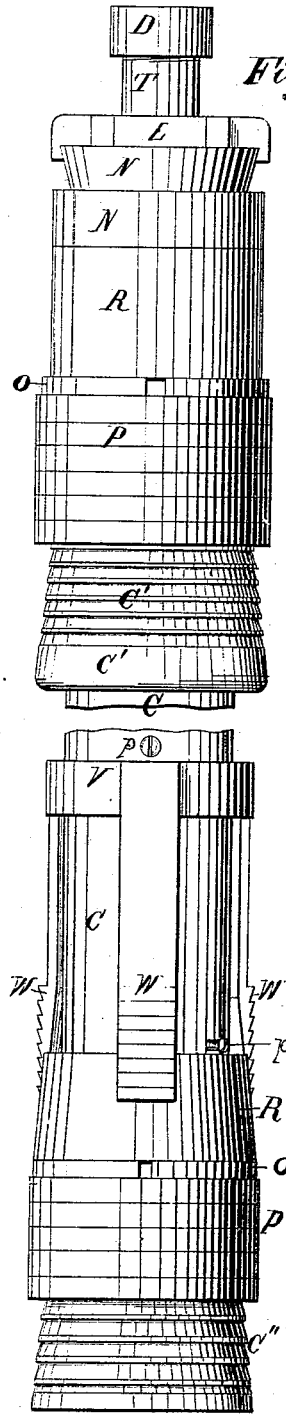


Fig. 3

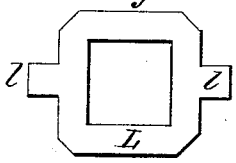


Fig. 4

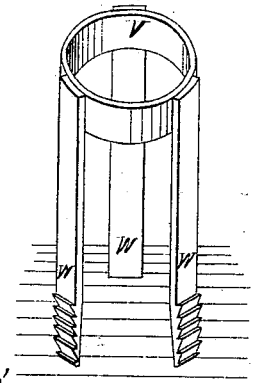
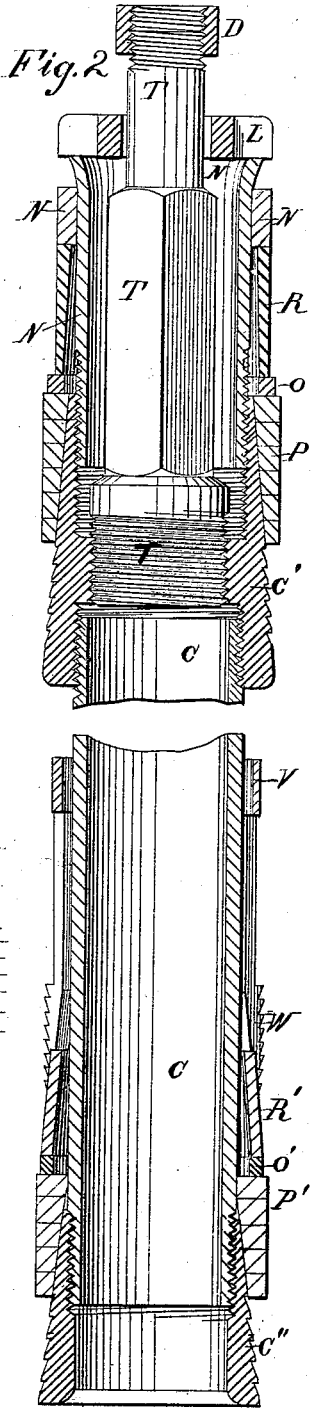


Fig. 2



WITNESSES

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UNITED STATES PATENT OFFICE.

JAMES P. GORDON, OF KARN'S CITY, PENNSYLVANIA.

IMPROVEMENT IN PACKERS FOR SHUTTING OFF WATER FROM OIL-WELLS.

Specification forming part of Letters Patent No. 167,400, dated September 7, 1875; application filed April 21, 1875.

To all whom it may concern:

Be it known that I, JAMES P. GORDON, of Karn's City, Butler county, Pennsylvania, have invented a new and useful Packer for Shutting off Water from Oil-Wells; and I do hereby declare the following to be a full and correct description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of my improved packing device. Fig. 2 is a central vertical section thereof. Fig. 4 is a separate view in perspective of the triple-barbed wedges. Fig. 3 is a plan or top view of the latch.

The same letter indicates the same part in all the figures where it occurs.

The object of my invention is to provide means for stopping off salt-water from oil-wells when veins occur below the depth to which the casing for shutting off the surface-water is usually sunk, which in the Pennsylvania oil regions is about six hundred feet. In what is called the "second sand," it is common to encounter veins of salt-water, and in this event it has heretofore been necessary, in order to shut it off, to extend the casing down from the top of the well to a point below the salt-water vein, an operation attended with great labor and expense, inasmuch as these veins are often met with many hundreds of feet below the depth to which it would be necessary to carry the casing to shut off the surface water. By my invention it is only necessary to use so much extra casing as will extend from a point in the well just above the inflowing vein to a point a short distance below it, this extra casing being packed at top and bottom by means at once simple, easy of application, and effectual.

My invention consists in the application to the upper and lower ends of the length of casing required to extend across the vein or water-course, and shut off the water, of packing devices, hereinafter described, by which the casing is securely held and rendered self-supporting in the desired position in the well, and the water is prevented from entering it, the whole apparatus being easily let down to the proper point, and permanently fixed there, all as hereinafter more fully set forth.

To enable others to make use of my invention I will proceed to describe my apparatus, and the mode of applying it.

Having prepared the necessary length of casing C, I screw onto the top and bottom of it the cones C′ C″, both of them having their bases downward, as shown. On these cones, which are roughened or corrugated to hold them, I place the leather packers P P′. Above the lower packer is placed the open expansible ring O′, and above this a loose ring, R′, conical on its outer surface and with its base resting on O′. To ring V are attached three elastic arms, which carry at their lower ends the barbed wedges W, which lie in contact with the outer surface of the conical ring R′. Their barbed teeth are cut so as to offer no resistance while descending the well, but to oppose being drawn up by catching in its sides. The rings V and R′ are, respectively, held in place and prevented from riding upon the casing by the pins *p p′*.

It is clear that after the casing, with these attachments at its lower end, has been lowered to a point some distance below the water-vein, if an attempt is made to draw it up the ring R′ will drive apart the wedges W, and cause them to engage the sides of the well and to become firmly wedged in between the well-walls and the loose ring R′, thereby stopping the upward movement of that ring and of the expansible ring O′ below it. By a continuation of the upward draft the cone C″ is farther drawn up and wedges the packer P′ tightly between it and the wall of the well, effectually packing the well below the water-vein, and firmly fixing the apparatus in the well.

The devices on the upper end of the casing are designed to afford the means of wedging in packer P between the well-wall and the cone C′, above the water-course, by forcing said packer down upon the cone. Just above the packer P is the open ring O, and above that the loose ring R, upon the top of which rests the shoulder of the nipple N. This nipple extends down and screws into the upper end of cone C′. By screwing down the nipple N, the ring O and packer P are forced onto the cone C′, and the packer is wedged in between the well-walls and the cone.

The tap T is the device by which the appa-

ratus is let down to the position which it is to occupy in the well, and by which the nipple N, at the proper time, is screwed down to fix the upper packing in place. This tap (see Fig. 2) is screwed at top into the coupling D, which connects it with the tubing or two-inch pipe by which it is lowered. Its lower end screws into the cone C′ by a left-hand screw. The upper end of the tap T is round, but its middle portion is square, and corresponds in size with the square opening in the latch L, Fig. 3. The latch L, by its lugs *l l*, engages with notches in the upper end of the nipple N, so that when the latch is turned the nipple must turn with it.

By unscrewing tap T from cone C′ and raising the tap a short distance the square part of the tap will enter the square hole in latch L, when, by turning the tap, the nipple N can be turned and screwed down or up, as desired.

Such being the construction, the operation is as follows: The position of the water-course or salt-water vein having been ascertained, the apparatus, properly prepared, as above described, is attached to the end of the two-inch tubing by the coupling D, which receives the upper end of tap T, and is let down into the well. When it reaches the required depth to fix the lower packer P′ below the level of the water-vein, that packer is located and held in place in the manner hereinbefore described. It then remains to fix the upper packer P in a similar manner. To effect this we unscrew the tap T from the cone C′, and draw the tap up until its square portion engages with the square hole in latch L. By turning the tap, the nipple N is then screwed down until the ring O and packer P are driven onto the cone C′, and the packer firmly wedged in between said cone and the walls of the well. The tubing is then drawn up, together with the tap T and the latch L, and the work is accomplished.

What I claim as my invention is—

1. The combination, with the lower end of a joint of well-casing, C, of the cone C″, packer P′, open ring O, loose conical ring R′, barbed wedges W, and ring V, all constructed, arranged, and operating substantially in the manner and for the purpose described.

2. The combination, with the upper end of a joint of well-casing, of the cone C′, packer P′, open ring O, loose ring R, nipple N, latch L, and tap T, all constructed, arranged, and operating in the manner and for the purpose specified.

3. In combination with any required length of well-casing, devices, constructed and operating substantially in the manner hereinbefore specified, attached to the upper and lower ends of the same, whereby said casing may be made self-sustaining at any desired point in an oil or artesian well, and have a water-tight packing inserted and fixed between its ends and the well-walls, for the purpose of shutting off a water-course or vein, substantially in the manner set forth.

The above specification of my said invention signed and witnessed at Karn's City, Butler county, Pennsylvania, this 16th day of April, A. D. 1875.

JAMES P. GORDON.

Witnesses:

M. C. BENEDICT,

W. P. STEWART.