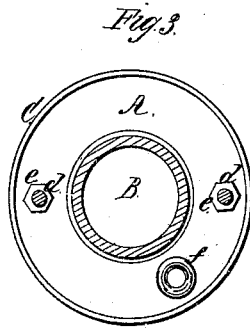
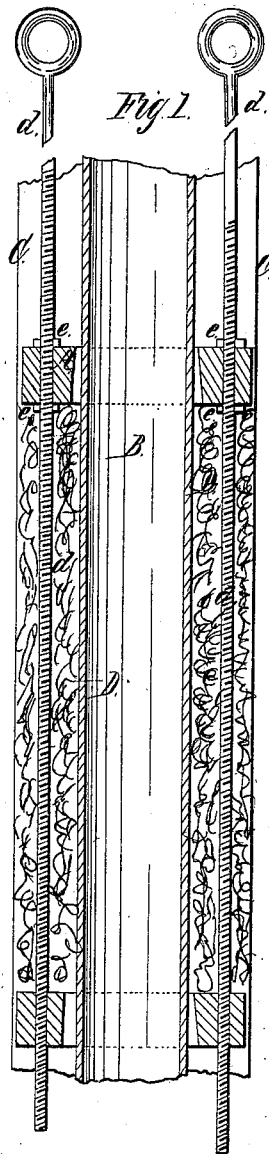
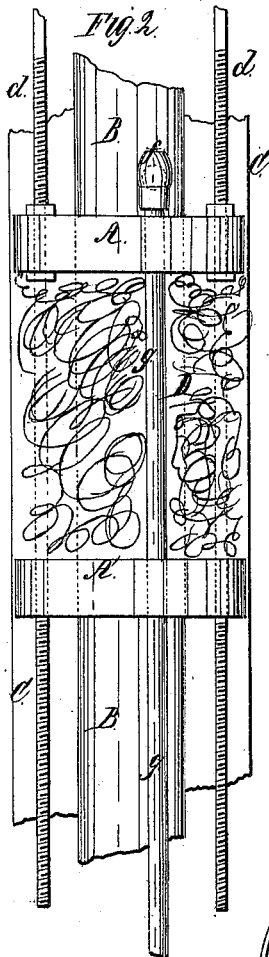


J. R. Cross,

Well Packing.

N^o 46,217.

Patented Feb. 7, 1865.



Witnesses:
Geo. W. Talcott.
John A. Davis.

Inventor:
John R. Cross.
by J. Trauer & Co. Attys.

UNITED STATES PATENT OFFICE.

JOHN R. CROSS, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN PACKING FOR OIL-WELLS.

Specification forming part of Letters Patent No. 46,217, dated February 7, 1865.

To all whom it may concern.

Be it known that I, JOHN R. CROSS, of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Method of Packing the Tubes of Oil-Wells; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a vertical section of a portion of an Artesian oil-well with the packing, the same being represented as not compressed. Fig. 2 is an elevation of the same with the packing compressed. Fig. 3 is a horizontal cross-section of a well immediately above the packing.

The oil-wells for which my invention is designed are usually of small bore and drilled through solid rock. At a point above where the oil enters the well, and as near thereto as can be determined, it is necessary to pack the space between the sides of the well and the pipe through which the oil is drawn or forced up to prevent the water from above entering with the oil. This is usually accomplished by a leathern bag partly filled with flax-seed, which is so loose when first applied that it allows the tube to easily pass down the well, but when subjected for a few hours to the absorption of water the seed swells so as to become so tight that neither water, oil, or gas can pass it. It is often necessary to remove the tube from a well for the purpose of cleaning the pipe or of applying the seed-bag at a different point if the result of the first application is not satisfactory, for the determining of its best position is a matter of experiment entirely. Withdrawing the tube from the well after the seed-bag has become tight from the absorption of water is difficult, as it requires great power and is attended with danger to the well. Frequently the iron tubes are drawn apart in the operation, leaving a portion remaining in the well, and sometimes the seed-bag itself remains after the tubes are removed, and can only be removed by much labor and cost. These accidents involve much expense, especially in wells that are producing oil, from the time that the production is stopped, and from the large amount of water which may enter the wells while the tube is out, and the least expense is the loss of the seed-bag, which is rendered useless in every instance.

It is the object of my invention to obviate these difficulties by providing an apparatus for packing that can be rendered tight at will by the operation of screw-rods reaching to the top of the well, or by the tube of the well itself, and in like manner can be loosened so that it can be placed higher or lower, as required, without removing the tube, and also enabling the tube to be taken out and replaced without the loss of or injury to the packing; and, furthermore, to enable the well to be relieved of an injurious pressure of gas by means of a self operating valve provided to the packing apparatus.

As represented in the drawings, my invention consists of two rings or flanges, A A', surrounding the tube B of the well C. Two screw-rods, *d d*, usually of half an inch in diameter, pass through both flanges, the upper one being fixed in its position on said rods by means of collars *e e*, or other convenient device. The rods, however, revolve freely in this flange, but are connected with the lower one, A, by means of screw-threads, which cause it to approach or recede from the upper or stationary, one according to the direction in which the rods *d d* are turned. The intermediate space between the two flanges and around the tube B contains a packing material consisting of hemp, cotton-waste, wicking, threads of twine, felting, or other fibrous and suitable material which is capable of compression and elongation, as the space between the flanges A A' is contracted or expanded. This material is connected with the flanges by being passed over a wire attached to each, or through rings or holes provided for the purpose, and the strands may be crossed or interwoven to make the mass more close when compressed. Before using, it is saturated with grease, tallow, or a composition of beeswax and tallow or other suitable substance for filling the pores and interstices between the fibers, and thus enable it to resist the passage of water.

The rods *d d* extend to the top of the well, and are lengthened out as the apparatus is lowered by adding sections thereto. The flanges, being loose both around the tube B and inside of the well, readily slide up or down, and when the point where it is desired to fix the packing has been decided the screw-rods *d d* are turned so as to draw the flange

A' nearer to the fixed one, A, and compress the hemp or other material with great force into a dense mass, which prevents any water from passing. If desired to alter the position of the packing, by turning the screw-rods the reverse direction the packing material is elongated, and consequently made loose, so that in two minutes the packing may be raised or lowered, as desired, and again tightened without loss of time, without drawing out the tube, and even without admitting any considerable portion of the water which stands above the packing into the oil chamber of the well.

The oil-tube may with equal facility be raised or lowered when the packing is not compressed, thereby saving the great expense of taking it entirely out of the well to place a new seed-bag on when any alteration is required, as has heretofore been necessary.

My packing apparatus is capable of modifications without varying the principle of its construction and operation. For instance, the tube B may be made with a slide-joint between the flanges A A', so that when the lower end of the tube touches the bottom of the well, the weight of the upper portion will cause the joint to slide together, and thus compress the packing D in the same manner that is done by the screw-rods *d d*. When the tube is raised to withdraw it, it would, of course, loosen the packing by elongating the threads or fibers D. In this case rods or bolts would have to be used to support the weight of the lower part of the tube in drawing it out of the well. The tube instead of a slide-joint might be provided with an external and internal screw of sufficient length to effect the adjustment of the packing by turning the upper portion of the tube so as to contract or elongate the space between the flanges A A', but either of these methods would be less reliable than the described screw-rods and not capable of

adjustment to different depths in the well, except by removing the greater portion of the pipe (that above the packing) each time. I also provide my packing apparatus with a gas-valve, *f*, on the top of the upper flange and connected with a tube, *g*, which extends through the packing D and the lower flange and is made of a greater length than the range of motion which the packing D permits with flange A'. If the gas which accumulates in the oil-chamber below the packing and frequently seriously interferes with the pumping attains a pressure greater than that of the column of water above the packing, it will raise the valve *f* and escape. At other times the valve is closed and prevents the water from above from passing through the tube *g*.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The arrangement for Artesian oil-wells of a fibrous material, D, consisting of hemp or other elastic substance, in combination with the rings A A', or other suitable frame therefor, so arranged that when said rings approach each other the packing material is compressed laterally, so as to fill the space between the tube and sides of the well, and relaxed when the rings are made to recede, the same being operated from the top of the well by the screw-rods *d d*, substantially in the manner and for the purpose set forth.

2. In combination with said packing device, the valve *f* and tube *g*, operating in the manner and for the purpose herein set forth.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOHN R. CROSS.

Witnesses:

ALBERT HAIGHT,
JNO. A. DAVIS.