

Fraser & Calkins,

Well Packing,

N^o 50,558.

Patented Oct. 24, 1865.

Fig. 1

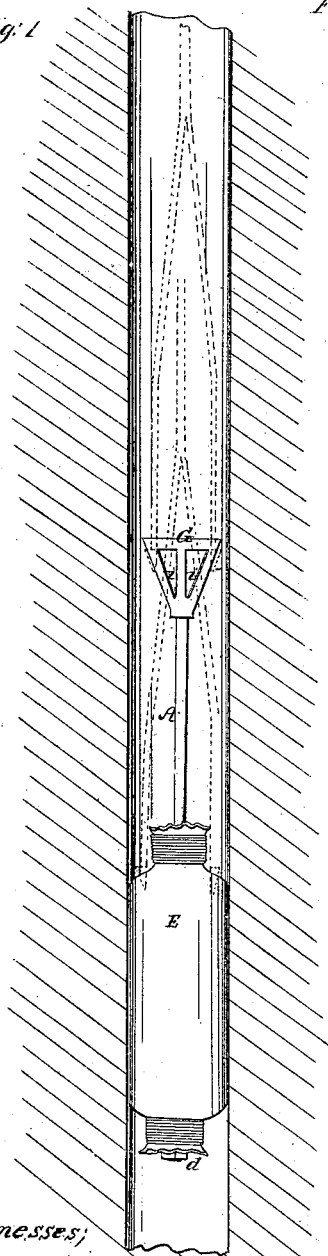


Fig. 2.

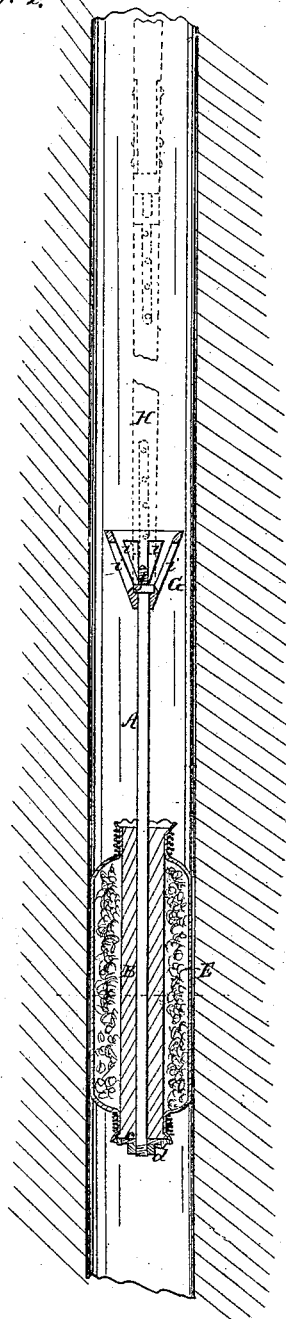


Fig. 3.



Fig. 4.



Witnesses;

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UNITED STATES PATENT OFFICE.

JAMES CALKINS AND J. FRASER, OF BUFFALO, NEW YORK.

IMPROVEMENT IN WELL-PACKING.

Specification forming part of Letters Patent No. 50,558, dated October 24, 1865.

To all whom it may concern:

Be it known that we, JAMES CALKINS and J. FRASER, both of the city of Buffalo, in the county of Erie and State of New York, have invented a new and useful Device for Closing Abandoned Petroleum-Wells; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is an elevation of our improved device, represented in the position in which it is employed for closing petroleum-wells when not in use. Fig. 2 is a vertical section of the same. Fig. 3 is a plan view of the top of the cone G. Fig. 4 is a horizontal section across the bag E.

Like letters designate corresponding parts in all of the figures.

In working Artesian wells containing petroleum it is necessary that they be tightly closed around the tube through which the oil is pumped or discharges. The object of this is to prevent water from the surface of the ground or from those strata of rock above the oil-producing series from descending to the bottom of the well, the effect of which, when it is permitted to do so, is to force the oil, which is a lighter fluid, away from the well and beyond the influence of the pump, so that it cannot be obtained.

In localities where oil-wells are numerous, as on Oil Creek, in Pennsylvania, it often occurs that many are abandoned from being non-producing, or yielding so little as to be unremunerative, and in such cases it is customary to withdraw the iron tubing, as being too valuable to abandon with the well, and thus leave it open, and whatever veins of water are pierced by this well are at liberty to flow to the bottom, together with any water from the surface which can enter at the top. It is known that the sand-rock in which the wells terminate, and from which the oil is chiefly obtained, is porous, and contains crevices which communicate between the different wells, and the water entering one of a certain number may fill the others, or, at least, force the oil away so that it cannot be obtained until this surplus water is exhausted by pumping. As much water may enter through one open well as can be withdrawn by a dozen pumps, and this becomes a

formidable evil, as it often entirely stops the production of oil in some districts, and compels all the wells to pump for days and weeks, at an enormous aggregate expense, to exhaust the water, so that they may again be got to producing oil.

It is the object of our invention to provide a simple and economical remedy in the shape of a packing, which may be inserted in the well when the tubing is removed, which will exclude all water from above it, and may remain, if desired, as a fixture beyond the reach of mischievous persons, or that can at any time be removed in order to tube and work the well again. As a cheap and reliable packing for Artesian wells, the seed-bag is unsurpassed and in universal use. Adopting its principle, our seed-bag for abandoned wells is constructed as follows:

A rod of five-eighths or three-fourths round iron, A, of five or six feet in length, constitutes the foundation of our structure. The lower portion of this is inclosed in a plug of pine or other soft wood, B, bored longitudinally to receive it. This wood may be of three inches diameter, or thereabout, for a four and a half-inch well, and should not be less than three feet long. It is securely held to the rod A by a washer, c, and nut d, on the lower end thereof. To this section of wood a leather seed-bag, E, is tied and filled with flaxseed in the ordinary manner, precisely as though it were the tubing of the well.

At the upper extremity of the rod A a skeleton cone, G, of metal is attached. It may be secured or riveted to the rod or simply held by the collar of the screw-pin f, which is a pointed external screw, made of brass, to resist corrosion in the water, and securely affixed to the top of the rod A. Its thread exactly fits the internal screw or screw-socket of the iron coupling used on the wooden pump-rods, (technically termed "sucker-rods,") which are used in all pumping-wells to connect the piston at the bottom of the well-tube with the working-beam for giving it reciprocating action. These rods are usually in twenty-foot sections, and united at their joints with iron screw-couplings, with the female portion of which the pin f, as before stated, is designed to fit.

In applying this device to close a well the

bag E is filled with dry flaxseed, and tied in the usual manner, when it is lowered down the well by attaching the pump-rods to it, as represented in red lines at H, Fig. 2, in succession until it has reached a depth sufficiently great to be below all veins of fresh water, which usually do not occur below the second sand-rock. When the proper depth of the bag is attained, it is suspended by clamping or otherwise securing the rods H at the top, and left for the seed to swell and render the bag tight, which it usually does in about twelve hours. When fully swelled, the pressure of the bag on the sides of the well is so great as not only to render it so tight as to exclude water from passing it from above, but to make it self-sustaining under the pressure above it, when the rods H may be unscrewed from the pin *f* and taken out of the well. The bag then remains at a depth of several hundred feet below the surface. Should it ever be desired to retube the well for pumping, this bag may be withdrawn by letting down the pump-rods H until the end of one reaches the cone G, when it is guided to the center, so as infallibly to engage with the pin *f* on the rod being revolved. A few turns give it a secure connection, when, by the power of a windlass at the top of the well, the bag is loosened by "turning," as it is called, and may then be drawn up. The turning consists in its being rent loose where it is tied at the top and turned downward, the seed escaping. In some cases the leather or the tying is too firm for this, and other means have to be resorted to. The cone G is made of skeleton form to admit of piercing the bag in such cases by using a "spear," which consists of long slender prongs of iron or steel, provided at their ends with lance-shaped points and barbs. These prongs may be passed through the slots *i i* of the cone and the bag stabbed, as shown in dotted lines in Fig. 1. The bag collapses with the escape of the seed, so as to offer little resistance, and by withdrawing the spear its barbs connect with the outer rim of the cone, as shown in red lines, Fig. 1, and by this means the apparatus may be readily drawn out of the well. The rim of the cone G nearly fills the space of the well, so that the rod, when let down, cannot fail of striking it and being guided by its sloping sides to the pin *f*. The cone is provided with the slots *i i* for the double purpose of spearing through it and of preventing sticks, straws, and sediments from accumulating on the pin *f*, so as to embed it and prevent a connection with the rod being made. The elevation of this cone is two or three feet above the top of the bag for the same reason, so that sediment may not, by accumulation, cover it.

Such a bag may be inserted at a trifling cost in every unused well in the neighborhood of others that are being worked, and by excluding fresh or surface water will prove of incalculable value, both in the saving of expense in pumping water from wells, but in the consequent increase in the producing oil. It is so easily applied that it may be inserted temporarily in a well where the tubing has been withdrawn for repairs, if they involve any considerable delay, and will effect a great saving by excluding the water, even if for a few hours only.

Our invention then has these functions and advantages: A seed-bag capable of being applied to unused wells which do not contain tubing. It may remain indefinitely, or be easily removed, if required. It may be inserted with pump-rods and withdrawn by the same or by spearing. When in use it cannot be disturbed or changed by evil-disposed persons. Lapse of time does not prevent its being withdrawn. Its cost is very small.

We do not confine ourselves to the precise construction represented, as it is obvious that it may be varied in form and proportion, and by the substitution of different materials, without materially affecting its functions.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A seed-bag, E, closing the whole aperture of the well, and provided with a means for attaching and detaching, a lowering and raising rod, or its equivalent, substantially for the purpose herein described.
2. The conical skeleton-formed guide G, in combination with the rod A and bag E, constructed and operating substantially as and for the purposes set forth.
3. Elevating the cone G and screw connecting-pin *f* so far above the top of the bag as to allow the accumulation of sediment without detriment to said connections, substantially as set forth.
4. The application to untubed petroleum-wells of a movable seed-bag placed between the oil-bearing series of rocks and the veins of fresh water for the purpose of excluding the latter from entering the fissures which contain the oil, substantially as and for the purposes herein set forth.

In witness whereof we have hereunto signed our names in the presence of two subscribing witnesses.

JAMES CALKINS.
J. FRASER.

Witnesses:

R. C. BEVERIDGE,
W. L. MULLER.