

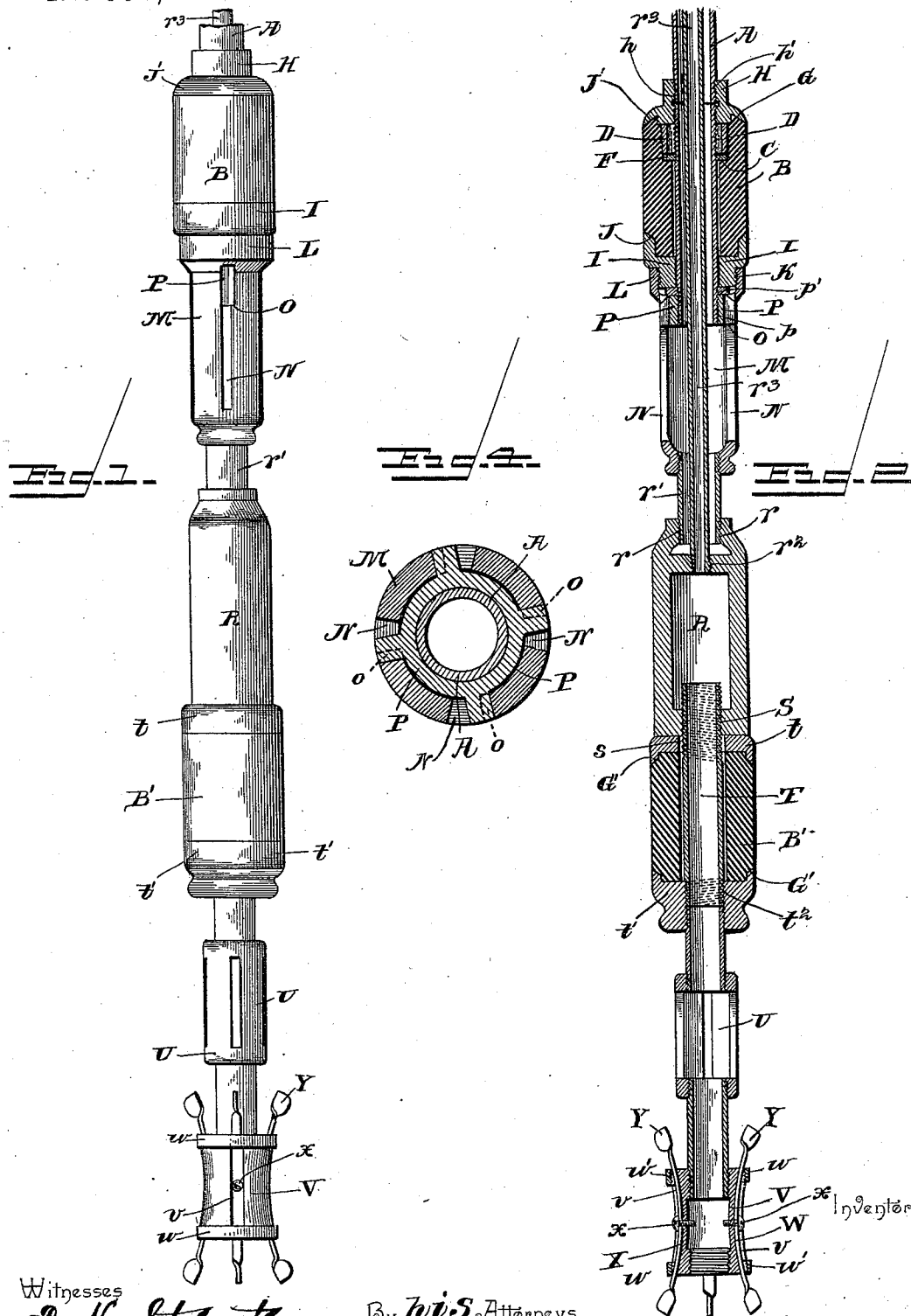
(No Model.)

2 Sheets—Sheet 1.

E. T. WARNER.
WELL PACKING.

No. 530,631.

Patented Dec. 11. 1894.



Witnesses

E. H. Stewart
J. O. Volkmann

By *his* Attorneys.

Egert T. Warner
Chas. H. Snow & Co.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3

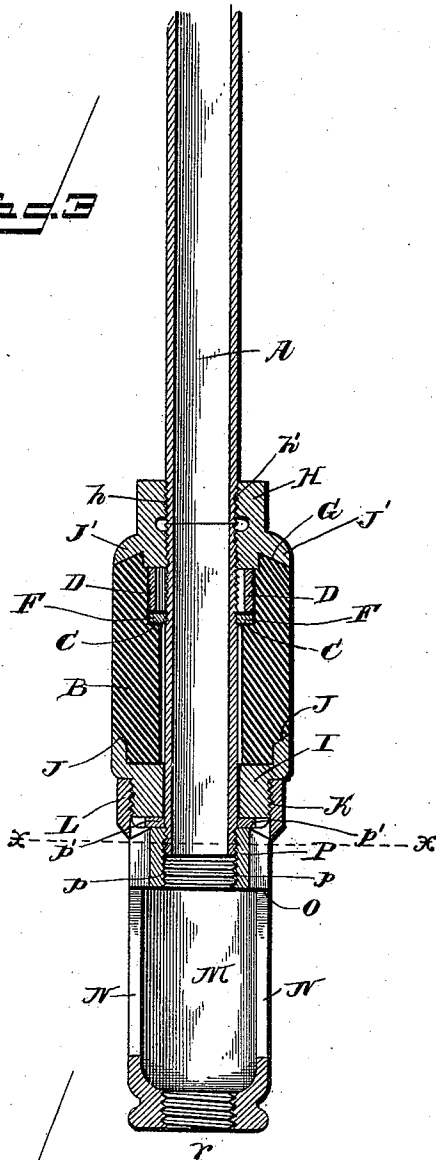


Fig. 4

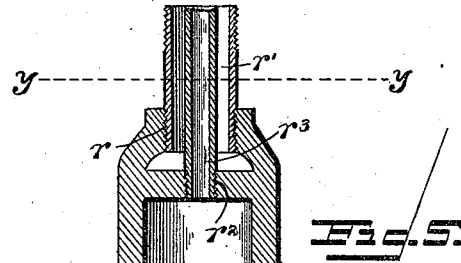
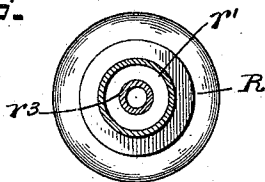
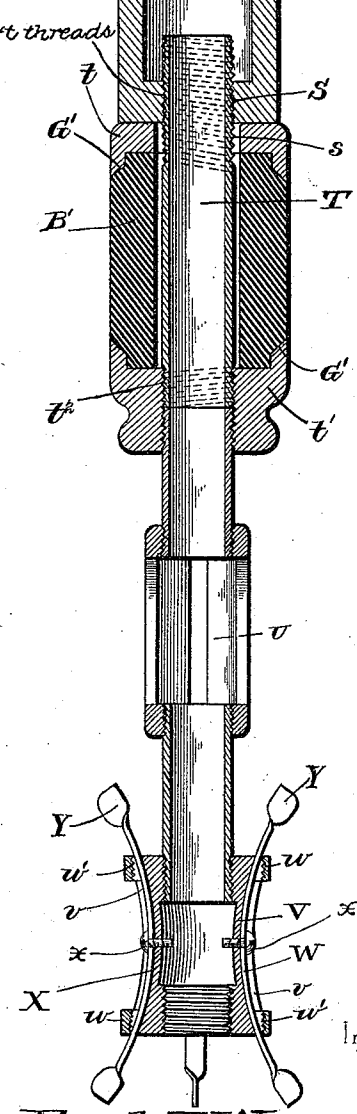


Fig. 5



Witnesses

E. H. Stewart,
D. P. Volkmann

By his Attorneys

Egert T. Warner

Cashow & Co

UNITED STATES PATENT OFFICE.

EGERT T. WARNER, OF ELWOOD, INDIANA.

WELL-PACKING.

SPECIFICATION forming part of Letters Patent No. 530,631, dated December 11, 1894.

Application filed February 10, 1894. Serial No. 499,811. (No model.)

To all whom it may concern:

Be it known that I, EGERT T. WARNER, a citizen of the United States, residing at Elwood, in the county of Madison and State of Indiana, have invented a new and useful Well-Packing, of which the following is a specification.

This invention relates to well packing for gas or oil wells; and it has for its object to effect certain improvements in packers for gas and oil wells, whereby efficient means shall be provided for completely separating the lower fluid or water which accumulates in gas or oil wells below the upper fluid or gas.

To this end the main and primary object of the present invention is to construct a combination packer the parts of which may be used either jointly or separately according to the depth of the well, to provide means for properly separating the gas or oil from the lower fluid which may have collected therebelow, by either conducting such lower fluid separately out of the well, or entirely cutting the same off from communication with the upper fluid or gas.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings:—Figure 1 is a side elevation of a combination well packer constructed in accordance with this invention. Fig. 2 is a central longitudinal sectional view thereof. Fig. 3 is an enlarged detail sectional view of the upper pressure packer. Fig. 4 is a transverse sectional view on the line *x—x* of Fig. 3. Fig. 5 is an enlarged detail sectional view of that portion of the packer which may be termed the lower or screw packer. Fig. 6 is a detail sectional view on the line *y—y* of Fig. 5.

Referring to the accompanying drawings, A represents a portion of an ordinary well tube employed in the tubing of a gas or oil well, and in the present invention the well tubing A is adapted to loosely pass through a rubber packer collar B, such as ordinarily employed in well packing, and which is adapted to be expanded out against the sides of the well to hold the packing in position,

and in the present invention the rubber collar B, is interiorly shouldered at C, at the upper end of the bore therethrough, and in 55
sleeve D, to which the upper end of the packer B, is wired or otherwise suitably fastened. The sleeve D, is adapted to loosely fit over the tube A, and is disposed directly above the 60
shoulder ring F, made fast on the tube A, and adapted to bear against the lower edge of the sleeve D, and the interior shoulder C, of the collar B, according as the packer is being 65
lifted out of or placed in the well.

The upper rubber packer B is provided with beveled upper and lower ends G, and the upper beveled end is adapted to be engaged by the packer cap H. The upper packer cap H, is interiorly threaded as at *h*, to detachably 70
engage the threaded portion *h'*, of the well tube A, so as to be carried by the well tube, and at this point it is to be noted that when the entire line of well tubing is free to yield to its weight, such weight will be placed on 75
the cap H, and a consequent pressure exerted onto the upper end of the rubber packer B, and thereby cause the same to swell out or expand against the sides of the well. This 80
may therefore properly be termed a pressure packer. The lower beveled end G, of the rubber packer collar B, is embraced by the lower packer cap I, which is provided with a 85
beveled flange J, to embrace and engage with the lower beveled end of the collar B, to properly hold the same in position, and this beveled flange J, of the lower packer cap I, is reversely disposed to the inwardly beveled flange J', of the upper cap H, and which embraces the upper end of the collar B. 90

The lower packer cap I, embracing the lower end of the collar B, is unthreaded and loosely receives the well tube A, to permit the same to freely work therethrough, but such packer cap is exteriorly threaded as at K, to 95
removably engage the upper threaded neck L, of the longitudinally slotted coupling cage M. The coupling cage M, is provided with a series of longitudinal slots N, having at their upper ends the shouldered off-sets O, to receive the wings of the winged coupling head P, adapted to slide in the slots of said cage. 100
The winged coupling head P, is interiorly threaded as at *p*, to engage the lower or inner

threaded end of the tube A, which passes through the upper packer, and the wings of said coupling head are adapted to rest on the shoulders of the slot off-sets when the packer 5 is being placed in position in the well so as to relieve the rubber B, from the weight of the line of tubing above the coupling head.

The construction just described completes the upper pressure packer, of the combination packer, as adapted to be placed in position within a gas or oil well by the well tubing, and acts in the capacity of an ordinary packer to pack the well above the gas or oil and to provide for the proper conducting of 15 the gas or oil to the top of the well and point of use.

In placing the upper pressure packer in position within a well, the winged coupling head rests in the shouldered off-sets O, as the tubing is being turned in position, and the pressure of the cap H, is relieved from the upper end of the rubber B.

After positioning the packer, the tubing A, is turned so as to bring the wings of the coupling head out of the off-sets O, to permit the same to slide downward in the slots N, which movement places the entire weight of the line of tubing onto the upper end of the rubber collar B, and expands the same out against 30 the sides of the well, to tightly hold the device in position, and at this point it is to be noted that a packing washer p' , is arranged on the well tube above the head P, and effectually prevents any gas or liquid from entering inside of the rubber collar and expanding the same so as to interfere with the easy positioning thereof, which is quite common in most forms of packing employing rubber collars.

In the act of lifting the tubing A, the shoulder ring F, is brought against the packer sleeve D, whereby the strain incident to removing the packer is placed on top of the rubber instead of at the bottom as is usually the case, so that the rubber is prevented from 45 expanding when the packer is being opened, but is stretched out so as to permit an easy removal from the well, or the free turning of the well tube inside of the rubber without disturbing the same.

Ordinarily the upper pressure packer just described is used in conjunction with a lower screw packer which cuts off the lower fluid or water from the gas or oil, which passes into the cage M, and out through the main well tubing A, in the ordinary manner, and adapted to be removably coupled to the lower end of the coupling cage M is the cylindrical closed fluid chamber R. The cylindrical chamber R, is provided at its upper end with the 60 threaded opening r , which receives the tube or pipe r' , coupling the same to the cage M, and which corresponds in diameter to the well tubing, and takes the place of the well tubing itself when the lower packer is placed in a well independent of the upper packer already described.

The closed fluid chamber R, is further pro-

vided with a threaded outlet opening r^2 , at the top, which removably receives the lower threaded end of the small fluid pipe r^3 , which 70 extends through the upper packer and the well tube A, to the top of the well, to provide means for drawing out the lower fluid or water to any convenient point of discharge. The said cylindrical chamber R, is provided at its 75 lower end with a left threaded opening S, which engages the left threaded upper end s, of the lower packer tubing T, onto which is fitted a lower rubber collar B', provided with beveled upper and lower ends G', the upper 80 of which beveled ends has fitted thereover the flanged cap t , unthreaded to loosely fit over the tubing T, while the lower beveled end of said collar B', is confined by the beveled flange of the lower flanged cap t' , interiorly threaded 85 as at t^2 , to engage threads on the tubing T.

The packer tubing T, supports in position directly below the rubber packer B', a slotted inlet cage U, to admit the lower fluid or water into the tubing and the chamber R, from 90 which it is conducted to the top of the well, and below the cage U, is supported in position the anchoring head V. The anchoring head V, is provided with a series of longitudinal spring slots v , which adjustably receive the curved anchoring spring W, projected above and below the head and confined therein by the retaining rings w , removably engaging the exteriorly threaded 95 ends w' , of said head. The anchoring springs W, are adjusted to and from the curved bases X, of the slots v , by the adjusting screws x , and are provided with twisted engaging points Y, which are adapted to bite in the sides of the well and prevent the packing from turning 105 therein when placed in position.

All of the screw joints of the combination packer are tightened before placing the same in position except the left threaded joint S—s, and by turning the tubing in a direction to screw the cylinder R, in position, the said cylinder will be screwed tightly onto the cap t , and thereby exert a screw pressure on the upper end of the rubber B', and expand the same out against the sides of the well. 115 When it is desired to leave the lower screw packer just described in the well, it will be seen that by the act of unscrewing the upper portion of the well tubing to take out that portion above the cylinder or chamber R, the latter will be screwed tightly onto the rubber B', so as to expand the same against the well sides by screw pressure.

Preferably the two parts of the packer are used conjointly as illustrated, but it will be obvious that the lower screw packer may be separately placed in position within a well by coupling the tubing A, in the upper threaded opening r , of the screw cylinder or chamber R, and subsequently removing this tubing in 125 the manner already described. It is to be further observed that in the event of not using the pipe r^3 , when the lower packer is used with or without the upper packer, the open-

ing r^2 , may be suitably plugged to cut off or separate the lower fluid or water from the upper gas or oil.

Changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a well packing, the combination with a line of well tubing; of the upper rubber packer loosely arranged on the well tubing and adapted to be expanded against the sides of the well by the weight of such tubing, an inlet cage for the upper packer and communicating with the well tubing below the upper packer, a lower rubber packer connected with the cage of the upper packer, an inlet cage for the lower packer below the same, and a separate fluid conducting pipe arranged within the well tubing and communicating with the interior tubing of the lower packer, said conducting pipe passing up through the upper packer and well tubing, substantially as set forth.

2. In a well packing, the combination with the well tubing; of a slotted combined coupling and inlet cage, a rubber packer loosely fitted over the well tubing, a packer sleeve made fast in the inner upper end of the rubber packer a shoulder ring fitted onto the tubing below said sleeve, upper and lower packer caps embracing the upper and lower ends of the rubber packer and the upper of which is fitted on the well tubing, and a winged coupling head fitted on the lower end of the well tubing and arranged to work in said slotted cage, substantially as set forth.

3. In a well packing, the combination with the well tubing; of a combined coupling and inlet cage provided with longitudinal slots having shouldered off-sets at their upper ends, a rubber collar loosely fitted over the

well tubing and having beveled upper and lower ends, an interior shoulder, a packer sleeve made fast within said collar, a shoulder ring fitted onto the tubing between said sleeve and the shoulder of the collar, upper and lower flanged packer caps embracing the upper and lower ends of the collar, the upper of said caps being fitted onto the well tubing and the lower cap being removably fitted in the upper end of said cage, and a winged coupling head fitted onto the lower end of the well tubing and working inside of said slotted cage and the off-sets of the slots, substantially as and for the purpose described.

4. In a well packing, the combination with the well tubing; of a slotted combined coupling and inlet cage, a cap loosely embracing the tubing and fitted to the upper end of the cage, the rubber packer sleeve supported in position on said cap and loosely fitting the well tubing, a winged coupling head fitted onto the well tubing and working in said cage, and a packing washer arranged on top of the winged coupling head and working over the lower side of the cap, substantially as set forth.

5. In a well packing, the combination with the well tubing and packing devices; of an anchoring head provided with a series of longitudinal spring slots, anchoring springs adjustably mounted in said slots and provided with twisted engaging points at their extremities above and below the anchoring head, and removable retaining rings engaging the upper and lower ends of said anchoring head to confine the spring ends therein, substantially as set forth.

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

EGERT T. WARNER.

Witnesses:

A. F. BOURDON,
WARD. L. ROACH.