

(No Model.)

W. A. DONNELL.
COMBINED WELL PACKING AND ANCHOR.

No. 406,162.

Patented July 2, 1889.

FIG. 1.

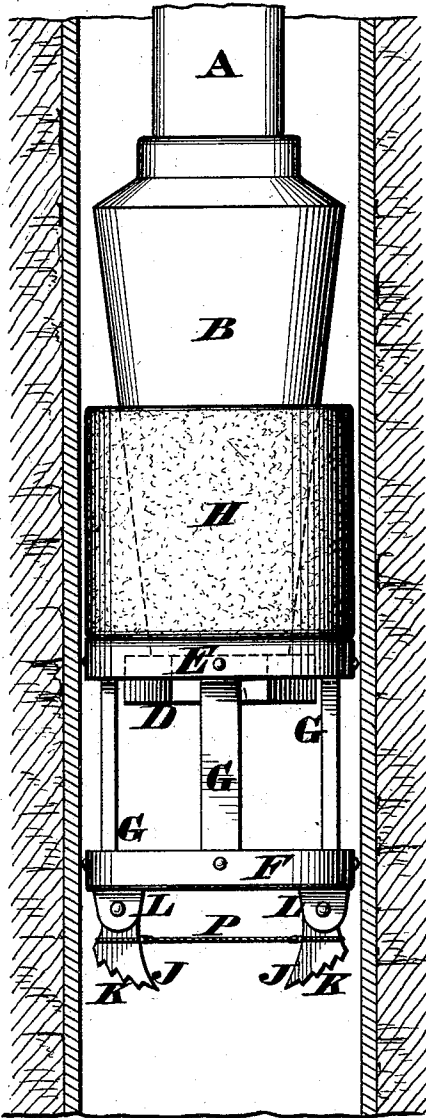


FIG. 2.

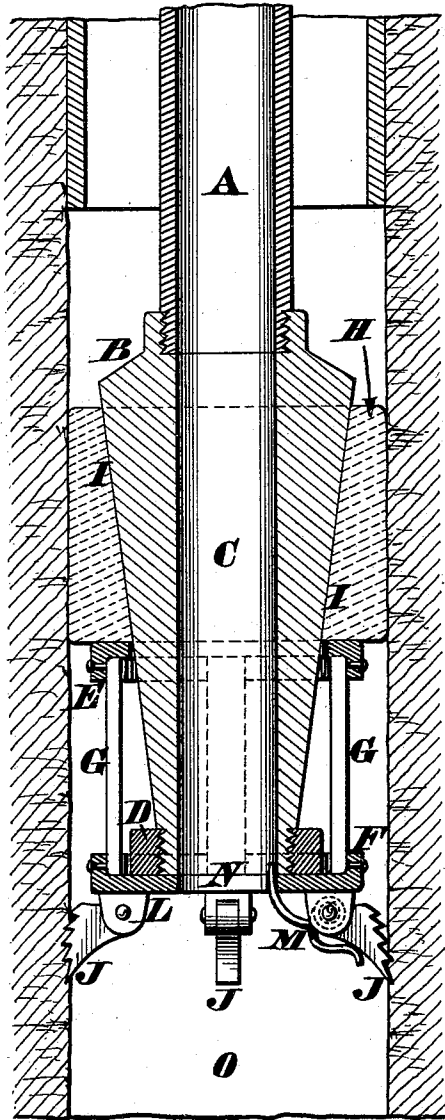
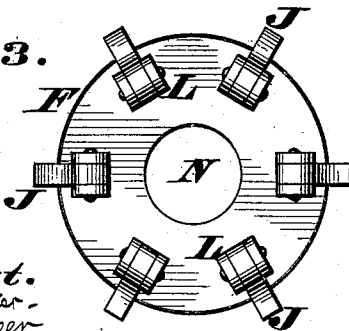
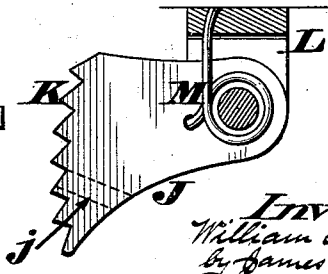


FIG. 3.



Attest.
S. S. Carpenter
C. S. Speer

FIG. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM A. DONNELL, OF GREENSBURG, INDIANA, ASSIGNOR OF ONE-HALF
TO JOSEPH DRAKE, OF SAME PLACE.

COMBINED WELL PACKING AND ANCHOR.

SPECIFICATION forming part of Letters Patent No. 406,162, dated July 2, 1889.

Application filed June 8, 1888. Serial No. 276,509. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. DONNELL, a citizen of the United States of America, residing at Greensburg, in the county of Decatur and State of Indiana, have invented certain new and useful Improvements in a Combined Well Packing and Anchor, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention comprises a specific construction of combined packing and anchor that enables a long line of pipe or tubing to be dispensed with in discharging gas from wells, the details of said device being as follows: The packing proper is a cylinder of any suitable elastic material or materials, india-rubber being preferred, for obvious reasons, and said cylinder has a central bore to admit a hollow conical plug secured to the lower end of the gas-discharge pipe. Furthermore, this cylinder rests upon a cage the lower end of which is provided with the anchoring devices, which latter consist of dogs or other detents adapted to engage with the walls of the well when a suitable depth has been reached, at which moment the dogs are liberated, so as to hold the combined packing and anchor immovably in place. Sufficient pressure is then brought to bear upon the exposed end of the gas-discharge pipe to cause the conical plug to descend within the elastic packing, and thereby expand the latter uniformly from end to end. Consequently this packing bears tightly against the wall of the well and prevents escape of gas, except as it flows through said pipe, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a vertical section of a gas-well showing my combined packing and anchor in the act of being lowered therein. Fig. 2 is a similar section, but showing this combined device securely anchored within the well. Fig. 3 is a plan of the under side of the anchor. Fig. 4 is an enlarged view of one of the dogs.

A represents a pipe of the size ordinarily used for discharging gas from bored or drilled wells, and B is a hollow tapering plug securely attached to the lower end of this pipe. The bore C of this plug is about the same as the interior diameter of said pipe, and the lower

end of said plug has a nut D screwed thereon. This nut traverses an open cylinder or cage, which usually consists of a pair of heads or rings E F, united by a system of bars or slats G, the upper head E having the packing H resting upon it. This packing is an elastic cylinder of slightly less diameter than the well, and has a central or longitudinal bore I, through which passes the conical plug B. The lower head F constitutes what I call the "anchor," inasmuch as said head carries the retaining devices, consisting of a series of detents or dogs J, the effective surfaces of which are preferably serrated at K to afford a very secure hold against the walls of the well. These dogs are pivoted in hangers L, depending from the head F, and they may be so arranged as to swing outwardly by their weight, or this outward swing may be effected by a spring M, (seen in Fig. 4,) said spring being suitably coiled and having one end attached to the hanger or to the head F and its opposite end connected to the dogs. Of these dogs as many may be used as desired, a pair of them being seen in Fig. 1 and six in Fig. 3, while four are suggested in Fig. 2.

N is a central opening in the head F, said opening being practically of the same diameter as the bore of the plug B.

In fitting together this combined packing and anchor the hollow plug B is first passed down through the packing H to permit the engagement of nut D, which latter is readily inserted between the bars G, and when the device is in its normal position this nut bears against the under side of the upper head E, as seen in Fig. 1. The plug being thus elevated, the packing H is not distended, but is of such a size as to readily enter the well or boring O after the gas-pipe A has been attached to said plug; but before the packing is lowered into said well the free ends of the dogs are swung inwardly and temporarily fastened together by a piece of twine P, so as to prevent said dogs coming in contact with the walls of the boring O or with the interior of the casing. This twine may be fastened in holes made in the dogs and near the free end of the latter, one of said holes being indicated by the dotted line j in Fig. 4. The device is now lowered until the desired depth is

reached, and a chisel is then allowed to descend within the pipe A and cut the cord or other temporary binder P, so as to allow the dogs to swing outwardly and engage with the walls. Pressure is now applied to the upper or exposed end of pipe A for the purpose of expanding the packing; but if the walls of the well are too soft the packing can be raised and a new test made, and so on until a hard stratum is found, capable of affording a tight joint, at which moment the dogs take a firm hold of the hard rock. Consequently further pressure upon pipe A cannot move the device another inch, but must cause the plug B to traverse the packing H until the nut D at the end of said plug rests upon the lower head F, as seen in Fig. 2. It is apparent this passage of the conical plug directly through the center of the packing must expand the latter uniformly from end to end, and thus cause said packing to fit so snugly within the well as to prevent any escape of gas except through the opening N, plug B, and pipe A. It is also apparent that the packing prevents water from the upper part of the well descending into the lower part and mixing with the gas. By thus anchoring the packing at a point below the water-stratum I am enabled to dispense with the pipe in the lower portion of the well, as the hard walls of the latter are not as liable to let gas escape as are the many joints and couplings in a long line of pipe where the packing is down deep in the bor-

ing. Therefore I diminish the cost of making the wells, while at the same time I increase their capacity for holding gas, as the tubing usually employed encroaches very materially on the limited area of such borings. Finally, the packer can be readily removed at any time by exerting a sufficient pull upon the upper end of pipe A, the first effect of which is to elevate the plug B until its nut D comes in contact with the head E, thereby allowing the cylinder H to contract and free itself from the well-walls. The next effect of this pull is to disengage the bite of the dogs, and then the entire device is drawn up bodily.

I claim as my invention—

A well packer and anchor consisting of the downwardly-tapering plug B, having an axial bore C, a pipe A, secured to the upper end of said plug, and a nut D, screwed to its lower end, in combination with an open cage composed of an upper ring E and lower ring F, united by a system of bars G, the lower ring F being provided with a series of self-acting dogs J, and the upper ring E carrying an elastic packing H, having a longitudinal bore I, traversed by said tapering plug B, all as herein described, and for the purpose stated.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM A. DONNEIL.

Witnesses:

W. E. CUMBACK,
SAMUEL V. WRIGHT.