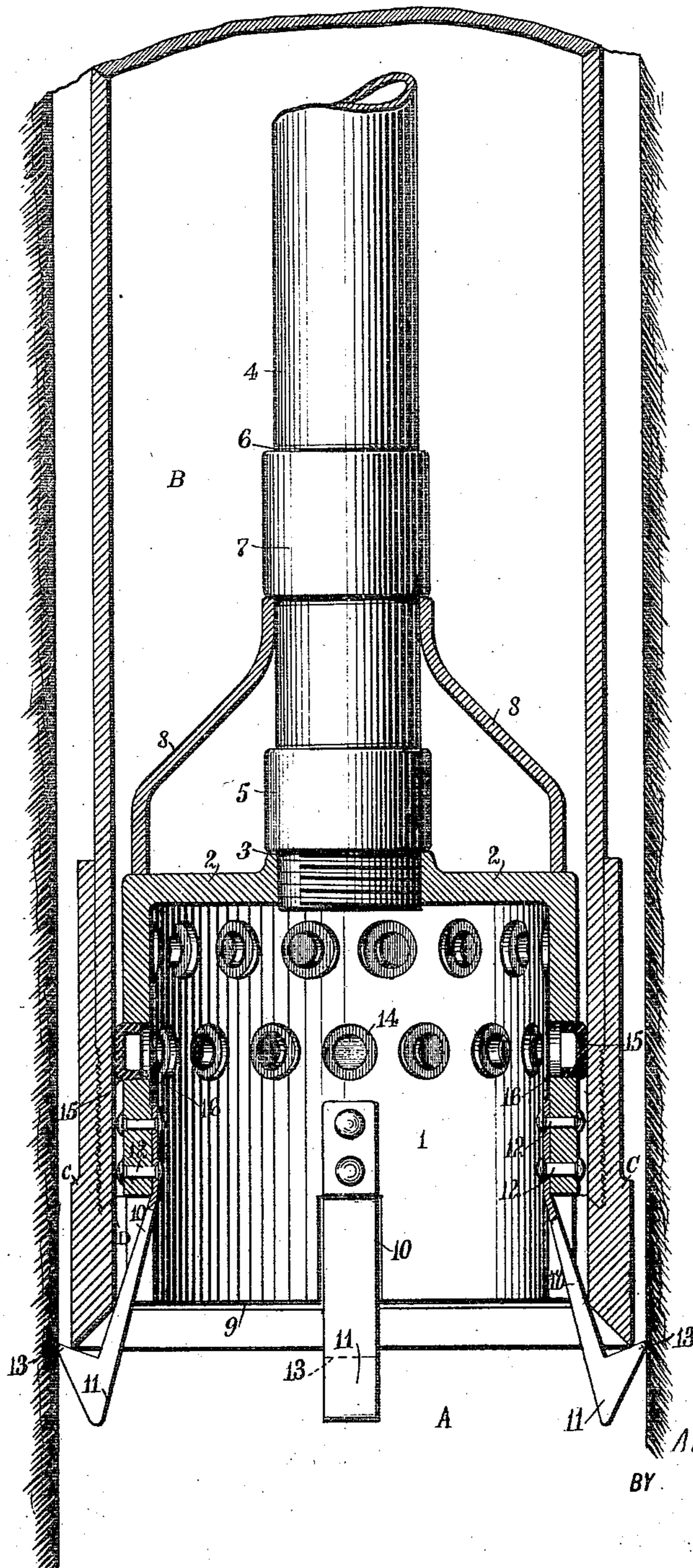


A. C. GRAHAM.
 PACKER FOR WELLS.
 APPLICATION FILED DEC. 12, 1910.

995,250.

Patented June 13, 1911.



WITNESSES
W. S. Orton

INVENTOR
Albert C. Graham
 BY *Munn & Co*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

ALBERT CLARENCE GRAHAM, OF OILFIELDS, CALIFORNIA.

PACKER FOR WELLS.

995,250.

Specification of Letters Patent. Patented June 13, 1911.

Application filed December 12, 1910. Serial No. 596,974.

To all whom it may concern:

Be it known that I, ALBERT C. GRAHAM, a citizen of the United States, and a resident of Oilfields, in the county of Fresno and State of California, have invented a new and Improved Packer for Wells, of which the following is a full, clear, and exact description.

This invention relates to a new and improved packer for use in wells and mines.

It is well-known that in sinking a well or a shaft for a mine, it is necessary to pass through strata of different materials, and that some of these strata contain a large amount of water. This water will flow into the mine or well, carrying with it large amounts of the surrounding earth, and it is necessary in some way to seal up these portions, so that the water will not flow into the well. This is frequently done by inserting a stopper of cement or other hardening plastic material, and then drilling through the cement in order to insert other casing in order to continue the sinking of the well. Heretofore it has been found necessary to withdraw the cement-receiving casing or packer, and sometimes it has been found necessary to even withdraw the casing itself, remove the packer and re-insert the casing. This is objectionable in that it delays the work, it is expensive to reinsert the casing which is often distorted and rendered useless.

One object of my invention is to provide a new and improved packer which may be inserted within the casing already in position and which is left in place in the casing after the insertion of the cementing material.

A further object of my invention is to provide a novel means by which the packer may be positioned at the end of the casing.

A further object is to provide means whereby the cementing material will firmly lock the packer in place, and a still further object is to provide means whereby the lowering device may be disconnected from the packer without disarranging it in its position at the end of the casing.

I attain these objects by inserting into any common form of well casing a packer having means projecting therefrom adapted to hook on the end of the casing, and having a pipe leading thereto, acting both as a lowering device for the packer and as a conduit, adapted to transmit a cementing material to

the body portion of the packer, and further it is so arranged that by rotating the pipe in one direction it is disengaged from the packer.

With the above and other objects in view, as will more fully hereinafter appear, the present invention consists in certain novel details of construction and arrangement of parts hereinafter fully described, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which the figure shown is a vertical elevation, partly in cross section, showing my improved packer in position at the end of the casing, the whole being positioned adjacent the bottom of the well.

The well A here shown has positioned therein a common form of casing B, having its lower end reinforced by any preferred form of shoe C, threaded on to the casing B by a right-hand thread connection disposed adjacent the rim D.

Positioned within the casing B is a cylindrical open-ended cast-iron packer 1, the upper end 2 of which has a central left-hand threaded opening 3. Removably inserted into this opening 3, is a left-hand threaded pipe section 4, forming a conduit for the passage of cementing material to the packer 1 and also constituting means by which the packer is lowered into position. Above the threads at the end of the pipe section 4, is a sleeve 5, by means of which the insertion of the pipe into the packer 1 is limited. A short distance above the sleeve 5, the pipe 4 is threaded with a right-hand screw 6, and upon these threads is a sleeve 7. Resting upon the outer face of the upper end 2 of the packer and bearing against the sleeve 7, is a funnel-shaped swage nipple 8. This swage nipple bears against the outer edge of the top of the packer 1, and acts as a reinforcement for this cast-iron member. As the packer is made of this frangible material, any distortion of the member while it is being inserted into the casing would quite likely break it, and this nipple protects the packer until it is in position. The lower open end 9 of the packer is slotted at 10, and through these slots project spring dogs 11, which are fastened at their upper ends to the inside of the packer 1 by bolts 12.

Each of these dogs has an angularly-disposed lip 13, which will spring out over the ends of the shoe C when the packer has been lowered to the end of the shoe.

- 5 The side of the packer 1 is provided with a number of apertures 14, which are covered by membranes 15, of leather, rubber or some other flexible material. These membranes may be of any preferred shape, but preferably I employ a cup-shaped form, as shown
10 in the drawing, the flanged ends 16 of which form a tight packing with the sides of the apertures 14.

When it is desired to form a seal in the well, the casing B, together with its attached shoe, C, is lowered almost to the bottom of the well. The packer 1 to which is threaded the pipe 4 by means of the left-hand threaded connection 3, is lowered into the
15 casing. It will be seen that the dogs 11 being confined within the casing, will press against the side of the casing until they reach the end when they will be released and spring outward into the space at the
25 end of the casing or at the end of the shoe in which case the lips 13 will engage the outer end of the shoe or may even engage with the side of the well itself. During this downward movement, the packer is pro-
30 tected by the swage nipple and no distortion is likely to occur which might afterward interfere with the unthreading of the pipe section 4 from the packer 1.

After the packer is lowered into position at the end of the shoe, cement, concrete or any other cementing material, is inserted through the pipe 4 into the packer 1. This cement will flow out through the open end 9 of the packer, and will fill up the space
40 below the packer and will, of course, fill up the hollow space in the packer itself. At the same time, the pressure of this filler will act against the membranes 15, forcing them outward against the inside of the casing B or against the inside of the shoe C,
45 thereby firmly locking the packer in position. It is to be understood that these membranes may be omitted, in which case a little of the cementing material would flow out through the apertures 14 and in hardening
50 would firmly lock the packer in place.

After the cementing material has set sufficiently, the pipe section 4 may be unscrewed from the packer 1, and together
55 with the swage nipple, withdrawn. It will be noted that in view of the fact that this pipe 4 is connected to the packer 1 by a left-hand screw thread, the unscrewing of this pipe will, if anything, tighten up the connection between the shoe and the casing. After this pipe section is withdrawn, the top of the packer may easily be drilled out and a bore may be drilled through the cementing material itself in order to con-
65 tinue the casing to the bottom of the well.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof, it is intended that
70 all matters contained herein in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is merely intended to cover all the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language,
80 might be said to fall therebetween and that materials, sizes and relativities of parts are non-essential, except as called for in the claims.

Having thus described my invention, I
85 claim as new and desire to secure by Letters Patent:

1. In combination with a casing for wells, a shoe on the end of said casing, a packer within the casing, dogs projecting from the
90 packer and engaging said shoe, and means on the packer, forming a tight joint between the packer and the casing.

2. In combination with a casing for wells, a packer within the casing, means projecting from the packer engaging said casing,
95 a conduit conveying cementing material to the packer, and means on the packer whereby the cementing material will cause a tight joint to be formed between the packer and
100 casing.

3. In combination with a well casing, a packer comprising a hollow body portion, a cementing material conduit leading to said packer, and means on said packer
105 whereby the cementing material will form a tight joint between the casing and packer.

4. In combination with a casing, a packer within said casing, said packer having apertures therein, and flexible means covering
110 said apertures, whereby a filler in said packer will force the means against said casing and connect the packer with the casing.

5. In a mining device, a lowering device,
115 a packer carried by said lowering device, anchoring means on said packer whereby the packer may be attached to the surrounding wall after it is lowered, and hook means on said packer whereby it may be
120 hooked to the end of the surrounding wall.

6. In combination with a casing having a threaded outer end, a shoe threaded to said end and projecting therefrom, a packer within said casing, spring dogs projecting
125 from the interior of said packer and engaging the end of said shoe, means on said packer whereby the latter is attached to said casing.

7. In combination with a casing having a
130

threaded outer end, a shoe threaded to said casing, a packer within said casing, spring dogs projecting from the interior of said packer and engaging the end of said shoe, 5 means on said packer whereby the latter is attached to said casing, and a conduit leading to said packer.

8. In a packer for wells a packer having a broad upper bearing surface, a pipe in 10 threaded engagement with said packer, a pair of sleeves on said pipe adjacent its connection with said packer, a nipple carried by said pipe, and slidable between said sleeves and bearing against the said surface 15 whereby the connection between the packer

and pipe is reinforced, and whereby the nipple is withdrawn with the pipe.

9. In combination with a casing, a hollow packer within said casing, means leading to said packer for conveying a filling 20 thereto, and means carried by said packer whereby the filling will cause said packer to adhere to said casing.

In testimony whereof I have signed my name to this specification in the presence of 25 two subscribing witnesses.

ALBERT CLARENCE GRAHAM.

Witnesses:

D. HEGGIE,

R. S. FINE.