D. F. HUNT.

WELL PACKING.

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1,136,879.

Patented Apr. 20, 1915.

Fig. 1.

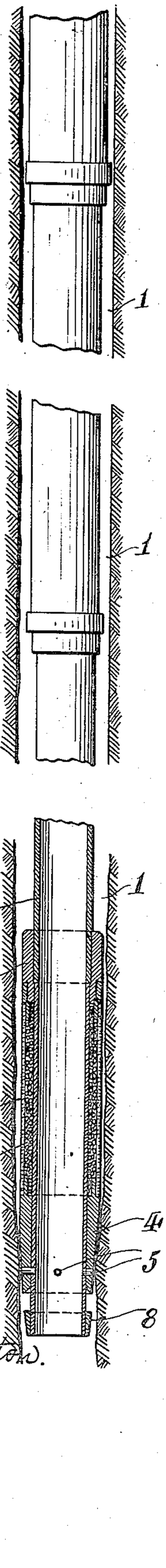


Fig. 2.

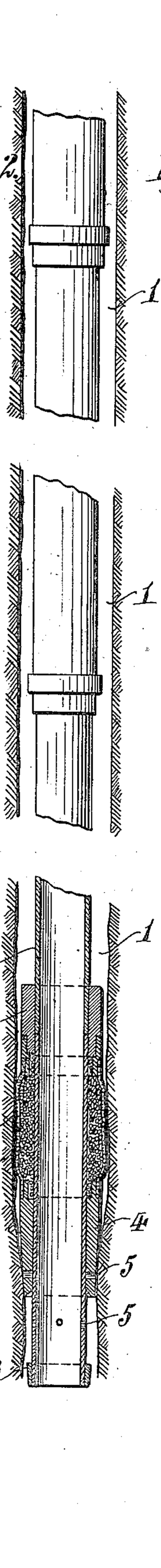
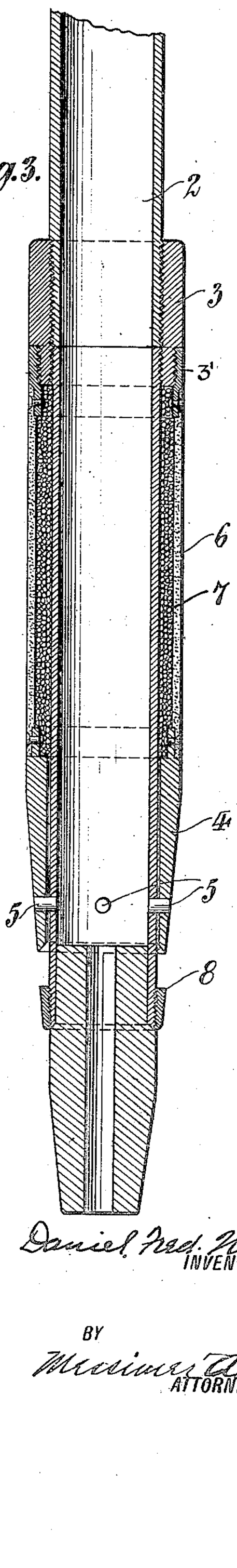


Fig. 3.



WITNESSES

Geo. Schmertz.

S. A. Thornton.

Daniel Fred. Hunt.
INVENTOR

BY

Marion Burton
ATTORNEYS

UNITED STATES PATENT OFFICE.

DANIEL FRED HUNT, OF EASTON, PENNSYLVANIA.

WELL-PACKING.

1,136,879. Specification of Letters Patent. Patented Apr. 20, 1915.

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To all whom it may concern:

Be it known that I, DANIEL F. HUNT, a citizen of the United States, residing in the city of Easton, county of Northampton, and State of Pennsylvania, have invented certain new and useful Improvements in Well-Packing, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to a well packing and one object of my invention is to provide a packing to be carried into position by the well casing and which is constructed to provide a water tight seal in the space between the casing and the side of the well to prevent liquid flowing about the outside of the casing into the bottom of the well.

In oil drilling, for instance, salt water is usually found at about 2000 feet below the surface, and, to prevent this and other waters from flowing into the oil pocket at the bottom of the well cement packing is sometimes introduced in the space between the casing and side of the well but as the cement takes time to harden frequently three or four days are lost before the casing can be wiped dry for testing; I propose to carry adjacent the end of the casing a collapsible tube capable of quickly expanding to fill the space between the casing and side of the well. One means by which I attain this object is to pin a shoe to the lower end of the casing and surround the casing for some distance along its length with a water tight flexible tube the lower end of which is affixed to the shoe and the upper end of which is suitably affixed to the casing and when the shoe is held by a constriction in the well to permit the weight of the casing to shear off retaining pins allowing the casing to slide through the shoe and the tube to expand or wrinkle outward into engagement with the side of the well.

The various other objects of the invention will be more fully set forth in the following description of one form of mechanism embodying the invention which consists in the new and novel features of construction and combination of parts hereinafter set forth and claimed.

For the purpose of disclosing a physical embodiment of my invention reference is had to the accompanying drawings in which—

Figure 1 is a side elevation partly in section of a well casing showing a preferred embodiment of my invention fixed thereto in position engaging a constriction in well, Fig. 2 is a similar view showing the flexible tube of the packer in sealing position, and Fig. 3 is an enlarged detailed sectional view of the improved packer and adjacent parts of the casing.

Referring to the drawings, which illustrate a preferred embodiment of the invention there is shown a well 1 in which is inserted the usual casing comprising sections of progressively decreasing diameter, the lower section 2 of which has suitably affixed thereto and spaced from the lower end, a collar 3, which in this disclosure is threaded thereon by threads having a reverse direction from the threads by which the casing sections are united. Spaced from the collar 3 in the direction toward the end of the section 2, and telescoping the same, is a set shoe 4 temporarily fastened to the section by transversely extending pins 5. This shoe is substantially frusto-conical or otherwise tapered in section toward the lower end so as to provide a wedging action when driven between the casing and side of the well.

Having one end suitably affixed to the collar 3, as by riveting the same to the reduced flange on the ring 3′ and forming therewith a water tight joint with the casing 2 and having its other end suitably affixed to the shoe 4 is a flexible waterproof tube 6 surrounding and preferably spaced from the casing and when in elongated position preferably disposed within the lines connecting the sides of the collar and shoe. While it is obvious that any suitable waterproof tube may be used, I have found that a tube of rawhide treated with a water-proofing oil possesses sufficient pliability to permit the same to expand into tight engagement with the wall of the well and at the same time is strong enough to resist any tearing action on the same. Within the space formed between the casing and tube and forming a lining for the tube may be fastened a suitable filler 7 and for this purpose a loose winding of some fibrous material such as twine has been found quite suitable. The end of the casing may have a stop ring 8 affixed thereto which will retain the shoe 4 on the casing should it be desired to withdraw the casing and shoe from the well after the pins 5 have been broken.

In operation the casing, having my im-

proved packer affixed thereto, is lowered into the well in the usual manner and when the shoe 4 engages a restriction or shoulder in the well, formed by the reduced diameter of the drilling, as shown in Fig. 1, the shoe will be held thereby and the heavy weight of the casing will shear off the pins 5 permitting the casing to slide through the shoe thus causing the sleeve 3 to approach the shoe 4. The tube 6 therebetween will belly outward and crowd itself against the adjacent wall of the well as shown in Fig. 2 thus sealing the portion of the well above the packing, thus formed, from the portion below the same. In these cases where the filler 7 is used, the movement of the shoe and sleeve toward each other will flatten the filler which action is facilitated by the fibrous character of the same and will cause it to force the tube outward, and only a slight movement of the casing will compact the filler into a solid hard packing ring.

It is apparent that this mode of well packing is inexpensive; does not require any special tool to insert the same in place; can be readily withdrawn with the casing; does not require any drilling to fit the casing in place, and as it is held against the side of the well by the heavy weight of the casing, frequently 2000 feet in length, a firm water tight engagement with the side of the well is effected. In making the tube 6 of rawhide a tough, readily waterproofed and inexpensive member is formed which readily conforms to the irregularities in the side of the well and possesses sufficient strength to withstand the weight of the casing without tearing. If for any reason a leak should occur in the tube 6 the upper or outer layers of the fibrous filler 7 would absorb the water and in expanding would force the lower portion of the tube 6 firmly into engagement with the wall of the well. Although I have shown only one form of mechanism embodying my invention, it is obvious that various changes within the skill of the mechanic may be made therein without departing from the spirit of the invention, provided the means set forth in the following claims are employed.

Having thus described my invention, what I claim as new and desire to protect by Letters Patent is:—

1. A combined well casing and packing comprising a casing, a collar affixed to said casing and forming a water tight connection therewith, a frusto-conical shoe having its smaller end downward, means fastening said shoe to said casing between the collar and the adjacent end thereof, a water proof tube having one end fastened to said collar and the other end fastened to the shoe and having a water tight connection with the collar and a fibrous filler disposed between said sleeve and shoe and between said casing and tube whereby when said shoe is wedged from movement by a constriction in the well the weight of the casing will disengage the casing from the shoe, compressing the packing and forcing the tube into engagement with the side of the well.

2. A combined well casing and packing comprising a casing, a collar affixed to said casing and forming a water tight connection therewith, a ring screwed to said collar, a shoe adapted to slide relative to said casing toward said collar, a pin fastening said shoe to said casing between the collar and the adjacent end thereof, a flexible tube connecting said ring and shoe and having a water tight connection with the ring and a filler disposed between said casing and shoe and between said casing and tube whereby when said shoe is held from movement by a constriction in the well the weight of the casing will shear off the pin, compressing the packing and forcing the tube into engagement with the side of the well.

3. In combination with a well casing, a packing carried thereby comprising an expandible tube having a shoe attached to the lower portion thereof and surrounding the casing, a sleeve fastening the upper portion of the tube to the casing, said shoe and sleeve having a diameter at least equal to the diameter of the tube, the portion of the tube fastened to the casing adapted to move toward said shoe to expand the tube and means temporarily fastening said shoe to said casing.

This specification signed and witnessed this 18th day of June, A. D., 1913.

DANIEL FRED HUNT.

Witnesses:
JOHN S. OSTERSLOCK,
JOHN H. HUNT.