Dec. 30, 1930. J. Q. LITTLE 1,786,761

CASING SHOE AND VALVE

Filed Oct. 21, 1929

Fig. 1.

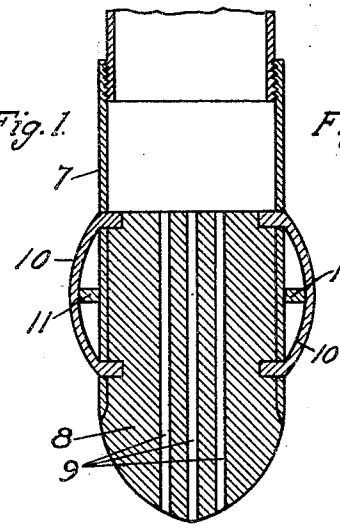


Fig. 2.

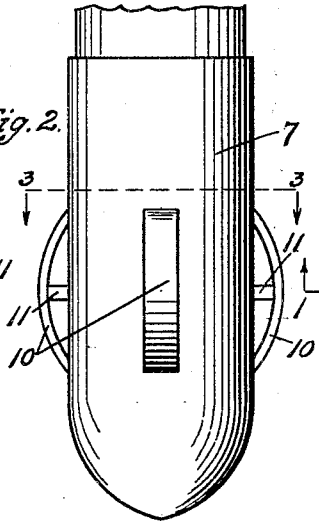


Fig. 3.

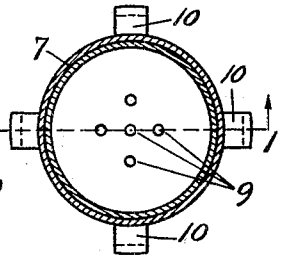


Fig. 4.

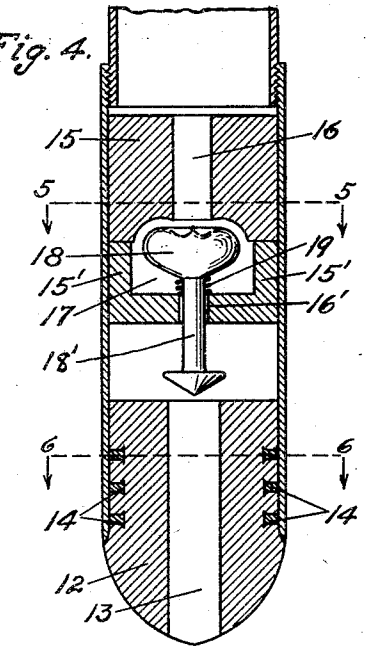


Fig. 5.

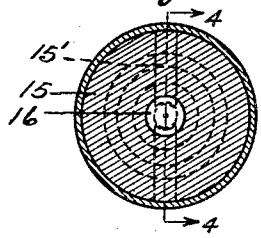
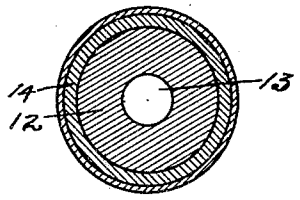


Fig. 6.



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Patented Dec. 30, 1930

REISSUED

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UNITED STATES PATENT OFFICE

JOHN Q. LITTLE, OF WHITTIER, CALIFORNIA

CASING SHOE AND VALVE

Application filed October 21, 1929. Serial No. 401,144.

My invention relates to casing shoes and valves of the character used in well casing for the purpose of guiding and placing well casing down in a deep well, and which is afterwards drilled through and destroyed in such a way as to make it possible and certain to remove the particles thereof from the well. I am aware that casing shoes have been made of cast iron and of concrete and that there are many objections thereto when it comes to drilling through them and in removing the pieces from the hole.

It is the object of my invention to provide a special casing shoe and a special valve which will serve all the purposes of shoes and valves now in use, and which will be more easily drilled out and carried out of the hole by the circulating fluid, and which will also have a certain yielding action which will tend to release under pressure any clogging which may take place in the passageway or passageways of the shoe. I accomplish this object by providing a casing shoe made of resilient material, such as vulcanized rubber and which is stiff enough to serve the purpose and at the same time is sufficiently resilient or yielding to yield under pressure for the purpose of permitting the passage of material through its passageway, and which can also be drilled out and removed after it has served its purpose.

In order to explain my invention, I have illustrated the same on the accompanying drawings, which I will now describe.

Figure 1 is a longitudinal sectional view through a casing foot with shoe;

Figure 2 is a side elevation of the same;

Figure 3 is a cross sectional view thereof taken on line 3—3 of Fig. 2;

Figure 4 is a longitudinal sectional view through a casing foot with valve and shoe of slightly modified form;

Figure 5 is a cross sectional view taken on line 5—5 of Fig. 4; and

Figure 6 is a cross sectional view taken on line 6—6 of Fig. 4.

Referring now in detail to the drawings, a casing foot or end is designated 7, with a casing shoe 8, formed therein, with passageways 9, therethrough, and with four guide and spacing members 10, 10, on the outside of the casing foot with their ends inserted through the casing foot and vulcanized into the body of the shoe, substantially as illustrated, with an intermediate brace piece 11 under each guide and centering member 10. The shoe 8 is made of a suitable resilient material, such as vulcanized rubber, sufficiently firm to perform the desired function and at the same time sufficiently resilient or yielding to yield under extreme pressure to permit matter to be forced therethrough. The guide and centering members 10 are preferably made of the same material with their ends inserted through the side of the case and vulcanized into the body of the shoe, substantially in the manner indicated.

Referring to Fig. 4, I have shown a slightly modified form of shoe, designated 12, with a single passageway 13, therethrough, and secured in place by means of rings 14, of metal, secured inside of the casing foot by welding or otherwise, and around which and secured to which the shoe is formed and vulcanized.

I have also shown a form of valve used to prevent back flow of the cement, and this comprises a body 15, having a passageway 16 therethrough, with a supporting yoke 15′, secured to the underside of the body 15, forming between said yoke and said body a valve space 17, in which is placed a valve member 18, adapted to seat upwardly against the body 15, to prevent back flow through the passageway 16. Said valve 18 has a stem 18′ extending down through a passage 16′ in the yoke 15′, with a coiled spring 19 for normally holding said valve member and stem in the position shown in full lines, Fig. 4. The yoke 15′ is indicated in broken lines in the sectional view, Fig. 5.

So far as I am aware, I am the first to conceive of the idea of making such parts as the casing shoe and the co-operating valves of resilient material, as distinguished from cast iron, cement, or other very hard material, whereby to secure a yielding function when needed, and which can also be drilled through readily and the pieces eliminated from the casing in the usual way, and while

I have shown one form or embodiment of the invention for descriptive purposes, I do not limit my invention except as I may be limited by the hereto appended claims.

I claim:

1. A casing shoe formed of resilient material with combination guide and centering members on the outside of the casing and inserted through the casing and into said casing shoe and vulcanized thereto, for the purpose described.

2. A casing shoe formed of rubber vulcanized into place and resilient, with passageway therethrough, said material being sufficiently yielding to permit under pressure the forcing of matter therethrough.

3. A casing shoe formed of vulcanized rubber, guide and centering members on the outside of the casing with portions inserted through the side of the casing and vulcanized into said shoe, whereby said shoe and said guide members are secured to said casing.

4. A casing shoe formed of resilient material and secured in a casing foot by guide and centering means on the outside of the casing foot and inserted through the side of the casing foot into said shoe.

5. Means forming a casing shoe and valve in a casing foot and consisting of a shoe body of resilient material with passageway therethrough, a valve body of resilient material and valve member therefor, and means for securing said bodies in place within said casing foot.

6. In combination with a well casing, a casing shoe and combination guide and holding members on the outside of said casing and inserted therethrough into said shoe for holding said shoe in place within said casing, said shoe and said guide and holding members being formed of vulcanized rubber and being yielding under pressure.

Signed at Los Angeles, Los Angeles County, California, this 10th day of October, 1929.

JOHN Q. LITTLE.