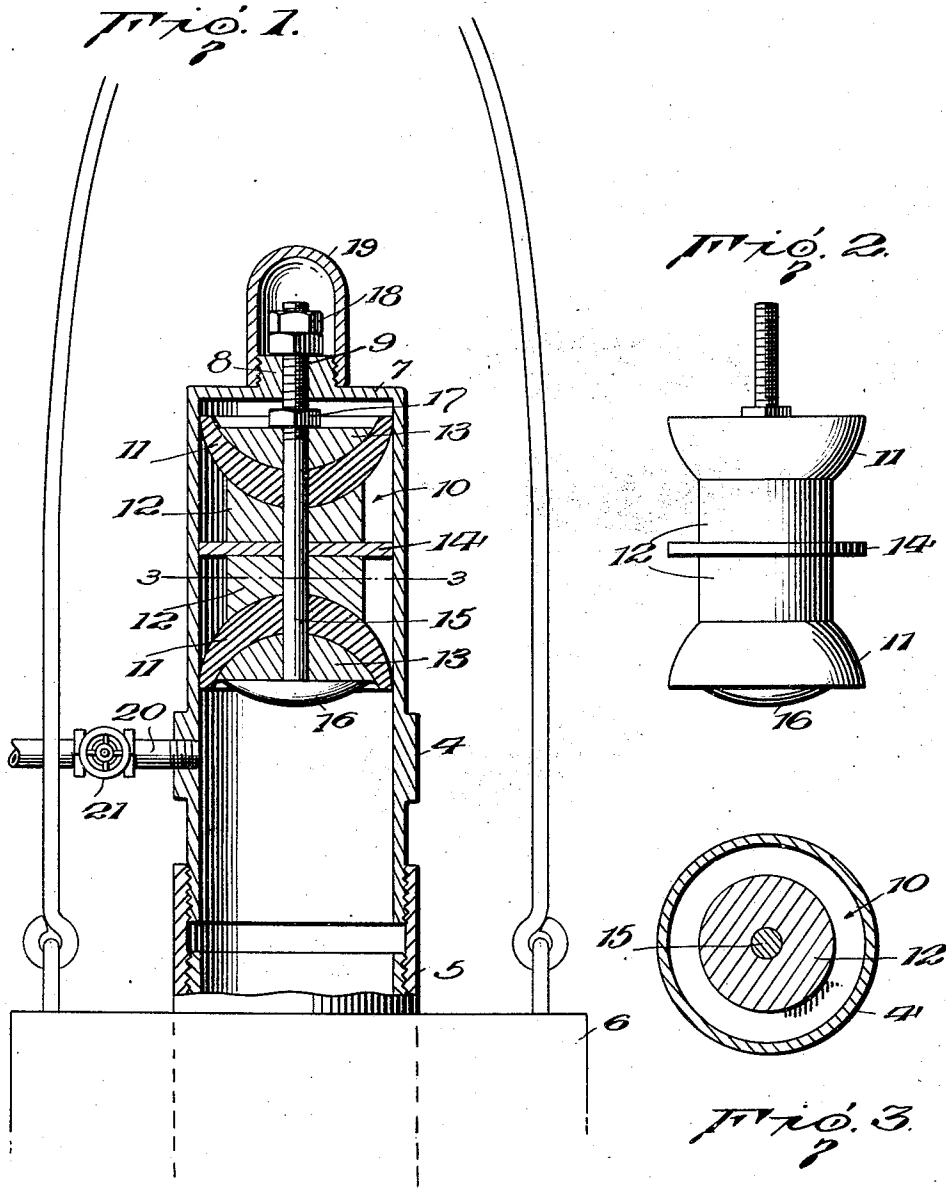


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OIL WELL CEMENTING PLUG

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OIL-WELL CEMENTING PLUG

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An object of this invention is to provide a novel type of oil-well cementing plug in head assembly which is inexpensive and one by which plug may be quickly placed in the well.

Another object is to design a cementing plug assembly which will readily and expeditiously locate in the casing to separate the cement from mud or other displacing fluid. Many objections to the methods now in use are overcome by my cementing plug. Additional objects and advantages will be apparent from a reading of the following specification and claims, and illustrated in the accompanying sheet of drawing wherein:

Figure 1 is a vertical transverse section through a cementing head.

Fig. 2 is a side elevation of cementing plug; and,

Fig. 3 is a horizontal section on line 3—3 of Fig. 1.

The same part is designated by the same reference numeral throughout the several views. Numeral 4 designates a casing nipple which is screwed into the top of casing 5 positioned in the elevator 6, having the usual bails. The upper end is closed at 7 and is provided with a screw threaded boss 8 which has a vertical aperture 9. This nipple is so constructed that the sides are parallel, and the closed end is in a plane at right angle to the sides, thus preventing any possible wedging of the plug in the head. Within the casing 4 is a cement plug designated generally at 10. It is composed of oppositely disposed crescent or hemispherical plugs or washers 11, preferably rubber, so that they will have the maximum effect of separating mud from cement. The members 11 are separated by means of wooden spacers 12, and provided with forming blocks 13.

Between the two spacers 12 is a scraping disc 14. The foregoing several members are held together by means of a bolt 15 provided with a mushroom head 16. The bolt 15 is made of non-ferrous material so that it can be quickly drilled, the reason for which will be described. The upper end of the bolt 15 is screw threaded, having a nut 17 provided thereto to lock the plug assembly together.

Bolt 15 extends upward through aperture

9, through the boss 8 and a pair of lock nuts 18 are placed thereon to hold the plug assembly in the upper portion of casing 4.

A cover or bull plug 19 is provided, to be screwed onto the boss 8 to form a pressure tight fitting over the upper end of the casing 4.

Flow through an inlet pipe 20 is controlled by a valve 21, the pipe 20 entering the wall of casing 4 at such place that when the plug is in raised position the inlet will be directly beneath the lower washer 11 of the plug.

In operation; fluid is introduced below the plug assembly so that the plug may be in place during any part of the operation it may be so desired, and likewise released at any stage of the operation.

After the casing is in its final position, the cementing head is positioned and the fluid line 20 attached. The entire plug is then assembled as shown in Fig. 2 and secured in the head by the lock nuts 18. After the mud is circulated so that the cementing operation is ready to begin, the cement is mixed and pumped into the casing through line 20 which is controlled by valve 21.

The plug assembly as shown in Fig. 2 is, during this time, securely held in the upper part of the casing as shown in Fig. 1. When most of the cement has been pumped in the pump pressure is considerably lessened due to the heavier weight of the cement column, and then the bull plug 19 may be loosened and removed from the head.

At the same time the lock nuts 18 may be slightly unscrewed in readiness for removal. As soon as the cement is in the casing, the lock nuts 18 are removed and the plug set free by forcing the bolt 15 down into the head, whereupon due to the partial vacuum created by the unequal weights of the columns of fluid, the plug will be drawn down into the casing.

As soon as this is accomplished, the displacing fluid is pumped into the casing and the bull plug 19 is replaced and made up securely. The bolt 15 which assembles the cementing plug is made of nonferrous metal in order that it may be easily drilled when the cementing plug is bored out of the hole for completion of the well.

The bull plug 19 is screwed to the boss 8 so

that both before and after the plug assembly is released the cementing head will be pressure tight at any time when it is subject to the high pressures which arise.

- 6 It is to be understood that the form of my invention herein shown and described is to be taken as a preferred embodiment of the same, and that various changes in the shape, size, and arrangement of parts, may be resorted to, without departing from the spirit of my invention or the scope of the subjoined claims.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In a device of the character described, a
15 cylindrical casing nipple open at its bottom and having a head at its top formed with a center boss, the nipple being of an even diameter throughout its depth, a plug slidable longitudinally in said nipple and having
20 washers at its ends and a scraper intermediate its length, the washers and scraper having edge portions contacting with walls of the nipple, a bolt extending axially through said plug with its threaded end portion projecting
25 upwardly therefrom and extending through the boss, securing nuts upon the protruding upper end of said bolt, a cover screwed upon said boss and enclosing the protruding upper end of said bolt, and a feed pipe engaged
30 through the walls of the nipple below said plug.

2. A cement plug for a well casing nipple comprising a bolt having a head at one end, formers upon said bolt, spacers upon the bolt
35 between the formers, a scraper between said spacers, flexible washers between the formers and spacers, the former being of greater diameter than the spacers and washer engaging faces of the formers and spacers being arcuate in cross section to form concavo-convexed
40 washers projecting radially from the formers and facing opposite ends of the plug, and a securing nut upon said bolt holding the formers and spacers in tight binding engagement
45 with the washers and formers with the outer face of one former bearing against the head of the bolt.

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