Dec. 5, 1950 D. U. SHAFFER 2,533,059

PROTECTING PACKER FOR CASING HEADS

Filed March 6, 1948

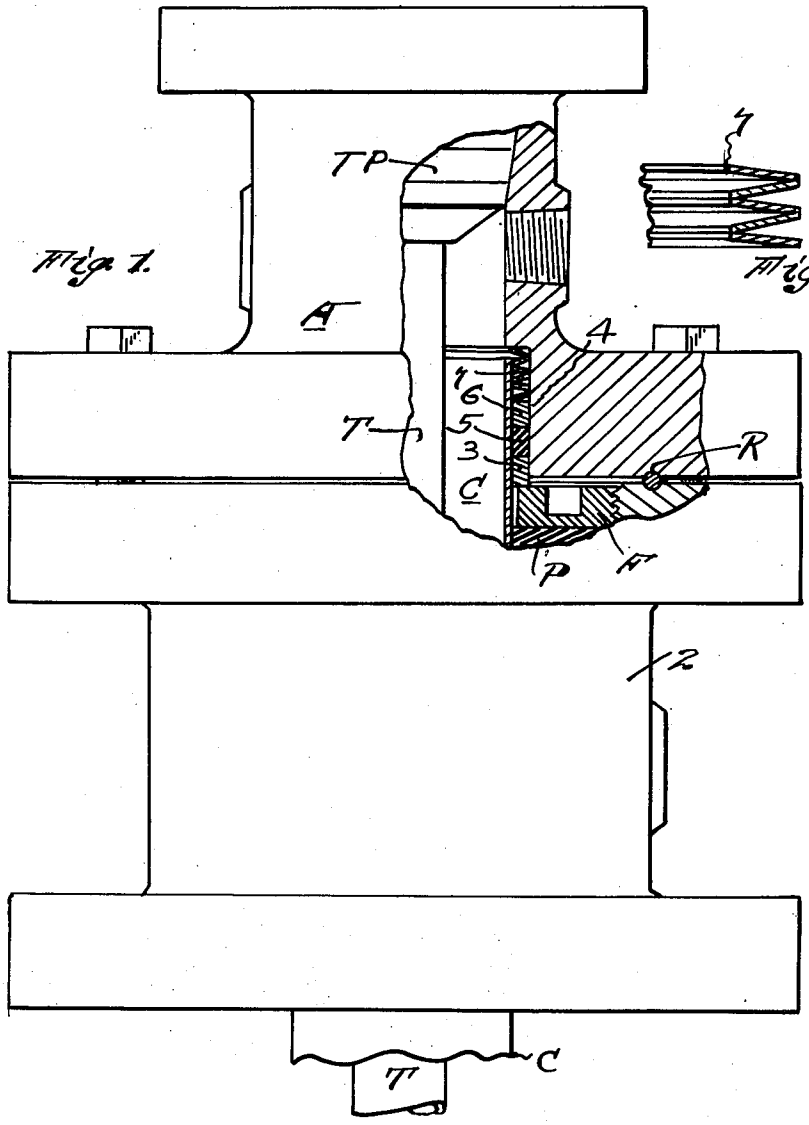


Fig. 1.

Fig. 2.

INVENTOR,
Donald U. Shaffer;
BY his attorney,
Frederick E. Maynard.

Patented Dec. 5, 1950 2,533,059

UNITED STATES PATENT OFFICE

2,533,059

PROTECTING PACKER FOR CASING HEADS

Donald U. Shaffer, Brea, Calif., assignor to Shaffer Tool Works, a corporation of California

Application March 6, 1948, Serial No. 13,496

2 Claims. (Cl. 166—14)

1

In the deep well industry casing heads are rigidly affixed to landed, oil string casing and have caps into which are secured the central oil tubing. Commonly a soft metal gasket is clinched marginally between cap and the head.

This invention concerns such a combination, and is a device to protect said ring from fluid pressure and from chemical attacks by the fluids.

These rings or gaskets are known as "A. P. I." rings, and an intent of the invention herein is to install a protective packing inwardly of the ring to cut off access of the fluids and their pressure from the ring.

It is a purpose of the invention to provide a very compact and high pressure exerting means, to seal off incidental channels leading to the A. P. I. ring, which is very simple and of low cost and can be installed readily and without need of material structural change in the conventional casing head cap.

The invention resides in certain advancements in this art as set forth in the ensuing disclosure and has, with the above, additional objects and advantages as will be developed hereinafter, and whose constructions, combinations and details of means, and the manner of operation will be made manifest in the following description of the herewith illustrative embodiment; it being understood that modifications, variations, adaptations and equivalents may be resorted to within the scope, spirit and principles of the invention as it is claimed hereinafter.

Figure 1 is a sectional elevation of a casing head in which the protector is installed.

Figure 2 is a detail section of a spring assembly for the packer.

In the bore of the main body of the head 2 there is landed an inside casing C onto which is compressed a packing P under a follower F just above which the casing C ends. A central oil tubing T extends to and is sealed in a packer TP; this being installed in a casing cap or flange A which is bolted on top of the head 2.

A metallic gasket ring, commonly known as an A. P. I. ring R is shown as clinched between the cap and the head. Difficulty is had in maintaining the ring R in a leak tight set, and further, it is subject to chemical attack which weakens it.

By this invention means is provided to prevent the flow of gases and/or liquids in the casing channels from reaching the ring.

In its preferred form the protecting means includes a bottom band 3 interposed between the casing C and the bore face 4 of the flange A and which seats on the follower F. On this band seats a suitable packing 5 to seal on the casing and on top of which packer rests a presser collar 6 which is subject to fluid pressure arising in the casing

2

C. In case of fairly high degrees of fluid pressure the collar 6 would effectively compact the packing 5 and stop fluid leak to the ring R. Since the incidental fluid pressure may not be reliable to stop the leak a powerful spring device is here used to constantly compact the packer 5. To effect the desired spring pressure and still have a compact form of spring on the collar the spring here shown consists of a stack of frusto-conoidal concavo-convex annulets 7 of strong resilient material, such as spring steel; the annulets being assembled in alternated position one on the other whereby to give axial compressibility to the stack, with great pressure on the packing 5. This pressure is set up as and when the cap is bolted into place on the head 2 while the band 3 lodges on the follower F.

Hence it will be seen that the protective packing unit 3—5—6 intercepts the flow of fluids from the head chamber to the A. P. I. ring R, and stops both pressure load and chemical re-actions on this ring.

What is claimed is:

1. A casing head having a main body and a cap with coaxial bores, the cap being superposed upon said body and having a counter bore in its lower end in which there is seated an annular packing assembly to surround an intruded, coaxial casing and seal between the casing and the wall of the counter bore, a metallic packing ring clinched between said body and said cap outwardly of and concentric to the body bore, and a rigid annular follower collar screwed in the bore in said body inwardly of said ring; said assembly including a bottom band seating on said collar whereby when the cap is clamped on said ring the said packing assembly is expanded and compacted in the counterbore to protect said ring.

2. The casing head of claim 1; and the said packing assembly further including a resilient device at its upper end and seating on a cap shoulder at the upper end of said counterbore.

DONALD U. SHAFFER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,398,013	Droppleman	Nov. 22, 1921
1,495,845	Heggem	May 27, 1924
2,456,081	Penick	Dec. 14, 1948
2,491,598	Allen	Dec. 20, 1949

FOREIGN PATENTS

Number	Country	Date
131,341	Great Britain	Aug. 28, 1919