Oct. 7, 1930. C. C. HOSMER 1,777,564

BLOWOUT PREVENTER FOR OIL WELLS

Filed Aug. 30, 1923

Fig. 1.

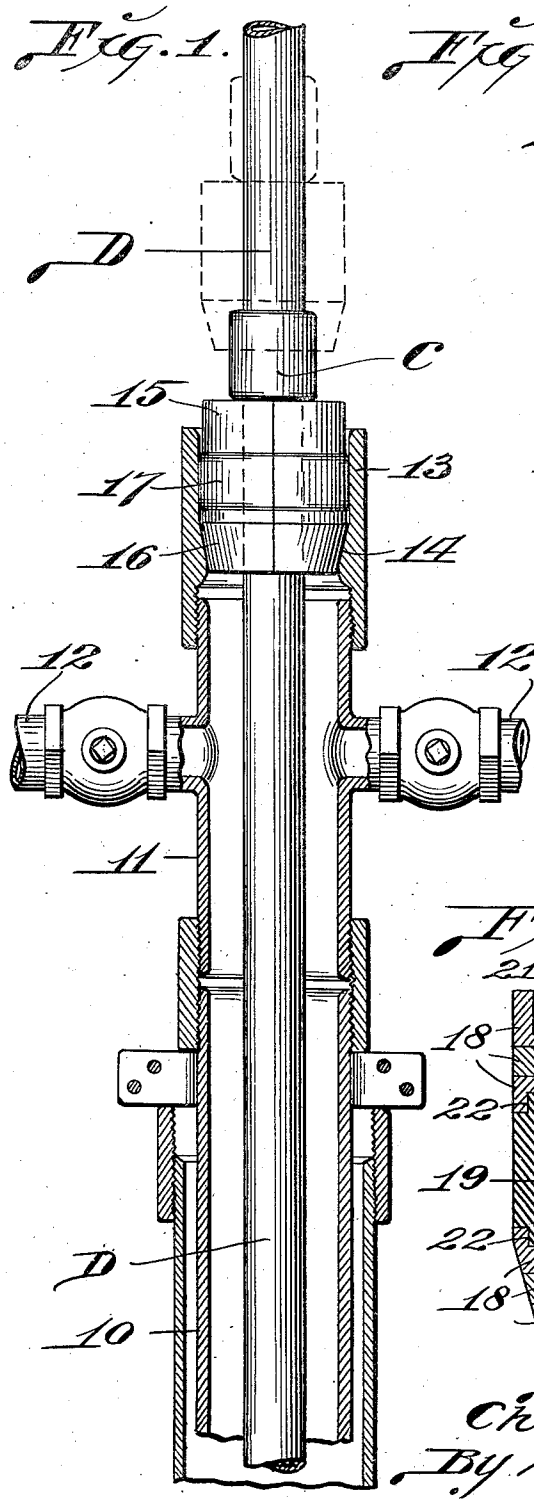


Fig. 2.

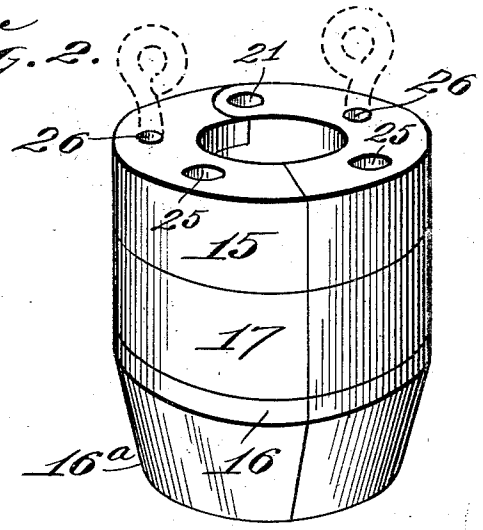


Fig. 3.

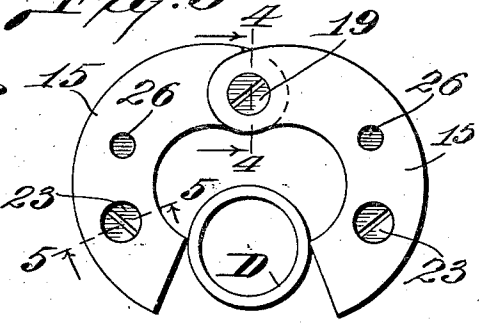


Fig. 4.

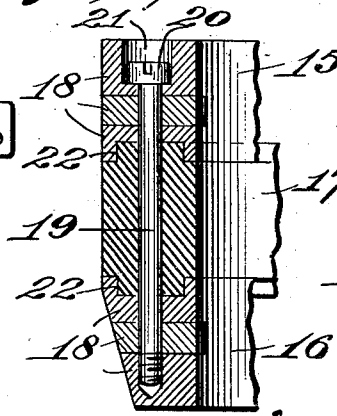
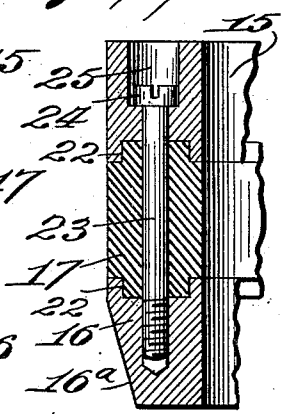


Fig. 5.



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By Martin & Smith Atty

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UNITED STATES PATENT OFFICE

CHESTER C. HOSMER, OF HUNTINGTON BEACH, CALIFORNIA

BLOW-OUT PREVENTER FOR OIL WELLS

Application filed August 30, 1923. Serial No. 660,145.

My invention relates generally to oil well appliances and more particularly to a packing device that is adapted to be applied to the upper ends or heads of oil well casings for preventing blowouts and which latter, it will be understood, frequently occur as a result of abnormal gas or oil pressures.

The principal objects of my invention are to provide a simple, practical and efficient device of unitary structure that may be easily and quickly applied to the drill tube and which device, under the weight of said drill tube, serves as a leakproof packing between said tube and the well casing or its head and consequently preventing troublesome and dangerous gas and oil "blowouts" that frequently occur during the drilling and operation of oil wells.

A further object of my invention is, to provide an oil well blowout preventor that may be easily and cheaply produced and which will act automatically under the weight of the engaged drill tube in producing the desired results. The construction herein illustrated and described is an improvement on the packer for oil wells for which Letters Patent No. 1,525,582 were issued to me February 10, 1925.

With the foregoing and other objects in view, my invention consists in certain novel features of construction and arrangement of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawings in which:

Fig. 1 is a vertical section taken through the center of an oil well casing head and showing my improved blowout preventor in position for use.

Fig. 2 is a perspective view of the split block or cylindrical packing member of the device and which is adapted to be applied to the drill tube.

Fig. 3 is a plan view showing the position of the parts of the split block or packing member when the same is opened for application to the drill tube.

Fig. 4 is a vertical section taken approximately on the line 4—4 of Fig. 3.

Fig. 5 is a vertical section taken approximately on the line 5—5 of Fig. 3.

Referring by numerals to the accompanying drawings, 10 designates an oil well casing, to the upper end of which is attached in the usual manner, a fitting 11, generally known as an overflow pipe and which is provided with one or more valved outlets 12 for controlling the flow of water or mud from the upper end of the casing and also for controlling the flow of oil or gas from said casing.

This overflow pipe is generally located above the ground and below the derrick floor.

The bowl or socket fitting that forms a part of my improved device, comprises a relatively short tubular member 13, having its lower portion internally threaded in order that it may be screwed onto the externally threaded upper end of the overflow pipe 11 and formed within this bowl, intermediate its ends, is an inclined shoulder or annular surface 14 that tapers or gradually decreases in diameter toward its lower end.

This inclined shoulder 14 is formed so that its least diameter, which is at its lower end, is approximately equal to or slightly greater than the internal diameter of the casing 10, consequently the opening into the upper end of said casing and the overflow pipe connected thereto, is in nowise restricted.

The packing member of my improved device comprises an upper two part ring 15, a lower two part ring 16, and an intermediate one piece gasket or packing ring 17.

The two part rings 15 and 16 are preferably formed of metal and the lower portion of the lower ring 16 is tapered as designated by 16^a so as to fit snugly upon the inclined or tapered shoulder 14 when the packing member is positioned within bowl 13.

These two metal rings are divided on diametrical lines and the ends of the two parts of each ring on one side, are formed with horizontally disposed interengaging lugs or ears such as 18 to form hinge connections or joints.

The two hinge joints thus formed are connected by a single hinge pin or screw 19 that passes through both sets or ears 18 and the threaded end of said pin or screw is seated in the lower ear or lug of the lower ring 16.

The head of this hinge pin occupies a recess 21 that is formed in the upper ear or lug of the upper ring 15.

The gasket or packing ring 17 that is interposed between the two part rings 15 and 16 is formed from a single piece or rubber of analogous compressible elastic material and said ring is split on a line that coincides with the dividing lines between the free ends of the parts of rings 15 and 16.

Hinge pin 19 passes through this gasket at a point diametrically opposite from the point where the gasket is split.

The upper and lower faces of the gasket or packing ring 17 are dovetailed into shallow grooves 2 that are formed respectively, in the under face of ring 15 and the upper face of ring 16.

Passing through rings 15 and 17 are tie bolts 23, the threaded ends of which are seated in ring 16 and the heads 24 on the upper ends of said bolts occupy recesses 25 in the upper portion of top ring 15. These tie bolts are located at points a short distance away from the free ends of the rings that compose the packing member.

Formed in the upper portion of top ring 15, preferably at points intermediate the ends of the two parts thereof are threaded recesses 26 that are adapted to receive the threaded ends of the hooks, eye bolts or the like that may be used when the packing member is lifted from the bowl.

Thus it will be seen that I have provided a unitary structure that is relatively simple in construction, very compact and which may be easily and quickly applied for use.

The halves of the packing member swing freely upon the hinge pin 19 and when opened and spread apart as illustrated in Fig. 3, said member may be readily fitted onto the drill tube D and which latter is raised or lowered so as to bring one of its collars or unions C into position directly above bowl 14.

After the packing member has been manipulated so as to encircle the drill rod, the latter and said member are lowered until the packing member enters the bowl 14.

The engagement of the tapered end 16^a on the lower portion of the packing member against the tapered shoulder 14, anchors said packing member within the bowl and the weight of the drill tube, acting through collar C, that bears against the upper face of ring 15 forces the latter downward a slight distance independently of the seated lower ring 16, thereby compressing gasket 17 vertically so that the inner and outer faces of the latter are respectively forced into intimate contact with the adjacent faces of the drill tube and bowl.

Obviously to attain the results just described, the external diameters of the rings 15 and 16 must be slightly less than the internal diameter of the bowl above the inclined shoulder 14 therein and the diameter of the openings in said ring must be slightly greater than the diameter of the drill tube to which the packing is applied.

Thus the device forms a joint between the well casing and drill tube that will withstand extremely high pressures, consequently the well is prevented from "blowing out" and, at the proper time a reduction of the pressure within the well casing may be effected, by opening one or both of the outlets 12.

If desired, suitable means may be provided to lock the packing member in position within the bowl, but this provision is not required where the drill is of any considerable length or weight.

Thus it will be seen that I have provided a relatively simple and practical packing member of unitary structure that may be readily manipulated when applied for use and which combines readily with a bowl-like holder in preventing oil and gas "blow-outs" in wells.

While I have shown and described a simple and practical form of my improved blowout preventer, it will be understood that the construction thereof may be varied in minor details, without departing from the spirit of the invention, the scope of which is set forth in the appended claims.

I claim as my invention:

1. In an oil well blowout preventer, a packing member of unitary structure comprising a pair of two-part rings that are spaced apart, a compressible split ring arranged between said two-part rings, a hinge pin seated in the lower one of said two-part rings and extending upwardly through the compressible split ring and through the upper one of the two-part rings so as to provide a hinge to permit the device to be opened and closed when applied to or removed from a well tube, the upper one of the two-part rings and said compressible split ring being loosely arranged on the hinge pin so that they may move downwardly thereupon when said compressible ring is compressed the split or opening in said packing member being disposed diametrically opposite to said hinge pin, the lower portion of the lower two-part ring being tapered, and said compressible split ring and

the upper one of the two-part metal rings having the same external diameters.

2. In an oil well blowout preventer, a packing member comprising a pair of metal rings each formed in two parts, a one-piece split compressible ring arranged between said two-part metal rings, a single hinging member for the parts of each two-part ring, which hinging member extends through the compressible ring at a point diametrically opposite to the split or opening therein, which single hinging member is loosely arranged in said compressible ring and the upper one of the two-part rings, the lower portion of the lower metal ring being provided with an externally tapered face and said compressible split ring and the upper one of the two-part metal rings having uniform external diameters.

3. In an oil well blowout preventer, a packing member comprising a pair of metal rings each formed in two parts, the lower one of said two-part metal rings being externally tapered, a one-piece split ring of compressible material arranged between the two-part metal rings, said compressible split ring and the upper one of the two-part metal rings having the same external diameters, a single hinge pin connecting the parts of the two two-part metal rings and extending through said compressible split ring at a point diametrically opposite to the split therein, said hinge pin being rigidly seated in one of the two-part metal rings and having sliding engagement with said split ring and the other two-part metal ring.

4. In an oil well blowout preventer, a packing member comprising a pair of metal rings, each formed in two parts, the lower one of said two-part rings being externally tapered, a one-piece split ring of compressible material arranged between the two-part metal rings, said compressible split ring having the same external diameter as said metal rings, a hinge pin connecting the parts of the two-part metal rings and extending through said compressible split ring at a point diametrically opposite to the split therein, said hinge pin being loosely seated in said split ring and the upper one of the two-part rings, and pins seated in the parts of the lower one of the two-part metal rings near the free ends of said parts and which pins are loosely seated in the split ring of compressible material and the parts of the upper one of the two-part metal rings.

5. In an oil well blowout preventer, a packing member comprising a pair of metal rings, each formed in two parts, the lower one of said two-part rings being externally tapered, a one-piece split ring of compressible material arranged between the two-part metal rings, said compressible split ring and the upper one of the two-part metal rings having uniform external diameters, a single hinge pin connecting the parts of the two-part metal rings and extending through said compressible split ring at a point diametrically opposite to the split therein, said hinge member being rigidly seated in one of the two-part metal rings and having sliding engagement with the compressible split ring and the other two-part metal ring, and pins seated in the parts of one of the two-part metal rings adjacent to the split therein and having sliding engagement with the other two-part metal ring and with said compressible split ring.

In testimony whereof I affix my signature.

CHESTER C. HOSMER.