Aug. 18, 1931. M. S. CUNNINGHAM 1,819,875

SAFETY CASING HEAD FOR OIL WELLS

Filed May 24, 1930

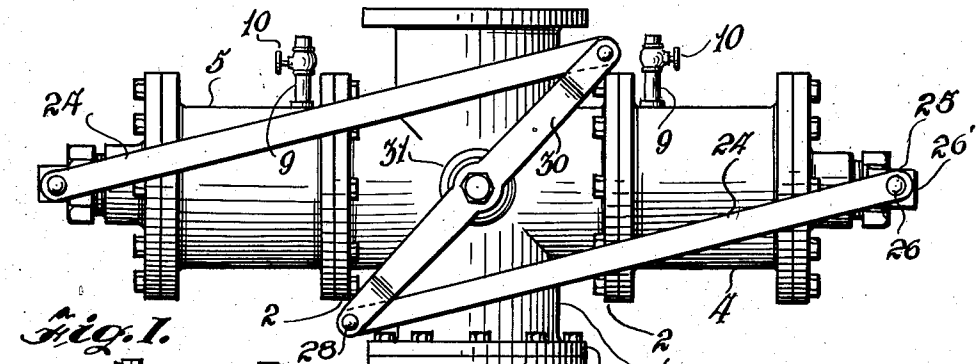
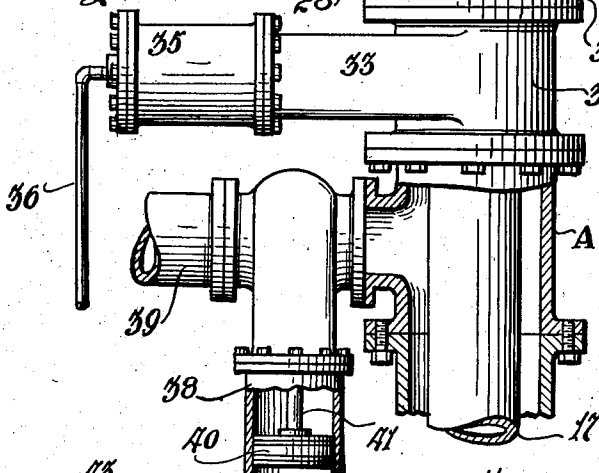


Fig. 1.



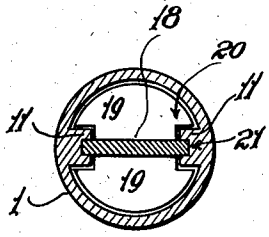


Fig. 3.

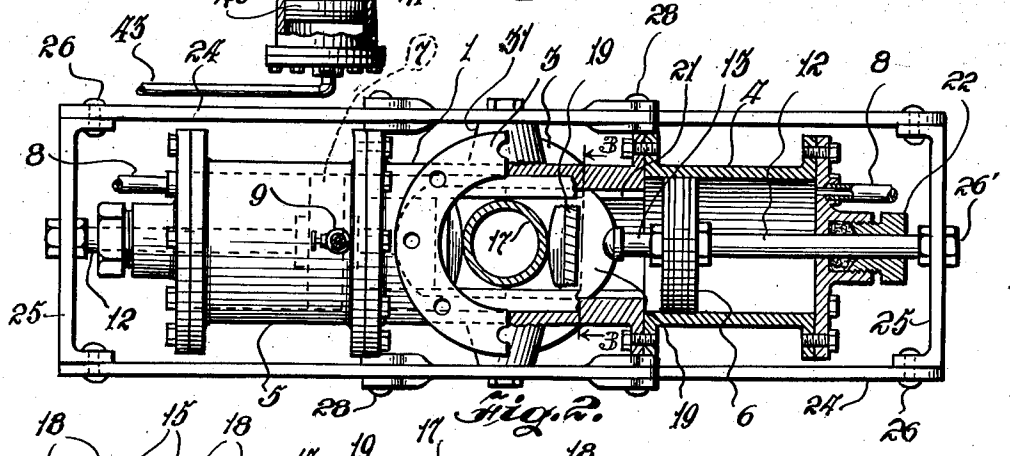


Fig. 2.

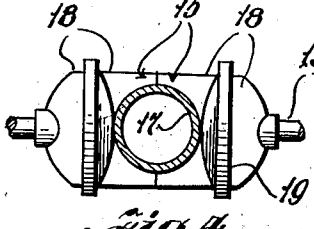


Fig. 4.

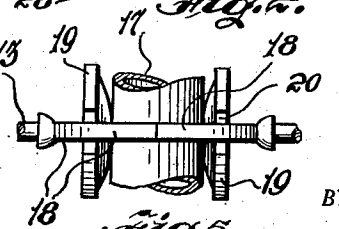


Fig. 5.

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UNITED STATES PATENT OFFICE

MARION STOKES CUNNINGHAM, OF DALLAS, TEXAS

SAFETY CASING HEAD FOR OIL WELLS

Application filed May 24, 1930. Serial No. 455,181.

My invention relates to oil well equipment and more particularly to a safety casing head for shutting off the flow of oil wells.

The primary object of my invention consists of means in combination with a casing head and oil well casing whereby the oil well when brought in may be quickly shut off, particularly in wild wells, and the oil or gas or both stopped from flowing from the well.

The invention also provides means for effecting these operations from remote points in the vicinity of the well and by the use of steam and without removing the well tools from the well.

Other and minor objects of my invention consist of means for closing the well after the tools have been withdrawn, and for drawing off quantities of oil or gas after the casing head has been removed.

With the above objects in view my invention will be better understood from a perusal of the following detailed description, taken in connection with the accompanying drawings and wherein:

Figure 1 represents a side elevational view of an oil well casing head and embodying my invention, the view being partly sectioned and partly broken away.

Figure 2 is a top plan view thereof.

Figure 3 is a cross sectional view in part, the view being taken along the line 3—3 in Figure 2; and

Figures 4 and 5 are, respectively, a detail top plan view and a side elevational view of the valve arrangement for closing the well when the tools are in the hole.

Having a more detailed reference to the drawings, 1 denotes a casing head with vertical and horizontal passages and including the annular flanged parts 2 and 3. Connected to opposite sides of the casing head and to the parts 2 are cylinders 4 and 5 and within these cylinders are disposed reciprocating members in the form of the pistons 6 and 7. Each of the cylinders are provided with steam inlet ports where there is secured a pipe 8 and exhaust ports wherein there are secured short pipes 9 with valves 10. The steam is supplied to the cylinders at a point remote from the well and moves the pistons 6 and 7 inwardly the air being exhausted through the pipes 9.

In Figure 2 it will be observed that the casing head interior is constructed with longitudinal ledges 11 for the purpose of supporting each of the valve members carried on the piston rods 12. These valve members are shown more clearly in Figs. 3, 4 and 5, and are connected to a prolongation 13 of the piston rods 12. Each member is provided with a semicircular opening or recess as at 15 for snugly engaging the periphery of the drill rod indicated at 17, the member 18 being relatively flat and being formed integrally with a disk-like part 19. The part 19 is recessed on opposite sides so that it will support the valve member upon the ledge in a slidable manner in the operation of the closing and opening operation of the members. These recessed portions are indicated at 20, in Figures 3 and 5, and likewise the ledges 11 are provided with a longitudinal slot 21 in which the side edges of the valve members slide. Packing nuts 22 are provided at each end of the cylinders 4 and 5. In order that each of the valve members may operate in unison with its mate, the construction includes links 24 in pairs at each slide of the cylinders. The outer ends of these links are pivoted to cross bars 25 by means of the bolts 26, the bar having a connection to the piston rods as at 26′ while the inner ends of the links are pivoted at 28 to a centrally pivoted bar 30 connected to the casing head by the members 31.

Spaced below and connected to the lower end of the casing head is a section of cylindrical formation 32 with a prolongation 33 and connected to the latter is a cylinder 35. This cylinder carries a piston (not shown) with rod on which is carried a standard gate valve (also not shown) for closing the casing A when the tools are removed from the well. A steam pipe 36 connects to the cylinder 35 and supplies steam for closing the valve when required.

There is also provided means for drawing off quantities of oil or gas when desired which consists of a pipe 39 and a cylinder 38. This cylinder carries a piston and rod 40

and 41 and a valve (not shown) carried on the rod and operating under steam pressure from the pipe 43 closes the valve.

From the foregoing it will be apparent that when steam is applied to the pistons 6 and 7, and the valves 10 opened, the valve members 18 will be closed snugly around the drill stem 17 as clearly shown in Figure 4 and in Figure 2 which will effectually cut off any oil or gas flow. When desirous of removing the tools, steam is admitted through the valves 10 the exhaust being through the pipes 18 which are opened and the valve members advanced from the drill rod. After removal of the tools, the valve operated by the piston in the cylinder 35 is operated to close the casing and quantities of liquid or gas drawn off by opening the lowermost valve operable by the piston 40.

What is claimed as new is:

A safety casing head for controlling oil wells, said head formed with vertical and horizontal passages, a cylinder connected to each end of the horizontal passages, pistons and rods in each cylinder; the interior of the cylinders and the interior of the horizontal passages being of substantially the same diameter; a valve member carried by each of the piston rods, said valve member comprising a disk-like formation for fitting snugly the interior walls of the horizontal passages of the head and including a relatively flat body portion for engaging one half of a drill rod, longitudinal ledges formed on opposite sides of the interior walls of the horizontal passages of the head; longitudinal grooves in the peripheries of the disk-like formation and adapted to permit the latter to slide over the ledges to guide the valve members to and from engagement with the drill rod; and means in the cylinders for introducing steam or similar pressure on each side of the pistons.

In testimony whereof I affix my signature.

MARION STOKES CUNNINGHAM.