

May 2, 1933.

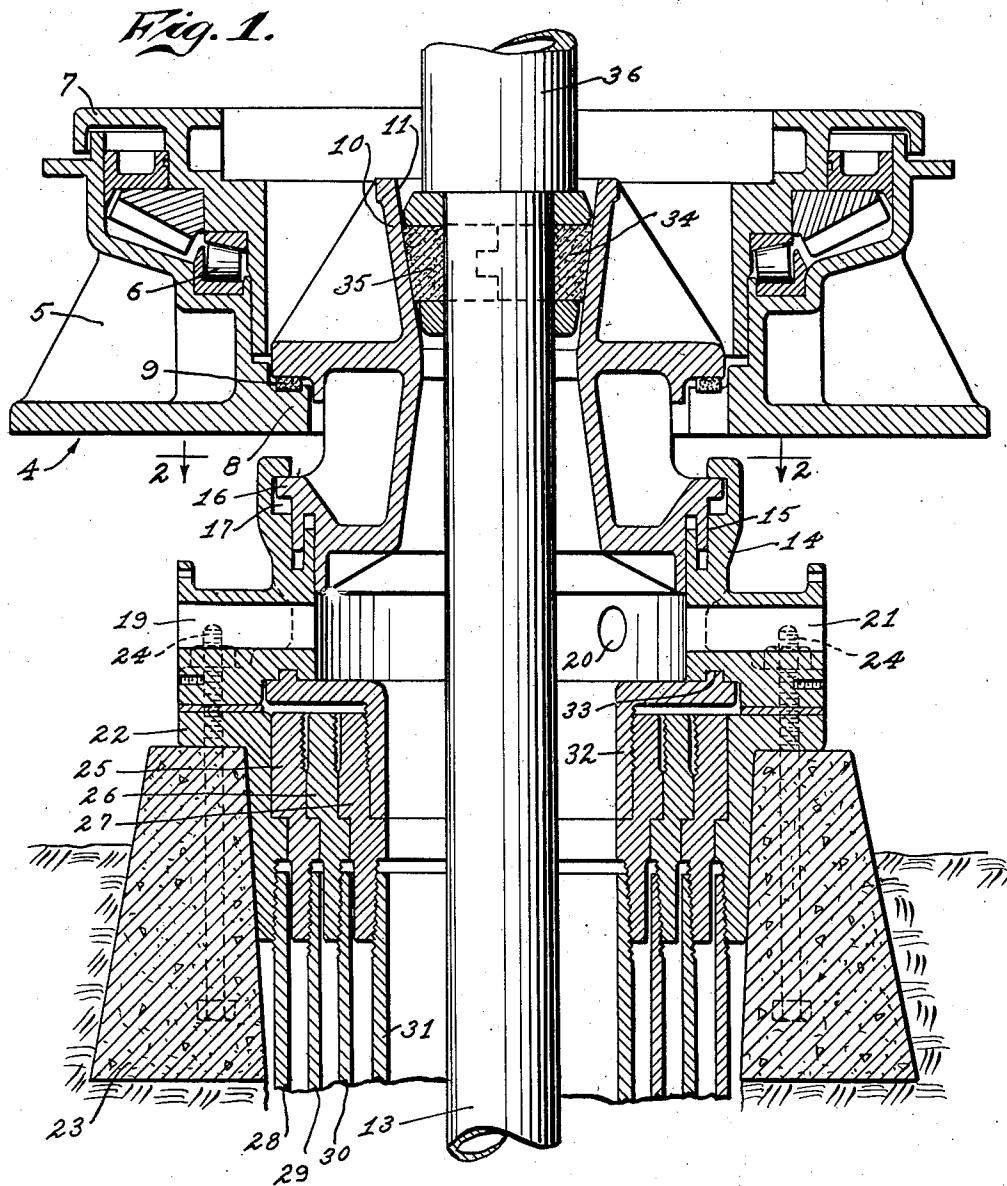
F. W. HILD

1,906,265

BLOW-OUT PREVENTER FOR ROTARY DRILLING

Filed Aug. 12, 1929

2 Sheets-Sheet 1



Inventor

Frederic W. Hild

By

Attorney

May 2, 1933.

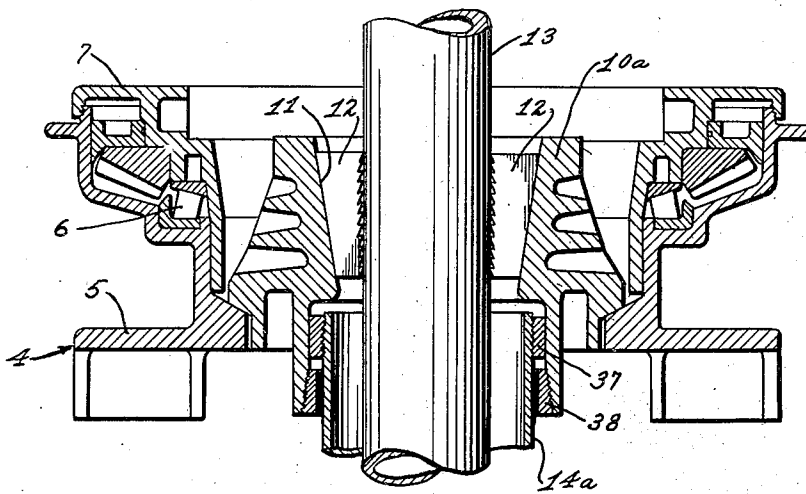
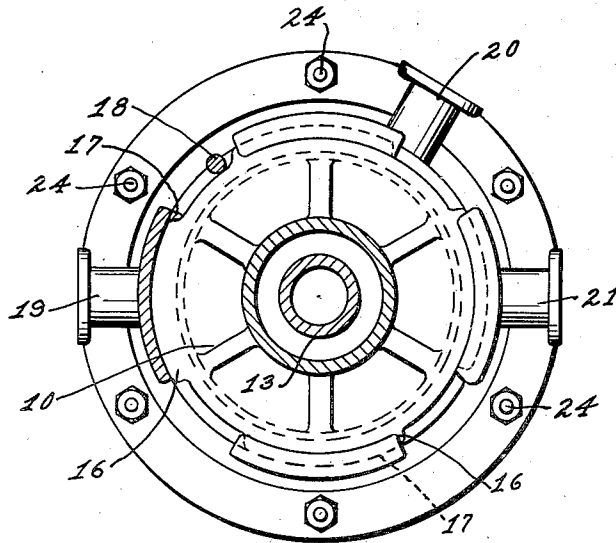
F. W. HILD

1,906,265

BLOW-OUT PREVENTER FOR ROTARY DRILLING

Filed Aug. 12, 1929

2 Sheets-Sheet 2



Inventor.

Fredric W. Hild

By

Attorney

UNITED STATES PATENT OFFICE

FREDERIC W. HILD, OF LOS ANGELES, CALIFORNIA

BLOW-OUT PREVENTER FOR ROTARY DRILLING

Application filed August 12, 1929. Serial No. 385,270.

My invention relates to blowout prevention and appertains more particularly to apparatus for preventing blowout of fluids used and encountered in the rotary system of drilling, this application being a continuation in part of my co-pending application Serial Number 312,887 filed October 16, 1928, for rotary drilling apparatus.

It is an object of my present invention to provide a rotary machine in fluid-tight connection with well casing and adapted to prevent blowouts by effecting closure of said casing by means of the drill pipe and a suitable packer.

Another object of my invention is to provide an expansion joint for flexibly securing the rotary machine in fluid-tight connection with well casing.

In my co-pending application Serial Number 382,384 filed July 31, 1929, for control head and blowout preventer, I have shown and described concentric terminal collars for well casings, horizontally disposed whereby a common control head may be in permanent predetermined position with respect to all of the casings in the well and with respect to the ground surface or the derrick floor. It is an object of my present invention to further improve this by providing a means which will maintain this relation and enable fluid-tight connection of the control head with the innermost casing in the well.

Other objects and advantages of my invention will be apparent from the following description and the accompanying drawings.

Figure 1 is a vertical section of the apparatus embodying my invention.

Figure 2 is a horizontal section taken on the line 2-2 of Figure 1.

Figure 3 is reproduced from my aforesaid application Serial Number 312,887.

Referring to the drawings, the rotary drilling machine 4 has a base 5 containing roller bearings 6 on which table 7 is rotatably mounted. The table is driven by the usual gear and pinion (not shown) and is adapted to receive a drive bushing (not shown). The base 5 has a ledge 8 containing rubber pads 9 on which slip ring 10 is seated. The ledge may be segmental in order to

pass the breech locking arrangement of the slip ring. The slip ring has the taper bore 11 converging axially downward, which is normally used to receive the slip 12 for supporting the drill pipe 13. The lower portion of the slip ring 10 has a taper bore converging axially upward for receiving a tapered, rotatable packer (not shown) such as illustrated and described in my aforesaid co-pending application Serial No. 382,384.

The slip ring 10 has fluid tight connection with outlet box 14 by means of tongues and grooves 15, the grooves being relatively deeper than the tongues so as to permit appreciable axial movement and thereby provide expansion joint. The slip ring is detachably secured to the outlet box by breech lock formed by segmental lugs 16 of the slip ring and segmental slots 17 of the outlet box. A pin 18 inserted into the outlet box intercepts one of the lugs and prevents their rotating out of engagement from the slots. The outlet box 14 has lateral outlets 19, 20 and 21 respectively which are adapted to be controlled by valves (not shown) including an automatic mud valve such as disclosed in my aforesaid co-opening application Serial No. 382,384. The outlet box is anchored to a suitable foundation 23 and is secured to the outermost casing terminal collar 22 by bolts 24.

Terminal collar 25 is seated in and contained by collar 22; likewise terminal collar 26 is seated in collar 25, and terminal collar 27 is seated in collar 26. Casings 28, 29, 30 and 31 are threaded into and suspended from collars 22, 25, 26 and 27 respectively. Each of the contained collars is threaded at its upper end. The flange collar 32 is threaded into and seated fluid-tight in the innermost terminal collar 27. The flange collar is also in fluid-tight connection with outlet box 14 as indicated by tongue and groove 33.

The split packer 34 is seated in the taper bore 11 of the slip ring 10 and grips the drill pipe 13 which extends through the slip ring and the packer into the well casing. The packer 34 comprises top and bottom metal pieces between which is sandwiched the soft rubber packing 35, the metal pieces being just large enough so that the packer cannot

be forced through the slip ring. The drill pipe coupling 36 rests upon packer 34, the weight of the heavy drill pipe forcing the rubber packing against the taper bore 11 and the drill pipe 13.

In Figure 3, the slip ring 10a is secured to the casing top 14a by an expansion joint formed by the casing collar 37 which is threaded to the casing top 14a, and by the slip ring collar 38 which is threaded to the slip ring 10a.

The operation of the blowout preventer apparatus which I have herein described is as follows: Upon indication of fluid ejection, the drillers will place the packer 34 in the slip ring 10 as shown in Figure 1. The heavy weight of the drill pipe will counteract the upward pressure of the underground fluid so that discharge of the fluid will be confined to the outlets 19, 20 or 21 which are valve controlled. In the absence of packer 34, the slips 12 will effect a substantial closure of the opening through slip ring 10 and also will support the drill pipe.

Although I have described several specific embodiments of my invention, it will be obvious to those skilled in the art, that various modifications may be made in the details of construction, the general arrangement, the association of the several co-operating parts and the application of my invention without departing from the spirit thereof or the principles herein set forth.

I claim as my invention:

1. In combination, a casing head, a cover fastened thereon, an expansion joint between the cover and the head, and a rotary table having a stationary part on which the cover is supported.

2. In combination, a casing head connected to well casing, a cover adapted to pass a drill string and fastened to the head, said fastening including an expansion joint, and a rotary table having a stationary part on which the cover is supported.

3. In combination, a casing head, a cover for the casing head, a breech lock between the head and the cover, and a rotary table having a stationary part on which the cover is supported.

4. In combination, a rotary table having a stationary flange, a casing head cover supported on top of the flange, and a casing head secured to the cover by a breech lock connection.

5. In combination, a rotary table having a stationary flange, a casing head cover supported on top of the flange, and a casing head secured to the cover by an expansion joint.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 8th day of August, 1929.

FREDERIC W. HILD,