

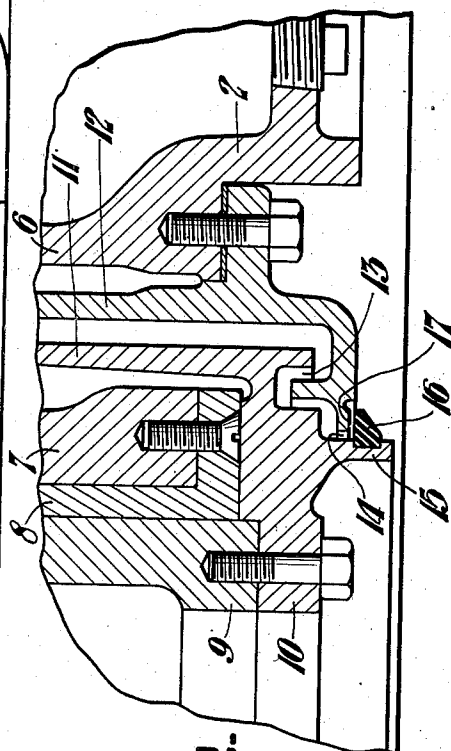
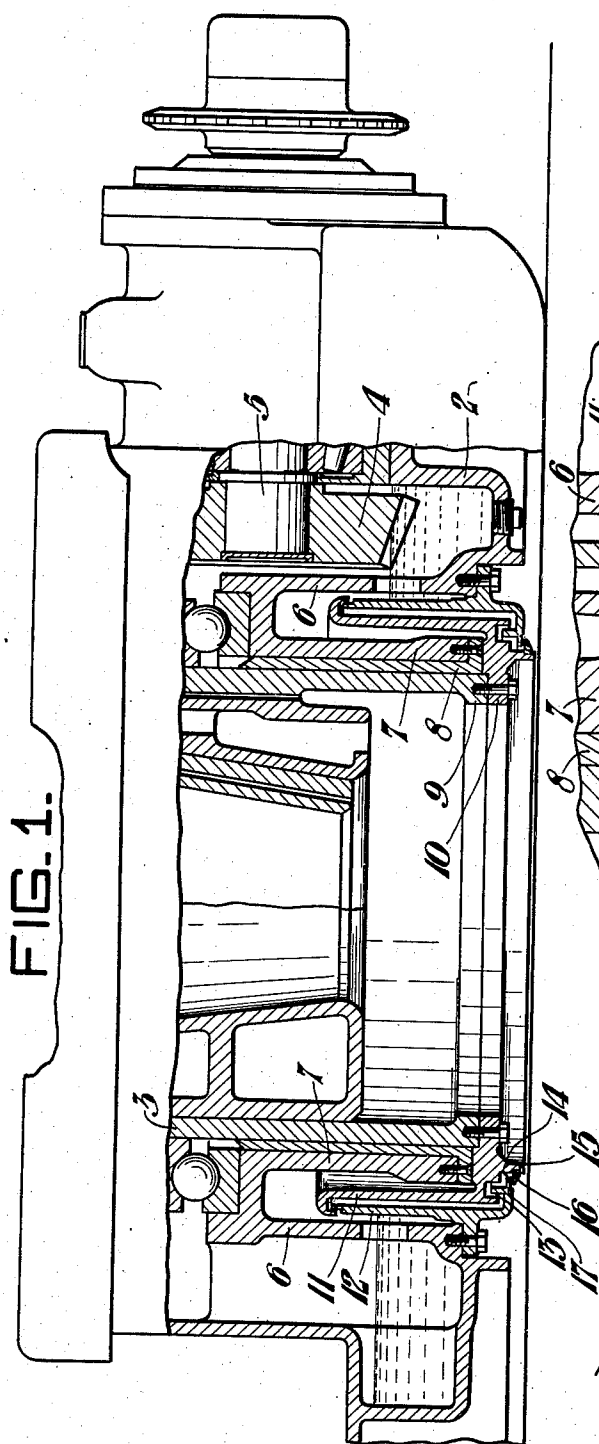
Dec. 11, 1945.

A. R. MAIER

2,390,601

BLOW OUT SEAL FOR WELL DRILLING ROTARIES

Filed Aug. 26, 1943



INVENTOR:
AUGUST R. MAIER,
BY *John E. Jackson*
HIS ATTORNEY

UNITED STATES PATENT OFFICE

2,390,601

BLOWOUT SEAL FOR WELL DRILLING
ROTARIESAugust R. Maier, Oil City, Pa., assignor to Oil
Well Supply Company, a corporation of New
Jersey

Application August 26, 1943, Serial No. 500,167

2 Claims. (Cl. 255—23)

This invention relates to improvements in blow out seals for well drilling rotaries.

As disclosed in the prior patent to S. C. Fietinghoff et al., No. 2,275,895, dated March 10, 1942, sealing means have been provided at the bottom of a well drilling rotary to prevent the ingress of foreign matter between the rotating and stationary parts which would contaminate the lubricating system of and injure the rotary. While the labyrinth seal of said patent is adequate under many operating conditions, it has been found inadequate in the case of severe blow outs.

The blow out hazard is present when drilling in areas having gas pockets, and when such gas pocket is pierced, the resulting gas flow blows out at the top of the well, blowing mud and debris at high velocity and pressure. Such hazard may continue as when the driller elects to continue without first sealing the gas, and the continued operation with mud and foreign matter entering the rotary lubricating system eventually ruins the rotary mechanism.

It is the prime object of my invention to provide a positive blow out seal for a well drilling rotary which may be easily and readily applied, and which will be actuated by the force of the blow out itself to effect such a seal.

Additional objects and advantages will become apparent from the following description taken in connection with the accompanying drawing wherein:

Fig. 1 is an elevational view, partly in section, showing my invention applied to a well drilling rotary; and

Fig. 2 is an enlarged sectional view of a portion of Fig. 1, particularly showing the blow out seal.

In the drawing, the rotary includes a base 2 and a table 3 rotatably supported thereon in the usual manner, said table being driven by suitable gearing including a pinion 4 on a shaft 5. The inner wall 6 of the base 2 has a depending flange 7 carrying the hold-down bearing 8 for the downwardly extending annular portion 9 of the table 3.

Secured to the lower end of the rotatable table extension 9 is a hold-down ring 10 having an upwardly disposed annular flange 11 coacting with a stationary oil retainer ring 12, as set forth in said patent to Fietinghoff et al., the ring 12 being secured to the lower portion of the inner wall 6 of the rotary base.

The open joint between said moving hold-down and stationary oil retainer rings 10 and 12 respectively, is provided with interfitting portions

forming a labyrinth seal 13, but the same does not avoid the necessity for an outer annular clearance opening 14 through which fluid under pressure may enter the rotary and mix with the oil flowing in the base 2 thereof.

To seal this opening, I provide an annular skirt 15 upon the hold-down ring 10 depending below and adjacent said opening 14, having its outer face recessed to contain a flexible sealing ring 16 of rubber or the like. The sealing ring 16 extends laterally beneath and beyond the opening 14, and in close proximity to but normally out of contact with the under surface of a portion of the stationary structure of the rotary base, such as the retainer ring 12. The latter preferably has a smooth machined annular face portion 17 formed thereon to minimize the wear upon ring 16 when in contact therewith.

In operation, and in the event of a blow out in the well, the upwardly rushing gas and foreign matter which would be directed toward opening 14, strikes the flexible sealing ring 16 and deflects the same upwardly against the face 17 to close the opening 14 and effectively seal the interior of the rotary, whether the rotary is stationary or in motion. In addition, when the rotary is in operation, the ring 16 functions as a slinging member, for which purpose it is preferably upwardly and outwardly tapered in cross-section as shown, to form a thin terminal slinging lip at its outer periphery.

Hence, it will be seen that I have provided a blow out seal which is actuated by the force of the blow out, and which is effective under all conditions of operation. My improved seal has the added advantage of being readily applicable to existing rotaries by welding or attaching the flange 15 and applying ring 16 thereto.

Various changes and modifications are contemplated within the scope of the following claims.

I claim:

1. In a well drilling rotary including a rotatable table and a stationary base, a blow out seal therefor including a flexible sealing ring secured to the lower portion of the table structure and extending laterally beneath and beyond the joint between said table structure and an adjacent portion of the stationary base in proximity to the latter, said sealing ring being normally out of contact with said portion of the base and actuated by the force of the blow out into sealing contact with said base portion, and said sealing ring having a tapered cross-section terminating in a peripheral slinging lip.

2. In a well drilling rotary including a rotatable table and a stationary base, a blow out seal therefor including a flexible sealing ring secured to the lower portion of the table structure and extending laterally beneath and beyond the joint between said table structure and an adjacent portion of the stationary base in proximity to the latter, said sealing ring being normally out of

contact with said portion of the base and actuated by the force of the blow out into sealing contact with said base portion, said sealing ring having an outer peripheral edge portion comprising a slinging lip for discharge of fluid therefrom during rotation of the table.

AUGUST R. MAIER.