P. ARBON.

CASING HEAD.

APPLICATION FILED APR. 21, 1919.

1,352,423.

Patented Sept. 14, 1920.

3 SHEETS—SHEET 1.

FIG. 1.

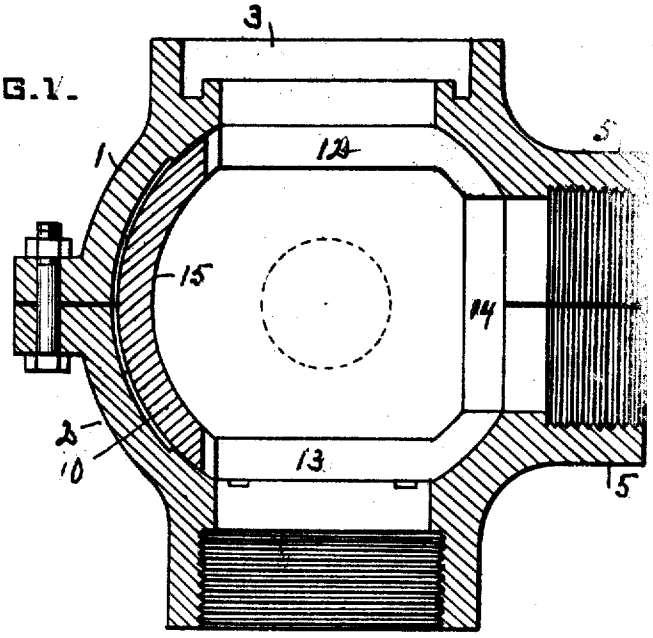
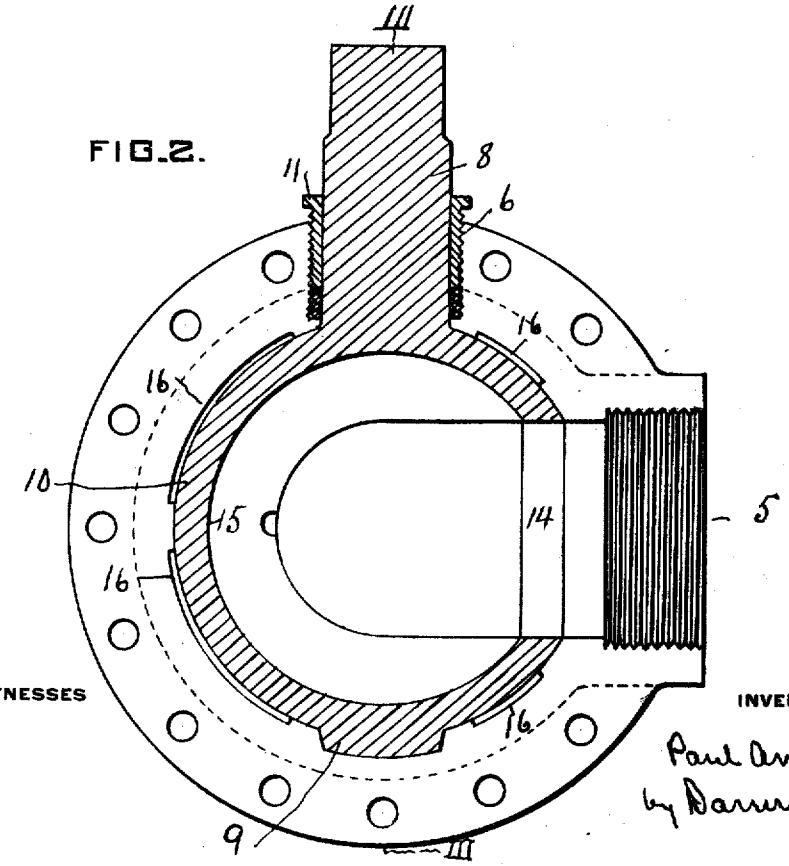


FIG. 2.



WITNESSES

INVENTOR

Paul Arbon

by Darrow & Wolcott

Attys

P. ARBON.

CASING HEAD.

APPLICATION FILED APR. 21, 1919.

1,352,423. **Patented Sept. 14, 1920.**

3 SHEETS—SHEET 2.

FIG. 3

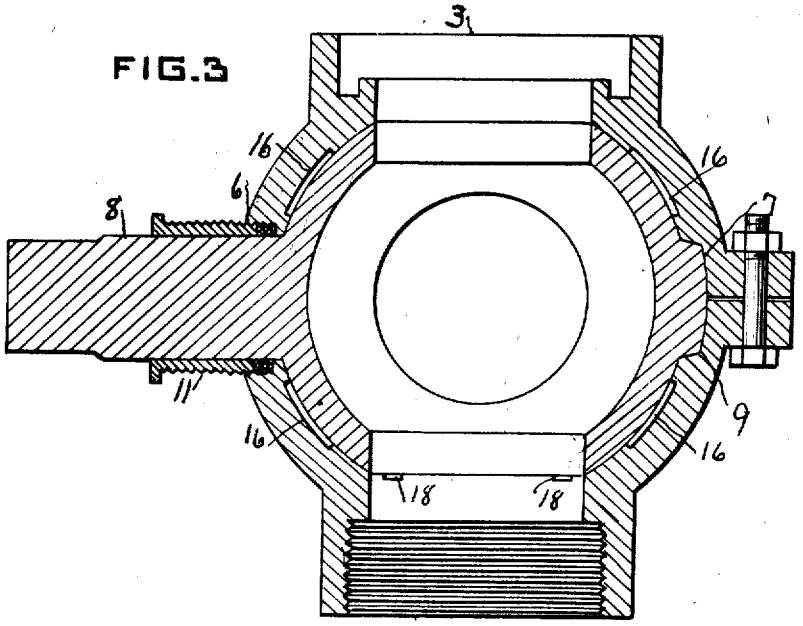
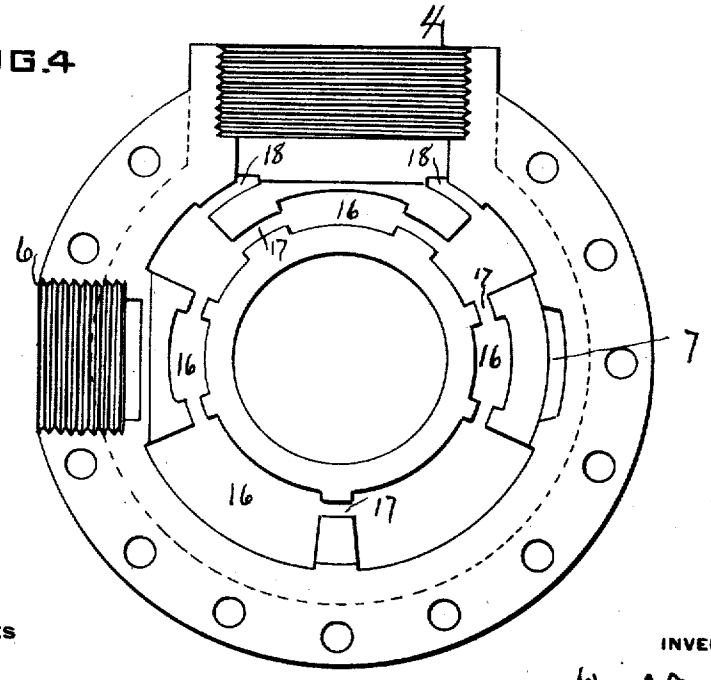


FIG. 4



WITNESSES

INVENTOR

Paul Arbon

by Dominick Wolcott

Atty

P. ARBON.

CASING HEAD.

APPLICATION FILED APR. 21, 1919.

1,352,423.

Patented Sept. 14, 1920.

3 SHEETS—SHEET 3.

FIG.5.

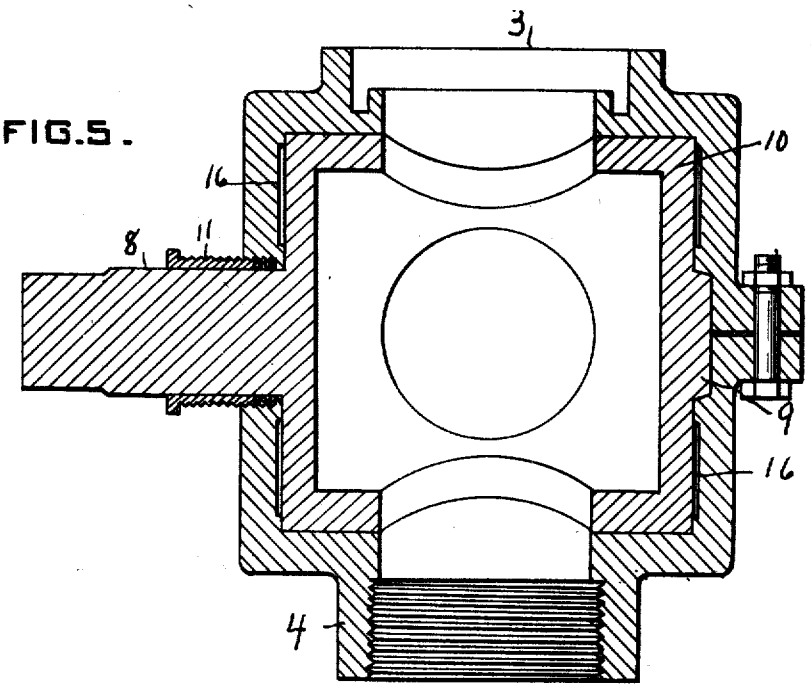
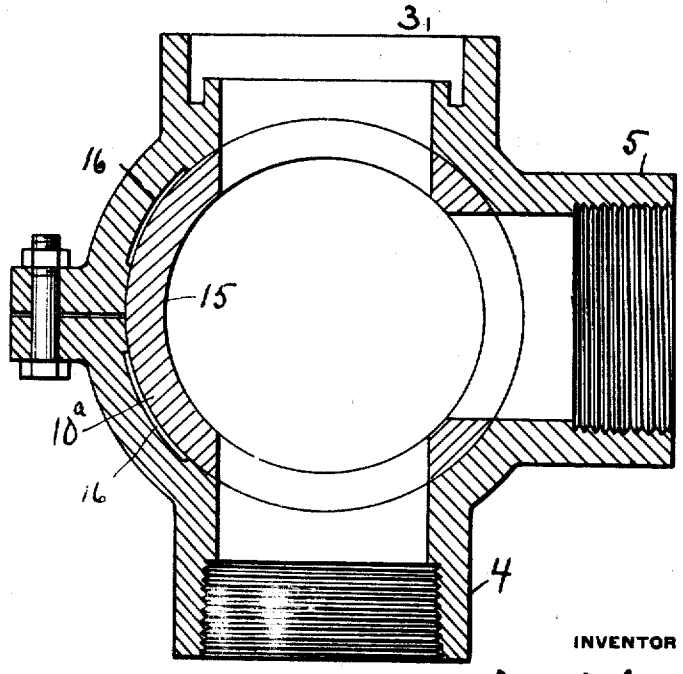


FIG.6.



WITNESSES

INVENTOR

Paul Arbon

by Dennis & Wolcott

attys

UNITED STATES PATENT OFFICE.

PAUL ARBON, OF TULSA, OKLAHOMA.

CASING-HEAD.

1,352,423. Specification of Letters Patent. Patented Sept. 14, 1920.

Application filed April 21, 1919. Serial No. 291,578.

To all whom it may concern:

Be it known that I, PAUL ARBON, residing at Tulsa, in the county of Tulsa and State of Oklahoma, a subject of Great Britain, have invented or discovered certain new and useful Improvements in Casing-Heads, of which improvements the following is a specification.

The improvements described herein relate to what is known in the art as casing heads which are adapted to be secured to the top of oil well casings for the purpose of controlling the escape of oil and gas, such control being effective not only when the tools have been removed but also while the tools are operating in the well. It frequently occurs in drilling wells that the tool will break into the sand containing oil or gas or both under a very high pressure which strikes suddenly on the casing head and renders the shifting of the movable member very difficult at a time when quick closing is necessary to avoid waste and danger.

The invention described herein has for its object a construction of casing in which provision is made for establishing between the movable member and the inclosing shell a pressure equal to that exerted against the inner surfaces of the movable member by the escaping fluids. It is a further object of the invention to construct the movable member with oppositely disposed trunnions having the axes coincident with the axis of movement of the member, and to provide bearings for the trunnions in the inclosing shell. The invention is hereinafter more fully described and claimed.

In the accompanying drawings forming a part of this specification, Figure 1 is a sectional elevation of a casing head embodying the improvements described herein; Fig. 2 is a view showing the one half of the shell in plan and the movable member in section; Fig. 3 is a sectional elevation, the plane of section being indicated by the line III—III, Fig. 2, and Fig. 4 is a plan view of one half of the inclosing shell; Figs. 5 and 6 are views similar to Figs. 1 and 2 illustrating a modification of the construction of casing head.

In the practice of the invention the inclosing case or shell is made in two similar sections, each section having flanges whereby they may be secured together. The shell is provided with nozzles 3, 4, and 5, the entire nozzles 3 and 4 and one half of the nozzle 5 being formed on the respective sections. The nozzles 3 and 4 are arranged so that their axes will be in alinement, while the nozzle 5 is arranged with its axis at right angles to the axes of the other nozzles. The several nozzles are provided with suitable means, as internal threads, whereby the shell may be secured to the well casing and also to the pipe lines. The edge of each section is provided with a semicircular notch 6 at a point ninety degrees from the nozzles and at a point diametrically opposite to the notch which forms a semicircular recess 7. These notches and recesses form, when the sections are placed together, bearings for the trunnions 8 and 9 formed on opposite sides or ends of the movable member 10, the trunnion 8 being extended outside of the shell and serving as an operating stem for the movable member. Leakage around this trunnion 8 is prevented by a stuffing box 11 of any suitable construction. The movable member or valve 9, which may be spherical as shown in Figs. 1 to 4 or cylindrical as shown in Figs. 5 and 6, is made hollow but with ports 12, 13 and 14 so arranged as to be in register with the nozzles 3, 4, and 5 when the valve is in the position shown in Figs. 1, 3, and 5, and also so arranged as to provide a dead wall 15 adapted when the valve is turned on its trunnions to close either one of the ports leading to the nozzles 3 and 5, dependent on the direction in which the valve is rotated.

As shown in the several views and particularly in Fig. 4, shallow recesses 16 are formed in the inner surfaces of the shell sections adjacent recesses being connected by narrow channels 17 and the series of recesses in the section intended to be secured to the well casing, are connected to the nozzle 4 by channels 18, so that fluids escaping from the well may flow through the channels into the recesses. It is preferred that the shallow recesses should extend to the edges of the sections so that the recesses in one of the shell sections will communicate freely with the recesses in the other section. These recesses which as stated are connected to the nozzle 4, are so arranged or located that the fluid in them will bear in such directions on the surface of the valve or movable member that the inner and outer surfaces of the valve will be subjected to equal and oppositely acting fluid pressures

and can therefore be easily turned regardless of the pressure in the well.

It will be readily understood by those skilled in the art, that the movable member may be made spherical as shown in Figs. 1 to 4 inclusive, or cylindrical as shown at 10^a in Figs. 5 and 6. In both forms provision is made for so balancing pressures in the movable member that it can be easily turned.

I claim herein as my invention:

1. A casing head for gas and oil wells having in combination a shell consisting of sections adapted to be detachably secured together, each section having a nozzle and a semicircular projection forming one half of a third nozzle and each section having one half of bearings for trunnions, said bearings being arranged with their axes at right angles to the axes of the respective nozzles, and a rotatable valve having a diametrical passage therethrough and a passage or opening extending at right angles from the diametrical passage and having trunnions with their axes at right angles to the axes of said passages or openings, one of the trunnions extending outside of the shell.

2. A casing head for gas and oil wells, having in combination a shell provided with diametrically arranged nozzles and with a third nozzle arranged at right angles to the other nozzles, the inner wall of the shell having recesses connected to one of the nozzles and a rotatable valve arranged in said shell and having a stem extending through an opening in the shell.

3. A casing head for gas and oil wells having in combination a shell formed in sections adapted to be detachably secured together each section having a nozzle and a semicircular projection forming one half of a third nozzle and each section having one half of bearings for trunnions, the inner wall of each section having recesses so arranged that when the sections are secured together, the recesses in the respective sections will be in communication, and the recesses in one section connected to the nozzle of said section and a rotatable valve having a diametrical passage therethrough and a passage extending at right angles from the diametrical passage and provided with trunnions, one of said trunnions extending outside of the shell.

In testimony whereof, I have hereunto set my hand.

PAUL ARBON.