

Aug. 3, 1926.

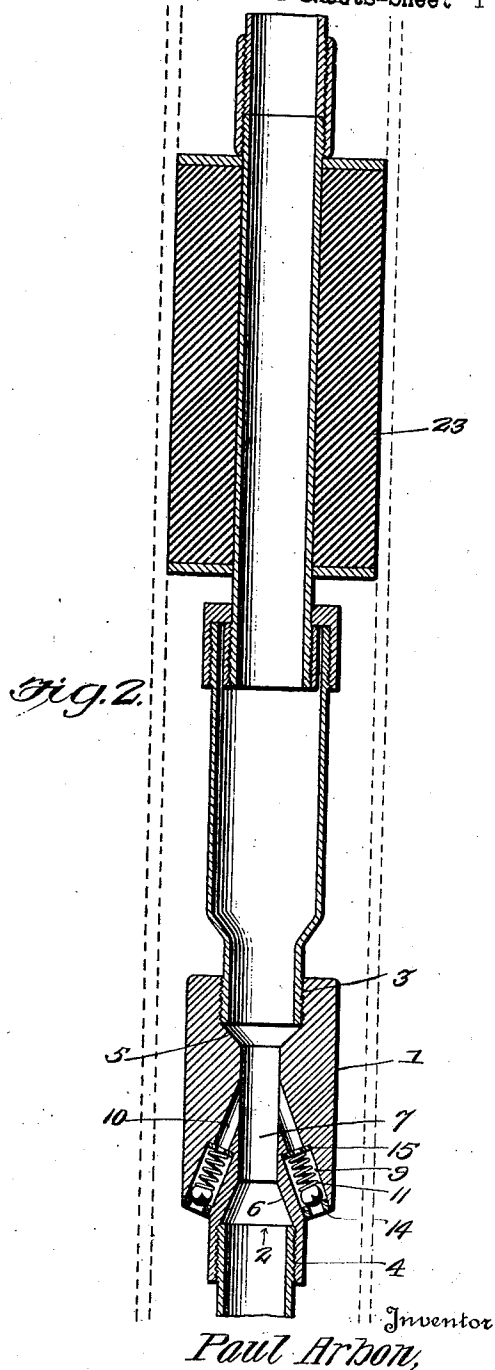
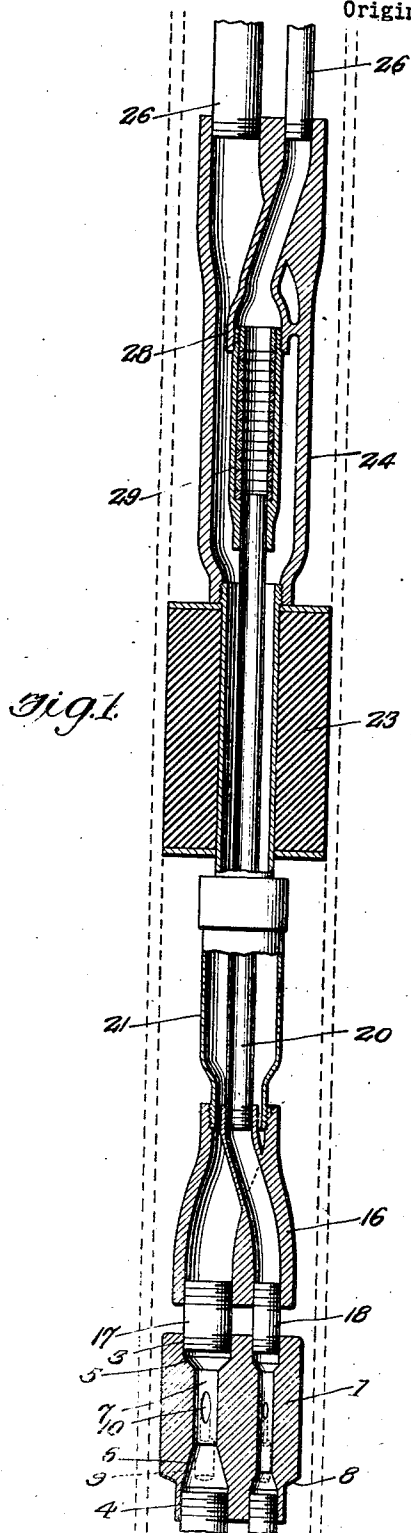
P. ARBON

1,594,809

OIL JET OR EJECTOR

Original Filed Jan. 2, 1923

2 Sheets-Sheet 1



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Fig. 5

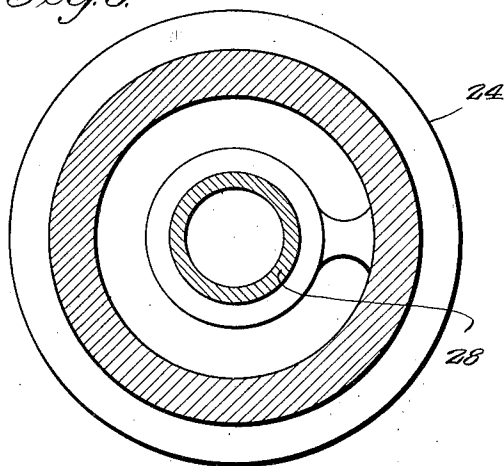


Fig. 4

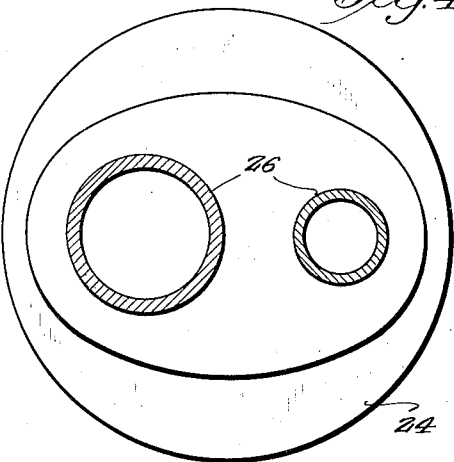


Fig. 6

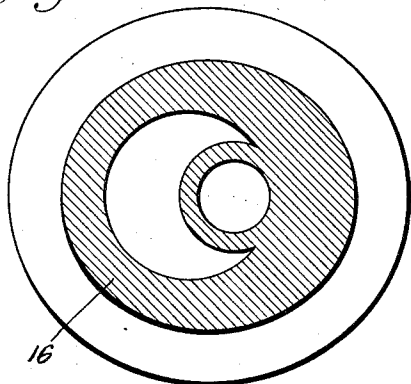


Fig. 3

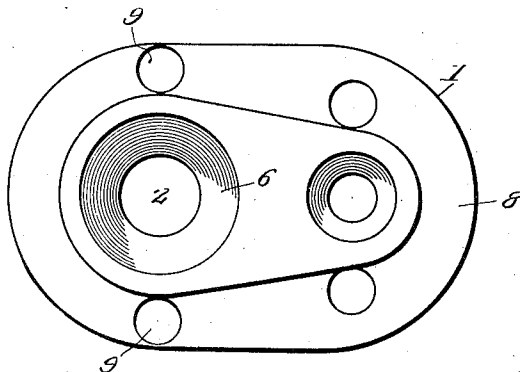
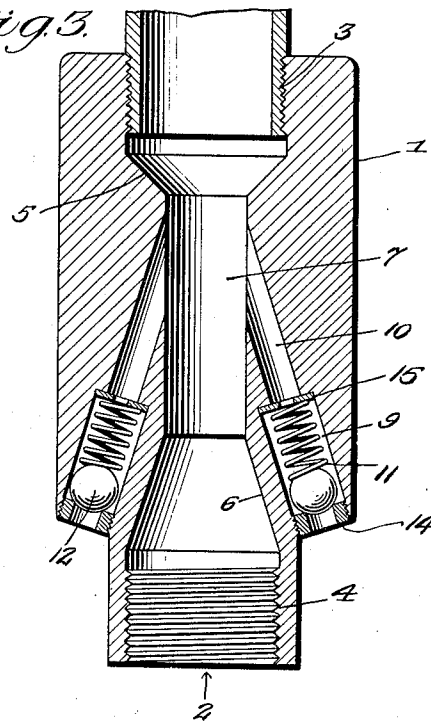


Fig. 7

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Patented Aug. 3, 1926.

1,594,809

UNITED STATES PATENT OFFICE.

PAUL ARBON, OF TULSA, OKLAHOMA.

OIL JET OR EJECTOR.

Application filed January 2, 1923, Serial No. 610,264. Renewed February 3, 1926.

The present invention relates to the construction and arrangement of an ejector or "jet" such as may be utilized in connection with the elevation of crude oil from wells with the assistance of either natural or artificial pressure.

The main object of the present invention is to construct a strong durable mechanism consisting of as few parts as possible, all of which are capable of being adjusted or may be removed for substitution or repair, the adjustments being both with relation to flow and volume.

Another object consists in providing for the application of the present invention to a multiple structure, such a structure being essential in many instances to successful production of oil and gas under the contemplated system.

More specifically the invention includes a tubular casing having a restricted passage or passages, a plurality of inclined ports for each passage, automatic valves in said ports, and means for regulating said valves.

Reference will be had to the accompanying drawings, forming a part of this specification and wherein like numerals of reference designate corresponding parts throughout the several views, in which:—

Figure 1 is a vertical sectional view through a double ejector or jet and including the packer and attending connections.

Figure 2 is a similar view through an ejector of the single type.

Figure 3 is an enlarged vertical sectional view through the ejector shown in Figure 1.

Figure 4 is a top plan view of the multiple jet.

Figure 5 is a transverse sectional view through the upper casting shown in Figure 1.

Figure 6 is a transverse sectional view through the lower casting, and

Figure 7 is a bottom view of the multiple jet.

The jet comprises the body 1 in the form of a casting having a longitudinal central passage 2. The wall of the passage 2 near the ends of the body are formed with internal threads 3 and 4 and inward and adjacent the threaded portions are converged at 5 and 6 to form the restricted passage 7. It will be noted that the upward converging wall 5 is more acute than the lower converging wall 6 the function for which will be more clearly set forth. The lower portion

of the body 1 is of reduced diameter to a point slightly beyond the internal threads 4 to form the annular inclined shoulder 8 shown more clearly in Figure 1 and extending upwardly through this shoulder are the ejector ports or jet passages.

By reference to Figure 2 these ports or passages will be seen to include the enlarged chambers 9 and the smaller ports or passages 10. The chambers 9 extend from the shoulder 8, adjacent which point they are internally threaded for a distance, inwardly to a point beyond the wall 6, and the passages 10 connect the chambers 9 with the restricted passage. The common longitudinal axis of the chambers 9 and the passages 10 are substantially parallel to the wall 6.

Within the chambers 9 are located the coil springs 11 and one end of each of these springs engages and seats the ball valve 14 against its adjustable seat, the opposite end abutting against a washer plate 15. The valve seats are in the form of externally threaded collars, the threads of each valve seat engaging the internal threads of its respective chamber and thus permitting longitudinal movement or adjustment and consequent varying of spring tension.

The washer plates 15 are substantially the diameter of the chambers and abut against the upper shoulder or face of the latter, the central openings in the washers registering with the smaller passages 10. Obviously by utilizing a washer with a smaller or larger central opening the volume of flow through the ports can be regulated, within the scope of the volume permitted by the passage.

Due to the construction and arrangement of parts a single or multiple jet arrangement may be provided, the term jet embodying an entire operating unit, i. e., the central passage and the controlling ports. In Figure 1 the jet is shown to be of the multiple type, and the use of such a multiple jet is more fully set forth in a co-pending application filed January 2, 1923, Serial Number 610,265. For the sake of illustration, however, an assembly of parts are disclosed and includes the packer 23, the casing 16 with dual passages and nipples 17 and 18 connecting same with the double jet. From the casting 16 concentric pipes 20 and 21 extend through the packer 23, where again a dual passage casting 24 is provided to permit the connection of conducting pipes 26. In this casting 24 attention is directed to the con-

nection between the central pipe 20 and the threaded projection 28. Within this connection are arranged a series of brass rings 29 through which the pipe 20 travels in seating the packer. Obviously this packing eliminates leakage and provides a suitable bearing for the tube.

What I claim as new and useful and desire to secure by Letters Patent, is:—

10 1. A jet flower comprising a tubular casing having a restricted passageway intermediate its ends and a threaded portion at its lower end of larger diameter than said passageway, a plurality of oppositely disposed straight ports extending upwardly and inwardly to said restricted passageway from the bottom of the casing, and means for controlling the passage of fluid through said ports.

20 2. A jet flower comprising a casing having a longitudinal central passageway, the wall of said passageway gradually converging upwardly from the bottom of the casing to form a restricted portion, a plurality of oppositely disposed straight ports extending from the bottom of the casing through the casing parallel to said converging wall and terminating in said restricted portion, and valves controlling the passage of fluid through said ports.

30 3. A jet flower comprising a casing having a longitudinal passageway, the wall of said passageway gradually converging upwardly from the bottom of the casing to form a restricted portion in said passageway, oppositely disposed straight ports extending upwardly and inwardly from the bottom of the casing and terminating within the restricted portion of said passageway, and control valves for said ports.

40 4. A jet flower comprising a body having a longitudinally extending passageway, and upper and lower threaded portions, the lower threaded portion being of reduced diameter, thereby forming an external annular shoulder arranged substantially at right angles to the axis of said passageway, a restricted portion in said longitudinal passageway formed by a wall converging upwardly from the reduced threaded portion, a plurality of oppositely disposed straight ports projecting upwardly and inwardly from said shoulder, extending substantially parallel to said converging wall, and terminating at said restricted passageway portion, the axes of said passageway and ports intersect-

ing at a common point and spring controlled valves for regulating the flow of fluid through said ports.

5. A jet flower comprising a body portion having upper and lower threaded ends, a Venturi-shaped passageway formed in said body between the threaded ends, said body being provided with shoulders arranged at opposite sides of the passageway and having their lower surfaces in planes arranged substantially at right angles to the axis of the passageway, upwardly converging straight ports extending from the shoulders to the reduced portion of the Venturi shaped passageway and having their axes intersecting the axis of the passageway at a common point, and valves controlling said ports.

6. A jet flower comprising a body portion having upper and lower threaded ends, a Venturi-shaped passageway formed in said body between the threaded ends, said body being provided with shoulders arranged at opposite sides of the passageway and having their lower surfaces in planes arranged substantially at right angles to the axis of the passageway, upwardly converging ports extending from the shoulders to the reduced portion of the passageway and having their lower end portions enlarged, annular shoulders arranged between the upper and lower end portions of the ports, removable apertured disks arranged in the ports and abutting against the last mentioned shoulders, valve seats screwed into the lower ends of said ports, valves in the ports adapted to engage said seats, and springs arranged in the ports and bearing against said disks and said valves.

7. A jet flower comprising a casing having a longitudinal central passageway, a straight port extending from the bottom of the casing upwardly and inwardly and terminating in said passageway, said port having an enlarged lower end portion, a shoulder in the port between the upper and lower end portions of the same, a removable apertured disk arranged in the port and abutting against said shoulder, a valve seat detachably arranged in the lower end portion of the port, a valve in the port engaging said seat, and a spring in the port bearing at one end on said disk and at the opposite end on said valve.

In testimony whereof I affix my signature.

PAUL ARBON.