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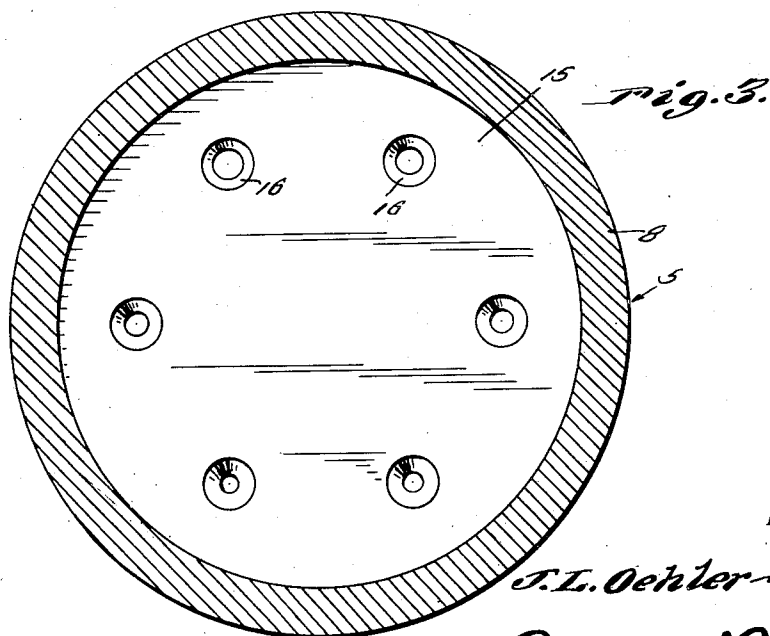
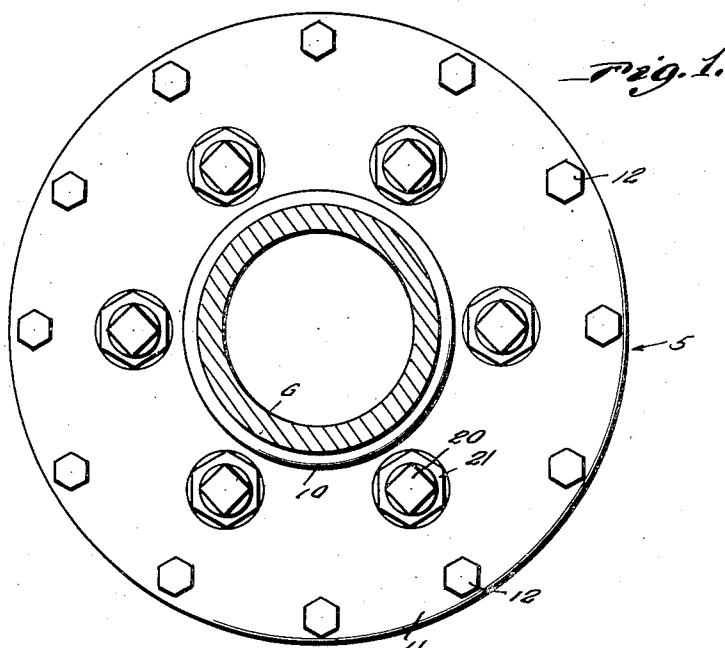
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FLOW REGULATING MEANS FOR OIL WELLS

Filed Feb. 11, 1938

2 Sheets-Sheet 1



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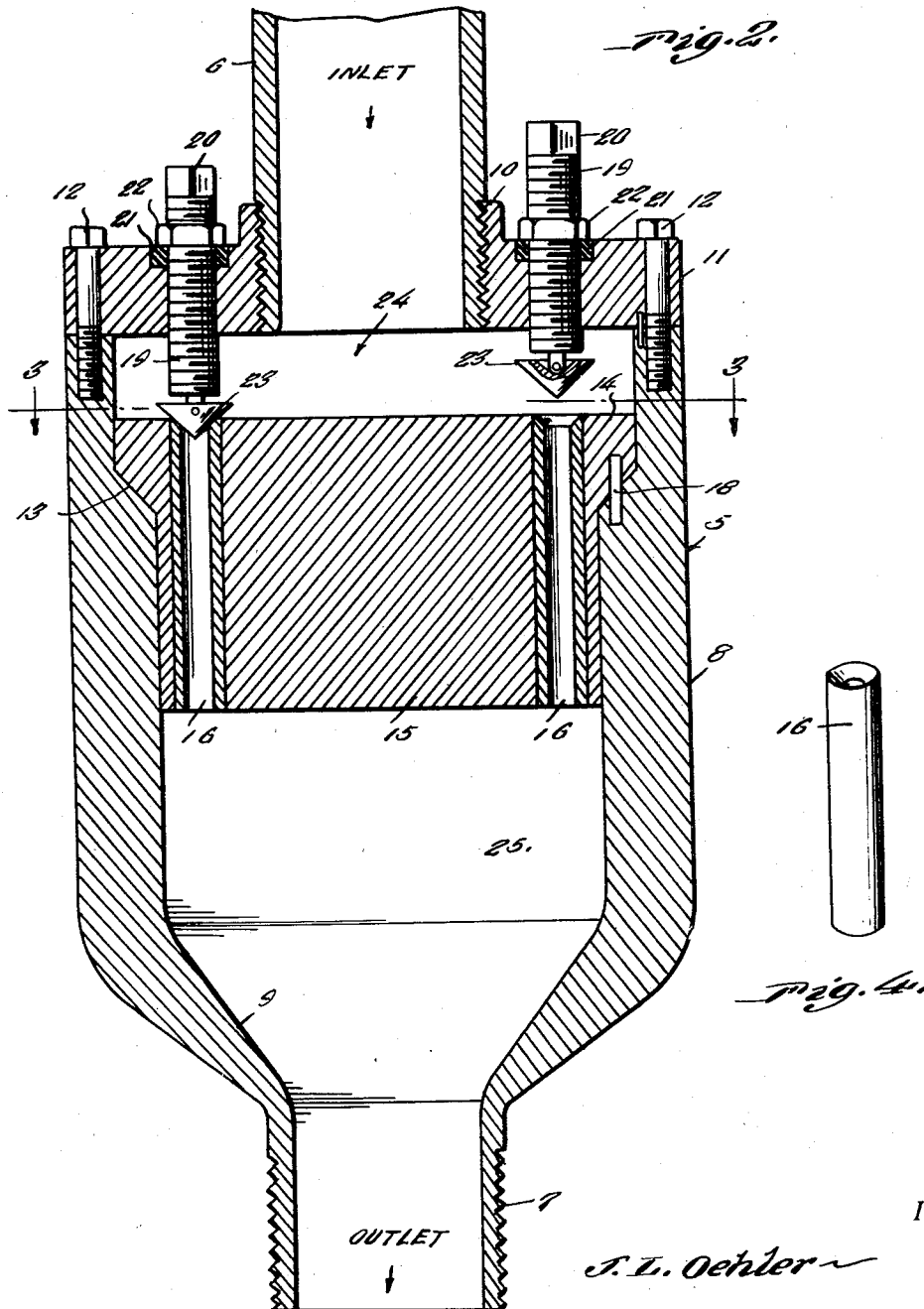
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FLOW REGULATING MEANS FOR OIL WELLS

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UNITED STATES PATENT OFFICE

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FLOW REGULATING MEANS FOR OIL WELLS

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Application February 11, 1938, Serial No. 190,116

3 Claims. (Cl. 277—57)

This invention relates to manually adjusted oil flow control and regulating means designed for use as a component part of what may be generally referred to as an oil well, and the principal object is to enable the attendant to restrict and have complete control of the flow and to increase and decrease the quantity and velocity without closing down the well to do so.

Briefly, the preferred embodiment of the invention is characterized by an especially constructed valved jointing unit or coupling for adjoining complementary pipe sections in the line, said unit having incorporated therein a plurality of selectively usable valves, all or any one of which may be utilized to adjust and determine the flow of oil through said lines.

Visualized with greater particularity, the invention comprises a novel nipple construction having therein a multiple bored partition or choke plate, there being associated with said plate a multiple valve carrying head provided with self adapting selectively usable valving means.

Other features and advantages will become more readily apparent from the following description and the accompanying illustrative drawings.

In the drawings:

Figure 1 is what may be conveniently called a top plan view of the assembly seen in Figure 2.

Figure 2 is a central vertical section through the arrangement depicted in Figure 1, portions being in elevation for adequate and satisfactory illustration.

Figure 3 is a horizontal section taken on the plane of the line 3—3 of Figure 2.

Figure 4 is a detail perspective view, of one of the bore lining inserts.

Referring now to the drawings by distinguishing reference characters, it will be observed that the nipple style coupling device, as a unit, is denoted by the numeral 5. One section of the pipe line 6 is connected thereto and constitutes the inlet. The other pipe section (not shown) is connected to the nipple per se forming the outlet and indicated at 7. The cylindrical body portion 8 is properly tapered and reduced as at 9 to merge into the outlet 7, this being in longitudinal alignment with the pipe 6. The threaded end of the pipe 6 is tapped into a screw-threaded collar 10 formed centrally in the annular closing head 11, the latter part being bolted to the shell or wall of the casing as indicated at the point 12. That part of the body 8 to which the annular head 11 is bolted is slightly reduced in thickness to form a shoulder as at the point

13 and this shoulder serves to accommodate the flanged or shouldered end 14 of the removable adapter plate or partitioning member 15. This part 15 is a heavy steel disk of considerable thickness and the same is provided eccentrically with a bore. In each bore is a tubular insert 16. Each insert 16 is renewable and composed of a suitable hard alloy metal. These inserts (preferably tungsten carbide, or perhaps a special steel ebonite rubber) can be driven out and replaced to change the diameter of the bore or passage as desired. The shoulder portion 14 is properly matched and appropriately connected to the shoulder portion 13 by way of dowel pins or the like 18. Then too, similar dowel pins 17 are employed between the annulus 11 and the body 8. The use of one or more dowel pins 18 is perhaps a necessary adjunct in that the annulus 11 must accurately fit the body at the exact or predetermined point, in order to line up properly with the divider plate. In some instances, the elements 20 are numbered (not shown) to indicate the size of the bore or openings therebeneath. Consequently, the respective dowel pins 17 and 18 facilitate accurate assembling and matching of the coordinating features.

The detachable and renewable closing head or annulus 11 is provided with screw-threaded holes in alignment with the lined passages in the partitioning or divider plate 15. Adjusting screws 19 having tool-ends 20 are threaded into these holes. A suitable packing gland 21 is utilized and a tight adjustment is maintained by the associated lock nut 22. On the stem on the inner end of the adjusting screw is a pivoted conical valve element 23, this being self-leveling and therefore self-adapting to adjust itself to the concave valve seat ring 17.

It will be observed that the central portion of the divider or partitioning plate 15 is imperforate. It is the marginal or peripheral portion which is provided with the especially lined fluid passages. Moreover, there is a valve for each passage and it is possible to completely close, completely open, or partially close any one of the passages 16. Thus the oil, as it flows into the unit 5 by way of the inlet pipe 6, is trapped in the chamber 24 and its passage into the outlet chamber 25 is determined or regulated by the opening or closing of the various passages 16.

By using the shouldered hard metal and sturdy block 15 and removably fastening it in the shouldered cylindrical housing or casing 8, it may be removed and cleaned or replaced. The various bores can be repaired by simply driving out the

lining sleeves 16 and replacing them with new ones. Then too, the individual self-leveling or adapting valve devices are renewable and replaceable as is the complete head 11. Moreover, by
 5 having definite control of the flow of the fluid at all times through the medium of this device, repairs in the fluid line may be made expeditiously to the mutual advantage of all concerned.

It is thought that the description taken in connection with the drawings will enable a clear understanding of the invention to be had. Therefore, a more lengthy description is thought unnecessary.

While the preferred embodiment of the invention has been shown and described, it is to be understood that minor changes coming within the field of invention claimed may be resorted to if desired.

I claim:

- 20 1. A flow control coupling of the class described comprising a body cylindrical in cross section and reduced in diameter at one end and terminating in a screw threaded attaching nipple, the opposite end being open and provided with an
 25 internal abutment shoulder, a disklike block fitting into said coupling and having a shoulder engaging first named shoulder, said block having a plurality of eccentric circumferentially spaced fluid passages extending therethrough,
 30 the outer end of said block terminating inwardly of the adjacent end of the body, an annulus detachably bolted on the open end of said body and constituting a closure and having a central screw threaded pipe attaching collar, and a plurality
 35 of eccentrically mounted individually adjustable screws threaded in said annulus and extending into said body and provided on their inner ends with self-adapting conical valve heads cooperable with said passages.
- 40 2. In a flow regulating coupling for oil wells, a hollow body having a pipe line accommodation outlet nipple at one end, a removable closing

head at the opposite end, said head being provided with means for operative connection of the inlet pipe thereto, said head being marginally provided with a plurality of circumferentially spaced screw-threaded holes, a partition mounted in the body intermediate the ends thereof and disposed parallel to said closing head, said partition having circumferentially spaced holes in registry with holes in said head, individual renewable and removable bushings mounted in the holes in said partition, the normal upper ends of said bushings being provided with conical valve seats, a screw-threaded valve operating bolt in each of the threaded holes in said head, the outer end of the bolt being readily accessible and disposed eccentrically with respect to the inlet pipe connection, and a conical self-adapting and seating valve head on the inner end of each bolt disposed for coaction with the adjacent valve seat on the complemental bushings.

3. A flow control and coupling unit adapted for disposition between the pipe ends and comprising a coupling having an outlet nipple attachable to one pipe, the opposite end of said coupling being open and provided with an internal abutment shoulder, a partitioning block fitting into said coupling and having a shoulder engaging the first named shoulder, said block having a plurality of eccentric circumferentially spaced fluid passages extending therethrough, the valving face of said block terminating inwardly of the adjacent end of the coupling body, an annulus detachably bolted to the open end of said body and disposed in parallelism with said block and having a central screw-threaded pipe attaching collar, and a plurality of eccentrically mounted individually adjustable screws threaded in said annulus and extending into the body and provided on their inner ends with self-adapting valve heads cooperable with said passages.

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