

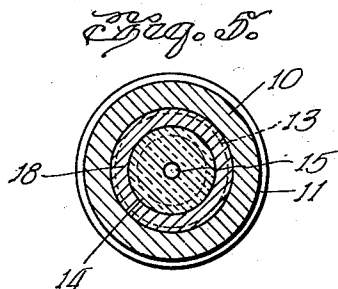
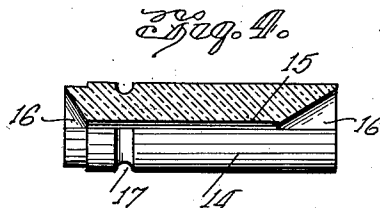
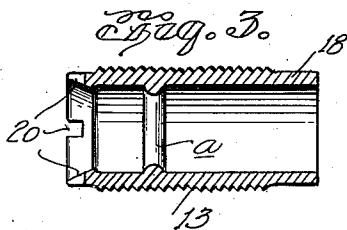
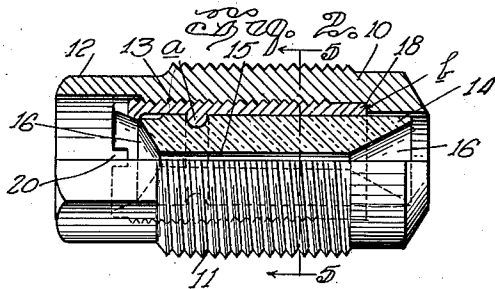
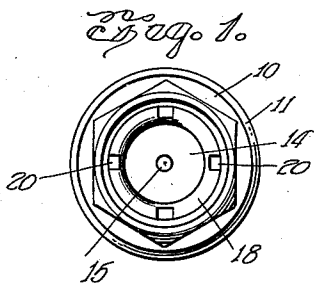
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E. G. SCHICK

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OIL WELL CHOKE

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OIL WELL CHOKE

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2 Claims. (Cl. 138-40)

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This invention relates to oil producing wells and more particularly to chokes or flow nipples for such wells.

In flowing wells under their own pressures, it has long been the practice to constrict the flow of oil by constraining the same to pass from the well tubing through a choke and the quantity of oil so delivered is predetermined by the fixed diameter of the choke orifice. These chokes usually consist of a shell containing a core of hardened steel and sometimes of glass, calculated to resist abrasive wear caused by sand entrained in the liquid emerging from the tubing under high pressure. However, cores of hardened steel and glass are found to erode quickly and frequent replacement of worn chokes is necessary if predetermined production of oil is to be maintained.

It is therefore the principal object of the invention to provide an oil well choke having a replaceable core possessed of greater wearing qualities than any heretofore employed and to accomplish this end, a core is produced from a ceramic containing as nearly 100% alumina as obtainable, having a compression strength of approximately 350,000 pounds per square inch. About this core is formed a bushing of aluminum by molding in molten condition after heating the ceramic core to approximately 2000° F. in the mold. Under this temperature, the aluminum silicon alloy of the bushing forms an inseparable bond with the ceramic core and leakage between the core and bushing is rendered impossible and at the same time, abrasive wear upon the core when put into use, will be negligible.

Another object of the invention is to provide an oil well choke operative as a bottom hole or surface choke which is economical not only from the standpoint of manufacture but continues as a medium of economy by effecting a material saving in shut-down time ordinarily consumed in replacing worn chokes. As a conservation measure, an oil and gas ratio may be maintained over longer periods of time by installing the invention as a bottom hole choke since its wearing qualities increases the interim between replacement.

With the foregoing objects as paramount, the invention has further reference to certain features of accomplishment which will become apparent as the description proceeds, taken in connection with the accompanying drawing wherein:

Figure 1 is an end view of a choke embodying the invention.

Figure 2 is a side elevational view, partly in vertical section.

Figure 3 is a side elevational view of the alumi-

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num bushing per se in longitudinal section.

Figure 4 is a side elevational view of the ceramic core per se, partly in longitudinal section, and

5 Figure 5 is a view of the choke in transverse section, taken on line 5-5 on Figure 2.

Continuing with a more detailed description of the drawing, reference is made primarily to Figure 2 wherein numeral 10 denotes an adapted 10 or shell which may be of any required external shape or design which, in the present case includes threads 11 and a hexagonal end 12 to receive a wrench. The interior of the shell 10 is threaded at 13 for a purpose to be hereinafter 15 described.

A replaceable core for the shell 10 is composed of a pre-cast ceramic body 14. The ceramic may be a composition of a variety of clays and their analysis such as alumina which must comprise 20 as nearly 100% of the composition as possible. This material, which is basically pure corundum, barite, zircon, silica and other minerals, has been selected for its tensile and compression strength, approaching approximately 350,000 25 pounds per square inch. Moreover, the material is non-absorptive; is unaffected by high temperatures and has a low co-efficient of expansion which renders it superior to any known substance for the purpose herein specified, of comparable 30 economy of production and fabrication into the desired form.

The body 14 has an orifice or passage 15 extending axially therethrough, opening at each end into conical recesses 16 in each end of the body 14. The diameter of this opening 15 deter- 35 mines the quantity of liquid delivered from the well and has the further effect of conserving natural well pressure and minimizes difficulties usually encountered in sanding up. The body 14 40 further has an annular recess or groove 17 near one end thereof to serve as an anchoring medium for a bushing 18 in a manner to become apparent presently.

The bushing 18 of non-ferrous metal, preferably silica aluminum alloy is formed in a mold (not shown), about the ceramic body 14. This may be accomplished in different ways, such for example as by a mold in which threads are already 45 formed to cast the threads 13 on the exterior of the bushing, or by forming the bushing in a smooth walled mold, allowing stock for subsequent tooling and threading. This element is placed in a mold of a design calculated to form the metal bushing 18 as illustrated and the mold is grad- 50 ually heated to the temperature stated, allowing

about 30 minutes in the process. After attaining the required temperature, the metal for the bushing 18 is melted and poured into the mold, after which the latter is permitted to cool, whereupon the fused elements are removed from the mold and the bushing is threaded, unless threads are provided in the mold, and otherwise finished for mounting in the shell 10, as shown.

The annular groove 17 of the ceramic body 14 will receive the molten metal α of the bushing 18 as a positive insurance against leakage between the body and bushing although the solid solutions formed by fusion render this likelihood highly improbable.

It is apparent from the foregoing that should the orifice 15 of the ceramic body 14 finally become enlarged by the erosive action of abrasives entrained in the oil, replacement of the core may be easily and quickly effected by inserting a proper tool into the recesses 20 in one end of the bushing 18 and thereby removing the same from the shell 10. When a new core is installed in the shell, the inner end thereof bears against a shoulder b in the latter as a stop.

Manifestly, the construction as shown and described is capable of some modification and such modification as may be construed to fall within the scope and meaning of the appended claims is also considered to be within the spirit and intent of the invention.

What is claimed is:

1. An oil well choke including an interiorly threaded adapter shell, a replaceable core consisting of a ceramic body having an alumina content of substantially 100% and provided with an axial bore, and a non-ferrous bushing inseparably fused about said body, said bushing being threadedly retained in said shell.

2. An oil well choke comprising an interiorly and exteriorly threaded shell, a core comprised of a ceramic body having an axial bore and composed chiefly of aluminum oxide and a bushing receivable on said shell consisting of aluminum silicon alloy inseparably bonded to the exterior of said body, said bushing being threadedly retained in said shell.

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