

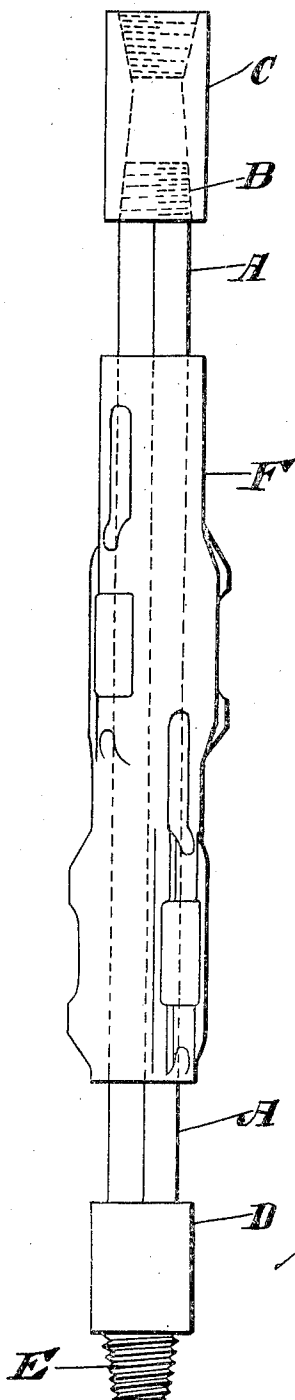
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WELL REAMER

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WELL REAMER

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1 Claim. (Cl. 255—73)

My invention is an improvement in drilling and other tools used in the drilling and operation of oil, gas, and other wells; having built into said improvement the function of a jar without the use of links or mechanical springs.

The principal use, or object, of my invention is to provide a device, or tool, of this character that is positive in action, simple and inexpensive in construction. A new, novel, and easily operated tool, that is strong, durable, reliable, and useful. That will obviate and avoid the costly and dangerous conditions that now exist in the drilling and operating of oil, gas, and other wells.

In the drilling of deep oil, gas, and other wells, the only approved apparatus now in use is the rotary drill. This consists of iron or steel sectioned hollow pipe, or stem, having rotary movement by reason of steam, or other power, applied at the top of the well. To the lower end of such stem or drill-pipe is attached a bit or other tool.

In practically all such drilling, a reamer is attached to such stem, or drill-pipe, both the bit and reamer being larger in circumference than the stem or drill-pipe.

It is the history of rotary drilling that on all too many occasions the tools get stuck in the hole. When this occurs, occasioned by a cave-in, or the formation of a crust or cone, above the reamer or bit, it is rarely discovered until the tools are being taken out. This upward movement in taking the drill-pipe and tools out of the well draws the reamer into the obstruction, and when such obstruction is of sufficient density as to stop such upward movement, the ominous cry of "tools stuck" is heard.

When these incidents occur, the method commonly practiced; and practically the only method, of removing the tools is by main force to pull the reamer and bit through the obstruction. When this upward pull is exerted, one of four things happen; you pull through; you pull down the crown-block; you collapse the derrick, or you break the drill-pipe or stem above the obstruction.

Since the inception of rotary drilling, the drilling fraternity has been seeking a practical method, or tool, that would utilize that principal used in standard drills, the jar. A device that could be made a part and parcel of rotary drilling, that could be utilized as a part of standard equipment in the everyday drilling as distinguished from a fishing tool, that would provide a means of forcing such drill-pipe, or stem, and the reamer and bit down, thus freeing same from the obstruction blocking its upward movement.

Referring to attached drawing: A refers to a mandrel. It is here shown as hexagon in form;

it may be any non-circular form, or used as a spline, depending on the character of tool desired and the depth of the hole, or well, contemplated. This mandrel has a center circular opening, conforming to that of the drill-pipe, or stem, irrespective of shape or style mandrel used. The mandrel is of smaller exterior diameter than the drill-pipe or stem.

B refers to the threaded tapered upper end of the mandrel, intended to co-engage box or bumper, C, box C being of greater external diameter than the mandrel, but of the same diameter as the drill-pipe. D shows the bottom bumper, being an integral part of the mandrel, but sized to conform to the size of the stem, or drill-pipe but being of greater external diameter than the mandrel. E shows the threaded tapered lower end of mandrel, intended to co-engage the bit or other tool used, or to extend the drill-pipe.

F shows the block or reamer equipped with projecting drag teeth. Instead of drag teeth the reamer may be equipped with cutter wheels, scrapers or a stabilizer. This block F is shown as having a hexagonal center opening to conform to the hexagonal mandrel. In use, this opening may be in any non-circular form, or made to conform to a spline mandrel (see A). When block F (or any other tool) is mounted upon mandrel A, said block F has a vertical reciprocation upon said mandrel A. This vertical movement between C and D being in this drawing shown as 18 inches. This factor is also optional, depending like the mandrel, upon size of well, depth desired, and formation of soil encountered.

In drilling (or going down in the well), block F (or other tool used) contacts and rides against the lower end of box C. When the drill pipe or stem is being withdrawn from the well, block F contacts and rides against the upper end of bumper D.

I claim, when and if said reamer block F becomes wedged, or stuck, that at that time, by reason of the vertical movement of the mandrel through said block F, the drill pipe or stem can be raised (in this diagram) 18 inches and the weight of the entire drill-pipe or stem (depending on the depth of the well) or so much weight as desired, may be expended by said box C contacting block F thus providing the jar required to loosen said block F.

I claim:

In combination with a drill string for rotary drilling, a reamer slidably mounted on said drill string, means to prevent relative rotation between said drill string and said reamer, and means to jar said reamer.

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