BIT BREAKER AND HANDLE

BACKGROUND OF THE INVENTION

The drilling of boreholes with a rotary drilling rig requires that a drill bit be attached to or removed from the end of a tubing string from time to time. Drill bits are extremely heavy and difficult for roughnecks to handle. Usually one or more people are required for the difficult task of manually screwing the bit onto or off of the end of the tubing string.

It has been proposed to use a bit breaker wherein a plate member is apertured and provided with lugs for engagement with the external flow passageways formed exteriorly of a bit. However, such a tool is dangerous to use in proximity of the borehole for the reason that the bit could inadvertently be dropped to the bottom of the wellbore. This is a catastrophic event in the oil field and calls for an expensive fishing job to be carried out by experts.

It would, therefore, be desirable to have made available a tool which could be placed in the rotary table, and within which the drill bit could be safely seated in such a manner that the bit is precluded from falling into the borehole, and at the same time, the bit is controllably rotated in either direction. Such a novel and desirable combination of apparatus would enable the bit to be made up and broke out respective to the drill tubing in a safe and reliable manner. Moreover, it would be convenient if a removal handle could be attached to the bit in a manner which would enable the bit to be lifted and manipulated by two people. Such a desirable combination is also the subject of the present invention.

SUMMARY OF THE INVENTION

The combination with a drill bit, rotary table, and drill tubing of a bit breaker apparatus. The apparatus preferably is in the form of a plate having an outer geometrical configuration which conforms to the general configuration of the kelly drive of a drilling rig so that as the turn table rotates, the plate member rotates therewith.

An axial passageway is formed through the plate member through which the lower marginal end of the bit can be telescopingly received. Circumferentially spaced apart lugs project radially inwardly from the plate member and towards the axial centerline of the passageway. The lugs are of a size to be slidably received in close tolerance relationship within the lower marginal length of the external bit passageway. The bit passageway is reduced in width at the marginal outlet end thereof so as to form a shoulder which abuttingly engages the lugs.

The plate member is seated within the kelly drive of a turntable, the bit is telescopingly received and supported by the plate member. The drill tubing is held stationary as the turntable makes up or breaks out the bit respective to the drill tubing.

A sub combination of the present invention provides opposed radial counterbores formed into the main body portions of the bit. The counterbores receive the marginal end of a handle so that the bit can be easily manipulated by two roughnecks.

Accordingly, a primary object of the present invention is the provision of method and apparatus for making up and breaking out drill bits by employment of the turntable of the drilling rig in order to rotate the bit respective to the drill tubing.

Another object of the present invention is the provision of a bit breaker in combination with a bit, drill tubing, and rotary drilling rig by which the bit can be safely held within the turntable and rotated respective to the drill tubing.

A still further object of the present invention is the provision of a sub combination comprising opposed counterbores formed within the main body of the bit which removably accepts a plurality of handles to enable the bit to be manipulated.

Another and still further object of the present invention is the provision of an adaptor tool by which a drill bit is releasably held respective to the turntable of a rotary rig so that the bit can be made up and broke out respective to the drill tubing.

An additional object of this invention is the provision of a drill bit in combination with a bit breaker tool by which a drilling rig turntable can be used to make up and break out a bit respective to a drill tubing string.

These and various other objects and advantages of the invention will become readily apparent to those skilled in the art upon reading the following detailed description and claims and by referring to the accompanying drawings.

The above objects are attained in accordance with the present invention by the provision of a method for use with apparatus fabricated in a manner substantially as described in the above abstract and summary.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a fragmentary, part cross-sectional, side view of one embodiment of the present invention;

FIG. **2** is a bottom view of the bit disclosed in FIG. **1**;

FIG. **3** is a cross-sectional view taken along line **3—3** of FIG. **1**;

FIG. **4** is an enlarged, fragmentary, detail of part of the apparatus disclosed in FIG. **1**;

FIG. **5** is an enlarged, side elevational view of part of another embodiment of the present invention; and,

FIG. **6** is a reduced, part diagrammatical, part schematical representation of one embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

In FIGS. 1–3 of the drawings, there is disclosed a bit **10** in combination with a bit breaker **12**, both of which are made in accordance with the present invention. The bit breaker is seen to be received within the kelly drive **14** of a conventional turntable of a drilling rig. The bit includes the usual threaded pin end **16** to which there is threadedly engaged a string of drill tubing **17**.

The bit enlarges into a boss **18** which further enlarges into a main body portion **20**. The bottom of the bit has a cutting face **22** and **23** formed thereon, and may include diamond stud assemblies and the like, as exemplified by my co-pending patent application Ser. No. 170,901 filed July 21, 1980.

A plurality of external passageways **24** are radially spaced about the bit. The passageways outwardly open away from the bit and admit the flow of drilling fluid and cuttings across the bit and back uphole, as is known to those skilled in the art.

It will be noted that external passageways **24** are quite different from other external passageways **26**, the latter