OIL WELL AGITATOR

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This invention relates to an improved oil well agitator tool and one object of the invention is to provide a device capable of being attached to a drill stem between the stem and a bit and by means of which material in the bottom of an oil well may be thoroughly agitated and a good flow of oil assured.

Another object of the invention is to provide a device for the purpose of agitating or mixing sand, paraffin, cavings or other sediment which may accumulate in the bottom of an oil or gas well so that it can be bailed out with a bailer or sand pump.

Another object of the invention is to form the agitator that, when it is in use, a pumping action may take place and material of a liquid or semi-liquid nature in the bottom of an oil well alternately sucked into and forced out of a barrel forming part of the attachment. By this arrangement a very thorough agitation will take place and the walls of a well and a screen about the lower portion of a well casing kept clear of sand and other substances liable to cause clogging of the well.

Another object of the invention is to provide a device of this character which is extremely simple in its construction, very easy to apply and not liable to get out of order.

The invention is illustrated in the accompanying drawing, wherein:

Figure 1 is a longitudinal sectional view through the agitator showing portions thereof in elevation, and

Figure 2 is a transverse sectional view taken on the line 2—2 of Figure 1.

The improved oil well agitator is adapted to be suspended from the lower end of a drill stem or bar 1 and consists briefly of a barrel 2, piston or plunger 3 and a sub or coupling 4 serving as a closure for the lower end of the barrel and also constituting a socket or coupling for engagement with the upper end of a bit 5.

The barrel consists of a tube formed of steel or any other desired strong metal and may be of any length and diameter desired. The tube is circular in cross section, as shown in Figure 2, and adjacent its upper and lower ends is bored to form side openings 6 and 7.

These openings are formed in spaced relation to the upper and lower ends of the barrel and are spaced from each other circumferentially thereof. It will be understood that, while four openings have been shown near each end of the barrel in the present illustration, any number desired may be provided. The upper portion of the barrel above the openings 6 is internally thickened to form a bushing 8 which fits snugly about the piston and serves not only as a guide for the piston but also constitutes a closure for the upper end of the barrel about the piston.

The piston is also preferably formed of steel or other strong metal and is of an even diameter throughout the greater portion of its length so that it may slide easily through the bushing 8. The lower end of the piston is reduced in diameter to form a neck 9 about which are disposed a cup or washer 10 of fiber or any other suitable material and washers 11 of steel or other desired metal. These washers are of less diameter than the fiber cup 10 and serve as reinforcements for the cup. After the cup and washers have been applied, a securing nut 12 is screwed upon the neck in order to firmly clamp the cup and washers in place. In order to prevent the nut from working loose, a cotter key 13 is passed through the nut and through an opening drilled transversely through the neck. The upper end of the piston is enlarged to form a head 14 adapted to limit downward movement of the piston by engagement with the upper end of the barrel and this head has its upper end 15 reduced and threaded so that it may be screwed into the threaded lower end of the stem or drill bar 1. It will thus be seen that when the device is in use the drill stem or bar may be reciprocated in the well to slide the piston longitudinally in the barrel and thereby cause the cup which has firm contacting engagement with the walls of the barrel to reciprocate in the barrel and cause the liquid or semi-liquid material in the bottom of the well to be alternately drawn inwardsly through the openings 6 and 7 and forced out of these openings. It will be readily understood that as the piston moves upwardly the liquid will be...
drawn inwardly through the openings 7 and forced outwardly through the openings 6 and when the piston moves downwardly the reverse will take place and the liquid will be drawn inwardly through the openings 6 and forced outwardly through the openings 7.

The sub or coupling 4 is provided intermediate its ends with flat side faces 15 so that it may be firmly gripped by a wrench and its threaded upper end 16 screwed tightly into the threaded lower end of the barrel. This coupling when in place is disposed beneath the openings 7 and may, therefore, serve to tightly close the lower end of the barrel without interrupting the side openings near the lower end thereof. The lower end of the coupling is bored to form a socket internally threaded, as shown at 17, and into this socket is adapted to be screwed the threaded upper end of the bit 5. It will thus be seen that the agitator when in use may have the upper end of its piston screwed into the lower end of the drill stem or bar 1 and a bit engaged with the lower end of the coupling. Therefore, the device may be easily set in place and no special machinery is necessary for its operation.

Having thus described the invention, I claim:

A tool for agitating liquid and fluid materials in shot holes of oil wells comprising an elongated barrel unobstructed internally throughout its entire length and provided near its opposite ends with perforations extending through the side walls thereof, said tool being adapted to be inserted in an oil well with the barrel opposite the shot hole of the well, means closing the lower end of the barrel and holding said barrel in operative position, and a rod mounted for reciprocation within the barrel and having one end thereof passing through the upper end of said barrel for attachment to a drill stem and its other end provided with a piston head frictionally engaging the inner walls of the barrel between the upper and lower perforations therein, said piston head having a stroke more than twice the diameter of the barrel but less than the extreme length of said barrel whereby when the piston is reciprocated liquid and fluid materials in said shot hole will be drawn alternately through the upper and lower perforations into the barrel and then forced outwardly under pressure directly against the adjacent walls of the shot hole to agitate and loosen the material and permit ready removal thereof when said tool is withdrawn from the well.

In testimony whereof I affix my signature.

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