

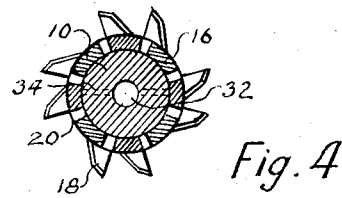
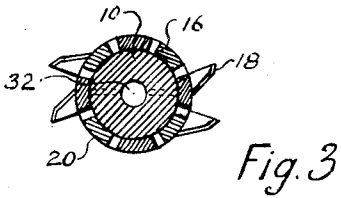
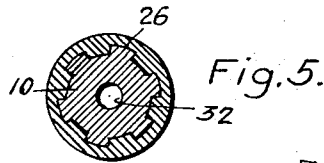
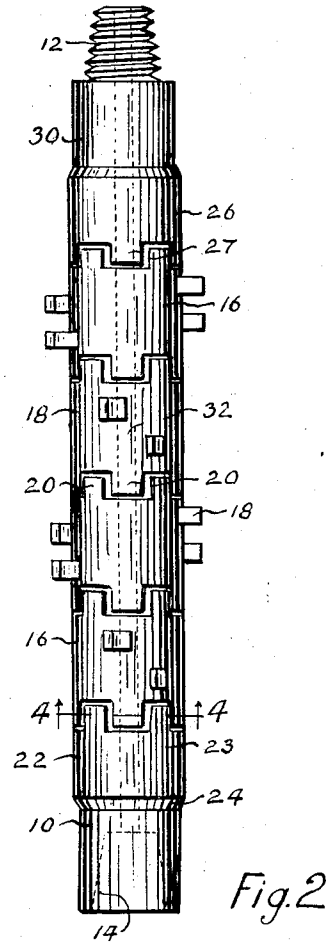
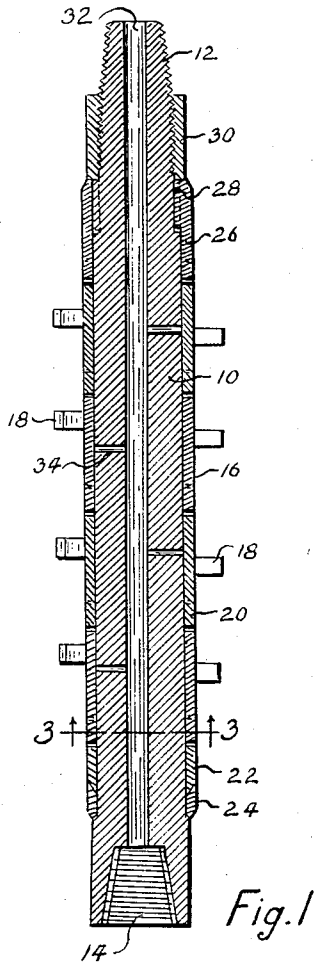
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WELL REAMER

Filed March 3, 1927



INVENTOR

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UNITED STATES PATENT OFFICE.

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WELL REAMER.

Application filed March 3, 1927. Serial No. 172,310.

My invention relates to improvements in well reamers used for the purpose of reaming wells, such as oil, gas, and water wells, by either the rotary or percussive methods of drilling.

The principal object of the invention is to provide a well reamer with parts for reaming that can be given an independent movement to prevent the reamer from sticking as the drilling or reaming proceeds.

Another object of the invention is to provide a well reamer with cutting sections that can be operated with the sections having horizontal and vertical play, or operated with the sections having no play.

Another object of the invention is to provide a well reamer with reaming cutters that can be placed in position by the driller to cut on two or more sides of the reamer depending whether the driller prefers to have cutters all around the reamer body or to have clearance on two sides.

Other objects and advantages of the invention will be apparent as it is better understood from the following description when considered in connection with the accompanying drawings illustrating a preferred embodiment thereof.

On the drawings:

Fig. 1 is a sectional elevation of the well reamer.

Fig. 2 is a side elevation of the well reamer.

Fig. 3 is a sectional view taken from the line 3—3 Fig. 1.

Fig. 4 is a sectional view taken from the line 4—4 Fig. 2.

Fig. 5 is a section taken on the line 5—5 of Figs. 1 and 2.

Similar numerals refer to similar parts throughout the several figures.

The numeral 10, Figs. 1, 2, 3, and 4 indicates the body of the well-reamer, upon the upper end of which is the threaded connection 12, Figs. 1 and 2, and upon the lower end is the threaded connection 14, Figs. 1 and 2.

Arranged around the body 10 is a series of superimposed annular sleeves 16, having a plurality of cutting teeth 18, Figs. 1, 2, 3 and 4, projecting outwardly. These teeth may be in any desired position upon the sleeve, and may be arranged to cut on two sides as shown in Fig. 3, or four sides as shown in Fig. 4.

The ends of the sleeves are castellated, toothed or meshed and connected together by the lugs 20 which interlock one sleeve with another, Figs. 1, 2, 3 and 4.

Below the bottom sleeve 16 is a collar 22, provided at its upper end with projecting lugs 23, Fig. 2. This collar 22 is securely fastened to the body 10 by welding, threading or other suitable means, the weld being shown at 24, Figs. 1 and 2.

At the top of the sleeves 16 is the spline collar 26, Figs. 1, 2 and 5. The splines 28 Fig. 1 run parallel with the axis of the body 10, into which they fit and against which they abut. When it is desirable to give the sleeves play, the lower end of the collar 26 has lugs 27 projecting into the top sleeve 16, Fig. 2. Above and in contact with this spline collar 26 is the threaded collar 30, Figs. 1 and 2.

In assembling, the sleeves 16 are placed upon the body 10 and turned individually to any desired position that the lugs and grooves will allow, the spline collar 26 is then placed in position, and the collar 30 is then screwed down upon the spline collar 26, the tool is then ready to be connected to the string of drilling tools.

In operating the well reamer for cable tool drilling the cutting edge of the teeth is placed horizontally. In rotary drilling the water channel 32, Fig. 1, is provided and is necessary to wash away the cuttings, and the cross channel 34 prevents the cuttings in soft formations from forming a solid ball around the cutting teeth and sleeves.

The sleeves 16 are shown to be loosely mounted both in regards to the body 10 and in regard to each other, the amount of play may be regulated by the position of the collar 22 or by changing the length and width of the lugs or length of the sleeves, this play allows an independent movement of the sleeves, which will allow a jarring action should the tool become stuck in the hole, and will allow the cuttings to be shaken loose, should they stick around the sleeves.

The position of the teeth may be changed at the desire of the driller, by simply turning the sleeves from one lug to another, which in some formations is a valuable feature, as clearance is sometimes necessary.

I claim:

1. A well reamer, provided with a body portion having a tongue and groove collar

secured to the lower end thereof, and having annular sleeves provided with tongues and grooves on the top and bottom, and cutting teeth on the sides thereof, said sleeves being
5 slidably mounted and in connection with said collar, and a spline joint collar having tongues and grooves in the bottom connecting with the top sleeve, and a threaded collar
10 securely holding said spline joint collar, thus preventing said sleeve from turning around said body.

2. A well reamer, provided with a body around which a cutter carrying sleeve is loosely mounted, said sleeve having tongues
15 and grooves at the top and bottom so spaced as to allow the sleeve a degree of movement independent of said body of the reamer, the body being prevented from turning completely around inside the sleeve by similar
20 tongues and grooves provided in firmly held collars attached to the body and positioned at the top and bottom of said sleeve.

3. A well reamer, having a body portion around which a series of cutter carrying
25 sleeves are slidably mounted, said sleeves being tongued and grooved for the purpose of securing them at the bottom by a tongued and grooved stationary collar, and at the top by a detachable tongued and grooved spline
30 collar, the tongues and grooves being so spaced as to allow the sleeves to be turned when assembling so that the cutting teeth on each sleeve may be arranged and secured in
35 different positions vertically with regard to the cutting teeth on the adjoining sleeves.

4. A well reamer, having a body portion threaded at the top and bottom, and pro-

vided with a water course therethrough, said body portion having a tongued and grooved collar welded to the lower end, and a series
40 of cutter carrying sleeves, tongued and grooved at the top and bottom and slidably fitted together, and a spline collar having tongues and grooves at the bottom end which
45 fit on the top sleeve, and a threaded collar screwed down on the top of said spline collar, thus securing the assembly around the body of said reamer.

5. A well reamer, having a body portion around which a series of cutter carrying
50 sleeves are slidably mounted, said sleeves being tongued and grooved for the purpose of securing them at the bottom by a tongued and grooved nondetachable collar, and at the top by a tongued and grooved detachable
55 collar, said tongues and grooves being so spaced as to allow the sleeves to be turned when assembling so that the cutting teeth on each sleeve may be arranged and secured in
60 different positions vertically with regard to the cutting teeth on the adjoining sleeves.

6. A well reamer, provided with a mandrel having a water course therethrough, and a threaded tool joint on the end thereof, an
annular tongued and grooved sleeve welded
65 to the lower end thereof, and a tongued and grooved cutter carrying sleeve mounted above said welded sleeve, and a detachable
tongued and grooved collar mounted above
said cutter carrying sleeve, said collar being
70 provided with means for preventing its rotation upon said mandrel when in operating position.

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