Jan. 10, 1928. 1,656,022

A. B. SCOTT

ROTARY DISK

Filed Dec. 27. 1926

Fig. 1.

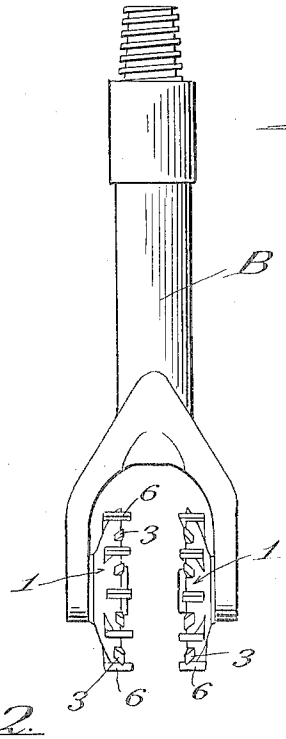


Fig. 2.

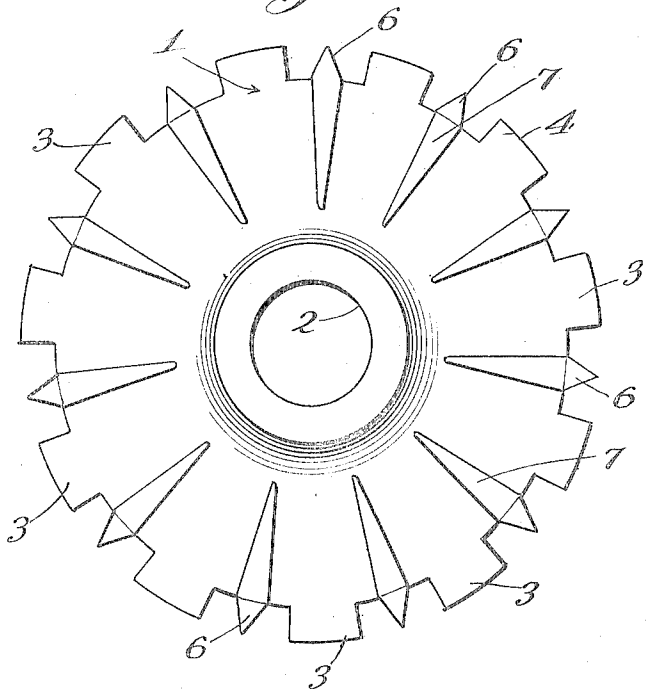
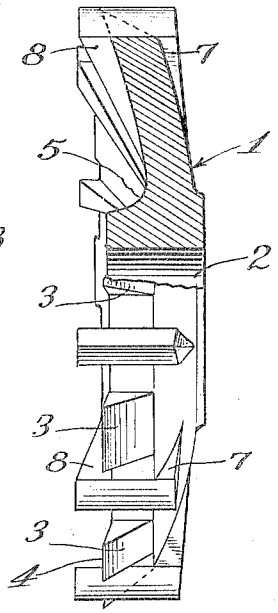


Fig. 3.



Inventor
Augustus B. Scott.
by Hazard and Miller
Attorneys.

Witness:
Wm. Hall

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UNITED STATES PATENT OFFICE.

AUGUSTUS B. SCOTT, OF LONG BEACH, CALIFORNIA, ASSIGNOR TO SCOTT SUPREME OIL TOOL COMPANY, OF SANTA ANA, CALIFORNIA, A CORPORATION OF CALIFORNIA.

ROTARY DISK.

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This invention relates to deep well apparatus, artesian, oil or the like, and more particularly to disks adapted to be applied to a rotary disk bit.

It is an object of this invention to provide a rotary disk having alternate horizontal and vertical teeth on the periphery thereof, whereby a cutting and scooping operation is performed in the well as the disk rotates.

Another object of this invention is to provide a disk which is strong, durable and efficient in its action and is well adapted to perform the services required of it.

With the foregoing and other objects in view which will be made manifest in the following detailed description and specifically pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 is a front elevation of a pair of my disks as applied to the conventional type of rotary disk bit,

Fig. 2 is a plan view of one of my improved disks, and

Fig. 3 is a side elevation partly in section of my rotary disk.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, 1 designates my rotary disk as an entirety. This disk is substantially cup-shaped and is provided with an aperture therethrough designated at 2 whereby the same may be applied to a rotary disk bit. A plurality of pointed elongated cutting teeth are formed on the periphery of this disk. These teeth are designated at 3 and one of the same is shown in section in Fig. 3. These teeth are substantially curved and pointed as at 4 and are formed integral with the disk and the teeth have one surface thereof formed as a continuation of the outer surface of the disk, whereas the other surface thereof is cupped and is provided with a gentle curve as at 5 gradually merging into a long radius of curvature. The teeth 3 are spaced at equal distances along the periphery of the disk and between them are formed a plurality of transverse teeth 6. The teeth 6 have longitudinal axes on the periphery of the disk which are perpendicular to the longitudinal axes of the teeth 3. The teeth 6 are of a shape similar to the teeth 3 but are perpendicular to the same and are not concavo-convex in form as are the teeth 3. The teeth 6 are provided with a pair of reinforcing ribs 7 and 8 as shown clearly in Figs. 2 and 3 to prevent breaking of the same. The extreme outer points on the teeth 3 and on the teeth 6 are located substantially on the same peripheral circumference, that is, they are equi-distant from the center of the disk.

In actual operation my improved disk provides for cutting and scooping action within a well. When the disk bit B is lowered into the well with the disks thereon and operation is commenced, the teeth 3 provide a cutting edge and dig or loosen the material whereas the transverse teeth 6 provide what may be termed a scooping or scraping operation. As the disk penetrates the earth or formation it cuts in two directions and unlike the disks now used in actual practice it leaves no cone or center in the bottom of the well which it is drilling. Furthermore, disks which embody the principles of my invention prevent the drilling of a crooked well. On penetrating a sloping or slanting formation, such as limestone or hard shale, the disk will not cut off center as the weight of the drill stem will hold it on the hard formation.

It is obvious therefore that I have provided a disk which will perform efficiently the operation of drilling, which is adapted for heavy duty and which is not likely to break in the well.

It will be understood that various changes in the detail of construction may be made without departing from the spirit and scope of the invention as defined by the appended claims.

I claim:

1. A cutting disk comprising an combination a substantially cup-shaped member, teeth having line edges on the periphery thereof, certain of said teeth having longitudinal axes perpendicular to the direction of the perpendicular axis of the disk, others of said teeth having longitudinal axes parallel to the perpendicular axis of the disk.

2. A cutting disk comprising in combination a cup-shaped member, teeth having line edges on the periphery of said cup-shaped member, said teeth having longitudinal axes parallel to the perpendicular axis of the disk, and webs reinforcing said teeth.

3. A cutting disk comprising in combination a substantially cup-shaped member, teeth having line edges on the periphery of said cup-shaped member, certain of said teeth having longitudinal axes parallel to the perpendicular axis of the disk, and webs reinforcing said teeth, others of said teeth having their longitudinal axes perpendicular to the direction of the perpendicular axis of the disk, said second mentioned teeth being arranged in alternate relation on the periphery of said disk with respect to the first mentioned teeth, the outer extremities of said teeth being arranged on the same marginal circumference.

4. A cutting disk having teeth on the periphery thereof, said teeth having line edges, certain of said teeth being arranged at an angle to the axis of the disk and others of said teeth being arranged parallel to the said axis.

5. A cutting disk having teeth on the periphery thereof, said teeth having line edges, certain of said teeth having their longitudinal axes in the plane of the disk, and others of said teeth having their longitudinal axes at an angle to said plane.

6. A cutting disk having teeth on the periphery thereof, said teeth having line edges, certain of said teeth having their longitudinal axes in the plane of the disk, others of said teeth having their longitudinal axes perpendicular to said plane.

7. A cutting disk comprising in combination a substantially cup-shaped member, teeth having line edges on the periphery thereof, said teeth having their longitudinal axes alternately disposed perpendicular to the direction of the perpendicular axis of the disk and parallel to the perpendicular axis of the disk.

8. A device as claimed in claim 7, and in addition, ribs reenforcing the teeth, the longitudinal axes of which are parallel to the perpendicular axis of the disk.

9. A cutting disk having teeth on the periphery thereof, said teeth having line edges, said teeth having their longitudinal axes alternately perpendicular to the direction of the axis of the disk, and parallel to the perpendicular axis of the disk.

10. A device as claimed in claim 9, and in addition, ribs reenforcing the teeth which have their longitudinal axes parallel to the perpendicular axis of the disk.

11. A device as claimed in claim 9, and in addition, ribs reenforcing the teeth which have their longitudinal axes parallel to the perpendicular axis of the disk, all of said teeth having their outer extremities arranged on the same marginal cylinder of rotation.

12. A cutting disk having teeth with line edges on the periphery thereof, said teeth having their longitudinal axes alternately in the plane of the disk and perpendicular to the plane of the disk.

13. A cutting disk having teeth with line edges on the periphery thereof, said teeth having their axes alternately in the plane of the disk and at an angle to said plane.

14. A rotary disk having two sets of peripheral teeth disposed in the same plane and provided with cutting edges, the cutting edges of each set of teeth being parallel to one another, and the cutting edges of the teeth of one set being at a substantial angle to the cutting edges of the teeth of the other set.

15. A rotary disk having two sets of peripheral teeth provided with cutting edges, the cutting edges of each set of teeth being parallel to one another, the cutting edges of the teeth of one set being at a substantial angle to the cutting edges of the teeth of the other set, and the teeth of one set alternating with the teeth of the other set.

In testimony whereof I have signed my name to this specification.

AUGUSTUS B. SCOTT.