No. 750,840. PATENTED FEB. 2, 1904.

C. C. FOX.

WELL DRILL.

APPLICATION FILED OCT. 8, 1903.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 1.

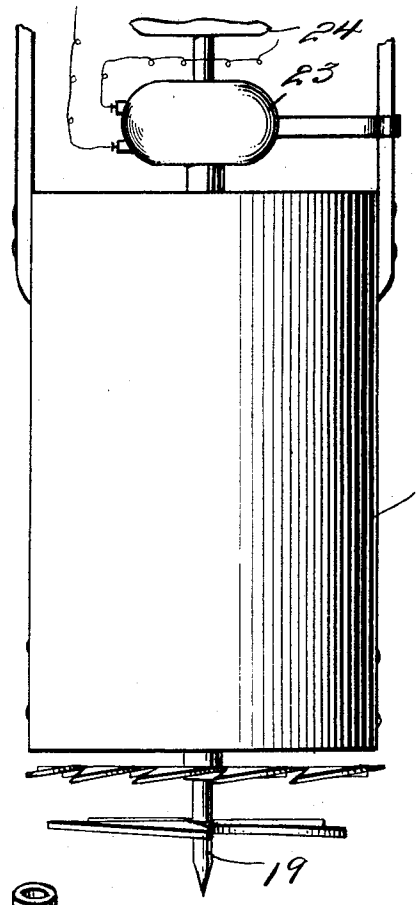


Fig. 3.

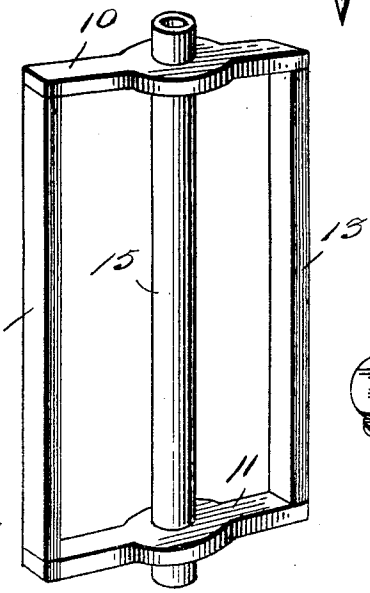
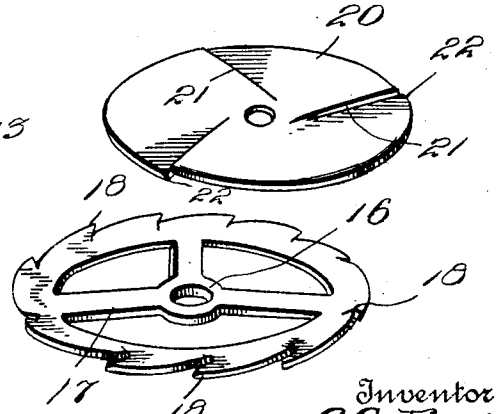


Fig. 6



Witnesses
O. McSimpson
F. C. Jones

Inventor
C. C. Fox

Fig. 5.

By Brownell & Brownell
Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 750,840. PATENTED FEB. 2, 1904.

C. C. FOX.

WELL DRILL.

APPLICATION FILED OCT. 8, 1903.

NO MODEL. 2 SHEETS—SHEET 2.

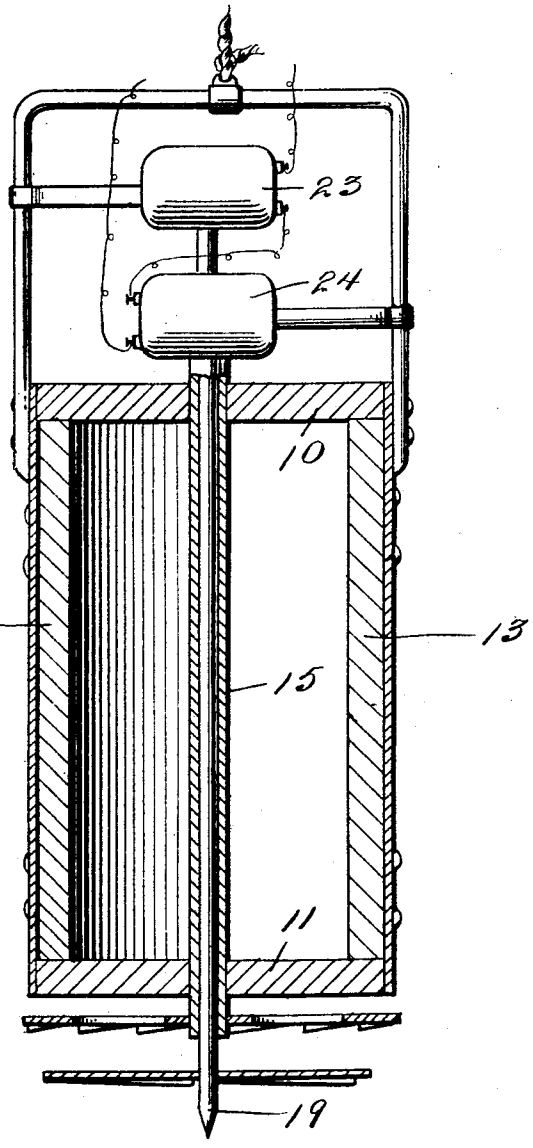


Fig. 2.

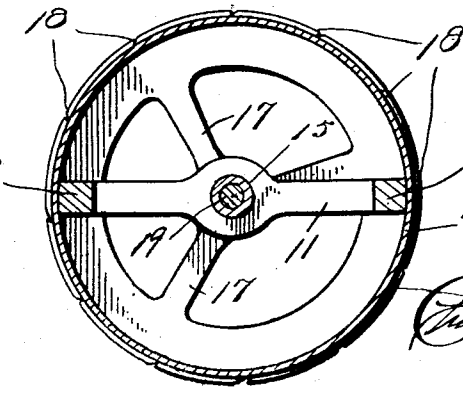


Fig. 4.

Witnesses
Ons Simpson
F. C. Jones

Inventor
C. C. Fox
Attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 750,840. Patented February 2, 1904.

UNITED STATES PATENT OFFICE.

CHRISTOPHER CORNELIUS FOX, OF HIGGINSVILLE, MISSOURI.

WELL-DRILL.

SPECIFICATION forming part of Letters Patent No. 750,840, dated February 2, 1904.

Application filed October 8, 1903. Serial No. 176,214. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER CORNELIUS FOX, a citizen of the United States, residing at Higginsville, in the county of Lafayette, State of Missouri, have invented certain new and useful Improvements in Well-Drills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to well-drills; and it has for its object to provide a construction which may be easily operated to speedily drill a shaft of considerable dimensions and in which the ordinary lengthy drill-shafts are not used.

A further object of the invention is to provide a drill including a bucket in which the dirt may be raised from the shaft periodically.

Other objects and advantages of the invention will be understood from the following description and include the provision of means for preventing displacement of the frame of the apparatus rotatably.

In the drawings forming a portion of this specification, in which like numerals of reference indicate similar parts in the several views, Figure 1 is a side elevation showing the drill-bucket with the bits projecting therebelow. Fig. 2 is a vertical section through the drill, the motors connected with the drill-shafts being in elevation. Fig. 3 is a perspective view of the frame of the drill. Fig. 4 is a transverse section through the bucket and the frame between the upper and lower cross-pieces of the latter. Fig. 5 is a detail view of the upper drill-bit. Fig. 6 is a detail view of the lower drill-bit.

Referring now to the drawings, the present drill comprises a frame including upper and lower cross-pieces 10 and 11 and connected longitudinal pieces 12 and 13, this frame being disposed within a metal cylinder 14, forming what may be termed the "bucket." The frame is slightly shorter than the bucket, and its members 10 and 11 are disposed diametrically of the bucket.

In the end pieces 10 and 11 of the frame are bearings in which is received a tubular shaft 15, which projects slightly below the bucket and at its lower end is provided with a bit in the form of a wheel comprising a felly having teeth deflected downwardly therefrom and which felly is connected to the central hub 16 by means of the spokes 17. The teeth in question are indicated at 18.

Through the hollow shaft 15 is passed a shaft 19, which projects from both ends of the hollow shaft, the lower end of the shaft 19 being pointed, so that it will bore into the earth. Upon the shaft 19, directly above the point thereof, is fixed a second bit 20 in the form of a disk having slits 21 cut from its periphery inwardly beyond and at one side of the center of the disk, the disk at one side of each slit being turned downwardly to form a cutting edge 22. Upon the upper member 10 of the frame are mounted two motors 23 and 24, one of which has its revoluble member connected with the hollow shaft, while the other has its revoluble member connected with the solid shaft. These motors are incased, as shown, so as to protect them from injury, and disposed to rotate their respective shafts in opposite directions. The result of rotating the shafts in opposite directions is that the bits correspondingly rotate and cut oppositely, so that instead of the frame and bucket rotating in the boring they are held against rotation by the opposition of the bits.

A lifting-tackle is connected with the frame of the drill, so that the entire apparatus may be lifted from or lowered into the boring. As the upper bit cuts the material is forced upwardly into the bucket, and as the lower bit cuts it is also forced upwardly between the spokes of the upper bit and into the bucket. When a sufficient quantity of material has passed into the bucket, the latter may be raised and emptied.

When cutting rock, a quantity of water is supplied to the bucket, and the fine particles that enter the bucket are pumped out, it being understood that the specific manner of using the drill may be varied to best suit the different conditions and the wishes of different operators.

In practice modifications of the specific construction shown may be made and any suit-

able materials and proportions may be used for the various parts without departing from the spirit of the invention.

What is claimed is—

1. A well-drill comprising an open-ended bucket, a frame fixed in the bucket, a hollow shaft journaled in the frame concentric with the bucket, a bit fixed to the lower end of the shaft below the bucket and having dirt-passages through its central portion, a second shaft passed through the hollow shaft and projecting from both ends thereof, a second bit attached to the second shaft below the first bit, said bits being formed to cut when rotated oppositely, and means for rotating the bits in opposite directions.

2. A well-drill comprising disk-shaped bits rotatably mounted one above the other, the upper bit having passages therethrough to receive material from the lower bit, said bit being formed to cut in opposite directions of rotation, means for rotating the bits in opposite directions, and a bucket disposed above and connected with the bits to receive material therefrom.

3. A well-drill comprising an open-ended cylindrical bucket having a frame fixed therein, a hollow shaft journaled in the frame longitudinally of the bucket, a bit fixed upon the shaft below the bucket and having dirt-passages therethrough, a second bit below the first bit, a shaft for the second bit passed through the hollow shaft, and separate motors for the shafts adapted to rotate them in opposite directions, said bits being formed to cut in opposite directions of rotation.

In testimony whereof I affix my signature in presence of two witnesses.

CHRISTOPHER CORNELIUS FOX.

Witnesses:

WILLIAM FOX,

WILLIAM WALKENKORST.