(No Model.)

R. C. ELLIOT.

DRILL JAR.

No. 359,856. Patented Mar. 22, 1887.

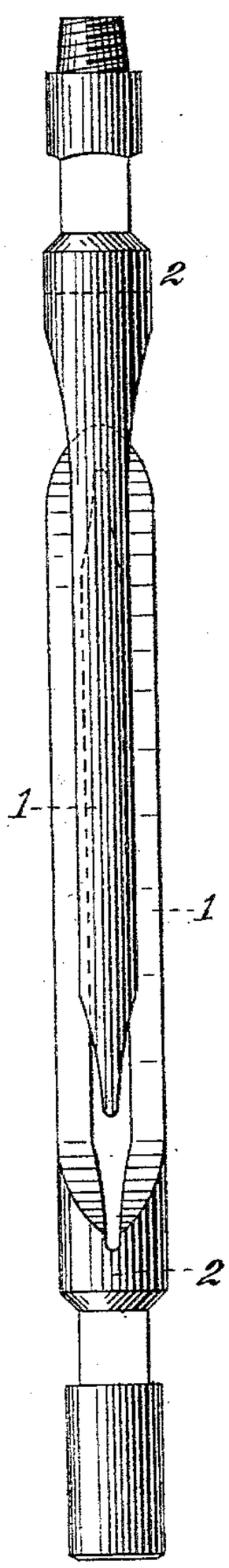

Fig. 1.

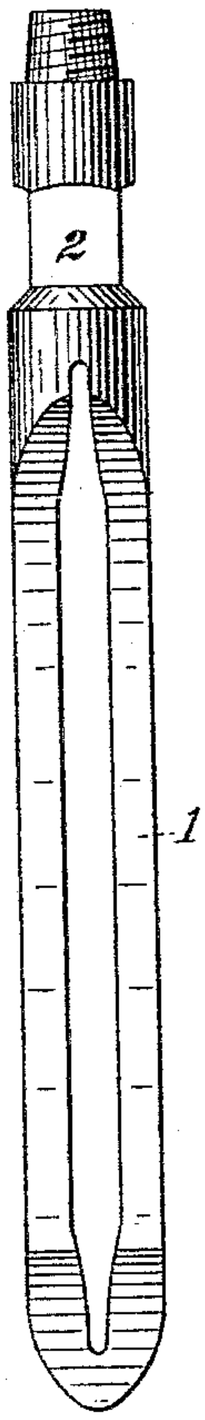

Fig. 2.

WITNESSES:

C. M. Clarke.

W. S. Murphy.

INVENTOR,

Robert C. Elliot

By Darwin S. Wolcott Att'y.

UNITED STATES PATENT OFFICE.

ROBERT C. ELLIOT, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF PART TO THOMAS A. GILLESPIE, OF SAME PLACE.

DRILL-JAR.

SPECIFICATION forming part of Letters Patent No. 359,856, dated March 22, 1887.

Application filed September 27, 1886. Serial No. 214,584. (No model.)

To all whom it may concern:

Be it known that I, ROBERT C. ELLIOT, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Drill-Jars, of which improvements the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a view in side elevation of jars for drills used in drilling oil, gas, and other wells. Fig. 2 is a similar view of one of the parts or members of the jars.

The device used in drilling oil, gas, and other wells, and known in the art as "jars," resembles two interlocked links of a chain, one being connected to the auger-bar and the other to the sinker-bar, and is used for imparting an upward jar or shock to the auger in order to loosen the bit. These jars, consisting of two parts or members, counterparts of each other, are formed of wrought-iron or steel, being forged to shape under a hammer. During the manufacture of the wrought-iron, and during the forging of the jars, the crystals of the metal are elongated, imparting a fibrous nature thereto. It has been ascertained by experience that the repeated blows or shocks to which the jars are subjected in use produces such a vibration in the jars transverse of their length as to break the elongated crystals or fibers of the metal, such disintegration or breaking of the fibers finally resulting in the rupture of the side pieces of the jars. This breaking of the jars generally occurs while the tools are in the well, thereby necessitating what is termed "fishing" for the auger bar and drill, and it frequently occurs that this fishing operation is unsuccessful, in which case the well must be abandoned. As this break in the jars usually occurs in the side bars, 1, near one of the heads 2, it has been attempted to overcome this difficulty by forming the side bars of worked or forged steel pieces; but experience has shown that such steel pieces are subject to the same weakening and disintegrating effect under vibratory action as the wrought-iron.

In order to overcome the above defects I form the jars of a close fine-grained tenacious cast metal—as, for example, cast-steel, phosphor-bronze, and the like. As the structure of these metals is crystalline, and as the crystals or grains of the metal after the jars have been formed by casting in suitably-formed mold are not disturbed or changed in shape by any subsequent working, any vibrations to which the jars may be subjected will not produce any disintegrating or weakening effects, as the crystals or grains can move or yield, and hence will not be destroyed. In cast-steel the crystals or grains are so interlocked with each other that the small vibrations will not effect any disengagement thereof, and in phosphor-bronze the grains or crystals are so small that the movement of each crystal will not be sufficient to produce any appreciable weakening effect. As the jars are subjected chiefly to longitudinal strains, and as both cast-steel, phosphor-bronze, and other metals of like nature are quite tenacious, the side bars, 1, need not be unduly increased in size. The jars, being cast, properly shaped, and interlocked with each other in suitable molds, do not require to be wrought—*i. e.*, hammered or forged into shape—but simply need smoothing or trimming on their exterior surfaces and the cutting-threads in the boxes at the ends thereof.

I claim herein as my invention—

1. Drill-jars formed of fine close-grained metal cast in suitable molds, substantially as set forth.

2. Drill-jars formed of phosphor-bronze, substantially as set forth.

In testimony whereof I have hereunto set my hand.

ROBERT C. ELLIOT.

Witnesses:
R. H. WHITTLESEY,
DARWIN S. WOLCOTT.