M. KELLOW.

BEARING FOR POWER DRIVEN ROCK DRILLS.

APPLICATION FILED DEC. 30, 1916.

1,281,786.

Patented Oct. 15, 1918.

2 SHEETS—SHEET 1.

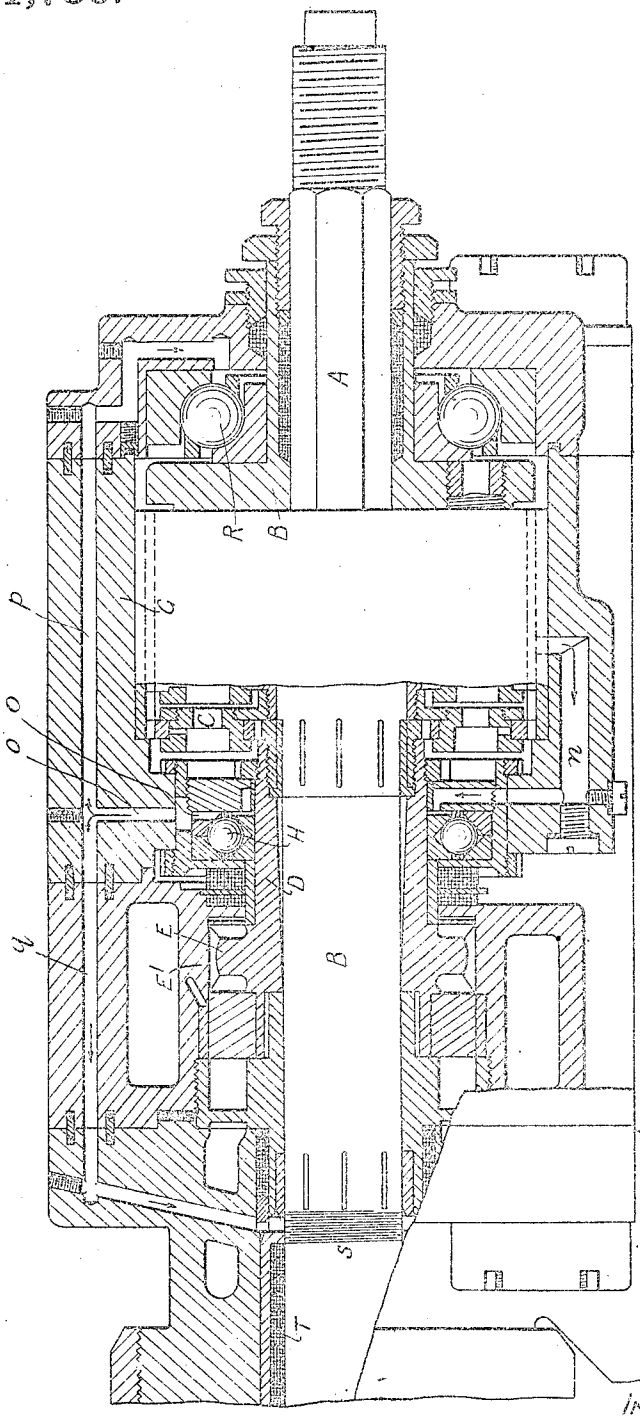


Fig. 1.

INVENTOR.

Moses Kellow

M. KELLOW.

BEARING FOR POWER DRIVEN ROCK DRILLS.

APPLICATION FILED DEC. 30, 1916.

1,281,786.

Patented Oct. 15, 1918.

2 SHEETS—SHEET 2.

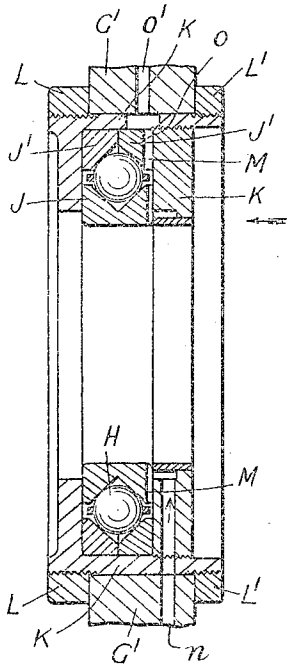


Fig. 2.

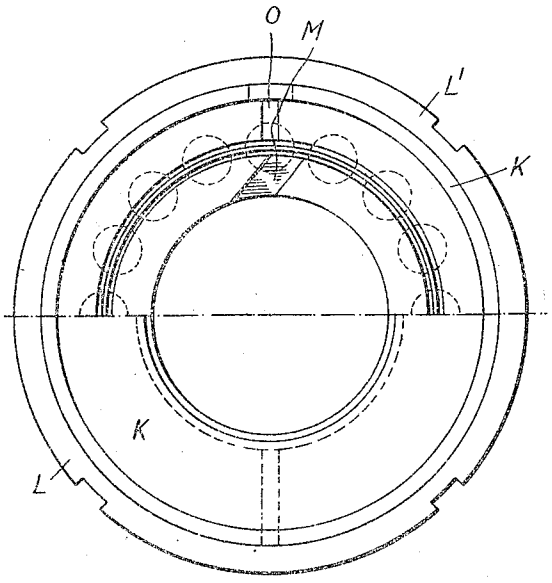


Fig. 3.

INVENTOR

Moses Kellow

UNITED STATES PATENT OFFICE.

MOSES KELLOW, OF PENRHYNDEUDRAETH, WALES.

BEARING FOR POWER-DRIVEN ROCK-DRILLS.

1,281,786. Specification of Letters Patent. Patented Oct. 15, 1918.

Original application filed July 11, 1914, Serial No. 850,455. Divided and this application filed December 30, 1916. Serial No. 139,911.

To all whom it may concern:

Be it known that I, MOSES KELLOW, a subject of the King of Great Britain and Ireland, residing at Penrhyndeudraeth, in the county of Merioneth, Wales, have invented new and useful Improvements in Bearings for Power-Driven Rock-Drills, of which the following is a specification.

This invention relates to rock-drills of the type wherein a turbine or other suitable motor is employed for rotating the drill, as, for example, is described in the specification to my co-pending application filed 11th July, 1914, Serial Number 850,455, of which the present application is a division. The present invention consists in certain improvements in power-drills of this class; particularly in the construction of the thrust-bearing between the turbine or other motor and the speed-reducing gear, and in the means for lubricating the said bearing and other working parts.

In the accompanying drawings, Figure 1 is a part longitudinal section of a turbine-driven rock-drill embodying my present improvements; Fig. 2 being a section, and Fig. 3 a face-view to an enlarged scale of the thrust-bearing before referred to as located between the motor and the speed-reducing gear through which rotative motion is transmitted to the drill.

The machine in its complete form comprises a turbine-driven rock-drill wherein the drill-rod A and a casing B, whereby it is operated, pass through the power-transmission gear, a portion of which is seen at C. The drill-rod-casing B is connected with the last member of the epicyclic power-transmission gear C, and the first member thereof is connected with the motor-shaft D; the latter being rotated by the turbine E. The opposite extremity of the drill-rod A projects beyond the left-hand end of the casing B and terminates in a piston inclosed in a cylinder; these parts not being shown in the drawing as they form no part of the present invention. To the back of the piston, water under high pressure is admitted for the purpose of forcing the drill-rod forward; the latter being capable of sliding longitudinally through the casing B, while rotating therewith and being rotated thereby. The construction of the turbine E and the means for applying a jet of high-pressure water thereto and for conveying the escaping water therefrom are described in detail in the specification to my aforesaid co-pending application. Between the turbine chamber E^1 and the chamber G which incloses the epicyclic speed-reducing gear C is arranged a ball-bearing H which constitutes one of the features of improvement of the present invention, and serves the double purpose of preserving correct alinement between the turbine E and the other rotating parts, and of resisting the longitudinal thrust incidental to reaction in the turbine.

Referring to Figs. 2 and 3 which illustrate the ball-bearing H on an enlarged scale, the series of antifriction balls are mounted in ball-races J J^1. The opposite extremities of the ball-race-housing K are provided with nuts L L^1; an extension G^1 of the gear-box forming a distance-piece between them. Upon slackening the nut L^1 and tightening the nut L, the ball-race-housing K and entire bearing are shifted to the left; and by operating the nuts L, L^1 in the reverse direction, the bearing is shifted in the opposite direction; adjustment of the entire bearing in a longitudinal direction being thereby affected.

For effecting the circulation of the lubricant to the ball-bearing H and to the other working parts of the entire machine, provisions of the following character are made. The inner member of the ball-race, which rotates at a high velocity, has two chases M milled in its side. This rotating member in conjunction with its housing K acts as a centrifugal pump and draws oil from the gear-box G by way of the passage *n*, seen in Fig. 1 below the drill-shaft, and forces it through the ball-chamber; the oil escaping thence by way of the passage *o*, seen in the same figure above the drill-shaft, and gains access to the radial passage o^1. The oil passes thence by way of two branches *p* and *q*; the former leading to the thrust-bearing R at the front of the machine and thence to the speed-reducing gear C; while the latter leads to the left-hand end of the turbine-shaft D, whence the oil returns to the gear-box G along the space between the drill-rod-casing B and the interior of the turbine-shaft D. Opposite the outlet from the oil-duct *q*, the drill-rod-casing B is cut with a fine-screw-thread *s* which serves to feed a portion of the oil toward the left to lubricate the surfaces of

the drill-rod-casing and of the packing T, and a portion to the right to lubricate the internal surface of the motor-shaft D. It may be explained that in the present design, the thread *s* is cut right-handedly, but it is inclosed partly within the extremity of the stuffing-box-liner which is stationary and partly within a ring which may be seen to the right of the oil-chamber and which rotates right-handedly in relation to the drill-rod-casing. The thread has therefore a right-hand movement in relation to the stuffing-box liner, and forces the oil toward the left. At the same time, it has a left hand movement relatively to the ring and forces the oil to the right.

I claim:—

1. In a bearing the combination of a ball race housing, a support therefor and means for axially adjusting the housing relatively to the support and locking it in adjusted position.

2. In a bearing the combination of a support, a ball race housing adjustably mounted on the support, means on opposite sides of the housing for axially adjusting the housing relatively to the support and for locking it in adjusted position.

3. The combination of a support, a ball race housing slidably mounted in said support and having end portions projecting beyond the walls of the support, locking rings having screw threaded engagement with the said projecting ends and bearing on opposite sides of the support.

4. In a ball bearing the combination of means for effecting the circulation of the lubricant, comprising radial chases formed in the face of a rotating member of the ball-race and operating as a centrifugal pump to circulate the lubricant through the said ball-bearing and to other working parts of the machine, substantially as set forth.

MOSES KELLOW.

Witnesses:
L. SHAW,
HENRY H. WATSON.