

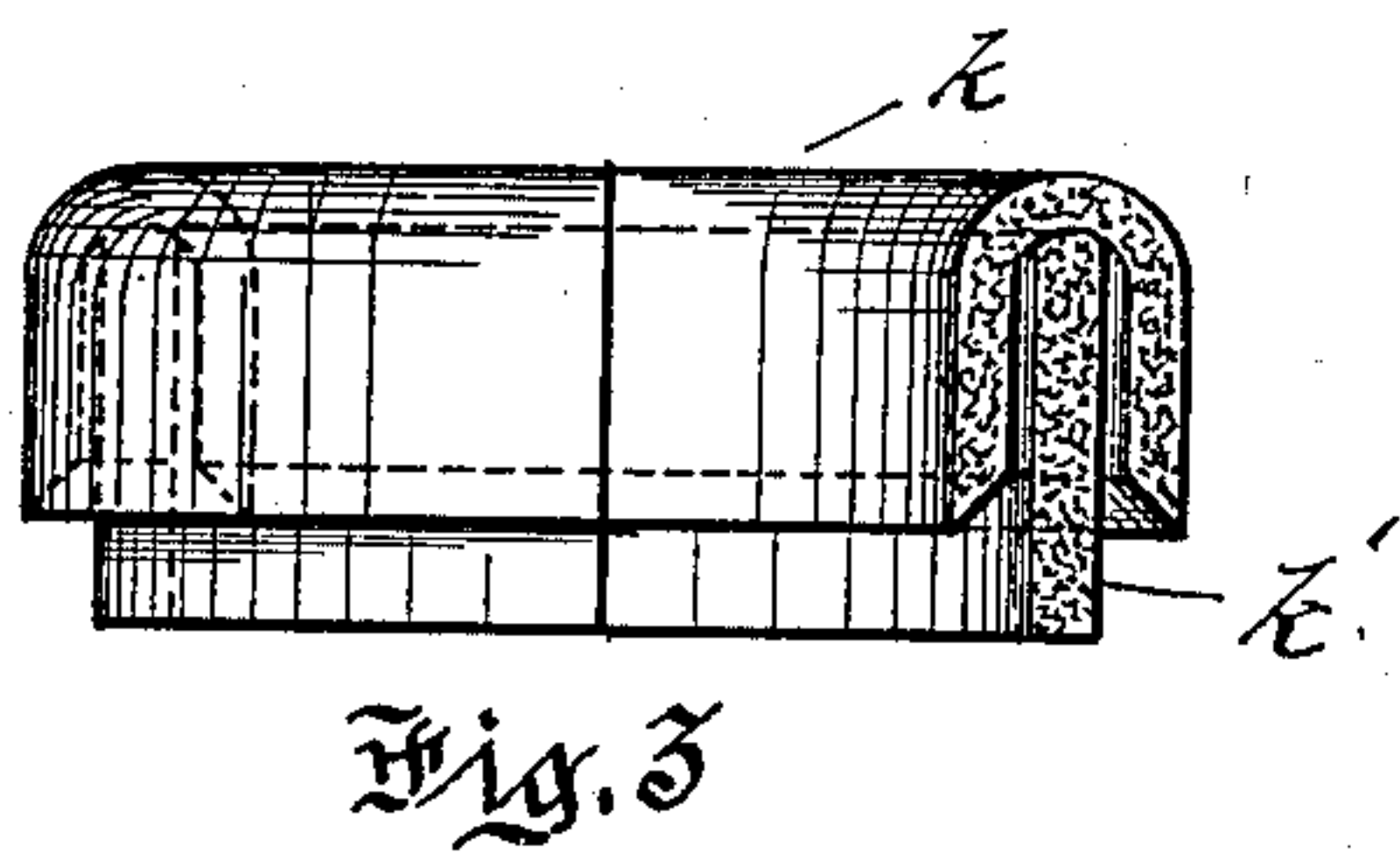
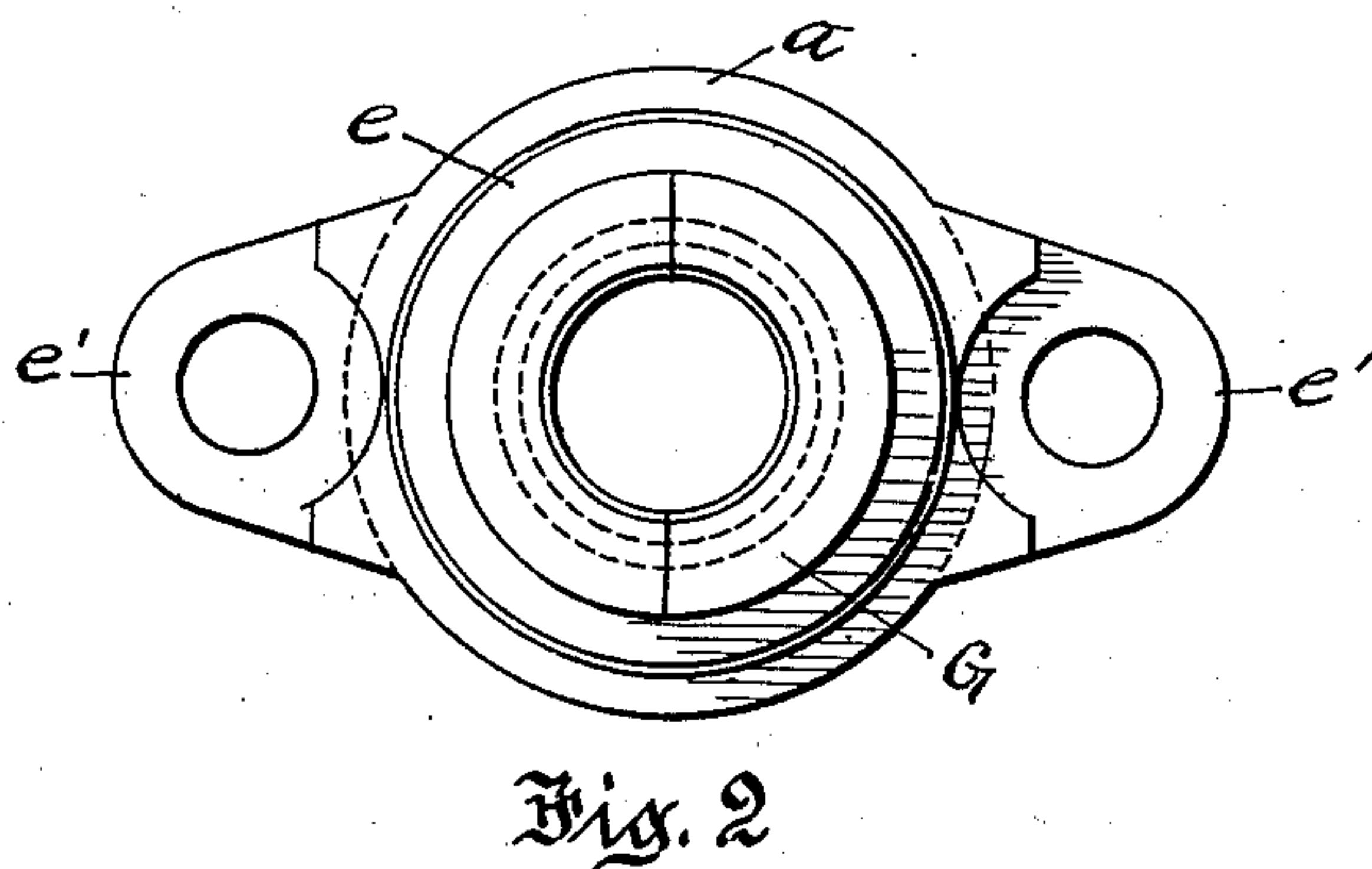
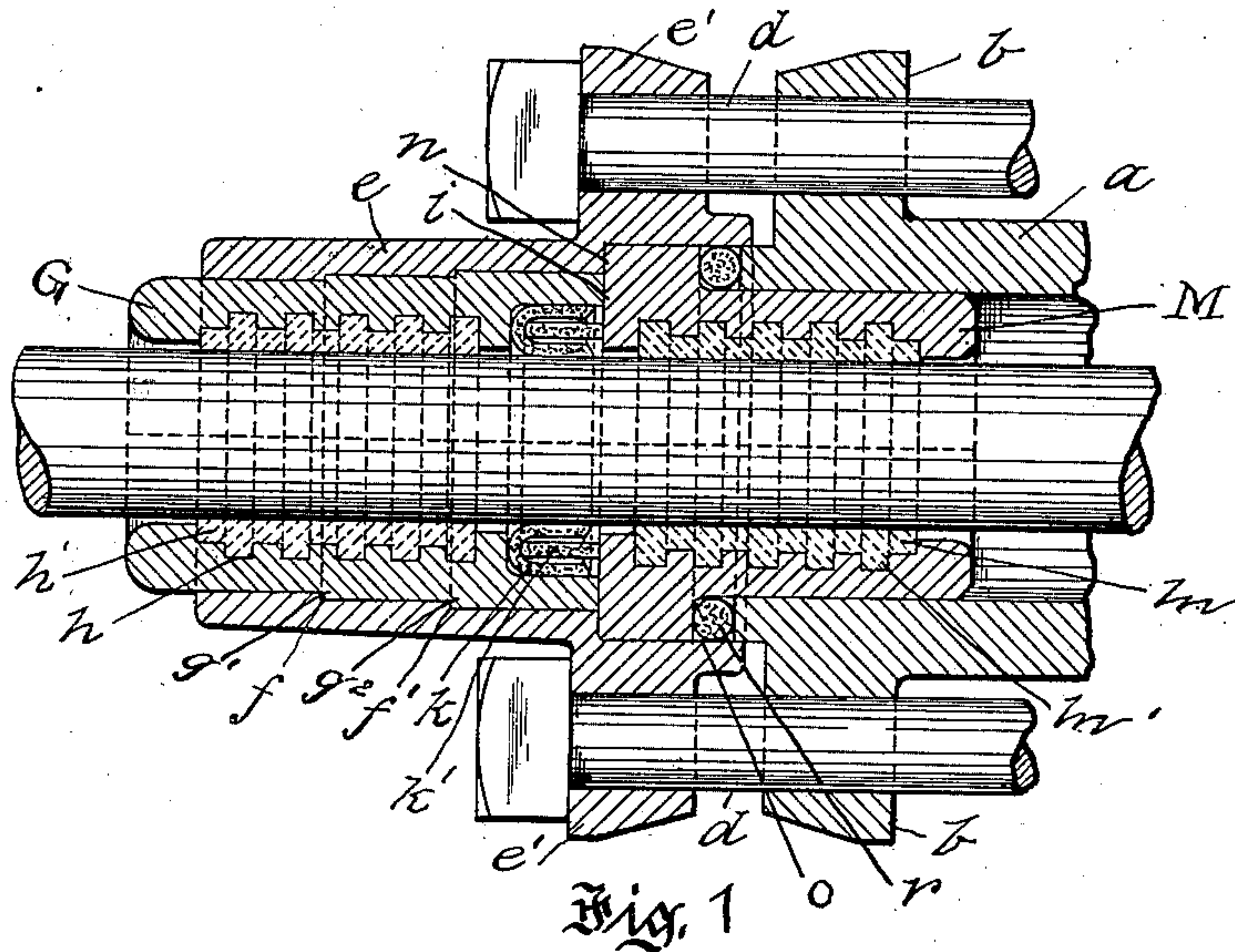
No. 661,683.

Patented Nov. 13, 1900.

A. BALL & T. OFFICER.  
ROCK' DRILL CYLINDER HEAD.

(Application filed June 20, 1899.)

(No Model.)



Witnesses  
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# UNITED STATES PATENT OFFICE.

ALBERT BALL AND THOMAS OFFICER, OF CLAREMONT, NEW HAMPSHIRE,  
ASSIGNORS TO THE SULLIVAN MACHINERY COMPANY, OF SAME PLACE  
AND CHICAGO, ILLINOIS.

## ROCK-DRILL CYLINDER-HEAD.

SPECIFICATION forming part of Letters Patent No. 661,683, dated November 13, 1900.

Application filed June 20, 1899. Serial No. 721,214. (No model.)

*To all whom it may concern:*

Be it known that we, ALBERT BALL and THOMAS OFFICER, residents of Claremont, in the county of Sullivan and State of New Hampshire, have invented a new and useful Improvement in Rock-Drill Cylinder-Heads; and we do hereby declare the following to be a full, clear, and exact description thereof.

Our invention relates to cylinder-heads for rock-drills and like machines.

The main objects of our invention are to provide a cylinder-head with a bearing which will always present a smooth even bearing-surface to the reciprocating rod which carries the cutting-tool and so reduce the cutting or wearing of said rod and at the same time to provide for the holding of the bearing securely in place and for its convenient removal when desired, as well as to provide for the proper packing of the head.

To these ends our invention comprises the novel features hereinafter set forth and claimed.

To enable others skilled in the art to make and use our invention, we will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal section of a cylinder-head and a portion of the cylinder of a suitable rock-drill embodying our invention. Fig. 2 is a front view. Fig. 3 is a detail view of the packing.

Like letters of reference indicate like parts in each view.

The letter *a* designates the lower end of the cylinder of a suitable rock-drill, having the lugs *b*, through which the rods *d* pass which secure the cylinder-head *e* to said cylinder. Accordingly, said cylinder-head *e* has the lugs *e'* corresponding to the lugs *b*, and through which the rods *d* also pass.

The interior walls of the head or shell *e* are formed with the annular shoulders *f f'*, said shoulders being of different diameters decreasing from the upper end and adapted to be engaged by corresponding shoulders *g' g²* on the partible bushing *G*. When said bushing *G* is contained within the cylinder-head *e*,

the shoulder *f* engages the shoulder *g'* and the shoulder *f'* the shoulder *g²*. In this manner the bushing is securely held in place, and it cannot be displaced by any downward force. Any downwardly-directed force only tends to hold said bushing more securely in place. Only one shoulder may be employed if desired.

As stated, the bushing *G* is partible, and in each half are formed the grooves or recesses *h*, adapted to receive and retain the babbitt *h'* or other suitable bearing metal. The recesses *h* act to lock the metal securely in place and provide sufficient thickness of metal to prevent its breaking from the jars which it receives in rock-drills of this character. By the use of such a partible bushing easy access may be had to the interior thereof when it is desired to remove the old bearing metal and replace it with fresh metal or with the old metal, provided it is not worn out.

Within the cylinder-head *e* and resting on the annular seat *i* is the annular U-shaped packing *k*, formed of leather or other flexible material. A ring *k'*, of leather or of some rigid material, if desired, is inserted within the U-shaped packing *k*.

Above the bushing *G* is the upper bushing *M*, also formed in halves and provided with the bearing metal or babbitt *m*, secured within like grooves *m'*. The lower or larger end of said bushing *M* rests on the seat *n*, within the head *e*, and bears against the ring *k'* within the U-shaped packing *k*. This acts to hold the packing securely in place, and insures a tight joint where air is used as the motive power for operating the drill.

The smaller end of the bushing *M* enters the cylinder *a*, and between the shoulder *o*, formed by the larger end of the bushing *M*, and the lower end of the cylinder is interposed the packing *r*. Any suitable compressible packing may be used for this purpose. The drawing up of the rods *d* acts to compress said packing and a very tight joint is obtained.

The above-described cylinder-head is particularly applicable to rock-drills operated



by air, as the arrangements for packing are such as to reduce the loss of air by leakage to a minimum.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. A cylinder-head for rock-drills having one or more annular shoulders formed therein decreasing in diameter from the upper to the lower end of said head, and a partible bushing within said head having corresponding shoulders engaging said shoulders in said head, substantially as set forth.

2. A cylinder-head for rock-drills having one or more annular shoulders formed therein decreasing in diameter from the upper to the lower end of said head, a partible bushing within said head having corresponding shoulders engaging said shoulders in said head, said bushing having grooves formed therein, and Babbitt metal engaging said grooves, substantially as set forth.

3. In a cylinder-head for rock-drills, a bushing contained within the shell of said head, a U-shaped packing engaging an abutment on said bushing, a ring within said packing, and

means bearing on said ring for holding it in the packing, substantially as set forth.

4. In a cylinder-head for rock-drills, a bushing contained within the shell of said head, a U-shaped packing engaging an abutment on said bushing, a ring within said packing, and an upper bushing bearing on said ring for holding it in the packing, substantially as set forth.

5. A cylinder-head having a shoulder at the upper end thereof, a bushing resting with its lower end on said shoulder, the upper end of said bushing extending beyond said head and adapted to enter the cylinder, and packing interposed between a shoulder on said bushing and the lower end of said cylinder, substantially as set forth.

In testimony whereof we, the said ALBERT BALL and THOMAS OFFICER, have hereunto set our hands.

ALBERT BALL.  
THOMAS OFFICER.

Witnesses:

GEO. E. WOLCOTT,  
JOHN H. COSSITT.