

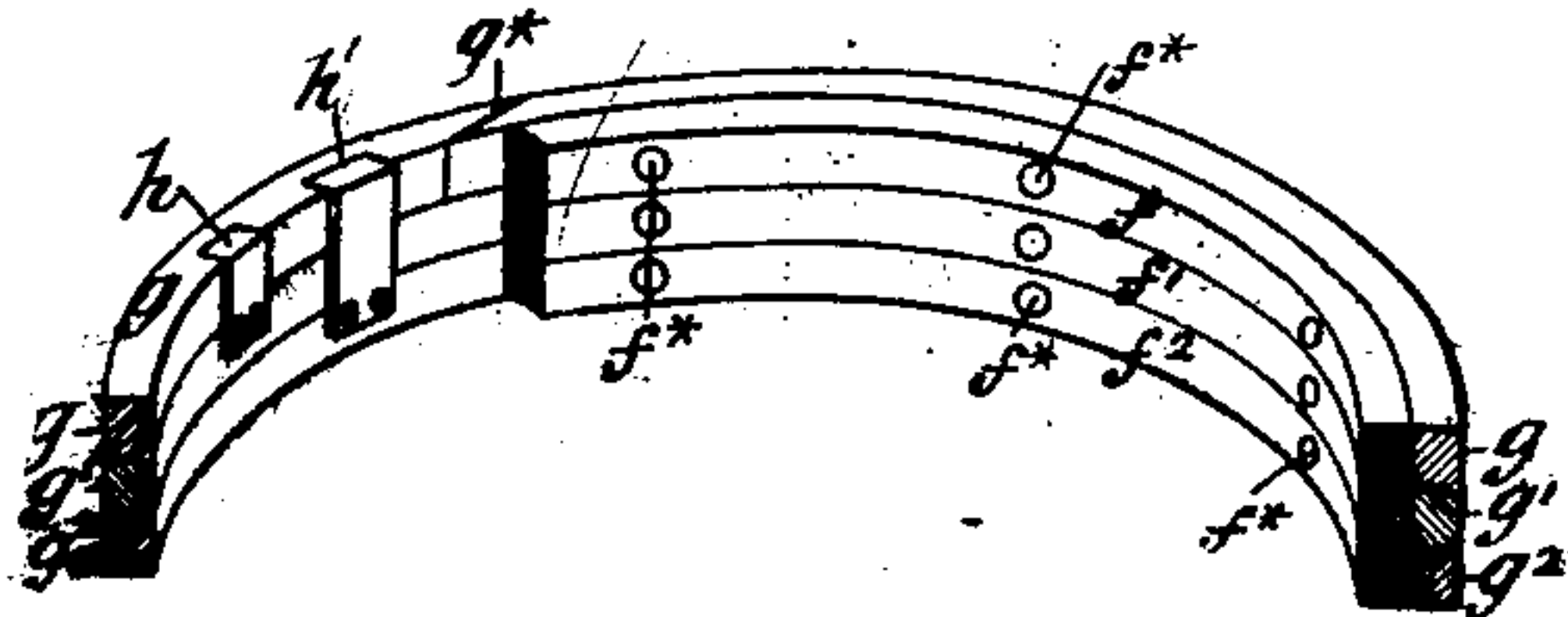
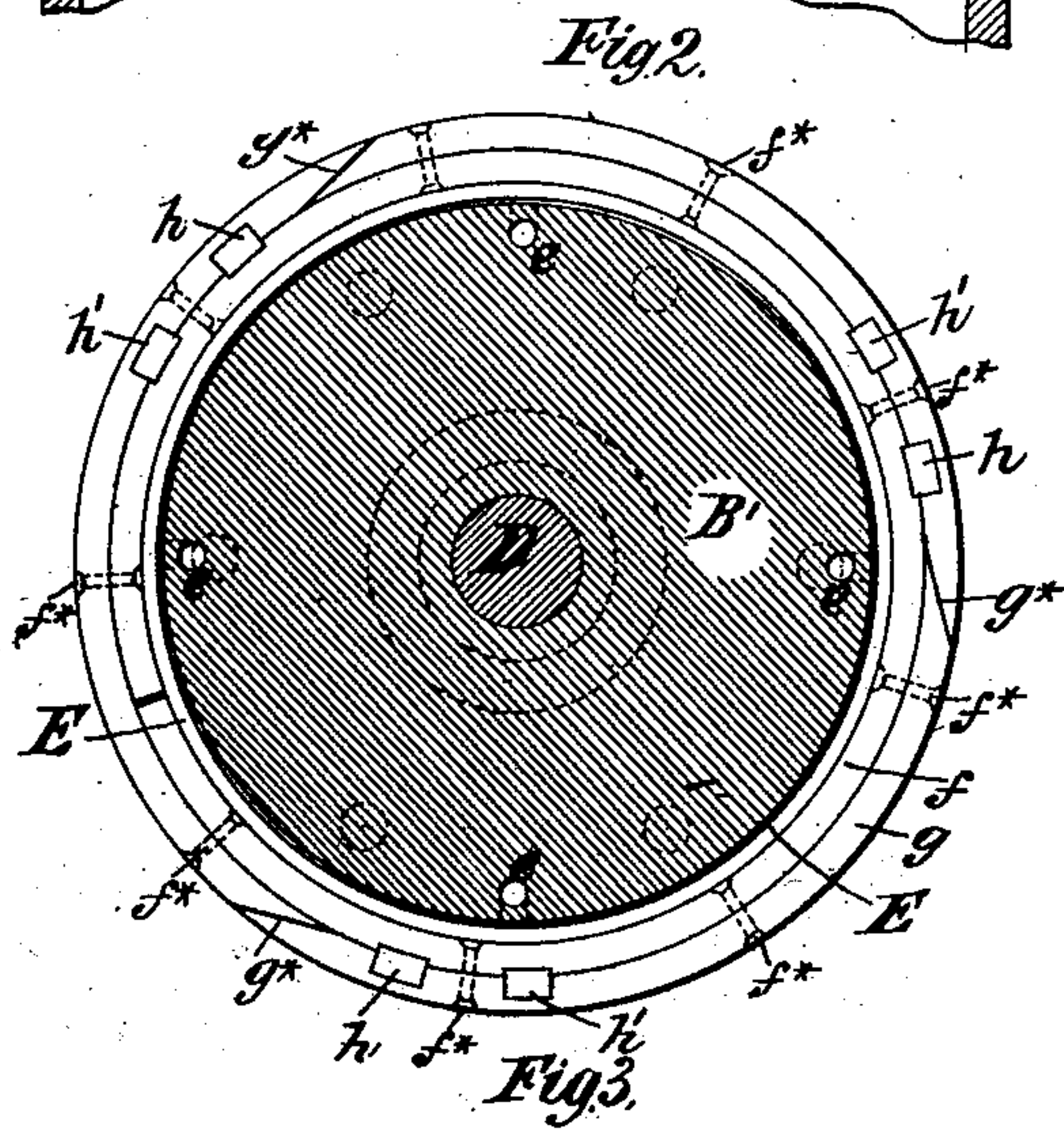
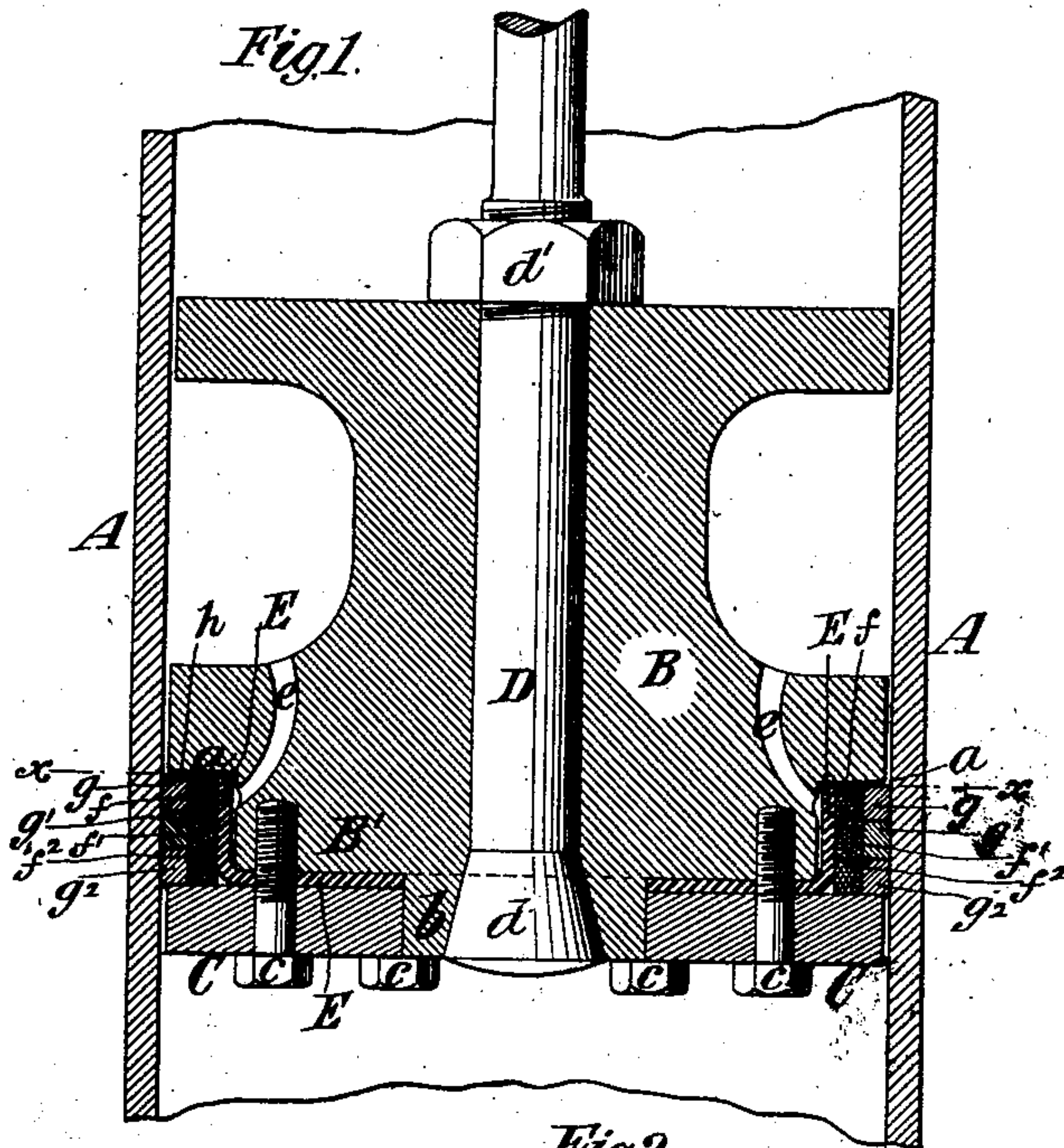
(No Model.)

A. B. SEE.

PACKING FOR HYDRAULIC PISTONS.

No. 311,380.

Patented Jan. 27, 1885.



Witnesses:
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UNITED STATES PATENT OFFICE.

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PACKING FOR HYDRAULIC PISTONS.

SPECIFICATION forming part of Letters Patent No. 311,380, dated January 27, 1885.

Application filed May 28, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALONZO B. SEE, of Yonkers, in the county of Westchester and State of New York, have invented a new and useful Improvement in Packing for Hydraulic Pistons, of which the following is a specification.

My invention is more particularly applicable to the pistons of hydraulic elevators which move vertically in their cylinders; but it is also useful for other hydraulic pistons.

The invention relates only to that class of packing which consists of a cup-packing, of leather or other analogous material, secured to the piston-body, and packing-rings surrounding the leather cup and having a bearing upon the inner periphery of the cylinder, the surrounding rings being forced outward by the pressure of water acting on the interior of the cup to expand it or spread it outward.

The repair of the packings of the kind above described is a frequent source of annoyance and expense, necessitating the temporary stoppage of the elevator; and the object of my invention is to provide a packing in which the wearing portions are of metal, thereby giving them great endurance and resistance to wear, while the remaining portions are of flexible or yielding material, which will cause and maintain a close and tight contact of the metal of the packing with the metal of the cylinder.

The invention consists in novel combinations of parts, hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a sectional elevation of a portion of a cylinder and a piston embodying my invention. Fig. 2 is a horizontal section on the dotted line *x x*, Fig. 1; and Fig. 3 is a perspective view illustrating a portion of the packing.

Similar letters of reference designate corresponding parts in all the figures.

A designates the cylinder, of which a portion only is represented.

B designates the piston, which may be of cast-iron, and which is constructed at the lower part with a shoulder, *a*, beyond which projects a circular portion, *B'*, of smaller diameter, and from the portion *B'* projects a hub or boss, *b*.

C designates the follower of the piston,

which fits upon the hub or boss *b*, and is thereby held concentric with the piston, and which is secured to the piston-body by bolts *c*. The piston-body and the follower C all fit loosely within the bored-out cylinder A, and the packing hereinafter described makes a tight joint with the cylinder.

D designates the piston-rod, which is to be secured immovably in the piston in any suitable manner. As here shown, the rod is inserted from the bottom of the piston, and is held against movement in the piston by means of a taper head, *d*, and a nut, *d'*; but the rod may be secured in the piston in any other well-known or suitable manner.

E designates a leather cup-packing, the edge of which projects upward around the circular piston portion *B'*, and which is clamped between the follower C and the piston-body. Free access for water to the interior of the packing is afforded by the holes *e*, which may be several in number, and through which, as the piston descends, water passes to press the leather cup outward or expand it. The portion of the packing external to the cup E is composed of two or more inner rings of any suitable flexible packing—such as canvas and rubber, or “Tuck’s” packing—square or rectangular in cross-section, and two or more sectional outer rings of metal corresponding to the rings of flexible packing. Each flexible and metallic ring form together a compound ring.

I have here shown the upwardly-turned and cylindric portion of the cup-packing E as surrounded or embraced by three rings, *f f' f''*, of flexible packing, and encircling these are three similar rings, *g g' g''*, of metal, which are each made in sections, and which form the wearing-surface of the packing. The packing-rings are all held in place between the shoulder *a* and the follower C.

The rings *g g' g''* are each composed of two or more sections. In this example of the invention three sections are employed, as shown in Fig. 2, and the joints *g** between the sections are chamfered off or scarfed tangentially to a circle smaller than the ring.

I have shown the three sections composing each metallic ring *g*, &c., as each secured to the corresponding flexible ring *f*, &c., by riv-

ets f^* , three being here shown to each section, and thus the three sections of each metallic ring are securely held upon the corresponding flexible ring. The three metallic rings are held together by means of clasps or clips $h h'$, which are made of sheet metal. The clasps or clips h are screwed or riveted to the middle metallic ring, g' , and catch and hold the upper ring, g . The clasps or clips h' are screwed or riveted to the lower ring, g'' , and catch and hold the middle ring, g' . In this way the three metallic rings are connected, and the sections of each being riveted to the corresponding flexible ring, the whole packing can be withdrawn as one piece when the follower is removed. These clasps also hold the rings together when applied in the piston, some means of holding them together being very desirable, as the rings will always be left loose between the shoulder a and the follower C, to obviate any tendency to bind which might result from the swelling of the flexible packing, and which might impede the expansion of the metallic rings, which is necessary to compensate for the wear of the said rings and the cylinder. The water, entering the interior of the cup E through the holes e , forces the cup outward, and the several flexible rings serve to evenly distribute the outward pressure upon the metallic rings and hold their sections in tight working contact with the cylinder A.

I am aware that cup-leather packings have been used in hydraulic pistons with various kinds of rings surrounding the cup-leather, and I do not claim such a packing, broadly, as of my invention.

The particular combination which is hereinabove described is the result of long experiment to secure a packing which would possess the durability, freedom from leakage, and provision for renewal, which are all necessary requisites of a packing for hydraulic elevators. The cup-leather, behind which the water acts, serves to transmit a uniform pressure to each portion of the packing which surrounds it. The metal rings only come in contact with the cylinder, and hence will not wear as rapidly as rings of flexible material. The metal rings, being in sections, adapt themselves to the bore of the cylinder whether it be truly

circular or not, and the flexible rings serve each to support the sections of an outer metal ring and allow of the sections yielding independently of each other, and also transmit to the metal ring the outward pressure which it receives from the leather cup. The series of compound rings arranged one above another also adapt themselves to inequalities in the length of the cylinder, and the single cup-packing around which they are placed serves to press them all outward and prevent outward leakage between them.

I am not aware that the combination of cup-leather packing and a number of compound packing-rings, all constructed and arranged as above particularly pointed out, has ever been used prior to my invention, and such combination and arrangement only do I desire to include in my invention.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a hydraulic piston, the combination, with the piston-body B, having water-passages e , and the follower C, of the packing consisting of the cup-leather E and a number of compound packing-rings surrounding the cup-leather, one above another, and each comprising an inner ring, f , of flexible material bearing on the cup-leather, and an outer metallic ring, g , composed of sections secured to the flexible ring, the several metallic rings forming the wearing-surface of the packing and the several flexible rings forming a yielding support to the metallic rings, and serving to transmit to them the outward pressure of the cup-leather, substantially as herein described.

2. In a hydraulic piston-packing, the combination, with a cup-packing, of compound packing-rings surrounding said cup-packing, each compound ring consisting of an inner flexible ring and an outer metallic ring secured thereto, and clasps or clips connecting the several compound rings, substantially as and for the purpose herein described.

ALONZO B. SEE.

Witnesses:

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