

No. 665,888.

Patented Jan. 15, 1901.

W. L. R. EMMET.
CUT-OUT.

(Application filed July 27, 1899.)

(No Model.)

2 Sheets—Sheet 1.

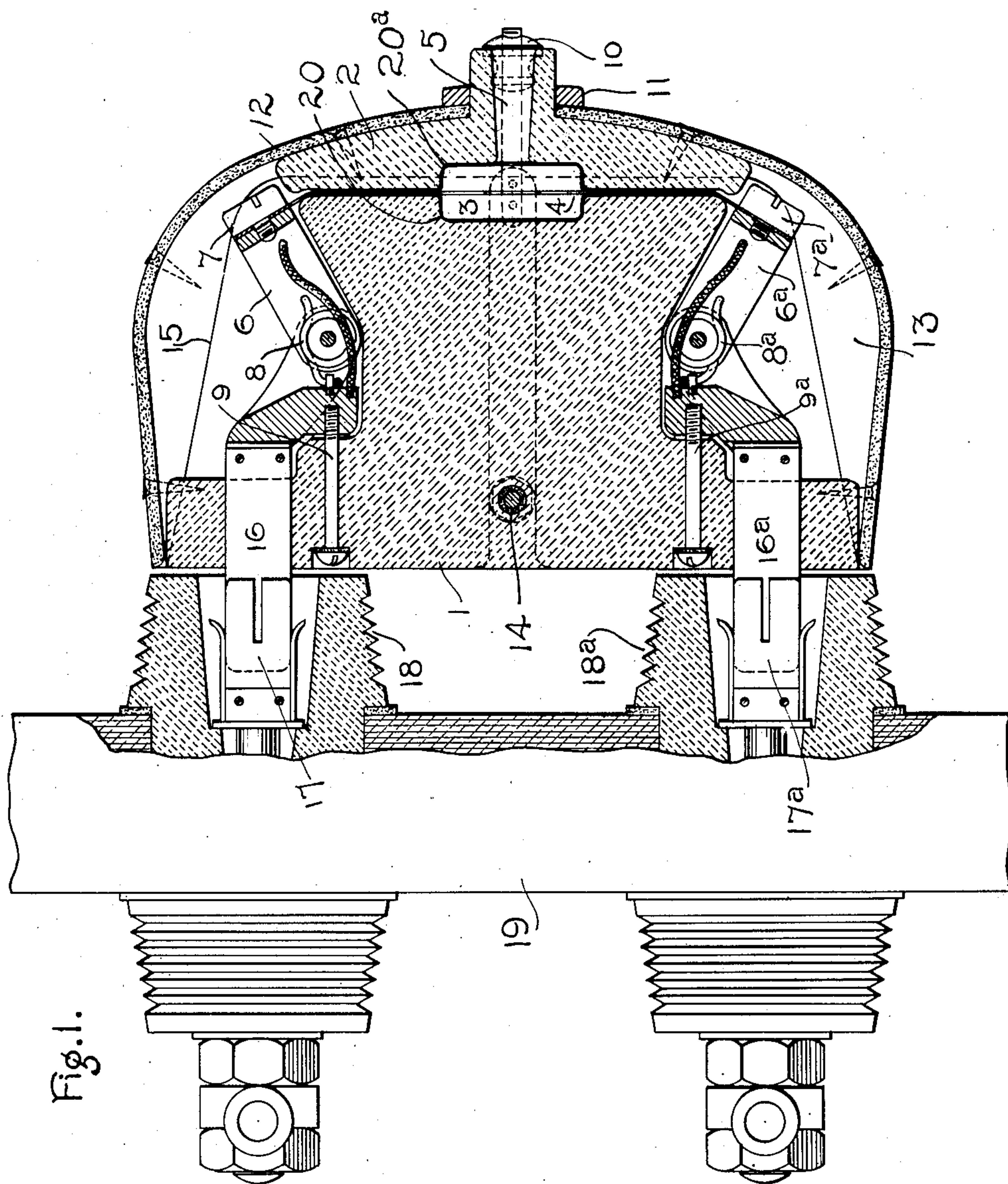


Fig. 1.

Witnesses.

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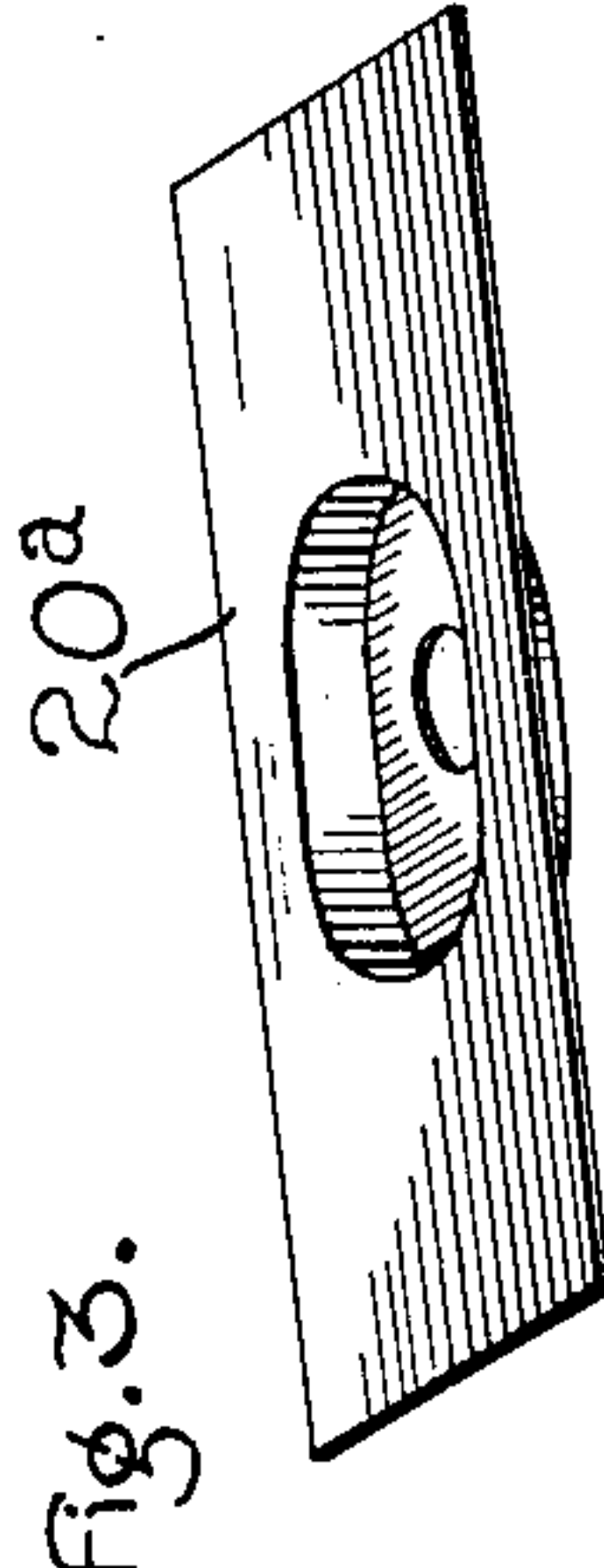
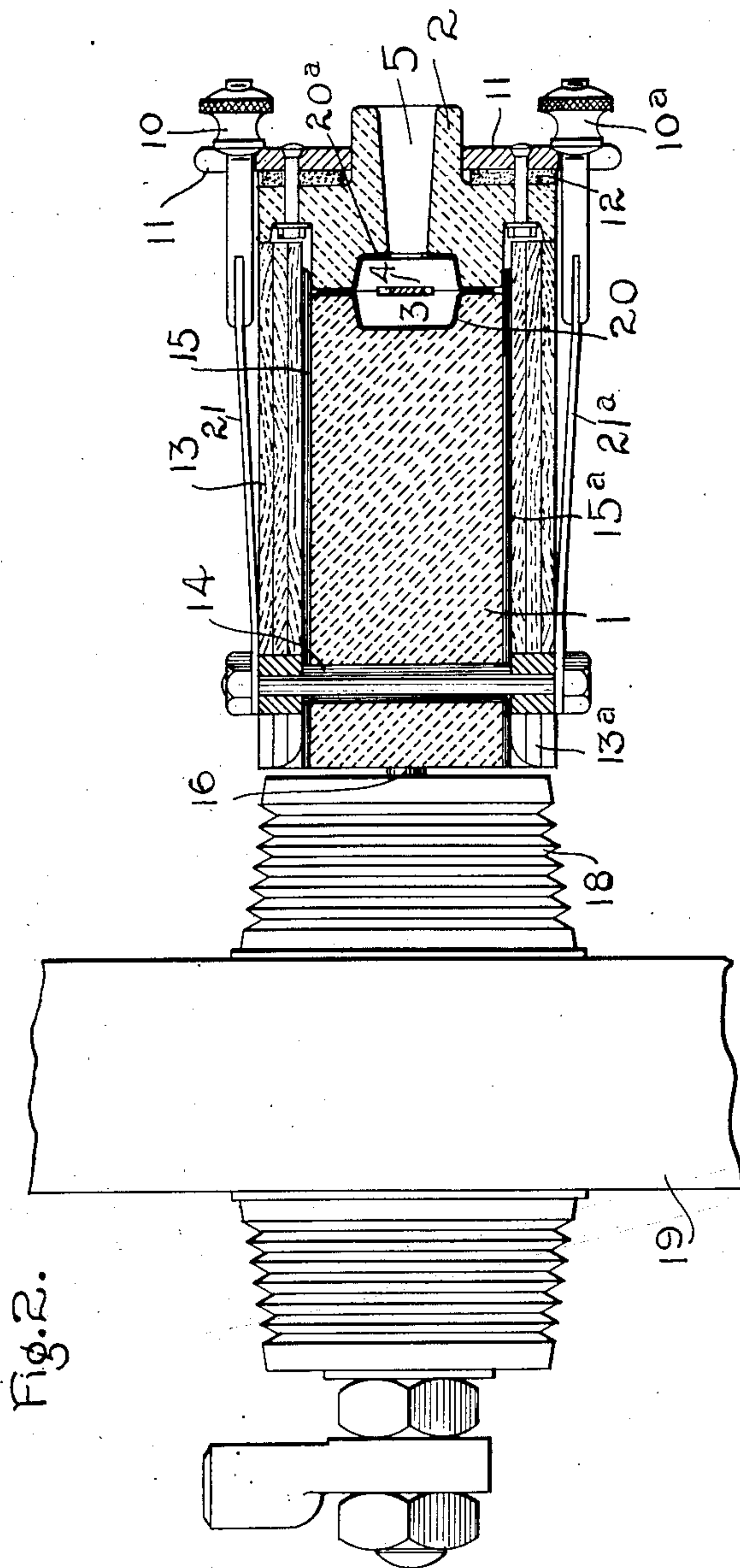
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UNITED STATES PATENT OFFICE.

WILLIAM L. R. EMMET, OF SCHENECTADY, NEW YORK, ASSIGNOR TO THE
GENERAL ELECTRIC COMPANY, OF NEW YORK.

CUT-OUT.

SPECIFICATION forming part of Letters Patent No. 665,888, dated January 15, 1901.

Application filed July 27, 1899. Serial No. 725,234. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM LE ROY EMMET, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Cut-Outs, (Case No. 1,112,) of which the following is a specification.

This invention relates to electric cut-outs of that type in which the point of rupture of the circuit is inclosed in a chamber having a contracted opening to the atmosphere through which the arc-gases on rupture of the circuit act expulsively to extinguish the arc.

The invention is particularly applicable to circuit-rupturing devices adapted to carry high-potential electric currents—as, for example, currents flowing under a potential of ten thousand volts.

In the specific embodiment of my invention herein shown the type of cut-out employed is a fuse of such current-carrying capacity as to give way by softening or melting when the current reaches a dangerous abnormal strength. Parts of the invention, however, are not limited in their application to cut-outs of the fuse type, but may be employed to extinguish an arc formed between two separating contact-terminals.

In carrying out my invention I inclose the rupturing point of the circuit in a chamber formed between two insulating and preferably fireproof bodies, inserting the fuse between said bodies at the joint, and preferably holding the fuse under tension, by reason of which when the device acts the two parts of the fuse between which the arc is drawn are rapidly spread asunder. On one side of the chamber is formed an opening, best located at a point opposite the weakened spot or spot of reduced current-carrying capacity in the fuse, so as to determine an outdrawing of the gases at exactly the point where the arc is formed when the device acts. In order to protect the walls of the chamber in which the fuse is mounted from damage by the arc-gases and the heat, I line it with paper or other flexible fabric, the paper being previously pressed or molded into a form following the superficial contour of the chamber or cavity, so that it may be placed within the same and will form a good fit. The paper

lining or capsule is provided with a rim or edge which overlaps the joint between the two bodies or blocks which form the inclosing chamber, and this serves as a gasket to make a tighter joint at the line of junction. The paper lining or capsule is provided with a hole registering with a hole formed in the wall of the chamber, through which the gases are expelled. In order to promote the expulsive action, the paper may be saturated or coated with some gas-producing body, for which a hydrocarbon may be used with good results, though of course paper itself would under heat give off volatile products which would assist the action. The paper lining serves to protect the walls of the chamber from the action of the arc-gases when the cut-out operates. The chamber in which the cut-out is mounted is formed of two blocks of insulating fireproof material, which may be clamped together by two laterally-movable set-screws formed on leaf-spring supports and adapted to be clamped in slots formed in an insulating-cover which houses the device.

The several features of novelty of the invention will be more fully hereinafter described and will be definitely indicated in the claims.

In the accompanying drawings, illustrating the invention, Figure 1 is a sectional view of a fuse embodying my improvements. Fig. 2 is a vertical section on a plane at right angles to that indicated in Fig. 1, the plane of the section being between the two insulating supports. Fig. 3 is a perspective view of the paper lining or capsule for the fuse-chamber.

1 and 2 represent two blocks of insulating refractory material, which may be best made of porcelain and which have two smooth faces centrally recessed, so as to form a chamber when assembled. A hole cored or drilled in the block 2 at a central point relatively to the chamber 3 acts as a duct for the gases expelled by the arc when the fuse acts. Between the two blocks is a metallic fuse, which may be formed of any suitable metal and is provided after a fashion familiar in the art, at a central point, with a section of reduced current-carrying capacity, so as to insure the giving way of the fuse at that point upon the transit of damaging current.

This point of reduced conductivity is formed in the fuse at a point opposite the vent 5 of the chamber. The confronting faces of the porcelain blocks 1 and 2 may be grooved slightly, or one of them may be so grooved to accommodate the fuse. This latter when the device is assembled for operation is held under tension by two spring-actuated clamp-bars 6 6^a, on a flat face of which is a set-screw 7 7^a, which passes through a hole in the end of the fuse and clamps it to the bar. These bars turn on pivots mounted in a metallic support, coil-springs 8 8^a tending to throw the arms apart. A flexible conductor, as shown, connects the spring-actuated clips with the metal support. The latter is fastened into the lower block 1, of porcelain, by screws 9 9^a. The upper insulating-block 2 is held in firm engagement with the lower by means of two clamps 10 10^a, provided with screw-threaded stems mounted on leaf-springs, the stems cooperating with slots, as indicated in Fig. 2, formed in a metal strip 11, secured by screws to the upper portion of the block 2. In assembling the blocks the threaded stems of the clamps are sprung into the slots in the metal top and the set-screws are adjusted until the parts are in firm engagement. Between the metal top and the top of the block is secured a cap 12, of thin insulating material, such as indurated fiber or other suitable fireproof insulator, adapted to house both of the porcelain blocks in which the cut-out is formed. The sides of this cover may be formed of three-ply wood or other insulating material, to which it is lagged fast by nails or screws, as indicated. These sides are indicated at 13 13^a. The sides are slotted at the bottom to straddle a transverse axis 14, on which the spring-clamps 21 21^a are mounted. At the sides of the lower block 1 are barriers 15 15^a, formed of refractory material, such as indurated fiber, which overlap the upper block, so as to prevent lateral spreading of the arc. The spring-terminals for the fuse are electrically connected with two stiff metal strips or posts 16 16^a, which may be inserted in a spring-clip formed by four metal springs, as indicated at 17 17^a, which springs form the terminals of the switchboard and are mounted in an insulator 18 18^a, screwed to the switchboard 19.

As thus organized it will be seen that when the paper capsules 20 20^a are placed in the cavities formed in the supporting-blocks and clamped together a comparatively close fit is formed, the paper acting as a packing for the joint. When the fuse acts, the retraction of the spring-arms 6 6^a springs a rapidly-lengthening arc, which heats the air in the chamber and raises the temperature of the paper lining, which contributes under the

heat its own gases, as well as that of the material with which it is painted or soaked, to increase the pressure of the gases within the chamber, thereby increasing the expulsive tendency and violently expelling the gases through the hole in the upper block, and thus extinguishing the arc.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. A cut-out having the point of circuit rupture inclosed in a chamber in which a vent is formed, said chamber being provided with a removable lining of paper.

2. A cut-out having the point of circuit rupture inclosed in a chamber in which a vent is formed, said chamber being lined with a flexible removable protective capsule.

3. A cut-out having the point of circuit rupture inclosed in a chamber in which a vent is formed, said chamber being lined with a thin fabric saturated or coated with a gas-producing material.

4. An electric cut-out having the point of circuit rupture inclosed in a chamber in which a vent is formed at a point between the terminals and opposite the rupturing-point, and a lining of thin fabric for the chamber, provided with an opening at said vent.

5. An electric cut-out having the point of circuit rupture inclosed in a chamber formed between two bodies, each provided with a protective lining of flexible material, such as paper, overlapping the edge to form a packing and a vent in the chamber.

6. An electric cut-out, comprising a strip of metal extending into a chamber provided with a protective lining of paper, and with a vent for the expulsion of gases generated by the arc at a point opposite the fuse and between its terminals.

7. A cut-out comprising a fuse extending into a chamber formed between two blocks of incombustible material, provided with a removable lining the terminals of the fuse being connected to spring-actuated retractors, and a vent for the chamber, the fuse being provided with a section of reduced current-carrying capacity at or near said vent.

8. An electric fuse held under tension between elastic supports and extending between two blocks of refractory material, a chamber formed between said blocks provided with a vent opposite the fuse, a cover for the operative parts, and clamps for securing said cover in fixed relation to the parts.

In witness whereof I have hereunto set my hand this 25th day of July, 1899.

WILLIAM L. R. EMMET.

Witnesses:

BENJAMIN B. HULL,
MABEL E. JACOBSON.