

(No Model.)

E. J. GUILFORD.
DEVICE FOR MARKING WATCH DIALS.

No. 431,807.

Patented July 8, 1890.

Fig. 1.

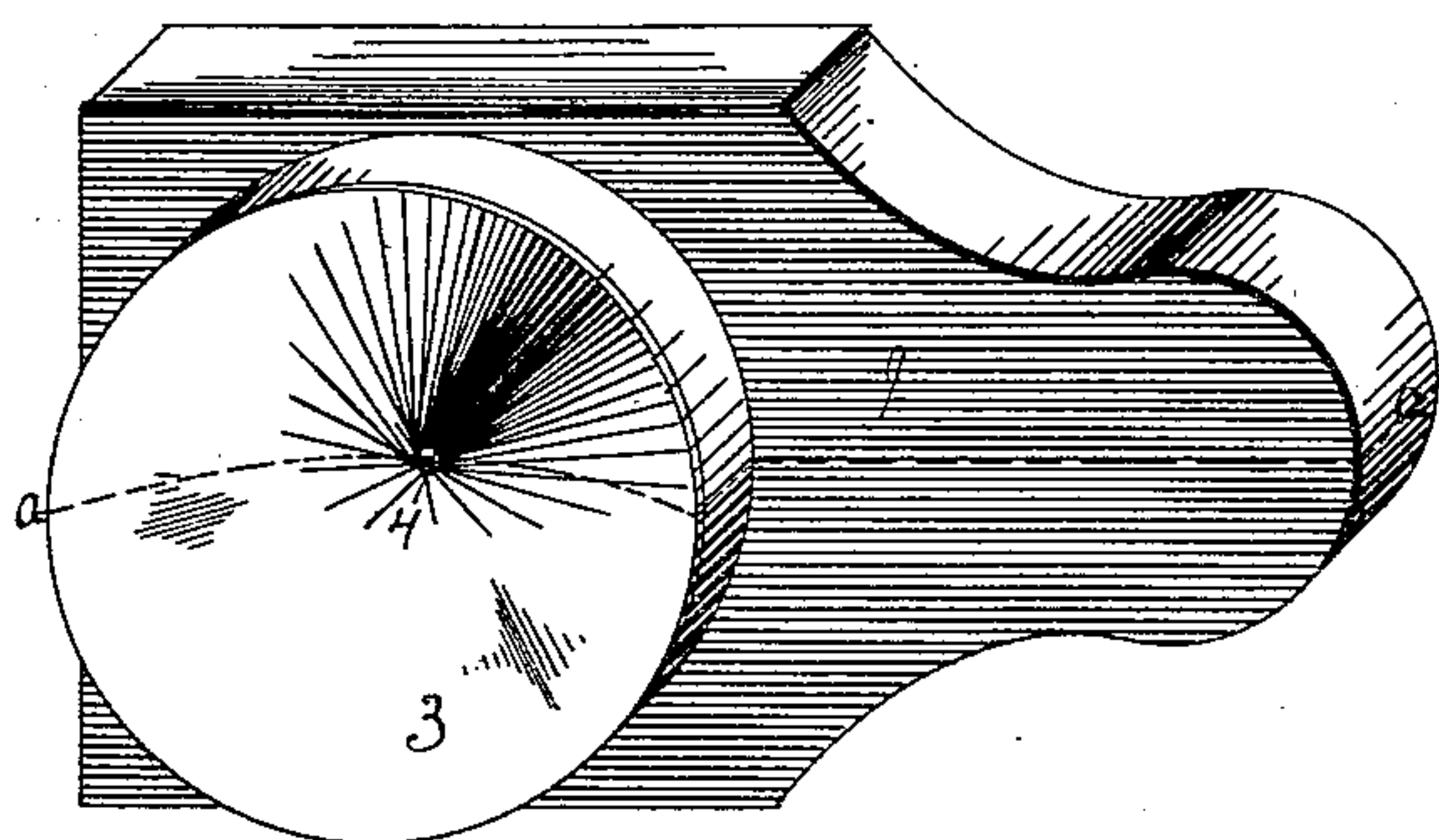


Fig. 2.

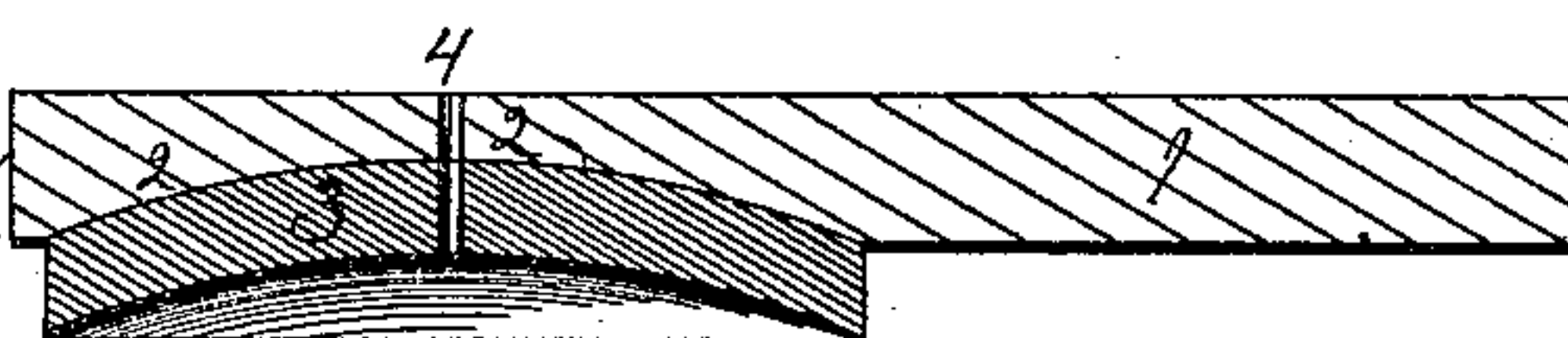


Fig. 6.

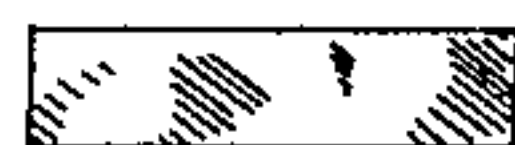


Fig. 3.

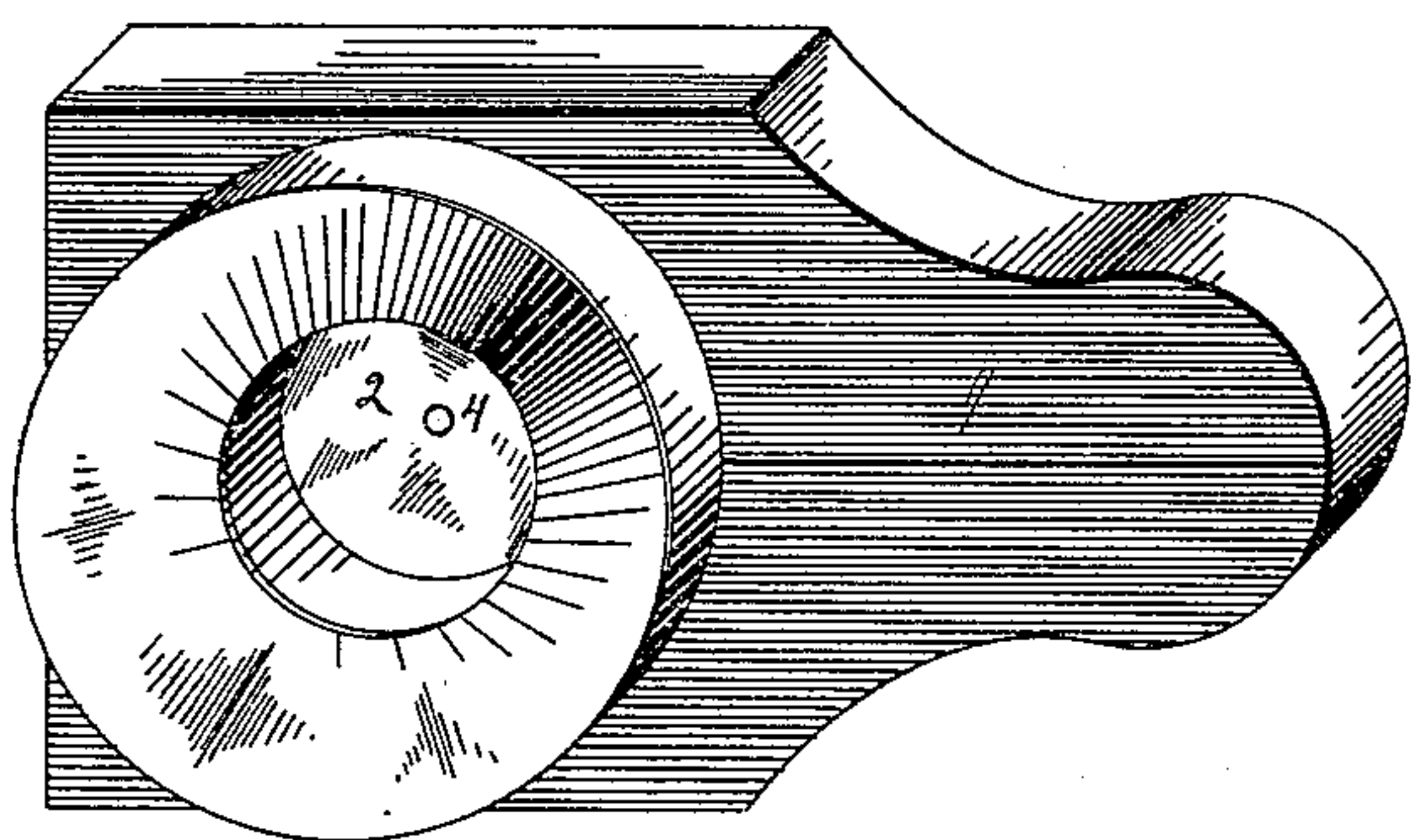


Fig. 7.

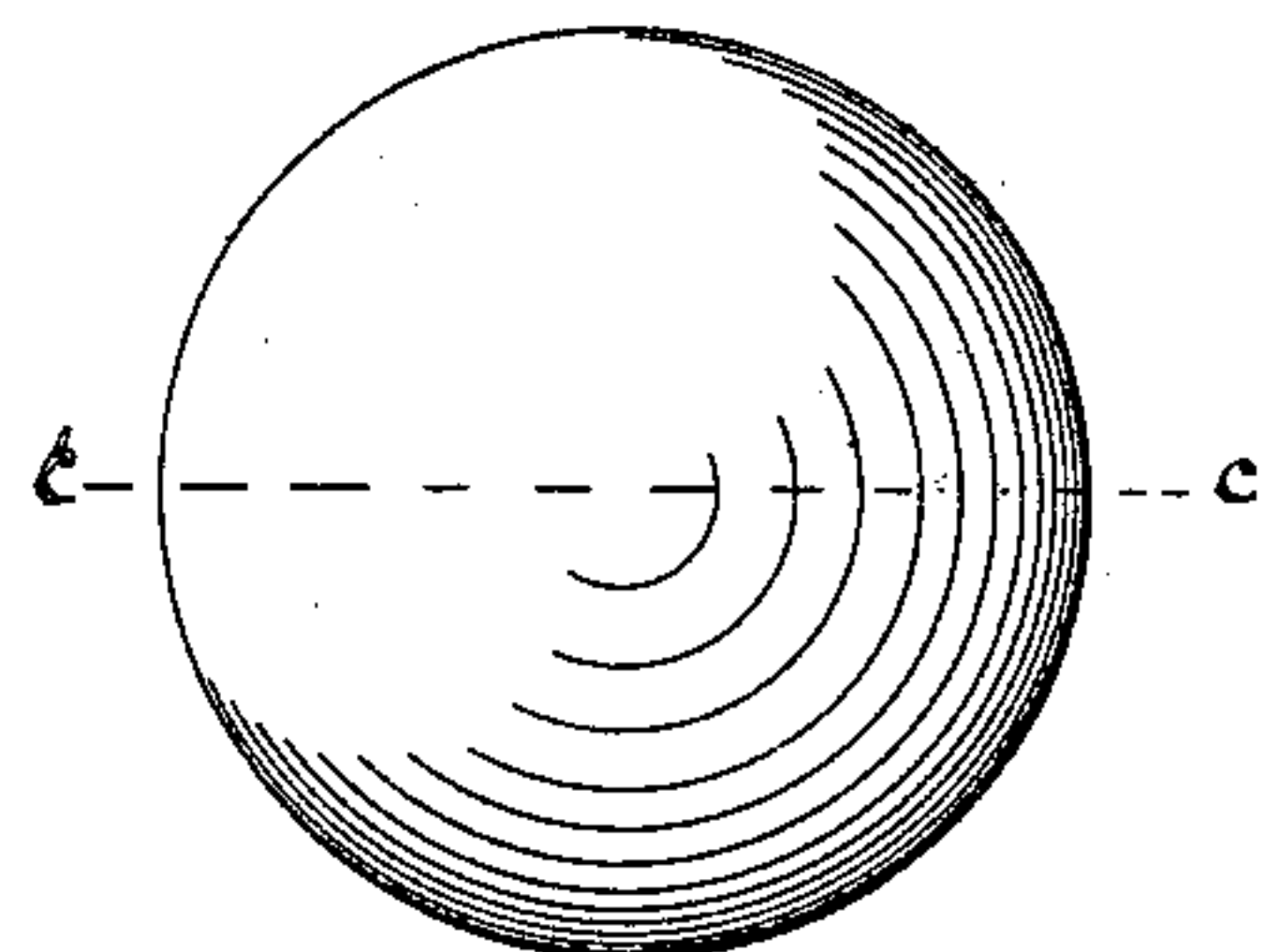


Fig. 4.

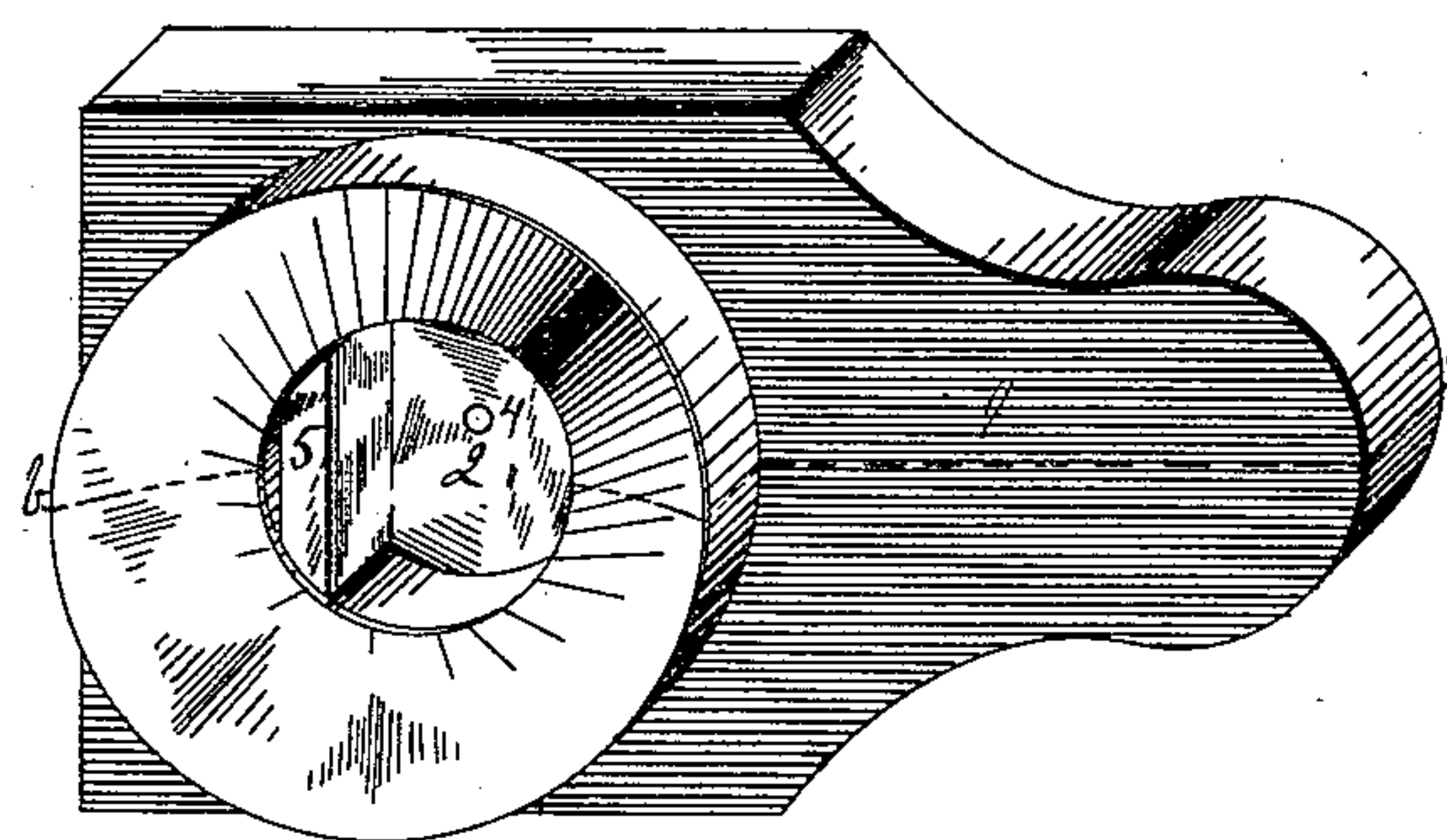
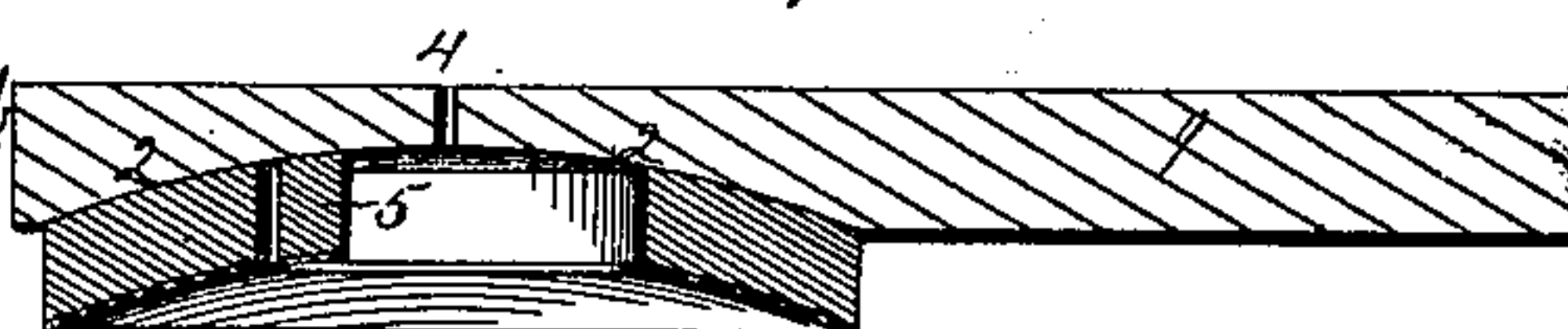


Fig. 8.



Fig. 5.



Witnesses:
Louis Clark
E. Behel

Inventor:
Edward J. Guilford
By A. O. Behel
Att'y.

UNITED STATES PATENT OFFICE.

EDWARD J. GUILFORD, OF ROCKFORD, ILLINOIS.

DEVICE FOR MARKING WATCH-DIALS.

SPECIFICATION forming part of Letters Patent No. 431,807, dated July 8, 1890.

Application filed January 5, 1889. Serial No. 295,500. (No model.)

To all whom it may concern:

Be it known that I, EDWARD J. GUILFORD, a citizen of the United States, residing at Rockford, in the county of Winnebago and State of Illinois, have invented a certain new and useful Device for Marking Watch-Dials, of which the following is a specification.

The object of this invention is to transfer characters or markings onto watch-dials by the employment of an elastic pad upon which the markings have been transferred.

The apparatus and process for marking watch-dials heretofore employed are very intricate and require expert workmen for operating and carrying them out. My device may be operated by less experienced hands, better and uniform results obtained at a much less cost.

In the accompanying drawings, Figure 1 is an isometrical representation of my improved transferring-pad secured to its base. Fig. 2 is a lengthwise central section of the pad, shown in Fig. 1 on dotted line *a*. Fig. 3 is an isometrical view of a pad made in ring form. Fig. 4 is also an isometrical view of a pad having its center portion cut away, leaving a strip of elastic material. Fig. 5 is a lengthwise central section of the pad, shown in Fig. 4 on dotted line *b*. Fig. 6 is a pad for placing a name or monogram on a watch-dial used in connection with the pad represented at Fig. 3. Fig. 7 is a face view of a watch-dial. Fig. 8 is a section on dotted line *c*, Fig. 7.

I will describe the process of manufacturing watch-dials up to the place when the characters or markings are placed thereon.

To a circular disk of copper plate is secured the feet usually found in dials. The plate is then pressed in suitable dies forming one of its faces concave and its other face convex. The dial is then coated with enamel and baked in a furnace to harden the enamel. The object in forming the dial with a concave and convex surface is in the baking process for hardening the enamel, and a second baking for permanently attaching the markings thereto. The concave face is placed downward in the furnace and the heat will soften the copper plates somewhat, causing it to assume nearly a flat position; but the heating to harden the enamel only tends partially to bring the dial

to a flat surface. When the dials have received their coating of hardened enamel, they are in condition to receive the markings, and will appear as represented at Figs. 7 and 8. It is at this stage that my improved device is used, and, as represented in the drawings, consists of a base-plate 1, which, in this instance, is capable of being secured in a press which may have an operating-handle or foot-pressure device. This base-plate has a concave face 2, to which is connected or otherwise secured normally pad 3 of elastic material, having its face concaved by reason of its conforming to the concavity of the base-plate. I have found this a reliable manner of giving the proper concavity to the pad. The concave face of this pad is covered with a layer of fine dental sheet-rubber, which give a fine surface to the pad, and enables me to use a different grade of rubber for the body of the pad.

The following steps are observed in using my pad: The markings are engraved into the surface of a steel plate. The depressions or cut-away portions of this steel plate are filled with a pigment usually employed for marking dials. This plate is then placed in a press as the lower or stationary plate. I cover the concave surface of my elastic pad with a separating powder. The pad is then placed in the press as the upper or movable portion. Pressure is then applied and the pad brought in contact with the engraved surface of the steel plate. This pressure will lift the pigment from the plate and transfer it to the concave face of the pad. The steel plate is then removed from the press and a watch-dial placed instead, its convex surface up. Downward pressure is again applied to the elastic pad, which is brought in contact with the convex surface of the dial, and the markings transferred from the pad to the dial. In pressing the pad either in contact with the engraved plate or with the dial air will gather between the surfaces, and the vent 4 will permit the escape of the air, thereby greatly relieving the pressure, which would be otherwise required. The dial is then placed in a furnace and the markings hardened by the action of the heat. This last subjection of the dial to the action of the heat will cause it to assume a flat condition, and the dial

will be finished so far as the markings are concerned. As it has been seen that the face of the dials upon which the markings are placed must be of convex form, so far as I have been able to demonstrate, the elastic pad must have its face conform approximately to the convex surface of the dial. When pressure is applied to the pad for the purpose of transferring the markings to the dial, the pressure will be substantially uniform throughout the face of the dial, thereby less liable to crack its enamel coating, and also preventing the slipping of the pad after it has been brought in contact with the dial.

A solid pad, as shown in Fig. 1, or one like that shown in Fig. 4, is employed when the markings are of the ordinary characters, such as supplied to the trade, or when a number of a special design are desired. In the form shown at Figs. 4 and 5 the center portion of the pad is cut away, thereby greatly relieving the pressure upon the dial, and a strip of elastic material 5, of sufficient size to transfer the names usually found on watch-dials, is placed within the cut-away portion of the pad.

It is common in watch-dial making that a single dial with a special name or monogram is ordered. In such cases I prefer to use a pad of ring form, (represented at Fig. 3 of the drawings,) the face of the ring transferring circles, minute-divisions, and hour-characters. The name or monogram may be placed on with an extra pad, such as shown at Fig. 6. By the employment of a separating-powder placed on the face of the elastic pads the markings will relieve themselves in better shape than without it.

I have described the pad represented at Fig. 1 as having a vent and the surface of the pad covered with a layer of elastic rubber. It is evident that all the pads may be similarly provided.

I claim as my invention—

1. An elastic pad for transferring circles, minute-divisions, and hour-characters to watch-dials, having its face normally concave to conform approximately to the convex surface of a watch-dial, substantially as set forth.

2. A device for transferring markings to watch-dials, consisting of an elastic pad having a separating-powder applied to its face, substantially as set forth.

3. A device for transferring markings to watch-dials, consisting of a base-plate, a ring of elastic material having a concave face and a strip of elastic material within the opening of the ring, said ring and strip secured to a base-plate, substantially as set forth.

4. A device for transferring markings to watch-dials, consisting of two portions, a ring, and a pad, each of elastic material, said ring having its face concave, substantially as set forth.

5. A device for transferring markings to watch-dials, consisting of a base having its face concave and a pad of elastic material secured to said concave face, the outer face of the pad thereby assuming the concavity of the base-plate, substantially as set forth.

6. A device for transferring markings to watch-dials, consisting of a base having its face concave, a pad of elastic material secured to said concave face, the outer face of the pad thereby assuming the concavity of the base-plate, and a vent to said pad, substantially as set forth.

7. A device for transferring markings to watch-dials, consisting of a solid base-plate and a pad of elastic material secured thereto and having its face normally concave, substantially as set forth.

8. A device for transferring markings to watch-dials, consisting of a ring of elastic material having its face normally concave, substantially as set forth.

9. A device for transferring markings to watch-dials, consisting of a ring of elastic material having its face normally concave, and a layer of fine rubber applied to its concave face, substantially as set forth.

EDWARD J. GUILFORD.

Witnesses:

A. O. BEHEL,
E. BEHEL.