

A. C. ENGERT.
Device for Refracting, Reinforcing, and Modulating
Sound.

No. 231,292.

Patented Aug. 17, 1880.

Fig. 1.



Fig. 2.

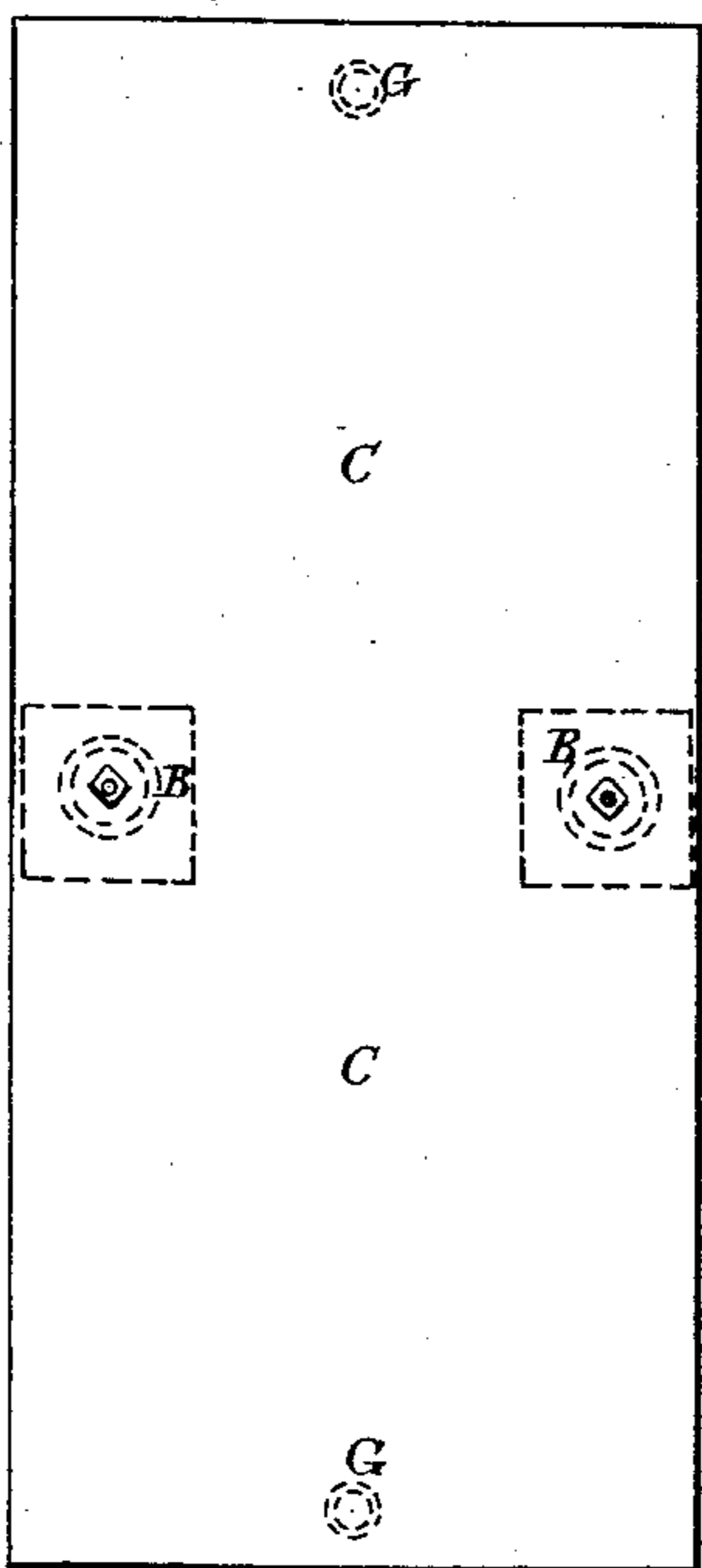


Fig. 3.

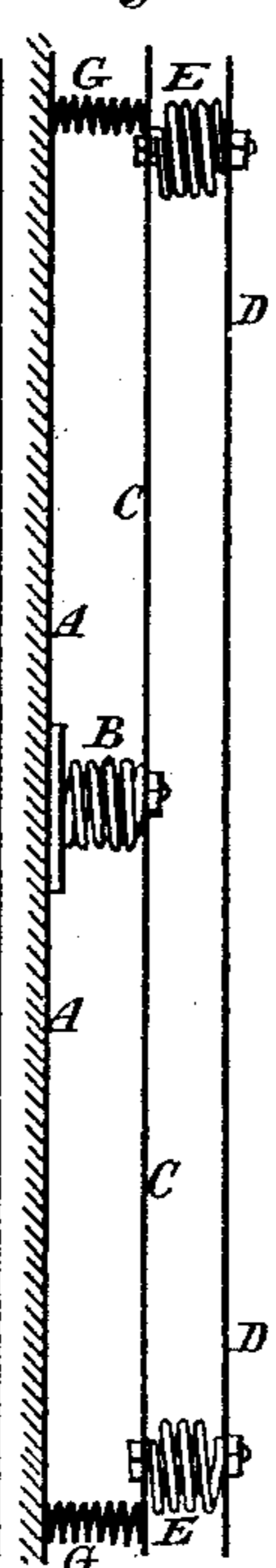


Fig. 4.

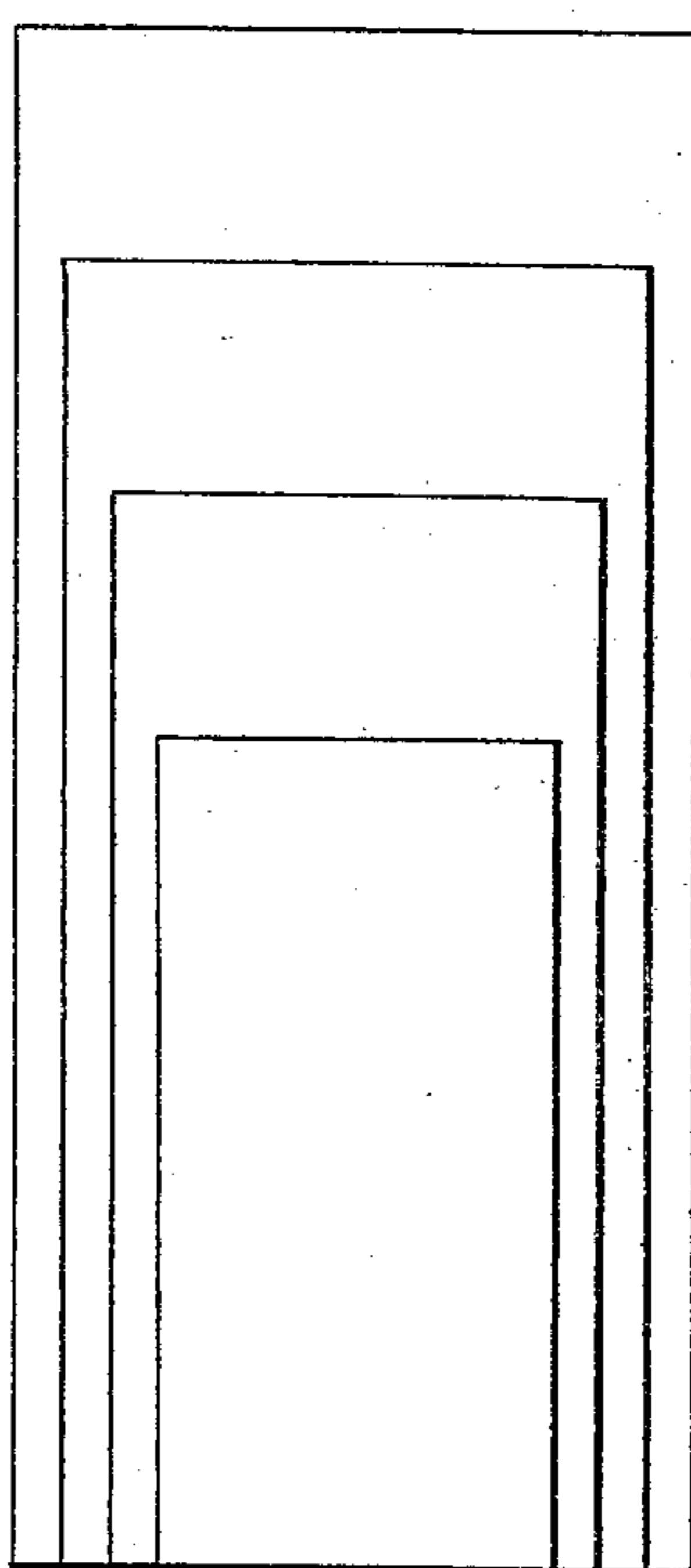


Fig. 5.

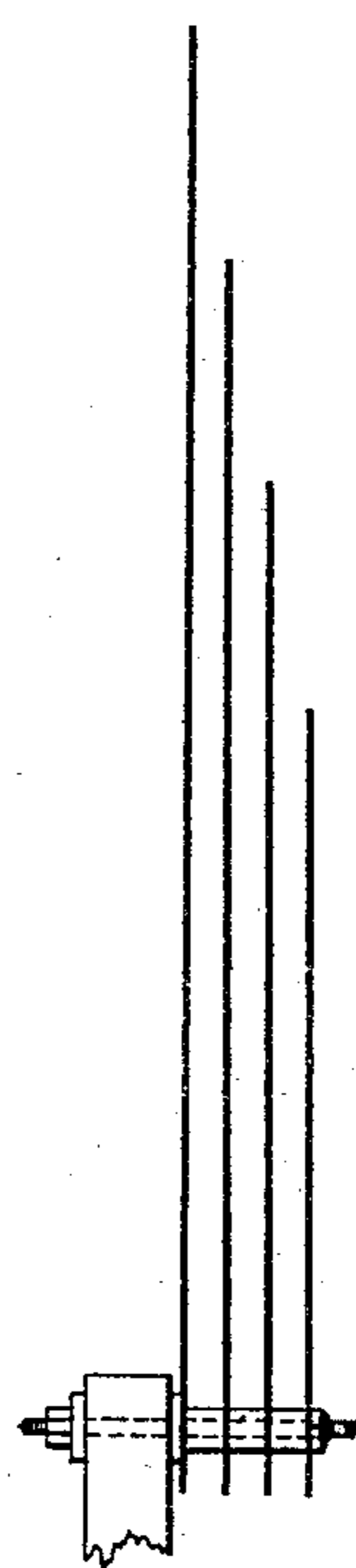


Fig. 7.

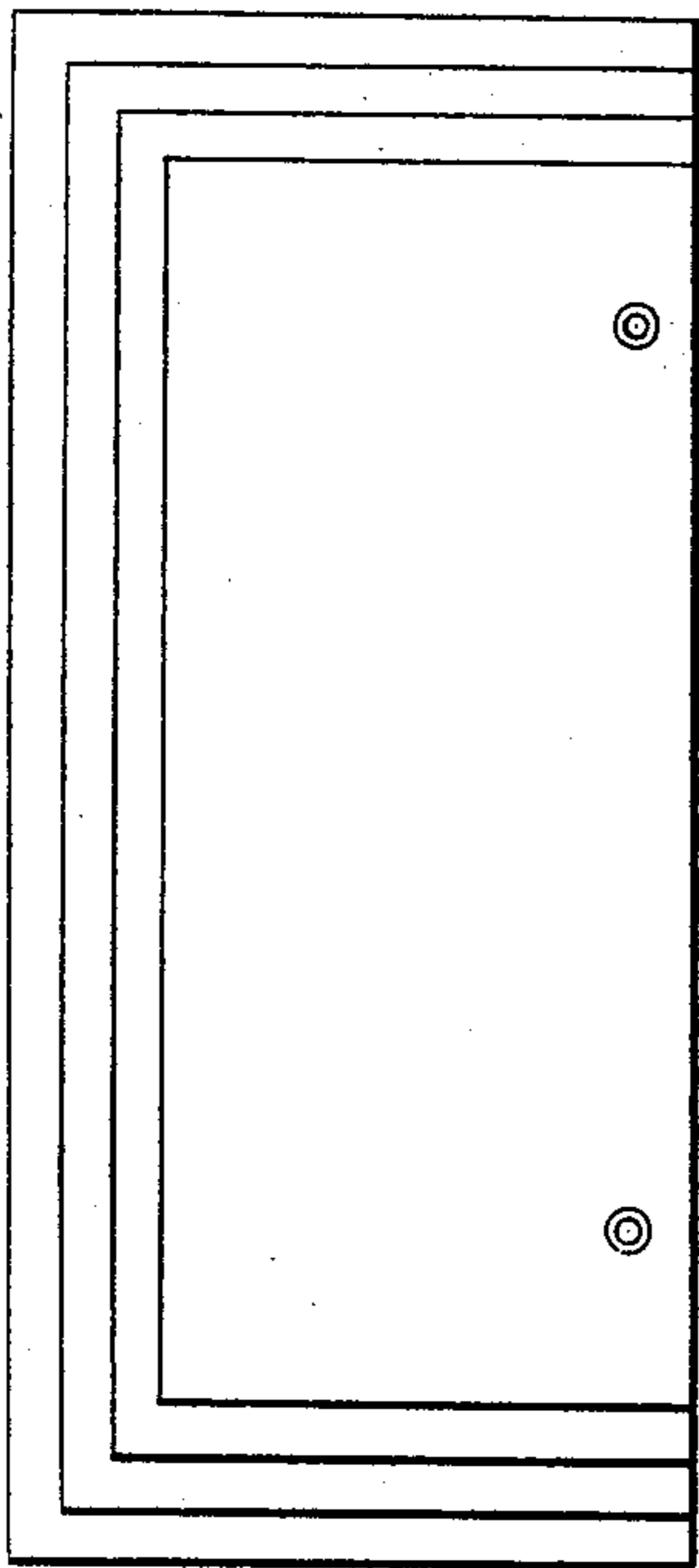


Fig. 8.

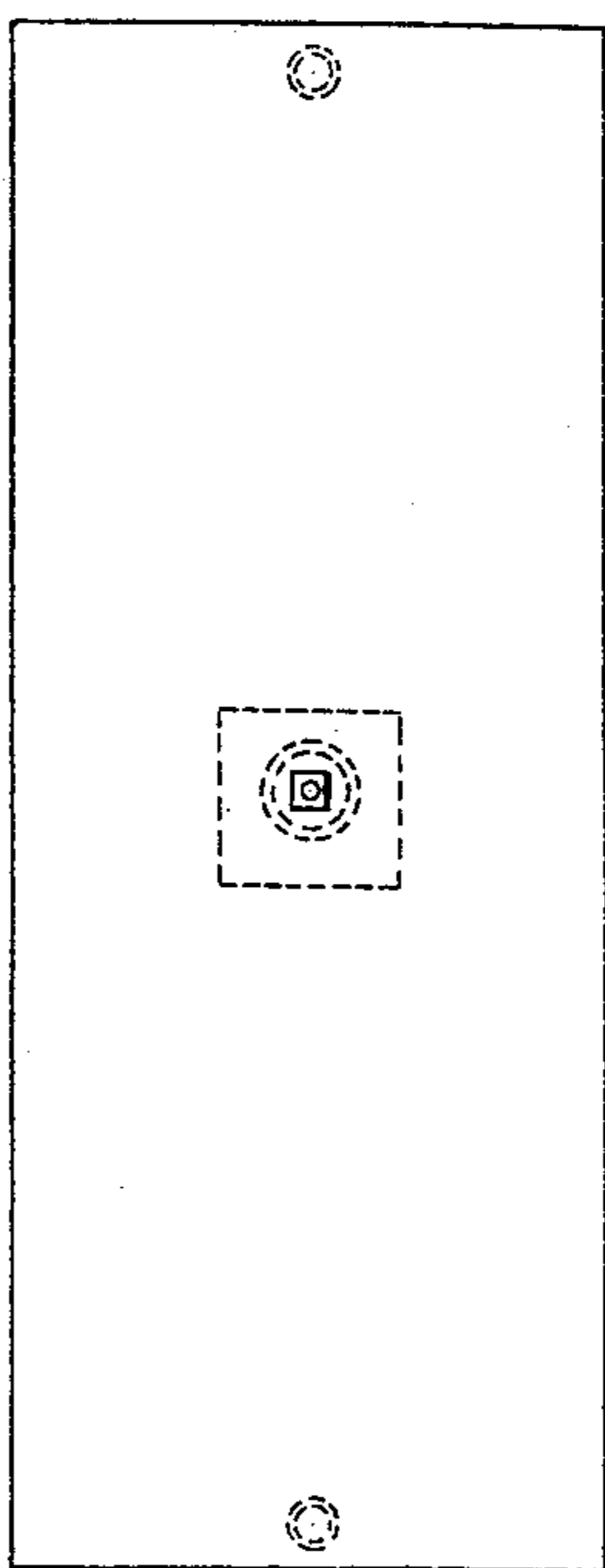


Fig. 6.

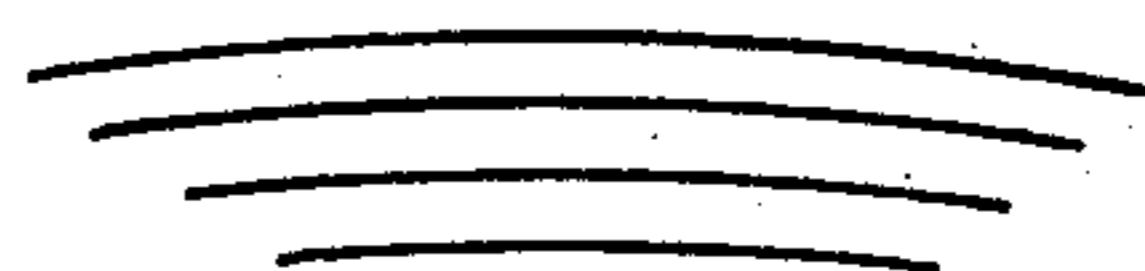
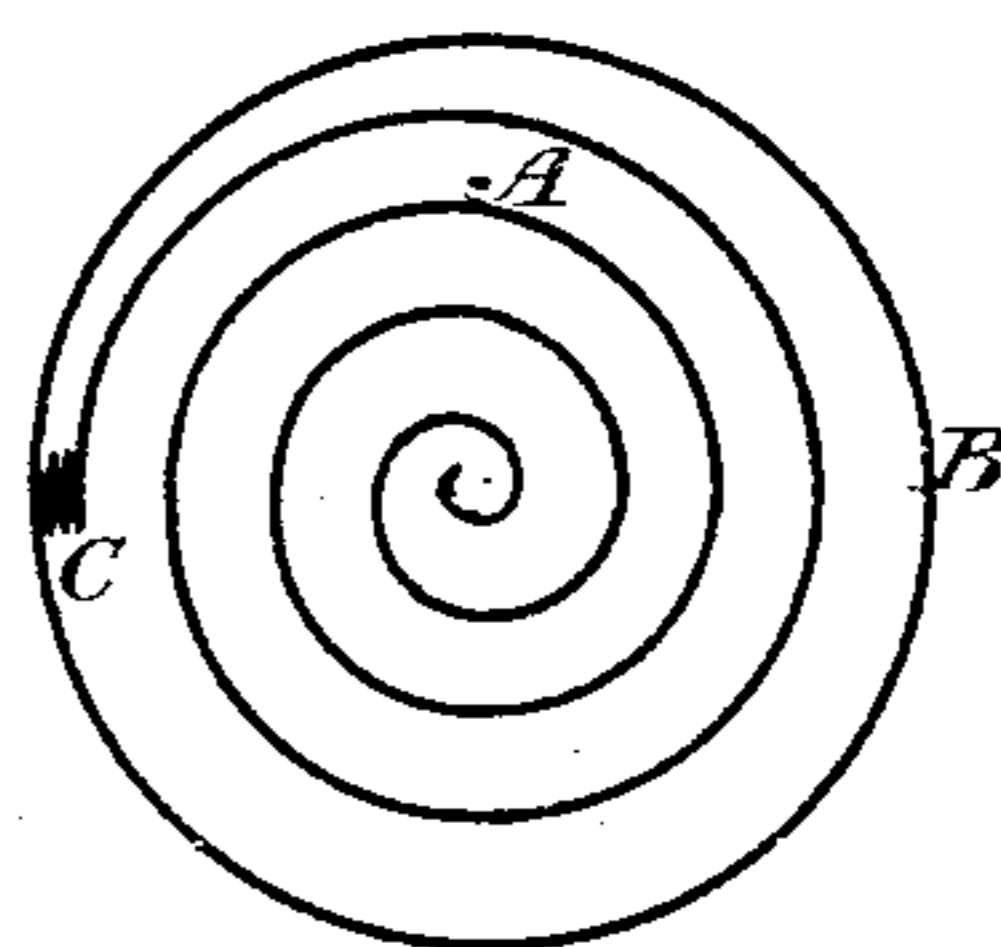


Fig. 9.



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DEVICE FOR REFRACTING, RE-ENFORCING, AND MODULATING SOUND.

SPECIFICATION forming part of Letters Patent No. 231,292, dated August 17, 1880.

Application filed September 8, 1879. Patented in England June 7, 1878.

To all whom it may concern:

Be it known that I, ADAM CYRUS ENGERT, of Bromley-by-Bow, in the county of Middlesex, England, have invented new and useful
5 Improvements in Means used for Refracting, Re-enforcing, and Modulating Sound, which improvements are fully set forth in the following specification, reference being had to the accompanying drawings.

10 This invention has for its object to furnish improved means for refracting, re-enforcing, and modulating sound.

For refracting, re-enforcing, and modulating sound in the interior of buildings—as, for example, in churches or concert-rooms—I suspend or secure thin sheets of steel or other hard metal or material to the walls on the inside of the building, or suspend such plates from frame-works or stands erected for the
15 purpose. Each plate has two pins, strips, or coiled or other springs of metal attached to it at different points, and is by these secured to the wall or stand; or it might be supported from the wall or stand by a single pin, strip,
20 or spring.

Plates supported by pins or springs in the above manner can also be applied to musical instruments—as, for example, to pianos—and be held in them either in a horizontal or vertical position. For a vertical piano the plates
30 might, for example, be placed at the back or upper part of the front of the frame or case of the instrument, and two, three, or more plates might be used, one in front of the other, at a slight distance apart, while for a horizontal
35 piano the plates might be either at the top, above the strings, or in the lower part of the case, below them, sustained by any desired number of springs. Similar plates may also
40 be applied to organs.

Plates carried in the above manner by stands can, in like manner, be employed in the open air; or I employ a sheet of hard metal coiled up into a spiral coil or scroll and placed with-
45 in a rectangular or other tubular casing, the outermost coil of the scroll being attached to the interior of the casing, and such casings, with the coiled plates within them, may be placed in different parts of the building, where-
50 ever it may be required to use them. The sides of the casing may also have openings

formed through them. Flat or slightly-curved sheets or plates of metal may similarly be placed within a casing, and be carried, in the manner hereinbefore described, by strips or
55 springs or pins from the side of the casing. Scrolls formed from metal plates may also be used without the casing, and be secured by the outermost coils to the walls of the building or to frames or stands.

60 The drawings hereunto annexed show examples of plates suspended in the manner above described from the inner face of the wall of a building.

Figure 1 shows an edge view, and Fig. 2 a
65 face view, of a plate sustained by springs at a short distance from the face of a wall—it may be the interior of a church, concert-room, or other building where it is desirable that speaking or singing shall be clearly heard
70 in every part of the building. Any desired extent of the surface of the wall of the building may thus have plates mounted in front of them, according to the effect required to be produced. The plates also need not be mount-
75 ed upon the wall of the building. They might be mounted at other parts of its interior, or upon frames or stands provided for the purpose. The plates also may either be flat or, as I prefer, slightly curved.

80 The plates should be placed at that part or parts of the building near which is produced the sound which it is desired to resound through the building, while at the other parts of the building provision may be made for prevent-
85 ing the re-echoing of any sound made near them.

In Figs. 1 and 2, A is part of the wall of the building. B B are two coiled springs, or it might be strips of metal, secured to the wall,
90 and also to the plate C, which may be of iron or steel, or other hard metal or material. G G are other very light springs for keeping the plates in position away from the wall.

In some cases a second plate, D, may simi-
95 larly be carried by springs E from the plate C, as shown at Fig. 3. The springs E are, by preference, so placed that a line drawn between them shall be at right angles to a line drawn between the springs B.

100 When two or more plates are used, one in front of the other, I make the plates one

smaller than the other, as shown at Figs. 4, 5, and 6, and at Fig. 7. The plates shown at Figs. 4, 5, and 6 are supported by two pins near their lower edge, and between the plates distance-pieces are mounted on the pins, to keep the plates apart and allow of them being all firmly clamped together. The plates shown at Fig. 7 are similarly supported by two pins near the edge of one of their longer sides.

10 Whenever the plates hang down or stand up from the springs or pins that carry them the plates, if made of thin metal or material, should be slightly curved in the manner shown at Fig. 6; but when stout plates are used it is
15 not necessary to bend them.

Fig. 8 shows a plate supported by a single spring at its center. Fig. 9 shows, as a modification of my apparatus, a coiled plate, A, placed within a cylindrical or other shaped casing, B, the outer edge of the coiled plate being secured to the interior of the casing by springs C. Such coiled plates, however, might be used without any protecting casing, and be secured to any part of a building or elsewhere,
20 wherever it is desired to reverberate sound.

25 In many cases it is desirable that provision should be made for arresting at times the action of the reverberatory plates. This may be

effected by means of dampers brought against the plates whenever they are not required to be in action. The dampers might be worked by wires from a treadle, or in other suitable manner.

Having thus described the nature of my invention, and the manner of performing the same, I would have it understood that I claim—

1. The hereinbefore-described apparatus for refracting, re-enforcing, and modulating sound, consisting essentially of the combination, with the plate C, of the main or supporting springs and the light or steadying springs, as described.

2. The combination, with the walls of a building, of a series of sound-refracting devices, each consisting of one or more hard metallic plates, the main or supporting springs, and the light or steadying springs, substantially as hereinbefore set forth.

London, August 25, 1879.

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