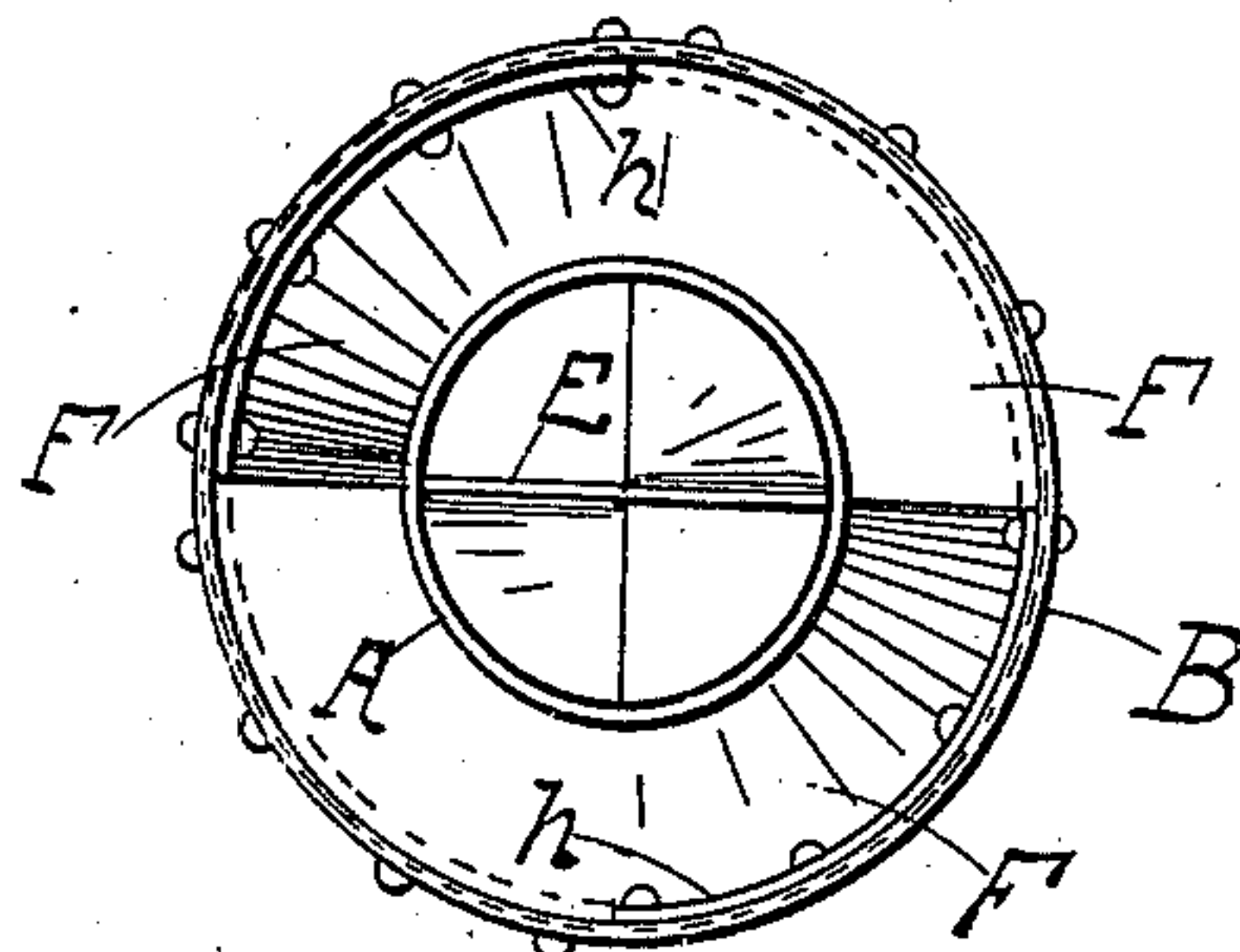
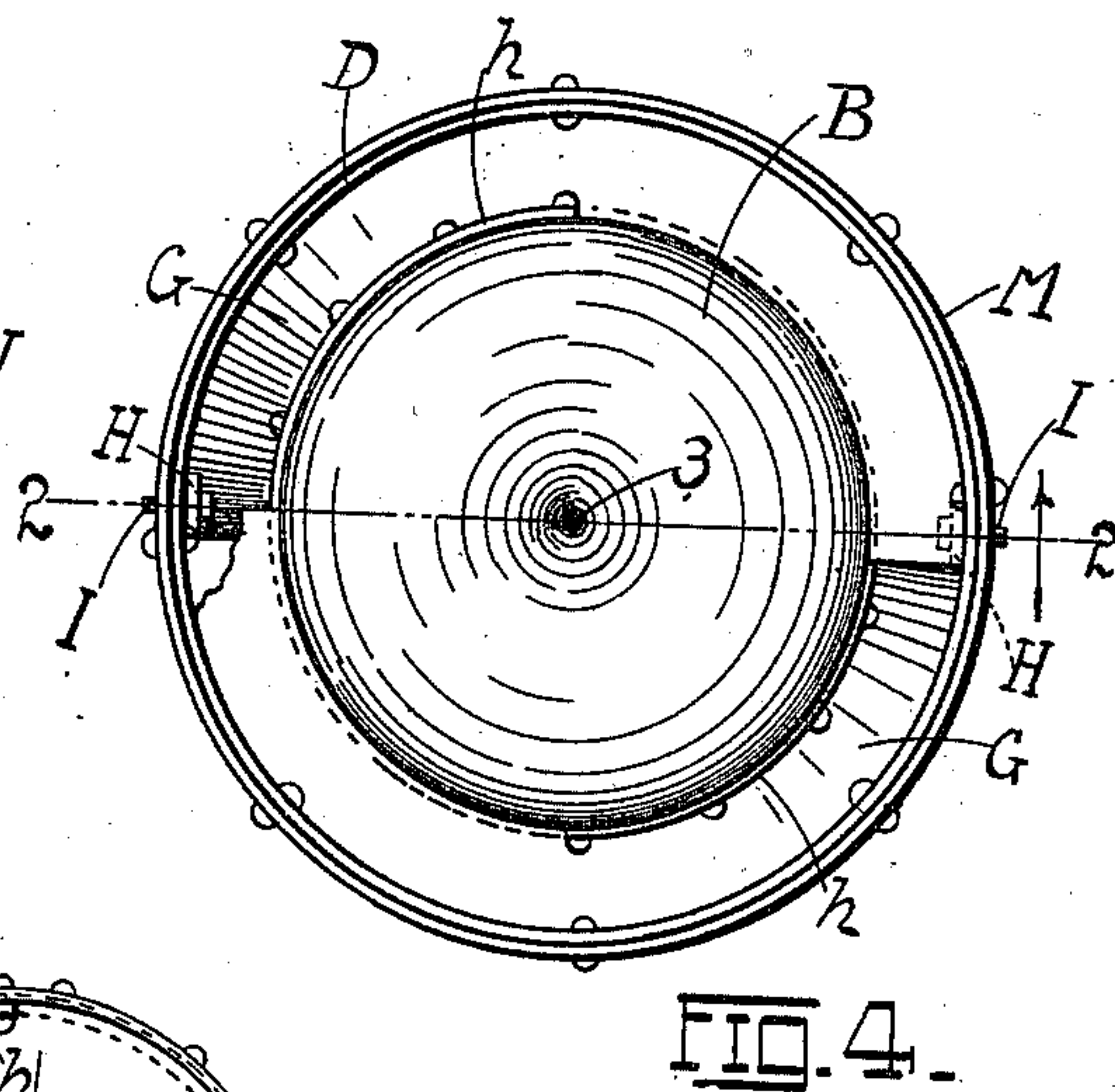
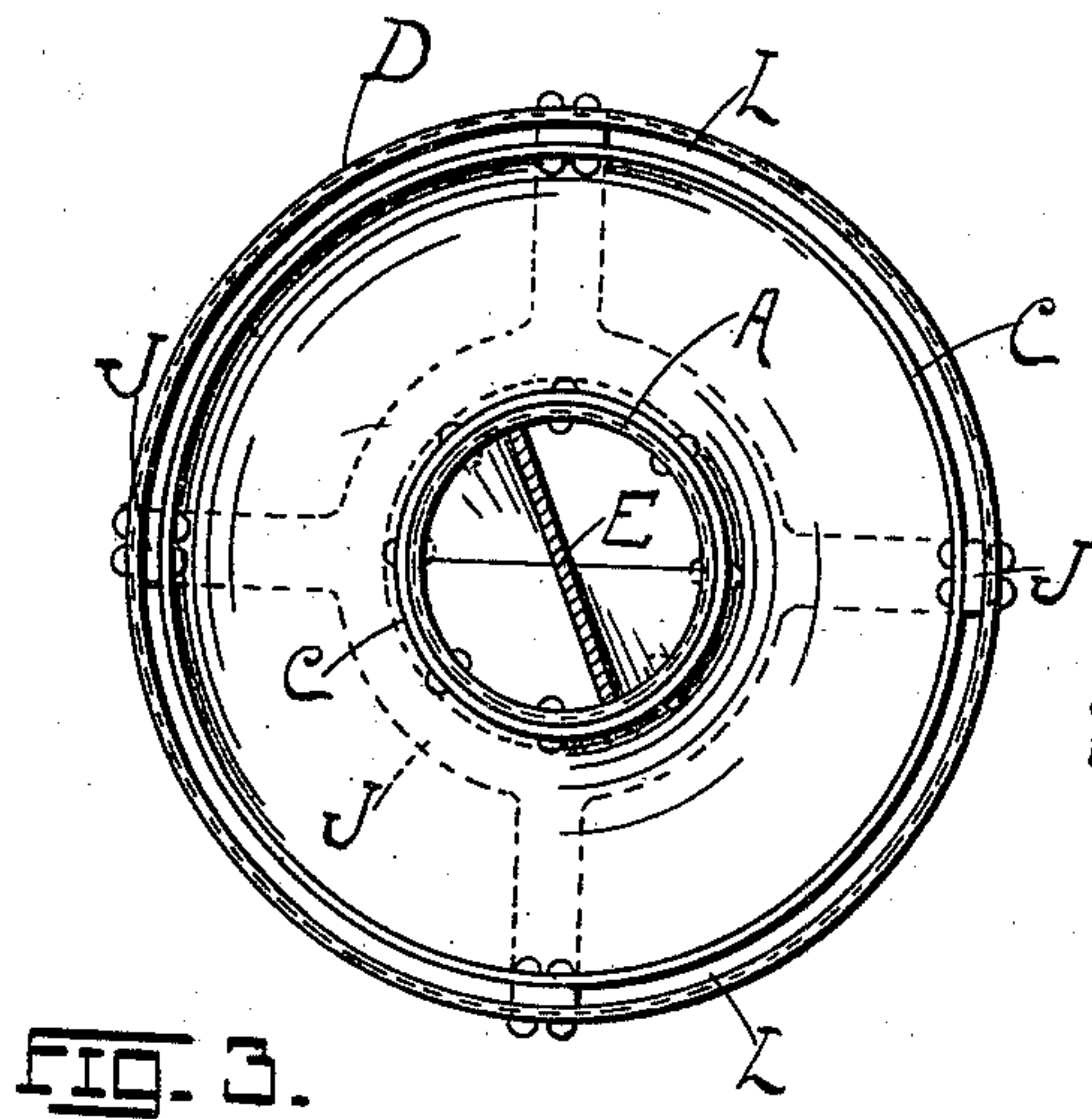
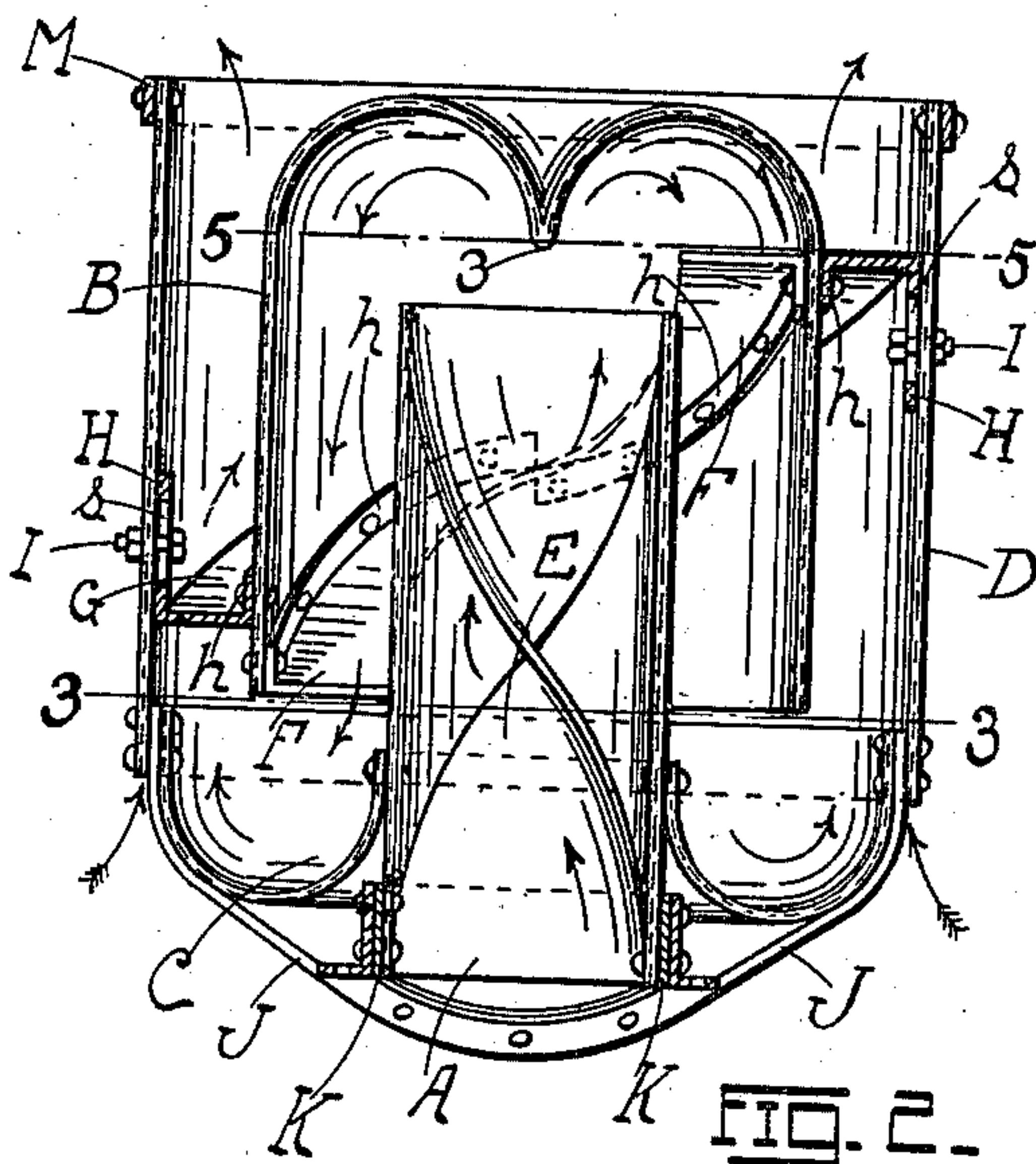
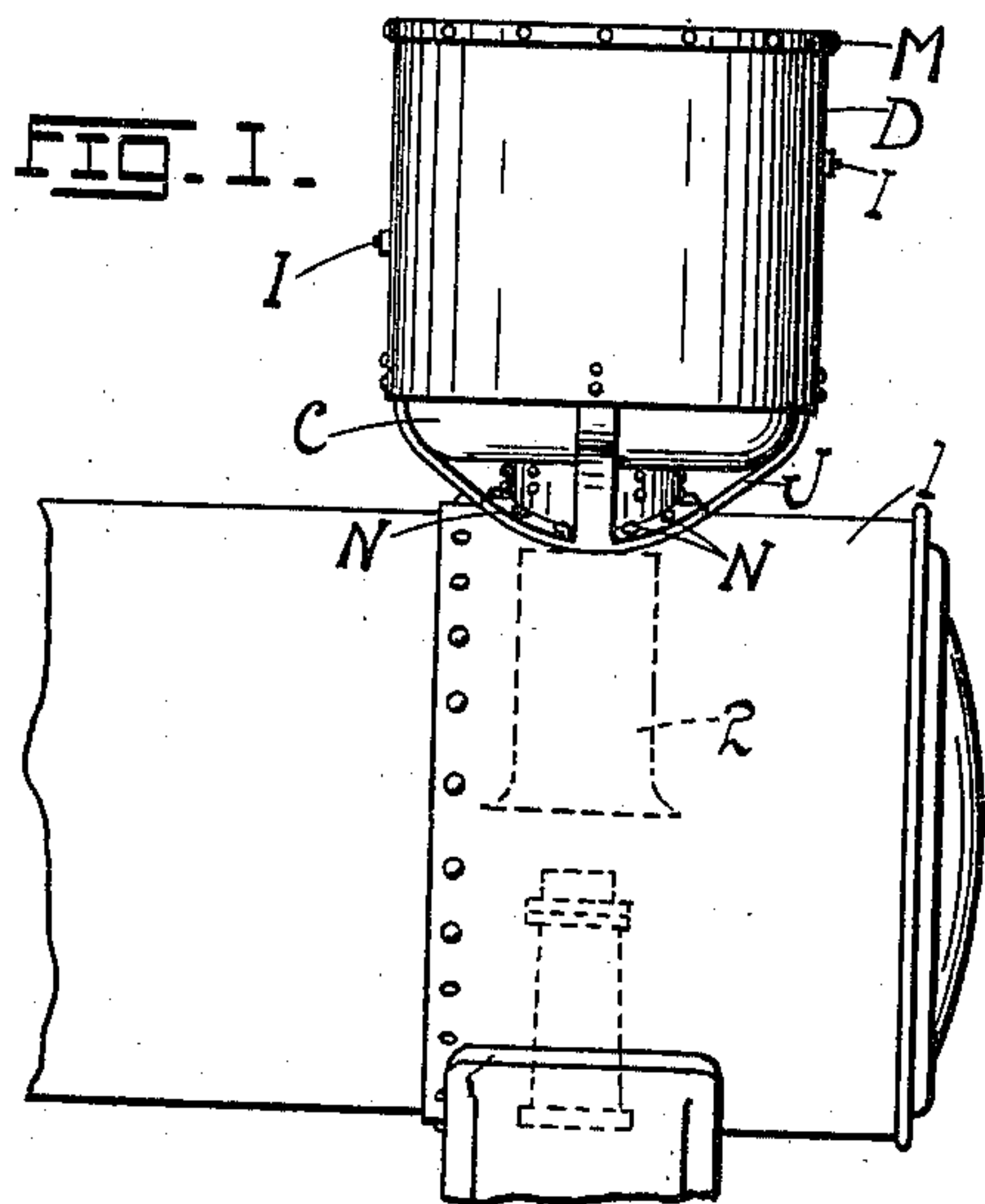


L. T. SICKA.
SPARK AND CINDER EXTINGUISHER.
APPLICATION FILED JULY 25, 1910.

989,655.

Patented Apr. 18, 1911.



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LOUIS T. SICKA, OF TOOELE, UTAH.

SPARK AND CINDER EXTINGUISHER.

989,655.

Specification of Letters Patent.

Patented Apr. 18, 1911.

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To all whom it may concern:

Be it known that I, LOUIS T. SICKA, citizen of the United States, residing at Tooele, in the county of Tooele and State of Utah, have invented certain new and useful Improvements in Spark and Cinder Extinguishers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in spark and cinder extinguishers; and it consists in the novel details of construction more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is an elevation of my apparatus as applied to the extension-front of a locomotive; Fig. 2 is a middle vertical section of the apparatus on the line 2—2 of Fig. 4; Fig. 3 is a horizontal cross-section on the line 3—3 of Fig. 2; Fig. 4 is a top plan thereof; and Fig. 5 is a horizontal cross-section on the line 5—5 of Fig. 2 omitting the outer drum and vanes secured thereto.

The present invention is particularly (though not exclusively) designed as a spark and cinder extinguisher for locomotives, the object sought being to so mix the live sparks and cinders (given off by solid fuel such as coal, coke and the like) with a proper complement of exhaust steam and air for the purpose of practically extinguishing and dampening the same, as to render the particles harmless and thereby prevent damage to crops, grass, forests and growing vegetables in the vicinity of railways.

The device is substituted for the usual locomotive smoke stack (when used on locomotive boilers) and offers advantages which will be fully apparent from a detailed description of the invention which is as follows:

Referring to the drawings, 1 represents the extension-front of locomotive boiler, or that portion from which the smoke-stack (when present) leads. The present attachment takes the place of the stack as previously stated. To the upper wall of the extension-front 1 and encompassing the smoke

and gas discharge opening is secured a riser or up-take A, about the base of which is secured a spider J, the terminals of whose arms are riveted jointly to the base of an outer drum or final discharge up-take D and to the outer wall of an annular, concave or trough-shaped bottom up-take deflector C, the inner wall of which is in turn riveted to the riser A. The arms J are preferably interposed between the adjacent faces of the parts C and D, whereby there results an annular air-space L between the parts, which space is interrupted only at the points where the arms J are secured. This space L serves as an intake for atmospheric air which as it rises mingles with the exhaust steam, cinders and sparks discharged through the lift pipe 2 (which when present, and as well understood in the art directs upwardly both the live blower-steam and the steam exhausted from the engine cylinders, not here shown). Superposed over the riser A, and interposed between said riser and the outer drum D is a cylindrical down-take deflector B provided with a central depending inverted conical spreader 3, the apex of the cone being on the line of the axis of the riser A.

Secured respectively to the inner and outer faces of the walls of the member B, are spiral vanes or equivalent mixing projections F, G, the opposite ends of the vane G being provided with respectively upwardly and downwardly projecting slotted lugs H which serve as the immediate means of adj-justably securing the member B to the outer drum D, the bolts I being passed through the walls of the drum D and through the slots s of the lugs to effect the connection between the parts. In this way the height of the member B (with its vanes F, G,) above the discharge end of the riser A may be accurately adjusted to conform to any desirable back pressure. The inside of the riser A is likewise provided with a spiral mixing vane or vanes E, secured in position in any suitable mechanical manner. Preferably, the vanes F and G are provided with flanges h through which rivets are passed to secure the vanes in place.

The bolts N by which the attachment is secured to the boiler extension 1 preferably

pass through the spider at the base of the arms J, though any equivalent method will answer the purpose. The upper edge of the drum D is preferably stiffened with a circular band M, and the base of the up-take or riser A is reinforced by a band or ring K to which the spider J is likewise secured in addition to being secured to the riser A.

The device while herein shown cylindrical or circular, may of course assume any other convenient form, for example a rectangular or hexagonal or other shape. The apparatus too may be proportioned to suit any and all conditions, and boilers, and to any and all conditions and velocities of exhaust, and to the draft produced thereby.

The operation of the device may be described briefly as follows: It is of course well understood that every exhaust of the engine cylinders projects the exhaust steam up into and through the lift pipe 2 (where such pipe is present) and creates a corresponding draft in the locomotive fire-box and flues leading therefrom. With each puff, the locomotive ejects (especially when fresh fuel is fed to the fire-box) large quantities of cinders, gases, and sparks, and unless these are moistened and extinguished much damage may result to crops, and forests. In the operation of my invention, as the stream of cinders, sparks, gases and exhaust steam is projected through the lift-pipe it flows into the riser or up-take A in which these various products are more or less intimately mixed by the vane or vanes E, (or their equivalents), the mixture thence impinging against the deflecting conical spreader roof 3 of the member or downward deflector B, the mixture being projected downward around the vane F and against the bottom trough-shaped annular or up-take deflector C. From this the mixture rises through the annular space between the member B and outer drum D, being not only cooled off by inflowing atmospheric air induced to flow upwardly through the annular air-space L (see arrows) and free to mingle with the rising mixture within the drum D, but the now combined products of steam, cinders, sparks, and air are again and finally brought into intimate contact and thoroughly mixed by the vane (or vanes) G, in the space (between the members B and D) which the products are obliged to traverse before they finally escape into the atmosphere.

As intimated above, the member B may be adjusted relatively to the up-take A, so as to produce any desired degree of back-pressure or retardation of the products, and hence the time within which the mixing may be effected may be carefully regulated. It may be stated in passing that the cinders and sparks are moistened to the proper ex-

tent by the exhaust steam which in its circuitous traverse is to a degree condensed, particularly so in cool weather. Of course when the engine is standing still, live steam may be blown through the lift-pipe in lieu of exhaust steam to create the necessary draft, as well understood in the art.

Having described my invention what I claim is:

1. A spark and cinder extinguisher for boiler furnaces comprising an up-take for the combustion products and steam, a down-take deflector coöperating therewith, an up-take deflector at the base of the down-take, and a final up-take discharge-member encompassing the bottom up-take deflector and spaced a suitable distance therefrom for admitting atmospheric air to mix with the escaping products.

2. A spark and cinder extinguisher for boiler furnaces comprising an up-take pipe, a down-take deflector provided with a spreader roof formation mounted above and encompassing the up-take pipe, a bottom up-take deflector receiving the contents of the down-take deflector, a final up-take discharge drum extending from the bottom up-take and spaced therefrom thereby forming an air space for induction of atmospheric air, and means in the path of the currents traversing the several members for mixing the combustion products and steam.

3. A spark and cinder extinguisher for boiler furnaces comprising an up-take pipe, a down-take deflector mounted above, and encompassing the walls of the up-take and spaced therefrom, a spreader on the said down-take deflector positioned over the discharge end of the up-take, a bottom up-take deflector receiving the discharge from the down-take, a final up-take discharge member leading from the bottom up-take and spaced therefrom thereby leaving an air space for the induction of atmospheric air, and suitable spiral vanes in the up-take pipe, and in the spaces between the up-take pipe and down-take deflector and between the down-take deflector and final up-take discharge member for the purpose set forth.

4. A spark and cinder extinguisher for boiler furnaces comprising an up-take pipe, a bottom concave up-take deflector having its inner wall secured to the peripheral walls of the up-take pipe, a spider secured to the up-take pipe below the concave deflector and having projecting arms engaging the outer face of the outer wall of said deflector, a final up-take discharge member secured to the arms of the spider and to the concave deflector and spaced from the outer wall of the latter by the spider arms aforesaid, an intermediate down-take deflector superposed above and enveloping the up-take pipe and spaced therefrom and terminating at the

concave up-take deflector, spiral vanes carried by the outer walls of the down-take deflector, slotted lugs carried by said vanes, means for securing said lugs to the walls of
5 the final up-take discharge member, and spiral vanes in the up-take pipe, the parts operating substantially as set forth.

In testimony whereof I affix my signature,
in presence of two witnesses.

LOUIS T. SICKA.

Witnesses:

CHAS. R. McBRIDE,
H. W. THOMSON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
