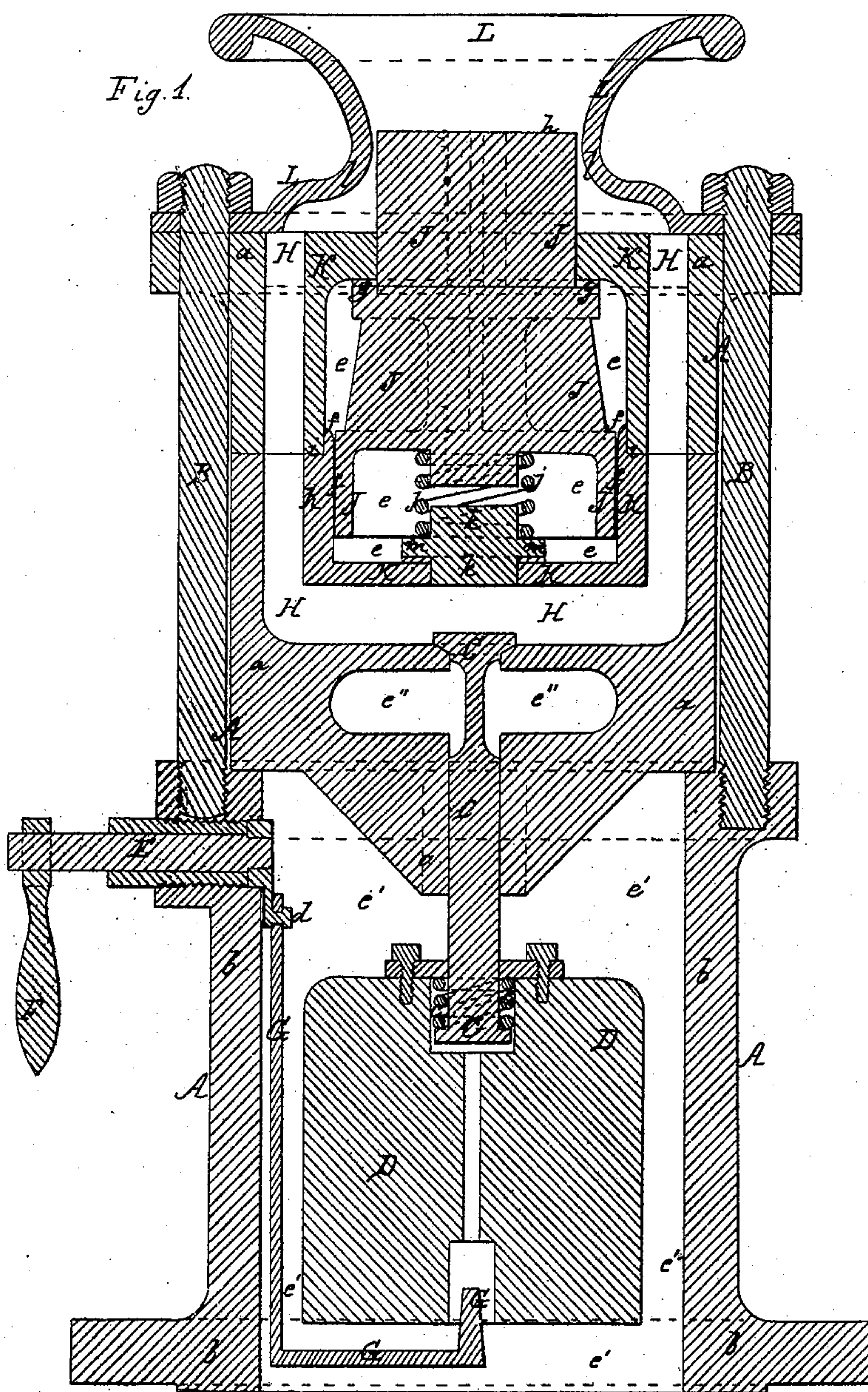


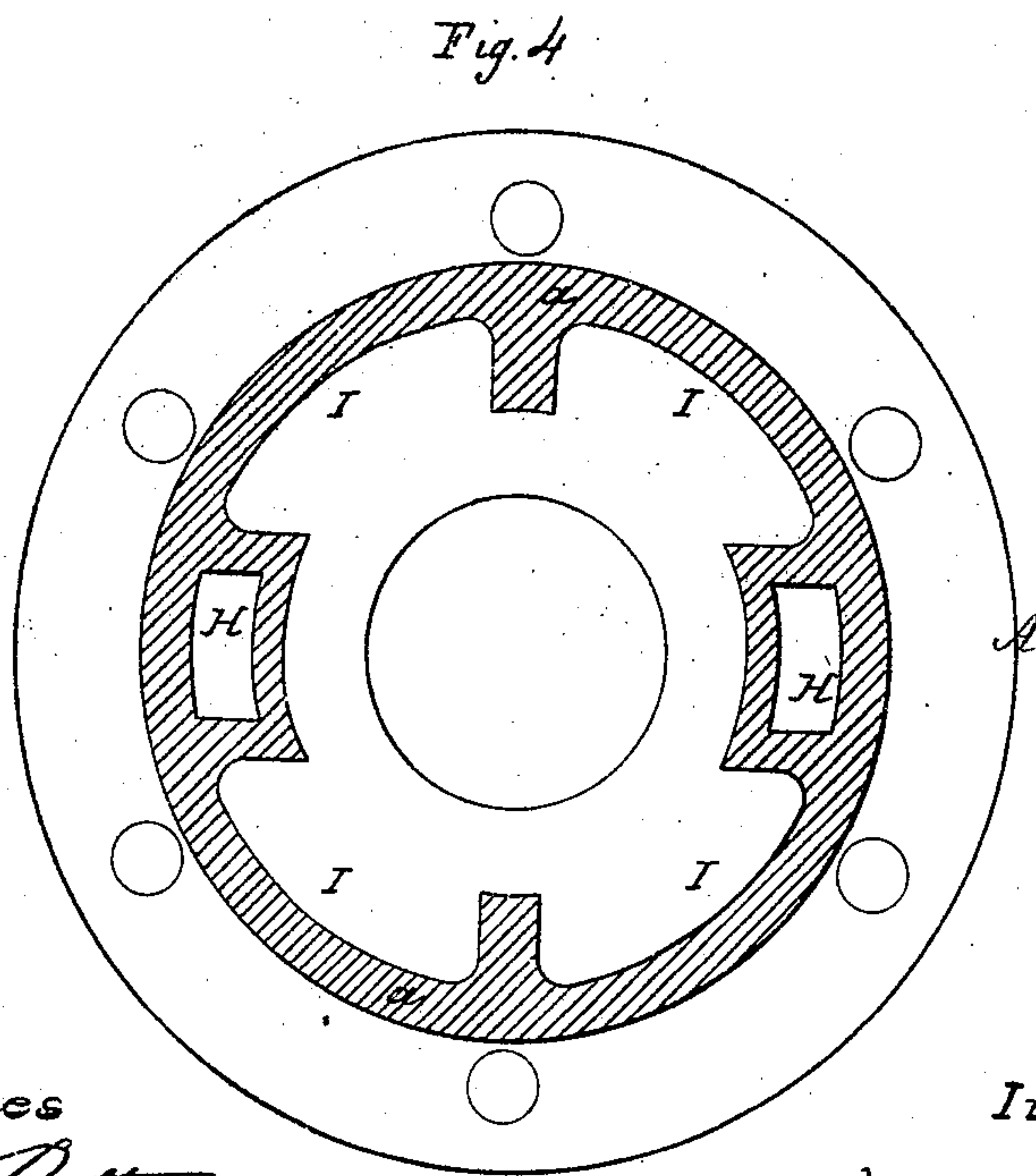
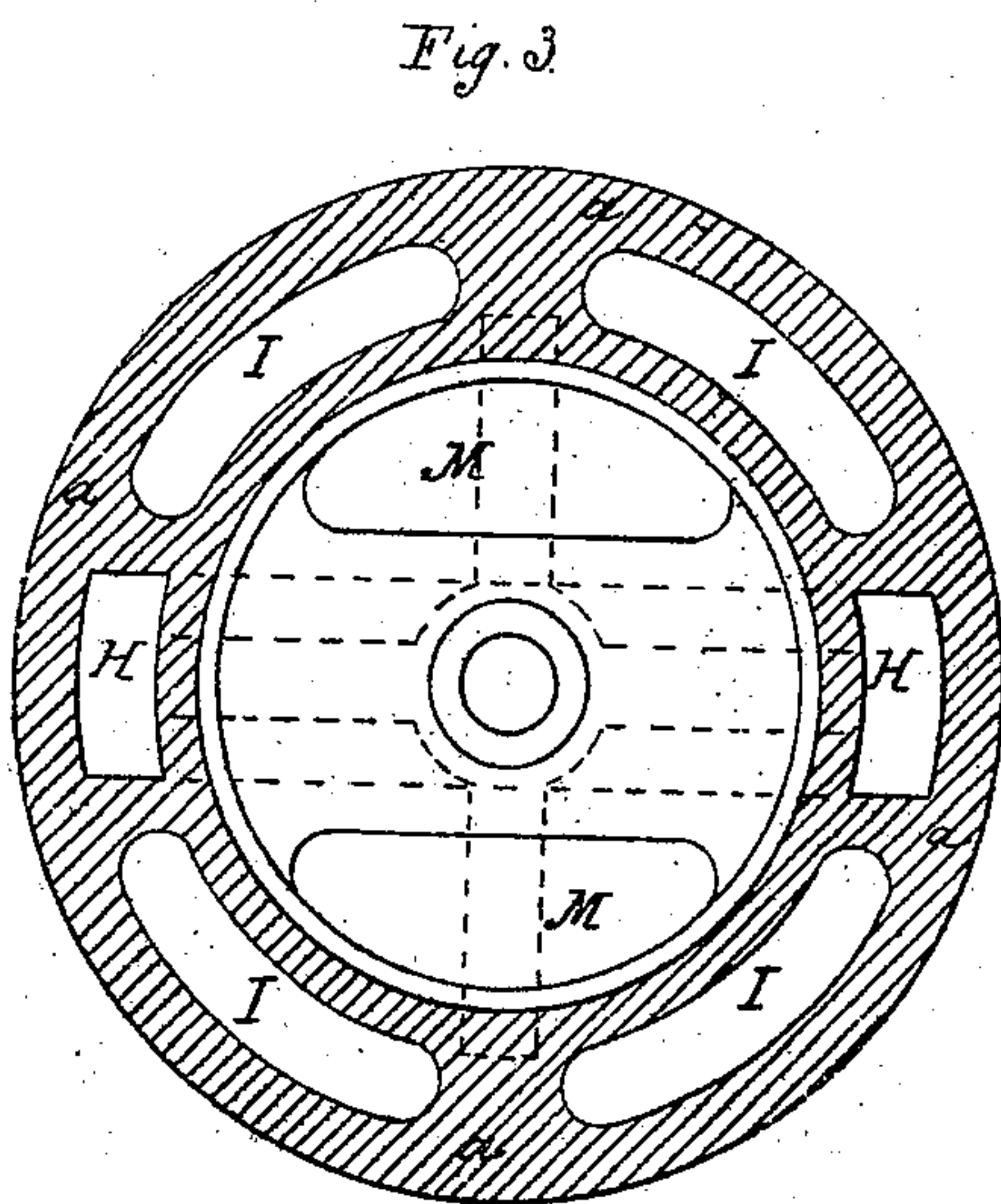
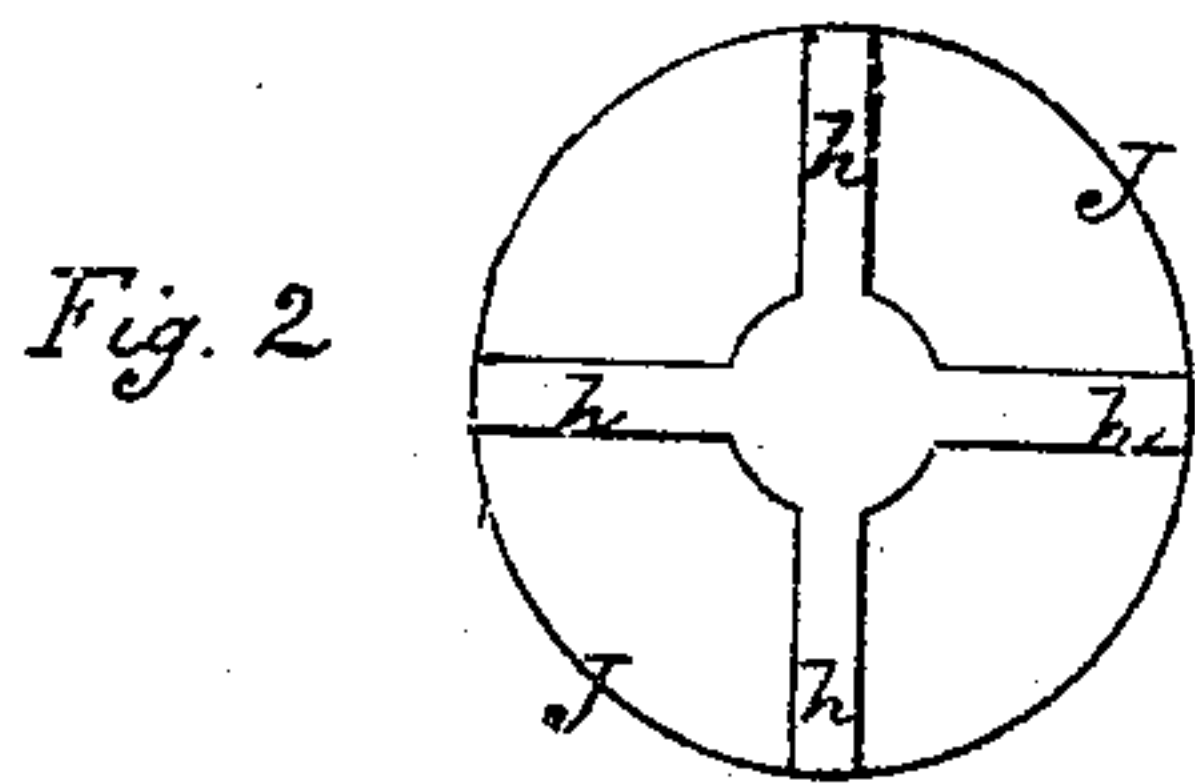
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Steam Generator Safety-Valve
N^o 72240
Patented Dec. 17, 1867.



Witnesses
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Charles Allen

Inventors
Henry Taylor and Joseph M. Coale,
By their atty. - A. B. Stoughton.

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United States Patent Office.

HENRY TAYLOR AND JOSEPH M. COALE, OF BALTIMORE, MARYLAND.

Letters Patent No. 72,240, dated December 17, 1867.

IMPROVEMENT IN STEAM-GENERATOR SAFETY-VALVES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that we, HENRY TAYLOR and JOSEPH M. COALE, of the city and county of Baltimore, and State of Maryland, have invented certain new and useful improvements in what we term Steam-Locked Automatic Safety-Valves; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a vertical central section through the safety-valve, showing its interior arrangement.

Figure 2 represents an end or top view of the yielding valve.

Figures 3 and 4 represent horizontal sections through the case, which show the shape and position of the openings therein.

Similar letters of reference, where they occur in the separate figures, denote like parts of the safety-valve in all of the drawings.

Our invention relates to a safety-valve for steam-boilers, which will blow off at any pressure for which it may be set automatically, and which the attendant can cause to blow off or escape steam at any time, but which he cannot weight down, or prevent from escaping steam at the pressure for which it was originally set before it was closed up, and is therefore beyond his reach, and cannot be tampered with by him for increasing the pressure in the boiler beyond a given point.

To enable others skilled in the art to make and use our invention, we will proceed to describe the same with reference to the drawings.

A represents a case or dome, which for convenience in making, placing, removing, or repairing the interior, may be divided into two parts, viz, an upper one, *a*, and a lower one, *b*, which are held together by the screw-bolts B. This case or dome is fastened to the steam-boiler in any of the usual well-known ways, and its interior is always in connection with the steam in the steam-boiler. In the lower portion of the interior of the case or dome A, there is suspended by a valve or valve-rod, C, a weight, D, the two being united by a spring, *c*, or other yielding connection, so that the rolling of the vessel, or the swaying motion of a locomotive, may not bind the valve-stem or prevent it from properly operating. The weight D and the valve C are first computed for the amount of pressure that the safety-valve is to bear before it blows off, and when this is calculated, and the weight and valve enclosed in the case, neither can be changed or tampered with, but the engineer or attendant can at any time test the valve, to see that it is operating right, by turning the rod E by means of the hand-lever F, there being a crank or wrist-pin, *d*, inside of the case, and on the rod or shaft E, to which a lifting-arm, G, is connected; said lifting-arm raising the weight D, as also the valve C, which allows the steam to escape through the passages H H to the open air. By turning the lever F down, as shown in fig. 1, the weight again drops and the valve C comes to its seat. Through openings I I, &c., fig. 3, which communicate with the interior of the boiler, the steam is free to occupy the space *e e e*, in, around, and under the valve J in the case K, it passing through at *f*, between the valve and the case, which joint, though fitting snugly, is not packed, as the packing would prevent the valve from working freely by the pressure of the steam alone. A flange, *g*, on the upper portion of the valve, has a seat against the under side of the top of the case and above the case. The top of the valve is of the form shown in fig. 2, it having radial ribs *h*, with open spaces between, so as to freely escape any steam that may pass the valve. The case K is in two parts, the junction being at *i i*. This is for the purpose of readily fitting the valve within the case. Under the valve J there is a coiled spring, *j*, which holds the valve up against its seat, when steam is first making, and before its pressure is sufficient to hold it up, and thus prevent it from leaking or wasting steam. And underneath the valve J there is also a plug, *k*, with a flange, *m*, on it, which serves to close an opening that the valve C is passed through to its seat, and may also serve as a gauge or guide to prevent the valve J from dropping too low, and will also prevent the valve C from rising too high. The under part of the valve J is of an inverted cup-form, so as to form a steam-chamber, the steam therein holding the valve closed against its seat. The upper portion L of the safety-valve is first contracted as at *l*, so as to shield the openings H, that is to prevent them from being stopped from the exterior, yet clear enough to allow the steam to pass freely through. Thence it terminates in a bell or trumpet-shaped top, as seen in the drawings. The steam from the boiler circulates in or occupies the space *e'*, around the weight D, as it communicates directly with the boiler; and steam from the boiler occupies the space *e''*, around the

upper part of the valve-stem C, and just below the valve, finding its way there by two avenues—first, by leaking past the valve-stem, which is not packed, but moves snugly and freely through the lower part of the case *a*; and secondly, by the openings, M, fig. 3, which are underneath the valve J, and communicate with the steam-space *e*, under and around said valve J, as heretofore mentioned. The valve C, it will be perceived, controls the steam-space and shuts it off from the atmosphere, which is in the passages H. And when the valve C opens up into H, the interior of boiler and the steam-spaces are all in communication with the open air, and of course the steam escapes into the air, and when it is closed, the interior of the boiler and of the valve is shut off from the external air, and there is no escape. When the pressure in the boiler is greater than that for which the weight D and the opening covered by the valve C is regulated for, the valve and weight will be raised, and steam will escape and as the steam escapes from under the valve J, said valve will cushion down upon the steam, and open a passage between its flange *g* and the seat upon which it was pressed up, allowing the steam to escape thereat. When the pressure in the boiler is reduced to that for which the weight and valve are regulated, or a little below that pressure, the weight drops, the valve is closed, the steam from the boiler passes up into and through the case, and closes the valve J as before. And thus the safety-valve is self-acting, and cannot be tampered with by the engineer, as, when put together, a wire and seal may be put into one of the screw-bolts B, and over or around its nut, so that the cover could not be removed to get at the interior without breaking the wire or seal.

Having thus fully described our invention, what we claim therein as new, and desire to secure by Letters Patent, is—

1. The combination of the weight and valve, when connected by a flexible joint, substantially as and for the purpose described.

2. We also claim, in combination with the closed self-acting safety-valve, the valve J, which is held shut by the steam in the boiler when at or below its regulated pressure, and opened by the steam in the boiler when its pressure rises above that which it is designed to carry, substantially as described.

3. We also claim, in combination with the passages H, the projecting top piece L, to prevent said passages from being stopped up, but at the same time allow the steam to escape through them when blown off through the safety-valve, as described.

4. We also claim the combination of the crank-shaft and lifter with the weight D and valve C, so that the attendant can at any time open the safety-valve, and allow the steam from the boiler to pass through, but cannot close said valve to prevent the escape of steam when its pressure exceeds that for which the safety-valve is computed, as set forth.

HENRY TAYLOR,
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Witnesses:

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EDM. F. BROWN.