

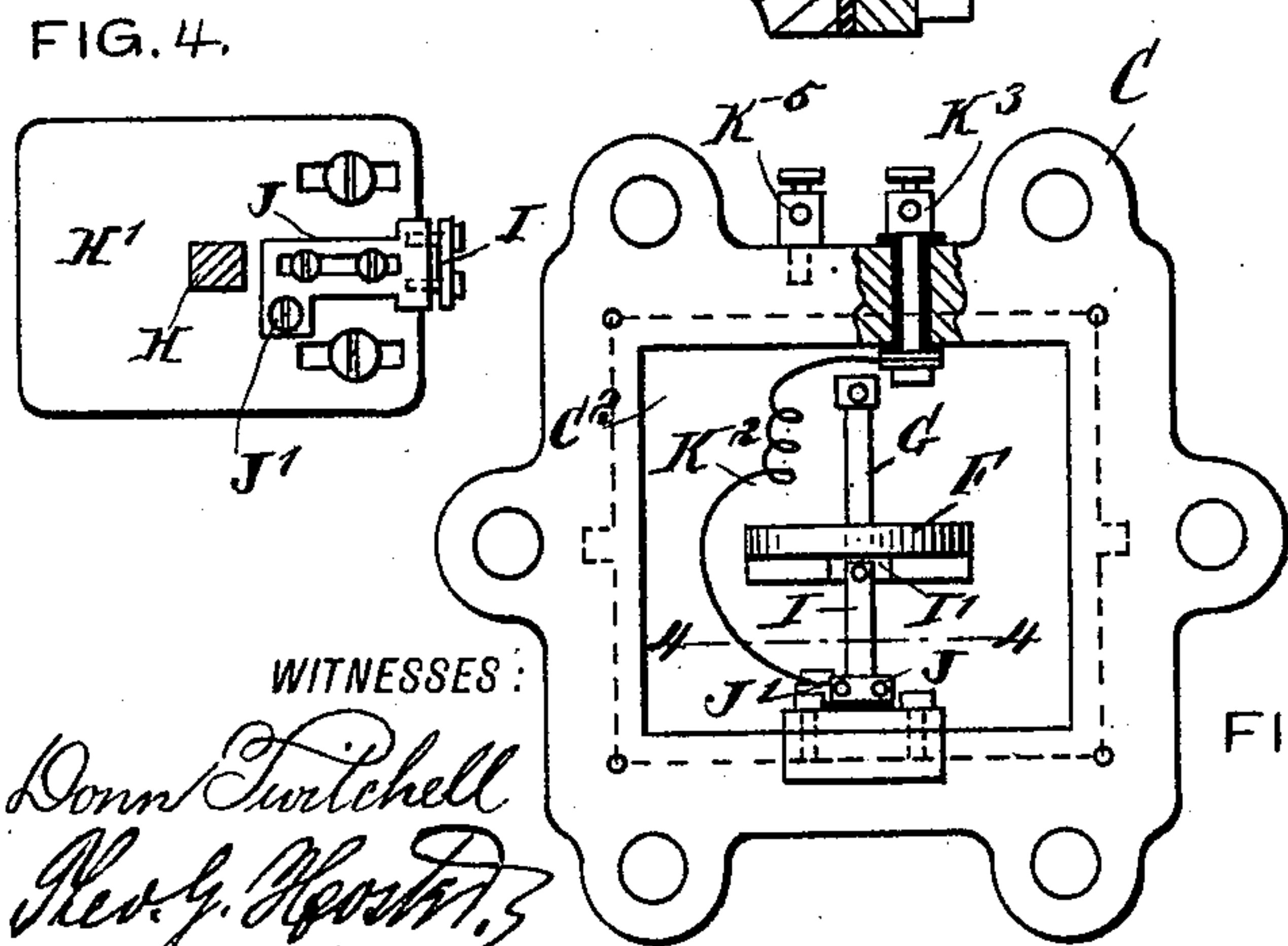
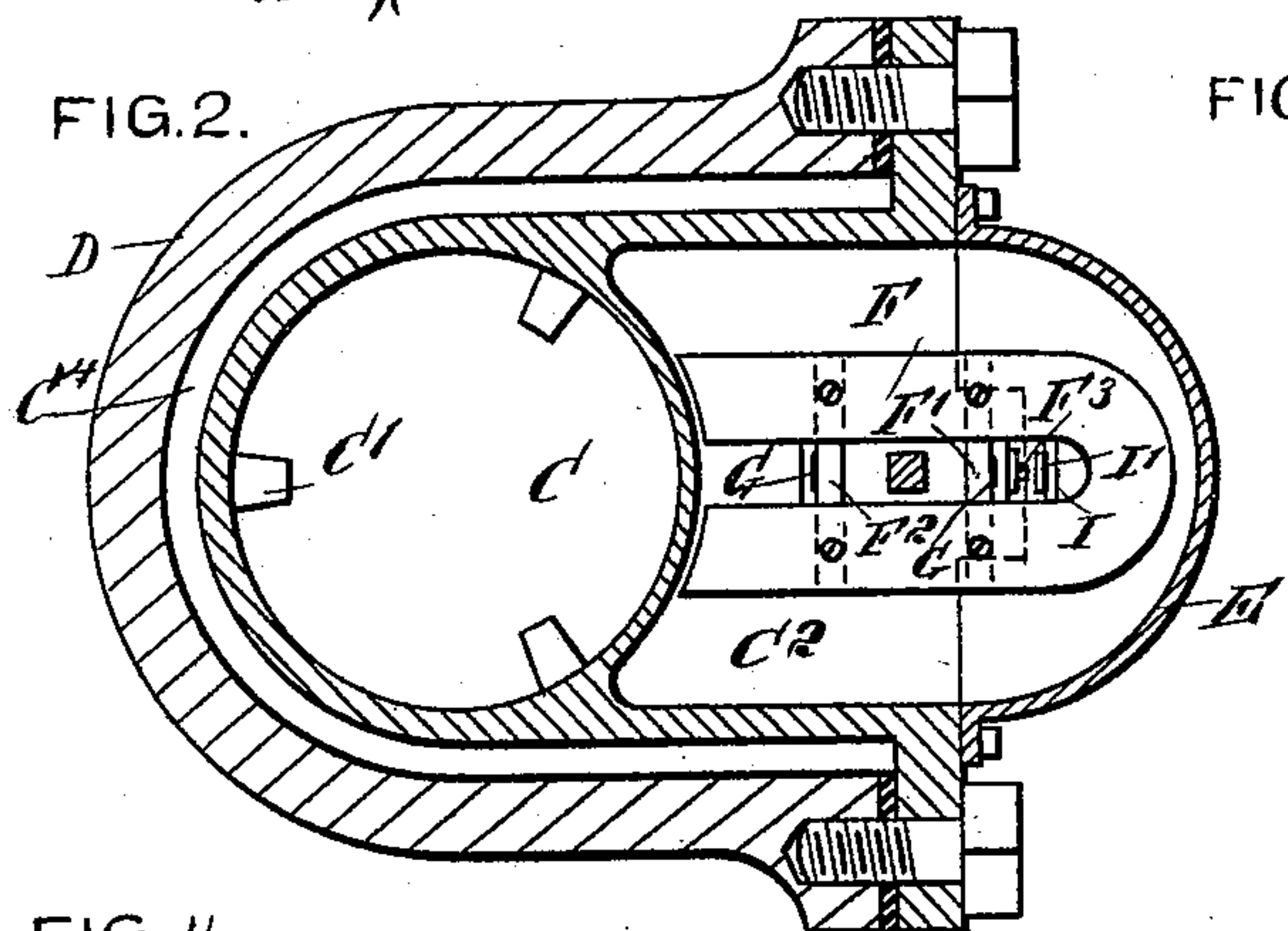
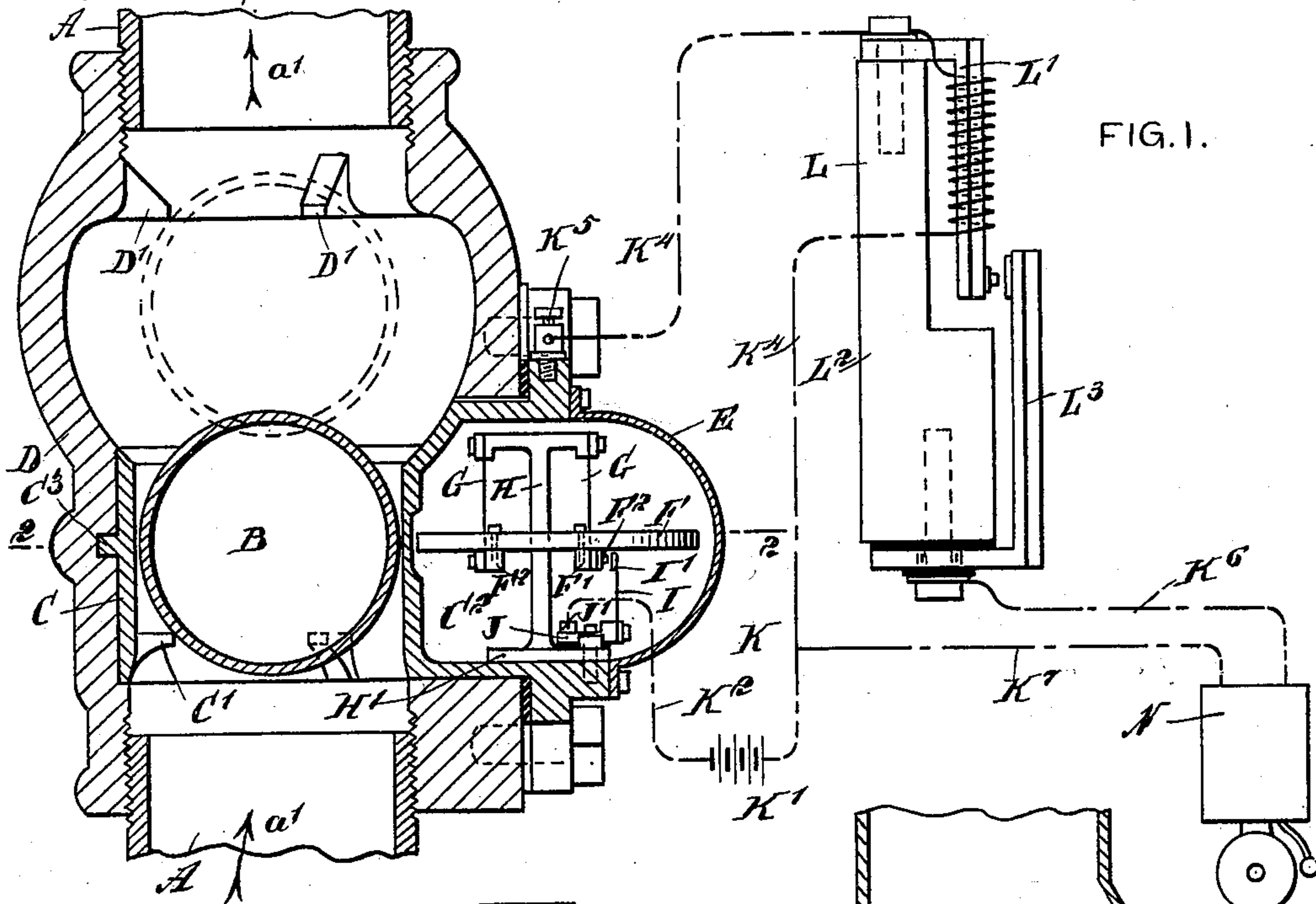
(No Model.)

O. CARPENTER.

MEANS FOR INDICATING MOVEMENT OR CESSATION OF MOVEMENT
OF FLUIDS.

No. 594,323.

Patented Nov. 23, 1897.



WITNESSES:
Donn Twitchell
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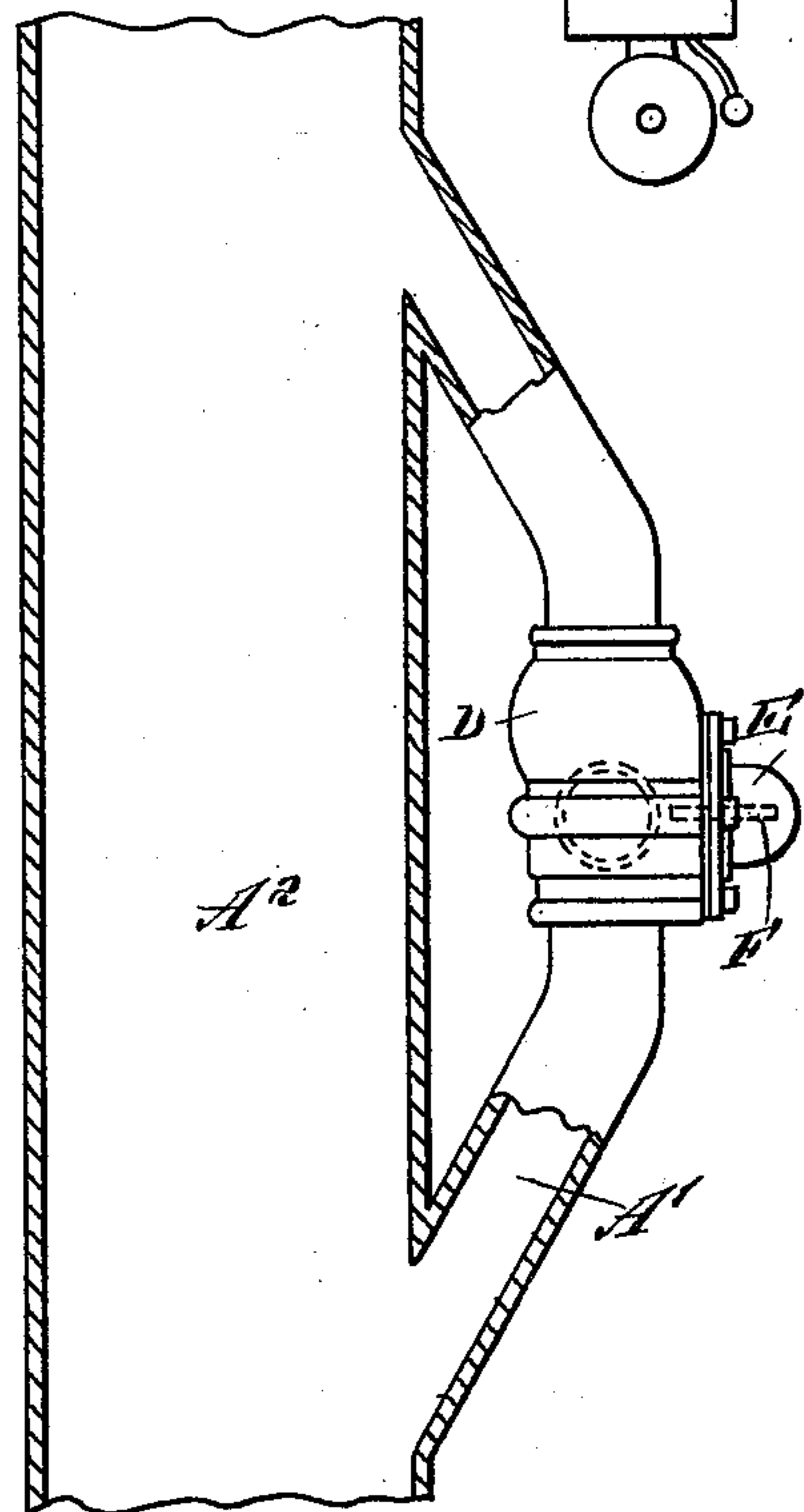


FIG. 3.

BY

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ATTORNEYS.

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ORVILLE CARPENTER, OF PAWTUCKET, RHODE ISLAND, ASSIGNOR OF
ONE-HALF TO JAMES M. CARPENTER, OF SAME PLACE.

MEANS FOR INDICATING MOVEMENT OR CESSATION OF MOVEMENT OF FLUID.

SPECIFICATION forming part of Letters Patent No. 594,323, dated November 23, 1897.

Application filed December 5, 1896. Serial No. 614,587. (No model.)

To all whom it may concern:

Be it known that I, ORVILLE CARPENTER, of Pawtucket, in the county of Providence and State of Rhode Island, have invented a new and Improved Means for Indicating the Movement or Cessation of Movement of a Fluid, of which the following is a full, clear, and exact description.

The invention relates to fire-sprinklers and other apparatus containing a fluid normally dormant, but adapted to flow when a valve or other device is opened, and to apparatus containing a fluid normally in motion and liable to have its flow interrupted.

The object of the invention is to provide a new and improved method and means for indicating the movement or cessation of movement of a fluid contained in a pipe, boiler, or other apparatus and whereby an alarm is automatically given whenever the fluid is flowing or its movement ceases.

The invention consists of certain parts and combinations, as will be fully described hereinafter and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement as arranged on the supply-pipe of a water-sprinkling system. Fig. 2 is a sectional plan view of the same on the line 2 2 of Fig. 1. Fig. 3 is a face view of the casing containing the magnet and other parts of the electric circuit. Fig. 4 is a sectional plan view of part of the same on the line 4 4 of Fig. 3; and Fig. 5 is a sectional side elevation of a modified form of the improvement, with the supply-pipe in section.

The improved device may be connected directly with a supply-pipe A, as illustrated in Figs. 1 and 2, or with a branch pipe A', connected at both ends with a supply-pipe A², as illustrated in Fig. 5. In either case the device is provided with a magnetic body B, preferably made of iron in the shape of a hollow ball, normally resting on lugs C', projecting from the inside of a non-magnetic casing C, attached to a casting D, arranged in the pipe A, and containing near its upper end lugs D' for limiting the traveling movement of the body B when the fluid contained

in the pipe flows in the direction of the arrow α' and carries the body with it to the said lugs, as indicated by dotted lines in Fig. 1. 55

The casing C is formed with an external chamber or recess C², closed by a removable cap E, and in this chamber is suspended a magnet F by flexible strips G, secured at their upper ends to the top of a bracket H, attached to the bottom of the chamber C², as shown. The poles of the magnet F are in close proximity to the external surface of the casing C, as indicated in Figs. 1 and 2, at such a point as to bring the body B into the field of the said magnet during the time the body is at rest on the lugs C', it being understood that the casing C is made of brass or other suitable non-magnetic material, while the body B is made of iron or the like, and consequently influences the magnet upon moving out of or into the field of said magnet, and which field extends through the wall of the non-magnetic casing C to the inside thereof. 75

The strips G are preferably secured to transverse bars F' F² of the magnet F, the bar F' carrying a contact-point F³, normally out of engagement with a contact-point I', formed on a plate I, secured at its lower end to a plate J, secured to but insulated from the base H' of the bracket H, as shown in Fig. 1. The plate J is adjustably held on the base H' to permit of bringing the contact-point I' the desired distance from the contact-point F³ during the time the magnet F is in an innermost position, held there by the body B as long as the latter rests on the lugs C', and is within the field of the magnet. 85

Now when the fluid contained in the pipe A flows in the direction of the arrow α' and carries the body B with it then the latter moves out of the field of the magnet F and the latter swings outward and the contact-point F³ moves in contact with the point I' to close an electric circuit K, containing a battery K', a double thermostat L, and an alarm-bell or other sounding device N, controlled by the thermostat L. The wire K² of the circuit K is connected with the binding-post J' on the plate J and with the insulated post K³, attached to the casing C, as shown in Fig. 3, then passes to the battery K', the return-wire K⁴ being wound around one ther- 95 100

mostat L', held on the casing L², and then passes to a binding-post K⁵, attached to the casing C. The other thermostat L³ is insulated on the casing L² and is connected by a wire K⁶ with the alarm-bell N, connected by a wire K⁷ with the wire K⁴. When the contact is made at the points F³ and I' at the time the body B has moved out of the field of the magnet F, then the circuit is closed and the thermostat L' is gradually heated, whereby it is caused to expand and finally make contact with the other thermostat L³ and close the circuit for the alarm-bell N, so that the latter is sounded. The thermostat L is preferably employed only in case the normally dormant fluid is frequently disturbed by a hammering or surging action of the fluid, whereby the body B is only moved for a short time from the field of the magnet F and then returns immediately to the lugs C' back into the field of the magnet. In such a case the closing of the circuit K does not sound the alarm-bell N, as the thermostat L' is not sufficiently heated during the time the body B moves from and back to its seat and the thermostats L' and L³ do not close the circuit for the alarm-bell N; but in case the flow in the supply-pipe A is for the length of time to which the thermostats L' and L³ are set then the closing of the circuit K finally causes a contact of the thermostats L' and L³ and the circuit for the alarm-bell N is closed and the alarm is sounded.

The casing C is preferably provided with an external rib C³, fitted into a corresponding recess C⁴ in the casting D, to securely hold the casing in place and to permit of properly fitting the casing into the casting.

The lugs D' are so arranged that when the body B is rested thereon the flow of the water in the pipe is not appreciably obstructed.

From the foregoing it will be understood that the device may be used for various other purposes than the one mentioned—for instance, as a low-water alarm for boilers—in which case the construction of the device will be altered from the one shown and described, without, however, deviating from the spirit of my invention. The arrangement may also be such that the body B is held normally out of the field of the magnet F and the circuit is closed, and when a disturbance of the water causes a sinking of the body B into the field of the magnet F then the position of the latter is disturbed and the circuit is broken to sound an alarm. The thermostats are simply a responsive device responding only to an excessively-prolonged flow of current, and I do not confine myself to this particular form of a device for accomplishing such a purpose, as it is evident other electrical or mechanical means could be substituted for them.

It is further evident that the magnet may be used to release a clockwork for actuating an alarm, or other mechanical means may be controlled by the magnet for the same purpose.

It is also evident that the arrangement described may be reversed—that is, the body in the fluid may be the magnet to influence the magnetic body on the outside of the casing whenever the magnet moves in the fluid and the outside body is in or out of the field of the magnet.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. A device of the class described, comprising a body in a fluid, the body being heavier than the fluid and arranged to be moved by the pressure of the fluid when the fluid is in motion, and a magnet exterior of the said fluid and body and so arranged that the body may come within and leave the field of said magnet, to cause a disturbance thereof, substantially as shown and described.

2. A device of the class described, comprising a body resting in a fluid and heavier than the fluid and arranged to be moved by the pressure of the fluid when in motion, and an electromagnetic alarm or indicating device exteriorly of the said fluid and body and controlled by the latter, substantially as shown and described.

3. A device of the class described, comprising an electromagnetic alarm or indicating device, a body normally at rest in a dormant fluid and in the field of a magnet of the said alarm, the body being heavier than the fluid and the said body being moved by the direct pressure of the fluid out of the field of the said magnet, to cause a disturbance of the latter so that the alarm or indicating device is actuated, and a responsive device in the circuit of the said alarm or indicating device and controlling the sounding or indicating device thereof, substantially as shown and described.

4. An indicator having a casing, a portion of which is adapted to have a fluid moved through it, a magnetic body normally carried within said portion of the casing and closing the same and capable of being forced out of said portion of the casing, and a magnetic alarm or indicating device actuated by the magnetic body, substantially as described.

5. An indicator having a magnetic body adapted to be moved by a fluid, the magnetic body being heavier than the fluid, and a magnetic alarm or indicating device actuated by the magnetic body, substantially as described.

6. An indicator having a casing with two chambers one of which is adapted to have a fluid moved through it, a magnetic body seated within said chamber and loosely engaging the sides thereof so that the fluid on passing through the chamber will force the magnetic body from its seat, and a magnetic alarm or indicating device actuated by the magnetic body, substantially as described.

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Witnesses:

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