

970,122.

Patented Sept. 13, 1910.

3 SHEETS—SHEET 1.

Fig. 1.

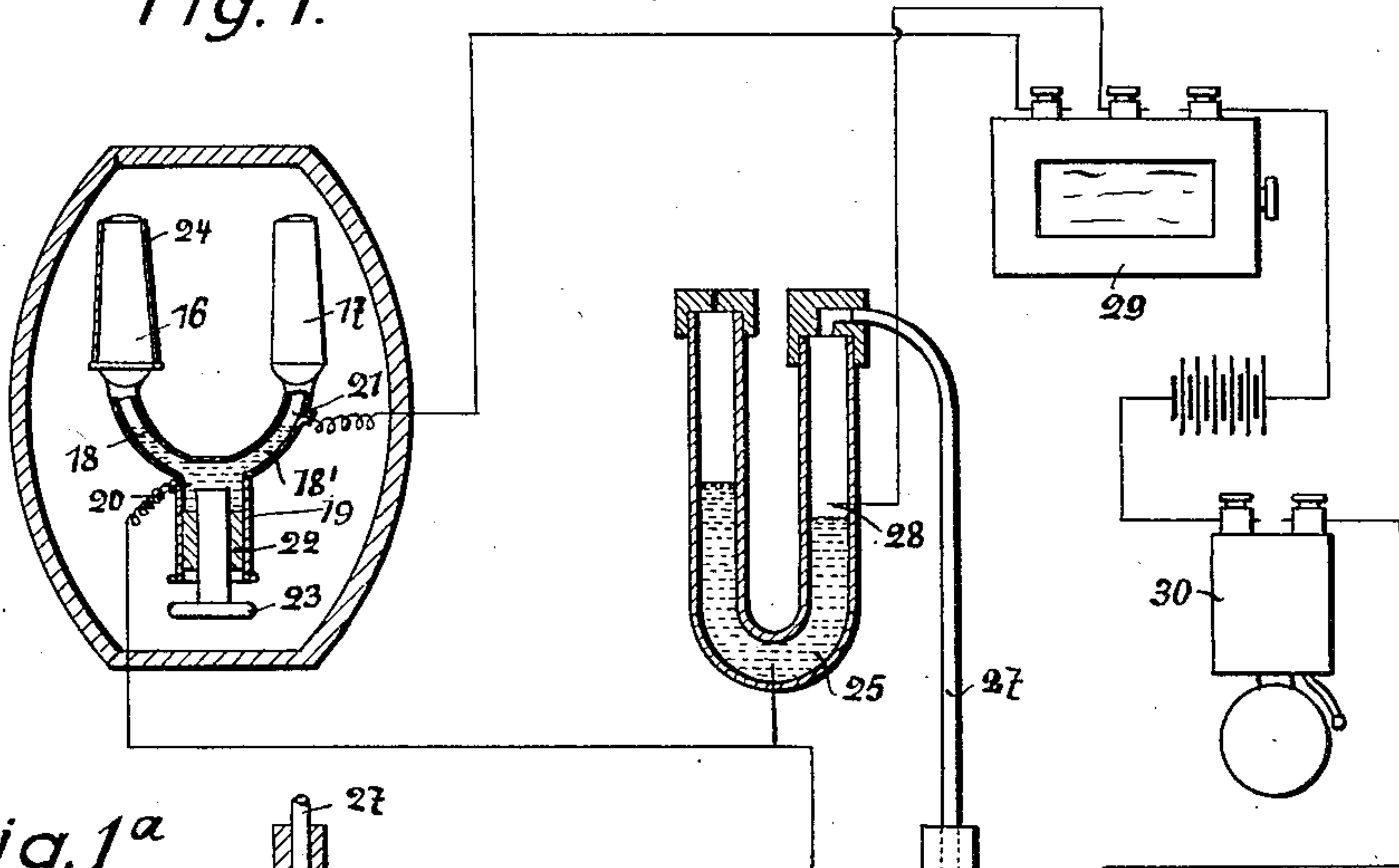


Fig. 1^a

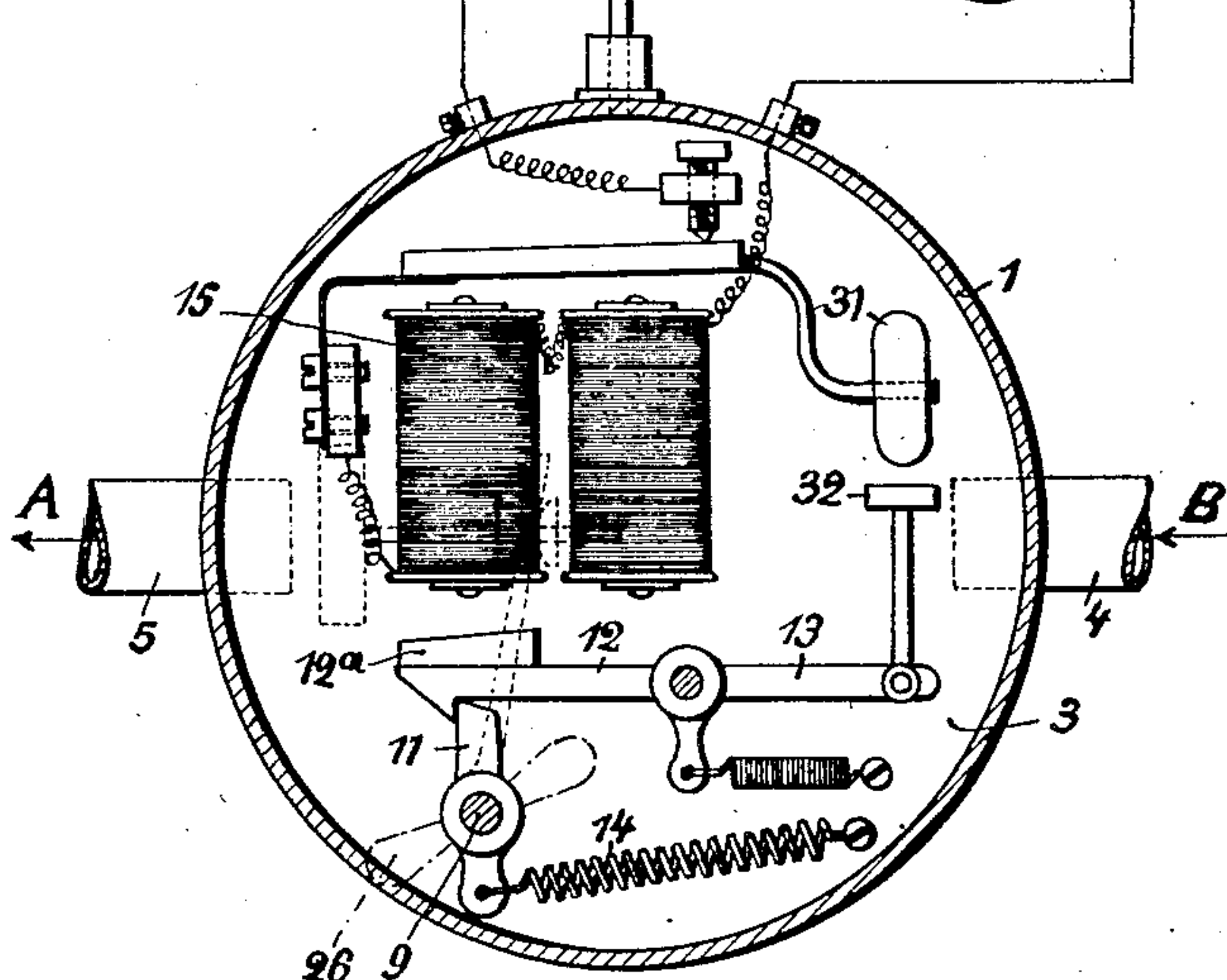
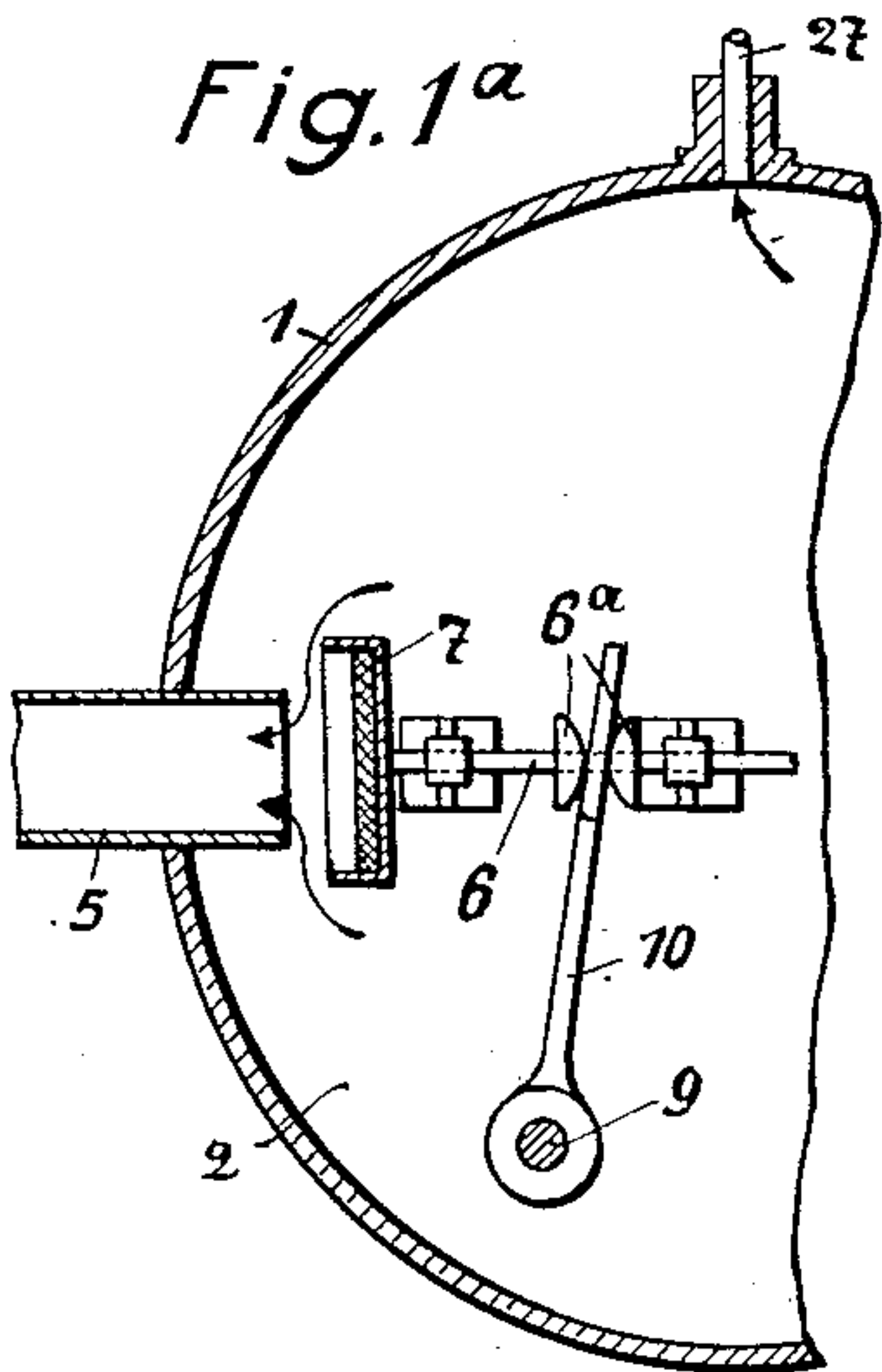
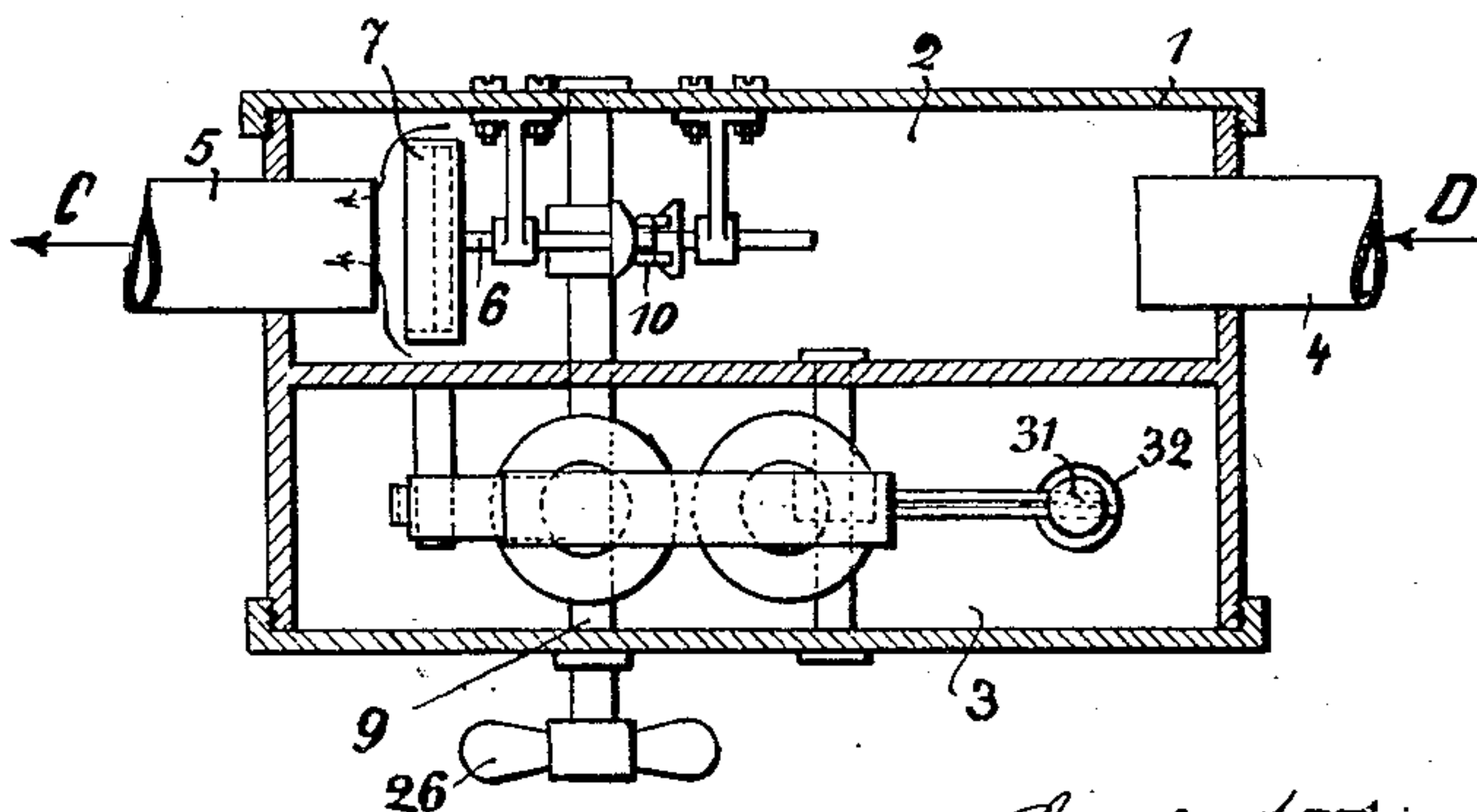


Fig. 2.



Witnesses:
 H. R. Schuck,
 Edw. Schorr.

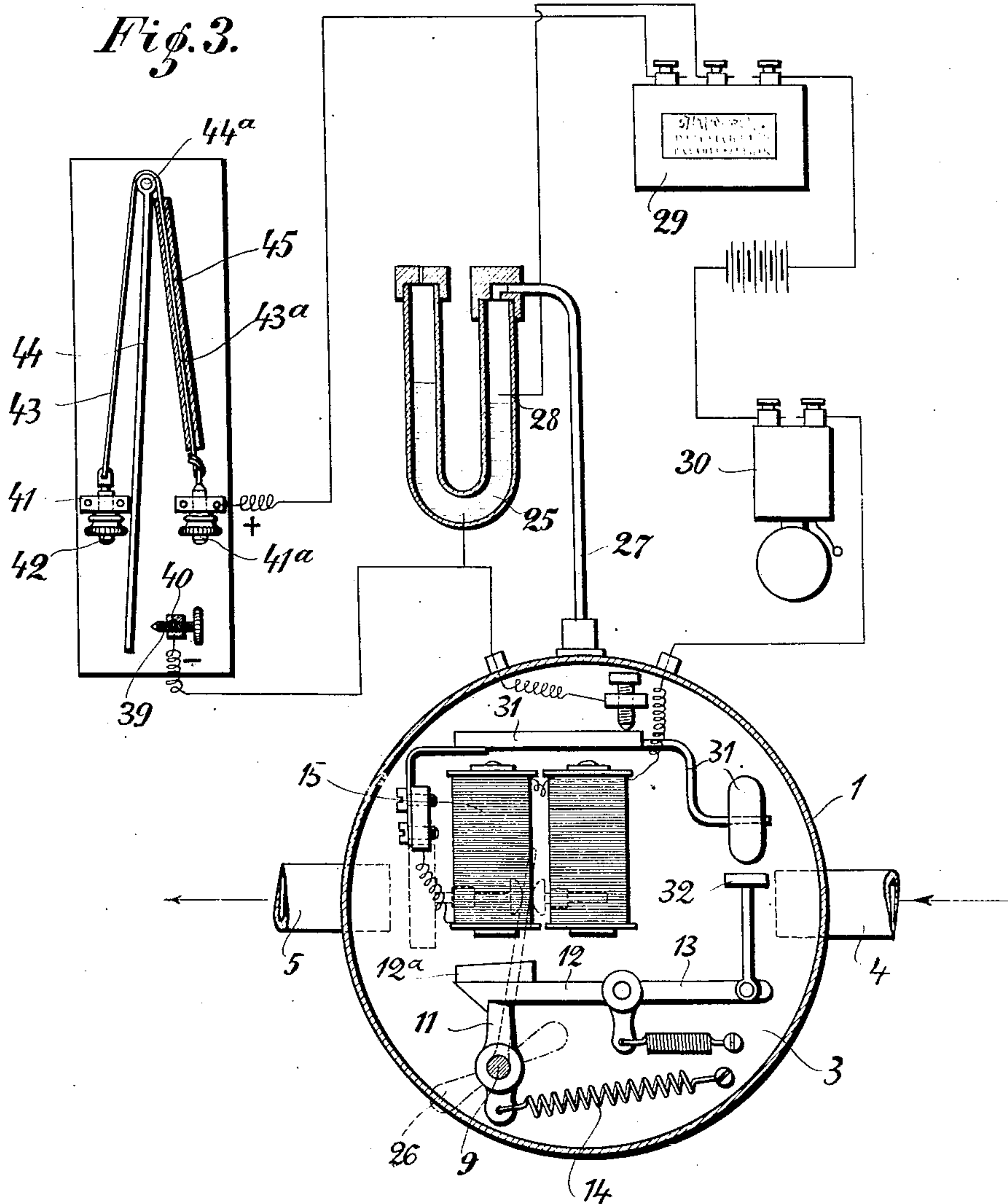
Inventors:
 Ludwig Schmidt &
 Herbert Schmidt,
 per Ambrose B. Brien, Attorney.

L. & H. SCHMIDT.
AUTOMATIC GAS CUT-OFF.
APPLICATION FILED FEB. 2, 1910.

970,122.

Patented Sept. 13, 1910.

3 SHEETS—SHEET 2.



Witnesses:
H. A. Schulz
Edw. Schorr.

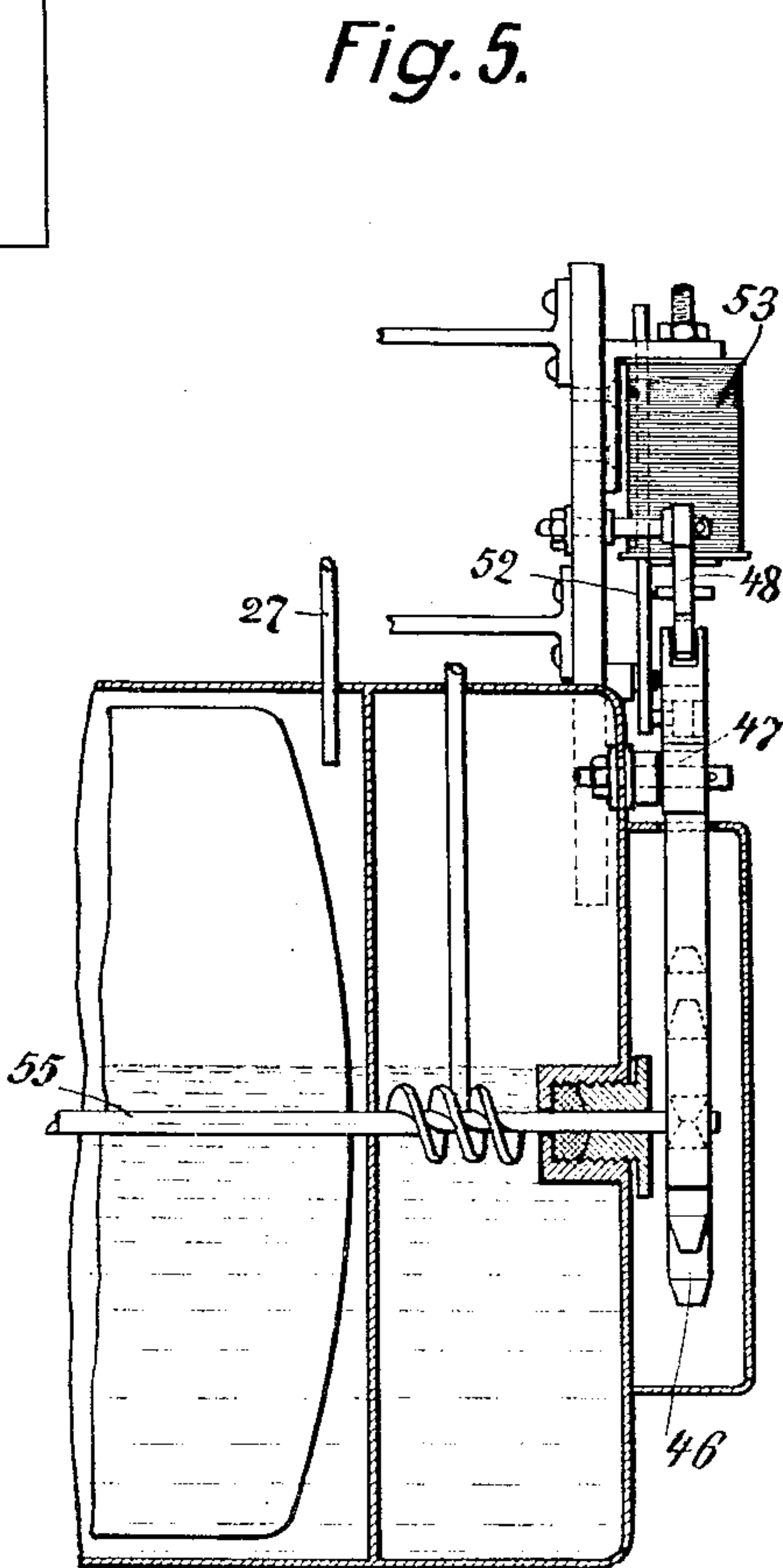
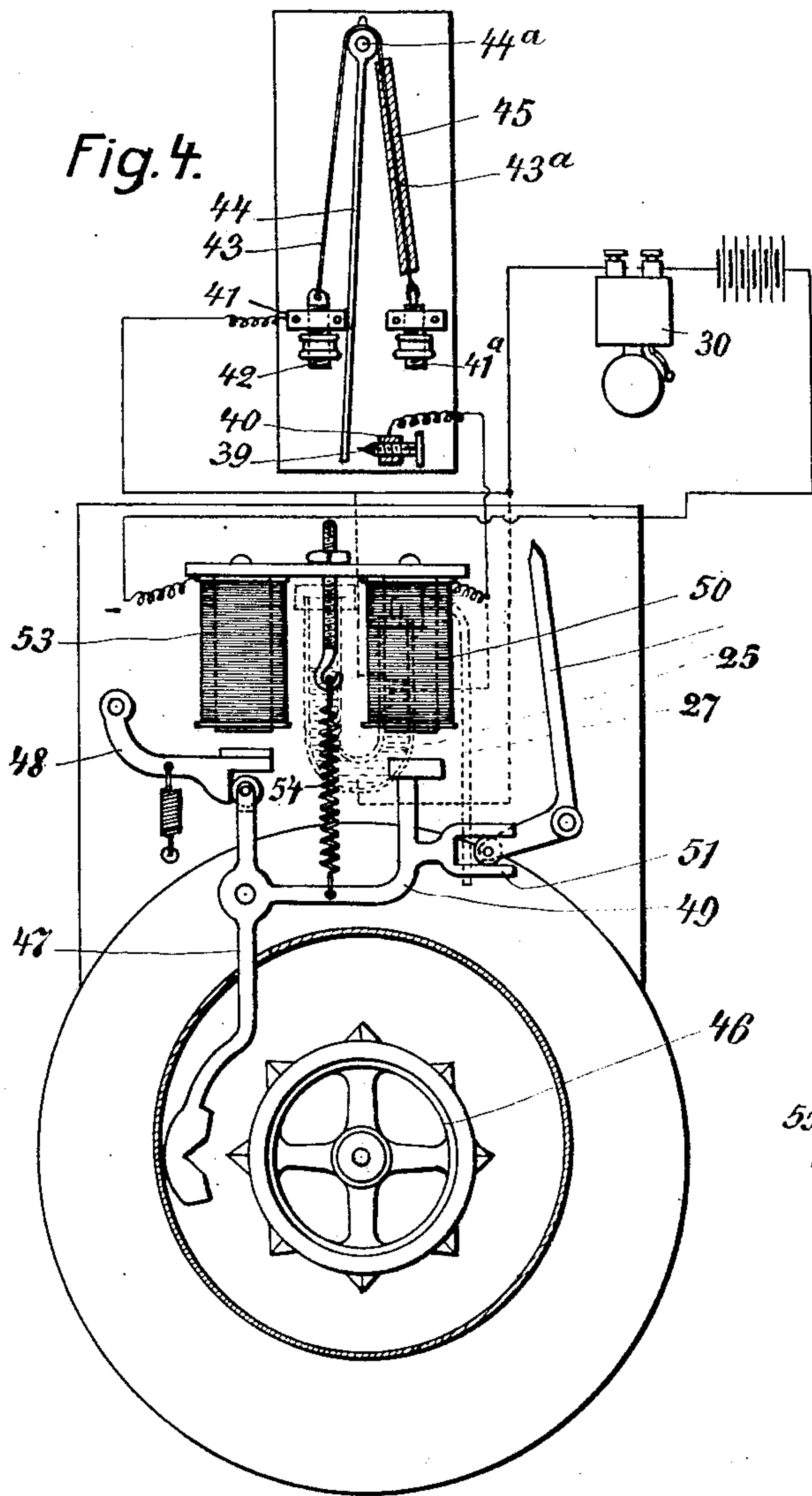
Inventors:
Ludwig Schmidt &
Herbert Schmidt
per Frank P. Briesen
Attorneys

L. & H. SCHMIDT.
AUTOMATIC GAS CUT-OFF.
APPLICATION FILED FEB. 2, 1910.

970,122.

Patented Sept. 13, 1910.

3 SHEETS—SHEET 3.



Witnesses:
W. A. Schulz.
Edw. Schorr.

Inventors:
Ludwig Schmidt &
Herbert Schmidt
per Frank G. Gieseler
Attorney

UNITED STATES PATENT OFFICE.

LUDWIG SCHMIDT AND HERBERT SCHMIDT, OF KAISERSWERTH, NEAR DUSSELDORF, GERMANY.

AUTOMATIC GAS CUT-OFF.

970,122.

Specification of Letters Patent. Patented Sept. 13, 1910.

Application filed February 2, 1910. Serial No. 541,639.

To all whom it may concern:

Be it known that we, LUDWIG SCHMIDT and HERBERT SCHMIDT, both citizens of the German Empire, and residing at Kaiserswerth, near Dusseldorf, Germany, have invented, as joint inventors, a new and Improved Automatic Gas Cut-Off, of which the following is a specification.

This invention relates to novel means of automatically cutting off the gas supply whenever the pressure of the gas decreases or when the gas escapes owing to leakage of the gas pipes or fixtures.

In the accompanying drawings: Figure 1 is a vertical section through an apparatus embodying my invention, Fig. 1^a a vertical section partly broken away on line C—D, Fig. 2, Fig. 2 a horizontal section on line A—B, Fig. 1, Fig. 3 a modification of the apparatus, Fig. 4 a front elevation, partly in section, showing the device applied to the drum of a gas meter, and Fig. 5 a side elevation, partly in section, of the lower part of Fig. 4.

The apparatus shown in the Figs. 1, 1^a and 2 comprises a casing which is preferably divided into two chambers by means of a gas-tight closing partition. The chamber 2 thus formed has a gas inlet-pipe 4 and an outlet-pipe 5, which may be closed by a cap 7. This cap is secured to a reciprocative rod 6 carrying collars 6^a, which straddle a spring-actuated arm 10. The latter is fastened to an axle 9, extending through both chambers 2 and 3 and carrying in chamber 3 a double arm lever 11. This lever is adapted to engage the hook of a two arm lever 12, 13, thereby preventing the spring 14 from turning lever 11 and closing cap 7. Lever arm 12 carries an iron block 12^a constituting an armature. The closing of the valve 7 is effected by exciting the electromagnets 15, which operate a magnetic hammer or rheotome 31. By striking the anvil 32, the hammer lowers the lever arm 13, so that the arm 12 releases lever 11, the ascending movement of arm 12 being facilitated by the energizing of magnets 15 which takes place at the same time. The lever 11 is thus liberated and turned by means of spring 14, thereby taking along the axle 9 and the spring-actuated arm 10 in the chamber 2, so as to seat valve 7. The current is closed whenever the gas-pressure decreases or ceases entirely by means of a U-shaped

tube or vessel 25 holding mercury or other similar material.

Two vessels 16, 17 are provided, which contain air, gas, ether, benzin, alcohol, steam, etc., and are connected by a curved tube 18, 18', made of non-conducting material. Tube 18, 18' has a socket 19, which may be closed by means of a suitable stopper 22 and contains mercury or another conducting substance. This mercury enters tube 18, 18' to assume a like level in both legs thereof. An electric contact 20 is inserted into socket 19, while contact 21 enters leg 18', said contact being arranged above the normal mercury level. Stopper 22 is perforated and contains a piston 23 which permits the level of the mercury to be altered. Vessel 16 is covered with a catalytic substance, such as spongy platinum or other convenient material. The differential thermometer formed in this way, may be inclosed within a casing permitting the entrance of gas by diffusion or otherwise. If gas escapes into the room in which the apparatus is located the temperature of the catalytic substance 24 rises, thereby heating and expanding the air, gas, etc., contained in vessel 16. In this way the mercury level in leg 18 will fall, while that in leg 18' will rise to conductively connect contacts 20, 21 and thus energize electromagnets 15. As soon as the calefaction of the contents of vessel 16 ceases and the expansion decreases, the mercury returns to its previous equilibrium position, thereby breaking the electric circuit. The interruption of the current may however, also be effected by slightly withdrawing piston 23 so that the mercury passes from legs 18, 18' into the socket 19 and establishes direct communication of vessels 16, 17. After the equilibrium has thus been reestablished the piston is returned to its former position, while shaft 9 is turned by handle 26 to reopen the valve and reset the device for the next operation.

The chamber 2 communicates by means of a pipe 27 with a non-conducting vessel 25, filled to a given level with mercury and being in circuit with electro-magnet 15 and the catalysifier above referred to. Projecting into the vessel 25 are two contact pieces, one of which is always in contact with the mercury, while contact piece 28 enters the mercury only when no gas-pressure prevails. Gas pressure, if any, effects an interruption

of the circuit, the mercury column being forced downward and away from contact 28, while the column in the other leg rises correspondingly. When the gas pressure decreases, however, contact 28 will close the circuit, as will be readily understood. An indicator 29 and an electric alarm-bell 30 may be interpolated into the circuit, as shown.

10 In the construction shown in Fig. 3 a contact, consisting of a screw 39 and of a bush 40 is inserted into the circuit. To a screw 42 is secured a wire 43, leading upwardly and over the boss of an arm 44, fast on an axle 44^a. The wire is secured to said boss, and extends downwardly as at 43^a to be fastened to a fixing screw 41^a. Wire section 43^a is covered with a catalytic substance 45. If gas escapes into the room in which the differential contact thermometer is located, the material 45 becomes heated and thereby distends wire section 43^a. As wire 43, 43^a is normally placed under tension, the extension of section 43^a causes a partial rotation of lever 44, until the latter abuts against contact 39, thus causing the closing of the circuit.

In the modification illustrated in Figs. 4 and 5, the gas-supply is cut off by closing the current, and the mechanism of the gas-meter is arrested. To the axle 55 of the gas-drum is secured a ratchet wheel 46, which can be held in position by means of the nipping device 47, 49, said device being under normal conditions maintained in an uncoupled position by a pawl 48, engaging the upper arm of the lever 47. Lever 47 is provided with a laterally extending bent-arm 49 carrying an armature which is adapted to be influenced by an electro-magnet 50, and which fits with a bifurcated part 51 over a roll of an index lever 52. Above the armature of the spring-influenced pawl 48, there is mounted an electro-magnet 53. The cir-

cuit of this electro-magnet incloses the contacts which, as above described are actuated by a catalysifier or by a decrease of pressure, a contact-device 25 being connected by tube 27 with the gas-meter or with the gas-supply pipe.

When owing to an escape of gas or to a decrease of pressure the current is closed, the electro-magnets 53 and 50 are energized to attract pawl 48 and release lever 47. A spring 54 is thus free to swing arm 47 against the ratchet wheel 46, thereby locking the meter drum and checking the passage of the gas. The effect of spring 54 is increased by electro-magnet 50, which attracts the arm 49 of said lever.

We claim:

1. A device of the character described, comprising a gas service pipe, a catalytic substance adapted to be subjected to the action of gas escaping therefrom, means controlled by the catalytic substance for closing an electric circuit, and means actuated by said circuit for closing the gas service pipe.

2. A device of the character described, comprising a gas service pipe, a vessel having a catalytic wall, a mercury column connected to the vessel, an electric circuit controlled by said mercury column, and means actuated by said circuit for closing the gas service pipe.

3. A device of the character described, comprising a gas service pipe, a pair of vessels one of which has a catalytic wall, a U-shaped mercury pipe the legs of which communicate with said vessels, an electric circuit controlled by the mercury pipe, and means actuated by said circuit for closing the gas service pipe.

LUDWIG SCHMIDT. [L. s.]

HERBERT SCHMIDT. [L. s.]

Witnesses:

OTTO KÖNIG,

CHAS. J. WRIGHT.