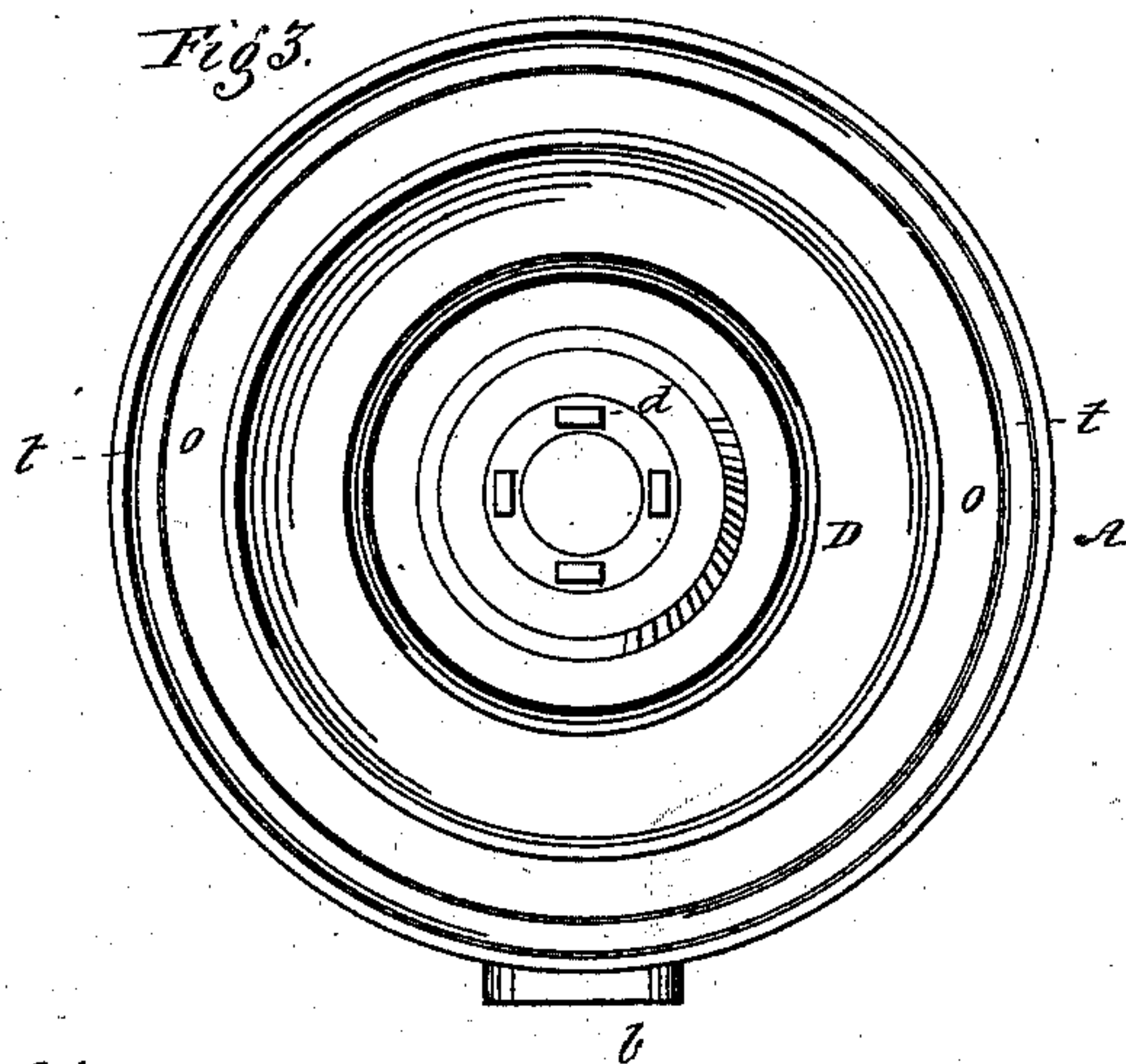
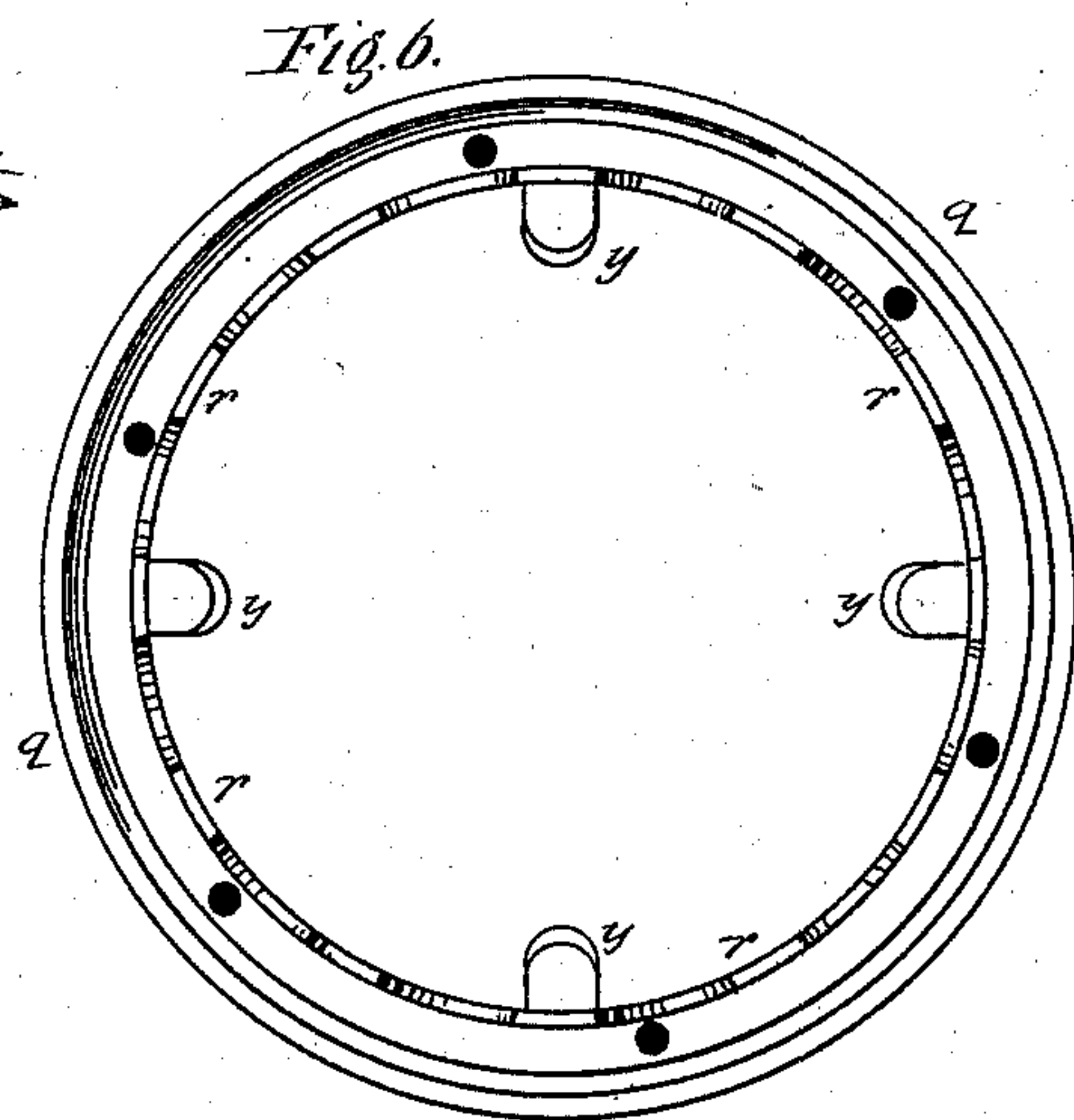
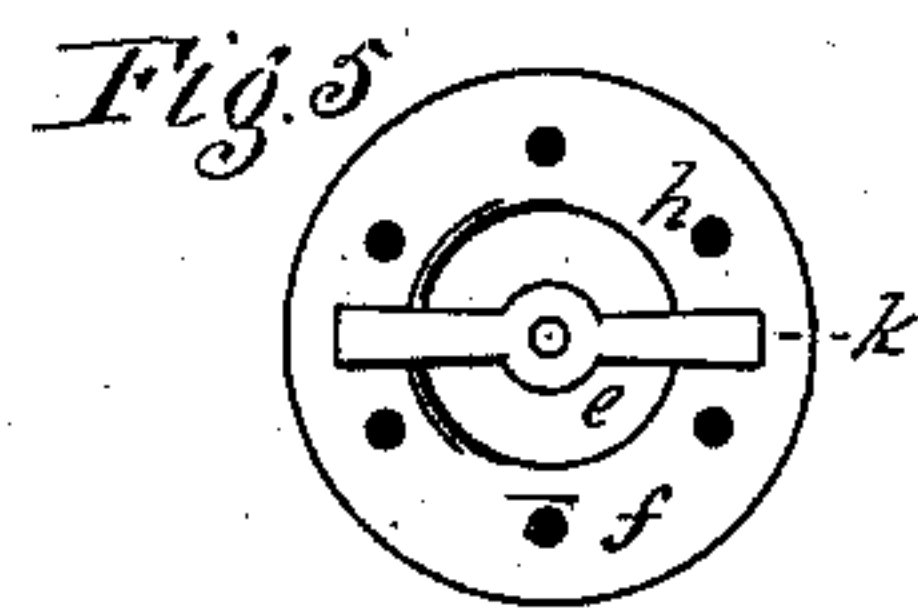
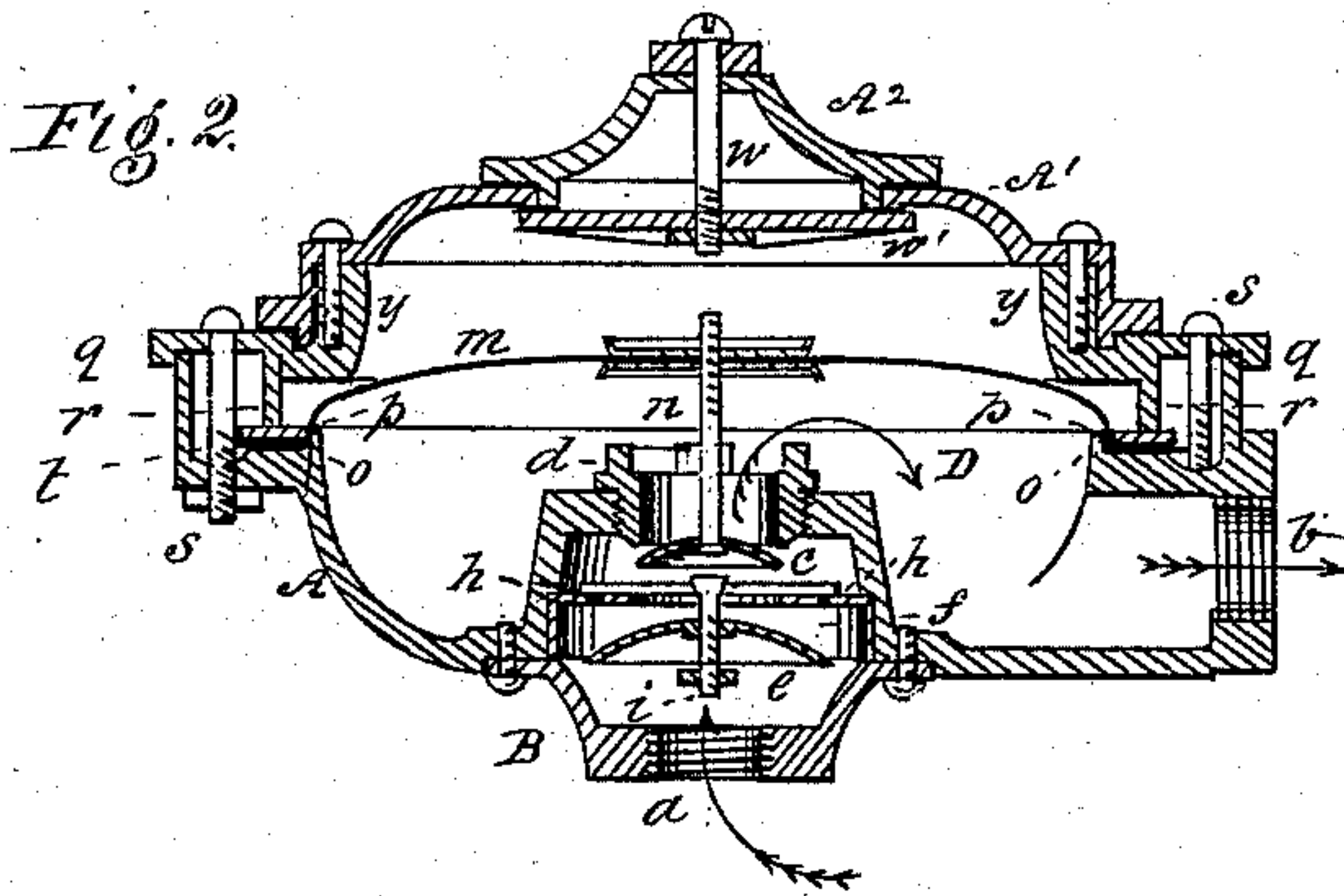
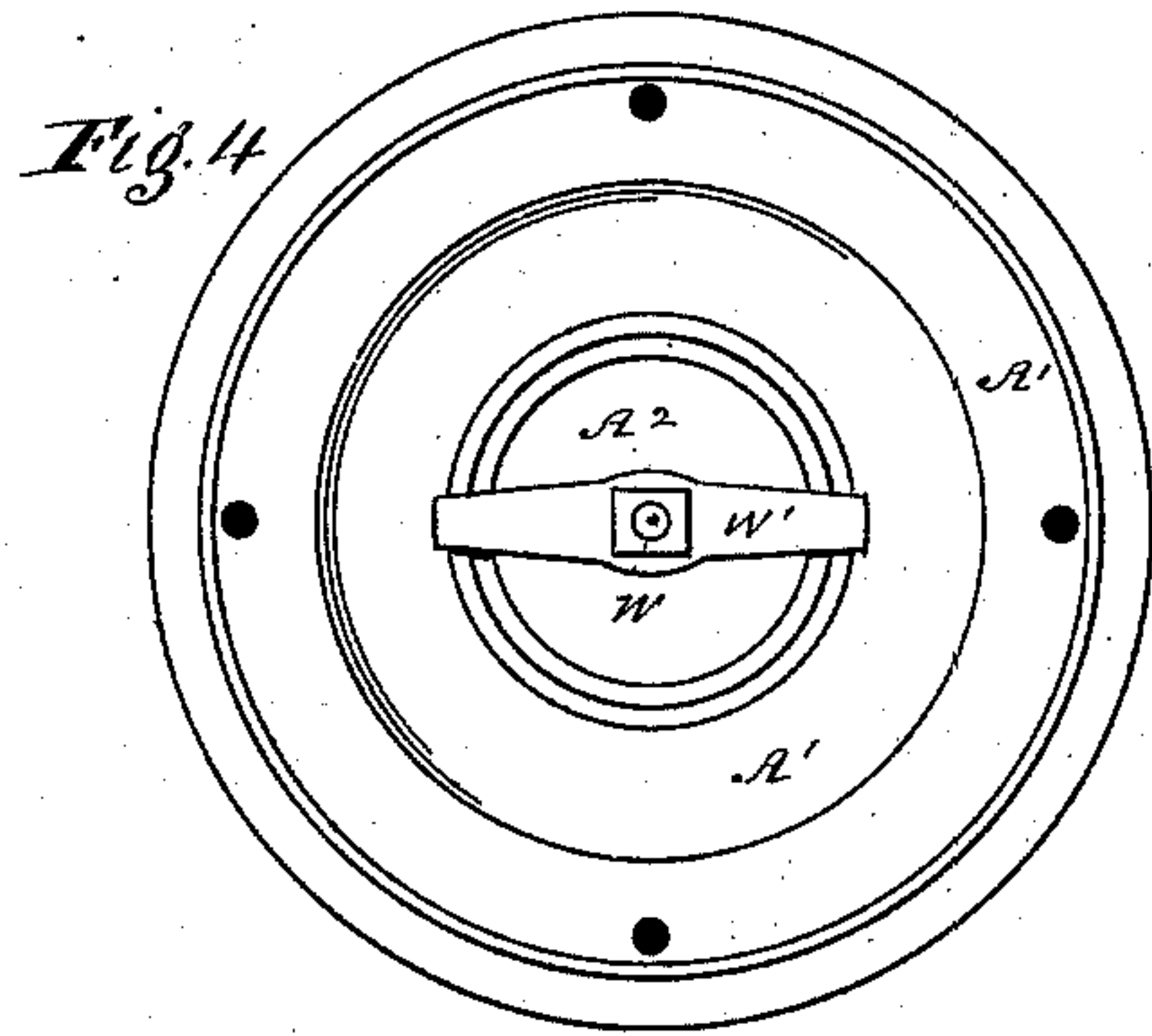
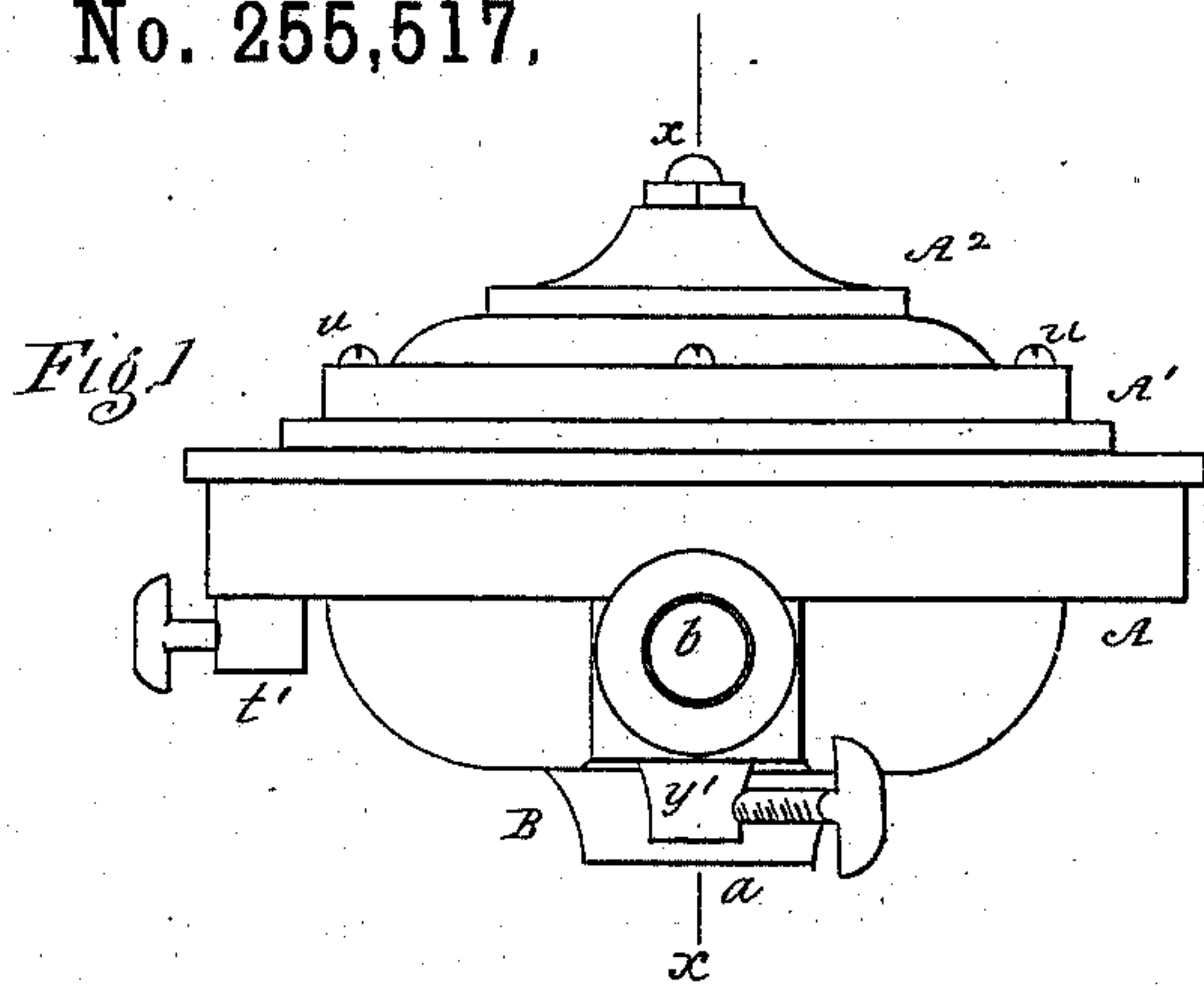


(No Model.)

G. S. LACEY.
GAS REGULATOR.

No. 255,517.

Patented Mar. 28, 1882.



Witnesses:
M. H. Topping
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UNITED STATES PATENT OFFICE.

GRIFFIN S. LACEY, OF NEW YORK, N. Y.

GAS-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 255,517, dated March 28, 1882.

Application filed November 2, 1881. (No model.)

To all whom it may concern:

Be it known that I, GRIFFIN S. LACEY, a citizen of the United States, residing in the city of New York, in the county and State of New York, have invented certain new and useful Improvements in Gas-Regulators; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to improvements in that class of gas-regulators in which a flexible diaphragm and an automatically-operating valve are employed for the purpose of regulating the flow of gas from the gas-meter to the gas-burners; and the chief objects of the invention are, first, to obviate the difficulties arising from extreme fluctuations of pressure of the gas entering the meter by causing it to enter the main-valve chamber of the regulator at a nearly uniform pressure, and thereby neutralizing the effects of extreme fluctuations of pressure in the street-mains; and, secondly, to provide improved means for securing the flexible diaphragm in position, so that it will not be liable to be injured or displaced, and so that all parts thereof will be subjected to a uniform tension, and can at all times be kept properly lubricated and in good working condition.

It is well known that in most cities the variations in the gas-pressure during the day and night are very great, the pressure being probably from one to one and a half inch during the day and from three to four inches during the night, or a portion thereof, and if the gas enters the regulator under these varying conditions, the operations of the latter must necessarily be affected thereby, and it cannot deliver gas to the burners at a perfectly uniform pressure. By means of the first of my improvements this difficulty is obviated, and by means of the second of my improvements the use of screws or bolts for securing the diaphragm is dispensed with, and the latter is secured in such a manner as to insure its perfect and uniform action and freedom from injury or displacement.

My invention consists, first, in the combination, in a diaphragm gas-regulator, with the ordinary diaphragm, valve, inlet, and outlet, of an auxiliary valve constructed, as herein-

after particularly described, to neutralize the effects of the variations in the street-pressures; secondly, in improved means for securing the diaphragm in position, all of which is hereinafter particularly set forth and described.

In the accompanying drawings, Figure 1 represents a side elevation of my improved gas-regulator; Fig. 2, a vertical section of the same on the line *xx* in Fig. 1; and Figs. 3, 4, 5, and 6 are details, hereinafter explained.

Similar letters of reference indicate the same parts in all the several figures.

A represents the main body of my gas-regulator, A' and A² the cover of the same, and B an auxiliary-valve chamber, all of which are made of cast-iron and of suitable form to accommodate the working parts.

a is the gas-inlet, through which the gas enters the regulator from the meter, and *b* the outlet, through which the gas passes from the regulator to the burners.

c represents the main valve, and *d* its valve-seat, both of which may be of suitable form, and D is the gas-chamber.

Immediately under the valve *c* and above the inlet *a*, I place an auxiliary cut-off consisting of a valve, *e*, and valve-seat *f*. These may be of the form shown in the drawings or of other form suitable for regulating the pressure of the inflowing gas, so that it shall enter the valve *c* at a nearly uniform pressure of, say, one inch or one and a half inch as a minimum pressure. To effect this result the valve *e* is loaded to such an extent that it remains passive until the pressure at the meter exceeds the said minimum pressure, and is raised proportionately to the increase of the outside pressure, so as to diminish the supply to the main valve *c*, and if the pressure at the meter is sufficient to raise the said valve *e* to its seat, the gas then passes through the perforations *h*, which are made of a proper size to admit a sufficient supply to the valve *c* under the highest pressure which is ever attained in the street-mains. By these means the gas is caused to enter the valve *c* at a nearly uniform pressure, and the gas is delivered to the burners with perfect regularity, whatever may be the street pressure.

Fig. 5 represents a plan view of the auxiliary valve and its seat detached. The valve *e* is arranged to slide vertically upon a rod, *i*,

secured at its upper end to a cross-bar, *k*, at the upper surface of the valve-seat.

m is the diaphragm, of leather or other suitable material, at the center of which the valve-rod *n* is secured, in the usual manner, to operate the valve *c*, in the manner that is common in all diaphragm-regulators.

By my improvement the diaphragm is secured without being pierced by screws or bolts, so that there is no liability of its being injured thereby. When a diaphragm is pierced by screws or bolts it is apt to be torn where the same pass through it, and consequently its tension will not be uniform over all its surface, and the uniformity of its action will be impaired. In my improvement a ledge, *o*, is formed around the body of the regulator, upon which the edges of the diaphragm rest, and a ring, *p*, is laid over the same, which is clamped by means of an annular plate, *q*, provided with an umber of projections, *r*, which rest upon said ring *p*. This plate *q* is interposed between the body of the regulator and its cover, and is held in position by screw-bolts *s*, which pass through both. By these means the diaphragm is clamped immovably in position without injury, and a uniform tension throughout its entire surface is secured.

Fig. 6 is a plan view of the under side of the plate *q*. A groove, *t*, is formed around the diaphragm, in which a lubricating material may be constantly held, so that the diaphragm may be kept constantly lubricated, and the lubri-

cator may be removed at pleasure by means of a drip device, *t'*.

The cover *A' A²* is secured to the body *A* by means of screw-bolts *u*, so that ready access may be had to the interior, and for further convenience I make it in two parts, which are clamped together by means of a screw-bolt, *w*, and bar *w'*; but this is not essential. In Fig. 4 is shown the under surface of the cover *A' A²*. The screw-bolts by means of which the cover is secured pass into lugs *y*, formed on the annular plate *q*. *y'* is a drip at the lower part of the body *A*, for the purpose of withdrawing the fluids of condensation.

In Fig. 3 is shown a plan view of the body of the regulator, the cover and diaphragm being removed.

What I claim as my invention is—

1. In combination with the valve *c*, diaphragm *m*, inlet *a*, and outlet *b*, each constructed as described, the auxiliary valve *e* and its valve-seat *f*, said valve *e* being arranged to slide vertically upon the rod *i*, and its valve-seat *f* being provided with the perforations *h*, as and for the purpose set forth.

2. The combination of the ledge *o*, ring *p*, and annular plate *q*, provided with the projections *r* for the purpose of clamping the diaphragm, as shown and described.

GRIFFIN S. LACEY.

Witnesses:

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