

No. 611,626.

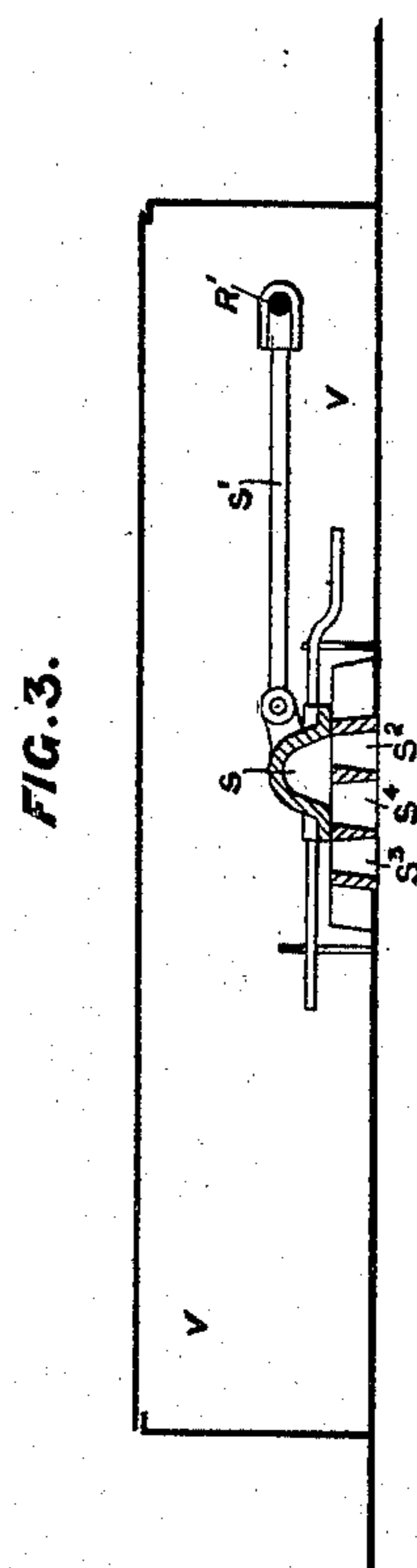
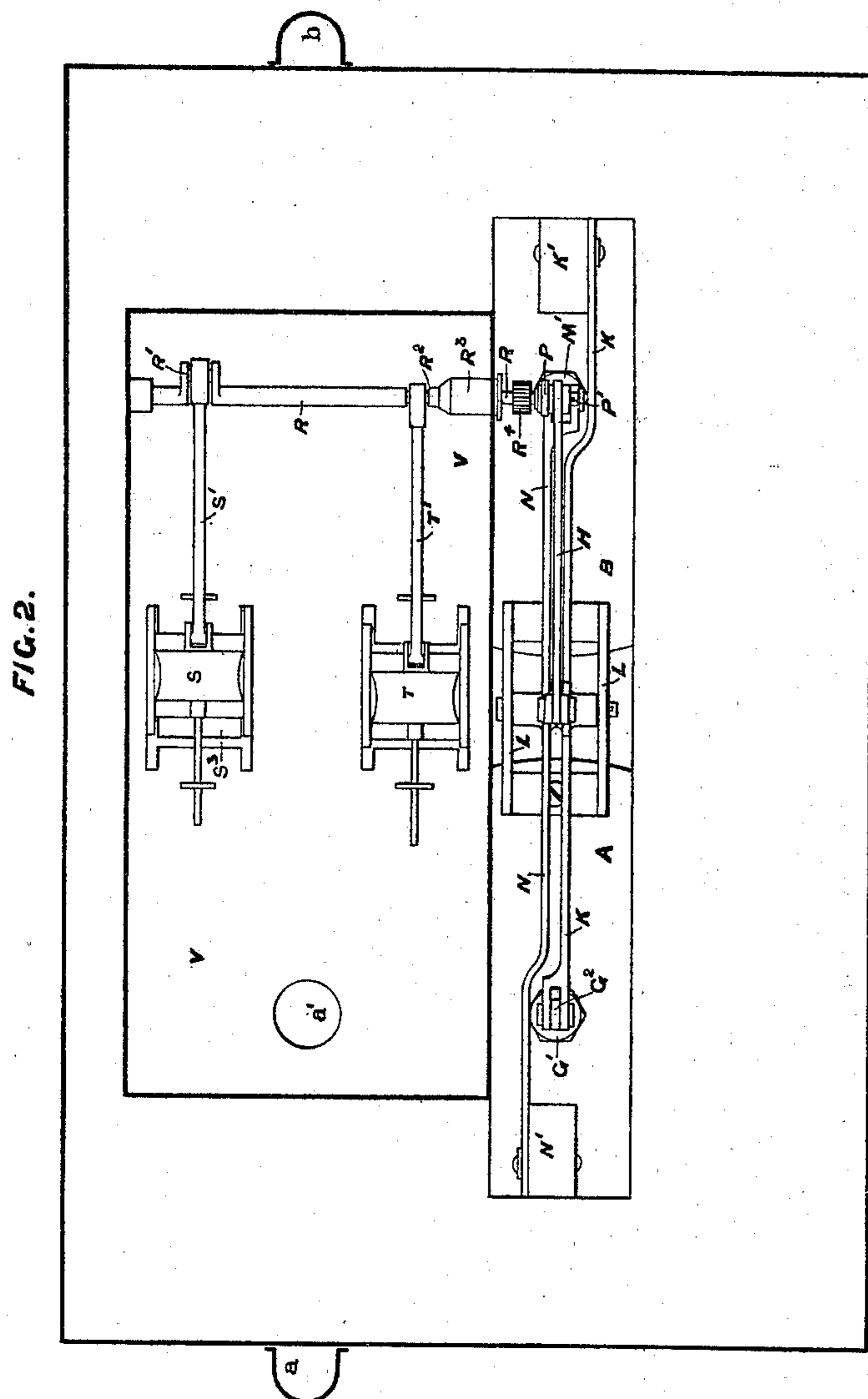
Patented Oct. 4, 1898.

**J. GREENALL.
GAS METER.**

(Application filed Oct. 18, 1897.)

(No Model.)

3 Sheets—Sheet 2.



WITNESSES:

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ATTORNEYS:

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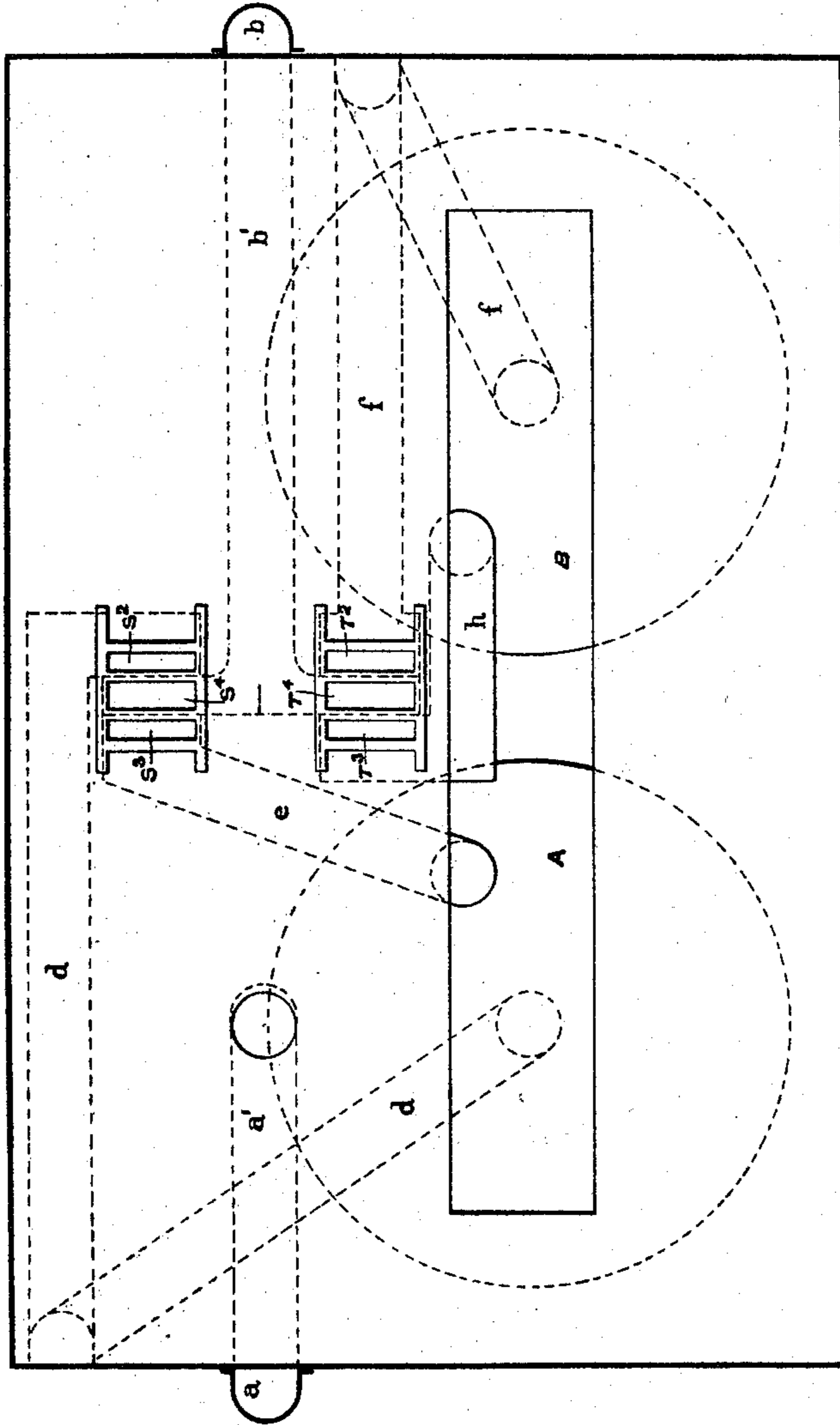
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3 Sheets—Sheet 3.

FIG. 4.



UNITED STATES PATENT OFFICE.

JOHN GREENALL, OF LEEDS, ENGLAND.

GAS-METER.

SPECIFICATION forming part of Letters Patent No. 611,626, dated October 4, 1898.

Application filed October 18, 1897. Serial No. 655,571. (No model.) Patented in England September 24, 1895, No. 17,850.

To all whom it may concern:

Be it known that I, JOHN GREENALL, a subject of the Queen of Great Britain and Ireland, and a resident of Leeds, in the county of York, England, have invented certain new and useful Improvements in Gas-Meters, (for which a patent has been obtained in Great Britain, No. 17,850, bearing date September 24, 1895,) of which the following is a specification.

The object of this invention is to construct a meter for measuring gas and other fluids which will not be subject to the variations and uncertainties of measurement and working which occur in wet and dry meters at present in use.

Referring to the drawings which form a part of this specification, Figure 1 is a sectional elevation of a meter constructed according to this invention, and Fig. 2 is a sectional plan of same. Figs. 3 and 4 are detail views.

A and B are two cylinders having inner portions A' and B' within same which form annular spaces C and D at the bases of the said cylinders. Bells E and F are situated within the cylinders A and B, and the lower ends of the said bells are immersed in glycerin seals contained in the annular spaces C and D, thus preventing the gas to be measured from passing between the opposite sides of the said bells. The bell E is suspended by a piston-rod G, which latter passes through a stuffing-box G' and is connected by means of a link G² with one end of a bell-crank lever K, mounted on a bracket L, and the opposite end of the lever K carries an adjustable weight K', which balances the bell E and parts connected therewith. The bell F is suspended by a piston-rod M, which latter passes through a stuffing-box M' and is connected through a link M² with a lever N, fulcrumed on the bracket L, and the opposite end of the lever N carries an adjustable weight N', which balances the bell F and parts connected therewith.

H is a rod which connects the bell-crank lever K with an adjustable pin P' of a crank P, which latter has a circular motion and is carried on the extremity of a crank-shaft R, and J is a rod which connects the end of the lever N with the adjustable pin P' of the

crank P. It will thus be seen that the rising and falling of the bells E and F communicate motion to the crank-shaft R, and as the bell E is set half a stroke in advance of the bell F no dead-point is obtained in the crank P. The crank-shaft R is provided with cranks R' and R², which are connected, respectively, with slide-valves S and T by means of connecting-rods S' and T', and the crank R' is set a quarter of a revolution in front of the crank R².

V is a valve-box in which the valves S and T are situated, and the crank-shaft R passes into the said valve-box V through a stuffing-box R³.

S² and S³ are the ports, and S⁴ the exhaust, of the valve S, and T² and T³ are the ports, and T⁴ the exhaust, of the valve T.

a is the inlet-pipe of the meter, which admits the gas-supply to the valve-box V by way of a passage a', and the exhausts S⁴ and T⁴ communicate with an outlet-pipe b by way of a passage b'.

The port S² is connected by means of a passage d with the interior of the cylinder A below the bell E, while the port S³ is connected with the interior of the cylinder A above the bell E by means of a passage e. The port T² is connected by means of a passage f with the interior of the cylinder B below the bell F, while the port T³ is connected with the interior of the cylinder B above the bell F by means of a passage h, and all these passages will be best seen by referring to Fig. 4. The ends of the passages d, e, f, and h are all prolonged a short distance into the interior of the cylinders A and B for the purpose of preventing the glycerin entering the said passages should the meter be overturned. The crank-shaft R is geared through the pinion R⁴ with the ordinary train of wheels R⁵, which in their turn operate a suitable index mechanism.

The gas entering the valve-box V is fed alternately on opposite sides of the bells E and F, thus causing them to rise and fall in a similar manner to that of the pistons of a steam-engine, and the movement of the bells E and F imparts the necessary movement to the crank-shaft R, and thence to the slide-valves S and T, while the gas that is expelled through the passages to the outlet-pipe b rep-

resents the supply from the meter after its quantity has been duly registered. It will thus be seen that the amount of gas passed per stroke depends on the length of stroke
5 given to the bells E and F, and this may be regulated by adjusting the pin P' in the crank P.

Having now described my invention, what I claim as new, and desire to secure by Letters
10 Patent, is—

1. The combination in a gas-meter, of two bells cylinders within and without such bells closed at their upper ends, and a sealing fluid
15 for the lower ends of the bells and within the annular spaces between the respective cylinders, rods connected with the respective bells and levers connected with the rods and a counterweight for each lever, a shaft and crank with an adjustable crank-pin, a link
20 connecting one of the levers to the crank-pin and a second link substantially at right angles to the first link connecting the crank-pin with the bell-crank arm on the other lever, and a train of gearing to the registering de-
25 vice receiving motion from the crank-shaft, substantially as set forth.

2. The combination in a gas-meter, of two bells, cylinders within and outside such bells

closed at their upper ends, and a sealing fluid
30 for the lower ends of the bells and within the annular spaces between the respective cylinders, rods connected with the respective bells and levers connected with the rods and a counterweight for each lever, a shaft and crank with an adjustable crank-pin, a link
35 connecting one of the levers to the crank-pin, and a second link substantially at right angles to the first link connecting the crank-pin with the bell-crank arm on the other lever, and a train of gearing to the registering de-
40 vice receiving motion from the crank-shaft, cranks at right angles to each other on the crank-shaft, valves connected to the cranks and receiving motion from the same, valve
45 seats and ports and connections to the inlet and outlet pipes and to the respective cylinders by which the movements of the bells are regulated by the action of the valves and the
50 extent of movement of the bells is determined by the adjustment of the crank-pin, substantially as set forth.

JOHN GREENALL.

Witnesses:

GRIFFITH BREWER,
JOHN JOWETT.