

(No Model.)

3 Sheets—Sheet 1.

J. PARKER.
COIN RELEASED SPIROMETER.

No. 414,323.

Patented Nov. 5, 1889.

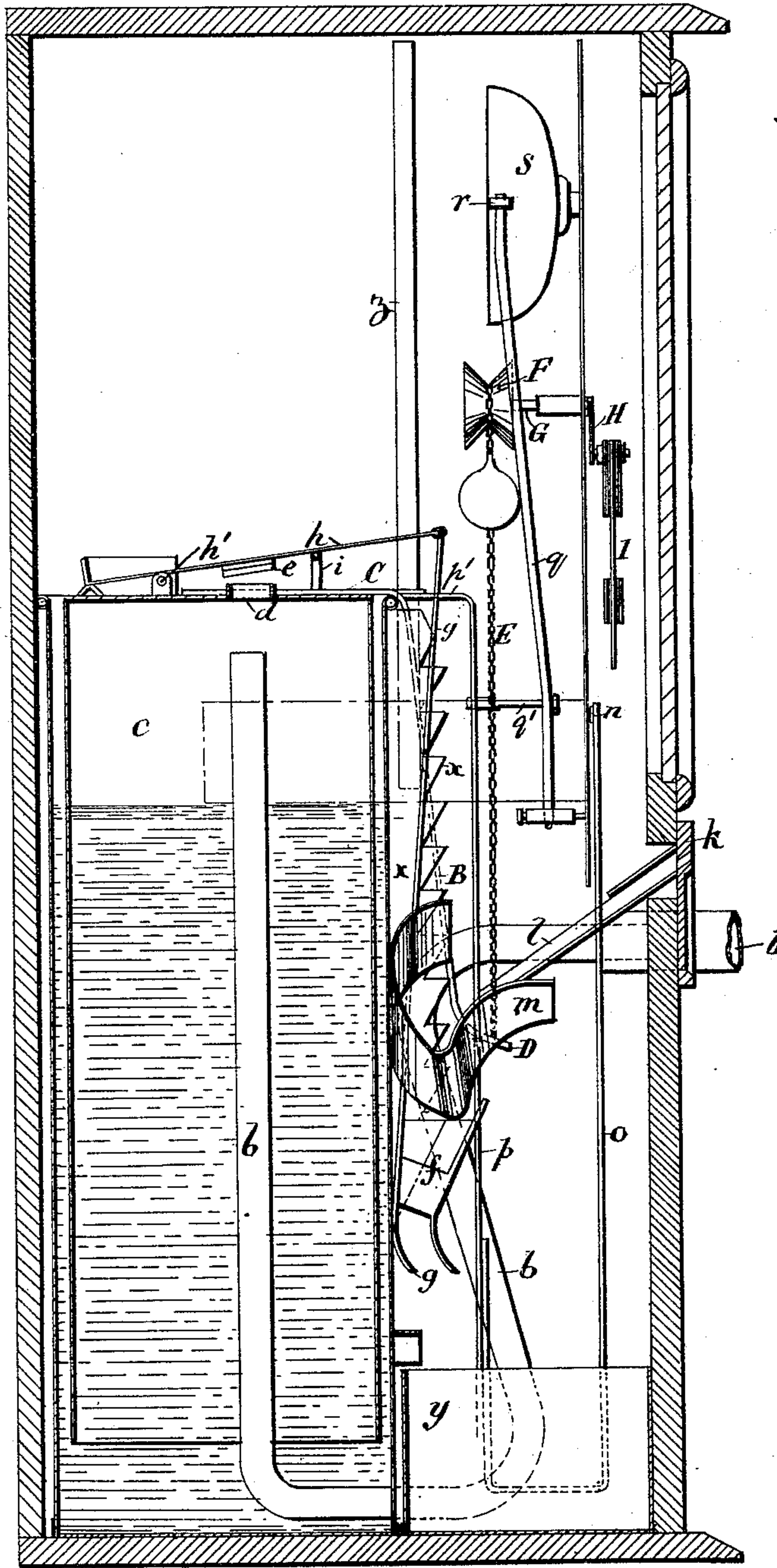
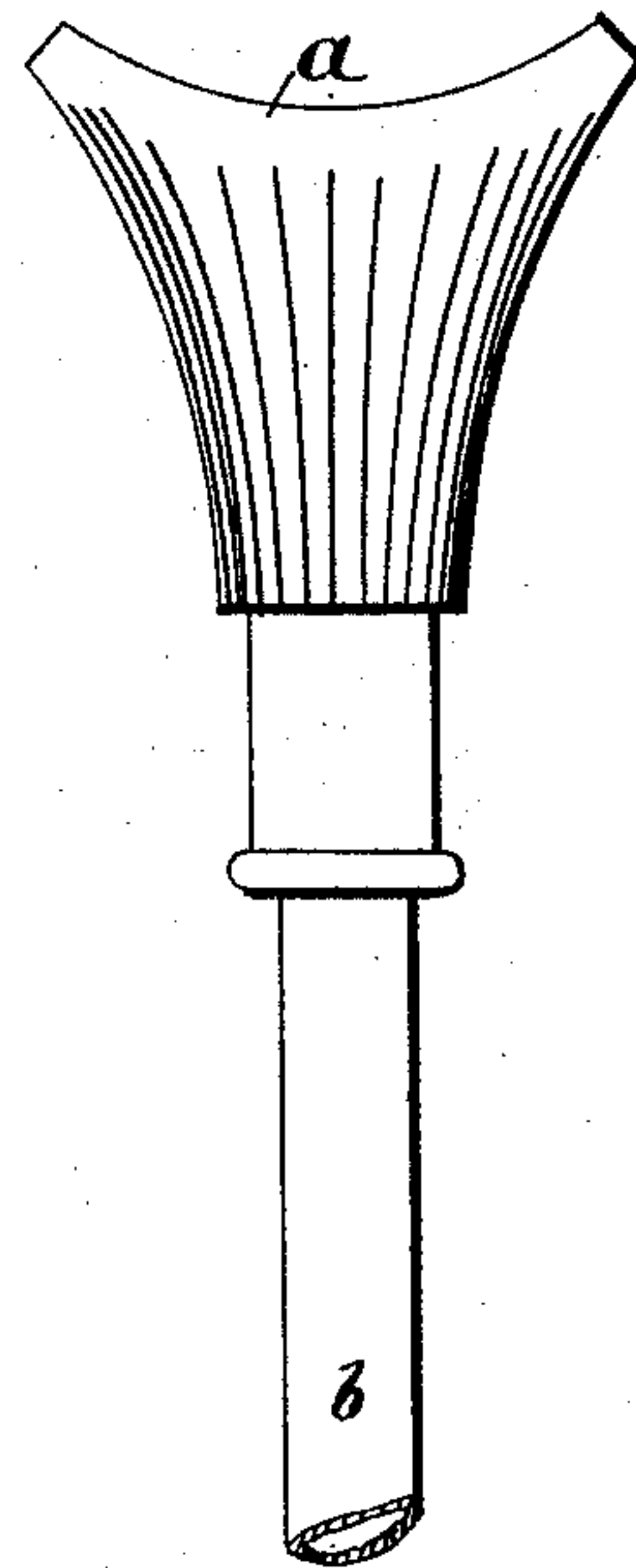


Fig. 1—



Witnesses:
C. F. Zees
J. M. Winter.

Inventor:
James Parker.
by Herbert W. Jenner.
Attorney.

(No Model.)

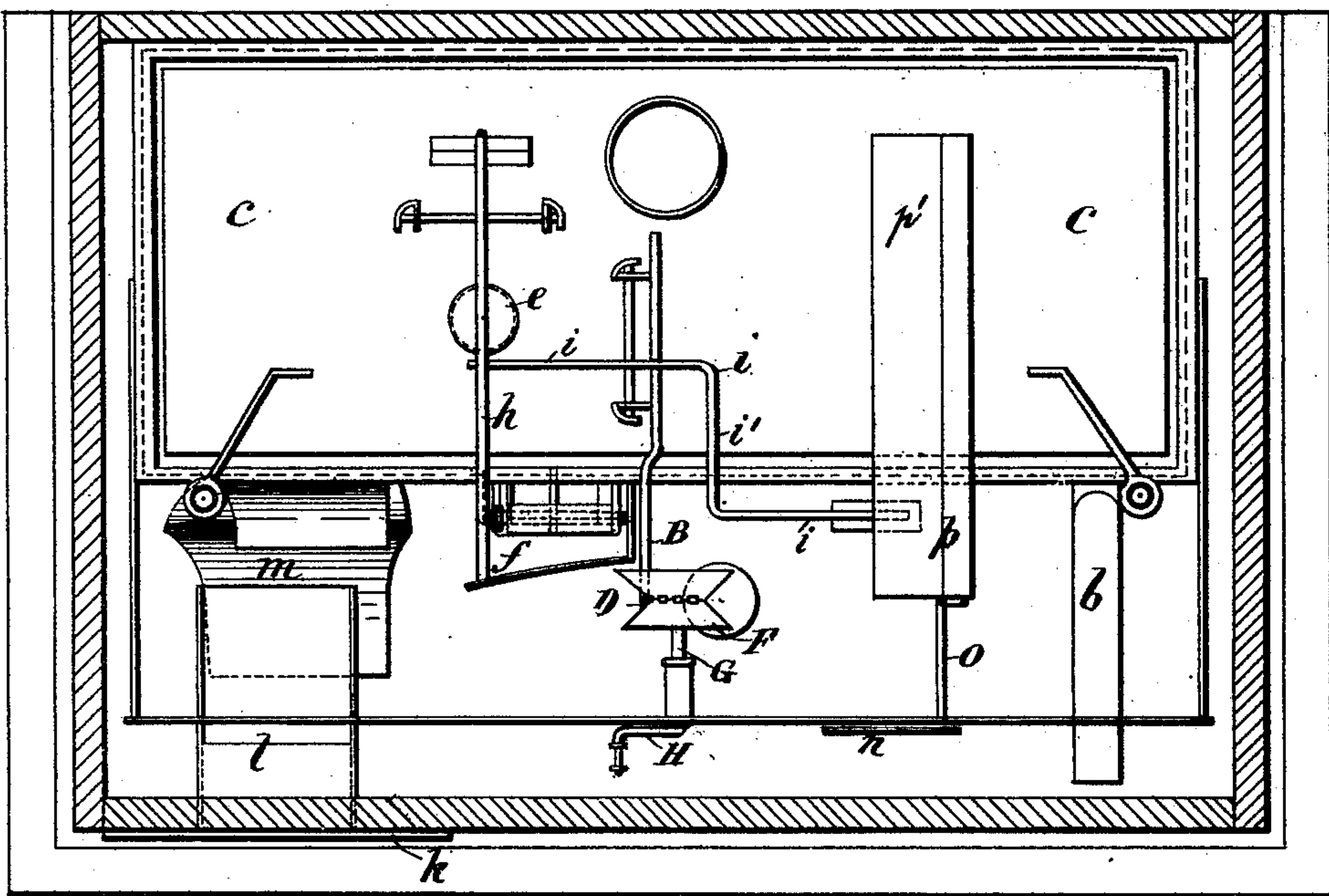
3 Sheets—Sheet 3.

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No. 414,323.

Patented Nov. 5, 1889.

Fig 3.



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UNITED STATES PATENT OFFICE.

JAMES PARKER, OF HULL, COUNTY OF YORK, ENGLAND.

COIN-RELEASED SPIROMETER.

SPECIFICATION forming part of Letters Patent No. 414,323, dated November 5, 1889.

Application filed June 5, 1889. Serial No. 313,143. (No model.) Patented in England August 4, 1888, No. 11,291, and in France January 30, 1889, No. 195,727.

To all whom it may concern:

Be it known that I, JAMES PARKER, a subject of the Queen of Great Britain and Ireland, residing at 26 Alexandra Road, Hull, in the county of York, England, have invented an Improved Coin-Controlled Spirometer, (for which I have applied for a patent in Great Britain, No. 11,291, dated August 4, 1888, and have obtained a patent in France, No. 195,727, dated January 30, 1889,) of which the following is a specification.

The object of this invention is to provide an apparatus which shall on the insertion of a proper coin be capable of measuring and indicating the air capacity of the lungs; and it consists, essentially, in means for conducting the breath from the mouth of the operator or experimenter through a suitable tube into a receiver of known capacity constructed somewhat similar to an ordinary gas-holder, the displacement of the receiver, and consequently the measurement of the volume of air inclosed, being indicated on a fixed scale, and the action of the said measuring apparatus being controlled by the insertion of a predetermined coin.

In the accompanying drawings, Figure 1 is a vertical section of one form of my apparatus constructed according to this invention; and Fig. 2 is a front elevation, and Fig. 3 is a plan, of the same.

The breath is conveyed through the mouth-piece *a* and tube *b* into the upper part of a floating vessel *c*, having an opening *d*, which is closed by the valve *e* when a coin of the proper weight and size is deposited in the cage *f*, suspended by the rods *g* from the end of the valve-lever *h*. The valve-lever *h* is pivoted by pin *h'* to the top of vessel *c*, and the cage-rods *g* are pivoted to the free end of said lever. When the cage *f* is empty, the valve *e* is held open by means of the counterweighted lever *i*, as clearly shown, the upper end of rod *i* bearing on the under side of the valve-lever *h*, and the middle portion of rod *i* being provided with a cranked portion which rests upon the top of vessel *c*. The rod *i* is free to turn upon said cranked portion as a pivot, and the weight is so proportioned that it requires the weight of the predetermined coin to lift it and close the valve. The coins are inserted

through the plate *k* and pass down the chutes *l* and *m* into the cage *f*. The slit in plate *k* is of such size that nothing larger than the predetermined coin can pass, and smaller coins would not be heavy enough to open the valve. The height to which the vessel *c* is elevated, and consequently the volume of air inclosed in it, is indicated by the pointer *n*, attached by a wire *o* to a serrated plate *p*, the teeth of which as they advance displace the counterweighted lever *q*, which on its return causes the hammer *r* to strike the bell *s*. The plate *p* is secured to the top of vessel *c* by its flange *p'*, so that both plate and pointer rise with the vessel. The bell-hammer lever *q* is pivoted on the pin *q'*, projecting from the side of the stationary vessel *A*, and the hammer *r* is secured to the top of lever *q*. The length of the teeth *t* corresponds with regular differences in the volumes of air conveyed to the reservoir *c*, and so serve to indicate the accumulation. The lever *u* is hinged to the lever *q* at the point *v*. A stop *v'* is secured to lever *q*, so that the lever *u* rests in a normally horizontal position. When the plate *p* rises, its teeth push against the end *w* of lever *u* and cause the lever *q* to turn radially upon pin *q'*, thereby drawing back the hammer and permitting it to strike the bell each time a tooth *t* passes the lever end *w*. The stop *v'* permits the lever *u* to turn in the one direction only, so that as the plate *p* ascends the bell-hammer lever *q* is displaced, as above described; but on its descent the lever *u* turns on its axis *v* and allows the end *w* to escape the teeth *t*.

For the purpose of ejecting the coin from the cage *f* after each operation of the apparatus a serrated plate *x* is placed vertically down the center of the traverse of the coin-cage *f*, so that as the cage ascends it slides with the said coin over the teeth *x*; but when the cage *f* descends the coin is caught by one of the teeth and ejected into the receptacle *y*. The plate *x* is secured to the side of the stationary vessel *A*, and the cage *f* is provided with a hole in the bottom of it, which slides over said plate *x* as the cage rises. The vertical motion of the vessel *c* is guided by the rods *z*, secured to the outer vessel *A*.

An arm *B* has one end *C* secured to the ves-

sel c, the outer end D being connected to the chain E, passing over a pulley F, connected to the spindle G of the crank H, to which is attached an acrobatic figure I, which is thus
 5 caused to rotate as the apparatus is operated. A moving figure may also be attached to the pointer n, if desired.

What I claim, and desire to secure by Letters Patent of the United States, is—

10 1. An apparatus for measuring and indicating the air capacity of the lungs, consisting of a mouth-piece and tube for conducting the air discharged from the mouth of the operator into a receiver, of a receiver of known
 15 capacity constructed similar to an ordinary gas-holder, and of a valve on the receiver, which valve is closed on the insertion of a coin of predetermined amount in the apparatus, so as to prevent the escape of air from
 20 the receiver, which is consequently raised by the air discharged from the mouth of the operator and indicates on a scale the quantity, the said valve being reopened on the descent of the holder, substantially as de-
 25 scribed.

2. The combination, with the stationary outer vessel and the floating inner vessel, of a normally-open air-escape valve at the top of the floating vessel and a coin-plate pro-
 30 vided with a slit, the balance of said valve and the size of said slit being so proportioned that the valve can only be closed by a coin of predetermined denomination, substantially as set forth.

3. The combination, with the stationary 35 outer vessel and the floating inner vessel, of a coin-controlled air-escape valve at the top of said inner vessel normally preventing the use of the instrument, substantially as set forth.

4. The combination, with the vertically- 40 moving coin-cage having a hole in its lower part, of the stationary plate provided with a series of upwardly-projecting teeth passing through said hole and adapted to slide past 45 the coin during the ascent of the cage and to eject the coin from the cage when said cage descends, substantially as set forth.

5. The combination, with a spirometer, of a stationary bell, a pivoted lever provided 50 with a hammer, a horizontal lever provided with a stop and a projecting end and pivoted to said bell-hammer lever, and a vertically-moving plate provided with teeth and secured to a moving part of the spirometer, whereby 55 the bell is automatically sounded at intervals, substantially as set forth.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JAMES PARKER.

Witnesses:

G. AUDSLEY,
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