

(No Model.)

2 Sheets—Sheet 1.

G. H. SMITH.
MEASURING VESSEL.

No. 373,537.

Patented Nov. 22, 1887.

Fig 1

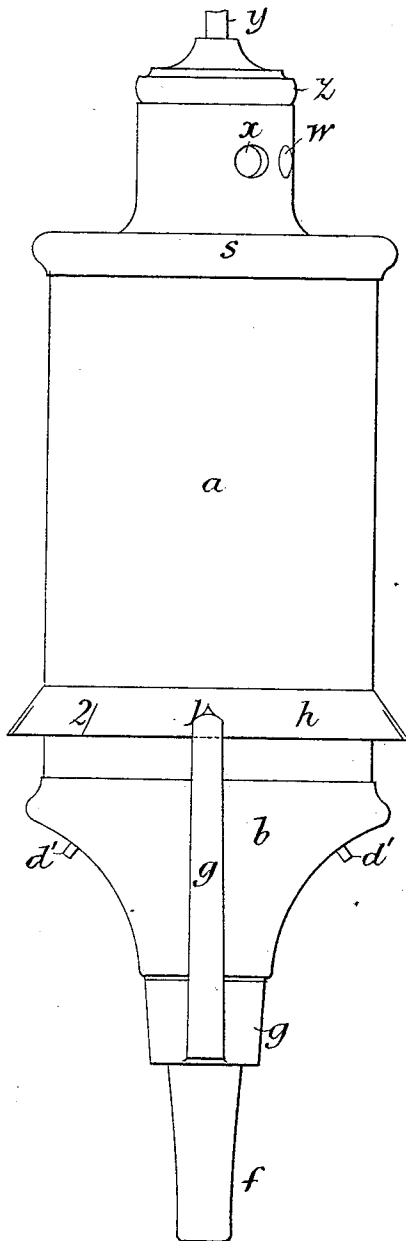
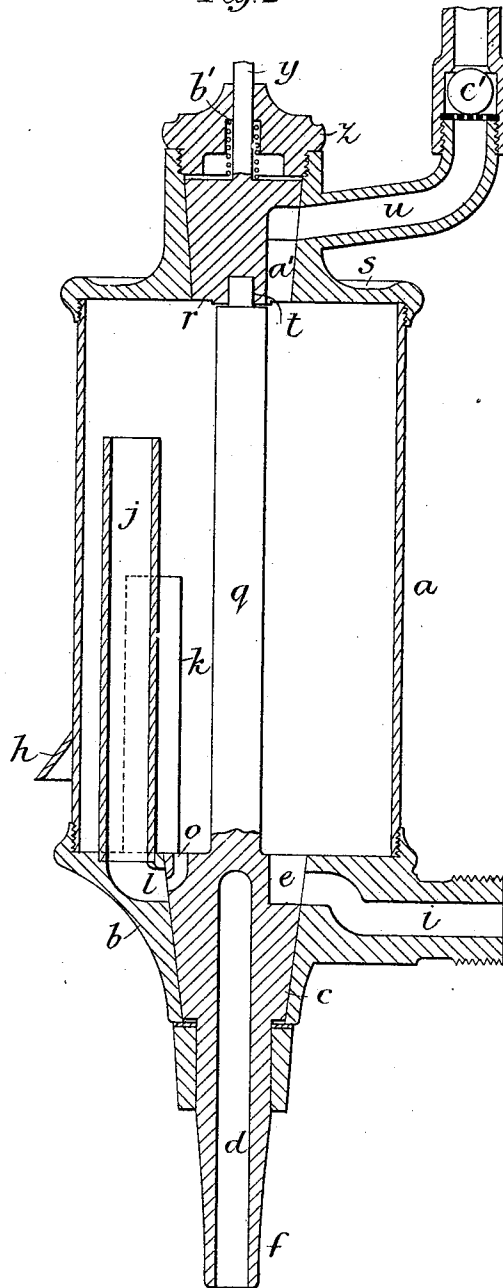


Fig 2



Witnesses:
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George H. Smith
By *John J. Macleod & Son*
his Attys.

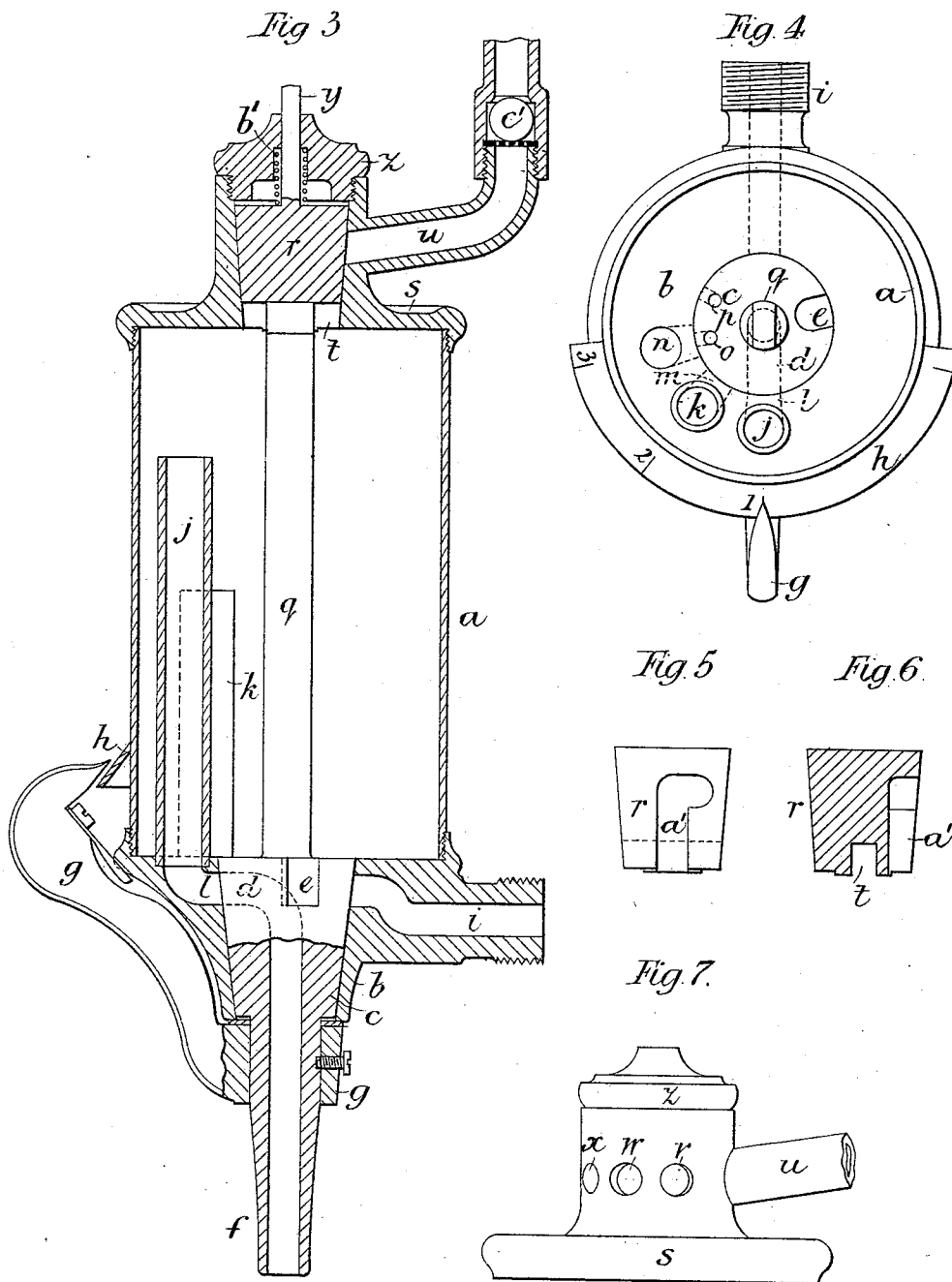
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2 Sheets—Sheet 2.

G. H. SMITH.
MEASURING VESSEL.

No. 373,537.

Patented Nov. 22, 1887.



Witnesses:
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Inventor:
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UNITED STATES PATENT OFFICE.

GEORGE HENRY SMITH, OF LONDON, ENGLAND.

MEASURING-VESSEL.

SPECIFICATION forming part of Letters Patent No. 373,537, dated November 22, 1887.

Application filed February 3, 1887. Serial No. 226,418. (No model.) Patented in England December 8, 1885, No. 15,065; in Germany September 19, 1886, No. 39,047, and in France September 21, 1886, No. 178,654.

To all whom it may concern:

Be it known that I, GEORGE HENRY SMITH, a subject of the Queen of great Britain, residing at London, England, have invented new and useful Improvements in the Construction of Taps for Measuring and Registering the Quantity of Liquid Passed Therethrough, (for which I have obtained patents in the following countries—namely, Great Britain, No. 15,065, dated December 8, 1885; Germany, No. 39,047, dated September 19, 1886, and in France, No. 178,654, dated September 21, 1886,) of which the following is a specification.

My improvements consist in so constructing measuring-taps that the minimum risk of derangement and liability to leak is obtained.

In order to carry out my invention I provide a cylinder made of any suitable material—such as brass, pottery, or glass—the capacity of such cylinder being equivalent (minus a slight portion consisting of other necessary parts) to the maximum quantity the tap is to measure. The bottom of the cylinder I construct of a suitable shape to form what may be termed the “cylinder base-cap,” and also to contain a two-way cone-cock whose axis runs in a vertical line with the cylinder. This cone at the bottom part is hollow and extends outward below the casing, thus forming the spout for the liquid drawn off. Outside this spout I place a casting of a suitable shape, which serves the double purpose of a washer and handle to turn the tap by. The bottom part or cover of the cylinder is formed with one of the connections to the barrel or vessel containing the liquid to be measured. Extending up from the cylinder base-cap and connected to suitable ports in the casing of the two-way cone-cock I attach pipes extending to any desired height into the cylinder. In the plug of this cone-cock passages are set apart the same distance as the ports referred to in the casing. The plug or cone-cock extends upward to the top of the cylinder; but the size of the plug may here be reduced. This extension of the plug engages into a one-way cone-cock in the top of the top cylinder-cover. Extending from the casing of the top cone-cock is a pipe, forming the other connection of the barrel referred to. Air-holes are made in the cone-

cock casing at similar distances apart to which the ports are in the lower casing. The plug of the top cone extends upward, and can be adapted to actuate an indicator or counter, which can be of any suitable construction.

In order to enable my invention to be fully understood, I will proceed to describe the same by reference to the accompanying drawings, in which—

Figure 1 represents a front elevation, and Figs. 2 and 3 are vertical transverse sections, of a tap for measuring and registering the quantity of liquid passed therethrough constructed according to my invention. Fig. 4 is a plan of the same with the top cylinder-cover removed. Figs. 5 and 6 are an elevation and a vertical section, respectively, of the plug of the upper cone-cock. Fig. 7 is a side elevation of the top cylinder-cover.

Similar letters in all the figures represent similar parts.

a is the cylinder, the capacity of which is almost equivalent to the maximum quantity the tap is to measure.

b is the cylinder base-cap, and *c* is the two-way cone-cock in the same, *d* and *e* representing the ways or passages.

f is the hollow bottom part of the cone-cock *c*, extending outward below the casing and forming the spout for the liquid drawn off.

g is the casting, fixed to the outside of the spout *f*, which casting serves as a washer and handle to turn the tap by.

h is a plate on the cylinder *a*, marked with suitable words, letters, figures, or the like, serving to indicate the positions to which the handle must be moved in order to draw off the required measured quantities of liquid.

i is the connection for the lower part of the barrel or vessel containing the liquid to be measured, the said connection being formed on the base-cap *b* of the cylinder *a*.

j and *k* are the pipes, extending up to any desired height within the cylinder from the base-cap *b*, and *l* and *m* are the ports in the cap *b*, to which the said pipes are connected, which cap forms the casing of the two-way cone-cock *c*.

n is a third port in the casing-cover *b*. The passage *d* in the cone-cock *c* can, by moving

the handle *g*, be brought into communication with any one of the ports *l*, *m*, and *n*. The two pipes *j* and *k*, of different height, with their ports *l* and *m*, allow only such portion
5 of the liquid to be withdrawn from the cylinder (and thereby measured) as is contained in either of the spaces between the upper ends of the pipes *j* or *k* and the top of the cylinder, while the port *n* allows of the whole of the
10 contents of the cylinder being withdrawn, and thereby measured.

o and *p* are the passages in the cone-cock *c*, set apart the same distance as the ports *l* and *m*, and communicating with the latter when
15 the cylinder is being filled, for the purpose of insuring the liquid filling the tubes *j* and *k*.

q is the reduced upward extension or rod of the cone-cock *c*, and *r* is the one-way cone-cock in the top cylinder-cover *s*, forming the
20 casing of the said cone-cock, *a'* representing the way or passage formed therein, which is always in communication with the interior of the cylinder *a*.

t is a notch or groove in the cone-cock *r*, in
25 which the upper end of the rod *q* engages, whereby the cone-cock *r* is caused to rotate with the lower cone-cock, *c*.

u is the pipe extending from the casing *s*, and forming a connection with the air-space
30 in the barrel or vessel containing the liquid to be measured.

v, *w*, and *x* are the air-holes in the casing *s* of the cone-cock *r*, made at distances apart corresponding to the ports *l*, *m*, and *n* in the
35 casing *b* of the lower cone-cock, *c*.

y is the upward extension of the cone-cock *r*, which extension can be adapted to actuate an indicator or counter of suitable construction. (Not shown in the drawings.)
40

z is the cover of the casing *s*, and *b'* is a spring for keeping the cocks *r* and *c* in position, and at the same time allowing them a certain amount of ease in action.

c' is a ball-valve, which I sometimes find it
45 advantageous to apply to the pipe *u*, as shown in the drawings, (or in any other suitable position,) the ball being of material of a less specific gravity than the liquid to be measured, so that as the said liquid enters the pipe
50 *u*, when the cylinder *a* has become full, the ball will float and close the pipe, and thereby prevent the liquid rising therein.

d' *d'* are stops for limiting the movement of the handle *g*.

55 The operation of the tap is as follows: The tap in its normal condition (that is to say, when it is in the position shown in Fig. 2) is closed, in which position the passage or way *e* in the lower two-way cone-cock, *c*, is in direct communication with the lower connection, *i*, from
60 the barrel or other vessel containing the supply of liquid to be measured, and the cylinder or chamber *a* will be filled from the said barrel or other vessel, the passage *d* being
65 closed. The passage *a'* in the top cone-cock, *r*, is now in communication with the pipe *u*, forming the upper connection of the barrel,

the air which was in the cylinder *a* being forced up this pipe by the liquid as it enters the cylinder. When the valve *c'* is used, the liquid in
70 rising will float the ball thereof, so as to close the valve and prevent the liquid rising any higher in the pipe *u*. To open the tap, in order to draw off a measured quantity—say, for example, the smallest measured quantity of
75 the liquid—the handle *g* is moved from the position shown in Fig. 2 to that shown in Figs. 1 and 3—that is to say, it is brought opposite the first division on the plate *h*. As the handle
80 *g* is moved into the said position, both the connections *i* and *u* from the barrel will be first simultaneously cut off as the passages *e* and *a'* will be brought against the faces of the casings *b* and *s*, and then the outlet-passage *d* in
85 the lower cone-cock, *c*, (which passage is connected to the hollow spout *f*,) will be brought in communication with the first port, *l*, in the casing *b*, the said port being connected to the longest pipe, *j*, in the cylinder *a* at the same
90 time the passage *a'* in the top cone-cock, *r*, will be brought in communication with the first opening, *v*, in the casing *s*. The liquid now being in connection with the spout *f* on the lower cone-cock, *c*, and also with the outer air
95 through the top cone-cock, *r*, it will run out of the cylinder *a* until the liquid comes to the level of the top of the first pipe, *j*, and the required measured quantity of liquid will in this manner have been drawn off. The handle *g* is then
100 moved back, so as to bring the cocks *c* and *r* into their former position, as shown in Fig. 2, and the cylinder *a* will again become full. If it be now required to draw off the next largest measured quantity of liquid, the handle must
105 be moved opposite the second division on the plate *h*, when the passage *d* will be brought in communication with the port *m* and pipe *k*, and the passage *a'* will be opposite the second air-opening, *w*, in the casing *s*, and the liquid
110 will run out of the cylinder until it reaches the level of the top of the pipe *k*. It will be obvious that the cylinder being full, if the handle *g* be moved from the position shown in Fig. 2 to the third division on the plate *h*, the whole
115 of the contents of the cylinder will be drawn off. It will thus be obvious that according to the size of the cylinder *a*, the number of pipes and the various lengths of the same, any varying quantities may be drawn from one measure. It will also be obvious that the said pipes
120 can be made telescopic, so as to allow of their being adjusted according to the quantity of liquid to be drawn off.

I have not shown in the drawings an indicator or counter applied to my improved tap,
125 as it will be obvious that this may be of any suitable construction, and it will be easily understood without further description in what manner the said indicator or counter can be operated by the tap. Further, the said indicator or counter would not always be required,
130 and in such cases I dispense with its use.

Having now particularly described and ascertained the nature of my said invention and

in what manner the same is to be performed,
I declare that what I claim is—

1. In a tap for measuring the quantity of
liquid passed through it, the combination, with
5 a cylinder or vessel of known capacity pro-
vided with internal pipes of known suitable
heights, of two cocks connected to each other,
so as to operate in unison, and inclosed by cas-
ings provided with ports or openings, whereby
10 when the liquid-outlet is opened external air
is simultaneously admitted to the interior of
said cylinder or vessel, substantially as set
forth.

2. The cylinder or vessel provided with in-
15 ternal pipes of suitable heights, combined with

two cocks connected to each other, so as to op-
erate in unison, and provided with ports, a
liquid-supply, and pipe-connections, one of
which communicates at the bottom and the
other at the top with said liquid-supply and 20
register with the ports in said cocks, whereby
when the liquid is not being drawn from the
tap said cylinder or vessel is in communica-
tion at bottom with the liquid in the source of
supply and at the top with the air-space of 25
said supply, substantially as set forth.

GEORGE HENRY SMITH.

Witnesses:

F. W. PRICE,

G. J. REDFERN.