

G. F. STARKWEATHER.

CENTER SEAL FOR GAS WORKS.

No. 344,060.

Patented June 22, 1886.

Fig. 1.

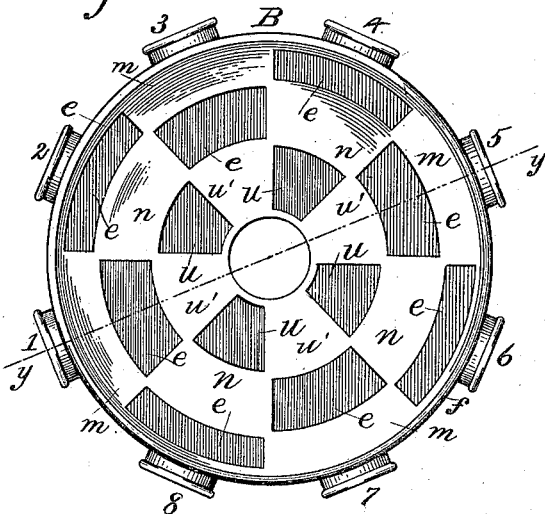


Fig. 2.

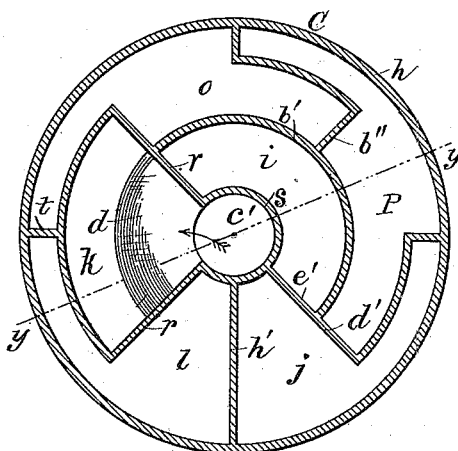


Fig. 3.

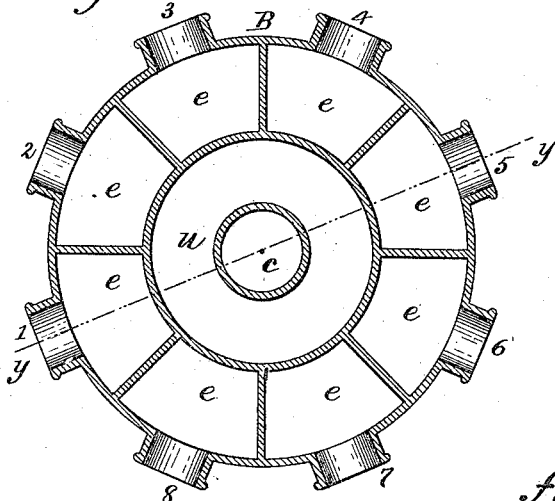


Fig. 4.

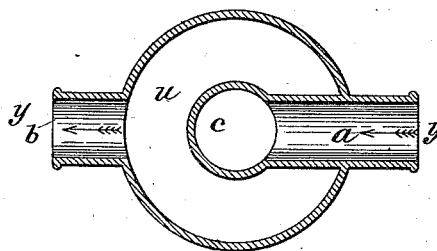
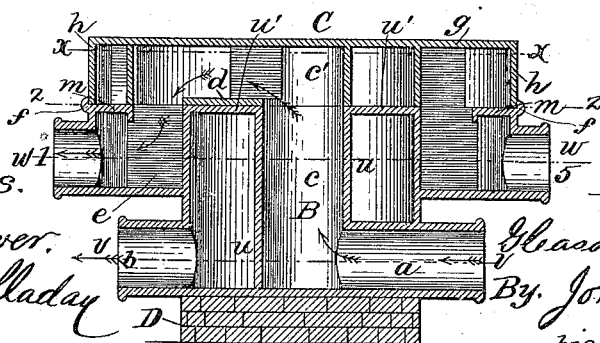


Fig. 5.



Witnesses.

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Arthur Holladay

Inventor.

Gleason F. Starkweather

By John Lane.

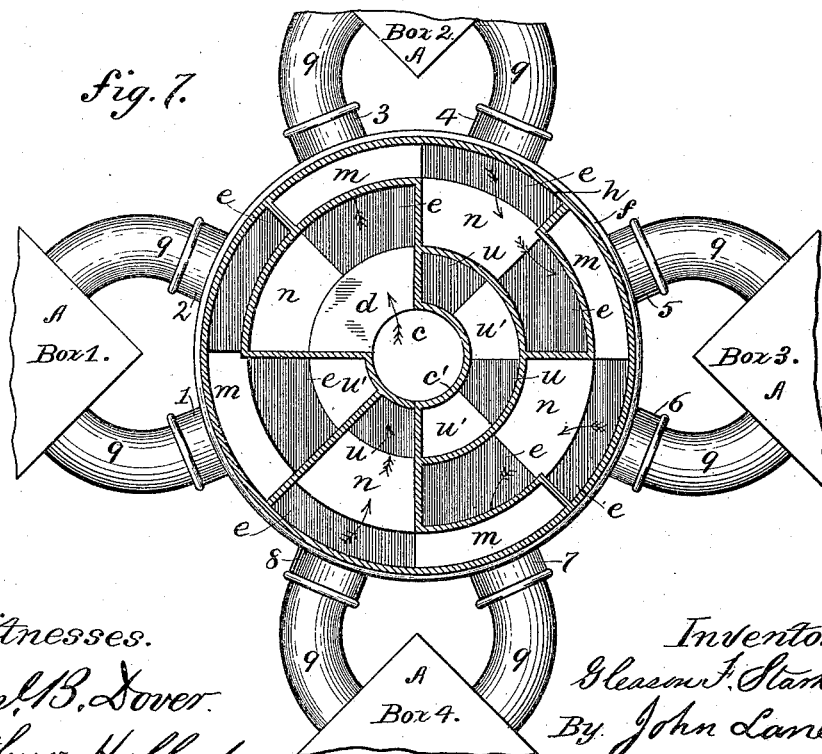
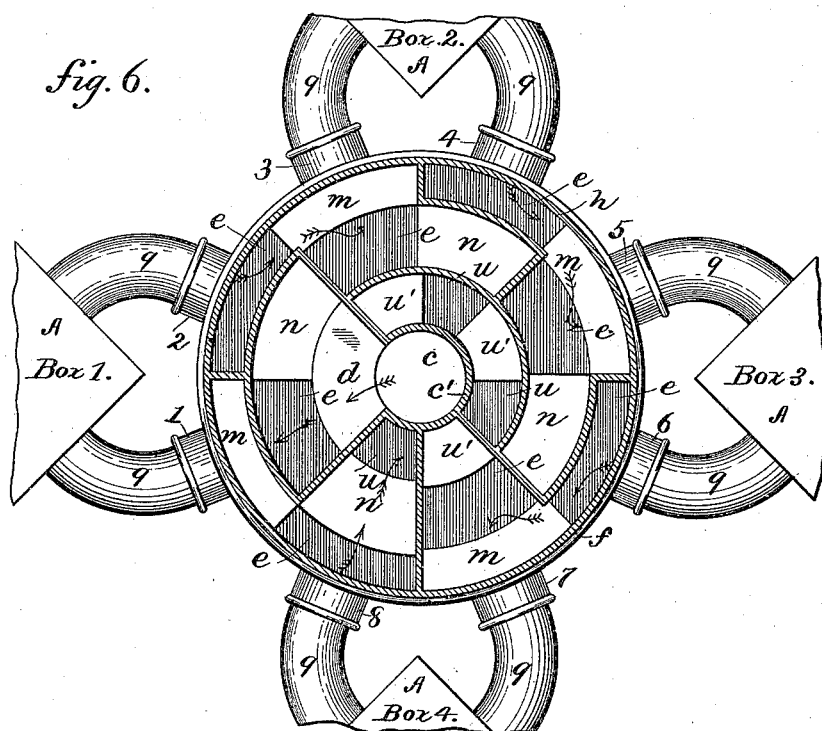
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# UNITED STATES PATENT OFFICE.

GLEASON F. STARKWEATHER, OF EVANSTON, ASSIGNOR TO NATHANIEL S. BOUTON, OF CHICAGO, ILLINOIS.

## CENTER SEAL FOR GAS-WORKS.

SPECIFICATION forming part of Letters Patent No. 344,060, dated June 22, 1886.

Application filed October 2, 1885. Serial No. 178,819. (No model.)

*To all whom it may concern:*

Be it known that I, GLEASON F. STARKWEATHER, a citizen of the United States, residing at Evanston, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Center Seals for Gas-Works, of which the following is a specification.

This invention relates to the center valve or center seal used in connecting the several boxes of an apparatus for purifying gas, and has the object of such a construction as to be able to shut off a box at pleasure for the purpose of being cleaned, and then after being cleaned again connected without disturbing the flow of gas through the other boxes.

Heretofore the center seal in general use has been so constructed as to shut off one box of the four, which, when cleaned and refilled with purifying matter, would remain idle until another box needed to be cleaned, when by turning the valve another step the cleaned box would be connected and at the same movement another box shut off, thus a box shut off and one turned on at every movement of the valve, and so on around to all the boxes. In my improvements the valve in being rotated shuts off a box at one movement and connects it again at the next movement, and so on around to all the boxes, by which a box need remain idle only for the purpose and time of being cleaned.

The invention consists, first, in making the center seal in two parts, the under part or seat, provided with a central chamber connected with the supply-pipe, an intermediate chamber outside of and around the central chamber, connected with the distributing-pipe, and a series of chambers outside of and around the intermediate chamber, each provided with a short pipe or thimble for connecting with the purifying-boxes; the upper part or valve, provided with a central chamber, open at one side, connected with an intermediate chamber partially floored over, a second intermediate chamber, and with four outer chambers; and, second, in certain other improved construction and arrangement of parts, which will first be set forth and described in the specification and afterward pointed out in the claims.

Referring to the drawings, like letters refer to like parts in all the figures, in which, Fig-

ure 1 is a top or plan view of the under section part or seat of my improved center seal, taken on the dotted line *z z* in Fig. 5, and showing how the several chambers are partially covered. Fig. 2 is a top or plan view of the upper section part or valve with its top plate removed, taken on the dotted lines *x x* in Fig. 5, showing its construction and how partitioned off. Fig. 3 is a cross-section plan view of the under section part or seat, taken on the dotted lines *w w* in Fig. 5, showing construction, how partitioned off, the several chambers, and how the thimbles are made with the outer chambers. Fig. 4 is a cross-section plan view of the under section part or seat, taken on the dotted lines *v v* in Fig. 5, showing the central chamber connected with the supply-pipe, and the intermediate chamber connected with the distributing-pipe. Fig. 5 is a vertical central section of my improved center seal, taken on the dotted lines *y y* of Figs. 1 and 2, also of Figs. 3 and 4. Fig. 6 is the same view as Fig. 2, with the seat added below the valve, showing both the seat and valve, showing the relative position of the valve with the seat when all the purifying-boxes are connected, and showing by the arrows how the flow of gas will travel from the central chamber, *c*, around until it finally enters at *u*, when it may pass out the distributing-pipe below. Fig. 7 is a like view as Fig. 6, with the valve rotated one-eighth part of a revolution, showing how the partitions have moved, and showing how the box 1 is shut off and the flow of gas changed in its travel.

My improved center seal is constructed in two parts, the under section part or seat, B, and the upper section part or valve, C.

The seat B may be preferably constructed of cast-iron, in one piece, having a series of chambers connected only by means of the valve seated thereon, a central cylindrical chamber, *c*, extending from the bottom to the top, with its top end open and its bottom end closed, and having the inlet or supply pipe *a* connected near its bottom end, as shown in Fig. 5. Around this chamber *c* is an intermediate cylindrical chamber, *u*, having its bottom end closed and its top end covered in part by one-eighth sectional covers *u'*, placed alternate, a cover, *u'*, and an opening, *u*, as shown in Fig. 1, and having the outflowing or

distributing pipe *b* connected near its bottom end, as shown in Fig. 5. Outside of this intermediate chamber is a series of chambers, preferably eight in number, arranged in the order forming a cylindrical part divided and partitioned off into eight chambers, *e*, as shown in Fig. 3, and each provided with one of the pipes or thimbles, which I have marked and numbered 1, 2, 3, 4, 5, 6, 7, and 8. All of said chambers *e* have a closed bottom end and a top end closed only in part, as follows: Each alternate chamber *e* is covered on its outer part by the cover *m*, and the other alternate chamber *e* covered on its inner part by the cover *n*, as shown in Fig. 1, and it will be observed that the outer covers, *m*, are opposite to the covers *n* on the intermediate chamber, as shown also in Fig. 1. The said seat may be erected upon a foundation of masonry, *D*, which may form a tank for catching drip, and a drip-pipe connected therewith in any usual manner.

A A A A represent four purifying-boxes, which may be arranged in the usual order at the four quarters, and each of said boxes connected to the seat *B* by two pipes, 9, one pipe to lead the gas from one chamber *e* to the box *A*, the other pipe to lead the gas to the adjoining chamber *e*, as shown in Figs. 6 and 7. Around the top and outer edge of the seat *B* is a flange, *f*, for steadying and holding the valve in its position, as will be understood by inspecting Fig. 5.

Hereinafter, when speaking of the chambers *e*, I will designate each chamber by connecting the thimble therewith as "thimble 1, chamber *e*," "thimble 2, chamber *e*," and so on to all the several chambers.

*C* represents the valve or upper section part, composed of the rim *h* and cover *g*, with partitions forming the central chamber, *c*, the two intermediate chambers, *i* and *k*, and the outer chambers, *o*, *p*, *j*, and *l*, each of the peculiar form shown, the said central chamber, *c*, corresponding in size with the central chamber in the seat, and opens at one side or quarter into the chamber *k*, formed by the partition *r*, leading outward from the central partition, *s*, at right angle with each other to within a short distance back from the rim *h*. Thence they turn toward each other and join. Thence a partition, *t*, extends single to the rim *h*, as shown. The inner part of said chamber *k* is provided with a floor, *d*, to cover the openings into the intermediate chamber *u* in the seat *B*, and to lead and permit the gas to flow from the central chamber, *c*, to the outer part of the chamber *k*; and *b'* represents a partition semicircular in form, with one leg joined to the partition *r*, forming the intermediate chamber *i*. From the center of the partition *b'* the partition *b''* leads outward to within a short distance back from the rim *h*, thence turning and leading parallel with the rim one-eighth of the circle, thence turning and joined to the rim, forming a grasshopper-leg-like partition; and *d'* represents a like

partition to the last named at one-quarter around the valve, with an extension joining to the central partition, *s*, and midway between partition *d'* and partition *r* is a straight partition, *h'*, from the central partition, *s*, to the rim *h*, as shown.

It will be observed that the form or shape of the chambers in the valve are peculiar; that the two chambers *l* and *j* are alike, only one is the reverse of the other, being one-eighth part of the circle, with extensions in opposite directions; that the chambers *o* and *p* are alike, with a main part having extensions each side, and that the chamber *k* is fan-shaped, all of suitable shape and form to lead and direct the flow of gas about the valve and seat, as will be hereinafter shown.

In operation, with the machine set for the gas to flow into all the four boxes *A*, as shown in Fig. 6, the gas will enter the supply-pipe *a* and follow the direction of the arrows, first into the chamber *c*, up into chamber *c'*, thence over the floor *d* in chamber *k* into thimble 1, chamber *e*, thence into box 1<sup>A</sup>, and returning through thimble 2, chamber *e*, thence up and over into thimble 3, chamber *e*, thence into box 2<sup>A</sup>, thence returning through thimble 4, chamber *e*, thence up and over into thimble 5, chamber *e*, thence into box 3<sup>A</sup>, thence returning through thimble 6, chamber *e*, thence up and over into thimble 7, chamber *e*, thence into box 4<sup>A</sup>, thence returning through thimble 8, chamber *e*, thence up and over the cover *n*, and down into the intermediate chamber *u*, from which it may pass out through the pipe *b*. When desired to shut off a box, the valve *C* is rotated one-eighth part of a revolution and stopped in the position shown in Fig. 7, when the flow of gas is the same as before, except instead of entering from the chamber *k* into the thimble 1, chamber *e*, it will now enter thimble 3, chamber *e*, and no gas can flow into box 1<sup>A</sup>, when the said box 1<sup>A</sup> may be cleaned and refilled with purifying matter, after which the valve is again turned one-eighth part, as before, bringing all the chambers into the same relative position as at first, and shown in Fig. 6, except that the valve has been turned one-quarter around, and the gas will now first enter box 2<sup>A</sup> and last enter box 1<sup>A</sup> of the series, and so on step by step of a one-eighth turn of the valve at a time stops off a box, and then puts it on again alternate, one box after another, in rotation, the first order being 1 2 3 4, then 2 3 4, then 2 3 4 1, then 3 4 1, then 3 4 1 2, then 4 1 2 3, then 1 2 3, then, completing the circuit, to 1 2 3 4, as at first, and which orders may be continued indefinitely.

It will be observed by inspecting Figs. 2 and 6 and noticing the arrows that each and all the chambers in the valve have a purpose, as chamber *k* is the supplying-chamber, the three chambers *o*, *p*, and *j* directing-chambers, and the chamber *l* the returning-chamber in guiding the flow of gas about the seat.

The valve *C* may be rotated by any usual

means. I preferably provide it with a cogged segment geared into a pinion operated by a crank, (not shown,) and stop marks, figures, or letters may be used around the outside of the rim and seat, (not shown,) to indicate the positions, and also a spring-dog, with stopping-places in seats, (not shown,) may be used to stop and hold the valve in a correct position, all of which will readily be understood.

10 Having thus set forth my invention, I claim—

1. In a center seal for gas-works, the combination of the central chamber, *c*, having the inflow or supply pipe connected therewith, with the intermediate chamber outside of the said central chamber, provided with covers covering each alternate one-eighth part of its top end, and having the outflow or distributing pipe connected thereto, substantially as and for the purpose set forth.

20 2. In the seat of a center seal for gas-works, the series of eight chambers *e*, arranged in a circle, each provided with a thimble for connecting with the purifying-boxes, and with covers covering in part only their top ends, substantially as and for the purpose set forth.

25 3. In a center seal for gas-works, the seat provided with the series of eight outer chambers *e*, arranged in a circle, each alternate chamber provided with a cover upon the outer part of its top end, and the other each alternate chamber provided with a cover upon the

inner part of its top end, substantially as and for the purpose set forth.

4. In a center seal for gas-works, the combination of the seat B, provided with a central chamber connected with the inflow or supply pipe, an intermediate chamber connected with the outflow or distributing pipe, a series of eight chambers provided with means for connecting with a series of purifying-boxes, with the valve seated upon the top of the said seat, and provided with partitions and chambers for directing the flow of the gas, substantially as and for the purpose set forth.

5. In a center seal for gas-works, the valve C, divided by partitions, and provided with the supplying-chamber provided with a floor over its inner part and connected with the central chamber, the three directing-chambers, and the returning-chamber, constructed and arranged substantially as and for the purpose set forth.

6. In a center seal for gas-works, the valve C, provided with a central chamber, two intermediate chambers, and four outer chambers, constructed, arranged, and adapted to operate substantially as and for the purpose set forth.

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Witnesses:

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FRANK M. WILSON.