

(No Model.)

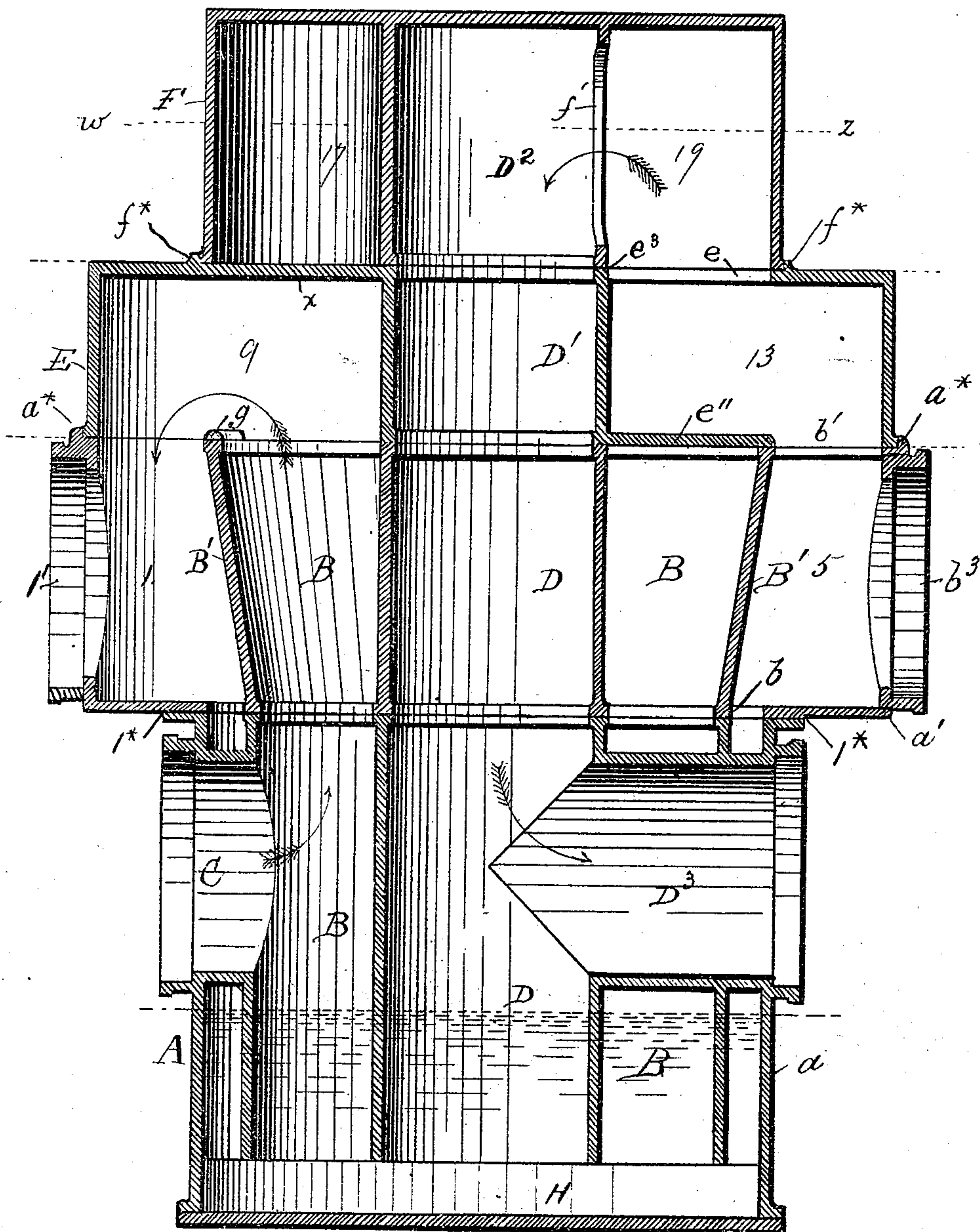
3 Sheets—Sheet 1.

K. M. MITCHELL.
CENTER SEAL.

No. 501,572.

Patented July 18, 1893.

Fig. 1



WITNESSES

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(No Model.)

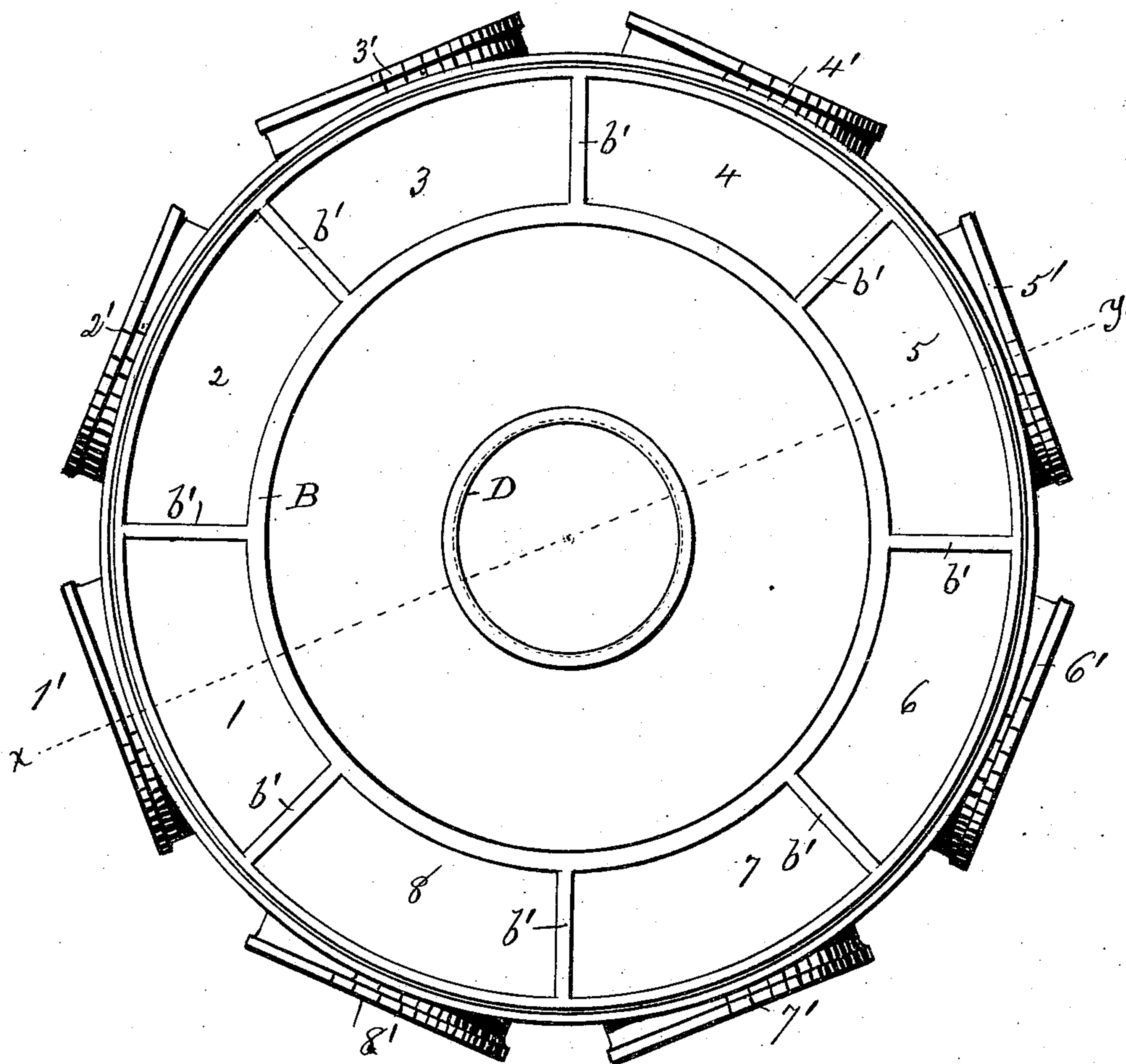
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Fig. 2



WITNESSES

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Fig. 3.

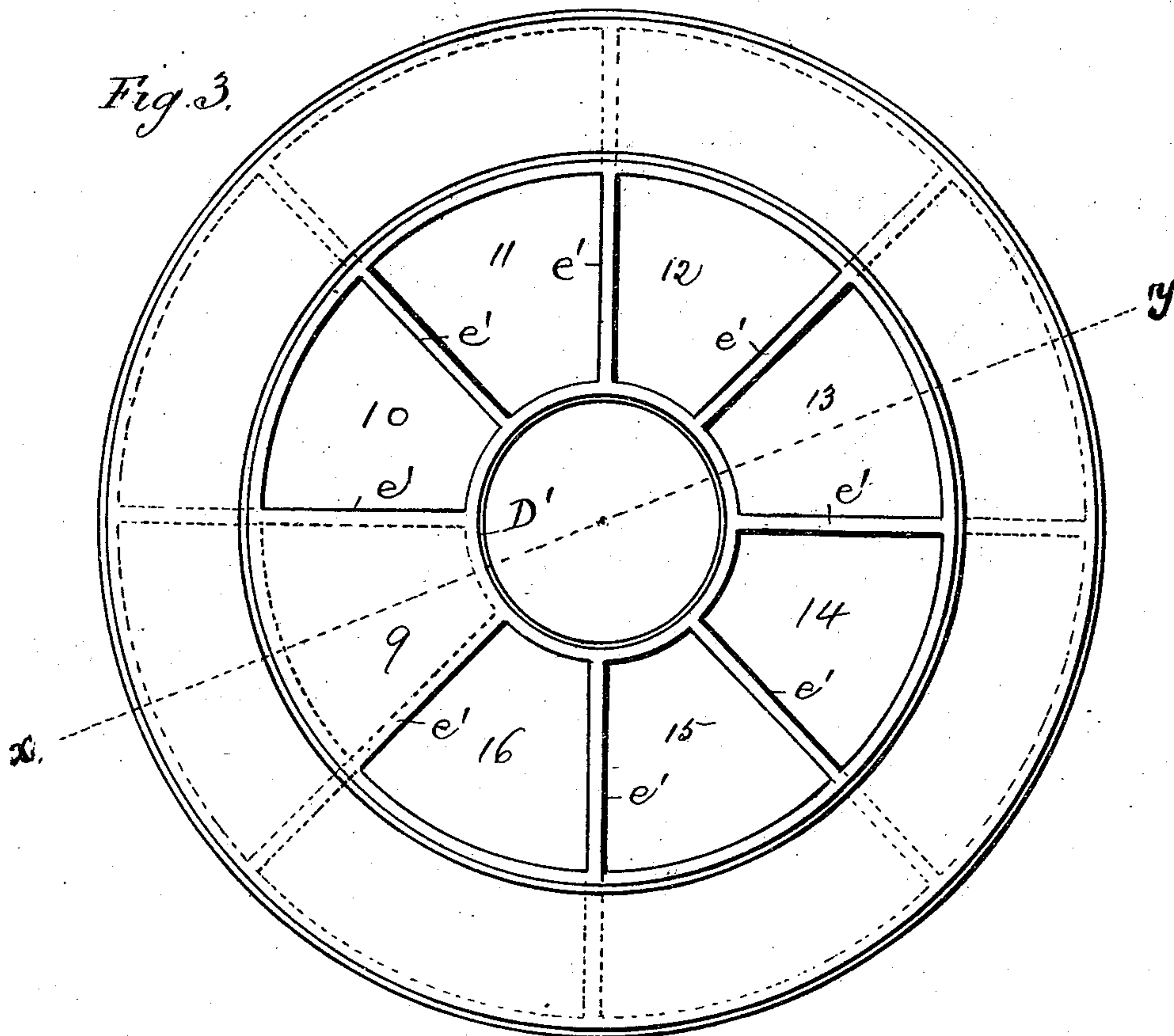
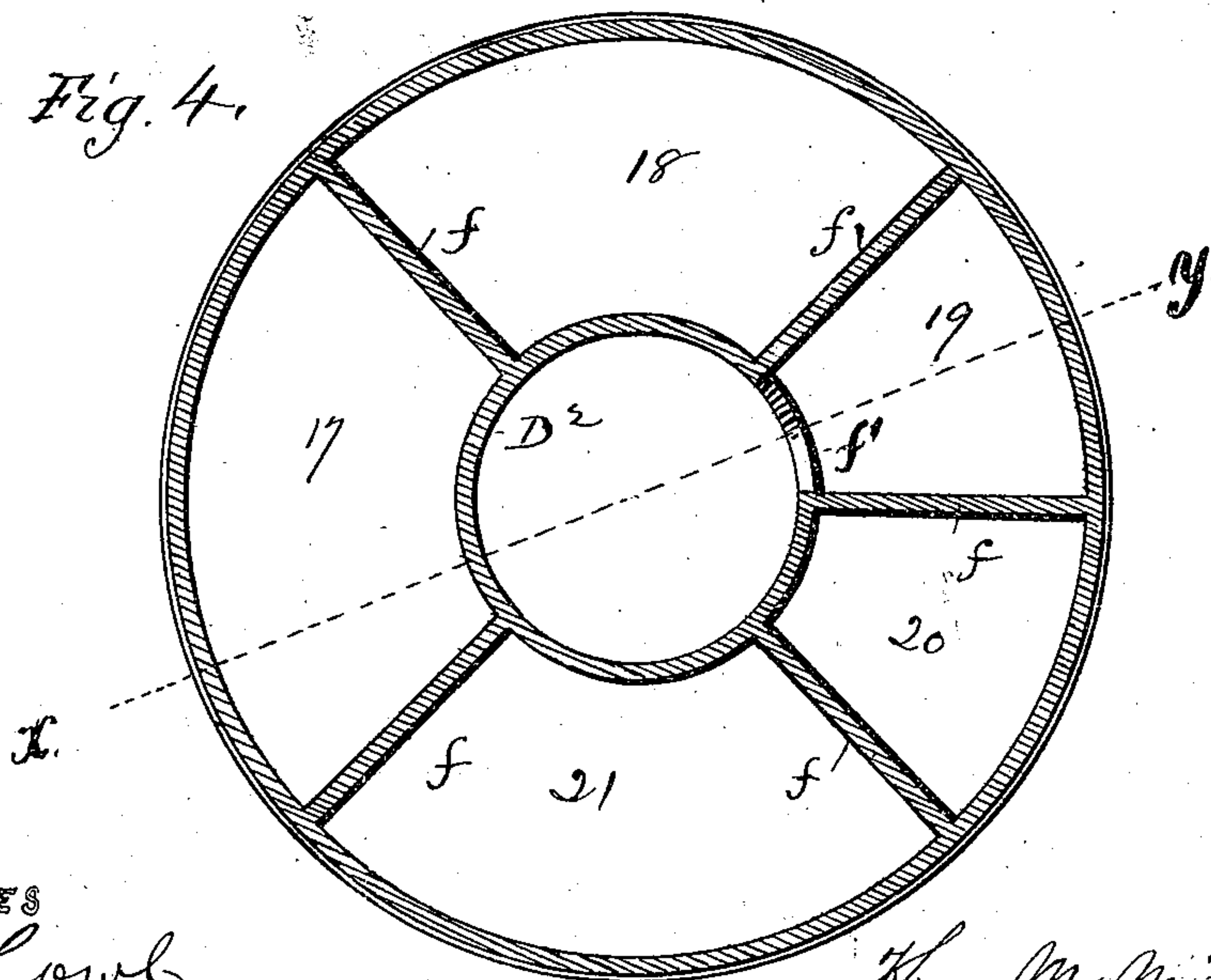


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CENTER-SEAL.

SPECIFICATION forming part of Letters Patent No. 501,572, dated July 18, 1893.

Application filed February 15, 1893. Serial No. 462,518. (No model.)

To all whom it may concern:

Be it known that I, KERR M. MITCHELL, of the city of St. Joseph, in the county of Buchanan and State of Missouri, have invented certain new and useful Improvements in Center-Seals; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters and figures of reference marked thereon, which form a part of this specification.

My improvement relates to a class of devices known as "center seals," and employed in the manufacture of gas, in conjunction with a certain number of purifying boxes to conduct gas in process of purification into and out of said purifying boxes.

The object of my invention is to supply a center seal which shall be simple and strong in construction, and which, by increasing the area of the inlet and outlet gas passages, enables me to decrease the height of said structure, and to reduce the diameter of the upper valve cover, or turret, thus materially cheapening the cost of said center seal, and rendering the same stronger and more compact.

My invention consists in various parts, and details, and combinations of the same, as will be fully described hereinafter, and set forth in the claims.

Reference is to be had to the accompanying drawings, forming a part of the specification, in which similar letters or numbers of reference indicate corresponding parts in all the figures.

In the drawings, Figure 1. is a sectional elevation of a center seal, along the line X—Y of Figs. 2, 3 and 4, embodying my improvements, showing the location and arrangement of the inlet and outlet pipes; of the inlet and outlet chambers, with the various discharge and receiving pipes opening therein, and leading therefrom to the usual cleaning boxes; and also of the rotatable and adjustable double turret, superposed upon the body of the center seal, as hereinafter described. Fig. 2. is a top plan view of my invention, having the superposed turrets removed, and showing in plan the radial partitions or ribs hereinafter described, between the outer periphery

of the receiving chamber, and the inner periphery of the shell or casing of said structure, and extending from the top of the receiving chamber to the base thereof. Fig. 3. is a top plan view of the lower rotatable turret or valve, with the upper or smaller turret removed; also showing in plan the radial partitions, or ribs, dividing said turret into separate chambers or cells corresponding to the radial chambers shown in Fig. 2. Fig. 4. is a sectional plan view of the upper rotatable turret or cap, through line W—Z of Fig. 1, and showing the upper end of the central outlet chamber; the radial partitions, or ribs dividing said turret or cap into separate radial chambers, extending from the outer periphery of said outlet chamber to the outer shell of said turret; and the outlet opening from said turret or cap into the outlet chamber.

In the drawings A. is the shell or case of a center seal. It is cylindrical in form; open at top and bottom and is seated in any proper manner, upon any proper base. Said shell or casing A. is composed of two sections,—a lower section *a*. and an upper section *a'*. The upper section *a'* is of greater diameter than the lower section *a*., and projects beyond it on every side. The junction of said two sections is at the point *l**. (Fig. 1.) and said shell extend upward to the point *a**., where said seal or tank proper is joined by the turrets or valves hereinafter described. Inside of said shell or case, and concentrically thereto is provided a cylindrical annular receiving chamber B, likewise open at top and bottom except as hereinafter described. The sides of the upper portion B' of said receiving chamber, are inclined outward at the point *b*. from the vertical line of the lower part of said chamber, so that said upper portion is bell or funnel shaped, and hence of greater relative capacity than the lower, or vertical part of said receiving chamber B. The upper end of said receiving chamber B. is flush with the top of said shell or casing A. C. is an inlet pipe let into the lower part of said receiving chamber B, passing through an opening in the shell A., for that purpose provided. Said pipe C, is provided for the admission of unpurified gas into and through said receiving chamber B. By this arrangement it will be seen that a space is left between the inner

side of the cylindrical shell A, and the outer side of the receiving chamber B. This space is divided vertically from the bottom to the top of said shell or casing A. and receiving chamber B. by eight radial ribs or partitions *b'* (Fig. 2,) into eight separate radial cells 1. 2. 3. 4. 5. 6. 7. and 8.—each of said cells extending from the top to the bottom of said shell, for the purpose of allowing the precipitation and separation from the gas, of condensed liquid, which may be drawn off from said tank or shell by any proper means. Into the upper and outer surface of each of said cells 1 to 8. inclusive, are let pipes 1'. 2'. 3'. 4'. 5'. 6'. 7'. and 8'. of proper relative capacity, for the purpose of providing ingress and egress through said cells 1 to 8 inclusive, of gas in process of purification, as hereinafter described.

D. is a central cylindrical outlet chamber through which purified gas is finally discharged from said center seal, or tank, through an outlet pipe D³. connecting with said outlet chamber D., through openings for that purpose provided in the wall of the shell of said tank, and the annular inlet chamber B. The cylindrical outlet chamber D. is continued upward through the center of said structure as shown at D' and D², through the center of the valves or turrets hereinafter described, by means of corresponding central cylindrical chambers therein (see Fig. 1.) to the top cover thereof, which closes the top of said outlet chamber; and both said outlet chamber D and pipe D³, are proportioned in diameter to the capacity of said receiving chamber B.

E. is a rotatable turret, or valve having the same diameter as the upper section A'. of the shell A. Said turret or valve E. is superposed on and rests upon said shell: being kept from shifting out of position by an annular rib *a**: and the contact surfaces of the bottom edges E with the shell A. are made with a ground gas-tight joint, and the turret may be rotated on the shell by means that are in common use and form no part of this invention. The center of said valve or turret E. consists of a cylindrical chamber serving as the extension of the outlet chamber D. heretofore described, integral with and rotating with said valve E. (See Fig. 1.) Said valve or turret E. is provided with eight radial ribs or partitions *e'* all extending from the outer surface of said central outlet chamber D. (instead of from any intermediate point), to the inner surface of the shell of said valve or turret, and from the top to the bottom of said valve, dividing said valve into eight separate radial chambers or cells, 9. 10. 11. 12. 13. 14. 15. and 16. corresponding to the cells 1 to 8 inclusive in Fig. 2. Seven of said radial chambers or cells, to-wit 10 to 16 inclusive, are provided with a partial floor or bottom *e''* fixedly attached to, and extending from the outer surface of the central opening D' to the upper portion B'. of the receiving

chamber B, and fitting closely over and covering the top of said receiving chamber B. One of said radial chambers or cells (namely 9.) is open at the bottom and adapted for the passage of gas from said receiving chamber B. through said cell 9. as hereinafter described. The top of said radial chamber or cell 9. is entirely closed (as seen at *x*), and as said cell is open at its bottom only as before described, it follows that when gas passes up into said chamber 9. from the receiving chamber B, it encounters the closed top of said chamber 9. and is deflected downward over the rim B' of said receiving chamber B, and passes out through one of the pipes 1' to 8'. inclusive, (depending upon the position of said chamber 9. with reference thereto) to a purifying box. At the bottom of this cell 9. is a rim or rib *g*, top-arched or semi-circular in its cross-section. This rib simply extends from one radial partition to the other, fitting over the top of the receiving chamber B., and prevents the accumulation of dust or other deposit.

It will be perceived that the valve or turret E. being rotatable, and carrying with it in such rotation the floor *e''* closing and covering the annular receiving chamber B. except that portion thereof directly under the covered cell 9. of the valve E. Said valve or turret may, at will, be rotated so as to bring said chamber 9. over any one of the cells 1 to 8 inclusive, thus causing gas from said receiving chamber B. to pass down through such cell so uncovered and out through its corresponding pipes. With the exception of cell or chamber 9. above described, which is entirely closed at the top, the said valve or turret E. is covered to and including its annular rib *a**. within which as above stated is a circular ground gas-tight joint or seat for the upper valve F. hereinafter described and which is superposed on said valve or turret E.

F. is a rotatable cylindrical valve or turret entirely closed at the top, and open at the bottom. Said valve is of less diameter than the valve E, upon which it is superposed, but of equal diameter with the top of the bell-shaped or conical portion B' of chamber B. and it rests at its bottom outer rim within a rib *f**. on valve E. with ground joints similar to those at *a**. Said valve F. may be rotated with, or independently of, the valve E, and in any direction. The center of said valve F. is occupied by a cylindrical outlet chamber, being practically an extension of the outlet chamber D. D'. but integral and rotatable with valve F. The bottom rim of this central chamber is constructed to fit gas tight, on the top of the portion of said outlet chamber D', included in valve E. by means of the ground joint, and to rotate thereon in any direction. (See Fig. 1.) Said valve or turret F. is provided with five radial ribs or partitions *f*. extending from the periphery of said central chamber D². outward to the shell or casing of said valve, and from the bottom to the top of

said valve; dividing said valve into five radial chambers or cells, 17. 18. 19. 20. and 21. open at bottom and closed at the top. Of these chambers or cells 17 18 and 21., are each proportionately as large as two of the series of cells 9 to 16 in valve E, immediately below them, and into which they open, so that when placed in position on valve E. in such manner that cells or chambers 9 and 10.—for an example—shall be immediately under chamber 17 of valve F. The radial rib or partition *e'* dividing said cells 9 and 10, will bisect the bottom of said cell 17. into two equal parts, each relatively as large as the cell beneath it, one of which parts will be hermetically closed at the bottom thereof by the cover *x.* of said cell 9. (see Fig. 1.), and the other half will open by its bottom into chamber or cell 10. directly below it. In this position cell 18, would cover cells 11 and 12 of valve E.; cell 21 of valve F. would cover cells 15 and 16 of valve E.; cell 20 would cover cell 14 of valve E.; and cell 19. would cover cell 13 of valve E. From the cell or chamber 19. of valve F. an outlet gas passage *f'* (see Fig. 4.) is provided for the escape of purified gas from said valve or turret F. into the central outlet chamber *D*². *D'*. *D.* down which it passes, and leaves said seal or tank through the outlet pipe *D*³.

The pipes 1' to 8' inclusive, leading from the cells or chambers 1. to 8. inclusive (see Fig. 2.) connect in pairs with purifying boxes, such as are commonly used in the manufacture of gas. Thus pipe 1'. will lead gas from said cell or chamber 1. into a purifying box, and pipe 2' will bring back said gas after passing through such purifying box into cell or chamber 2, &c.

By means of the double rotatable valves E. and F., operating together or independently of each other, I am enabled to use four purifying boxes at one time or only one; or if desired I am enabled to shut or cut out any one or more of said boxes from connection with said center seal.

It will be understood that the bottom of the seal is open: and that any suitable cock located as may be convenient in the base H. will admit water to a proper height below the outlet pipe *D*³, and into which water impurities and liquid properties of the gas are precipitated in the course of purification. The means for rotating the valves, being well known, need not be described.

The mode for operating my invention is as follows: In case it be desired to use but one purifying box, No. 1. of the series the valve E. is so placed that the cell 9. of valve E. shall be directly over the chamber 1. of the circular shell A. The valve F. will then be rotated so that the cell 19. will be directly over chamber 10 of valve E. Unpurified gas will then enter said receiving chamber B through pipes C. and will pass up into chamber 9. through its open bottom, where it will encounter the closed top *x.* of said chamber; pass down over the

rim B'. of this receiving chamber into cell 1. of said shell, and out through the pipe 1'. to the purifying box. After passing through said box, the gas will return through pipe 2' (Fig. 2.) into chamber 2, of the shell A. and up into and through chamber 10 of the valve E. into chamber 19 of valve or turret F., and thence inwardly through the gas passage *f'*. into the central outlet chamber *D*². *D'*. *D.* down which it passes and is thence discharged through the pipe *D*³. In case it be desired to use four purifying boxes, the turret or valve F. is given a quarter turn to the left, so that cell 19 of said valve F. will be directly over cell 16 of valve or turret E. Gas will then pass into and through said closed cell 9. into cell 1. or shell A. and out through pipe 1'. to its purifying box, from which it will pass back through pipe 2' into cell or chamber 2. of shell A.; thence up and into and through chamber 10 of valve E. into cell 21 of valve F. whence it will pass down over the rib or partition *e'* into and through cell 11. of valve E., into cell 3. of shell A and out through pipe 3' into a purifier No. 2. From thence it will pass back through pipes 4' into cell 4. of shell A., &c., until cell 19 of valve F is reached, when it is discharged into the central outlet chamber as before. In case it be desired to cut out any one of the purifying boxes, for example No. 1. connecting with pipe 1' 2', the valve F. would be rotated a quarter turn to the left, bringing cell 19 over cell 14 of valve E, while valve E would be rotated, carrying with it valve F, a quarter turn to the right, so that the covered cell 9. will be directly over cell 3. of said shell A. By this arrangement cells 1. and 2., and their respective pipes 1'. and 2'. and boxes, will be cut out, and gas will pass out through cell 3., of said shell A, and follow its due course, discharging through cell 19 as before.

I do not claim as novel in itself alone, a center seal receiving unpurified gas into an outer concentric chamber and discharging the same purified, through an inner concentric chamber or pipe; nor do I claim as novel one or more superposed rotatable valves or turrets; nor the division of a part of each of such valves or turrets into radial cells or chambers by means of radial ribs or partitions, as I am aware that various center seals combining one or more of the above elements, are in common use.

What I do claim as novel and peculiar to my invention is as follows:

1. In a center-seal, the annular receiving chamber composed of an upper and of a lower section, the upper section being conical or funnel-shaped as set forth, and whereby it has a greater relative capacity than its lower or vertical part, as and for the purposes described.

2. In combination with the annular receiving chamber B, having an upper conical section B', and with the radial chambers or cells of the turret E, the partial floor or bottom *e''*.

secured to and extending from the central opening through the said cone B', all as set forth.

3. In combination with a center seal having a conical section B' at the upper part of its receiving chamber, the central outlet pipe D. D' D², the turret valve E provided with the series of ribs or radial partitions all starting from the periphery of said pipe, and the turret valve F. provided with the series of radial partitions f'. all starting from said pipe, all such pipes terminating in the outer walls respectively.

4. In combination with the annular receiving chamber having a funnel-shaped upper section, the valve E, the turret or valve F. provided with the described series of chambers or cells and with the discharge passage f'. serving for the escape of the purified gas from said turret F. into the central outlet chamber D. D'. D². all substantially as set forth.

5. In a center-seal, in combination, a circular shell or case open at both ends, constricted in two sections, the upper section thereof being greater in diameter than the lower section thereof, and projecting beyond it on all sides; an annular inlet chamber within said casing also open at both ends, and provided with an inlet pipe and composed of two sections, the upper section thereof being funnel-shaped as shown; radial ribs or partitions dividing the space between said annular chamber and the casing into radial chambers or cells, open at both ends, and divided into pairs, each pair being provided respectively with an outlet and inlet port: a concentric cylindrical outlet chamber within said inlet chamber, open at both ends, and provided with an outlet port D³: a double valve or turret superposed on said shell or casing, and comprising an upper and lower valve adapted to be rotated in unison or independently of each other, and in any direction: and a means for the passage of gas to and from said seal into a series of purifying boxes, substantially as described.

6. In a center-seal, the combination of the shell or casing A, open at both ends: the annular receiving chamber B. with its inlet port: radial ribs or partitions dividing the space between said casing and inlet chamber into radial cells or chambers open at both ends, said cells being divided into pairs, each pair being provided with an outlet and inlet port: a central cylindrical outlet chamber, with its outlet pipe D³: two turrets or valves superposed on said shell or casing, connected therewith and with each other by ground gas-tight joints, and rotatable in unison or separately: a continuation of the outlet chamber upward through both turrets or valves to the top thereof, each section of said outlet chamber being fitted to the section thereof immediately be-

low it by a gas-tight joint, and rotatable thereon, the lower part of said double valve or turret being divided by radial ribs or partitions extending from the periphery of said outlet chamber outward to the sides of said valve or turret, and dividing the same into radial cells or chambers corresponding in number to those contained in the shell A: a partial circular floor in valve E. at right angles to, and integral with the lower end of the section D' of the outlet chamber D. and extending outward to and covering all of the top of the receiving chamber B, except that portion thereof under one of said radial cells or chambers 9,—said cell or chamber 9. being closed at its top and sides, and adapted as a gas passage from said receiving chamber to purifying boxes; the upper valve or turret F. open at its bottom, and closed at its top, and being smaller in diameter than the valve E., and having the central tube D², said valve being divided into five radial cells or chambers by five radial ribs or partitions extending from the periphery of said outlet chamber D. outward to the sides of said valve; three of said radial chambers or cells being each relatively as large as two of the radial cells of the valve E., and one of said cells being provided with an outlet opening into the top of said central outlet chamber through which purified gas passes out of said seal, substantially as described.

7. In a center-seal, in combination, the shell A. with its lower and upper sections a. a'; its outlet and inlet ports; the annular receiving chamber B. and inlet port C. and funnel-shaped upper section B'; the radial ribs or partitions b', and cells or chambers 1. to 8. inclusive; the central cylindrical outlet chamber D. D'. D². with its outlet pipe D³: the rotatable valve or turret E, with central cylindrical chamber: the partial floor e'' fitting over the top of the receiving chamber B. integral and rotating with said valve E: the radial ribs or partitions e'. extending from said central chamber to the outer casing of said valve E. and dividing the same into eight radial cells or chambers 9. to 16 inclusive: the cell or chamber 9, closed at its top and sides, and open at its bottom over the vacant space in said floor e'', and adapted as a gas passage from the receiving chamber to purifying boxes: the rotatable valve or turret F, superposed on the valve E, with its central cylindrical outlet chamber; its radial ribs or partitions F: the radial cells or chambers 17 to 21 inclusive, and the gas outlet from cell or chamber 19. into the central outlet chamber, substantially as and for the purpose described.

In witness whereof I have hereunto set my hand this 8th day of February, 1893.

KERR M. MITCHELL.

Witnesses:

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M. I. HUMISTON.