

(No Model.)

2 Sheets—Sheet 1.

J. HEARNE.
CENTER SEAL.

No. 485,629.

Patented Nov. 8, 1892.

Fig 1

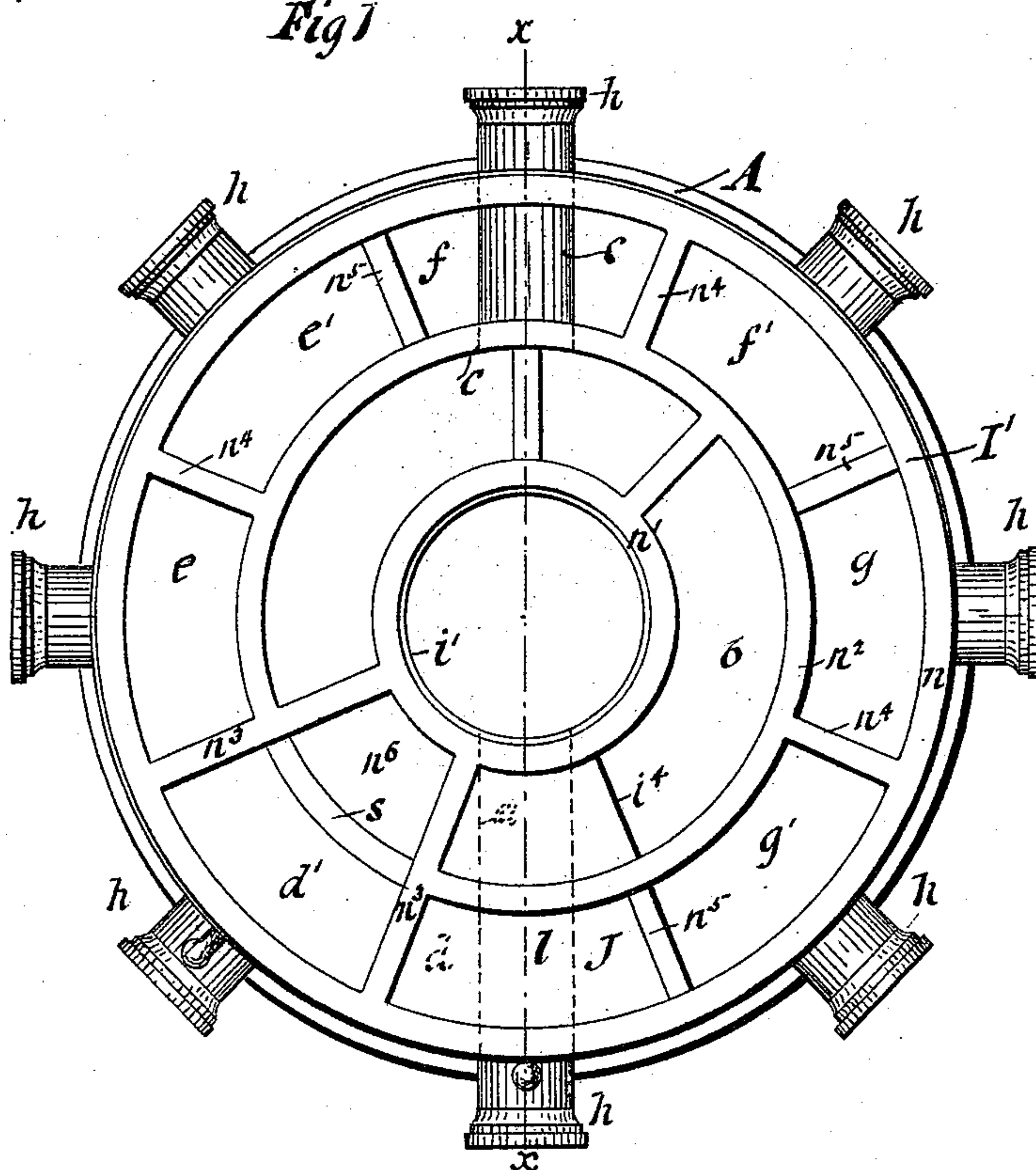
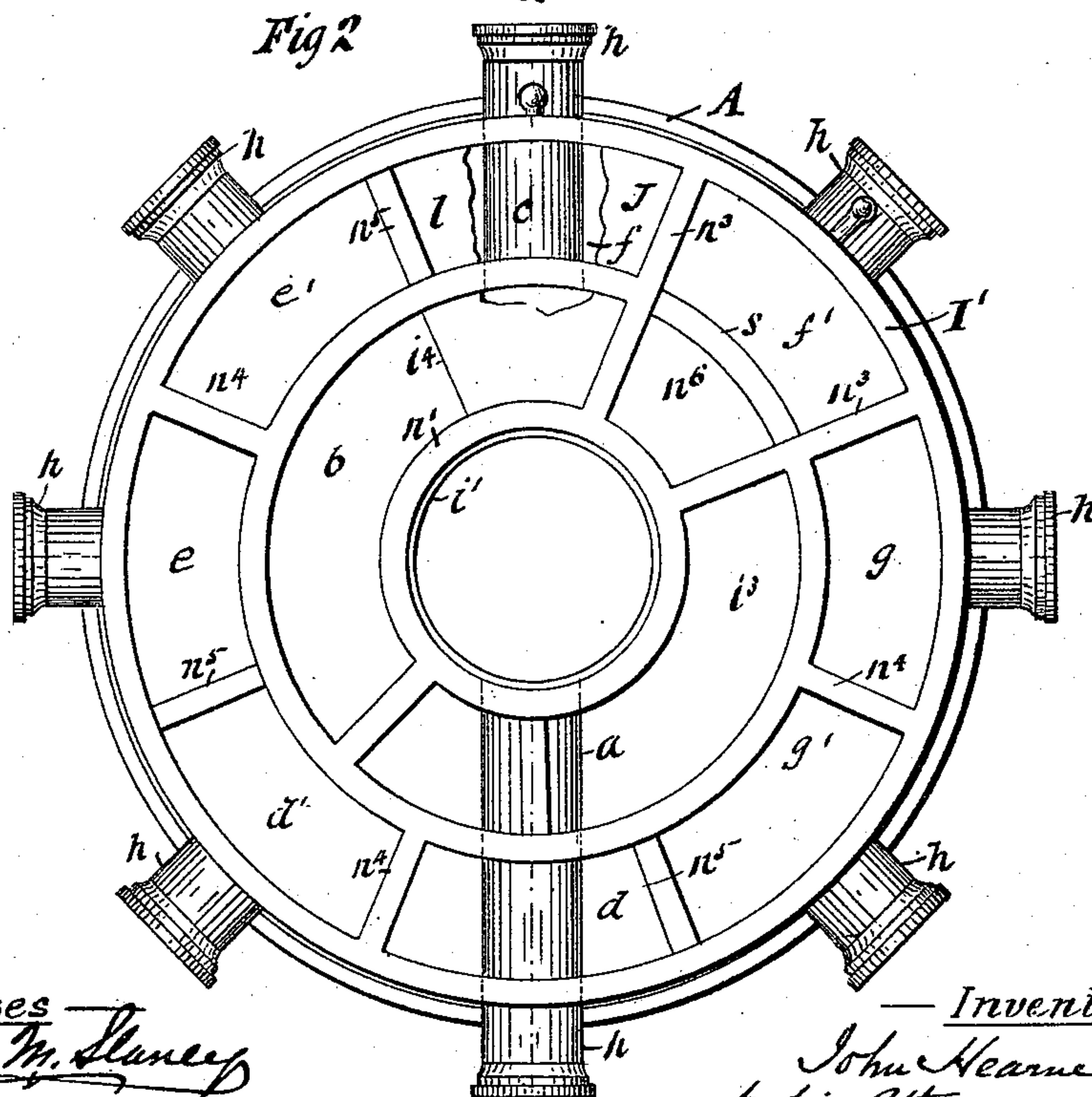


Fig 2



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—Inventor—
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by his Attorney,
Charles D. Griswold

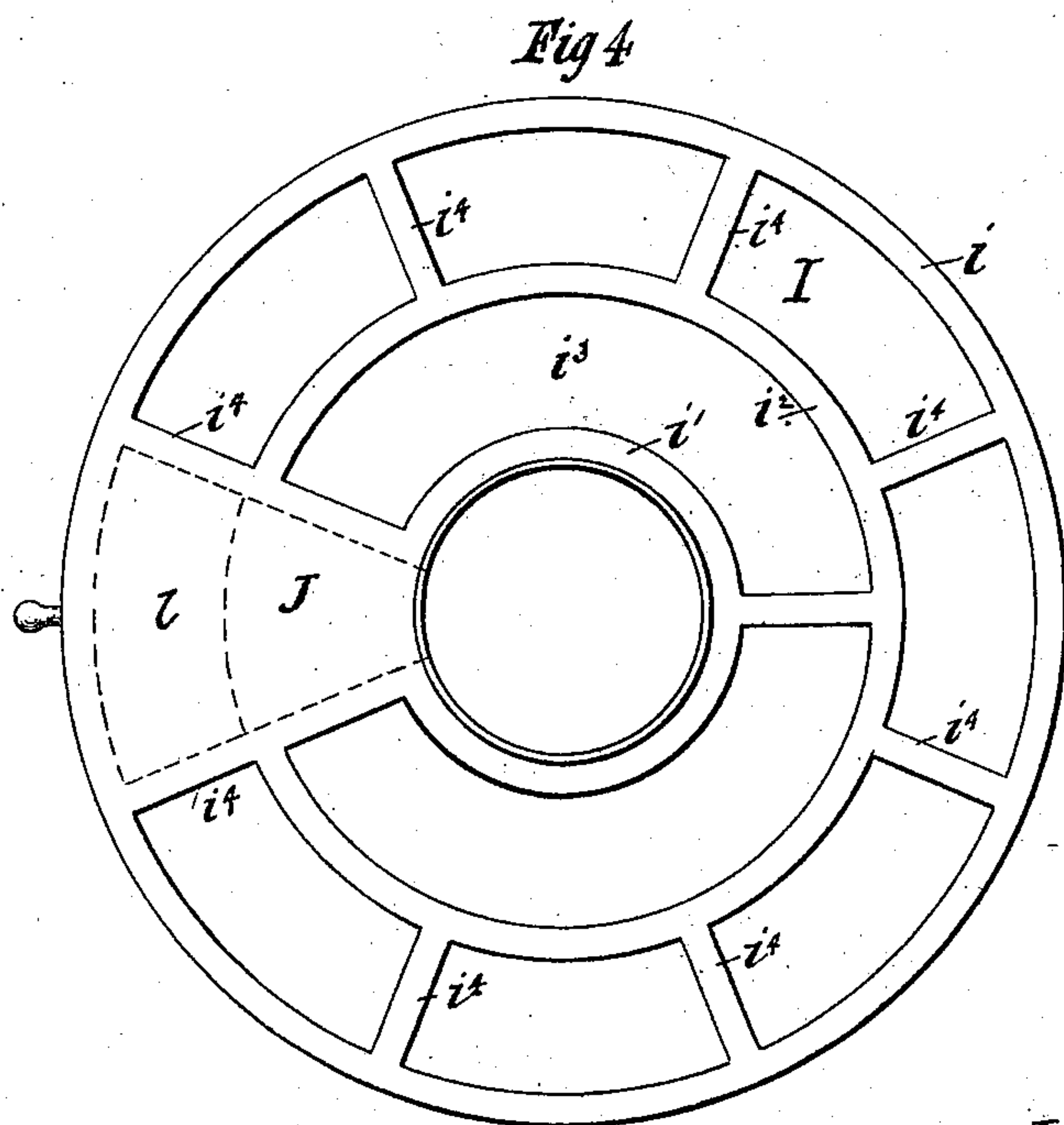
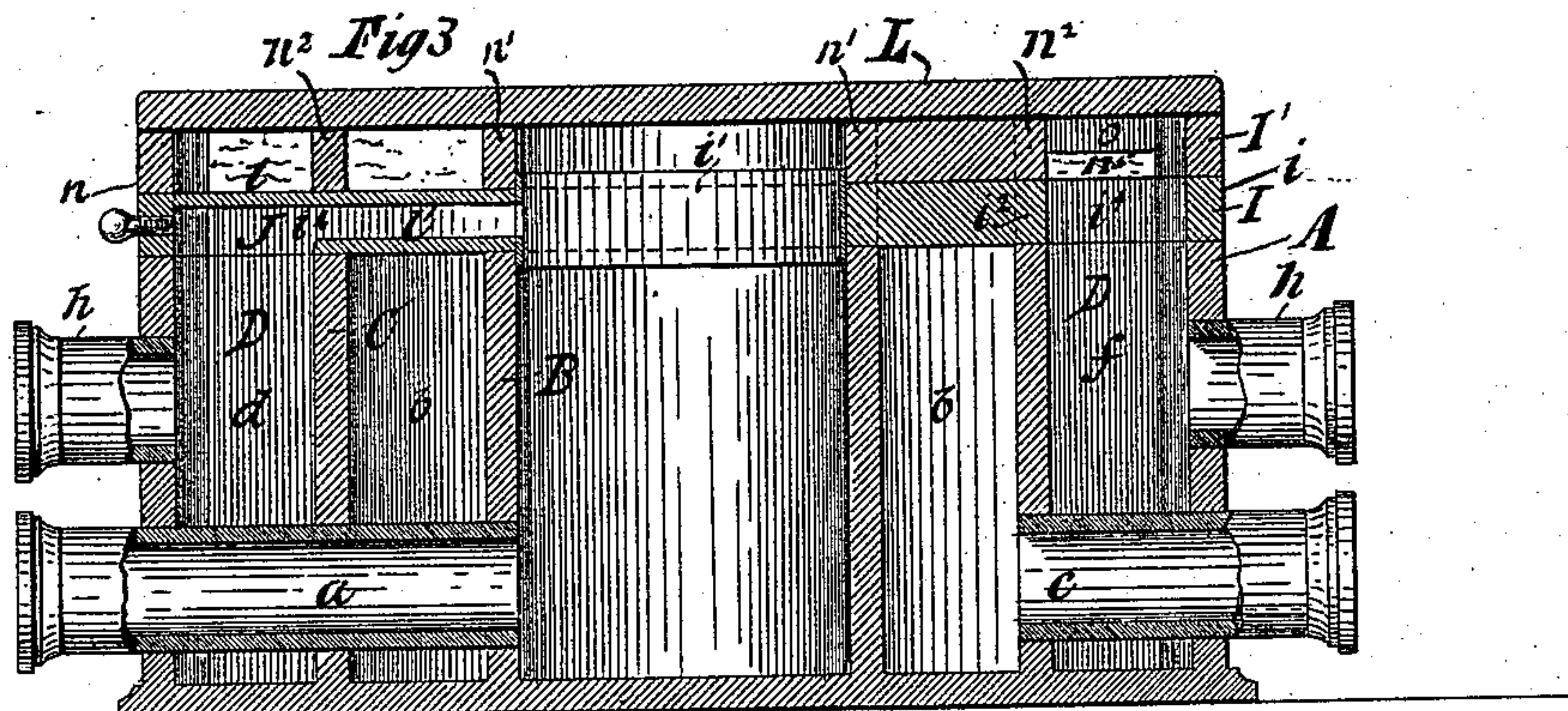
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UNITED STATES PATENT OFFICE.

JOHN HEARNE, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO WALTER P. ELLIOTT, OF NEW BRUNSWICK, NEW JERSEY.

CENTER SEAL.

SPECIFICATION forming part of Letters Patent No. 485,629, dated November 8, 1892.

Application filed July 2, 1891. Serial No. 398,278. (No model.)

To all whom it may concern:

Be it known that I, JOHN HEARNE, of New York, in the State of New York, have invented a certain new and useful Improvement in Center Seals, of which the following is a specification.

My improvement relates to a class of valves termed "center seals" and employed in conjunction with a number of gas-purifiers (usually four) to direct the gas into and out of said purifiers.

I will describe in detail a center seal embodying my improvement, and then point out the novel features in claims.

In the accompanying drawings, Figure 1 is a plan or top view of a center seal embodying my improvement with the top plate removed. Fig. 2 is a similar view, but showing the parts in a somewhat-different position. Fig. 3 is a vertical section of the same, taken on the line *x x*, Fig. 1. Fig. 4 is a detail of a portion of a cock employed.

Similar letters and numerals of reference designate corresponding parts in all the figures.

A designates the seal or valve shell, shown as cylindrical and having a closed bottom and open top. Arranged centrally within the shell A is a cup-shaped portion B, which is also cylindrical and is in communication at its lower end with the inner end of an inlet-port *a*, through which unpurified gas is admitted to the interior of the seal. The portion B constitutes in effect a continuation of said inlet-port and is flush with the upper edge of the shell A.

C designates a wall or partition also cylindrical and rising from the bottom of the valve-shell and flush with the top thereof. This portion is arranged intermediate of the outer wall of the shell and the cup-shaped portion B. Between the wall C and the cup-shaped portion B is an annular space *b*. The inner end of an outlet-port *c* communicates with the annular space *b*. Purified gas is received in the annular space *b* and passes out through the outlet-port *c*.

Extending between the portion C and the outer wall of the shell are in this example of my improvement eight radially-extending partitions D. These partitions are flush with

the upper edge of the valve-shell and divide the space between the partition C and the outer wall of the shell into eight compartments. These compartments operate in pairs when the seal is in use, as *d d'*, *e e'*, *f f'*, and *g g'*. Each of the compartments has a port *h*, communicating with its interior and the exterior of the valve-shell. Into each of the compartments *d e f g* is or may be received unpurified gas in manner about to be described. Such unpurified gas passes thence through the port *h* to a gas-purifier in the well-known manner and is from the purifier returned to the compartments *d'*, *e'*, *f'*, or *g'*, as the case may be, from which latter it may be passed directly to the outlet-port *c* or to one or more of the purifiers in communication with the seal, as desired. In the present example four purifiers will be arranged to operate in conjunction with the seal, one with each pair of compartments *d d'*, &c.

I I' designate the valve-cock. These parts when rotated operate in conjunction with each other and with the valve-shell to direct unpurified or purified gas in any desired direction and to and through any desired number of the compartments *d d'*, &c., and consequently to any desired purifier or purifiers in the series. The portion I is superposed directly upon the valve-shell A and may be rotated thereon. This portion consists of an outer rim *i*, an inner centrally-arranged tubular portion *i'*, and a circular portion *i''*, arranged intermediate of the rim *i* and the tubular portion *i'*. When the portion I is in position on the valve-shell A, the lower portion of the tubular portion *i'* extends within the upper end of the cup-shaped portion B. Between the tubular portion *i'* and the circular portion *i''* is a space *i'''*, corresponding to the space *b*. Extending between the circular portion *i''* and the rim *i* are radial ribs *i''''*, corresponding in number and arrangement to the partitions D. The circular portion *i''* and the ribs *i''''* are flush both top and bottom with the upper and lower edges of the rim *i*, and their surfaces, as well as those of said rim, are ground to form gas-tight joints when in position. The tubular portion *i'* forms in effect a continuation of the inlet-port *a*. Com-

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communicating with the interior of said tubular portion i' is one end of a gas-passage J. This passage is formed by plates l' , arranged between two of the ribs i^4 , so as to leave a space 5 between them. The ribs i^4 between which the plates l' are arranged extend to the tubular portion i' . The plate l' stops short of the rim i , so that an opening is left by which communication may be established between the inlet-port a for unpurified gas and 10 either of the compartments $d e f g$ by suitably rotating the portion I.

The portion I' of the cock resembles the portion I in that it has an outer rim n , a central ring-like or tubular portion n' , and an intermediate circular portion n^2 . All these portions have flush upper and lower surfaces, which are ground to form gas-tight joints. The ring-like portion n' fits over the upper 20 part of the tubular portion i' when the portion I' is in position on the portion I. Extending between the rim n and the circular portion n^2 are ribs $n^3 n^4 n^5$. The ribs n^3 also extend between the circular portion n^2 and 25 the ring-like portion n , forming a space n^6 between them which is over the space b , except when above the gas-passage J. The ribs $n^3 n^4$ are flush both top and bottom with the upper and lower sides of the rim n and are likewise ground to form gas-tight joints. The ribs n^5 are flush upon their lower sides with the said rim and are also ground; but upon their upper sides they do not extend to the upper edges of the rim n and the circular 35 portion n^2 , so that when the top plate L is secured upon the portion I' there will be spaces o between said plate and the upper edges of the ribs n^5 . This is so that when the different parts are arranged in proper relation to 40 each other gas may flow from a compartment d' , &c., of one pair of compartments over a rib n^5 and into a compartment e , &c., of a next adjacent pair of compartments. The part s of the circular portion n^2 which is between the ribs n^3 is also depressed upon its 45 upper side.

The operation is as follows: Unpurified gas enters at the inlet-port a and passes upwardly through the cup-shaped portion B and tubular portion i' to the gas-passage J. Assume 50 that the open outer end of the gas-passage is over the compartment d and the portion I' of the cock has been rotated so as to bring the space between the ribs n^3 over the compartment d' , as shown more clearly in Fig. 1. Gas will then flow through the compartment d and the port h to a purifier, and from thence will return to the compartment d' , passing up 55 over the part s of the circular portion n^2 , down into the space b , and thence through the outlet-port c . Thus the gas is caused to pass through but one purifier—say a purifier which I will designate for clearness "No. 1." If it is 60 desired that it pass through purifiers Nos. 1 and 2, the portion I' is given a quarter-turn to the right, the portion I remaining stationary. The gas will then pass from the

compartment d' into the compartment e , from thence to purifier No. 2, returning to compartment e' , and thence over part s and out, as 70 before. Another quarter-turn of the portion I' will cause the gas to pass in similar manner through purifiers Nos. 1, 2, and 3, and still another quarter-turn through purifiers 1, 2, 3, and 4. Of course portion I' may be 75 rotated in the reverse direction to put in all four purifiers at once, if desired. By this arrangement it will be seen that one or any desired number of the purifiers may be put into communication with the center seal. 80 There is, however, an additional operation. Suppose it is desired to cut out purifier No. 1, leaving in 2, 3, and 4, or any of them. The portion I of the cock is rotated so as to bring the gas-passage J over the compartment e . 85 No. 1 will then be cut out and the point of beginning of rotation of the portion I' will be at e' , and by rotating said part purifiers 3 and 4 may be successively brought into operation, as desired. Again, by rotating I' so 90 that the gas-passage is over f , as shown in Fig. 2, purifier No. 2 may be cut out and Nos. 3, 4, and 1 brought in, or any of them, as desired, and so on. It will therefore be readily 95 seen that by properly rotating the portions I I' of the cock relatively to each other and the valve-shell any desired number of purifiers or any particular purifier or purifiers may be brought into or out of communication with the center seal. This is very ad- 100 vantageous, because it not only admits of all four purifiers being brought into operation at once, but also makes it possible to renew an exhausted purifier or purifiers wherever located in the series without disturbing the 105 operation of any of the other purifiers in the series, neither of which is possible with center seals as at present constructed. My improvement therefore results in a material increase in capacity, besides a marked saving 110 in time and labor.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a center seal, the combination, with a valve-shell closed at one end and open at the 115 other and having inlet and outlet ports and divided into pairs of compartments, of inlet and outlet ports for each of said pairs of compartments, a cock superposed upon the valve-shell and comprising two parts constructed 120 and arranged to be rotated in unison or independently of each other, the one of said parts next the valve-shell being provided with the gas-passage J and the ribs i^4 and the other of said parts being provided with 125 the ribs n^3 , a gas-passage to the outlet-port of the valve between them, the ribs n^4 , and gas-passages arranged intermediate of the ribs n^4 and affording communication between adjacent pairs of compartments, the ribs $n^4 i^4$ 130 forming gas-tight joints arranged the one above the other, substantially as specified.

2. In a center seal, the combination of a closed casing, inlet and outlet pipes, a pas-

sage divided by partitions into a plurality of chambers communicating with the purifiers, a skeleton valve working gas-tight in said casing and divided by partitions corresponding to those in the passage, into an equal number of chambers with those connected with the purifiers and having a separate passage-way whereby communication may be established between the inlet-pipe and any one of the chambers connected with the purifiers, and an auxiliary skeleton valve overlying the main valve and working gas-tight between it and the top of the casing, said auxiliary valve being divided into chambers by partitions corresponding with alternate partitions in the main valve and having a separate passage-way whereby communication may be established between the outlet and any one of the chambers connecting with the purifiers, substantially as described.

3. In a center seal, the combination of a closed casing, concentric inlet and outlet chambers, an annular concentric passage divided by radial partitions into a plurality of

chambers communicating with the purifiers, a rotary skeleton valve working gas-tight in said casing and divided by radial partitions corresponding to those in the concentric passage into an equal number of chambers with those connected with the purifiers and having a separate passage-way whereby communication may be established between the inlet-pipe and any one of the chambers connected with the purifiers, and an auxiliary rotary skeleton valve overlying the main valve and working gas-tight between it and the top of the casing, said auxiliary valve being divided into chambers by partitions corresponding with alternate partitions in the main valve and having a separate passage-way whereby communication may be established between any one of the chambers connecting with the purifiers and the outlet-pipe, substantially as described.

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