

(No Model.)

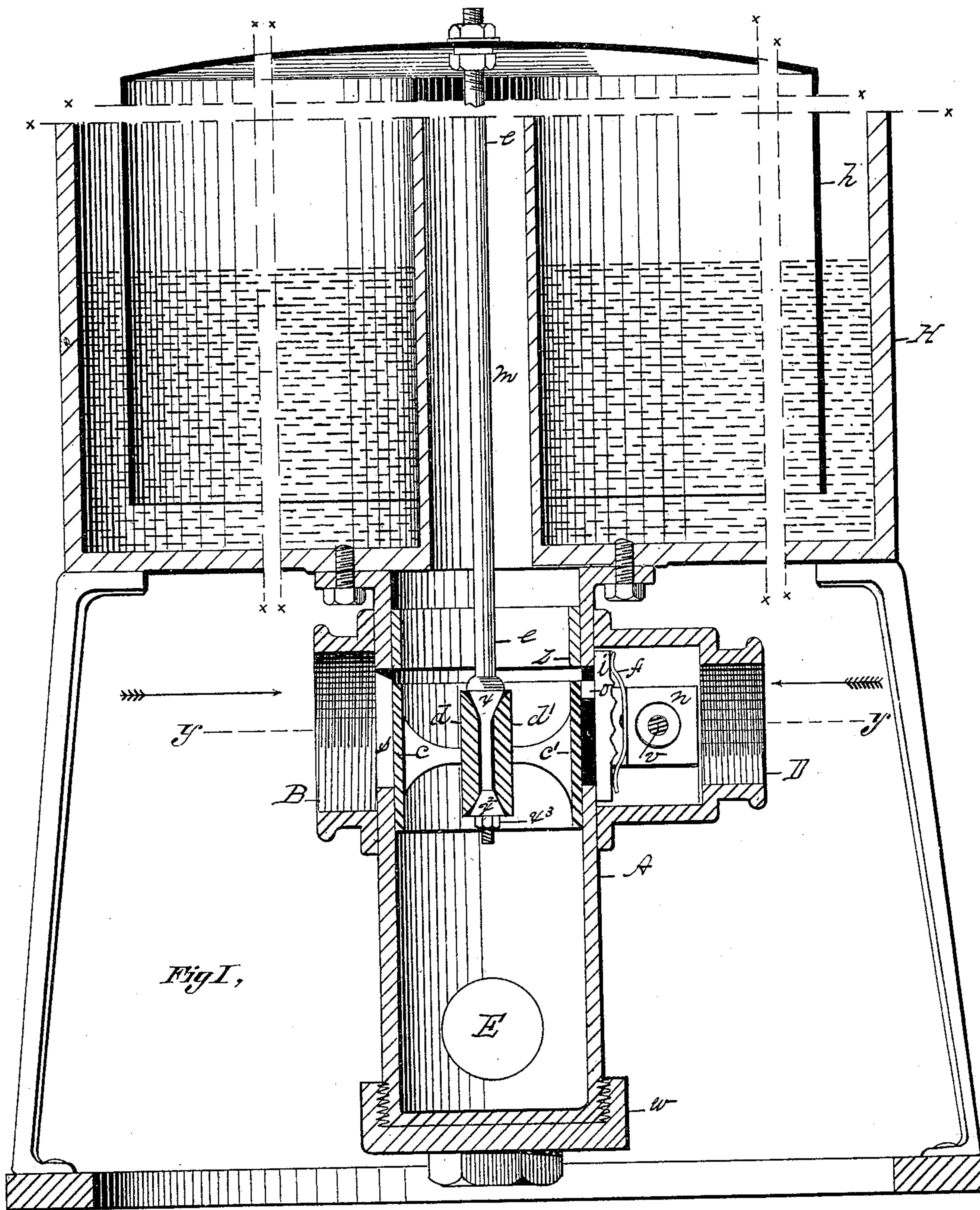
2 Sheets—Sheet 1.

C. F. HOVEY.

APPARATUS FOR REDUCING THE DENSITY OF ILLUMINATING GASES.

No. 273,843.

Patented Mar. 13, 1883.



Witnesses,
A. J. Hyde
Wm. H. Chapin.

Inventor;
Charles F. Hovey.
by Henry A. Chapin

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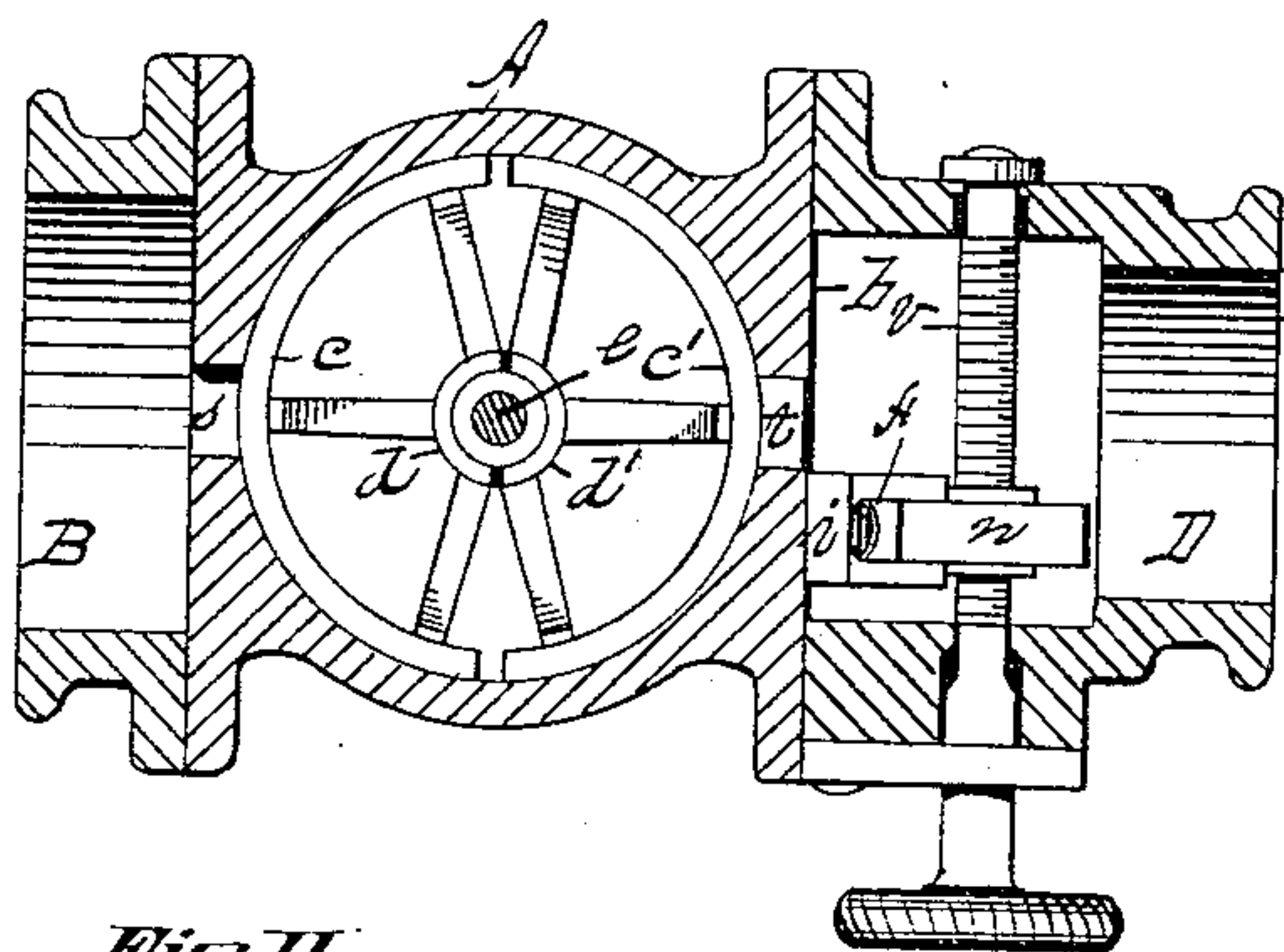


Fig II.

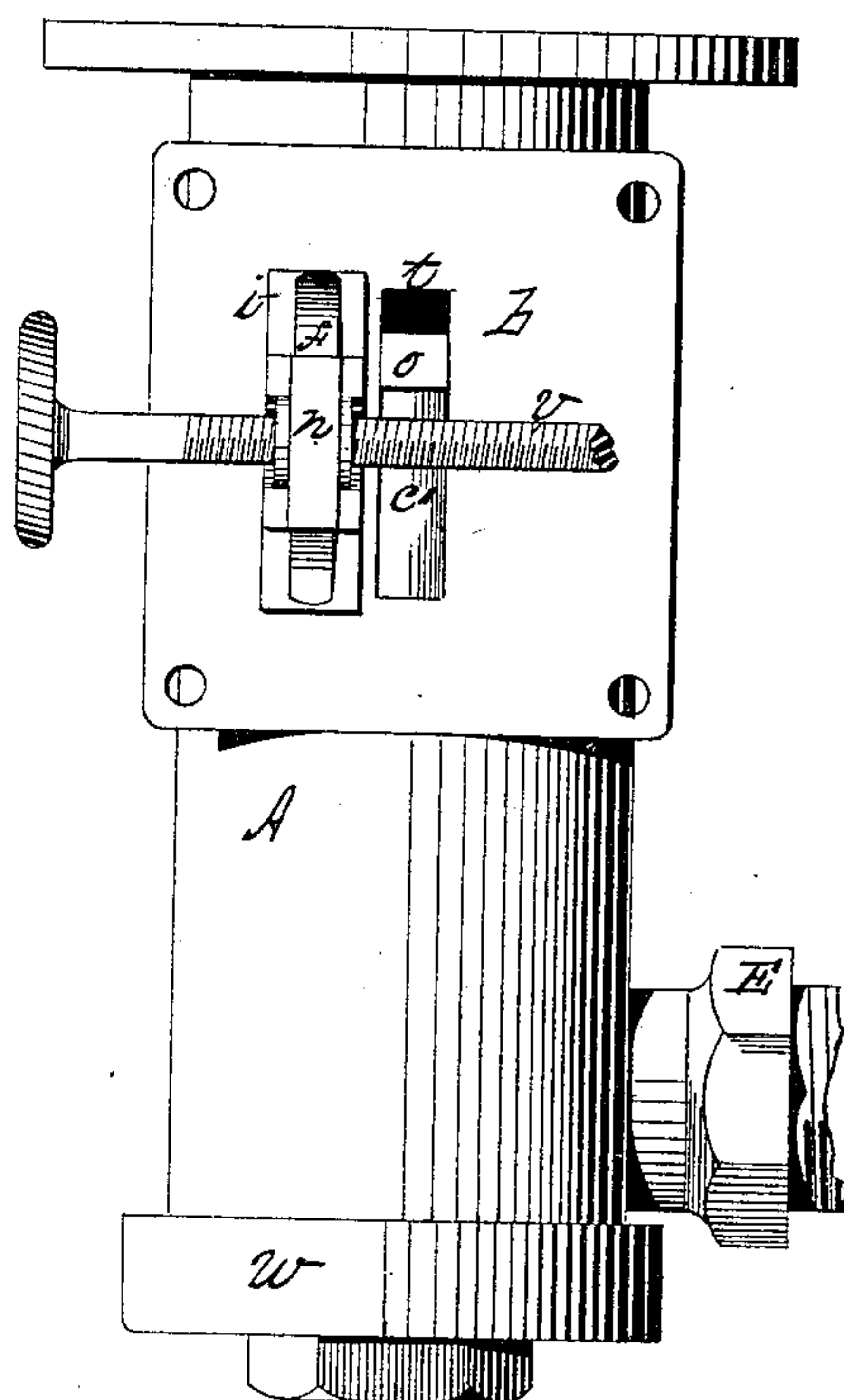


Fig III.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR REDUCING THE DENSITY OF ILLUMINATING-GASES.

SPECIFICATION forming part of Letters Patent No. 273,843, dated March 13, 1883.

Application filed May 22, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. HOVEY, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Apparatus for Reducing the Density of Illuminating-Gases, of which the following is a specification.

This invention relates to improvements in valve devices adapted to be interposed at the point of union of a gas and of an air current between said currents, as they flow either into a gas-holder or to a point of consumption in a hydrocarbon-gas apparatus, the object being to provide improved devices of this class for producing a proper mixture of said gas and air, and to so govern the gas and air passages in said valves as to cause the requisite proportions of said aeriform fluids to be admitted to said holder or conveyed to the place of combustion.

In the drawings forming part of this specification, Figure I is a view, partly in section, of an ordinary gas-holder and tank having applied thereto a gas-and-air-mixing valve constructed according to my invention. Fig. II is a transverse section through the valve-case on line *yy*, Fig. I, but showing certain detail parts in full lines. Fig. III is a side elevation of the mixing-valve with its air-inlet and cross-valve cover removed.

In the drawings, H indicates a gas-holder tank provided with a central vertical passage, *m*, and supported upon suitable legs, as shown, to provide room beneath it for the gas-and-air-mixing valve, which is bolted to the bottom thereof, as seen in Fig. I. The gas-holder *h* is of the usual construction. The vertical and transverse lines marked *x* through said tank and holder indicate broken lines therein.

The gas-and-air-mixing valve consists of the case A, mainly of cylindrical form, provided with a flange around its upper end, whereby it is bolted to the under side of tank H, and with an air-inlet and valve-box, D, and a gas-inlet, B, opposite to said inlet D. Said case is also provided with an outlet, E, upon one side, near its lower end, for the outward passage of the mixed gas and air from the case A and

from the holder *h*, and has two slots formed in its sides at the base of each of the inlets B and D, the slot at the base of inlet B being lettered *s*, and that at the base of D being lettered *t*. A cap, *w*, is screwed onto the lower end of said valve, making it gas-tight at that point. The case A is finished true and smooth in its interior, and has a stop-ring, *z*, fitted in its upper end, the lower edge of which is on a line with the upper ends of said slots *s* and *t*.

Two semicylindrical cut-off valves or gates, *c c'*, are fitted to move up and down in case A, in close contact with its sides and over said slots *s* and *t* therethrough. Said valves *c c'* are provided with suitable converging arms, as shown, to support the two halves *d d'* of a central hollow hub, whereby a free passage is formed centrally between the valves *c c'* to permit of an unobstructed movement of gas or of the contents of holder *h* downward toward the outlet E. The contiguous inner sides of said hubs *d d'* for a certain distance each side of their centers are parallel; but at each end thereof they are of a hollow conical form.

A valve-rod, *e*, whose upper end is secured to the roof of the gas-holder *h*, has a conical formation, *x*, near its lower end, adapted to fit between the upper ends of the hubs *d d'*, and from thence said rod extends downward between the parallel sides of said hubs, and sufficiently below their lower ends to permit of screwing a nut, *x³*, thereon. A cone-shaped plug, *x²*, is placed on rod *e* above nut *x³*, and is by the latter forced between the lower ends of said hubs, and the same movement of said nut draws the cone *x* between their upper ends. Thus by turning nut *x³* the valves or gates *c c'* are caused to be forced laterally against the sides of case A, or that portion thereof surrounding the slots *s t* therethrough, closely enough to prevent the passage of gas or air between said valves and case, and to compel any incoming flow of said aeriform fluids to pass only through such portion of said slots as the position of said valves may leave uncovered.

A cut-off block, *o*, is fixed to the side of the valve *c'*, and is adapted to fit closely against the opposite edge of the slot *t* in case A, and

is of the same thickness as the side of said case at this point, its outer face being in the same plane as the flat face *b* of the valve-box at the base of the inlet *D*, as clearly shown in Fig. III, and its upper edge is even with that of the valve *c'*, upon which it is secured.

The face *d* of the aforesaid valve-box upon the side of case *A*, at the base of the air-inlet *D*, is finished to a true surface, and a flat-faced cut-off valve, *i*, is tightly fitted to said surface, and is adapted to be moved transversely across slot *t* (more or less) by the screw-rod *v*, which is fixed to turn in opposite sides of the valve-box without moving endwise. A nut, *n*, moves back and forth on said rod *v*, and one edge thereof occupies a position between two upstanding projections on the back of valve *i*, (one of which projections is shown broken off in Fig. I,) and between the latter and said nut a spring, *f*, is interposed, which operates to press valve *i* tightly against the face *b*.

The screwed inlet *D*, together with the valve-box, of which the latter is a part, is bolted to the face *b* on case *A*.

The rod *e*, connecting the gas-holder *h* with the valves *c c'*, is adjustable vertically in the roof of said holder, to which it is attached, whereby said valves may be caused to occupy any desired position relative to the slots *s* and *t* when said holder is down. The gas-holder may be weighted or counterweighted, as is ordinarily practiced, to adjust it to such pressure as it is desired to maintain upon the supply and delivery pipes of the apparatus.

The operation of my improvements is as follows: The holder *h* and the valves *c c'* being in their lowest positions, leaving the slots *s t* open, the gas and air pipes, connected at *B* and *D*, are opened, letting gas and air flow through said slots to the interior of the valve, and thence out at the outlet *E* and up into holder *h* through passage *m* to such an extent as to cause the latter to operate vertically and to govern the position of the valves *c c'* within case *A*. The force of the pumps supplying the currents of gas and air and the weight of the gas-holder are, as usual, adapted one to the other, so as to keep up a supply-current through outlet *E* at nearly an unvarying pressure, be the draft by burning more or less. The holder is weighted to cause it, under ordinary burning-pressure, to retain valves *c c'* at a certain position relative to the lower ends of slots *s t*, and to leave such openings through the latter, when valve *i* lies partly over slot *t*, as are requisite for the passage of gas and air in proper proportions when the gas is of an ordinary or medium weight and richness; but when, as is often the case, the generator has been freshly supplied with gasoline, the gas becomes too

rich and gives out much smoke, screw *v* is turned to draw back valve *i* and increase the air-opening through slot *t*, and when from the exhaustion of the gasoline at the generator the gas becomes too thin, valve *i* is moved in a contrary direction to reduce the opening of the slot covered by it and reduce the supply of air. Since the outer face of block *o* on valve *c'* operates in close contact with the face of valve *i*, which arrangement and manner of operation are essential to the proper regulation of the air passage or aperture through slot *t*, the air-opening through slot *t* is exactly that determined by the upward position of the former in slot *t* and the transverse position of the latter across said block and slot.

The vertical position of the gas-holder *h* while the gas apparatus is in operation is variable from time to time according to the regularity of the supply of gas and air and the quantity burned, so that the vertical movement of the holder increases and reduces the openings through slots *s* and *t*.

What I claim as my invention is—

1. The gas-holder *h*, the tank *H*, having a central vertical passage, *m*, opening into said holder, the valve-case *A*, secured to said tank under said vertical passage, and provided with the gas and air inlets *B* and *D*, and with the slots *s* and *t* in its sides, and appliances within said case *A*, connected centrally with said holder, whereby by the movements of the latter the openings through said slots are increased or reduced, combined and operating substantially as set forth.

2. In combination, the tank *H*, provided with the passage *m*, the holder *h*, the rod *e*, secured centrally and adjustably to said holder and provided with the conical part *x*, the case *A*, having gas and air inlet slots in its sides, the valves *c c'*, having the sectional hubs *d d'*, the plug *x²*, and nut *x³*, substantially as set forth.

3. The case *A*, having the slot *t* therein, and provided with a valve-box on one side, having a valve-face, *b*, valve *c'*, having the block *o* thereon to fit between the sides of said slot, and having its outer face even with said face *b* of the valve-box, the valve *i*, having a bearing upon said face *b* and the face of said block *o*, capable of adjustment, by means substantially as described, transversely across said slot *t* and the face of said block, and means, substantially as described, for moving valve *c'* and the block vertically in said case *A*, combined and operating substantially as set forth.

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