

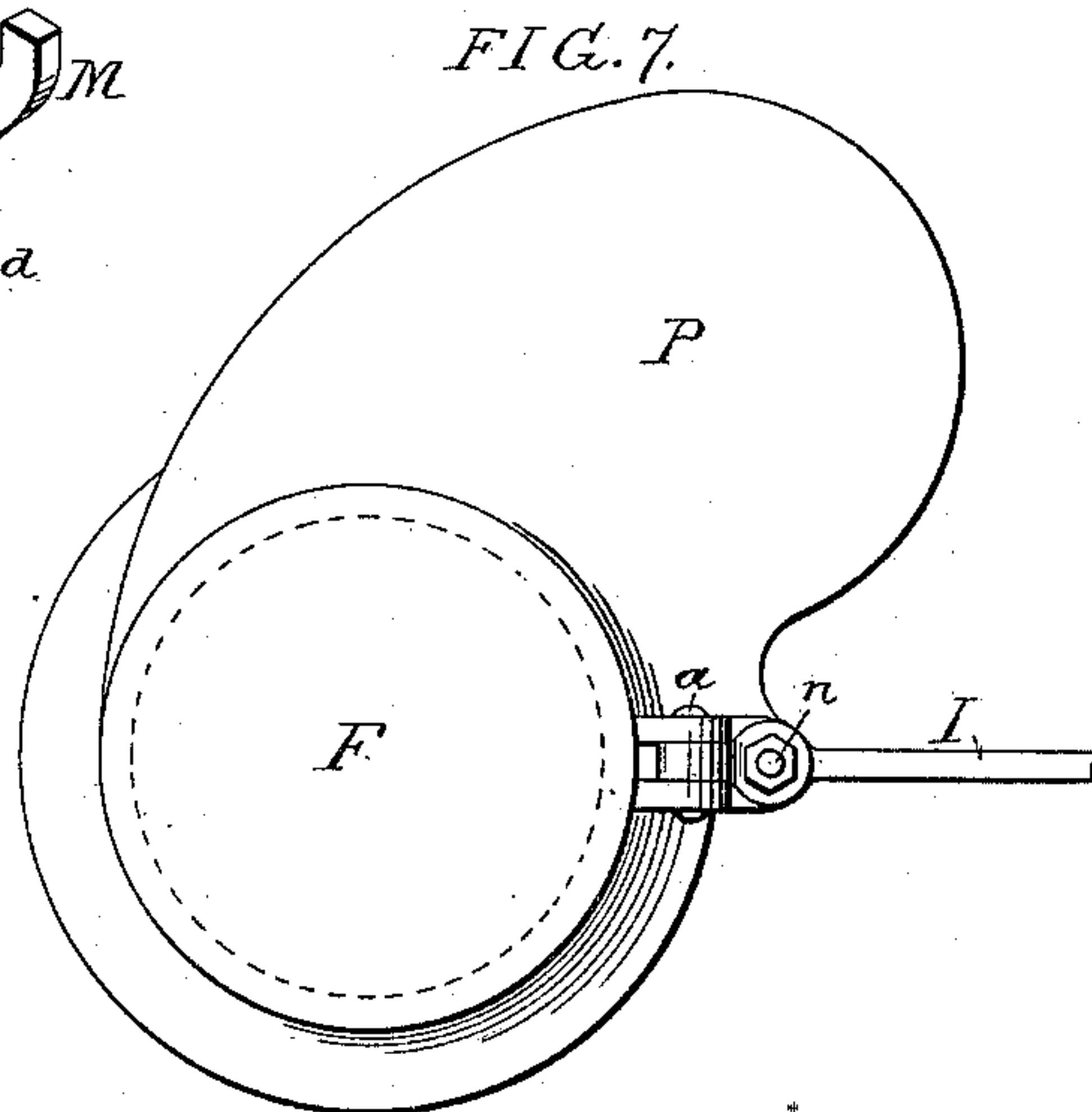
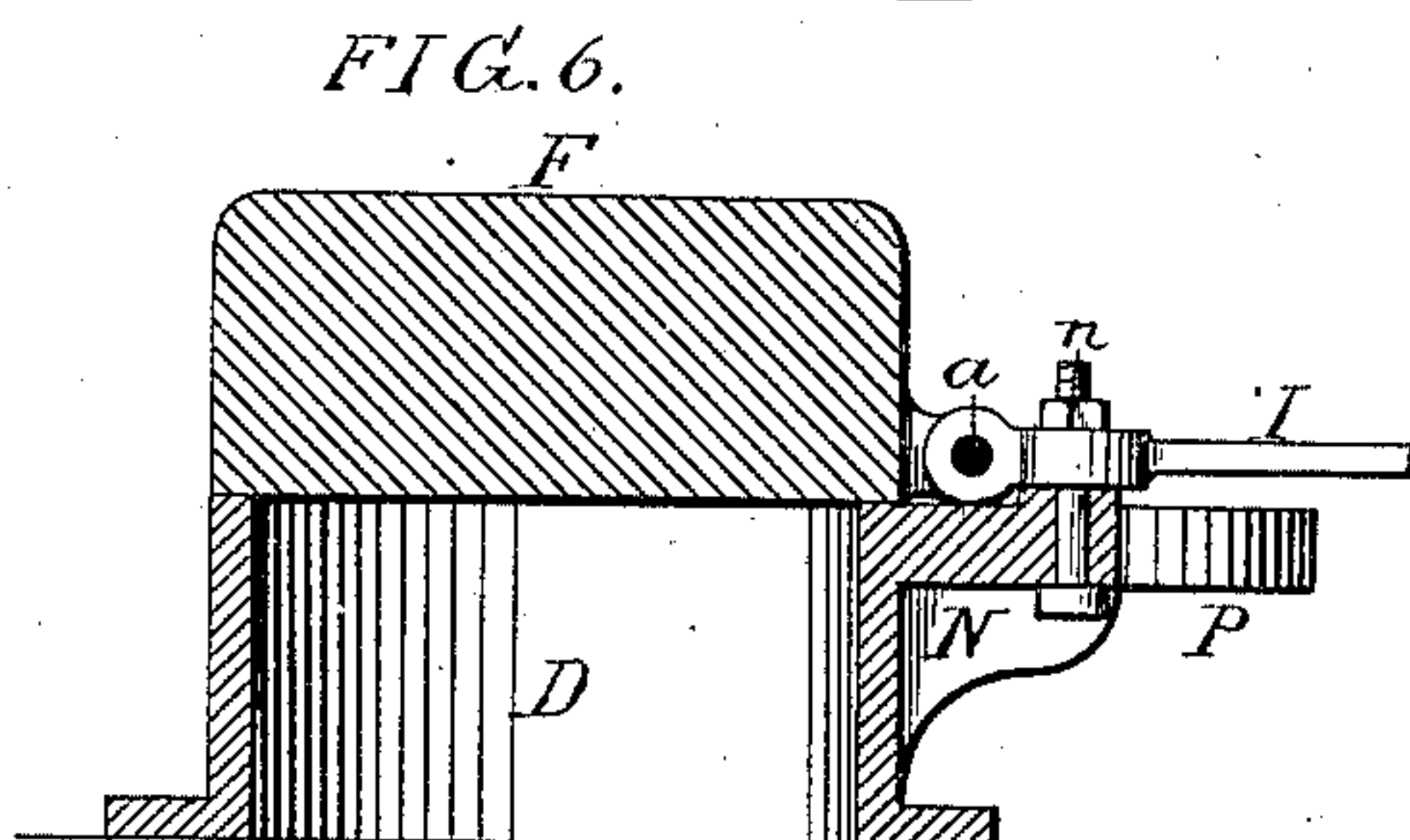
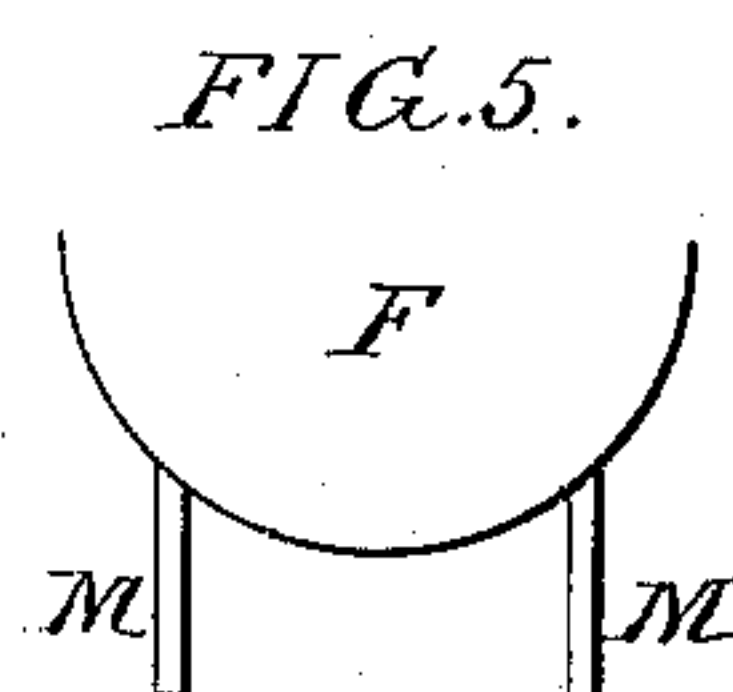
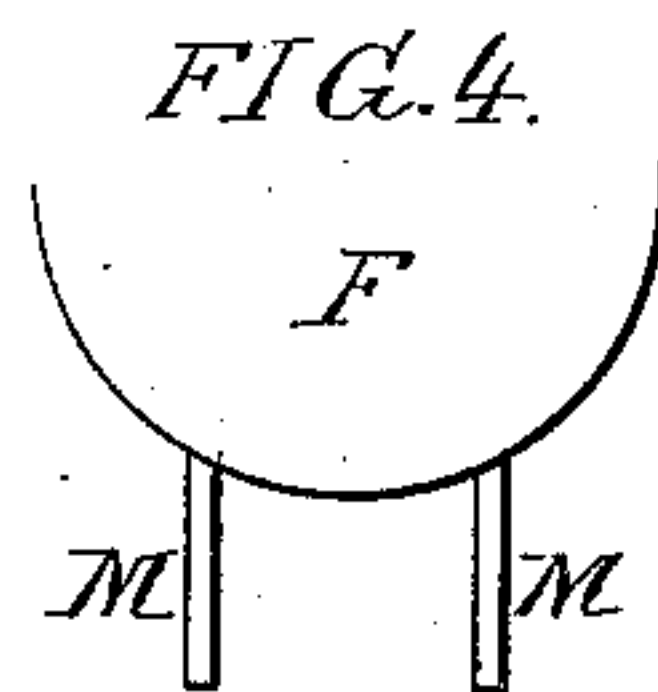
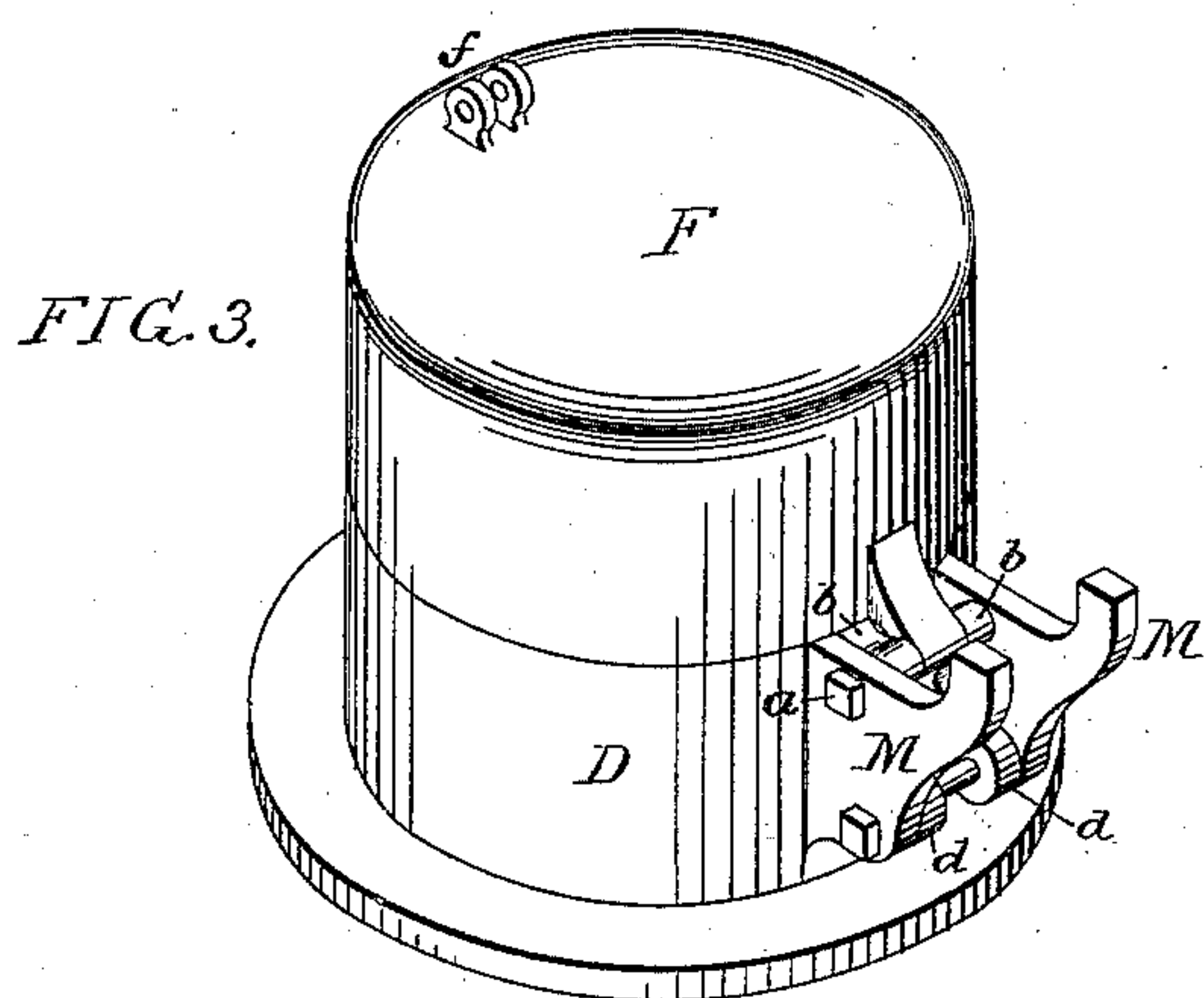
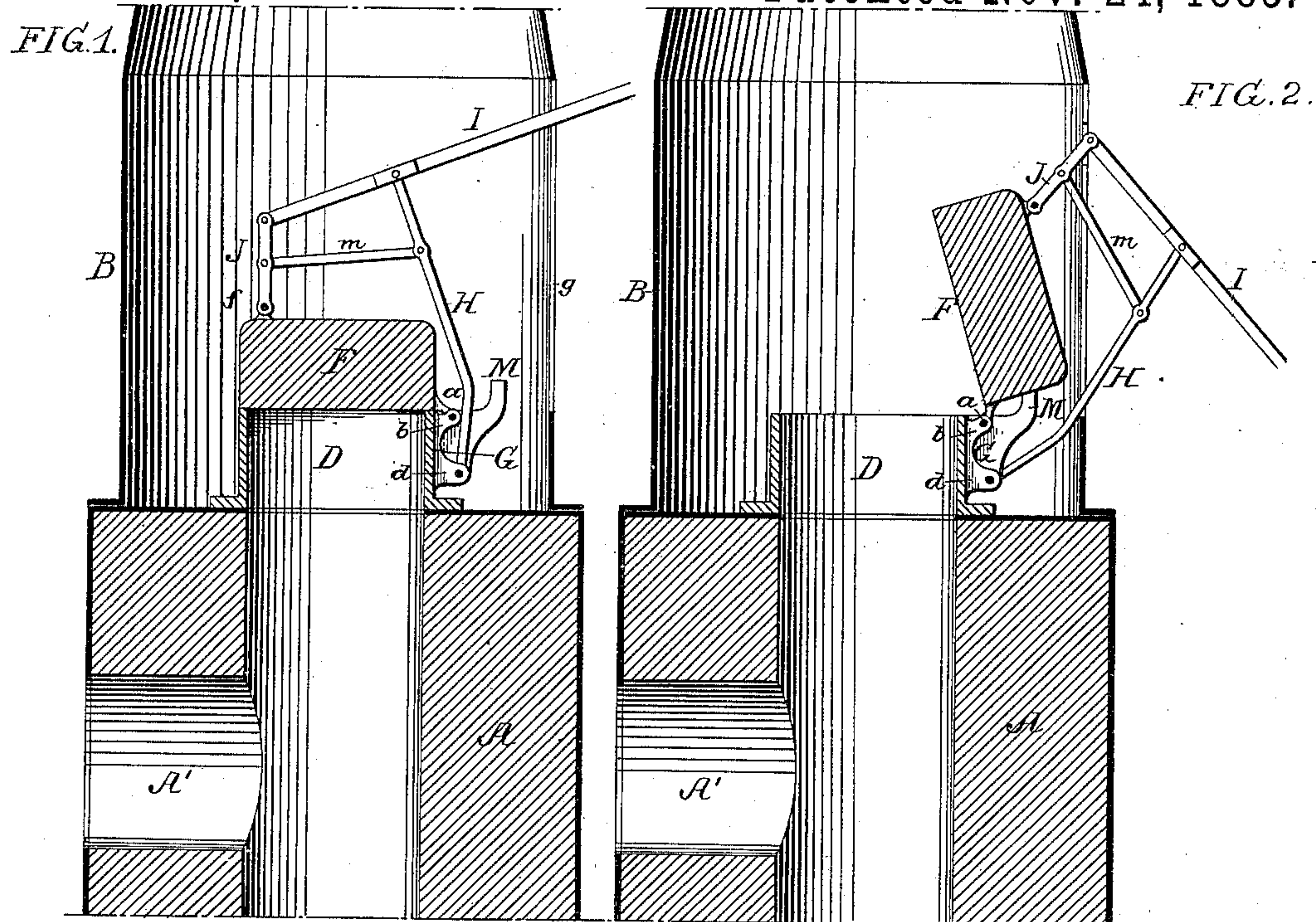
(No Model.)

W. T. BATE.

# RELIEF VALVE FOR GAS GENERATORS.

No. 331,024.

Patented Nov. 24, 1885.



Witnesses:  
William F Davis  
Henry Bossert.

Inventor:  
William T. Bate  
by his Attorneys,  
Howson and Sons



# UNITED STATES PATENT OFFICE.

WILLIAM T. BATE, OF CONSHOHOCKEN, PENNSYLVANIA.

## RELIEF-VALVE FOR GAS-GENERATORS.

SPECIFICATION forming part of Letters Patent No. 331,024, dated November 24, 1885.

Application filed May 25, 1885. Serial No. 166,546. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM T. BATE, a citizen of the United States, and a resident of Conshohocken, Montgomery county, Pennsylvania, have invented certain Improvements in Relief-Valves for Gas-Generators, of which the following is a specification.

The object of my invention is to provide the outlet-flue of a gas-generating furnace with a valve which, while serving to prevent the escape of gas into the stack during the proper generation of the gas, will act as a safety-valve to relieve any excess of pressure in the generator, the valve being readily lifted, when desired, in order to open communication between the flue and the stack.

In the accompanying drawings, Figure 1 is a view, partly in section and partly in elevation, of a portion of a gas-generating apparatus with my improved valve, the latter being closed; Fig. 2, a similar view with the valve open; Fig. 3, a perspective view of the valve, valve-seat, and valve-rest; Figs. 4 and 5, diagrams illustrating a feature in the construction of the said valve-rest, and Figs. 6 and 7 views illustrating a modification of the invention.

A represents part of the structure containing the discharge-flue of a gas-generating apparatus, surmounted by a stack, B, and having the usual lateral branch, A', leading to the scrubbers and purifiers. Above the structure A, and forming a continuation of the central flue of the same, is a cylindrical casing, D, the top of which forms a seat for a valve, F, which has at one side a lug, pivoted by a pin, *a*, to lugs *b* on a bracket, G, secured to or forming part of the casing D. To the other lugs, *d*, on this bracket is pivoted the lower end of a rod, H, to the upper end of which is pivoted a lever, I, the short arm of the latter being connected by a link, J, to a stud, *f*, on the valve F, and the long arm of the lever projecting through a slot, *g*, in the stack B, so as to be readily accessible from the outside of the same. Secured to the opposite sides of the bracket G are plates M, the projecting ends of which serve as supports for the valve F when the latter is open, as shown in Fig. 2.

In starting the apparatus the valve is opened, as shown in said figure, so that there is a free passage of the products of combustion from the vertical flue into and through the stack B; but

when gas is to be generated the lever I is manipulated so as to lower the valve F to its seat, as shown in Fig. 1, thus cutting off the escape through the stack and compelling the gas to pass through the lateral branch A' of the vertical flue.

Should there be any undue increase of pressure in the apparatus, the valve will be lifted, so as to permit the gas to escape into the stack, the valve being but slightly lifted if the increase of pressure is but slight, or being thrown wide open, as shown in Fig. 2, if there is an excessive increase of pressure, the valve turning on the pivot *a* as a center. This movement of the valve can be readily effected, owing to the fact that the pivot *a* is close to the casing D, the lever I and fulcrum-rod H affording a means whereby the valve may be readily lifted by hand when it is desired to again open the passage from the flue to the stack. In order to preserve the link J and fulcrum-rod H in their proper relative positions, whatever the position of the valve and its operating-lever, the said link and fulcrum-rod are connected by a rod, *m*.

The supporting-plates M may be such that they will stop the backward movement of the valve before the latter reaches a position in which it would remain, the valve being in such case self-closing; but it is preferable to so construct the supporting-plates that when the valve F is open and rests upon them its center of gravity will be somewhat outside of a vertical line drawn through the pivot *a*, so that it will have no tendency to fall back onto its seat of its own accord, but can be readily restored to the closed position by means of the lever I.

The position of rest of the valve F can be readily varied by bending the outer ends of the plates M toward or from each other, so as to provide a support for the valve nearer to or farther from the central line of the same, as shown in the diagrams, Figs. 4 and 5.

The valve shown in Figs. 6 and 7 is intended to be used in cases where there is no room in the stack above the valve for the operating-lever. In this case the valve is pivoted at *a* to the short arm of the lever I, and the latter is hung to a stud, N, on the side of the casing D, so that it is at liberty to swing horizontally, a segmental plate, P, which projects from one



side of the casing D flush with the top of the same, affording a support for the valve when it has been swung to one side in order to open a passage from the flue to the stack, and the slot *g* in the stack for the passage of the lever I being horizontal instead of vertical. In this case the upper end of the pivot-pin *n* serves as a stop for the valve when the latter is thrown open, the valve being prevented from moving so far back that it will not fall when the pressure is reduced.

I claim as my invention--

1. The combination of the flue structure and stack of a gas-generating apparatus, the valve-seat B, a valve adapted thereto and pivoted at one side at a point close to the seat, and an operating-lever connected to the valve, but pivoted independently thereof, as set forth.

2. The combination of the flue structure A of the gas-generating apparatus, the stack B, having a slot, *g*, a valve-seat, D, a valve adapted to said seat and pivoted at one side at a point close to the seat, and an operating-lever connected to the valve, but pivoted independently

thereof and projecting through the slot in the stack, as specified.

3. The combination of the valve-seat, the valve adapted thereto and pivoted at one side at a point close to the seat, the operating-lever connected to the valve, but pivoted independently thereof, and a stop for limiting the movement of the valve, as specified.

4. The combination of the valve-seat D, the pivoted valve F, free to swing upward from said seat, and plates M, upon the projecting outer ends of which the valve is supported when open, as specified.

5. The combination of the valve-seat, the pivoted valve, the operating-lever, the link, the fulcrum-rod, and the rod connecting said fulcrum-rod and link, as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WM. T. BATE.

Witnesses:

WILLIAM F. DAVIS,  
HARRY SMITH.