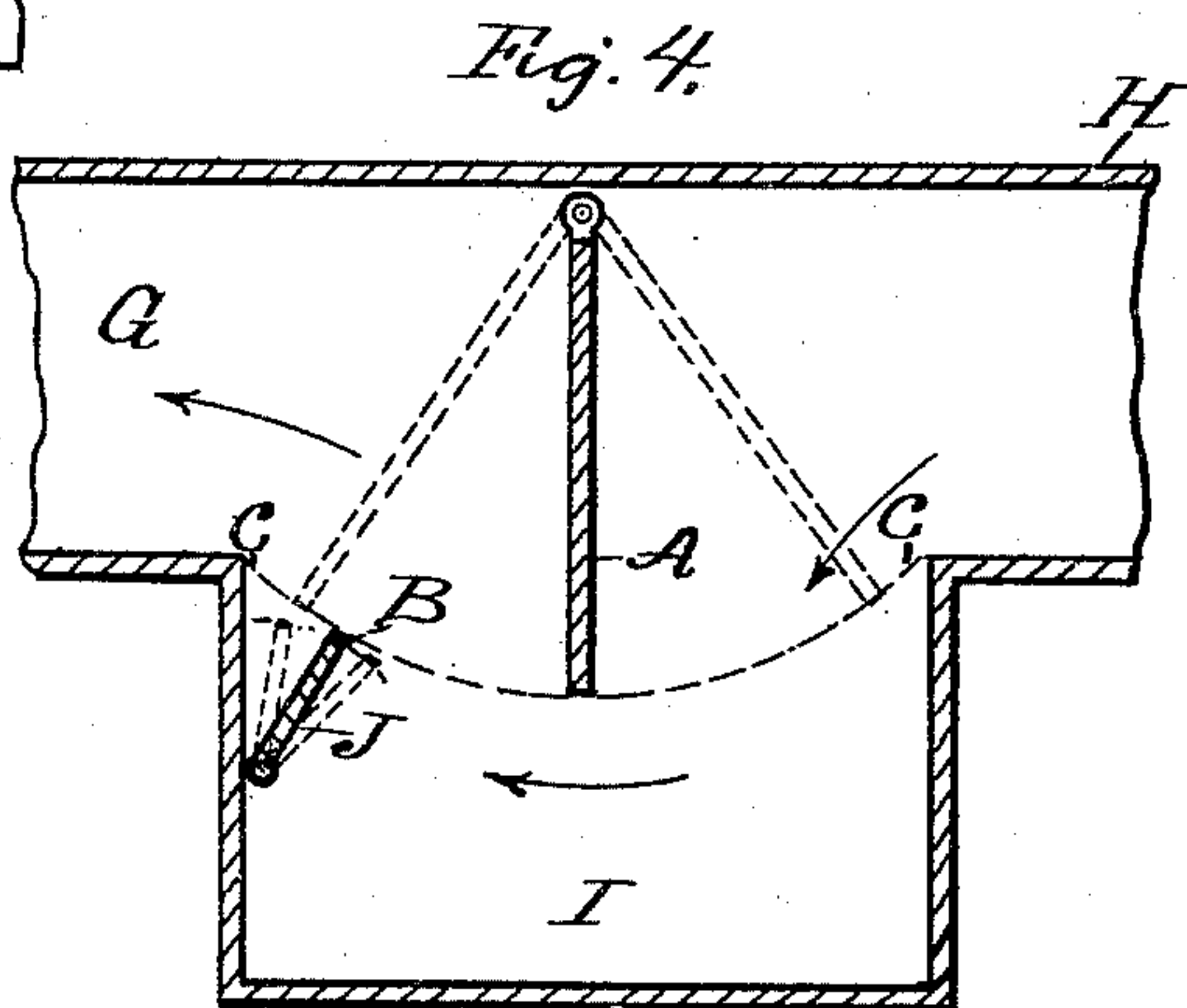
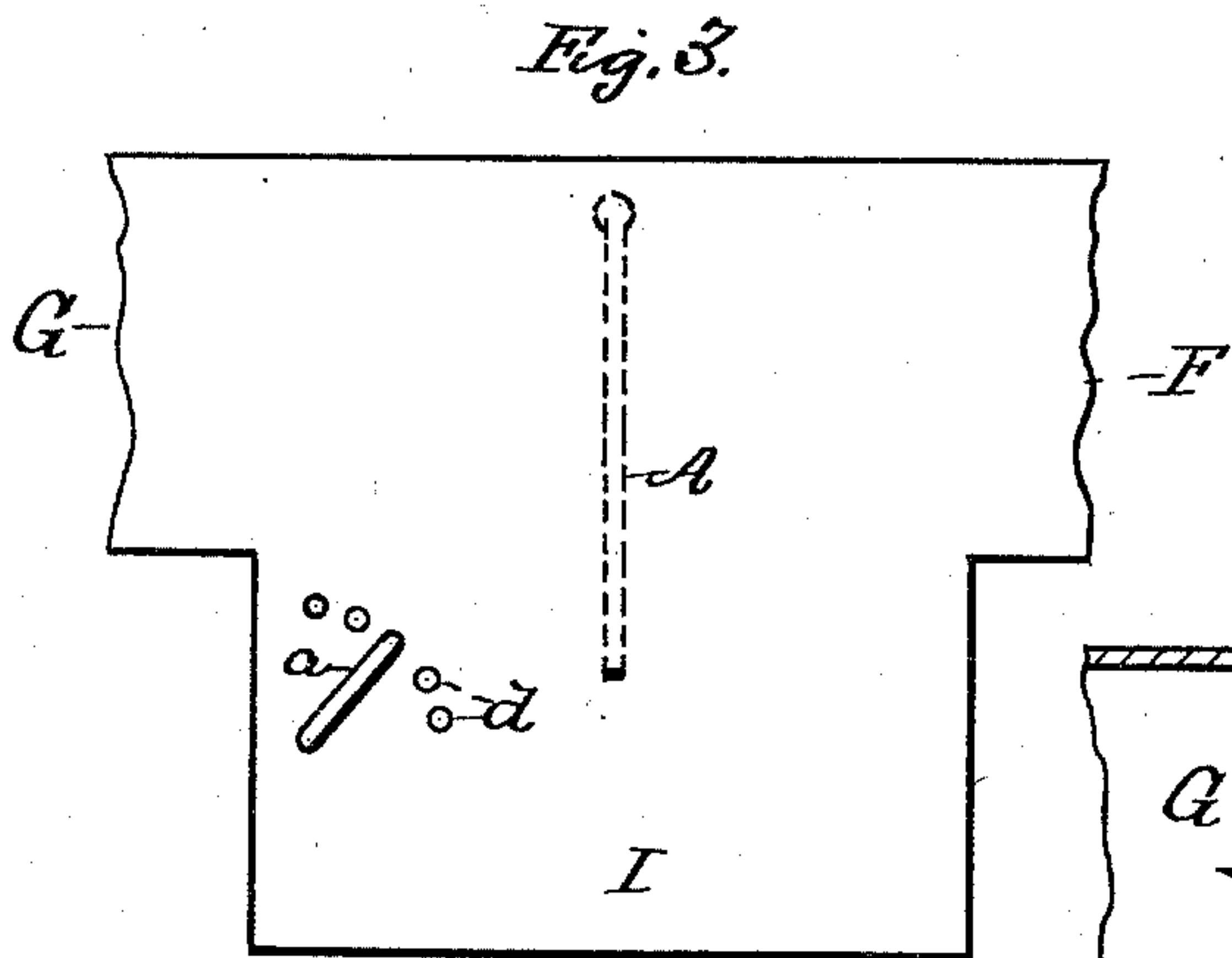
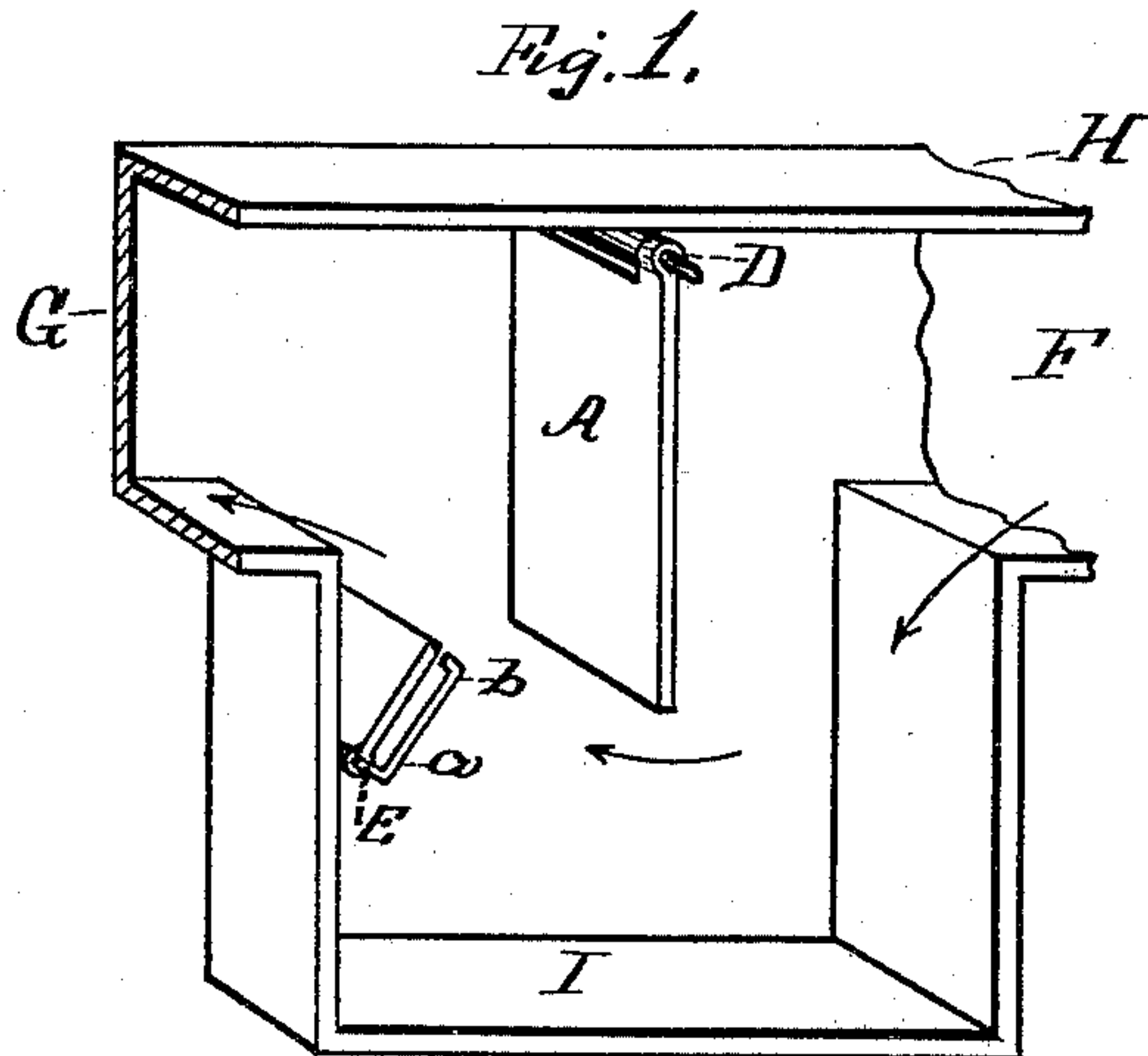
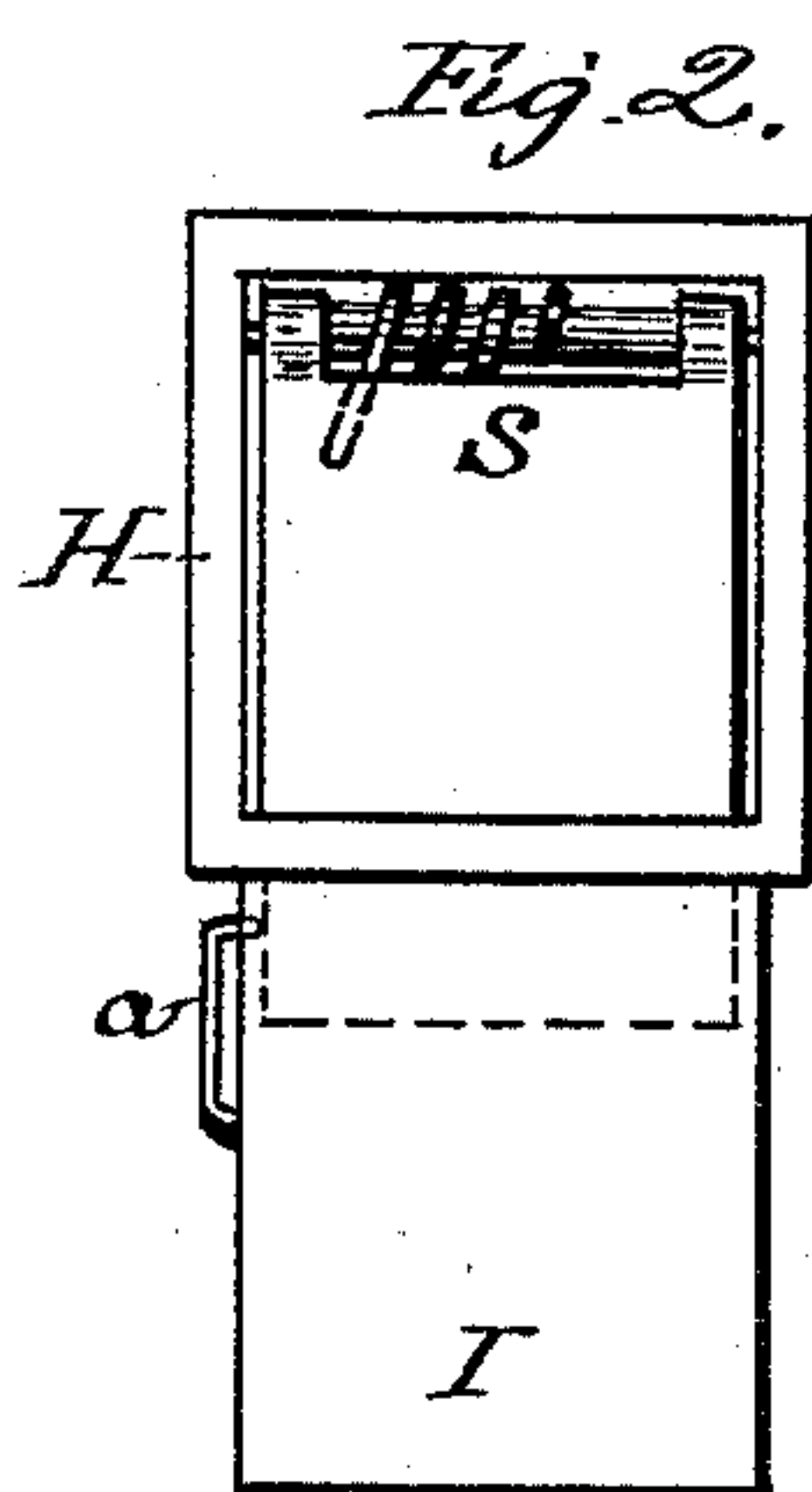


(No Model.)

S. P. SMITH.
AIR CURRENT GOVERNOR.

No. 426,649.

Patented Apr. 29, 1890.



WITNESSES:

Frank C. Curtis.
John T. Booth

INVENTOR:

Solomon P. Smith
by Geo. A. Mosher
Atty.

UNITED STATES PATENT OFFICE.

SOLOMON P. SMITH, OF WATERFORD, NEW YORK.

AIR-CURRENT GOVERNOR.

SPECIFICATION forming part of Letters Patent No. 426,649, dated April 29, 1890.

Application filed July 22, 1889. Serial No. 318,251. (No model.)

To all whom it may concern:

Be it known that I, SOLOMON P. SMITH, of Waterford, in the county of Saratoga and State of New York, have invented certain
5 new and useful Improvements in Air-Current Governors; and I do hereby declare that the following is a full, clear, and exact description thereof, that will enable others skilled in the art to which it appertains to make and use the
10 same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

Similar letters refer to similar parts in the
15 several figures therein.

My invention relates to improvements in air-current governors, and is especially applicable to air-conduits employed to supply fresh or cold air to hot-air furnaces.

20 The object of my invention is primarily to regulate and control the supply of air passing through a conduit under varying pressure by causing the degree of pressure to determine the area of the supply-opening, so that a given
25 quantity of air may pass in a given time, whether the degree of pressure varies or remains constant.

Figure 1 of the drawings is a view in perspective of the governor with the casing on
30 one side removed to show the interior. Fig. 2 is an end elevation showing the inlet-opening. Fig. 3 is a side elevation. Fig. 4 is a longitudinal vertical section.

35 H represents a portion of the conduit, and I the chamber opening into the lower side of the same.

40 The direction of the air-current passing through the conduit and chamber on its way to the furnace is shown by the arrows, F being the inlet-opening to and G the outlet-opening from the chamber.

45 A is the pendulum-valve, hinged at D and adapted to swing to and fro within the conduit and chamber, its lower end describing an arc of a circle, (represented by the dotted line extending from C to C,) and free to oscillate between the inlet and outlet openings on opposite sides of the chamber. The valve is hung to extend across the conduit and chamber and swing longitudinally of the same, its
50 width being slightly less than that of the con-

duit and chamber, in order to swing freely therein.

The relative dimensions of the conduit, chamber, and valve are such that the cross-sectional area of the air-passage in the
55 chamber beneath the valve when vertical is about the same as the cross-sectional area of the passage through the conduit, and such that the lower end of the valve when swung
60 in either direction to the limit of its oscillation will strike the bottom of the inlet and outlet openings at the termini of the dotted line C C, the whole area of the opening formed in the lower side of the conduit by the chamber,
65 and which is about equally divided by the valve, being about or a little more than double the cross-sectional area of the conduit. It is obvious, therefore, that a current of air passing through the conduit and chamber in the
70 direction of the arrows will deflect the valve from a vertical line, and that the degree of deflection will depend upon the rapidity of the air-current which represents or results from the difference in air-pressure. The
75 greater the pressure and rapidity the more will the valve be deflected toward the outlet-opening.

As the lower end of the valve approaches the outlet G, the area of the air-passage between the valve and end wall of the chamber
80 diminishes, and is entirely closed when the end of the valve strikes the end wall of the chamber at C. An increased pressure and rapidity of flow of the air acts thereby to proportionately
85 diminish the area of the air-passage. When the pressure and rapidity of flow decrease, the valve swings back by gravity and the air-passage is enlarged. The valve forms therefore a complete governor, and causes an ap-
90 proximately constant quantity of air to be delivered from the chamber to the conduit which leads to the furnace. This is of the greatest importance in the use of hot-air furnaces in windy weather.

95 The wind constantly varies in direction and force, which induces a constantly-varying degree of air-pressure in the air-conduit leading from the outside of a building to the furnace located within.

100 It will sometimes happen that a sudden gust of wind would throw the end of the valve

in contact with the chamber-wall at C and entirely close the passage. The air-current would in that case be wholly cut off, which would so reduce the pressure upon the valve that it would instantly fall away toward its vertical position, and the current would be at once re-established.

When desired, the valve may be provided with a spring S to assist it in resisting a sudden pressure, to cause it to more quickly open again, and to act as a buffer to prevent the valve from striking the chamber-wall with a blow which might produce an unpleasant sound. It is also evident that the valve will serve in the same manner to control or check any back-draft in case the air-current should be reversed and travel in the opposite direction to that shown by the arrows, the valve being deflected toward the opening F, which in that case would become the outlet-opening and G the inlet-opening.

I have also provided the throat-piece B, which is hinged to an end wall of the chamber and is adapted to swing out from the wall into the chamber toward the pendulum-valve, as shown by the dotted line J. This piece may be moved by the spring-arm *a*, secured to the outer end of the rod E, upon which the piece B is fixed or forming an extension of the rod.

The end of the arm is provided with a catch, as *b*, which may be sprung out and into the apertures *d* in the casing to hold the piece in any desired position to which it may be adjusted. By means of this adjustable throat-piece the capacity of the conduit may be varied and the action of the valve made quicker or more sensitive in case only a small cur-

rent of air is required or obtainable, for the reason that the valve does not travel so far to cut off the current when the throat-piece is thrown out toward it, as shown in Fig. 1, as it does when the throat-piece is thrown up to a vertical position against the chamber-wall. I am thus able to automatically control and govern the quantity of air delivered through an air-conduit whether the pressure be constant or variable.

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

1. An air-conduit having the inlet-passage F, the outlet-passage G, the intermediate depending chamber I, and the pendent valve A, pivoted to the upper walls of the conduit to hang in the center of such chamber, whereby the valve is adapted to be oscillated from one edge C to the opposite edge of the chamber, as shown and described.

2. An air-conduit having the inlet-passage F, the outlet-passage G, and the intermediate depending chamber I, in combination with a pendent valve A, pivoted to the upper walls of the conduit to hang in the center of such chamber and valve-controlling spring S, substantially as described.

3. An air-conduit having inlet F, outlet G, and intermediate depending chamber I, in combination with a hinged valve A and hinged throat-piece B, and means for adjusting the latter, as described.

In testimony whereof I have hereunto set my hand this 18th day of July, 1889.

SOLOMON P. SMITH.

Witnesses:

FRANK C. CURTIS,
CHAS. L. ALDEN.