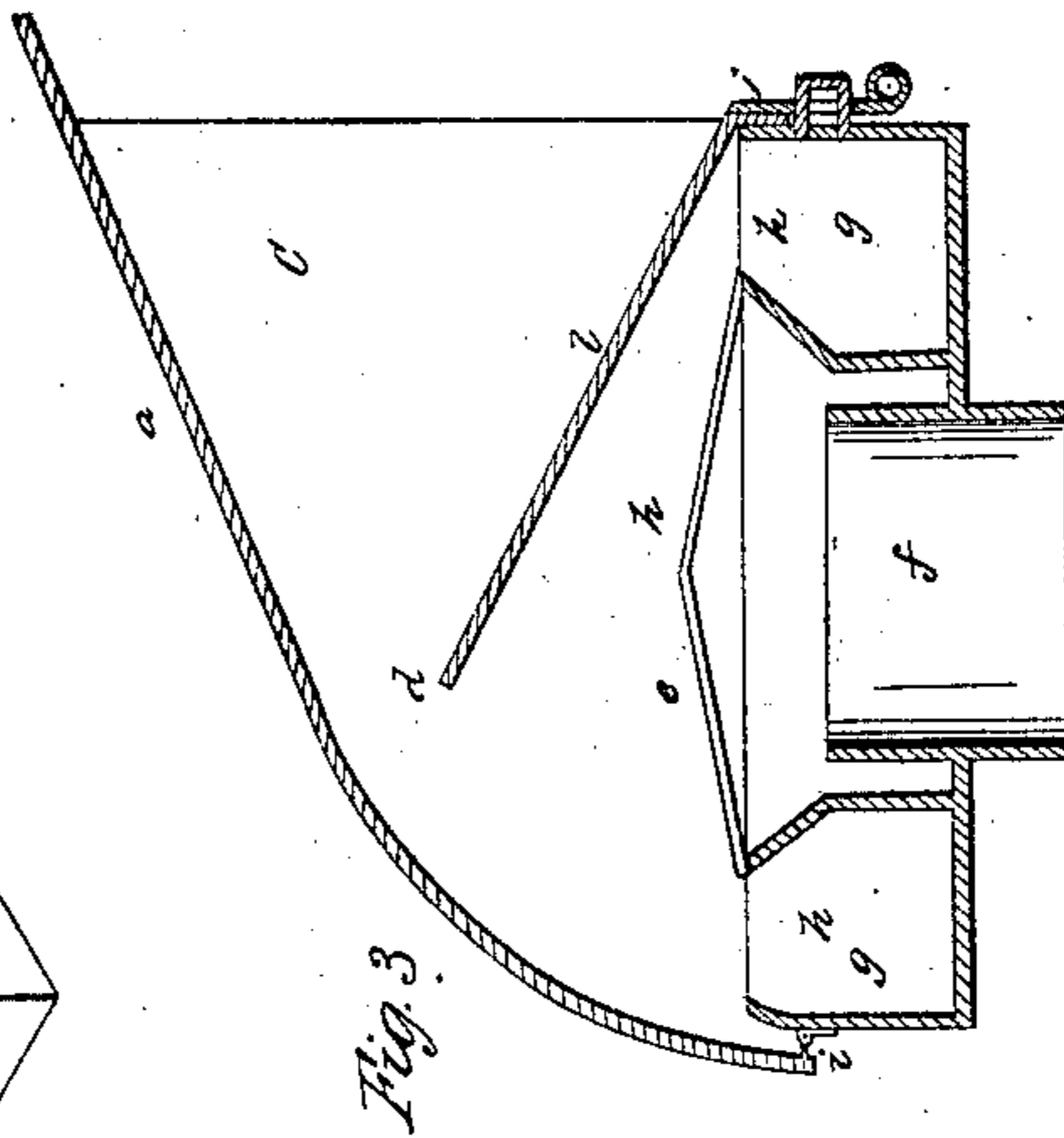
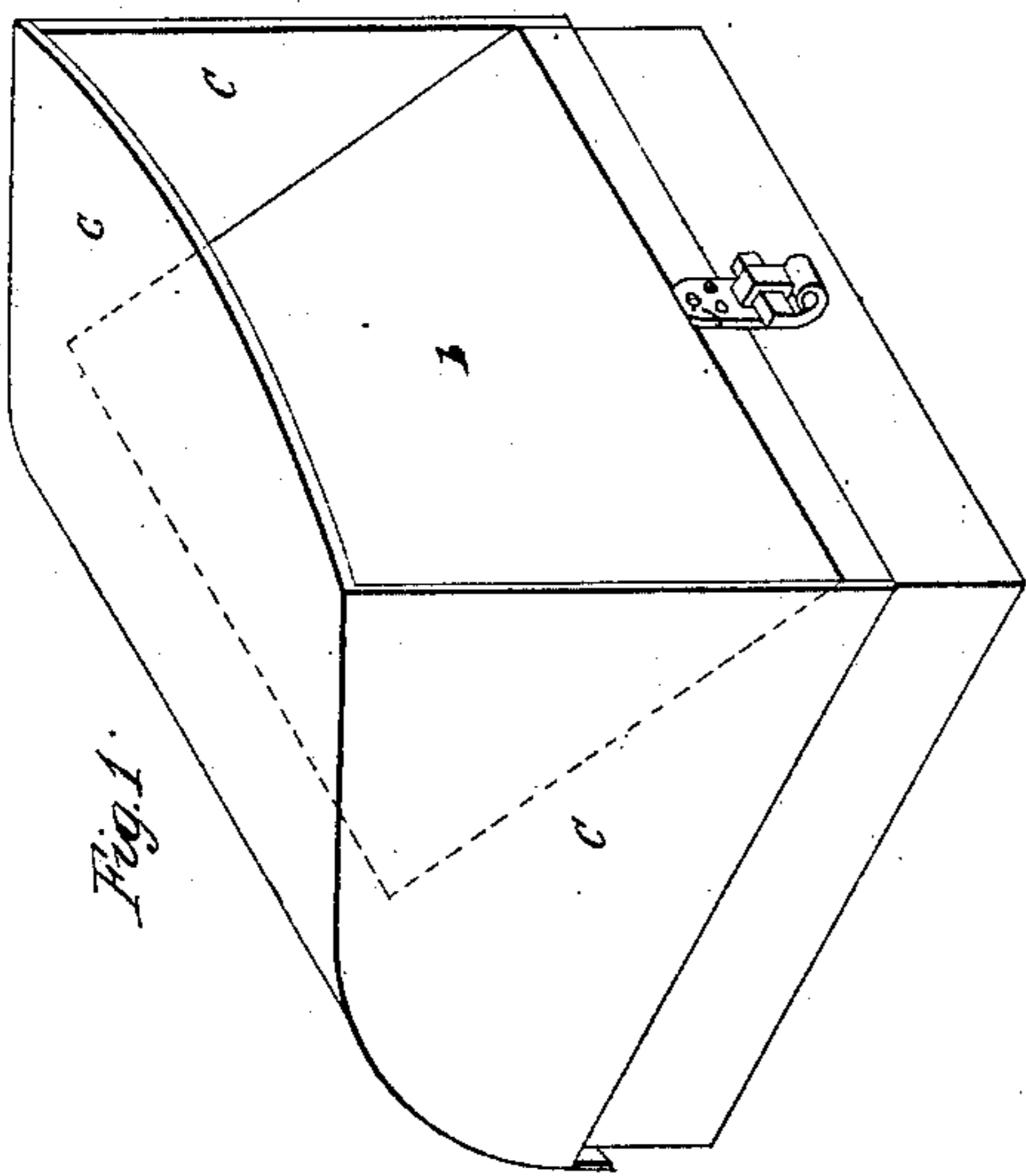
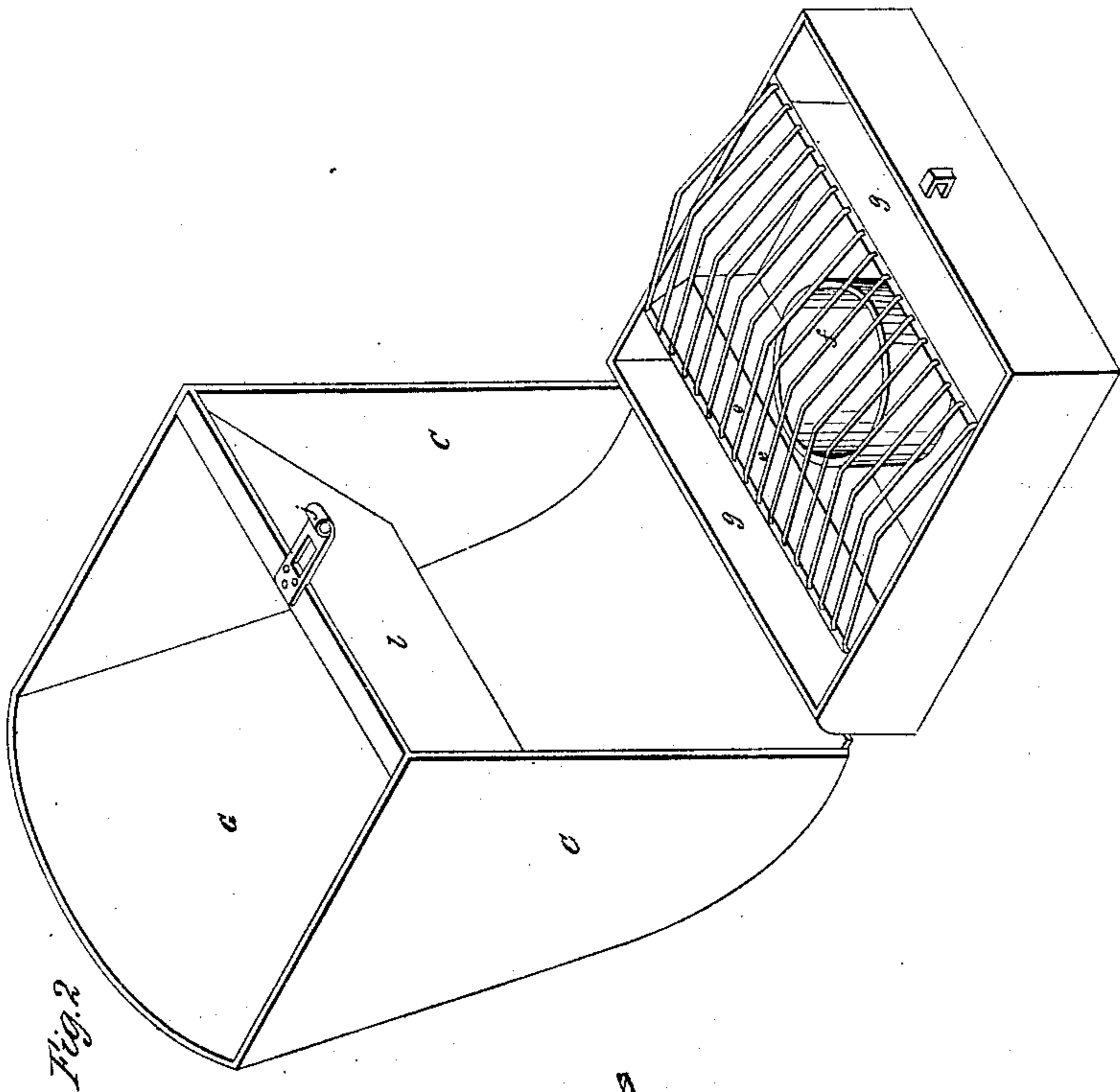


S. A. Clemens,

Car Ventilator,

Nº 10,251.

Patented Nov. 22, 1855.



UNITED STATES PATENT OFFICE.

S. A. CLEMENS, OF SPRINGFIELD, MASSACHUSETTS.

VENTILATING RAILROAD-CARS.

Specification of Letters Patent No. 10,251, dated November 22, 1853.

To all whom it may concern:

Be it known that I, STILLMAN A. CLEMENS, of Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Ventilators for Railroad-Cars, &c.; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

The nature of my improvement consists in an air filter, so made and arranged in connection with this apparatus, as to be kept wet with water, and through which a current of air is directed into the car or other apartment to which the apparatus is attached for the purpose of ventilation. The air filter may be made of sponge or felt or any porous or fibrous material or substance of such a degree of porosity as will readily absorb water by capillary attraction and at the same time permit the passage of a current of air through it when wetted. I have successfully used the filter made of sponges cut into thin sheets and sewed one upon the other or what is still better I have made the filter by cutting sponges into thin and narrow strips and woven them with twine warp using the strips of sponge for filling in the way the common rag carpeting is made. With proper care in weaving the material for the filter can thus be made of the thickness and density suitable for the use to which it is applied. The purpose for which the filter is used and arranged to be kept saturated with water is to purify and moisten the air which passes through it into the car or other apartment to be ventilated. This requires the ventilator to be constructed in such a way as will direct a current of air through the filter and also afford a constant supply of water to the latter and the form may be varied to effect these ends under different circumstances. The current of air directed through the filter may be either naturally or artificially produced according to the circumstances in which the ventilator is used.

The accompanying drawings represent a form of the ventilator designed for railroad cars and to be attached upon the roof of the car in the common way.

Figure 1 is a perspective view of the ventilator closed. Fig. 2 is a perspective view of the ventilator opened the cap being turned

back upon its hinge fastening and showing the interior of the apparatus with the sponge filter removed. And Fig. 3 is a sectional elevation showing the filter in position for use.

The same letters indicate like parts in each figure.

a and *b* Figs. 1, 2, and 3 represent respectively the top and intermediate plates of the apparatus by the opposite surfaces of which the air is gathered and in connection with the upright plates *c, c*, which join them and form the sides of the cap of the ventilator is directed in a current through the throat *d* (Fig. 3) into the body of the ventilator.

e, e, Figs. 2 and 3 represents a light grating of wire which lies over the circular opening *f*, (Figs. 2 and 3) through which the air passes into the car.

g g (Figs. 2 and 3) represent two water basins on opposite sides of the opening into the car.

h (Fig. 3) is the air filter resting upon the grating *e* and having its two opposite edges hanging from the grating into the water basins. The grating *e* is made a little crowning in the middle to prevent the water with which the filter may be saturated from collecting in drops upon the wires and dripping into the car through the opening *f*. And the area covered by the grating and filter is made much larger than that of the circular opening into the car in order that a sufficient quantity of air may more freely pass through the filter. The upper edges of the inner sides of the water basins are turned at an angle from each other to prevent the water splashing over through the opening into the car.

At *i* (Fig. 3) is a hinge by which the cap of the ventilator is attached to the lower part and on which it can be turned up to get access to the filter and water basins. The hinge is so attached as to set the lower edge of the cap plate *a*, a little distance off from the back side of the contiguous water basins for the purpose of permitting the escape of a small portion of the air current which enters the ventilator and which is to carry out with it the large particles of cinders, &c., which entering the throat *d* slide down upon the inner surface of the cap plate *a*.

j (Figs. 1, 2, and 3) is a catch by which the cap when shut down is secured to the lower part of the apparatus.

In attaching ventilators to the roofs of

railroad cars a metal tube or collar is commonly fastened in the air opening and made to extend a few inches above the roof. Upon this collar the tube of the above described ventilator is placed and thus adjusted it can be turned around upon the collar as upon an axis and cause the funnel-shaped opening to face toward either end of the car. It is made fast in either position as desired by a hook and staple or any other convenient connection with the roof which prevents its turning around unless the fastening is released by hand to reverse the position of the ventilator. When the apparatus is adjusted with its funnel opening in the direction the train is moving the motion of the cars causes a current of air to enter between the converging planes by which it is condensed and delivered through the throat into the body of the ventilator from which it passes through the filter and the tube into the car below.

To prepare the ventilator for use the water basins are nearly filled with water and the filter being wetted is placed in its position upon the grating with its opposite edges hanging in the water. By the passage of air through the filter the moisture with which it is saturated is rapidly evaporated and at the same time a steady supply is furnished by the capillary attraction of the substance drawing water from the basins and distributing it throughout the filter. By filling one of the basins and leaving the other empty when the wetted filter is put upon the grating as before by the joint action of capillary attraction and the principle of the siphon the water is drawn from the full basin and conveyed through the porous substance of the filter across into the empty basin until the fluid stands at about the same level in both. In this way a more copious supply of water can be furnished to the filter to meet the requirement of hot and dry weather. The dust and cinders which may collect on the upper surface and in the interstices of the filter may from time to time be removed by washing the filter in water.

By adjusting the ventilator in such a position that its funnel shaped opening faces in the direction opposite that in which the car to which it is attached is moving a tendency to a vacuum is produced in the space between the converging planes, and the air is drawn from the car upward through the ventilator and discharged externally. The construction and arrangement of the venti-

lator are thus adapted to effect both an outward and inward current of air but the filter is only useful when the current is directed into the car. When the apparatus is adjusted to produce an inward current of air and the cars are moving at the ordinary speed no difficulty is found in procuring a fair supply of filtered air in the car from the ventilator even though the windows and doors are closed as the air in the cars escaping through any existing cracks and fissures to make way for the external air forced in through the ventilator. But the quantity injected is sensibly increased by opening some of the windows especially those at the rear end of the car.

I have above described and pointed out the modes of constructing and applying my invention which I have essayed with success as applied to ventilating rail road cars through their roof; but it will be obvious that these may be greatly varied for ventilating cars and other purposes when the purification and moistening of currents of air are desirable without going beyond the limits of my invention and therefore I do not wish to confine myself to these special modes. Nor do I wish to limit myself to the use of all the subordinate parts of my invention as in some instances some of these may be dispensed with.

I do not claim the converging planes for gathering and condensing a current of air nor do I claim a mode of filtering air by causing it to pass through a porous or fibrous substance or material which is in a dry state or unprovided with arrangements for securing a continual supply of moisture to replace that which is evaporated by the air passing through it. Nor do I claim the arrangement for blowing the sparks outward through a narrow opening in the back of the ventilator.

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

The mode of ventilating rail road cars etc. by causing the air to pass through a sponge or other suitable porous or fibrous substance or material said material being provided with means for a continual supply of water to moisten it and replace that which is evaporated by the air which passes through it substantially as set forth and for the purpose specified.

S. A. CLEMENS.

Witnesses:

WM. M. McCAULEY,
 SAML P. BELL.