

(No Model.)

G. R. CASE.
AIR PUMP.

No. 435,010.

Patented Aug. 26, 1890.

Fig. 1

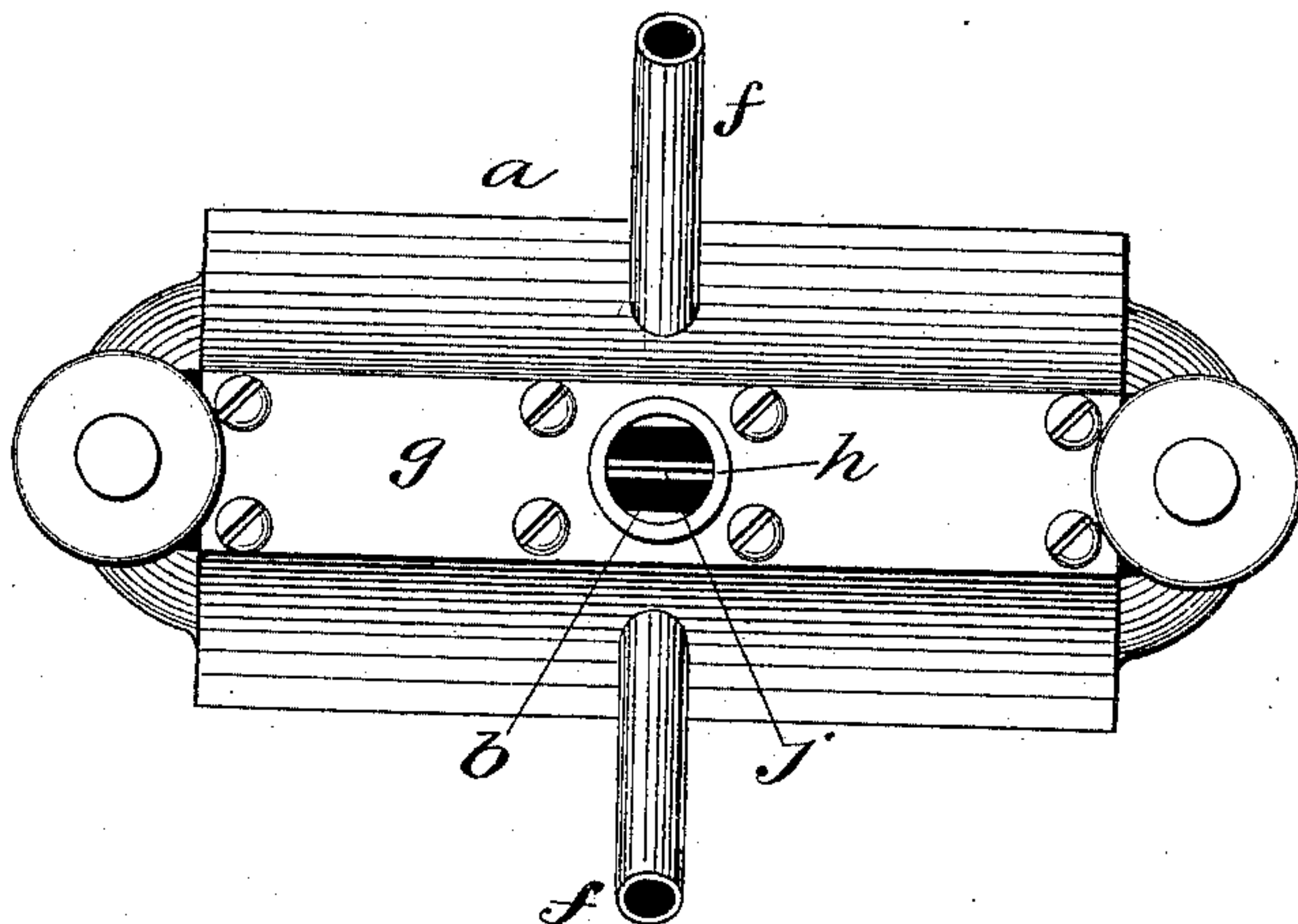


Fig. 2

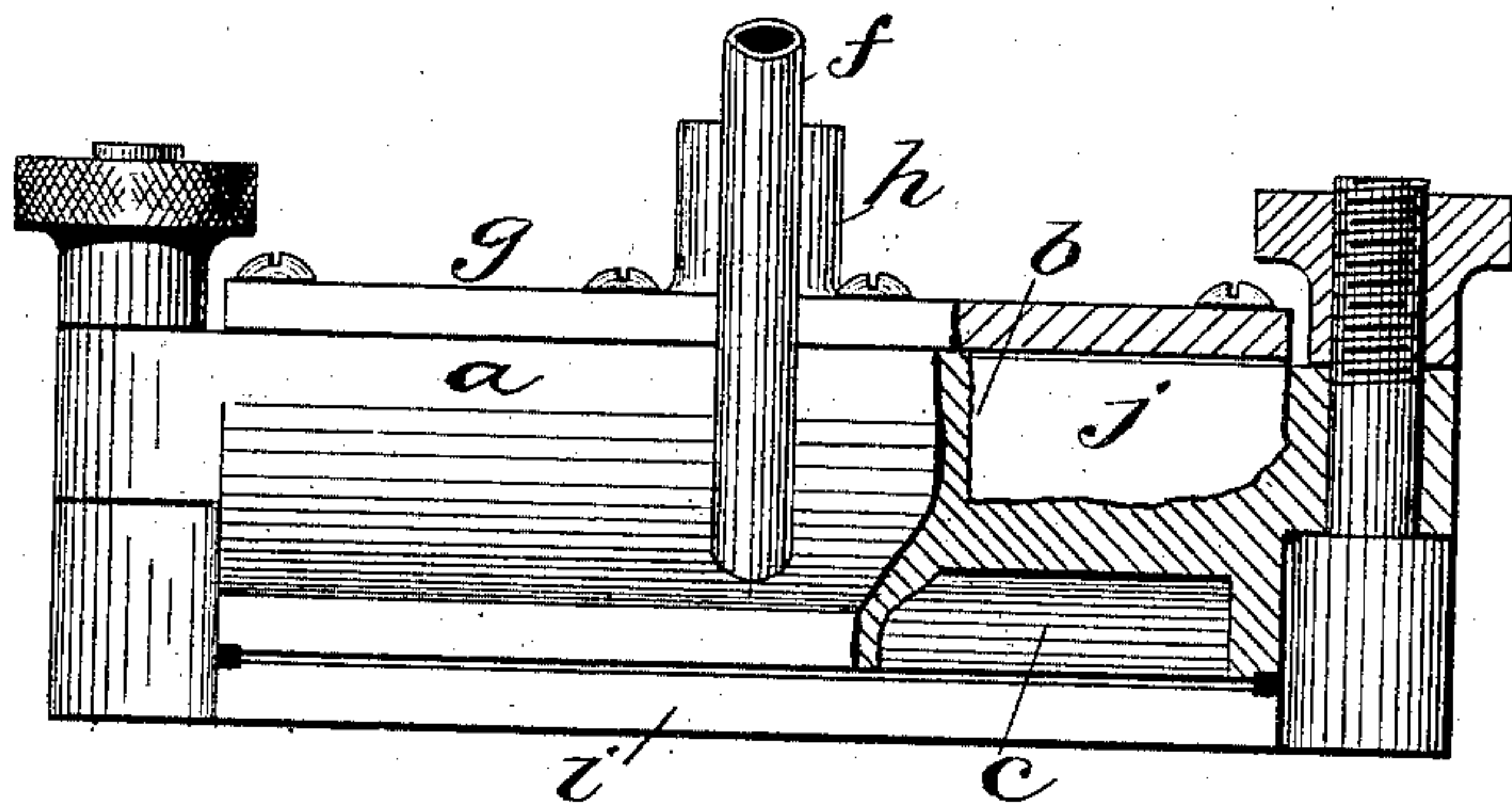
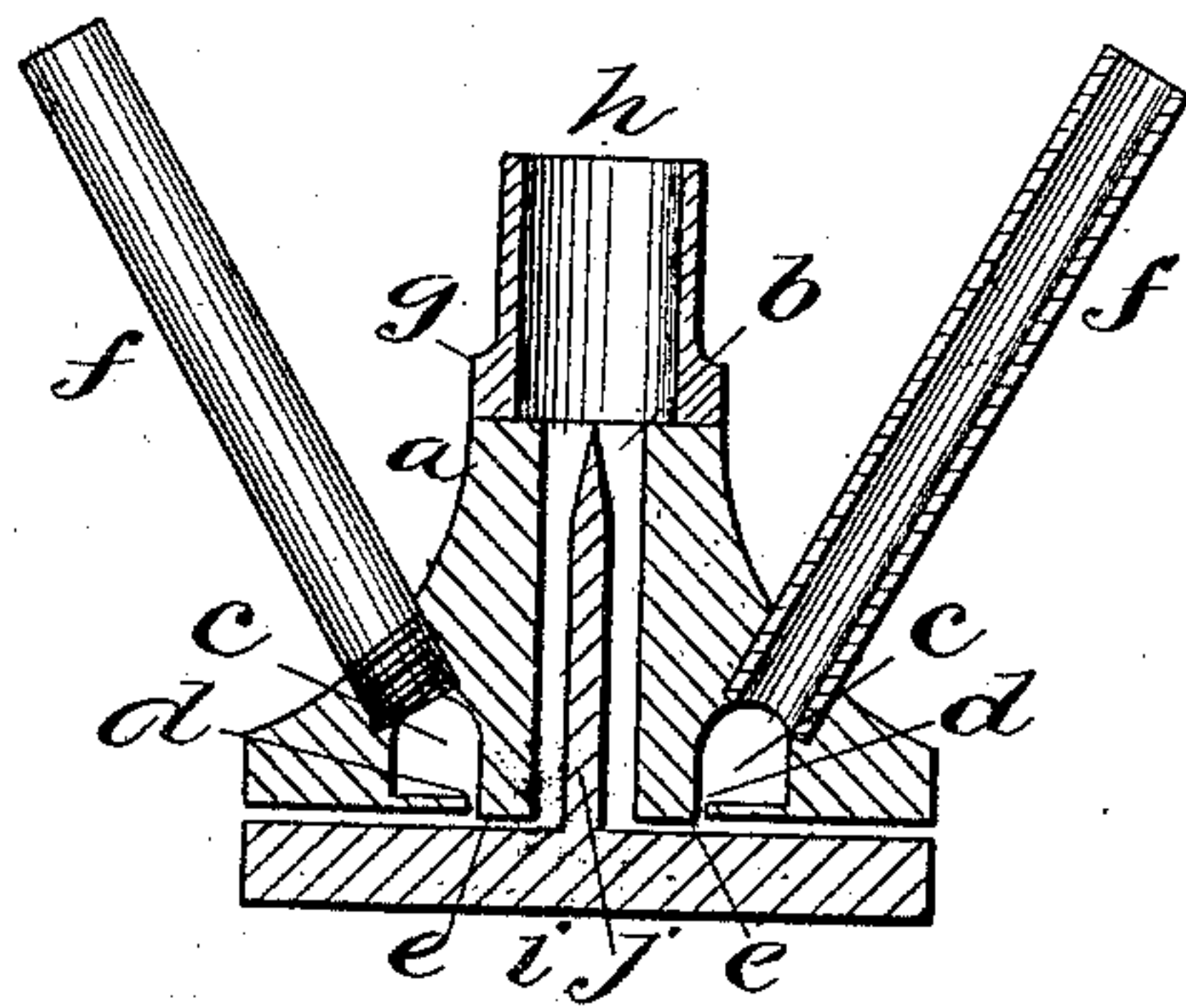


Fig. 3



Witnesses:

Arthur D. Jenkins.
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Inventor,

George R. Case, by
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Atty.

UNITED STATES PATENT OFFICE.

GEORGE R. CASE, OF HARTFORD, CONNECTICUT.

AIR-PUMP.

SPECIFICATION forming part of Letters Patent No. 435,010, dated August 26, 1890.

Application filed April 16, 1890. Serial No. 348,173. (No model.)

To all whom it may concern:

Be it known that I, GEORGE R. CASE, a citizen of the United States, residing at Hartford, in the county of Hartford and State of Connecticut, have invented certain new and useful Improvements in Air-Pumps, of which the following is a full, clear, and exact specification.

The invention relates to the class of devices for reducing the density of or wholly withdrawing gases, as air, to form a partial or complete vacuum in a vessel by the rapid flow of a fluid, as air or water; and the object is to construct a simple and cheap device which can be attached to any suitable fluid-supply, and will more rapidly and economically remove a large quantity of gas from a single or a battery of vessels than prior pumps of this class.

Referring to the accompanying drawings, Figure 1 is a top view of the pump. Fig. 2 is a side elevation with parts cut away to show the interior. Fig. 3 is a vertical transverse section of the pump.

In the views, the letter *a* indicates the body of the pump, which is preferably cast from a non-oxidizable or non-corrosive metal somewhat longer than it is wide, with a vertical longitudinal opening *b* and with longitudinal grooves or chambers *c* in the lower surface. The chambers *c* open through the bottom of the body by a very thin and narrow slit or crack *d*, which is parallel with the lower edge of the opening *b*, and the lower surface of the body between the lower edge of the opening *b* and the slit *d* projects slightly farther downward than the remaining portion, so as to form a shoulder or ridge *e* along the edge of the slit. Any desired number of tubes or nipples *f* may be connected to the body so as to open into the chambers *c*, and a cover-plate *g*, provided with a hub *h*, that opens into the opening *b*, is secured to the top of the body. A bottom plate *i* is held a slight distance from the bottom of the body, preferably by means of bolts or threaded screws that pass through perforations in projections from the ends of the body and plate, and clamp-nuts which screw upon the bolts and secure the parts together. This plate is provided with a central longitudinal upwardly-projecting diaphragm or

partition *j*, which projects into and divides the opening *b* into two chambers. The upper edge of this partition is preferably beveled, so as to present but little obstruction to the passage of fluid through the chambers.

In use the hub *h* is attached to the fluid-supply outlet, which fluid may be air, water, mercury, carbonic-acid gas, or the like, held under suitable pressure to give the desired velocity when passing through the pump, and the tubes *f* are joined by any suitable connections with the vessels from which the gas is to be removed. The fluid which is utilized to produce the rarefaction as it passes through the hub *h* is divided and goes each side of the partition *j*, and is deflected at an angle, preferably a right angle, by the bottom plate, and passes out in opposite directions through the thin cracks left between the bottom of the body and the top of the plate, and as the fluid under pressure travels through this narrow outlet in rushing past the slit *d* an initial vacuum is formed under the mouth of the slit, behind the shoulder *e*, which withdraws the gas from the chambers *c*, which in turn pulls the gas from the vessels in which the vacuum is to be formed. A battery of tubes may lead into the chambers *c*, and each of these tubes may be connected with a separate vessel, so that a number may be emptied at the same time.

The device is cheap in construction, and the chambers *c* and the narrow longitudinal outlet-slit *d* may be of considerable length without increasing the width of the device, thus keeping it small in size while increasing its efficiency.

I claim as my invention—

1. An air-pump consisting of a body provided with a vertical longitudinal opening connected with the fluid-supply pipe and having a reduced horizontal outlet, and a longitudinal chamber which opens by a thin slit into the reduced horizontal outlet, connected with the vessel to be emptied of gas, substantially as specified.

2. An air-pump consisting of a body provided with a vertical longitudinal opening connected with the fluid-supply pipe and having reduced horizontal outlets, a longitudinal diaphragm separating the reduced outlets, and longitudinal chambers which open by

thin slits into the reduced horizontal outlets connected with vessels to be emptied of gas, substantially as specified.

3. An air-pump consisting of a body provided with a vertical longitudinal opening connected with the fluid-supply pipe and having a reduced horizontal outlet, and a longitudinal chamber which opens by a thin slit into the reduced horizontal outlet connected with the vessel to be emptied of gas, the said horizontal outlet varying in thickness, whereby a shoulder is formed along the opening-slit from the longitudinal chamber, substantially as specified.

4. An air-pump consisting of a body pro-

vided with a vertical longitudinal opening connected with the fluid-supply pipe and having reduced horizontal outlets, a longitudinal diaphragm separating the reduced outlets, and longitudinal chambers which open by thin slits into the reduced horizontal outlets connected with vessels to be emptied of gas, the said horizontal outlets varying in thickness, whereby a shoulder is formed along each opening-slit from the longitudinal chambers, substantially as specified.

GEORGE R. CASE.

Witnesses:

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