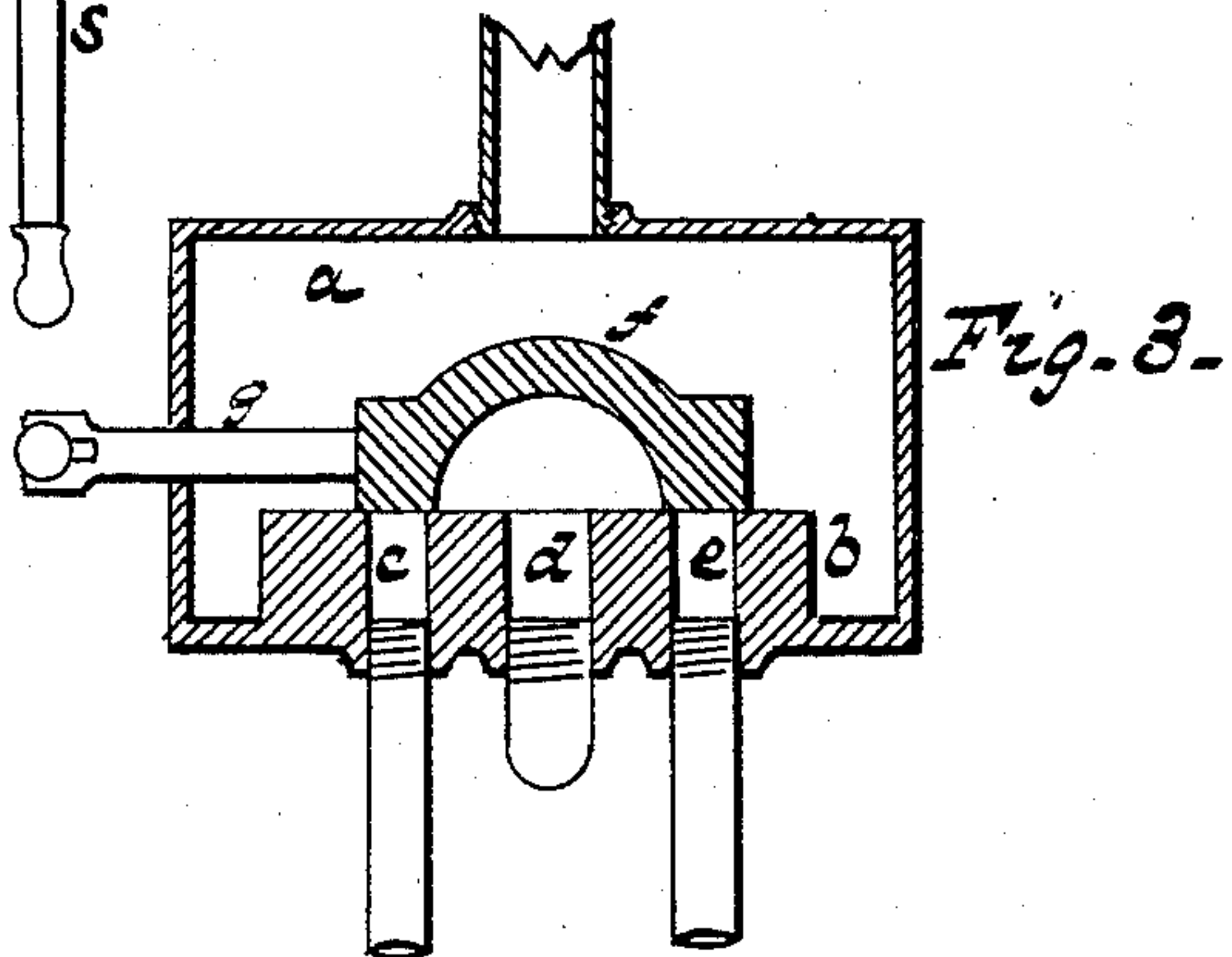
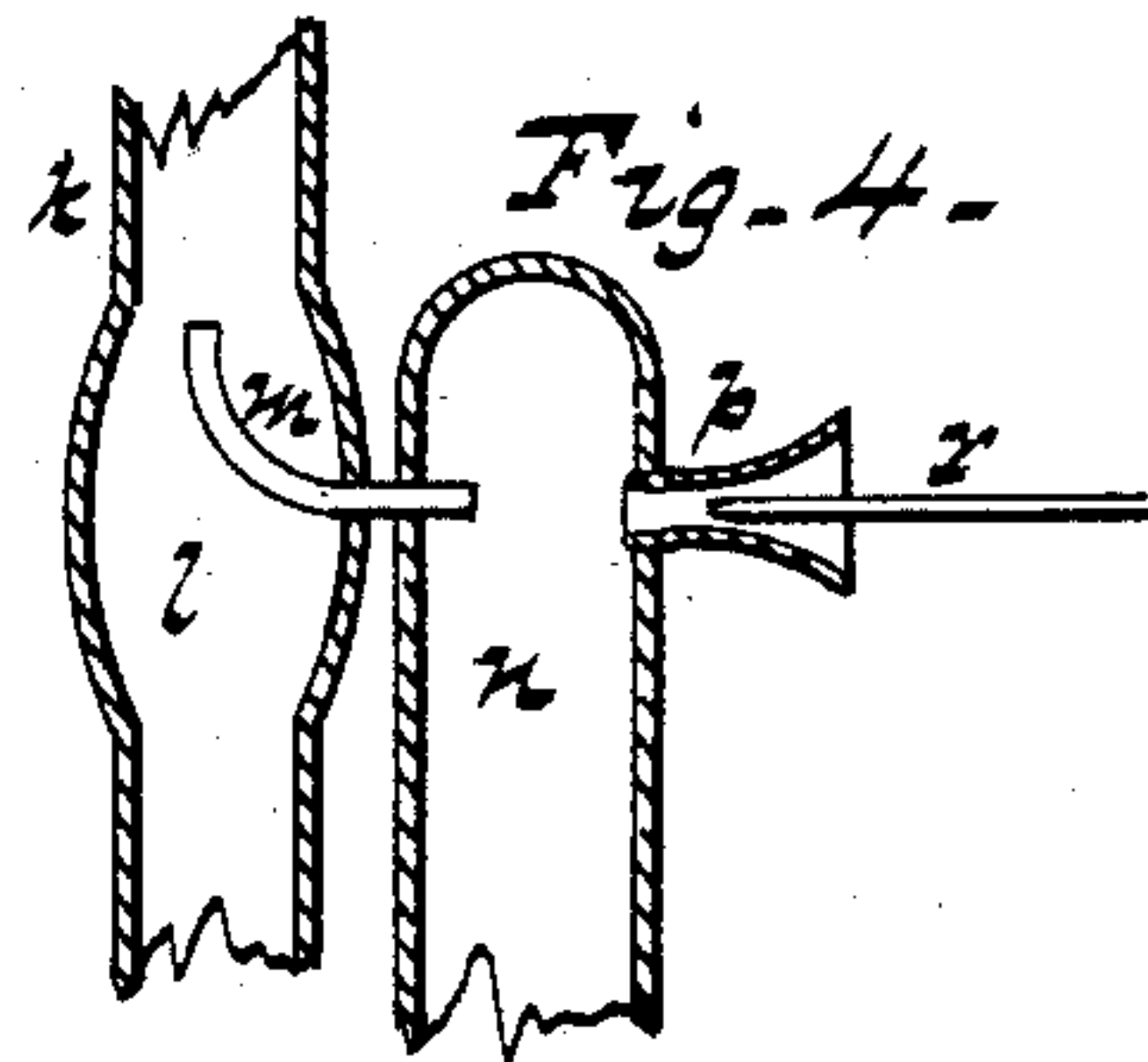
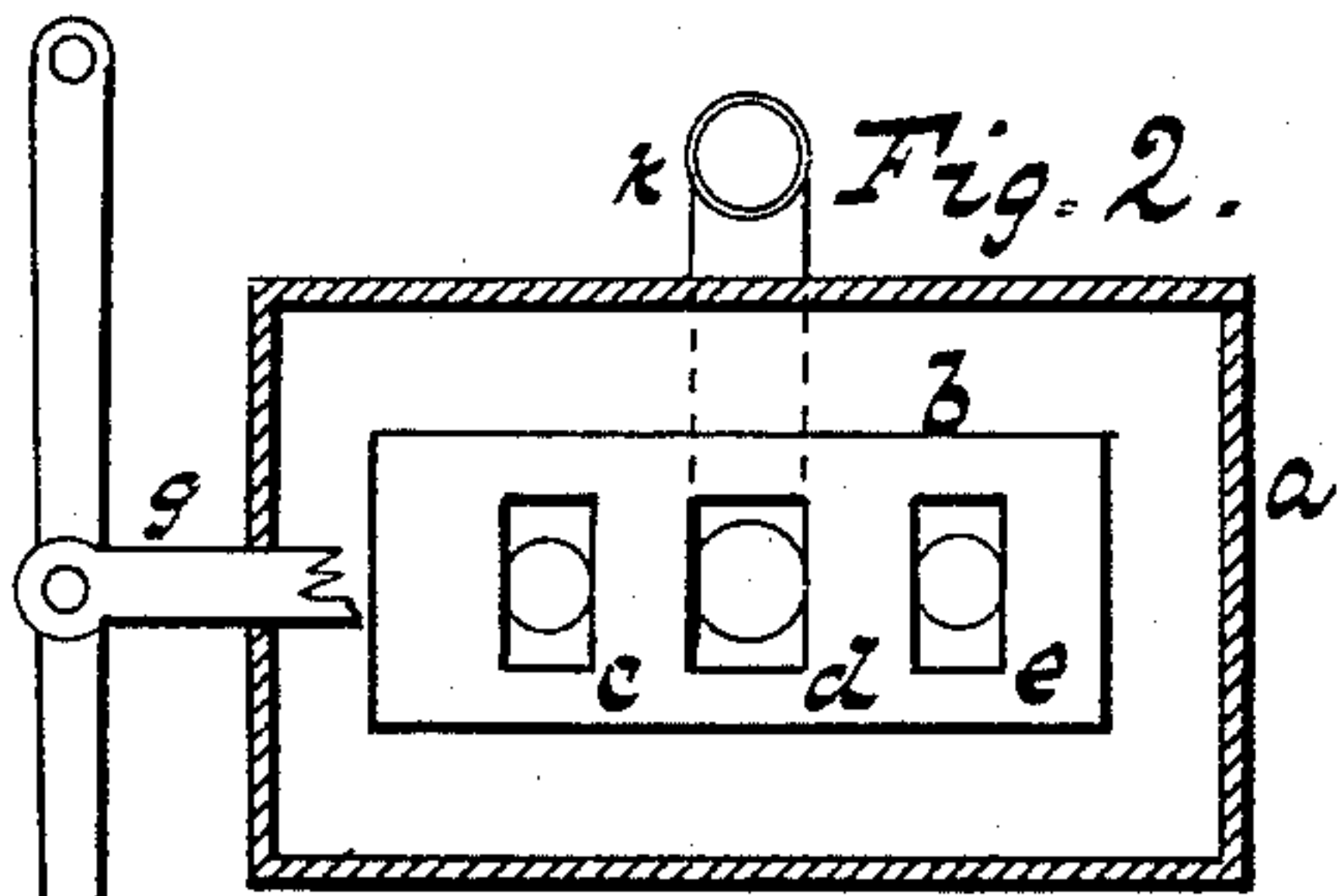
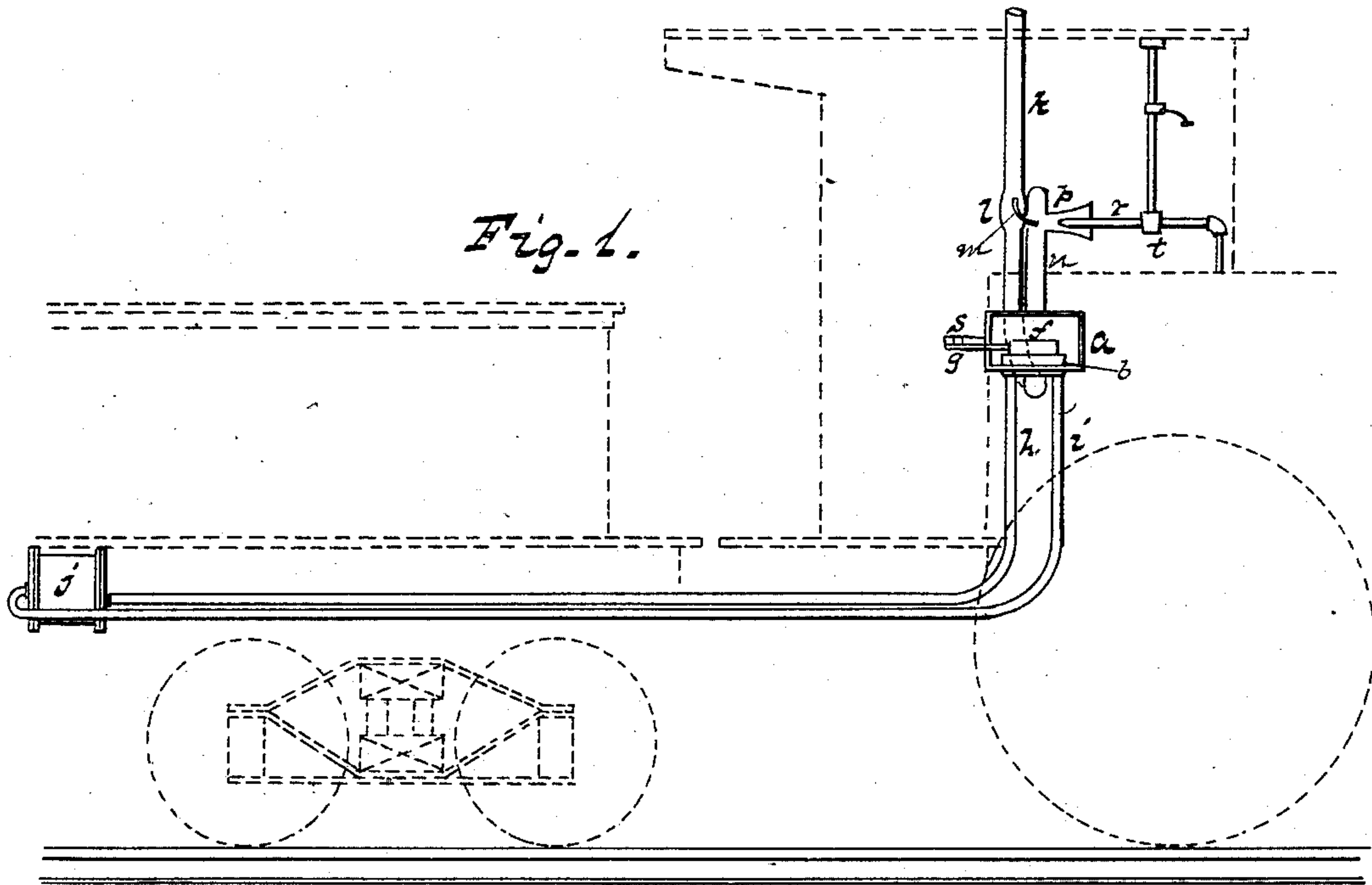


(No Model.)

G. W. DARBY.  
MEANS FOR OPERATING CAR BRAKES.

No. 315,012.

Patented Apr. 7, 1885.



Witnesses:  
M E Harrison  
E J Harrison

Inventor.  
George H. Darby  
Per O D Lewis  
att'y.

# UNITED STATES PATENT OFFICE.

GEORGE W. DARBY, OF ALLEGHENY CITY, PENNSYLVANIA.

## MEANS FOR OPERATING CAR-BRAKES.

SPECIFICATION forming part of Letters Patent No. 315,012, dated April 7, 1885.

Application filed October 15, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. DARBY, a citizen of the United States, and a resident of Allegheny City, in the county of Allegheny and State of Pennsylvania, have invented a new and useful means for operating car-brakes of that class wherein the brakes are caused to act by exhausting the air within a cylinder from one side of a piston and allowing it to enter at its normal or natural pressure on the opposite side of the piston, whereby the brake in connection therewith may be "set" or released quickly and at will, of which the following is a specification.

The invention I have made consists in the construction, combination, and arrangement of pipes and other parts with a valve-chamber containing a sliding valve and such ports as will accomplish the object of my invention, which will be readily understood from the following description, taken in connection with the accompanying drawings, wherein—

Figure 1 represents a side elevation of such parts as comprise my invention as applied to a locomotive and its tender, as shown in dotted lines; Fig. 2, a section, on a horizontal plane, of the valve-chest and the ports or openings therein; Fig. 3, a vertical central section of said valve-chest and its valve therein; Fig. 4, an enlarged vertical section of that portion of the device wherein the exhaust is effected.

To put my invention into practical form I combine with the exterior of the locomotive at any convenient point or location thereon a rectangular valve-chest, *a*, containing a suitable valve-seat, *b*, through which are three ports or openings, *c d e*, covered by a hollow sliding valve, *f*, provided with an operating rod or stem, *g*, all of which are very similar to those in use on many small steam-engines. From each of the two outside ports, *c e*, an independent pipe, *h* and *i*, extends to and is made to communicate with the interior of a closed cylinder, *j*, arranged underneath the tender or car for operating its brakes. One of these pipes is joined to one end of said cylinder *j* and the other pipe to its opposite end.

The central port, *d*, is provided with a vertical exhaust-pipe, *k*, that extends upward through the roof of the cab, and the middle section of this pipe *k* is somewhat enlarged or swelled to increase the size of its interior at that point. In the side of this swelled portion *l* of the exhaust-pipe *k* is entered and curved upwardly a smaller pipe, *m*, the inner end of which terminates just above the aforesaid enlargement *l*, the other end being in communication with a vertical close chamber, *n*, adjacent thereto, which chamber *n* is provided with an outwardly-extending trumpet-shaped mouth, *p*, wherein is located the nozzle or contracted end of a small pipe, *r*, connected with the boiler of the locomotive, and provided with a suitable cock, *t*, for the admission and regulation of such steam as may be required.

The several parts having been constructed, combined, and arranged with respect to each other in the manner shown and described, upon the admission of live steam under pressure from the boiler to the pipe *r*, leading into the trumpet-shaped mouth *p* of the vertical chamber *n*, it will quickly pass therefrom directly into and through the short curved pipe *m*, extending upward in the exhaust-way *k*, driving before it all the air found therein, and producing a strong suction on the central port, *d*. Now, if the valve *f*, by means of its lever *s*, be so moved or shifted on its seat as to bring the central port, *d*, in communication with either of the other two ports, the air will be speedily drawn from that end of the cylinder in connection therewith, producing a partial or complete vacuum proportioned to the force of the steam. At the same time the air will enter the opposite end of the cylinder through that pipe in connection with the uncovered port in such a manner as to act directly against the piston within the cylinder and force it in one direction, and which may be reversed by a simple change in the position of the valve.

Having thus briefly described my invention and its mode of operation, I claim—

As a means for operating car-brakes by atmospheric-air pressure on one side of a pis-



ton in connection with a complete or partial vacuum on the other side, the combination of a valve-chest containing openings or ports for the admission or withdrawal of air  
5 from a cylinder and pipes communicating therewith, a valve that shall slide over, close, open, and operate said air-ports, an exhaust-

pipe supplied with an inlet for live steam, and a stop-cock or means for controlling the same.

GEORGE W. DARBY.

Witnesses:

M. E. HARRISON,  
E. I. HARRISON.