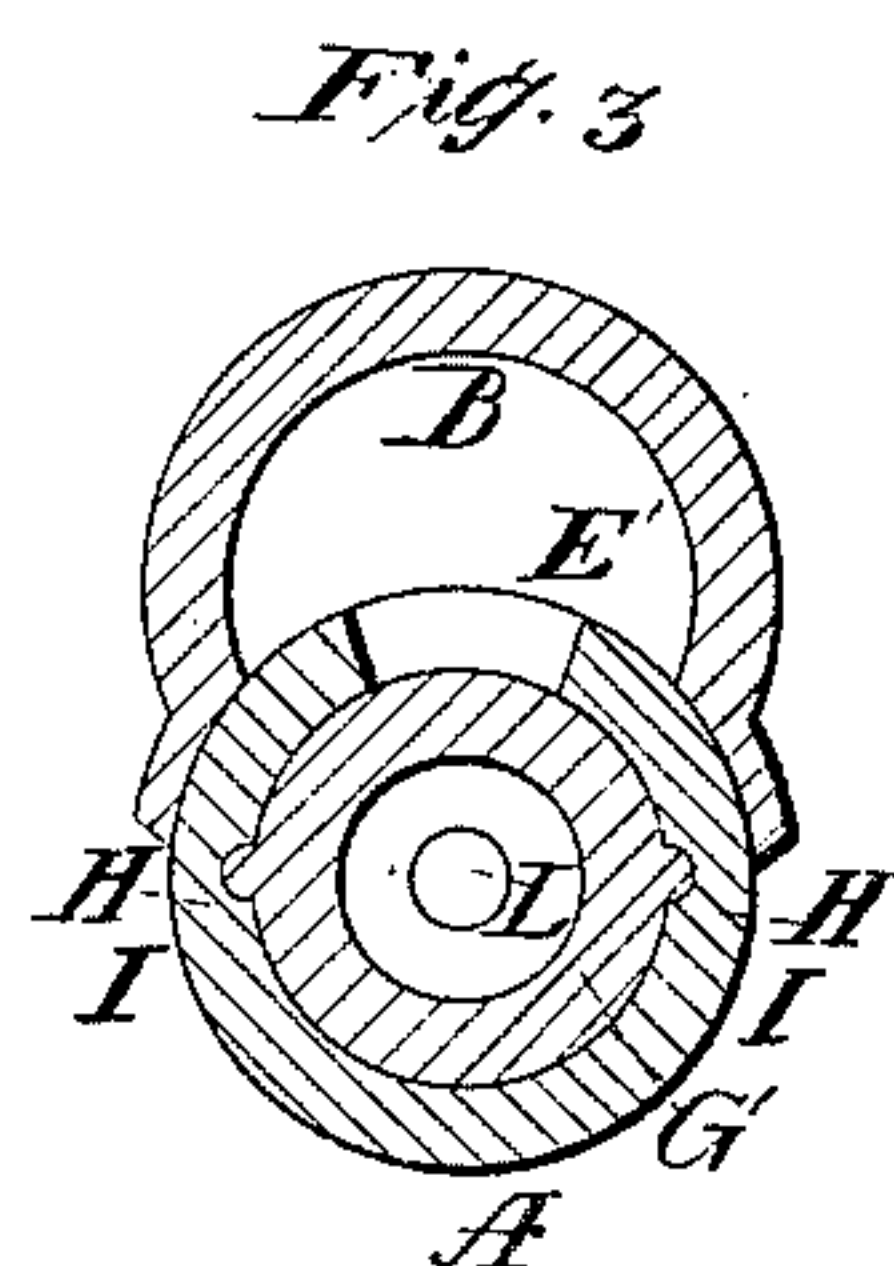
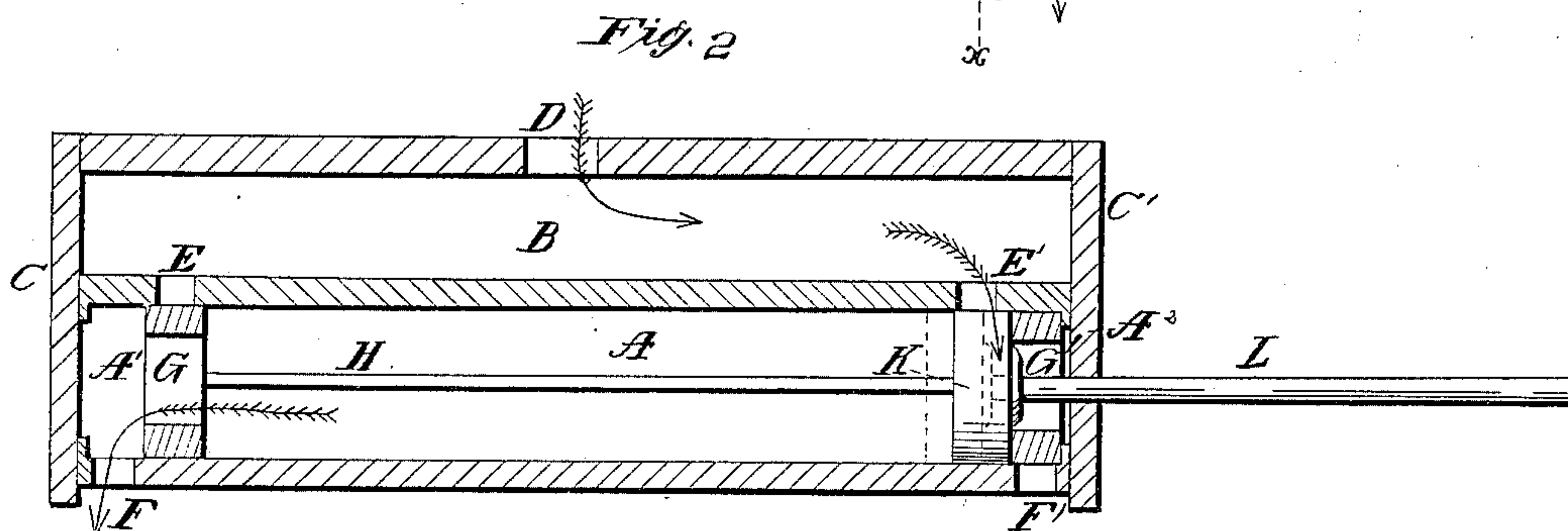
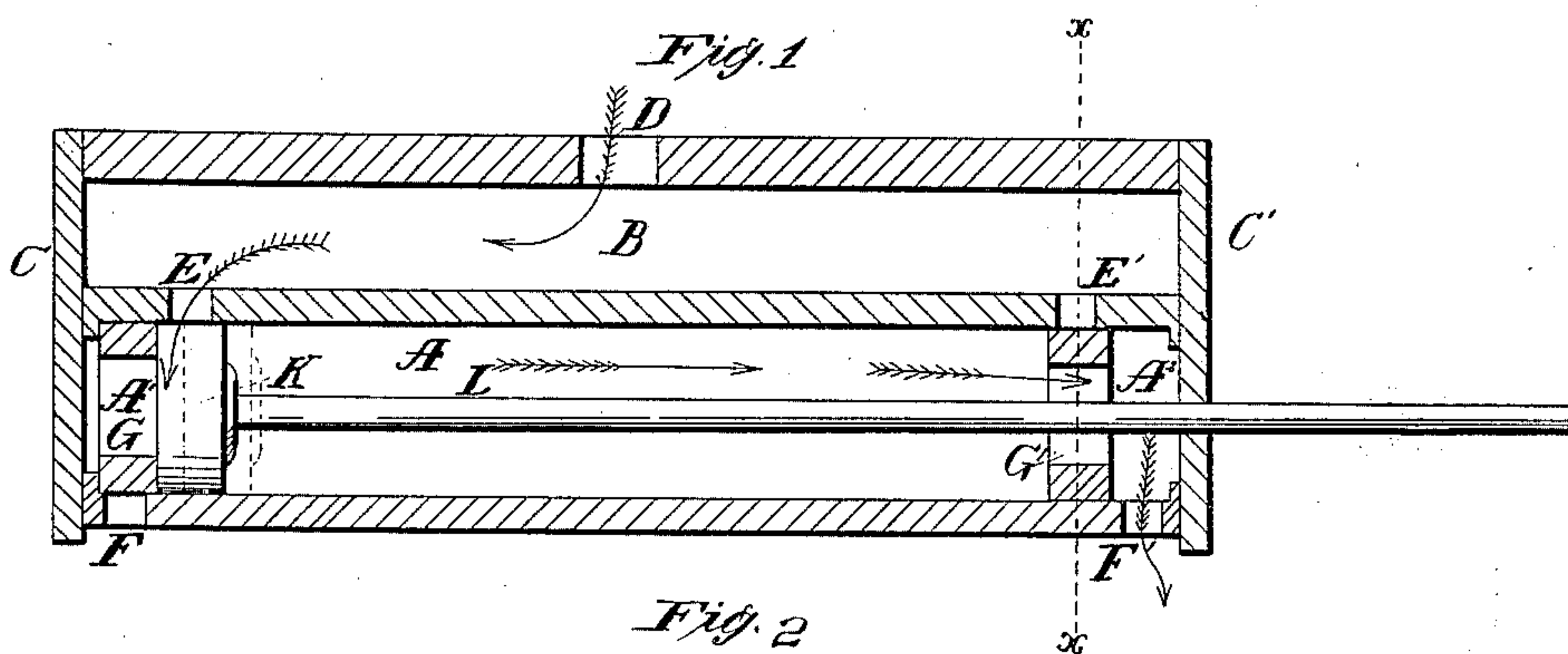


I. L. Bennett,
Steam Slide Valve.
N^o 6,096. Patented Feb. 6, 1849.



UNITED STATES PATENT OFFICE.

ISAAC L. BENNETT, OF WESTERLOW, NEW YORK.

PISTON-VALVE INCLOSED IN THE STEAM-CYLINDER.

Specification of Letters Patent No. 6,096, dated February 6, 1849.

To all whom it may concern:

Be it known that I, ISAAC L. BENNETT, of the town of Westerlow, in the county of Albany and State of New York, have invented a new and useful Improvement in Cut-Off Valves for Steam Engines, called "Bennett's Circular Cut-Off," which is described as follows, reference being had to the annexed drawings of the same, making
10 part of this specification.

Figure 1 is a longitudinal section through the center of the steam chest and steam cylinder, the arrows showing the direction of the steam when the piston is at the position represented by dotted lines in moving
15 toward the opposite end of the cylinder. Fig. 2, is also a longitudinal section of the steam chest and steam cylinder, the arrows showing the direction of the steam when the piston is at the position represented by dotted lines, its motion having been reversed and it being in the act of moving toward the opposite end of the cylinder. Fig. 3,
20 is a tranverse section of the steam cylinder and chest on the dotted line x, x , of Fig. 1, showing one of the valves and the piston rod.

Similar letters in the several figures refer to corresponding parts.

30 A is the steam cylinder; and B the steam chest, made in the usual manner, or in any convenient way.

c, c' , are the two heads.

35 D is the entrance for the steam from the boiler.

E, E', are two induction tubes through which the steam passes from the steam chest to the cylinder when the said tubes are alternately opened by the movement of the sliding ring valves.
40

F, F', are two eduction tubes through which the steam escapes from the cylinder, having acted against the two sides of the piston alternately.

45 G, G', are two sliding ring valves for opening and closing the induction and eduction tubes alternately.

H is a parallel connecting rod which connects the two sliding ring valves and causes
50 them to move simultaneously when one of them is struck by the piston.

K is the piston moving alternately to the right and left between the valves.

L is the piston rod.

55 The valves G G' are of the form of short hollow cylinders the diameter of the steam

cylinder, and packed with metallic, or other, packing in any convenient way. The valves are fixed to the rods H so that when one eduction or induction tube is open the other
60 will be closed, having just play enough in the cylinder, longitudinally, to produce this result. The piston is made solid like other pistons and is packed and secured to the rod L in the usual way. Its diameter is equal
65 to the internal diameter of the cylinder.

The connecting rods of the valves pass through the piston. The apertures in the piston through which the connecting rods pass being packed in any suitable and effective
70 manner, so that the joints shall be steam tight and yet allow the piston to slide freely back and forth over them.

Operation: The steam chamber B being filled with steam from the boiler will pass
75 through the induction tube E to the space between the piston and the end A' of the cylinder, and will drive the piston toward the opposite end A² of the cylinder; and during its traverse will strike the valve G'
80 Fig. 1, and move it against the end A² of the cylinder in the position represented at G' Fig. 2, and at the same time will change the position of the valve G at the opposite ends of the cylinder, being connected by
85 the rods H; thus closing the induction tube E that was open at the commencement of the operation and opening the one (E') that was closed and producing a like change in the position of the valves with respect to
90 the eduction tubes, letting off the steam at one end and confining it at the other end. The instant the piston is brought to the position represented by dotted lines in Fig. 2, by the continued rotary motion of the
95 fly wheel and crank the steam will rush in between the piston and end A² of the cylinder and will force the piston toward the end A' of the cylinder—the piston striking the valve G in its traverse and changing its
100 position and that of the valve G' and cutting off the steam from the induction tube E' that was open and letting it on to that which was closed—at the same time opening and closing one of the eduction tubes to correspond therewith—as represented in the
105 drawings.

The simplicity of the construction and the certainty of action of this arrangement of steam "cut-off" valves for steam engines
110 will be so very evident from an inspection of the drawings and perusal of the descrip-

tion that any further explanation would be considered superfluous.

The connecting rods may be affixed to the peripheries of the ring valves outside the piston and made to slide in parallel grooves on the inside of the cylinder as represented in the drawing; passing the rods, however, through the piston as described, I think, will generally be preferred; or a connection of rods outside of the cylinder; or a connection by longitudinal rods placed in grooves in the sides of the cylinder by which the cylinder will be left entirely free for the movement of the valves and piston.

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

The employment of the two sliding ring valves G G' in combination with the cylinder

A and reciprocating piston K for admitting the steam to, and discharging it from the cylinder in reciprocal succession by the alternate direct action of the piston on the ring valves and without the intervention of any other agent; whether the valves be connected in the manner described, or in any other way which is substantially the same, and by which analogous results are produced.

In testimony whereof I have hereunto signed my name before two subscribing witnesses this thirtieth day of June, 1848.

ISAAC L. BENNETT.

Witnesses:

DAN PEASE, Jr.,
WM. P. ELLIOT.