

G. W. ANDERSON.
Slide-Valve for Steam-Engines.

No. 223,693.

Patented Jan. 20, 1880.

Fig. 1.

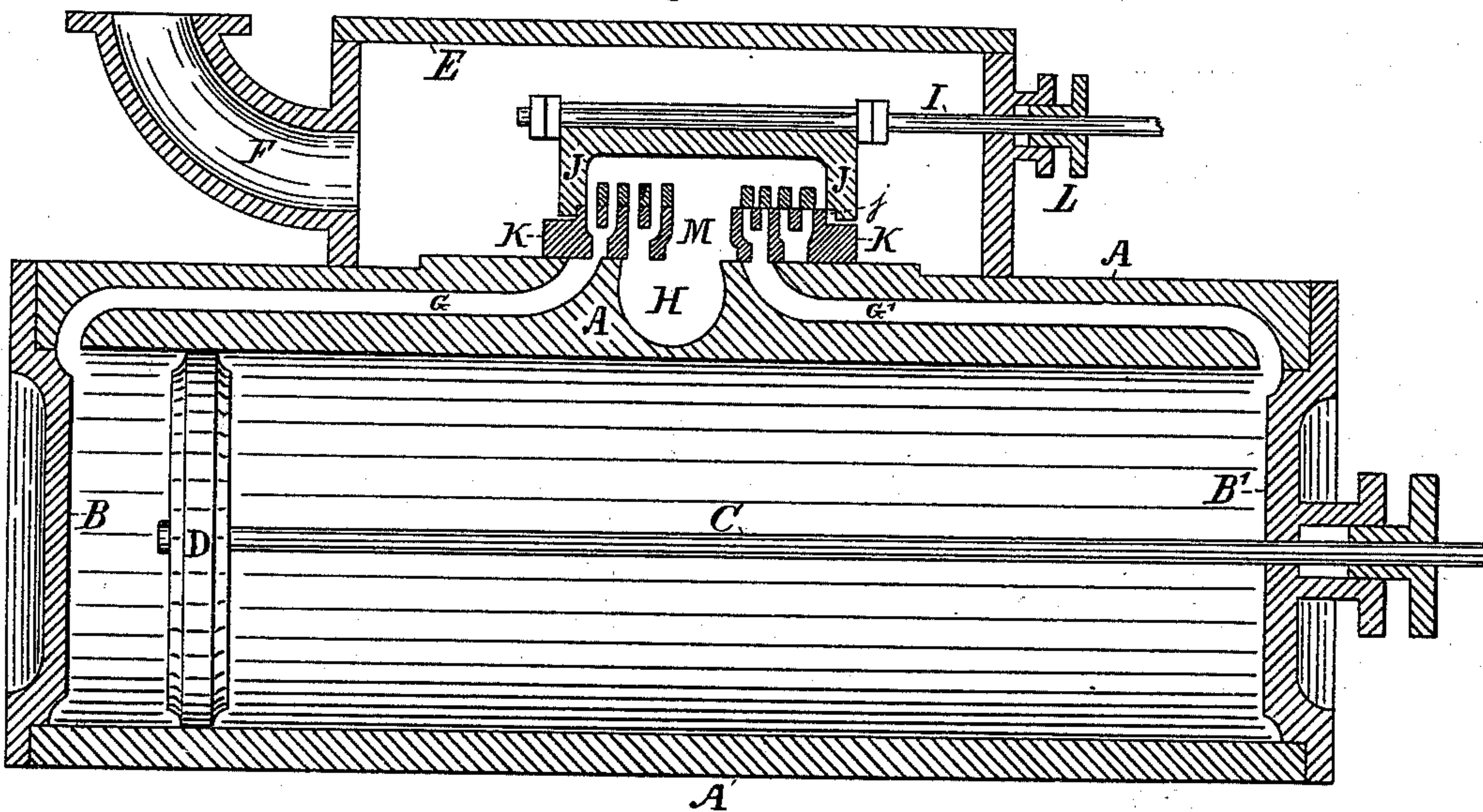


Fig. 2.

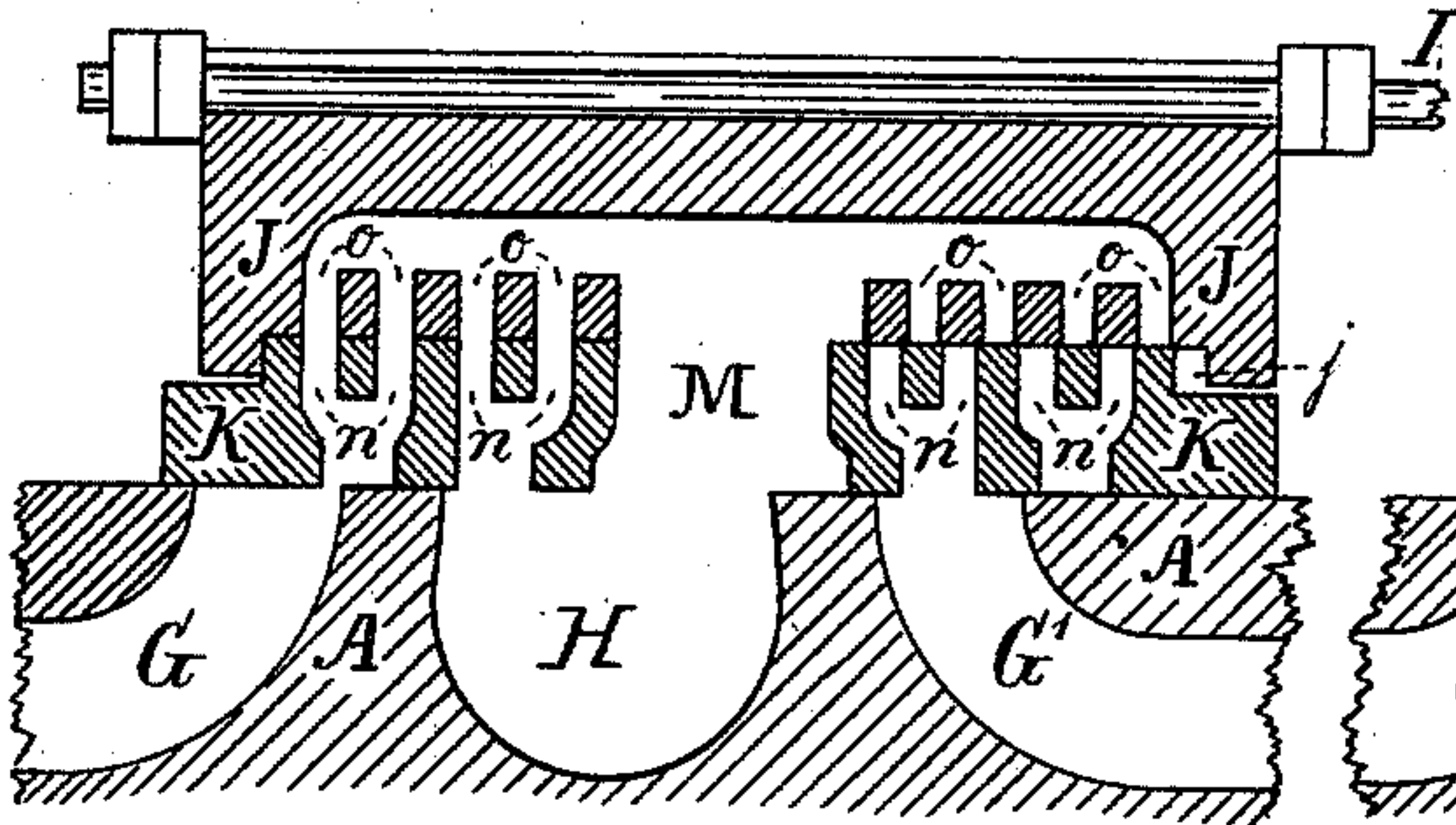
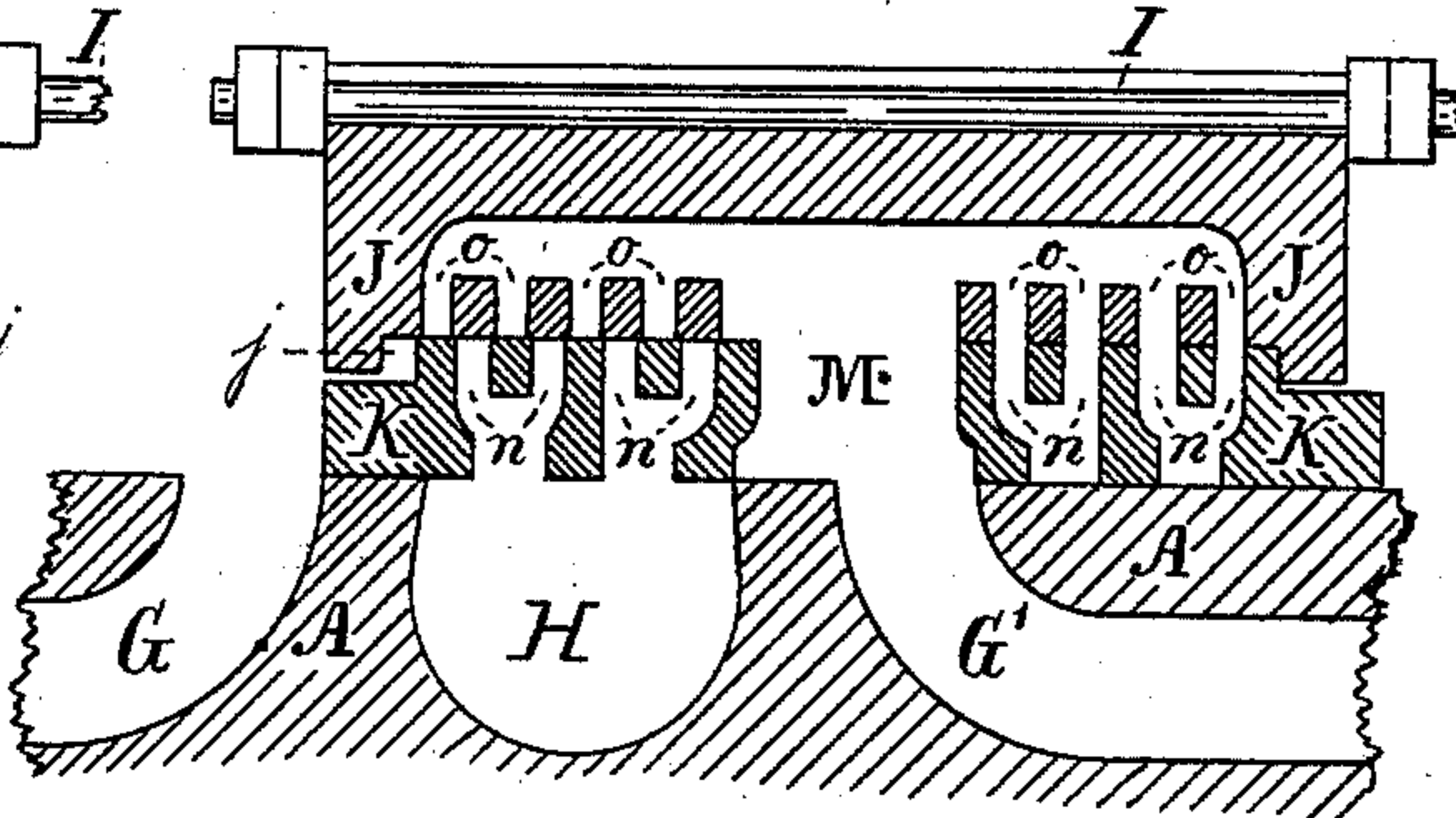


Fig. 3.



WITNESSES.

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GEORGE W. ANDERSON, OF ELIZABETHTOWN, INDIANA, ASSIGNOR TO
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SLIDE-VALVE FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 223,693, dated January 20, 1880.

Application filed August 22, 1879.

To all whom it may concern :

Be it known that I, GEORGE W. ANDERSON, of Elizabethtown, county of Bartholomew, and State of Indiana, have invented certain new and useful Improvements in Slide-Valves for Steam-Engines, of which the following is a specification, reference being had to the accompanying drawings, which are made part hereof, and on which similar letters
10 of reference indicate similar parts.

Figure 1 is a longitudinal vertical section of the cylinder and steam-chest of an ordinary engine with which my improved valve is used. Fig. 2 is a sectional view of the valve and
15 valve-seat separately, on an enlarged scale, in the same position as in Fig. 1. Fig. 3 is a sectional view of the same parts shown in Fig. 2, but showing them in the position they occupy when the stroke of the valve, which is illustrated as in course of being made by the
20 other views, has been completed and the return stroke commenced.

The object of my invention is to construct a valve which shall allow the steam to exhaust until the stroke of the piston has been
25 entirely completed, and thus prevent the cushioning and consequent loss of power which results from the leaving of a portion of the used steam in the cylinder. To accomplish this object I have devised a system of supplemental exhaust-ports in the valve, which
30 operate as hereinafter specified.

In the drawings, the portions marked A represent the cylinder to an ordinary steam-engine; B B', the heads thereto; C, the piston-rod; D, the piston-head; E, the steam-chest; F, the steam-pipe; G G', the steam-ports; H, the exhaust-port; I, the valve-stem; J K, the two parts of my improved valve; L,
40 a stuffing-box for the valve-stem; M, the main exhaust-port through the valve J K, and *n o* the small supplemental exhaust-ports in the valve, which are peculiar to my invention.

In the drawings, Fig. 1, the port G' is serving as the live-steam port, though the entrance
45 of the steam has been cut off by the valve and the engine is supposed to be "running on expansion." As will be seen, the piston-head

D has almost reached the extreme end of its stroke, while the port G still has a slight connection with the corresponding supplemental exhaust-ports *n o* of the valve, which permits the used steam to escape by way of M to the exhaust-port H of the engine. It will be understood in this connection that the greater
55 part of the exhaust takes place through the ports G, G', M, and H, in the usual manner, without the aid of the supplemental ports.

As soon as the exhaust is fully completed the valve begins to open for the admission of
60 fresh steam from the steam-chest and the piston commences its return stroke, the valve continuing its travel until the piston is half-way to the desired point of cut-off. When this has taken place the upper half, J, of the
65 valve slides along the lower half to the extent indicated by the small open space *j*, thus opening the supplemental ports on that side and closing those that had previously been open, as shown in Fig. 3. When the return
70 stroke is nearly completed the same operation takes place with reference to the exhaust-steam through the port G' and the corresponding supplemental exhaust-ports that
75 has been hereinbefore described in connection with the port G.

While my invention may be employed in connection with any engine which permits the use of a slide-valve, I regard it as particularly applicable to locomotive-engines, or those having an automatic cut-off.
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I divide the supplemental ports into several parts, as shown, so that the movement of the part J of the valve upon the part K need only be small—usually about one-eighth of an inch.
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As will be seen, the part K of the valve is slightly wider than the part J. It is also somewhat longer. This is so that the pressure of the steam in the steam-chest may be greatest upon the part K, and thus prevent it
90 from moving until the part J has moved the slight distance necessary to close the proper supplemental exhaust-ports and open the others.

In using my invention it makes no difference at what point in the stroke of the piston
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live steam is cut off, as the exhaust will continue in all cases to the extreme end of the stroke, unless the valve is misconstructured.

Having thus fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is—

The combination of the two parts J and K of a slide-valve, provided with supplemental exhaust-ports, which are opened and closed by the movement of the part J, and one of said parts having the offsets that form the

space *j* between said parts, when all constructed and arranged substantially as shown, and for the purpose set forth.

In witness whereof I have hereunto set my hand and seal at Indianapolis, Indiana, this 14th day of August, A. D. 1879.

GEORGE W. ANDERSON. [L. S.]

In presence of—

C. BRADFORD,
SAMUEL BRAY.