

(No Model.)

S. MILLS.
DUPLEX STEAM VALVE.

No. 353,457.

Patented Nov. 30, 1886.

Fig. I.

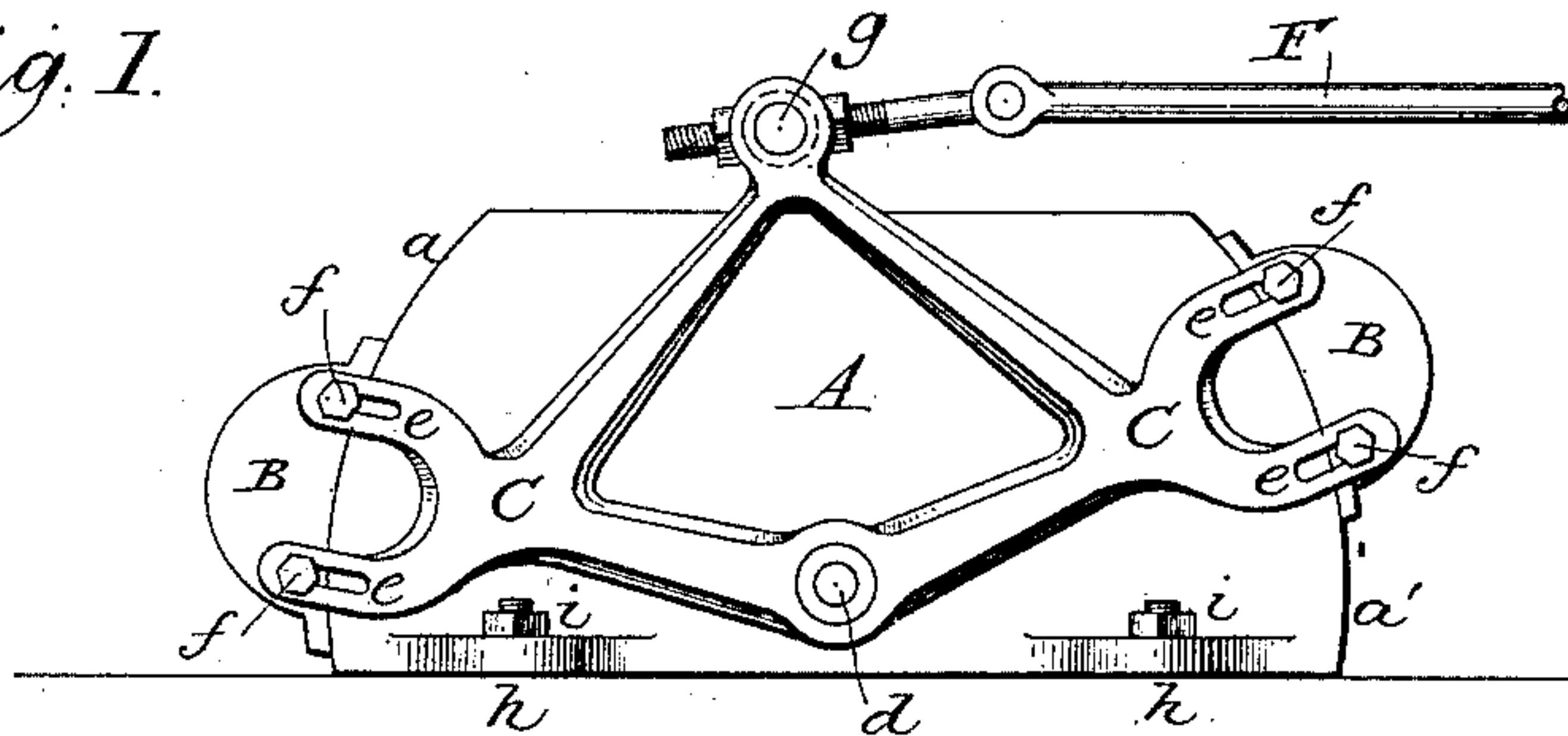


Fig. 2.

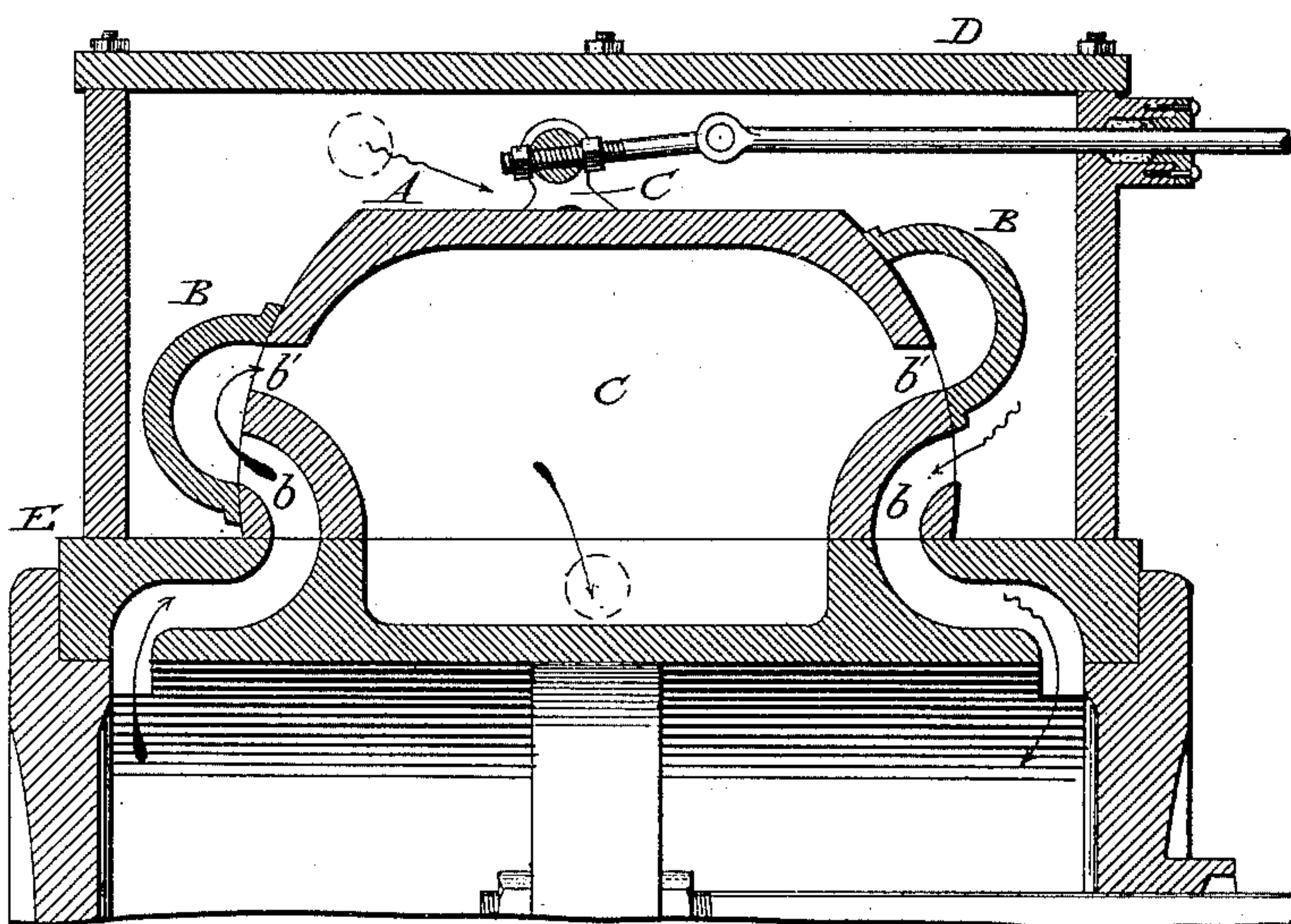
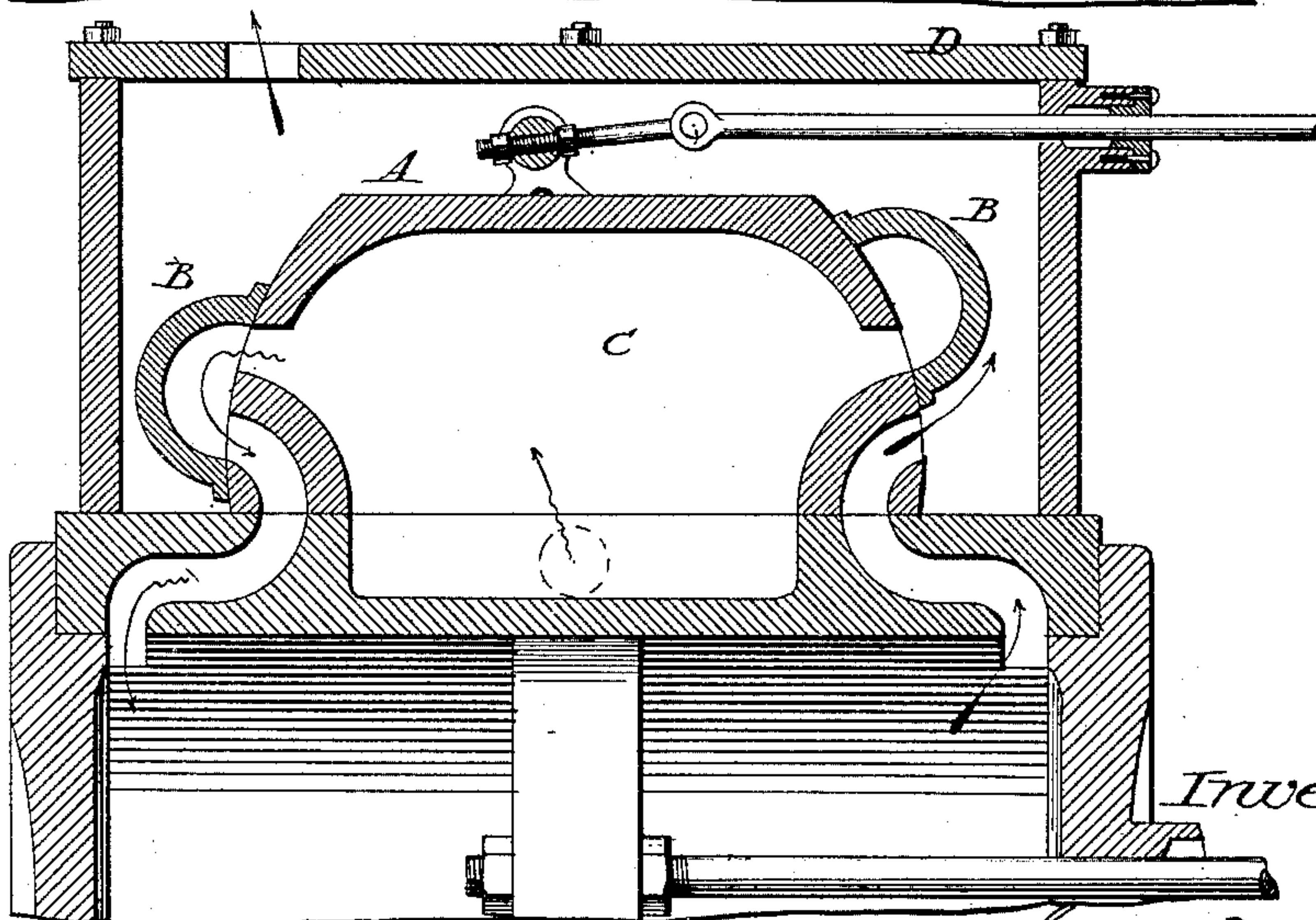


Fig. 3.



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UNITED STATES PATENT OFFICE.

SIMEON MILLS, OF MADISON, WISCONSIN.

DUPLEX STEAM-VALVE.

SPECIFICATION forming part of Letters Patent No. 353,457, dated November 30, 1886.

Application filed May 21, 1886. Serial No. 202,901. (No model.)

To all whom it may concern:

Be it known that I, SIMEON MILLS, a citizen of the United States, residing at the city of Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Duplex Steam-Valves; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to duplex steam-valves; and it consists of duplex concave steam-valves fitted and adjusted to the duplex convex faces of the valve-seat, the valves being attached to and carried by duplicate rock shafts, operated by the eccentric-rod from a common center within the steam-chest.

The object of my invention is to entirely relieve and prevent any and all friction of the valve upon the valve-seat by reason of the pressure of steam upon the valves when the engine is in operation.

In the drawings, Figure 1 is a side elevation of the valves, valve-seat, rock-shaft, and eccentric-rod. Fig. 2 is a longitudinal vertical section of the same, as well as of the steam-chest and end of the cylinder of the engine. Fig. 3 is also a longitudinal vertical section of the same, as well as of the steam-chest and a portion of the cylinder of the engine, showing by the arrows the reverse movement of the steam when the hollow valve-seat is used as the steam-chest and the exhaust-steam is discharged through the steam-chest, the steam being supplied through the upper ports to either end of the cylinder by the oscillating rotary movement of the valves, and when thus used the friction of the valves upon the valve-seats will be automatically relieved by the outward pressure of the steam.

A is the valve-seat, having its ends provided with convex faces *a a'*, as shown in all the figures, and also with steam-ports *b b* and *b' b'*, and a hollow space, *c*, in its under interior side, all arranged as clearly shown in Fig. 2. To each end of the valve-seat A is fitted a concave valve, B, and upon each side a rock-shaft,

C, is pivoted upon or attached to a common axle, *d*, so that the two shafts may rock or operate from and upon a common center. The outer ends of these shafts are provided with longitudinal slots *e e*, and between them the valves B B are arranged and attached, and then adjusted to the ends of the valve-seat A by set-screws *f f*, passing through the slots *e e*, as clearly shown in Fig. 1, or by any other suitable device. The rock-shafts C C are rigidly connected by a cross-rod, *g*, to which the operating eccentric-rod E is attached, as shown in Fig. 1. The duplex valve thus constructed also has its valve-seat provided with ears *h h*, and, by means of bolts or screws *i i* passing through them, can be secured in its proper place in the steam-chest D, so as to have its steam-ports connect with the ports of the cylinder F of the engine, as clearly shown in Fig. 2. When thus arranged and operated by the eccentric, the valves will supply steam to either end of the cylinder alternately through the steam-ports *b b*, the exhaust-steam escaping through the ports *b' b'* to the exhaust-chamber *c* of the valve-seat, all as shown by the arrows in the same figures.

A duplex steam-valve thus constructed, arranged, and adjusted will prevent all friction of the valves upon the valve-seat caused by the pressure of the steam when the engine is in operation, and it may be conveniently substituted, when desired, for ordinary slide D-valve.

Having thus described my invention, what I claim is—

1. A duplex steam-valve consisting of a double-faced convex valve-seat, A, the adjustable concave valves B B, and rock-shafts C C, constructed and arranged to operate as herein shown and described.

2. In combination with the valve-seat A and the valves B B, the rock-shafts C C, having their ends provided with slots *e e*, and set-screws *f f*, for adjusting the valves to the valve-seat, as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

SIMEON MILLS.

Witnesses:

ROBERT WOOTTON,

C. B. WOOTTON.