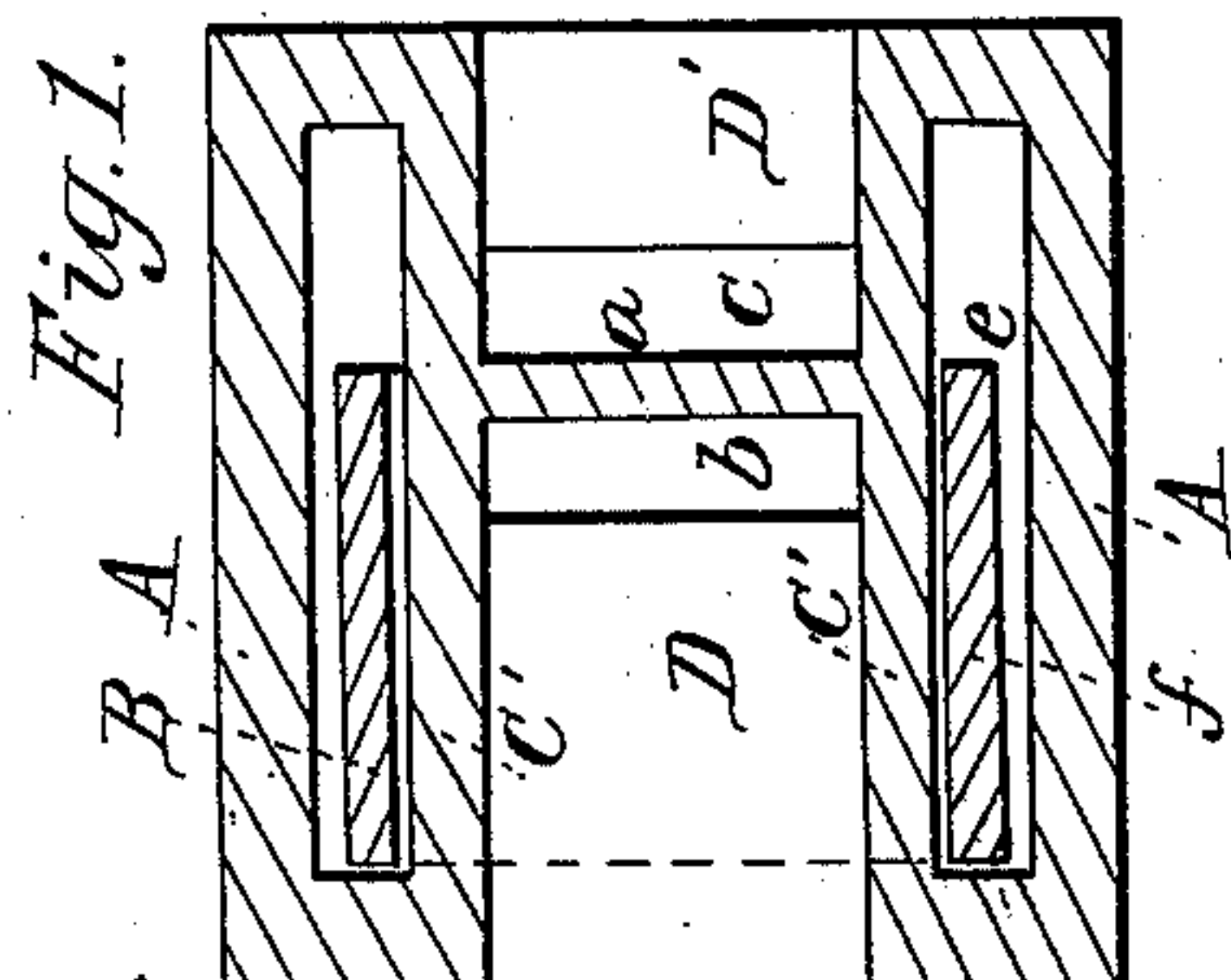
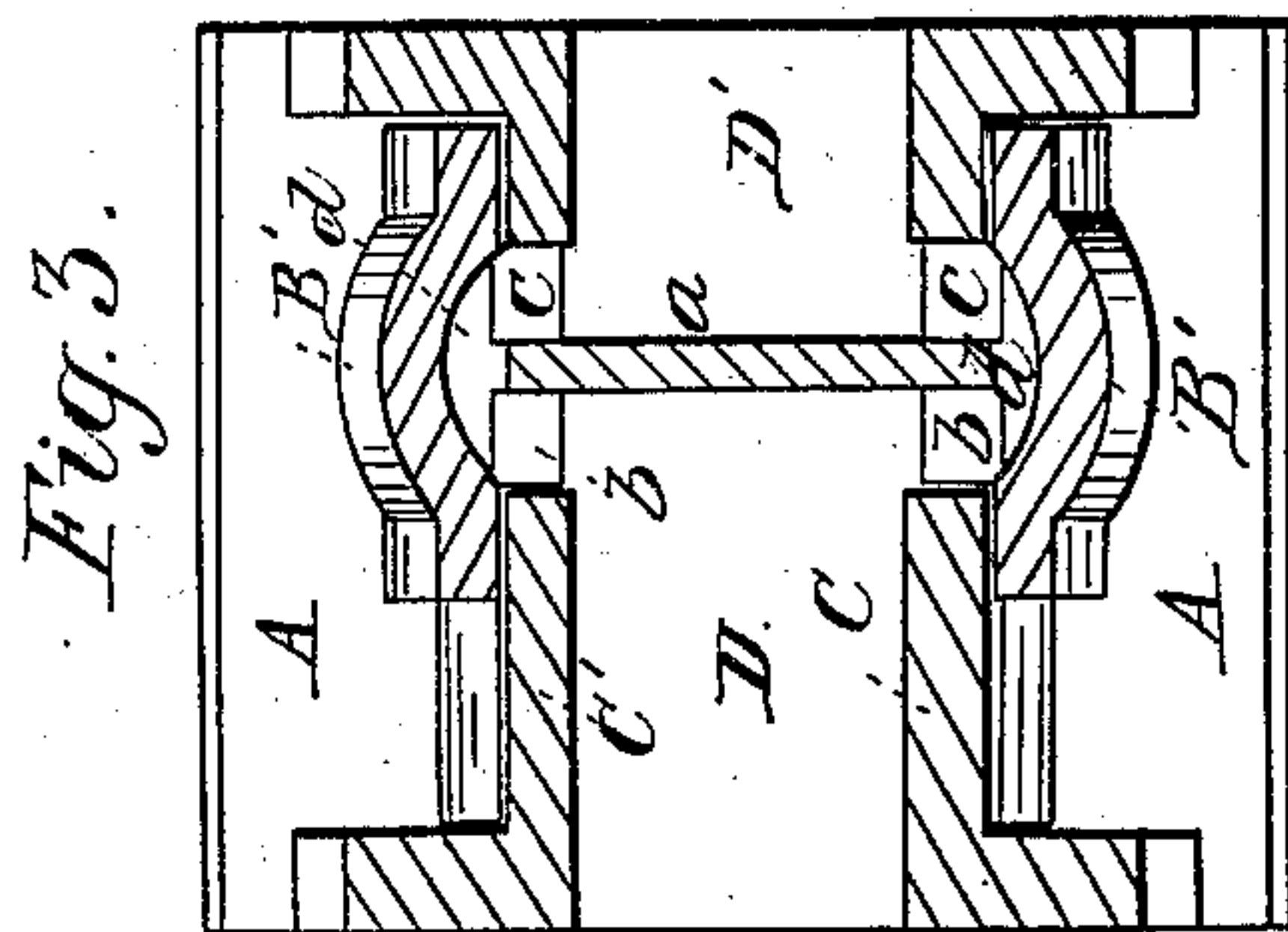
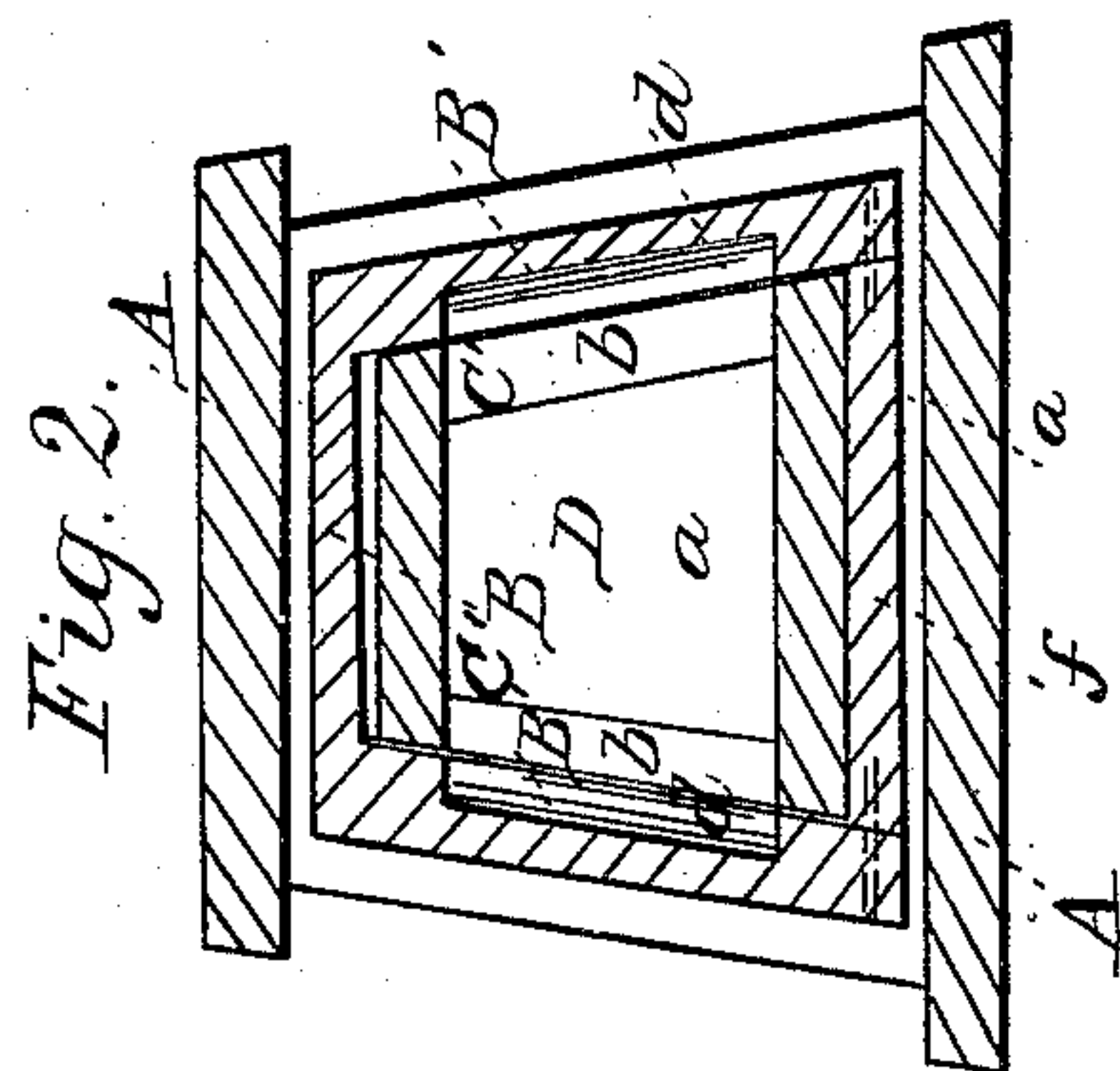


G. B. McClench,
Check Valve,
No 34,310, Patented Feb. 4, 1862.



Witnesses.
R. D. Rice
Isaiah McClench

Inventor.
Geo. B. McClench

UNITED STATES PATENT OFFICE.

GEORGE B. McCLENCH, OF HALLOWELL, MAINE.

IMPROVED VALVE FOR HYDRAULIC ENGINES.

Specification forming part of Letters Patent No. 34,310, dated February 4, 1862.

To all whom it may concern:

Be it known that I, GEORGE B. McCLENCH, a citizen of the United States of America, and a resident of Hallowell, in the county of Kennebec and State of Maine, have invented a new and useful Improvement in Valve Apparatus for Hydraulic or Pneumatic Engines; and I do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 denotes a longitudinal and vertical section, Fig. 2 a transverse section, and Fig. 3 a horizontal section, of a valve, its seat and chest constructed in accordance with my said invention.

The nature of my invention consists, first, in an improved or new arrangement of the opposite rubbing or port faces of the valve and those of the seat thereof; second, in a connection-piece and its chamber, in combination with the two valve-plates, their seat, and the chest when arranged in the improved manner, as specified.

In the drawings, A denotes the valve-chest or reception-chamber, B B' B' being the valve-ports, while C' C' are the plates composing the seat thereof. These plates I arrange out of parallelism or at an acute angle to one another, or so that if produced they shall be at an angle with each other, they constituting the opposite sides or boundaries of a tube or chamber D D', which is wedge-shaped or trapezoidal in its transverse section. This chamber is divided by a cross-partition *a*, and is furnished with ports *b b c c*, leading through the seat-plates and close against the partition, as seen in Fig. 3. Each of the valve-plates B' B' is similarly arranged with regard to the other, and is furnished with a curved recess or chamber *d*, which, when covering the two adjacent ports, opens communication from one port D to the other port D' of the seat-tubes D D'. The two plates B' B', I connect above the tube D D', the connection being shown in Fig. 2 at B. They may be disconnected below the said tube; but in order to counteract their tendency under pressure on them to be borne toward one another at their lower ends or parts I not only form a chamber or passage *e* between the bottom of the tube D D' and that of the reception chamber or chest A, but I join the two valve-plates by a connection bar or plate *f*, extending from one to the

other and through the passage *e*, the said passage being large enough to allow of the necessary movements of the valve over the ports.

From the above it will be seen that owing to the connection and the peculiar or angular arrangement of the two opposite rubbing-faces of the valve a pressure within the chest A, tending to force either valve-plate B laterally against its seat will be mostly, if not entirely, counteracted by a similar pressure exerted on the other valve-plate. The valve thus to a great measure becomes a "balanced valve." There is, however, a small downward pressure exerted on the whole valve when in use, this latter pressure operating to cause its rubbing-surfaces and those of the seat to maintain or form tight joints as they wear.

While my invention causes the valve to operate as an ordinary balanced valve, there results from it the very important tendency of the working-surfaces to always closely fit, however they may wear.

In order to understand the operation of my invention, we may consider the chamber A to be the steam-chest of a steam-engine and that the passage D leads to the exhaust-pipe. In this case the passage D is supposed to lead into one end of the cylinder. While the valve may close the ports *b b* and open the ports *c c* steam will be passing through the latter from the chest A and into the chamber D', from whence it will flow to one end of the cylinder; but while the valve-recesses *d d'* cover all the ports *b b c c* communication from *c c* to *b b* will be effected, and the steam will "exhaust" or pass from such end of the cylinder through the passage D', the recesses *d d'*, and into the passage D.

I claim—

1. The arrangement, substantially as described, of the two opposite port faces of the valve, as well as those of its seat.

2. The connection-piece *f* and its passage *e*, in combination with the two valve-plates and their seat and chest when the two opposite port-faces of the valve and those of the seat thereof are arranged in manner substantially as hereinbefore described.

GEO. B. McCLENCH.

Witnesses:

N. D. RICE,
ISAIAH McCLENCH.