

E. S. CHAPPELL.  
Slide-Valves.

No. 221,956.

Patented Nov. 25, 1879.

FIG. 1.

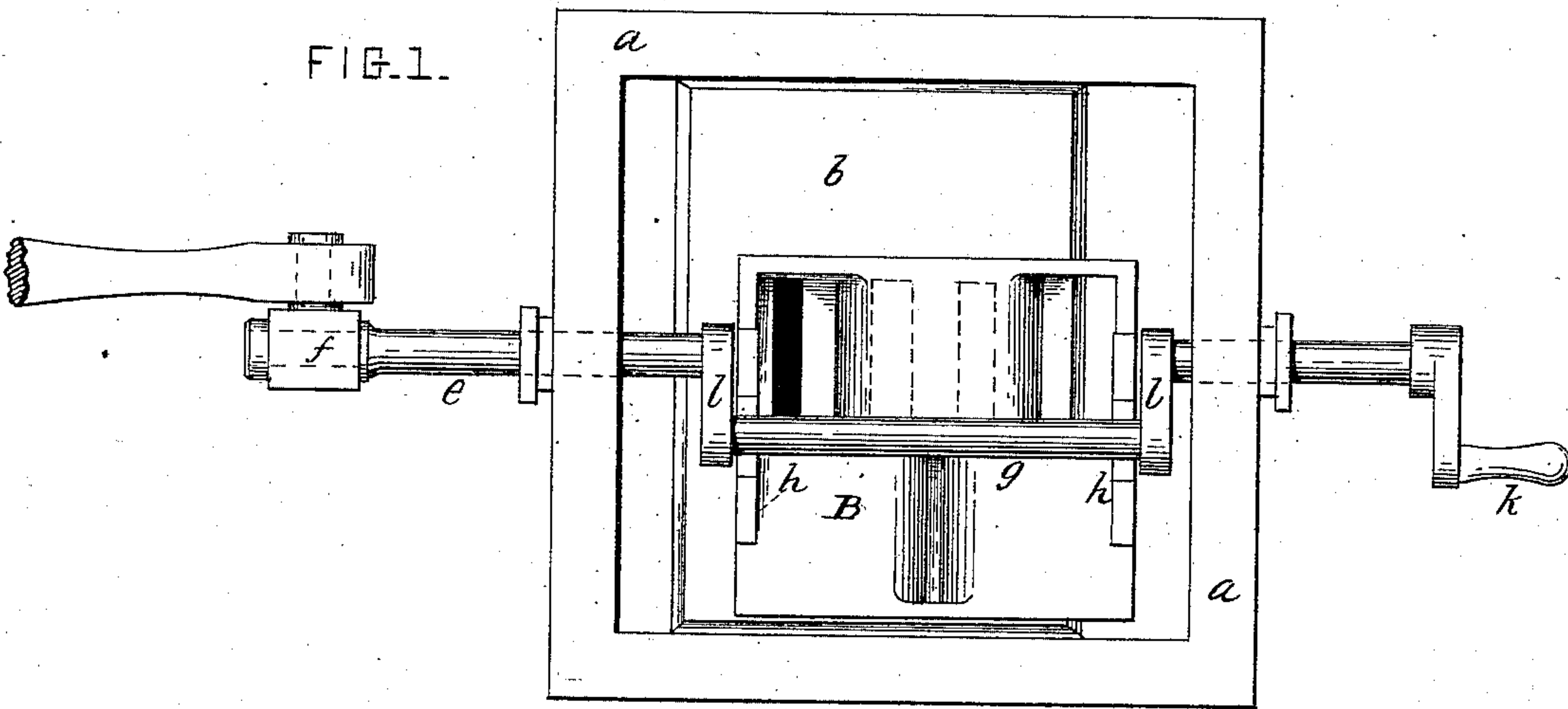


FIG. 2.  
(Section on *xx*)  
*B*

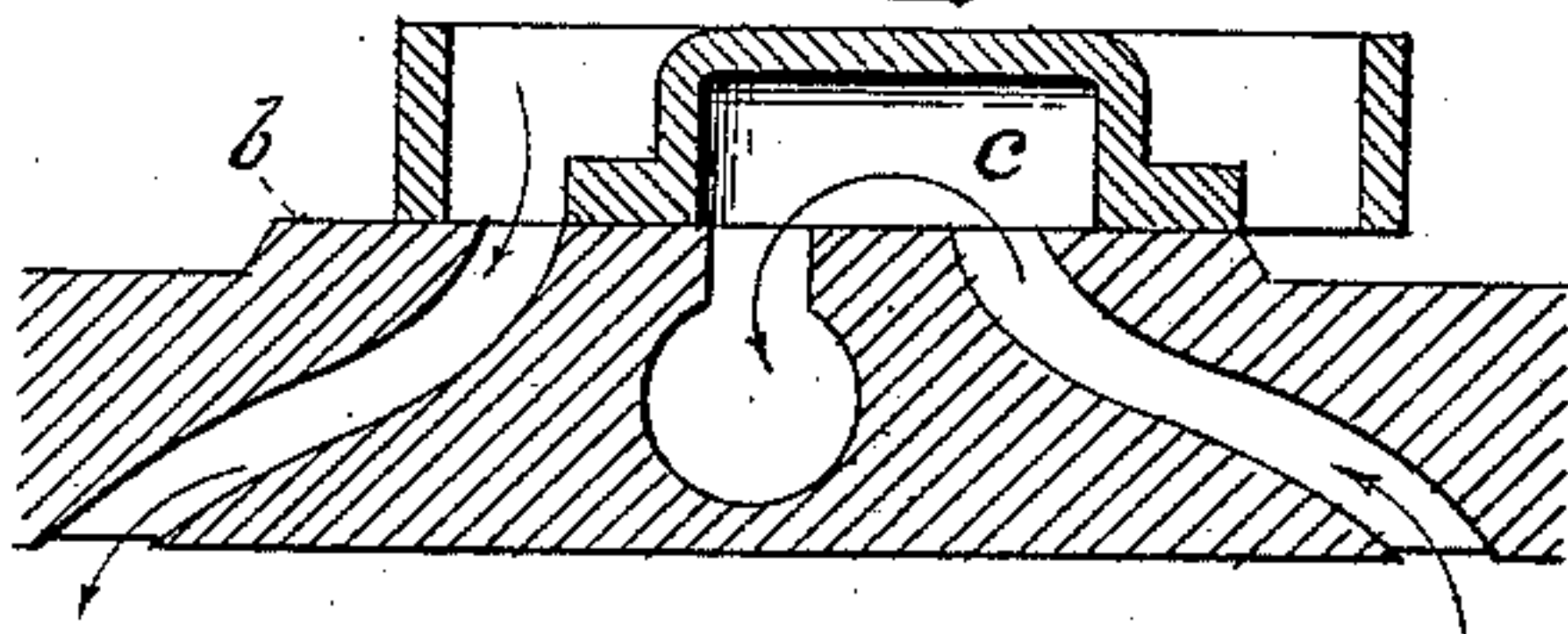


FIG. 3.  
(Section on *yy*)  
*B*

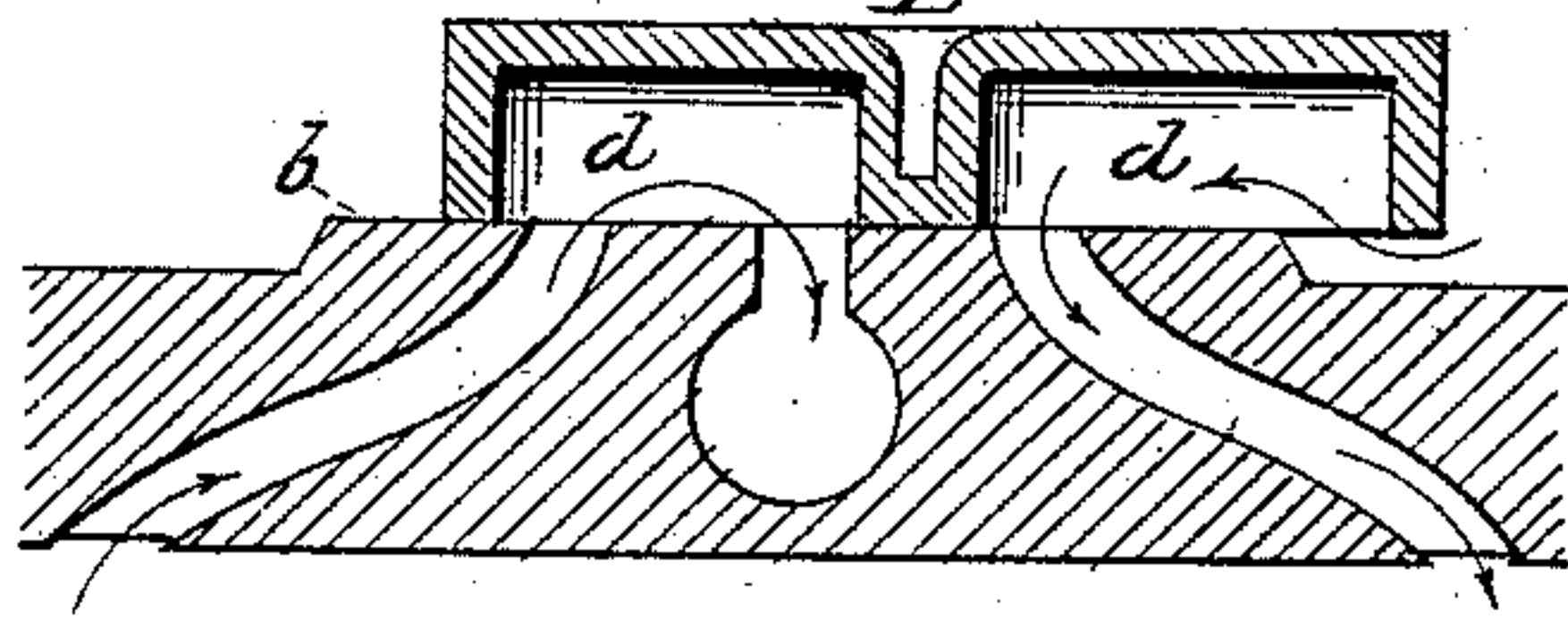


FIG. 4.

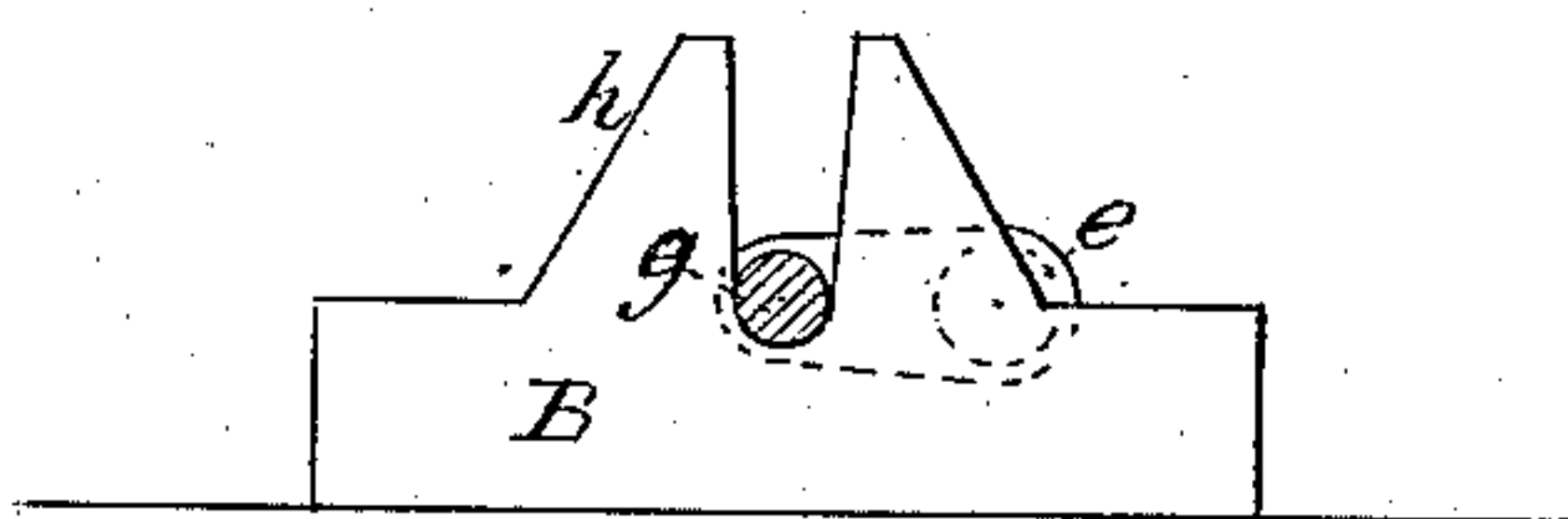
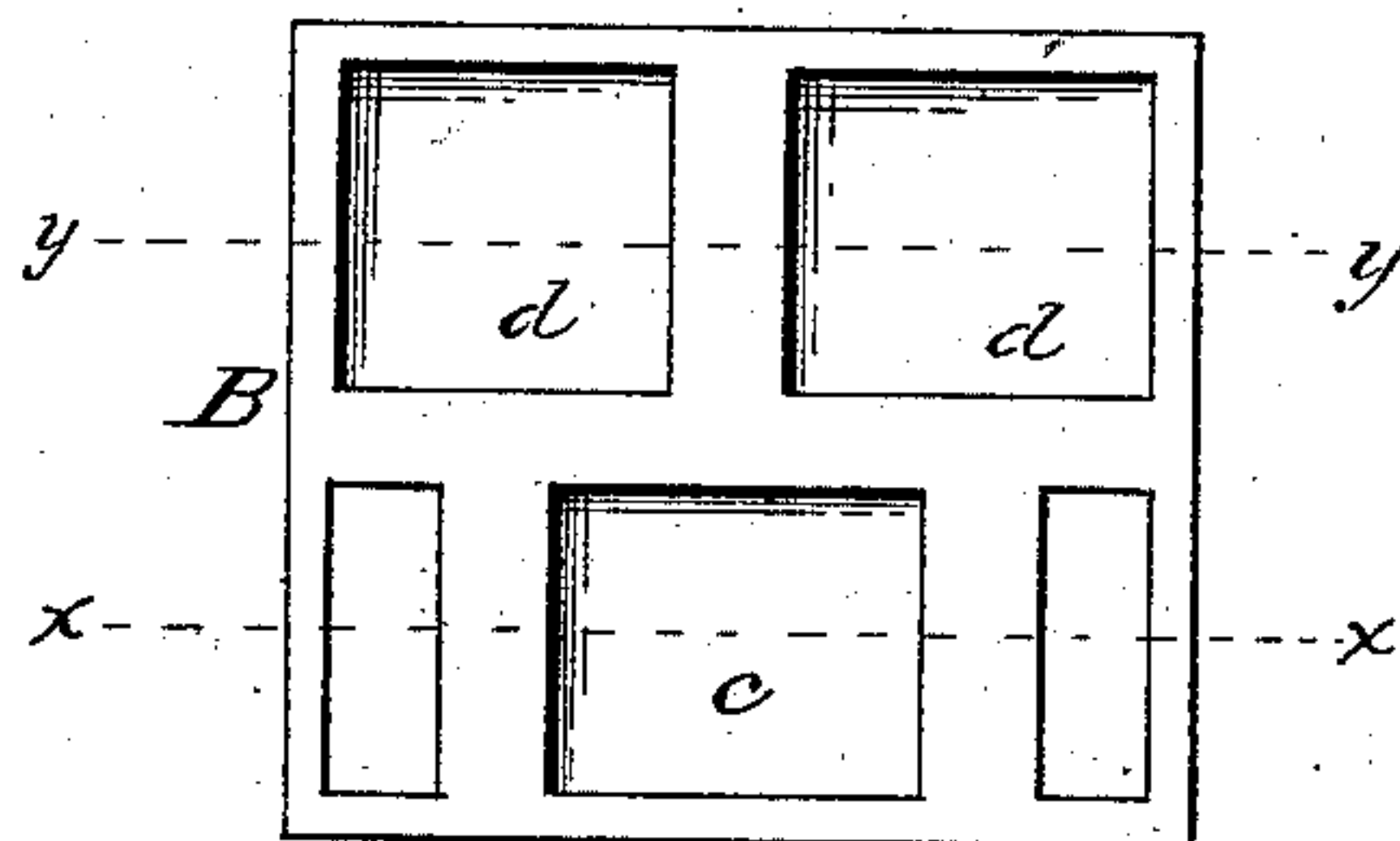


FIG. 5.



ATTEST=

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# UNITED STATES PATENT OFFICE.

ELISHA S. CHAPPELL, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN SLIDE-VALVES.

Specification forming part of Letters Patent No. **221,956**, dated November 25, 1879; application filed July 7, 1879.

*To all whom it may concern:*

Be it known that I, ELISHA S. CHAPPELL, formerly of Pembroke, Maine, but now residing in Boston, Massachusetts, have invented certain new and useful Improvements in Slide-Valves, of which the following is a specification.

My invention aims to provide a simple and efficient form of reversing-valve; and it relates to that class of valves which reverse the engine by changing the position of the valve on its seat without altering the eccentric.

In a former application, filed March 10, 1879, I show a valve of this kind formed in two sections, placed in line on the stem, by separating which, or forcing the same together, the direction of the steam and exhaust becomes reversed.

Now, my present invention may be stated to consist in a valve of duplex form, or composed of two valves joined together side by side, one valve being short with a single cavity and arranged to move between the ends of the seat, so as to admit the steam in the usual manner, while the other valve is elongated, with two cavities, and is arranged to move over the ends of the seat, and admit the steam through the cavities of the valve over each end of the seat, so that by shifting the double valve laterally on the seat, either side is brought into position over the ports and the action reversed accordingly.

In the annexed drawings, Figure 1 presents a plan view of my improved valve, the side or top of the valve-chest being removed. Figs. 2 and 3 are fragmentary sections, illustrating, respectively, the two relatively-reversed positions of the valve. Fig. 4 is an end view of the double valve, and Fig. 5 is an inverted plan thereof.

As illustrated, *a* indicates the valve-chest, and *b* the valve-seat, which, as may be observed, are about twice the usual width. The steam and exhaust ports, which are of the ordinary form, open on the center of the seat in the usual manner, as seen in Figs. 1, 2, and 3.

Now, *B* is the valve, which in fact consists of two valves, joined side by side. The valve on one side is short, and of the usual form, with a single central exhaust-cavity, as seen at *c*, the ends of the valve being adapted to

slide over the steam-ports in the usual manner, as shown in Fig. 2, which is a section on the line *x x*. The other valve is longer and has a cavity, *d*, at each end, and in its movement it projects beyond the ends of the seat, and admits the steam through the cavities of the valve, as seen in Fig. 3, which is a section of the valve on *y y*. The two valves, or two sides of the valve, are so arranged, relatively to each other, as shown in Fig. 5, that when either one is placed over the ports, the direction of the steam and the exhaust will be, relatively, reverse to that which would be allowed by the other valve, as illustrated by Figs. 2 and 3.

*e* indicates the valve-stem, to which the usual reciprocating movement is imparted to work the valves, by an eccentric or other suitable driving device. The stem is guided in each end of the valve-chest by suitable glands, as illustrated, and its outer end is capable of turning in the guide-block *f* of the eccentric-rod, but is incapable of moving endwise therein. The middle part of the stem within the chest is cranked, as shown, and the valve is mounted between the crank-arms *l*, while the elongated crank-pin *g* extends through slotted uprights *h h*, rising from each end of the valve, and drops into a groove along the middle of the valve, as shown in Figs. 1 and 4. The valve being mounted on the stem in this manner, it will now be readily seen that the reciprocation of the stem will correspondingly move the valve, and thus regularly admit and exhaust the steam, while by turning the stem one half-revolution by means of the handle *k*, the crank *g* will shift the valve from one side of the seat to the other, thus bringing the valve of the opposite side into position over the ports and thus reversing the engine.

This form of valve is well adapted for locomotive or marine engines; and it will be observed that, while it is quite simple in its construction and efficient in action, it enables the engine to be reversed with great ease and quickness, by a very simple movement.

It has also the further advantage that any reasonable amount of lap may be given to the valves to operate either in going ahead or in backing, which is not practicable with many other forms of reversing-valves.

I do not confine myself to the precise means described for operating the valve, as any suitable device for reciprocating the valve, and shifting it from side to side, may be employed, but the means shown is believed to be well adapted for the purpose.

What I claim as my invention is—

A duplex reversing slide-valve consisting of two valves joined side by side, one valve being short and adapted to slide between the ends of the seat, and admit the steam in the usual manner, while the other valve is elongated,

with a cavity at each end, adapted to project over the ends of the seat, and admit the steam through the cavities of the valve, the said double valve being adapted to be shifted laterally on the seat, so as to bring either side over the ports, and thus reverse the action of the valve, substantially as herein set forth.

ELISHA S. CHAPPELL.

Witnesses:

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E. TYLER.