

A. MARICHAL.
VALVE.

No. 556,549.

Patented Mar. 17, 1896.

FIG. 1.

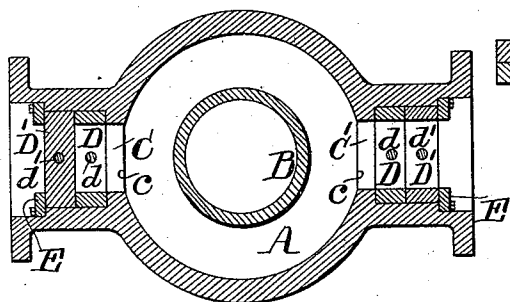


FIG. 3.

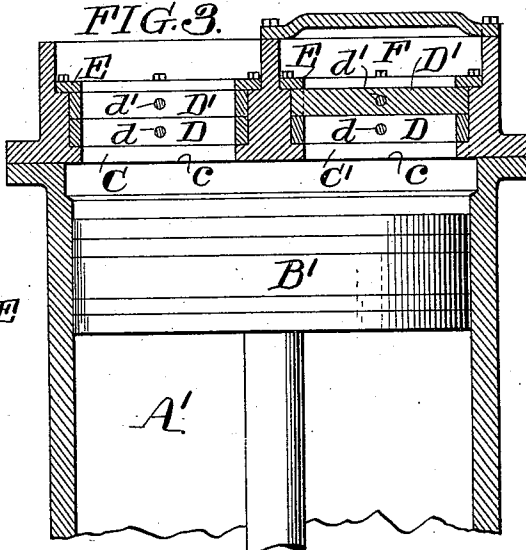


FIG. 2.

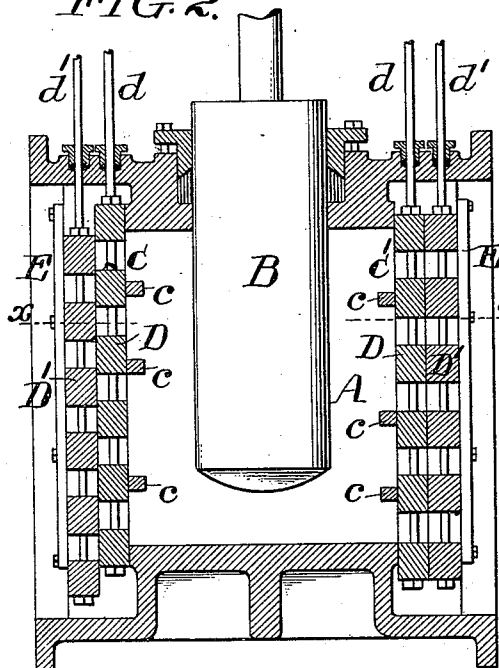


FIG. 4.

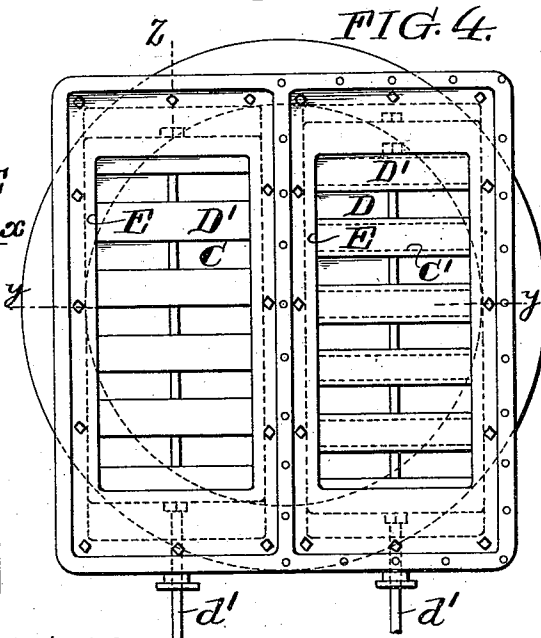
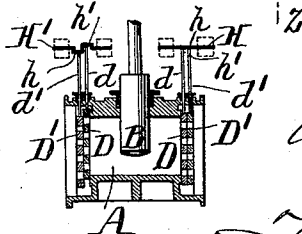


FIG. 10.



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FIG. 6.

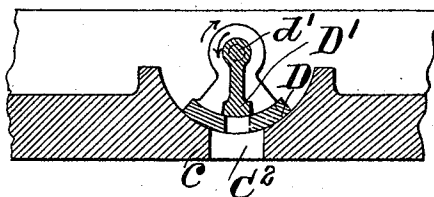


FIG. 5.

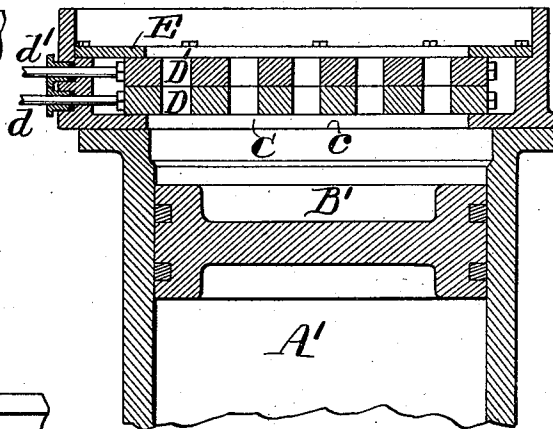


FIG. 7.

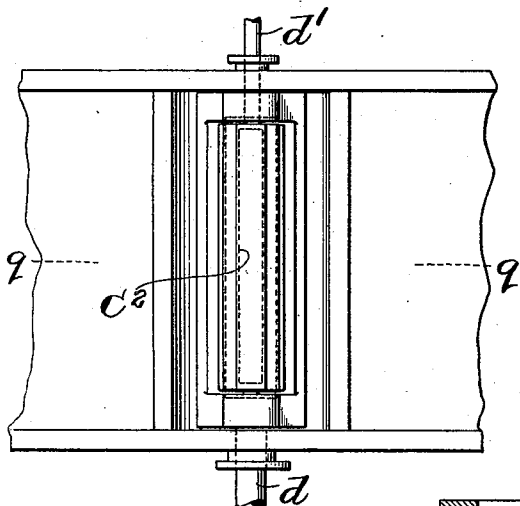


FIG. 8.

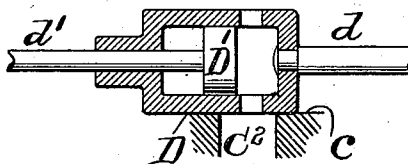
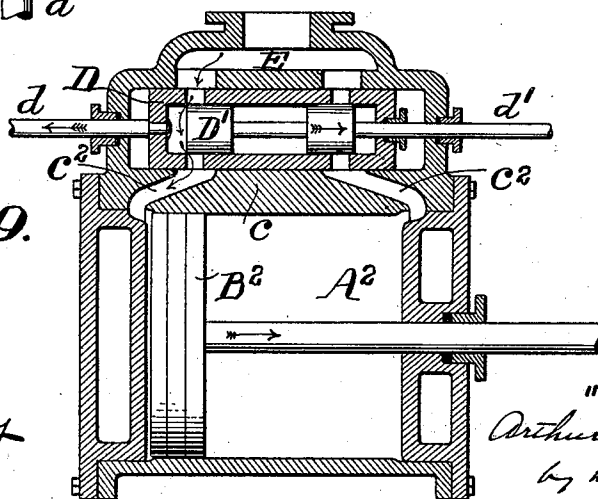


FIG. 9.



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UNITED STATES PATENT OFFICE.

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VALVE.

SPECIFICATION forming part of Letters Patent No. 556,549, dated March 17, 1896.

Application filed January 14, 1895. Serial No. 534,788. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR MARICHAL, a subject of the King of Belgium, residing at Rue Verte 135, Brussels, Belgium, have invented a certain new and useful Improvement in Valves, of which the following is a true and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to the construction and operation of valves, and has for its object to increase the rapidity with which the valves can be opened and closed.

Generally speaking, my invention may be said to consist in making the valve-seat movable in the opposite direction to the motion of the valve and so that the port or passage through the valve will be opened or closed by a valve-motion only one-half so great in extent as that necessary where a fixed valve-seat is employed.

My invention will be best understood, however, as described in connection with the drawings in which it is illustrated in various modifications, and in which—

Figure 1 is a view of a pump-cylinder provided with my improved valves, said view being taken on the section-line *xx* of Fig. 2. Fig. 2 is a longitudinal section taken through the center of Fig. 1. Fig. 3 is a longitudinal section on the line *yy* of Fig. 4 of a blowing-engine provided with my valve, Fig. 4 being an end view of the same and Fig. 5 a section on line *zz* of Fig. 4. Fig. 6 is a section on line *qq* of Fig. 7, and Fig. 7 a plan view of my invention applied to an oscillating-valve construction. Fig. 8 shows my invention embodied in a piston-valve. Fig. 9 is a sectional view of a steam-engine cylinder having a piston admission-valve embodying my invention, and Fig. 10 illustrates a simple device for operating the movable members making up the valve.

While my invention is, as indicated in the drawings, of general application, it is particularly adapted for use in combination with engines, pumps and compressors, and as a means of increasing the speed by which the entrance and exit ports of the cylinders can be opened and closed. Any valve-actuating

mechanism can be employed to actuate the two movable members of the valve, and in all cases the result of employing my valve in place of one of ordinary construction is to double, if desired, the speed of opening or closing.

A, Figs. 1 and 2, indicates a pump-cylinder; B, a plunger moving therein; A', Figs. 3, 4 and 5, the cylinder of a blowing-engine; B', the piston moving therein.

A², Fig. 9, is the cylinder of a steam-engine; B², the engine-piston.

The above drawings indicate the class of machines to which my invention is particularly applicable.

C and C' indicate, respectively, the admission and delivery ports or passages of the pump and compressor illustrated, C² C², Fig. 9, indicating the ports leading from the two ends of the steam-engine cylinder, and C², Figs. 6, 7 and 8, indicating ports in any engine or apparatus.

c, Figs. 1, 2, 3 and 5, indicate cross-bars extending across the ports and serving to assist in supporting the slotted valve-seats moving over the ports; but said bars should be so disposed and formed as not to in any material degree coact with the valve-seat in closing the port.

D indicates my reciprocating valve-seat which extends and moves over the port and is preferably slotted, and in the case of the pump and compressor made of gridiron shape, as shown.

d indicates a valve-stem by which the movable seat D is actuated.

D' indicates the valve proper, which is seated on the movable seat D and is given a motion in the opposite direction to the seat, d' indicating the valve-stem.

E indicates the back bearing for the valves D'.

The form of the port and shape and motion of the valve-seat and valve must, in order to obtain the quick opening and closing which is the object of my invention, be of such form and relative arrangement that the opening between the port and either of the movable members shall at no time be materially less than the opening between the two valve mem-

bers, or, in other words, the opening and closing of the port must be effected by the relative action of the movable seat and of the valve, and not by the action of either of these parts in relation to the edges of the port. This essential requirement is compatible with a relation between the movable seat and the port by which the port is entirely closed by the seat during a portion of its stroke; but this must only occur after or simultaneously with the closing of the port by the action of the two moving members. I prefer, however, a construction to which the port is never to any material degree closed by the action of the movable seat alone, and by preference, in case of the application of my invention to pumps and compressors, I use a movable seat of gridiron form, such as is indicated in Figs. 1 to 5, and the slots in which always open freely into the port. For use in connection with such a movable seat the valve is, of course, of corresponding gridiron form.

To return to the drawings, F, Fig. 3, indicates the receiving-chamber of the blowing-engine.

E, Fig. 9, indicates the steam-chamber of the engine represented in that figure.

In Fig. 6 pivoted oscillating valves and valve-seats are shown. These and the piston-valves shown in Figs. 8 and 9 are of ordinary and well-understood constructions.

In Fig. 10 I have illustrated a simple valve-motion for acting on the valve and movable seat of such a pump as is shown in Fig. 2, H H' indicating shafts driven by a moving part of the engine or pump and having cranks *h* and *h'* set at one hundred and eighty degrees and connected, respectively, to the valve-stem *d'* of the valve D' and the stem *d* of the movable seat D. By this arrangement obviously a reciprocating motion in opposite directions is given to the two valve members, and, of course, any other valve mechanism may be adapted for the same use.

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

1. In combination with a port or passage, a valve for opening and closing the same consisting of two movable members one seated on the port, the other seated on the first, and both moving simultaneously but in opposite directions, the port in which said valve operates being formed as described and so that the opening between it and either valve member shall not at any time be materially less than the opening between the two valve members.

2. In combination with a port or passage, a valve for opening and closing the same consisting of two movable members one seated on the port, the other seated on the first, and both moving simultaneously but in opposite directions, the port in which said valve operates being formed as described and so that it will not at any time in the motion of the valve members be entirely closed by either one of said members alone.

3. In combination with a port or passage, a valve for opening and closing the same consisting of a movable slotted valve-seat reciprocating over but not tending to close the port and a reciprocating valve moving simultaneously over said valve-seat and in an opposite direction thereto, substantially as and for the purpose specified.

4. In combination with a port or passage a reciprocating valve-seat having a series of slots therein which register with the port in all positions of the seat and a gridiron valve seated thereon and moving simultaneously in a direction opposite to that of the seat, substantially as and for the purpose specified.

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Witnesses:

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