

No. 698,504.

Patented Apr. 29, 1902.

C. W. HUNT.
VALVE.

(Application filed Oct. 31, 1901.)

(No Model.)

Fig. 1.

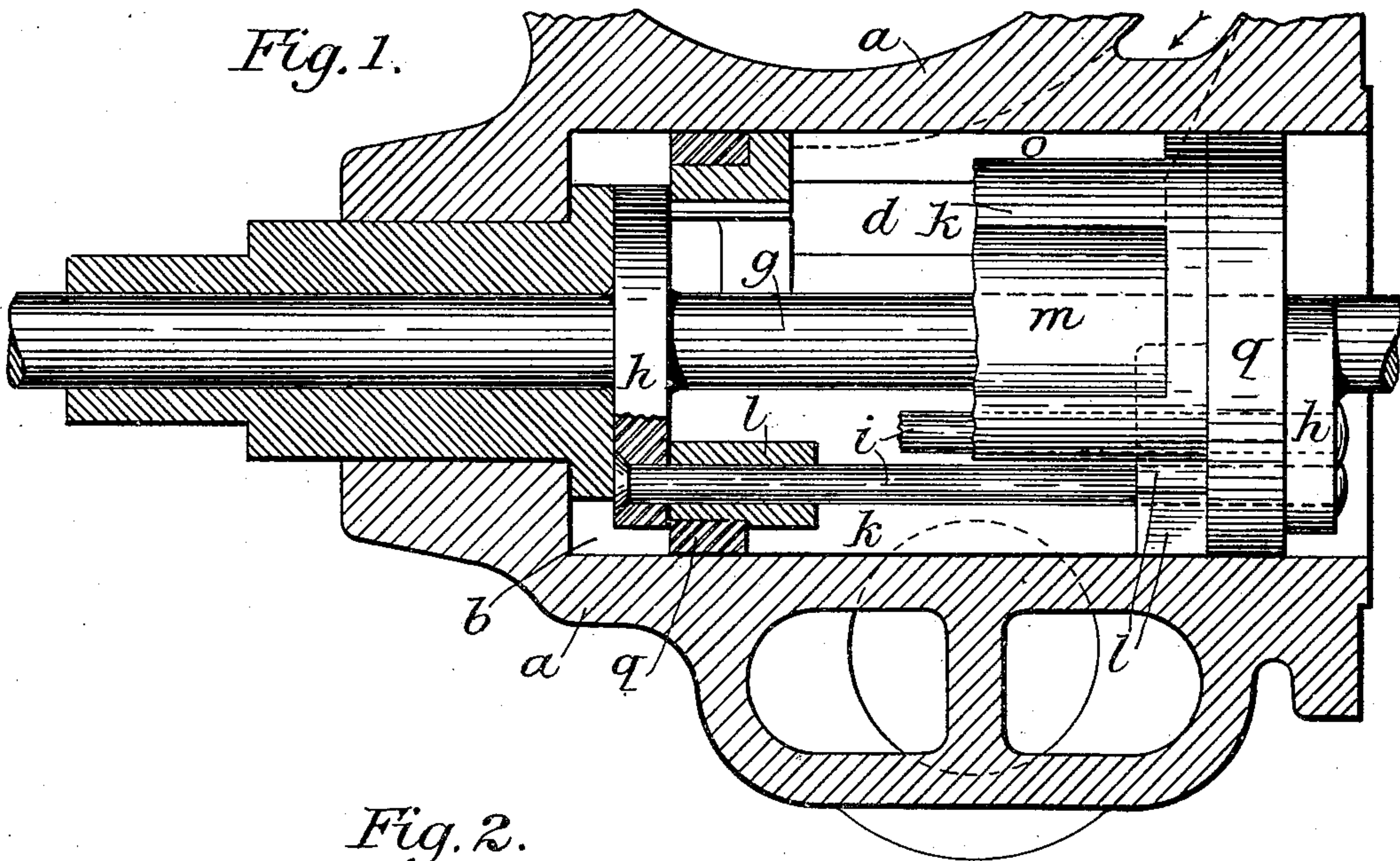
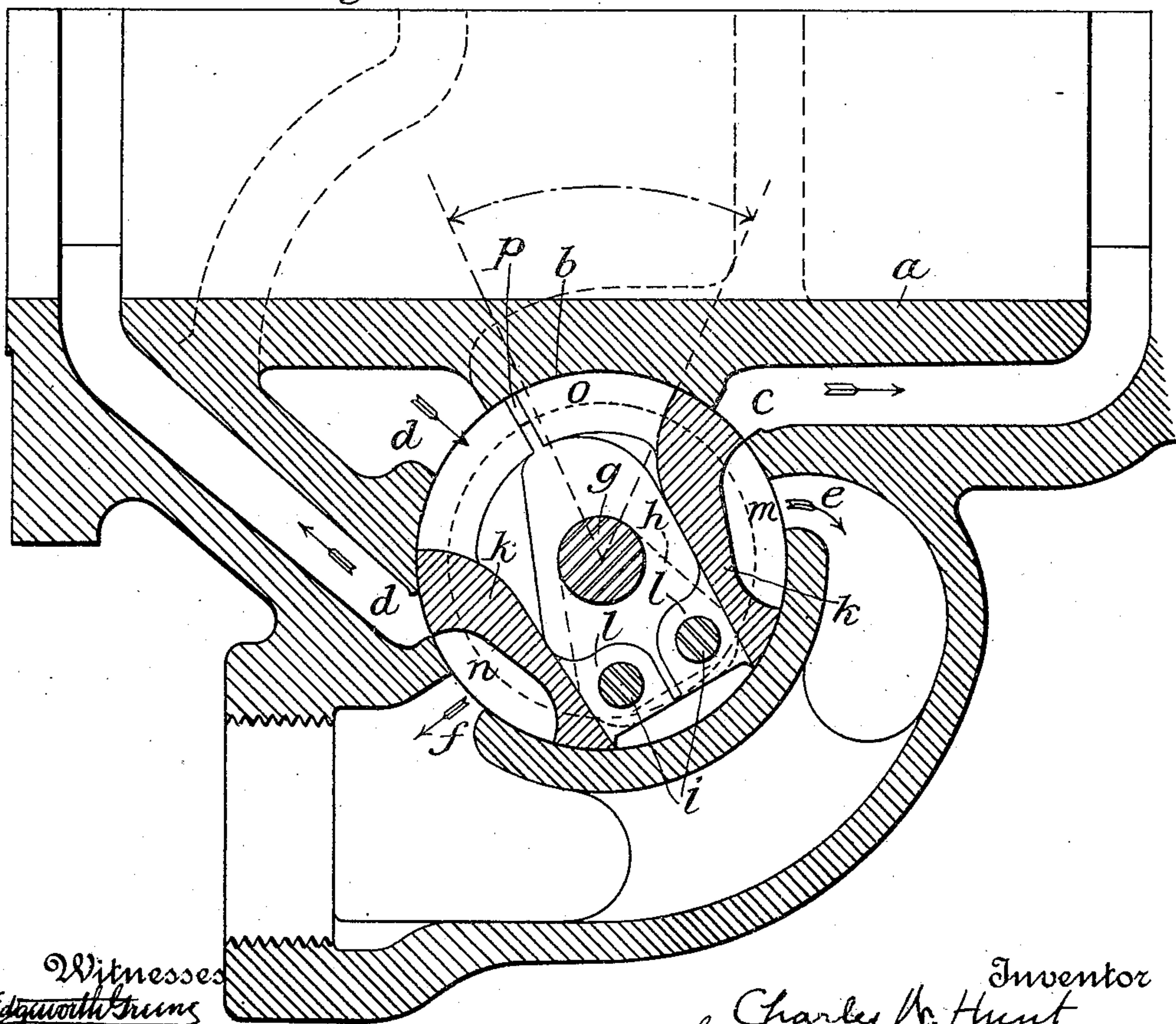


Fig. 2.



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VALVE.

SPECIFICATION forming part of Letters Patent No. 698,504, dated April 29, 1902.

Application filed October 31, 1901. Serial No. 80,609. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. HUNT, a citizen of the United States, residing in West New Brighton, borough of Richmond, city of New York, State of New York, have invented certain new and useful Improvements in Valves, of which the following is a specification, reference being had to the accompanying drawings, forming a part hereof.

10 This invention relates to steam-valves of the type generally known as "piston" or "plug" valves, and has for its object to improve the construction of such valves, so as to overcome some of the difficulties incident to the use of such valves as heretofore constructed. It is well known that with the ordinary plug-valve much trouble is experienced, particularly in starting up an engine and until all parts are heated equally, by reason of the binding of the valve in its seat, which is due to the unequal expansion of the valve itself and of the body of the metal in which the seat is formed. Heretofore it has been usual to make the valve in one piece, in which compensation for the changes due to differences of expansion is impossible, the result being that when the valve is first heated by the admission of steam and before the valve-seat is heated the valve binds in its seat. In the present case the valve is made up with relatively movable parts which adapt themselves to the different conditions without binding and, further, are so arranged and combined as to form practically an integral valve-body when in operation. The valve-seat and its supports are also so constructed and arranged with relation to the valve-body as to reduce to a minimum the amount of water which can be entrapped in the ports and in the valve.

40 The invention will be more fully described hereinafter with reference to the accompanying drawings, in which for the purpose of explanation it is illustrated as embodied in a convenient and practical form.

50 In the drawings, Figure 1 is a view, partly in section and partly in elevation, showing a portion of a steam-cylinder and its valve-chest with a valve in position therein, that portion of the valve which is at the right of the median line being shown in elevation, while that at the left is shown partly in sec-

tion. Fig. 2 is a transverse section on the plane of the median line of Fig. 1.

In the drawings a portion of an ordinary steam-cylinder is represented at *a*, with a cylindrical cavity, forming the valve-chest, at *b*. The valve-chest receives the oscillating valve to be described hereinafter, and in order that the amount of water which can be entrapped in the valve-chest may be reduced to a minimum the several ports in the wall of the valve-chest are arranged as represented in Fig. 2, the cylinder-ports *c* and *d* being unsymmetrically disposed, one as near as possible to the cylinder-wall, and therefore at the highest practicable point, while the other is opposite the first, and therefore at the lowest practicable point. The steam-inlet port *d* is also formed near the cylinder-wall, and the two exhaust-ports *e* and *f* are formed, respectively, near the cylinder-ports *c* and *d*, but farther from the cylinder-wall. This arrangement places the exhaust-port *f* at or slightly above the lowest point of the valve-chest, so that no or only a small amount of water can be entrapped within the valve-chest.

As indicated above, the valve is made up of parts which can accommodate themselves to the expansion and contraction of the walls of the valve-chest. As represented in the drawings, the shaft *g*, which constitutes the stem of the oscillating valve and is supported in suitable stuffing-boxes, is provided with in the valve-chest with arms *h*, which support two pins or rods *i*. The two members *k* of the valve-body are loosely mounted upon the pins or rods *i*, respectively, by means of interior lugs *l*, which receive such pins or rods and are suitably formed with steam-passages *m*, *n*, and *o* to coöperate in the usual manner with the several ports of the valve-chest. The two members *k* are not in close contact with each other, but are separated by a narrow space to permit of relative movement under the influence of changes in temperature. The two parts may be conveniently cast in one piece and then separated by a saw-cut to leave between them the necessary space, as indicated at *p*.

It will be obvious that the two members of the valve-body can move relatively to each other when steam is first admitted, and the valve-body becomes heated and expands be-

fore the walls of the valve-chest become heated, and that by such relative movement, the surfaces being suitably formed, the valve-body will adapt itself to the conditions which
 5 then obtain and will likewise accommodate itself to the conditions which obtain when all the parts have been fully heated. The valve-body is preferably so formed that it will be perfectly balanced under normal conditions
 10 of operation, and it is therefore more or less unbalanced when the temperatures of the valve and chest are different, as in starting and cooling off.

In order that the valve-body may become
 15 practically an integral whole under normal conditions of operation and that undue wear between the valve-body and the walls of the valve-chest may be avoided, rings *q* are applied about the two parts of the valve-body,
 20 such rings having a proper fit within the valve-chest and being somewhat loose upon the valve-body when the valve parts are hot and the chest cold. As the valve parts become heated up, however, the members of the
 25 valve-body expand against the valve-chamber until the various parts are equally heated, when the rings bind the valve members together into a practically integral body and at the same time receive the pressure due to the
 30 pressure of the steam and relieve the walls of the valve-chest.

It will be understood that the invention is not limited to the precise construction and arrangement of parts shown and described here-
 35 in, but that the same can be varied to suit different requirements or as may be desired.

I claim as my invention—

1. A valve comprising members separated longitudinally for relative movement, means to secure said members together for common
 40 movement, and rings placed about said members to receive the outward pressure thereof, substantially as shown and described.

2. A valve comprising a shaft, valve members supported by said shaft for movement
 45 toward and from each other in the plane of the axis, and rings placed about said valve members to receive the outward pressure, substantially as shown and described.

3. A valve comprising a shaft, arms on said
 50 shaft, rods or pins carried by said arms and valve members mounted upon said rods or pins for movement toward or from each other, substantially as shown and described.

4. The combination of a steam-cylinder, 55 valve-chest and oscillating valve, cylinder-ports being formed in the valve-chest and unsymmetrically disposed, one being near the cylinder and the other remote therefrom, an inlet-port being formed in the valve-chest
 60 near the cylinder and exhaust-ports being formed in the steam-chest respectively near the cylinder-ports, whereby one of said exhaust-ports is near the lowest point of the steam-chest, substantially as shown and de- 65 scribed.

This specification signed and witnessed this 29th day of October, A. D. 1901.

CHARLES W. HUNT.

In presence of—

W. B. GREELEY,
 L. E. VARNEY.