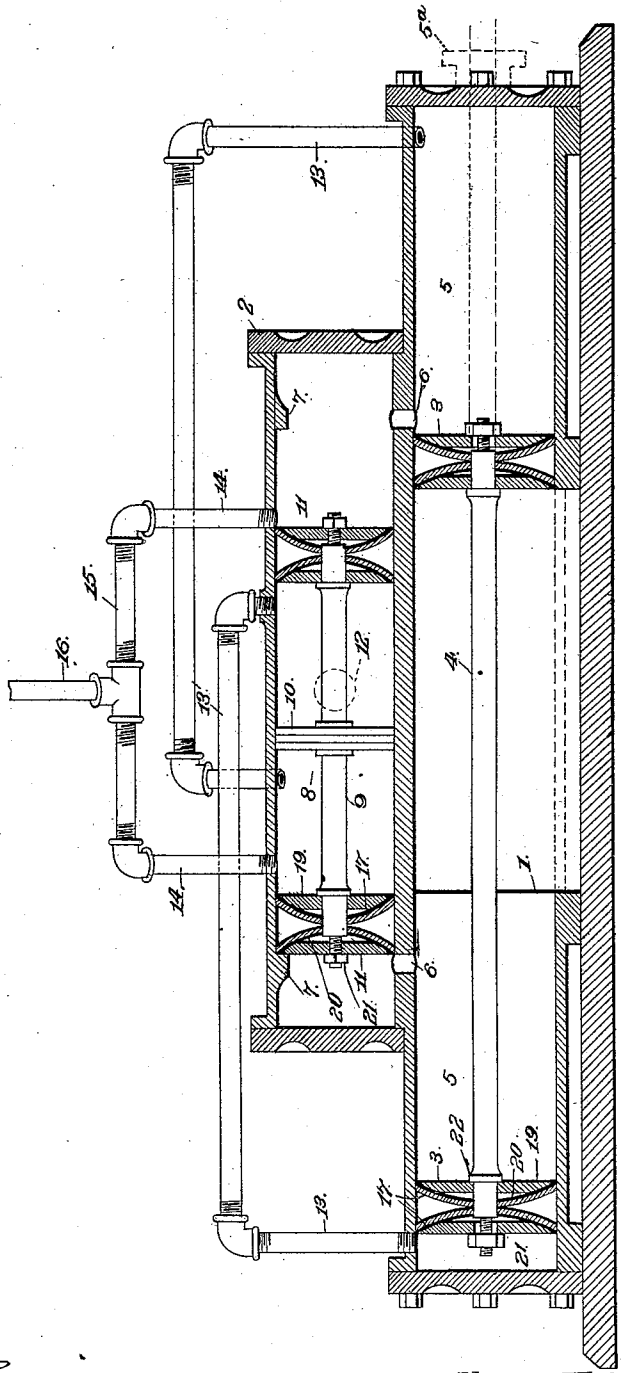
(No Model.) 2 Sheets—Sheet 1.

A. J. GRIFFIN.

VALVE FOR STEAM MOTORS.

No. 469,695. Patented Mar. 1, 1892.

Fig. 1.



Witnesses

M. Fowler

Wm. Bagger

Inventor

Alonzo J. Griffin

By his Attorneys,

C. A. Snow & Co.

(No Model.) 2 Sheets—Sheet 2.

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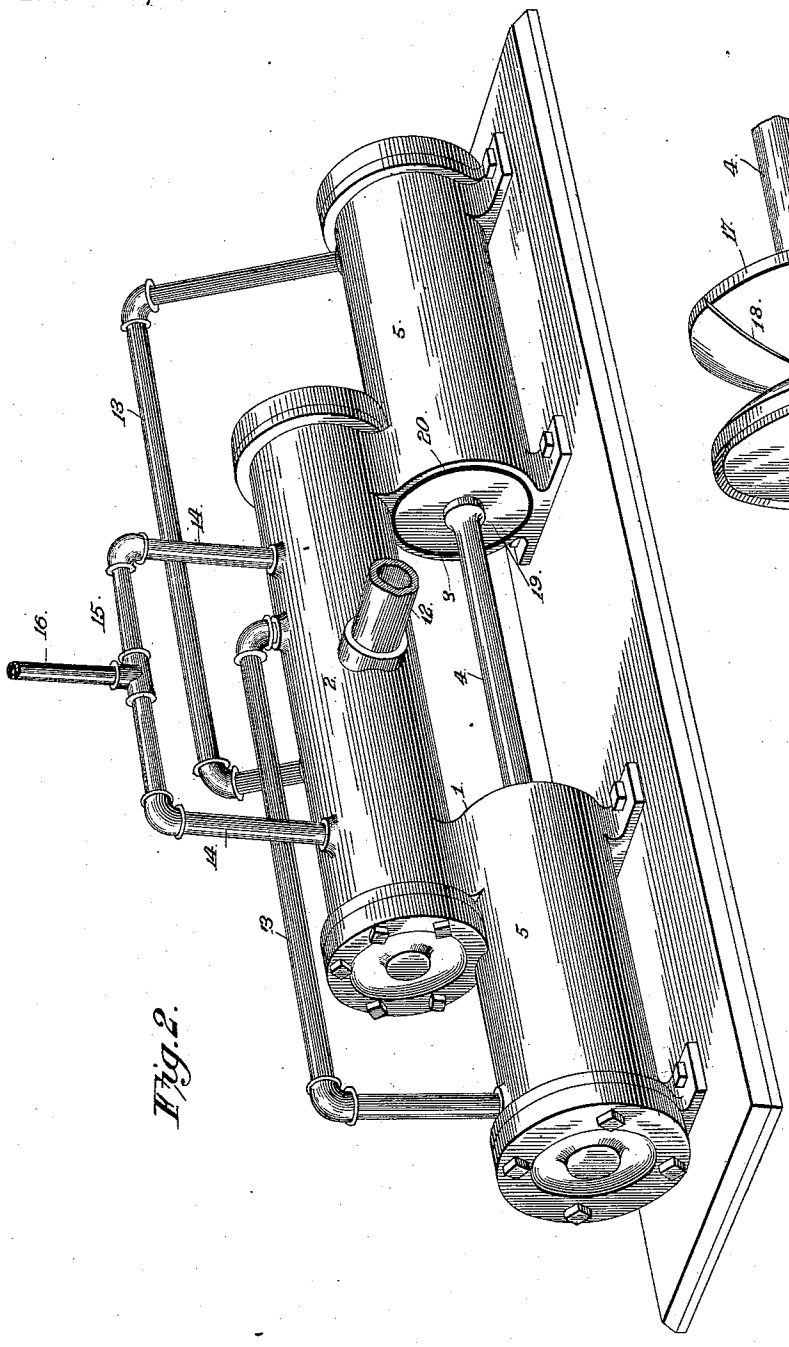

Fig. 2.

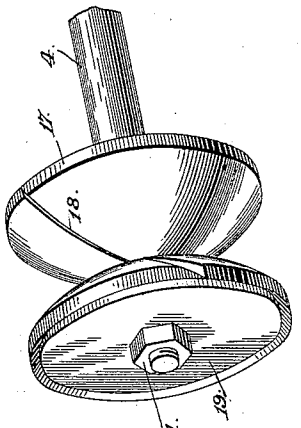

Fig. 3.

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UNITED STATES PATENT OFFICE.

ALONZO J. GRIFFIN, OF WILKES-BARRÉ, PENNSYLVANIA.

VALVE FOR STEAM-MOTORS.

SPECIFICATION forming part of Letters Patent No. 469,695, dated March 1, 1892.

Application filed March 31, 1891. Serial No. 387,142. (No model.)

To all whom it may concern:

Be it known that I, ALONZO J. GRIFFIN, a citizen of the United States, residing at Wilkes-Barré, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Improvement in Valves for Steam-Motors, of which the following is a specification.

This invention relates to steam-engines or motors adapted to be operated by steam or other fluid pressure; and it has for its object to construct a machine of this class which shall be exceedingly simple, durable, inexpensive, and not liable to get out of order, which may be readily adapted or applied to various purposes, and in which the valve mechanism shall be exceedingly simple and automatically operated.

With these ends in view the invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings hereto annexed, Figure 1 is a longitudinal sectional view of a motor or engine constructed in accordance with my invention. Fig. 2 is a perspective view of the same. Fig. 3 is a perspective detail view illustrating the preferred construction of the pistons.

Like numerals of reference indicate like parts in the several figures.

1 designates the main cylinder, and 2 the valve-chamber, which is likewise cylindrical in shape and which may be arranged, as shown, contiguous to the main cylinder. The latter may be composed, as shown in Fig. 2, of two separate chambers or compartments arranged in a line with each other and each containing a piston 3, both pistons being mounted upon a single rod or stem 4. One end of the latter may project through a packing-box 5^a in the end of one of the chambers for the purpose of transmitting motion through suitable intermediate mechanism to the machinery which is to be driven. This, however, is not necessary, inasmuch as motion may be taken from that portion of the piston-rod which is located between the ends of the chambers or compartments of the main cylinder.

Although it is obvious that the main cylinder 1 may be constructed or composed of a single uninterrupted cylinder, in which event the piston-rod must be projected through one end of said cylinder, I shall describe the said cylinder only as being composed of two separate sections or compartments, as illustrated in the drawings hereto annexed. To indicate a continuous cylinder, however, dotted lines have been used in the figures of the drawings.

The compartments 5 of the main cylinder are provided near their inner or adjacent ends with openings 6, connecting with the valve-chamber 2 near the ends of the latter. Said valve-chamber is provided at a slightly greater distance from its ends than the openings 6 with lugs or abutments 7, serving as stops for the valve. The latter, which is described by 8, is composed of a stem 9, having a central piston 10 and provided at its ends with piston-heads 11. The supply-opening for steam or other motive fluid is connected with an inlet-pipe 12, which is connected centrally to the valve-chamber.

To the ends of the main cylinder or of the compartments of the latter are connected pipes 13, the opposite ends of which are connected with the valve-chamber, each of said pipes being connected with the end of the valve-chamber distant from the end of the main cylinder with which it is connected. Thus the pipe 13, which is connected with what may be termed the "right-hand end" of the main cylinder, is connected with the valve-chamber near the left-hand end of the latter, and vice versa. It is not to be understood that the connections of the pipes 13 with the valve-chamber 2 are to be made very near the ends of the latter, but on opposite sides of the center thereof, so as to communicate with the spaces on opposite sides of the central piston 10 in the said valve-chamber.

Suitably connected with the valve-chamber 2 at points near the pipes 13 are pipes 14, which are connected by a pipe 15, having an exhaust branch 16.

The pistons used in connection with my improved motor-engine are preferably constructed of spring metal in the form of disks 17, which are provided with radial slits or cuts 18 to enable them to be folded to an approximately conical or frustum shape, the edges being either brought together and suitably secured or overlapped, as may be desired. In

the make-up of each piston two of these disks are to be placed upon the stem or rod adjacent to each other and their convex sides in contact with each other.

Solid disks 19 are to be placed adjacent to the outer concave sides of the disks 17, packing 20 being interposed, if desired. Means are to be provided for forcing the outer disks in the direction of each other, so as to throw the outer edges of the disks 17 in an outward direction to engage the inner wall of the cylinder in which the piston is mounted, thus insuring a tight joint. For the purpose of forcing the disks 20 in the direction of each other an ordinary nut 21 may be used, the piston-rod being provided with an annular shoulder 22 to bear against the opposite disk 19. A spring may be interposed between the collar 22 and the adjacent disk 19. It will be seen that in this manner an exceedingly simple and closely-fitting piston may be constructed and one in which wear is automatically taken up, the disks 17 being automatically expanded as wear takes place, so as to bear continually against the walls of the cylinder.

It is obvious that the construction just described of the pistons may be varied in numerous ways, and I desire it to be understood that I do not limit myself to the precise construction herein described and illustrated, but reserve the right to any changes and modifications to which recourse may be had without departing from the spirit of my invention.

The operation of my motor-engine will be readily understood from the foregoing description, taken in connection with the drawings hereto annexed, by those skilled in the art to which it appertains. Assuming that the valve 8 originally occupies a position near the left-hand end of the valve-chamber, as shown in the drawings hereto annexed, the steam or other motive fluid will enter through the pipe 12 into the space in the valve-chamber between the central piston 10 and the right-hand piston 11 of the valve 8 and will pass from said space through one of the pipes 13 to the left-hand end or to the left-hand compartment of the main cylinder, thus forcing the pistons in the latter in a right-hand direction until the left-hand piston 3 in the main cylinder passes the opening 6, connecting the latter with the left-hand end of the valve-chamber. The steam contained in the right-hand end of the main cylinder meanwhile escapes through the pipe 13 into the space or compartment between the central piston 10 and left-hand piston 11 of the valve, and from said space through the pipes 14 and 15 and the exhaust branch 16. As soon as the left-hand piston 3 in the main cylinder passes the opening 6 the live steam will enter the extreme left-hand end of the valve-chamber, forcing the valve in a right-hand direction until the stop 7 is encountered. This changes the position of the central piston 10 of the valve to a position to the right of the inlet-port, and all conditions being thus reversed the pistons in the main cylinder will be forced in an opposite direction. It will be seen that by this construction and arrangement of parts the operation of the valve is rendered absolutely automatic and is performed solely under the impulse of the steam or other motive fluid by which the engine is driven. It will also be seen that it becomes possible by my improved construction to dispense altogether with packing-boxes, inasmuch as it is unnecessary to extend either the valve-stem or the piston-rod through the ends of their respective cylinders.

Having thus described my invention, I claim—

1. In a machine of the class described, the combination of the main cylinder or cylinders, the valve-chamber arranged adjacent to the same and having connection therewith through openings near the ends of said valve-chamber, the piston-rod arranged in the main cylinder and provided with pistons near the ends of the latter, a valve arranged in the valve-chamber and consisting of a stem having a central piston and one at each end, the inlet-pipe connected centrally to the valve-chamber, and pipes connecting the spaces on opposite sides of the central valve-piston with the ends of the main cylinder and a suitable exhaust, substantially as set forth.

2. In a machine of the class described, the combination of the main cylinder, the piston-rod arranged in the latter and carrying two pistons, and a valve-chamber having connection with the main cylinder near the ends of the latter, the valve comprising a stem having a central piston and one at each end, the inlet-pipe connected centrally with said valve-chamber, pipes connecting the spaces on opposite sides of the central valve-piston with the piston ends of the main cylinder, and pipes connecting the said spaces with the exhaust, substantially as set forth.

3. In a machine of the class described, the combination, with the valve-chamber having the central inlet-port and provided with interiorly-arranged spaces near each end, of the valve comprising a stem having a central piston and one piston at each end, and means for automatically reciprocating said valve under the impulse of the steam or other motive power, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

A. J. GRIFFIN.

Witnesses:
CHAS. F. B. COLBURN,
L. D. HAY.