

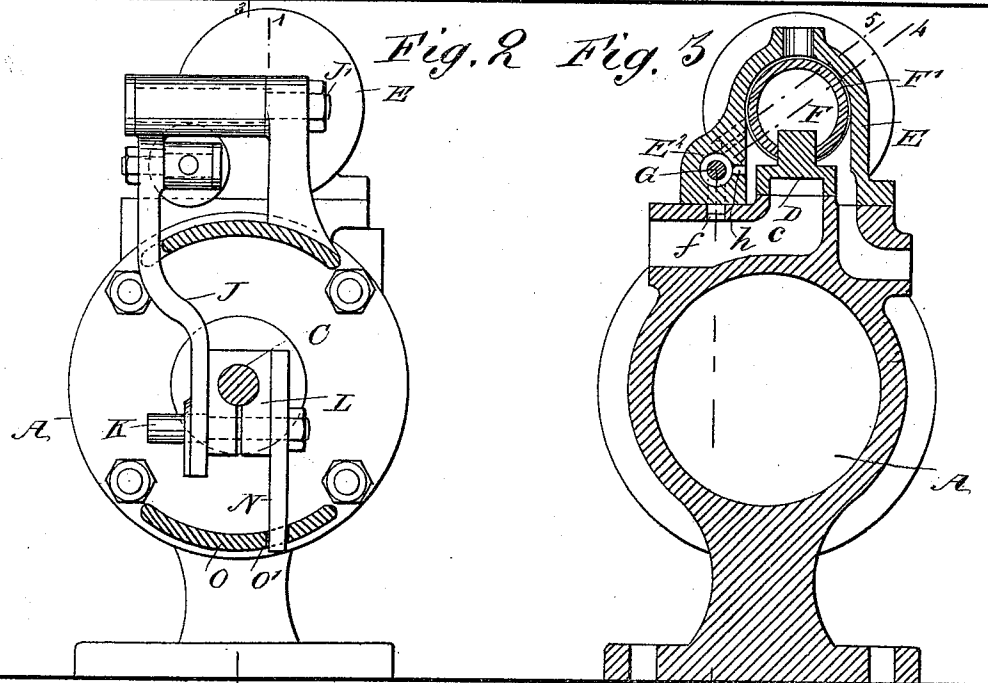
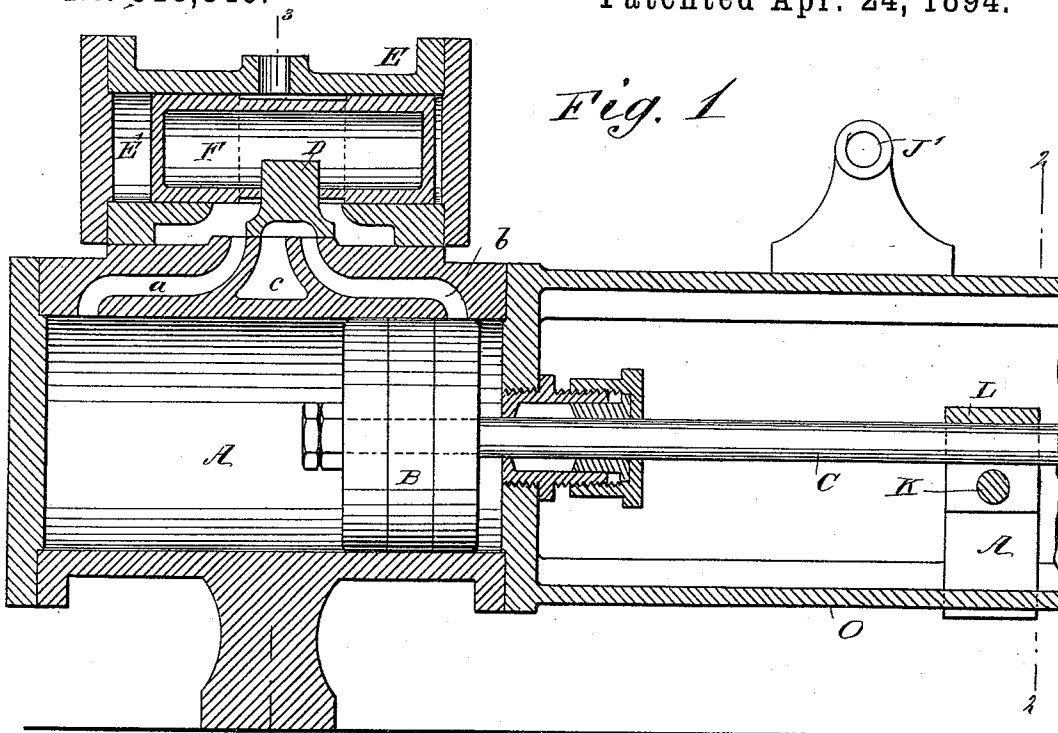
(No Model.)

2 Sheets—Sheet 1:

J. J. KWIS.
STEAM ACTUATED VALVE.

No. 518,846.

Patented Apr. 24, 1894.



WITNESSES: 1

C. Neveu

C. Sedgwick

INVENTOR

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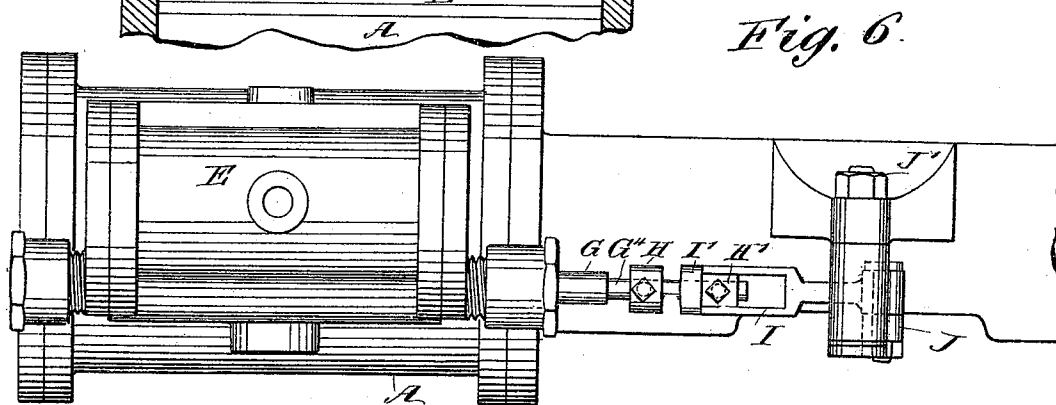
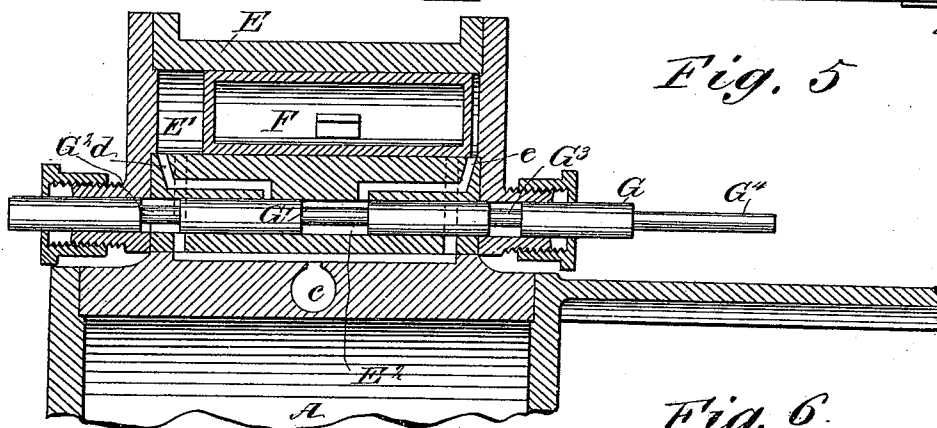
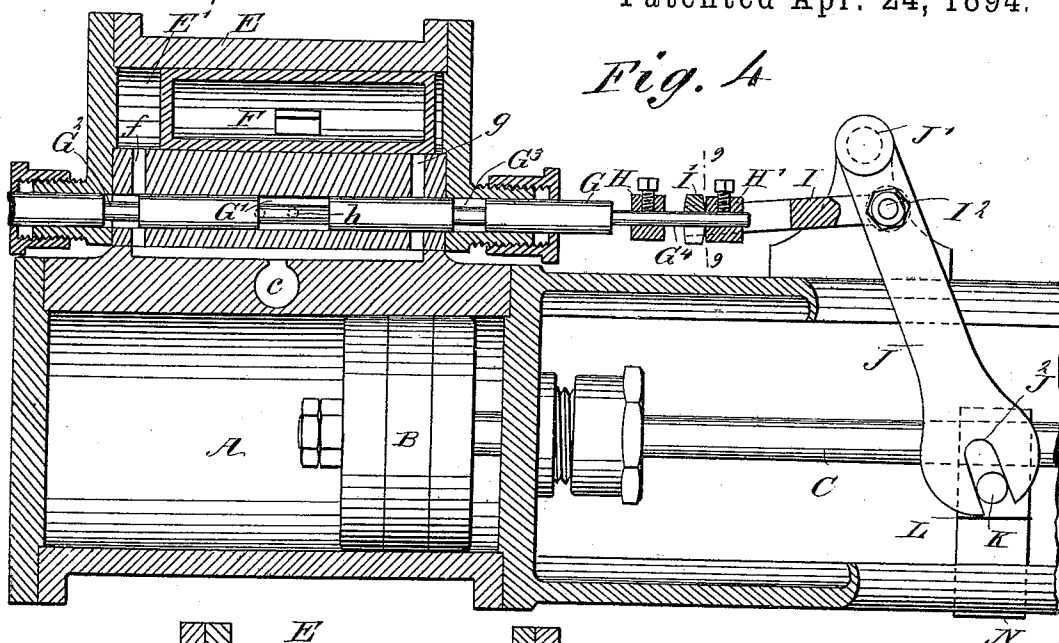
BY

BY *Munn & Co*
ATTORNEYS.

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WITNESSES:
C. Nevins
Le Sedgwick

Fig. 7 Fig. 8 Fig. 9



INVENTOR
J. J. Kwis
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UNITED STATES PATENT OFFICE.

JOSEPH J. KWIS, OF FINDLAY, OHIO, ASSIGNOR TO THE ADAMS BROTHERS COMPANY, OF SAME PLACE.

STEAM-ACTUATED VALVE.

SPECIFICATION forming part of Letters Patent No. 518,846, dated April 24, 1894.

Application filed August 11, 1893. Serial No. 482,877. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH J. KWIS, of Findlay, in the county of Hancock and State of Ohio, have invented a new and Improved Steam-Actuated Valve, of which the following is a full, clear, and exact description.

The invention relates to steam pumps, and its object is provide a new and improved steam actuated valve, which is simple and durable in construction, very effective in operation, and arranged to positively control the movement of the main piston valve.

The invention consists of certain parts and details, and combinations of the same, as will be hereinafter described and then pointed out in the claim.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a sectional side elevation of the improvement on the line 1—1 of Fig. 2. Fig. 2 is a transverse section of the same on the line 2—2 of Fig. 1. Fig. 3 is a similar view of the same on the line 3—3 of Fig. 1. Fig. 4 is a sectional side elevation of the improvement on the line 4—4 of Fig. 3. Fig. 5 is a similar view of the same on the line 5—5 of Fig. 3. Fig. 6 is a plan view of the improvement. Figs. 7 and 8 are face views of the stop collars; and Fig. 9 is a transverse section of the yoke on the line 9—9 of Fig. 4.

The steam pump on which the improvement is applied, is provided with the usual steam cylinder A, in which reciprocates the piston B, secured on the piston rod C, connected with the plunger of the pump in the usual manner. The cylinder A is provided with the usual steam inlet ports *a* and *b*, and the exhaust port *c*, controlled by the usual slide valve D, extending into the steam chest E, and carried by the main piston valve F, fitted to slide in a cylindrical bore E', arranged in the steam chest E. The ends of the bore E' are connected by steam inlet ports *d* and *e*, see Fig. 5, with the middle portion of a second cylindrical bore E², also formed in the steam chest E and containing an auxiliary piston valve G, adapted to be directly actuated from the piston C as hereinafter more fully described.

From the ends of the bore E' lead the exhaust ports *f* and *g*, passing transversely through the bore E² and leading into the exhaust *c*, as plainly shown in Fig. 4. The auxiliary balanced piston valve G is provided with the reduced portions G', G² and G³, of which the reduced portion G' controls the ports *d* and *e*, the reduced portion G² controls the port *f*, and the reduced portion G³ controls the port *g*. The middle portion of the bore E² opens into the steam space by ports *h*, as indicated in Figs. 3 and 4. The valve G extends beyond the steam inlet ports, through the ends of the stuffing-box.

The stem G⁴, of the auxiliary piston valve G carries the stops H and H', between which operates the forked end I', of a yoke I, pivotally connected at I² with an arm J, fulcrumed at J', to a bracket extending from the main frame of the pump. The lower end of the arm J is formed with a slot J², engaging a stud K held on a block L, clamped or otherwise fastened on the piston rod C, so that the forward and backward motion of the latter causes the block L and stud K to impart a swinging motion to the arm J. This motion of the arm J is transmitted by the yoke I and collars H and H' to the auxiliary piston valve G, to connect and disconnect the several reduced portions G', G² and G³ with and from their respective ports, as hereinafter more fully described. From the block L extends downward an arm N, engaging a longitudinally-extending groove O' formed in the bottom O, of the frame connecting the steam cylinder with the pump cylinder, the said plate N serving to prevent the piston C and block L from turning.

The operation is as follows: When the several parts are in the position as illustrated in the drawings, then the live steam in the steam chest E can pass through the port *a* into the left hand end of the cylinder A to push the piston B inward, and at the time the latter nears the end of its innermost stroke the stud K has moved the arm J a sufficient distance to cause the yoke I to exert a pull on the collar H' to move the auxiliary piston valve G to the right to the position shown in Figs. 4 and 5, whereby the left hand end of the bore E' is connected by the port *f* with the exhaust *c*, as the

reduced portion G^2 of the piston valve then opens the said port f . At the same time, the middle portion of the bore E^2 is connected at the reduced part G' of the piston valve with the port e , so that live steam from the steam chest can pass into the right hand end of the bore E' to shift the main piston valve F to the left. This movement of the main piston valve carries the slide valve D in a like direction, whereby the port a is connected with the exhaust port c and the port b is open to the live steam, the latter then passing through the said port into the inner end of the cylinder A to return the piston B . When the latter nears the end of its outward stroke, the stud K has imparted a swinging motion to the arm J , so that the forked end I' of the yoke I engages the other collar H so as to shift the auxiliary piston valve G to the left, to cut off the port f and to open the port g by the reduced end G^3 of the auxiliary piston valve passing across the said port. The latter then connects the right hand end of the bore E' with the exhaust, and at the same time the middle portion of the bore E^2 is connected by the port d with the left hand end of the bore E' , to permit live steam to pass into the end of the bore E' to again force the piston valve F to the right into the position shown in the drawings. This movement of the main piston valve F carries the main valve D back to its former position in Fig. 1, to again admit steam to the left hand end of the cylinder A . The above described operation is then repeated. It will be seen that by this arrangement the auxiliary pis-

ton valve G is directly and positively actuated from the piston rod C , whereby all undue friction is avoided, and the main piston valve F is positively shifted whenever the piston B nears the end of its outward or inward stroke.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

In a steam-actuated piston valve, the combination with a steam-chest having a main bore and an auxiliary bore, steam inlet ports leading from the auxiliary bore to the ends of the main bore and exhaust ports which are independent of the inlet ports and lead from the end of the said main bore transversely through the auxiliary bore to the common exhaust passage, of a main piston valve fitted to slide in the said main bore and connected with and carrying the main slide valve, the auxiliary, balanced piston valve fitted to slide in the said auxiliary bore and extending through both ends of the steam-chest, the same being provided with the three reduced portions, G' , G^2 , G^3 , of which one controls the said steam inlet ports and the other the exhaust port for the first named bore, and means, substantially as described, for imparting a sliding motion to the said auxiliary piston valve from the main piston rod, as shown and described.

JOSEPH J. KWIS.

Witnesses:

ED. V. BOPE,
JOHN A. MEEKS.