

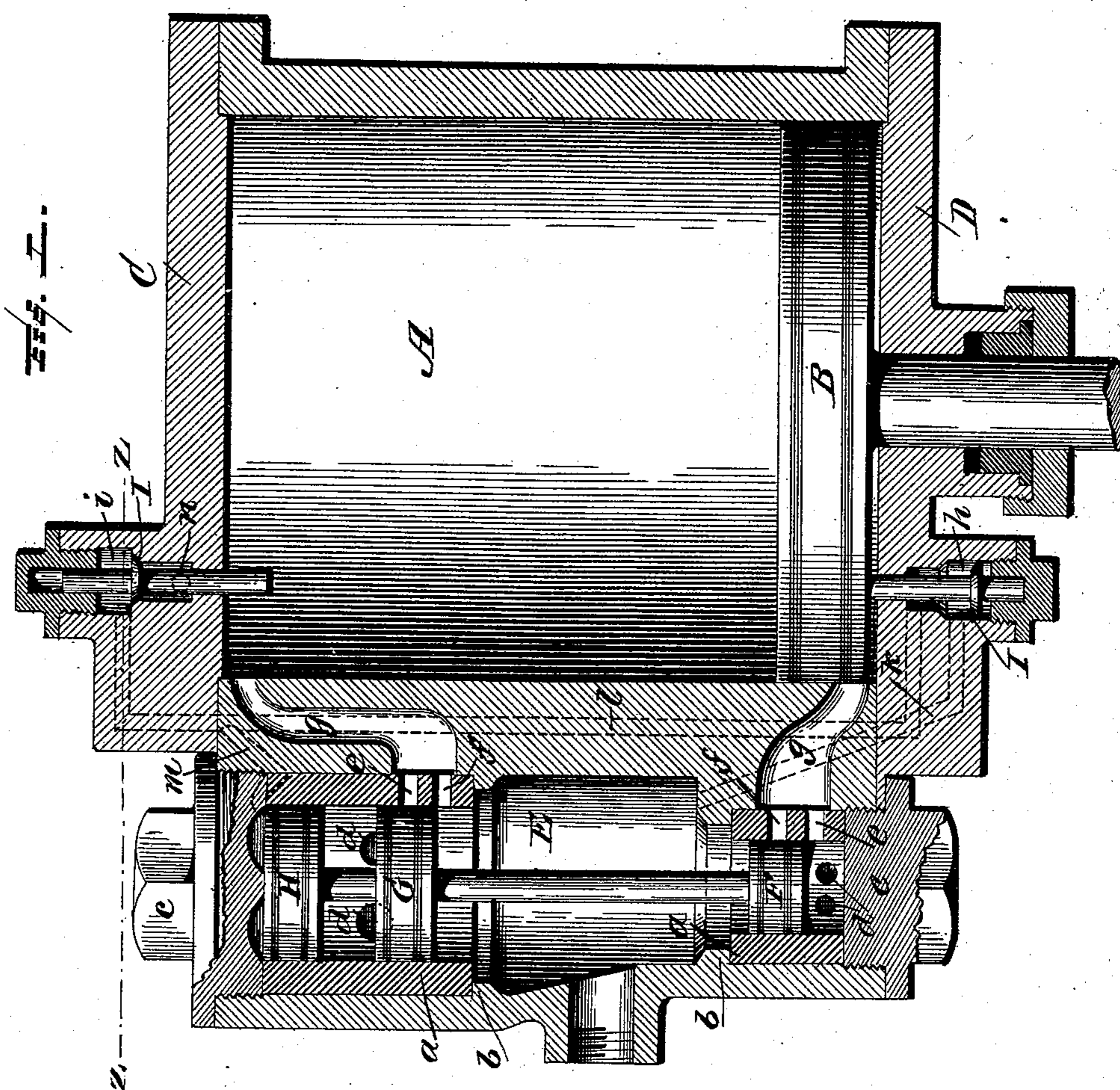
(No Model.)

2 Sheets—Sheet 1.

A. A. NANNEY.
STEAM ACTUATED VALVE FOR ENGINES.

No. 471,882.

Patented Mar. 29, 1892.



Witnesses

L. C. Mills.

Roy Dawson

Inventor

Addison A. Nanney,

per Cha. V. Fowler

Attorney

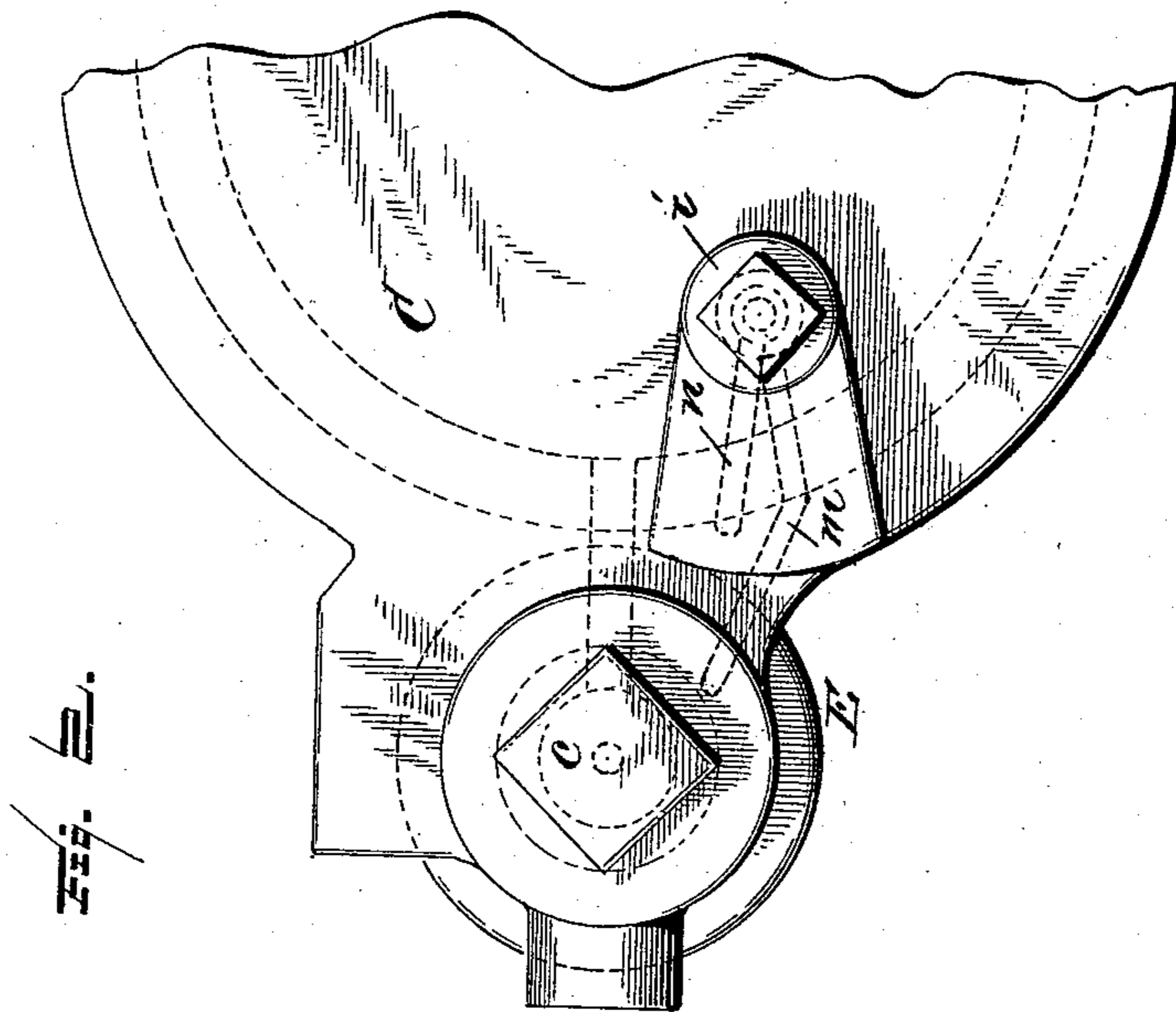
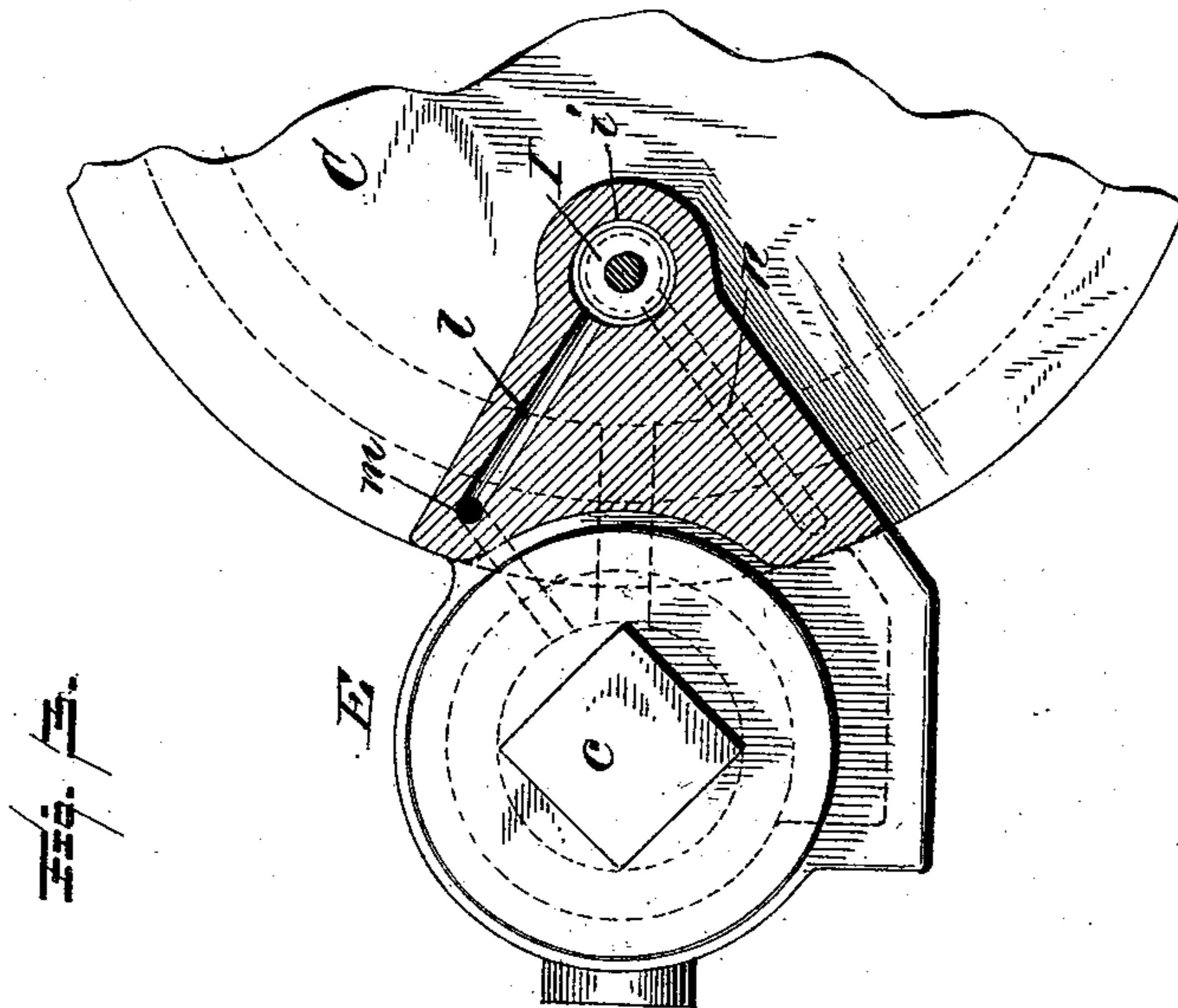
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UNITED STATES PATENT OFFICE.

ADDISON A. NANNEY, OF EVANSVILLE, INDIANA.

STEAM-ACTUATED VALVE FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 471,882, dated March 29, 1892.

Application filed November 20, 1891. Serial No. 412,512. (No model.)

To all whom it may concern:

Be it known that I, ADDISON A. NANNEY, a citizen of the United States, residing at Evansville, in the county of Vanderburgh and State of Indiana, have invented certain new and useful Improvements in Steam-Actuated Valves for Engines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

Figure 1 of the drawings represents a longitudinal section of my improved steam-actuated valve for engines, showing the several connections thereto and the main cylinder and piston. Fig. 2 represents an end view of the valve-chest and part of the main cylinder. Fig. 3 represents a sectional view taken on line *z z* of Fig. 1.

The present invention has relation to that class of valves which are operated by steam-pressure and are controlled by the piston in the main cylinder, also to a valve that has unequal areas, upon which the steam presses, whereby the valve is operated by equalizing and removing the pressure from the opposite side of the piston of greater area.

The invention consists in the several details of constructions, substantially as shown in the drawings and hereinafter described and claimed.

In the accompanying drawings, A represents the main cylinder, and B the piston thereof, the heads of the cylinder being represented at C D. Upon one side of the cylinder is the steam-chest E, which contains the valve and which is composed of the small piston F and the large pistons G H. The valve-seats *a* are made separate from the steam-chest, so that they may be easily renewed when worn, and are cylindrical, said seats being placed in the chest and resting against the flanges *b*, and are held in position by the cap-nuts *c*. Each seat is provided with exhaust-ports *d*, leading to the atmosphere, and also exhaust-ports *e*, leading from the cylinder to the valve-chest, the seat being also provided with steam-ports *f*, which lead from the valve-chest to the passages *g* from either end of the cylinder. The heads C D of the main cylinder are provided, respectively, with a

valve-chest, (shown at *h i*), which contain the puppet-valves I, and which are alternately opened by the piston B during the stroke of the same. From the steam-chest E leads a steam-passage *k* into the valve-chest *h*, as shown in dotted lines of Fig. 1, and the valve-chests *h i* communicate by means of the passage *l*, and a second passage *m* extends therefrom and communicates with the steam-chest E above the piston H, and in the valve-chest *i* under the valve I and which communicates therewith is a passage *n*, said passage leading to the atmosphere, as shown in dotted lines, Fig. 2.

The operation is as follows: The position of the parts being as shown in Fig. 1, it will be seen that the piston B has nearly reached the end of the stroke and opened the valve I in the valve-chest *h*, which opens communication between the steam-chest E through the passages *k l* at the back of the piston H. The pressure of steam on the piston G is now counterbalanced and the pressure on piston F moves it and opens the exhaust-port *e* in the upper end of the cylinder and closing the lower exhaust-port *e* and opening the steam-port *f* in the lower end of the cylinder. This causes the steam to enter the cylinder under the piston and move it to the top thereof, where it strikes the valve-stem and opens valve I in the valve-chest *i*, the valve I in the valve-chest *h* being now closed, which will exhaust the steam from behind the piston H through the passages *l m n* and from the latter to the atmosphere, thus destroying the equilibrium of the pressure upon the pistons G H. The pressure being greater on piston G than on the piston F, the valve will move up and assume the position shown in Fig. 1. It will be noticed that the exhaust-passages *d* at the upper end of the cylinder are between the two pistons G H, so that there is an equilibrium upon the exhaust as well as the steam side of the pistons. It should be noticed that the steam in the chest E causes the valve to remain in the upper end of the valve-chest, owing to the unequal area of the pistons F G; but when through the operation of the puppet-valves by means of the piston steam is let into the valve-chest behind the piston H an equilibrium between the piston G H is established and the piston F moves the valve.

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

1. In a steam-actuated valve, the combination of a valve composed of three pistons, two of which have greater area than the third, a valve-chest having exhaust-ports for one end of the cylinder between the pistons of greater area, and separate steam and exhaust ports to the main cylinder controlled by the said valve, substantially as and for the purpose described.

2. In a steam-actuated valve, the combination of a valve composed of three pistons, two of which are of greater area than the third, a valve-chest having exhaust-ports between the pistons of greater area, separate steam and exhaust ports to the main cylinder, a steam and exhaust passage, and puppet-valves operated by the main piston for controlling said

passage, substantially as and for the purpose described.

3. In a steam-actuated valve, the combination of the valve composed of three pistons, one of which is of less area than the others, the steam-chest having the independent steam and exhaust ports for each end of the cylinder, the exhaust-port between the pistons of equal area, the exhaust-port below the piston of reduced area, and means for operating the valve, substantially as and for the purpose set forth.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

ADDISON A. NANNEY.

Witnesses:

WM. FRANCKE,
H. W. LAUER.