(No Model.)

2 Sheets—Sheet 1.

J. H. BLESSING.

AUTOMATIC STEAM VALVE.

No. 257,280. Patented May 2, 1882.

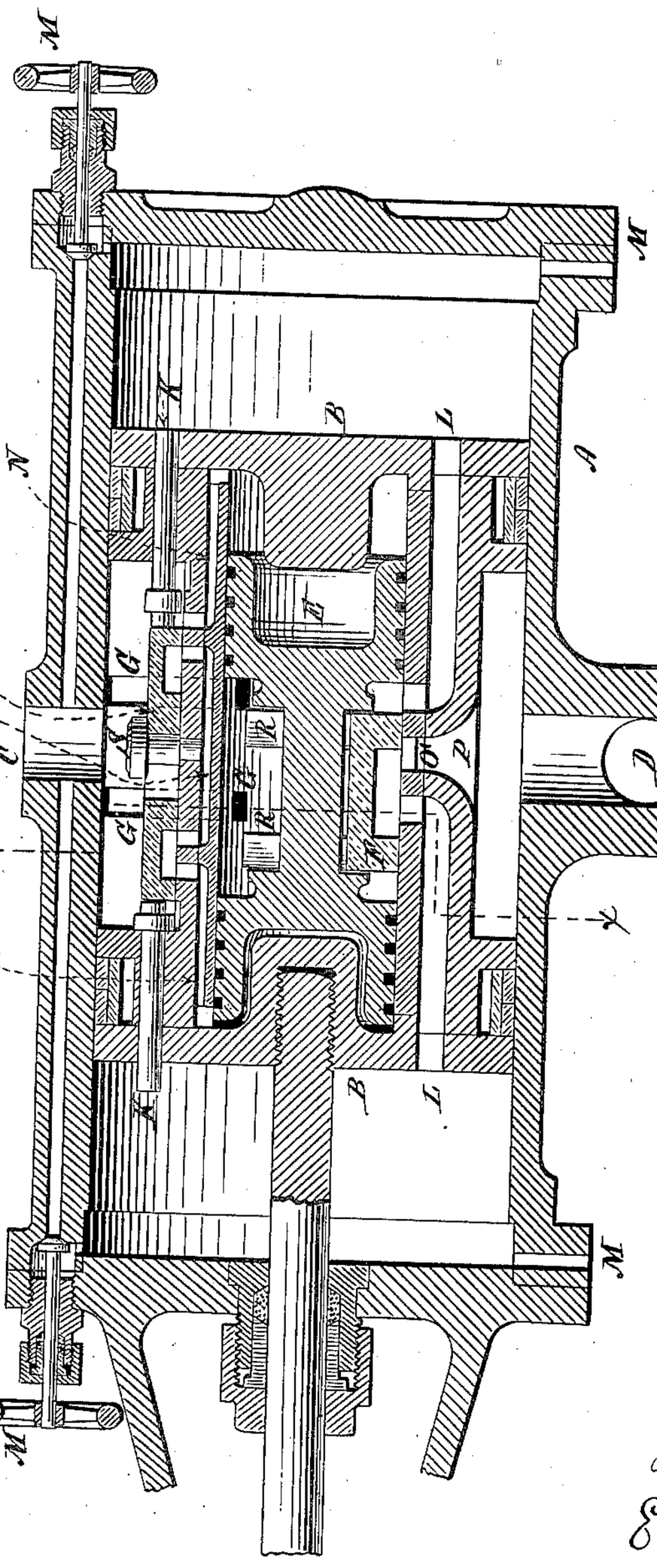

Figure 1.

Witnesses:

Geo. H. Miatt

A. Greef Jr.

Inventor:

James H. Blessing,

By his attorney

E. N. Dickerson Jr

(No Model.)

2 Sheets—Sheet 2.

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Figure 3.

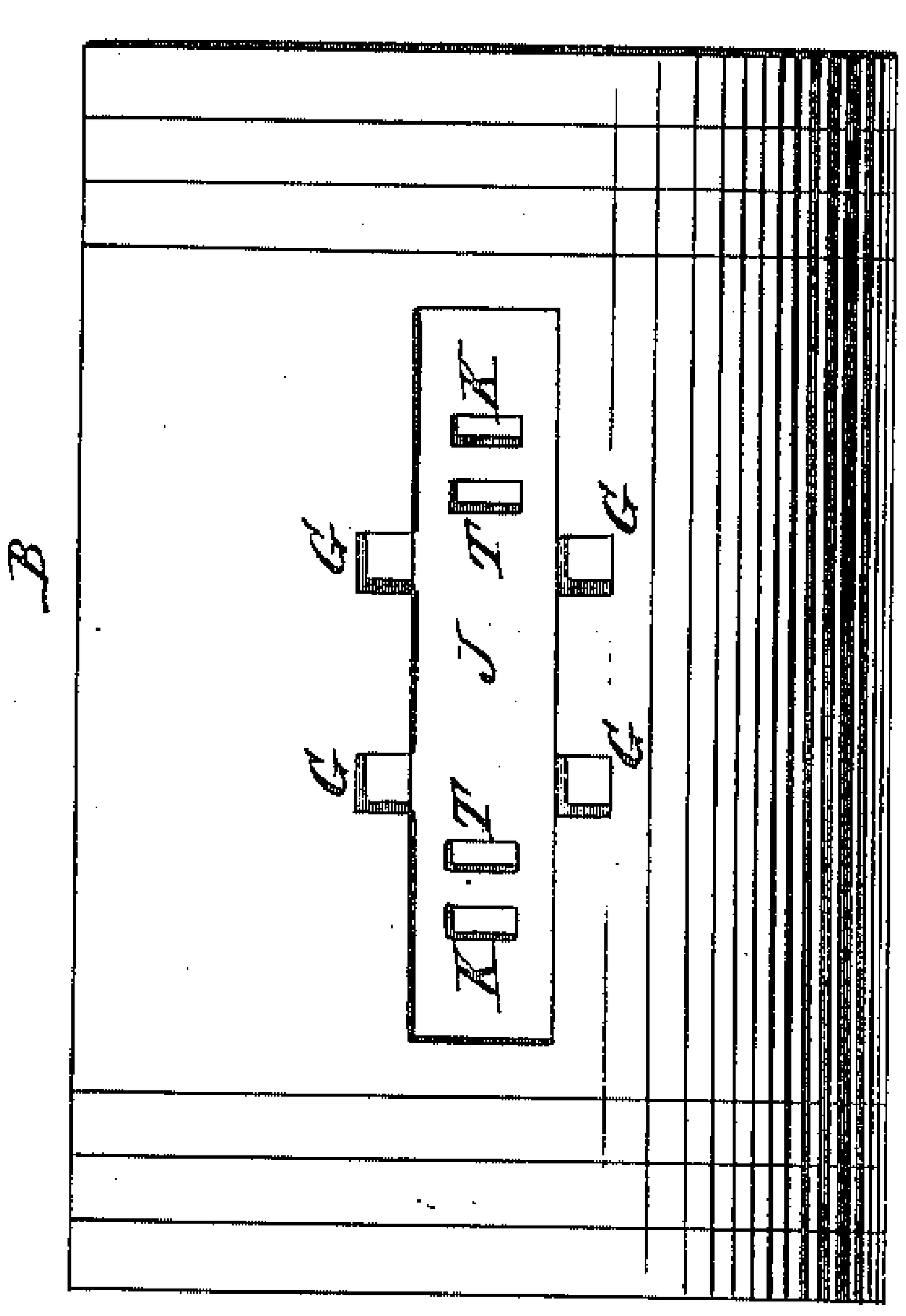
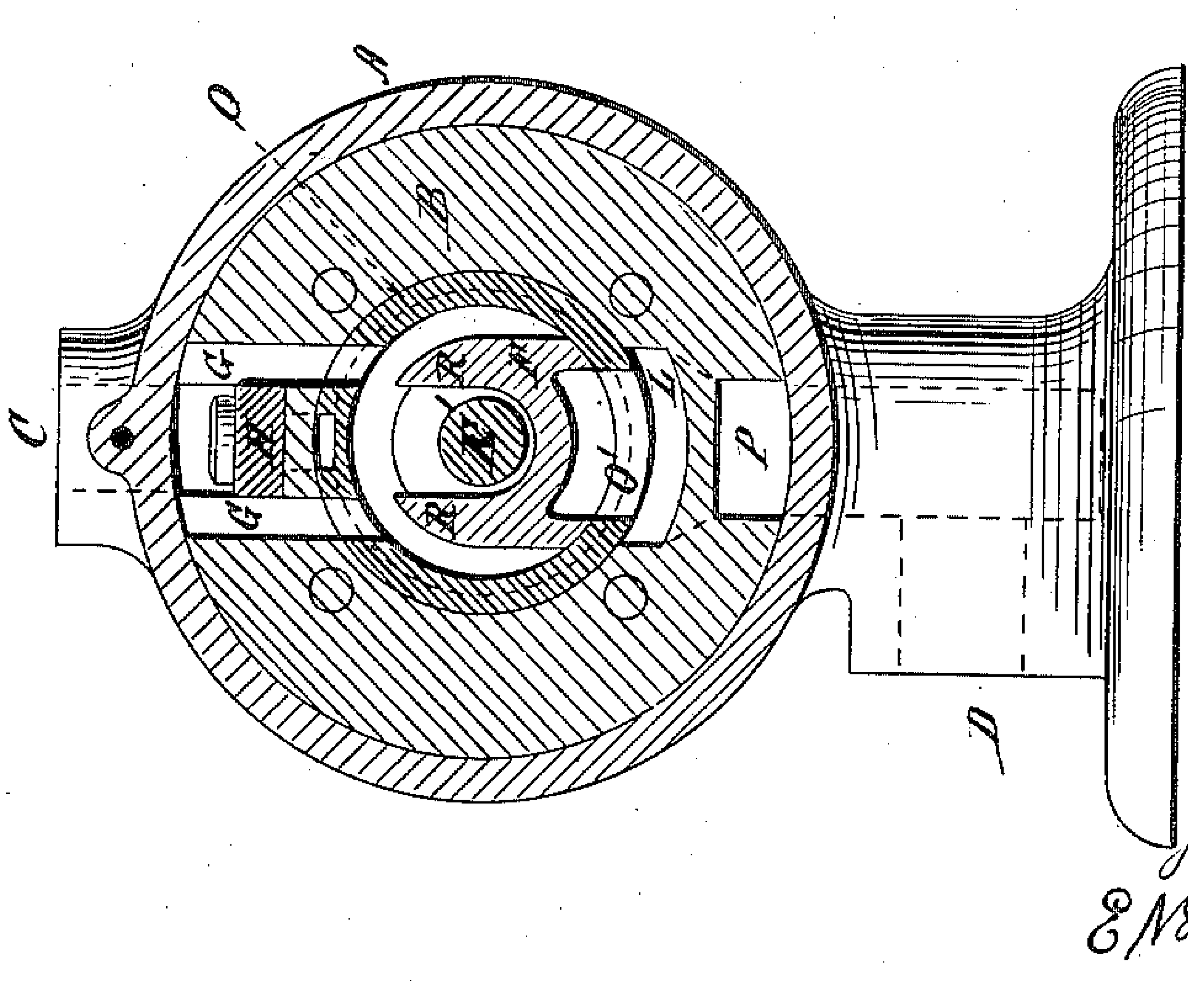


Figure 2.



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Geo. W. Miatt
A Gref Jr.

Inventor:
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By his attorney
E N Dickerson Jr

UNITED STATES PATENT OFFICE.

JAMES H. BLESSING, OF ALBANY, NEW YORK.

AUTOMATIC STEAM-VALVE.

SPECIFICATION forming part of Letters Patent No. 257,280, dated May 2, 1882.

Application filed March 6, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. BLESSING, of the city of Albany and State of New York, have invented a new and useful Improvement in Automatic Steam-Valves for Pumps, of which the following is a full, true, and exact description, reference being had to the accompanying drawings.

This invention relates to that class of pump-cylinders in which the steam and exhaust valves are operated by an auxiliary valve, which auxiliary valve is moved by a tappet or tappets. In my contrivance the valves and valve-moving apparatus are all located within the piston of the steam-cylinder, and are generally so contrived as to operate with but little necessity for stuffing-boxes or similar means of packing.

In my drawings, Figure 1 represents a vertical section through the cylinder, showing the piston and valve operating mechanism; Fig. 2, a section at right angles through Fig. 1 on the line *x x;* Fig. 3, a horizontal view of the upper surface of the piston.

My piston contains both the main and auxiliary valves, and is provided with tappets for moving said auxiliary valves.

A represents the steam-cylinder; B, the piston containing the parts before described.

C represents the steam and D the exhaust pipes of the steam-cylinder.

Within the piston B is arranged the auxiliary piston E, which operates the main valve F. This piston is suitably packed within a cylinder arranged within the piston B, and is made cup-shaped at its ends, receiving the corresponding projections on the inside of the piston-heads, thereby avoiding the necessity of large clearances.

The steam-valve is shown at F, and is an ordinary D slide-valve, but slides upon a cylindrical seat within the piston B, as is clearly shown in Fig. 2. This valve is provided with arms R, which surround the auxiliary piston E, by means of which arms motion is transmitted from said auxiliary piston to the main valve F. Steam is admitted to the central chamber surrounding the stem of piston E by the ports G, communicating immediately with the steam-supply C. Passages L L are provided in the lower part of the piston for allowing the ingress and escape of steam from the two ends of the cylinder.

P represents the exhaust-port communicating with the exhaust-pipe D, previously described.

In the situation shown in Fig. 1 the piston is moving in the direction of the arrow, and the main valve F being thrown to the left, steam is entering the cylinder on the right, and the exhaust-steam is escaping through the passage L on the left of the apparatus, and so to the exhaust. It will be plain that after the auxiliary piston E is thrown to the other end of its cylinder the motion of the main piston will begin in the opposite direction. The position of this auxiliary piston E is determined by the valve H, which slides upon the valve-seat shown in Fig. 3. This valve is moved by tappets K, projecting through the ends of the piston, and adapted to strike against the cylinder-heads. The valve H contains two steam-passages at either end, and is substantially two D-valves connected together. This valve is guided in its valve-seat J by a slot and pin, S. Steam-passages N connect with the ends of the interior cylinder, as is clearly shown. Cut around the exterior piston is an annular passage, O, (shown in dotted lines in Fig. 2,) which opens into the exhaust-chamber P at O′, Fig. 1. This passage communicates with the exhaust-ports T T. (Shown in Fig. 3.) In the position shown in the figure the auxiliary valve is thrown to the left, and consequently the port and passage on the right of the apparatus is uncovered, and the steam, entering by C, can pass to the interior cylinder on the right of the auxiliary piston E, while the left side of the cylinder is in communication with the exhaust-port by the exhaust-passages T and O, heretofore described. As the piston continues its movement to the left the tappet K on the left of the apparatus, striking against the cylinder-head, will throw the valve H in the opposite direction, thereby admitting steam to the left of the piston E and opening the exhaust-port on the right of said piston. The piston E will consequently be thrown to the right, thereby reversing the position of the main valve F, and the main piston will move in the opposite direction or to the right.

At M M M are shown valves for operating

the apparatus on starting in the well-known way.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, in a steam-cylinder, of a piston, a main valve located within said piston and carried by it, and serving to operate said piston, and an auxiliary valve, also carried by and moving with said piston, which valve serves to operate the main valve, substantially as shown and described.

2. The combination, in a steam-cylinder, of a piston, an interior auxiliary piston operating a main valve carried by said piston, and an auxiliary valve located in the main piston, serving to operate the auxiliary piston, substantially as shown and described.

3. The combination, in a steam-cylinder provided with a steam-inlet above and an exhaust-outlet below, of a main piston carrying a steam-valve operating said piston, and arranged at the bottom of said piston, an auxiliary piston for operating the main valve, an auxiliary valve for operating said auxiliary piston, and the steam and exhaust passages passing around or through the main piston for conveying the steam from the steam-inlet to the steam-outlet, substantially as shown and described.

4. The combination, in a steam-cylinder, of a main piston carrying a slide-valve for operating itself, an interior auxiliary piston located centrally with relation to the axis of the main piston, and an auxiliary valve for operating the auxiliary piston, and itself carried by the main piston, substantially as shown and described.

JAMES H. BLESSING.

Witnesses:
GEO. H. EVANS,
ANTHONY GREF, Jr.