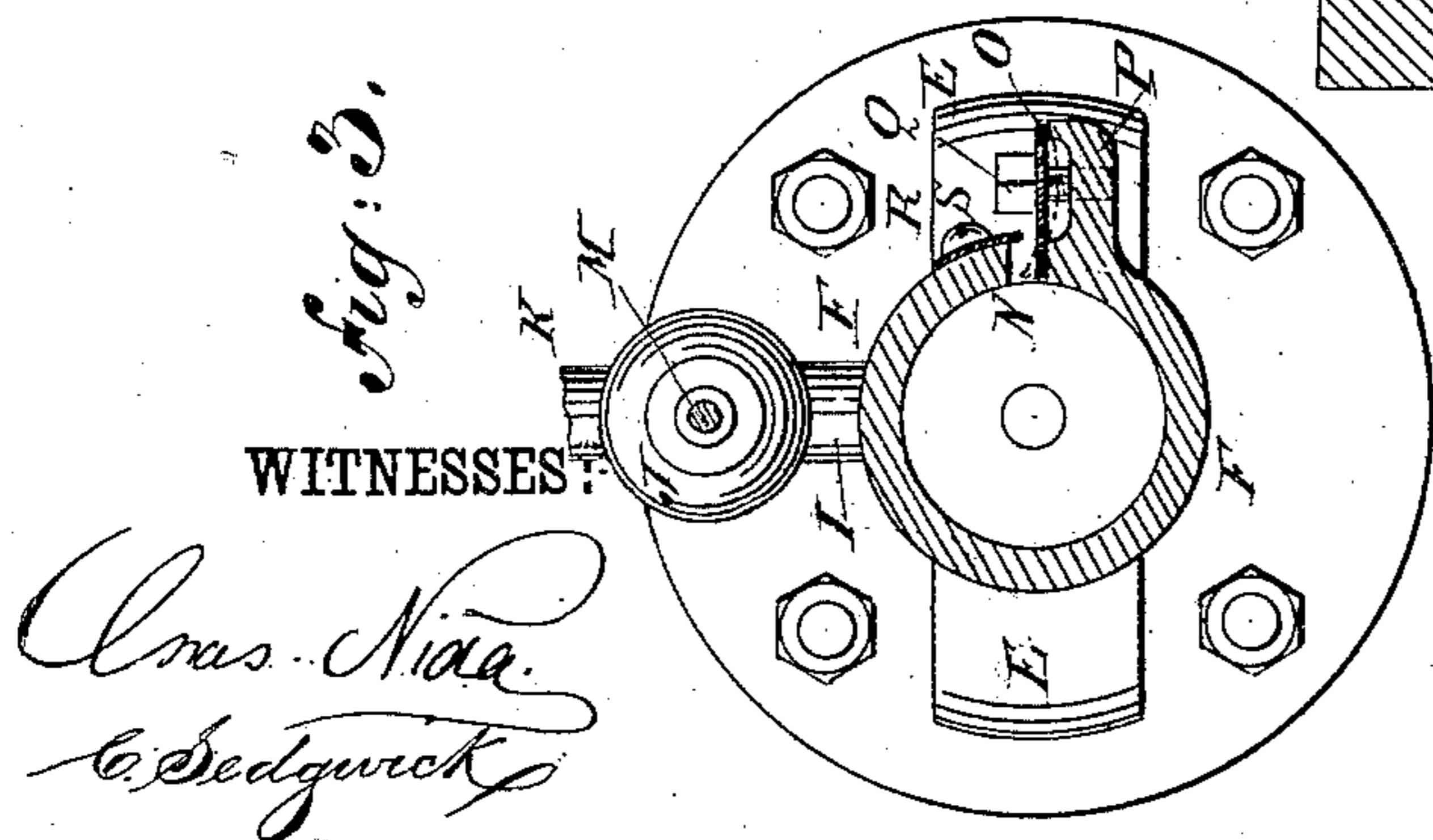
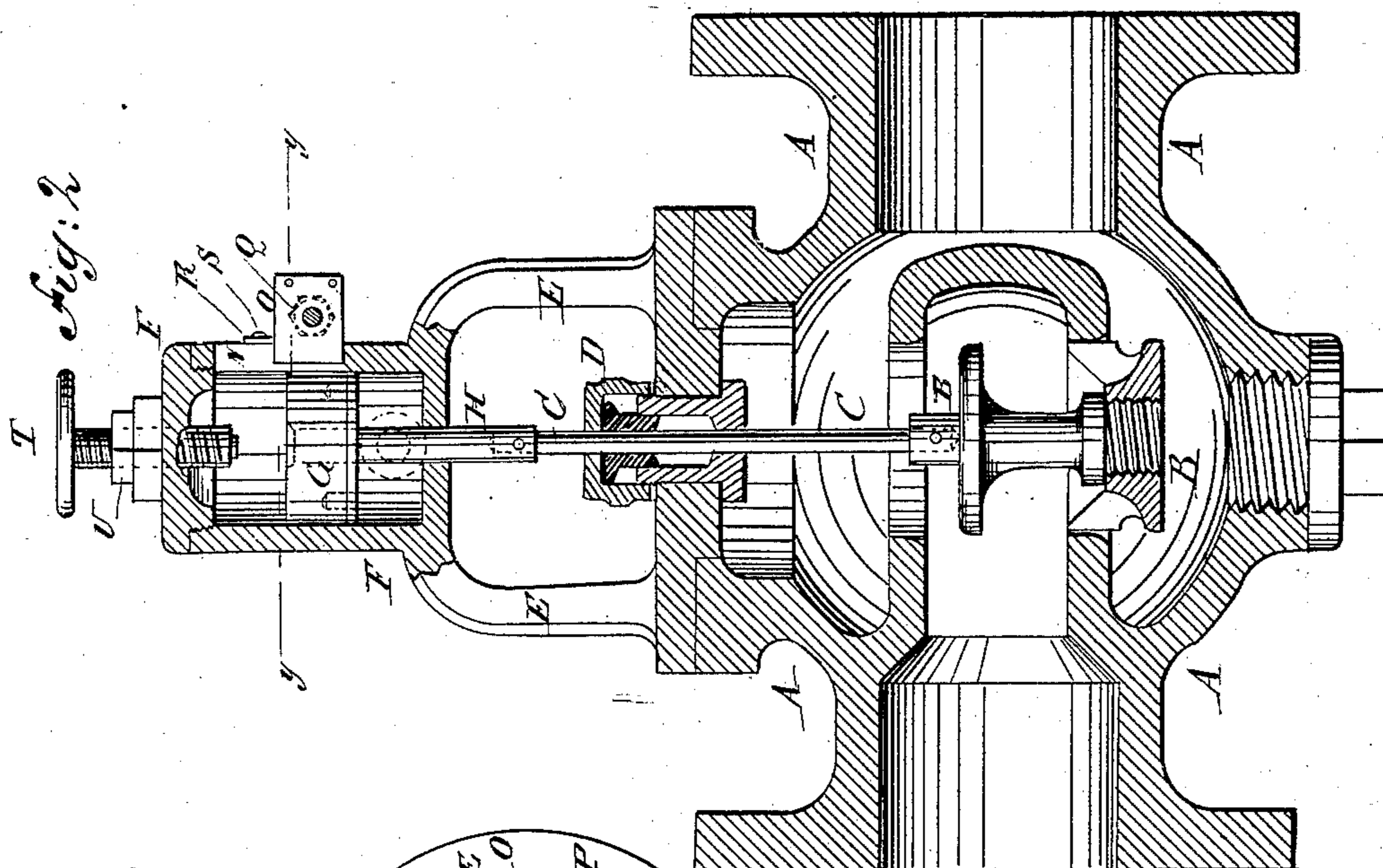
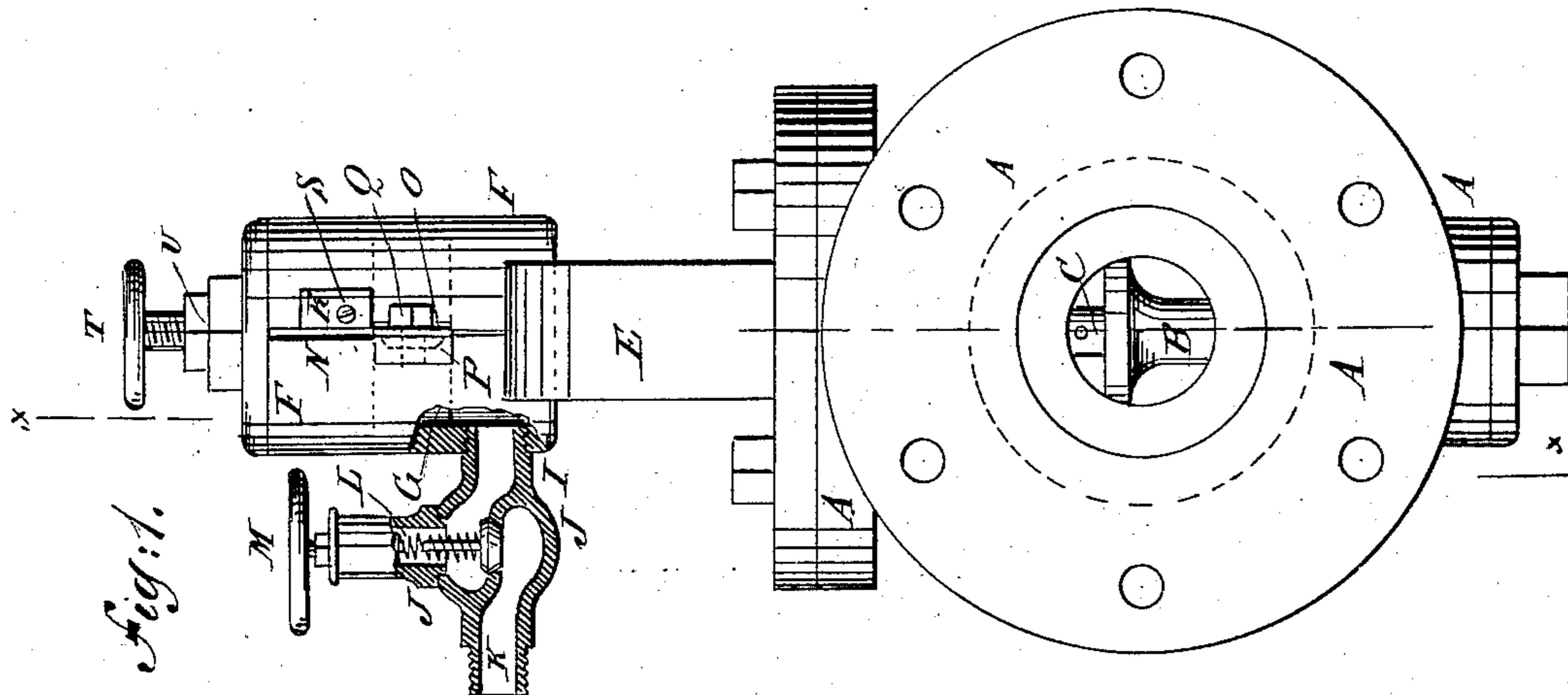


(No Model.)

E. HILL.  
REGULATING VALVE.

No. 317,357.

Patented May 5, 1885.



INVENTOR:  
*E. Hill*  
BY *Munn & Co.*  
ATTORNEYS.

# UNITED STATES PATENT OFFICE.

EBENEZER HILL, OF SOUTH NORWALK, CONNECTICUT.

## REGULATING-VALVE.

SPECIFICATION forming part of Letters Patent No. 317,357, dated May 5, 1885.

Application filed January 6, 1885. (No model.)

*To all whom it may concern:*

Be it known that I, EBENEZER HILL, of South Norwalk, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Regulating-Valves, of which the following is a full, clear, and exact description.

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

Figure 1 is a side elevation of my improvement, partly in section, and shown as applied to a throttle-valve. Fig. 2 is a sectional front elevation of the same, taken through the broken line *xx*, Fig. 1. Fig. 3 is a sectional plan view of the same, taken through the line *yy*, Fig. 2.

The object of the invention is to provide a mechanism simple in construction and reliable in operation for controlling throttle-valves in the steam-supply pipes of engines, operating air-compressors, controlling the dampers of boiler-furnaces, and other similar uses.

The invention relates to a regulating-valve constructed with a safety-valve to be connected with the air or steam space of an air-compressor or steam-boiler, a cylinder having an outlet-slot and connected with the safety-valve, and the piston and piston-rod to be connected with the rod of the valve or damper to be regulated. The cylinder is provided with an outlet-slot and a concaved lug, to the concaved side of which is secured by a bolt, an elastic metallic plate with its edge within the said outlet-slot, so that the width of the said outlet-slot can be regulated by adjusting the said fastening-bolt, as will be hereinafter fully described and claimed.

I will describe my improvement as applied to a throttle-valve placed in the steam-supply pipe of an engine driving an air-compressor, but do not limit myself to that application, as it can be used with advantage for controlling the dampers of boiler-furnaces, and for various other similar purposes.

A represents the stock or shell, and B the valve, of an ordinary two-seat throttle-valve, which is designed to be inserted in the steam-supply pipe of an engine operating an air-compressor. The rod C of the valve B passes up through a stuffing-box, D, in the top of the stock A, or in the base of a stand, E, se-

cured to the said top. To the top of the stand E is secured, or upon it is formed, a short cylinder, F, which is made with a closed lower end, and has a head secured to its upper end.

Within the cylinder F is placed a piston, G, the rod H of which extends downward, and is connected with the valve-rod C by a pin or other suitable means, so that the said piston G and the valve B will move together. With the lower part of the cylinder F, below the piston G, is connected the outlet-pipe I of an ordinary safety-valve, J, the inlet-pipe K of which is designed to be connected with the receiver of an air-compressor. The safety-valve J is held closed by a spring, L, or equivalent weight adjusted to hold the valve closed until a fixed air-pressure is reached. The tension of the spring L is regulated by a hand-screw, M, passing in through the top of the valve J, and connected with the upper end of the said spring L. With this construction, when the pressure exceeds the fixed limit, the valve J opens and air is discharged into the cylinder F until the pressure is reduced to the fixed limit. As the air presses into the cylinder F the piston G is forced upward more or less, according to the amount of the pressure, and raises the valve B through the same space, throttling the steam more or less, according to the amount of movement. The upward movement of the piston G is limited by a hand-screw, T, which passes down through a screw-hole in the head of the cylinder F, and which is secured in place when adjusted by a jam-nut, U. As the air-pressure is reduced the safety-valve J closes, and the valve B and piston G drop back to their places by their own weight.

In the side of the cylinder F is formed a slot, N, extending from the upper end of the said cylinder to the lower limit of the movement of the piston G, so that as the said piston moves upward it will uncover more or less of the lower part of the slot N, to give the air from the safety-valve J an escape-passage proportioned to the amount of the "blow" at the said safety-valve.

The sensitiveness of the mechanism depends upon the width of the slot N, and to enable this width to be regulated the edge of an elastic metallic plate, O, is inserted in the lower part of the said slot. The plate O is secured to a lug, P, by a bolt, Q, passing through the

said plate and into or through the said lug. The lug P is formed upon the side of the cylinder F, and the side of the said lug next the plate O is concaved, as shown in Fig. 3, so that  
5 by screwing the bolt Q forward the middle part of the said plate O will be drawn into the recess in the said lug P, which will cause the edge of the said plate to curve toward the other side of the slot N, and thus make the said  
10 slot narrower, as indicated in dotted lines in Fig. 3, or wholly close it, as may be required. Through the upper part of the slot N air passes to and from the upper part of the interior of the cylinder F as the piston G moves  
15 down and up. The size of the air-passage in the upper part of the slot N is regulated by a plate, R, secured to the said cylinder by a screw, S.

When the mechanism is used for regulating  
20 a damper, the piston-rod H is connected with the damper-rod, and the safety-valve J is connected with the steam-space of the boiler, or with a steam-pipe opening into the said space and having the same steam-pressure.

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

1. A regulating-valve constructed substantially as herein shown and described, and consisting of the safety-valve J, to be connected  
30 with the air or steam space, the cylinder F, having outlet-slot N, and connected with the safety-valve, and the piston and piston-rod G, H, to be connected with the rod of the valve or damper to be regulated, as set forth. 35

2. In a pressure-regulator, the combination, with the air-pipe K and the throttle-valve A, B, of the safety-valve J, the cylinder F, having outlet-slot N, and the piston G, substantially as herein shown and described, whereby  
40 the escape from the said safety-valve will be made to operate the said throttle-valve, as set forth.

3. In a pressure-regulating valve, the combination, with the cylinder F, having outlet-  
45 slot N, and provided with a concaved lug, P, of the elastic metallic plate O and the bolt Q, substantially as herein shown and described, whereby the width of the said slot can be readily regulated, as set forth.

EBENEZER HILL.

Witnesses:

JOHN A. SLATER,  
GEO. W. PALMER.