

(No Model.)

M. BERGER.  
VALVE FOR STEAM CYLINDERS.

No. 558,473.

Patented Apr. 21, 1896.

Fig. 1.

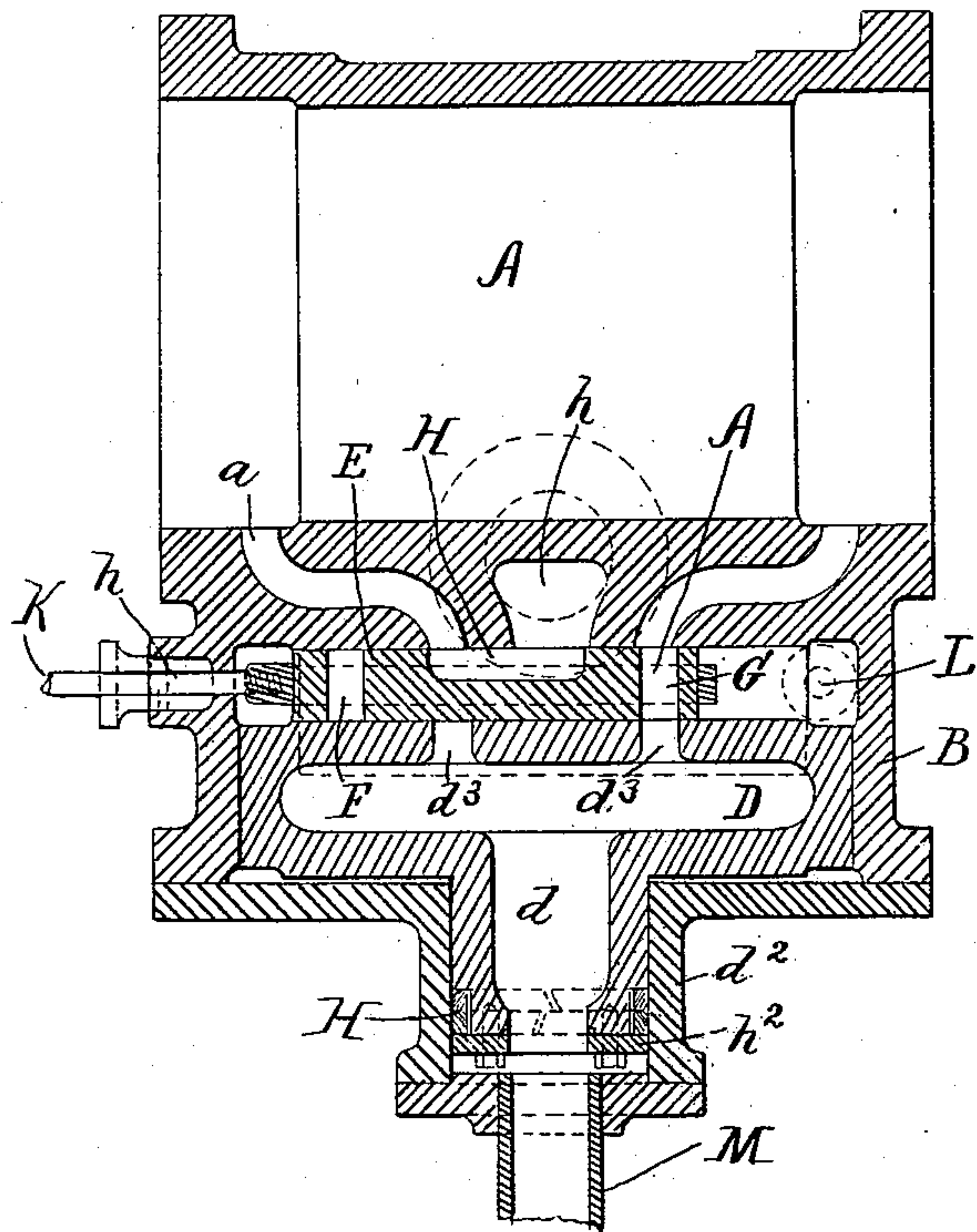


Fig. 2.

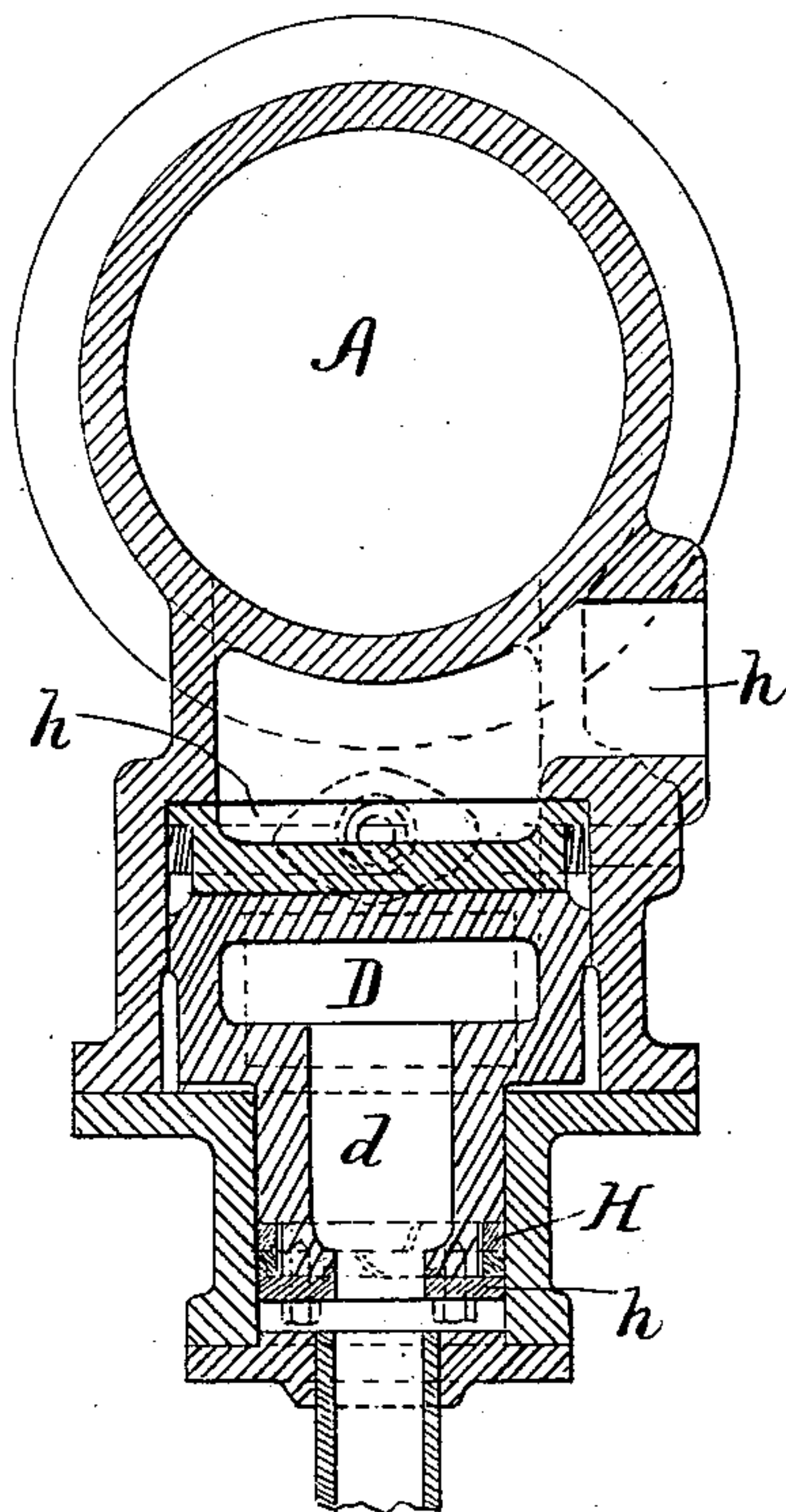
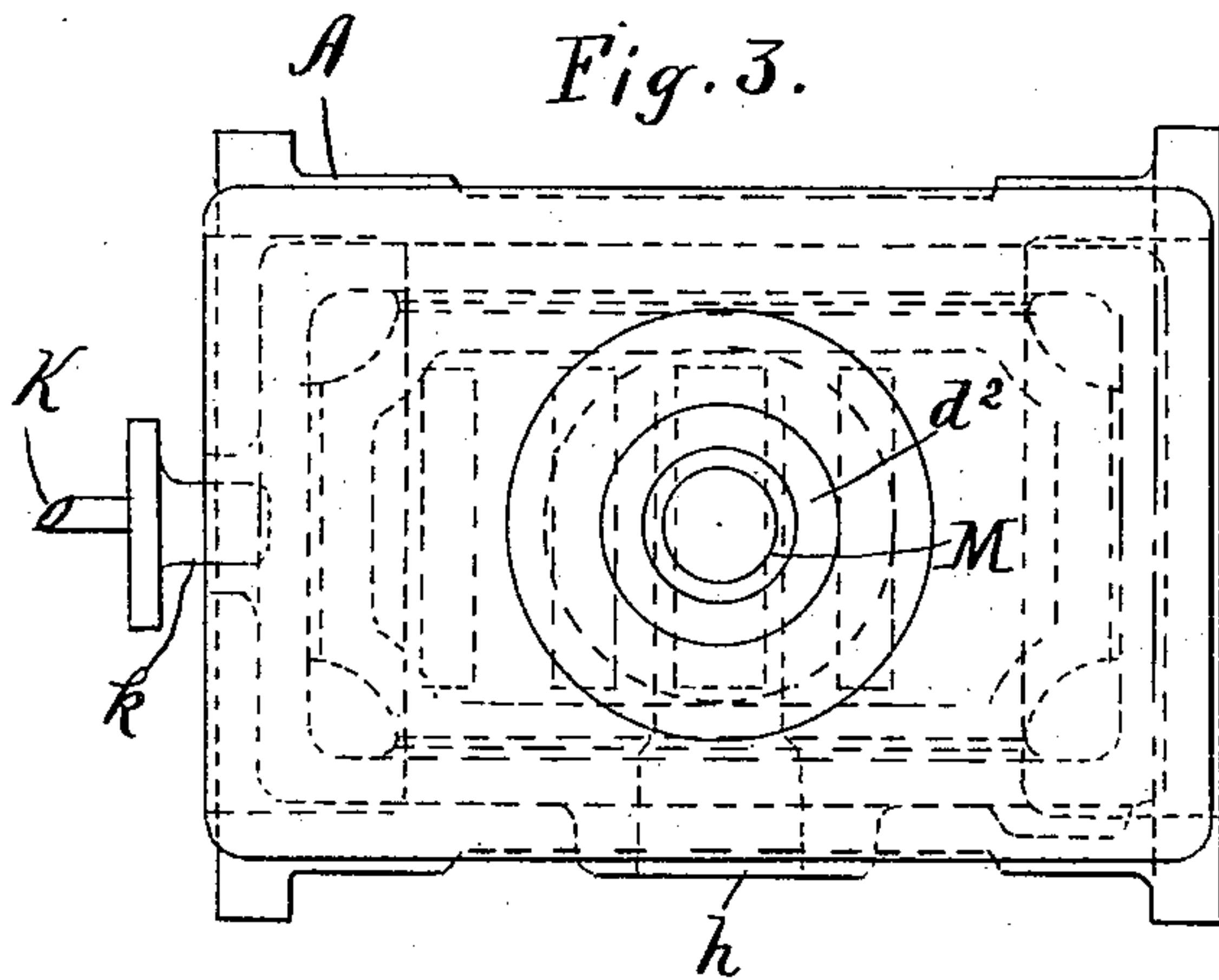


Fig. 3.



WITNESSES:  
Chas. C. Wagner.  
C. Gerst.

INVENTOR  
Matthew Berger.  
BY  
Edgar Tate & Co.  
ATTORNEYS



# UNITED STATES PATENT OFFICE.

MATTHEW BERGER, OF SOUTH BETHLEHEM, PENNSYLVANIA.

## VALVE FOR STEAM-CYLINDERS.

SPECIFICATION forming part of Letters Patent No. 558,473, dated April 21, 1896.

Application filed March 3, 1896. Serial No. 581,635. (No model.)

*To all whom it may concern:*

Be it known that I, MATTHEW BERGER, a citizen of the United States, and a resident of South Bethlehem, in the county of Northampton and State of Pennsylvania, have invented certain new and useful Improvements in Steam-Valves for Steam-Cylinders, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof, in which similar letters of reference indicate corresponding parts.

This invention relates to valves for the steam-cylinders of railway and other steam engines; and the object thereof is to provide a simple and effective device of this class which is perfectly balanced and the movement of which is free and the operation as nearly perfect as possible.

The invention is fully disclosed in the following specification, of which the accompanying drawings form a part, in which—

Figure 1 is a central longitudinal section of the steam-cylinder of a railway-engine, showing my improvement applied thereto; Fig. 2, a transverse central section of the same, and Fig. 3 a bottom plan view.

In the drawings forming part of this specification, A represents the steam-cylinder, and formed thereon or secured thereto at one side thereof is a steam-chest B, in which is placed a hollow steam-receiver D, provided with a tubular piston or steam-entrance which fits within a tubular extension  $d^2$  on the side of the steam-chest, and at the end of which is placed a packing-ring H and a follower  $h$ , and communicating with the opposite ends of the cylinder A are steam-passages  $a$ , which are curved inwardly and outwardly and which communicate with the steam-chest B, as shown in Fig. 1, and between the receiver D and said passages or the walls of the cylinder in which they are formed is a balanced valve E, which has two transverse passages F and G. The steam-receiver D is also provided with two passages  $d^3$ , and the inner side of the valve E with an exhaust port or passage H, which is adapted to place either of the passages  $a$  in communication with the exhaust-passage  $h$  in the cylinder.

Connected with the valve E at one end thereof is an operating-rod K, which passes

through a packing-box  $k$ , and at the opposite end of the steam-chest is a waste-pipe L, through which any steam that may collect therein may pass.

The tubular extension  $d^2$  of the steam-chest is also provided with a steam-supply pipe M, and the dimensions of the steam-passages  $a$  and the passages  $d^3$  and the exhaust-port H in the valve E are such that the said valve, when in operation, is exactly balanced by the pressure of the steam, and the dimensions of the tubular piston  $d$  are also so adjusted as to assist in the counterbalancing of the valve.

The rod K may be connected with the valve E in any desired manner, and it is evident that changes in and modifications of the construction herein described may be made without departing from the spirit of my invention or sacrificing its advantages, and I reserve the right to make all such alterations therein and modifications thereof as fairly come within the scope of the invention.

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

1. The combination with a steam-cylinder provided with a steam-chest at one side thereof, which is provided with a tubular extension, of a steam-receiver within said chest and provided with a tubular piston or extension which enters said tubular extension of the steam-chest and said tubular extension or piston being provided with a packing ring or rings and follower and the steam-cylinder being provided at each end with supply-passages which are curved inwardly and outwardly and which communicate with the steam-chest and a balanced valve which is placed within the steam-chest and between the walls of the steam-chest and the steam-receiver, said balanced valve being provided with two transverse passages, and said steam-receiver with two similar ports or passages and said valve being also provided in its cylinder side with an exhaust-passage which is formed therein and which is adapted to communicate with the supply-passages of the cylinder and also with the exhaust-pipe thereof, substantially as shown and described.

2. The combination with a steam-cylinder provided with a steam-chest at one side thereof, which is provided with a tubular extension



sion, of a steam-receiver within said chest, and provided with a tubular piston or extension which enters said tubular extension of the steam-chest and said tubular extension or piston being provided with a packing ring or rings and follower and the steam-cylinder being provided at each end with supply-passages which are curved inwardly and outwardly and which communicate with the steam-chest and a balanced valve which is placed within the steam-chest and between the walls of the steam-chest and the steam-receiver, said balanced valve being provided with two transverse passages, and said steam-receiver with two similar ports or passages and said valve being also provided in its cylinder side with an exhaust-passage which is formed therein and which is adapted to communicate with the supply-passages of the cylinder and also with the exhaust-pipe thereof, and said valve being provided with an operating-rod which passes through one of the ends of the steam-chest and said steam-chest being provided with an escape pipe or passage, substantially as shown and described.

3. The combination with a steam-cylinder provided with supply-passages as *a*, at each end thereof, and a steam-chest formed on, or secured to one side thereof of a steam-receiver within said steam-chest and a balanced valve mounted within said steam-receiver, and said cylinder and said balanced valve being provided with transverse passages and said steam-receiver being provided with ports or openings adjacent to said valve, and the inner side of said valve being also provided with an exhaust-passage which is adapted to communicate with the supply-passages of the cylinder, and with the exhaust-pipe, said valve being also provided with an operating-rod and said steam-chest with an escape-pipe, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 26th day of February, A. D. 1896.

MATTHEW BERGER.

Witnesses:

M. P. CASHNER,  
WM. STUBBLEBINE.