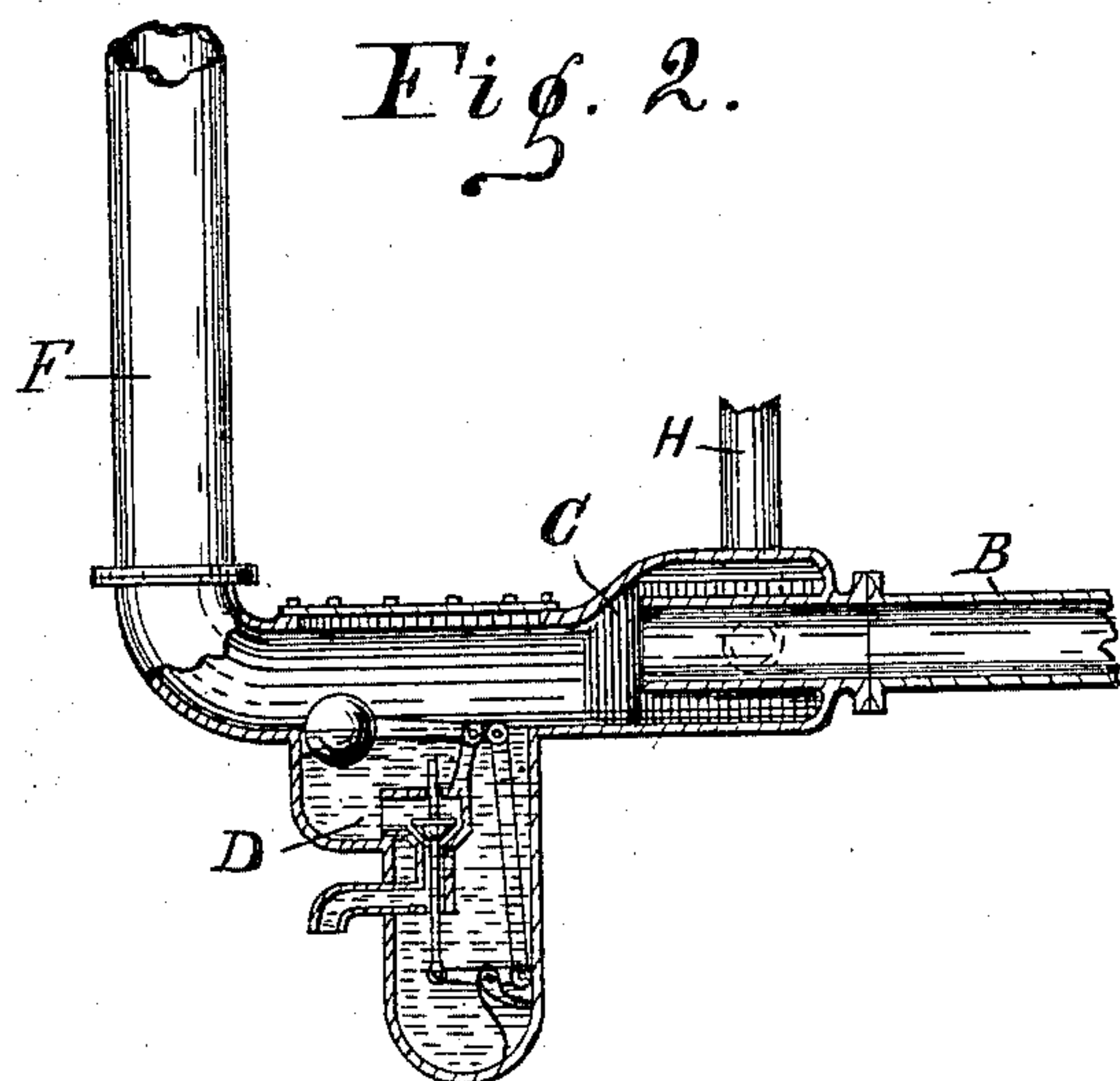


(No Model.)

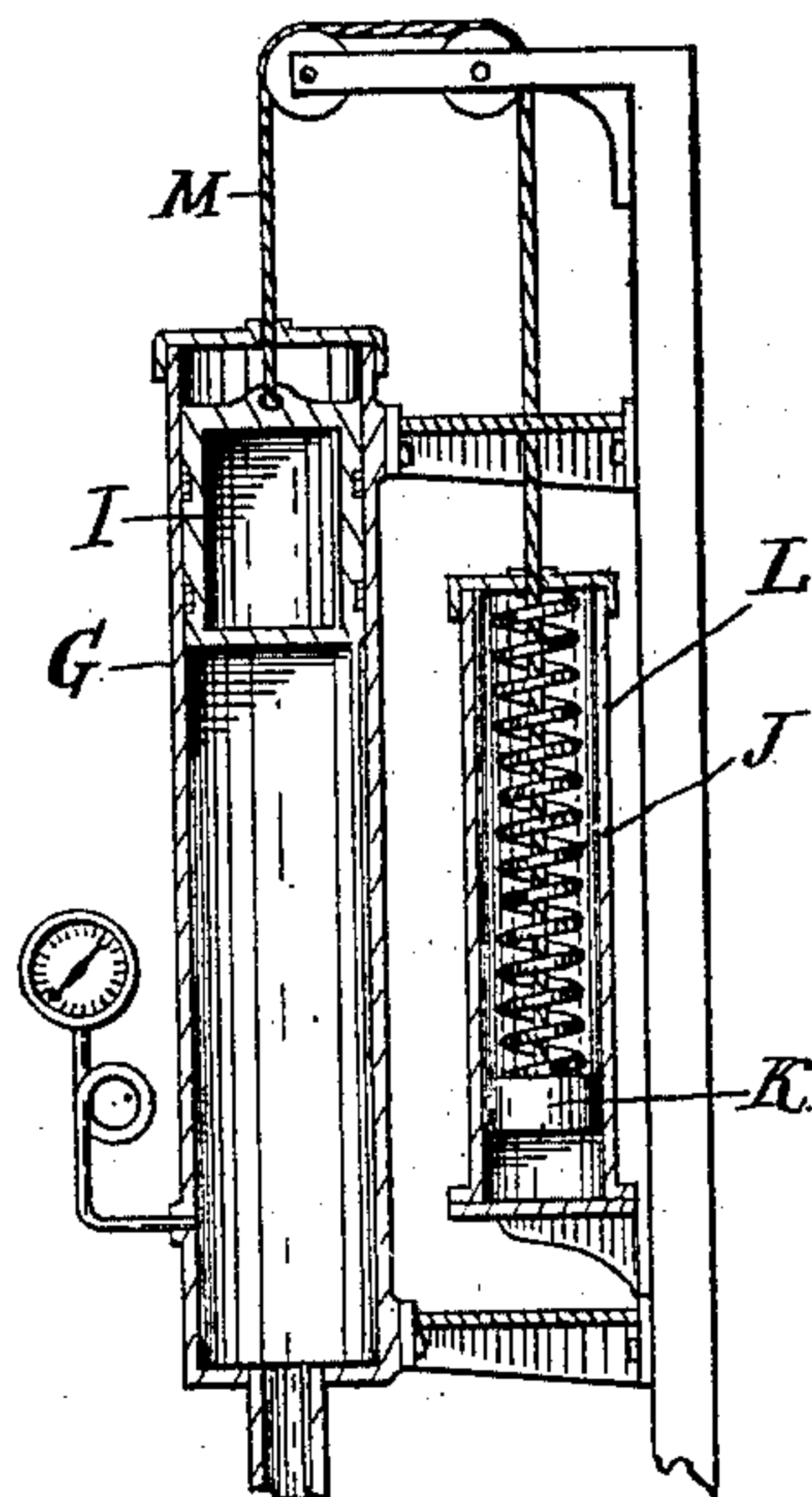
F. L. McGAHAN.  
EXHAUST MECHANISM.

No. 462,272.

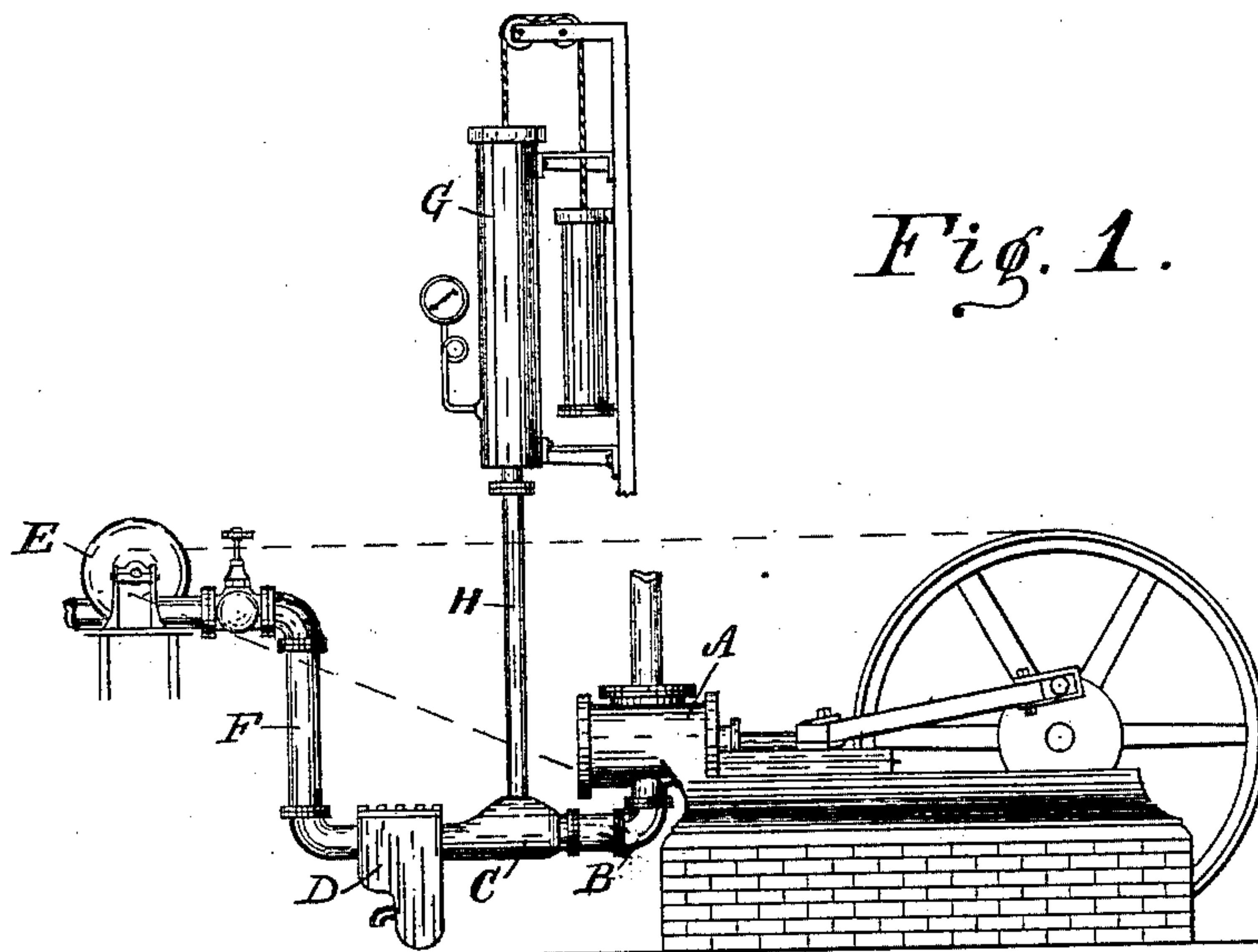
Patented Nov. 3, 1891.



*Fig. 2.*



*Fig. 3.*



*Fig. 1.*

WITNESSES:  
O. N. Hood.  
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# UNITED STATES PATENT OFFICE.

FRED. L. MCGAHAN, OF INDIANAPOLIS, INDIANA.

## EXHAUST MECHANISM.

SPECIFICATION forming part of Letters Patent No. 462,272, dated November 3, 1891.

Application filed July 20, 1891. Serial No. 400,065. (No model.)

*To all whom it may concern:*

Be it known that I, FRED. L. MCGAHAN, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented a new and useful Exhaust Mechanism for Steam-Engines, of which the following is a specification.

My invention relates to an improved mechanism for assisting the exhaust of steam-engines, the same being shown and described as a part of my pending application, Serial No. 378,280, for a patent for "apparatus for condensing exhaust-steam."

The object of my improvement is to form and maintain a partial vacuum in the exhaust-pipe of a steam-engine.

The accompanying drawings illustrate my invention.

Figure 1 represents a side elevation of my apparatus attached to a steam-engine. Fig. 2 represents a central longitudinal section of the vacuum-chamber of the exhaust-pipe and the condense-water trap connected therewith. Fig. 3 represents a central vertical section of the auxiliary vacuum-chamber.

In the drawings, A designates the steam-cylinder; B, the exhaust-steam pipe; C, the vacuum-chamber connected with the exhaust-steam pipe; D, a trap for the condense water collecting in the vacuum-chamber, and E an exhaust-fan connected with the vacuum-chamber by pipe F.

For the purpose of aiding in the maintenance of a partial vacuum in the vacuum-chamber and the exhaust-pipe connected therewith in case the movement of the exhaust-fan should be momentarily interrupted by the slipping of its driving-belt, I provide

a cylinder G, which is connected with the vacuum-chamber by pipe H. Cylinder G is provided with a nicely-fitting piston I, which is held normally at the upper end of the cylinder by means of a spiral spring J, arranged between a loosely-fitting piston K and the head of a cylinder L, in which the piston K is mounted, said piston being connected by a cord M with the piston I.

The operation of my device is as follows: The engine being started and fan E thereby put in motion, a partial vacuum is formed in chamber C, and the exhaust-pipe connected therewith. At the same time piston I in the cylinder G yields to the pressure of the atmosphere until said pressure is balanced by spring J. Should the speed of the exhaust-fan be momentarily interrupted by the slipping of its belt or otherwise, the piston is at once drawn upward in the cylinder G by the recoil of spring J, thus maintaining the vacuum in the exhaust-pipe until the fan recovers its normal speed. The exhaust-steam from the engine passing into the vacuum formed by the exhaust-fan and being driven forward by said fan, the piston of the engine is relieved from back-pressure.

I claim as my invention—

The combination of the exhaust-pipe of a steam-engine, the exhaust-fan connected therewith, the cylinder G, the piston I, and spring J, all arranged to co-operate substantially as and for the purpose set forth.

FRED. L. MCGAHAN.

Witnesses:

H. P. HOOD,  
A. M. HOOD.