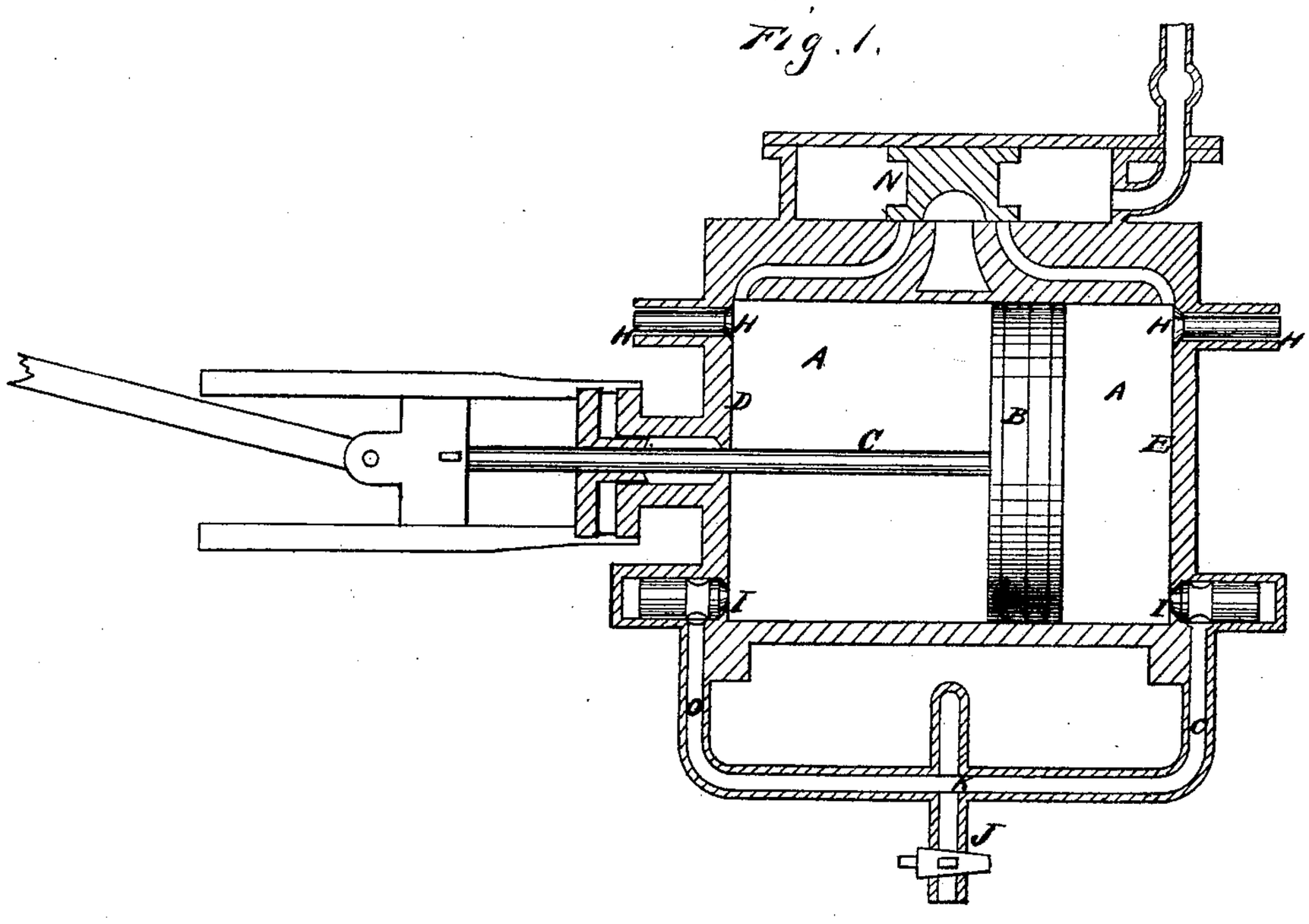
A. FRASER.

Steam Engines.

No. 141,343. Patented July 29, 1873.

Fig. 1.



Witnesses

Jno. L. Boone

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UNITED STATES PATENT OFFICE.

ANDREW FRASER, OF VIRGINIA CITY, NEVADA.

IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. **141,343**, dated July 29, 1873; application filed May 2, 1873.

To all whom it may concern:

Be it known that I, ANDREW FRASER, of Virginia City, Storey county, State of Nevada, have invented an Improvement in Steam-Engines; and do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention without further invention or experiment.

My invention relates to improvements in the construction of steam-engines for mines, railroads, and other purposes where power can be saved and stored up for future use, from descending loads in mining-shafts or on railroads, by constructing the engine in such a manner as to make its piston compress and store up atmospheric air, either in the steam-boiler or in separate air-holders, from whence it can be used to assist in ascending the same or other shaft or incline, thus utilizing a force which would otherwise be lost, and at the same time providing a most effective brake for the descending load.

In order to more fully illustrate and explain my invention, reference is had to the accompanying drawings forming a part of this specification, in which—

Figure 1 is a longitudinal section of my invention.

A A represent the cylinder, B the piston, and C the piston-rod, of an ordinary steam-engine.

My invention contemplates constructing both of the cylinder-heads D E with one or more openings, H, communicating with the outer air; and also one or more passages, I, which communicate with a pipe, O. This pipe communicates either with the steam-boiler or with separate air-holders, and is provided with a relief-valve, J, which is under the control of the engineer. The openings H are each closed by a valve which opens inwardly, while the openings I are provided with valves which open in a reverse direction or outwardly.

Now, when the load is descending, by placing the link which operates the steam-valve N upon the center or dead-point, both steam-ports will be closed and the valve will remain stationary; and, if a balance-valve be used, the cylinder will be converted into a complete air-compresser, as the air will be prevented from escaping through the steam-ports by lifting the valve. In this condition the power of the descent will operate the piston and cause it to draw in air at the passage H and force it out through the passages I into the boiler or air-tanks, where it will be stored up in a compressed form so as to serve in lifting the succeeding load.

By converting the steam-cylinder into an air-compresser while the load is descending, the operation serves also as a brake to the descending load, which can be regulated by the engineer at pleasure by opening or closing the relief-valve J, thus regulating the pressure against the piston to accommodate the descending load, and at the same time storing up all of the power that the descending load is capable of imparting.

The best style of air-valves with which I am acquainted is the style used in the Waring compresser, which has five receiving and two discharging valves in each cylinder-head placed around the periphery, the discharge-valves always being at the bottom. All the valves are kept to their seats by conical spiral springs, so that the air-valves remain inactive when the engine is being driven by steam; and, in turn, the steam-valves remain inactive when the engine is converted into an air-pump or compresser.

By the above-described arrangement I am able to utilize power which is at present wasted, and at the same time provide a brake for regulating the descent of the load.

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

The steam-cylinder A A, provided with the steam-valve N and automatic air valves H H I I, in combination with the pipes O O, valve J, and an air-receiver, substantially as described.

In witness whereof I hereunto set my hand and seal.

ANDREW FRASER. [L. S.]

Witnesses:
G. W. HAZLETON,
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