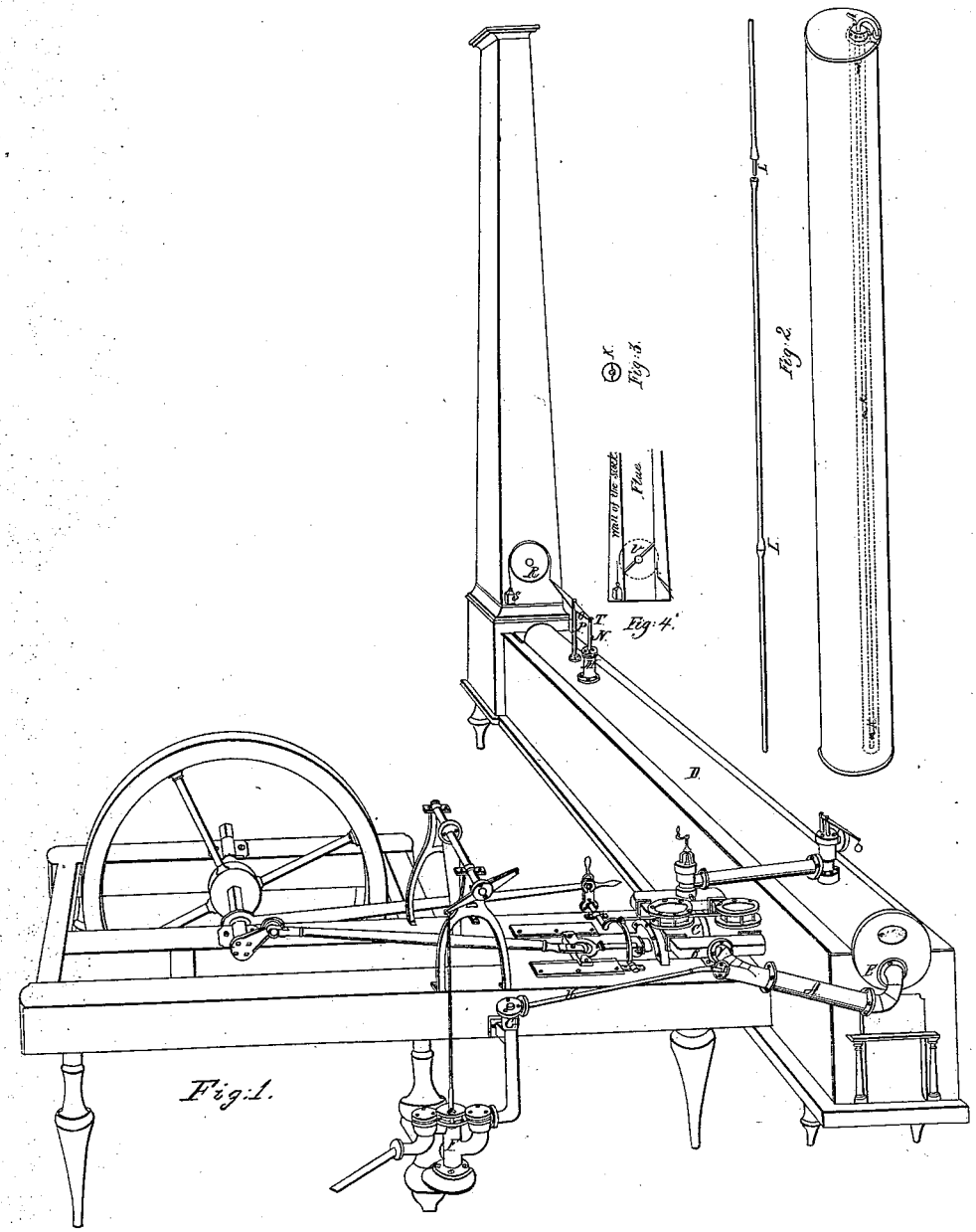
N. Cope,

Reciprocating Steam Engine,

No. 2,968, Patented Feb. 20, 1843.



UNITED STATES PATENT OFFICE.

NATHAN COPE, OF HANOVER, OHIO.

IMPROVEMENT IN THE MODE OF HEATING THE SUPPLY-WATER AND CARRYING OFF THE ESCAPE STEAM IN HIGH-PRESSURE STEAM-ENGINES.

Specification forming part of Letters Patent No. **2,968**, dated February 20, 1843.

To all whom it may concern:

Be it known that I, NATHAN COPE, of Hanover, in the county of Columbiana and State of Ohio, have invented a new and useful Improvement in the Mode of Constructing High-Pressure Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view. Fig. 2 is a side view of the boiler and the escape-pipe, which is placed within it, and also of the supply-pipe and the manner of connecting it. Fig. 3 shows the manner in which the supply-pipe is supported in the inside of the escape-pipe. Fig. 4 shows the construction of the damper.

A, Fig. 1, represents the escape-pipe commencing at each end of the cylinder C by a side pipe B, which unites in and is attached to a single pipe at V, and thence enters the boiler D at E about five inches from the bottom and extends lengthwise through the boiler D and projecting about three inches, as represented at A in Fig. 2, where the escape steam enters the rarefied air in the stack or chimney through a suitable communication. The escape-pipe should be about eight inches in diameter for an engine of twenty-five horse-power, (the dimensions here given should be varied in proportion to the difference in the size of different engines and the density of the steam,) and is made in sections with flanges and bolted together in the ordinary manner. Near the end connected with B it is provided with a branch or piece designed to receive the supplying-pipe H. As represented at I in Fig. 1, it is placed about one inch lower at A in Fig. 2 than it is at E in Fig. 1 for the purpose of enabling the condensed steam to pass out of said pipe at A, Fig. 2.

The boiler D is supplied with water by means of the force-pump F with the stop-valve placed at G. The water from thence enters the supply-pipe H, which is made in sections of such lengths as are best adapted to the various situations in which it may be placed, and is fastened together by male and female screws, as represented at L in Fig. 2. The supply-pipe enters the escape-pipe A at I and continues in the inside of said escape-pipe, where it is held by means of supports, as represented at K K K in Figs. 2 and 3, to its lower or farther end and then extending through the end of the escape-pipe, where by a curve it returns and communicates with a hole in the head of the boiler D near its lower side, as represented at I, Fig. 2, at which point the water is discharged into the boiler D after having passed through the length of the supply-pipe, which pipe is firmly held at each end by screw-bolts passing through the flanges in the ordinary manner.

The advantage gained by the operation of the above invention consists in the escape steam being discharged into the stack or chimney, where the air is highly rarefied by the heat of the furnace, thereby proportionally diminishing the resistance occasioned by being otherwise discharged, as is customary, into the atmosphere, where the resistance it meets with is equal to fifteen pounds upon each square inch of the area of the piston-head, and also by heating the supply-water before it is discharged into the boiler by passing the supply-pipe through the said escape-pipe, where it is heated to a degree of heat but little inferior to the temperature of the escape steam itself, thereby causing a corresponding saving of caloric or fuel.

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

An improvement in the mode of constructing high-pressure steam-engines (applicable to all the various constructions now in use, the original invention of which engines is hereby expressly disclaimed) by introducing the escape pipe or pipes into and through the boiler or boilers, so that the escape steam may be discharged from thence into the stack or chimney or some suitable place that will communicate with the same, and also passing the supply pipe or pipes through which the water is conveyed to supply the boiler or boilers into and lengthwise through the said escape pipe or pipes, where the supply-water will be heated by the escape steam previous to its passing into the boiler or boilers, as herein described.

NATHAN COPE.

Witnesses:
HUGH JORDAN,
JESSE VAN MATER.