

A. A. HEATH.

Improvement in Steam Engines.

No. 121,364.

Fig. 1.

Patented Nov. 28, 1871.

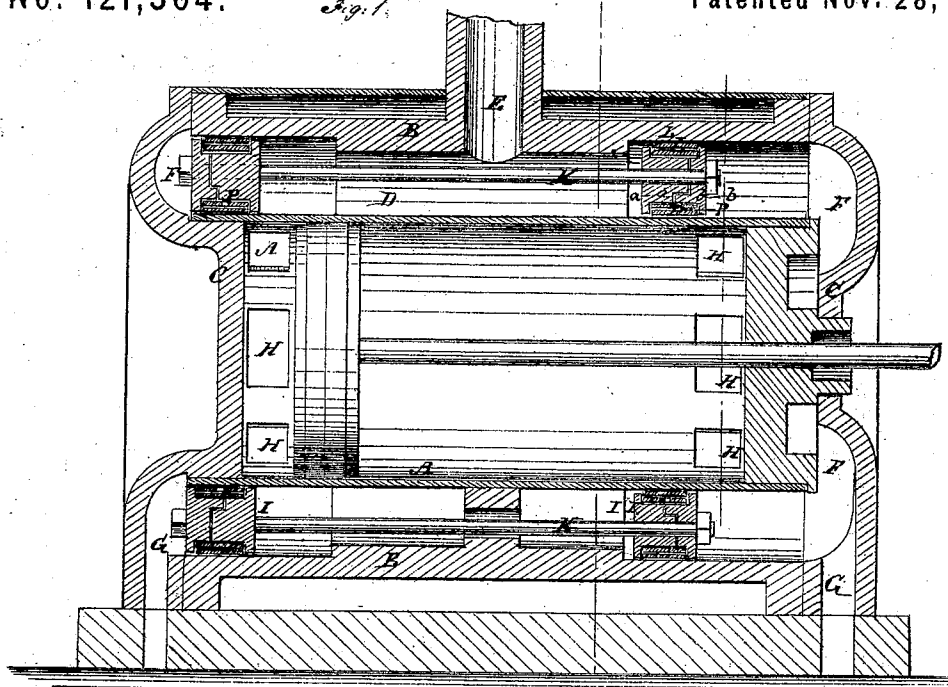
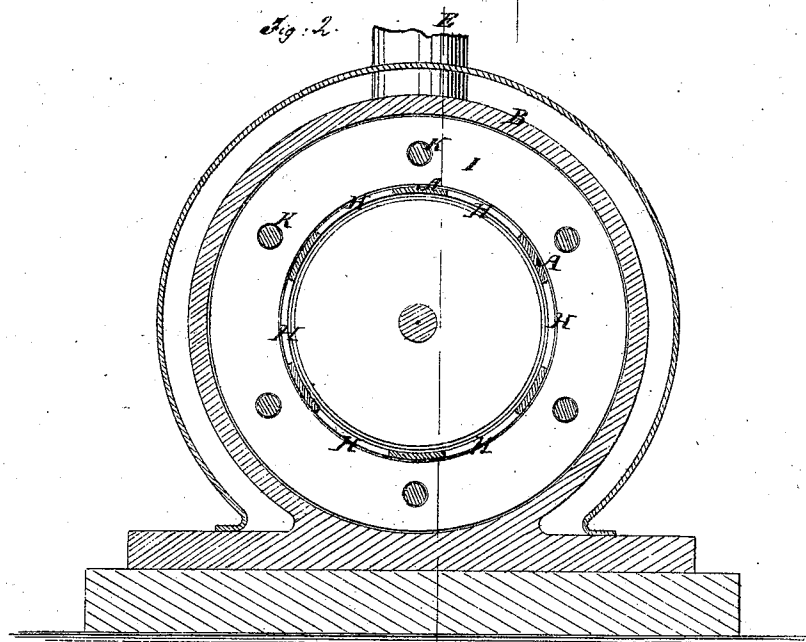
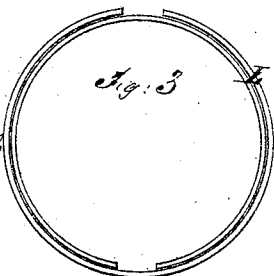


Fig. 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

ARDEN A. HEATH, OF MERCER, PENNSYLVANIA.

IMPROVEMENT IN STEAM-ENGINES.

Specification forming part of Letters Patent No. 121,364, dated November 28, 1871.

To all whom it may concern:

Be it known that I, ARDEN A. HEATH, of Mercer, in the county of Mercer and State of Pennsylvania, have invented a new and useful Improvement in Steam-Engines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawing forming part of this specification.

My invention relates to an improved arrangement of the steam-chests, ports, and valves, having for its object to balance the valve as evenly as possible, shorten the steam-passages, enlarge the area of the ports without correspondingly enlarging the waste of steam in the ports, and to provide for jacketing the cylinder more readily than can now be done. The invention consists in a steam-chest surrounding the cylinder, and annular valves working between the cylinder and the steam-chest on ports at each end of the cylinder, admitting the steam from the space between the rings or valves, and exhausting into the jacket behind the said rings or between the rings and the end of the jacket, all as hereinafter more fully described.

Figure 1 is a longitudinal sectional elevation of my improved steam-engine. Fig. 2 is a transverse section of the same, and Fig. 3 is a side elevation of the packing-rings for the piston.

A is the cylinder, and B a cylindrical steam-chest surrounding it, being connected to it by the heads *c*, and inclosing the annular steam-space D, into which the steam is admitted through the pipe E. The heads are provided with the annular spaces F, leading to the exhaust-passages G. H represents the ports leading from the steam-space into the cylinder A. Any suitable number of them may be provided around the cylinder to instantly fill and exhaust the cylinder. I represents the annular pistons, working back and forth in the space D over the ports, one at each end, being connected together by rods K, two of which may pass through one of the cylinder-heads to be connected with any valve-gear for working them. The outer surface of the cylinder A and the inner surface

of the cylinder B are turned up truly for the pistons to fit between them steam-tight, and the said pistons are fitted with metal packing-rings L. The pistons are composed of a solid ring, preferably made in two parts, *a b*, and bolted together tightly, so that steam cannot pass from one face to another, both the outer and inner faces being recessed to provide space for the packing-rings. As the steam might force the packing-rings in the inner face of the piston backward to the bottom of the recess when passing over the ports H, at which time there is a direct pressure on the rings, I have provided holes P in these rings to admit steam behind them and balance their pressure. This arrangement of the engine admits of the application of a jacket more easily and better than when a square steam-jacket is arranged on the side of the cylinder, which greatly interferes with the fitting of the jacket. The steam-chest cylinder B and the cylinder A may be formed in one casting, proper stays being formed to connect them together between the parts where the valves work; or they may be cast separately and connected by the heads, as preferred. The steam may be exhausted from a pipe leading out of the cylinder B near each end, instead of through the annular spaces F in the cylinder-heads, if preferred.

It will be seen that but little steam is lost by the amount contained in the ports so as not to be effective, for said ports are very short, being only equal to the thickness of cylinder A, which need not be thick, as it is constantly exposed to steam pressure at the outside.

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

1. The annular steam-chest, annular valves, and the ports H, arranged substantially as specified.
2. The arrangement, with the annular space D, of the annular exhaust-spaces F and passages G, substantially as specified.

ARDEN A. HEATH.

Witnesses:

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