A. Nadow.

Steam-Engine Piston.

No 73456 Patented Jan. 21, 1868.

Fig: 2.

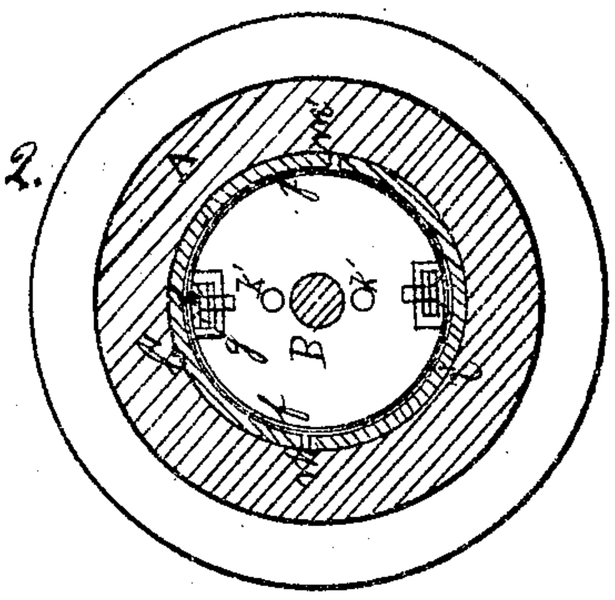


Fig: 4.

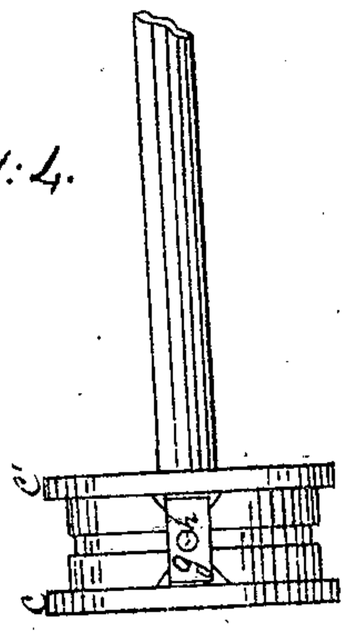


Fig: 1.

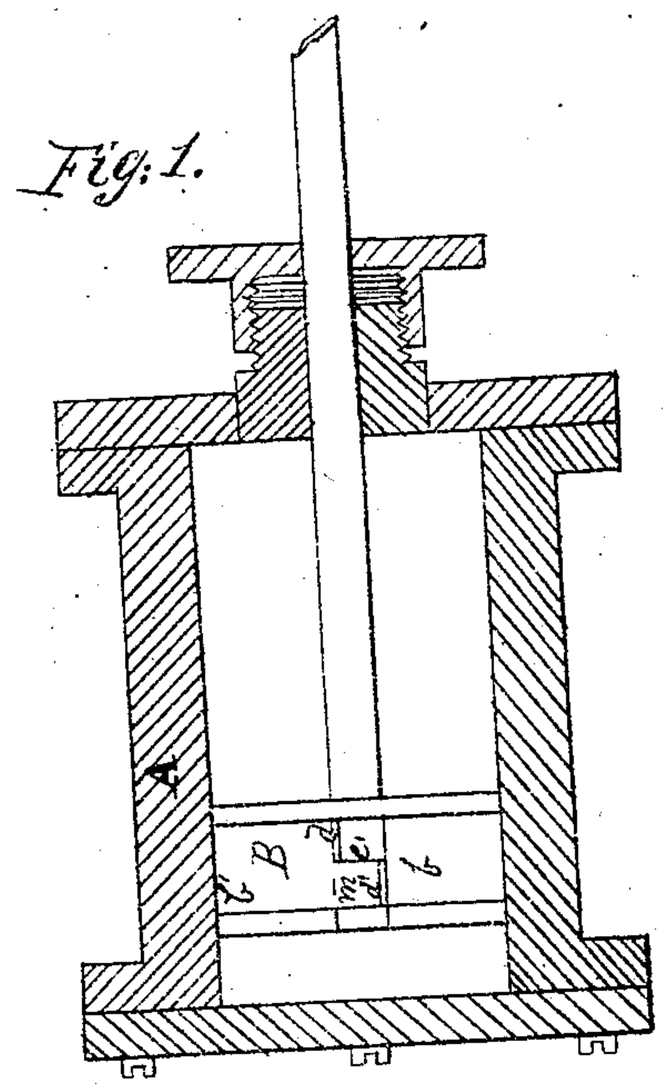
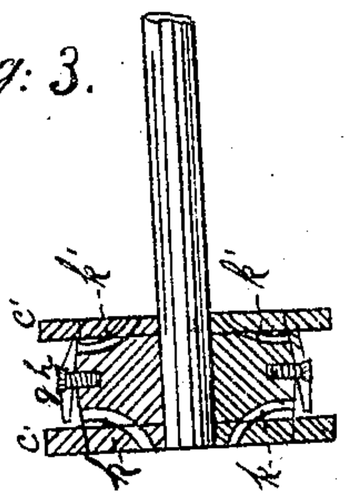


Fig: 3.



Witnesses.
Wetton & Brodbeg
J. B. Gardiner

Inventor.
Alexander. Nadow

United States Patent Office.

ALEXANDER NADOW, OF SPRINGFIELD, MASSACHUSETTS.

Letters Patent No. 73,456, *dated January* 21, 1868.

IMPROVEMENT IN STEAM-ENGINE PISTONS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, ALEXANDER NADOW, of Springfield, Hampden county, Commonwealth of Massachusetts, have invented certain Improvements in the Pistons of Steam-Engines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon. In the drawings—

Figure 1 is a longitudinal section of a steam-cylinder, A, showing the piston B, as arranged in my invention.

Figure 2 is a cross-section of the same, showing the piston B, with one head, *c*, removed.

Figure 3 is a section of the piston, with the ring *b* removed; and

Figure 4, a view of the piston, with the ring *b* removed.

The object of my invention is to obtain a cheap and accurately-fitting piston, which is "packed" or rendered steam-tight, by means of a ring, *b*, formed in two or more segments, and expanded against the inside of the cylinder by means of steam, which is let inside of the piston in a peculiar manner, or, if preferred, by means of a spring inside of the piston, the form of the ring and manner of letting the steam inside of the piston being the improvements constituting this invention.

The construction is as follows: The outside ring *b* of the piston B is formed of two or more segments, C C′, fig. 2, and fits over the piston, as shown in fig. 3, having two heads, *c c′*. This ring, at the joints *m m′*, is of peculiar form, as shown in fig. 1, so as to allow it to spread out against the cylinder, for if the space *d* be made very much larger by the expansion of the ring, no steam can get by, as it is stopped by the part *e* of the joint, when the two parts of the ring are ground to an accurate fit.

Pistons, as usually constructed, are made of a number of rings, placed side by side, and cut at only one place in each ring, and placed on the piston so as to "break joints," or else are made of a great number of segments, also breaking joints. Now, in the first case, any expansion of the rings throws them greatly out of the form of a true circle, thus making an inaccurate fit in the cylinder, and in the second case, they are very expensive. Now, in my invention, only one ring is used, with joints, as described, made in two, or at most, three segments, though I do not wish to confine myself to any particular number, and thus forms a very cheap and durable ring, and also, when expanded, it fits the cylinder much better than a ring cut in only one place.

Inside of this packing-ring is a double ring, of thin metal, *f f′*, which serves for the steam to act against when let inside of the piston, as I will now describe. *g* is a valve hung on a pivot, at *h*. Under each end of this valve is a port, *k k′*, communicating with the cylinder at each side of the piston. Now as steam is let on at one side of the piston it enters at this port, *k*, and blows up into the inside of the piston, and as it does this, the valve *g* is moved so as to cover the port *k′*, and thus preventing the steam from blowing through the piston. As the steam comes inside of the piston, it acts on *f f′*, the thin metal ring spoken of, and forces it out against the packing-ring *b*, which is forced against the inside of the cylinder, thus packing the piston.

One objection to "self" or steam-packing pistons has been that they required so much room for expansion, that when used without steam, as in the case of a locomotive going down a grade, all the ports being loose, would lie on the bottom of the cylinder, and thus wear it out of a circular form, but in this arrangement, so little room is required that a very small amount of space between the packing-ring and the cylinder is necessary, thus obviating this difficulty. The simplicity of this arrangement makes it nearly impossible to be got out of order, while the two great requirements, cheapness and durability, are at the same time combined with this simplicity.

Now, having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The valve *g*, when used in combination with the piston B and ports *k k′*, substantially as described.

ALEXANDER NADOW.

Witnesses:

J. B. GARDINER,

MILTON BRADLEY.