

J. M. Davidson.

Steam Engine.

N^o 86,974.

Patented Feb 16, 1869.

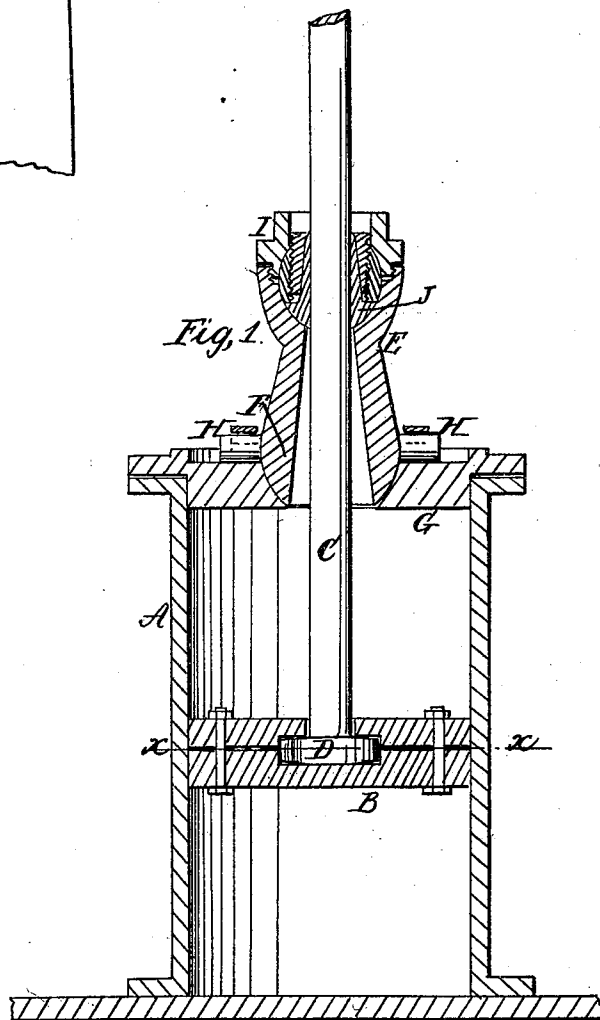
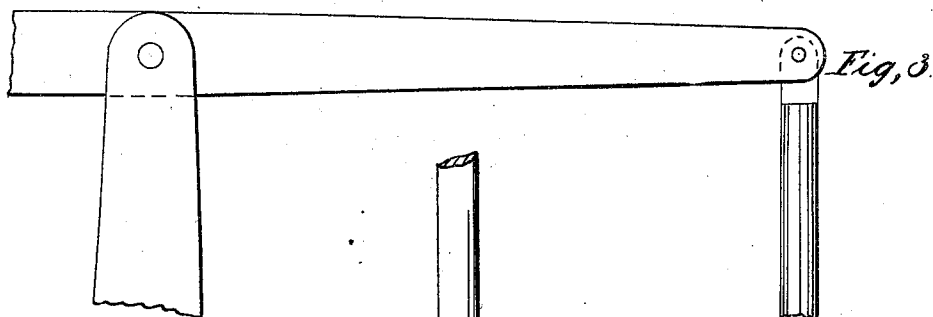


Fig. 1.

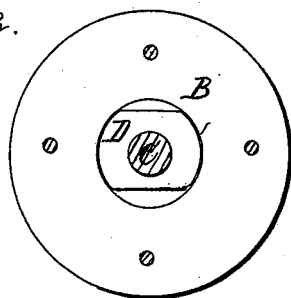


Fig. 2.

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JAMES M. DAVIDSON, OF NAPOLEON, ARKANSAS.

Letters Patent No. 86,974, dated February 16, 1869.

IMPROVEMENT IN STEAM-ENGINES.

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, JAMES M. DAVIDSON, of Napoleon, in the county of Desha, and State of Arkansas, 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 those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention relates to a new and useful improvement in steam-engines, blowing-cylinders, and all other machinery where cylinders and pistons are used; and

It consists in so constructing the piston and piston-rod, and connecting the rod with the cylinder-head, that a pitman or connecting-rod and cross-head are dispensed with, as will be hereinafter more fully described.

In the accompanying plate of drawings—

Figure 1 represents a vertical central section of a steam-cylinder, with piston and rod, with the latter connected with the piston and cylinder-head, and packed according to my invention

Figure 2 is a cross-section of fig. 1, through the line *x z*.

Similar letters of reference indicate corresponding parts.

A is the cylinder

B is the piston.

C is the piston-rod.

In dispensing with the pitman-rod and cross-head, which usually connect the piston-rod with the working-beam of the engine, it is necessary to so construct the parts that the piston-rod will, in its up-and-down motion, conform to the arc of the circle which is described by the end of the working-beam.

In my invention, I accomplish this in the following manner:

I construct the piston B in two parts, with a chamber between them, as seen in the drawing, and on the end of the piston-rod I form a head, D, rounded somewhat on its upper and lower sides, so that the rod may be allowed to vibrate, or rock, when it is thrown out of line.

E may be called the oscillating box.

Its lower end, F, is globular in form, which fits, by a ground joint, the globular cavity through the cylinder-head G.

It is confined to the cylinder-head by two trunnions H.

The piston-rod is packed in this oscillating box by ball-packing rings, confined in a globular cavity, formed in the top of the box and the lower side of the cap I, as seen in the drawing.

These rings are so formed that, by screwing the parts together, as represented, the inner ring J (which is cut like the ordinary packing-ring, so that it may be compressed) may be adjusted to the rod so as to form a steam-tight joint, as it will be seen that the rings are made tapering for that purpose.

Figure 3 is a section of a working-beam, with its fulcrum shown in red color.

It will be seen that when in operation, the end of the working-beam, vibrating on its trunnions or fulcrum, will describe the arc of a circle, as indicated in the drawing, and that, by this method of connecting the piston-rod with the cylinder, the engine will work without a cross-head, or a connecting-rod, (or pitman,) and the piston-rod will vibrate without strain or binding in any part, and with less friction than the ordinary engine, as the wearing-surface is greatly reduced as compared with the common engine.

The oscillating box E, extending upward, as it does, from the cylinder-head, acts as a guide for the piston-rod, while the vibration of the rod renders a connecting-rod unnecessary.

The wearing-surface, and consequently the friction, are greatly reduced, while the application of the power is more direct, and the working-parts are brought into a smaller space than is possible when the common engine is used.

I claim as new, and desire to secure by Letters Patent—

1. The construction and combination of the oscillating box E, cylinder-head G, trunnions H, piston B, and piston-rod C D, substantially as herein set forth.

2. The construction of the ball-packing, with its cap, I, in the oscillating box E, combined with the piston-rod C, substantially as described.

JAMES M. DAVIDSON.

Witnesses:

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