

Strong & Stickney,

Direct Acting Steam Engine.

No. 109,270.

Patented Nov. 15, 1870.

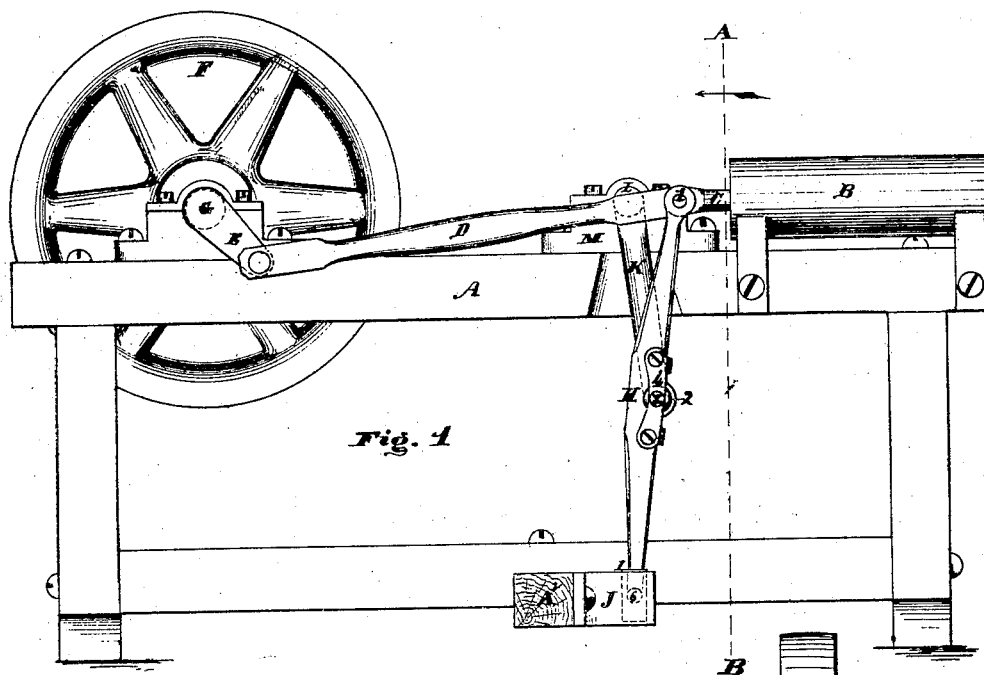


Fig. 1

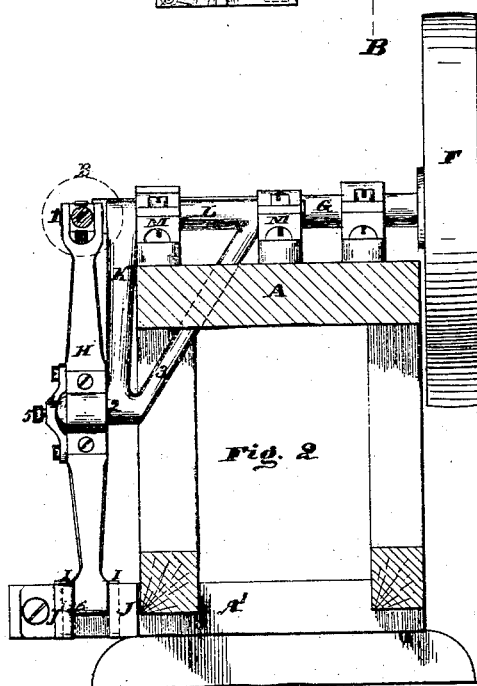


Fig. 2

Witnesses

W. Spring
J. L. Spring

Inventors

Charles Strong
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United States Patent Office.

CHARLES STRONG AND AUGUSTIN W. STICKNEY, OF LEBANON, NEW HAMPSHIRE.

Letters Patent No. 109,270, dated November 15, 1870.

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 we, CHARLES STRONG, and AUGUSTIN W. STICKNEY, of Lebanon, in the county of Grafton and State of New Hampshire, have invented certain new and useful Improvements in Steam-Engines; and we do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing which forms a part of this specification, in which—

Figure 1 represents a side view of so much of a steam-engine as is necessary to illustrate our invention; and

Figure 2 represents a transverse section of the same, at line A B, fig. 1.

To enable those skilled in the art to which our invention belongs to make and use the same, we will proceed to describe it more in detail.

The nature of our invention consists in the combination, with the piston-rod and pitman of a steam-engine, of certain peculiar devices for guiding the end of the piston-rod in a direct line, as hereinafter described.

In the drawing—

The part marked A represents the bed or supporting-frame;

B, the cylinder;

C, the piston-rod;

D, the pitman;

E, the crank;

F, the fly-wheel; and

G, the main shaft.

At the connecting joint I, between the pitman D and piston-rod C, is pivoted an upright rocking-bar, H, the lower end of which is pivoted to slide blocks I, arranged between the vertical ways J J, at the lower part A' of the supporting frame.

The central part of the rocking-bar H is hung upon a wrist, 2, at the lower end of a pendulum-arm, K, as shown in the drawing.

The pendulum-arm K is formed upon the end of a rock-shaft, L, which shaft is supported in bearings M upon the bed A. The center of the shaft L is arranged in exactly the same horizontal plane as the center of the piston-rod, their axes being at right angles to each other.

The bearings M, which support the rock-shaft L, are at same distance apart, and the arm K is stiffened by a brace, 3, to prevent lateral motion or springing of the parts.

A yoke, 4, is attached to the bar H, over the end of the wrist 2, and a set-screw, 5, is arranged therein, that may be turned up against the end of the wrist 2, to prevent any looseness or play between the wrist 2 and bar H.

The center of the wrist 2 is exactly half-way between the center of the joint-bolt 1, in the piston-rod head, and the center of the pivot-bolt 6, which connects the foot of the bar H to the slide-blocks I, while all three of said centers 2, 1, and 6, are in the same line; and when the piston is at half-stroke, or at the center of the cylinder, the axis of pin 1 and shaft L are in the same line, and all of the centers 1, 2, 6, L, in the same vertical plane.

As the bar H and arm K rock back and forth with the action of the piston-rod C, the upward curve of the arc through which the pivot 1 would naturally swing, is equal to the downward curve of the arc through which swings the wrist 2, consequently, the action of the former is counteracted by the latter, and the effect produced is to carry the pivot back and forth in a direct line, thereby guiding the head of the piston-rod C in an accurate manner.

Instead of attaching the lower end of the bar H to the sliding-blocks I, it may be attached to a crank of suitable length, which would produce the same effect, as it would allow the cut-off bar H a simple up-and-down motion.

Or, if preferred, a device similar to the one by which the upper or main motion is obtained, may be combined with the lower end of the bar H.

It will be apparent to those skilled in the art that, by the use of our invention, a great amount of friction and strain incident to the common mode of guiding the end of piston-rods will be obviated.

Having described our improvements in steam-engines,

What we claim as new and of our invention, and desire to secure by Letters Patent, is—

1. The combination, with the end of the piston-rod and pitman, of a rocking-bar and pendulum-arm, substantially as and for the purposes set forth.

2. The combination, with the bar H and wrist 2, of the yoke 4 and set-screw 5, substantially as and for the purposes set forth.

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AUGUSTIN W. STICKNEY.

Witnesses:

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