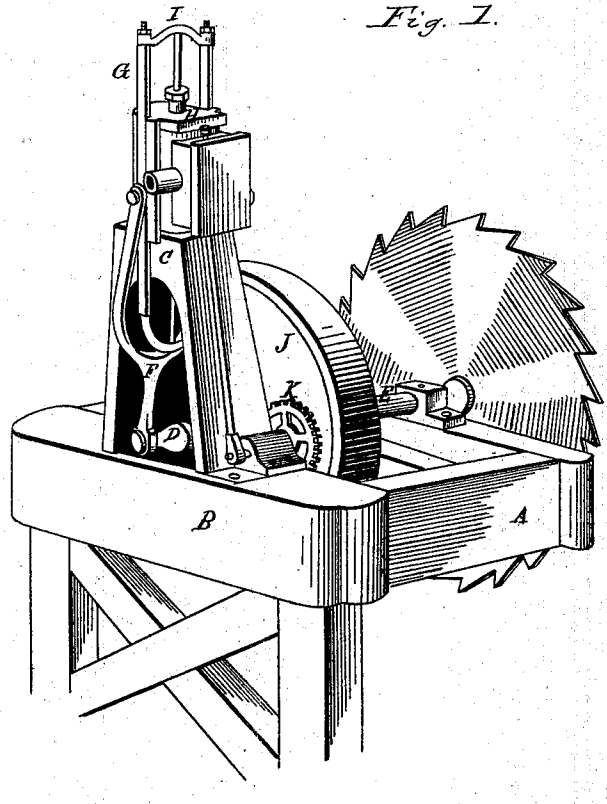
2 Sheets--Sheet 1.

I. BROWN.

Reciprocating Steam Engines and Circular Saw-Mills Combined.

No. 139,233. Patented May 27, 1873.

Fig. 1.



Witnesses:

Edw. F. Brown,

J. D. Cornell

Inventor:

Isaac Brown

2 Sheets--Sheet 2.

I. BROWN.

Reciprocating Steam Engines and Circular Saw-Mills Combined.

No. 139,233. Patented May 27, 1873.

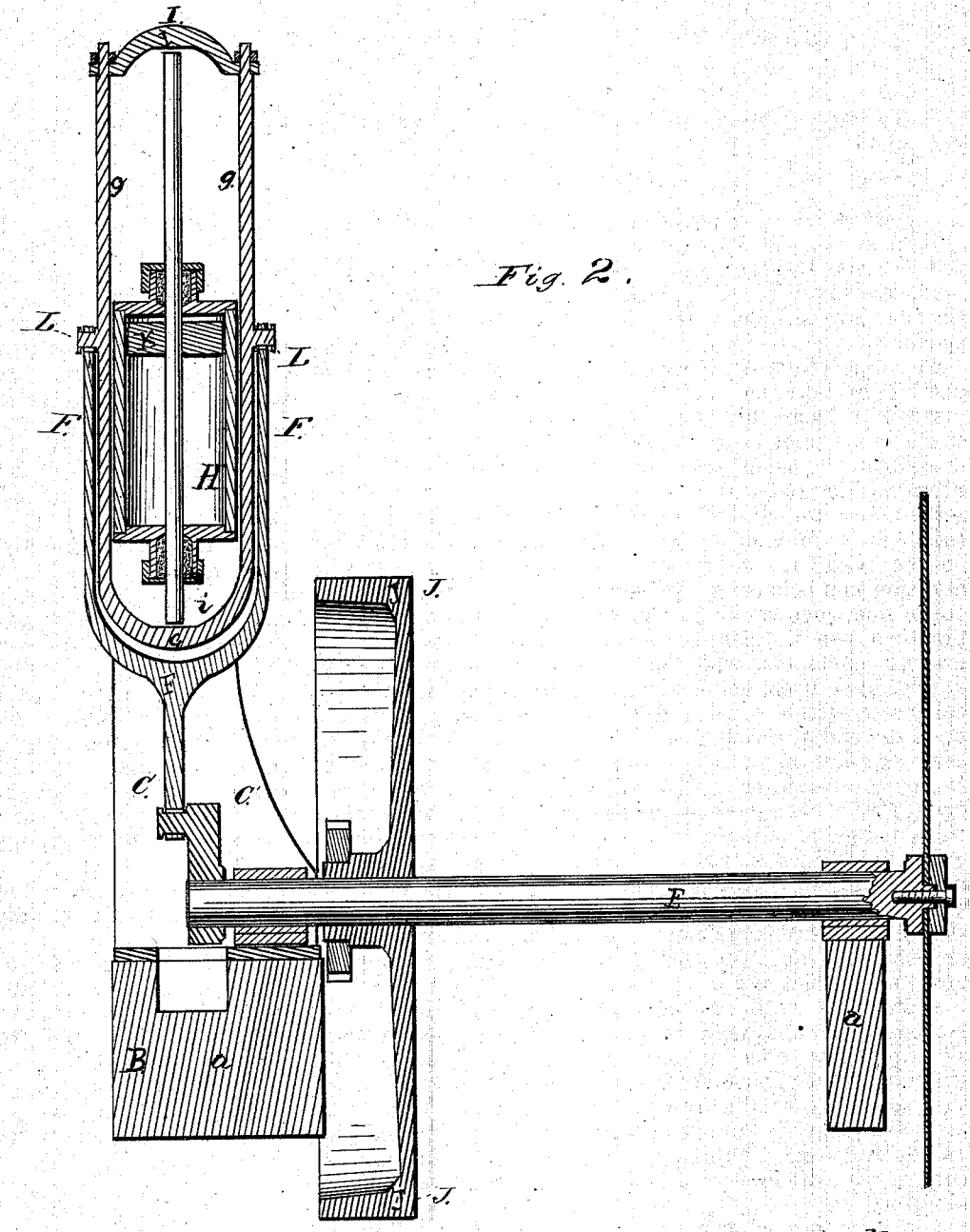


Fig. 2.

Witnesses.
Wm. H. Bates.
M. Gardner.

Inventor:
Isaac Brown.

UNITED STATES PATENT OFFICE.

ISAAC BROWN, OF GLENVILLE, MARYLAND.

IMPROVEMENT IN RECIPROCATING STEAM-ENGINES AND SAW-MILLS COMBINED.

Specification forming part of Letters Patent No. **139,233**, dated May 27, 1873; application filed April 9, 1873.

To all whom it may concern:

Be it known that I, ISAAC BROWN, of Glenville, Prince George county, State of Maryland, have invented a Combined Steam-Engine Circular-Saw Mill, of which the following is a specification:

The object of my invention is the disconnecting of both ends of the double-length piston-rod from the U-shaped cross-head, while at the same time, at each stroke of the engine, all the useful effect of an actual connection of the rod with the cross-head is preserved, and the disadvantages avoided, and the piston is prevented from lateral pressure on the cylinder, and avoids the cutting or abrasion that is induced by the piston working out of line when running at great speed. Its practical use is therefore well adapted to driving machinery, where quick speed is required, by a direct action upon the large circular saw, which is secured in the usual way upon the end of the shaft of the engine, which shaft supplies the place of saw-mandrel. This engine can be either vertical or horizontal for driving other machinery requiring quick speeds without the aid of belts.

The following description, with the drawing, in which Figure 1 is a perspective and Fig. 2 a vertical sectional view, will enable those skilled in the construction of steam-engines and portable steam saw-mills to understand how to construct and use the same.

A frame of wood or iron is constructed, of length, width, and depth of the usual dimensions to allow room for the machinery of a circular-saw mill, with additional strength in the back part of the frame A, on which is erected a vertical engine, with shaft, fly-wheel, valve motions, and appliances to make a steam-engine, with the improvements as hereinafter described.

The elevation of the cylinder H on the stand C is made sufficient in height above the crank D to give the usual length to the forked connecting-rod F, which extends on each side of the cylinder H to the lugs L, and connected thereto by straps, gibs, &c. These lugs are formed and firmly connected to or with a looped or U-shaped rod, performing the office of cross-head G, which cross-head is worked on each side of the cylinder H, extending above and below it, and guided by wood or other material secured thereto, and adjustable with bolts at each end of the cylinder H. The piston-rod is of double length with the head K, near the middle and opposite the lugs L on the cross-head G, and thereby balances the action of the connecting-rod F to the pressure upon the cross-head G. This piston-rod passes through glands in each head of the cylinder H, extending in length so as to nearly fill the space between the inside of each end of the cross-head at I, where a smooth bearing-surface is made for both ends of the rod to press against it in either direction. The yoke-piece across one end of the cross-head is made adjustable to take up lost motion at the piston-rod to prevent jarring, but left so slack as not to be carried out of line by the wear of the cross-head or gibs; and, thus arranged, the speed of the piston may move at any rate that the substantial construction of the parts will justify without cutting or abrading the cylinder.

I have not described the parts pertaining to the ordinary steam-engine further than in the drawings only to show the connection with my improvement for a more clear understanding of the same.

I claim—

The combination of a steam cylinder, detached piston-rod, cross-head, and forked connecting-rods, as described.

ISAAC BROWN.

Witnesses:
EDM. F. BROWN,
J. D. O'CONNELL.