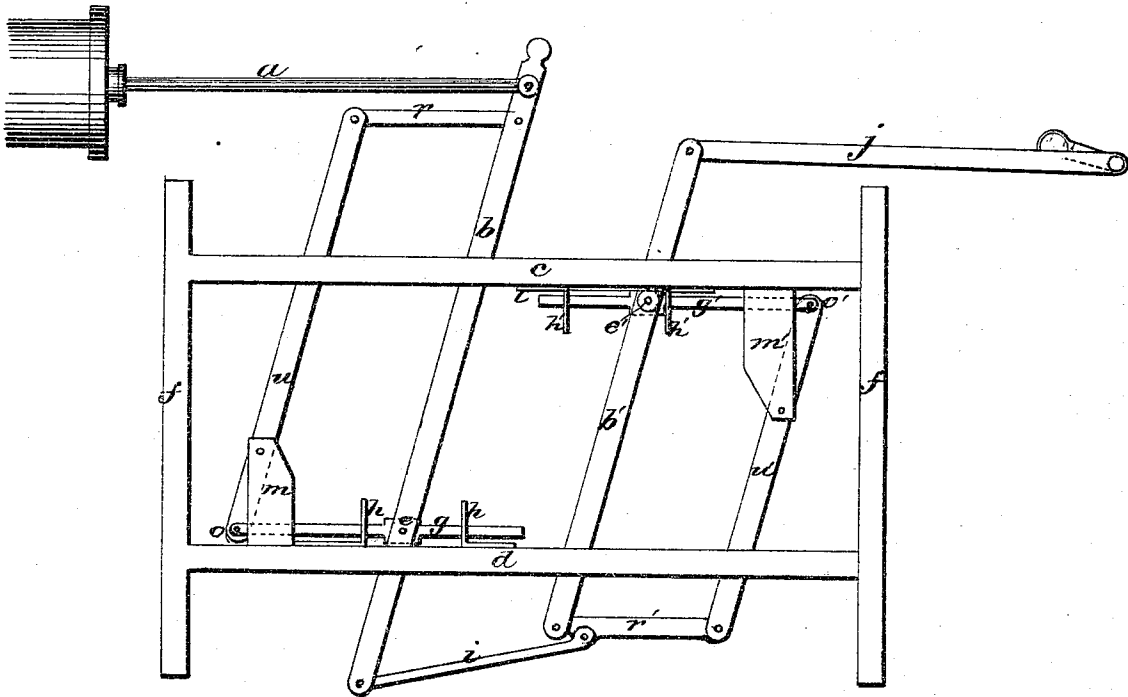


R. S. EDWARDS.

Improvement in the mode of Connecting the Piston
and Pitman of Steam Engines.

No. 123,623.

Patented Feb. 13, 1872.



Witnesses.

C. F. Brown.
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Richard S. Edwards
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Atty.

UNITED STATES PATENT OFFICE.

RICHARD S. EDWARDS, OF SAVANNAH, MISSOURI.

IMPROVEMENT IN THE MODE OF CONNECTING THE PISTON AND PITMAN OF STEAM-ENGINES.

Specification forming part of Letters Patent No. 123,623, dated February 13, 1872.

Specification describing certain Improvements in Apparatus for Connecting the Piston and Pitman of a Steam-Engine, invented by RICHARD S. EDWARDS, of Savannah, Andrew county, Missouri.

This invention relates to an apparatus to be interposed between the piston of a steam-engine and the pitman that would otherwise connect the piston with any piece of machinery—a crank-pin, for instance—for the purpose of enabling the power to overcome a greater resistance than if connected directly with the pitman.

The figure is a side elevation.

Referring to the drawing, *a* is the piston, and *j* the pitman. The outer end of the piston is jointed to the longer arm of a lever, *b*, which, in common with the lever *b'*, hereinafter mentioned, passes through slots formed lengthwise of the bars *c d*, placed one above the other and supported by standards *f*. The fulcrum of the lever *b* is a pin, *e*, connecting said lever with a bar, *g*, that slides in lugs *h*, springing from plates *l* attached to the upper side of the bar *d*. Between lugs *m*, projecting upward from the same bar, is pivoted a lever, *n*, whose lower extremity is connected by a link, *o*, with one end of the sliding-bar *g*. The upper extremity of the lever *n*, which is parallel with the lever *b*, is connected with the same by means of a horizontal link, *r*. The lower end of the lever *b* is connected by a link, *i*, with the lower end of the parallel lever *b'*, whose fulcrum is a pin, *e'*, connecting the lever *b'* with a bar, *g'*, that slides in lugs *h'*, springing from plates *l* attached to the under side of the bar *c*. Between lugs *m'*, projecting downward from the same bar, is pivoted a lever, *n'*, whose upper extremity is

connected, by a link, *o'*, with one end of the sliding-bar *g'*. The lower extremity of the lever *n'*, which is parallel with the lever *b'*, is connected with the same by means of a horizontal link, *r'*. To the shorter arm of the lever *b'* is jointed one end of the pitman *j*, whose other end may be jointed to the wrist-pin of a crank.

Inasmuch as the pitman *j* is connected with the shorter arm of the lever *b'* while the piston *a* is connected with the longer arm of the lever *b* the pitman must move more slowly than the piston. This retardation is augmented by making the levers *b' n'*, respectively, shorter than the levers *b n*, and still further increased by making the fulcrums *e e'* sliding, owing to which arrangement the lower ends of the levers *b b'* move more slowly than as though the fulcrums *e* were fixed. The upper end of the lever *b'* is retarded in the same ratio as its lower end, and also moves more slowly than as though the fulcrums *e'* were fixed. This loss in speed is compensated for by a gain in power, enabling the pitman to do more difficult work than as though it were connected directly with the piston.

I claim as my invention—

The combination of the levers *b b' n n'*, connecting-rods *i r r'*, and sliding-bars *g g'*, with a suitable frame and supports, all arranged so as to form a connecting apparatus between the piston and pitman of a steam-engine, substantially as specified.

RICHARD S. EDWARDS.

Witnesses:

RANSOM SANBORN,
SAMUEL C. THOMPSON.