J. W. MATHIESON.

DIRECT-ACTING PUMPING-ENGINE.

No. 171,678. Patented Jan. 4, 1876.

Fig. 2.

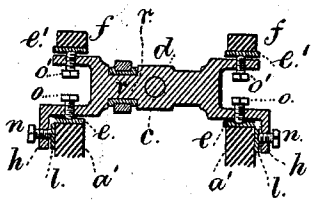
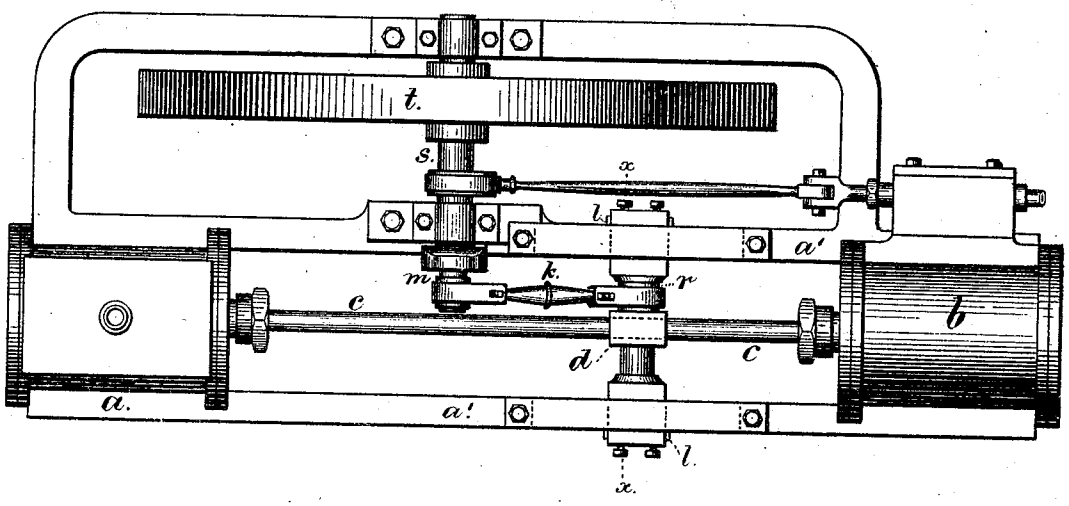


Fig. 1.



Witnesses

Chas. H. Smith

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atty

UNITED STATES PATENT OFFICE.

JAMES W. MATHIESON, OF BROOKLYN, NEW YORK, ASSIGNOR TO SARAH HARDICK, EXECUTRIX, AND JOHN RYER AND ABRAHAM H. VAN HOESEN, EXECUTORS, OF THE ESTATE OF CHAS. B. HARDICK, DECEASED.

IMPROVEMENT IN DIRECT-ACTING PUMPING-ENGINES.

Specification forming part of Letters Patent No. **171,678**, dated January 4, 1876; application filed October 21, 1875.

To all whom it may concern:

Be it known that I, JAMES W. MATHIESON, of Brooklyn, in the county of Kings and State of New York, have invented an Improvement in Direct-Acting Pumping-Engines, of which the following is a specification:

In engines that are used for direct-acting pumps, the connecting-rod has been introduced between the crank of a fly-wheel shaft and a cross-head upon the piston-rod; but said connecting-rod being outside of the slides, there is a leverage that tends to bend the piston-rod, to spring the cross-head, and to bind and wear the slides.

I make use of a connecting-rod that is applied between the slides and the piston-rod of the direct-acting pumping-engine, so as to lessen the leverage and strain upon the piston-rod, and I construct the slides and cross-head so as to prevent looseness, compensate wear, and maintain the adjustment of the parts.

In the drawing, Figure 1 is a plan, and Fig. 2 is a vertical section at the line *x x* of the cross-head and slides.

The water-cylinder *a* and steam-cylinder *b* are of any usual or desired construction, and the piston-rod *c* may be in one piece from one piston to the other, or it may be in two parts, keyed together in the cross-head *d*, or otherwise secured. This cross-head *d* is made with hollow ends, with top and bottom slide-blocks *e e'*, that bear against the top of the bed *a'* and under side of the slide-bar *f*, respectively, and there are set-screws *o o'*, passing through the end portions of the cross-head, and serving to adjust the slide-blocks to maintain the piston-rods in their proper position vertically. The flanges *h* at the ends of the cross-head are provided with slide-blocks *l* and adjusting-screws *n*, that serve to determine the position of the cross-head and piston-rods horizontally, and to compensate wear, the said slide-blocks taking their bearings against the edges of the frame. The connecting-rod *k* is applied between the crank-pin *m* and the journal-bearing *r* of the cross-head *d*, and it is provided with the usual straps, keys, and boxes, and the crank *m* is upon the shaft *s* of the fly-wheel *t*.

It will now be seen that the connecting-rod swings in a plane that is as near to the piston-rod as consistent with the proper shape of the parts, and that the journal *r* is in the same horizontal plane as the piston-rods, and close to the same; hence that there is no undue strain upon the cross-head or piston-rods, and that the wear of the slides and slide-blocks is compensated by the adjusting-screws.

I do not claim connecting-rods from the cross-head to cranks when the piston-rod of the engine is above the piston-rod of the pump and the crank-shaft crosses above the latter, as this has been used, and links or connecting-rods have passed from a cross-head to cranks upon a shaft at one end of the steam-cylinder, and in other instances the crank-shaft has passed below the piston-rod, and the connecting-rod been jointed below the piston-rods to the cross-head.

I claim as my invention—

1. The cross-head *d*, made open at the ends, and provided with slide-blocks *e e'* and adjusting-screws *o o'*, in combination with the flanges *h*, slide-blocks *l*, and set-screws *n*, substantially as set forth.

2. The direct-acting pumping-engine having the piston-rods in line with each other at opposite sides of the cross-head, in combination with a connecting-rod and crank, swinging between the piston-rod and the slide for the cross-head, the shaft of the crank, the piston-rods, and the joint of the connecting-rod to the cross-head, all being in the same horizontal plane, as and for the purposes set forth.

Signed by me this 18th day of October, A. D. 1875.

JAMES W. MATHIESON.

Witnesses:

GEO. T. PINCKNEY,

CHAS. H. SMITH.