

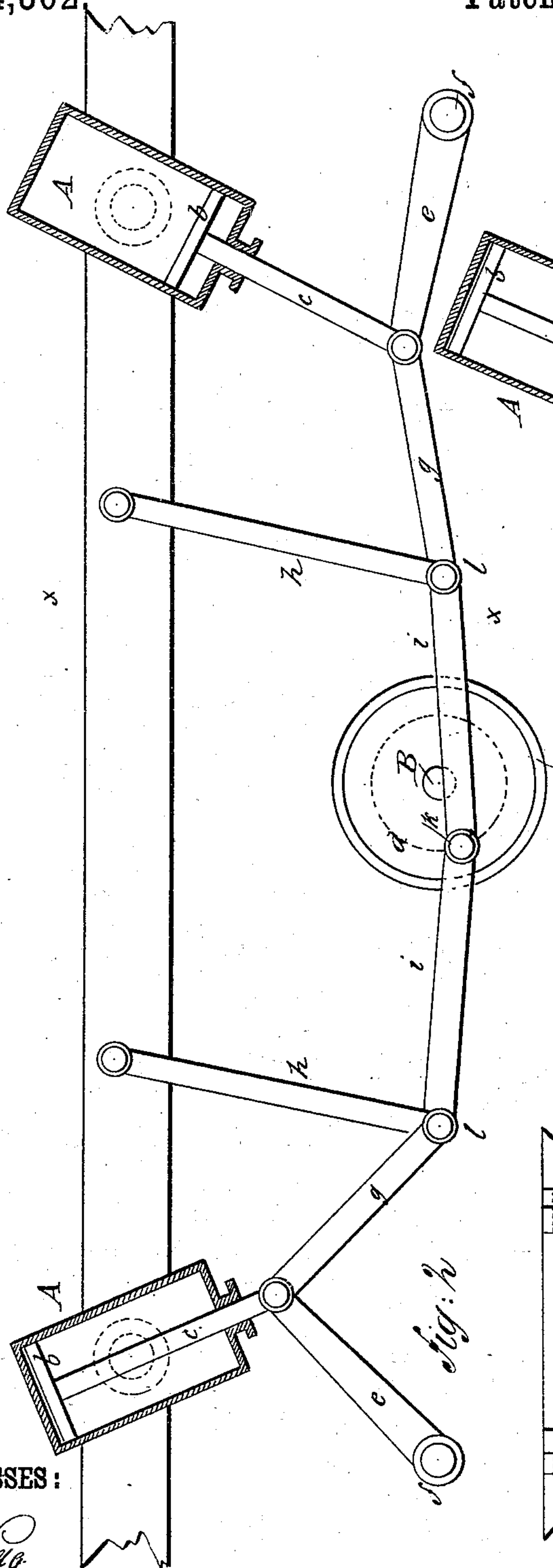
(No Model.)

R. L. STEVENS.  
DOUBLE OSCILLATING ENGINE.

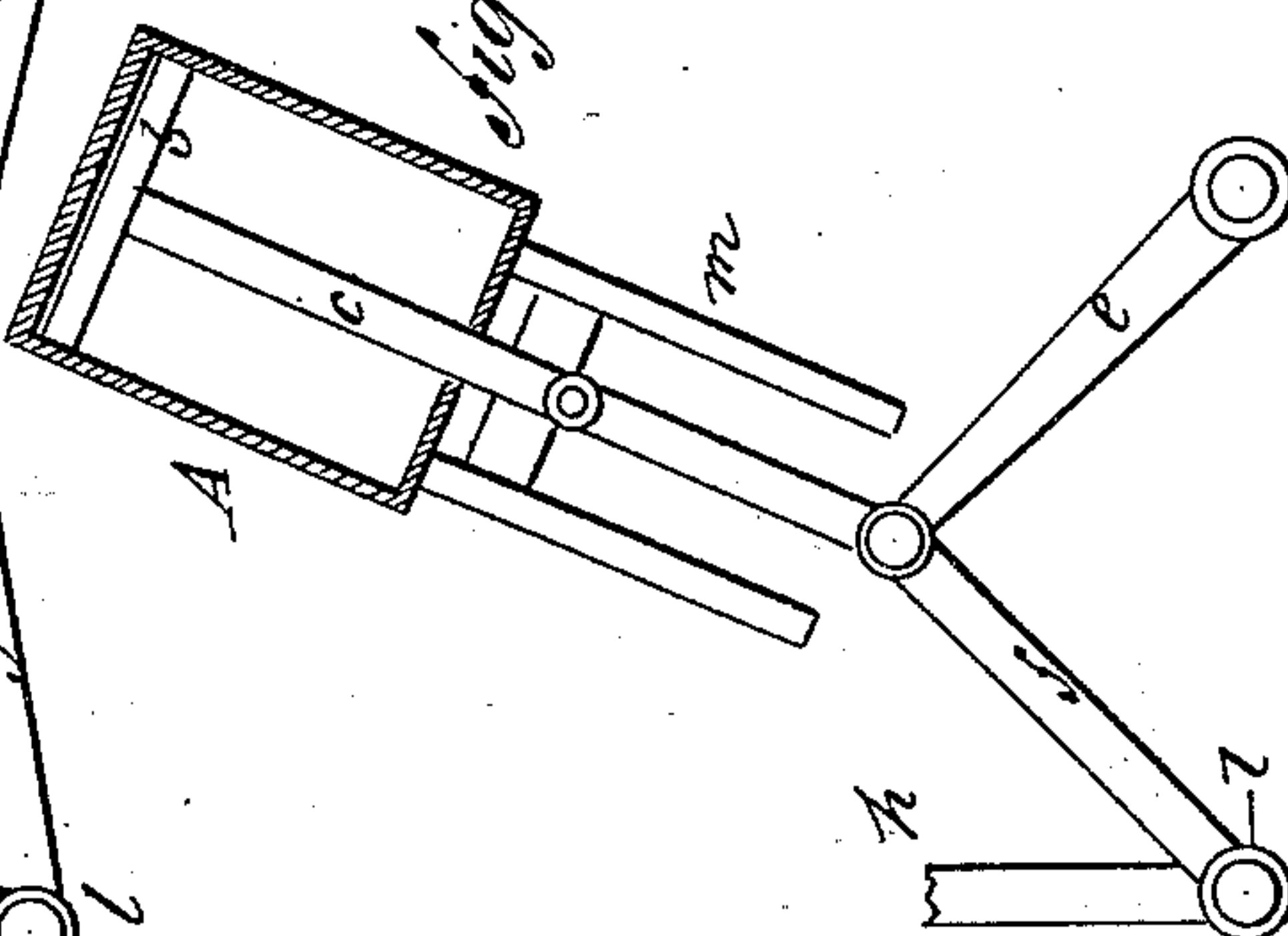
No. 264,362.

Patented Sept. 12, 1882.

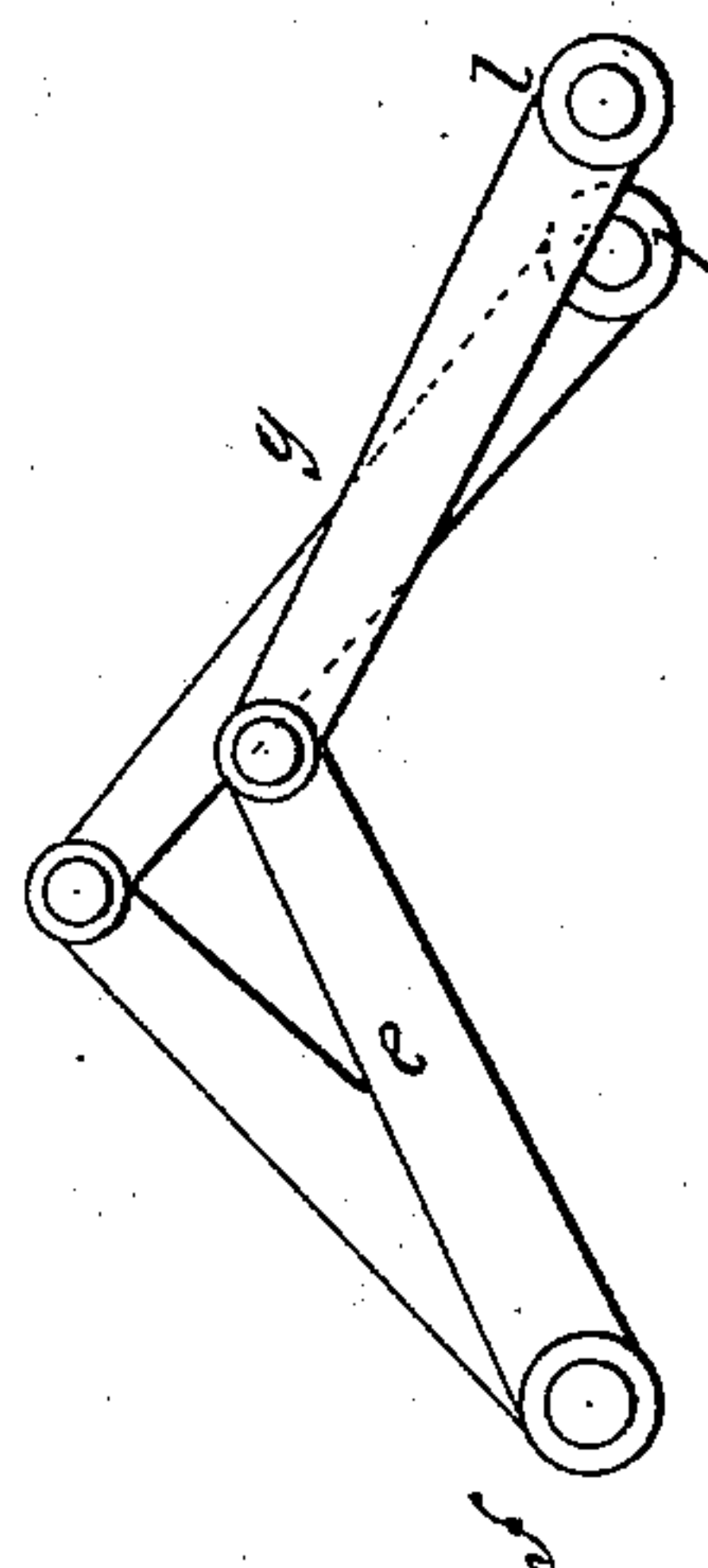
*Fig. 1.*



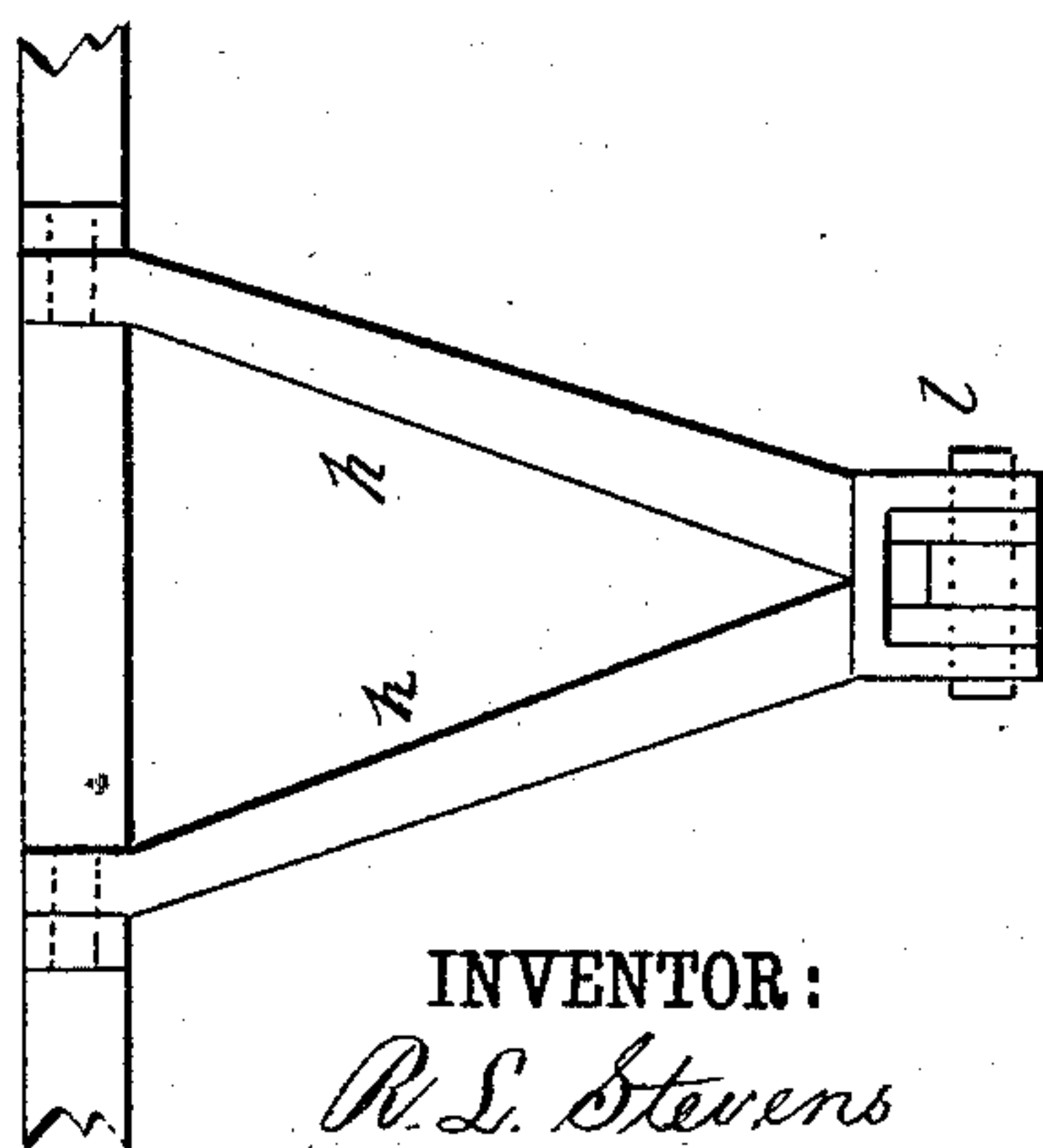
*Fig. 3.*



*Fig. 4.*



*Fig. 2.*



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# UNITED STATES PATENT OFFICE.

ROBERT L. STEVENS, OF ALBANY, OREGON.

## DOUBLE OSCILLATING ENGINE.

SPECIFICATION forming part of Letters Patent No. 264,362, dated September 12, 1882.

Application filed May 27, 1882. (No model.)

To all whom it may concern:

Be it known that I, ROBERT L. STEVENS, of Albany, in the county of Linn and State of Oregon, have invented a new and useful Improvement in Double Oscillating Engines, of which the following is a full, clear, and exact description.

In Letters Patent granted to me October 18, 1881, No. 248,524, an engine is shown employing two cylinders connecting to a reciprocating slide.

My present invention relates to that class of engines, and may be regarded as an improvement or modification of the one shown in the said Letters Patent.

The object is to avoid the downward pressure upon the slide and the friction resulting from such pressure. To that end my invention consists in the use of a swing in the place of a reciprocating slide, as hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a side elevation of an engine embodying my improvements. Fig. 2 is a side view of the forked swings. Fig. 3 shows the application of the invention in connection with a fixed cylinder.

Referring first to Fig. 1, A A are oscillating cylinders, of the usual form, which are to be sustained in any suitable manner, and are fitted with pistons *b* and rods *c*.

At B is the shaft to be driven, provided with a crank-disk, *d*.

*e e* are arms hung on fixed centers *f*, and jointed at their outer ends to the ends of the piston-rods *c*.

*g g* are links jointed at one end to the piston-rods *c*, and to the ends of the arms *e*, and jointed at their other ends to swings *h h*, which are suspended at a point above the shaft B, and sufficiently distant from the cylinders A to insure the desired movement.

*i i* are links from the ends of the swings *h* to the crank-pin *k*. The joints at *l*, by which the swings *h* and links *g i* are connected, will be formed as a cross-head, which may be fitted to move between suitable guides to prevent lateral strain, or for the same purpose the swings *h* may be forked at their upper ends, as shown in Fig. 2.

The pivoted arms *e* and links *g*, in connection with each cylinder, form toggle-bars that are moved by reciprocation of the piston-rod, the greatest angle being at the extreme inward position of the piston, at which time the power is to be applied, and in the extreme outward positions of the pistons this bar and link are brought to nearly a horizontal line. The point of suspension of the swings *h* is sufficiently distant to insure a straight line movement of the cross-head at *l*, and the downward pressure of the bars *f* is thus neutralized by the swings, so that the operation, while it is substantially the same as the reciprocating slides, is without noticeable friction.

In Fig. 3 the improvement is shown as applied in connection with a fixed cylinder, in which case the piston-rod *c* is fitted for movement in slides *m*.

Fig. 4 shows an arrangement of the pivoted arms and links for use with two contiguous cylinders, as in the Letters Patent aforesaid.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In a double oscillating engine, the combination of swings *h* with the pivoted bars or links *e g i*, the piston *c*, and crank, substantially as described, for operation as set forth.

2. The combination of oscillating cylinder A, piston and rod *c*, pivoted arm *e*, link *g*, and swing *h* with the cross-head *l*, substantially as shown and described.

ROBERT L. STEVENS.

Witnesses:

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