No. 642,761. Patented Feb. 6, 1900.

M. H. SMITH.

RECIPROCATING ENGINE.

(Application filed June 29, 1897.)

(No Model.)

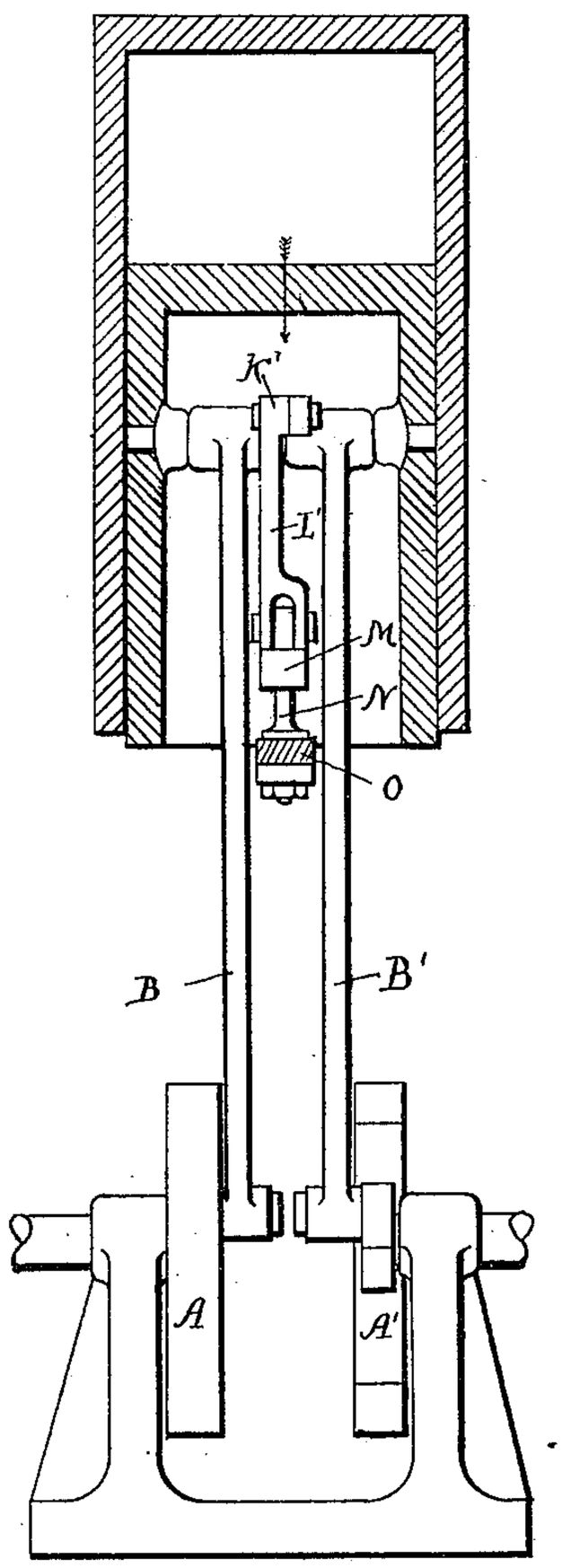

Fig. 1

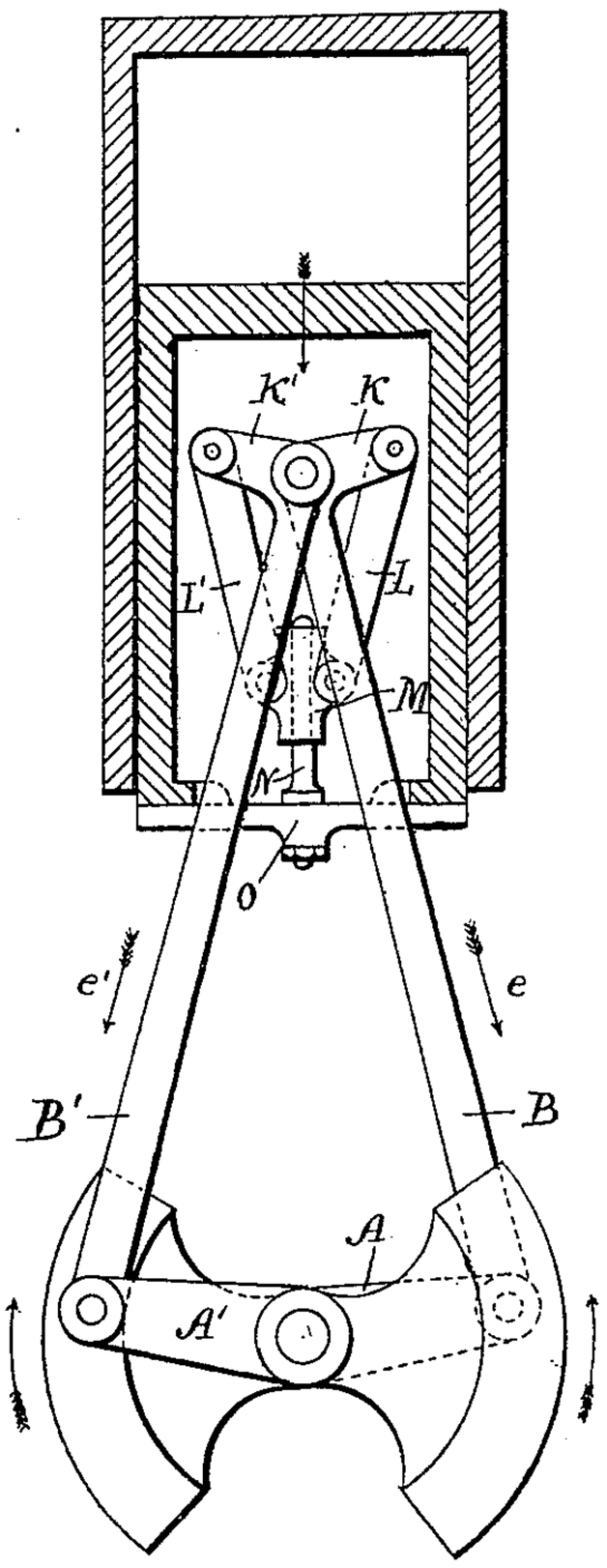

Fig. 2

Witnesses
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UNITED STATES PATENT OFFICE.

MICHAEL HOLROYD SMITH, OF LONDON, ENGLAND.

RECIPROCATING ENGINE.

SPECIFICATION forming part of Letters Patent No. 642,761, dated February 6, 1900.

Application filed June 29, 1897. Serial No. 642,890. (No model.)

To all whom it may concern:

Be it known that I, MICHAEL HOLROYD SMITH, a subject of the Queen of Great Britain and Ireland, and a resident of Albany Buildings, 47 Victoria street, Westminster, London, in the county of Middlesex, England, have invented a certain new and useful Improved Means for Lessening Vibration in Reciprocating Engines and Machines, of which the following is a specification.

The object of my invention is to lessen the vibration of reciprocating engines by providing novel mechanism for balancing the operative parts. In order to accomplish this object, I divide the power-shaft and mount upon the contiguous extremities thereon a pair of counterbalanced cranks operatively connected, respectively, with the piston by means of a pair of oppositely-disposed bell-crank levers coaxially-fulcrumed within the piston and connected for correlative movement by a pair of connecting-rods pivoted to the short arms of the levers and to a guide common to both and designed to compel identical movement thereof.

Referring to the drawings, Figure 1 is a sectional elevation of my device applied as in use; and Fig. 2 is a similar view, the section being taken at right angles to that shown in Fig. 1.

Referring to the letters of reference, indicating corresponding parts in the several views, A A′ indicate a pair of counterweighted cranks keyed or otherwise secured upon the contiguous extremities of the shafts or shaft-sections, mounted in suitable bearings, as usual.

B B′ indicate the long arms or connecting-rods of a pair of bell-crank levers having coaxial fulcrums upon the interior of a hollow piston C and from the oppositely-disposed short arms *k k′* of which extend toward the open end of the piston a pair of links or connecting-arms L L′, pivoted at their lower ends to the opposite sides of a guide-sleeve M, longitudinally movable upon the guide-pin N, extending coaxially into the piston from a supporting-bracket O. It will now be obvious that the reciprocation of the piston will cause the counterweighted cranks A A′ to revolve in opposite directions and that the thrust of each lever, which would otherwise cause vibration, will be counteracted by its counterweight and the opposing thrust exerted upon the other crank.

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

In a reciprocating engine, the cylinder, the piston, the two shafts, the two cranks connected therewith, two counterweights connected with the cranks, and two connecting-rods provided with bell-cranks at their upper ends, combined with suitable connecting-rods for each of the bell-cranks, a sleeve to which the lower ends of the connecting-rods are pivoted, a guide-pin, and a suitable support therefor, the bell-cranks being pivoted inside of the hollow piston, substantially as shown and described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

MICHAEL HOLROYD SMITH.

Witnesses:

REGINALD WALTER BARKER,

CHAS. ROCHE.