

E. L. & E. D. COURTWRIGHT.
INTERNAL COMBUSTION ENGINE AND THE LIKE.
APPLICATION FILED DEC. 20, 1911.

1,039,492.

Patented Sept. 24, 1912.

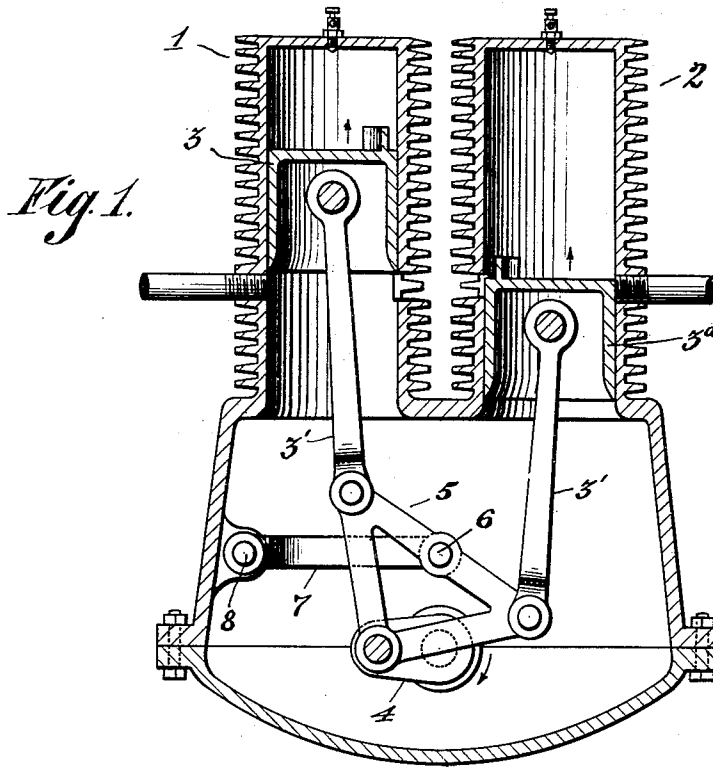
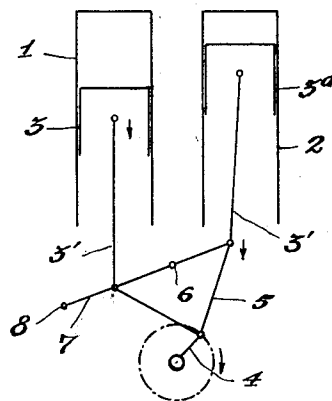
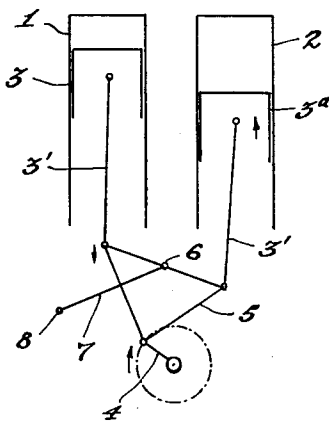


Fig. 2.

Fig. 3.



Witnesses

James C. Sproll.
Arleta Adams

Inventors

Elmer L. Courtwright.
Edgar D. Courtwright.

By

Adams & Brooks

Attorneys

UNITED STATES PATENT OFFICE.

ELMER L. COURTWRIGHT AND EDGAR D. COURTWRIGHT, OF TACOMA, WASHINGTON.

INTERNAL-COMBUSTION ENGINE AND THE LIKE.

1,039,492.

Specification of Letters Patent. Patented Sept. 24, 1912.

Application filed December 20, 1911. Serial No. 666,881.

To all whom it may concern:

Be it known that we, ELMER L. COURTWRIGHT and EDGAR D. COURTWRIGHT, citizens of the United States, residing at Tacoma, in the county of Pierce and State of Washington, have invented certain new and useful Improvements in Internal-Combustion Engines and the Like, of which the following is a specification.

Our invention has particular reference to mechanism for connecting the pistons of an engine or the like with the crank shaft and has for a primary object to provide a novel construction of this character which is productive of a more effective movement of the pistons, and further, overcomes dead centering of the connected crank.

Other objects will be set forth as our description progresses and those features of construction, arrangements and combinations of parts on which we desire protection, succinctly defined in our annexed claims.

Referring to the accompanying drawing wherein like numerals of reference indicate like parts throughout the several views: Figure 1 is a transverse section of an engine equipped with motion converting mechanism constructed in accordance with our invention, and Figs. 2 and 3 are diagrammatical views thereof.

In accordance with our invention, we provide a driving connection between pistons, of cylinders in duplex arrangement, and the crank, through the medium of which we obtain comparatively long quick strokes of the pistons with a comparatively slow motion during the change of stroke.

Referring to the drawing by numerals of reference, 3, 3^a indicate the pistons one of which has a "lead" over the other, by which arrangement one will enter on its slow motion or change of stroke practically simultaneously with the entering of the other on its stroke, thereby overcoming undue vibrations to the apparatus.

Reference numerals 1 and 2 indicate the cylinders, as for example, of an engine of the explosive type, and 4 the crank of the drive shaft.

Reference numeral 5 indicates a driving connection pivotally connected at its opposite end portions with the crank 4 and piston-stems 3' respectively. Intermediate the pivotal points of stems 3', connection 5 is pivoted, as at 6, to a fulcrum member 7, the latter conveniently comprising an oscilla-

tory arm pivotally supported, as at 8, on the crank case, as shown. In thus mounting the driving connection 5 for bodily movement in an arcuate path, as contradistinguished from a straight path, the change of stroke of a piston occurs sooner in the revolution of the crank shaft, as diagrammatically illustrated in Fig. 2, in which view piston 3 is about to start on its inward stroke, at which time it will swing driving connection 5 on pivot 6 to throw crank 4 over center, as indicated in Fig. 3, pivot 6 moving upwardly slightly to permit of this, as is apparent.

Our invention is particularly adapted for use in connection with explosive engines, wherein a plural throw crank shaft is employed, a driving connection 5 being connected with each crank and the related pair of pistons, as is well understood. We do not however, wish to be understood as limiting our invention to this particular application.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent of the United States of America, is:—

1. The combination of a pair of cylinders, reciprocatory pistons in said cylinders, and a shaft provided with a crank, of a driving connection connected with the stems of said pistons and said crank, and a fulcrum member having said driving connection pivoted thereto intermediate the points of engagement of said piston-stems, said member being supported for movement bodily in an arcuate path.

2. The combination of a pair of cylinders, reciprocatory pistons in said cylinders one of which pistons has a lead over the other, and a shaft provided with a crank, of a driving connection pivotally connected at one end portion to the crank of said shaft, a fulcrum member pivotally connected with the other end portion of said driving connection, said pistons having their stems pivoted to said connection on opposite sides of its point of connection with said fulcrum member, and means supporting said fulcrum member for bodily movement in an arcuate path.

3. The combination of a pair of cylinders, reciprocatory pistons in said cylinders one of which pistons has a lead over the other, and a shaft provided with a crank, of a driving connection pivotally connected at

one end portion to the crank of said shaft,
a fulcrum member pivotally connected with
the other end portion of said driving con-
nection, said pistons having their stems piv-
5 oted to said connection on opposite sides of
its point of connection with said fulcrum
member, and a fulcrum member comprising
an arm pivoted to said driving connection
and to a relatively fixed part for directing
10 said connection through an arcuate path

during its bodily movement with said crank
shaft.

In testimony whereof we affix our signa-
tures in presence of two witnesses.

ELMER L. COURTWRIGHT.
EDGAR D. COURTWRIGHT.

Witnesses:

GEORGE H. BERRY,
L. L. THORNELY.