F. A. EDMUNDS & N. G. WARMING.

CRANK CONNECTION FOR MULTICYLINDER ENGINES.

APPLICATION FILED FEB. 13, 1909.

962,200. Patented June 21, 1910.

Fig. 1

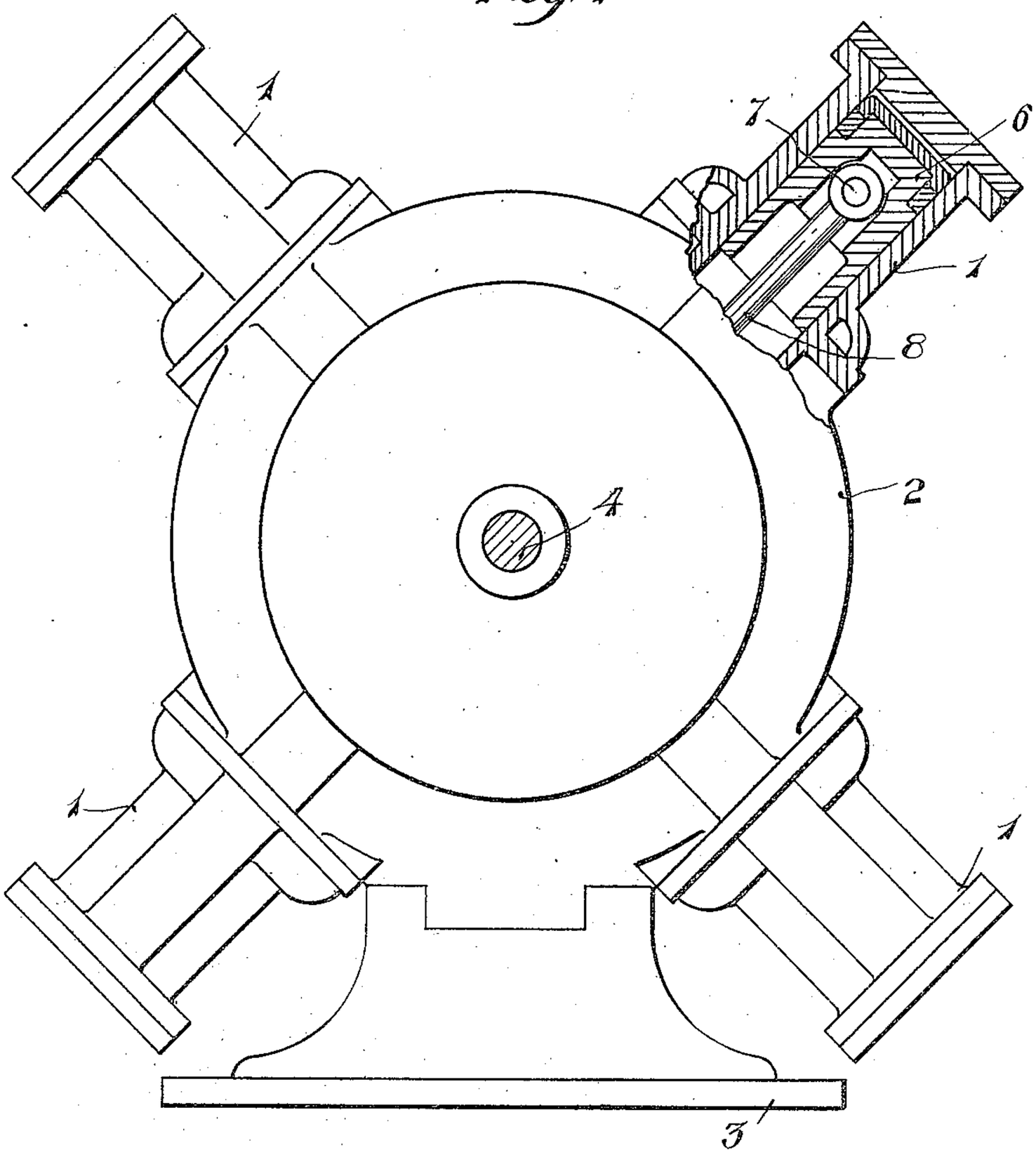
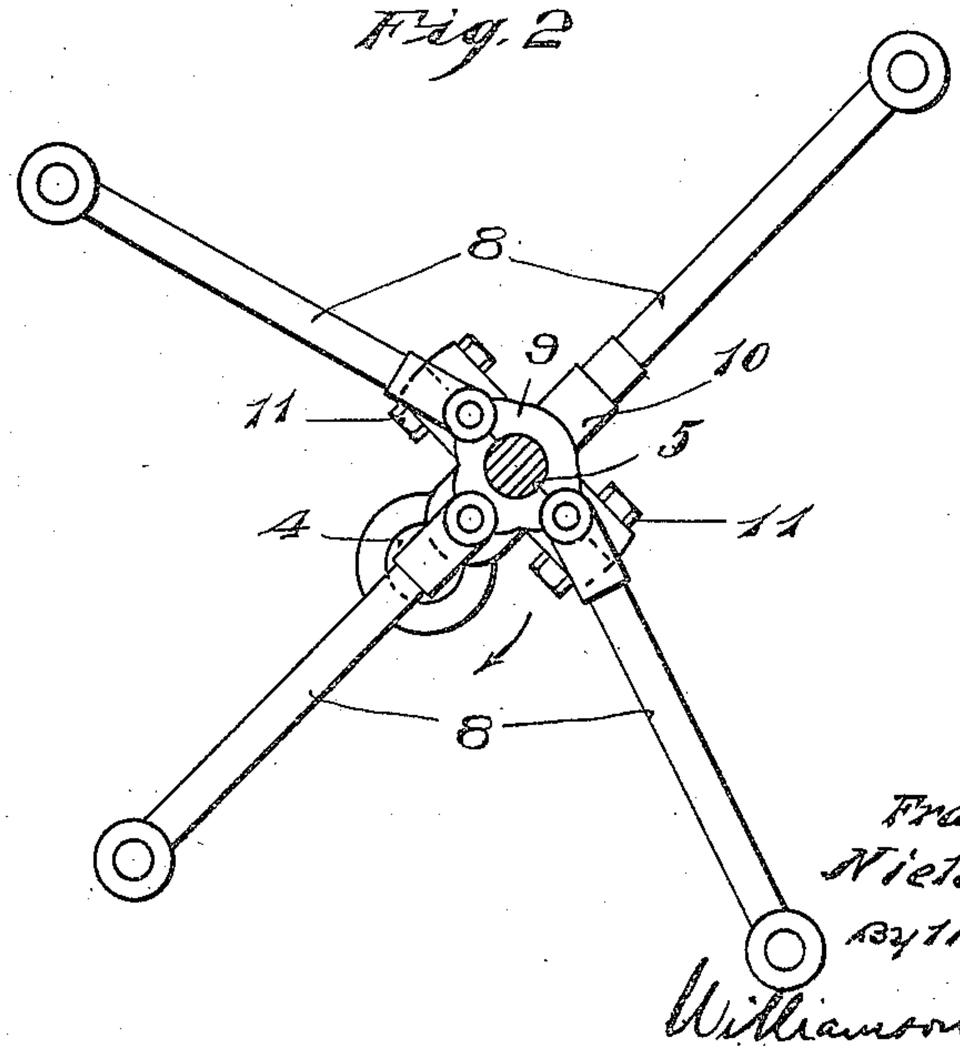


Fig. 2



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UNITED STATES PATENT OFFICE.

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CRANK CONNECTION FOR MULTICYLINDER-ENGINES.

962,200. Specification of Letters Patent. Patented June 21, 1910.

Application filed February 13, 1909. Serial No. 477,507.

To all whom it may concern:

Be it known that we, FRANK A. EDMUNDS and NIELS G. WARMING, citizens of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Crank Connections for Multi-cylinder-Engines; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to and has for its object to improve the construction of crank connections for multi-cylinder engines, and to this end, it consists of the novel devices and combinations of devices hereinafter described and defined in the claim.

The improved engine is illustrated in the accompanying drawings, wherein like characters indicate like parts throughout the several views.

Referring to the drawings, Figure 1 shows a portion of a type of engine in which the system of connecting rods, illustrated in Fig. 2, is adapted to be applied; and Fig. 2 is a diagrammatic view showing the improved crank connections for multi-cylinder engines.

In the engine illustrated, four cylinders 1 are employed and these are radially disposed and rigidly secured to a crank shaft casing 2, which, in turn, is rigidly secured to a base casting 3.

The engine crank shaft 4 is journaled in suitable bearings in the casing 2 and is provided with a crank 5 that works in the crank case 2, and is centrally located in respect to a vertical plane intersecting the axes of the several cylinders.

Working in each cylinder 1 is a recessed piston 6, each of which is pivotally connected by a pin 7 to the outer end of a crank rod 8. Loosely journaled on the wrist pin of the crank 5 is a so-called crank sleeve 9 to which the inner end of one of the crank rods 8 is rigidly connected at 10 and to which all of the other crank rods 8 are pivotally connected. This so-called crank sleeve 9, which may take various forms, is preferably split diametrically through the axis of the wrist pin upon which it is mounted and through the pivotal connections between the same and two of the said crank rods 8, and the two parts of this crank sleeve are rigidly but detachably connected by short nutted bolts 11. The crank rod which is rigidly connected to the said crank sleeve holds the same against rotation, but, of course, permits the wrist pin of the crank 5 to rotate within the same. By this arrangement, it is made possible to efficiently couple a multiplicity of crank rods to a shaft having a single or common crank.

The crank connections above described may, as is evident, be applied to any desired number of cylinders and pistons. While of simple construction, it has in practice been found highly efficient for the purposes had in view.

What we claim is:

The combination with a plurality of radially movable members and means for guiding the same, of a shaft having a crank, a crank sleeve mounted on said crank, and crank rods connected to said radially movable members and to said sleeve, one of the said crank rods being rigidly connected to said crank sleeve and the other crank rods being pivotally connected thereto, and the said sleeve being divided on a line that intersects the pivotal connections between said sleeve and two of said pivotally connected crank rods, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANK A. EDMUNDS.
NIELS G. WARMING.

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