

Dec. 15, 1931.

G. PIELSTICK

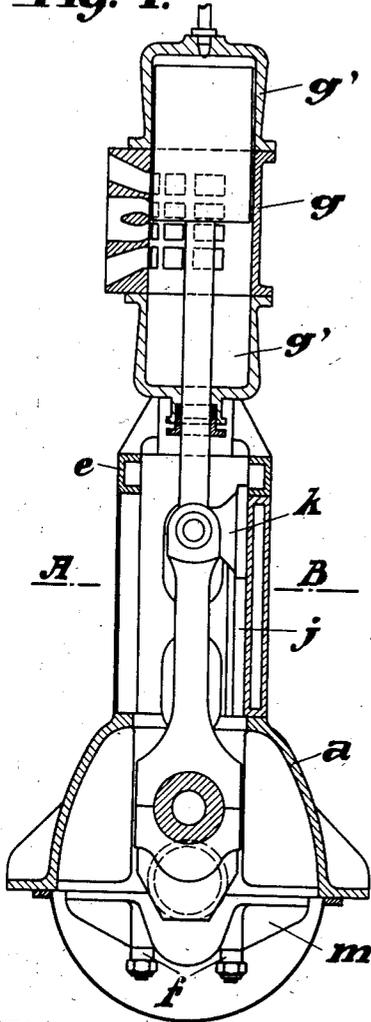
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MULTICYLINDER COMBUSTION ENGINE

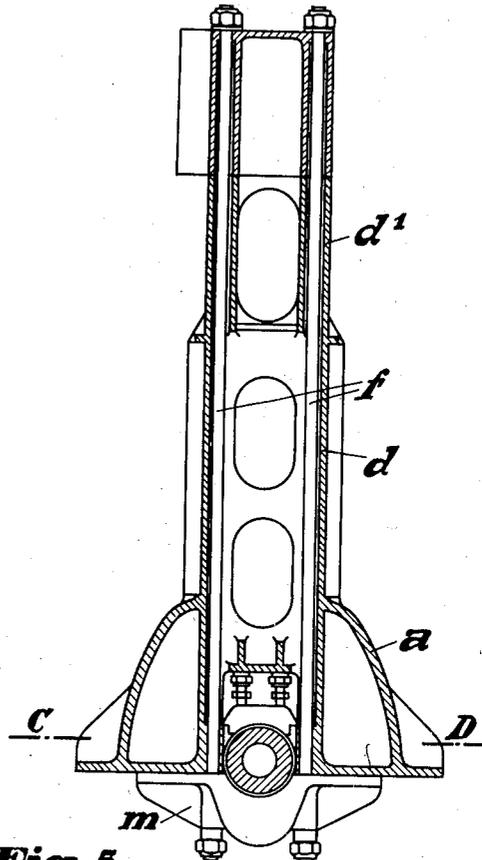
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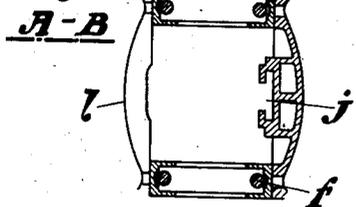
**Fig. 1.**



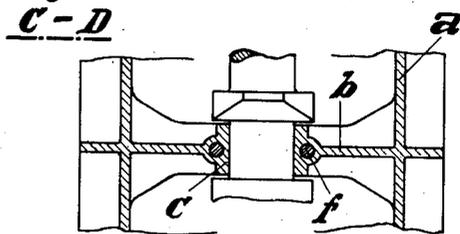
**Fig. 2.**



**Fig. 4.**



**Fig. 5.**



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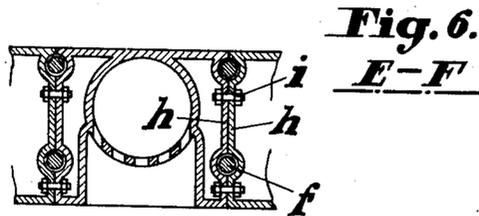
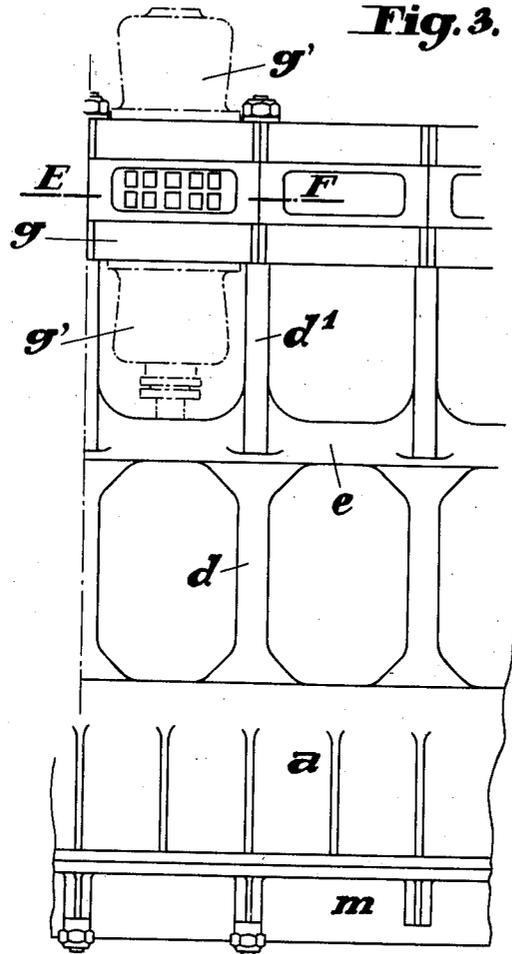
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# UNITED STATES PATENT OFFICE

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## MULTICYLINDER COMBUSTION ENGINE

Application filed April 15, 1929, Serial No. 355,174, and in Germany April 24, 1928.

This invention relates to multicylinder combustion engines in which the cylinders are individually attached to a longitudinally extending carrier.

One object of the invention is the provision of a multicylinder engine of this type in which the middle portions of the cylinders are connected to a longitudinally extending superstructure on a longitudinally extending carrier by means of tension rods or through bolts.

Other objects and advantages of the invention will be more apparent from the following description and from the accompanying drawings, in which—

Fig. 1 is a cross sectional view transversely of an engine taken centrally of a cylinder, embodying the present invention;

Fig. 2 is a transverse section taken through a pair of connecting rods;

Fig. 3 is a front elevation of the engine;

Fig. 4 is a horizontal section on the line A—B of Fig. 1;

Fig. 5 is a section on the line C—D of Fig. 2; and

Fig. 6 is a section on the line E—F of Fig. 3.

In accordance with the present invention a series of individual cylinder portions forming the intermediate portions of the cylinders of an engine is arranged above a superstructure or frame preferably integrally provided on a longitudinally extending carrier, these parts being firmly held together by means of clamping or tension rods which extend at right angles to the carrier. The cylinder portions mentioned are attached to one another in a detachable manner, and support cylinder heads in a manner permitting their removal without disturbing the clamping rods. As shown in the drawings the multicylinder internal combustion engine comprises a stationary lower longitudinal carrier *a* in which cross ribs *b* may be provided for the support of the bearing housings *c* for the crank shaft. On the longitudinal carrier *a* is a superstructure preferably integral therewith and embodying the upstanding supports *d* which are stiffened at their intermediate portions by longitudinally extending mem-

bers or ribs *e* located above the longitudinal carrier *a*. Beneath the ribs *e* the supports *d* are preferably of channel shape in cross section as shown in Fig. 4. The portions of the superstructure which extend above the ribs *e*, namely the uprights designated *d'* are preferably of tubular form. Inside of the supports *d* and *d'* are arranged clamping or tension rods *f* extending slightly beyond the upper end of cylinder portions *g* which rest upon the supports *d'*. The lower ends of the rods pass through lower bearing supports *m* and secure them to the longitudinal carrier *a* as well as securing the latter to the cylinder portions *g*.

The cylinder portions *g* each constitute an intermediate portion of a working cylinder and, as shown, the scavenging and exhaust passages for the two cycle Diesel type engine to which the invention is herein applied are provided in this portion. Cylinder ends *g'* are detachably connected to these intermediate cylinder portions as by means of suitable attaching bolts adapted to be removed without disturbing the clamping engagement of the through rods *f*. Each cylinder is thus individually connected to the superstructure and longitudinal carrier by means of the through bolts or rods *f*, the cylinders being arranged side by side and detachably fastened one to another by means of bolts or the like *i* extending through cross plates *h* provided preferably integrally with each cylinder portion *g* as shown in Fig. 6. These cross plates *h* are so formed that adjacent plates surround the clamping rods *f* at their upper ends. The series of connected individual cylinder portions *g* provides a rigid structure which is rigidly connected by means of the through bolts to the longitudinal carrier, thus providing a rigid engine assembly. It will be apparent that the various parts forming this assembly are readily interconnected by simple attaching means to provide a rigid yet light construction, this construction permitting the removal of the cylinder ends *g'* without disturbing the connection of the cylinder portions *g* to the carrier and to one another. The construction described also provides for the addition of

other cylinders and for their ready replacement or removal.

Between the two adjacent members *f* there is a track *j* for the cross head *k* of the engine, the front portion of the superstructure section being covered by a removable plate *l*, the various cross heads corresponding to the various cylinders being similarly enclosed. Below the longitudinal carrier *a* is the usual lower crank case portion *m* as shown in Fig. 1, this portion being detachably fastened at its edges to a lower side of the longitudinal carrier.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A multicylinder combustion engine comprising a longitudinally extending carrier having a longitudinally extending superstructure integral therewith, said superstructure including a longitudinally extending rigidifying member above said carrier and connections extending from said member to said carrier, a series of individual piston guiding cylinder portions open at opposite ends and resting on said superstructure above said member, a series of tension rods extending through said cylinder portions, superstructure, and supporting carrier, and securing said cylinder portions to said carrier, cylinder heads removably attached to said cylinder portions independently of said rods, said cylinder portions having opposite cross plates abutting cross plates of adjacent cylinder portions and enclosing said rods, and means removably securing adjacent cross plates together.

2. A multicylinder combustion engine comprising a longitudinally extending carrier having a longitudinally extending superstructure, a series of individual piston guiding cylinder portions open at opposite ends and each forming only a part of the cylinders of the engine, said cylinder portions resting on said superstructure, a series of tension rods extending from said superstructure transversely thereof securing said cylinder portions thereto, means for removably securing the cylinder portions directly to an adjacent cylinder portion, and a cylinder head piece removably secured to each of said cylinder portions independently of said tension rods and adapted to be removed without disturbing the connection between the tension rods and the cylinder portions, each cylinder head piece having a piston guiding part forming a portion of the engine cylinder.

3. A multicylinder combustion engine comprising a longitudinally extending car-

rier having a longitudinally extending structure, a series of piston guiding cylinder portions open at opposite ends and forming only the middle parts of the cylinders of the engine, said cylinder portions resting on said superstructure, fastening means securing said cylinder portions to the superstructure, means removably securing each cylinder portion directly to an adjacent cylinder portion, and a cylinder head piece removably secured at each end of each of said cylinder portions and adapted to be removed without disturbing the connection between said fastening means and said cylinder portions, each cylinder head piece having a generally cylindrical piston guiding portion forming an outer part of an engine cylinder.

In testimony whereof I have affixed my signature.

GUSTAV PIELSTICK.

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