(No Model.)

P. & M. E. SCHMIT.

ENGINE.

No. 592,023. Patented Oct. 19, 1897.

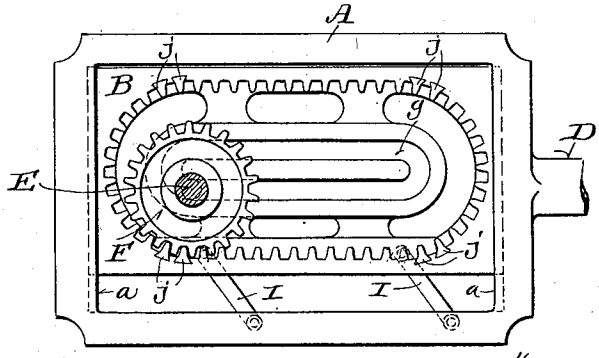

Fig. 1.

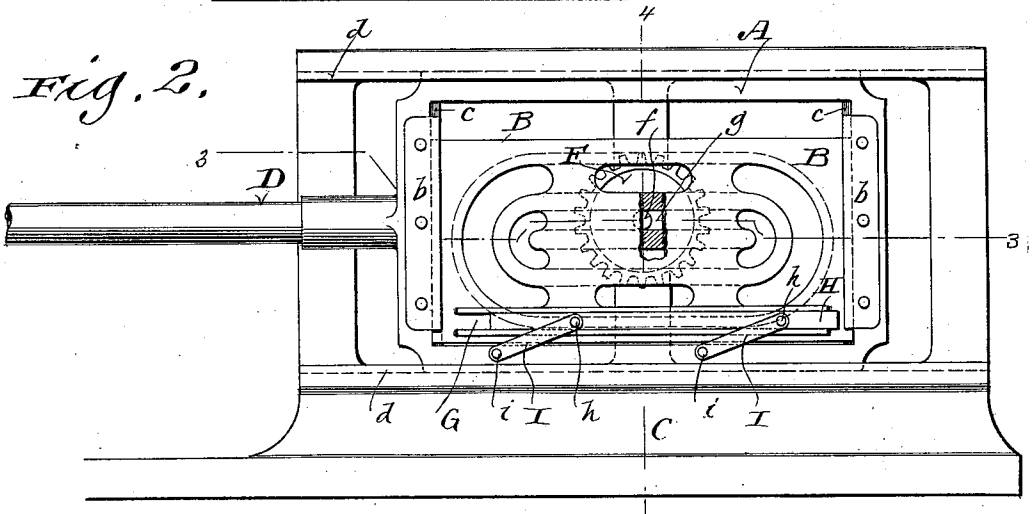

Fig. 2.

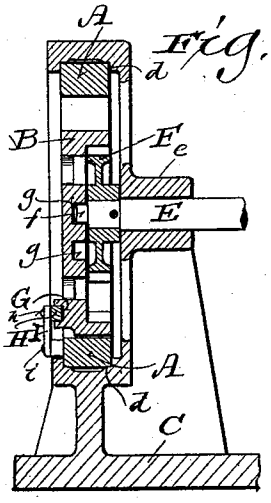

Fig. 4.

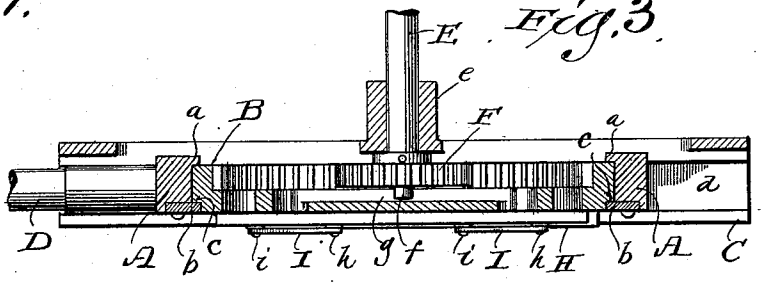

Fig. 3.

Witnesses:
Geo. W. Young,
B. C. Koloff.

Inventors:
Peter Schmit,
Mick E. Schmit,
By H. G. Underwood
Attorney

UNITED STATES PATENT OFFICE.

PETER SCHMIT AND MICK E. SCHMIT, OF FREDONIA, WISCONSIN.

ENGINE.

SPECIFICATION forming part of Letters Patent No. 592,023, dated October 19, 1897.

Application filed July 2, 1897. Serial No. 643,254. (No model.)

To all whom it may concern:

Be it known that we, PETER SCHMIT and MICK E. SCHMIT, citizens of the United States, and residents of Fredonia, in the county of Ozaukee and State of Wisconsin, have invented certain new and useful Improvements in Engines; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention relates to the construction of engines and particularly to a substitute for the ordinary crank-wheel and wrist-pin and pitman connecting the same to the cross-head; and it consists in certain peculiarities of construction and combination of parts, as will be fully set forth hereinafter and subsequently claimed.

In the drawings, Figure 1 is a view showing one side of our improved cross-head together with the gear-wheel on the shaft in engagement with the lower horizontal series of teeth on the internal rack carried by said cross-head. Fig. 2 is a view showing the opposite side of our cross-head, with the gear-wheel in engagement with the upper horizontal rack-teeth, and also showing the guide or way in which the cross-head slides. Fig. 3 is a longitudinal sectional view on the line indicated by 3 3 in Fig. 2. Fig. 4 is a transverse vertical sectional view on the line indicated by 4 4 in Fig. 2.

Referring to the drawings, A represents the cross-head, and B the internal rack vertically movable within the same. This rack B has square ends sliding against the square inner faces of the end pieces of the cross-head, said end pieces having inwardly-projecting edges *a a* on one side and removable pieces *b b* on the opposite side, and the adjacent ends of the rack B on said last-named side being shouldered, as shown at *c c*, so that the rack B is kept from slipping out of place within the cross-head A.

C represents a frame having guides or ways *d d*, wherein the cross-head moves in its longitudinal reciprocations.

D is the end of the piston-rod fast to the cross-head. The cylinder and piston are not shown, and same may be of any ordinary or preferred construction. The teeth of the internal rack B are continuous, and arranged on upper and lower parallel horizontal lines with connecting semicircular ends.

E is the main shaft of the engine, journaled in a suitable bearing *e* on the frame C, and F is a gear-wheel fast on the inner end of said shaft, which engages with the teeth of the internal rack B, and *f* is the end of this shaft projecting beyond the gear-wheel, and preferably reduced in diameter, this end *f* moving in the oblong round-ended guideway *g*, formed in the frame of the rack B and everywhere in line with the line of the rack-teeth.

G is a horizontal guideway formed in the lower part of the frame of the rack B, and H is a slide-bar moving therein. I I are parallel arms or links pivoted to said slide H and to the lower horizontal part of the cross-head A, as shown at *h i*. The other end of the main shaft E is not shown, but it is to be understood that the same is provided with an ordinary fly-wheel.

The internal rack B is of cast metal, but as the corner teeth of the same are subjected to the most wear in the movement of the gear-wheel we prefer to make certain of the same removable, as shown at *j j* in Fig. 1. These removable teeth are preferably of steel, and when worn can be easily replaced.

The operation of our device will be readily understood from the foregoing description of its construction, taken in connection with the accompanying drawings. With each reciprocation of the piston-rod D the cross-head A causes a rectilinear reciprocating movement of the internal rack B carried thereby, and thus imparts a continuous circular motion to the gear-wheel F and shaft E, said shaft and gear-wheel being guided by the described oblong round-ended guideway *g* in which the shaft end *f* travels, thereby performing all the functions of the ordinary crank-motion, and entirely dispensing with the usual pitman or connecting-rod, crank-wheel, and wrist-pin.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

In an engine, the combination with the piston-rod of a cross-head rigidly secured thereto and movable in suitable guides or ways, an internal rack having vertical movement

within said cross-head, the teeth of said rack being arranged on an oblong round-ended line, a correspondingly-shaped guideway formed on the frame of said rack within the line of said teeth, a horizontal guideway formed on said frame, a slide in said last-named guideway, parallel arms or links pivotally secured to said slide and to said cross-head, and a shaft carrying a gear-wheel on its inner end in engagement with said rack-teeth, said inner end projecting beyond said gear-wheel and traveling in the oblong round-ended guideway on the rack-frame, substantially as set forth.

In testimony that we claim the foregoing we have hereunto set our hands, at Fredonia, in the county of Ozaukee and State of Wisconsin, in the presence of two witnesses.

PETER SCHMIT.
MICK E. SCHMIT.

Witnesses:
JACOB STUPF,
PETER PAULUS.