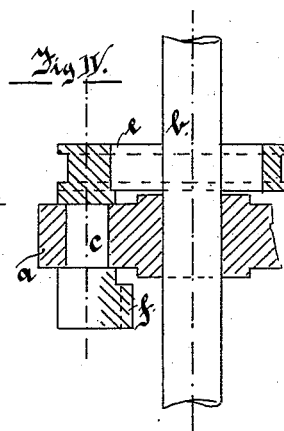
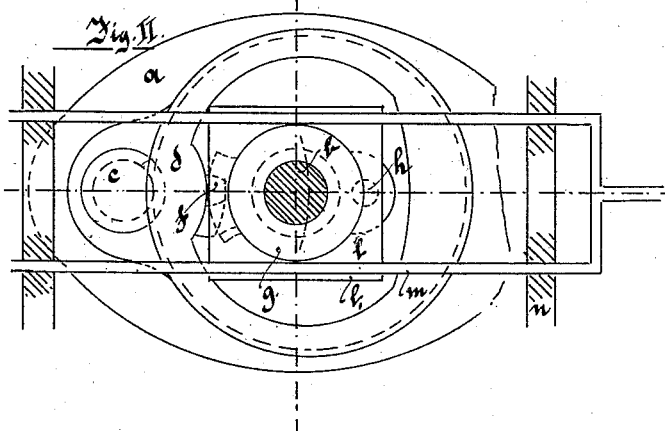
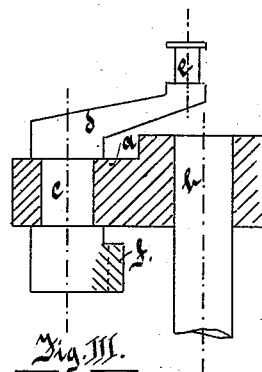
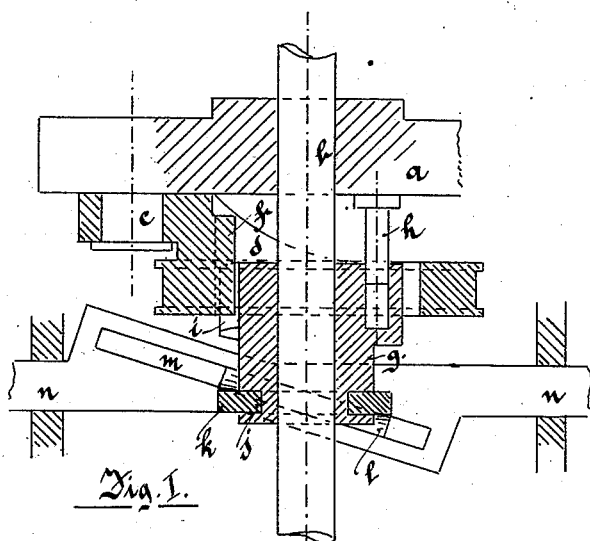


(No Model.)

P. I. SCHMALTZ.
REVERSIBLE VALVE GEAR.

No. 347,386.

Patented Aug. 17, 1886.



Witnesses:

Geo. E. Reid,
Jas. R. Loggins.

Inventor:

Saul D. Schmaltz.

UNITED STATES PATENT OFFICE.

PAUL IMMANUEL SCHMALTZ, OF ALBANY, NEW YORK.

REVERSIBLE VALVE-GEAR.

SPECIFICATION forming part of Letters Patent No. 347,386, dated August 17, 1886.

Application filed May 26, 1886. Serial No. 203,346. (No model.)

To all whom it may concern:

Be it known that I, PAUL IMMANUEL SCHMALTZ, a subject of the Emperor of Germany, residing at 98 Grand street, Albany, county of Albany, State of New York, have invented a new and useful Cut-Off and Reversible Valve-Gear for Engines; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to reduce the frictional wear and resulting defects of cut-off and reversible engine-valve gears to a minimum, and to the same end to reduce the number of working parts and wearing-surfaces, as found in the existing cut-off and reversing valve-gears, thus creating a more reliable valve-gear, which can be operated by hand and automatically.

My previous application, No. 196,908, March 29, 1886, for "engine-valve gear" of the same kind, makes use of the main crank-pin of the engine by pivoting a counter-crank on same, and giving a motion to this counter-crank by a sleeve sliding on part of engine-shaft, or otherwise in line with same, and providing this sleeve with spiral grooves to fit similar ones on pivot-extension. My present aim is to use the same method with an independent crank on any part of the engine-shaft, or in line with same, for obvious reasons.

Figure I in the drawings represents a sectional view of the mechanism, whereby all parts are situated on one side of the crank. Fig. II is an end view thereof. Figs. III and

IV show how the parts may be distributed on both sides of the crank, if required.

To attain my object, I secure a crank, *a*, of suitable shape, on the engine-shaft *b*, provided with a pivot, *c*, male or female, with which a counter-crank, *d*, is connected provided with an eccentric or eccentric-pin, *e*. This pivot receives also in a suitable place one or more spiral teeth or grooves, *f*, on a cylindrical surface concentric to center line of pivot *e*. A sleeve, *g*, with suitable parallel guide in shape of a feather or pin, *h*, as indicated, and spiral cam *i*, or cams, male or female, to fit spiral teeth or grooves *f*, and provided with a ring-shaped groove, *j*, can be moved parallel to center line of pivot, whereby the cams engage, and an altered position of the eccentric can be obtained. The mechanism to attain this sliding motion of said sleeve may be of any practical shape—for instance, a ring, *k*, fitting into groove *j*, with recesses or projections *l* attached, having inclined surfaces *l'*, to suit similar ones on a forked bar, *m*, which is guided in a plane, *n*, divergent from the direction of said inclines.

What I do claim, and desire to secure by Letters Patent, is—

The combination of crank *a*, an engine-shaft, *b*, back of the main bearing-pivot *c*, counter-crank *d*, eccentric *e*, spiral teeth *f*, sleeve *g*, with parallel guide *h*, cam *i*, and groove *j*, as set forth.

PAUL IMMANUEL SCHMALTZ.

Witnesses:

GEO. E. REID,
JOS. R. GEOGHAN.

Corrections in Letters Patent No. 347,386.

It is hereby certified that in Letters Patent No. 347,386, granted August 17, 1886, upon the application of Paul Immanuel Schmaltz, of Albany, New York, for an improvement in "Reversible Valve Gear," errors appear in the printed specification requiring the following corrections, viz: In line 64 the word "an" should read *on*; in line 65 the comma after the word "shaft" should be stricken out; and same line, the hyphen between the words "bearing" and "pivot" should be stricken out and a comma inserted instead; and that the said Letters Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 7th day of September, A. D. 1886.

[SEAL.]

D. L. HAWKINS,
Acting Secretary of the Interior.

Countersigned:

R. B. VANCE,
Acting Commissioner of Patents.