

## F02G

**HOT GAS OR COMBUSTION-PRODUCT POSITIVE-DISPLACEMENT ENGINE PLANTS (steam engine plants, special vapour plants, plants operating on either hot gas or combustion-product gases together with other fluid F01K; gas-turbine plants F02C; jet-propulsion plants F02K); USE OF WASTE HEAT OF COMBUSTION ENGINES; NOT OTHERWISE PROVIDED FOR**

### Definition statement

*This subclass/group covers:*

Hot-gas or combustion product positive-displacement engine plants and use of waste heat of combustion engines, not otherwise provided for.

## F02G 1/00

**Hot gas positive-displacement engine plants (positive-displacement engine plants characterised by the working gas being generated by combustion in the plant F02G3/00)**

### Definition statement

*This subclass/group covers:*

Hot gas positive-displacement engine plants, e.g. Stirling engines.

### References relevant to classification in this group

*This subclass/group does not cover:*

Steam engine plants, special vapour plants, plants operating on either hot gas or combustion-product gases together with other fluid	<a href="#">F01K</a>
Gas-turbine plants	<a href="#">F02C</a>
Jet-propulsion plants	<a href="#">F02K</a>

### Informative references

*Attention is drawn to the following places, which may be of interest for search:*

Positive-displacement engine plants	<a href="#">F02G 3/00</a>
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characterised by the working gas being generated by combustion in the plant	
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## Glossary of terms

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

Plant	an engine together with such additional apparatus as is necessary to run the engine. For example, a steam engine plant includes a steam engine and means for generating the steam.
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## F02G 1/043

**the engine being operated by expansion and contraction of a mass of working gas which is heated and cooled in one of a plurality of constantly communicating expansible chambers, e.g. Stirling cycle type engine**

### Definition statement

*This subclass/group covers:*

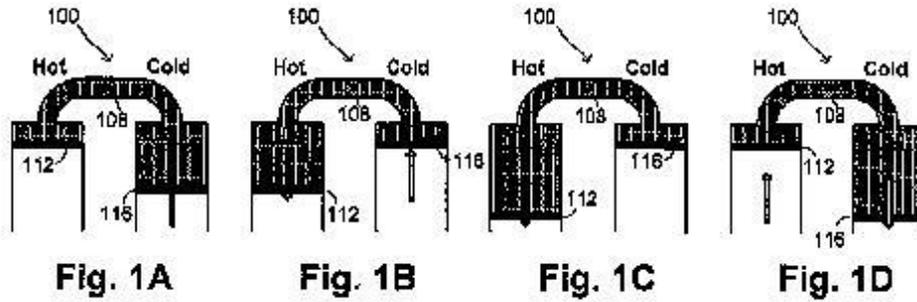
"Stirling" type engines.

Stirling engines are divided in three types:

- Alpha.

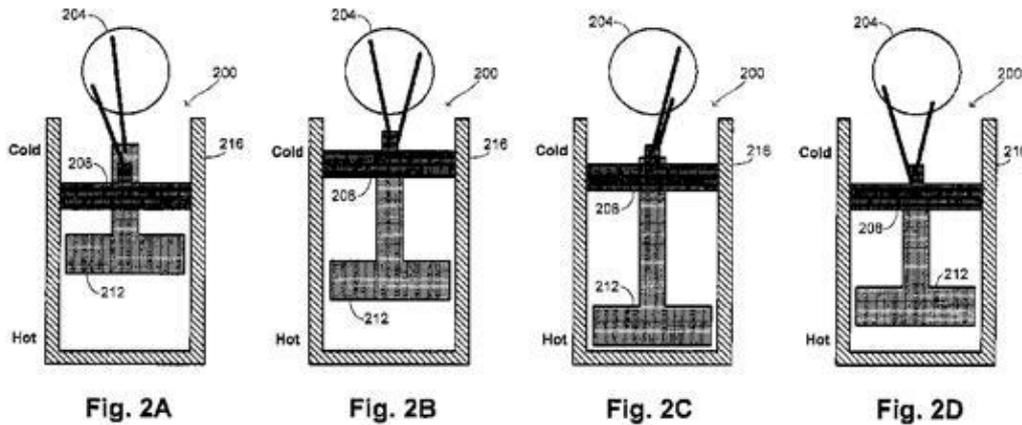
Pairs of sealed pistons in separate cylinders (no displacer).

- a. with parallel pistons.
- b. with cylinders opposed in line.
- c. with cylinders opposed parallel.



- Beta.

Piston - displacer arrangement: piston and displacer in the same cylinder. Cylinder has a hot end and a cool end:



- Gamma.

Piston - displacer arrangement : piston and displacer in separate cylinders:

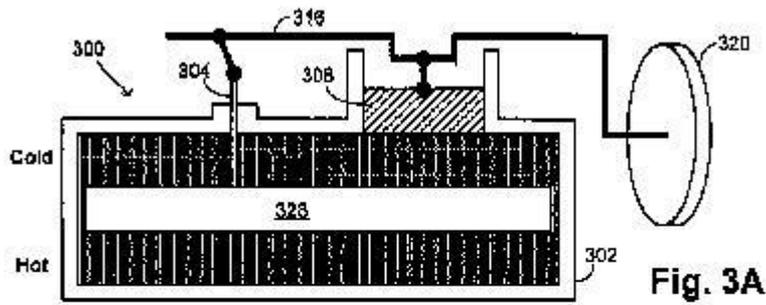


Fig. 3A

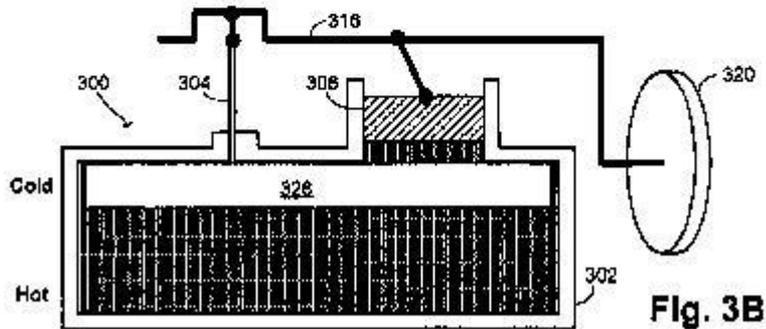


Fig. 3B

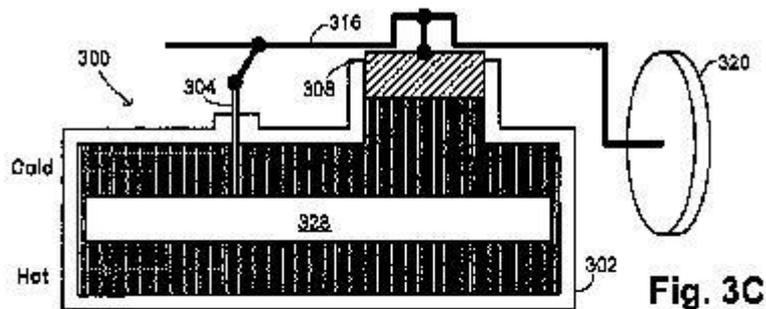


Fig. 3C

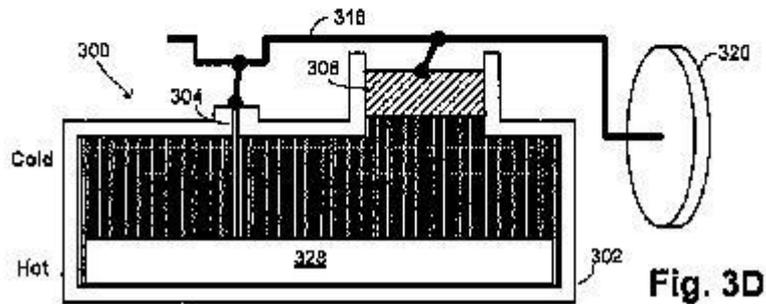
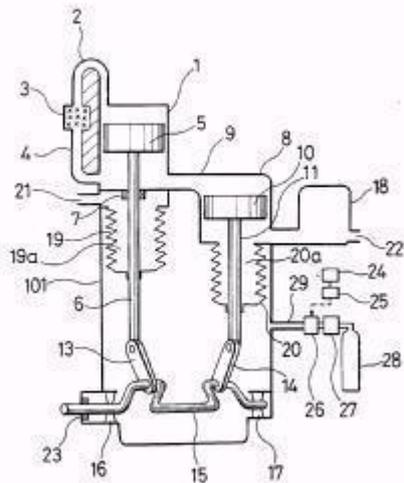


Fig. 3D

F I G 2



## F02G 1/044

having at least two working members, e.g. pistons, delivering power output

### Definition statement

*This subclass/group covers:*

Stirling type engine having at least two working members, e.g. pistons, delivering power output. E.g. Vuilleumier cycle:

Fig. 1.

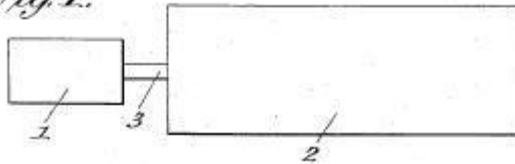


Fig. 2.

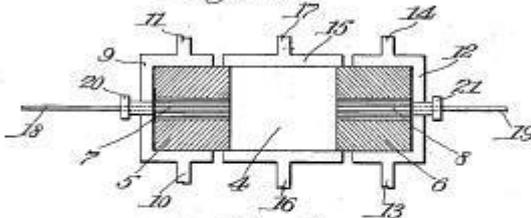
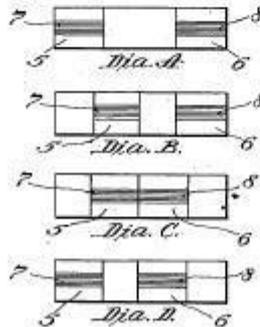


Fig. 3.



Inventor

Rudolph Vuilleumier.  
Hans. Cameron, Lewis & Mason  
Attorneys

## F02G 3/00

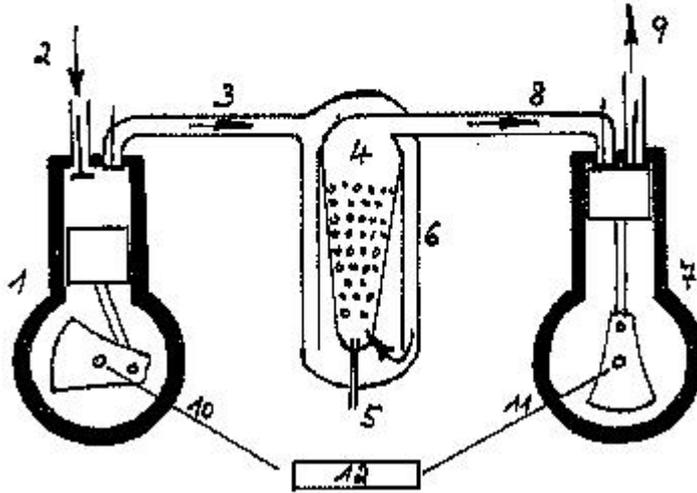
Positive-displacement engine plants characterised by the working gas being generated by combustion in the plant

### Definition statement

This subclass/group covers:

Positive-displacement engine plants characterised by the working gas being generated by combustion in the plant, e.g. positive displacement engine plants with external combustion:

Fig. 1 Brennkraftmaschine als Hubkolbenmaschine ( Variante I )



**References relevant to classification in this group**

*This subclass/group does not cover:*

Stirling engines	<a href="#">F02G 1/043</a>
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**Glossary of terms**

*In this subclass/group, the following terms (or expressions) are used with the meaning indicated:*

Plant	an engine together with such additional apparatus as is necessary to run the engine. For example, a steam engine plant includes a steam engine and means for generating the steam.
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**F02G 5/00**

**Profiting from waste heat of combustion engines, not otherwise provided for**

**Definition statement**

*This subclass/group covers:*

Profiting from waste heat of combustion engines, not otherwise provided for, e.g. converting heat directly to electric power via a thermoelectric generator using the Seebeck effect or converting the waste heat to mechanical power using a Rankine cycle.

### **References relevant to classification in this group**

*This subclass/group does not cover:*

Exhaust or silencing apparatus combined or associated with devices profiting by exhaust heat	<a href="#">F01N 5/02</a>
Vehicle heating derived from propulsion plant	<a href="#">B60H 1/02</a>