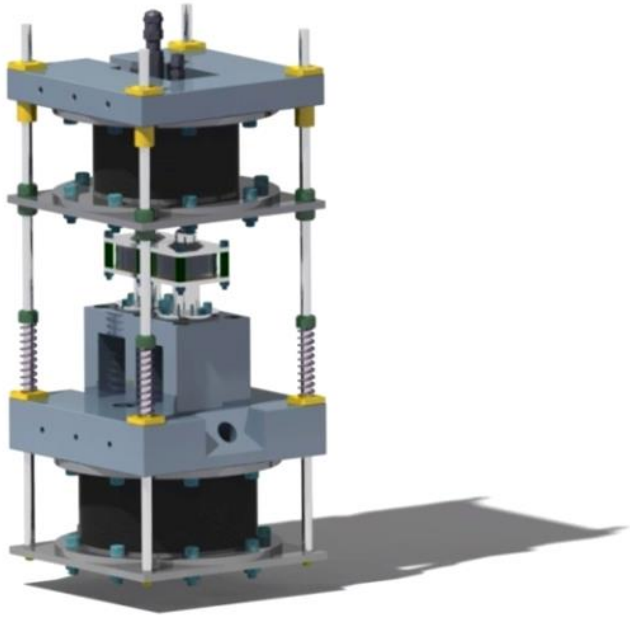
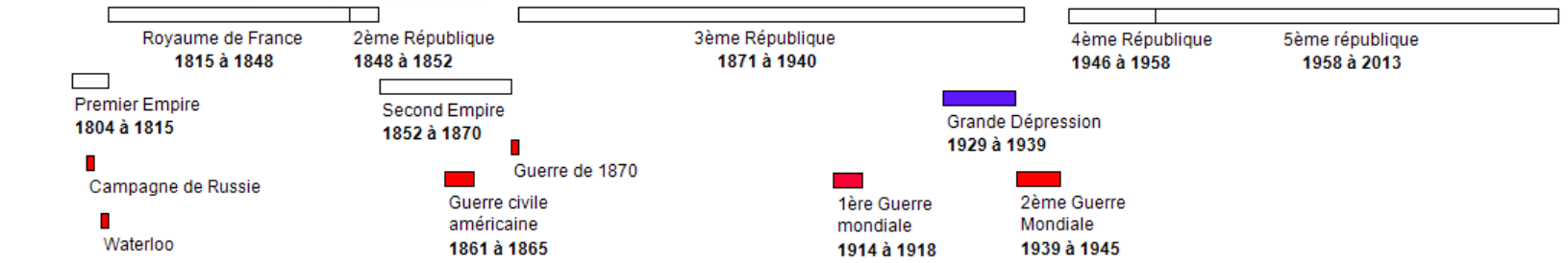
PROJET INDEHO

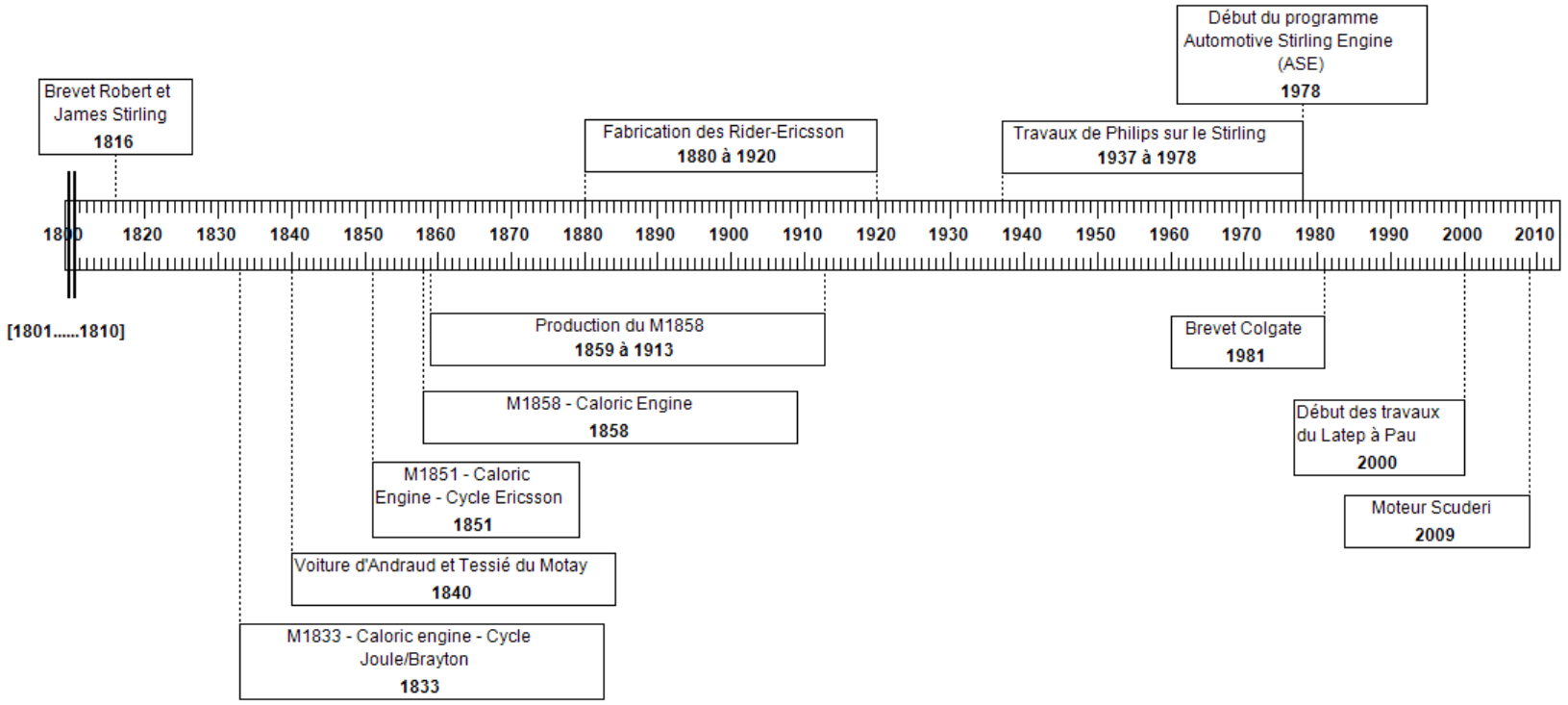
Système de micro-cogénération à cylindrée variable



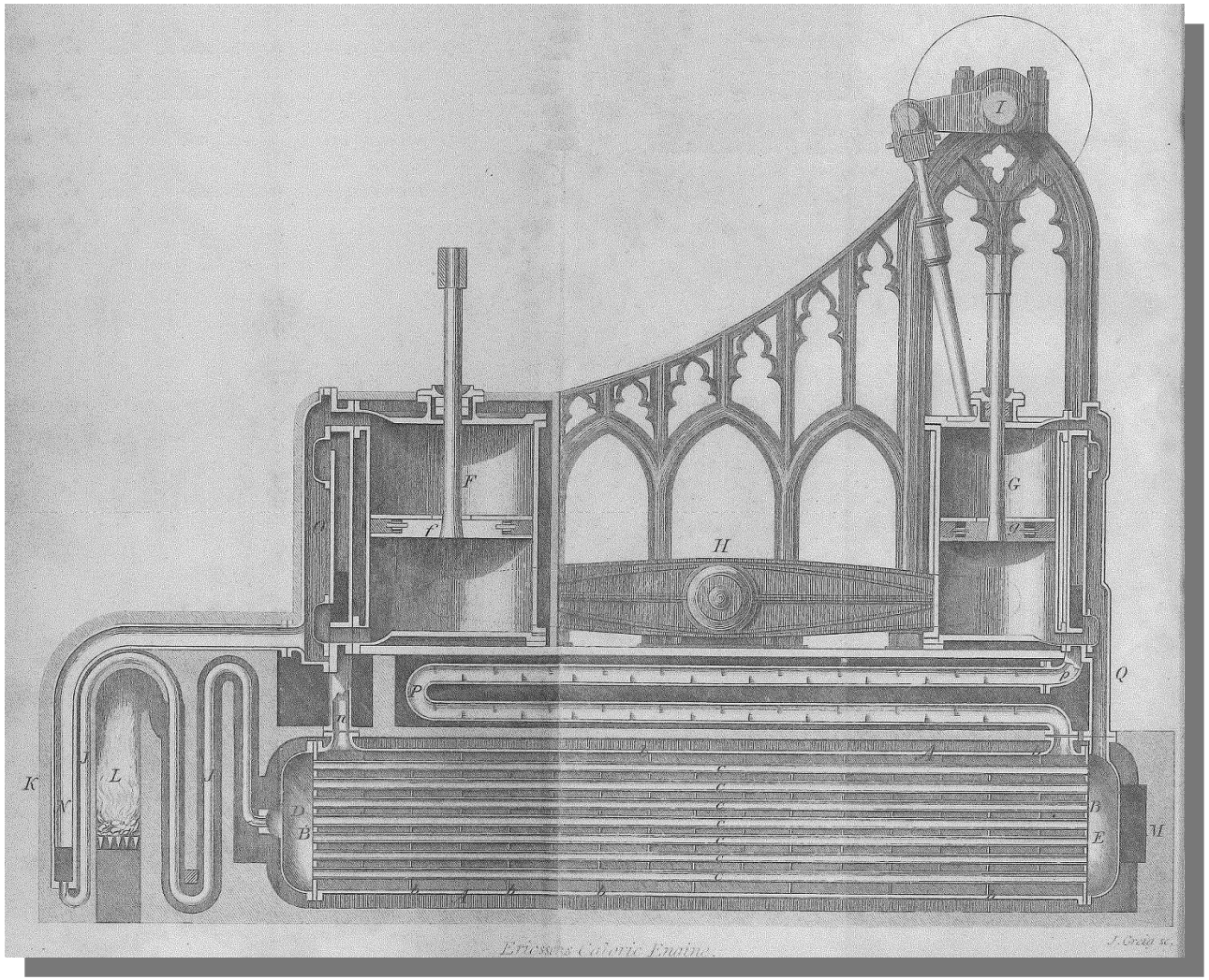
M. Doubs, Doctorant
ASSYSTEM - FEMTO-ST Energie



Stirling

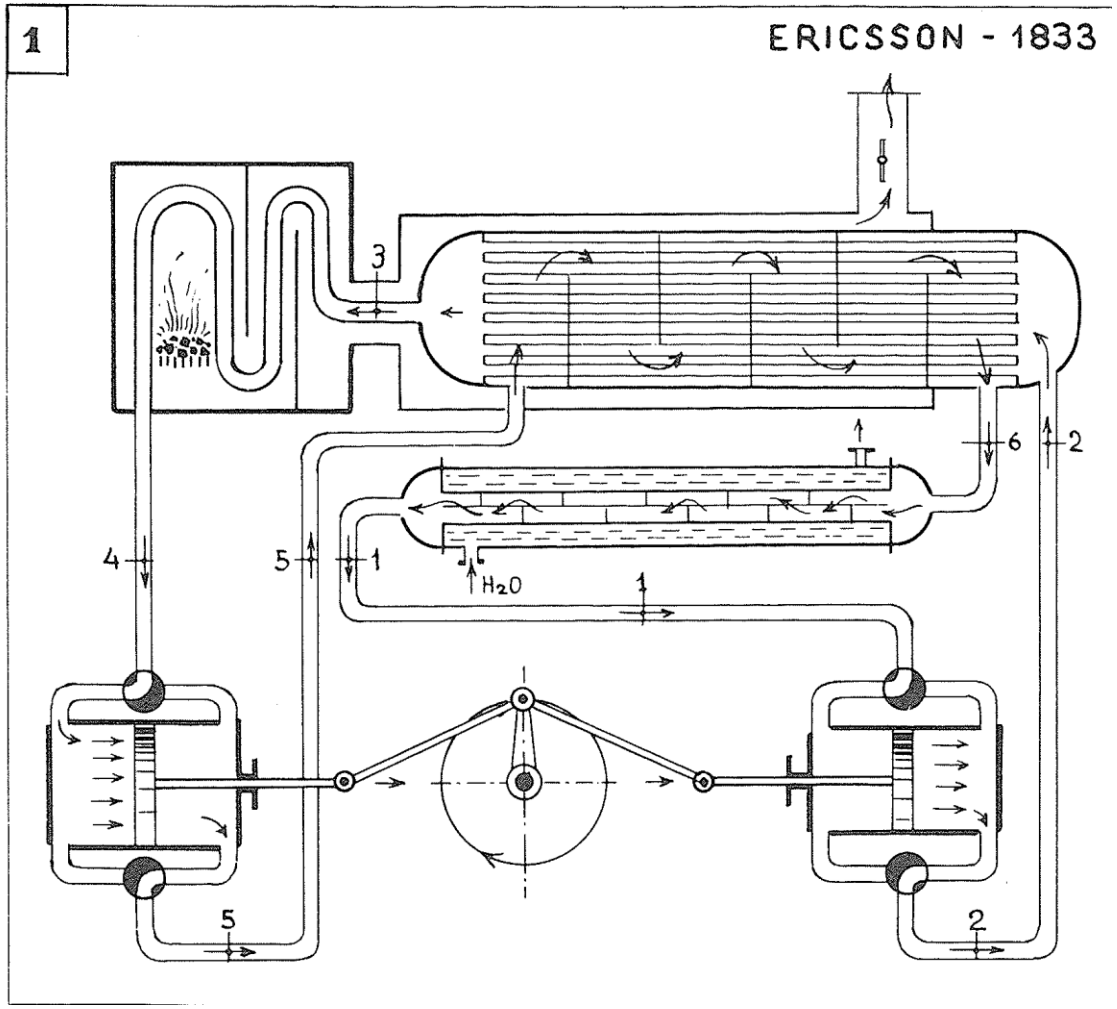


Ericsson



M1833

- Un seul exemplaire
- 55 tours par minute
- $Ø_{détente}$ 355mm, $Ø_{compression}$ 260mm
- Course de 457mm

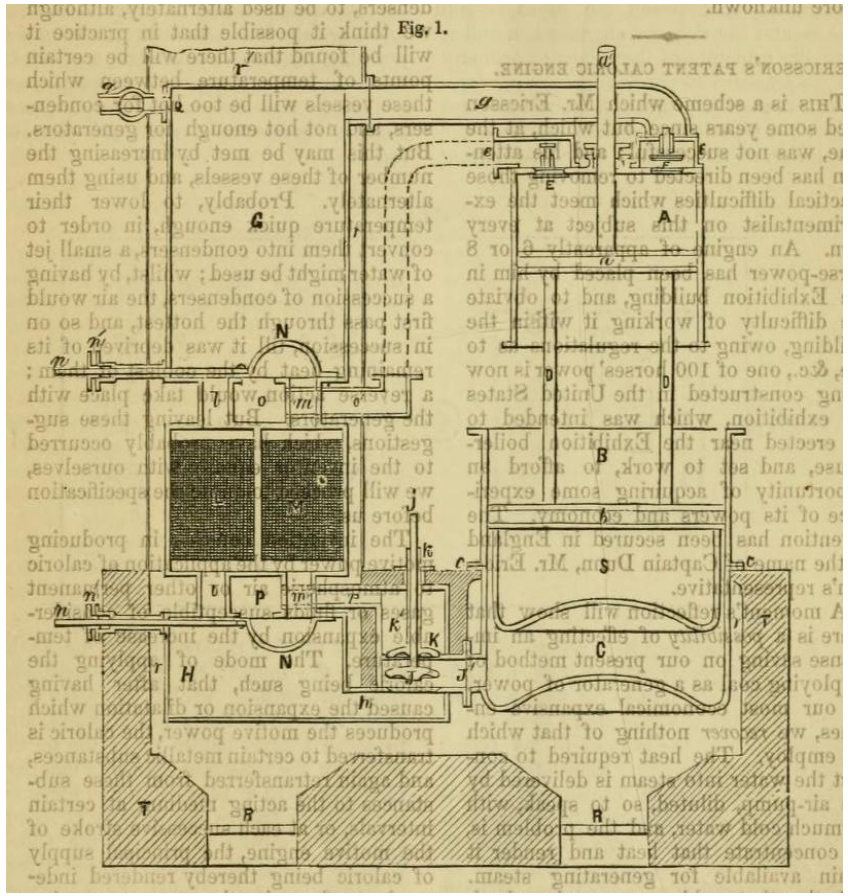


M1833

- θ_2 = 153°C ; θ_4 = 525°C ; θ_5 = 276°C
- $P_{2,3,4}$ = 3,7 atm ; $P_{5,6,1}$ = 1 atm
- Puissance de 3,7kW
- Rendement entre 5 et 10% (8,7%*)

*I. Kolin, The Evolution of the Heat Engine, Reprint. Moriya Pr, 1998.

M1851



Appleton's mechanics' magazine and engineers' journal. New York : D. Appleton & Co., 1851.

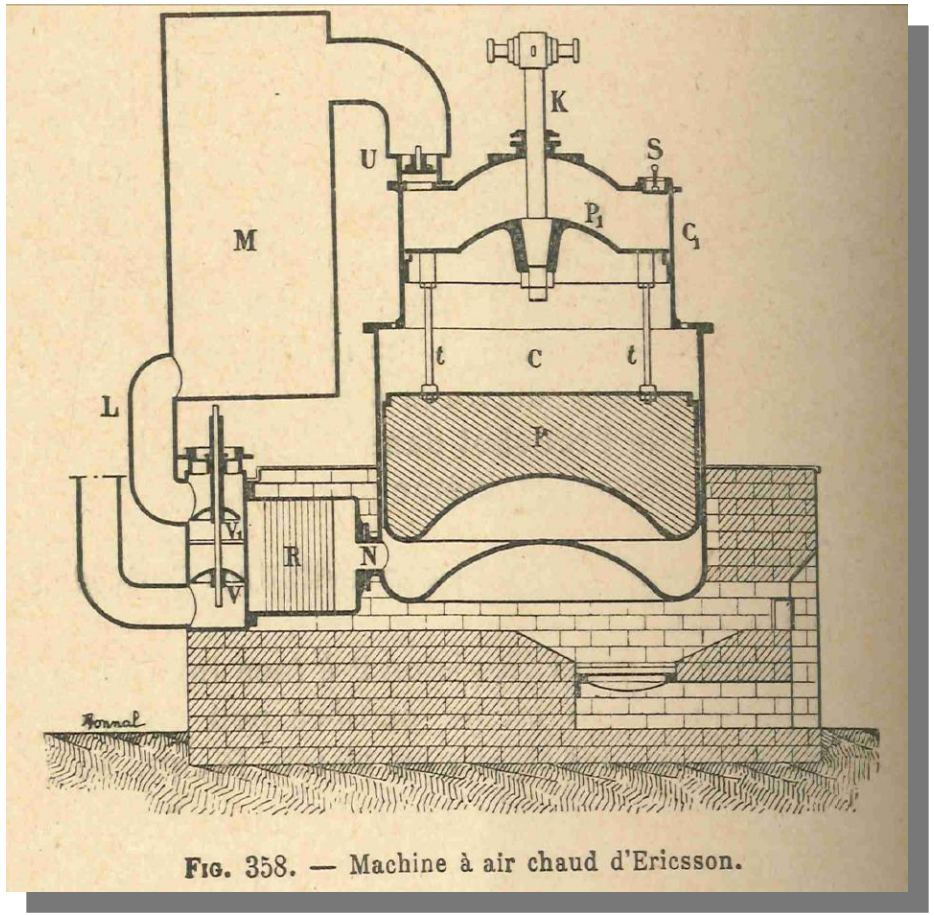
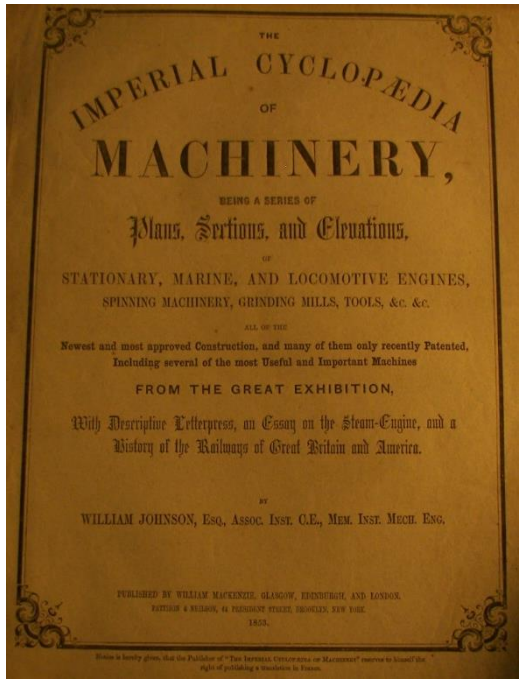
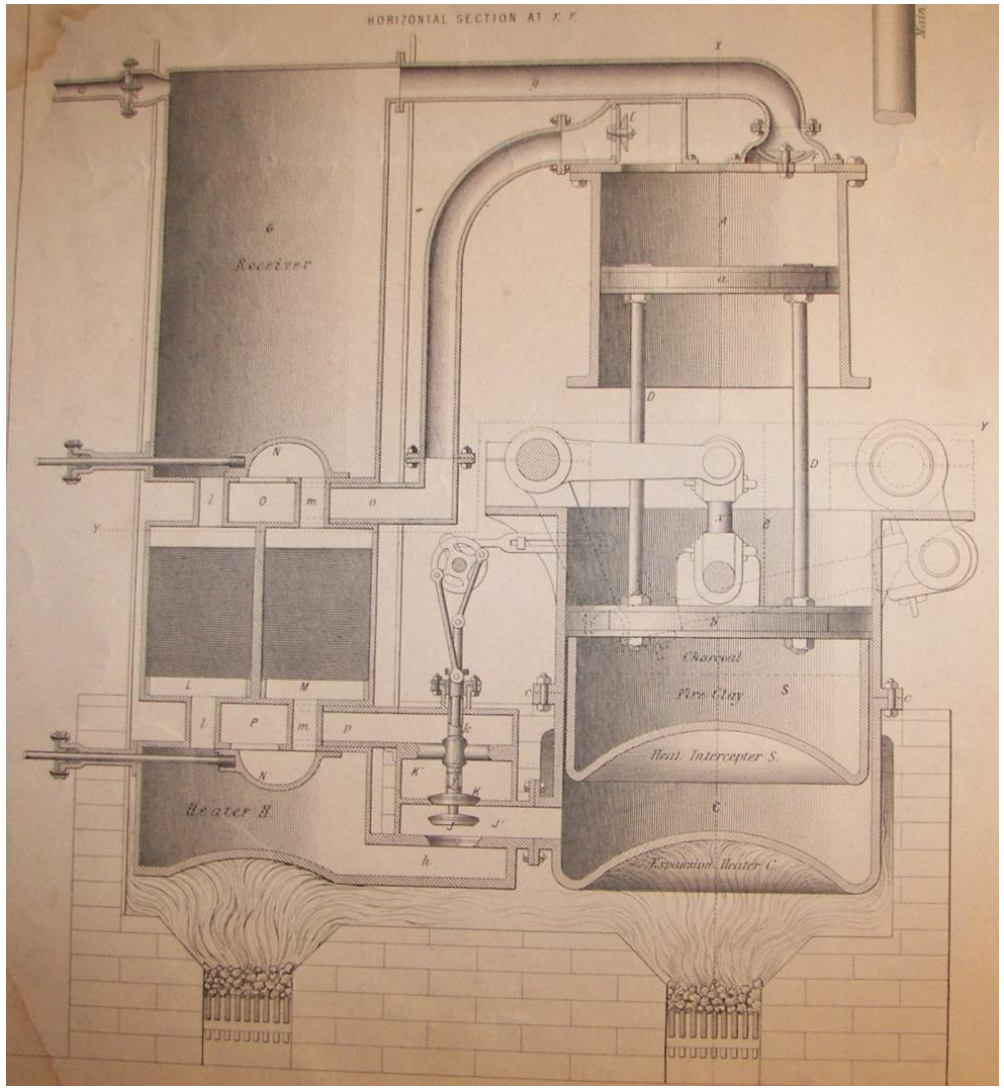


Fig. 358. — Machine à air chaud d'Ericsson.

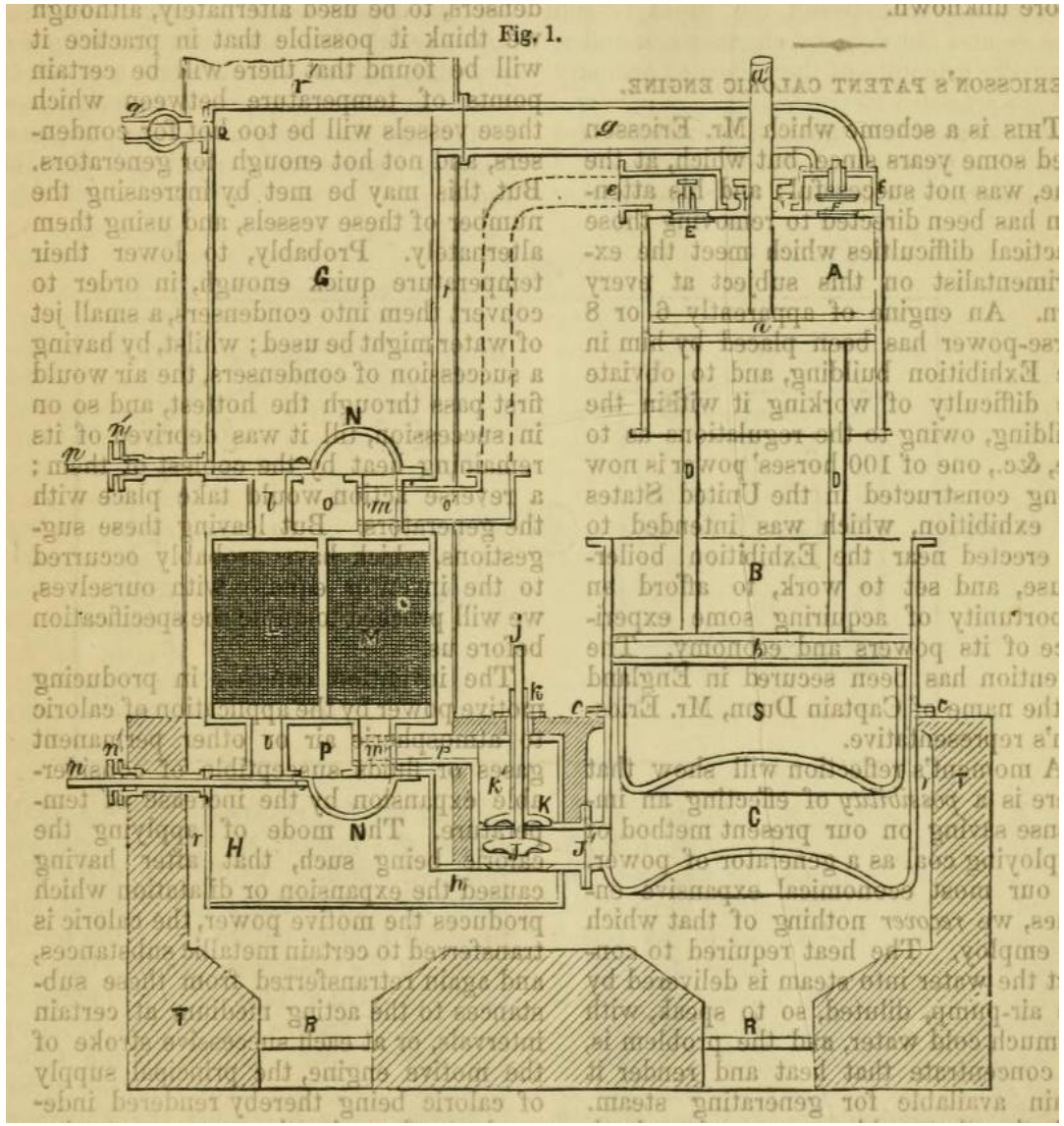
J. Dejust, Machines à vapeur et machines thermiques diverses, Dunod 1899

M1851


THE
IMPERIAL CYCLOPÆDIA
OF
MACHINERY,
BEING A SERIES OF
Plans, Sections, and Elevations,
OF
STATIONARY, MARINE, AND LOCOMOTIVE ENGINES,
SPINNING MACHINERY, GRINDING MILLS, TOOLS, &c. &c.
ALL OF THE
Newest and most approved Construction, and many of them only recently Patented,
Including several of the most Useful and Important Machines
FROM THE GREAT EXHIBITION,
With Descriptive Letterpress, an Essay on the Steam-Engine, and a History of the Railways of Great Britain and America.
BY
WILLIAM JOHNSON, Esq., Assoc. Inst. C.E., Mem. Inst. Mech. Eng.
PUBLISHED BY WILLIAM MACKENZIE, GLASGOW, EDINBURGH, AND LONDON.
1853.



The Imperial Cyclopaedia of Machinery, by William Johnson, 1853



M1851

- Deux exemplaires et un double pour le navire Ericsson
- $\emptyset_{dét}$ 1504mm, $\emptyset_{comp}$ 1240mm avec course de 230mm

- $\theta_{\zeta(comp\ adm)}$ = 85,5 °C
- $\theta_{\xi(foyer)}$ = 343 °C
- $\theta_{\alpha(dét\ adm)}$ = 244 °C
- P_G = 1,4 à 1,65 atm

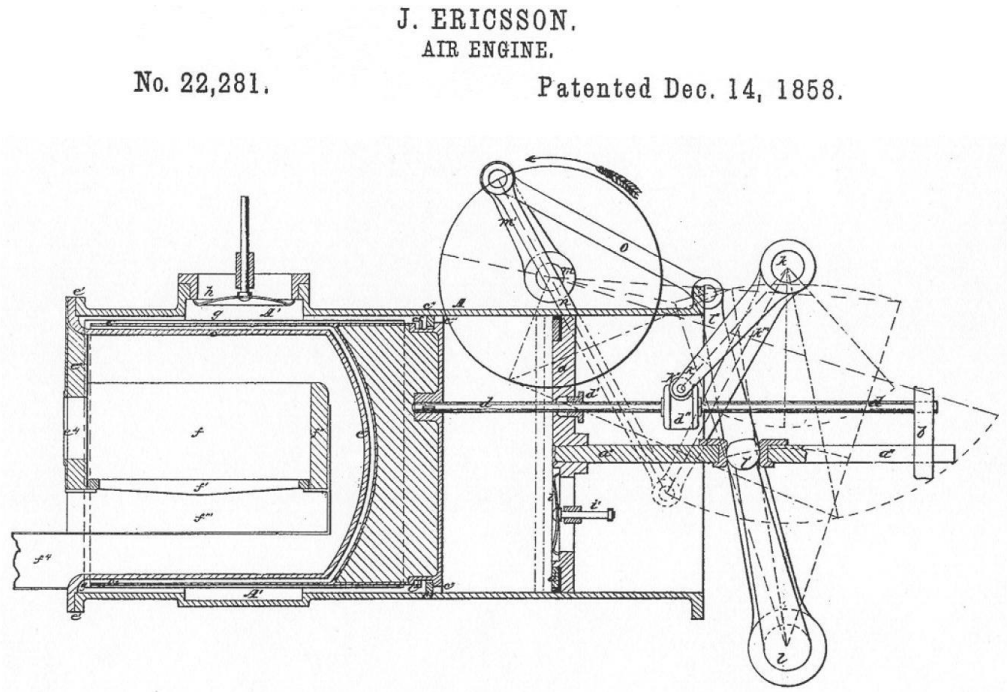
- $\theta_{\delta(comp\ echp)}$ = 146,4°C
- $\theta_{\gamma(dét\ echp)}$ = 311,4°C

- Entre 30 et 50 tours par minute
- Puissance entre 2kW et 3 kW
- Rendement minimum 2,45%

Fermeture soupape admission entre 65,3% et 78% de la course.

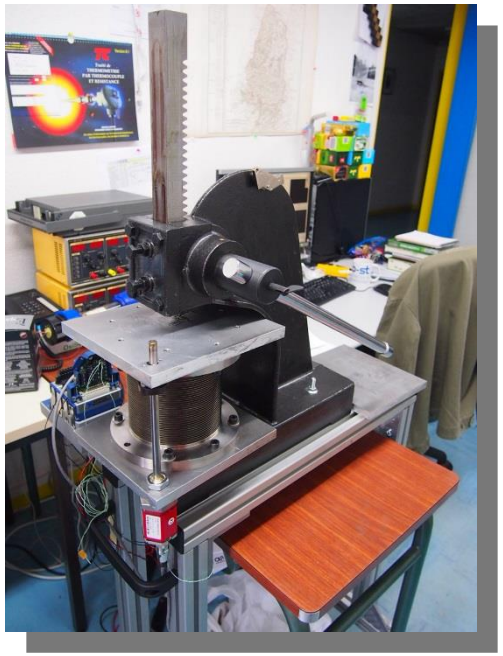
Appleton's mechanics' magazine and engineers' journal. New York : D. Appleton & Co., 1851.

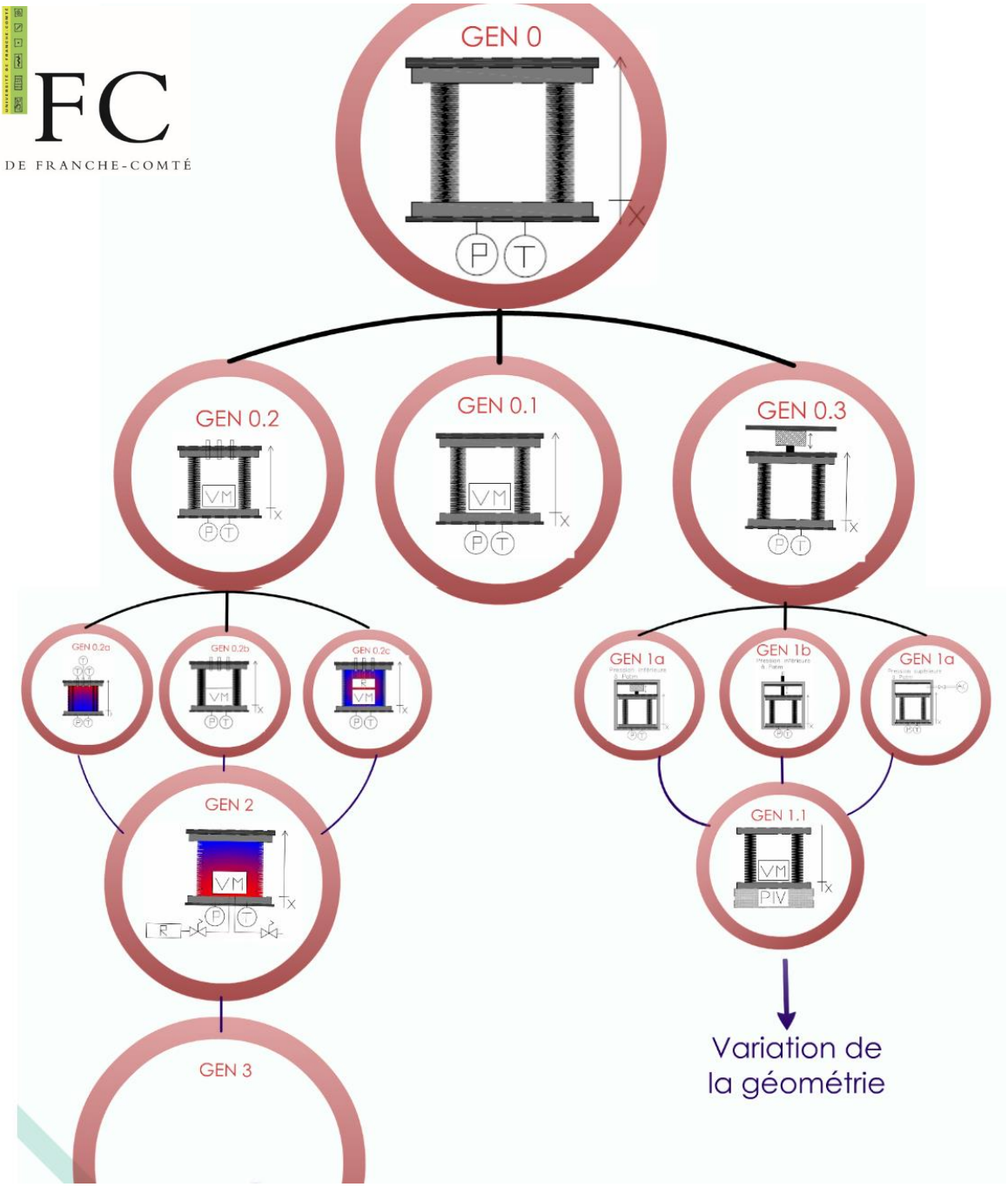
M1851 de marine et successeur M1858

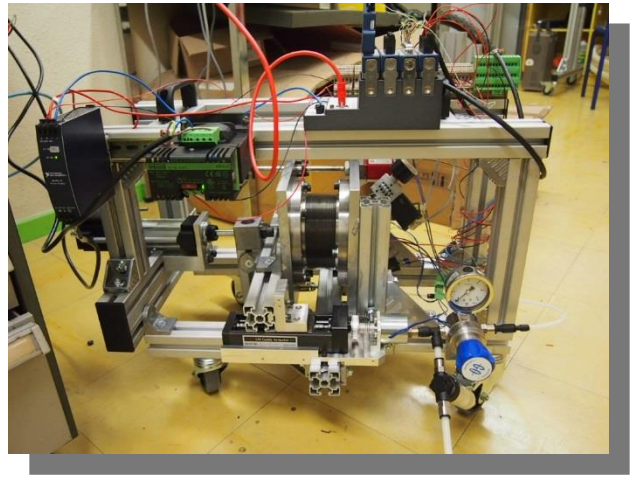


femto-st SCIENCES & TECHNOLOGIES

UFC UNIVERSITÉ DE FRANCHE-COMTÉ

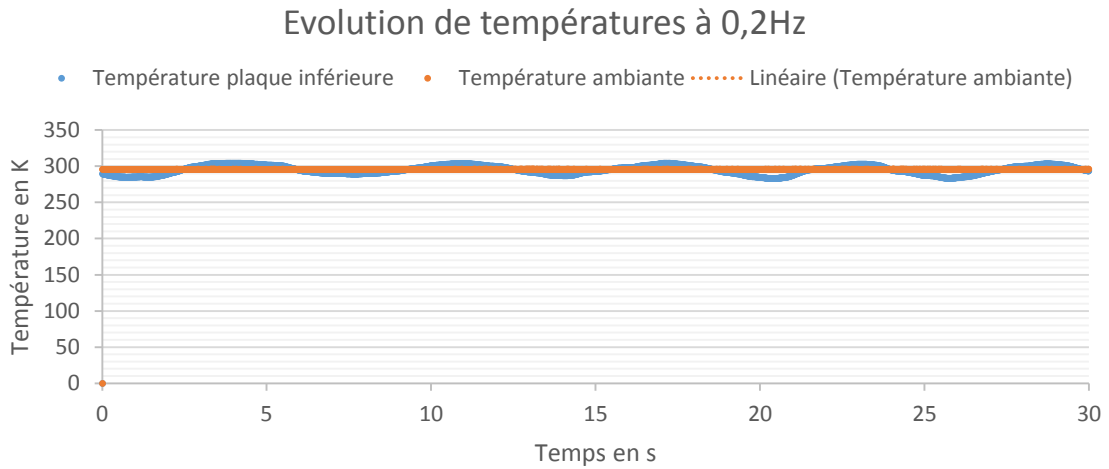


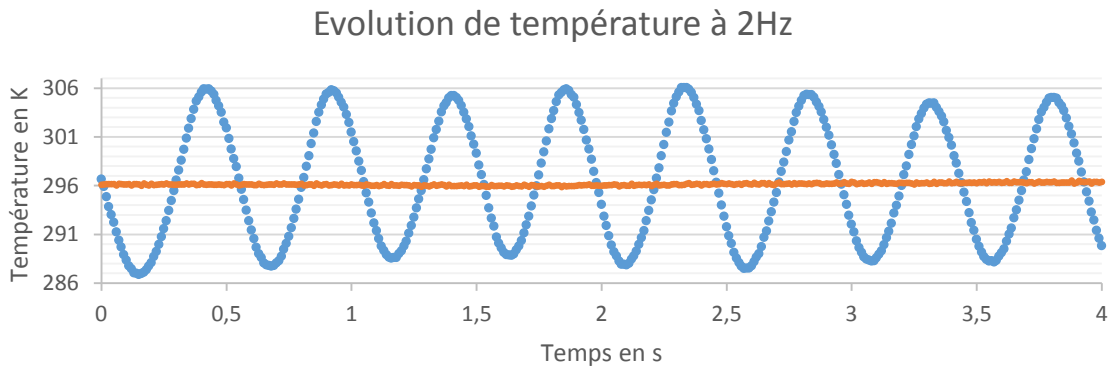




assystem

GEN 0.1





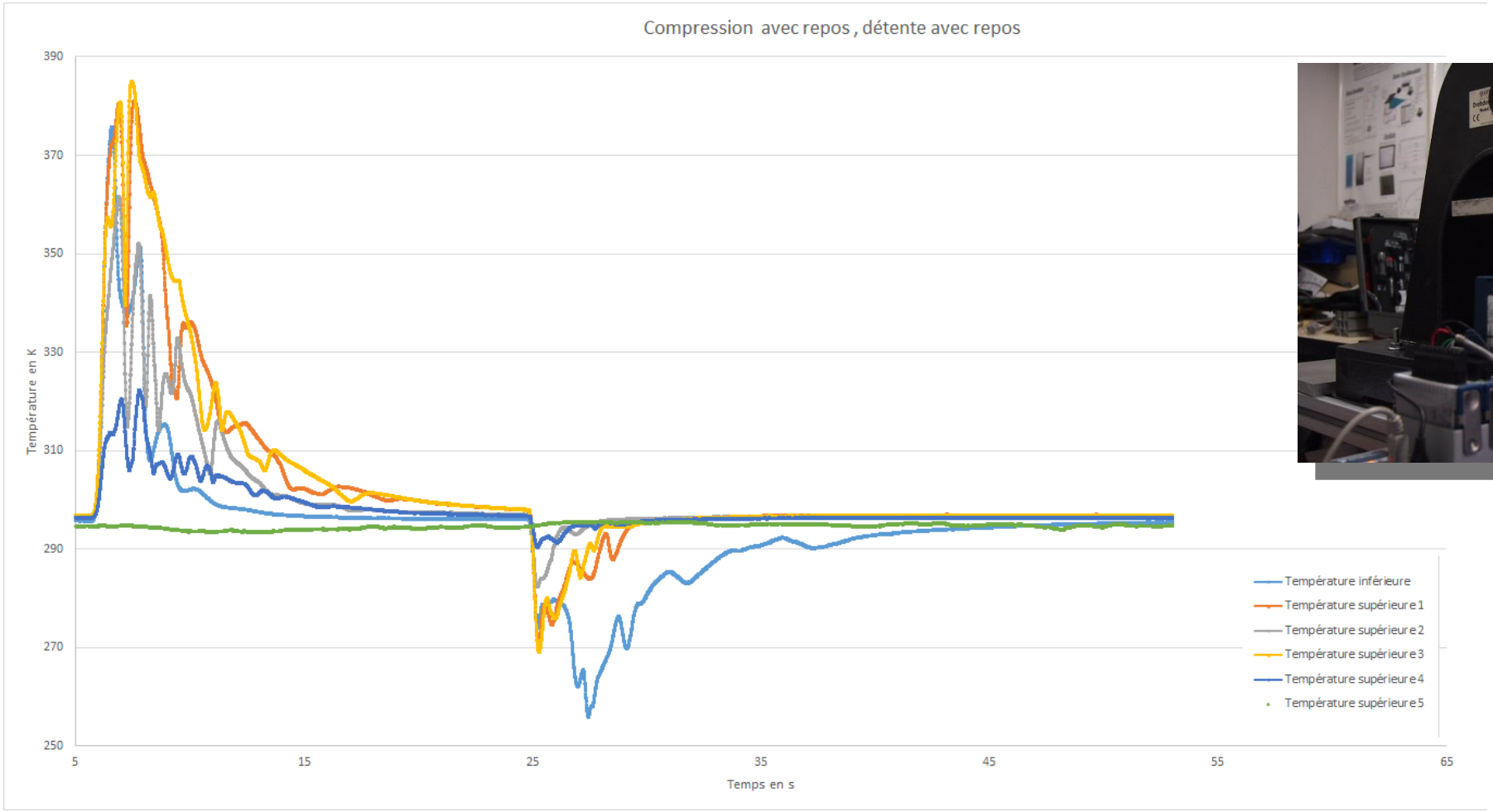
Gamme de 0,2Hz à 3Hz

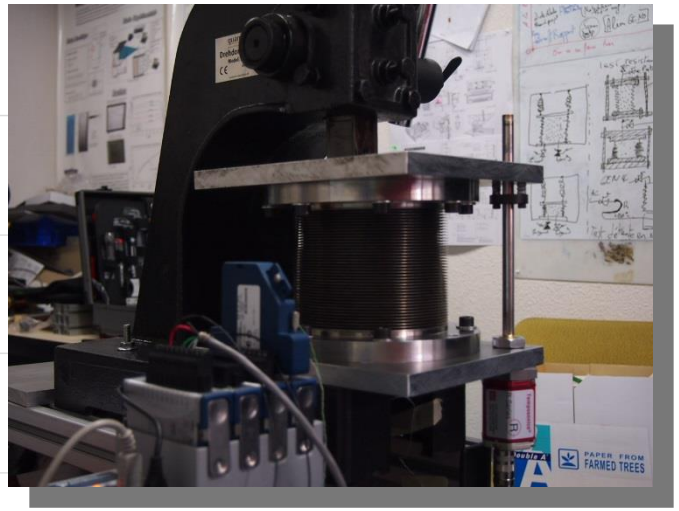
- Coefficient polytropique entre 1,36 et 1,4

Essai à 0,006Hz

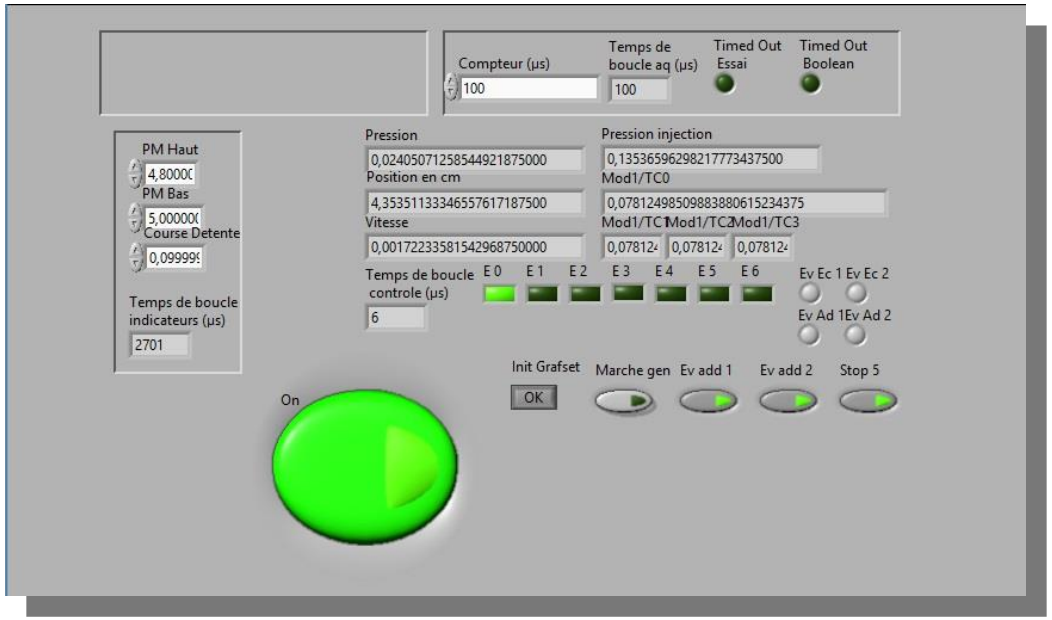
- Coefficient polytropique de 1,16

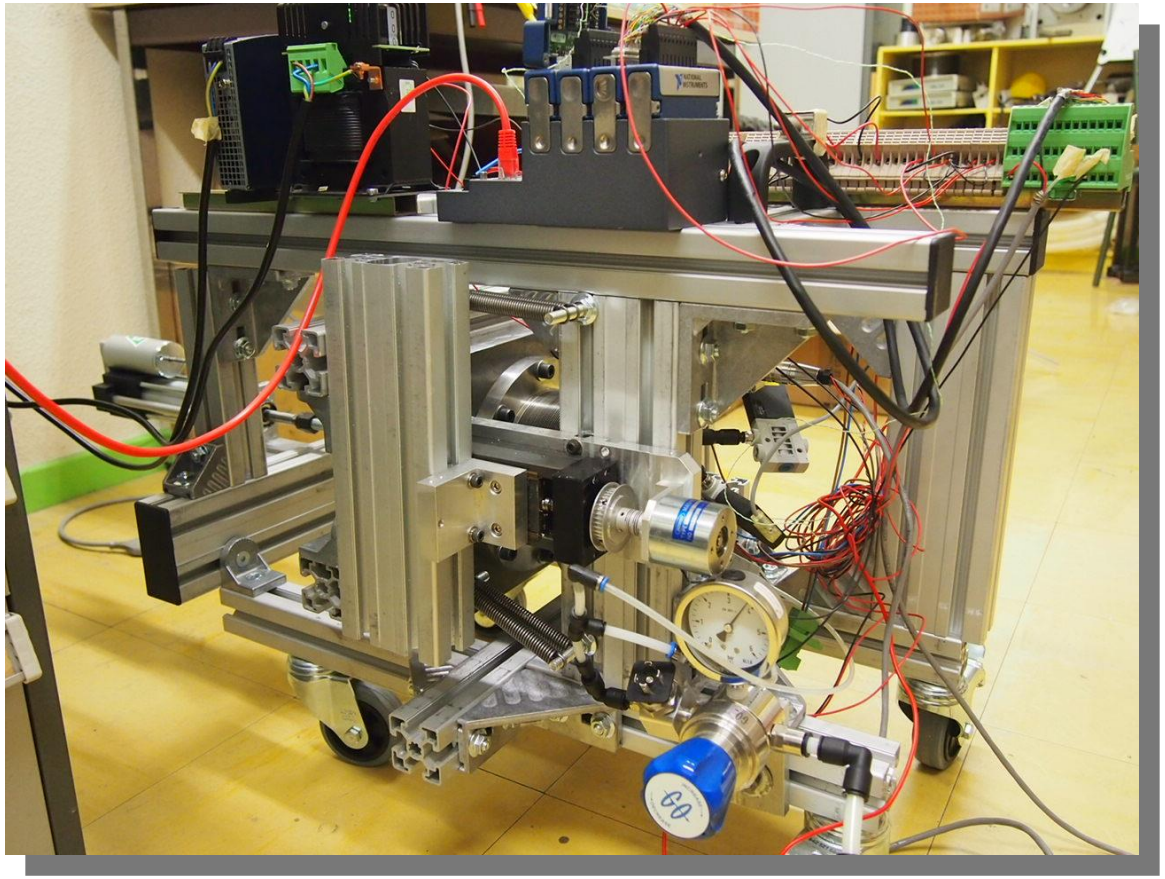
GEN 0.2


Compression avec repos , détente avec repos
Température en K
390
370
350
330
310
290
270
250
5
15
25
35
45
55
65
Temps en s
Température inférieure
Température supérieure 1
Température supérieure 2
Température supérieure 3
Température supérieure 4
Température supérieure 5

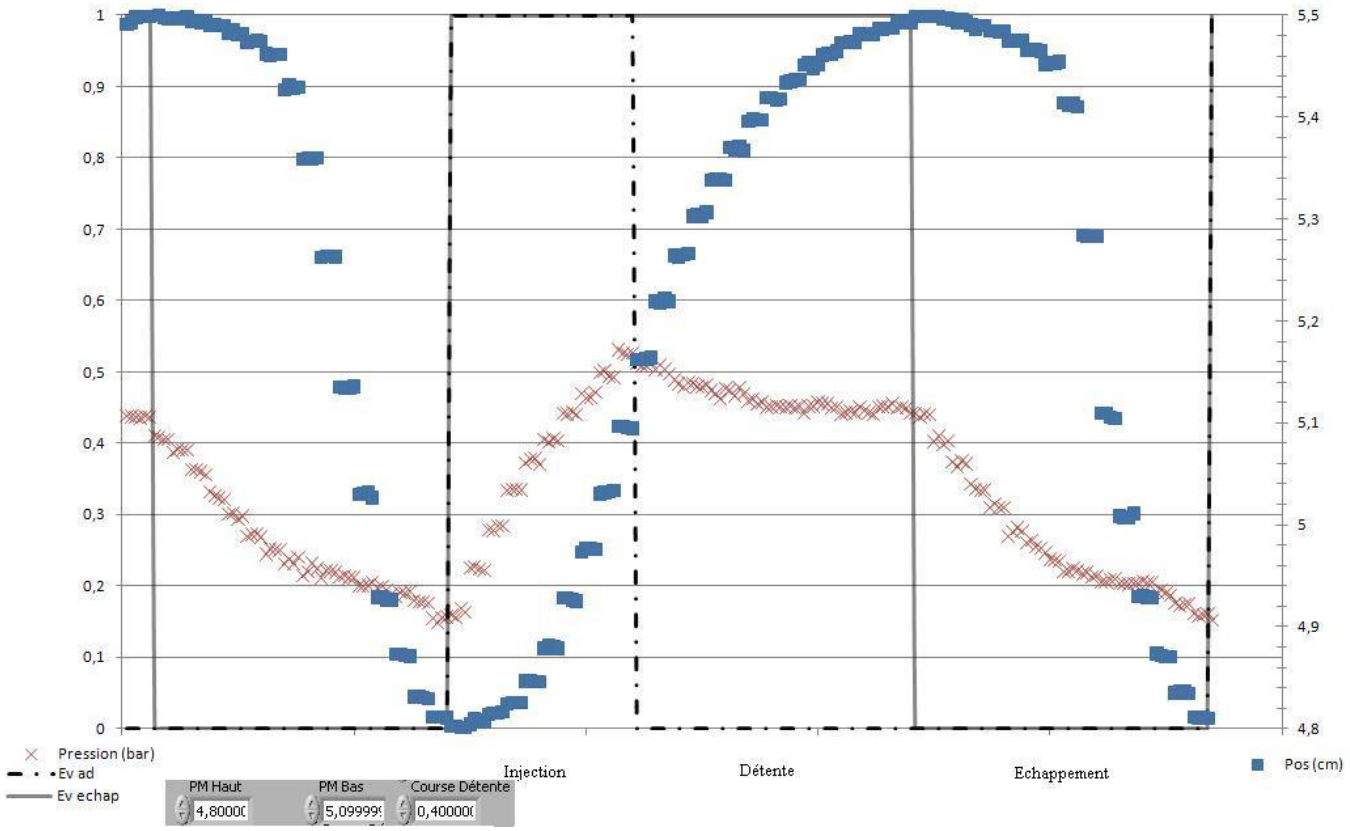


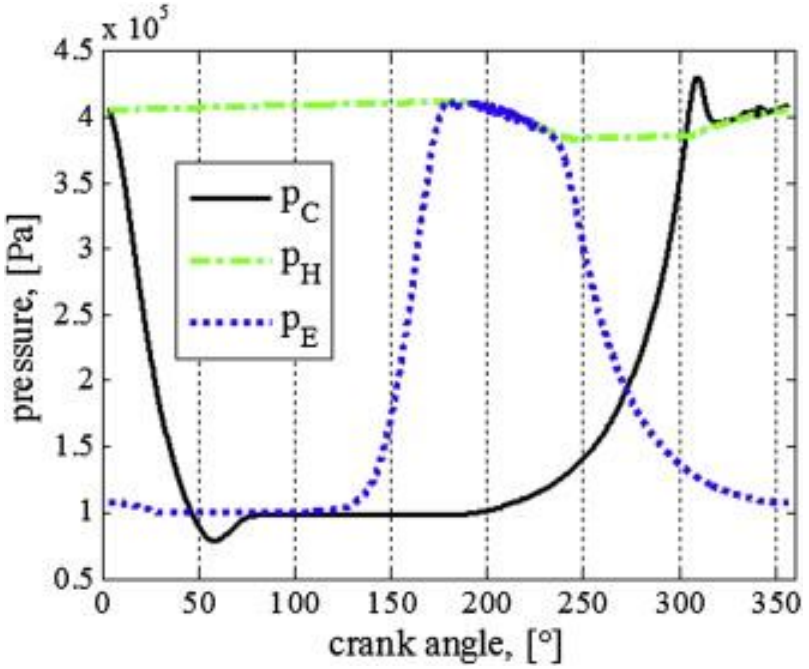
GEN 2.0


Compteur (µs)
100
Temps de boucle aq (µs)
100
Timed Out Essai
Timed Out Boolean
PM Haut
4,80000
PM Bas
5,00000
Course Detente
0,09999
Temps de boucle indicateurs (µs)
2701
Pression
0,024050712585449218750000
Position en cm
4,353511333465576171875000
Vitesse
0,001722335815429687500000
Pression injection
0,135365962982177734375000
Mod1/TC0
0,078124985098838806152343750
Mod1/TC1
Mod1/TC2
Mod1/TC3
Temps de boucle controle (µs)
6
E 0
E 1
E 2
E 3
E 4
E 5
E 6
Ev Ec 1
Ev Ec 2
Ev Ad 1
Ev Ad 2
Init Grafset
OK
Marche gen
Ev add 1
Ev add 2
Stop 5
On



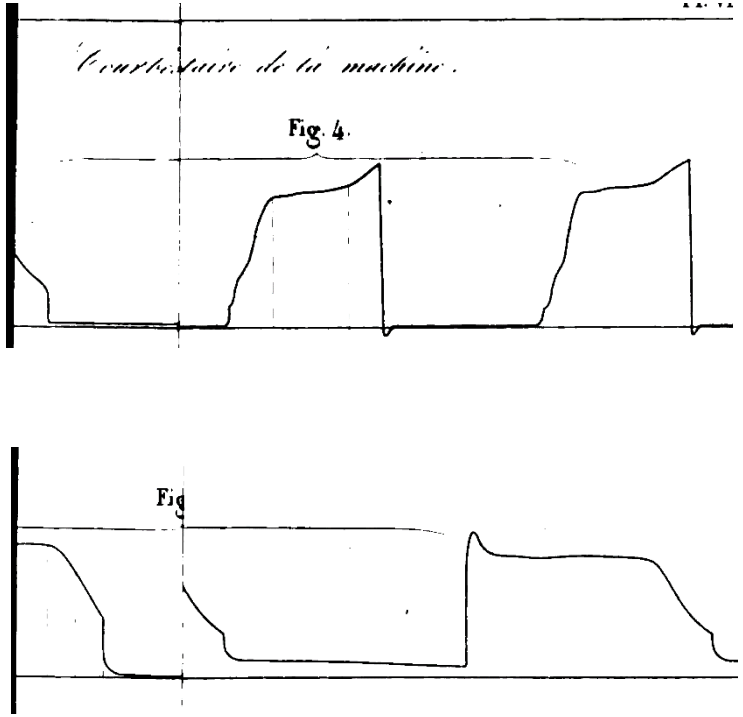
GEN 2.0

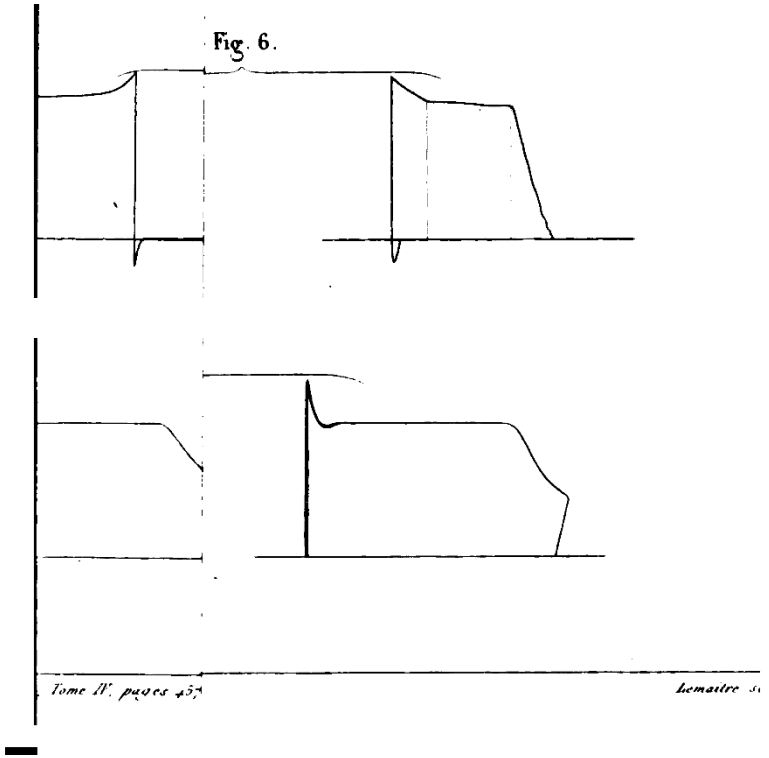




Source : *Dynamic simulation of a small modified Joule cycle reciprocating Ericsson engine for micro-cogeneration systems,*
Frederic Lontsia, Oumarou Hamandjoda, Kennedy Fozao, Pascal Stouffs, Jean Nganhou- Energy Volume 63, 15 December 2013, Pages 309–316

Conclusion





Questions

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