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Precis

The engine house was built in about 1859, to house a Sims compound pumping engine, probably built and supplied by a Hayle foundry. The engine was an unusual development of the Cornish beam engine, designed to improve efficiency by expanding the steam in two stages rather than one.

The term “compound” refers to its two cylinders: a small high-pressure cylinder mounted above a much larger low-pressure cylinder. The steam first entered the high-pressure cylinder, where it expanded partially, and then passed to the low-pressure cylinder for further expansion before being condensed.

The two cylinders operated through a common piston rod, making this a tandem compound engine.

This arrangement explains the unusually tall engine house at Knap Down. The building had to accommodate the vertically stacked cylinders as well as the large working beam and associated pumping machinery.

The engine house was built with a substantial bob wall at the front, while a tall circular chimney was incorporated into the rear wall.

The Sims design is therefore significant because it represents an attempt to combine the deep pumping capabilities of the Cornish beam engine with the greater steam economy of compound expansion. It was a short-lived design.

Although the exact details of the Knap Down engine's valve gear, pipework and ancillary machinery remain uncertain, the surviving building and contemporary descriptions provide a strong basis for reconstructing its principal arrangement ([Historic England, 1168925](#)).

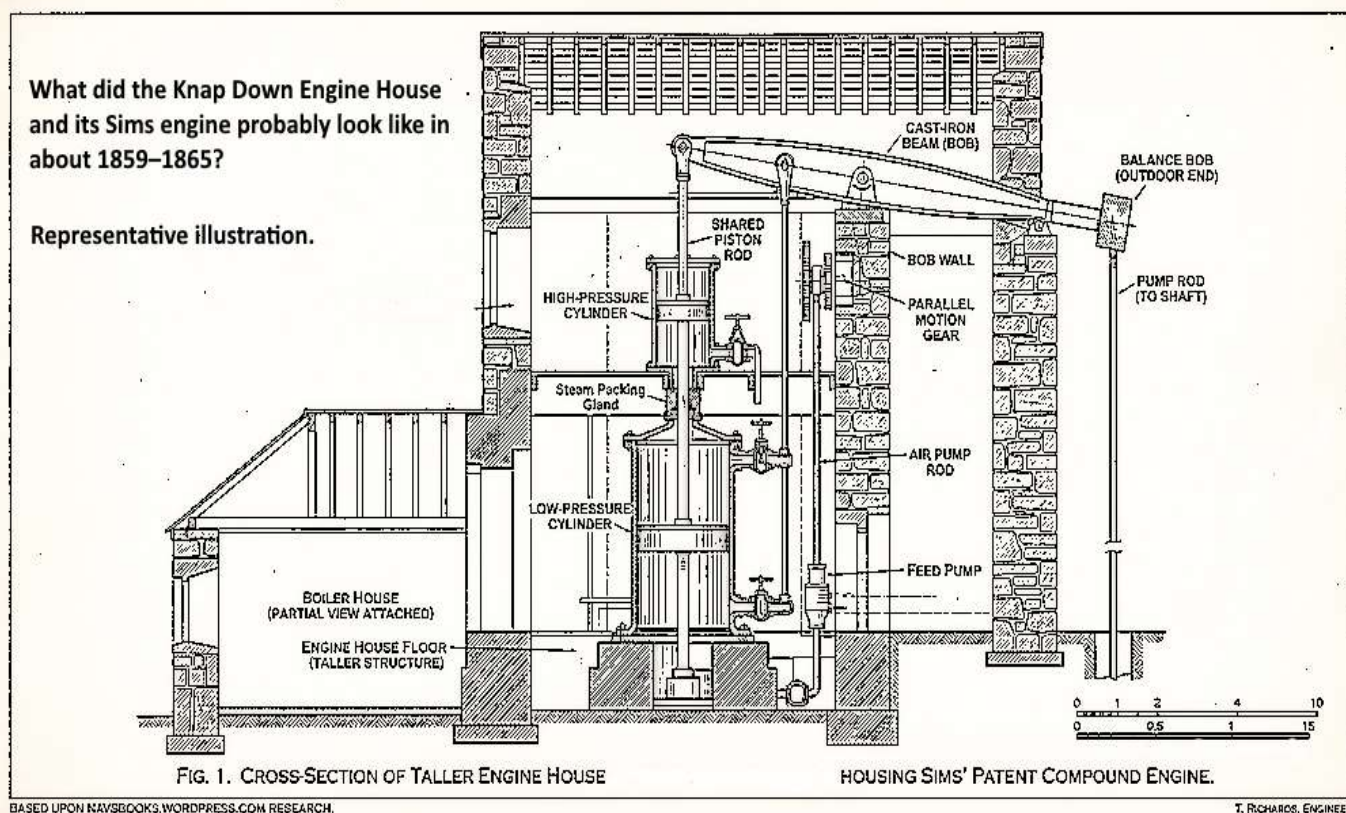
In essence, Knap Down was not simply a conventional Cornish engine: its defining feature was the Sims tandem compound arrangement—two vertically aligned cylinders, high-pressure above low-pressure, working through a common piston rod—housed within an unusually tall engine house.

Summary

A form of tandem compounding of early beam engines, with a high pressure steam cylinder mounted on top of a low pressure one, introduced in Cornwall the 1840s by James Sims. A chimney was attached (not shown).

Representative Illustration of a Sims Compound Pumping Engine

Not an exact proof of the Knap Down engine's internal layout.



The James Sims compound engine, devised in the 1840s, was a single-acting Cornish engine that featured a smaller high-pressure cylinder mounted directly above a larger low-pressure cylinder, with both pistons operating on a common rod. Designed to increase fuel efficiency through two-stage steam expansion, its real-world performance rarely surpassed that of a conventional single-cylinder engine.

Due to its added mechanical complexity and notoriously difficult maintenance—particularly when servicing the internal steam seals between the stacked cylinders—most Sims compound engines suffered from high operational overhead and had relatively short working lives.

References:

<https://navsbooks.wordpress.com/tag/sims-compound-engine/>

https://www.emerald.com/jmipi/article-pdf/23/1864/54/2647856/imotp_1864_23279.pdf

<https://www.combemartinville.co.uk/combe-martin-industrial-history/early-silver-mining-in-combe-martin>

The Knap Down Engine was worked by the North Devon Silver Lead Mining Company (Vale of Girt and Nap Down). Douglas Stuckey (1965): *Adventurers Slopes. The Story of The Silver and other mines of Combe Martin in Devon*. Historic England, List Entry No.1168925.

Exmoor Heritage Monument MDE8272; <https://www.exmoorher.co.uk/Monument/MDE8272>.

Notes:

1. The diagram serves as a representative structural cross-section based on Sims' patent and surviving engine house dimensions (Historic England, listing [1168925](#)), not an exact surviving as-built mechanical survey of Knap Down at Combe Martin. [Based upon navsbooks.wordpress.com research.](#)

2. Engine house ruins on private or former industrial land may be unsafe or closed to public access.

3.

Engine House Model at Combe Martin Museum, North Devon

[Visit Combe Martin Museum on Cross Street, EX34 0DH, nr Ilfracombe, North Devon.](#)

