

Cornish Boiler: Definition, Parts, Working, Advantages, Applications [with PDF]

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Cornish Boiler is a fire tube boiler.

After Cochran, Locomotive, Scotch marine boiler, a Cornish boiler is another type of fire tube boiler.

This type of boiler works on very limited pressure which is up to 20 bar only.

It has a long horizontal cylinder with a single large flue containing the fire.

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Definition Cornish Boiler:

Cornish boiler is a fire tube boiler that works is to produce steam by the burning of fuel(coal) and further used in the steam turbine, textile or sugar mill industry, and so on.

Construction or Parts of Cornish Boiler:

A Cornish Boiler consists of several parts those are:

- *Shell*
- *Grate*
- *Furnace*
- *Combustion chamber*
- *Chimney*
- *Smokebox*
- *Water level indicator*
- *Safety Valve*
- *Man Hole*
- *Stop Valve*
- *Blow off valve*

Shell:

A shell contains water inside it as well as a tube. The transfer of heat between water takes place in the shell.

And also the shell is like it covers all the components of the boiler and it is also called the main body.

Grate:

It is a door form which the fuel is provided for burning and generating heat.

The grate is located at the bottom of the furnace.

Furnace:

A furnace works like a mediator you know why? because it is connected between the fire tube and the combustion chamber.

Here fuel burns and produces Heat.

Combustion chamber:

Here in the combustion chamber the fuel burns and produces heat which is then supplied to the tube here water is surrounded.

The combustion chamber is connected to the furnace.

Ash pit:

Here ash of fuel which is completely burned and no use inside the boiler.

Chimney:

The chimney is here for releasing the exhaust gases to the atmosphere.

Smokebox:

The smokebox is provided here to collect the smoke and further sends it to the chimney.

Water level indicator:

This is an instrument which gives the detail of the water level of the boiler. This also works when water exceeds the limit or water down the limit.

Safety Valve:

The safety valve is another type instrument which is used for safety purpose and This also works when no other indicators work.

Man Hole:

It is the main hole from which when any components inside the boiler get damage then an engineer will enter and replace it from here.

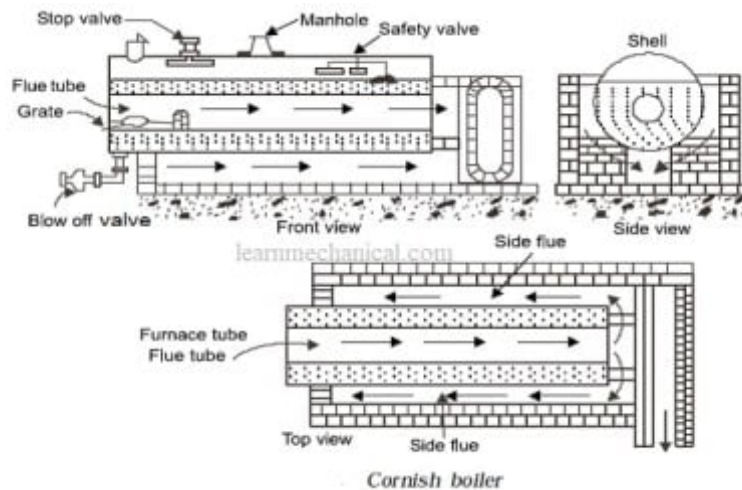
Stop Valve:

The stop valve is also used for regulating the control of things.

Blow off valve:

A blow off valve is used to clean the boiler by discharging the water and sediments from the bottom of the boiler

Working Principle of Cornish Boiler:



Cornish Boiler

The working substance here is COAL.

Lets study working,

At the grate, the fuel which is coal is provided and it sends to the furnace.

Here we burn the fuel by providing some amount of fire to it. So as we know this is a single large tube boiler.

Burning of coal produces the heat which is then sent to the tube and here water is surrounded.

Why water is surrounded automatically? Because we supply water here and with the use of an instrument, water level indicator we measure the level of water.

So now tube has as much heat that water gets start heated which means water first converts into saturated steam and then it further heated and converts into superheated steam which is now working steam.

The steam can be further used for different purposes.

Meanwhile here the burning coal ash comes to the ash pit and from here it comes to the smokebox and the gas will release to the chimney to the environment.

And we extract the ash from the system and clean this.

Advantages of Cornish Boiler:

The advantages of a Cornish boiler are:

- *The designs are simple and easy.*
- *The construction is easy and its compactness.*
- *It is a portable types boiler.*
- *The maintenance cost is low.*
- *It can handle load fluctuation to some extent.*

Disadvantages of Cornish Boiler:

These are some disadvantages of Cornish Boiler:

- *It is a type of low production steam rate which is around 1350 kg/hour.*
- *The pressure is low comparatively other boilers which are 12-13 bar.*

Applications of Cornish Boiler:

Application of the Cornish boiler are:

- *It is used in several industries like sugar, mill, chemical, and other more industry.*
- *It is also used to run the steam turbine.*
- *Cornish Boiler used in marines.*

This is all about **Cornish Boiler**. For further queries put in on the comment section, we will look those out quickly.

And Don't forget to share this article and be a part of Spread_the_knowledge.

FAQ:

What is the cornish boiler?

It is another type of fire tube boiler. It produces steam by burning fuel which is coal.

What is a fire tube boiler?

There are mainly two types of boiler.

1. **Water-tube boiler** (In this type the water is flowing inside the tube and hot flue gases surround them) whereas,
2. **Fire-tube boiler** (The hot flue gases presents and flows inside the tube and water surround them)

What is the construction of the Cornish boiler?

A Cornish boiler consists of:

1. *Shell*
2. *Grate*

3. Furnace
4. Combustion chamber
5. Chimney
6. Smokebox
7. Water level indicator
8. Safety Valve
9. Man Hole
10. Stop Valve
11. Blow off valve

What are the different types of fire tube boiler?

Cornish boiler
Cochran boiler
Lancashire boiler
Locomotive boiler
Scotch marine boiler
Horizontal return tubular boiler
Vertical fire-tube boiler

What are the different types of water tube boiler?

Lamont Boiler
Loeffler boiler and
Yarrow boiler.
Benson Boiler
Babcock and Wilcox Boiler

References:

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