



SNS COLLEGE OF TECHNOLOGY

AN AUTONOMOUS INSTITUTION



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DEPARTMENT OF AGRICULTURAL ENGINEERING

COURSE CODE & NAME: 19AGT301 & HEAT POWER ENGINEERING

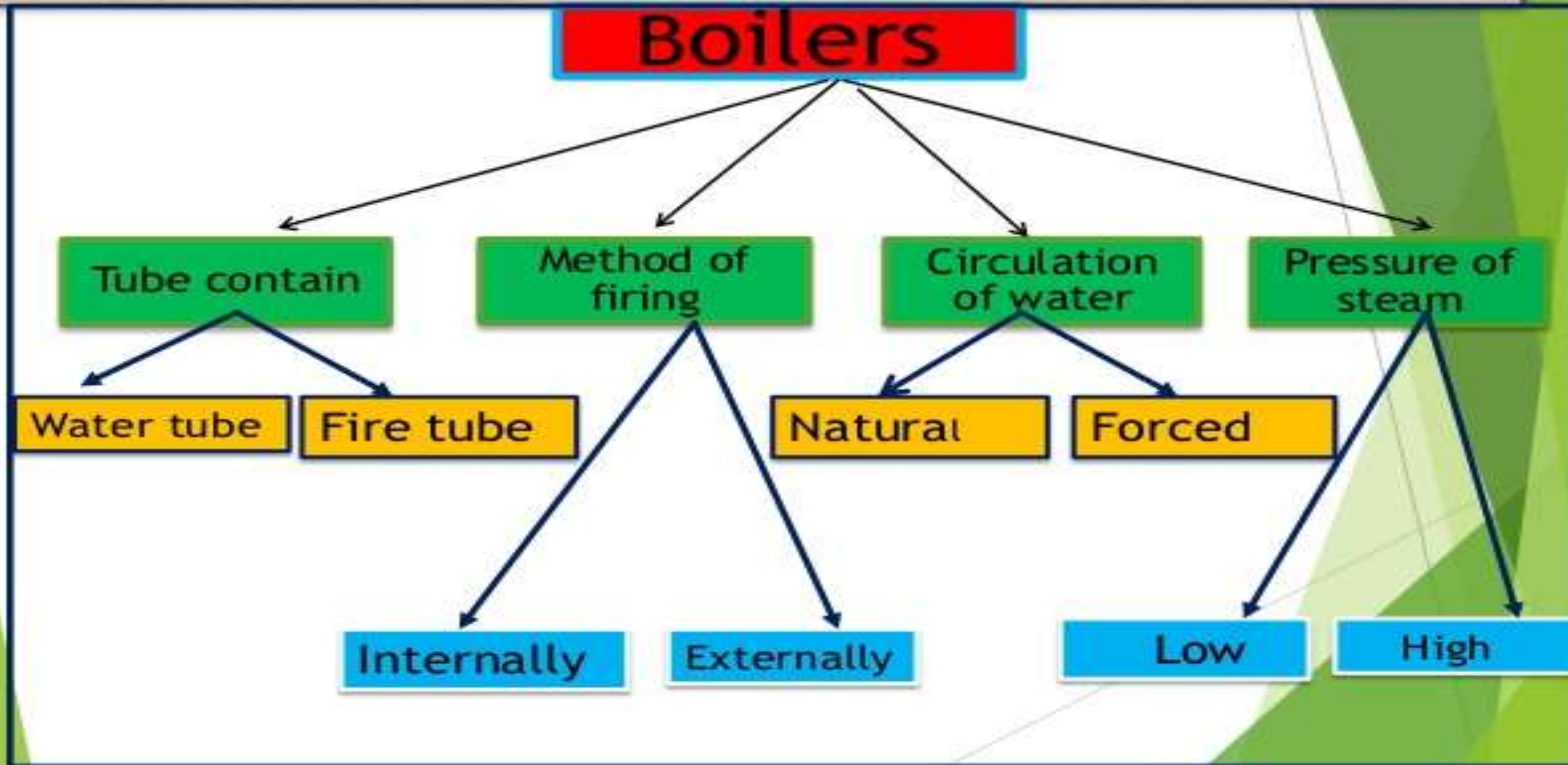
III YEAR / V SEMESTER

UNIT : V BOILERS

Topic : Fire Tube Boilers



Classification of boilers





SELECTION OF BOILER



- The working pressure & quality of steam.
- Steam generation rate.
- Floor area available.
- Accessibility for repair & inspection.
- Comparative initial cost.
- The fuel & water available.
- Operating & maintenance cost.



PROPERTIES OF BOILER



- a) **Safety**: The boiler should be safe under the operating conditions.
- b) **Accessibility**: the various part of boiler should be accessible for repair & maintenance.
- c) **Capacity**: Should be capable of supplying Steam according to the requirements.
- d) **Efficiency**: Should be able to absorb a maximum amount of heat produced due to burning of fuel in the furnace.
- e) It should be **simple in construction**.
- f) Its **initial cost** and **maintenance cost** is low.
- g) It should be **capable of quick starting and loading**



F.T vs W.T BOILERS



S No.	Particulars	Fire Tube Boilers	Water Tube Boilers
1.	Mode Of Firing	Internally Fired	Externally Fired
2.	Rate Of Steam Production	Lower	Higher
3.	Construction	Difficult	Simple
4.	Transportation	Difficult	Simple
5.	Treatment Of Water	Not So Necessary	More Necessary
6.	Operating Pressure	Limited To 16 Bar	Under High Pressure As 100 Bar
7.	Floor Area	More Floor Area	Less Floor Area
8.	Shell Diameter	Large For Same Power	Small Same Power
9.	Explosion	Less	More
10.	Risk Of Bursting	Lesser	More Risk



FIRE TUBE BOILER

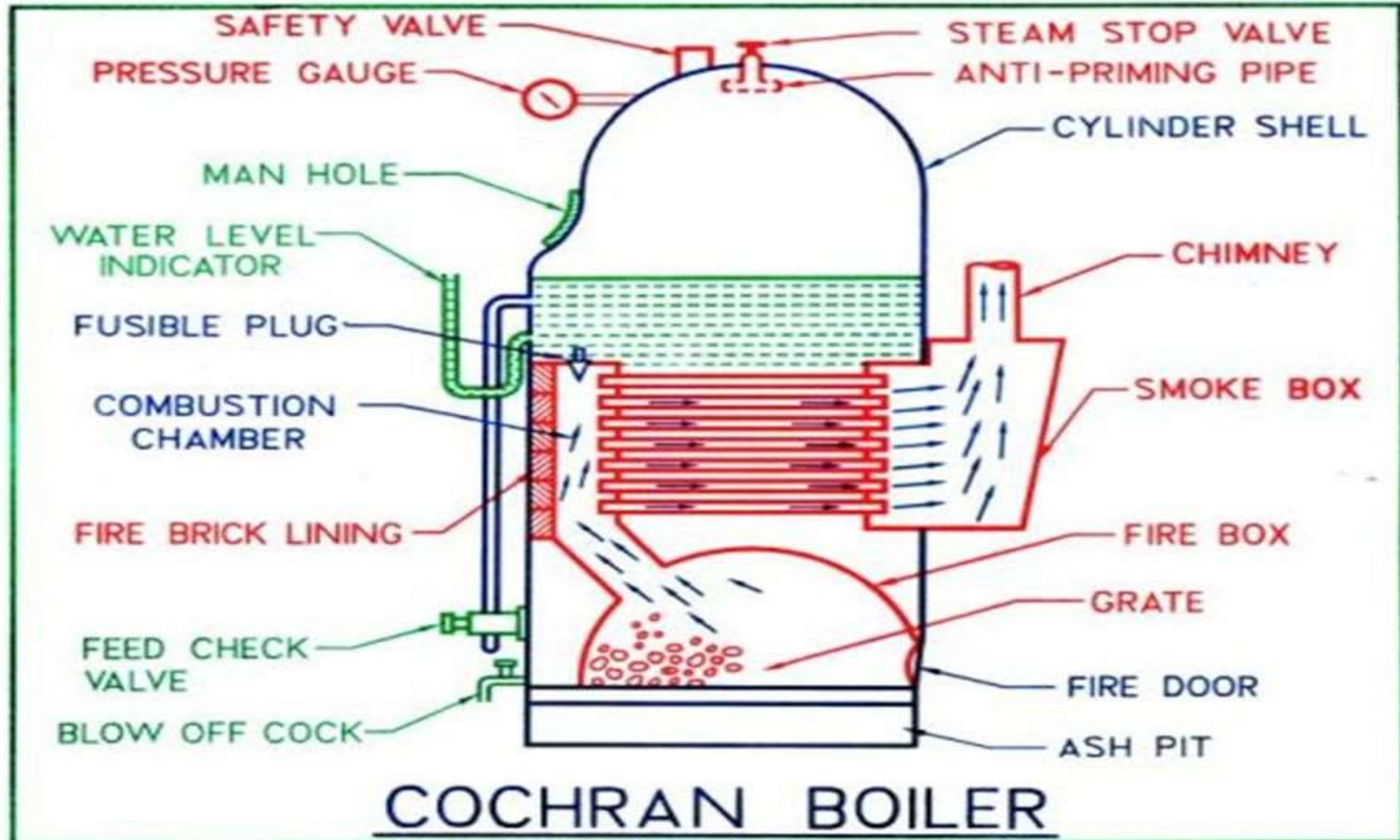


COCHRAN BOILER





COCHRAN BOILER





Cochran Boiler

- Simple vertical boiler
- Suitable for small plants require small quantity of steam.
- Size = 1 m Dia. x 2 m high (*evaporation 20kg/hr.*)
- Size = 3 m Dia. x 6 m high (*evaporation 3000kg/hr.*)
- Heating surface= 10 to 25 times of grate area
- Steam pressure= upto 20 bar
- Efficiency = 70 to 75%



Cochran Boiler

Advantages:

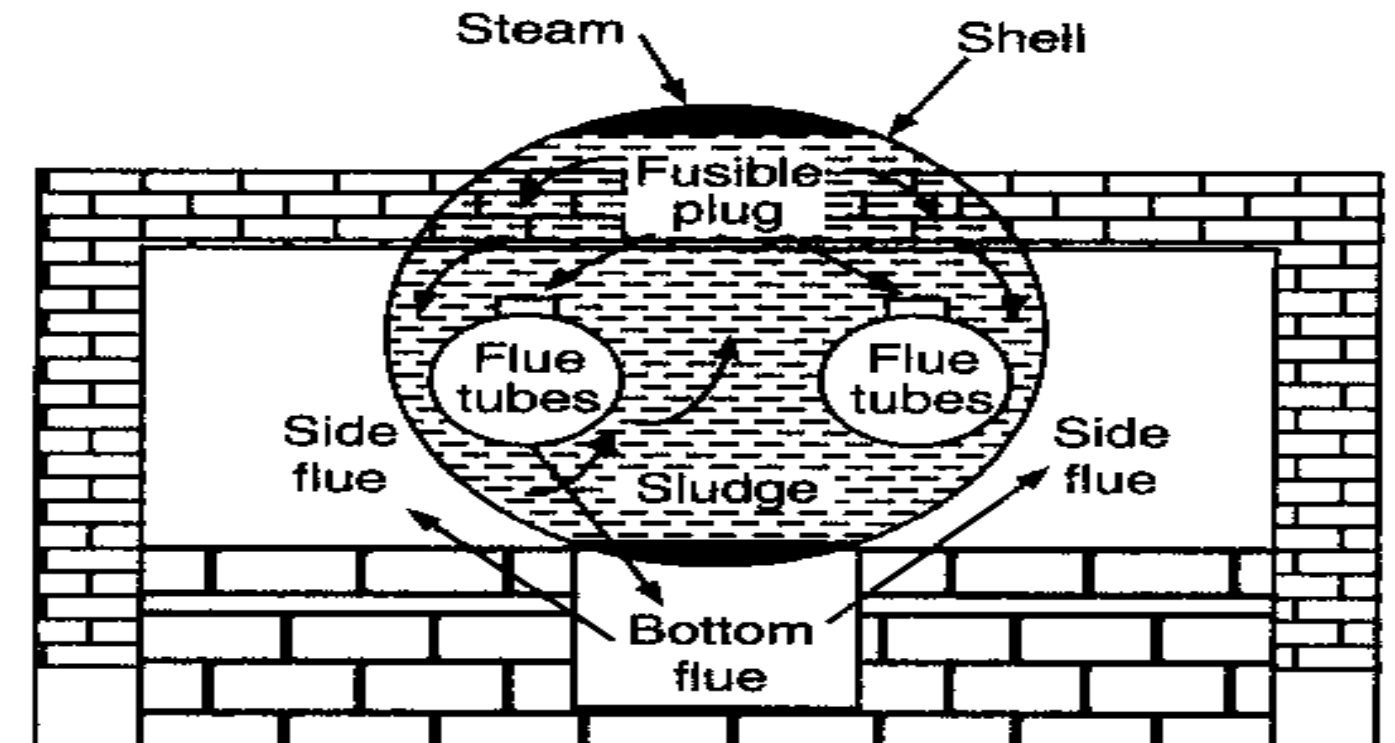
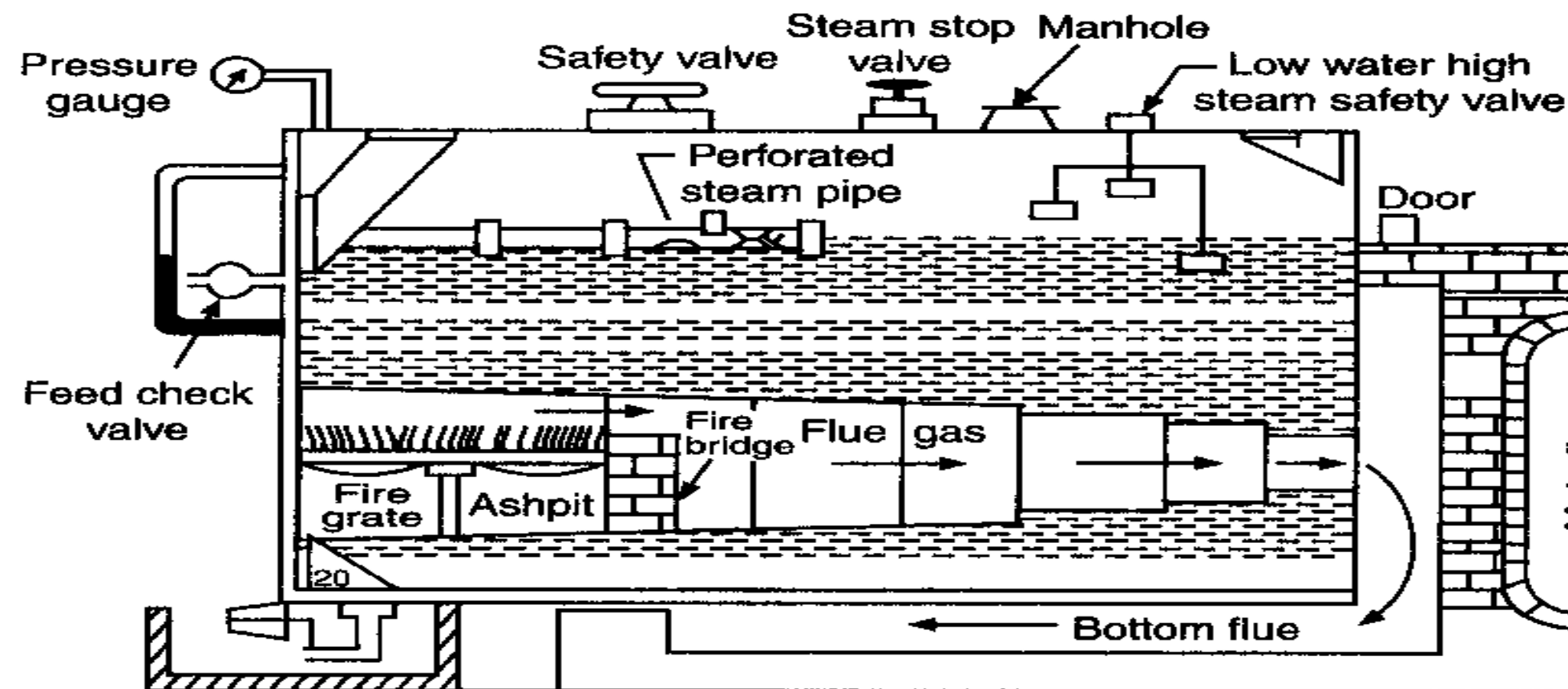
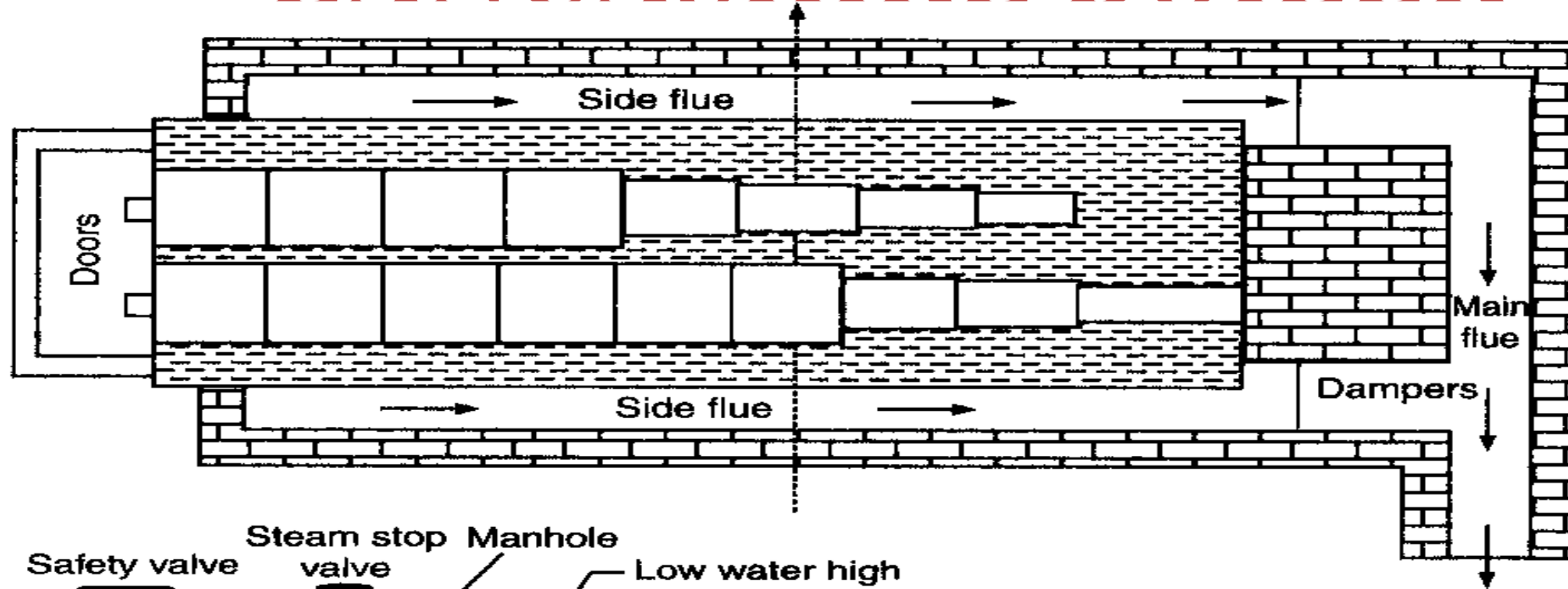
- **Low floor area required.**
- **Low initialization cost.**
- **It is easy to operate.**
- **Transport from one place to another is very easy.**
- **It has a higher volume to area ratio.**

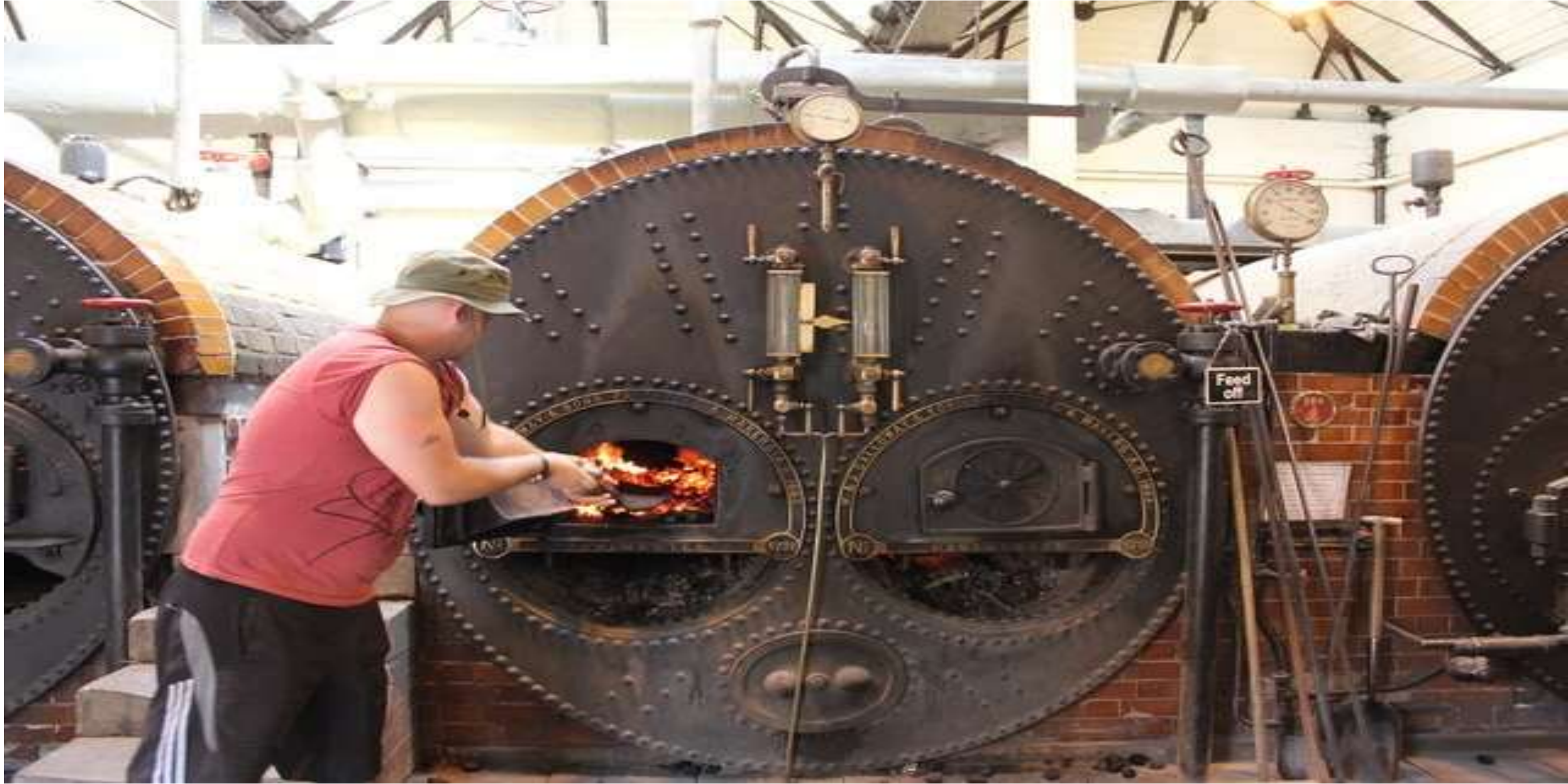
Disadvantages:

- **Low steam generation rate.**
- **Limited pressure handles capacity.**
- **It is difficult to inspect and maintain.**



LANCASHIRE BOILER









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Thank You