

Section-6

Q2

Ans.

Cochran Boiler :-

• Cochran Boiler or Vertical Multitubular Boiler:

- These are various design of vertical multitubular boiler.
- A Cochran Boiler is considered to be one of the most efficient type of such boilers.
- It is an improved type of simple vertical boiler.
- This boiler consists of an external cylindrical shell and a fire box as shown in fig.
- The shell & fire box are both hemispherical, The hemispherical crown of the boiler shell gives maximum space and strength to withstand the press. of steam inside the boiler.
- The hemispherical crown of the fire box is also advantageous for resisting intense heat.
- The fire box & the combustion chamber is connected through a short pipe.
- The flue gases from the combustion chamber flow to the smoke box through a no. of smoke tubes.

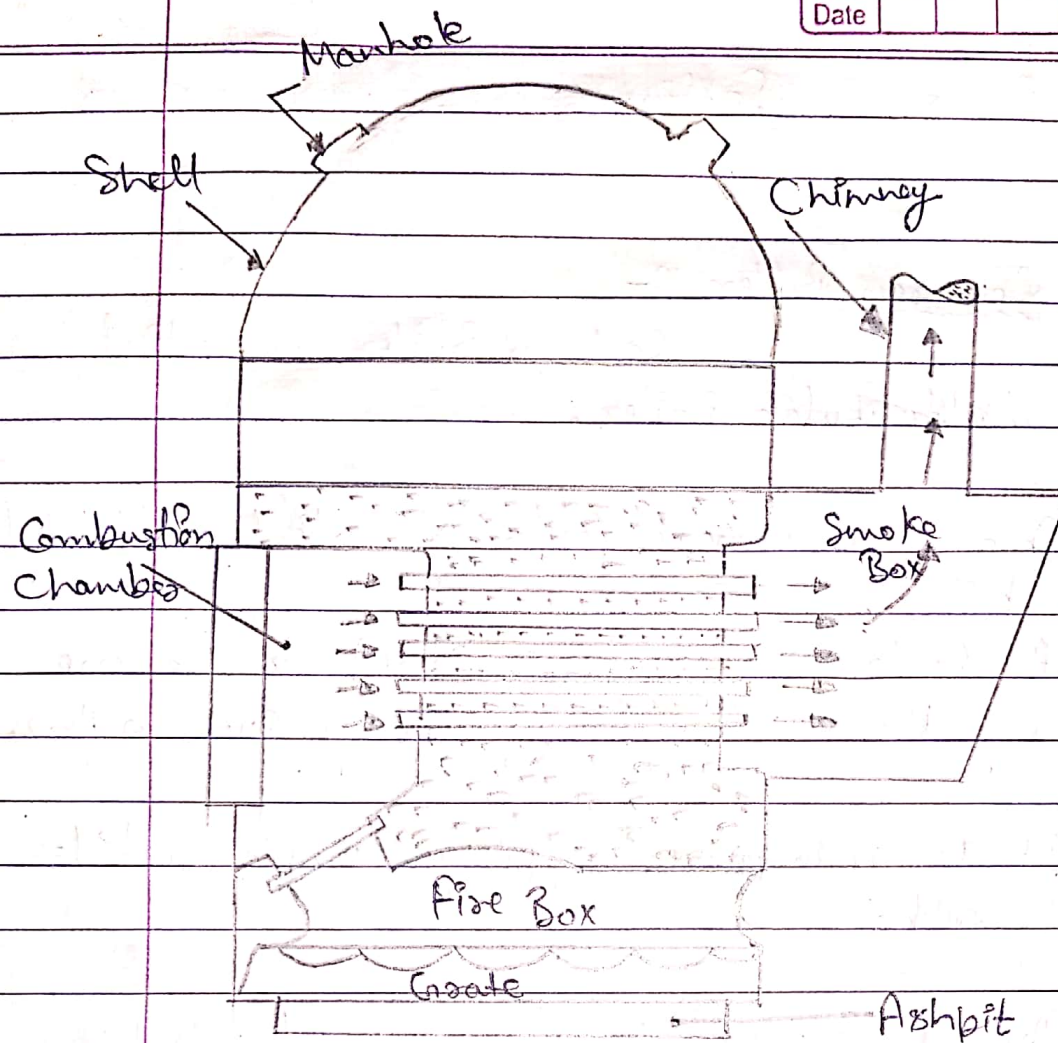


fig - Cochran Boiler

- At the bottom of the fire box, there is a grate (in case of coal firing) and the coal is fed through the fire hole.
- If the boiler is used for oil firing, no grate is provided, but the bottom of the fire box is lined with firebricks.
- The oil burner is fitted at the fire hole.

⇒ Benson Boiler :- It is a high pressure, Down less, water tube steam boiler using forced circulation.

- In this boiler, the feed water enters at one end and discharged superheated steam at the other end.
- The feed pump, increases the pressure of water to supercritical pressure. (i.e. above the critical pressure of 225 bar) &
- Thus the water directly transforms into steam without boiling.
- The diagrammatic sketch of a Benson Boiler is shown in fig.
- The feed water passes through the economiser to the water cooled walls of the furnace.
- The water receives heat by radiation through the economiser to the water cooled walls of the furnace.
- The temp. rises to almost critical temp. It enters the evaporator & may get superheated to some degree. Finally, it is passed through the superheater to obtain desired superheated steam.

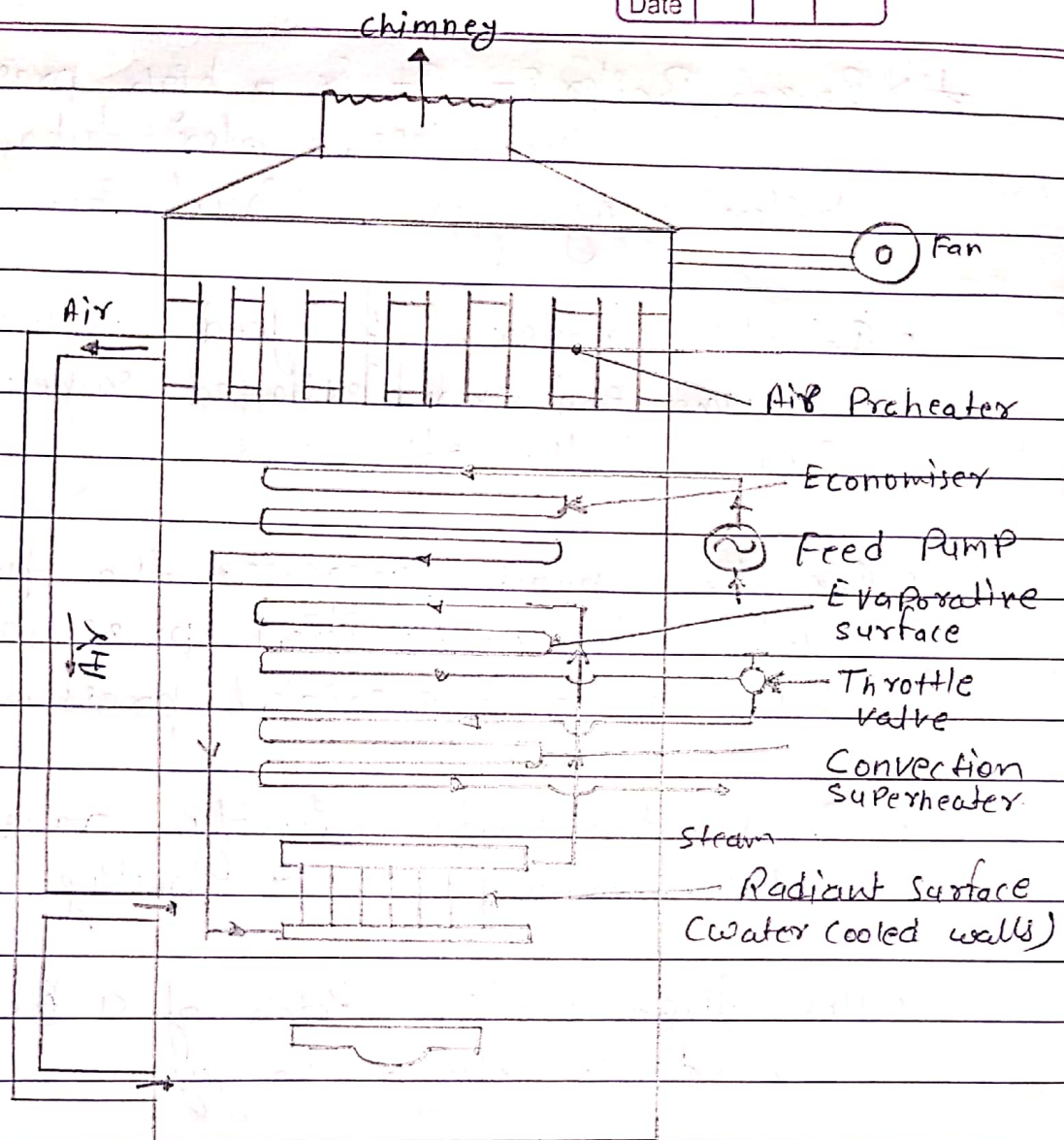


Fig:- Benson Boiler

- The Benson Boiler is also known as light-weight boiler as there is no longer water & steam drum.
- The thermal eff. upto 90 percent may be achieved by this boiler.
- The average operating press. & Capacity of such boilers are 250 bar & 135 tonnes/h.
- It can be started within 15 minutes.