Refining of crude oil : The crude oil is separated into various useful fractions by *fractional distillation* and finally converted into desired specific products. The process is called "*refining of crude oil*" and the plants set up for the purpose, are called the *oil refineries*. The processs of refining involves the following steps :

Step 1. Separation of water (Cottrell's process) : The crude oil from the oil well is an *extremely stable emulsion of oil and salt water*. The process of freeing oil from water consists *in allowing the crude to flow between two highly charged electrodes*. The colloidal water-droplets coalesce to form large drops, which separate out from the oil.

Step 2. Removal of harmful sulphur compounds involves in *treating oil with copper oxide*. A reaction occurs with sulphur compounds, which results in the formation of copper sulphide (a solid), which is then removed by filtration.

Step 3. Fractional distillation : The crude oil is then heated to about 400°C in an iron retort, whereby all volatile constituents, except the residue (alphalt or coke) are evaporated. The hot vapours are then passed up a "*fractionating column*", which is a tall cylindrical tower containing a number of horizontal stainless steel *trays* at short distances (*see* Fig. 7). Each tray is provided with small *chimney*,

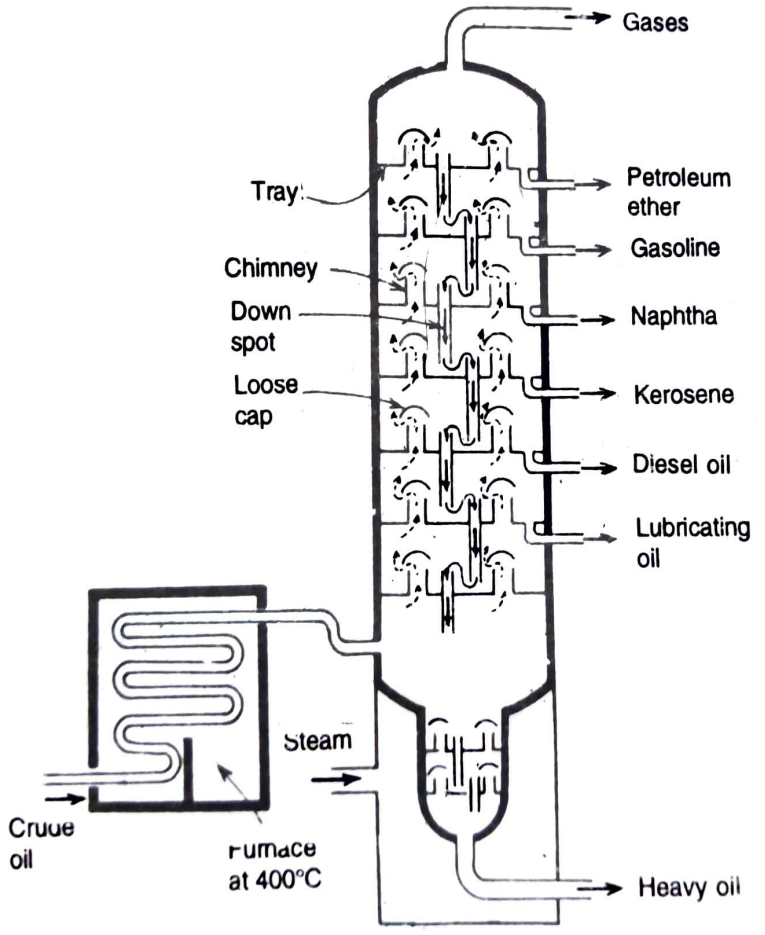

Fig. 7. Fractional distillation of crude petroleum.

covered with a loose *cap*. As the vapours go up, they become gradually cooler and fractional condensation takes place at different heights of column. *Higher boiling fraction condenses first; while the lower boiling fractions turn-by-turn.* Various principal fractionation products thus obtained are given in Table 5.