

01

Friday

JULY

Fuel handling

Wk 27 Day 12

Three types. — solid, liquid & gases.

Factors →

1 Plant fuel rate

2 Plant location in respect of fuel shipping

3. Storage area available

Fuel system is designed in accordance with the type and nature of fuel.

Coal may be transported by means of

1) Transportation by Sea or river

2) Transportation by rail

3) Transportation by ropeways.

4) Transportation by road

5) Transportation of coal by pipeline.

Various stages in coal handling

1) coal delivery 2) unloading, 3) preparation

4) Transfer, 5) outdoor storage 6) Covered

storage 7) inplant handling 8) Weighing

and measuring 9) transfer finally

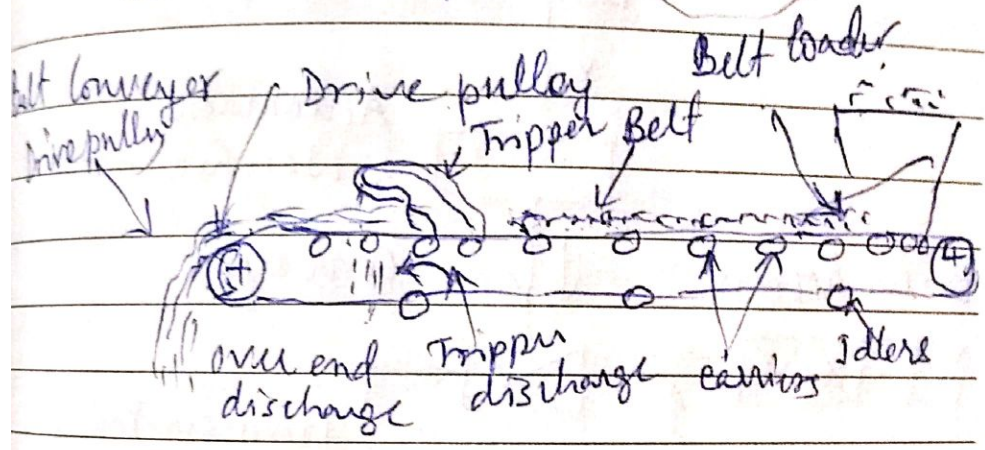
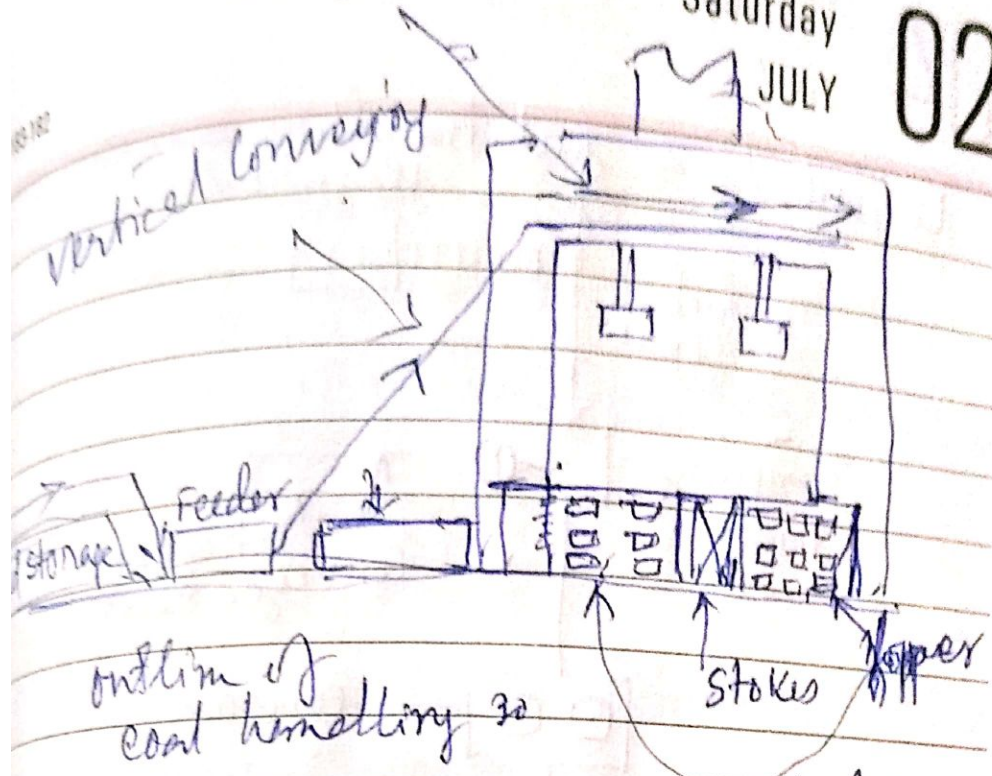
Important

JULY						
WK	M	T	W	T	F	S
27						
28	4	5	6	7	8	9
29	11	12	13	14	15	16
30	18	19	20	21	22	23
31	25	26	27	28	29	30

horizontal conveying

Saturday
JULY

02



Transfer → means handling of coal betⁿ subiding point & final storage point from where it is discharged to the firing equipment.
Equipment used.

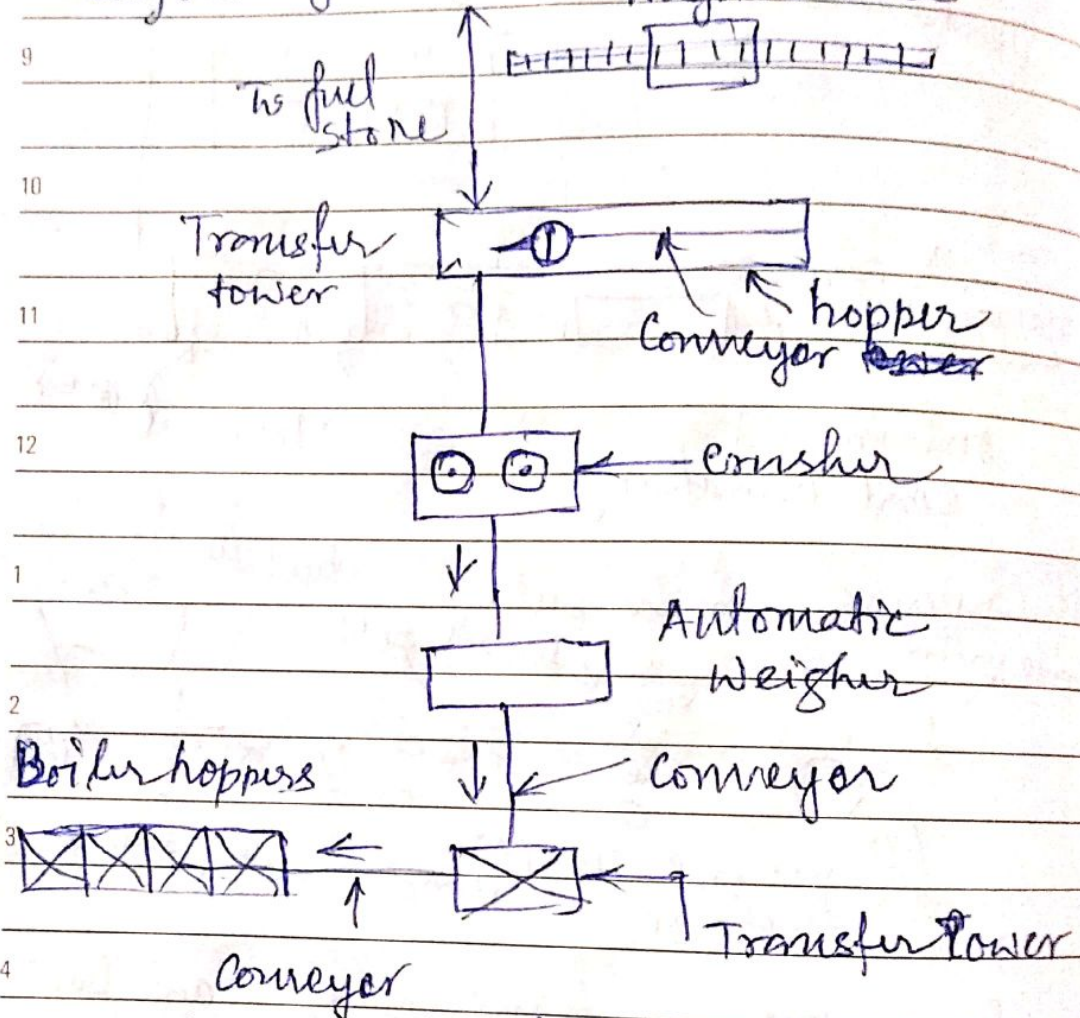
1. Belt conveyors
2. Screw conveyors
3. Vee bucket elevator & conveyor
4. Pivoted bucket conveyor
5. Grab bucket conveyor
6. Flight conveyors (scrapers)
7. Skip hoist
8. Mass flow conveyor
9. chutes.

Sunday 03

Important



Layout of a fuel handling equipment



Layout of a fuel handling equipment

Combustion equipment for steam boilers

The combustion equipment is necessary to receive fuel & air proportionate to each other and to the boiler steam demand, mix, ignite and perform any other combustion duties such as distillation of volatile from coal prior to ignition.

Fluid fuels are handled by burners
solid lump fuels by stokers

AUGUST

WK	M	T	W	T
32	1	2	3	4
33	8	9	10	11
34	15	16	17	18
35	22	23	24	25
36	29	30	31	

Tuesday
JULY

05

120-179

Basic requirements of combustion equipment

- ① Thorough mixing of fuel & air
- ② Optimum fuel air ratios leading to most complete combustion possible maintained over full load range.
- ③ Ready & accurate response of rate of fuel feed to load demand.
- ④ Continuous & reliable ignition of fuel.
- ⑤ Practical distillation of volatile components of coal
- ⑥ Adequate control over point of formation and accumulation of ash when coal is the fuel.

Liquid fuel is most preferred for boilers although transportation cost is higher due to its cleanliness operation. The liquid fuel is mostly preferred.

The gaseous fuel is always preferred near to its source because the cost of storage is highest compared to all.

Depending on the type of combustion equipment boilers may be

2011
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28

1) Solid fuel fired

a) hand fired

b) Stoker fired

Important

→ overfed stoker

→ underfed stoker

of

06

Wednesday
JULY

- c) Pulverised fuel fired
- i) Unit system
 - ii) Central system
 - iii) Combination of Unit & Central

2. Liquid fuel fired
- a) Injection system
 - b) Evaporation system
 - c) Combination of both Injection & Evaporation

3. Gaseous fuel fired
- a) Atmospheric p^r system
 - b) High p^r system

Burning of coal

The two most commonly used methods are

- 1) Stoker firing
- 2) Pulverised fuel firing

Stoker - It is a power operated fuel feeding mechanism and grate.

Advantages

- 1) Cheaper grade fuel can be used
- 2) Higher efficiency is attained
- 3) Greater flexibility
- 4) Less smoke produced
- 5) Less building span reqd.
- 6) Can be used for small coal
- 7) Very reliable & maintenance is low

Important

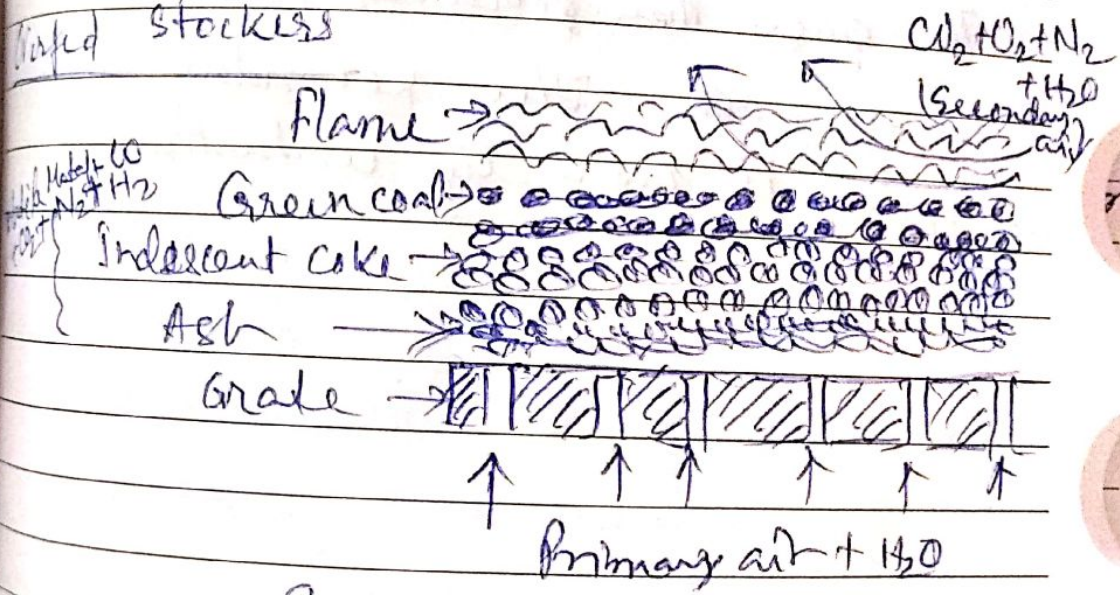
AUGUST

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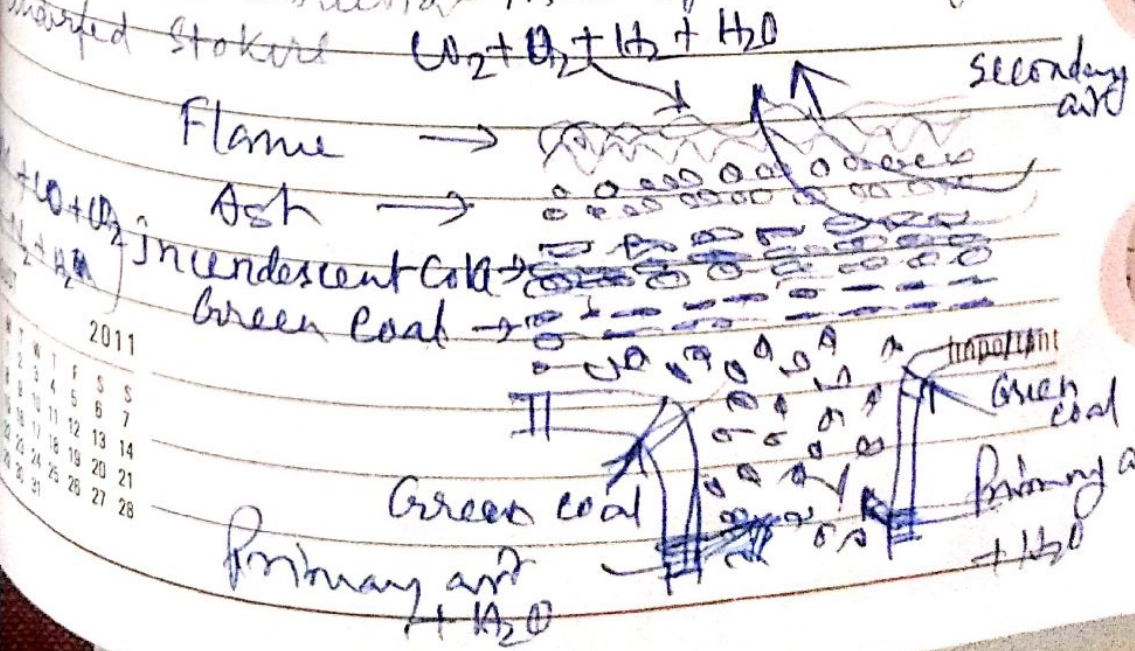
Disadvantages

- 1) Construction is complicated
- 2) Initial cost may be higher for large plants
- 3) A certain amount is lost through the grades
- 4) Sudden variation of steam demand can't be maintained
- 5) Excessive wear of moving parts.

Grate Stokers



Principle of overfed stoker
 fuel coke & ash in the fuel bed moves
 opposite direction that of air and gases



2011

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8	9	10	11	12	13	14
15	16	17	18	19	20	21
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29	30	31				

The underfed principle is best for
9 Bituminous & Semi bituminous coal.

10 Air entering through the holes of the grate
comes in contact with the raw coal

11 (green coal) Then it passes thro' the
incandescent coke where reactions

12 similar to overfed system takes place.

1 The gases then produced pass thro' a

2 layer of ash. The secondary air is
supplied to burn the combustion gases

3

4

5

6

7