

★ SHAFTS :- its purpose & construction :-

★ Shafts and its purpose :-

• Shafts are vertical passages or wells, reaching from the ground surface down to the tunnel roof.

• Shafts purpose in tunnel

They are used in construction of tunnels as they provide many advantages:-

- (a) They greatly expedite the work of tunneling by providing two faces per shaft for driving.
- (b) They provide outlets for excavated material and means to access into the tunnel for building materials.
- (c) They help in laying correct alignment and help to carry the ~~ent~~ centre line into the tunnel proper.
- (d) In long tunnels they provide proper ventilation. They also helpful for exhausting smoke and foul air out of the tunnel.

§ CONSTRUCTION OF SHAFTS :-

In rocks, construction of shafts consists of following two operations:-

- ① Drilling and blasting
- ② Mucking

① Drilling - The pyramidal cut or centre cut pattern of holes is adopted. In case of large shafts to facilitate the mucking and drilling simultaneously, stepping of shaft is resorted as shown in figure:-

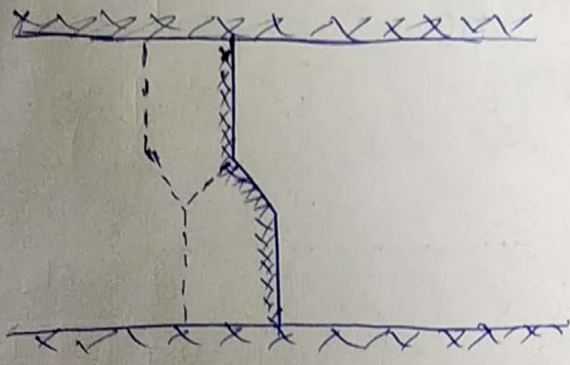


Fig. :- Stepping in shafts

(2) Mucking :- This is generally done manually. The muck is loaded into buckets and lifted up. A simple method of mucking is shown in fig. 1-

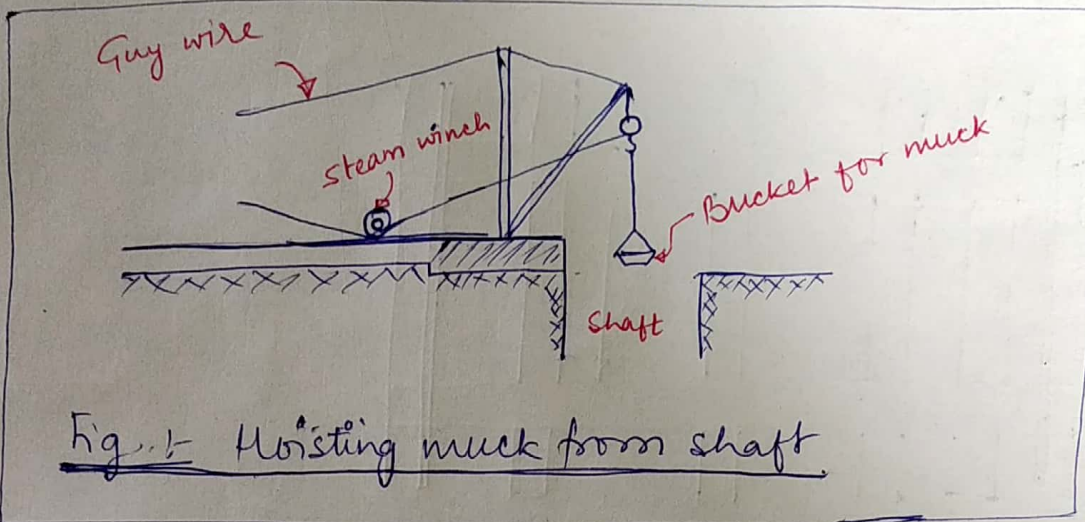


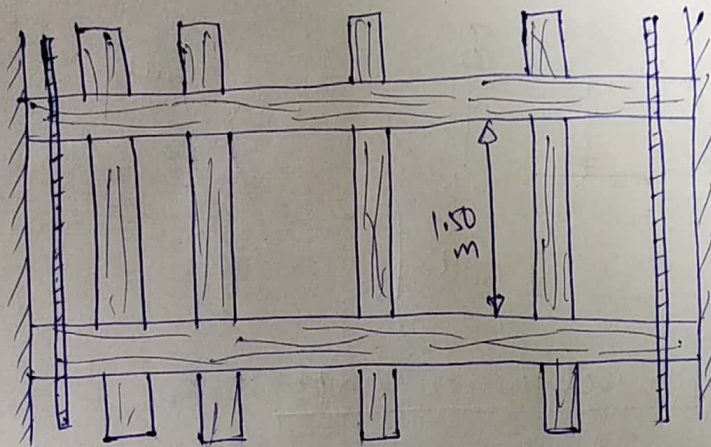
Fig. 1 Hoisting muck from shaft

In this mucking method, twin buckets could be used so that as one bucket rises the other descends. The explosive charge should be so controlled that the blasted pieces may weight from 9 kg to 90 kg for easy handling

Timbering - • Though generally no horizontal pressure is exerted in rock shafts, yet timbering is found necessary to carry guides for the cages and supports lagging.

- Lagging is used to prevent small pieces of rock, breaking loose and falling down and injuring workers
- Timber sets are made of two side plates and a pair of end plates and are called as HEAD FRAMES

The timber set is divided into two compartments; one is used as ladder way and the other as hoisting way as shown in figure :-



(Section view)

Figure :- Timbering for shaft in rocks.