

# The Canadian Engineer

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## NOTES ON HEADGEARS FOR COLLIERIES AND OTHER MINES.

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The headgear or frame supporting the pulleys around which pass the ropes attached to the cages for the conveyance of men and material to and from the working level is generally the most important structure in any mining equipment, as on its utility and stability depends the entire output of the mine as well as the safety of the men working underground.

Under these circumstances, therefore, it will be readily seen that it is not a wise policy to attempt to skimp the material, design of details, or execution of the work in the shop, but, in view of the indeterminate nature of the vibra-

tion, coal per trip arose, and consequently we see to-day collieries with winding plants capable of handling three and four loaded tubs per trip and landing same at the pit mouth from the working level, which may be anything up to about three parts of a mile, well under a minute.

Double, and even treble, decked cages are to-day quite an ordinary event, and occasionally you will find a plant where two pit tubs or corves are carried on each deck, each containing about 1,600 or 2,000 pounds of coal, and, with the cage, chains and rope, making in all somewhere around 30,000 to 40,000 pounds of dead weight to move on the loaded side of the shaft.

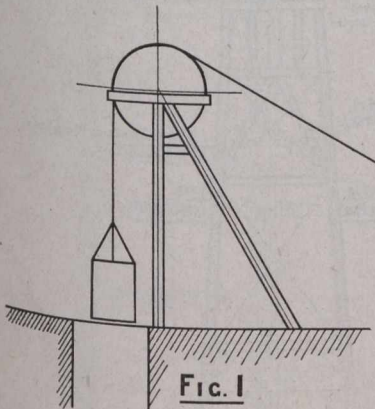


Fig. 1

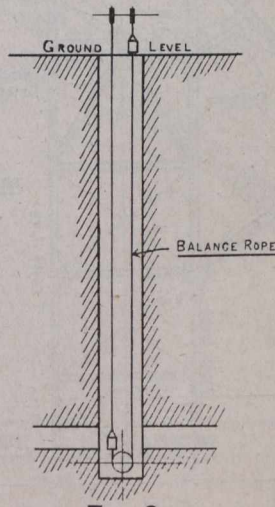


Fig. 2

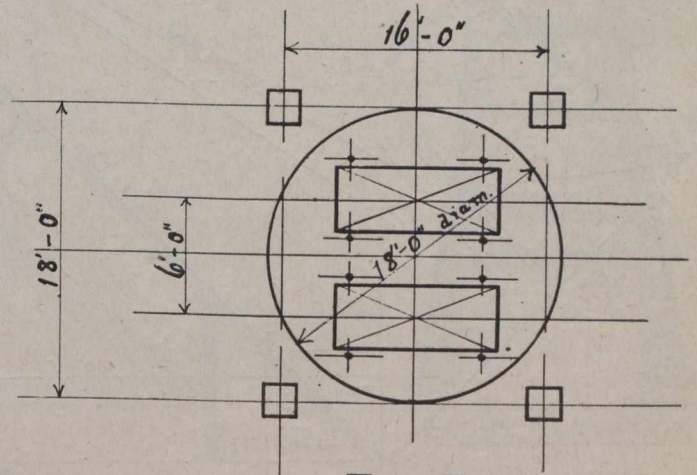


Fig. 3

tory stresses on the structure and the sudden application of loads, good allowances should be made for impact and low unit stresses adopted generally.

Quite a large amount of the detail work is purely derived from experience and practical requirements, and this will be referred to in detail later.

Probably the earliest form of headgear consisted of a timber frame built up in the manner shown in Fig. 1. The writer has seen quite a number of this type, ranging from about fifteen to thirty feet high, with more or less detail, according to the loads carried. Generally, however, the speed of winding was very slow and the loads light; also, each frame carried one pulley only, so there was no necessity for much equipment in the way of guides.

As the seams near the surface were worked out and the demand for coal grew, a gradual evolution took place in all colliery equipment.

With the increased depth and greater time occupied in winding the material to the surface, the desire to carry more

Practically all modern plants are designed with two sheaves or pulleys on the headgear, each provided with a rope supporting a cage, arranged so that when one is at the top of the shaft the other is at the bottom, and thus to a large extent they balance each other, so far as the winding engine is concerned, as the two ropes are led to two drums, mounted side by side on the same shaft, one being taken over the top side of the drum on the one side, and the other led underneath the other drum, so that as soon as one rope unwinds the other winds up.

The amount of the unbalanced load is measured by the quantity of coal carried per trip and the difference in the length of the rope from the supporting pulley on the headgear to the cage.

Sometimes, however, the latter is also balanced, and this is done by attaching another rope to the bottom of each cage and passing same around a pulley in the bottom of the shaft exactly as shown in Fig. 2.