

NEW TYPE CANE OFF-LOADING GRAB

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Abstract

The need for a cane grab, which would be operated by the crane driver from the cab and not require an extra man to guide it, has been long overdue in the South African sugar industry. Such a cane grab was seen in operation in Louisiana and one has been manufactured locally and is operating successfully at Umfolozi.

Introduction

The most commonly used cane grab in the South African industry is the so called hydraulic grab. In fact the grab is not hydraulically operated as the hydraulics are only in the form of a dashpot damper to prevent it from opening noisily and too fast.

This type of grab has to be opened and closed by means of a trigger device which is operated by a person on the ground, by means of a long rope which is attached to the device. A third person is sometimes employed to guide the grab with a second rope in order to keep it at right angles to the vehicle being off-loaded.

Maintenance on this type of grab is extremely high and the hydraulic cylinders require constant attention and if not properly maintained cause the grab to open loudly, and with the sudden release of the bundle, the crane grab sometimes jumps off the rails. Then the electric wires touch causing a trip out, usually resulting in a lengthy mill stop.

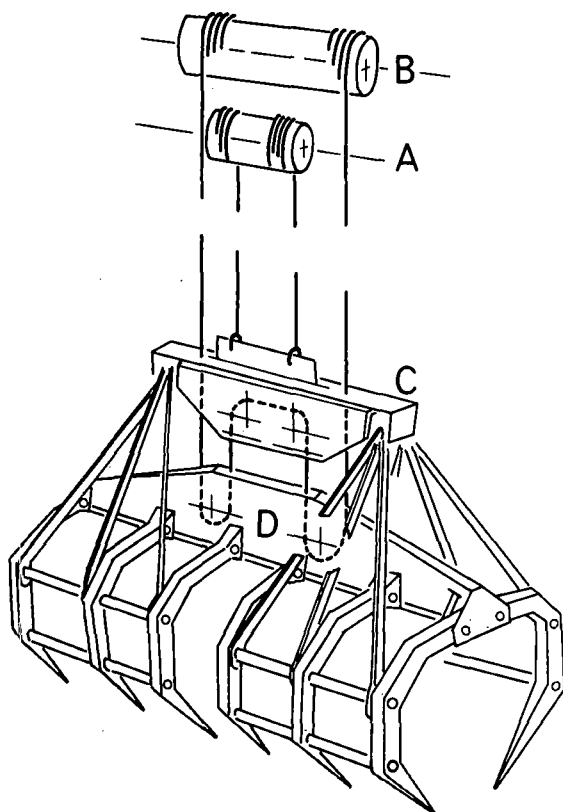


FIGURE 1 Sketch showing arrangement of ropes on two-drum operated cane grab.

New Type Cane Grab

Principle of Operation

The main draw-back with the new type of cane grab is that it cannot replace the old type of grab because the crane requires two hoist drums and most existing cranes are only fitted with one hoist drum. Therefore, the crane has to be altered to have two hoist drums.

The crane operator has only two levers, one for each hoist. Each drum drops two ropes to the grab i.e. four ropes attached to the grab. Drum A shown in Figure 1 has its two ropes attached to the lifting beam C and drum B has its two ropes passing over two sheaves on the closing and opening beam D and then attached to the underside of the lifting beam C.

In order to close the grab, the lifting beam is held stationary while the hoist drum B is operated to "lift", thus raising beam D and closing the tynes of the grab. When the grab is closed the crane driver operates drum A to lift, and the grab rises with its load.

To open the grab the crane driver keeps drum A stationary and lowers drum B, causing the beam D to lower and the tynes of the grab to open. The speed of opening and closing can be controlled by the crane driver.

The grab is kept at right angles to the movement of the crane at all times because of the four ropes attached to it.

Results

This type of grab has been in operation for two seasons at Umfolozi and has speeded up the off-loading of SAR wagons from three per hour to ten per hour. Previously two overhead cranes were used and now only one is required.

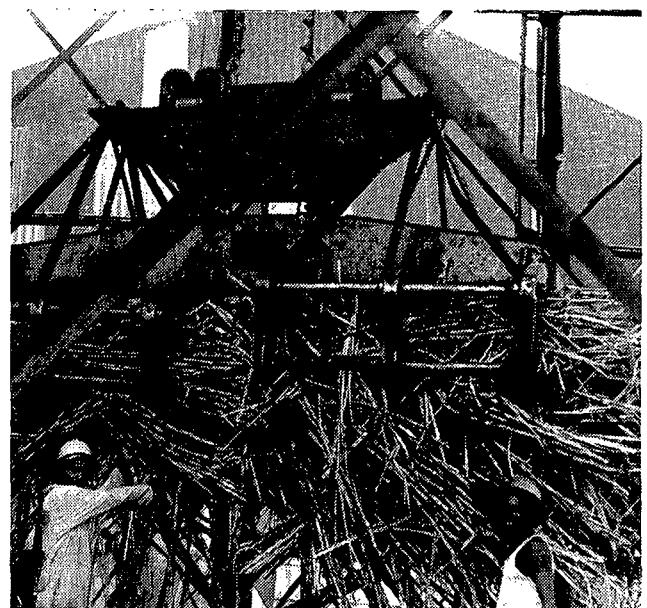


FIGURE 2 The loaded grab lifting approximately four tons of cane.

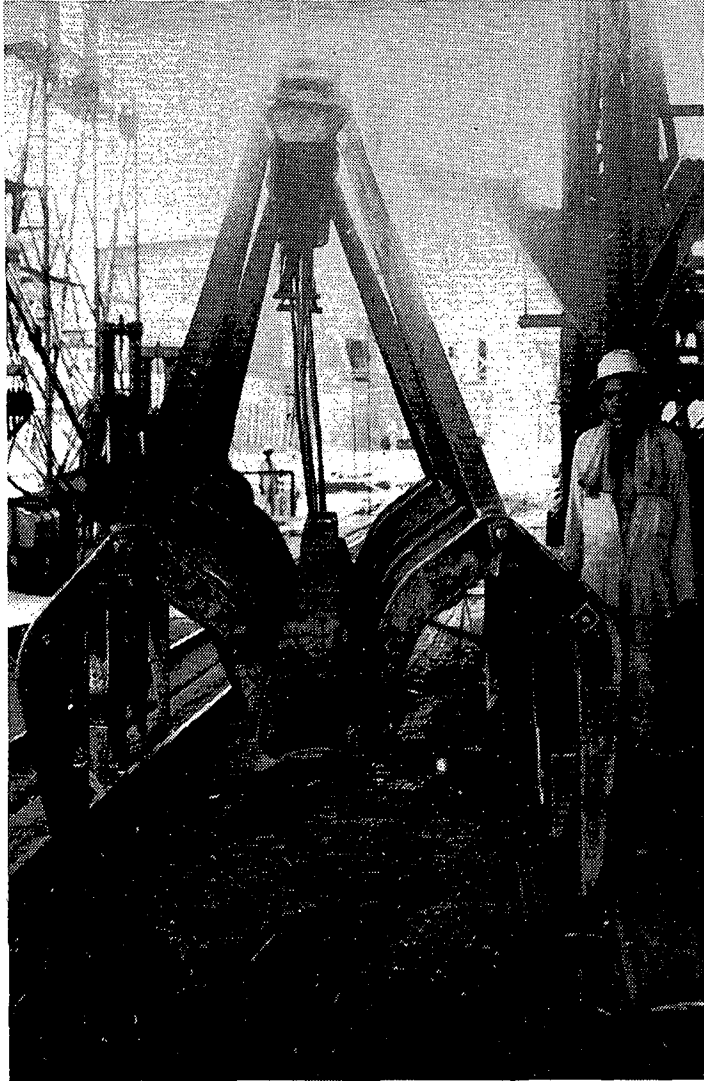


FIGURE 3 End view of opened grab illustrating width to suit railway wagon.

Capacity

The crane is designed to lift 8 tons which includes the mass of the grab of approximately 4 tons (see Figure 2). The length of the grab is 4 metres and the overall height is 3 metres. The width of the grab when fully open has been designed to fit inside a SAR cane wagon (see Figure 3).

Conclusion

The new type of cane grab has resulted in a saving of labour and has speeded up the off-loading of cane from SAR wagons. The maintenance is considerably less than on the type previously used.

A second grab has been ordered, with certain modifications to reduce maintenance to a minimum.