IN THE ROLLING MILLS OF THE COUNTRY

ROLL CHANGING AT SLABBING MILLS

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The performance of slabbing mills in a modern metallurgical plant is a determining factor in the performance of finish-rolling departments. This lends added importance to the task of cutting down on slabbing mill downtime. In 1969, downtime of slabbing mills accounted for 9.3 to 16.3% of scheduled production time. These high downtime figures are accumulated in delays in repairs and roll changing. That in turn stems from the fact that the vertical and horizontal stands are located 2 to 2.5 m apart, and can be serviced by only one electrically powered gantry crane at a time.

This state of affairs calls for more careful design of roll-changing gear; but despite that fact, chain transfers whose design allows for changing rolls only along the longitudinal roll axis have been installed on some slabbing mills (Fig. 1). This type of roll-changing gear features a speed of 0.05 m/sec for horizontal translation of the rollers.

Fig. 1. Chain transfer type roll changing gear: 1) roll grab; 2) chain; 3) bottom guide chain; 4) tension sprocket; 5) drive; 6) top guide chain; 7) rails; 8) drive sprocket.
Fig. 2. Rack type roll changing gear: 1) drive for transverse motion; 2) drive for longitudinal motion; 3) rack for longitudinal motion; 4) rack for transverse motion; 5, 6) moving cross arms; 7) stationary cross arm

which have to be moved 6 m during roll changes. The roll changing gear is powered by a 16 kW 710 rpm electric motor. The design of the chain mechanism allows for removing the horizontal rolls from the working stand of the slabbing mill, but does not permit installation of new horizontal rolls on the frame of the roll changing gear before roll changes are initiated, since the worn-out rolls have to be completely removed first. All these operations keep the gantry crane busy at the expense of maintenance of the basic components and equipment in the horizontal and vertical stands.

With the object of speeding up the roll changes and freeing the electrically powered gantry crane for other work, attempts were made to devise roll-changing gear capable of installing new rolls in the stand before repairs were begun. This rack type roll changing gear has been installed and has performed satisfactorily on the slabbing mill at the Zaporozhstal plant (Fig. 2). The technical data for this gear are the following:

- Longitudinal speed, m/sec ... 0.109
- Transverse speed, m/sec ... 0.077
- Longitudinal travel of rack, m ... 6.9
- Transverse travel of rack, m ... 1.42

The principal distinguishing feature of this roll changing gear is the ability of the roll changing platform to move in two directions, longitudinal and transverse. This makes it possible to install new rolls on the cross arm 6 before the mill is shut down for preventive maintenance.

In roll changing, worn-out rolls are removed from the horizontal stand by the roll changing mechanism (motion in longitudinal direction) and moved to one side (motion in transverse direction). The new rolls are then moved to the axial line of the horizontal stand, the cross arm 6 takes up the position previously occupied by the crossarm 5.