

HOT WORKING OF METALS

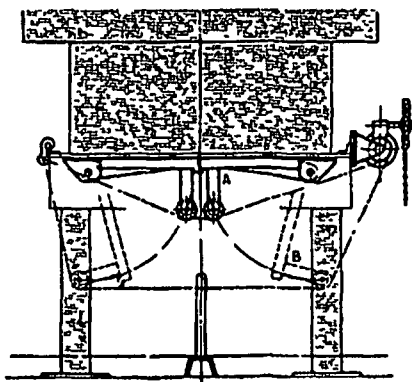


Fig. 27-6. Suggested method of raising bottom doors of cupola by mechanical means.

equipment. They should be closed when the air supply fails or when the melting equipment is shut down, in order to prevent the accumulation of combustible gases in the air supply system. In the cupola, the blast gate may be omitted if alternate tuyeres are opened to permit air circulation.

Blast gates should be so located in relation to the cupola wind box that the duct volume will be kept to a minimum. Motorized dampers may be installed at centrifugal blowers so that they will close automatically when the air supply fails.

Positive-pressure blowers should be equipped with safety valves having liberal discharge areas. If these are not provided, clogging of the cupola with slag or quick closing of the gate or damper may produce sufficient pressure in the blast pipe to burst it.

Every cupola should have at least one safety type tuyere, with a small channel $1\frac{1}{4}$ or 2 in. below the normal tuyere level. This channel has a fusible plate that will melt through should the slag and iron rise to an unsafe level.

Tapping out

Tapping out with safety requires skill and should be done only by experienced and dependable men. In "botting-up" the hole, the bott should not be thrust directly into the stream of molten metal or it will cause spattering. To eliminate this, place the bott

immediately over the stream of metal close to the hole and aim it down toward the hole at a sharp angle.

A supply of botts ready for use should be kept within convenient reach of the man who does the tapping.

When the cupola is tapped, the back end of the tapping bar should be held below the level of the hole, to prevent puncturing the sand bed and causing run-out through the bottom.

A tilting spout placed with one end directly beneath the stationary cupola spout and mounted on trunnions on a stand adds to safety and efficiency. It can be tilted back and forth by a foot lever. The rear end of the tilting spout is closed so that when that end is tilted down it forms a reservoir to receive the molten metal from the cupola. When the supplementary spout is tilted forward, the metal runs from it into the waiting ladle. At the same time more metal continues to run into the spout from the cupola. Thus the stream of metal runs from the cupola continuously, and the tilting spout acts as a reservoir between ladle loads.

The slag spout of the cupola should be equipped with a shield or guard to protect workers from sprays of molten slag and to form a hood to collect slag wool.

The slag wool is sometimes collected through a wet slagging system wherein slag is thrown off into a water-filled container or trough and flushed away.

Dropping cupola bottom

When the cupola is in operation, its bottom doors should be supported by one solid prop and two adjustable screw props (of the required structural strength) on a metal prop base set on a concrete footing or other fabricated footing of equivalent strength (Fig 27-5).

Temporary supports (timbers, blocking, etc.) should be placed under the cupola bottom doors to prevent their falling on employees while the metal props are being adjusted to proper height. Mechanical means for raising the bottom doors of the cupola should be provided (Fig 27-6).

Dropping the bottom doors of a cupola requires extraordinary care. One of the best methods is to use a block and tackle with a wire rope and chain leader attached