

33—Hot Working of Metals

castings onto another conveyor, which takes them to the tumbling barrels. Empty flasks are brought back to the molding section by still another conveyor.

This is a complete system for mass production where each man has one job to do rather than several. In the installation of such a system, shear points, crush points, and moving parts must be effectively guarded.

Where conveyor systems run over passageways and working areas, the employees beneath should be protected by screens, grilles, or guards strong enough to resist the impact of the heaviest piece handled by the conveyor.

Where chain conveyors operate at various levels, other than in a fixed horizontal plane, a mechanism of safety dogs should be installed in accordance with applicable standards on both the upgrade and the downgrade. In case of chain failure, the safety dogs will hold the chain and prevent the load from piling up at the bottom of the incline.

Elevators and monorails

Elevator openings at floor levels should be protected by manually or mechanically operated elevator gates at least 6 ft high. Slots should be no more than 1 in. wide, and the gates should extend as close to the floor as practicable.

The drive mechanism should be electrically or mechanically interlocked with the gates so that the elevator cannot be started until the gate is closed and so that the gate cannot be opened until the elevator is at floor level.

Elevators, except for those that are hydraulically operated, should be equipped with safety blocks controlled by a speed governor that will hold the elevator in case of cable failure or overspeeding.

All types of elevators should have upper and lower travel limit devices.

Monorail systems should be provided with stops or interlocks that will prevent the trolley equipment from running off at open switches. Permanent rail stops should be installed at the ends of all such equipment.

Scrap breakers

Shears should be guarded to protect operators and passersby from flying particles. The working floor should be clear and level.

Use of a drop to break castings or scrap

inside the foundry buildings during working hours should be prohibited unless such operations are performed within a permanent enclosure of planking or equivalent strong enough to withstand the most severe impacts from the demolition weight or flying scrap. The enclosure should be high enough to protect workmen in the vicinity from flying fragments of metal.

If a rope is used, it should extend over pulleys to a point clear of the breaking area to assure that the operator will be at a safe distance and to prevent entanglement.

Storage

Foundry materials and equipment not in regular use should be stored in the space provided in a safe, orderly manner on level and substantial foundations.

When workmen remove materials from bins located at floor level or from storage piles, they should not undermine the piles and thereby cause cave-ins.

Hopper bins containing material which is fed out at the bottom, either by hand or by mechanical means, should be covered with a grating which will prevent workmen from entering the bin. No one should be allowed to get on the rails of a bin nor to enter a hopper to break down bridged material.

A worker who must enter a bin should wear a safety belt with attached lifeline, tended by a man similarly equipped.

Pattern storage buildings should have racks and shelves substantial enough to hold the loads placed upon them. The floors and stairways should be well designed and kept in good condition. The storage area should be well lighted. The pattern keeper should be provided with a sound ladder so that he can safely reach the patterns.

The pattern keeper, who is likely to be alone in the pattern storage area, should report at regular intervals to the molding floor supervisor.

Flammable liquids should be stored in accordance with National Fire Protection Association Standard No. 30, *Flammable & Combustible Liquids Code*. See Chapter 42, "Flammable and Combustible Liquids."

Slag disposal

Furnaces and pits should be designed to