

Hoisting Apparatus and Conveyors

ing beneath the boom. Otherwise, if the truck wheels should roll into a low spot in the pavement, the boom might suddenly crash through a car roof.

If not disassembled, a crane being transported should have the crane engine running and the operator in the cab to swing the boom when necessary to avoid fouling trees, poles, or buildings when the vehicle turns corners.

Before heavy, slow-moving equipment, or heavy equipment on a low-slung trailer, is moved over any public or private railroad grade crossing, a responsible representative of the railroad company should be notified. The railroad then can provide flag protection to guard against a train's striking the equipment while it is moving over the crossing, or if the equipment becomes stalled or "hung up" on the crossing. This is an important precaution for the benefit of both the equipment owner and the railroad company.

Electric wires. The boom and cables of a crane should be kept away from all electric wires, regardless of their voltage. Equipment should be operated in such a manner that no part of it, including the load, can come within 6 ft of electric lines or apparatus unless the power in the lines is shut off. Local laws may specify distances greater than 6 ft. In such a case, the local law shall prevail.

The U.S. Army Corps of Engineers has established the following minimum required clearances and requires a notice of them to be posted at the operator's position.

Power Lines Nominal System kv	Minimum Required Clearance Feet
Under 69	10
69	12
115-161	15
230-285	20
345	25
500	35

Electronic devices are available that can be attached to the boom and will sound an alarm if the boom comes within a predetermined distance from a live wire. This equipment is subject to failure and should be used only when it is absolutely impossible to main-

tain minimum clearances, barricade, or de-energize power lines.

One state has a law allowing the prosecution of employers and equipment operators who permit crane booms to come within 6 ft of high-voltage lines or who operate at any location without a sign, "Unlawful To Operate This Equipment Within Six Feet of High-Voltage Lines" posted on the rig.

Boom guards of wood or of pipe mounted on 15-kv insulators provide mechanical protection against contact.

If a crane boom contacts a conductor, the hazard is greatest to the hook-on man and others who may touch the load or the sling. To protect these men, a commercially available load hook with an insulated link can be used.

If the boom or cables accidentally come into contact with a wire, the operator should swing the crane to get clear. If the wire has been broken and the boom cannot be cleared from it, the operator should stay on the crane and remain calm.

A crawler crane, if the ground is wet or damp, will be electrically grounded, and when the boom touches a power line, the wire will, in turn, be grounded and the power company circuit breaker will open. Some arcing may occur. After a few seconds, however, the circuit breaker will automatically close and reenergize the wire. Again the circuit breaker may open, and again it will close. Thus the wire may be "dead" at one instant, but live a few seconds later.

On the other hand, if the boom of an automotive crane on rubber tires should become tangled with a "hot" electric wire, the entire crane will be energized, for the rubber tires will insulate the crane and truck from the ground. Hence, the circuit breaker may not open, and the wire and the crane may remain energized.

Stepping from the crane to the ground is often fatal, for one hand and one foot may be in contact with the crane when the other foot touches the ground. Therefore, the operator should remain on the crane until the emergency crew from the electric company arrives and frees the crane from the live wire.

If the gasoline tank should become ignited or if for any other reason it is impossible for the operator to remain on the crane, he should jump, making sure that all parts of his body