to give the nip-point of the belt and pulley the maximum protection.

(c) If the cone is located less than 3 feet from the floor or working platform, the cone pulley and belt shall be guarded to a height of 3 feet regardless of whether the belt is endless or laced with rawhide.

§ 50–204.168 Gears.

Gears shall be guarded in accordance with one of the following specifications:

(a) A complete enclosure.

(b) A standard guard as described in section 204.181 at least 7 feet high extending 6 inches above the mesh point of the gears.

(c) By a band guard covering the face of the gear and having flanges extended inward beyond the root of the teeth on the exposed side or sides. Where any portion of the train of gears guarded by a band guard is less than 6 feet from the floor a disk guard or a complete enclosure to the height of 6 feet shall be required.

§ 50–204.169 Sprockets and chains.

All sprocket wheels and chains shall be enclosed unless more than 7 feet above the floor or platform. Where the drive extends over other machines or working areas, protection against falling shall be provided.

§ 50–204.170 Openings for oiling.

When frequent oiling must be made, openings with hinged or sliding self-closing covers shall be provided. All points not readily accessible shall have oil feed tubes if lubricant is to be added while machinery is in motion.

§ 50–204.171 Friction drives.

(a) The driving point of all friction drives when exposed to contact shall be guarded.

(b) All arm or spoke friction drives and all web friction drives with holes in the web shall be entirely enclosed.

(c) All projecting bolts on friction drives where exposed to contact shall be guarded.

§ 50–204.172 Keys, set screws, and other projections.

All projecting keys, set screws and other projections in revolving parts shall be removed or made flush or guarded by metal covers. This does not apply to keys or set screws within gear or sprocket casings or other enclosures, nor to keys, set screws, or oil cups in hubs of pulleys less than twenty inches in diameter where they are within the plane of the rim of the pulley.

§ 50–204.173 Collars.

All revolving collars, including split collars, shall be cylindrical, and screws or bolts used in collars shall not project beyond the largest periphery of the collar.

§ 50–204.174 Couplings.

(a) Shaft couplings shall be so constructed as to present no hazard from bolts, nuts, set screws, or revolving surfaces.

(b) Bolts, nuts, and set screws will, however, be permitted where they are covered with safety sleeves or where they are used parallel with the shafting and are countersunk or else do not extend beyond the flange of the coupling.

GUARD STANDARDS FOR MECHANICAL POWER TRANSMISSION

§ 50–204.179 Materials.

(a) Standard conditions will be secured by the use of the following materials: Expanded metal, perforated or solid metal or wire mesh on a frame of angle iron or iron pipe securely fastened to floor or to frame of machine (see section 50–204.181).

(1) All metal shall be free from burrs and sharp edges.

(2) Wire mesh shall be of the type in which the wires are securely fastened at every cross point either by welding, soldering, or galvanizing, except in case of diamond or square wire mesh made of No. 14 gauge wire, ¾ inch mesh or heavier.

(b) Design of guards:

(1) Where it is necessary to change belts, make adjustments or apply oil or grease, guards shall have hinged sections or be removable.

(2) Guards shall be designed so as not to interfere with the usual machine operations, but give the maximum protection to the operator.

(c) Methods of manufacture:

(1) Filler material shall be expanded metal, sheet or perforated metal, or wire mesh and be securely fastened to frame.

(2) By welding to frame every 4 inches. By weaving through channel or angle frame, or if No. 14 gauge ¾ inch mesh or heavier is used, by bending entirely around rod frames.

(3) Where openings in pipe railing are to be filled in with expanded metal, wire or sheet metal, the filler material shall be made into panels with rolled edges or bound with "V" or "U" edging of No. 24 gauge or heavier sheet metal fastened to the panels with bolts or rivets spaced not more than 5 inches center to center. The bound panels shall be fastened to the railing by sheet-metal clips spaced not more than 5 inches center to center.

(4) Where the design of guards requires filled material of greater area than 12 square feet, additional frame members shall be provided to maintain panel area within this limit.

(5) All joints of framework shall be made equivalent in strength to the material of the frame.

§ 50–204.180 Disk, shield, and "U" guards.

(a) Disk guard: A disk guard shall consist of a sheet-metal disk not less than No. 22 gauge fastened by "U" bolts or rivets to spokes of pulleys, flywheels, or gears. Where possibility of contact with sharp edges of the disk exists, the edge shall be rolled or wired. In all cases the nuts shall be provided with lock nuts which shall be placed on the unexposed side of the wheel.

(b) Shield guards.

(1) A shield guard shall consist of a frame filled in with wire mesh, expanded, perforated, or solid sheet metal.

(2) If area of shield does not exceed 6 square feet the wire mesh or expanded metal may be fastened in a framework of ⅜ inch solid rod, ¾ inch x ¾ inch x ⅛ inch angle iron or metal construction of equivalent strength.

(3) Metal shields may have edges entirely rolled around a ⅜ inch solid iron rod. All material of shield guard shall meet the requirements of section 50–204.181.

(c) "U" Guards: A "U" guard consisting of a flat surface with edge members shall be designed to cover the under surface and lower edge of a belt, multiple chain, or rope drive. It shall be constructed of materials specified in table of section 50–204.181 and shall conform to the requirements of sections 50–204.183 and 50–204.184. Edges shall be smooth, and if size of guard requires, these edges shall be reinforced by rolling, wiring, or by binding with angle or flat iron.

§ 50–204.181 Approved materials.

(a) Minimum Requirements. The materials and dimensions specified in this section shall apply to all guards except horizonal overhead belts, rope, cable or chain guards more than 7 feet above floor, or platform. (For the latter, see table following section 50–204.184.)

TABLE OF STANDARD MATERIALS AND DIMENSIONS

Material	Clearance from moving part at all points	Largest mesh or opening allowable	Minimum gauge (U.S. standard) or thickness	Minimum height of guard from floor or platform level
Woven wire	Under 2"	½"	No. 16	7'0".
	2"–4"	½"	No. 16	7'0".
	Under 4"	½"	No. 16	7'0".
	4"–15"	2"	No. 12	7'0".
Expanded metal	Under 4"	½"	No. 18	7'0".
	4"–15"	2"	No. 13	7'0".
Perforated metal	Under 4"	½"	No. 20	7'0".
	4"–15"	2"	No. 14	7'0".
Sheet metal	Under 4"		No. 23	7'0".
	4"–15"		No. 22	7'0".
Wood or metal strip crossed	Under 4"	½"	Wood ¾" / Metal No. 16	7'0".
	4"–15"	2"	Wood ¾" / Metal No. 16	7'0".
Wood or metal strip not crossed	Under 4"	½" width	Wood ¾" / Metal No. 16	7'0".
	4"–15"	1" width	Wood ¾" / Metal No. 16	7'0".
Std. rail	Min. 15" / Max. 20"	See Standard for Railings Section 204.185.		