

SAFETY

HANDBOOK

Compliments of BellSystemleadpoisoning.com

WIRE PRODUCTS SHOPS

Western Electric
Company
INCORPORATED



June 1946

Western Electric Company

INCORPORATED

HAWTHORNE WORKS

**This Book of Safety Rules was issued by
the Safety Department and the Wire Prod-
ucts Shops to:**

Name _____

E. No. _____

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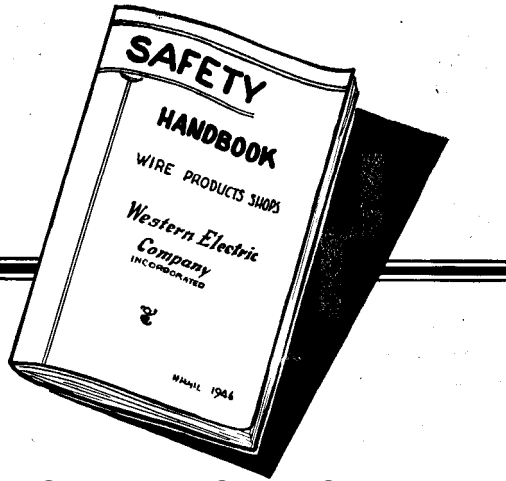
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**NO JOB IS SO IMPORTANT
AND NO SERVICE IS SO URGENT-
THAT WE CANNOT TAKE TIME
TO PERFORM OUR WORK SAFELY.**

BELL SYSTEM

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**IT ISN'T HOW OFTEN
 YOU READ IT—
 IT'S HOW WELL
 YOU KNOW AND
 APPLY IT**

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2. HEALTH SUGGESTIONS

- 2.1 Clean the teeth, gums and tongue daily, preferably before retiring.
- 2.2 At least twice a year, see a dentist.
- 2.3 Always wash your hands before eating.
- 2.4 Do not over-eat. This applies especially to meat.
- 2.5 Eat plenty of fruit and vegetables.
- 2.6 Take your time in eating, and chew your food thoroughly.
- 2.7 Have a thorough bowel movement daily.
- 2.8 Stand, sit, and walk erect.
- 2.9 Hold a handkerchief before your mouth when you sneeze or cough. Encourage others to do so.
- 2.10 Sleep eight hours. Never sleep with anyone suffering from a cold.
- 2.11 Go to the oculist every few years. Glasses worn now while reading may save you from the necessity of wearing them steadily a few years later, and in some cases may even prevent blindness.
- 2.12 Do not worry-it is a short circuit that burns out the storage batteries of the brain and nerves and destroys the power for activity.
- 2.13 If you are in normal health, stay that way. If you are not in normal health, get that way.
- 2.14 Select a doctor who wants you to stay well and is willing to look for slight functional defects-not one who thinks his only service is in treating the sick.
- 2.15 When you become sick, do something for your condition at once.
- 2.16 If you have a cold, protect other people. If the other fellow has a cold, protect yourself.

**IT IS EVERYBODY'S BUSINESS
TO BE CAREFUL**

2.17 Have an active interest in the people who work with you.

2.18 The common cold is responsible for more absence from work than any other single cause.

2.19 Neglected colds frequently result in tonsilitis, bronchitis, influenza, pleurisy, and pneumonia.

2.20 You may "catch cold" from a germ entering your nose and throat passages from the air expelled when an infected person talks, coughs or sneezes. You may catch cold by using an unwashed glass, spoon or fork which has just been used by someone with a cold. Washing your hands before eating or before touching your face will help prevent infection.

2.21 People who "take cold," in distinction to "catching cold" are often those who have poor circulation or some local infection in the nose or throat. Wearing either too little or too much clothing,, so that the body is chilled or overheated, often brings on a cold. If the skin is kept clean and healthy by a frequent warm bath, followed by a cold plunge or shower or a dash of cold water and a vigorous rubbing, the body can better stand quick changes of temperature.

3. HOME SAFETY

Observing the following few simple safety suggestions can prevent a large number of home accidents:

3.1 See that toys and other things are in a safe place after children have finished playing with them.

**SAFETY IS BOUGHT
ONLY THROUGH THOUGHT**

- 3.2 Keep stairways and hallways well lighted and free from obstruction.
- 3.3 Keep steps and guard railings in good repair.
- 3.4 Tack down or use backing on all loose rugs.
- 3.5 Cover icy steps and walks with sand.
- 3.6 Never stand on a chair box or bench to hang a picture. Use a stepladder.
- 3.7 Keep matches out of reach of children.
- 3.8 Keep cooking utensils well back on the stove, where children cannot reach them.
- 3.9 Never use gasoline or benzine for cleaning. Carry on your cleaning operations outdoors with non-flammable liquids. Better still, send your clothes to a cleaner who is properly equipped to do the job.
- 3.10 Never use gasoline, kerosene, etc., to start a fire.
- 3.11 Use a screen in front of an open fireplace.
- 3.12 Never start your car or keep your engine running in a closed garage.
- 3.13 Keep poisons out of children's reach and where there is no danger of their being picked up by mistake.
- 3.14 Never leave shells in a gun when it is not in use, and never look into a gun when cleaning it unless it has been taken apart or "broken."
- 3.15 It is a good practice to take a gun apart when it is not in use.
- 3.16 Take no chances with cuts and bruises. Clean cuts thoroughly and remember that a bruise over a bone may cause a bone abscess.
- 3.17 If you are a First Aid graduate, teach your family some of the fundamentals of First Aid.
- 3.18 Do not throw sweepings, contents of vacuum

**HORSEPLAY OFTEN SADDLES SOME-
ONE WITH A LIFE-LONG INJURY**

cleaner bags, etc., into a furnace fire, as a dust explosion may result.

3.19 Flat rubber rings, similar to those used on preserve jars, attached to the backs of rugs will increase the friction and reduce the possibility of their sliding on polished floors. A special rubber paint for this purpose is also available at department stores.

3.20 Rugs should not be placed at or near the head of a stairway, as they may cause a bad fall down the steps.

3.21 Furniture should be so arranged that no obstruction is in the normal path of travel.

4. MEDICAL SERVICE

41 Medical service is available at all times, day and night, 7 days a week. Report any injury to your immediate supervisor at once, who will make arrangements for you to go to the hospital for treatment. If at any time when away from the plant you have need of medical or surgical aid for an injury which you received while at work, call Lawndale 5000 or Cicero 500, ask for the hospital, and tell of your case.

In the event of an injury to an employee assigned to work away from the plant, medical treatment shall be secured at once at the most convenient location. Employee will be reimbursed for any expenses incurred in obtaining treatment.

4.2 Do not neglect any minor injuries, such as small cuts, bruises, scratches, burns and foreign objects in the eye. No injury is too small to require proper care. In case of a more serious accident, re-

**DON'T TRY TO SAVE TIME OR MA-
TERIAL AT THE RISK OF PERSONAL
INJURY -- YOU CAN'T WIN**



HAVE THE SCRATCHES TREATED, REGARDLESS OF HOW SMALL THEY ARE

port at once to the hospital. Have someone go with you.

4.3 After each treatment return the hospital pass to your immediate supervisor.

4.4 Regardless of how trifling your injury may seem it **MUST** be reported. The hospital and its staff are at your disposal. Let them decide the seriousness of your injury. A very trifling scratch may develop into a serious infection that will cause you untold suffering.

4.5 Homemade bandages are a source of infection. A makeshift or non-sterile bandage may be worse than none at all. Let the hospital attendants treat your injury.

5. HEALTH RULES FOR LEAD WORKERS

5.1 Personal cleanliness is essential to good health, particularly in working around lead.

5.2 Gloves should be worn at all times for this work, and so far as possible, the metal should be kept from coming in contact with the body.

5.3 Always wash your hands thoroughly and clean under finger nails before eating.

5.4 Make use of shower baths. Bath towels are furnished.

5.5 Follow the instructions of your supervisor and take every precaution to keep from inhaling lead dust, as it is harmful if taken into the body.

5.6 Respirators in regular use shall be washed with soap and water and filter pads replaced once each week.

5.7 The practice of chewing tobacco or eating anything on the job is prohibited among lead workers to prevent small quantities of lead from being swallowed.

**CARELESSNESS MEANS
INJURIES**

6. GENERAL SAFETY PRECAUTIONS

6.1 Goggles with hardened lenses are furnished by the Company without charge. They are used to protect the eyes from:

1. Flying objects and molten metal.
2. Injurious light and heat rays.
2. Acids and other corrosive liquids.
4. Dust and wind.

Goggles issued to one individual are not to be worn by anyone else.

When watching welding operations protect yourself with proper goggles to prevent eye injury from harmful light rays.

Goggles which have become broken or defective, do not fit, or are unsatisfactory in any way shall be reported at once to your supervisor, who will arrange to have necessary corrections made.

Ordinary spectacles are not sufficient protection and should not be worn in place of goggles. If you are wearing spectacles and require goggle protection, take the matter up with your supervisor.

When striking steel against steel you must protect your eyes by wearing goggles to prevent the possibility of a steel chip entering your eyes.

Do not slight the use of goggles wherever they are indicated as being necessary. In case of question, be on the safe side and wear them.

6.2 Use care in handling compressed air lines. Serious injuries have resulted from careless handling of compressed air.

6.3 Avoid all so-called "horseplay."

6.4 Do not handle or use materials of a dangerous nature except specifically directed by your supervisor.

**MAKE EVERY DAY A
"SAFETY DAY"**

6.5 Follow carefully the instructions in this booklet pertaining to your work.

6.6 Safety shoes for men and women are obtainable in a number of styles and are similar to other shoes except for a concealed steel toe cap which will withstand a heavy impact. This feature has prevented many serious foot injuries. All employees are urged to wear safety shoes.

These shoes may be purchased at cost in the safety shoe store at the south end of Building 38-3, at any time of the day. Your supervisor will give you permission to visit the shoe store on Company time.

Safety shoes may be purchased with no down payment and weekly pay deductions as low as \$1.25.

You are urged to wear safety shoes on all shop jobs. Your supervisor can give you further information regarding safety shoes.

6.7 Scissors are one of our most common tools in handling wire and in operating wire fabricating machinery. The following instructions cover scissors specifically:

Use scissors for their intended purpose-not as a screw driver or as a hammer.

Scissors are for cutting-not to be used as a brake for slowing up revolving heads.

Scissors should be tight and in good repair. If yours are not, exchange them for a new pair.

When scissors are not actually in use, put them in a safe place, preferably in apron pocket.

Scissors in use in the shop should have rounded points.

Be careful not to place them on machine frames where they may be jarred or thrown off.

Last-Always use scissors with the points

**CUTS NEGLECTED OFTEN BECOME
INFECTED--HAVE THEM TREATED**

turned away from you—Never toward your hand or other parts of your body.

6.8 To avoid becoming entangled, tight fitting clothing should always be worn around moving machinery.

6.9 Attend to your own work. Be careful not to distract the attention of your fellow workmen.

6.10 Be a "good housekeeper." Orderly working areas are safer places to work.

6.11 Do not attempt to operate any machine with which you are not familiar.

6.12 Always walk. It is much safer than running.

6.13 Do not under any circumstances handle any poisonous materials without first understanding their characteristics, and use.

6.14 Lifting

Strains and sprains are often caused by improper methods of lifting.

Heavy objects can be moved more safely, with greater precision and often more quickly with rollers, jacks, etc. If it is necessary for the work to be done by hand, obtain sufficient help to avoid straining. In lifting or moving heavy objects, the strength should be applied evenly and gradually. A secure position should be maintained to prevent slipping.

Learn to lift the RIGHT WAY to avoid strains; bend your knees, keep your body erect, keep your mouth open, then push upward evenly and gradually with your leg muscles. It is much easier and SAFER.

Do not over-exert yourself in lifting. Procure help. Do not lift empty platform skids alone. Ask for help. Remember that material you are lifting may slip out of your hands. Protect your feet as

**IF YOU DON'T KNOW THE SAFE WAY
ASK YOUR SUPERVISOR**

much as possible by keeping them out of the way. The wearing of safety shoes is recommended.

6.15 Use no equipment which is not in good condition.

6.16 Don't wear plain glass goggles at your work when prescription lenses are needed. See your supervisor.

7. CRANES

7.1 Only the authorized operator should operate a crane.

7.2 Crane operators should take signals from one man only.

7.3 If power goes off, move all controllers to the off position.

7.4 Get on and off cranes at regular landing positions only.

7.5 Do not climb from one crane to another.

7.6 When leaving crane cab, throw controllers to off position and open main switch.

7.7 Each crane is equipped with a rope, which is to be used as a means of reaching the floor in an emergency.

7.8 Crane cabs are to be kept free of tools or anything that may drop or be dislodged.

7.9 Be sure that hoist is centered over load before lifting, then lift carefully.

7.10 If possible, always avoid moving loads over people. If necessary to do so, ring warning bell.

7.11 Avoid making a side pull. Cranes are made to lift.

7.12 Crane Signals. (See Paragraph 10.4 of Section 10.

**YOU CAN SEE THRU GLASS GOGGLES
BUT NOT THRU GLASS EYES**

**SECTIONS 8, 9, 10 AND 11 - LEAD COVERED
CABLE.**

8. INSULATING & TWISTING

General Instructions

8.1 Because of the amount of scrap wire which results from the jobs in this department, be very careful to keep all loose wire off the floor and out of the aisles.

8.2 Electric truck operators should slow down and sound their horn in crossing all aisles and when approaching or passing through entrances from one building to another.

8.3 Be sure that each truck is properly loaded in such a manner that it is evenly balanced with no possibility of a spool of wire falling off the truck. Truck operators in piling wire should be sure that their pile will not shift.

8.4 Due to the heavy traffic in the main center aisle of Building 106-1, truck operators should avoid this aisle as far as possible.

8.5 Electric truck operators should always face in the direction the truck is going.

8.6 Be sure that you do not attempt to lift material too heavy for one man. Get help!

8.7 Do not leave scissors or other small tools on machines where vibration may shake them into revolving machinery.

8.8 Do not attempt any work other than that to which you are assigned.

8.9 Operators of paper slitting machines must wear gloves when setting up or adjusting knives.

8.10 Truck operators should carefully read the Safety Handbook for Operators of Industrial Trucks.

Pulp Insulating Machines

8.11 Goggles are required at all times on this work.

8.12 To minimize the danger of slipping, care should

be taken to keep all water mopped up as well as possible around these machines.

8.13 Always wash your hands before eating to eliminate possibility of contaminating food with dye or copper dust.

8.14 Rubber gloves are to be used when handling dye and acids, as they are both poisonous. Acid causes severe burns when it comes in contact with the skin.

8.15 Respirators must be worn when mixing dye to eliminate possibility of infecting nose and throat membrane from flying dye particles.

8.16 Extreme care is necessary in washing down pulp storage tanks. Slippery floors are particularly hazardous.

8.17 Gloves with leather palms should be worn when pulling wire through the furnace.

8.18 Take-up arbors should be pulled out slowly. not allowed to drop out quickly. If the arbors are allowed to drop out quickly, there is greater possibility of their jarring loose and falling on the operator's feet, causing injury. Keep your feet spread apart while doing this. If the friction brakes on these arbors do not function properly, notify your supervisor.

8.19 Exercise care with loose ends of wire. Make sure that they do not drop into revolving take-up reels. When thrown out by revolving reels, flying pieces of wire can be very dangerous.

8.20 Twisting machine operators must wear side screen goggles at all times. Do not clean goggles while standing in front of twisting machines which are running.

8.21 Never operate a twisting machine without all guards and gates in position.

8.22 Keep all material out of twister aisles.

**THE BEST SAFETY DEVICE KNOWN
IS A CAREFUL WORKER**

8.23 Never open gates until the twisting machine has come to a complete stop.

8.24 Make sure that reel locks are properly set in supply reel arbors.

Paper Insulating Machines

8.25 Insulating machine operators must wear safety caps and goggles at all times.

8.26 Do not wear loose clothing, particularly around insulating machines.

8.27 Do not attempt to untangle wire while the insulating machine is running.

9. STRANDING

(Safety goggles must be worn on this job)

9.1 In loading stranders, exercise care in lifting. Operator and helper should be careful to take a firm hold on the reel to be removed or loaded.

9.2 Strander operator or helper should carry only the number of polishers that he can safely handle.

9.3 When working on a machine, be sure the switch at that location is in the "off" position.

9.4 When guiding cable on core trucks, be very careful to keep your hand from getting caught between the core and the truck.

9.5 The reel tag should be fastened to the truck when it is not in motion.

9.6 When bringing up a broken pair the wire should be looped in the layer where the break occurred and the spot marked on each succeeding layer with chalk. No attempt should be made to pull the wire out in succeeding layers.

9.7 When removing core trucks from the machines, they should be guided carefully, as the castor wheels have a tendency to go in unexpected directions.

**AT WORK, AT HOME, AT PLAY,
DO THINGS THE SAFE WAY**

Stock Selectors

9.8 In loading trucks with full reels, two men are required.

9.9 In handling reels of wire, always wear gloves.

9.10 Before picking up the load of wire with an electric truck, stock selectors should make certain that the truck is loaded uniformly to prevent tipping.

9.11 Loaded pallets shall be handled in lots of 3 or less and no more than 4 empty ones. These should not be elevated above the top of truck uprights when moving. When stacking pallets, truck should be positioned, then pallets elevated to desired height.

Lathe Operators

9.12 Goggles are required at all times on this job.

9.13 Gloves should be worn by bench lathe operators.

9.14 When approaching the end of a reel, the speed of the rewinder should be reduced to lessen the hazard of whipping ends.

9.15 Empty reels should be placed out of the way and piled correctly to prevent falling.

Inspectors

9.16 Inspectors checking machines should be alert to the danger from turning trucks and operators loading drums. See Section 33.

9.17 When counting wire or checking the machine loading, the inspector should be certain that he has control of the switch at his location.

Oven Truckers and Tenders

9.18 Electric truck operators must be alert for pedestrians and other employees working in the area or walking out of oven doors.

DON'T TRY TO SAVE TIME OR MATERIAL AT THE RISK OF PERSONAL INJURY-YOU CAN'T WIN

9.19 When handling cable trucks, electric truck operators should be careful to avoid running or backing into other trucks.

9.20 Electric truck operators, before moving cable trucks, should make certain that they are firmly held by the grippers or hoist.

9.21 When loading elevators, always make certain that the spokes of the cable trucks will clear the doors.

9.22 Operators should not ride loaded elevators.

9.23 Do not remove cable from vacuum tanks without testing approach to see that it is safely set.

10. LEAD SHEATHING

Press Room Cranes

10.1 See Section 7.

10.2 In handling loads, be sure that the chains are hooked straight-no crossing. Crossed chains are liable to break. In placing the hooks on lead skids, it shall be placed through the eye of the skid from the inside. Use lead skids that are equipped with end guards. Be sure that the hoist is directly over, the load to prevent its swinging. In moving down the floor, carry the skids as far away from the main aisle as possible. Use the warning bell. In landing loaded skids be careful to place them squarely on the platform cross beams. Do not allow skid to strike lead kettle.

10.3 When removing or replacing die blocks, use special chain sling designed for this purpose. Make sure that the press operator places the safety guard in position through the eye bolts. Before lifting die blocks, see that a wood skid is placed under the front edge so that the block will slide out of the press without jerking. Do not attempt to service more than two press crews at the same time.

**BE CAREFUL WHEN OFF THE JOB
SO YOU CAN STAY ON THE JOB**

Crane Signals

10.4 The following signals are standard practice crane signals:

1. Hoist-Forearm vertical, make small horizontal circle with hand.
2. Lower-Arm extended, hand below hip, wave forearm downward.
3. Stop-Arm extended, hand level with hip, hold position rigidly.
4. Rack-(Move sideways) Arm extended, hand just above hip,, fingers closed, thumb extended horizontally; jerk hand in direction of racking.
5. Travel-Forearm vertical, hand open, wave forearm in direction of travel.
6. Emergency Stop-Arm extended, hand level with hip. Wave hand quickly from right to left.

Press Operations

10.5 Do not attempt to light a furnace unless you are authorized to do so. Before lighting, blow out thoroughly, start exhaust fan and blower.

10.6 Operators and helpers must wear goggles and gloves at all times to protect eyes from molten metal and to protect hands from burns.

10.7 To avoid the hazard of "blowouts" always allow the full cooling period, which shall start when the pressure is applied upon the lead. Time elapsed in filling cylinder and setting ram is not considered cooling time.

10.8 Be sure that the temperature of the kettle does not exceed the indicated limits. Excessively hot lead will change the cooling cycle and a "blowout" may result.

**BETTER A DELAY THAN
AN INJURY**

10.9 When removing cylinder bolts from press, handle them carefully. Do not drop them-place them on floor.

10.10 When changing die blocks always place a block of wood between cylinder and chain to prevent cylinder from falling and breaking stay chains.

10.11 Keep floor clear around machines.

10.12 Don't use stairs leading to loading platforms to store tools.

10.13 Place "blowout" guard in position after making changes and before starting to extrude.

10.14 Either press operator or helper shall remain with the press at all times.

10.15 Apply pressure-slowly when starting extruding operation.

10.16 Use burlap pads for protection to hands when handling sheath.

10.17 Always use wooden bar to remove loaded reels from take-up rolls. Look in each direction before moving reel.

10.18 Operators or press helpers shall not go to the reel yard to obtain empty reels. Experienced men shall always bring reels through the buildings to prevent injury to pedestrians.

10.19 Wear respirators when drossing kettles.

Casting Antimony Billets

10.20 Always wear goggles when casting billets. Always wear jumpers, overalls, undershirts, gloves and leggings, which are provided for this job.

10.21 Heat ladle before dipping it into molten metal to prevent the spattering that occurs when a cold ladle contacts hot metal. Molds and ladles should be greased with mutton tallow to prevent molten metal from adhering to them.

— SAFETY —
FIRST, LAST AND ALWAYS

10.22 In loading billet kettles be sure that the lead pigs are dry. Wet pigs will generate steam, causing molten metal to be thrown from kettle.

10.23 Be alert to prevent overheating.

10.24 In cleaning or drossing kettles wear respirators and goggles.

10.25 Before dumping billets from the molds, be sure that they are solidified.

Tape Armoring

10.26 Goggles are required at all times on this job.

10.27 During the armoring operation of corrosion resistant cable upon which mica dust is used, respirators shall be worn.

10.28 Wear gloves at all times during the armoring operation.

10.29 Remove compounds from hands with cold cream and industrial towels.

10.30 When necessary to clean machine parts, use carbon tetrachloride.

10.31 Overalls and jumpers are furnished for this job. Avoid wearing loose or torn clothing near armoring machines. Clothing of this type can easily get caught in revolving machinery.

10.32 Operators and machine helpers shall be at their proper locations before machines are started.

10.33 Machine operators shall make certain that the machine is clear, and sound starting signal.

10.34 Guards shall not be opened before machine comes to a full stop. All guards shall be closed before machine is started.

10.35 Electrical hoists must be used for handling pads of steel tape.

10.36 All oiling of armoring machines will be done by the Machine Maintenance Department.

THE REST SAFETY DEVICE KNOWN
IS A CAREFUL WORKER

10.37 Cranes have been provided for spotting loaded supply and take-up reels, but at present are not in service. Special care must, therefore, be exercised. In moving reels, use the approved method and secure the necessary help.

10.38 It is very important that all used rags and waste be thrown into the containers provided for this purpose.

11. CABLE REEL BUILDING, HANDLING AND REPAIRING

11.1 Good Housekeeping

Exercise every precaution against allowing reels, parts of reels, lags, etc., with nails in them to remain where they might be stepped on. Due to the variety of hazardous materials "good housekeeping" is extremely important. Safety shoes are recommended for all operations on reel building, handling, and repairs.

11.2 Building

Side screen goggles are to be worn when working on this job.

The rolling of reel heads is an extremely hazardous job. Be sure that you understand the following instruction before attempting it. Be alert to keep away from a head which may be tipped by a gust of wind. Be sure your trucks are on solid ground when they are being loaded or unloaded. Use care in removing heads from trucks so that the weight doesn't become unbalanced, causing the truck to tip. Be sure that your feet are in the clear before allowing the head to drop from the truck to the ground. In storing heads be sure that they are placed at the proper angle to avoid sliding and tipping.

All saws, nailing machines, boring mills and drill presses are provided with guards. Be sure that they are in place and in good order before starting work. Material to be used in any of these machines should be securely fastened. Do not wear loose clothing around these machines. Tables of these machines

should be cleaned with a brush, not with your hands.

When handling reel heads, be sure that you have solid footing and have sufficient help to keep the heads from falling.

The reel shop floor must be kept clean. Particularly, it must be kept free from boards and small pieces of lumber containing nails. When finished with a tool, return it to its proper place.

All large reels require two men to turn them.

Before handling steel drums make certain there are no tears in the metals, or burrs which are hazardous.

Assembling heads to the steel drums of the larger types of reels requires four men. It should never be attempted with a fewer number.

Small reels, which are sometimes placed in piles should never be piled more than four feet in height.

When reels are to be painted, care should be taken not roll them out to the paint booth faster than they can be handled.

Never use defective bushings. Use only bushings that do not have to be forced into the heads.

11.3 Lagging

Operators and helpers shall wear goggles with acetate sideshields and gloves while on this job.

Operators must use care when cutting steel tape-bend the ends up and backward immediately after cutting

See that compressing cable is in good shape. Keep hands clear when tightening cable.

When releasing reel from machine, watch position of other workers.

**WHEN YOU LOSE YOUR TEMPER
YOU LOSE YOUR RESISTANCE
TO INJURY**

In removing lags from trucks or stacks, always make certain that there are no loose lags clinging to the bundle which you are handling. Scrap iron should be removed from bundles by cutting with a hatchet.

11.4 Handling

When rolling reels away from cars or from doorways, be alert to avoid striking anyone coming from doors or from behind cars. Be extremely careful when rolling reels across the street, making certain that no one is near before allowing the reel to roll freely. Do not roll reels too close to anyone ahead. Care should be exercised in removing reels from the crane stand. Avoid being directly in front of them when they come to the rolling position. Nails are too often picked up by the rims of the reels and are very hazardous to hands. Leather faced gloves should always be worn on this work.

Never attempt to right a fallen reel alone. Never attempt to catch a falling reel.

11.5 Tractors and Trucks

Do not attempt to drive tractors or trucks unless you are thoroughly familiar with their operation and are authorized by your supervisor to drive. Slow up and sound your horn at all doorways and before entering the street. Feet should always be inside of the bumpers-never dangling from the side or allowed to rest on top. In handling loaded lag trucks always make certain that they are not overloaded to the point where lags may become dislodged during the operation. Tractor operators in our yard should be constantly alert to pedestrian and truck traffic. Report immediately any failure of your equipment. Read your Safety Handbook for Operators of Industrial Trucks and follow its instructions.

11.6 Reel Yard Cranes

See Section 7 on Cranes.

Exercise due caution when climbing crane structure ladders. They are at times covered with ice and

snow. Never lift reel until absolutely certain that the hooks are secure in the reel bushings. Never transport a cable over the heads of other workmen.

11.7 Loading and Storing

Men working on loading platforms should be especially careful that they have a firm footing when handling reels near the edges of the platform.

Protruding nails and other objects are very hazardous in handling reels. Remove them at once.

In loading trucks care should be taken to see that they are properly blocked before rolling reels onto them.

Freight car doors are opened and closed in the following manner: A hook is provided for the handle and while one man with this hook pulls the door open or shut, another man helps from the rear edge of the door.

Freight car floors often have nails and other objects fastened to them, which are hazardous. For this reason never work in a car which is not properly lighted. Inspect car floors carefully.

When loading reels of cable into freight cars, care must be taken that you are not caught between reel and car.

Be sure that your fingers, arms and feet are well in the clear before starting to turn reel.

11.8 Repairing

When dismantling reels, make certain that all of your tools are in good condition. Handle wrenches away from reels to avoid bruised fingers and knuckles. In placing "helpers" wrenches, hold them properly when driving them into the wooden head, to avoid crushed fingers. When driving out bolts make sure there is no possibility of hitting anyone passing on the other side. In removing drum lags make certain that both heads will fall against the guards on the last lag that is removed.

Read Paragraph 11.2.

**SECTIONS 12, 13, 14, 15, 16, 17, 18, 19, 20 and 21,
SWITCHBOARD CABLE, MAGNET WIRE AND
SWITCHBOARD WIRE.**

12. WIRE WINDERS

12.1 Side screen goggles must be worn at all times while operating wire winding machines or standing in their vicinity.

12.2 All reel guards must be placed in the running position before starting the motor.

12.3 Operator should never stand directly in line with either supply or take-up reels. Stand at one side to avoid the danger of being struck by flying ends of wire from supply reel.

12.4 Keep all tools off lathe base to avoid the hazard of their dropping due to machine vibration.

12.5 Keep scissors sharp with the points rounded.

12.6 Examine all spools before using to guard against broken flanges and split centers, which may be thrown out when the machine is in operation.

12.7 Place all empty supply reels in a safe location where no one will trip over them.

12.8 Place all remnants of wire in a scrap basket; never leave them on the floor.

13. CABLE WINDERS

13.1 New employees must spend two full days observing the speeds and the winding practices of an experienced operator before attempting to do this work. The weight of revolving spools and the speed necessitates close attention by the operator to assure safety.

13.2 Make sure that both take-up and supply reel arbors are securely locked in place.

13.3 Always be alert to stop machine quickly when necessary. Do not attempt to stop or slow up a fast revolving reel with your hand.

13.4 When end of cable reaches the measuring device, the operator should step to the left to avoid the possibility of being struck by the whipping end.

13.5 Do not attempt to remove take-up arbor until the lowering device has placed the reel in a safe position for removal from the machine.

13.6 Always be certain that the brakes on supply reels are in good working order.

13.7 Be very careful when using the cable cutter. Keep hands as far as possible from the cutting edge.

13.8 Roll finished reels of cable forward to avoid the possibility of getting your feet under the reel heads.

14. COTTON PROCESSING

14.1 A new employee is not to be placed on a machine until she has observed the operation and the machine's various functions for one-half day.

14.2 It is imperative that safety caps be properly worn to preclude the possibility of hair being caught in revolving spindles. Make sure the hair is completely covered.

14.3 To prevent injury by being caught in moving machinery, loose sleeves and clothing should not be worn. Rings should not be worn while operating machines.

14.4 Scissors should not be placed on any part of the machine.

Use scissors for their intended purposes-not as a screw driver or as a hammer.

Never use scissors as a brake for slowing up revolving heads.

Scissors should be tight and in good repair. If yours are not, exchange them for a new pair.

**A CLEAN MACHINE IS AN IMPORTANT
FACTOR IN SAFETY**

When scissors are not actually in use, put them in a safe place, preferably in apron pocket.

Scissors for use in the shop should have rounded points.

Be careful not to place them on machine frames, where they may be jarred or thrown off.

Last-Always use scissors with point turned away from you-never toward your hand or other parts of your body..

14.5 Always pull pans along the floor. It is much better to pull them than to attempt to push them.

14.6 Have the porter assigned to your area deliver pans if they are piled too high.

14.7 Keep the aisle clear near the machine.

14.8 Climbing over conduit is not permitted. Use the aisles.

14.9 Operators should never attempt any sort of repairs to machines. Notify your supervisor when repairs are necessary.

14.10 Carefully examine all paper tubes, discarding any defective tubes. Be sure winding spindle is properly expanded and tightening pin removed before starting head.

14.11 Have any sharp edges or burrs removed from springs.

14.12 Bating lunch nearer than fifty feet from where dye materials are stored or used is not permitted.

14.13 Respirators and rubber gloves should always be used in handling dye materials. After handling dye materials always wash your hands and clean fingernails before eating.

14.14 When leaving aisles make certain that no electric trucks are approaching.

**THINK SAFELY AND
LIVE SAFELY**

14.15 Wear gloves in handling cases and crates. Obtain help to lift heavy objects.

14.16 Always pick up loose nails from the floor.

14.17 All protruding nails on packing cases must be removed before any materials are removed from the case.

15. TWISTING

15.1 Goggles must be worn at all times while operating twisters.

15.2 The combination safety latch and reel retainer must be in proper position before machine is set in motion. This prevents the possibility of the reel slipping from position.

15.3 Examine each reel carefully before using, to make sure that flanges are not cracked and that the cores are intact.

15.4 Sliding guards must be in the closed position when the machine is running.

15.5 Report all excessive oil leakage to your supervisor.

15.6 Exercise caution in lifting reels to the supply rack. Let your legs do most of the work.

15.7 A firm hold with the right hand on the bottom and the left hand on top is the proper way to handle reels.

15.8 The use of a good shop apron is recommended for operators running twisters.

15.9 Watch the spring tension on brake arms. Improper tension causes wire breakage, which is hazardous.

**DON'T DEPEND ON OTHERS
LOOK TO YOUR OWN SAFETY**

18.2 Textiles should be firmly pressed down and locked under retaining springs, to prevent the cops being thrown out of the machines.

18.3 Be sure both supply and take-up are securely locked in position.

18.4 Examine all reels before using, discarding any that are bent or have defective cores.

18.5 Report any excessive oil leaks immediately.

18.6 Use care in handling scissors at these machines. Don't permit them to come in contact with revolving textile carrier.

18.7 Scissors must be sharp and the points rounded.

18.8 Operators should avoid carrying spools of supply wire or textiles in excess of fifteen pounds.

19. PAINTING MACHINES

19.1 Because of the benzene used in the painting mixture, the hazard of fire is always present.

19.2 As far as possible, avoid breathing in the fumes while operating this machine, especially when mixing paint.

19.3 Washing hands in benzene is not permitted. Hand cream is provided for your protection.

19.4 Reels must be securely locked in both supply and take-up arbors by spring retainers before starting machine.

19.5 Be sure the ventilating fans are operating properly. This protects against the hazardous fumes and facilitates drying.

19.6 Keep machine and floor clean.

19.7 If it is necessary to leave the machine for more than 10 minutes, remove all waste from the stuffing box.

20. INSULATING

20.1 Goggles must be worn at all times.

20.2 Safety caps must be worn by all women operators while working around insulating machines. Never wear loose clothing or rings while operating machines.

20.3 Scissors should be grasped firmly to prevent their slipping from oily hands.

20.4 Clutches should be released prior to starting the machine.

20.5 Stand directly in front of the unit to eliminate the possibility of contact with an adjacent unit when replacing textiles.

20.6 Hold the No. 215 supply spools firmly on both sides when placing them in the machine.

20.7 The unit should be at a complete stop before attempting to cut the textile. Wait until it stops; do not use any object to assist in slowing up the machine.

20.8 Report any mechanical defects immediately.

20.9 Employees are urged to wear shoes that afford adequate protection. Soft soled shoes are not desirable.

20.10 In handling wire after making a braze, be careful to avoid burns.

20.11 Keep adequate supplies stored properly in the machine bins.

20.12 After removing take-up reels from the machines, place them in the proper racks, not in the aisles. Someone may fall over them if they are not in their proper location.

20.13 Handle one supply reel at a time to avoid the added weight and the possibility of dropping the additional reels.

TAKE CARE -NOT CHANCES

20.14 Be sure all hand tools are in good repair.

20.15 This work requires that you give close attention and consideration to operators adjacent to you.

20.16 Make certain of your footing around these machines. Avoid slipping or stumbling.

20.17 Do not use scissors for forcing cops on spindles. They may slip and an injury result. Use scissors for their intended purpose-not as a hammer or screw driver.

20.18 Keep floors clear of wire and scrap textiles. "Good housekeeping" is important.

21. MAGNET WIRE INSULATING

21.1 Insulating heads of these machines should never be stopped or slowed up with your hand. A severe injury may result if the hands are used.

21.2 Goggles and safety caps must be worn when working in the vicinity of these machines.

21.3 The wearing of rings and bracelets while working on these machines is prohibited.

21.4 Be careful of the hazard of lifting excessive weights. Obtain help when in doubt.

21.5 Care must be exercised to make certain that your hands do not contact adjoining heads while they are in motion.

21.6 Be very careful in the use of scissors.

Do not use scissors in place of screw drivers, hammers, etc.

Do not use scissors with dull or loose cutting blades.

Do not use scissors to stop momentum of revolving insulating heads.

Do not cut wire toward the hand. Cut away from the hand.

Do not use scissors having sharp points (Improperly ground).

Do not retain scissors in hand while removing wire from reels.

Do not place scissors on machine while machine is in motion. Vibration may cause them to fall into revolving machinery.

Do not use scissor blades as a knife.

21.7 Do not use defective screw drivers:

21.8 Do not place hand back of screw driver blade when tightening set screws in guides. Avoid puncture wounds by keeping hands in the clear.

21.9 Always have set screws replaced if the slots are worn.

21.10 Be prompt in reporting illness or other disabilities to supervisors.

21.11 Always use canvas pads to guide wire when winding from one spool to another.

21.12 Do not attempt to place wire around capstan on 16 head insulators when head is in motion. Injury may result from being caught in a loop of wire.

SECTIONS 22, 23, 24, 25 ENAMELED WIRE, TINNED WIRE AND COMPOUNDS.

22. FINE AND HEAVY WIRE ENAMELING MACHINES

22.1 Do not stand on machines. Use the ladders that are provided. When necessary to move them pull rather than push them; if defective, report immediately.

22.2 Never leave dirty or greasy rags and waste lying about. They are a fire hazard. Always place them in the receptacle provided.

22.3 Before inserting a steel rod to clean condensate from the ovens, be sure to disconnect the heat switch and protect the hands with gloves.

22.4 Tools, oil cans and machine parts must not be left on top of folding ladders. A jar may topple them down and an injury may result.

22.5 Machine tools must be kept clean and free from scrap wire at all times.

22.6 Do not carry matches when working on enameling machines or when mixing compounds.

22.7 Never attempt to change speeds on flat type machines while they are running. To do so causes excessive strain on gears, which might result in dangerous breakage.

22.8 Wear goggles when cleaning machines.

22.9 Do not carry things in your hands when going up or down ladders. Keep trousers turned up and shoe strings tied.

22.10 Always keep catwalks clear.

22.11 All loose and defective wire must be kept in pans under the reeling machines.

22.12 Care must be exercised during a machine cleanup to guard against the danger of dropping tools or apparatus from the tops of the machines.

22.13 When cutting defective wire from a spool, place the spool in a rack on the take-up stand of the machine and cut with a knife, using a downward stroke.

22.14 When removing scrap from No. 215 spools, wear goggles.

22.15 Step ladders should always be fully opened before using. Do not attempt to over-reach from a ladder. Get off and move it.

22.16 Report all burnt out lamps in oven or ceiling fixtures in order to insure adequate light at all times.

22.17 Operators are not to remove and insert fuses on any machines. All electrical work will be done by the Works Service Departments.

22.18 Always remove burnt or sticky wire from the oven before attempting to repair a break. This will prevent cuts from the burnt wire.

22.19 The operation of all fire apparatus is covered

**A CHANCE TAKER IS AN
ACCIDENT MAKER**

individually with each operator. Be sure you are familiar with all the procedure.

22.20 Many cases of personal injury are the result of improper lifting of heavy objects. Guard against strained and wrenched backs by lifting in the proper manner. Get help for the heavier pans.

Bending over at the waist and lifting throws an excessive strain on the muscles of the back and should be avoided. When it is necessary to lift heavy objects, bend the knees and hips keeping the back as nearly vertical as possible. This allows the leg muscles to come into play and relieves the strain on the back.

23. TINNING MACHINES

23.1 In the operation of the tinning machines the following safety equipment is furnished each operator. Never operate the machines without any of it.

Goggles

Two pairs of canvas gloves

Sleevelets

Heavy sweat shirts

Safety shoes recommended

23.2 Check location of nearest water supply.

23.3 If acid is splashed on the skin or clothing or in the eyes, wash the acid off immediately with large quantities of water. Direct the water so that it will run under the clothing.

23.4 Always wear rubber gloves when working with acid.

23.5 Exercise extreme caution to prevent acid spillage.

23.6 Caution must be exercised to prevent water

**INJURIES CAN BE PREVENTED
IF YOU DO YOUR PART**

from coming in contact with molten tin. Water will cause the tin to splash violently.

23.7 When removing a die be sure that the steam leading to it has been shut off. Lock die securely before steam is turned on.

23.3 Always wash the hands thoroughly before eating.

24. CAUSTIC SODA TANKS

24.1 One man on each shift is solely responsible for operating this equipment. He must wear goggles, sleevelets, rubber apron, rubber gloves, and wooden-soled shoes. All cleaning and operation of the equipment is his responsibility. However, everyone working in this location should familiarize themselves with the location of the showers and the emergency spray heads.

24.2 If any caustic soda solution comes in contact with the skin or clothing, it should be diluted immediately with large quantities of water.

24.3 Caustic soda should be added to the tanks slowly, taking care to prevent its forming lumps or cakes.

25. COMPOUND ROOM

25.1 While mixing, pouring and molding hot compounds, paints and varnishes, goggles, respirator gloves and leggings must be worn.

25.2 Mixtures used in the manufacture of lacquer, paint, varnish and compounds are highly flammable. Special individual instructions covering the methods are given to each man. Never attempt to do any work of any sort in this location without being fully instructed.

25.3 Do not wash hands in alcohol, benzine or turpentine because of the danger of fire.

25.4 Always keep aisles and emergency exits clear.

SECTIONS 26, 27, 28, 29, 30, 31, 32 ROD AND WIRE MILL.

26. GENERAL RULES FOR ROD AND WIRE MILL

26.1 Be sure to lift properly if you are handling a heavy object, but do not try to lift a very heavy weight alone. Always get help.

26.2 Do not wear overalls or jumpers which are badly torn. They might get caught in machinery. Keep wrists and arms protected against burns and scratches.

26.3 Wear your safety shoes-especially in Wire Mill where you come in contact with so much heavy material.

26.4 Don't wear shoes until soles become too thin. Thin soles offer little protection against puncture wounds, etc.

26.5 Don't wear gloves which are too greasy or badly worn.

26.6 Wear goggles at all times in the vicinity of wire drawing machinery.

26.7 Keep all nails off the floor.

26.8 Never remain under monorail while crane is moving overhead.

26.9 All spools, empty or otherwise, should be piled safely and neatly. Under no circumstances should spools be thrown, since such practice tends to loosen or burr the heads, which may cause an injury to someone handling them later.

26.10 Never stand directly in front of machine take-up while machine is running.

26.11 Do not start machines being repaired until authorized by repairman.

26.12 Never use pliers with sharp points.

26.13 Regulate blowers or ventilators to satisfy the average man rather than individuals.

SAFETY PAYS BIG DIVIDENDS

26.14 Always have both steel sides in skids of wire whenever you handle them. Particular care should be given to insure proper nesting and to guard against spools falling out of annealing furnace skids.

26.15 Electric truck operator should not depend on his horn. With so much noise around machines, the horn may not be heard.

26.16 Rubber gloves and proper goggles should be used at all times while flushing machines with caustic soda.

26.17 Operators should always go to a proper station to change cranes or to get on or off cranes.

26.18 When a load is properly hooked up, the crane operator should watch the spotter and other operators so as not to raise the load until the spotter and operator step aside.

26.19 Crane operator should not raise or lower a load when crane is moving.

26.20 An electrician must be called when fuses are to be changed or other electrical work is to be done on cranes. All electrical work will be done by the Works Service Departments.

26.21 Precautions must be taken and operator must slow up when crane is making a switch or going through a switch. A switch out of line may cause a head injury to crane operator.

26.22 When training a new employee on a crane, the operator should be sure that the new employee has safety belt on and attached to frame before starting crane.

26.23 Crane operators should not pass over anyone when the crane is loaded.

**SAFETY ON THE JOB MEANS
HAPPINESS IN THE HOME**

27. NO. 1 MACHINES

27.1 Side screen goggles must be worn at all times when in the machine area.

27.2 Operators should be careful to have proper footing before loading full spools of supply wire on skids and when pulling rod from supply racks to steel plates back of machines.

27.3 Do not use files without handles.

27.4 Use only bolt cutters which are in good condition and see that they are kept in their proper location at the welder.

27.5 Do not handle rod feeding into the machine while machine is in operation.

27.6 All guards are to be closed when machine is in operation.

27.7 When handling coils-of rod push them with the rod pushers.

27.8 "Good housekeeping" is imperative around these machines.

27.9 Do not operate machine with a capstan which has the edge chipped or which has a deep groove worn in it. This causes the wire to cross.

27.10 Operators must not stand below crane when it is in motion.

27.11 Do not take wire out of the machine until it has come to a complete stop.

27.12 Do not pile empty supply spools more than three high between the machines. Spools are liable to fall if piled higher.

**DON'T DEPEND ON LUCK
BE CAREFUL**

28. NO. 2 MACHINES

28.1 Side screen goggles are required at all times when operating these machines.

28.2 A new machine operator should not attempt to operate these machines without a full knowledge of the precautions required in the machine's operation.

28.3 Be very careful to keep all oil and grease cleaned up around these machines.

28.4 Keep machine aisles clear of loose wire.

28.5 Do not place anything on top of the machines.

28.6 Do not handle wires in the machine while it is running. Severe cuts may result.

28.7 Be sure that your file is equipped with a handle.

28.8 Examine all reels for fins and burrs. These may cause cuts when the reels are handled.

28.9 Be alert for the hazard of burns at all times, especially when removing wire and brazing.

28.10 Spool guards must be kept closed at all times.

28.11 Be sure that spool anchors are clamped in place.

28.12 Spool arbor drive plates must be kept tight at all times.

28.13 Caution must be exercised when stringing the machines to avoid punctures to the hands.

28.14 Remove supply wire from skids by turning spool on its side and then rolling it off the skid.

28.15 Avoid overfilling spools.

28.16 Exercise caution when entering main aisles from machine aisles.

28.17 Empty spools should always be stacked—never left on the floor.

**IT TAKES LONGER TO REPORT AN
INJURY THAN TO PREVENT ONE**

28.18 All cloths used for cleaning and wiping should be placed in the proper container.

28.19 Clean machines are important. Good operators cooperate with one another in keeping their machines clean.

28.20 Under no circumstances should gloves, files, or other materials be placed in the die stringer or drive compartments of the machines.

29. NO. 3 MACHINES

29.1 Side screen goggles must be worn at all times around these machines.

29.2 Do not use long nosed pliers with sharp points, which may cause puncture wounds.

29.3 All take-up guards must be closed while the machine is in operation.

29.4 Care should be taken to keep all oil and grease cleaned up around machines.

29.5 Exercise care in handling trays of wire to prevent their overbalancing.

29.6 All scrap wire should be removed or put in a proper container immediately.

30. DIAMOND DIE LABORATORY

30.1 Goggles should be worn at all times.

30.2 Sharp tools used for lapping dies must be handled carefully. These tools shall not be left lying on the bench.

30.3 Care must be exercised in handling acid. Wear rubber gloves and goggles.

30.4 Report all defective tools and machinery.

30.5 When opening oxygen tank valve, first make sure that the regulator screw is fully released.

30.6 Be sure that all files are equipped with handles.

30.7 Leather gloves should be worn when making chilled iron dies.

30.8 Sharp points on reamers used for making dies should be broken off.

- 30.9 Never use hands or fingers to throw belts on or off hand cutting lathe. Always use belt tool that is provided.
- 30.10 When putting belts on pulleys of lapping machine be sure the machine is stopped.

31. ELECTROLYTIC ROOM

- 31.1 Never work alone in this area.
- 31.2 Cup type goggles and wooden-soled shoes must be worn when working in this location.
- 31.3 Care must be taken in stacking electrodes to prevent them from slipping and falling.
- 31.4 When putting acid in dip tank, wooden-soled shoes, cup type goggles, and rubber gloves must be worn.
- 31.5 While working in the electrolytic rooms wear two pairs of gloves at all times-one canvas and one leather faced-the canvas gloves to be worn inside.
- 31.6 Gloves should be changed frequently and allowed to dry.
- 31.7 Use care when storing or handling carboys of acid to prevent the acid from burning your clothing or body. See that all acid carboys are properly labelled.
- 31.8 Always wear acid dipper's goggles and rubber gloves when working with acid.
- 31.9 When handling acid check the nearest supply of clean water and see that it is available for emergency use in case acid is spilled.
- 31.10 If you get acid or alkali on any part of your body or in your eyes, wash the place immediately with large quantities of clean water, using the drinking fountain if convenient, and then report to your supervisor.

**IT IS EVERYBODY'S BUSINESS
TO BE CAREFUL**

- 31.11 Wash gloves in fresh water before taking them off to remove all acid or alkali. This will prevent possible burns when you touch the gloves.
- 31.12 Trucking of acid carboys from one location to another should be done with an approved carboy truck.
- 31.13 When a carboy has been emptied of acid, it should be washed out and tagged to denote that it is empty and clean.
- 31.14 Drums of acid should be stored in a cool place, with the bung up.
- 31.15 Pour acid into water slowly and cautiously. Never pour water into acid as it will react violently and may burn you seriously.

32. ROD MILL

- 32.1 Rod Mill operators must protect their eyes by wearing goggles at all times.
- 32.2 Specific instructions for operation of the billet furnace will be found near the burner control.
- 32.3 Rod Mill "catchers" must be carefully alert at all times and for maximum safety observe the following precautions:
- Avoid being struck by the rod by never walking in front of the delivery pipes. Always step over. Watch the catcher ahead of you before starting the bar.
- Avoid injury from falling by exercising every precaution to prevent slipping when working scrap out of the looping pits.
- Catchers must watch the movements of a man working in the looping pits.
- For safety, use only a moderately sharp ax and one with a tight handle.
- Warn your fellow workers quickly if a rod tangles or breaks; they may not have seen it.
- To avoid any possibility of becoming entangled, coiler operators must not step over the rod conveyor unless the coiler is shut down.

Look against the direction of travel of hot rod so you can instantly detect any variation if it tangles or jams.

Keep your safety shoes in good condition.

Leather puttees are furnished. Wear them for your protection.

33. INSPECTION

33.1 General

Inspectors are required to wear and use the same protective equipment as prescribed for operators working in the same area. Inspectors should read all sections of this handbook, paying particular attention to the section which covers the material which they are inspecting. Since much of our inspection work involves handling wire, inspectors should make certain that all scrap wire is placed in the proper containers. Many scratches can be avoided by using gloves when handling wire. In performing counting and packing jobs, do not attempt to lift heavy loads alone. Your inspection work necessitates traveling through many different locations. Do not enter restricted areas where goggles are worn unless you are wearing them. A fall on the slippery floor may be serious; proceed with caution in areas where lubricants are used.

33.2 Lead Covered Cable Inspection

To avoid slivers and to minimize electrical shocks, leather gloves are furnished for use in the ringout operation. To avoid possible injury, inspectors should not attempt to roll reels or move the end of cable. Call a floor hand trained to roll reels or move cable ends. Do not remain between test positions while the crane is loading adjacent positions. It is difficult for the crane operator to see unless you step back. When handling D. C. Insulation Resistance, do not touch the test leads after the tester has signalled; a severe shock may result. To prevent the possibility of a high voltage shock, testers should not place their hands in the back of a D. C.

test set. In case of trouble notify the Maintenance Group. To avoid a tripping hazard always pick up your test leads. When it is necessary to move the transformer truck obtain help from a floor hand. When operating the high voltage test set do not allow anyone in the immediate vicinity of the cable under test.

To avoid the danger of falling over chairs, testers should always place chairs in their designate³ places.

A lead sheath inspector must always wear goggles to protect his eyes against possible injury from molten lead and other hazards.

When inspecting sheath and handling samples, care must be exercised to avoid burns.

Inspectors in the pressroom area must be alert to crane movements, thus aiding the crane operator to avoid carrying loads over anyone's head.

To avoid possible danger from "blowouts" inspectors should not stand directly in front of the press when operation is starting at the beginning of a charge.

When taking samples of alloy from kettle spouts or billet kettles, wear gloves in addition to goggles and handle the ladle carefully to avoid spilling the molten metal.

When sawing samples, hold the pipe with the clamping fixture. An injury may result from the saw blades if the pipe is held with the hands.

Never step in front of a take-up reel without first making sure the pressmen are not in the act of pushing the reel from the rolls.

Before operating the arbor press be sure no one is close enough to be struck by the descending handle.

Read and heed the general precautions for workers around lead found under the lead sheathing section of this booklet.

**INSPECTION POINTS THE
WAY TO PROTECTION**

33.3 Inspection of Wire

Inspectors should read carefully the sections of this book covering the Wire and Rod Mill, Enameled Wire and Magnet Wire.

When through ringing out reels on pallets, give them 1/4 turn.

When inspecting 60 pounds or heavier spools of wire, wear foot guards in addition to safety shoes.

Keep scrap wire in containers.

When removing or replacing side panels in annealing baskets, be sure the panel is in the guide channels.

Inspectors of enameled wire should note the condition of the wooden sample boxes and remove from service any splintered or broken boxes.

All wire inspectors should watch for steel slivers on spools.

Remove any defective spools from service. The next person to handle them may not notice the defective condition.

33.4 Switchboard Cable Inspection

The precautions listed under Sections 13, 14, 15, 16, 17, 18, 19, 20, 21, are to be followed by inspectors of switchboard cable and wire.

In addition the following specific items require careful attention:

When using switchboard cable breakdown testing equipment, do not attempt any repairs or adjustments. Call the Testing and Equipment Maintenance Group.

Care must be exercised when moving cables from testing area to winding floor. Be sure that the aisle is clear before pushing cables across.

33.5 Purchased Material Inspection

The inspection of raw material necessitates the opening of shipping containers of all kinds. This work requires moving and rearranging. Do not at-

tempt to lift large containers alone. Obtain help. When opening crates and boxes, use the tools provided and wear goggles and gloves. Do not allow nails or boards with protruding nails to remain on the floor.

Raw material inspectors can effectively reduce injuries by calling the interested supervisor's attention to conditions of incoming material which may be hazardous. For example, a certain material may require unpacking in a special manner to avoid injury.

Safety shoes are recommended for all raw material inspection work.

33.6 Wire Mill Laboratory and Copper Bar Inspection

Goggles must be worn when handling samples of wire at the drawing machines.

Use the tool provided to turn copper bars.

Stay clear of piled bars when operator is loading.

Be alert and keep clear of trucks removing bars from box cars.

Wear goggles for protection against flying wire when making tensile strength tests.

Wear leather palm gloves for protection against burns when using the electric annealer.

33.7 Phenol Plastics, Textiles and Miscellaneous Materials

Goggles and respirators must be worn when sampling phenol plastic materials.

Wear goggles when making trial runs of phenol plastics. Always use the slide provided for handling the fine bar test sample from press to bench.

Before removing sample from vise, stop the milling cutter to avoid becoming entangled.

Report at once the first sign of a leak in the high pressure steam line.

Use sampling thief to sample dyes, thus minimizing contact with dye stuffs.

"Good housekeeping" is important in the inspec-

tion area. Keep aisles clear and material in orderly rows. Check the stability of stacked material before cutting binding straps.

33.8 Chemical Laboratory

Label and identify all chemicals. Do not keep any unidentified chemicals.

Acids, bases or salts should be removed from body or clothing with a generous amount of water.

Cracked glassware should be discarded immediately.

Heat resisting glassware should always be used in mixing chemicals which generate heat when dissolved or when reacting with other substances.

Pour acid into water slowly and cautiously. Never pour water into acid as it will react violently and may burn you seriously.

Chemicals or salts which tend to fuse or crust over when put into solution should be added to the water or solution in small quantities and carefully agitated until completely dissolved. A crust formation allows gas or steam pockets to form, which may cause a violent explosion.

Exercise caution when using solvents of any kind. Use as small a quantity as possible and keep the room well ventilated.

Never place flammable solvents in a drying oven. If material is suspected of containing traces of flammable solvents leave oven door partly open.

33.9 Testing and Control Equipment Maintenance

Maintenance men should carry goggles at all times. They should be worn in all areas where operators are required to wear them. Goggles are to be worn when removing and replacing fuses, when using compressed air, to clean equipment, soldering, and at all times around temperature control Equipment.

Do not work on any electrical equipment unless it is a part of your assigned work.

All electrical circuits should be treated as "live" until it is definitely shown that they are "dead."

Before starting to work on equipment, remove obstructions and make the work as accessible as possible.

Never climb over anything you can walk around.

Use tools only for the purpose intended.

When checking the tensile strength and elongation tester, stay clear of suspended weights to avoid foot injuries.

Use care in handling mercury, lead, soldering acids and other corrosive materials. Use plenty of water to flush the area if any is spilled upon the skin. Always wash hands thoroughly after handling material of this sort.

If a soldering iron falls remember to let it go. Don't try to catch it. Painful burns can be avoided by training yourself to let hot objects fall.

Don't leave hot objects on benches without marking or guarding them.

33.10 Sealing and Handling Group

Goggles are required at all times on this work. All jobs in this group require striking steel on steel: therefore, adequate eye protection as provided by side screen goggles is necessary.

Wear gloves at all times to avoid injuries from slivers, nails, etc., when pushing reels.

To avoid foot injuries safety shoes should be worn. Never step on the head corrugations of steel reels to start them rolling. A slip might result in a crushed foot.

Never attempt to move a full sized reel alone. Obtain help.

Sealers must handle the gas torches carefully. Never hang them in the racks pointing toward the truck aisle. To avoid the possibility of burning a truck operator, always point the flame of the torches inward.

Sharp cable knives and cutters are safest.

Do not allow burrs and mushrooming to remain on the striking edge of tools. To avoid flying pieces of steel, remove such defects with the grinder located in the sealing area. Never use the grinder unless wearing goggles.

Keep tools in containers and location provided. "Good housekeeping" prevents injuries.

Men working in the sealing area must watch the movement of the lagging crane. Always step out of its direct path. Help the crane operator to avoid carrying a load over anyone's head.

To avoid striking Inspectors, floormen must watch carefully when removing reels from test rolls.

When moving cable, never let it get out of control. It is unsafe to depend on another reel, sealing rolls or floor stops to retard the cable's motion.

Only those authorized should operate the tram car.

Helpers should ride on control platform only.

Never attempt to get on or off or load or unload when car is in motion.

Hook up chains when leaving station.

Open control switch when leaving car.

34. USEFUL INFORMATION

34.1 Standard Gages--Comparative Tables

34.2 Decimal Equivalent of Fractions

34.3 Units of Measure

Linear

Square

Cubic

Circular

34.4 Conversion Equivalents

**Do You Know How To Administer
Artificial Respiration?---Practice
Regularly**

34.1 STANDARD GAGES — COMPARATIVE TABLES

Gage Number	Birmingham Wire (BWC) (Also Known as Status Iron Wire)	American Wire or Brown & Sharpe	American Steel & Wire Co. Formerly Washburn & Moen	Copper Wire	
				Brown & Sharpe Gage	
				Feet Per Pound	Resistance Per Foot 68°
1	.300	.289297	.2830	3.947	.0001237
2	.284	.257627	.2625	4.977	.0001560
3	.259	.229423	.2437	6.276	.0001967
4		.204307	.2253	7.914	.0002480
5	.220	.181940	.2070	9.980	.0003128
6		.162023	.1920	12.58	.0003944
7	.180	.144285	.1770	15.87	.0004973
8		.128490	.1620	20.01	.0006271
9	.148	.114434	.1483	25.23	.0007908
10	.134	.101897	.1350	31.82	.0009972
11	.120	.090742	.1205	40.12	.001257
12		.080808	.1055	50.59	.001586
13	.095	.071962	.0915	63.79	.001999
14	.083	.064084	.0800	80.44	.002521
15	.072	.057068	.0720	101.4	.003179
16	.065	.050821	.0625	127.9	.004009
17	.058	.045257	.0540	161.3	.005055
18		.040303	.0475	203.4	.006374
19	.042	.035890	.0410	256.5	.008038
20	.035	.031961	.0348	323.4	.01014
21	.032	.028462	.03175	407.8	.01278
22	.028	.025346	.0286	514.2	.01612
23		.022572	.0258	648.4	.02032
24	.022	.020101	.0230	817.6	.02563
25		.017900	.0204	1031	.03231
26	.018	.015941	.0181	1300	.04075
27	.016	.014195	.0173	1639	.05138
28	.014	.012641	.0162	2067	.06479
29	.013	.011257	.0150	2607	.08170
30	.012	.010025	.0140	3287	.1030
31	.010	.008928	.0132	4145	.1299
32	.009	.007950	.0128	5227	.1638

34.1 STANDARD GAGES — COMPARATIVE TABLES — Cont'd

Gage Number	Birmingham Wire (BWG) Also Known as Stubbs Iron Wire	American Wire Brown & Sharpe	American Steel & Wire Co. Formerly Washburn & Moen	Copper Wire	
				Brown & Sharpe Gage	
				Feet Per Pound	Resistance Per Foot 68°
33	.008	.007080	.0118	6591	.2066
34	.007	.006305	.0104	8311	.2605
35	.005	.005615	.0095	10480	.3284
36	.004	.005000	.0090	13210	.4142
37		.004453	.0085	16660	.5222
38		.003965	.0080	21010	.6585
39		.003531	.0075	26500	.8304
40		.003144	.0070	33410	1.047

WHEN WEARING HAIR PROTECTION, REMEMBER TO COVER ALL THE HAIR. EXPOSED CURLS IN THE FRONT ARE THE MOST APT TO GET CAUGHT.

34.2 DECIMAL EQUIVALENT OF FRACTIONS

Fraction	Decimal Equivalent	Fraction	Decimal Equivalent
1/64	.015625	33/64	.515625
1/32	.031250	17/32	.531250
3/64	.046875	35/64	.546875
1/16	.062500	9/16	.562500
5/64	.078125	37/64	.578125
3/32	.093750	19/32	.593750
7/64	.109375	39/64	.609375
1/8	.125000	5/8	.625000
9/64	.140625	41/64	.640625
5/32	.156250	21/32	.656250
11/64	.171875	43/64	.671875
3/16	.187500	11/16	.687500
13/64	.203125	45/64	.703125
7/32	.218750	23/32	.718750
15/64	.234375	47/64	.734375
1/4	.250000	3/4	.750000
17/64	.265625	49/64	.765625
9/32	.281250	25/32	.781250
19/64	.296875	51/64	.796875
5/16	.312500	13/16	.812500
21/64	.328125	53/64	.828125
11/32	.343750	27/32	.843750
23/64	.359375	55/64	.859375
3/8	.375000	7/8	.875000
25/64	.390625	57/64	.890625
13/32	.406250	29/32	.906250
27/64	.421875	59/64	.921875
7/16	.437500	15/16	.937500
29/64	.453125	61/64	.953125
15/32	.468750	31/32	.968750
31/64	.484375	63/64	.984375
1/2	.500000	1	1.000000

