



JOHN F. KENNEDY  
SPACE CENTER

COLOR CODE FOR SHOP MACHINERY AND EQUIPMENT

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JOHN F. KENNEDY SPACE CENTER, NASA

STANDARD

for

COLOR CODE FOR SHOP MACHINERY AND EQUIPMENT

Authentication: \_\_\_\_\_

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JOHN F. KENNEDY SPACE CENTER, NASA

STANDARD

for

COLOR CODE FOR SHOP MACHINERY AND EQUIPMENT

This standard has been approved by the Civil Engineering Division of the John F. Kennedy Space Center (KSC) and is mandatory for use by KSC and associated contractors.

1. SCOPE

1.1 Scope. This standard specifies color codes for shop machines, tools, and similar equipment used only in interior environments. The term "color code" describes painting or refinishing of equipment from touch-up of existing finish to complete repainting of the item. Color code emphasis alerts personnel by highlighting hazardous or critical areas associated with the machine tool or equipment. Equipment or parts of equipment required by present or future directives to be painted with special compounds or paints, because of exposure to outdoor environments, heat, cold, acids, or other special conditions will not be effected by this standard.

2. APPLICABLE DOCUMENTS

2.1 The following documents form a part of this standard to the extent specified herein. Unless otherwise indicated, the issue in effect on the date of invitation for bids or request for proposals shall apply.

SPECIFICATIONS

Military

NAVDOCKS P-309, Jan. 1966

The Application of Color to  
Shore Establishment

Federal

TT-P-645

Primer Paint, Zinc-Chromate,  
Alkyd Type

TT-E-489

Enamel, Alkyd, Gloss, Class A

## STANDARDS

### Federal

No. 595

Colors for Ready Mixed Paints

### Kennedy Space Center

KSC-STD-5 (Interim)

Color Code for Piping Systems

## PUBLICATIONS

### American Standard Association

ZR 53

Safety Color Code for Marking  
Physical Hazards

## 3. REQUIREMENTS

3.1 Safety Colors. The use of safety colors shall be in accordance with KSD-STD-5 (Interim), "Color Code for Piping Systems," and in accordance with instructions furnished by the KSC Safety Office, RE.

3.2 Painting Schedule. Painting schedule shall be coordinated with responsible personnel of the using activity.

3.3 Operating Equipment. No cleaning or painting shall be performed while machine or equipment is in operation.

3.4 Name Plates. Painters shall be given specific instructions and guidance to preserve original condition of name plates and identification numbers by masking prior to painting.

3.5 Interior Exposure. Surfaces exposed to interior environments only shall be refinished with gloss enamel, Federal Specification TT-E-489 or approved equivalent. Colors shall be selected from Federal Standard 595, by number.

3.6 Main Body. The main body of machinery and equipment shall be painted machine tool gray, color number 16187.

3.7 Working Areas. Working areas and other critical parts shall be highlighted with ivory, color number 13711. Application shall be restricted to areas where the worker is expected to direct his interest, not to parts where it may prove distracting. It shall not be used for decorative purposes.

3.8 Hazardous Elements. Extremely hazardous elements may exist on some equipment which are likely to cut, crush, burn, or shock personnel. These parts will be painted vivid orange, color number 12246. This is not to be interpreted as authorizing the painting of machined parts, such as face plates, chucks, spindles, etc. Overuse of the vivid orange color will defeat the intended purpose.

3.9 Obstructions. Accidents can be caused by striking obstructions inadvertently or by stumbling and falling. To provide visual warnings of such hazards, brilliant yellow, color number 13538, shall be used.

3.10 Other Hazards. Areas which may represent hazards such as pit and platform edges, obstructions, beams on jib and wall cranes and moving parts on large machinery, i.e., shapers, planers and broaches shall be made more conspicuous by banding in alternate stripes of brilliant yellow, color number 13538, and black, color number 17038.

3.11 Touch Up. The finish on equipment so painted may be touched up, provided touch-up does not involve refinishing a total area equal to more than 25 percent of the painted surface area of the item. Where more than 25 percent of the painted surface area must be touched up, the surface shall be completely repainted.

3.12 Non-Gray Equipment. Equipment received from the manufacturer, finished in colors other than machine tool gray, color number 16187, may be touched up with colors and compatible materials to match existing finish, provided touch-up does not involve refinishing a total area equal to more than 10 percent of the painted surface area of the item. Where more than 10 percent of the painted surface area must be touched up, the item shall be completely repainted machine tool gray, color number 16187.

3.13 Exceptions. Instrument repair benches or other special purpose benches and parts of equipment items originally having natural wood finish may be refinished in natural wood or white enamel, color number 17875. Working surfaces of bench tops of, or covered with, metal or composition need not be repainted.

### 3.14 Colors, Specific Applications.

3.14.1 Gray. Color number 16187, applied to machinery and equipment major body portion.

3.14.2 Ivory. Color number 13711, applied to work areas, hand wheel spokes, levers, tailstock, turret, saddle, throat, and areas in shadows. Do not paint chrome parts, handles, or knobs.

3.14.3 Vivid Orange. Color number 12246, applied to open flywheels, gears, rams, and exposed hazardous parts of shears, brakes, planers, rolling and crushing devices, and forming presses. Guards which do not completely cover the hazard, such as on circular saws, band saws, and jointer shall be painted vivid orange. Where machine guards completely enclose a hazard, only the inside area of the guards and the hazard, such as gears which would be exposed with the guard removed shall be painted vivid orange. Vivid orange shall be applied to guards around hot pipes or hot work area surfaces and to guards around high-voltage lines. Where complete guarding is not practicable and painting of the hazardous element such as exposed overhead electric wires of rails for hoisting or conveying equipment is impractical, the adjacent beams, covers, or supporting rails shall be conspicuously painted vivid orange.

3.14.4 Blue. Color number 15123, applied to electrical controls. On machines, the outside areas of switch and fuse boxes and electrical controls (machine station box) shall be blue. Other control boxes which may be found on remote parts of the machine and larger control boxes on nearby walls shall also be color number 15123. The inside surface of doors on these switch and fuse boxes and control panels in shops shall be painted vivid orange to reveal and discourage the careless practice of leaving these doors open.

#### NOTE

Terminal cabinets for communication, telephone, or public address systems, etc, are not to be considered electrical cabinets and shall be painted to match adjacent wall color. Their interiors shall remain as painted by the vendor.

3.14.5 Brilliant Yellow. Color number 13538, applied to materials handling equipment, i.e., hand trucks, dollies, jacks, and portable floor cranes, crane hook blocks (do not paint hook), guard railings, curbing, posts, and similar obstructions.

3.14.6 Red. Color number 11105, shall remain the basic color for designating fire protection equipment, danger, and stop signs.

3.14.7 Purple. Color number 17142, shall designate radiation hazards.

3.14.8 Black. Color number 17038, used in conjunction with brilliant yellow, color number 13538, for banding as set forth in paragraph 3.10.

### 3.15 Surface Preparation for Previously Painted Machinery.

3.15.1 Chemically Clean Surface. A chemically clean surface must be presented for successful paint application. Surfaces may appear clean and still be unfit to paint since a thin film of oil may prevent adhesion and seriously slow the drying of the finish coats.

3.15.2 Surface Condition. The surfaces to be painted shall be clean, dry, and free from dust, grease, oil, and rust. Glossy surfaces shall be sanded to dull the gloss to ensure adhesion. Remove all rust and scale by chipping, scraping, sand-blasting, or wirebrushing.

3.15.3 Cleaning Method. The approved method for cleaning machinery surfaces is to first clean the affected surfaces thoroughly with a lint-free cloth to remove visible oil and grease deposits. The surface shall then be thoroughly degreased with a clean, lint-free cloth moistened with clean mineral spirits. Mineral spirits shall be contained in safety cans. Repeat this cleaning until no discoloration is obtained when the surface is wiped with a solvent-moistened white cloth. When these cloths become soiled they shall be discarded.

3.15.4 Bare Spots. Bare spots resulting from scraping or chipping shall be sanded to a feather edge and spot primed with a lacquer proof primer meeting the requirements of Federal Specification TT-P-645. Allow priming coats to dry thoroughly and apply two coats of enamel, Federal Specification TT-E-489, in the required color as set forth in this standard. Allow each coat to dry thoroughly before applying succeeding coat.

3.16 Maximum Standardization. Maximum standardization of color application shall be accomplished in accordance with the general pattern shown for representative types of machines (Figures 1 through 25). Highlighted areas are as indicated. On equipment for which no representative types are illustrated, painting will be accomplished in accordance with the purpose and intent as interpreted by responsible personnel of the using activity of the general instructions as set forth herein.

## 4. QUALITY ASSURANCE PROVISIONS

4.1 There are no applicable requirements.

## 5. PREPARATION FOR DELIVERY

5.1 There are no applicable requirements.

## 6. NOTES

6.1 There are no applicable requirements.

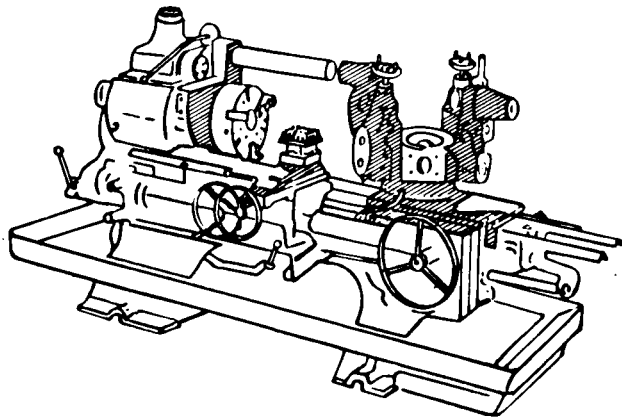


Figure 1. TURRET LATHE

HIGHLIGHT

- FRONT OF HEADSTOCK
- NOSE PIECE COVER
- TURRET RAM OR SADDLE
- CROSS SLIDE
- CHUCKING OR BAR TUBES
- OUTBOARD BAR SUPPORT

Figure 2. UNIVERSAL GRINDING MACHINE

HIGHLIGHT

- FRONT END HEADSTOCK
- FOOTSTOCK
- FRONT SURFACE WHEELHEAD
- STEADY RESTS
- WHEEL GUARD
- FRONT SOLASH GUARD
- FRONT OF TABLE

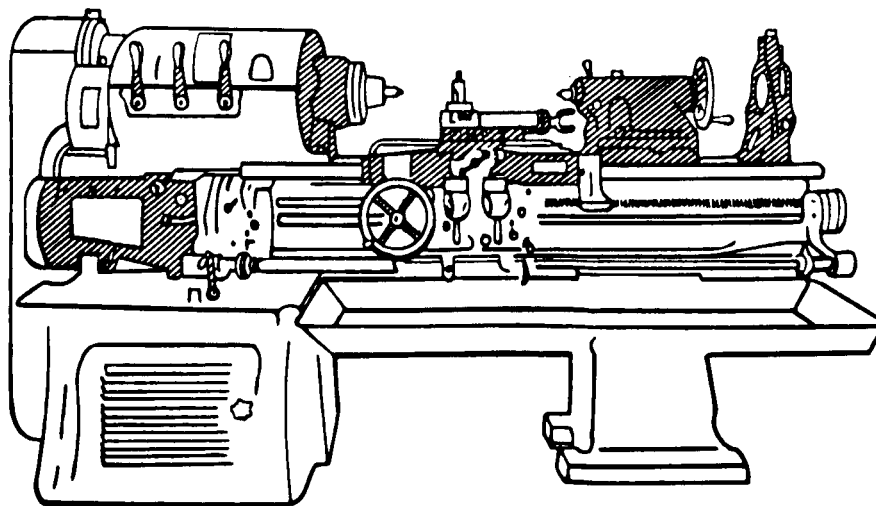
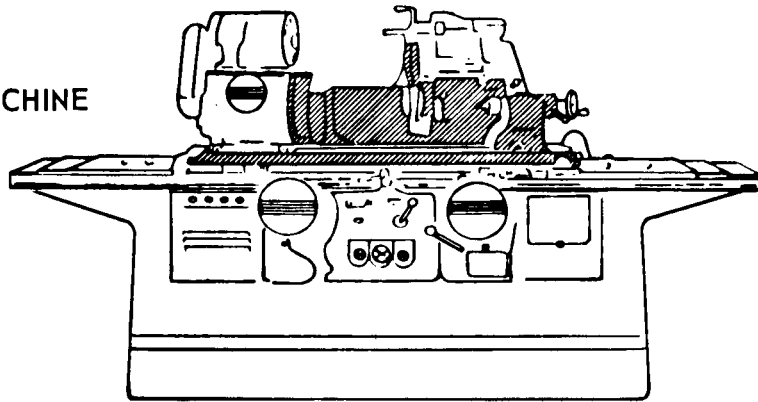


Figure 3. ENGINE LATHE

HIGHLIGHT

- FRONT SURFACE OF HEADSTOCK SURROUNDING FACE PLATE
- TAIL STOCK
- FRONT SURFACE OF CARRIAGE AND COMPOUND REST
- INSIDE TOP SURFACE OF BED
- TAPER ATTACHMENT
- FACE OF QUICK CHANGE GEAR BOX
- STEADY RESTS



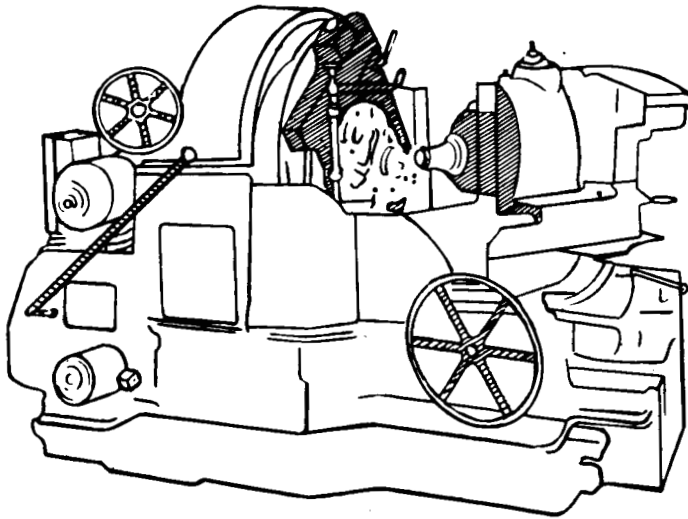


Figure 4. BEVEL GEAR GENERATOR

HIGHLIGHT  
 WORK HEAD  
 CUTTER HEAD

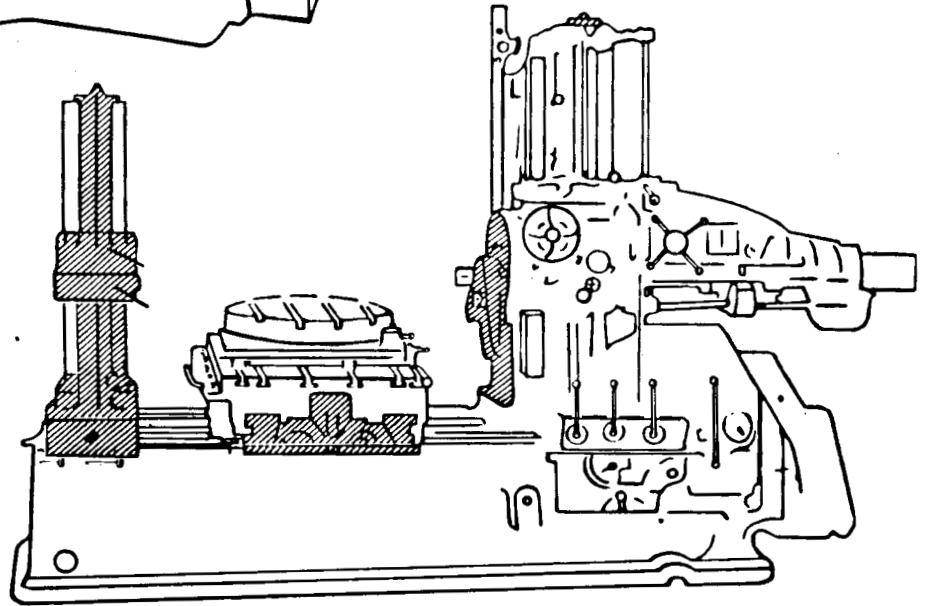


Figure 5. HORIZONTAL BORING MILL

HIGHLIGHT  
 FRONT SURFACE OF COLUMN  
 BORING BAR HEAD  
 CUTBOARD BAR SUPPORT  
 TOP SURFACE OF BED  
 ENDS OF TABLE  
 TOP SURFACE OF COLUMN

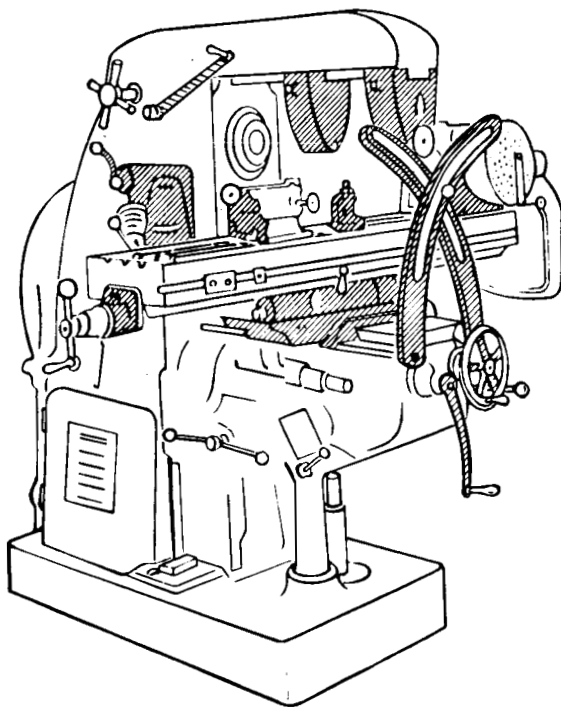


Figure 6. MILLING MACHINE

HIGHLIGHT  
 FRONT AND SIDES OF SADDLE  
 UNDERCUT AT FRONT FACE OF COLUMN  
 DIVIDING HEADSTOCK AND FOOTSTOCK  
 ENDS OF TABLE  
 VISE  
 FACE OF SPEED GEAR BOX  
 OVERARM SUPPORT  
 OVERARM BRACES  
 SCREW JACK

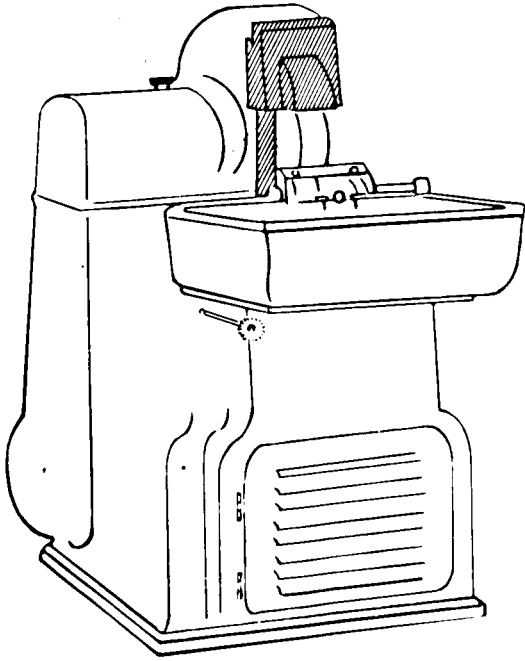


Figure 7. WET TOOL GRINDER

HIGHLIGHT  
WHEEL GUARD

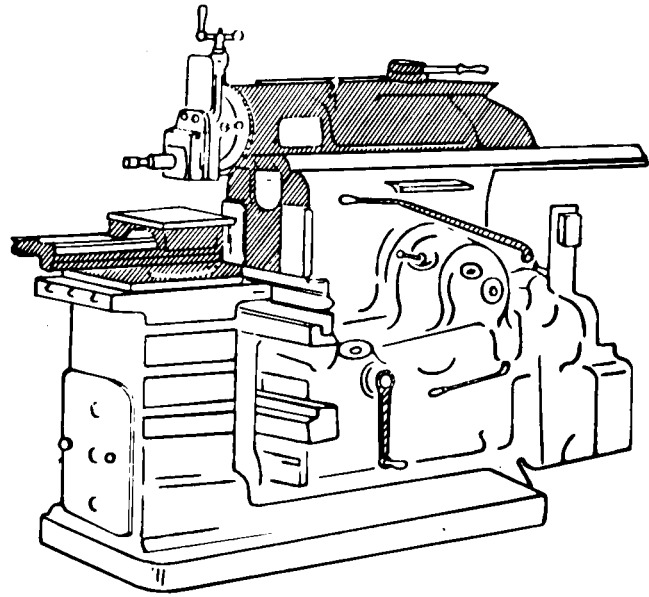


Figure 8. SHAPER

HIGHLIGHT  
RAM  
FRONT OF COLUMN  
VISE AND VISE BASE

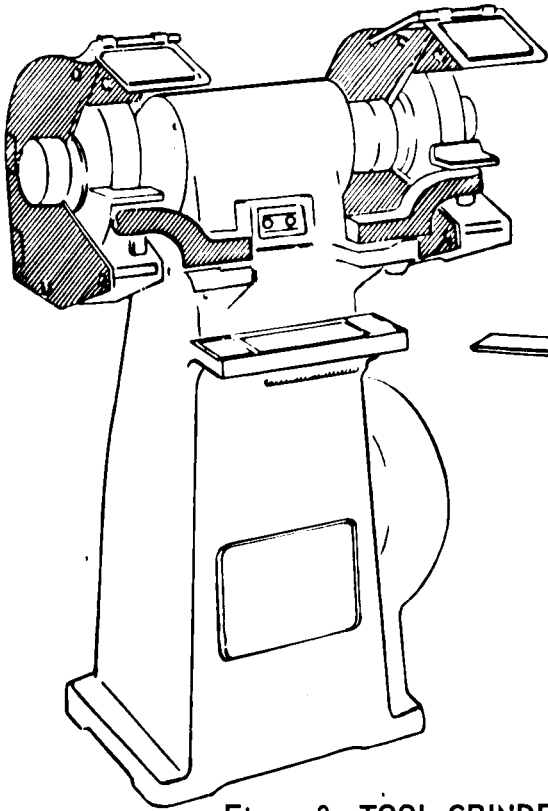


Figure 9. TOOL GRINDER

HIGHLIGHT  
WHEEL GUARD  
TOOL REST SUPPORT

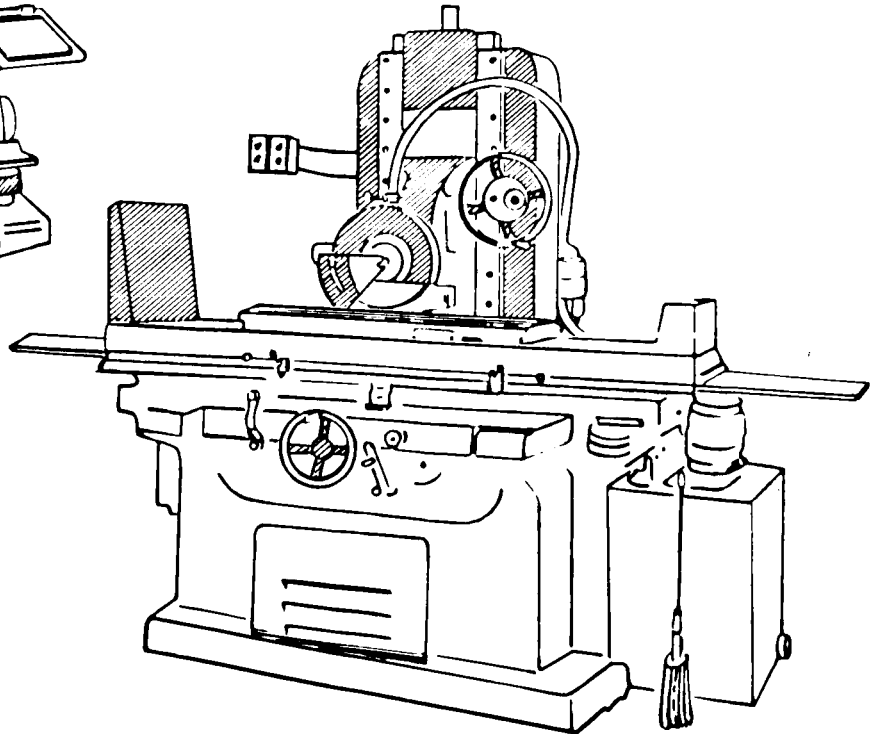


Figure 10. SURFACE GRINDER

HIGHLIGHT  
TABLE GUARDS  
WHEEL GUARD  
FRONT OF FRAME  
FRONT OF HEAD

Figure 11. POWER BRAKE

HIGHLIGHT  
FRONT OF RAM  
FRONT AND ENDS OF TABLE  
INSIDE SURFACES OF COLUMNS

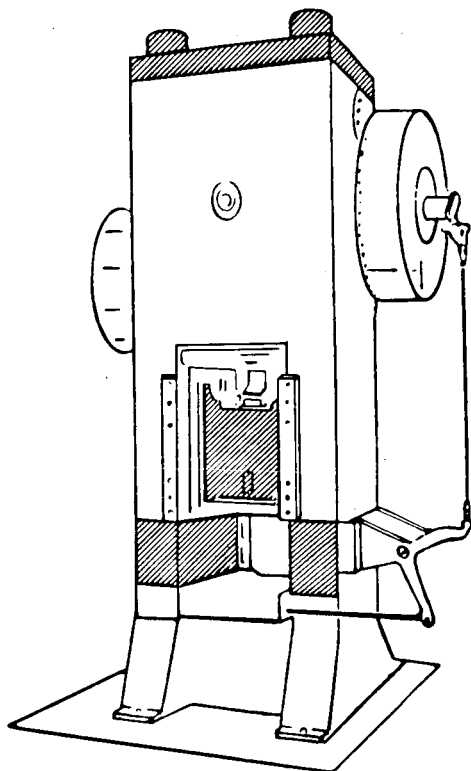
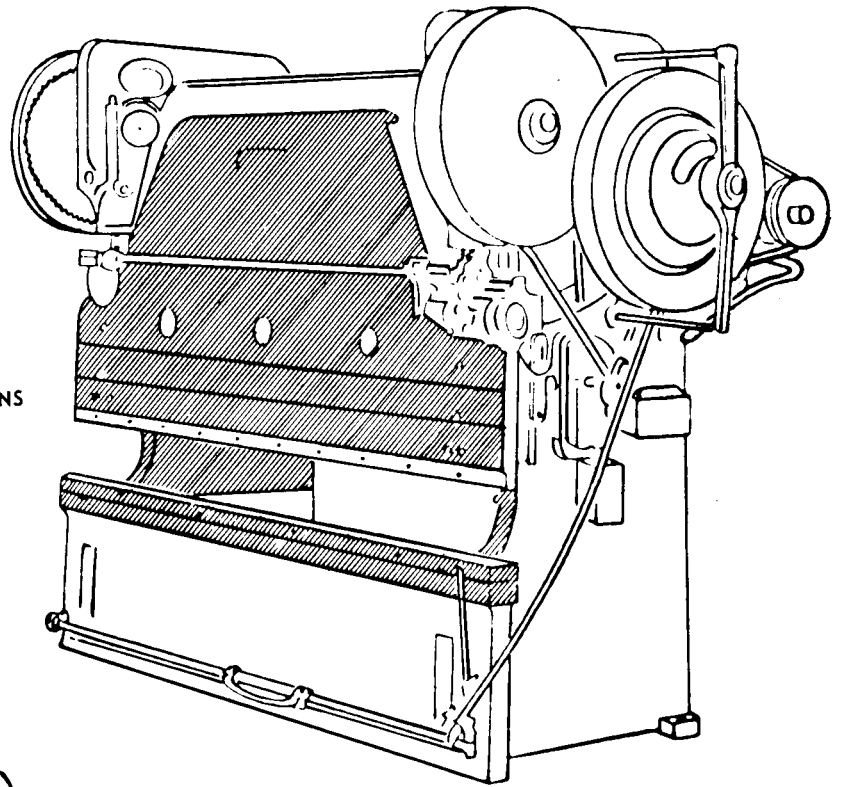


Figure 12. STRAIGHT SIDE PRESS

HIGHLIGHT  
FRONT OF RAM  
FRONT AND INSIDE OF COLUMNS  
TOP SURFACE OF PRESS

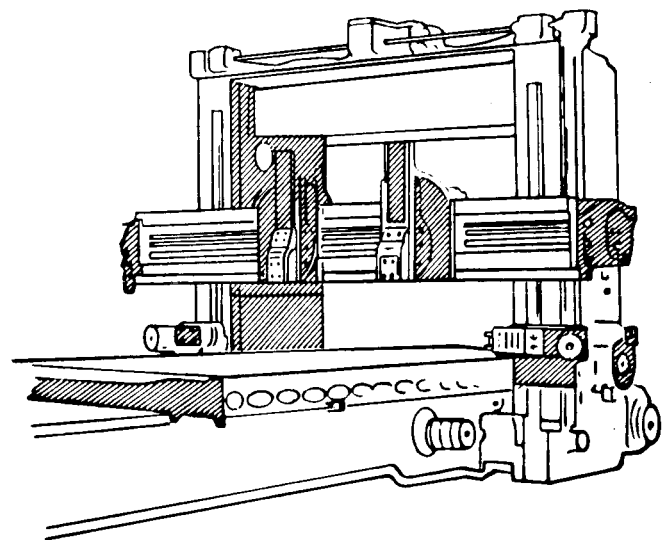


Figure 13. DOUBLE HEAD PLANER

HIGHLIGHT  
ENDS OF CROSS RAIL  
RAIL HEADS  
SIDE HEADS  
ENDS OF TABLE  
FEED GEAR COVERS ON RAIL AND SIDE HEADS  
HIGHEST UNIT ON BRIDGE  
INSIDE OF COLUMNS

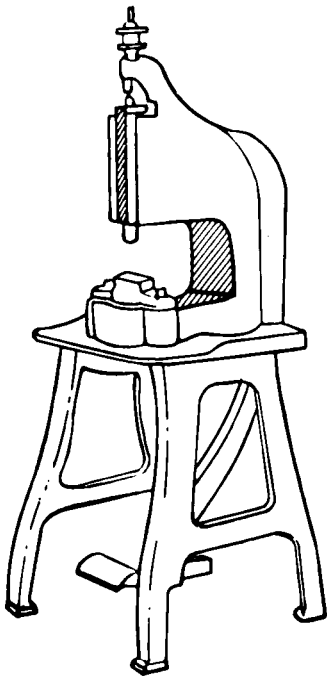


Figure 14. KICK PRESS

HIGHLIGHT  
INSIDE OF FRAME  
RAM

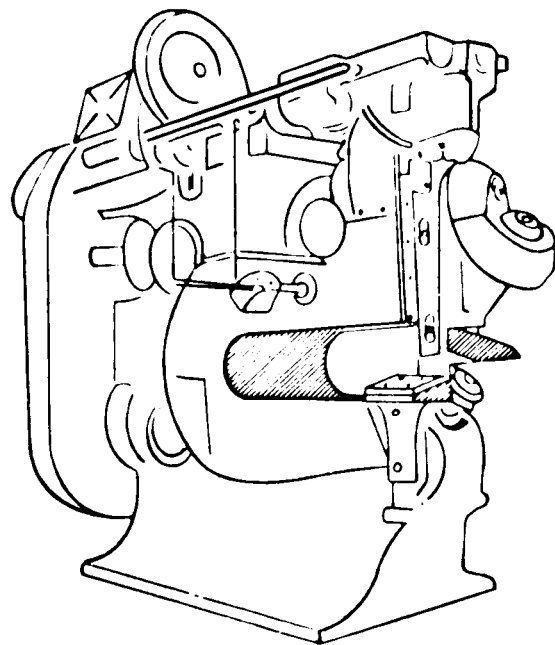


Figure 15. ROTARY TYPE POWER SHEAR

HIGHLIGHT  
FRONT OF RAM  
THROAT OF COLUMN  
FRONT OF TOOL BLOCK

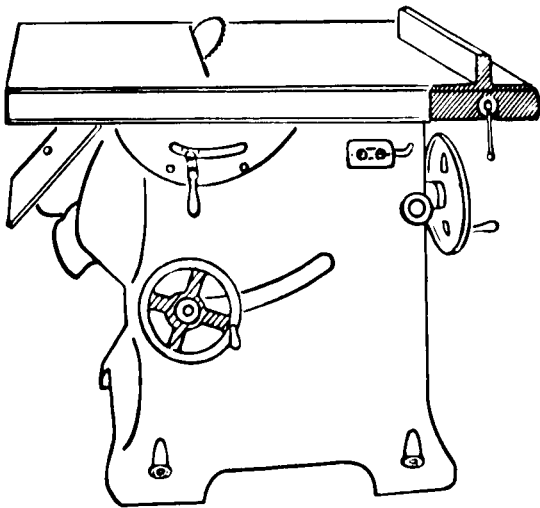


Figure 16. TABLE SAW

HIGHLIGHT  
FRONT OF ADJUSTABLE GAUGE

Figure 17. TAPPING MACHINE

HIGHLIGHT

FRONT OF COLUMN  
LOWER BEARING COVERS

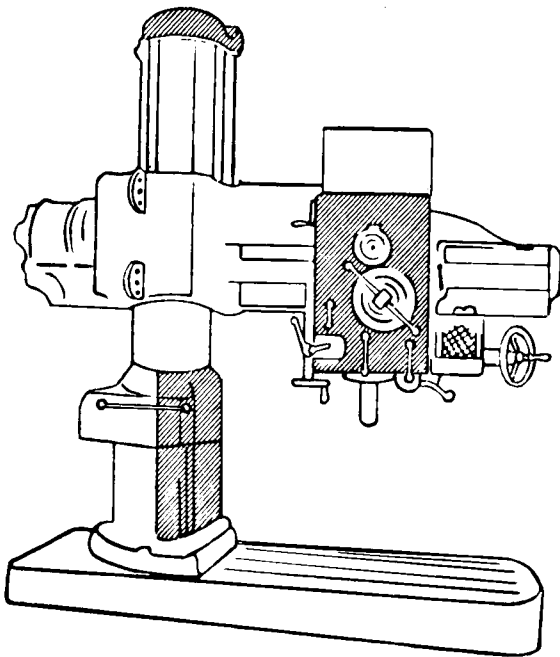
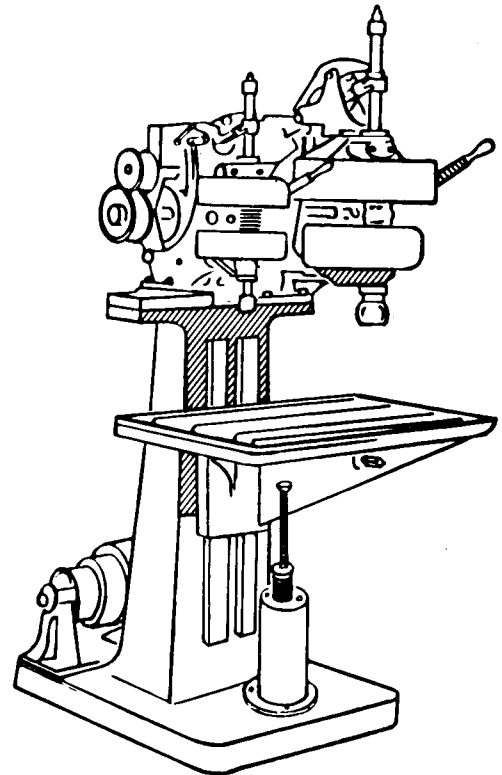


Figure 18. RADIAL DRILLING MACHINE

HIGHLIGHT

TOP OF COLUMN  
FRONT OF DRILL HEAD  
INSIDE OF COLUMN SUPPORT

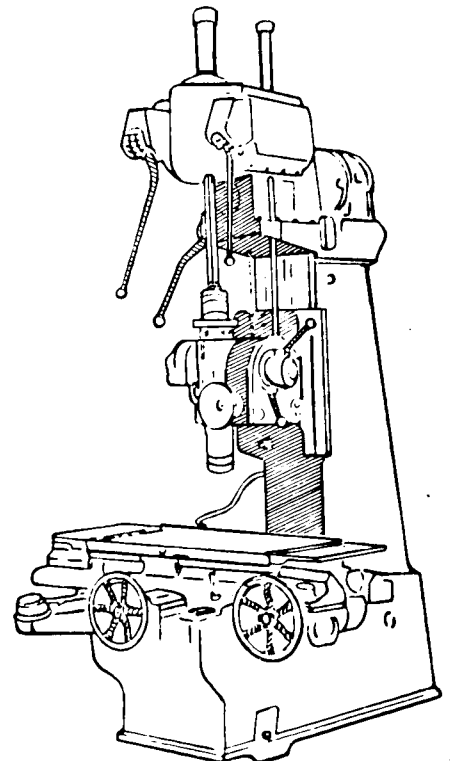


Figure 19. JIG BORER

HIGHLIGHT

FRONT OF COLUMN  
FRONT OF FEED GEAR BOX  
FRONT AND UNDERSIDE OF DRIVE GEAR BOX

Figure 21. MULTIPLE SPINDLE DRILLING MACHINE

HIGHLIGHT

SPINDLE SUPPORT BRACKETS  
FRONT OF COLUMN  
HORIZONTAL SURFACE ON TOP OF MACHINE

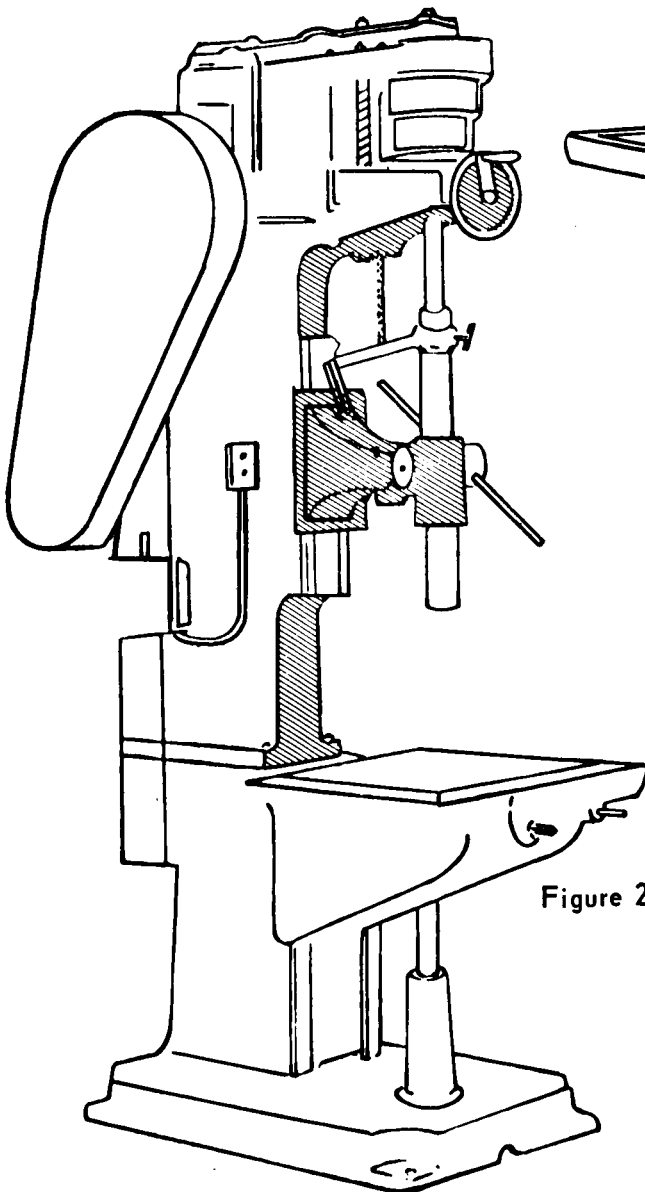
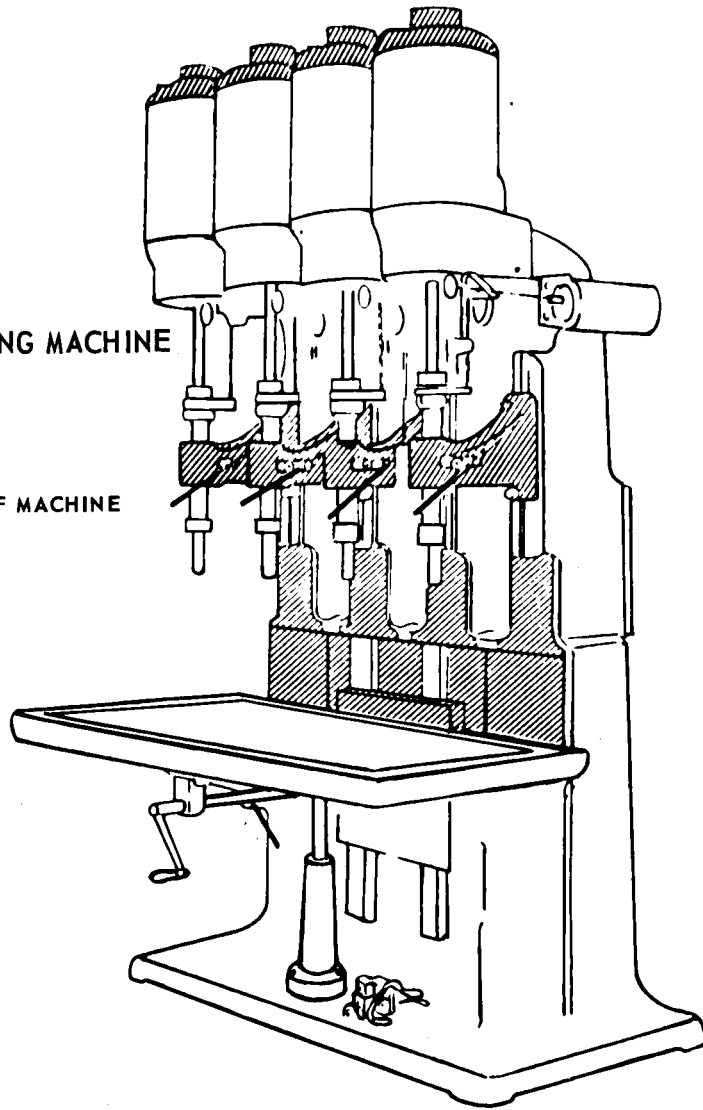


Figure 20. SINGLE SPINDLE DRILLING MACHINE

HIGHLIGHT

SPINDLE SUPPORT BRACKET  
FRONT OF COLUMN  
HORIZONTAL SURFACE ON TOP OF MACHINE

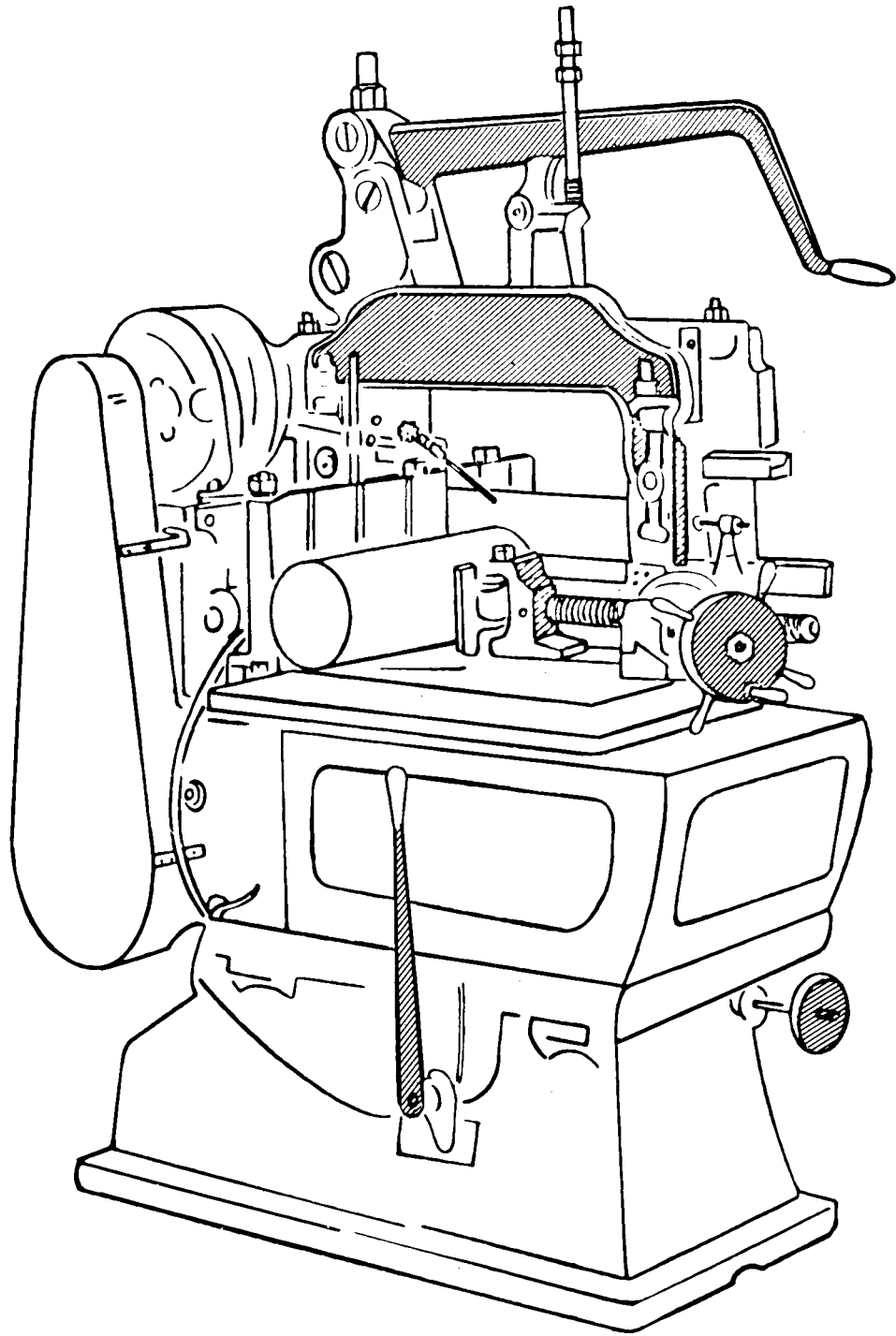


Figure 22. POWER CUT-OFF SAW

HIGHLIGHT

VISE

BLADE FRAME

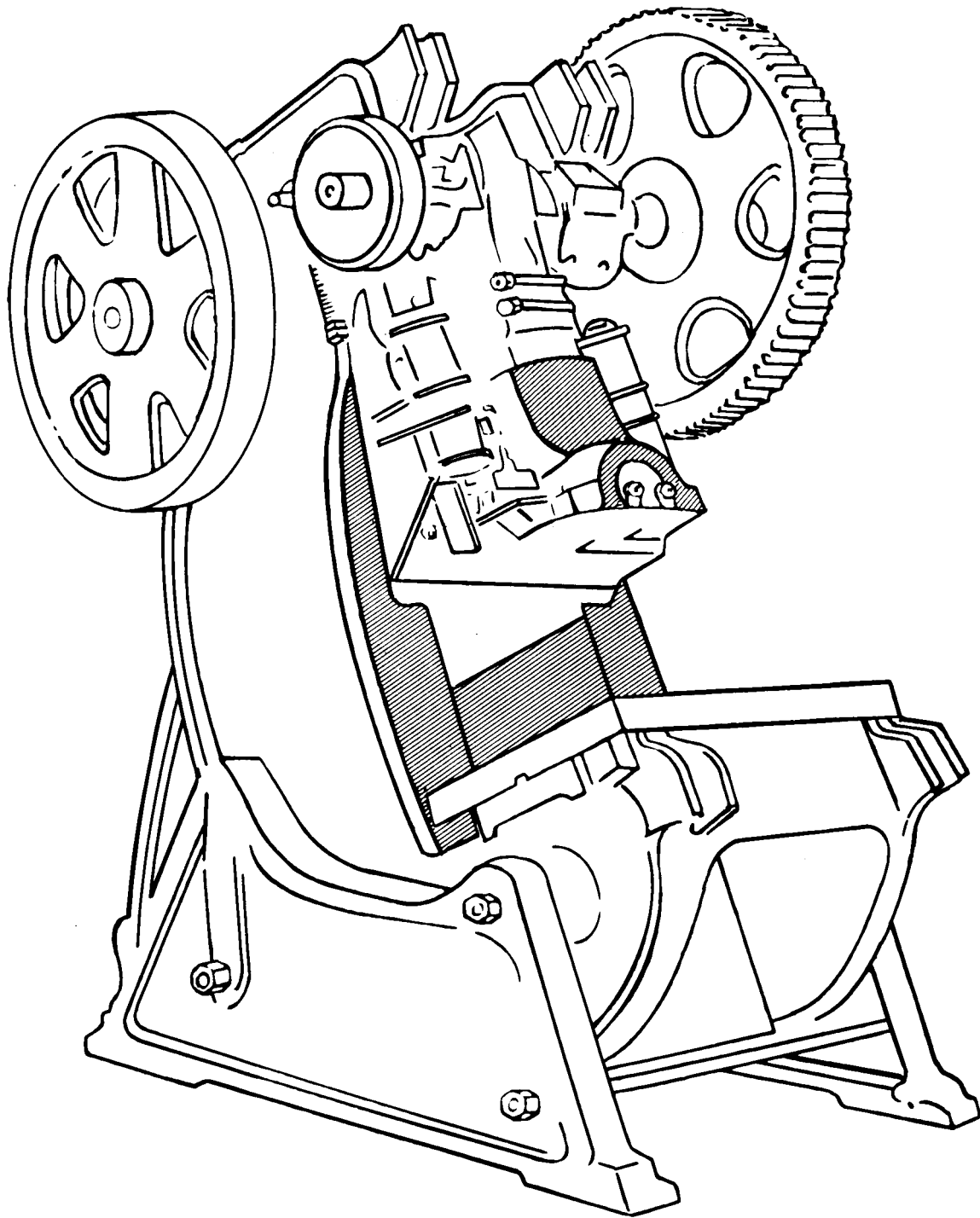


Figure 23. PUNCH PRESS

HIGHLIGHT

RAM OR SLIDE

FRONT AND INSIDE OF COLUMNS OR THROAT



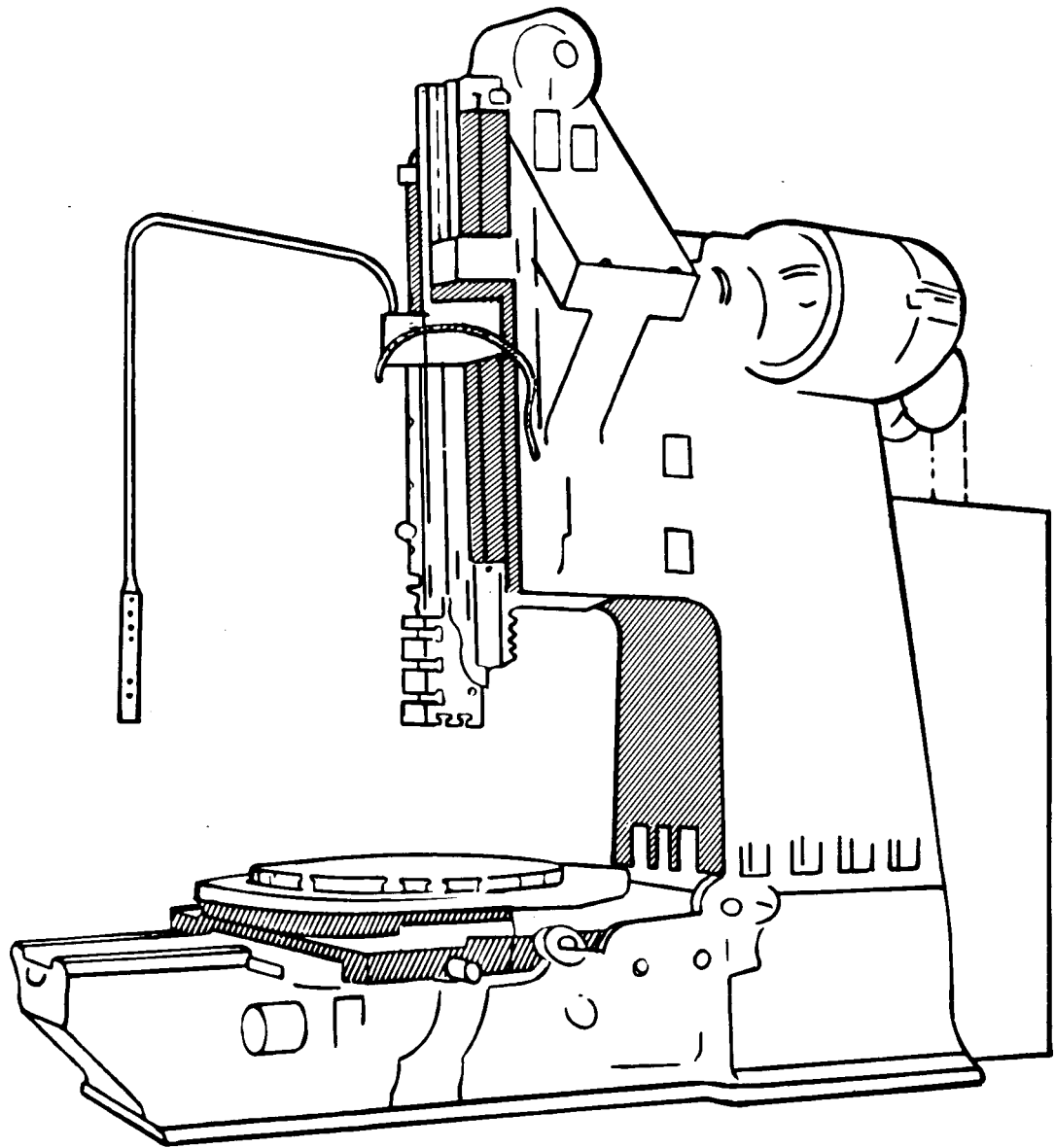


Figure 24. SLOTTOR

HIGHLIGHT

FRONT SURFACE OF COLUMN

RAM SLIDE

FRONT OF TABLE SADDLE

ENDS OF TABLE

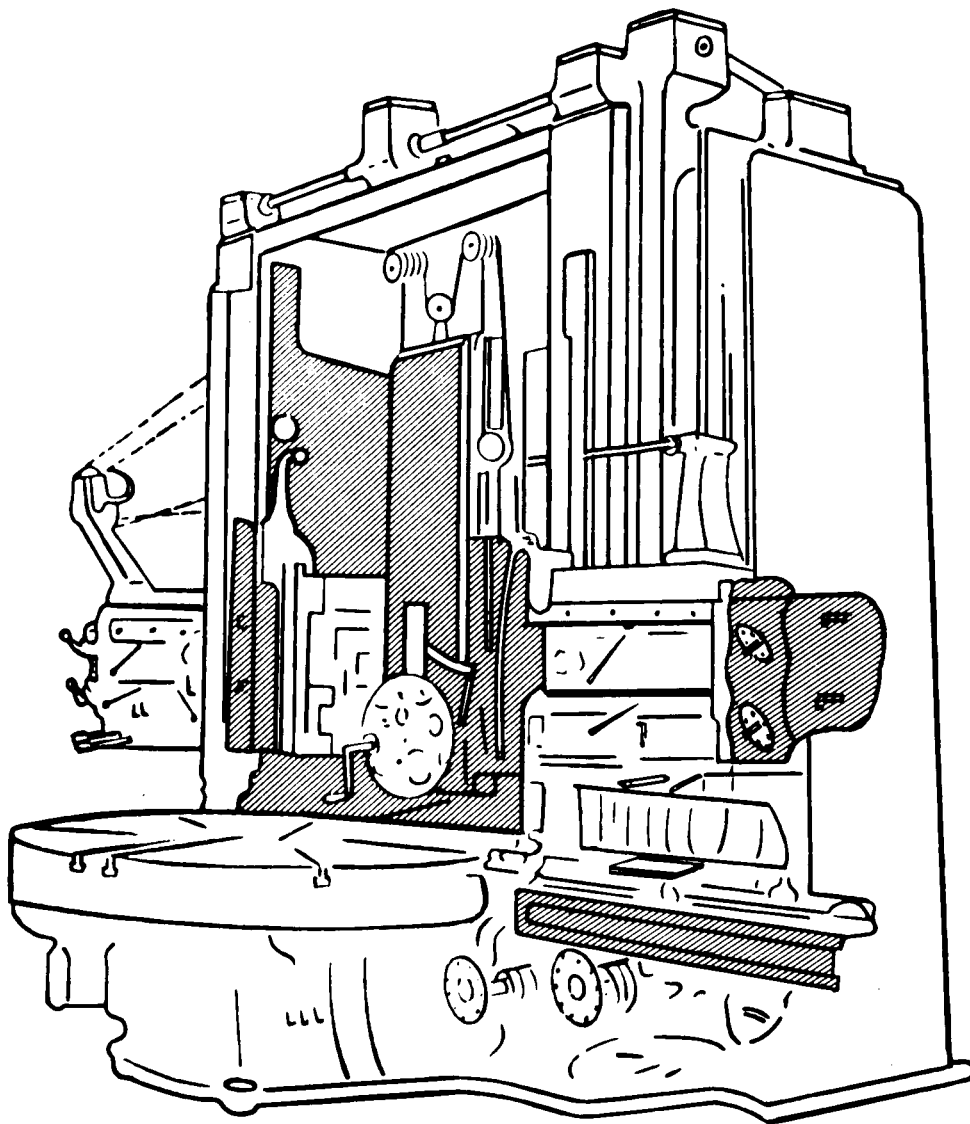


Figure 25. VERTICAL BORING MILL

HIGHLIGHT

ENDS OF CROSS RAIL  
ALL PAINTED SURFACES OF BORING HEADS  
INSIDE OF COLUMNS  
HIGHEST UNIT ON BRIDGE  
FRONT OF SIDE HEAD

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