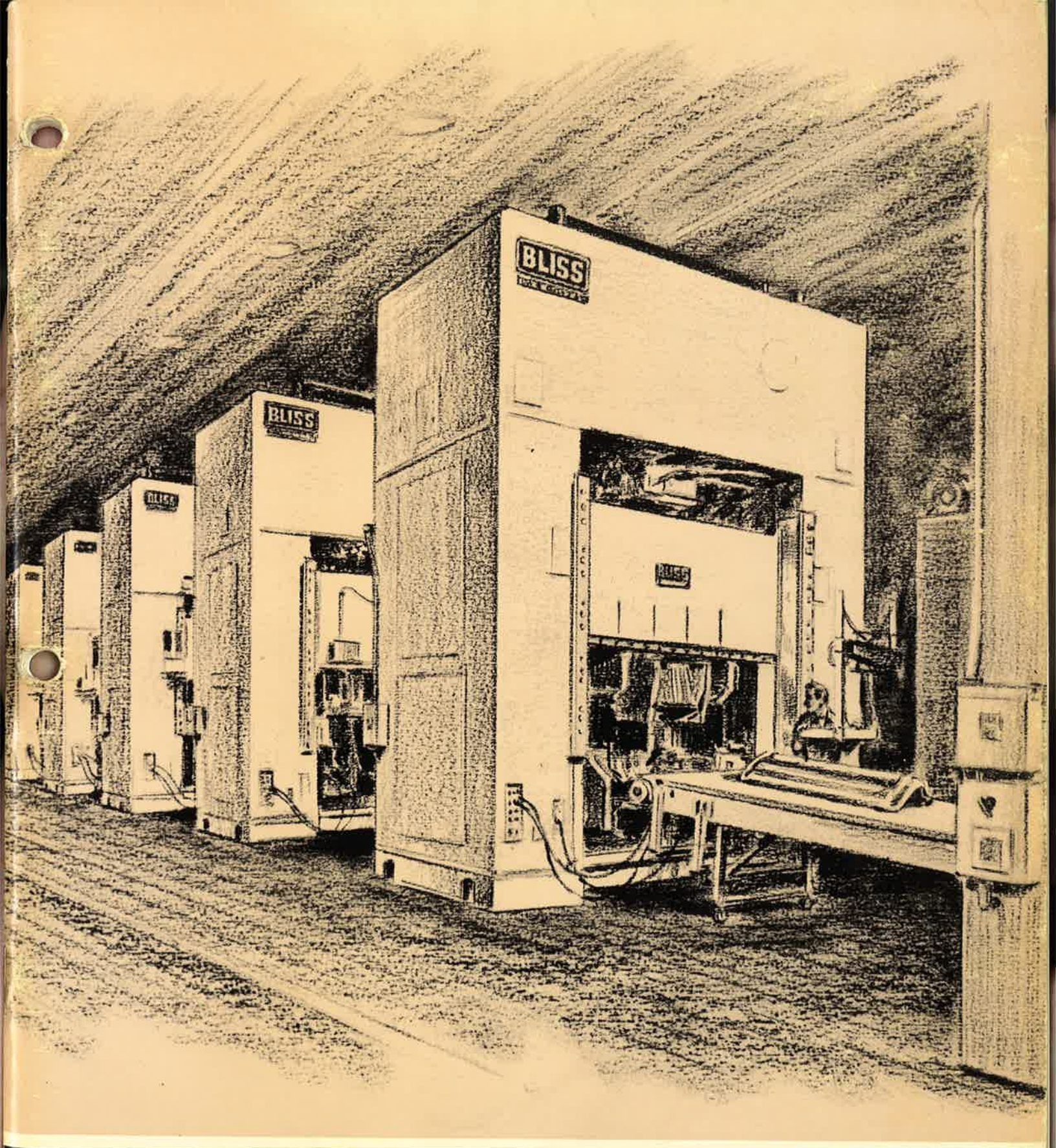



# BLISS GENERAL PRESS CATALOG

# PRESS BUILDING IN DEPTH

**While various catalogs and data sheets cover specific Bliss press lines in detail, this catalog covers the E. W. Bliss Company's entire line of mechanical and hydraulic presses, along with machines built for special operations. The wide variety of equipment shown here is intended to provide not just a broad picture of what Bliss now offers in the press field, but an idea of what can be done to meet your unique production requirements. For full information on any of the equipment shown, or for a discussion of your metalworking problems, contact the nearest Bliss sales office, or write directly to Bliss Press Headquarters, Bliss Tower, Canton, Ohio. We'll be happy to provide the information you need or arrange for a consultation.**

# BLISS GENERAL PRESS CATALOG

CATALOG NUMBER 35 J

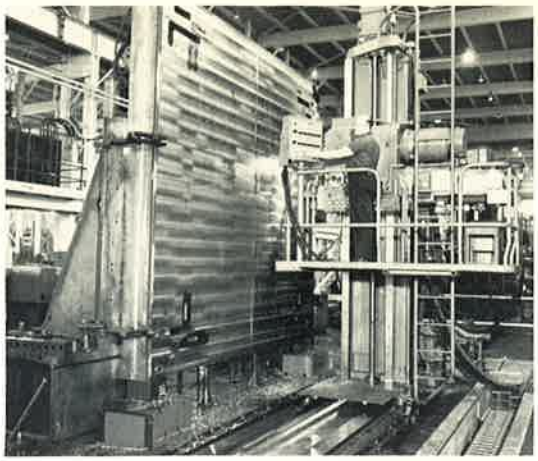
## CONTENTS

# BLISS SETS THE STANDARD OF VALUE

## IT STARTS WITH AN ENGINEERING CONCEPT

In point of time, Bliss' press building experience outdates all others. Even more important, this experience has gone hand in hand with sustained leadership.

Since 1857, Bliss has pointed the way in improved press design, better materials of construction, and refinement of manufacturing techniques. To a significant degree, Bliss' present engineering capability is an extension of its historical position of leadership in the industry.

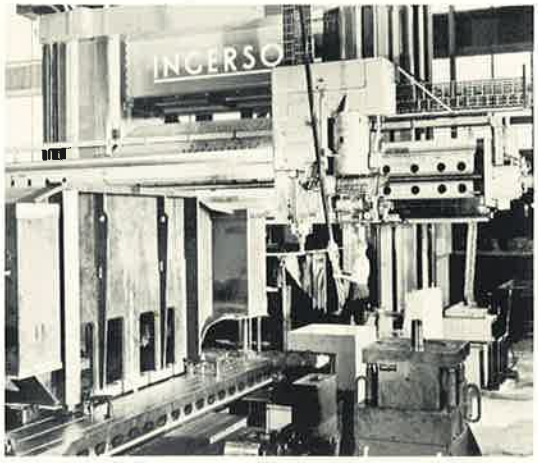


Recently installed tape-controlled drilling machine typifies the constant upgrading of production facilities at Bliss plants.

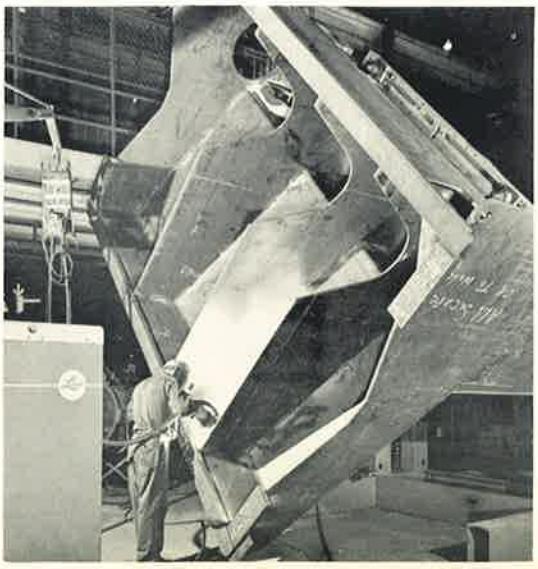
Castings continue to occupy an important place in smaller press construction. Bliss' Meehanite foundry produces castings of highest quality.

## *IT IS SHAPED IN THE WORLD'S LARGEST PRESS BUILDING FACILITIES*

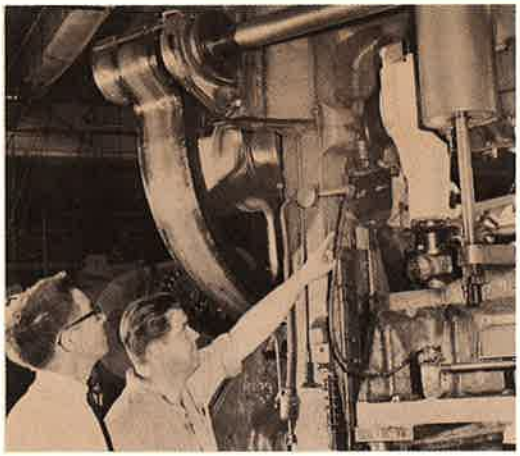
Facilities are the muscle of leadership. It has long been a Bliss policy to invest heavily in the physical plant necessary to sustain a "can do" rather than a "make do" philosophy. Result is the largest and most versatile press building capability in the world.




This 14-foot planer mill is part of a recent expansion program designed to maintain peak efficiency while increasing production.



Weldments make up a large part of modern press construction. The Press Division has welding positioners with capacities up to 120,000 pounds and crane capacities to 150 tons.



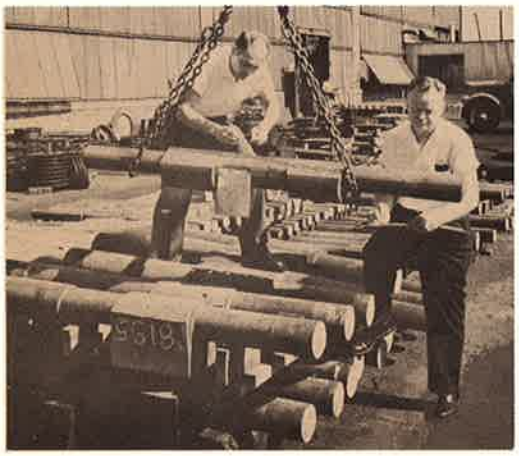
This 20-year-old Bliss Double Crank Press needs a new crankshaft. A call to the local Bliss sales office...

results in immediate check of parts warehouse. The crankshaft—a special—is not in stock.

## *MAINTAINED BY AN UNEQUALED SERVICE ORGANIZATION...*

Inventive design and reliable construction are the prerequisites of value in presses. Service — concerned with the continuing performance of Bliss equipment in customers' plants — gives depth to the total picture of value.

A substantial part of our large manufacturing capability is devoted to maintaining a stock of replacement parts. Thus, no user of the smaller standard Bliss presses is more than air hours away from critical replacements. A well-staffed and mobile field service department assures Bliss customers of expert assistance throughout the free world. Above all, a determination to make every Bliss press a testimonial to Bliss value guarantees the customer continued satisfaction during the long service life of his Bliss equipment.



Outdoor stockpile of rough forged crankshafts yields a suitable blank.

Four and a half days later the newly machined crankshaft is installed and the press back in operation.

# ...AND ASSURED BY AN EXACTING QUALITY CONTROL PROGRAM

Bliss' Quality Control Program is a three-part operation: pre-production laboratory analysis of materials and processing techniques; in-process precision testing; and final inspection including factory assembly and run-in prior to shipment.

Pre-production QC is handled by laboratory personnel under the supervision of metallurgists and welding engineers. It determines proper materials, processing procedures, and surface treatments.

In-process QC combines physical checks with non-destructive examination, such as x-ray, Zyglo, and Magnaflux.

Quality Engineering examines rejects to assure that proper manufacturing techniques are employed to preclude recurrences. Process capability studies are regularly performed to assure continued high quality of manufacturing operations.

Final inspection gives specific meaning to Bliss' motto: "The standard of value." In this ultimate test each press is factory assembled and the manager of Quality Control must personnally certify that the unit conforms both to the customer's specifications and to Bliss' own exacting standards of manufacturing and performance.

Material deflection test—one of many metallurgical analyses.

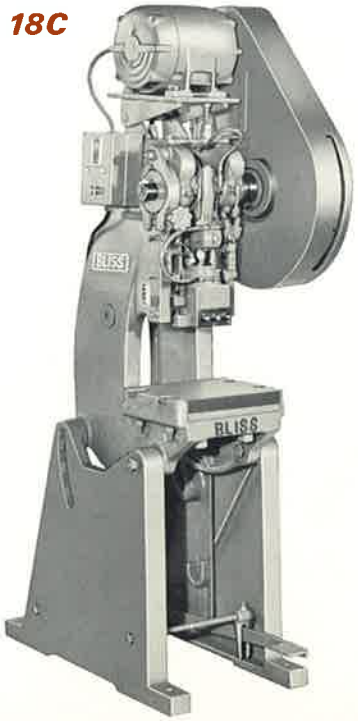
Ultrasonic inspection—one of several non-destructive test techniques.

# WORKHORSES OF THE INDUSTRY

Bliss Inclinable Presses are used for all types of metal forming operations including blanking, perforating, forming, bending, drawing, assembly and combination die. Available in a wide range of standard sizes from 10-ton to 250-ton, Bliss Inclinables can be fitted with many optional features and accessories. They are offered in either flywheel or geared drives, with either a positive Rolling Key clutch or a combination air friction clutch and brake to suit requirements. All are available with variable speed drives. To facilitate handling and increase production, Bliss manufactures a complete line of feeds such as roll (single and double) dial, transfer an other types. Every Bliss Inclinable is machined to accept a standard die cushion, which can be added at any time during the life of the press without field modification. The Bliss line of Inclinables includes presses of 10, 22, 35, 45, 60, 75 and 110 tons capacity in standard cast Meehanite construction or, where customer requirements dictate, welded steel construction is also available. Presses of 150, 200 and 250-ton capacities are of welded steel frame construction.

**18C** These 10 ton presses are used for a wide range of light blanking, forming and assembly operations at high speeds. The highly-reliable Bliss Rolling Key clutch with single tripping device is standard equipment. Frames are cast Meehanite. These presses are adaptable to many types of feeds and workholder devices to speed production.

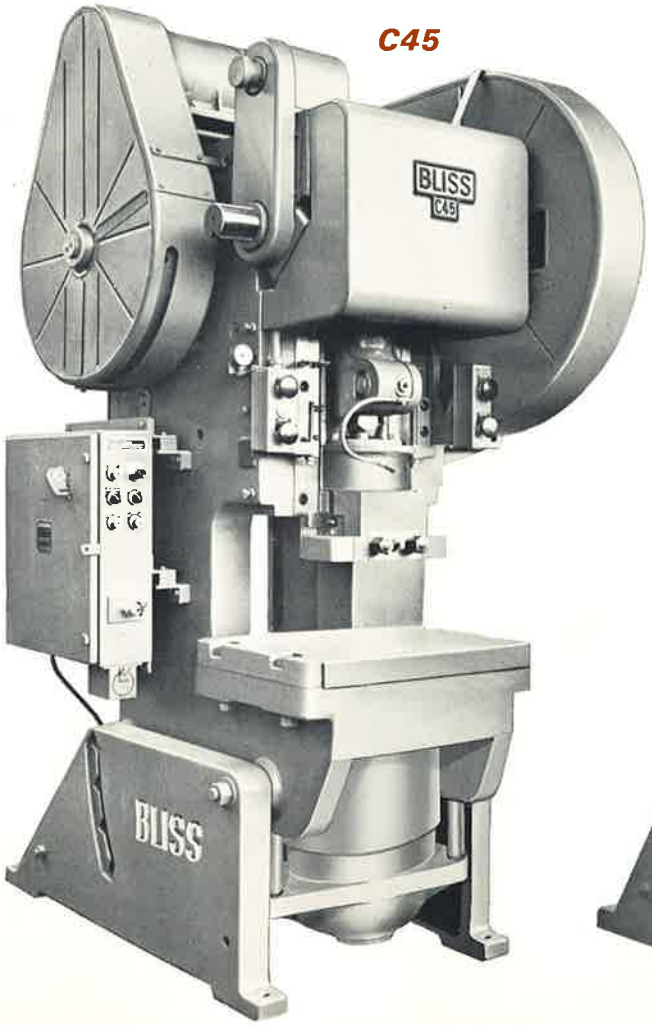
**18C**



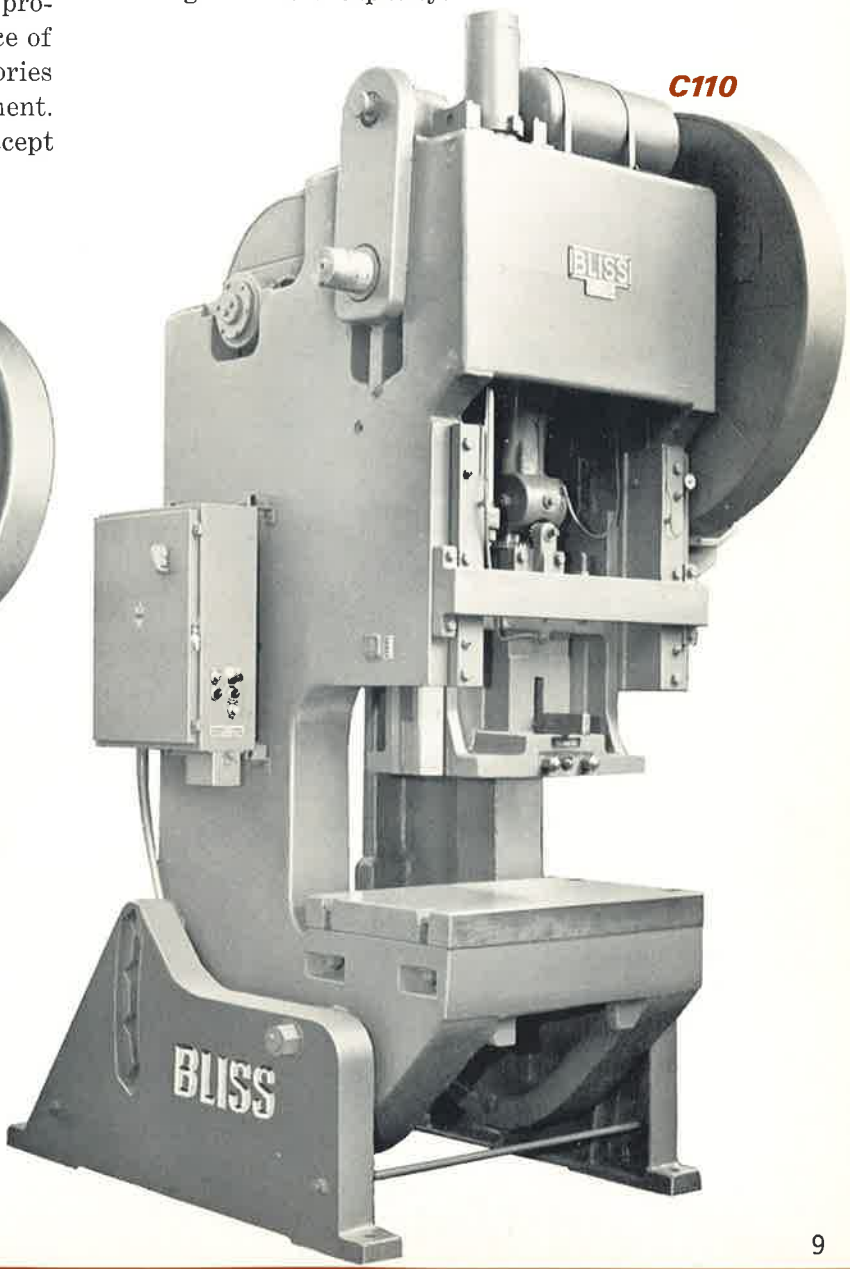
**C45** This 45-ton Inclinable is typical of the medium size "C" series line of Inclinable presses. Cast Meehanite frames and precise design specifications of these presses result in a very low deflection of .0015 inch maximum deflection per inch of throat depth. Maximum die space and easily accessible work area simplify die setup. Models up to 60 tons capacity are equipped with V-type bronze-plated gibs. Long, rapid manual adjustments and ease of locking the adjusting screw characterize the design of the slide assembly. Wrench-on-screw adjustment on models up to 60 tons capacity provides fast, easy slide adjustment. A wide choice of drives, clutches, optional features and accessories is available to suit virtually any job requirement. All "C" Series Inclinables are machined to accept the standard "UCO" type cushion.

**C110** Larger "C" Series Inclinables such as the 75 and 110-ton models combine the same basic design characteristics of the smaller "C" presses with added features required for larger jobs. Air counterbalances for the slide are standard equipment on these units. A motorized slide adjustment is optional. L-type gibs with replaceable bronze liners are used on all inclinables above 60 tons capacity to better support and align the more massive slides of the larger presses. Ball-joint connections are standard on all "C" Series presses through 110 tons capacity.

C45

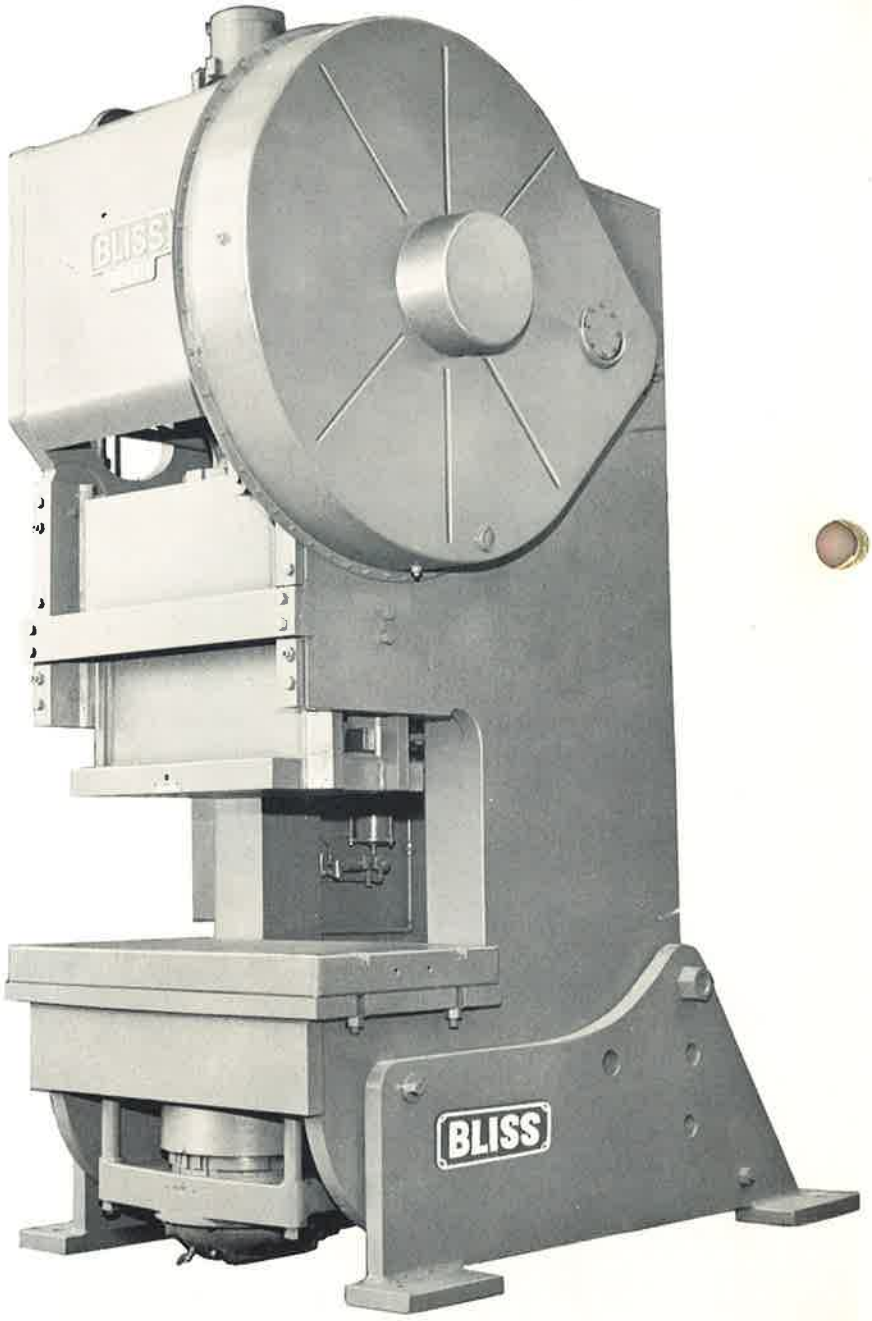



C110



# C-150, C-200, C-250

These large Inclinable Presses of 150, 200 and 250 tons capacity are constructed of steel weldments. They are regularly furnished with geared drive and a driveshaft-mounted type "AK" combination air friction clutch and brake. These presses are well-suited for such operations as drawing and forming, and for heavy blanking. These presses are also available with crankshaft-mounted air friction clutch and brake units. Many features, usually classed as "extras" are standard equipment on these machines. These include power operated barrel-type slide adjustment with wrist-pin connection and air counterbalanced slides. Removable 45 degree front gibs and bronze liners on the slide are also standard in these press sizes.

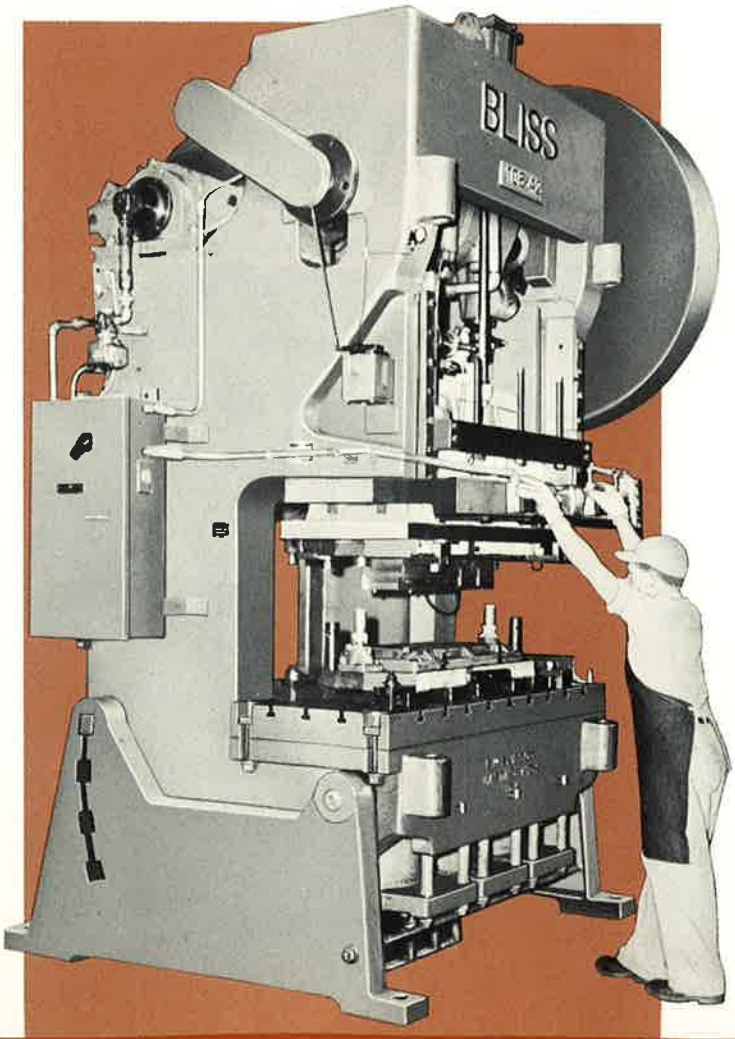


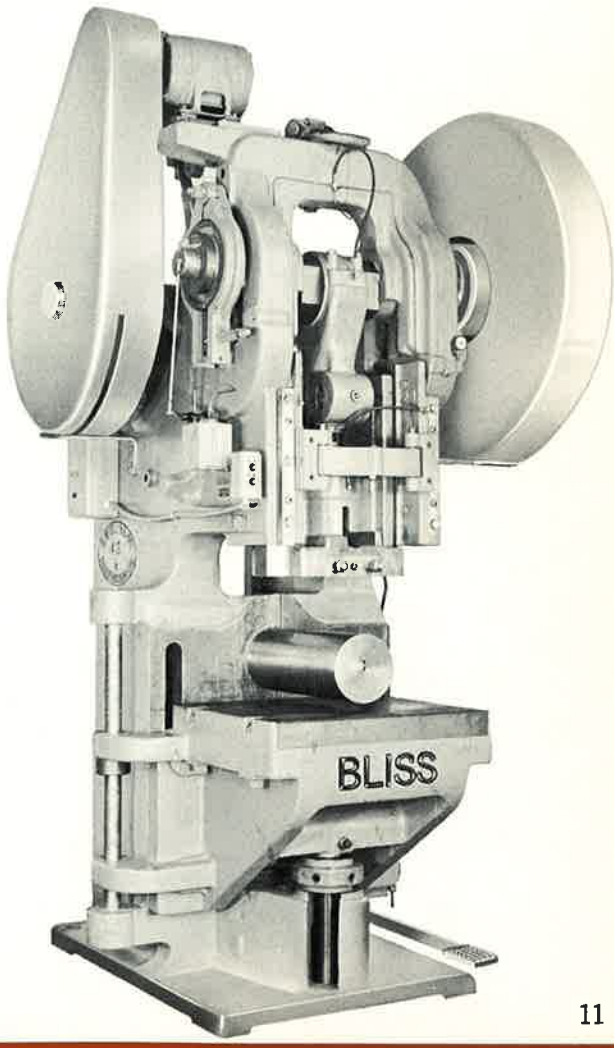
# DOUBLE CRANK INCLINABLES

Available in capacities from 18 to 175 tons, the double-crank inclinable offers several advantages in certain manufacturing situations. The wide beds, for example, with easy access from three sides, help accommodate large or irregular shaped workpieces. An optional inclining feature facilitates gravity disposal of scrap or stampings. A flanged slide is standard, and designed to handle wide dies or a series of dies for multiple or progressive die work. Twin cranks distribute forces evenly over the working area, resulting in greater accuracy and longer die life. The double crank series performs a wide variety of punching, shearing, perforating and stamping operations. Models up to and including 75 tons are available as either non-geared or single-geared units. Over 75 tons, these presses are single-geared. The Bliss Rolling Key clutch is standard on models of 18 through 75 tons capacity, while the larger presses are regularly furnished with a combination air friction clutch and brake. The combination unit can also be adapted to the smaller models.

# HORN PRESSES

Bliss Horn Presses are designed for hook forming, seam closing, riveting, cylinder perforating and other work requiring special horns. They are also well-suited to conventional blanking and forming jobs requiring a table or bed. Adjustable table height adds flexibility permitting use of dies having a wide range in shut-height. Available in capacities from 10 to 95 tons, smaller models (non-geared 10 and 18-ton) are equipped with the rolling key clutch. Models of 22 tons capacity and over are regularly furnished with an air friction clutch, with the crankshaft-mounted RKC clutch available on non-geared units.

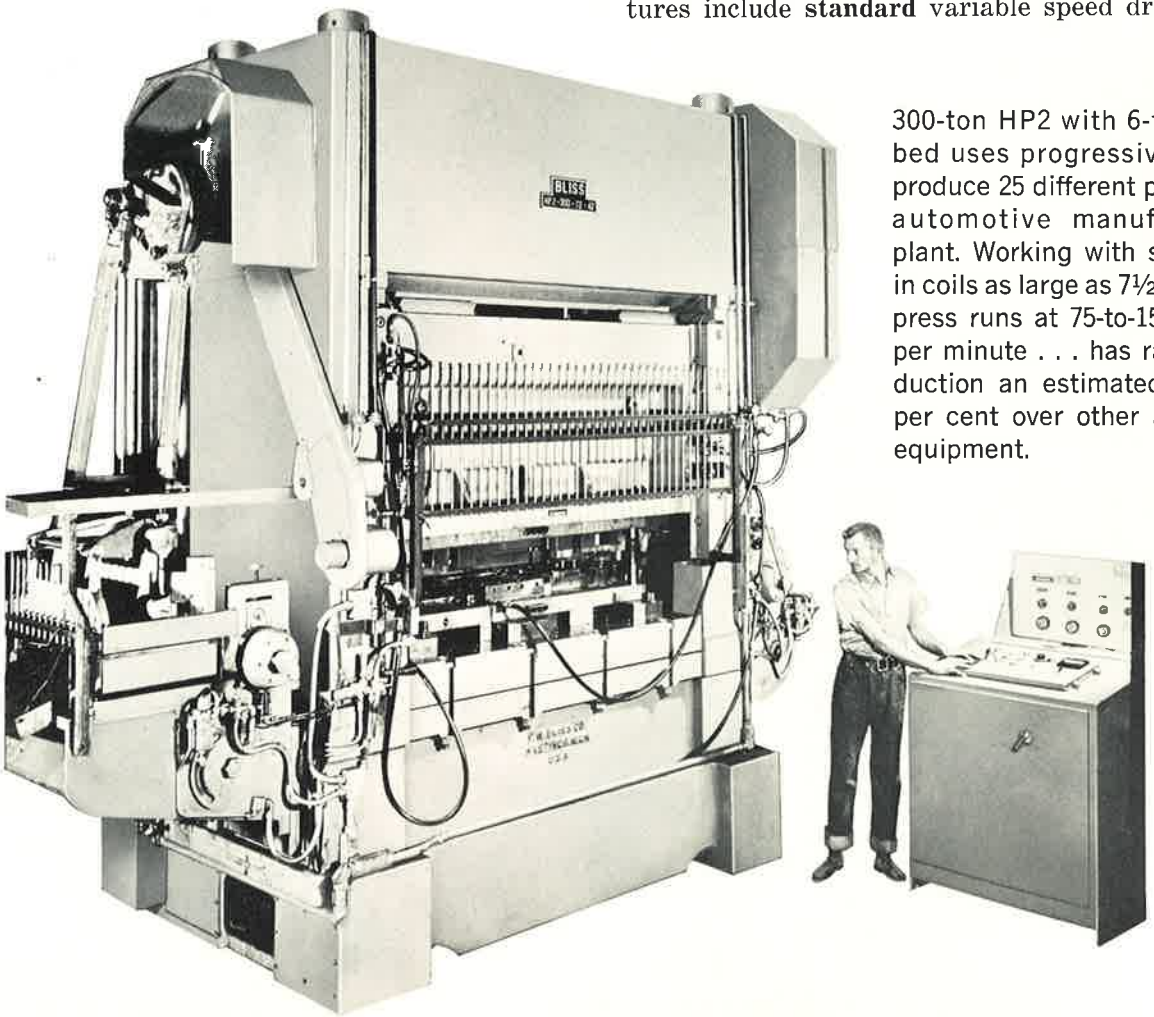


# HP2 HIGH PRODUCTION PRESSES

The Bliss HP2 Series High Production Presses are the current generation of the original high production, double-crank, precision presses pioneered by Bliss to meet the demands of progressive die work. The current design incorporates innovations and improvements based on 30 years experience in building this equipment. The new HP2's are designed to provide for greater ease of operation, adjustment and maintenance. Constructed of cast Meehanite, they provide the ultimate in rigidity, stamping, precision, load distribution, and die life. Standard capacities range from 25 to 300 tons. Greater tonnages can be provided on special request.

HP2's are rugged from the floor up. Uprights, slides and beds are designed for maximum rigidity. Bliss deflection standard in bending and shear for both bed and slide is .0005″ min. to .001″ max. (per foot between tie rod centers with the load evenly distributed over the center ⅔ of the bolster) depending on the right to left dimension of the press. If required, the minimum deflection of .0005″ may be attained on any standard press regardless of the right to left dimension at slight additional cost. This, coupled with the superior vibration-damping qualities of the Meehanite frames and pre-stressed steel tie rod construction, results in maximum precision and die life. Crankshafts are balanced and counterweighted to reduce eccentric forces. Other features include **standard** variable speed drive with

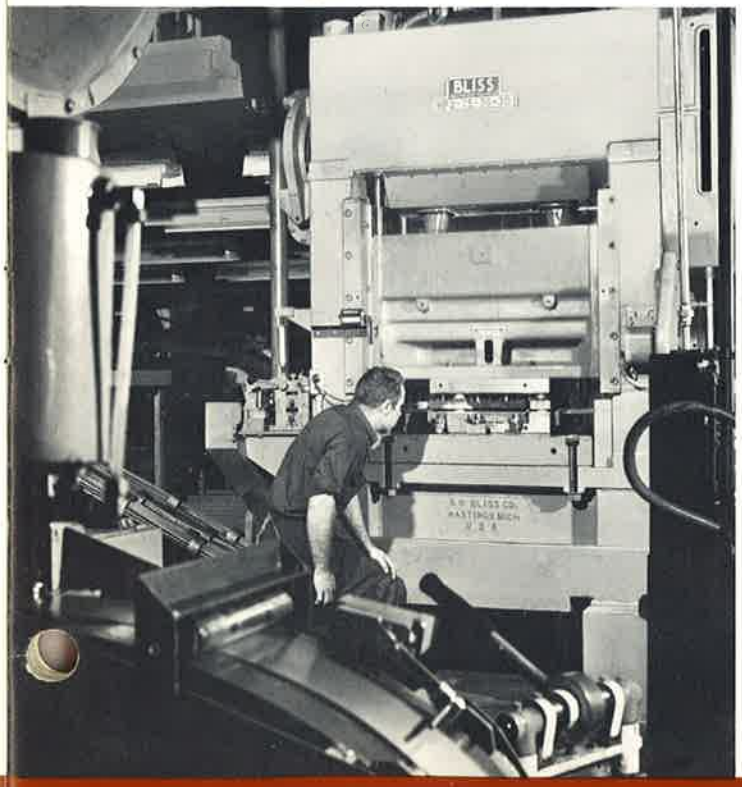



300-ton HP2 with 6-foot-wide bed uses progressive dies to produce 25 different parts in an automotive manufacturer's plant. Working with strip steel in coils as large as 7½ tons, this press runs at 75-to-150 strokes per minute . . . has raised production an estimated 15-to-20 per cent over other automatic equipment.

# HIGH SPEED GAP FRAME PRESSES

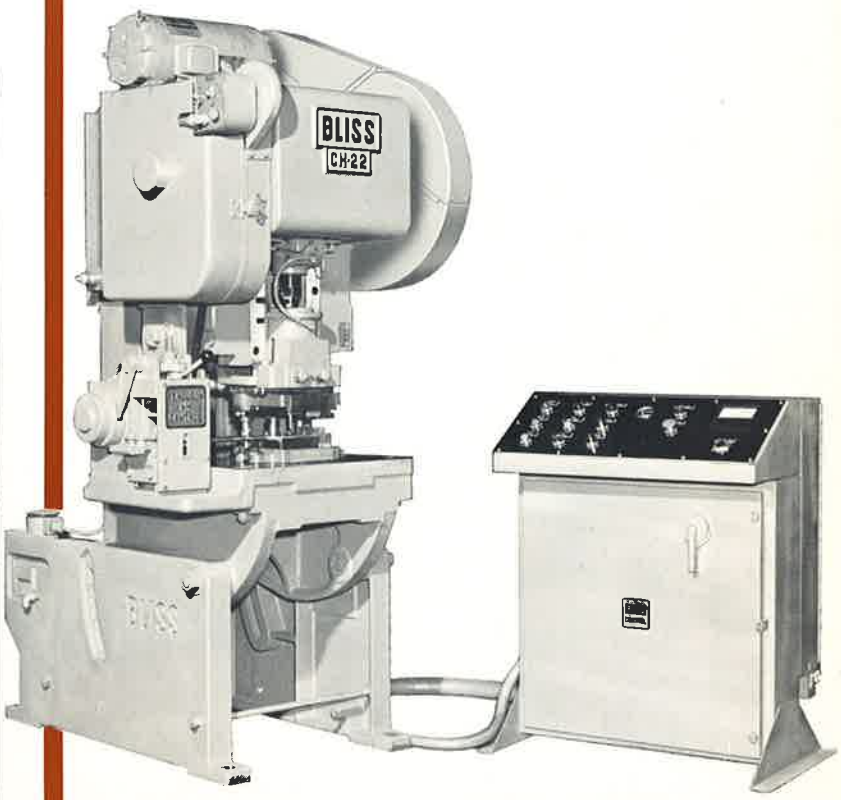
remote speed control, liberal size die area, console control and recirculating oil lubrication, to name a few. Extremely accurate square corner gibbing provides eight-point guidance of the slide. This results in precise alignment enabling new highs in slide-to-bed parallelism (Bliss standard is .0005″ per foot, not to exceed .002″, left to right and front to back), thus giving longer die life and more precise finished products. The Bliss "CKU" combination air friction clutch and brake with "unsticker" is standard. The precision type "R" rack and pinion roll feed is used with this press and can be fed side-to-side or front-to-back.

75-ton HP2 turns out armature laminations for gasoline engine ignition systems. It is being operated at 415 strokes per minute on .018″ by 6″ cold rolled steel strip.




## CH SERIES

These high-speed gap frame presses incorporate a number of modifications to the standard "C" Series Inclinable line which account for their efficient and trouble-free operation at the much higher speeds employed with continuous, automated feeding. Usually non-geared, these presses are available in capacities from 22 to 60 tons, and operate at speeds as high as 1200 strokes per minute. Because of their design and high speeds, they are well-suited for the production of large quantities of small and medium parts such as washers, snap rings, electrical and electronic components. Frames are of cast Meehanite, while slides ride in solid bronze gibs for smooth operation at high speeds. A fast-acting Bliss "SU" clutch with power "unsticker" is mounted on the counterweighted crankshaft. A large, separate brake provides quick stops in a misfeed detection, or regular stops at top stroke. A variety of controls, feeds and optional features makes the CH Series easily adaptable to specialized customer operations.

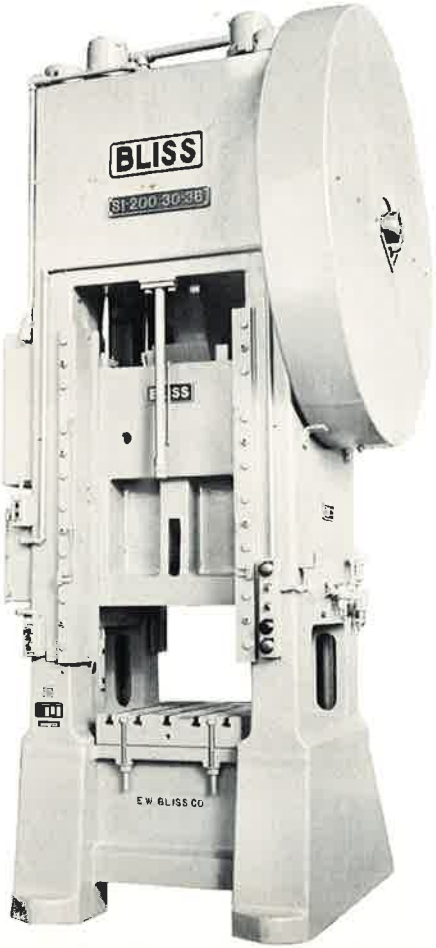


# SINGLE ACTION TOP-DRIVE PRESSES

*(Crankshaft Design - Cast Frame)*

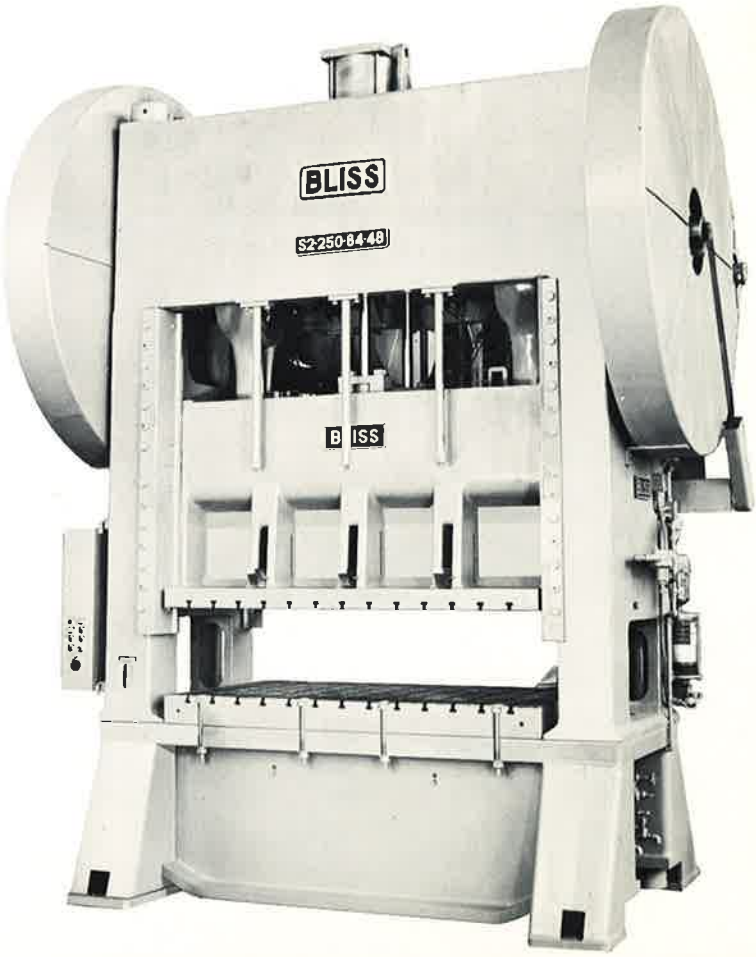
## ONE-POINT PRESSES

Bliss straight-side, one-point (S1) presses are widely used for blanking, piercing, stamping, forming and similar operations on medium-sized parts. Available in capacities from 60 to 600 tons, they are used extensively in the automotive, appliance, aircraft, hardware, farm machinery and furniture industries. The S1 presses feature four-piece construction with bed, box-type crown, slide and uprights of cast Meehanite. Barrel-type slide adjustment permits long adjustments to accommodate dies in greatly varying heights. The type "AK" single-disc pneumatic friction clutch and brake is standard equipment, while a crankshaft-mounted air friction clutch is available as an option.




## TWO-POINT PRESSES

Bliss straight-side, two-point (S2) presses are used for blanking, forming, drawing and other operations on a wide variety of parts where die size dictates two-point design. Available in capacities from 50 to 300 tons, the S2 press is of the same basic four-piece construction as the S1, using the same clutch and incorporating the same design features. These presses can be equipped with Bliss die cushions, knockouts, automatic feeds and special lubrication systems to suit customer requirements. They are available, as are the S1 series, in either single or twin end drives.



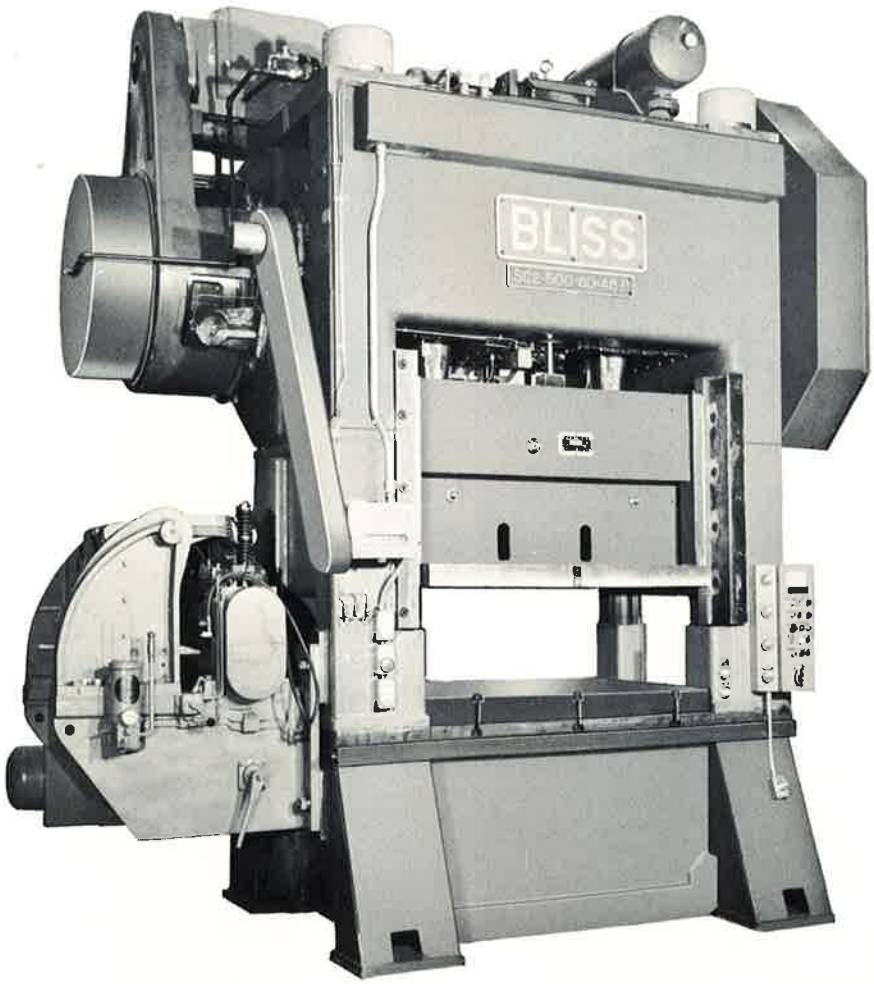
# SINGLE ACTION TOP-DRIVE PRESSES

BLISS

*(Crankshaft or Eccentric Shaft Design—Welded Construction)*

Bliss welded design presses using crankshaft or eccentric shafts are used for general purpose forming, drawing, and blanking operations. They are suited to either short or long production run applications. Available in capacities from 75 to 2000 tons these presses are offered in a wide range of bed areas. They can be furnished as either non-geared, single geared or double geared machines with either single end or twin end drives.

Standard units are of the non-inbuilt design with various degrees of inbuilding available as an option. Design features include 8 point gibbing, air counterbalances, provisions for bar-type knock-outs, automatic recirculating oil lubrication, motor-driven adjustment and either the type "AK" clutch and brake or the type "DK-FK" low inertia independent clutch and brake. Many optional features are available such as various overload devices, tie rod tensioning devices, part die-setting and cycle controllers, die cushions and a variety of feed arrangements. These presses can also be adapted to rolling bolsters.

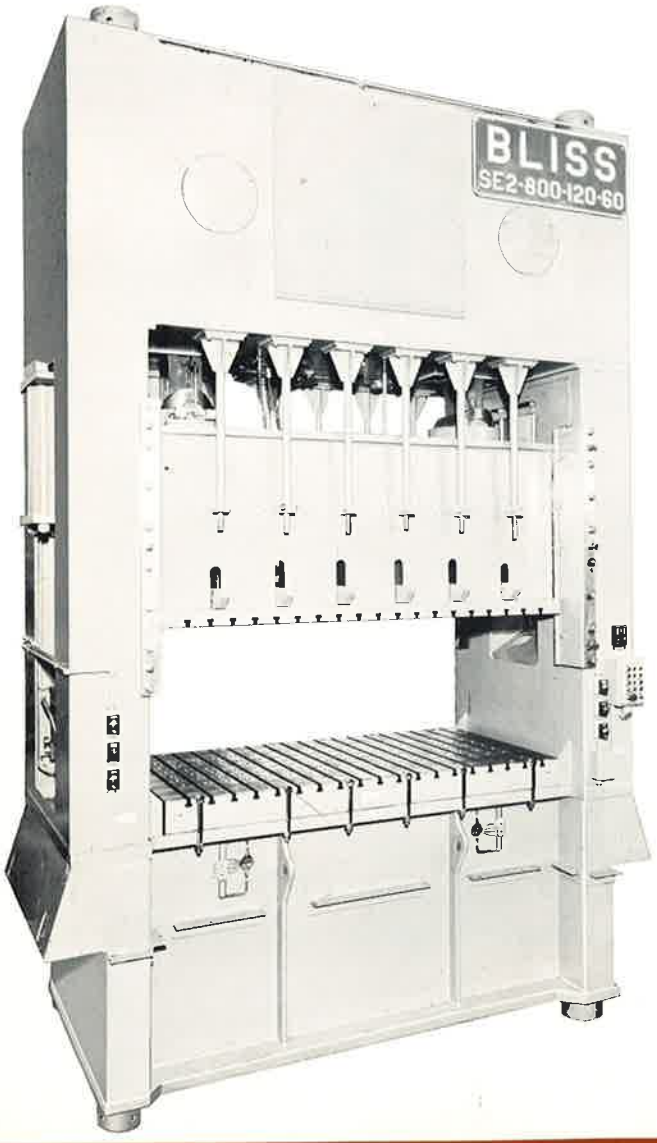


# SINGLE ACTION TOP-DRIVE PRESSES

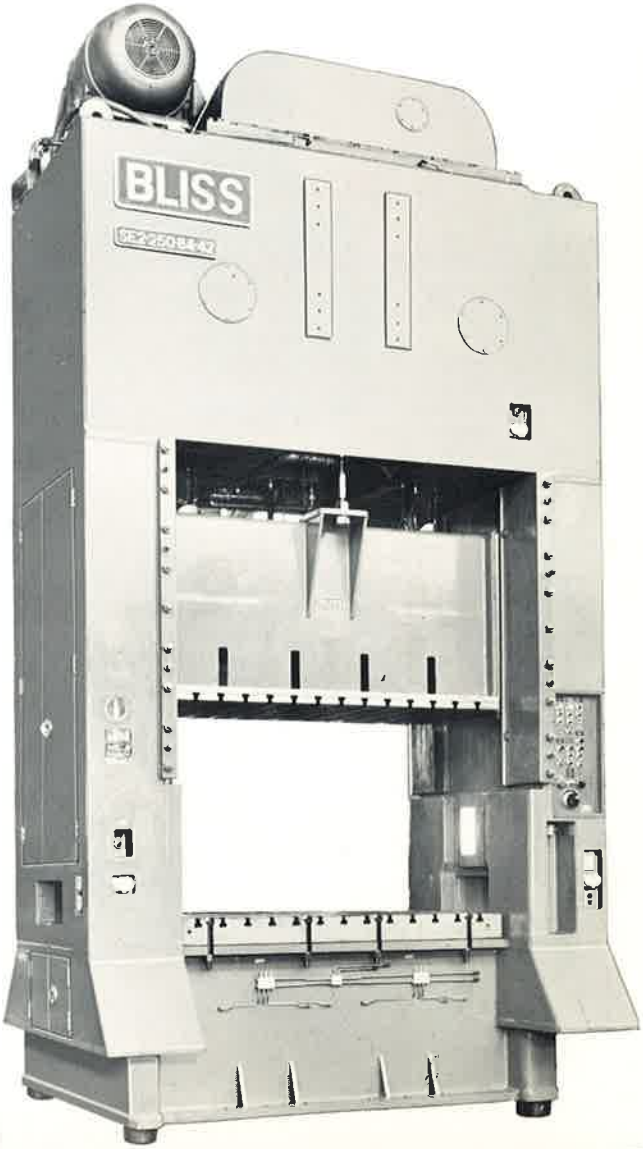
*(Eccentric Gear Design-Welded Construction)*

These straight side single action eccentric gear presses are the latest generation of Bliss designs, brought to a high degree of standardization to cover a broad range of industry requirements and are widely used for forming, drawing and blanking operations. They are the most rugged of the straight-side, top-drive presses. Frames are of welded steel throughout, designed for maximum rigidity and accessibility. Available in J.I.C. standard tonnages of 200 to 2000 these presses offer extreme ranges of bed sizes and length of stroke.

SE2-800-120-60
Non-inbuilt design




SE2-250-84-42
Inbuilt design



# DESIGN FEATURES

The standard Bliss eccentric gear press is of the non-inbuilt design with varying degrees of in-building including fully enclosed available as an optional extra. Standard design features of these presses include:

(1) 8 point gibbing for full guidance of the slide at all four corners in both directions of lateral thrust.

(2) Slide and bed are rigid stress relieved weldments. Slide deflection in the standard press is guaranteed not to exceed .00175″ per foot between pitman centers with rated load evenly distributed between such centers. Bed deflection does not exceed .00175″ per foot of die space with rated load evenly distributed over center ⅔ of distance between tie rod centers. These calculations take into account both bending and shear deflection. Lower deflection ratings may be provided when required at slight additional cost.

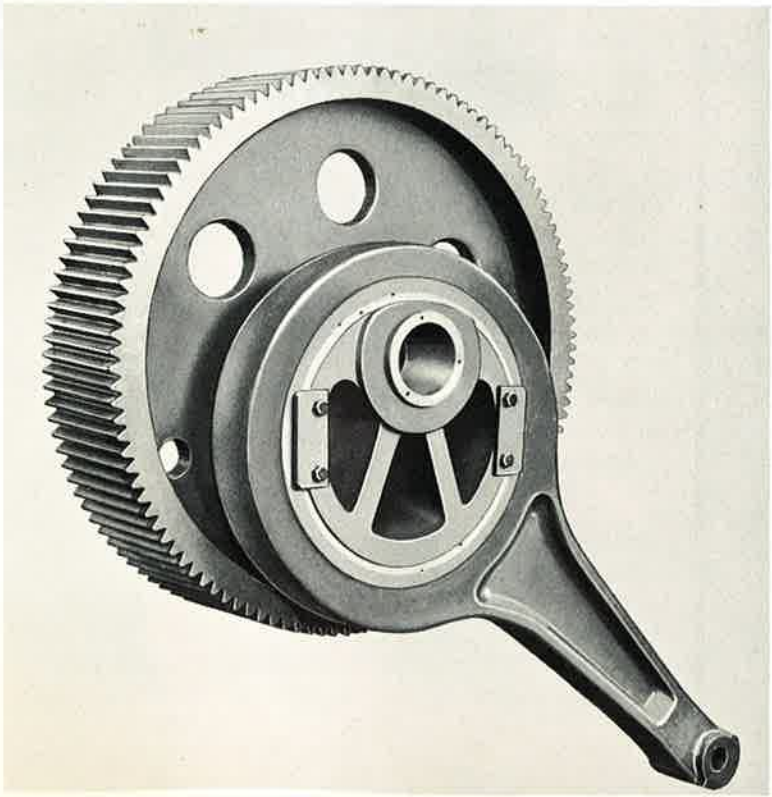
(3) Provision for bar type knockouts.

(4) Counterbalance cylinders.

(5) Automatic recirculating oil lubrication with high pressure, positive displacement serving all points on the press.

(6) Either the type "AK" clutch and brake or the type "DK-FK" low inertia independent clutch and brake.

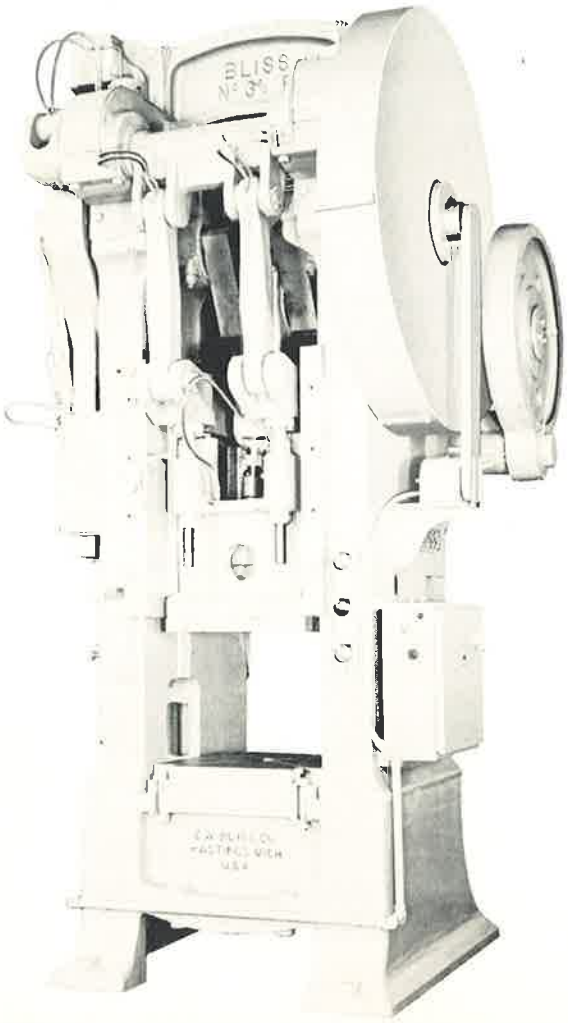
To satisfy special production requirements these presses can be furnished with a variety of optional features to insure optimum production and efficiency. These features include: Automatic control devices, overload protection, tie rod tensioning devices, fast die-setting and cycle controllers, die cushions and automatic feeds. These presses can be easily adapted for a variety of Bliss rolling bolster configurations. This type of installation most frequently incorporates special control devices to help realize the most from this equipment. Some of the devices that can be furnished are automatic die clamps, bolster elevating mechanisms, slow inch provision for die setting and bolster hold downs. These presses can be equipped with a variety of feeds for both right to left or front to back feeding.

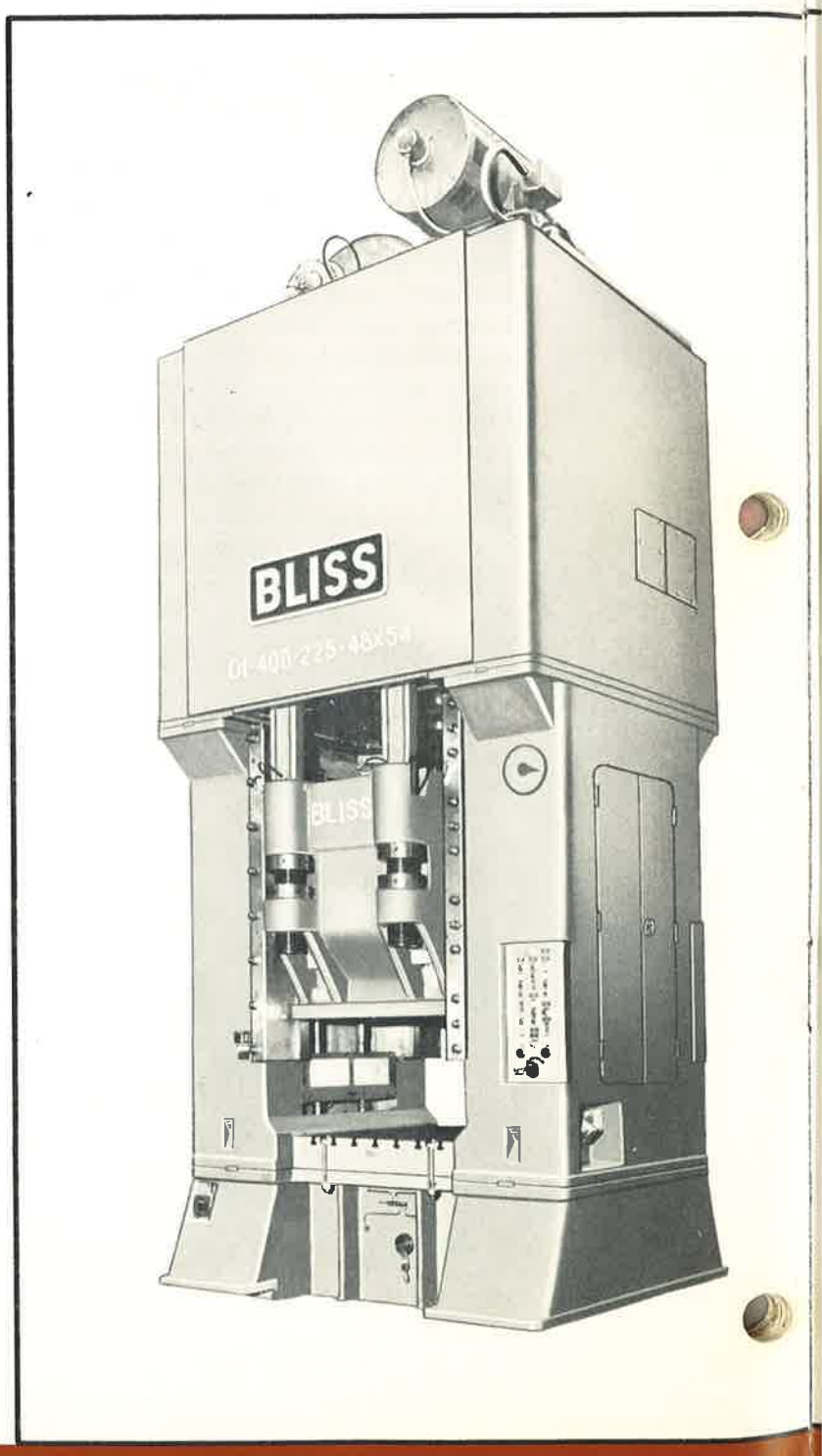


Design of the Bliss eccentric gear element reduces the bending moment to a minimum, eliminating the possibility of torsional deflection which can occur under heavy loads with crank-type drives. Gear and eccentric are an integral piece, machined from ductile iron and running in large, bronze bearings. Gearing can be either single or double to suit speed requirements.

# SINGLE CRANK TOGGLE DRAWING PRESSES

These presses are available in capacities from 60 to 435 tons. They are used for shallow and deep drawing operations, and for forming round, square and irregular shapes. The toggles operate the blankholder and provide an adequate dwell period allowing the plunger to perform the complete draw. Constructed of cast Meehanite, these presses are popular with makers of stainless steel, aluminum and copper kitchen utensils, automotive components, electrical parts, watch cases and home appliance components. The Bliss Type "AK" pneumatic friction clutch is standard on this model.



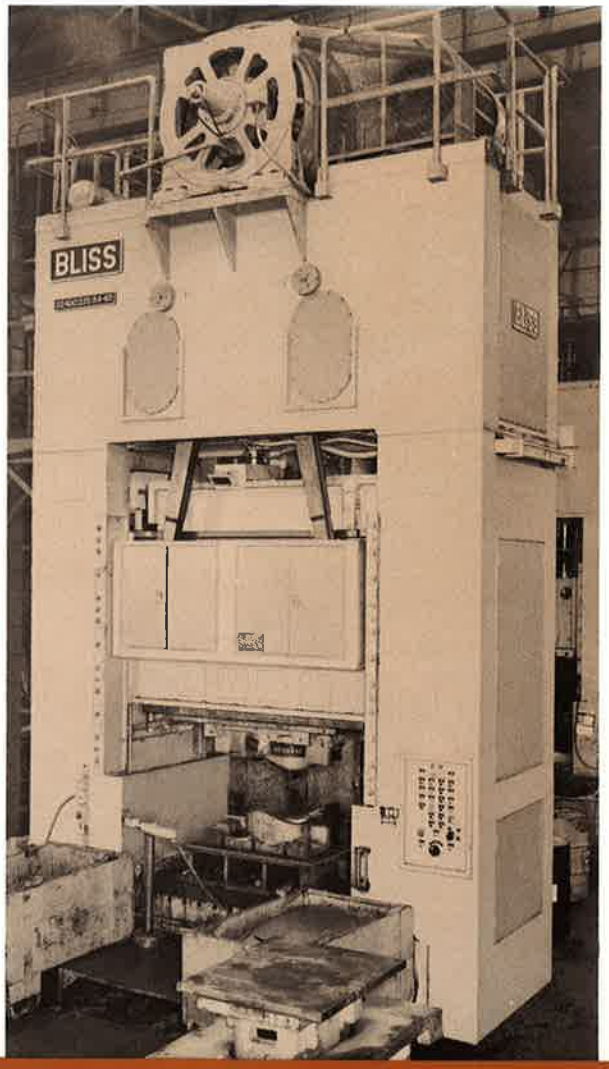
# ONE-POINT PRESSES

These presses are used for heavy, deep drawing over a relatively small area and for draws requiring more blank-holding pressure than can be obtained from a cushion on a single action press. On the double-action presses, the Bliss toggle mechanism transfers the entire blank-holding load to the frame, allowing the crankshaft to provide nearly all its power to the plunger. This press line is characterized by heavy frames of four-piece tie rod construction with components of fully stress relieved welded steel. Plunger adjustment is motorized and the blankholder adjustment is made manually. Either the type "AK" combination clutch and brake or the independent type "FK" clutch and "DK" brake can be furnished. And air counterbalance is standard on both the inner and the outer slides. A variety of optional features include Bliss die cushions with a locking device, which can be installed at any time without modification; overload protection comprised of interlocked hydraulic and electric systems which stop the press in the event of overload; hydraulic pinch adjustment on blankholder; automatic or semi-automatic slide positioning which speeds die changes and helps protect dies; and a slow-inch mechanism which permits the set-up man to produce an actual work piece under inching conditions.

These presses are used for producing automotive brake drums, crankcase pans, deep tubs, lawnmower bodies, wheelbarrow trays and other heavy stampings. Smaller sizes and tonnages produce kitchen utensils and small appliances. Capacities range from 200 to 2000 tons on the inner ram.

# TWO AND FOUR POINT PRESSES

Similar in construction, function, and features to the one-point presses, these machines are used to produce larger parts and when subsequent die size dictates a more even distribution of tonnage to the die area. Examples are large automotive panels, bathtubs and sinks, caskets, aircraft parts and metal furniture. The inner and outer ram adjustments are motorized. Capacities range from 200 to 1600 tons on the plunger.



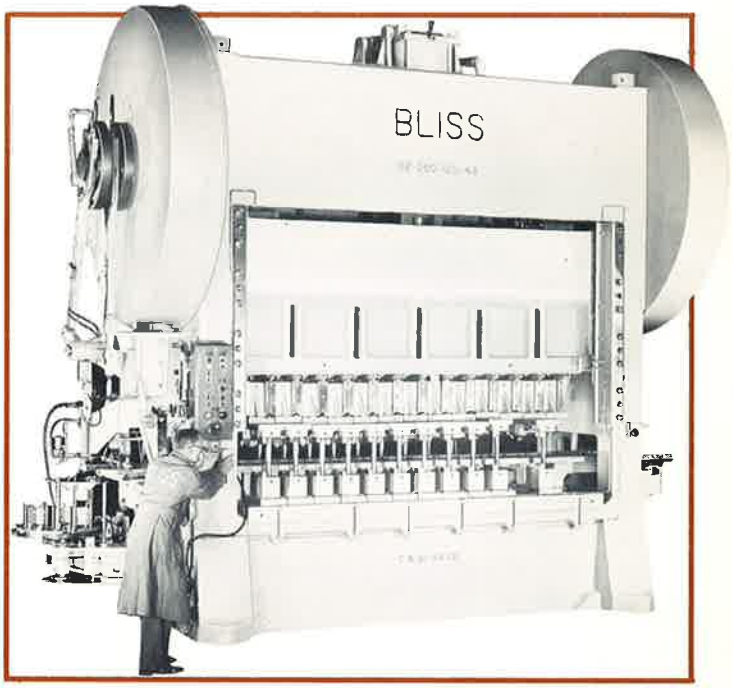
# TWO-AND FOUR-POINT, SINGLE, DOUBLE AND TRIPLE ACTION

Used for drawing large sheet metal parts and for trimming, seaming, restriking, forming and other heavy operations, these presses are available in a wide range of sizes and capacities to meet customer specifications. Popular for the flexibility it offers in plant layout, the underdrive press' low overall height makes installation in modern one-story buildings practical. The entire drive mechanism of these presses is below the production floor level. This important characteristic makes it possible to perform routine maintenance without interfering with daily production. The Bliss link-type drive, mounted below the floor level, provides a high mechanical advantage in converting rotary motion to vertical motion of the slide. These presses will not stick at bottom stroke, due to the design of the rockershafts which rock to within 5 degrees of vertical alignment. A demountable gear case, containing all drive gearing except the bedmounted main gear, is mounted on the underside of the press and can be removed for maintenance and service. A minimum of gears is used to drive the press, resulting in low inertia load on the drive as well as a higher tripping rate and longer life for the Bliss air friction clutch and brake. Special features of underdrive presses include "inching" mechanisms for aiding in die-setting; a rotary synchronizing switch to control stops, starts, interlocks, motion and time of auxiliary press equipment into the press cycle; Bliss die cushions; and various other controls and adjustments.

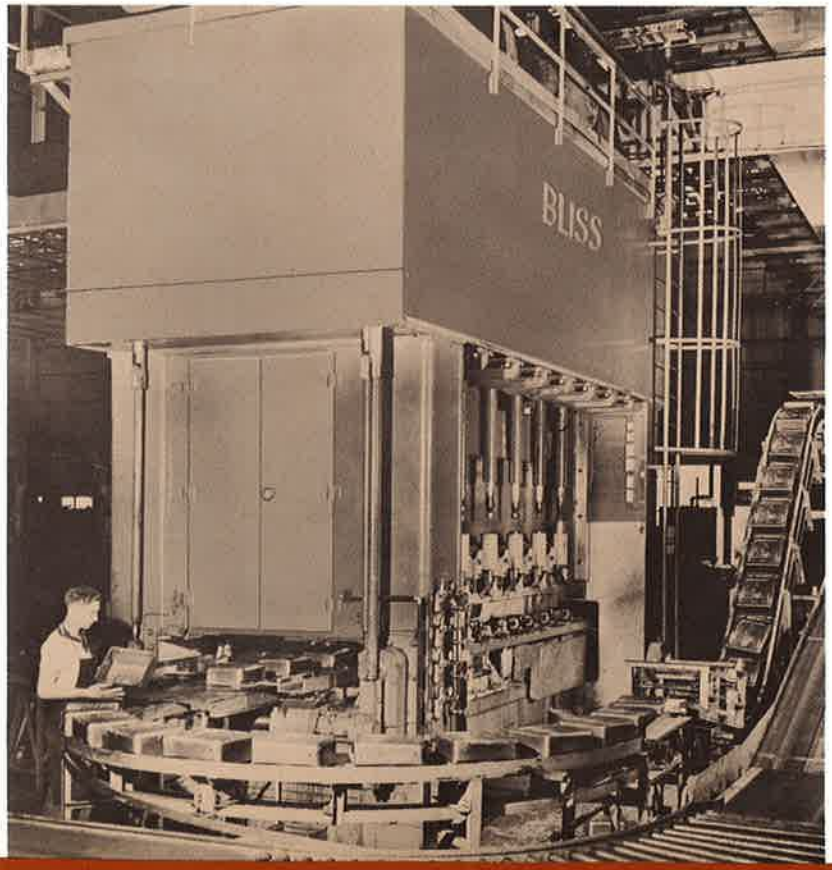
# TRANSFER FEED PRESSES

BLISS

Bliss introduced the transfer feed press in 1896 and since then has built well over 1000 of these units. Bliss transfer feed presses are found in industries where large quantities of uniform parts are made, such as ordnance material, automotive, appliance and can-making. A typical arrangement employs a conveyor linkage fitted with workholder devices to carry the parts through a series of progressive dies in the same press. Industries employing mass production techniques are turning not only to the transfer feed press, but to entire systems of such presses to speed production and improve quality and part uniformity. Where part size prohibits the use of a single press, Bliss can furnish a synchronized line of presses with a transfer mechanism between presses that can operate either front to back or right to left.




This press represents the 1000th transfer feed press manufactured by Bliss. It is a 250 ton unit and produces 1680 starter end plates per hour.



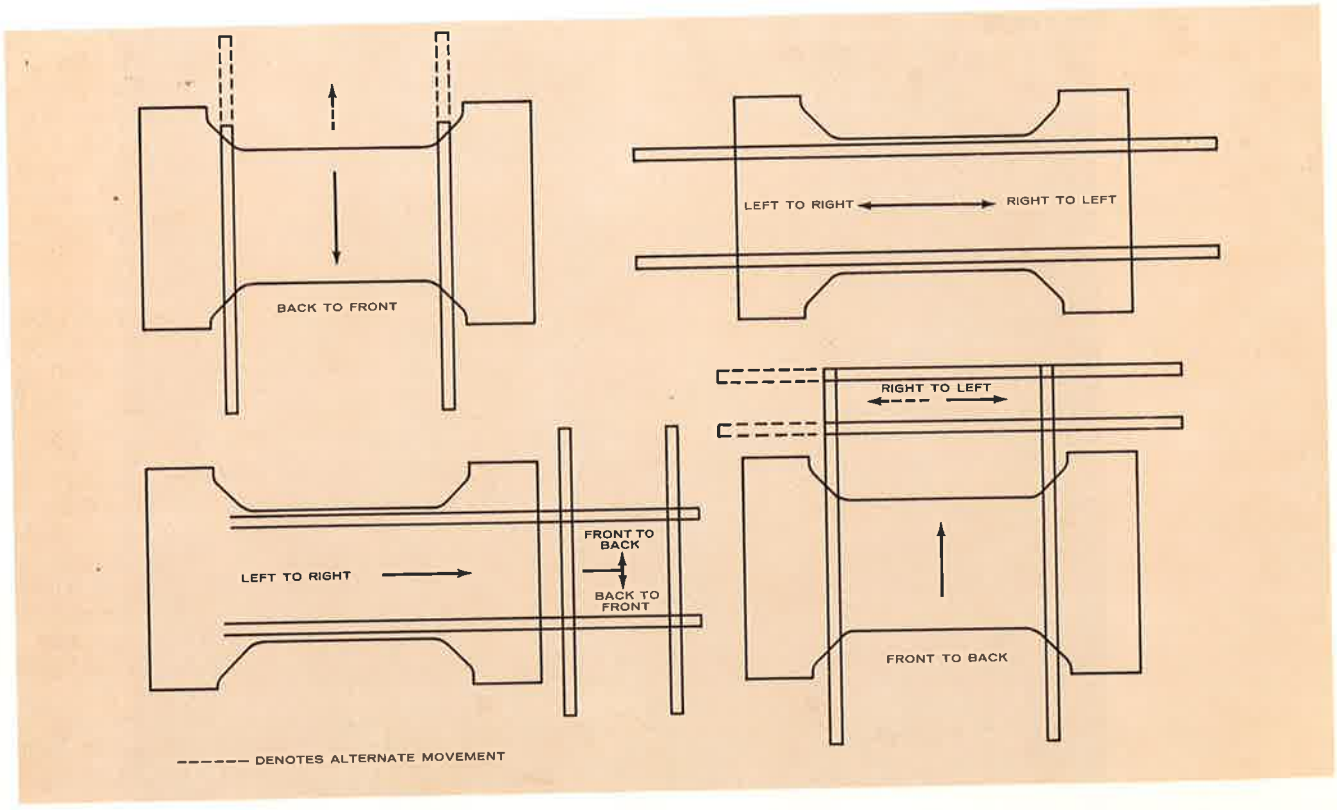

Every hour, this 700-ton machine produces 600 deep-drawn vegetable pans. The Bliss S2-700-192 x 48 straight side press has a seven-station transfer feed, single-roll feed, power-driven stock straightener and coil cradle. The first station completely forms the pan while succeeding stations trim, punch holes, and form and trim the sides.

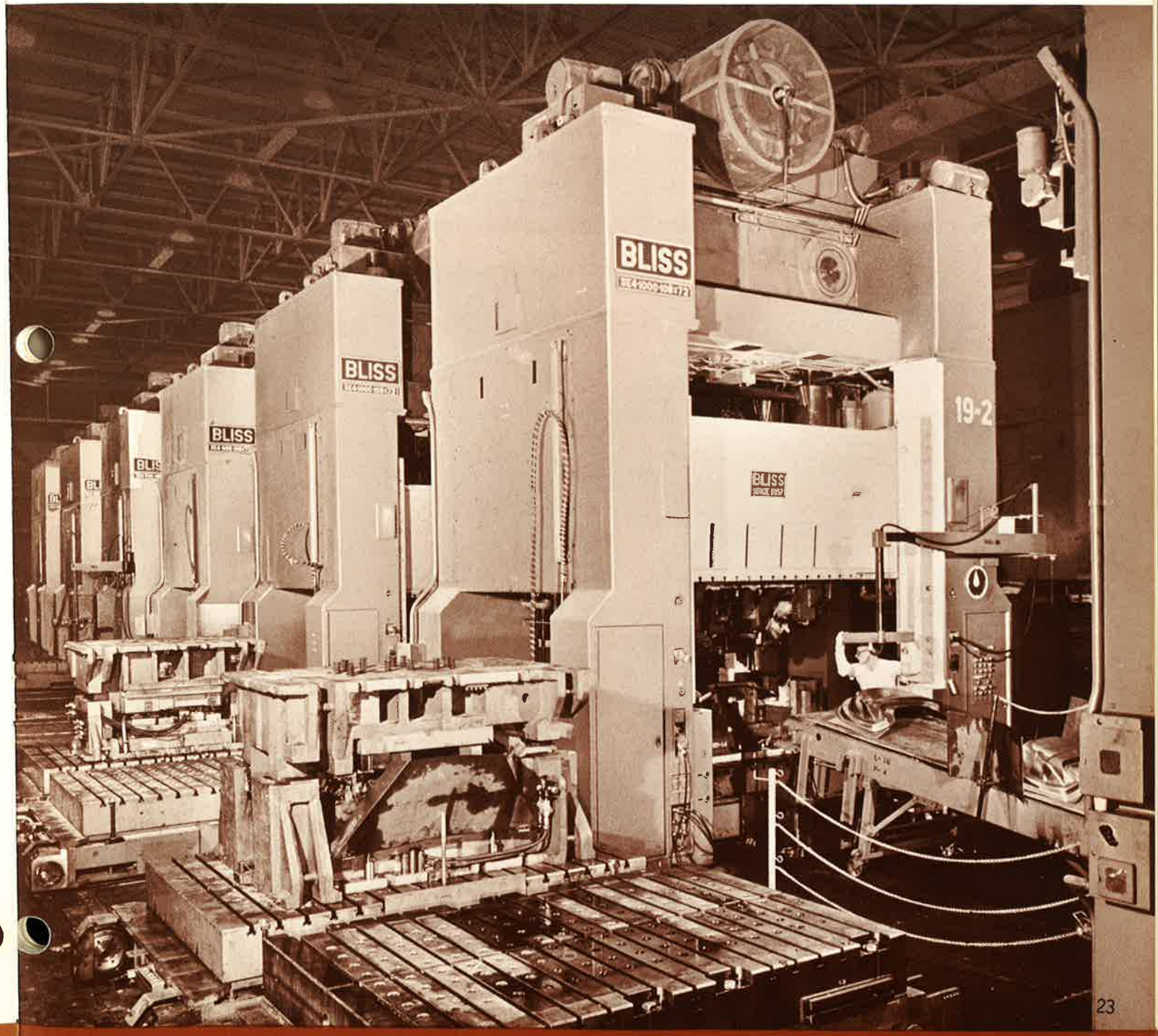
# ROLLING BOLSTER PRESSES

The obvious advantage of rolling bolsters on a production line . . . faster and more accurate die-change . . . is by no means the only benefit derived from this major advance in press technology. Reduced inventories, parts storage, and parts handling are direct results of rapid die-change. While rolling bolsters can be designed for almost any type of press, they are most often used in conjunction with large straight-side top-driven or under-driven presses, either single or double-action types.

The bolsters are self-powered, interlocked and controlled at the master panel. While one die stamps out parts, another die can be secured to a bolster outside the press. Changing large dies merely involves moving the rolling bolster with die attached into the press and automatically positioning and clamping it in place. Die changeover time is often reduced from hours to minutes.

More than two bolsters are sometimes used, and various bolster arrangements are available to suit individual plant requirements. More typical Bliss rolling bolster configurations are shown below. Other features of these presses include: automatic die clamps, bolster clamps, automatic slide-positioning devices, hydraulic overload protection, and tonnage indicators.

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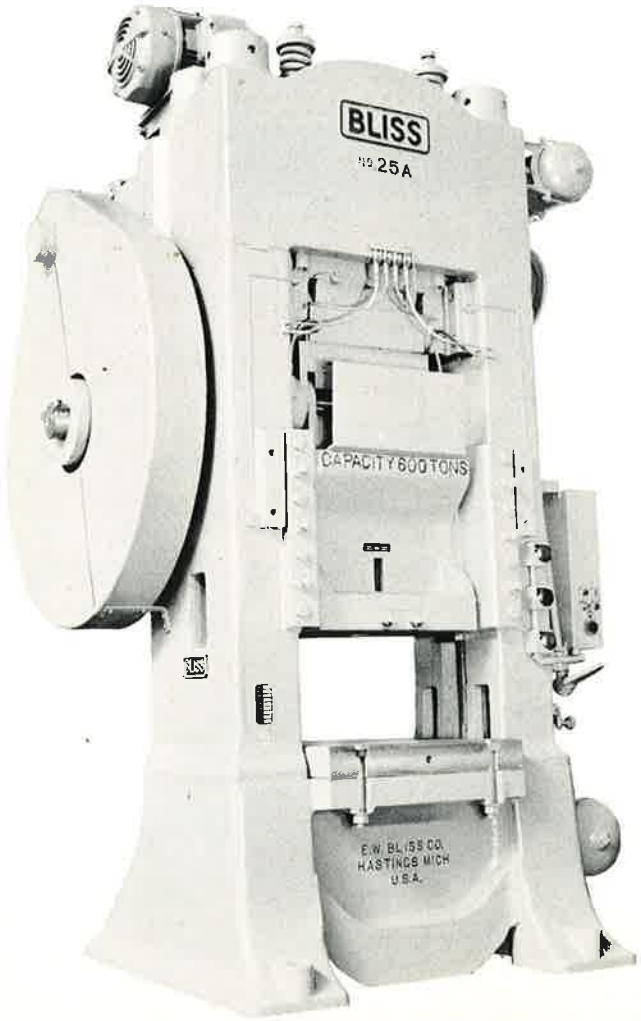
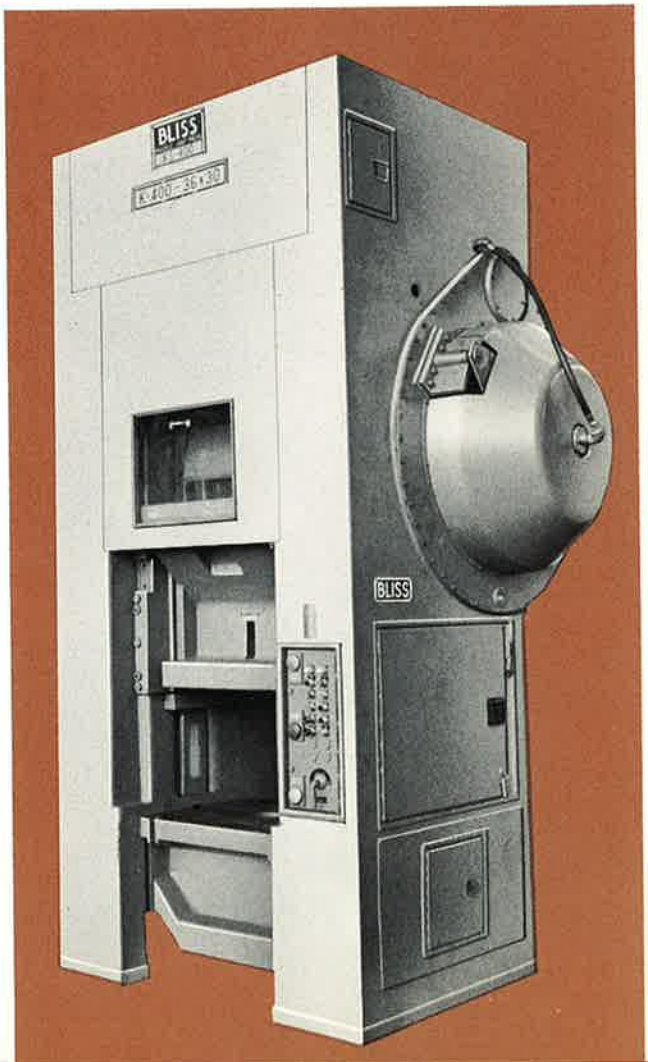
# KNUCKLE JOINT PRESSES

Bliss Knuckle Joint Presses are ruggedly designed for heavy work requiring high tonnage close to the bottom of the stroke. Types of work performed are coining, embossing, extruding, heading, sizing and swaging. They have been especially valuable in replacing expensive straddle milling operations to achieve thickness tolerances of ± .001 inches. These presses, equipped with manual and automatic feeding devices, are capable of high rates of production such as those maintained in leading mints throughout the world. Bliss Knuckle Joint Presses are available in standard sizes in capac-

Cast Meehanite Knuckle Joint press.

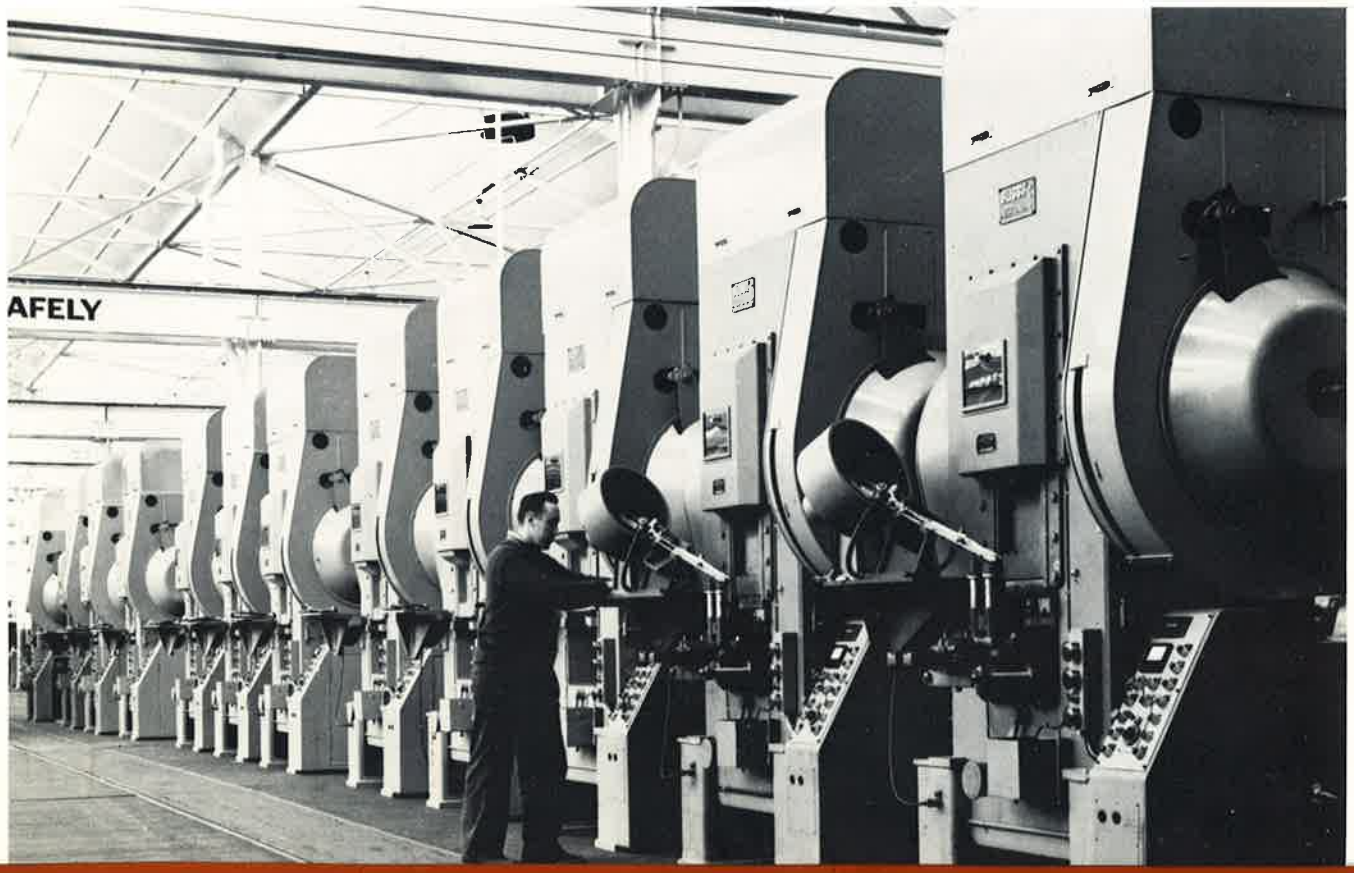



New design Knuckle Joint features welded steel uprights with cast Meehanite slide, bed and crown, automatic recirculating oil and a crankshaft or a backshaft mounted clutch and brake.



ities from 100 to 4000 tons. On presses of 800 tons and up, the clutch is usually the Bliss Type "AK," arranged for mounting on the backshaft. Lining plates on both clutch and brake are easily removed without disassembling the clutch or taking it off the press. Knuckle joints are available with four-piece cast Meehanite frame, or with welded steel construction. New "K" series knuckle-joints are completely enclosed with welded steel uprights and cast slide, bed and crown. They are available in capacities from 250 to 1000 ton and feature a crankshaft or a backshaft mounted clutch and brake.

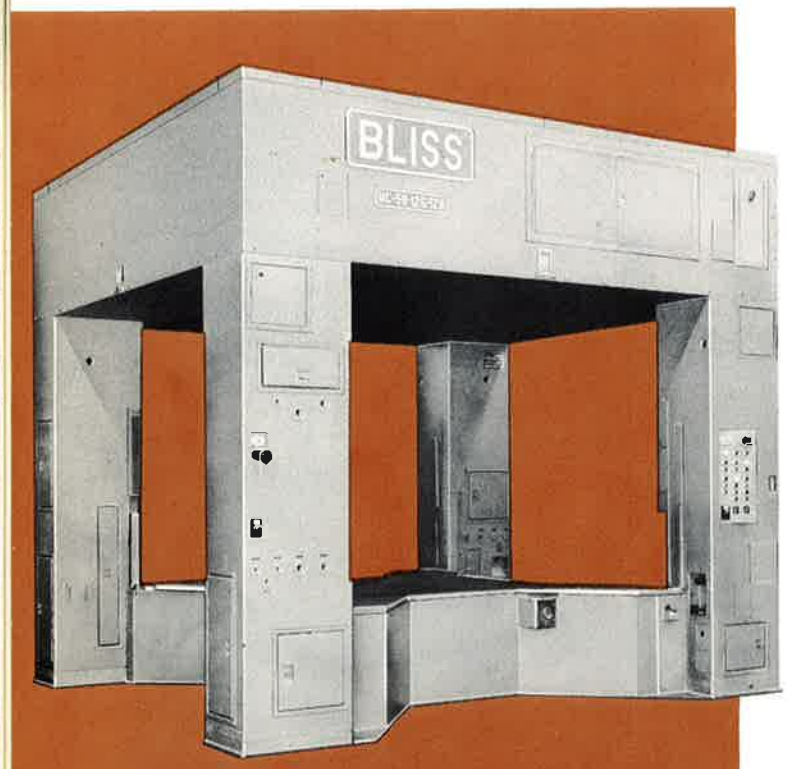
This line of 200-ton knuckle-joint presses is minting coins at speeds from 90 to 180 strokes per minute.



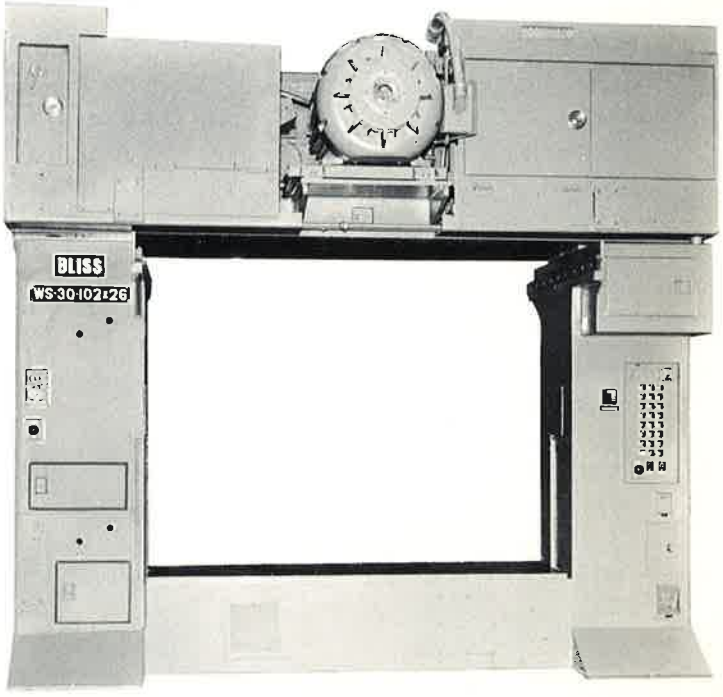
# WELDING PRESSES

These presses are used primarily by the automotive industry to speed production of body parts permanently assembled by welding. They are also well-suited for many similar jobs in the appliance industry. The Bliss line of welding presses includes cloverleaf, straight side and gap frame designs. Complete inbuilding of controls and piping result in both a modern appearing and highly accessible design. Gibs are also enclosed and totally protected from welding splatter. Combination eccentric gear and segment drive has a low inertia loading which lengthens the life of the clutch. The press is a two-cycle, up-acting type. Gear case is mounted in the crown . . . can be easily removed to expose the drive for fast service. The welding press is equipped with a Bliss quill mounted special friction clutch. Clutch and brake linings can be replaced without disassembly.

126 x 126 Cloverleaf Style Welding Press




102 x 26 Straightside Welding Press



# BLISS LEAD EXTRUSION EQUIPMENT FOR HOSE & CABLE MANUFACTURERS

There are three basic types of lead extrusion presses manufactured by Bliss. Each, when applied to either lead sheathing hose or cable for curing purposes or the high production of solid or resin core solder wire, represents a design that has been developed through many years of experience producing this type of equipment.

**A** This 2500 Ton Oil Hydraulic ram type cyclic arrangement is used for lead sheathing rubber hose or cable for curing purposes. This type press is available in tonnages of 1000-3000. Each size employs the most highly developed hydraulic equipment available for this application. Push button control provides semi-automatic and automatic cycle operation including automatic pick-up and charge of the pre-cast lead billets to the lead extrusion cylinder.

**B** The continuous extruder can also perform the function of lead sheathing rubber hose and cable. The operation of this machine is continuous. By charging molten lead to a mechanically driven rotating screw in a stationary housing where the lead is cooled to plastic state this method realizes the following advantages: (A) No stop mark aggravation, (B) No lead chips, (C) Labor reduced by approximately 20%, (D) Less floor space, (E) Minimum variation in wall thickness, and (F) Less maintenance when compared to ram-type cyclic presses. These continuous machines are available in two sizes (Model 3A and 4A) and are capable of extruding approximately 3600 to 7200 pounds of lead tubes per hour, respectively.

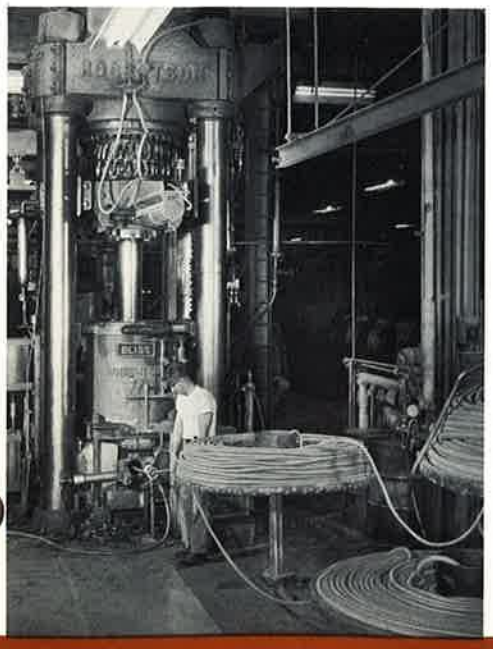
Bliss also manufactures complete accessory equipment for the above process such as lead stripping, melting and casting equipment and die blocks in sizes of 7″ through 12″ bores having O.D. hose capability of ⅜″ through 5″ diameter.

## *VERTICAL AND HORIZONTAL SOLDER WIRE EXTRUSION PRESSES*

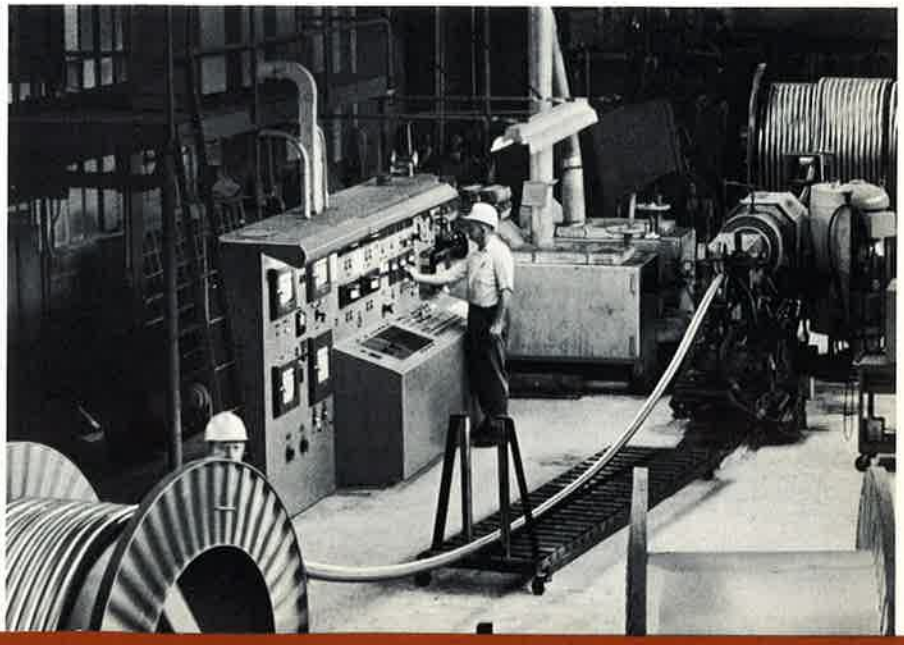
Bliss also offers both vertical and horizontal extrusion presses for the production of solder wire. Two vertical models, of 450 and 650 tons capacity, are easily set up for extruding multi-strand solid or single cored solder wire and lead pipe. These units feature a single acting main hydraulic ram, pushbutton controls for hydraulic and air systems, automatic single cycle or manual control and electrical interlocks between press controls and moving parts to assure proper sequence of operation and to prevent overloads.

The Bliss Horizontal Solder Press is available in 250 and 350 tons capacity. These machines represent a versatile concept that is easily adapted to the production of solid or cored solder wire or bars in a wide range of sizes. A minimum of floor space is required and special foundations or footings are eliminated. The equipment is ruggedly built to withstand the high pressures required for the extrusion of lead-tin or other alloys.

**A**



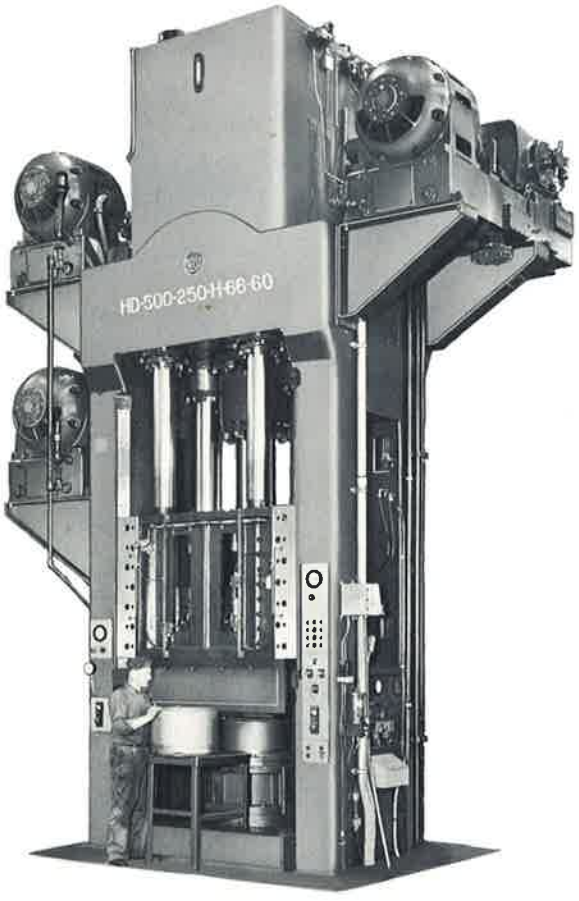
**B**



# HYDRO-DYNAMIC METALWORKING PRESSES

As companion equipment to its many types of mechanical presses, Bliss offers a complete line of general purpose hydraulic presses as well as many special designs. These range from a 10-ton gap frame machine to giant extrusion presses of 35,000 tons capacity. Designs include single and double action types, open rod and housing construction, with die cushions, feeds, die slides, sliding or rolling bolsters and many other accessories. Whatever the type, all Bliss hydraulics are distinguished by the simplified Bliss Hydro-Dynamic circuitry . . . a design which has proved itself in hundreds of installations . . . outstanding for year-in, year-out service with a minimum of maintenance.

Other Bliss design features provide easy die set-up




This double action press is located in the plant of a major supplier of automotive and appliance parts. The operation shown is a redraw of a domestic washing machine tub. The press has a capacity of 500 tons on the plunger and 250 tons on the blankholder.

Electronic control on this double action press provides precise control for deep drawing, blanking and forming missile parts to close tolerances. Console controls ram speeds and motions as well as cushions from one station.

and protection against overloading either press or dies. Closing stroke drive . . . permits fast starting and high speed approach and return.

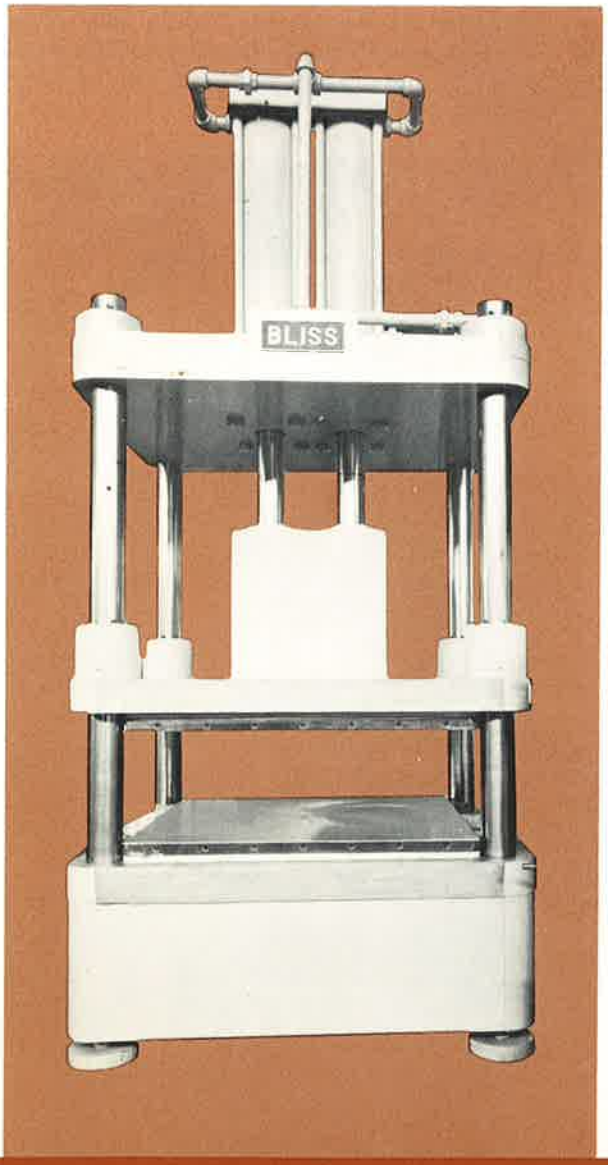
Universal electric control . . . allows speed change and reversal by ram position.

Stop button on cycle control . . . permits instant stopping at any point in the cycle.

Jogging by push buttons . . . aids in die setup. Press stops on release of button. Only one operator is required: no signaling.

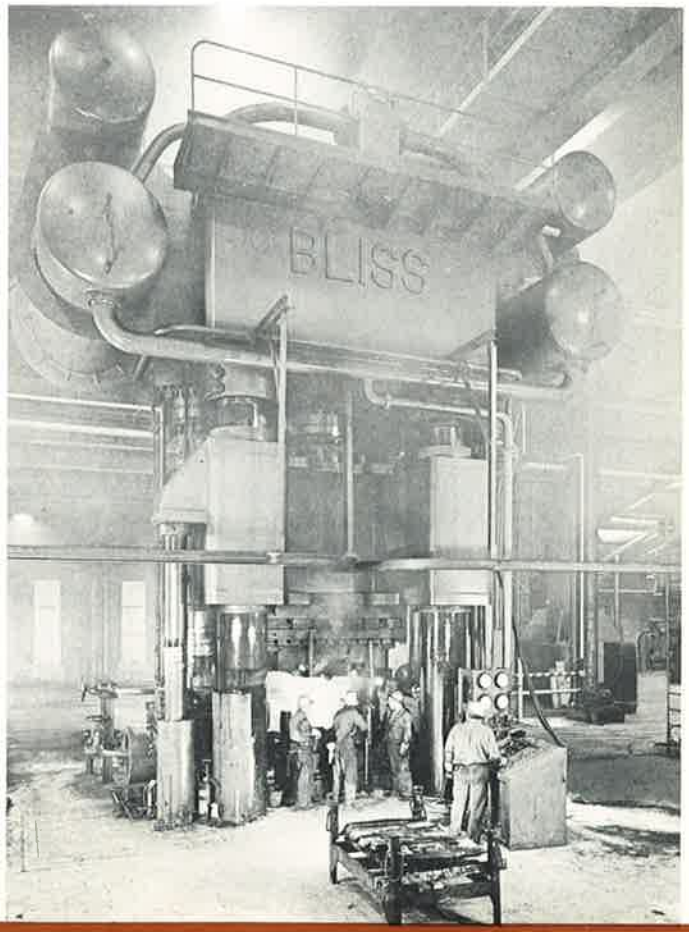
No work, no pressure . . . pump by-passes during idle periods and saves wear on the pump and components.

Positive cooling and filtering . . . provides clean fluid at all times for better operation and long life of hydraulic components.




Heated platens are used on this 175-ton Bliss hydraulic press to form large plastic sheets into a variety of shapes. Press has closely controlled time cycle to provide exact dwell.

This 8000-ton Bliss water-hydraulic press is in the forge plant of a leading aluminum producer. With companion 3000 and 5000-ton Bliss presses, they are among the largest ever installed in a contract forge shop.

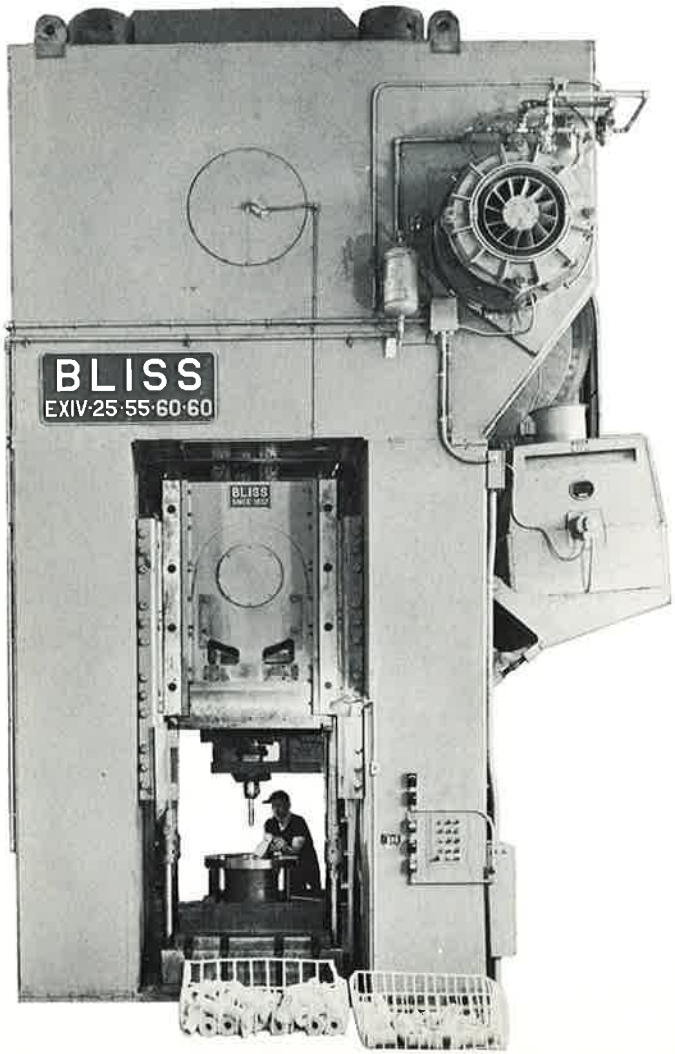


# SPECIAL PURPOSE PRESSES

The presses shown on the preceding pages represent various Bliss standard press lines. The company's technical know-how and facilities have also been applied to many unique manufacturing problems beyond the scope of standard equipment, resulting in a number of special purpose presses. A representative sampling of these specially-built units is shown in this section.

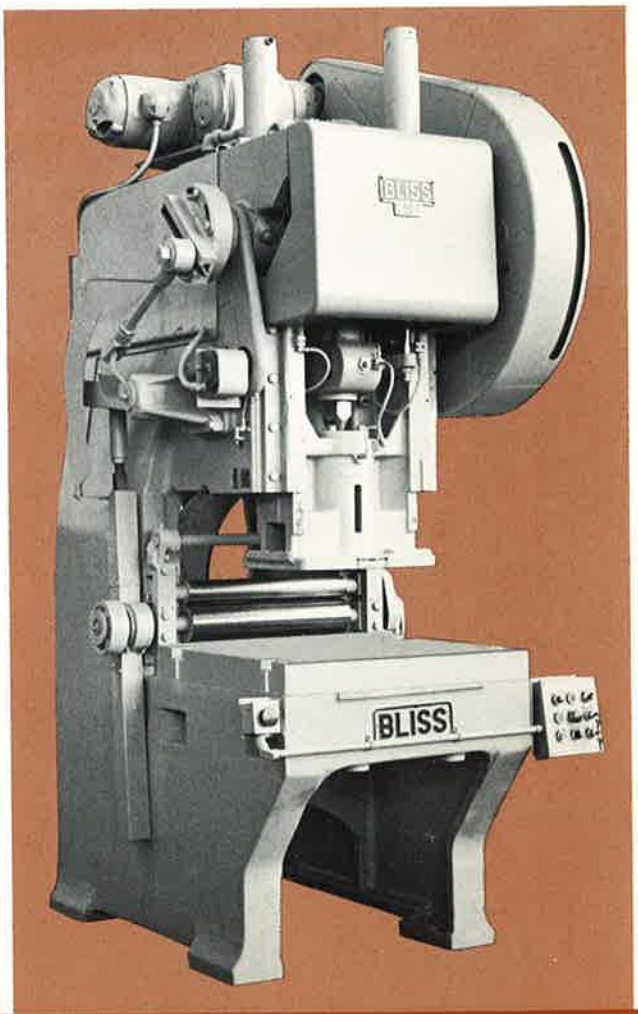
## MECHANICAL COLD EXTRUSION PRESS

World's largest cold extrusion press, this 2500-ton giant puts the squeeze on production costs by turning out 350, twenty-pound axle spindles per hour. Four press operations are employed in this order: backward extrusion and piercing, forward extrusion, combination forward and backward extrusion, and final nosing (done on another Bliss press). It produces a part that is close to its "finish" dimensions, and stronger than the original metal because of the cold working.



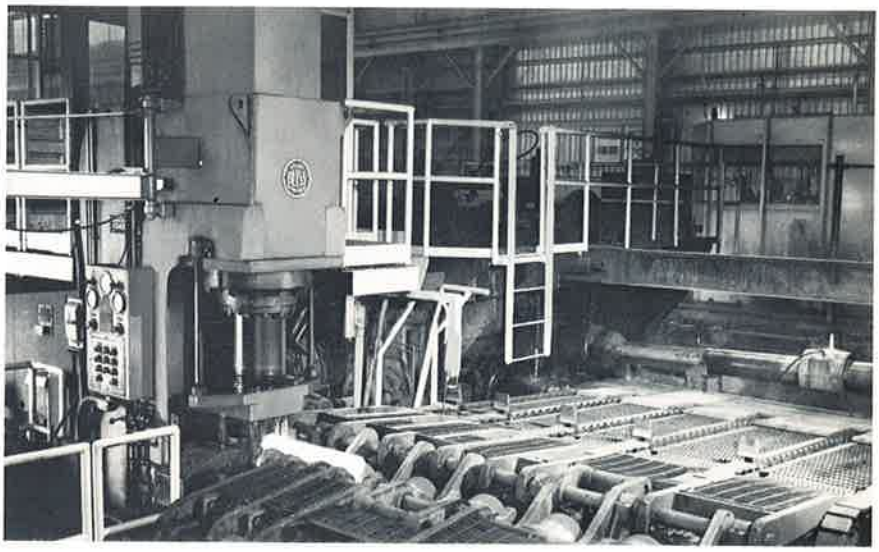

## AUTOMATIC FOIL PRESS

The Bliss C50F press is designed for the high-speed production of foil products such as pie plates, cake pans and TV dinner trays. This 50-ton machine employs a companion Bliss rack and pinion feed for back-to-front feeding. Designed for long feed lengths involving wide but very thin material, it will maintain extremely accurate feeding at high speeds over years of use. A self-locking powered-in motion micro-feed length adjustment by air motor is available as are such special features as removable front section which permits die and bolster to be changed as a unit. Cast Meehanite frame with fixed legs insures the rigidity and stability necessary for long life of large and close-fitting dies.



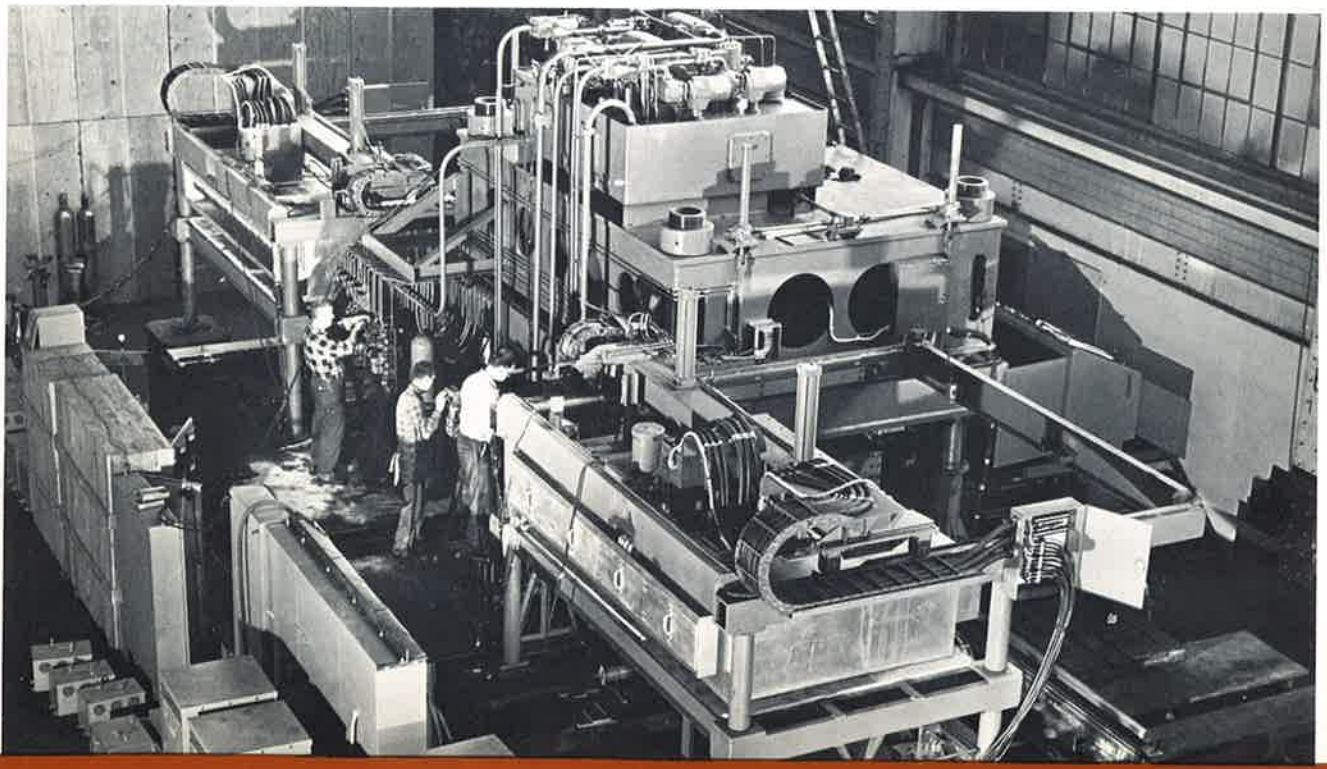
## BILLET CENTERING PRESS

This Bliss hydraulic billet-centering press provides the piercing mill with accurately centered rounds in the production of seamless steel tubing. A vertical ram clamps the hot billet in a 185 ton grip as a horizontal punch moves out to indent the end with an accurately-centered starter hole for the piercing plug.



## HOT SIZING PRESS

This hot sizing press was built by Bliss for the production of special parts for aerospace vehicles. Used in classified government applications, it is highly instrumented and works at high speeds to extremely close tolerances.



# SPECIAL PURPOSE PRESSES

## DEEP THROAT PRESSES

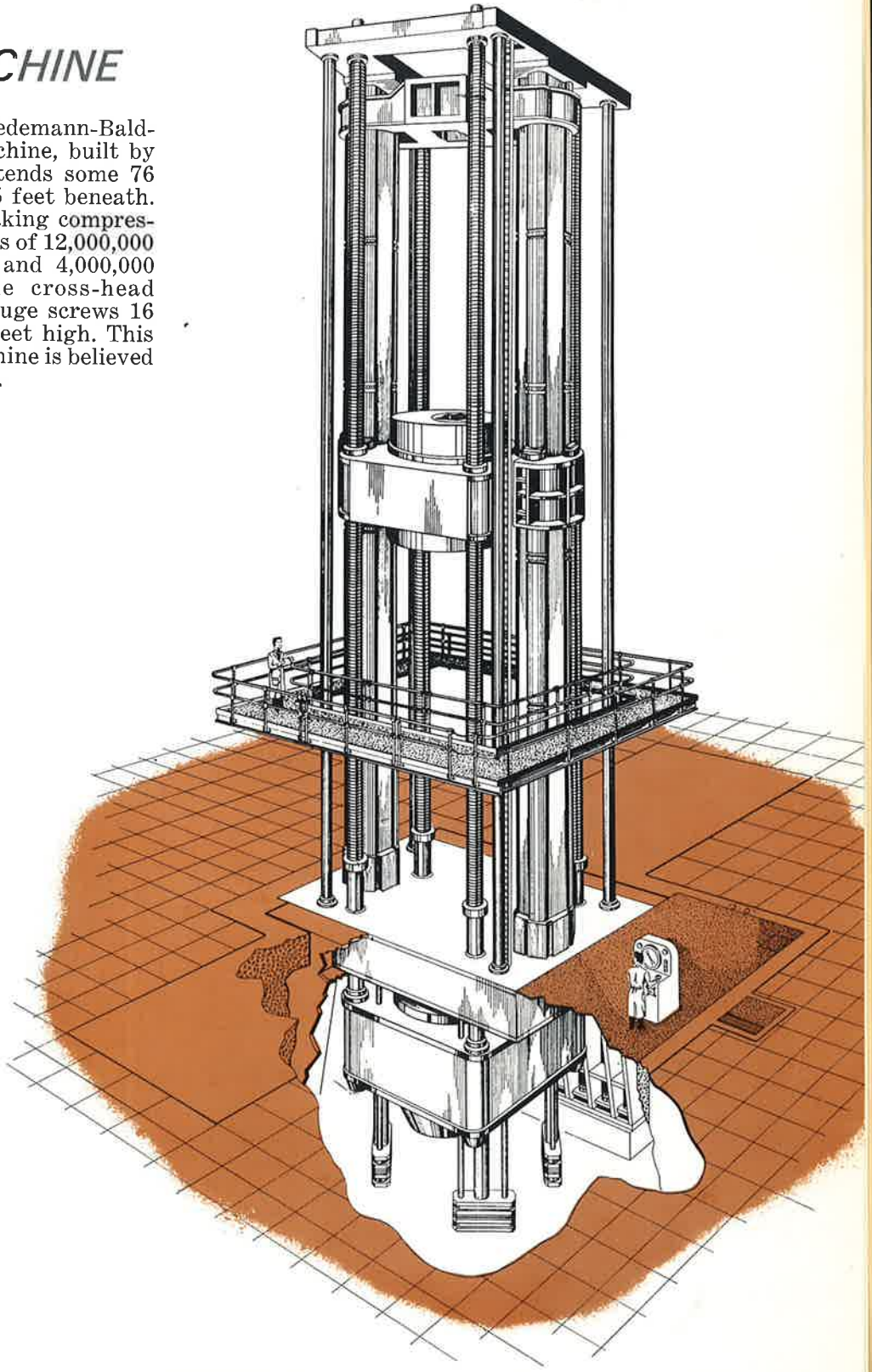
Bliss Deep Throat presses are designed for high speed punching, cutting and forming on large, wide sheets. They are available in capacities from 4 to 75 tons. All frames are welded steel construction and fully stress-relieved for stability. Bliss Rolling Key Clutch is standard equipment. Extra long gibs support the slide at all positions for greater accuracy, while heavy duty crankshafts insure toughness and resistance to shock.


## GAP FRAME PRESSES

Bliss open back gap frame presses are available in both one and two point designs in capacities from 22 to 1000 tons. They provide exceptionally clear access to the die area from the front or either side. These machines have heavy stress relieved box-type steel weldment frames with fixed base. Double gearing with a single end drive can provide operating speeds of 15 strokes per minute. The Bliss type "AK" combination pneumatic friction clutch and brake is mounted on the back shaft; and the flywheel is equipped with an air-operated brake.

# *UNIVERSAL TESTING MACHINE*

This 12,000,000-pound Wiedemann-Baldwin Universal Testing Machine, built by Bliss' Canton Division, extends some 76 feet above the floor and 25 feet beneath. The press is capable of making compression, tensile and flexure tests of 12,000,000 pounds, 6,000,000 pounds and 4,000,000 pounds respectively. The cross-head moves vertically on four huge screws 16 inches in diameter by 84 feet high. This hydraulically-powered machine is believed to be the largest of its kind.

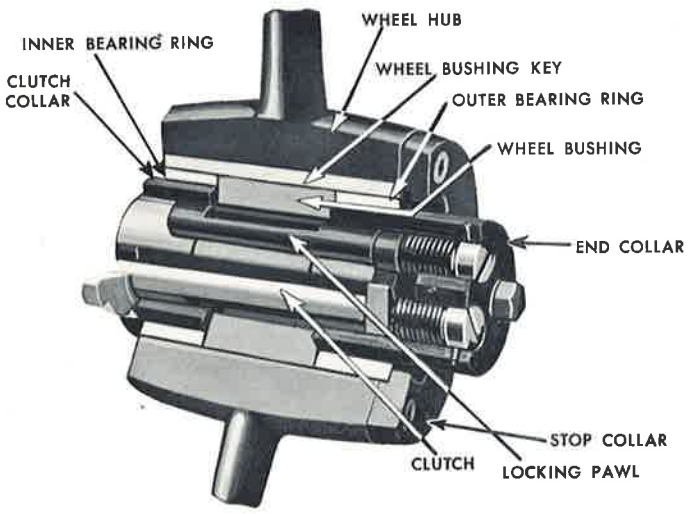


## BLISS CLUTCH... HEART OF THE PRESS

The clutch is the heart of the press and Bliss offers a variety of mechanical and air friction units to suit all requirements. Their record of reliability and service is unsurpassed in the industry.

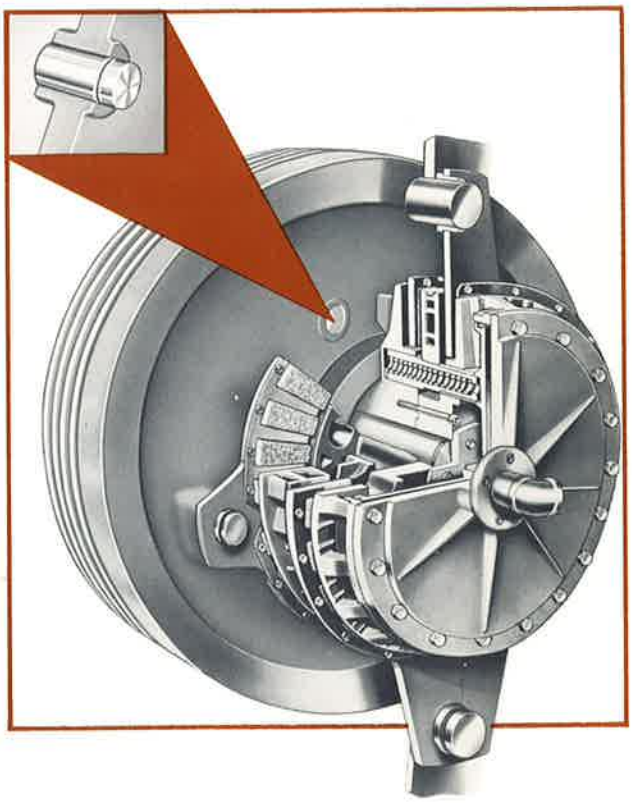
## ROLLING KEY POSITIVE CLUTCH

Most successful positive clutch ever developed for power presses, the Bliss Rolling Key Clutch has large engaging surfaces that are close to the shaft axis and run the full length of the flywheel bearing. Result is lower velocities and greatly reduced strain on the working parts. Driving and locking members function independently, allowing full engagement before impact. This reliable, trouble-free clutch is ideal for slower speeds and for single tripping operations.



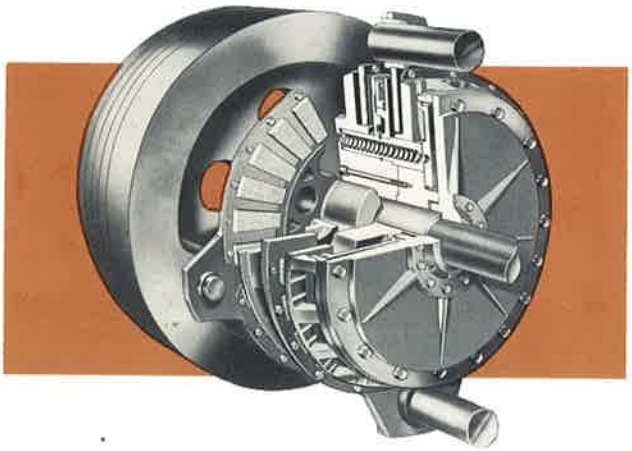

## TYPE "CKU" AIR FRICTION CLUTCH WITH UNSTICKER

This combination clutch and brake mounts on the crankshaft. On geared presses, the main gear runs continuously. Advantages: reduces flywheel slowdown, cuts power consumption, distributes tooth wear evenly. This arrangement also allows exceptionally high single tripping without overheating. Linings can be quickly replaced without dismantling the clutch. The unsticker pin permits the power of the press to be used in freeing presses that are stuck on bottom. The socket for the pin is electrically interlocked with the press controls.



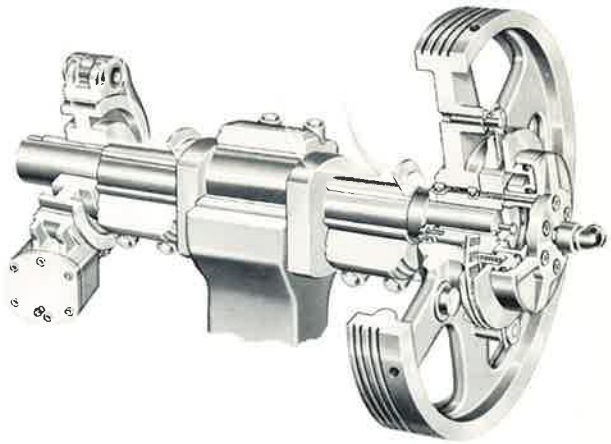
## TYPE "AK" ADJUSTABLE DISC AIR FRICTION CLUTCH AND BRAKE

This clutch is most often specified for medium and large Bliss Straight Side Presses. Its outstanding record for reliable, low maintenance service is due to a number of unusual design features. The action is extremely fast due to short travel of the driving disc. Clutch and brake act as a single unit, preventing overlapping engagement. Clutch and disc "float" in their mountings and align themselves automatically. Plates create a centrifugal blower effect to help cool friction surfaces. Lining plates can be replaced without removing the clutch or dismantling the press.



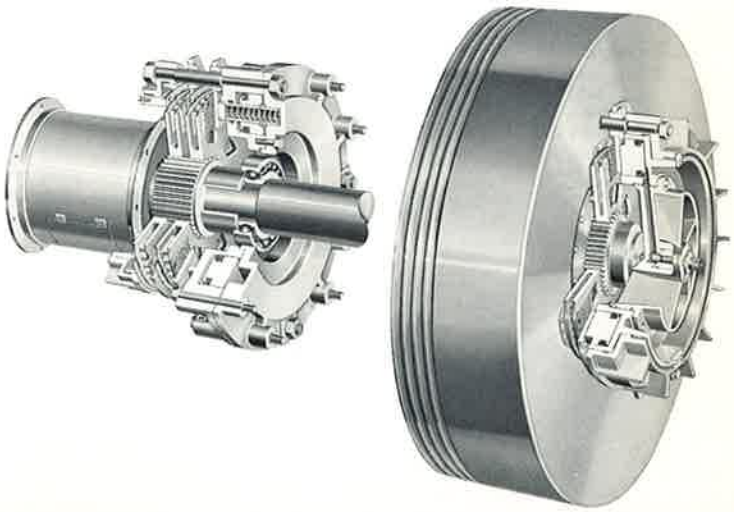
## TYPE "SU" CLUTCH WITH UNSTICKER AND SEPARATE BRAKE

Used in high speed applications the Bliss type "SU" clutch with power driven unsticker and large separate brake is a crankshaft-mounted, disc type clutch with provision for jogging and baring for die setup. It provides rapid engagements and disengagements with minimum lining wear. When required, linings can be easily replaced. An integral part of the clutch is the unsticking device which provides fast, easy freeing of a press stuck on bottom.



## TYPE "FK-DK" LOW INERTIA CLUTCH AND SEPARATE BRAKE

Where heat dissipation rates cannot be achieved conveniently with a combination clutch and brake, the independent clutch and brake design is recommended. Pin and bushing arrangement enables rapid change of linings which are interchangeable with those of the combination clutch and brake design. Where needed, the low inertia brake design lends itself to the use of multiple discs for more rapid heat dissipation, which also permits controlling torque on the brake independently of heat dissipation requirements. Both clutch and brake can be adjusted for lining wear.

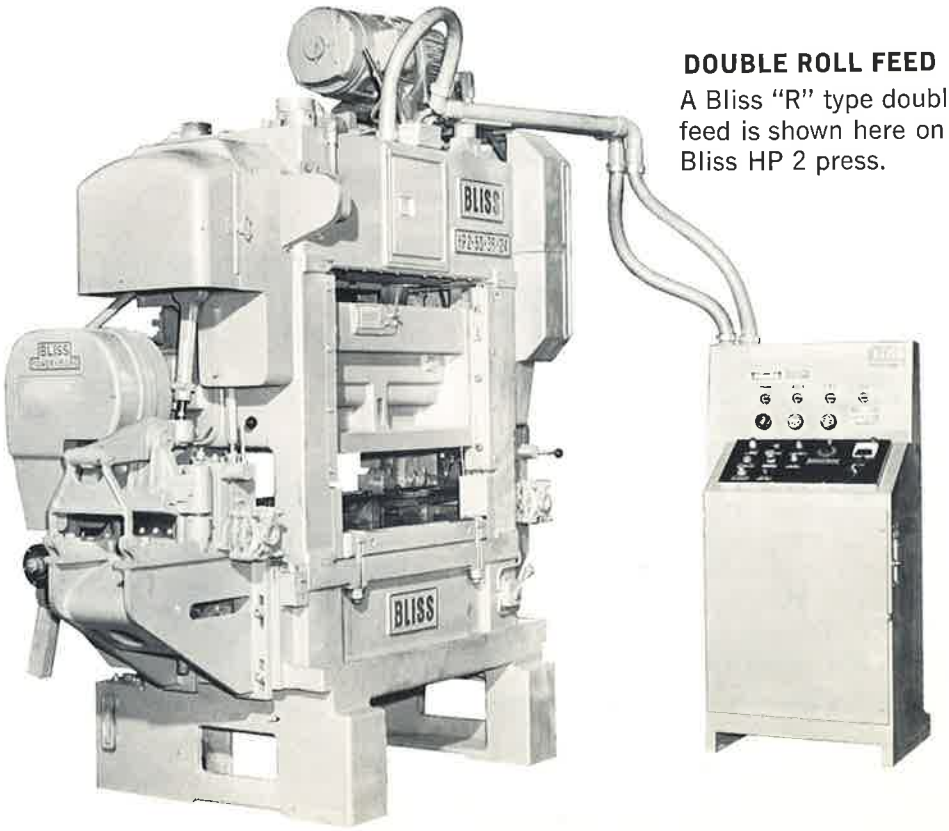


# FEEDS

The production rate of any press, no matter how carefully engineered, can be no better than its feed. Both press and feed are "partners in production," and of equal importance in determining both the speed and accuracy of any operation. Bliss for years has had press engineers design and supervise the building of feeds. Mechanical feeds convert the presses to which they are attached into automatic or semi-automatic machines. In addition they facilitate material handling and increase production. Three basic feeds available are: single roll, double roll and dial. In addition Bliss also offers transfer feeds and custom feeds for special requirements, as well as feed accessories including coil cradles, stock straighteners, scrap cutters and special stock-handling equipment.

## "R" TYPE RACK AND PINION

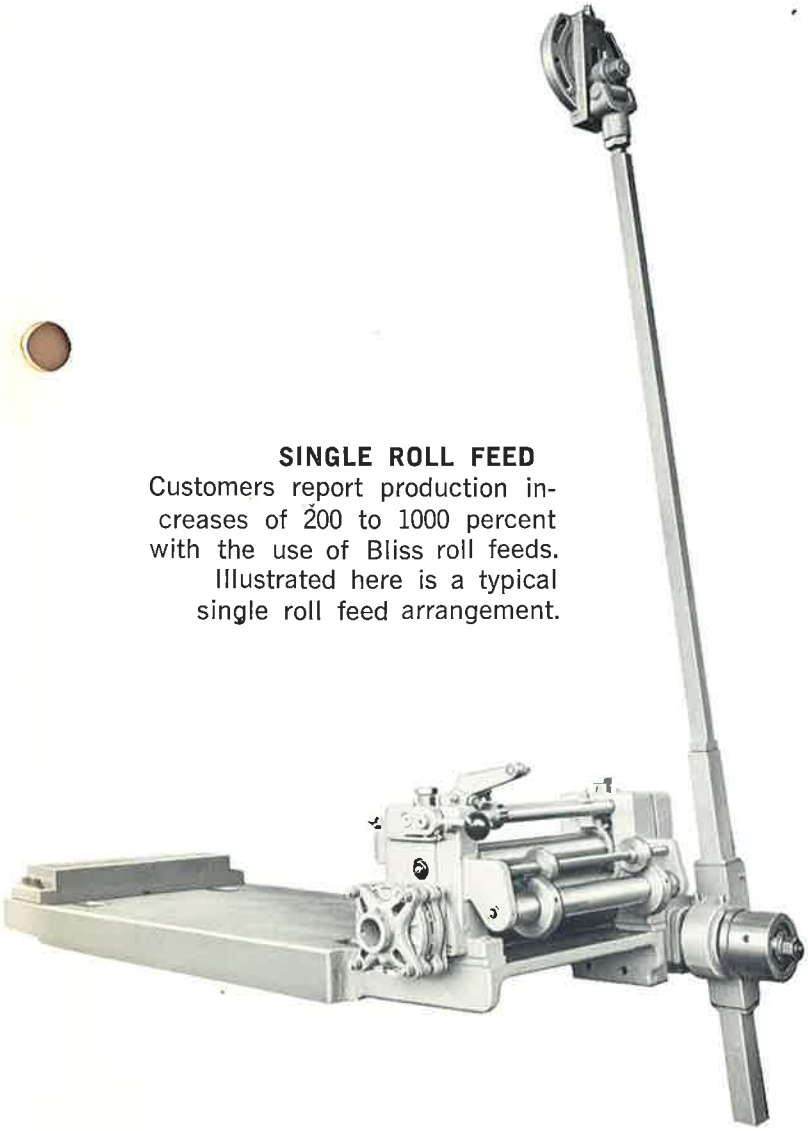
Bliss precision Type "R" rack and pinion roll feeds are designed for use with Bliss presses. A two-piece feed block permits precise timing of feed relative to press cycle. Rolls are hardened and ground and driven by hardened gears running in oil, while cam-actuated roll release permits precise release for all piloting requirements. A precision over-running clutch insures accurate feeding, and roll brakes are the efficient disc-type, air-cooled. Water-cooled brakes are also available. Feed level is quickly adjusted by ratchet wrench.



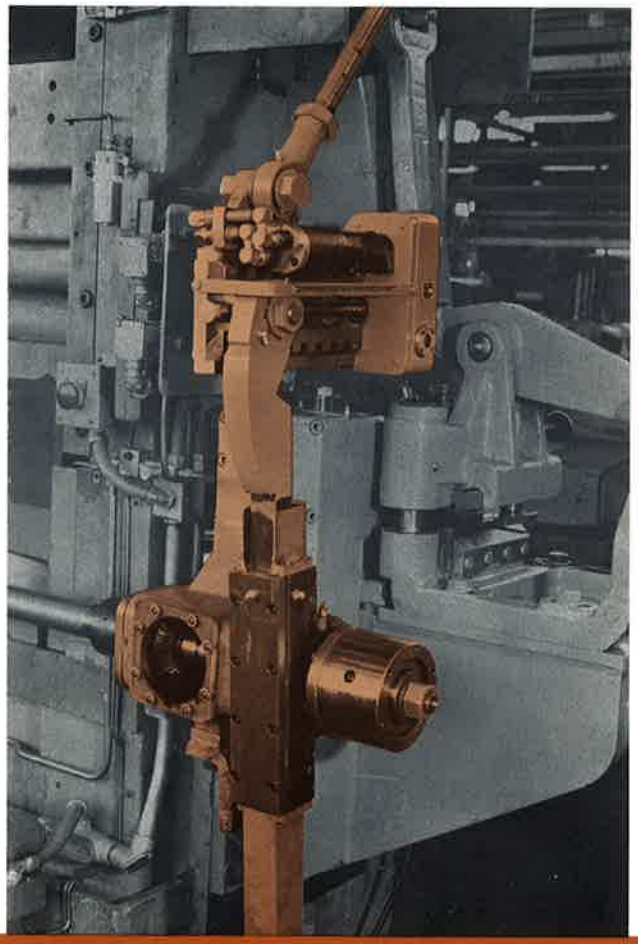

**DOUBLE ROLL FEED**
A Bliss "R" type double roll feed is shown here on a Bliss HP 2 press.

# IN-MOTION ADJUSTMENT

The Bliss In-Motion feed adjustment is powered through the entire feed length. Tedious manual setting changes at awkward points on the press, with alternating startups and stops, are completely eliminated. Instead, pushbuttons actuate a geared-down air motor—while press and feed are operating—shortening or lengthening the feed over its entire length. All feed adjustments, including both coarse and fine, are combined into a single quickly accomplished step.

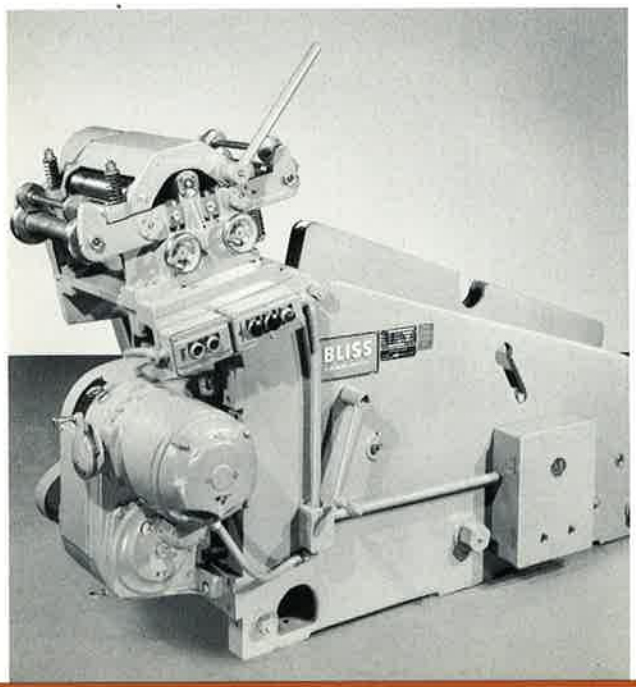


**SINGLE ROLL FEED**
Customers report production increases of 200 to 1000 percent with the use of Bliss roll feeds. Illustrated here is a typical single roll feed arrangement.



# COIL CRADLE

This power-driven coil cradle uncoils stock and feeds it through a five-roll straightener from where it is hand-threaded to the press feed. It is typical of the coil handling equipment manufactured by Bliss.




# DIE CUSHIONS

Equipping a Bliss or any make of press with a Bliss die cushion greatly extends its range of work. A cushion not only supplies the blankholding pressure for a wide range of drawing and forming operations but can also be used as a lift out pad.

Bliss builds cushions in a wide variety of styles and capacities including pneumatic and hydro-pneumatic units. Standard cushions can be installed in side-by-side multiples for large bed areas or stacked to increase cushion tonnage in relatively small die space. Cushions can be either internally or externally guided. When the dimensions of a press bed opening and cushion tonnage will not permit installation of a standard cushion, Bliss can furnish special designs.

Special features available with Bliss cushions include locking devices, snubbers and motorized position adjustment between top of cushion and bottom of bolster.

## *BLISS CUSHION DESIGNATIONS*

UC — Inverted cylinder pneumatic, single unit

UCO — Inverted cylinder pneumatic, single unit with slug chute

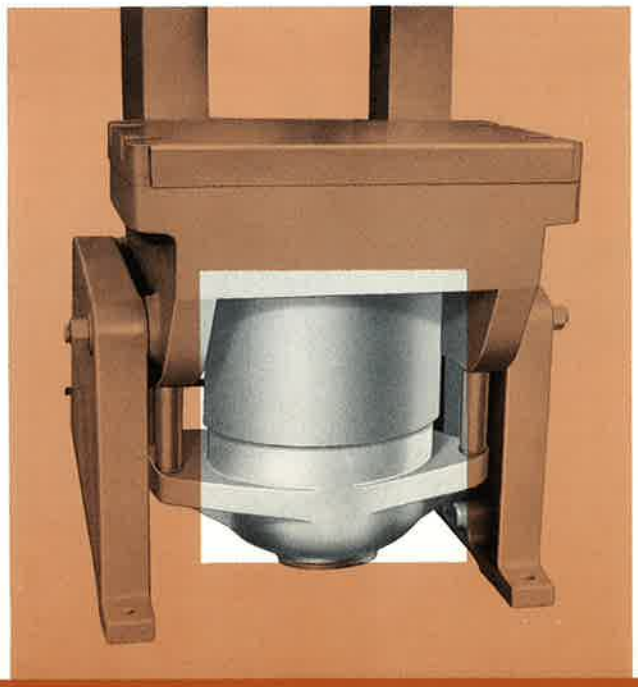
UCC — Inverted cylinder pneumatic, two stacked units

UCCC — Inverted cylinder pneumatic, three stacked units

EH — Self-contained hydro-pneumatic

FH — Non-self-contained hydro-pneumatic

L — Suffix denoting locking device on any of the above



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