

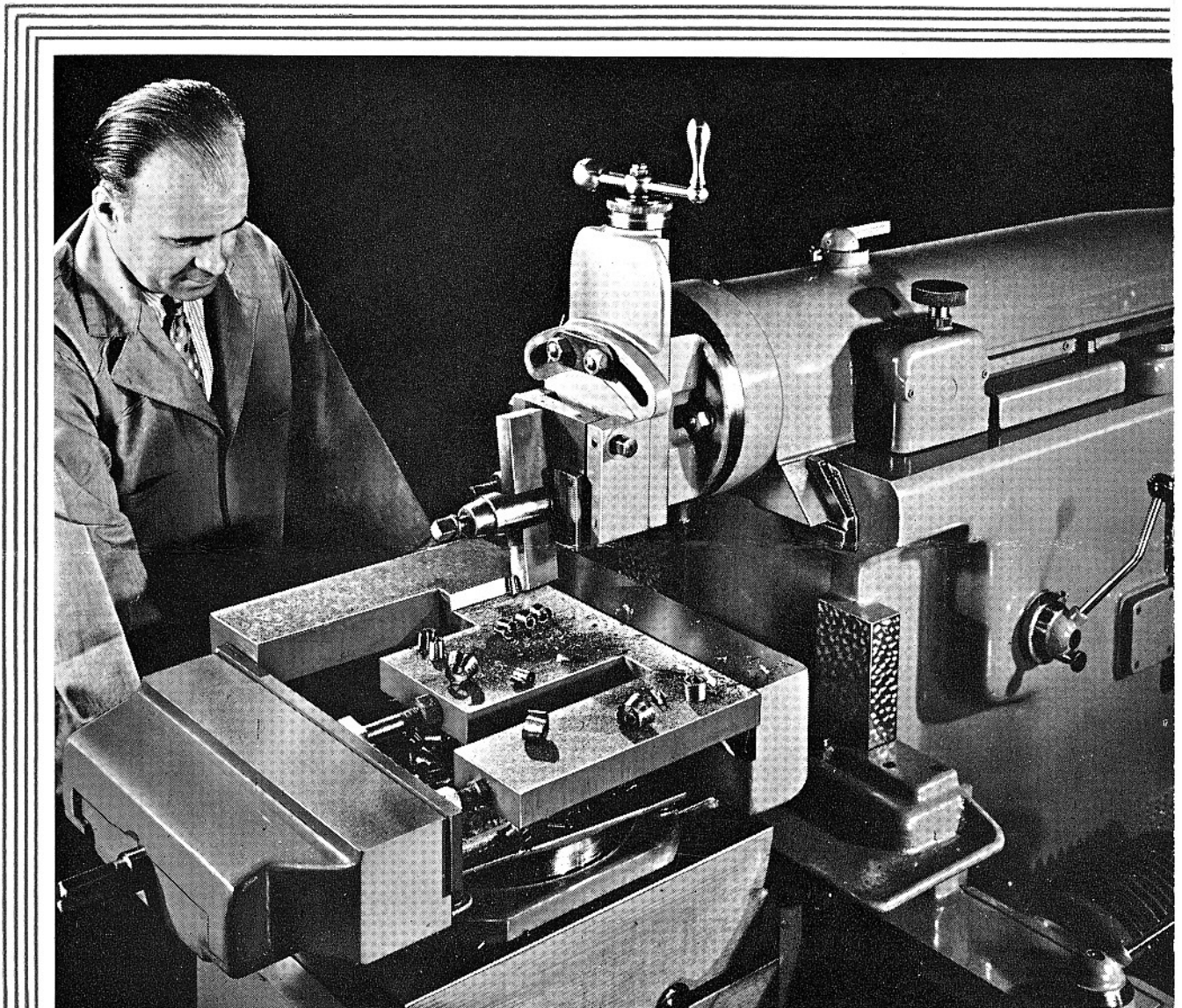
Hy-Draulic **SHAPERS**

16"

20"

24"

28"



Hy-Draulic

Reg. U. S. Pat. Off.

Shapers.. Planers.. Slotters.. Shaper-Planers
ROCKFORD MACHINE TOOL CO.

ROCKFORD, ILLINOIS, U. S. A.

Basic Advantages of . . .

Hy-Draulic

SHAPERS

We believe that the Hy-Draulic Shaper represents the greatest advancement ever made in shaper design, construction, and operation; that it gives users greater proportionate benefits than those derived from the use of hydraulic power in other machine tools.

The statement above is verified in the columns below which compare some of the inherent disadvantages of mechanical ram-drives and feeds with the corresponding superiorities of the Hy-Draulic ram-drive and Hy-Draulic feeds.

Study This Comparison

Mechanical Drives

Cutting Speed and Pressure Change Continually

The diagram below, Fig. 1, shows how the cutting speed of a mechanical ram-drive changes continually from one end of the stroke to the other. The cutting tool must retain its edge at maximum ram-speed, but it produces only at the average for the entire stroke. Cutting pres-

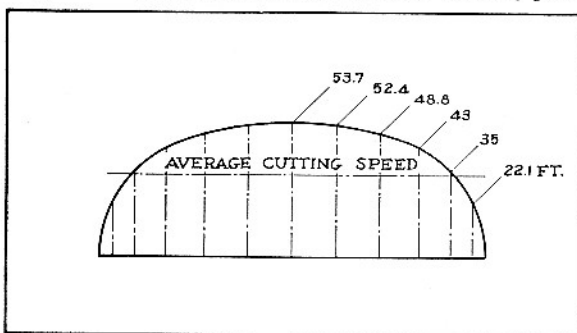


Fig. 1 — Mechanical drive wastes tool capacity and power.

sure fluctuates also, and the average working pressure is less than maximum for which power must be provided.

Bull-Gear Deficiencies

In a bull-gear shaper-drive, arc C, Fig. 3, represents a cutting stroke, arc R, the rapid return. Structural requirements confine return ratios to relatively close limits.

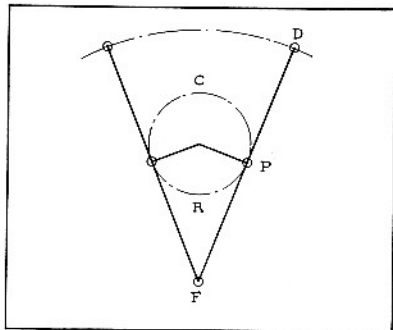


Fig. 3 — Demonstrating mechanical limitations

Hy-Draulic Drive

Constant Cutting Speeds

Fig. 2, below, shows how cutting speed in the Hy-Draulic ram-drive is constant throughout each cut. Reversals are practically instantaneous, yet smooth and free from shock. All of the capacity of the tool can be used throughout the entire length of every cut . . . and the uniform pressure on the tool conserves power. Here

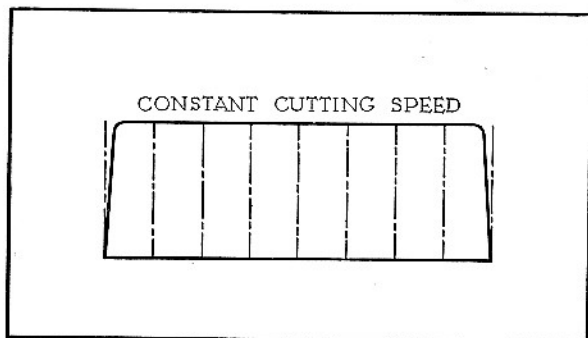


Fig. 2 — Hy-Draulic drive is efficient and economical.

are basic advantages of the Hy-Draulic ram-drive which promote high production, efficiency, and economy.

Hy-Draulic Efficiency

In the Hy-Draulic shaper-drive, power is applied close to the ram in a straight line directly back of the tool. See Fig. 4. Design of return ratios is largely a matter

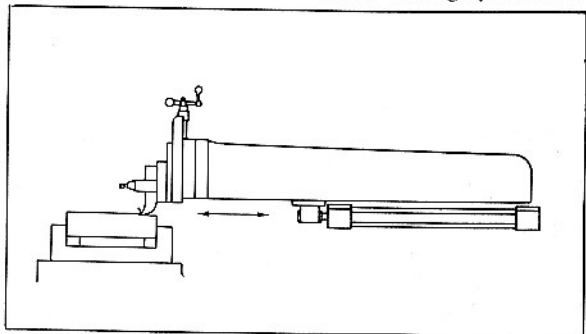


Fig. 4 — Hy-Draulic ram-drive is direct.

Please turn to page 3

Mechanical Drives

Power travels through gears, shafts, bearings, sliding block or link to *short* lever FP . . . and to ram via longer lever FD and rocker-arm connection. This is clearly a mechanical disadvantage, and wasteful.

Mechanical Feeds Limited

Mechanical shaper-feeds must be limited in number, and to definite increments, otherwise the mechanism becomes too complicated and costly. Timing and speed of movement are limited, which often causes back of cutting edge to drag on work-piece.

Cumbersome Stroke- and Ram-Adjustment

Altering length of stroke in mechanical ram-drive involves unclamping, cranking, re-clamping . . . and sometimes gear-shifting. Altering ram position relative to work-piece is a separate operation, which also requires tools, and takes valuable time away from productive operation of the shaper.

Rigid Drive Can Mark Work

The rigidly connected mechanical drive transmits small irregularities in gearing to finished surfaces of work-pieces . . . and the accumulated lost motion of the various joints and bearings encourages the development of chatter marks on jobs in process.

Mechanical Complication and Waste

Acceptable until superseded, the mechanical shaper wastes tool capacity and power, has limited number of feeds, cumbersome stroke- and ram-adjustment, a tendency to restrict production in other ways, may mark or mar surfaces as finished.

Hy-Draulic Shaper

PERFORMANCE

The basic advantages of Hy-Draulic Shapers provide many operating superiorities, some of which are indicated graphically below. Fig. 5 shows relative difference in ram-action of a mechanical-drive shaper and a Hy-Draulic Shaper. Both curves were traced by new shapers of the same size, operating under exactly equal

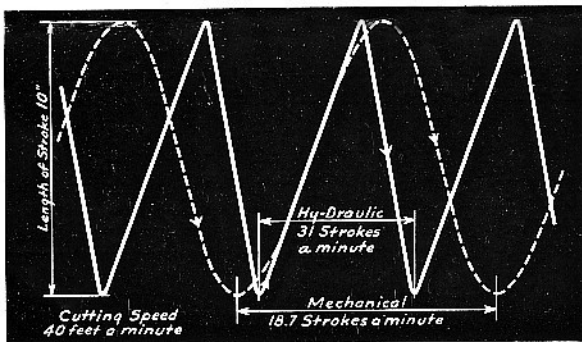


Fig. 5 — Hy-Draulic Shaper has faster reverse, speedier return.

conditions, set for 10" stroke and cutting speed of 40 feet a minute. The Hy-Draulic Shaper gets in almost twice as many strokes a minute. Fig. 6 shows the relative performance of the same shapers in a short-stroke speed test — Hy-Draulic wins, 3.62 to 1! Adjusting stroke-length and its position relative to work is so easy on

Hy-Draulic Drive

of selecting rapid speeds most suitable for maximum operating efficiency and metal removal. Gears, bearings, and blocks are eliminated; weight is reduced, lubrication is inherent, power is conserved.

Hy-Draulic Feeds Infinite

Hy-Draulic shaper-feeds are infinitely adjustable easily to any desired rate in the range of the hydraulic equipment . . . and at no extra cost. The rapid cushioned independent feed-movement occurs while the tool is clear of the work.

Simple Stroke Control

In the Hy-Draulic drive, a pair of trip dogs governs *both* stroke-length and its position relative to work-piece. Conveniently located, easily adjusted quickly by hand without tools; and without affecting cutting speed; this design tops everything for speed, ease, and economy.

Hy-Draulic Drive Gives Fine Finish

The direct, straight-line application of smooth-flowing oil under tremendous pressure, and positive control, eliminates joints, bearings, and rigid connections . . . nothing in the Hy-Draulic ram-drive can mark or mar the finest finished surface.

Hy-Draulic Simplicity and Economy

Advanced in design, the Hy-Draulic Shaper has notable advantages of hydraulic ram-drive, hydraulic feeds, and other exclusive features; new operating convenience, nothing to cause tool vibration, inherent lubrication, high productive capacity. See details below and opposite.

Hy-Draulic Shapers that there is no excuse for "cutting air". See Fig. 7. Changing from stroke A to B and

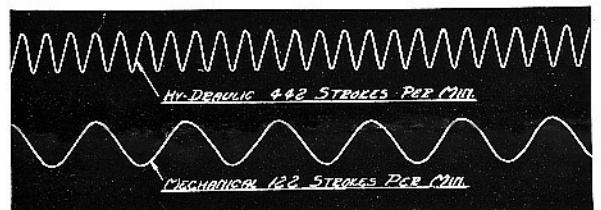


Fig. 6 — Hy-Draulic Shaper has highest number of strokes per minute.

back again merely means moving one stop, by hand, without stopping the shaper. No tools, no "cut-and-try", no cranking — no change in cutting speed unless you want it!

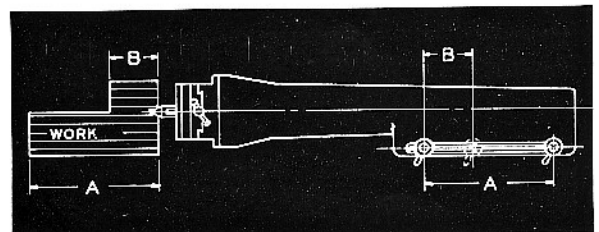


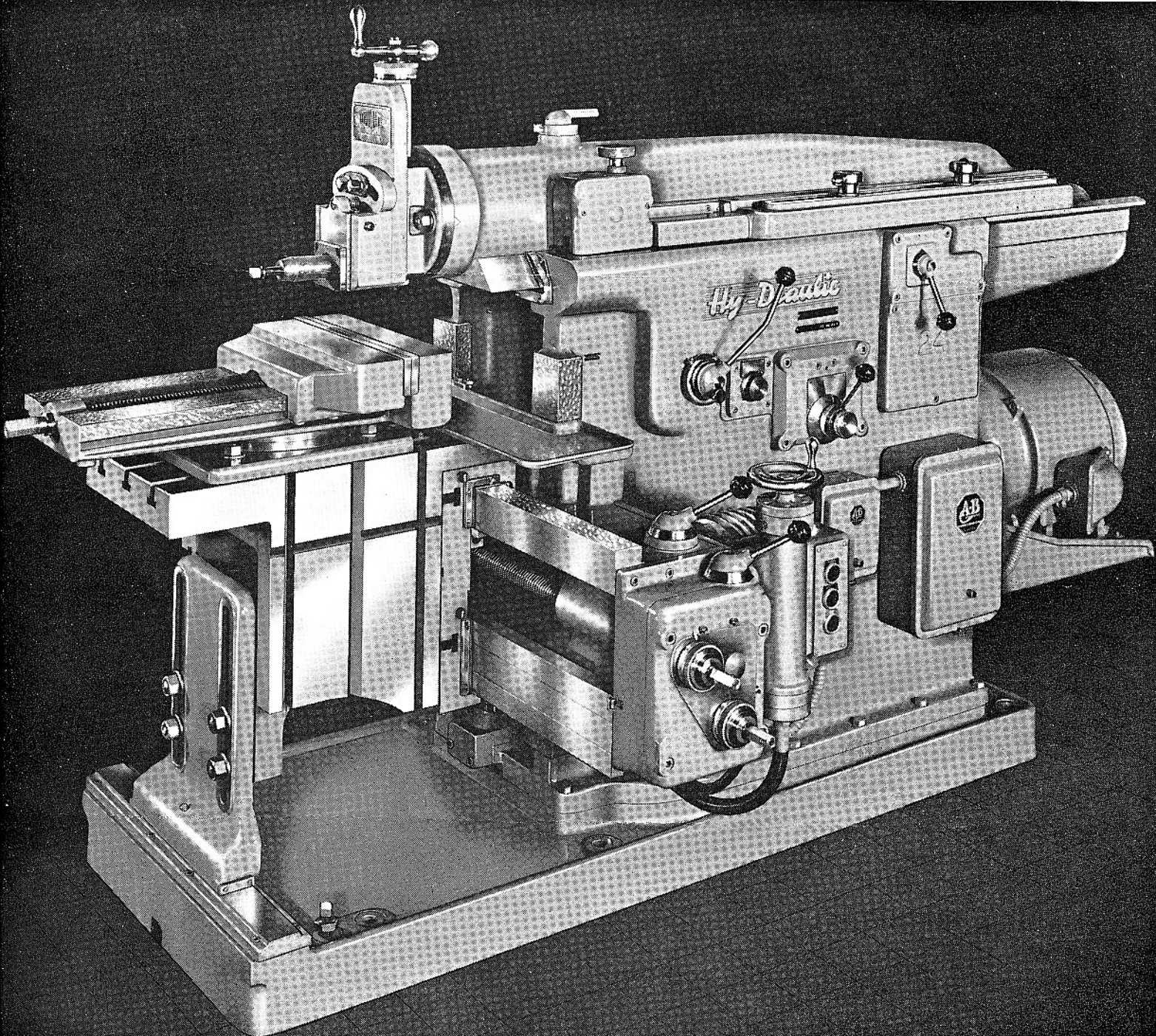
Fig. 7 — Hy-Draulic Shaper saves power, removes metal faster.

Hy-Draulic SHAPERS

Features of...

Hy-Draulic Shaper

CONSTRUCTION



- 1- Ram is box section, well ribbed for strength; well supported, for accuracy; light, for high speed operation. Extra wide bearings are flame hardened and ground and have forced filtered lubrication.
- 2- Ram stroke is adjustable for length and position, easily and safely, without using tools or stopping machine.
- 3- Safety guard at rear protects workmen, ram, hydraulic cylinder, motor, and floor.
- 4- Ram movement can be reversed instantly anywhere in either direction of movement.
- 5- Standard main drive motor mounted at rear is out of the way, protected, easily inspected.
- 6- Accurately machined rigid column, securely mounted on base, contains compact hydraulic equipment, its oil reservoir, and filters; all readily accessible.

Hy-Draulic SHAPERS

- 7— Ram speeds, indicated on etched plate, are infinitely adjustable in designed range by conveniently placed lever.
- 8— Built-in push button station enables operator easily to start and stop main drive and rapid traverse motors.
- 9— Any cross feed whatever up to specified maximum can be obtained by turning the feed adjusting handwheel.
- 10— Rapid traverse of work up or down, toward operator or away; and direction of cross feed; are all governed by two levers at end of cross rail. The top bearing on the cross rail is flame hardened and ground.
- 11— Hand operation of table sideways and vertically is obtained with safety crank. Micrometer dials indicate exact settings, and amounts of feeds. These controls are duplicated on opposite end of rail.
- 12— Heavy extended base provides solid foundation for column and outboard table-support.
- 13— Outboard support for table is rigid, easily adjusted, slides on a hardened steel way.
- 14— Table has widely separated bearings with ample area, latest type wipers to seal in lubricant and keep surfaces clean. The table may be removed and large work clamped directly on the apron.
- 15— Single-screw vise is standard equipment. Off-set jaws permit holding work vertically.
- 16— Established rate of cutting speed remains constant throughout the stroke. A unique Hy-Draulic feature, as indicated on page 2. Hydraulic tool lifter available as extra equipment permits use of carbide tools.
- 17— Single-lever control for start, stop, and speed ranges of ram. This is duplicated on opposite side of column for operating convenience in starting and stopping ram.
- 18— New control permits use of maximum return speed independently of cutting speed. With a flick of the wrist, the operator may select maximum return speed at all times, or vary the return speed with the cutting speed, for setups, indicating work, etc.

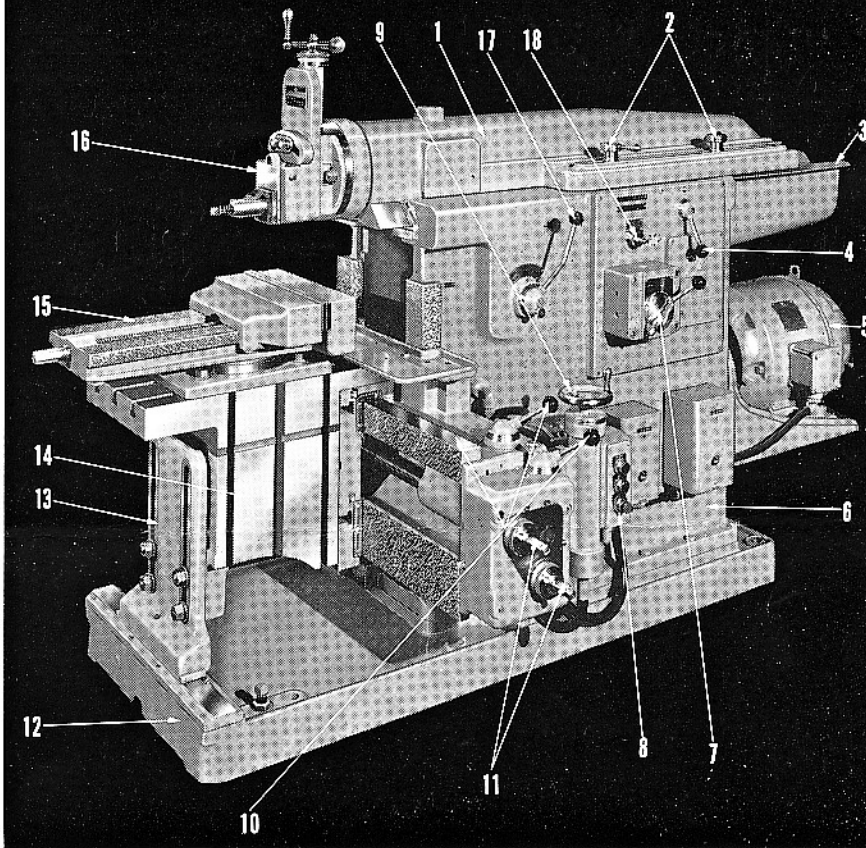


Fig. 8 — Hy-Draulic Shaper. Showing Grouping Of All Controls

S P E C I F I C A T I O N S

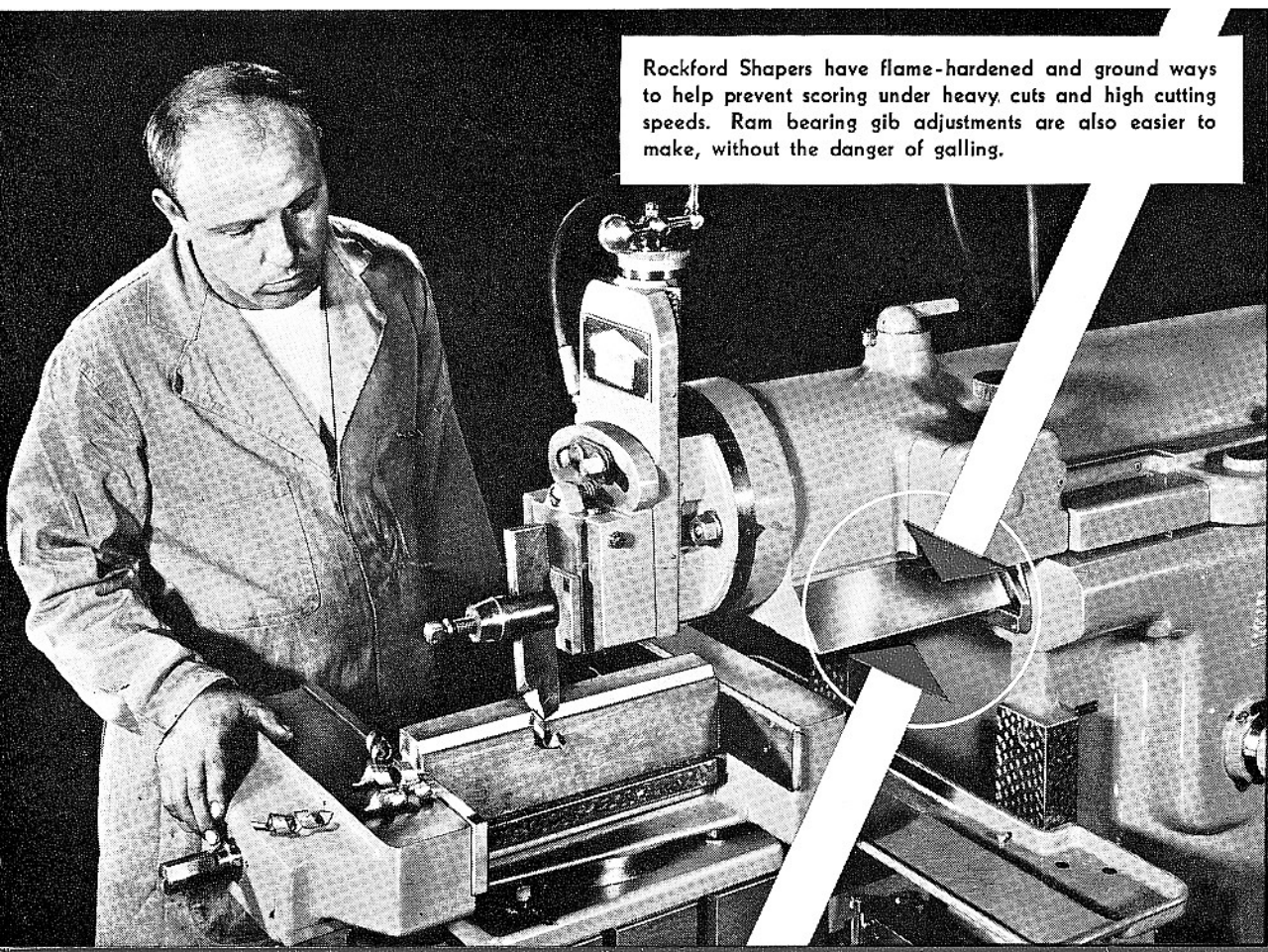
Hy-Draulic Shaper		16"	20"	24" Special	24" Heavy Duty	28"
Stroke length	maximum.....	18"	22"	26"	26"	30"
	minimum.....	1"	1"	1"	1"	1"
Table travel	horizontal.....	26"	26"	26"	30½"	30½"
	vertical.....	11"	11"	11"	13"	13"
Vertical hand adjustment to Head.....	7½"	7½"	7½"	7½"	7½"	
Table top, Standard, width x depth.....	13"x16"	13"x20"	13"x24"	14"x24"	14"x28"	
Table top, Universal, width x depth.....	13½"x15"	13½"x15"	13½"x15"	15"x19"	15"x19"	
Table to Ram (Standard Table) max. distance.....	15¼"	15¼"	15¼"	17½"	17½"	
Table to Ram (Universal Table) max. distance.....	14¼"	14¼"	14¼"	16¼"	16¼"	
Tee slots in table-top and side.....	3	3	3	3	3	
Tee Slots in top, center to center.....	4"	4"	4"	4½"	4½"	
Tee Slots in side, center to center (Standard Table only).....	5"	5"	5"	5½"	5½"	
Tee Slot bolt diameter.....	⅝"	⅝"	⅝"	⅝"	⅝"	
Cutting speed range, feet a minute.....	10 to 140 feet	10 to 140 feet	10 to 140 feet	10 to 100 feet	10 to 100 feet	
Number of cutting speeds in above ranges.....	Infinite	Infinite	Infinite	Infinite	Infinite	
Cross-feeds to Table, range.....	0 to 0.110"	0 to 0.110"	0 to 0.110"	0 to 0.110"	0 to 0.110"	
Vise Jaw size, single screw.....	2½"x15"	2½"x15"	2½"x15"	3"x17"	3"x17"	
Vise opens, single screw.....	14"	14"	14"	15"	15"	
Tool Post Slot size.....	⅜"x1 ⅜"	⅜"x1 ⅜"	⅜"x1 ⅜"	1"x2"	1"x2"	
Motor recommended	size.....	7½ h.p.	7½ h.p.	7½ h.p.	10 h.p.	10 h.p.
	speed.....	1200 r.p.m.	1200 r.p.m.	1200 r.p.m.	1200 r.p.m.	1200 r.p.m.
* Weight with motor, net.....	5500 lbs.	5550 lbs.	5650 lbs.	7000 lbs.	7500 lbs.	
* Shipping weight, domestic crated.....	5650 lbs.	5750 lbs.	5800 lbs.	7200 lbs.	7700 lbs.	
* Shipping weight, boxed for export.....	6750 lbs.	6900 lbs.	7200 lbs.	8700 lbs.	9050 lbs.	
* For Universal Table add.....	400 lbs.	400 lbs.	400 lbs.	500 lbs.	500 lbs.	
* Dimensions of export box.....	62"x61"x100"	62"x61"x100"	62"x61"x100"	72"x67"x114"	72"x67"x114"	
* Cubage of export box.....	219 cu. ft.	219 cu. ft.	219 cu. ft.	318 cu. ft.	318 cu. ft.	

(*—Average)

Design, construction and specifications of products shown herein are subject to change without notice.

FLAME - HARDENED AND GROUND RAM WAYS

Rockford Shapers have flame-hardened and ground ways to help prevent scoring under heavy cuts and high cutting speeds. Ram bearing gib adjustments are also easier to make, without the danger of galling.



Universal Table—The Hy-Draulic Shaper shown below is equipped with Universal Table which can be tilted forward or backward through 15° each side of center,

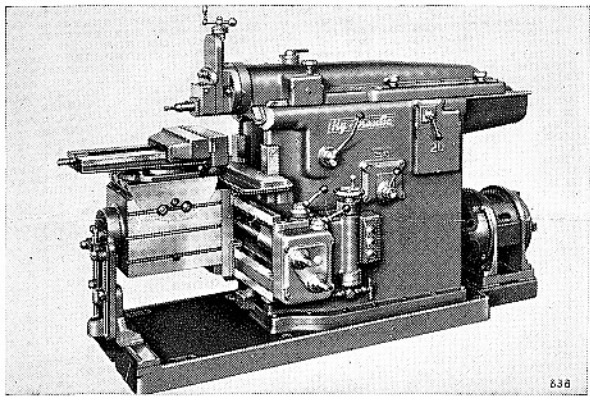


Fig. 9 — Universal Table and Power Down-Feed

and revolved through 360° around a horizontal axis. Adjustments are made quickly, easily, and accurately; clamping means are extremely powerful.

Power Down-Feed — All Hy-Draulic Shapers listed in specifications above can be equipped at any time with power feed to the tool head, operating downward or upward, and in any angular position of the slide. Adjustment of feed ranges from 0 to maximum of .018" per stroke.

Double-Screw Vise — Castings are semi-steel, extra heavy. Jaws are faced with steel plates. Movable jaw floats, for handling irregular or angular work. Base is graduated 90°

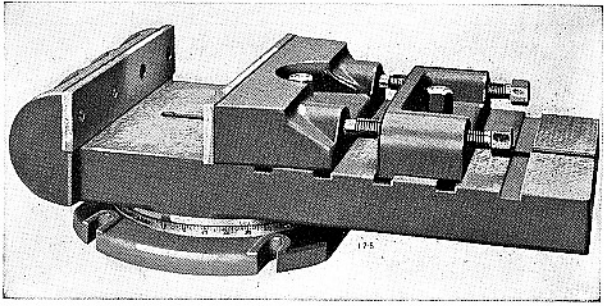


Fig. 10 — Double-Screw Vise

each side of center. For 16", 20" and 24" Special Shapers, vise opens 14"; jaw facing size, 2½" x 12". For 24" and 28" Shapers, vise opens 15"; jaw facing size, 3" x 14".

Index Centers — Index Centers are accurate and rigid. Adjustable index pin registers with accurately spaced holes

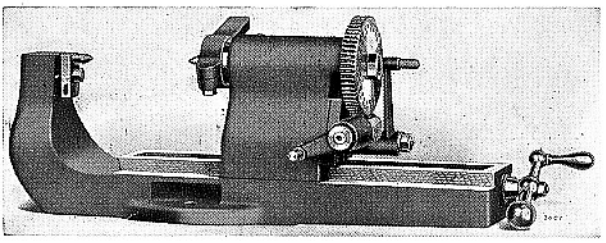


Fig. 11 — Index Centers

in worm-gear. Dead center is adjustable for taper work. Base can be bolted on table for straight work, or gripped in vise for adjustment to any horizontal angle.

Hy-Draulic Shaper Accessories