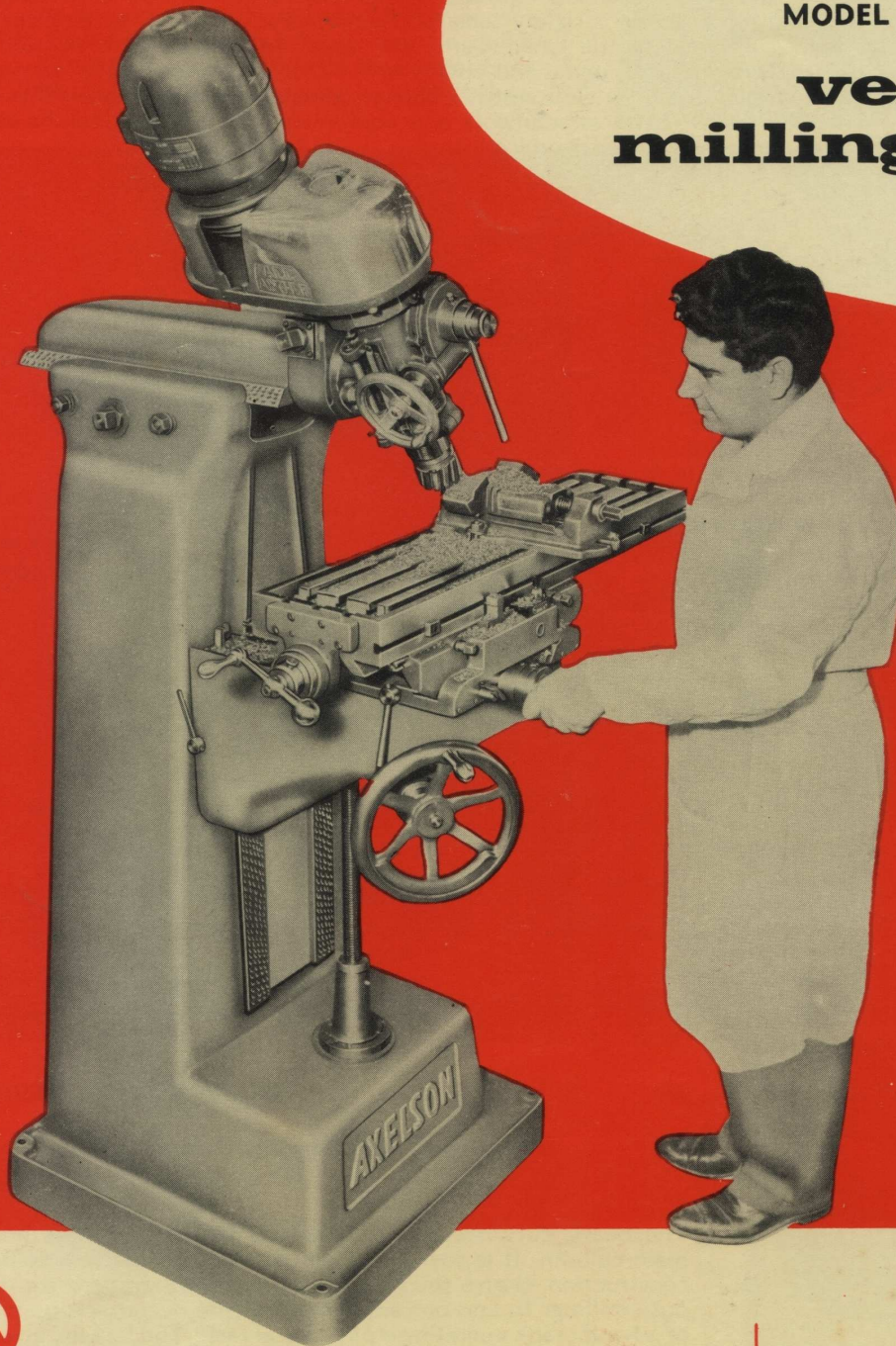


# Axelson

MODEL 1½V RAM TYPE

## vertical milling machine



### Featuring

1. Extra large work capacity.
2. "All-angle" Milling, Drilling, & Boring.
3. Super precision Quill type Spindle.
4. Manual or Power Spindle Feed.
5. Manual or Power Table Feed.
6. Up to 16 Spindle Speeds 50-6400 RPM.
7. Convertible to 1, 2 or 3 slide Hydraulic Duplicating.



# Axelson

Manufacturing Company

DIVISION OF U. S. INDUSTRIES, INC.  
6160 So. Boyle Avenue  
Los Angeles 58, California





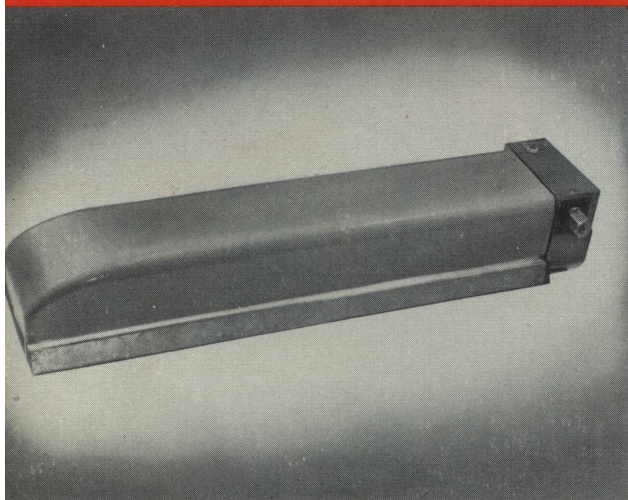
**THE AXELSON  
MODEL 1½V  
RAM TYPE  
VERTICAL  
MILLING  
MACHINE**

The Axelson Model 1½V Ram Type Vertical Milling Machine is a medium sized versatile machine tool designed for use in the tool room, pattern shop, plastic fabricators, repair shops and metal working shops of all types. The machine can be used to equal advantage for milling, drilling, boring, on a great variety of work.

The outstanding advantage of the Axelson Model 1½V is reflected in its extra capacity, increased horsepower and wide range of spindle speeds available. The head may be powered with ¾, 1, or 1½ H.P. motors which supply 6, 8, 12, or 16 spindle speeds depending upon the motor speed and back gearing equipment selected. Spindle speeds may range from 50 RPM to 6400 RPM and the machine is rigidly constructed to take advantage of carbide cutting tools. Power feed to the spindle and the table are available if desired. The machine provides 22" under the cutter with 12½" or optional 20½" ram slide travel. Tables are 9" x 36" with 22" longitudinal travel or optional 9" x 42" with 28" travel. Extra attachments and equipment are available for handling a wide range of work economically.

**MAIN CASTINGS**

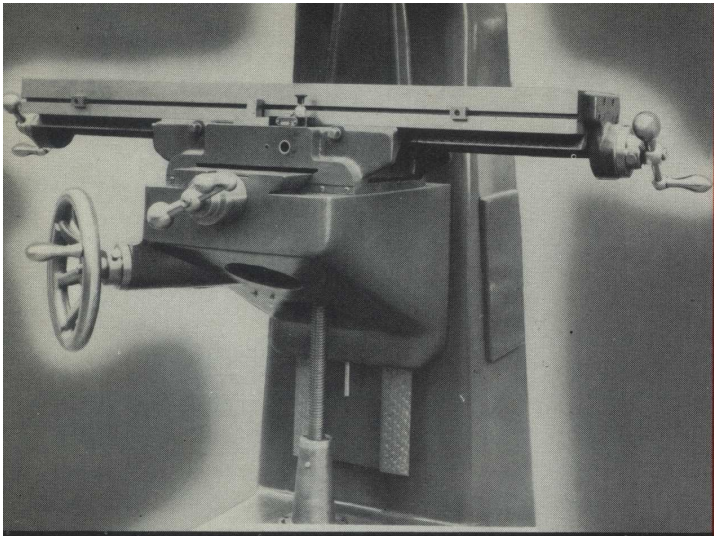
All castings are made in Axelson's own foundry which also casts the famous Axelson Lathe beds and parts. They are made from "Axloy" Axelson #35 CNM semi-steel formulation containing chrome, nickel and molybdenum. The formulation is designed for high strength, rigidity and great resistance to wear. It has a modulus of elasticity of approximately twenty million as compared with eight million for regular cast iron. In addition, the heavy box type structure of the main column and base is ribbed on the inside to provide the strength and rigidity required for heavy accurate work.



**HEAVY DUTY OVERARM**

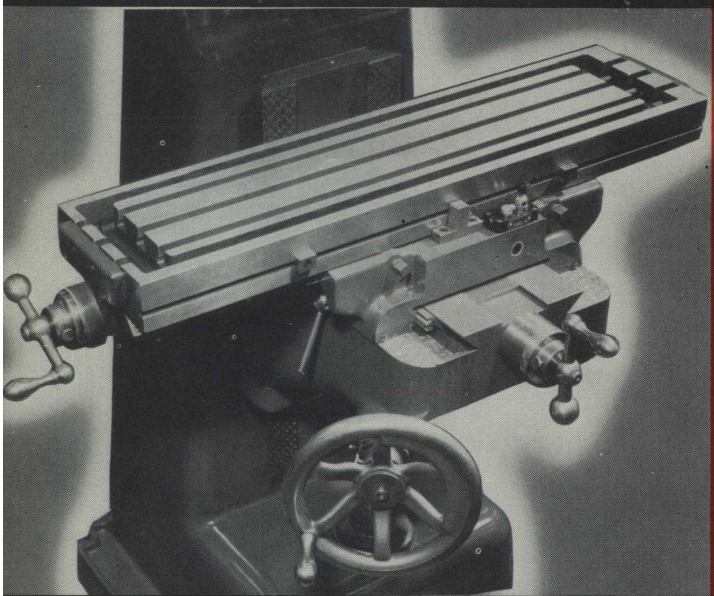
The heavy duty overarm is mounted on dovetail ways on the main column. It is cast from "Axloy" and is of extremely heavy construction to give the rigidity and strength required for heavy duty milling. In and out adjustment of the overarm is by means of a hand crank operating a pinion and rack. The locking arrangement provides positive clamping in any desired position or setting. The standard overarm provides 12½" travel and optional overarm permits 20½" travel.





### SADDLE — KNEE

The saddle and knee is of extra heavy construction to give the extra strength required to absorb the stresses of heavy milling cuts. The saddle slides on a 12" wide dovetail way cast integral with the column and provides a 14" long bearing support. Positive lever locking rigidly clamps the saddle and knee at any desired position for the work at hand. Vertical adjustment of the knee is by a large diameter hand wheel operating a vertical screw through a set of bevel gears. A large dial graduated in thousandths of an inch assists the operator in making accurate settings quickly.



### TABLE

The table is cast from "Axloy" for extra strength and to provide a durable working surface with long-wearing qualities. The standard table has a 9"x36" working surface and top and sides are precision ground. The table has three T-slots and a well around the edge for collecting coolant. One end of the table is tapped for coolant removal. Optional tables are available which provide 9"x42" working surface. Feeding is through a precision screw which may be operated by ball cranks at either end of the table. Large adjustable dials graduated to read in thousandths of an inch are provided at each end of the feed screw.



### "ALL-ANGLE" MILLING HEAD

The type 30 precision all-angle milling head is of quill type construction and is ideally suited for milling, drilling, boring, reaming, and grinding operations. It is powered by  $\frac{3}{4}$ , 1, or  $1\frac{1}{2}$  H.P. motors and supplies 6, 8, 12, or 16 spindle speeds. Feeding is by hand wheel, hand lever, or power feed.

The all-angle head may be rotated 360° around the overarm. The  $1\frac{1}{2}$ V machine has a built-in crank operated worm wheel angle adjuster which saves valuable minutes in making desired settings. If desired, a positive draw taper pin may be installed for quickly and accurately locating the head on vertical center. Large graduated dials assist the operator in making fast, accurate angle settings for any desired angle of operation. This saves time, and work moves faster because it is faster to change the machine than to reset the work.



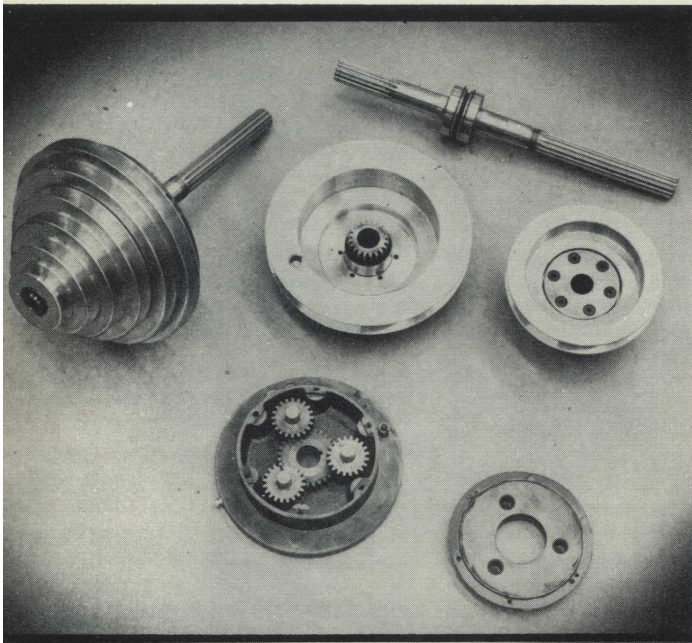
## SPINDLE SPEEDS AND MOTORS

Axelson type 30 milling attachments may be supplied with either 6 or 12 spindle speeds or with patented back gear feature to supply 8 or 16 spindle speeds. The extra speeds provide the necessary power on the low speed ranges for heavy milling with large cutters. This is accomplished through back gears which give a 3 to 1 reduction through a set of planetary gears located in the V-belt sheave. The spindle speeds available are dependent upon the motor selected, as shown in the table, and all speeds are reversible. Speed changing is a manual operation performed by loosening the motor mounting screws and moving the motor toward the spindle pulley which permits shifting the belts to any desired pulley step.

### MOTORS AND CONTROLS

Motors can be supplied for 220/440 volt, 3 phase, 50 or 60 cycle; or 115/230 volt, 1 phase, 60 cycle current with manual forward, stop, and reverse switch installed on the motor. If desired, J.I.C., magnetic and other switches are available upon request. The entire motor bracket rotates 360° about the attachment and may be set at any desired position. This has a particular advantage of moving the motor bracket to avoid any interference with some projection of the work being machined.

H.P.	Motor Speed	Back Gear	No. Speeds	Spindle Speeds — RPM
3/4, 1	1200	No	6	300, 530, 865, 1625, 2400, 4250
3/4, 1	1200	Yes	8	100, 180, 300, 530, 865, 1625, 2400, 4250
3/4, 1, 1 1/2	1800	No	6	450, 800, 1300, 2240, 3600, 6400
3/4, 1, 1 1/2	1800	Yes	8	150, 250, 450, 800, 1300, 2240, 3600, 6400
<b>Two Speed Motors</b>				
1	1200/600	No	12	300, 532, 866, 1625, 2400, 4250 150, 265, 432, 812, 1200, 2125
1	1200/600	Yes	16	100, 175, 300, 532, 866, 1625, 2400, 4250 50, 87, 150, 265, 433, 812, 1200, 2125
1 1/2	1800/900	No	12	450, 800, 1300, 2240, 3600, 6400 225, 400, 650, 1120, 1800, 3200
1 1/2	1800/900	Yes	16	150, 250, 450, 800, 1300, 2240, 3600, 6400 75, 125, 225, 400, 650, 1120, 1800, 3200



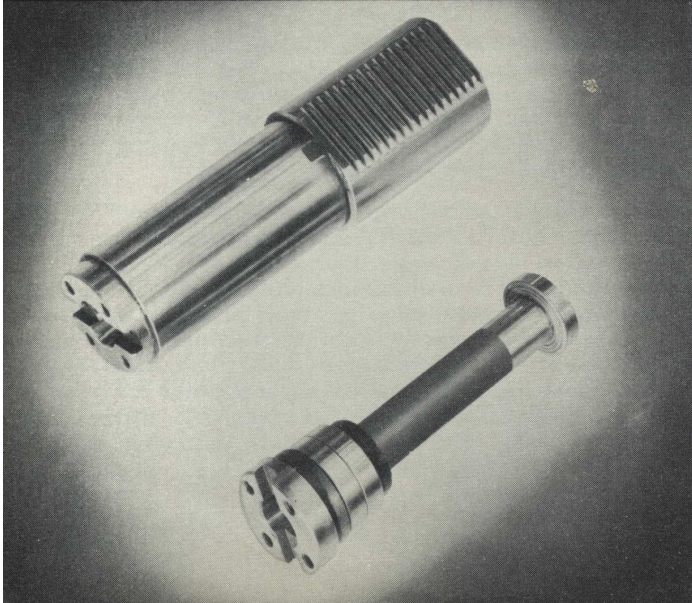
### PLANETARY BACK GEAR

A planetary back gear arrangement located in the spindle pulley provides an additional two or four speeds (depending upon motor selection) in the lower speed range for heavy duty milling with large cutters. The planetary gears give a 3 to 1 reduction and may be engaged or disengaged by a knurled pull pin.

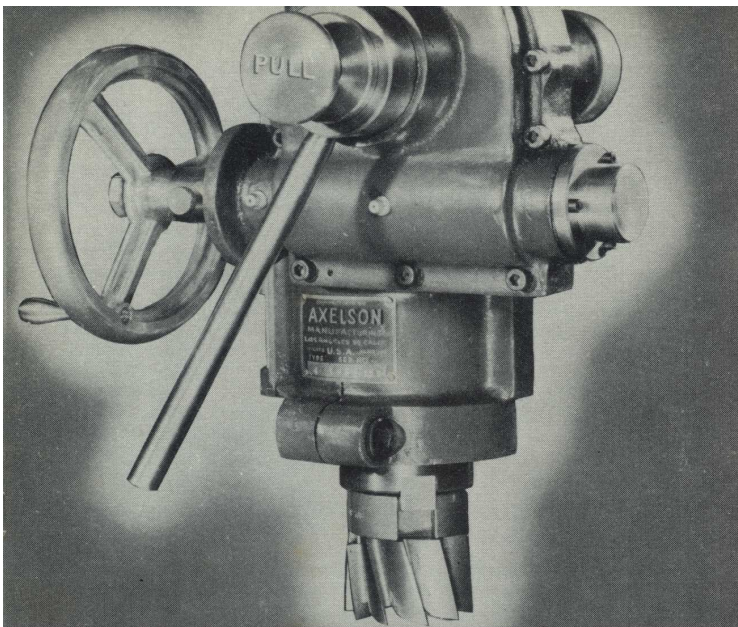
### THE QUILL AND SPINDLE

The precision ground quill is made of heat treated mechanical tubing, accurately machined, honed and draw lapped with housing. The quill has a 3 1/2" long travel and is provided with a rack for feeding. A quill lock that is positive in action permits the operator to accurately locate the cutter at any desired height. The quill weight is adjustably compensated for sensitivity.

The precision hardened vertical spindle is made from chrome moly steel, accurately ground and fitted in the spindle quill. The spindle is mounted on preloaded #7 precision angular contact bearings that eliminates looseness in the bearing in a radial or axial direction while the other end of the spindle is carried on a single row double shielded ball bearing taking the radial load only. The spindle has a No. 30 National Standard Taper with positive key drive. Cutters and tools are interchangeable with the horizontal spindle. Cutter and arbors do not stick in the spindle and it is not necessary to drive them out by pounding when changing tools. As a result, the original precision of the bearings is preserved over a long period of time.





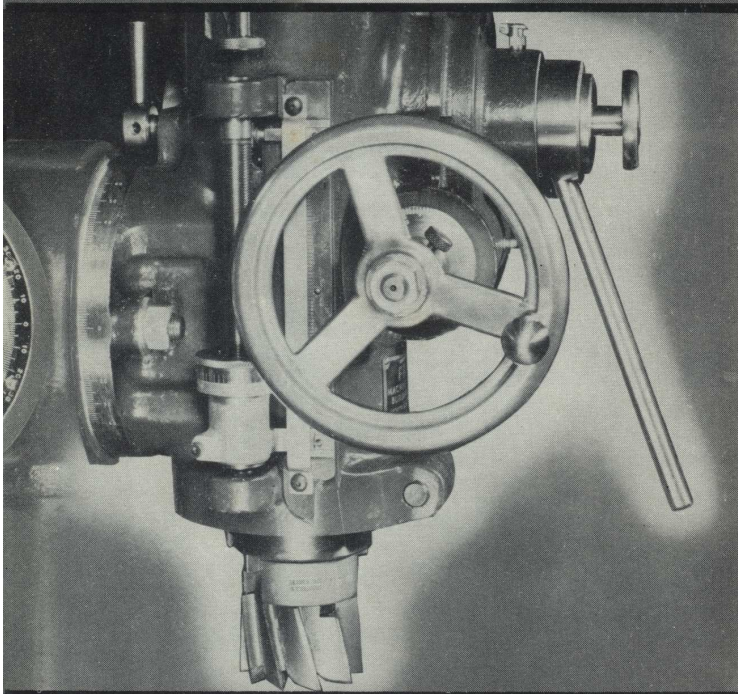


### **SPINDLE FEEDING**

Both hand wheel and hand lever feed to the quill is supplied on the No. 30 milling head as standard equipment.

### **HAND LEVER FEED**

Hand lever feed for sensitive feeding is through a rack and pinion and is engaged by a pull pin at the hub of the hand lever. Pulling out engages a positive jaw clutch for hand lever feeding and pushing in disengages the clutch and engages the hand wheel feed.

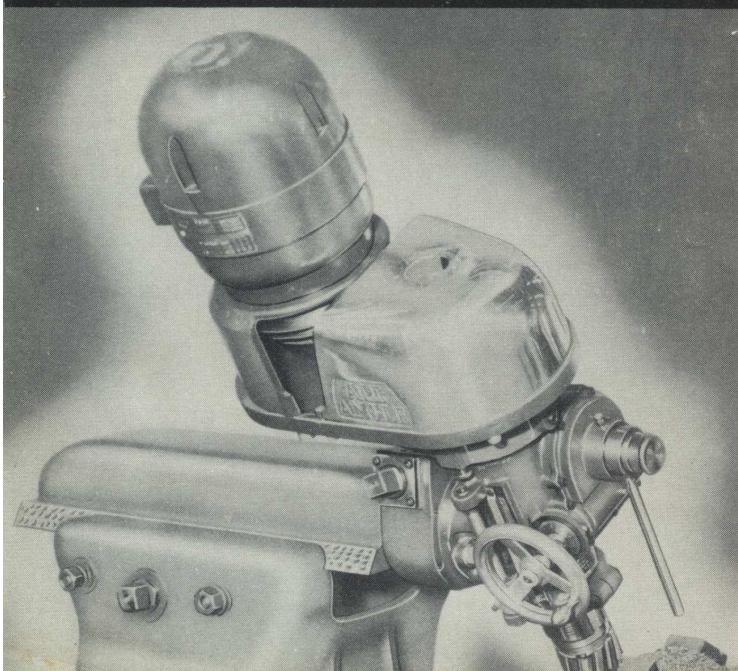


### **HAND WHEEL FEED**

Hand wheel feed operates through a 34 to 1 ratio worm and worm gear and provides fine feeding and sufficient power for heavy drilling, boring, or milling operations. A large adjustable dial on the hand wheel graduated in thousandths of an inch, assists the operator in feeding to desired depths or in making accurate cutter settings.

### **MICROMETER QUILL STOP**

A built-in adjustable micrometer quill stop is provided to assist the operator in making accurate settings or feeding to accurate depths. The stop consists of a micrometer screw, knurled stop nut with pointer, and a 5 1/2" scale mounted on the head. The stop nut is graduated to read in thousandths and is provided with a positive clamping screw that locks the stop nut rigidly in place. The stop has a working range of 3 1/2"



### **WORM WHEEL ANGLE ADJUSTER**

To facilitate making angle settings quickly, a crank operated worm wheel adjuster is built into the end of the overarm ram. It is a simple operation to loosen the locking screws and adjust the head to any desired angle. This saves time and eliminates the necessity of resetting work for angle operations. A large, easy-to-read graduated dial assists the operator in making accurate settings.



### ONE-SHOT LUBRICATION SYSTEM

A one-shot lubrication system is built into the saddle to provide fast, simple lubrication to the table ways, knee ways, and feed screw nut. Eight points are lubricated with metered amounts of oil at one press of the button to insure long accurate service. A built-in sight oil gauge tells the operator at a glance the quantity of oil in the reservoir. Other points of the machine requiring less frequent attention are lubricated through Zerk oil fittings.

### POWER FEED TO QUILL

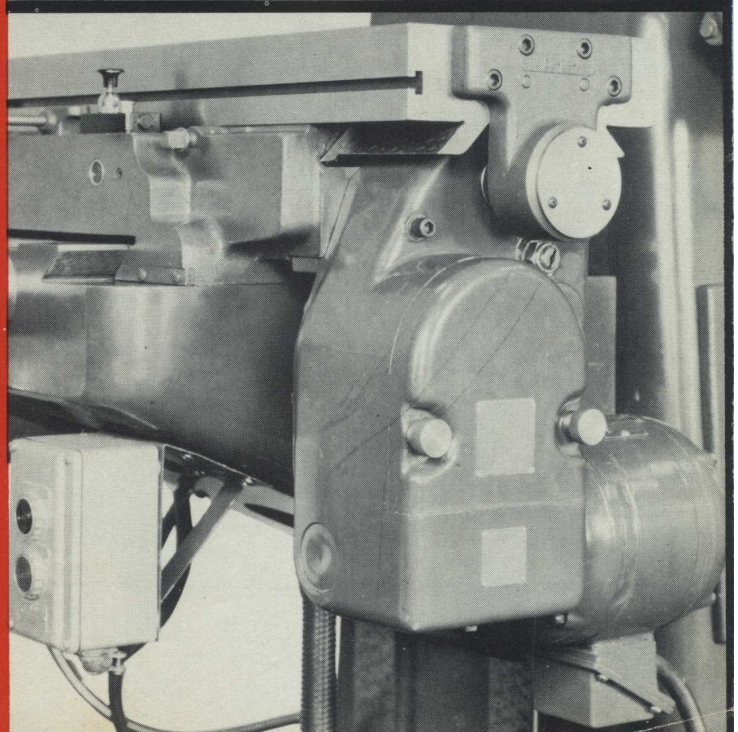
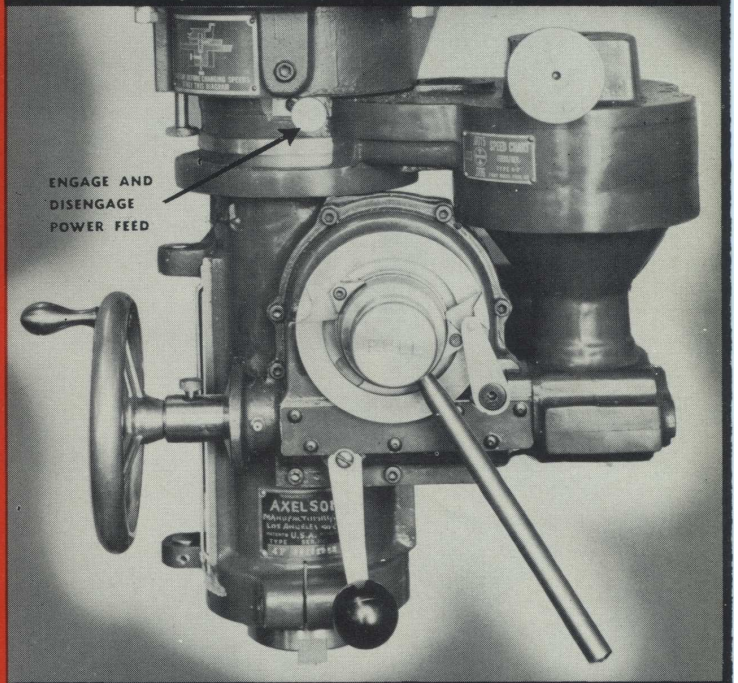
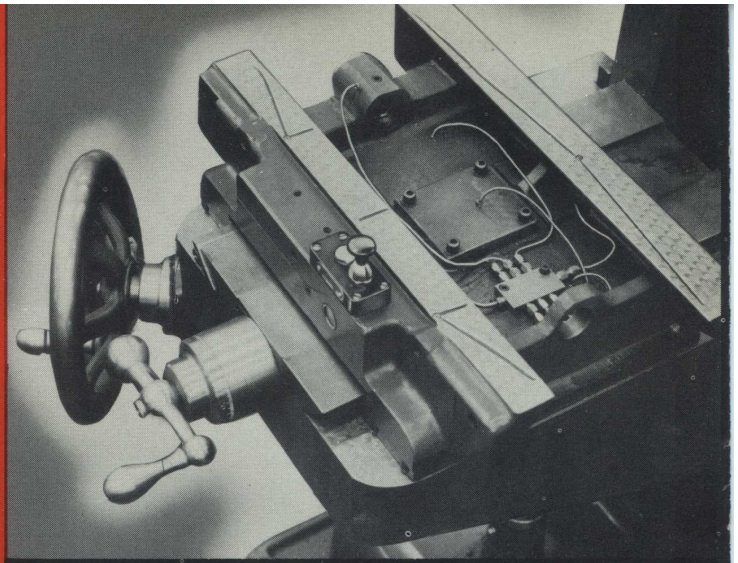
Power feed to the quill, available as an extra, is supplied through a positive gear attachment. It provides a powerful steady rate of feed to the quill for milling, drilling, and boring operations. Three feeds of .0015", .003", and .006", per revolution of the spindle may be quickly selected by turning the knurled knob located on the power feed gear box. When not desired, the power feed can be disconnected by turning the knurled knob on the head which avoids excessive use of the gears when not needed. Control of feeding is through a lever mounted at the side of the housing. A forward position feeds the spindle down and a backward position of the lever feeds the spindle up. Two trip dogs are provided for power feeding — one is a permanent cut out and acts to protect the spindle and gearing at the end of the spindle travel. The other is adjustable and may be set for disengaging the feed at any desired point.

### POWER TABLE FEED

Motorized power table feed is available as an extra to provide powerful steady longitudinal table feed. This attachment is powered by a  $\frac{1}{3}$  H.P. motor and drive is through a series of pick-off gears that permit changing the rate of feed to provide a range of  $\frac{1}{2}$ " to 13" per minute. Additional gears provide 81 feed changes from .525" to 13.125" per minute and gears may be selected to give any desired feed in this range.

Control for power feeding is by a lever at the front of the machine that controls the direction of feed as well as disengaging feed. Adjustable stop dogs may be set at any desired points over the full working range of the table to provide automatic feed trip. The table power feed unit is equipped with a slip clutch as a safety measure in case the table is fed past the table stop. The addition of power table feed reduces the overall table travel by 3".

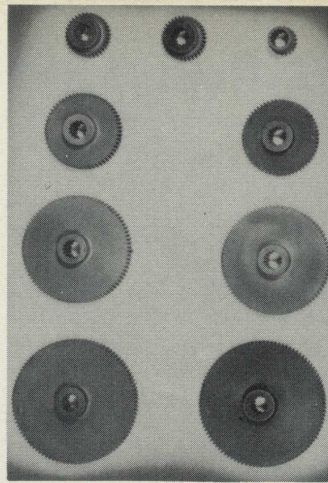
Change gears are stored in a convenient dust free compartment provided in the main housing.





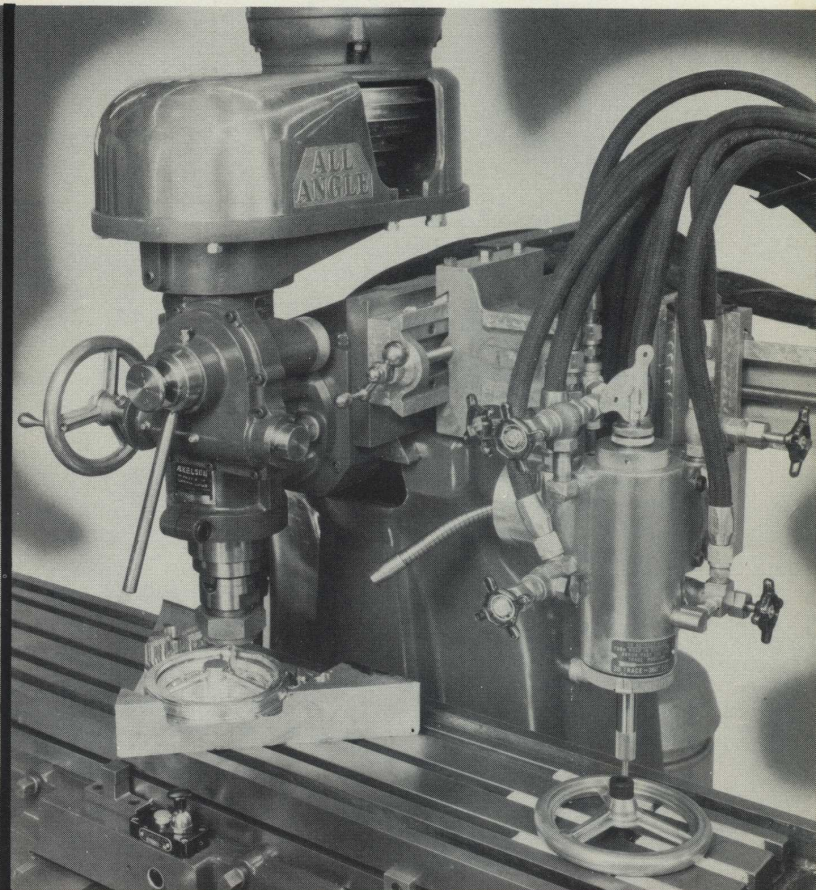
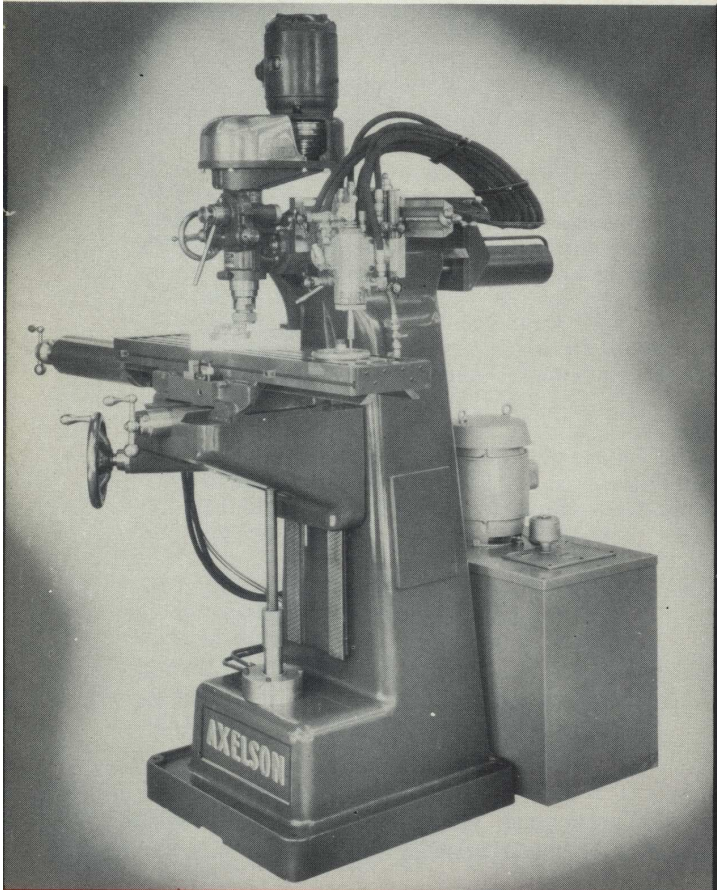
### HYDRAULIC DUPLICATOR ATTACHMENT

A hydraulic duplicator attachment may be supplied for making duplicate molds, dies, or for contour milling to templates. The duplicator sensing tracer head controls the movement of the table, knee, and ram slide. In operation, the operator moves the stylus over the master which in turn causes the cutter to move in like manner. Less than six ounces of pressure is all that is required to move the stylus finger. Oil pressure is supplied by a self-contained unit resting on the floor at the rear of the machine. If not desired, the sensing head may be quickly removed, restoring the machine to its standard manual operation. Tracing units may include 1, 2 or 3 slide control units.



### ADDITIONAL GEARS

Additional pick-off gears are available to provide for 81 table feed changes. This range is from .525" to 13.125" per minute and gears may be selected to give any desired feeds in this range. Gears are cut from alloy steel and are heat treated.



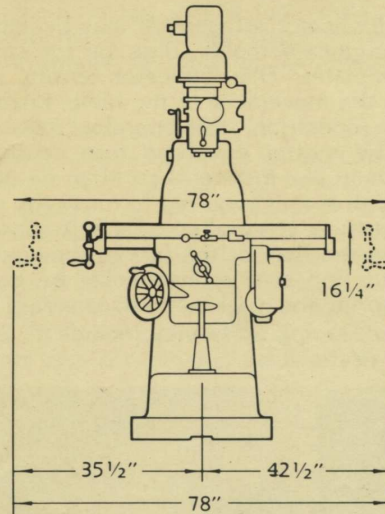
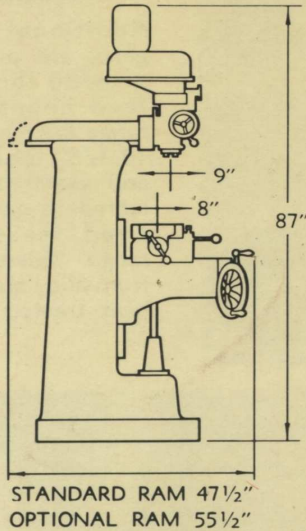
### ADDITIONAL EQUIPMENT

Additional equipment, adapters, and tooling are available at extra cost, as follows:

1. #189 Collet Chuck and Wrenches
2. #180 Collet  $\frac{1}{8}$ " to  $\frac{3}{4}$ "
3. #409 Collet Chuck and Wrenches.
4. #400 Collets  $\frac{1}{8}$ " to 1"
5. Drill chuck 0" to  $17/32$ "
6. Drill Chuck Adapter.
7. Axelson Offset Boring Head, Std. 3"
8. Boring Head Adapter.
9. Shell Mill Arbor  $\frac{1}{2}$ ",  $\frac{3}{4}$ ", 1"
10. Adapter, Drawbar style, No. 30 NST to No. 2 MT, No. 3 MT, No. 7 B. & S.
11. Coolant System with Motor.
12. Power Table Feed—with adjustable automatic trips—Feeds of  $\frac{1}{2}$ " to 13" per minute.
13. Additional pick-off gears for Power Feed Attachment (Specify feeds desired—81 feeds available, two feeds per set of gears.)
14. Shaper Attachment, Self Contained, Motor Driven, 4" stroke.
15. Power Feed to Quill—Provides Three Feeds, .0015", .003", and .006" per revolution.
16. Dividing Head—11" Plain.
17. Dividing Head—11" Universal.
18. 6" Chuck, 3 Jaw Universal for dividing heads.
19. Swivel Base Vises,  $4\frac{1}{2}$ " or  $6\frac{1}{2}$ ".
20. Rotary Tables, 9" and 12".
21. Precision Locating Attachment.
22. Micrometer measuring attachment—dial indicator reading to .0001" installed on table and cross slide.



# Axelson 1½V Ram Type Vertical Milling Machine



## SPECIFICATIONS

### Capacity

Longitudinal Travel .....	22"
With Optional Table .....	28"
Cross .....	8"
Vertical .....	16"
Spindle Nose to Top of Table.....	22"
Ram Travel .....	12½"
with optional Ram .....	20½"
Depth of throat (Ram out) .....	16"
with optional Ram .....	24"
Combined Travel—Table Cross & Ram.....	20½"
with optional Ram .....	28½"
Table — Working Surface .....	9" x 36"
with optional Table .....	9" x 42"
Number of T-Slots.....	Three 9/16 x 2½"
Cutter Capacity	
Shell end Milling Cutter .....	4" dia.
Collet Capacity .....	⅛" to 1" dia.
Drilling Capacity using Std.	
Drill Chuck .....	17/32 dia.
Spindle, Nose .....	No. 30 N.S. Taper
Spindle Bearings .....	Preloaded #7 Precision

Quill Travel .....	3½"
Speeds, Standard, 6 Spindle Speeds	450-6400 RPM
Optional, with back gear, 8 speeds	150-6400 RPM
with back gear and 2 speed Motor:	
16 Speeds .....	75-6400 RPM
or 16 Speeds .....	50-4250 RPM
Motor Drive .....	¾, 1, or 1½ H.P.
Power Spindle Feed (Extra)	
.....	.0015", .003" and .006" per Rev.
Controls .....	as Specified
Power Table Feed (Extra) .....	½" to 13" per min.
Feed Dials .....	3" dia. calibrated to .001"
Lubrication—Bijur one-shot System built-in—lubricates table ways, knee ways and lead screw nut.	
Motor Support — and belt housing swivels 360° around spindle permitting spindle to be used at any angle without interference.	
Floor Space .....	6'1" x 4'9" x 7'3" high
Weight—approximate Net Wt. ....	2100 lbs.
approximate Shipping Wt. ....	2200 lbs.

### STANDARD EQUIPMENT

Axelson Model 1½V Ram Type Vertical Milling Machines have the following standard equipment: One-shot oiling system for sliding surfaces of knee, table, and saddle; built in worm head adjuster; two ball cranks on table feed with dials; table top and sides precision ground; table tapped for coolant system; rack and pinion on ram slide; lever operated clamps on table, saddle, and knee; table stop dogs; precision lead screws for table, saddle and knee; instruction manual and parts catalog; necessary wrenches.

### OTHER AXELSON MILLING MACHINES AND MILLING ATTACHMENTS

- Model 10R Ram Type Universal Milling Machine  
Bulletin #5501-M
- Model 10RH Ram Type Duplex Milling Machine  
Bulletin #5501-M
- Model No. 30 "all-angle" Milling Attachments  
Bulletin #5502-M

Write for Bulletin illustrating and describing the above milling machines and equipment in full.

# Axelson

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