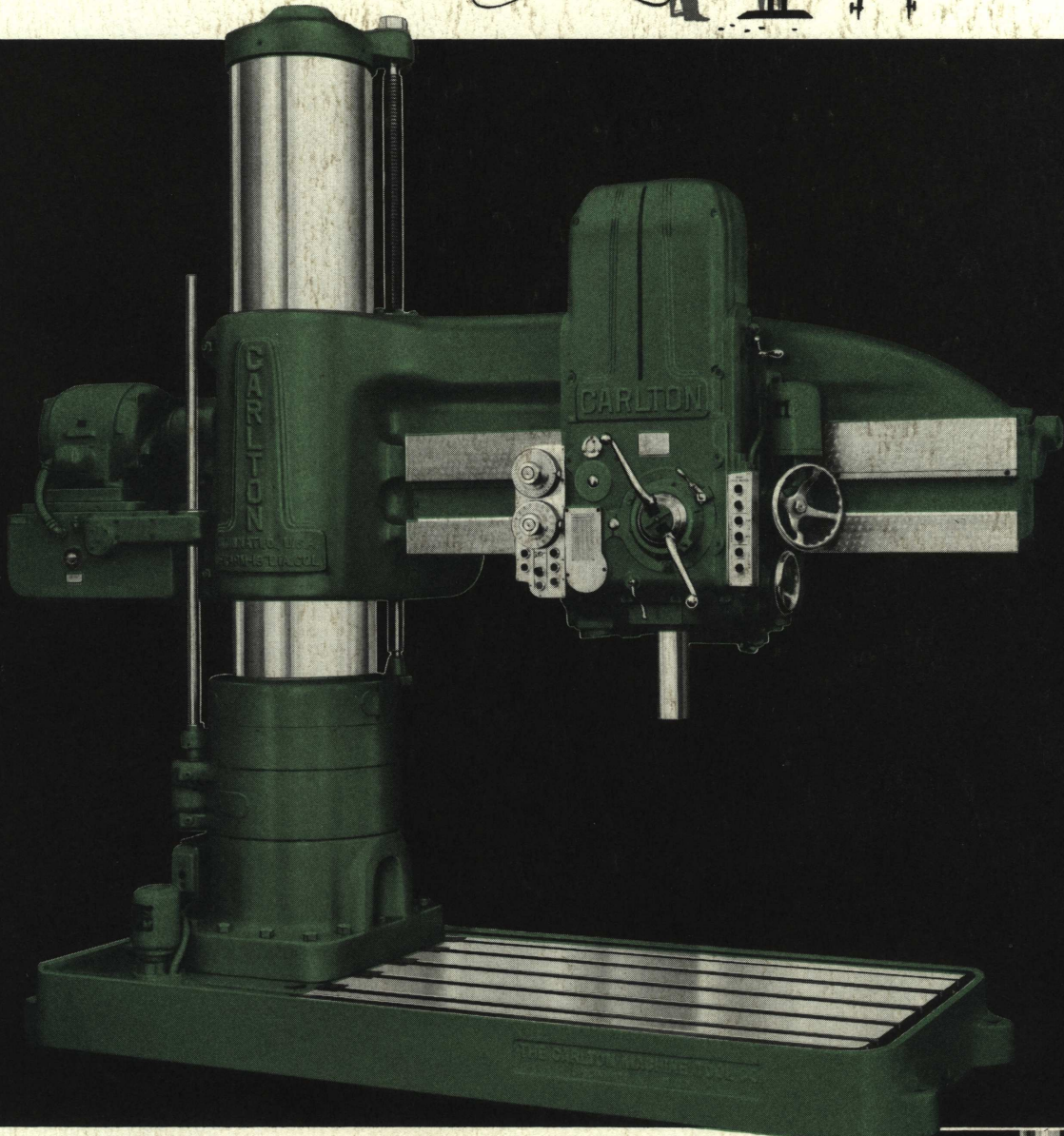
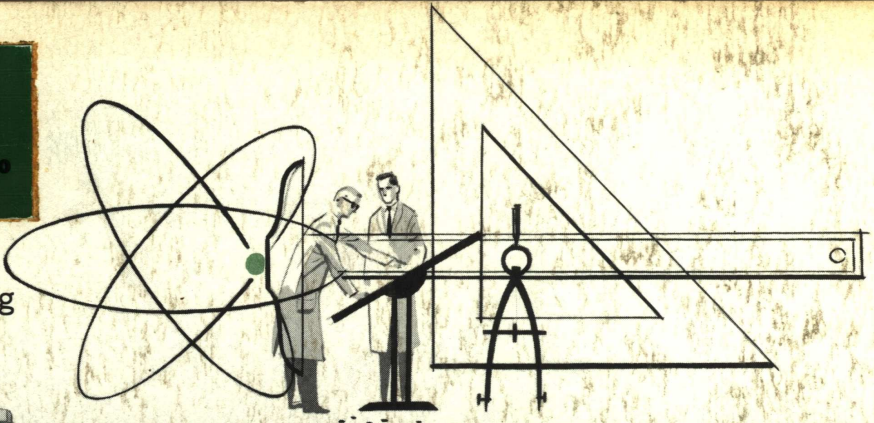


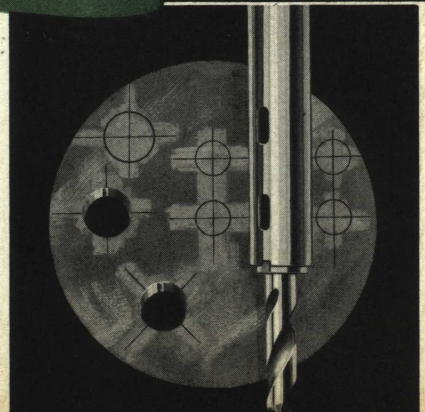
Barney Machinery Company
MACHINE TOOLS
1002 GREENTREE ROAD • PITTSBURGH, PA. 15220
Telephone 922-1207

modern design — modern engineering

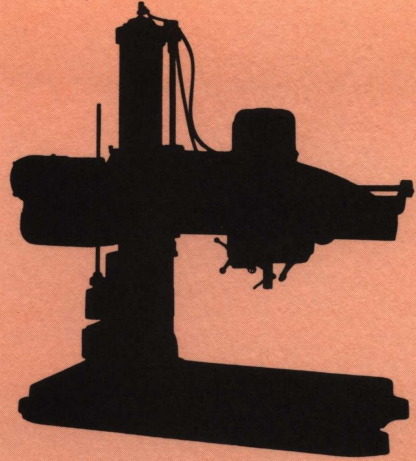


*Specialists in Drilling
and Boring Machines since 1916...*

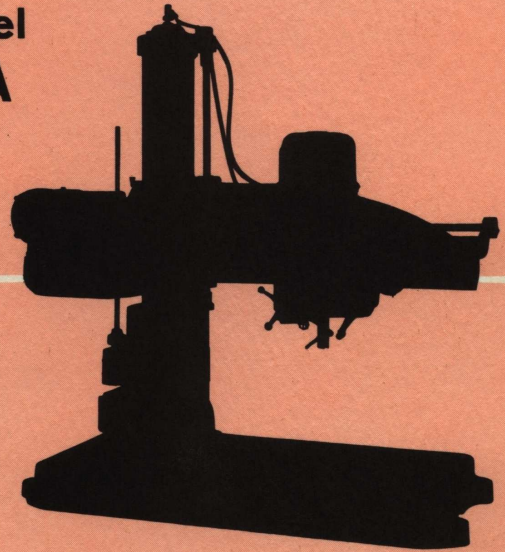
THE CARLTON MACHINE TOOL COMPANY
CINCINNATI 25, OHIO



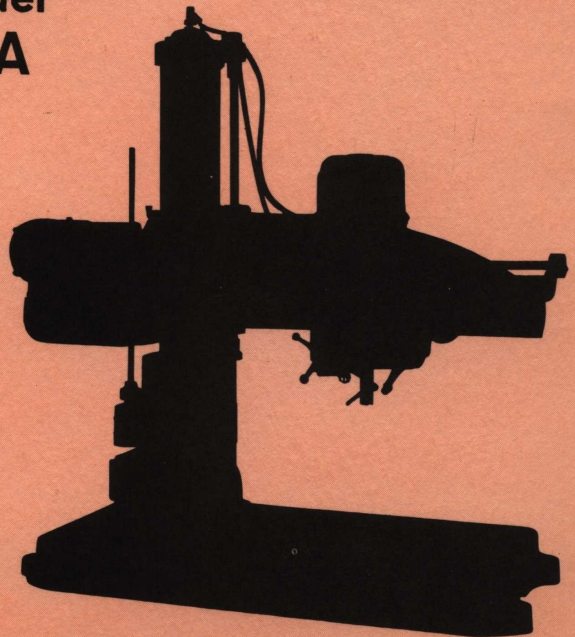
**Model
3-A**



**Model
4-A**



**Model
5-A**



Carlton

The Standard of
Excellence in
Radial Drills

Carlton

your best buy in radial drills

Carlton has concentrated exclusively on radial drill, research, engineering and manufacturing since 1916. As a result of this single purpose, Carlton was the first radial drill manufacturer to bring you the low hung drive to spindle, all ball bearing construction, independent electric power for spindle and auxiliary components, push-button control, 3-unit power clamping, precision column clamping . . . and finally, the pre-selector systems of speed-feed control.

A continuing program of product research assures you of unequalled design and construction

features, longer life accuracy—in short, the most modern and up-to-date radial drill performance available.

Carlton also offers the widest possible choice: in sizes (3-ft. to 12-ft. arm lengths, 9" to 26" column diameters) . . . plus your choice of speed-feed controls . . . plus your choice of bases . . . plus a special tool set-up engineered to meet your drilling requirements.

Presented on the following pages are the reasons why Carlton is your very best buy in radial drills. The Carlton Machine Tool Co., Cincinnati 25, Ohio.

index

Arm Clamping	12-13	Head	7	Power range pre-select	2-3
Arm detail	14-15	Head clamping	12-13	Pre-select	2
Column clamping	12-13	Low hung drive	5	Safety features	20
Column detail	14-15	Main driving clutch	10	Specifications	18-19
Elevating mechanism	11	Manual control	2-4	Speed-feed controls	2
Feed mechanism	8	Motors	9	Spindle	6
Floor plan dimensions	16-17	Power clamping, 3-unit	12-13		

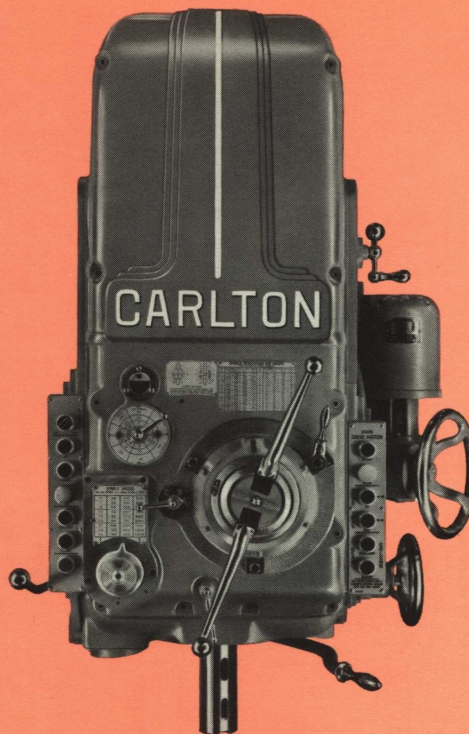
**UNLIMITED
-AND UNEQUALED
CHOICE OF
SPEED-FEED CONTROLS**

only with Carlton can you take your choice of three different types of speed-feed controls.

For versatility and flexibility in your production operations you can choose between the two speed-feed controls that help the operation more productive. Pre-Select and Power Range Pre-Select.

And in Manual Control, there's nothing that can equal Carlton's simplified head.

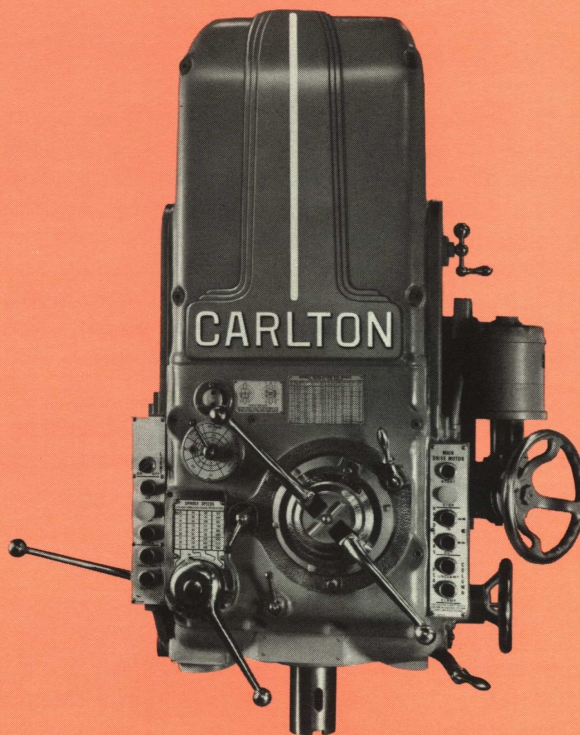
There's no compromising with your requirements at Carlton. Here you select the speed-feed control that fits your drilling set-up exactly.



POWER-RANGE PRE-SELECT



PRE-SELECT

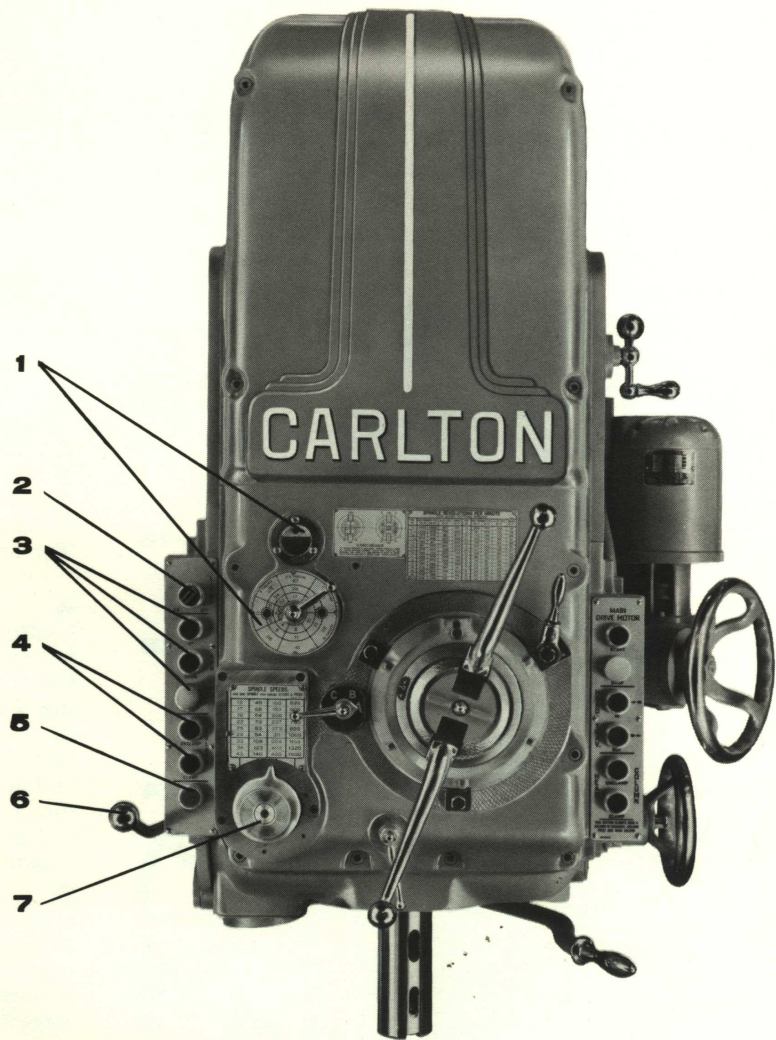


MANUAL CONTROL

**The Power Range Pre-select
reduces shifting time
by fifty percent
over the manual method.
It pre-selects four different
speed ranges and neutral.**

Nine speeds are selected manually in each range. So, with one lever and one dial, you can select 36 spindle speeds. Feeds are selected manually.

This type of pre-selector is ideal for drilling requirements where a limited number of speed changes are made frequently.



POWER RANGE PRE-SELECT

1 Feed shifting levers.

2 Light switch for twin beam flood lights.

3 Arm pushbutton controls for raising, lowering and stopping arm. Same controls automatically clamp and unclamp arm and lubricate arm and elevating screw. The arm bearing on column and the elevating screw are lubricated automatically every time the arm is moved.

4 Column clamp and unclamp pushbuttons. These controls are independent of the combination power head and column station on the right side of the head, permitting the arm to move radially without disturbing the positioning of the head.

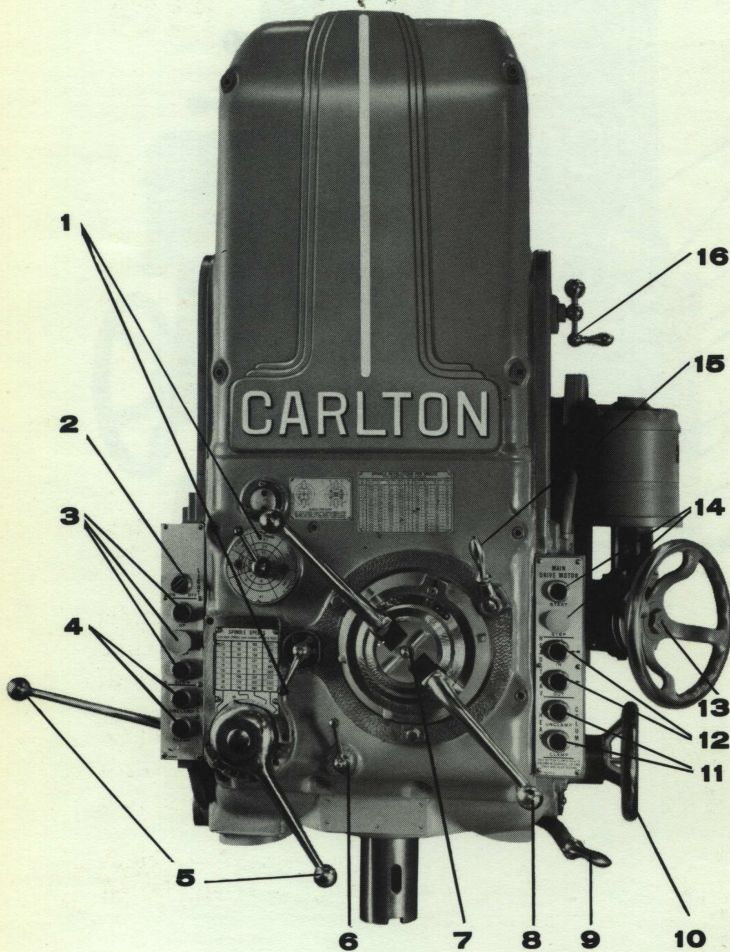
5 Power range pre-select pushbutton.

6 Manual lever for nine speeds. This lever has vertical and horizontal motion. An indicating pointer moves vertically with the two motions of the lever to point directly to the speed that is selected by the range pre-select dial.

7 Power range pre-select dial. This dial pre-selects any one of the four ranges and a neutral while the operation is in progress. Upon pressing the shift button and placing the spindle control lever in neutral, the gears will shift to the range selected before the spindle comes to a complete stop.

● For description of right hand controls, see page 4.

MANUAL CONTROL



Carlton manual controls have been designed with ease of operation in mind. The arrangement of pushbuttons and levers is so orderly and logical, operators quickly develop a "touch system" which means faster operation than any other manually operated radial drill.

Direct reading speed and feed charts further simplify shifting.

1 Feed shifting levers. Two easy to shift levers and two easy to read reference dials are all that are required to control 18 feeds to the spindle.

2 Light switch for twin beam flood lights.

3 Arm pushbutton controls for raising, lowering and stopping arm. Same controls automatically clamp and unclamp arm and lubricate arm and elevating screw. The arm bearing on column and the elevating screw are lubricated automatically every time the arm is moved.

4 Column clamp and unclamp pushbuttons. These controls are independent of the combination power head and column station on the right side of the head, permitting the arm to move radially without disturbing the positioning of the head.

5 2 levers control 36 spindle speeds. An indicating pointer moves vertically with the two motions of the front shifter lever and points directly to the column on the direct reading plate containing the speed selected. Front shifter lever selects four ranges and neutral (for rotating spindle by hand).

6 Clutch lever to declutch power feed whenever fine hand feed operations are required.

7 Tapping interlock. When this dial is turned a few degrees, the feed levers are locked out making it impossible to engage the feed clutch during tapping or reaming operations.

8 Feed clutch and quick return levers to engage power feed and for rapid advance and retraction of spindle when disengaged.

9 Spindle control lever starts, stops and reverses the spindle.

10 Feed handwheel for fine feeding. A pull-clutch in the center of the hub can be retracted when power feeding so that handwheel does not revolve.

11 Power clamp for head and column. These pushbuttons clamp and unclamp the head and column in sequence. Slight pressure on the clamp button clamps the column first, full pressure clamps both column and head. Slight pressure on the unclamp button unclamps the head first, full pressure unclamps the head and column.

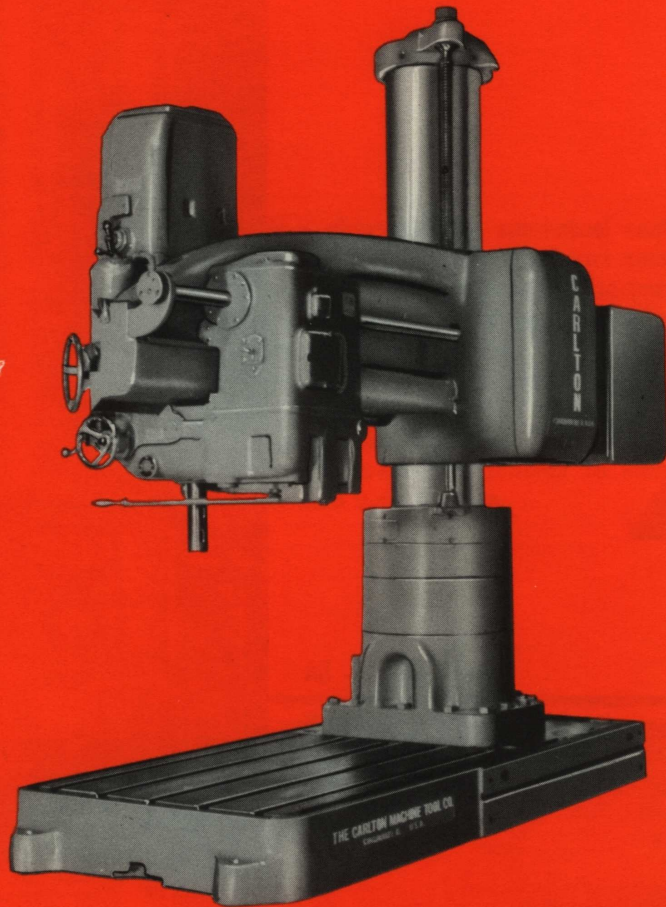
12 Power rapid traverse pushbuttons control movement of head along the arm.

13 Handwheel for fine location of head.

14 Start-stop main drive motor. Mushroom button provides instant stops for greater safety.

15 Dial clamp for clamping dial after setting to predetermined drill depth.

16 Counterbalance adjustment. This is in addition to the counterweight that is geared to the spindle. Clockwise rotation adds tension.



LOW HUNG DRIVE

Carlton's exclusive low-hung drive brings the head and the spindle down to the work . . . not just the spindle. Thus the main drive gear is placed on the lowest part of the head, and drives on the largest diameter of the spindle, closest to the cutting tool.

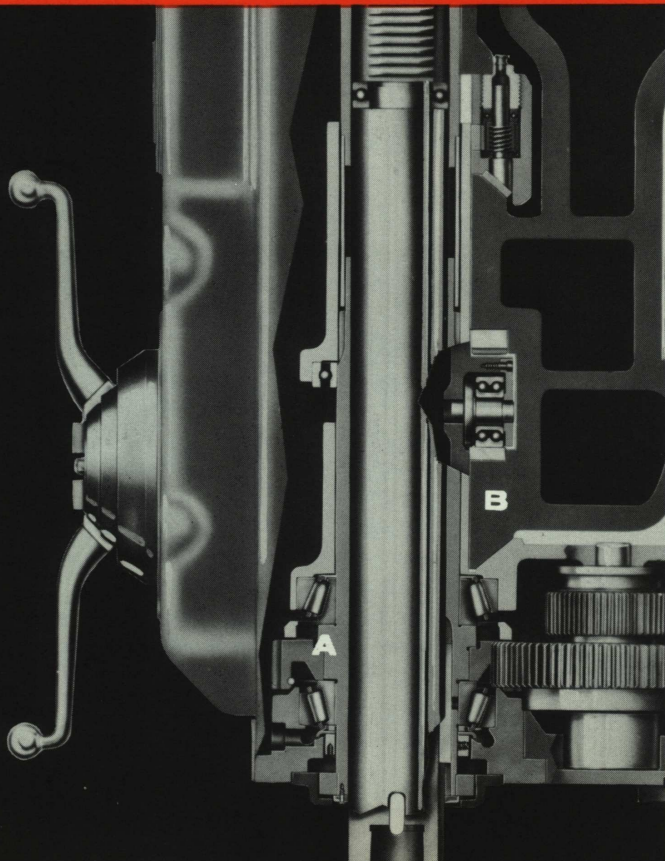
This principle permits maximum torque transmission, and is well established by its wide use in planers, lathes and milling machines.

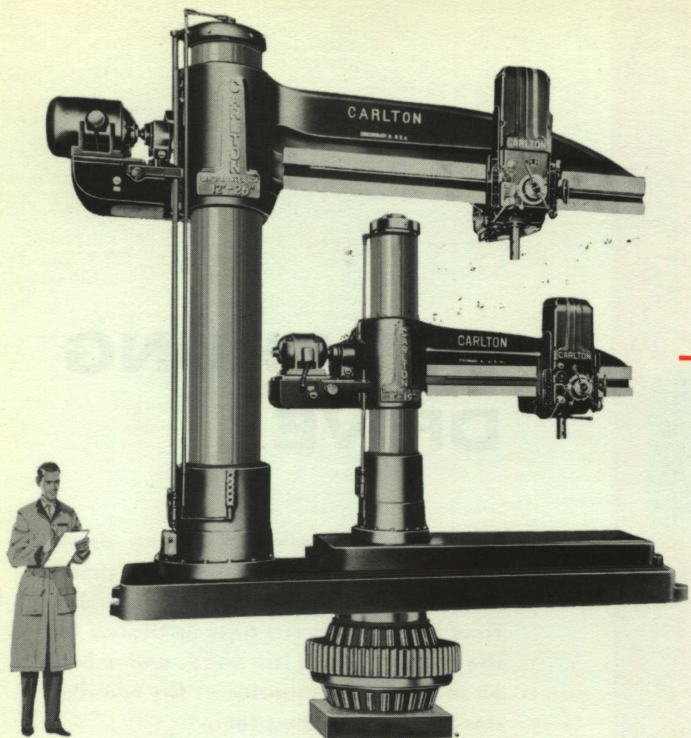
Carlton design also brings the spindle closer to the radial arm support than is possible on any other radial drill. This—plus the low-hung drive principle—assures greater spindle rigidity, minimizes spindle twist, eliminates vibration . . . and thereby increases tool life.

Every bearing in the head—including spindle bearings—is lubricated automatically.

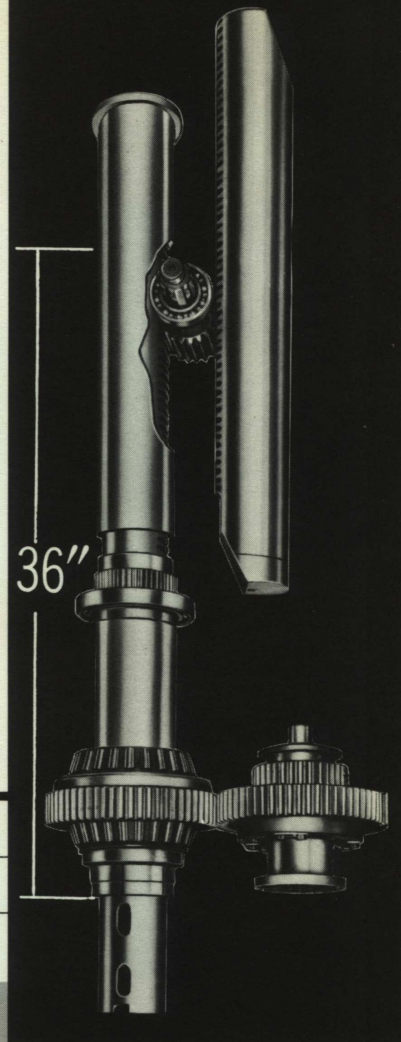
Compare location of point A with point B.

Note the main drive gear is below the bottom of the arm—the Carlton low-hung drive principle that brings the driving power closer to the work, yet maintains close proximity to the arm for greater rigidity.





	3A	4A	5A
Spindle travel	18"	20"	24"
Length of spindle bearing support	29 $\frac{1}{8}$ "	32"	36"
Bearing can support	60,000 lbs.	87,000 lbs.	87,000 lbs.



The Carlton spindle is supported on selected precision taper roller bearings that can carry enormous loads. For example, the spindle bearings on the 4A can support 87,000 lbs.—more than enough capacity to swing the combined weight of the two largest Carlton radial drills . . . thus demonstrating the extra reserve that Carlton provides to meet every conceivable requirement.

RUGGED, PRECISION-MOUNTED SPINDLE

The spindle bearings never feed away from the head, but are always rigidly supported close to the arm for greater ruggedness and accuracy.

The supporting bearing for the vertical slide of the spindle remains constant, regardless of how far the spindle may be extended. For example, the 5A has a 24" spindle travel with 36" bearing support . . . which is 1½ times the length of the tool travel. The spindle is equally well supported in the 3A and 4A models.

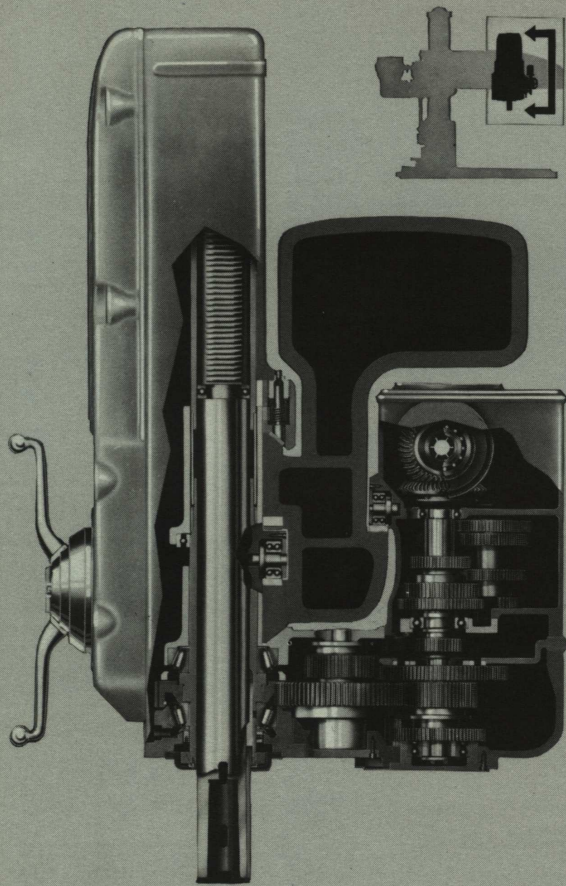
Thanks to the low-hung drive design Carlton is able to use an extra large spindle. The spindle itself is made from a hammered forging and is carburized to full depth of case, rather than superficial surface hardening as in conventional radial drill spindles.

The spindle is counterbalanced by means of a counter-

weight that is geared to the spindle through a solid pinion for normal weight tools. With this design it is impossible for the spindle ever to fall out. In addition to the counterweight, Carlton also provides an auxiliary counterbalancing spring which is adjustable to compensate for heavier-than-normal tools.

For heavier tools, the counterbalance spring is adjusted to the proper tension necessary to balance the tool. This adjustment is made manually with the lever extending from the upper right side of the head.

The bearings that support the vertical slide of the spindle are replaceable. Should it ever become necessary to re-fit the spindle, it is easy and inexpensive to replace them with bearings that are manufactured to new machine tolerances.



THE POWERFUL, PERFECTLY BALANCED

Carlton

HEAD

The most significant design advantage Carlton offers is the under-the-arm mounting of the powerful head. This makes possible the low-hung drive principle—probably the greatest single contribution to hole drilling accuracy and efficiency.

Pioneered by Carlton, the low-hung drive has been enthusiastically received by radial drill users who have welcomed the increased drilling power and rigidity, and by other radial drill manufacturers who have tried without success to copy the design.

The Carlton method of mounting the head underneath the arm achieves perfect balance naturally, with none of the overbalance, wear and adjustment problems presented by other methods of headstock mounting.

The powerful headstock gear train consists of gears made of drop forgings with hardened and ground teeth. Gear shafts are short and sturdy (none over 8"), multiple-splined, hardened and ground. Gear train is lubricated with continuous bath of filtered oil.

The head rolls on two sets of double row ball bearings on two parallel hardened and ground arm wear strips.

The dovetail design of the armways, plus the ball bearing mounting, makes for quick and easy

adjustment. It eliminates the taper gibs required on machines where overbalance to the head exists—and eliminates needless expense of periodic replanning, refitting and rescraping of armways.

better balance, less wear with

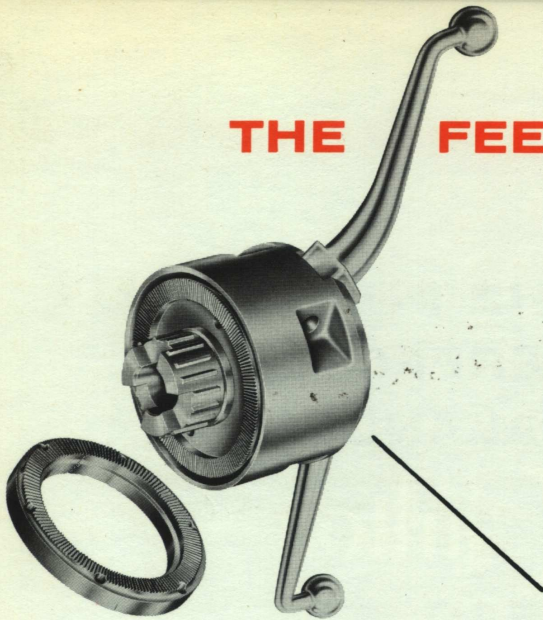
Carlton's under-the-arm head design

The unique under-the-arm design puts the cutting tool closer to the source of power . . . thereby promoting greater hole drilling efficiency. It permits the use of a head that's balanced *before* installation . . . rather than one that must be built in anticipation of balancing after mounting on the arm.

The weight of the balanced Carlton head is distributed equally to the front and rear of the arm. This results in less wear, contributing to longer life precision performance.

Because the drive is under the arm, the spindle never projects far from the head. Less leverage is applied against the arm because of the close and rigid support the arm provides to the spindle.

THE FEED MECHANISM

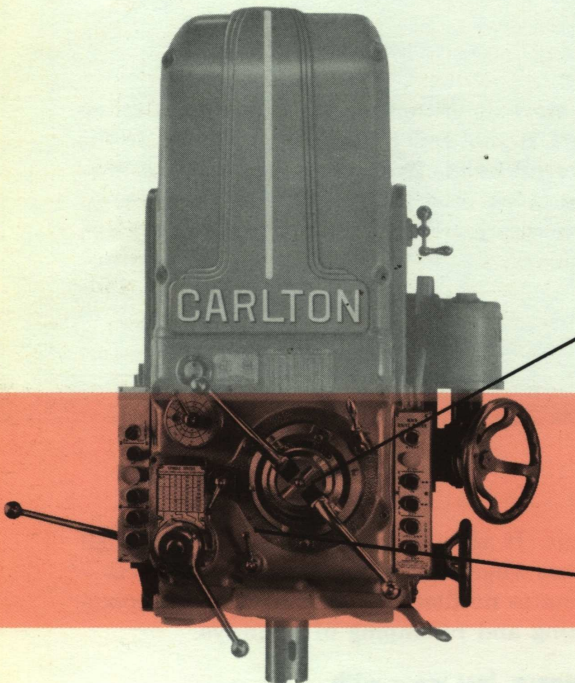


The feed mechanism on Carlton radial drills is smartly engineered to provide a positive, powerful feeding of the drill into the work. Design is extremely simple, thus assuring trouble-free operation. All gears are heat treated and have shaved teeth to assure smooth power transmission and quiet operation.

Carlton radial drills are built with 18 feed and tap leads, .004 to .125, including 8, 11½, 14 and 18 thread tap leads. Many other feed and tap leads available to meet most requirements.

FEED CLUTCH

The feed clutch is designed for constant penetration. Serrated teeth are milled into each plate which, when engaged by the clutch levers, transmit positive vertical feed to the spindle. There is no chance for slippage. And the clutch is so easy to engage, a flip of the finger is all that's required. Adjustment to the clutch is made from the front of the head; it isn't necessary to remove any large components.



TAPPING INTERLOCK

Standard equipment on Carlton radial drills since 1920, the tapping interlock eliminates any possibility of engaging the power feed. Turning the interlock a few degrees restricts the movement of the levers so that the operator can advance or retract the spindle without engaging the feed when tapping or reaming.

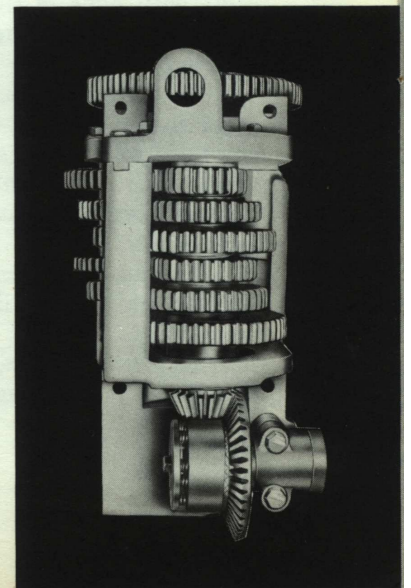
POWER FEED DISENGAGE

Power feed may be de-clutched for hand feed at any time by means of this lever conveniently located at bottom and center of headstock.

SAFETY FEED CLUTCH

The ingenious Carlton safety feed clutch is designed to transmit 50% more thrust than the rated capacity of the machine. It will release, with a clicking sound, when taxed beyond its capacity. This safety device prevents overloading, breaking of parts and destruction of valuable tools. Full protection for the life of the machine!

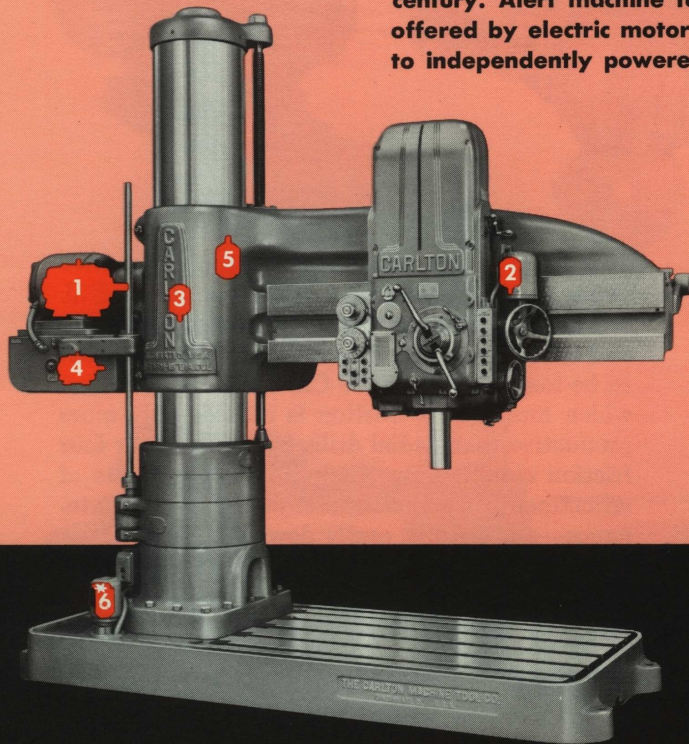
The clutch is placed on the output side of the feed mechanism where it transmits constant torque regardless of the speed-feed combination selected. This clutch is set and tested at the factory and never needs adjustment.



Carlton

POWERED FOR EFFICIENCY AND ECONOMY

The productive capacity of machinery has been increased many times since the introduction of the electric motor at the turn of the century. Alert machine tool manufacturers recognize the great potential offered by electric motors early in the evolution from countershafts to independently powered machines and components.



Carlton, pioneer of many other important developments in its field, was the first radial drill manufacturer to apply the modern principle of direct power transmission to radial drills. Today Carlton offers more electric motors as standard equipment—at no extra cost—than any other radial drill! As a result Carlton radial drills are the most efficient and economical available. Here's why:

✱ extra optional power

1. MAIN DRIVE MOTOR

Carlton is the only radial drill that utilizes *all* the horsepower of the main drive motor to power the spindle. None of the valuable metalcutting energy is diverted from the main drive motor to run auxiliary components.

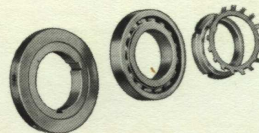
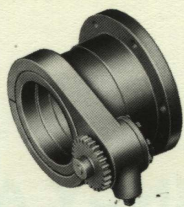
AUXILIARY MOTORS

Carlton is the only radial drill manufacturer who furnishes four auxiliary motors as standard equipment . . . to run

- | | |
|------------------------------|---------------------------------------|
| 2. Head Rapid Traverse Motor | 5. Arm raising and lowering |
| 3. Arm clamp and unclamp | ✱ 6. Plus optional coolant pump motor |
| 4. Column clamp and unclamp | |

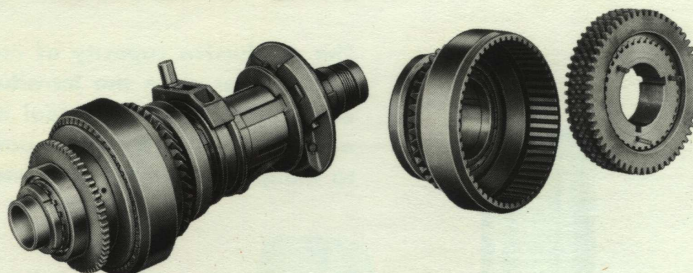
Of the five motors Carlton furnishes as standard equipment, only the main drive motor runs continuously. All others operate intermittently as required. The length of the clamp-and-unclamp cycle for arm, column and head

doesn't exceed 2/5 sec. Total operating time for all auxiliary motors (except coolant) rarely ever exceeds 30 minutes operating time in an 8-hr. day.



MAIN DRIVING CLUTCH

The main driving clutch will transmit more power than is needed to drive the largest cutting tool, yet is sensitive enough for the very smallest tapping operation.



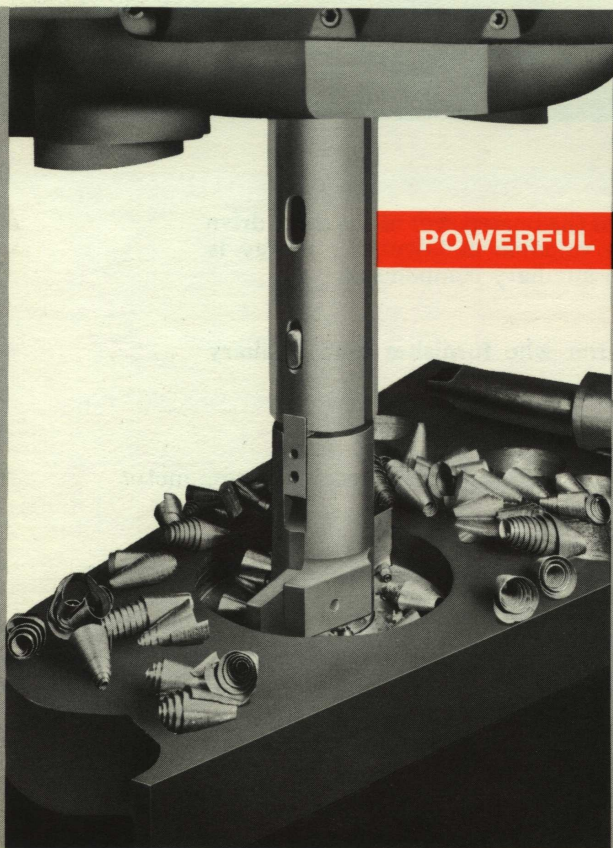
The clutch is designed, engineered and built entirely by Carlton. It is ruggedly constructed and operates in cascading, filtered oil. Parts are precision machined. Spiral bevel gear teeth are hardened and ground.

The clutch operates at constant speed at all times and consistently transmits constant torque through the entire speed range.

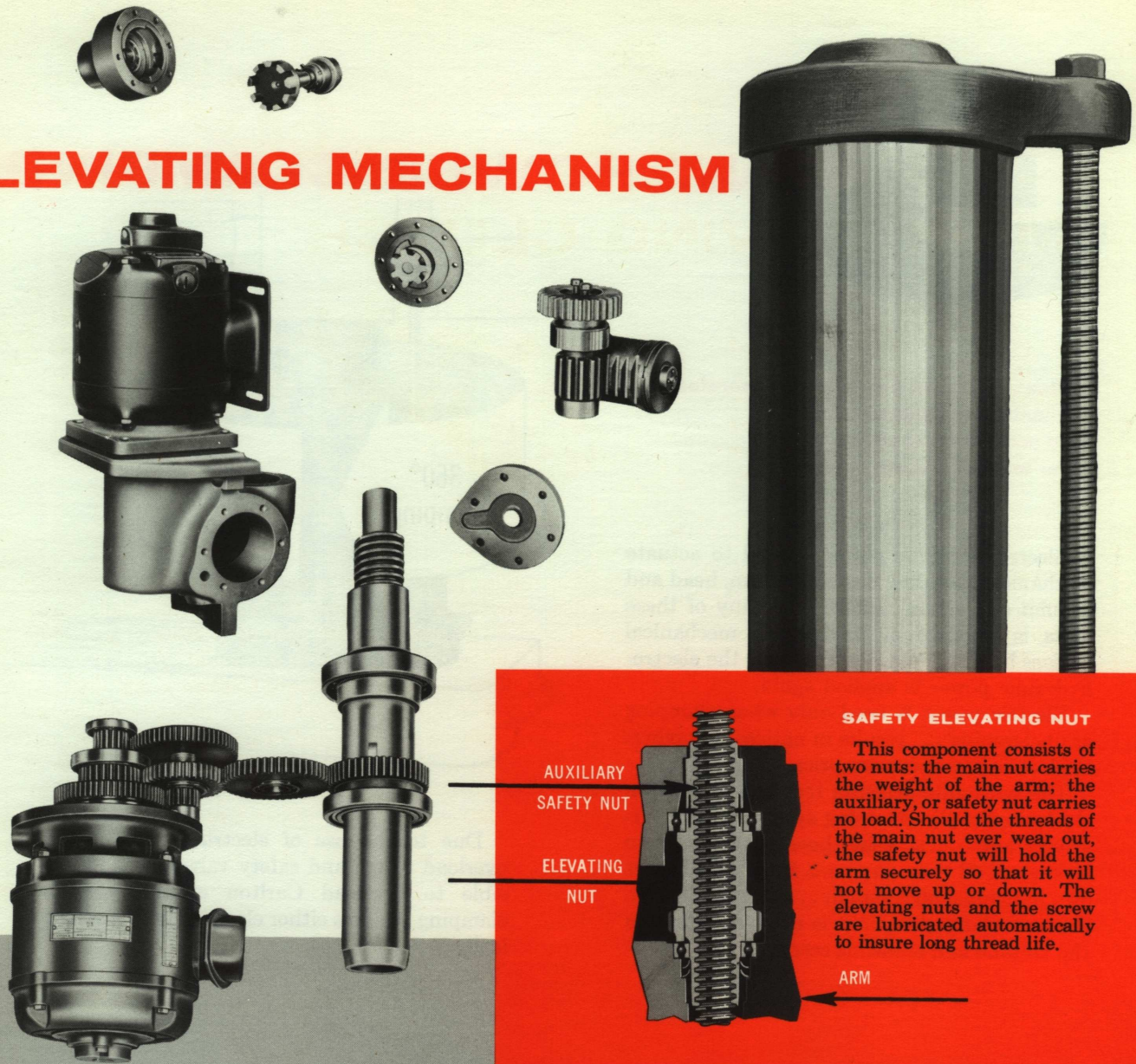
The design of this clutch—plus the fact that the main drive motor is used exclusively to drive the clutch—makes it possible for Carlton to de-

liver more of the horsepower of the main drive motor to the spindle than any other radial drill.

The main driving clutch is readily accessible and easily adjusted. It is the *only friction clutch* to be found in the entire Carlton radial drill . . . which means that Carlton is considerably more productive than radial drills having three or four friction clutches. By eliminating these points of adjustment, Carlton thereby reduces maintenance—and with it, costly downtime.



ELEVATING MECHANISM



Carlton elevating mechanism is designed for minimum wear and years of trouble-free service. It consists of motor, elevating unit, screw and nut, safety elevating nut and bearings. There are no clutches to adjust, no clutch parts to replace. The unit operates only when arm is positioned to a different elevation. Arm rate of travel is 50 inches per minute for 3A, 4A, and 5A.

The design of this unit, plus Carlton's principle of powering components independently, makes every Carlton radial drill absolutely safe. On some radial drills the elevating mechanism is powered

by the main drive motor. Perhaps "over-powered" is a better word because sometime the full force of 40 or 50 horsepower is applied to the elevating mechanism. The radial thus destroys itself by knocking the cap off the top of the column and stripping out the threads of the elevating nut.

However, on Carltons, a separate elevating motor is provided for the sole purpose of raising and lowering the arm. Since it is used for this one function only, the elevating motor has exactly the right electrical specifications (4-5 hp).

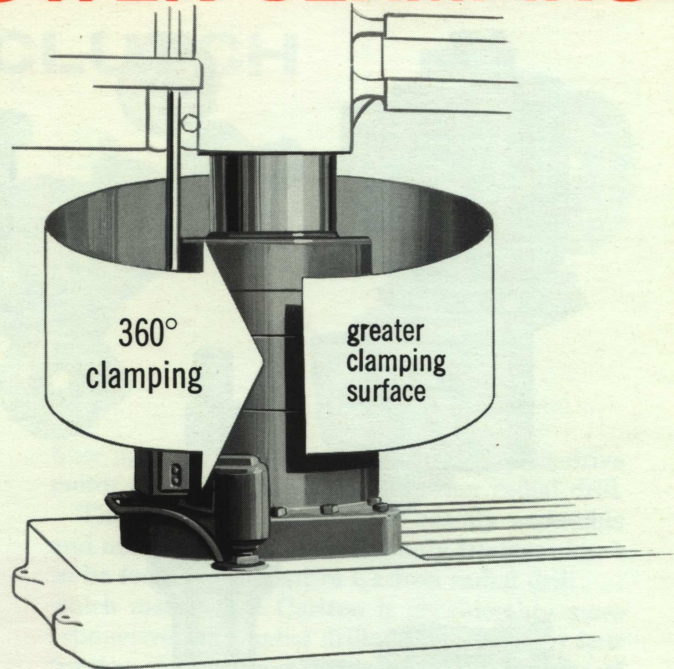
3 UNIT POWER CLAMPING

Carlton's exclusive 3-unit power-operated mechanical clamping of arm, head and column is easier, faster and costs less to operate

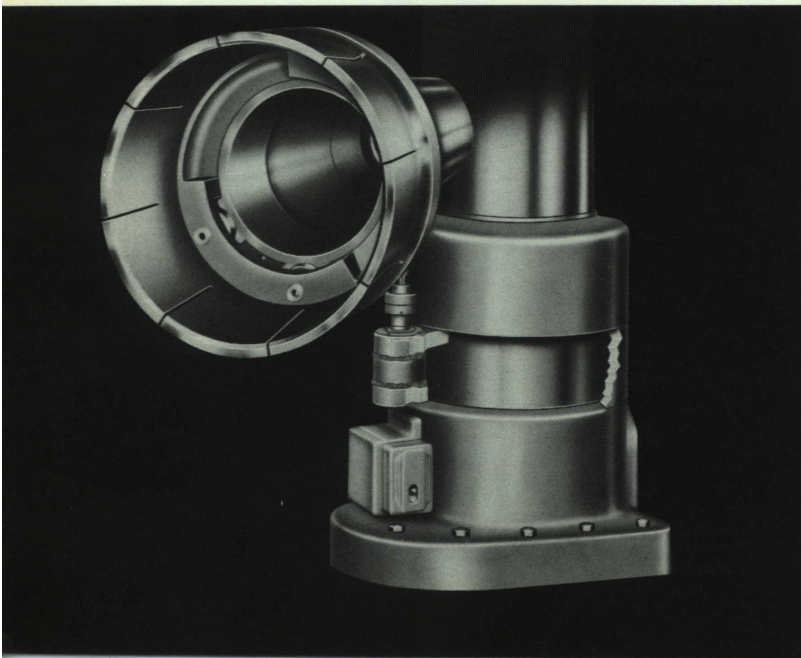
Electro-hydraulic power is used to actuate mechanical clamping devices on arm, head and column of Carlton radials. Once any of these units is clamped or unclamped, mechanical devices hold them in position until the electro-hydraulic power is applied again.

Electric power is used only when clamping or unclamping . . . results in noticeable savings in electric power consumption.

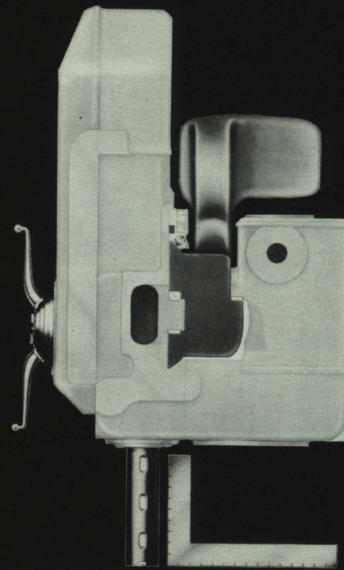
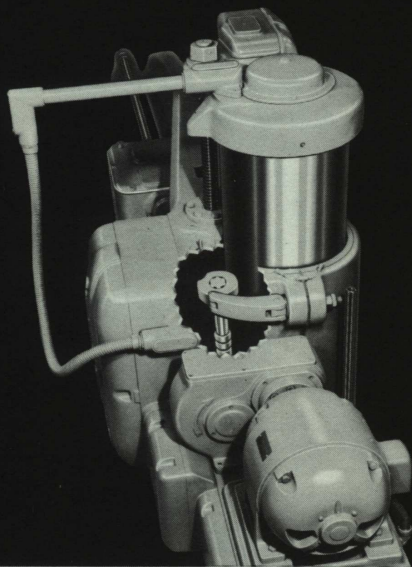
The hydraulic pressure required in Carlton electro-hydraulic clamping systems is comparatively low . . . so that there is positively no leakage of oil from any unit. Each unit has its own individual oil reservoir . . . and the oil from the arm clamp reservoir is used to lubricate the column and elevating screw.



Due to the use of electrical interlocking, overload relays and safety valves, it is impossible to overload Carlton electro-hydraulic clamping systems either electrically or mechanically.



POWER
CLAMPING
TO COLUMN



POWER ARM CLAMPING

With a single pushbutton, you control the vertical travel of the arm **and** arm clamp **automatically**. Whenever this button is actuated, the arm is first automatically unclamped, then lubricated, then moved. When the stop button is pushed, the arm stops instantly and is clamped to the column automatically.

The arm clamping mechanism is electro-hydraulic, and the electric motor runs only when clamping or unclamping. Total running time for a complete arm unclamp-clamp cycle is less than 2 seconds.

POWER HEAD CLAMPING

The double dovetail construction of head and arm assures accurate clamping of head to arm. The entire bearing area of the head thus becomes clamping area, not merely pinching action at two points. Clamping pressure applied on the upper dovetail draws the head up tightly against the lower dovetail. This action also draws the head toward the vertical ways of the arm. Thus the spindle will always be aligned properly, absolutely parallel to the arm and perpendicular to the base.

Carlton power clamping to column requires a minimum of energy. Therefore, the greater percentage of clamping force is applied to clamping together, instead of dissipating most of it to contact the old-fashioned split column still found in many radial drills today.

Unique in column clamping design and operation, the exclusive Carlton column clamping device gives you these important advantages:

Greater accuracy: Spindle displacement or

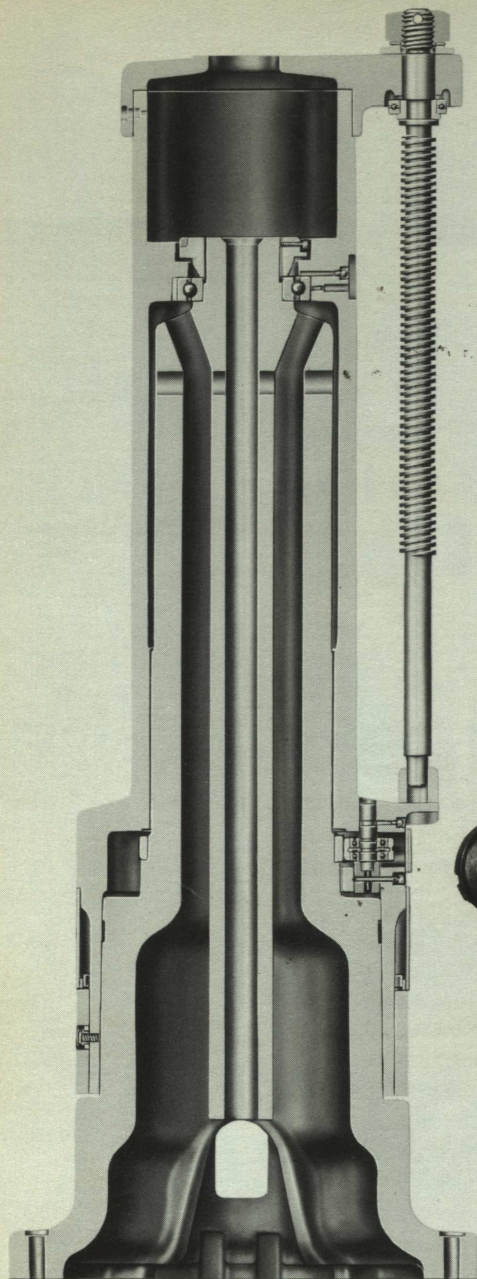
movement when clamping column reduced to a maximum of .001".

20% more rigidity in the machine due to 360° of clamping surface and the omission of the horizontal split opposite the arm ways.

Faster operation: Less time required to locate accurately in layout or jig work.

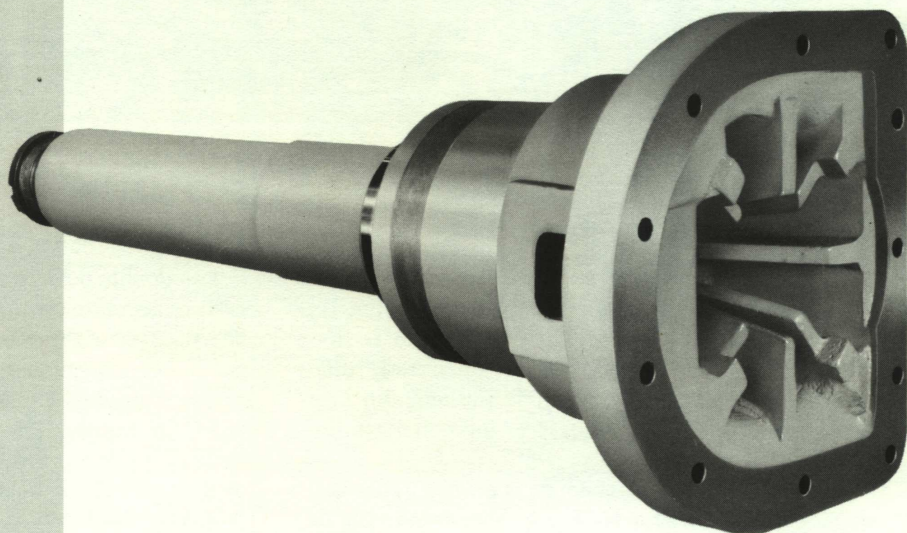
Less operator fatigue: With pushbutton control, few motions are required to clamp column.

Better finished surfaces because of more stability in column.

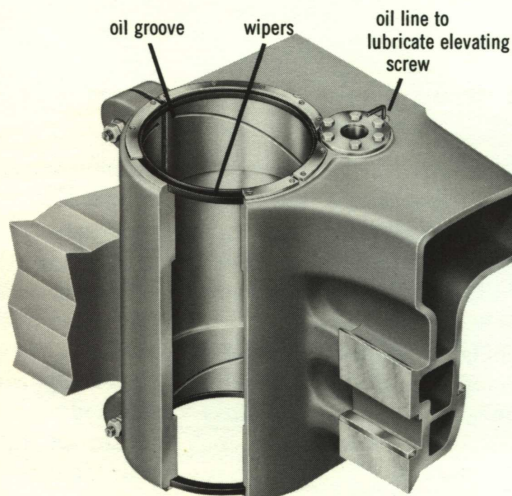


COLUMN

Both the inner and outer columns are designed to provide the greatest resistance to drilling strains. Both are made of close-grained, semi-steel castings. The inner column is of double tubular design and is heavily ribbed all the way down to the bottom. The ribs extend directly to the bolt holes in the flange of the inner column which is bolted to the base. The outer column revolves on anti-friction bearings around a hardened and ground steel ring, shrink-fitted to column—best suited for taking the radial load of the machine.



AUTOMATIC LUBRICATION



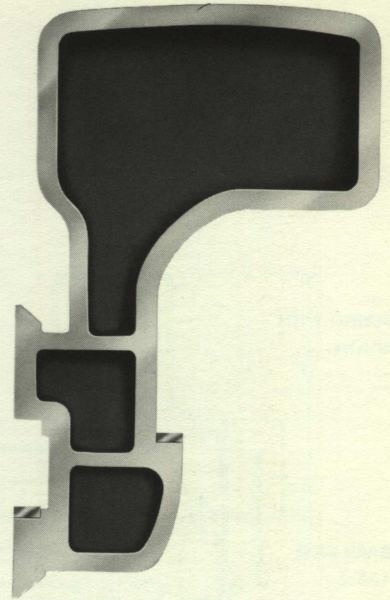
The arm and column are automatically lubricated each time the arm is elevated or lowered. Wipers installed at top and bottom of arm shear the column clean of all foreign material and thus prevent scoring the arm or column.

ARM

The Carlton arm is a close-grained, semi-steel casting. It is a large, triple box section, heavily ribbed support member for the spindle. This design affords rigid support to the spindle, overcomes vibration and resists the bending movements transmitted to the spindle when drilling and boring.

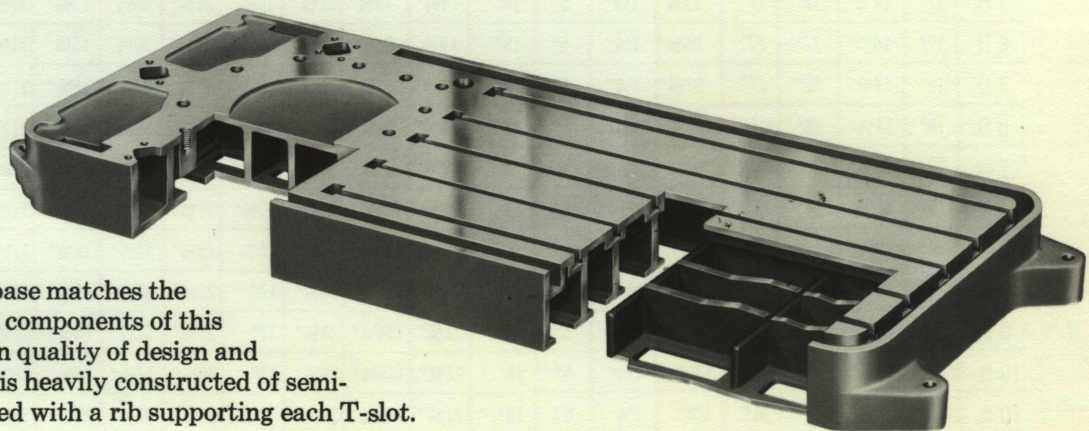
Hardened and ground steel ways are provided for smooth travel and accurate positioning of headstock.

Automatic internal lubrication and dual shear wipers are important Carlton design features contributing to smooth, trouble-free operation of arm and column.

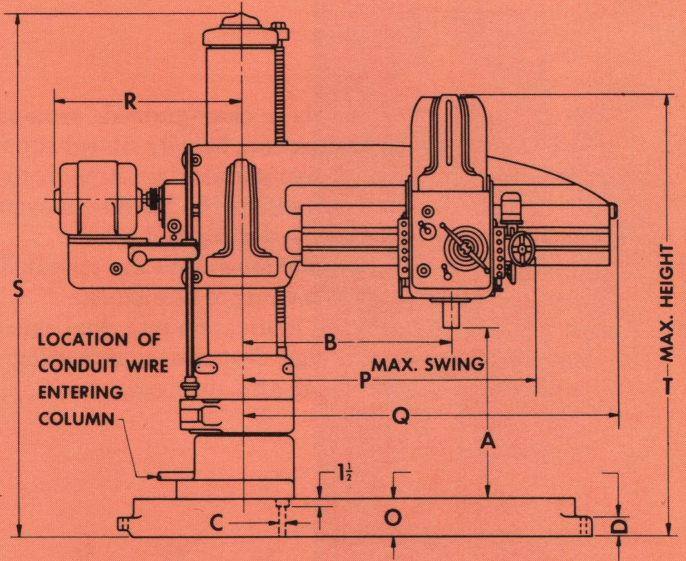
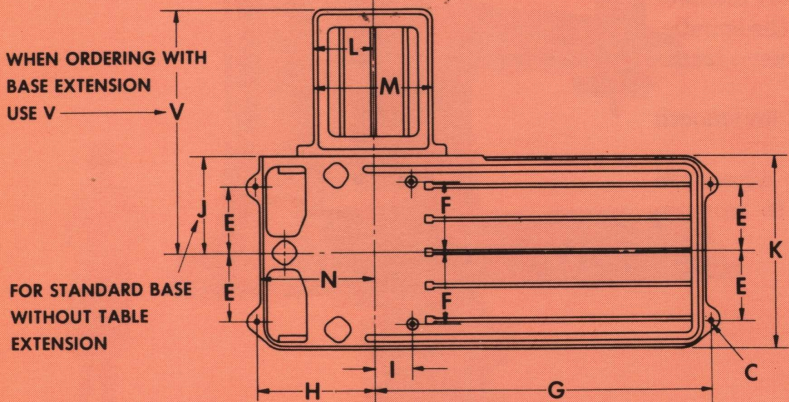


BASE

The Carlton base matches the other important components of this fine radial drill in quality of design and construction. It is heavily constructed of semi-steel and designed with a rib supporting each T-slot.

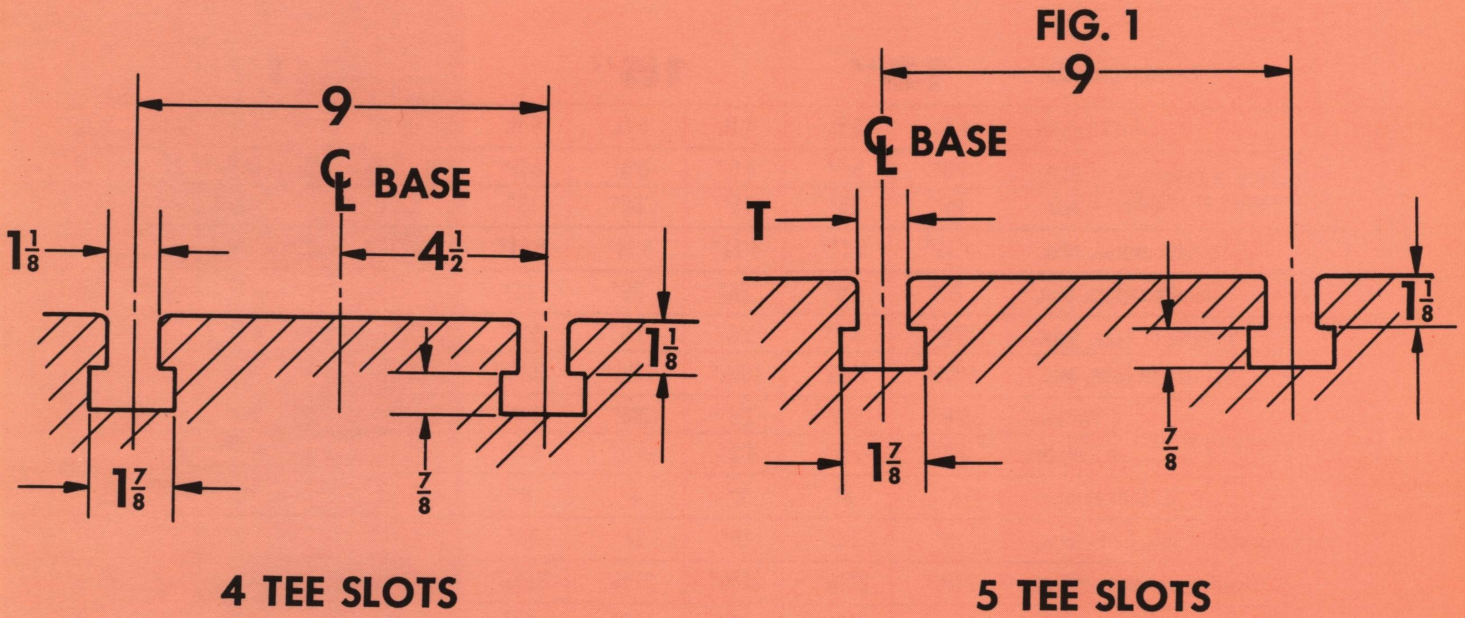


GENERAL



SIZE	DIA. OF ARM COL.	A		B		C	D	E	F	G	H	I	J	K	L	M	N	O	P		Q
		MIN.	MAX.	MIN.	MAX.														POWER	TRAV.	
4 ft.	13"	10½"	60"	26"	59"	1¼"	4"	15¾"	15¾"	66¼"	27¾"	8⅝"	22"	42½"	15¾"	31½"	25¾"	8"	85"	76"	
5 ft.	13"	10½"	60"	26"	71"	1¼"	4"	15¾"	15¾"	78¼"	27¾"	8⅝"	22"	42½"	15¾"	31½"	25¾"	8"	97"	88"	
4 ft.	15"	10½"	66"	26"	59"	1¼"	4"	15¾"	15¾"	66¼"	27¾"	8⅝"	22"	42½"	15¾"	31½"	25¾"	8"	85"	76"	
5 ft.	15"	10½"	66"	26"	71"	1¼"	4"	15¾"	15¾"	78¼"	27¾"	8⅝"	22"	42½"	15¾"	31½"	25¾"	8"	97"	88"	
6 ft.	15"	10½"	66"	26"	83"	1¼"	4"	15¾"	15¾"	90¼"	27¾"	8⅝"	22"	42½"	15¾"	31½"	25¾"	8"	109"	100"	
5 ft.	17"	14½"	72"	27"	73¾"	1¼"	5"	18"	19⅝"	79¾"	31¾"	10¼"	25¾"	50½"	15¾"	31½"	29¾"	10"	99"	90"	
6 ft.	17"	14½"	72"	27"	85¾"	1¼"	5"	18"	19⅝"	91¾"	31¾"	10¼"	25¾"	50½"	15¾"	31½"	29¾"	10"	111"	102"	
7 ft.	17"	14½"	72"	27"	97¾"	1¼"	5"	18"	19⅝"	103¾"	31¾"	10¼"	25¾"	50½"	15¾"	31½"	29¾"	10"	123"	114"	
6 ft.	19"	14½"	78"	27"	85¾"	1¼"	5"	18"	19⅝"	91¾"	31¾"	10¼"	25¾"	50½"	15¾"	31½"	29¾"	10"	111"	102"	
7 ft.	19"	14½"	78"	27"	97¾"	1¼"	5"	18"	19⅝"	103¾"	31¾"	10¼"	25¾"	50½"	15¾"	31½"	29¾"	10"	123"	114"	
8 ft.	19"	14½"	78"	27"	109¾"	1¼"	5"	18"	19⅝"	115¾"	31¾"	10¼"	25¾"	50½"	15¾"	31½"	29¾"	10"	135"	126"	
7 ft.	22"	18½"	84"	30"	99"	1¼"	5"	18"	21¾"	109¾"	38¾"	17"	29½"	57½"	15¾"	31½"	37"	12"	126"	117"	
8 ft.	22"	18½"	84"	30"	111"	1¼"	5"	18"	21¾"	121¾"	38¾"	17"	29½"	57½"	15¾"	31½"	37"	12"	138"	129"	
9 ft.	22"	18½"	84"	30"	123"	1¼"	5"	18"	21¾"	133¾"	38¾"	17"	29½"	57½"	15¾"	31½"	37"	12"	150"	141"	
10 ft.	22"	18½"	84"	30"	135"	1¼"	5"	18"	21¾"	145¾"	38¾"	17"	29½"	57½"	15¾"	31½"	37"	12"	162"	153"	
10 ft.	26"	20½"	88"	34"	138"	1¼"	5"	18"	21¾"	145¾"	38¾"	17"	29½"	57½"	15¾"	31½"	37"	12"	162"	153"	
11 ft.	26"	20½"	88"	34"	150"	1¼"	5"	18"	21¾"	157¾"	38¾"	17"	29½"	57½"	15¾"	31½"	37"	12"	174"	165"	
12 ft.	26"	20½"	88"	34"	162"	1¼"	5"	18"	21¾"	169¾"	38¾"	17"	29½"	57½"	15¾"	31½"	37"	12"	186"	177"	

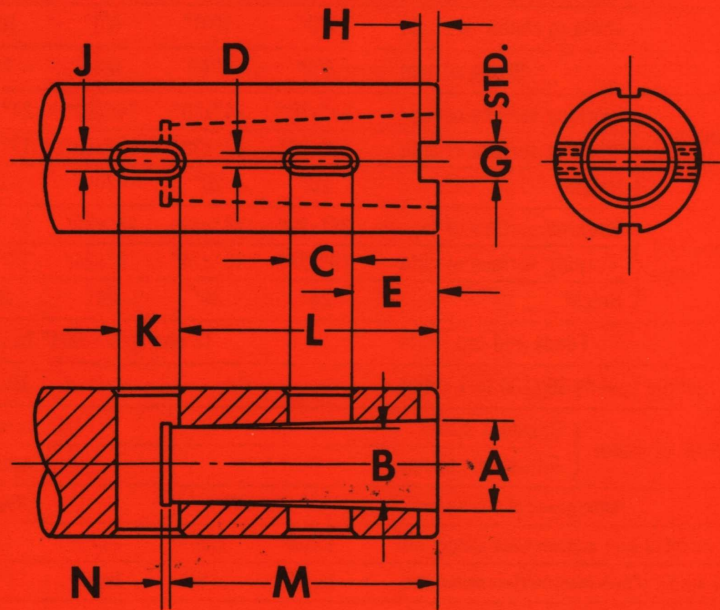
DIMENSIONS



R S T V T

53"	110"	121"	60 3/4"	1 1/8"
53"	110"	121"	60 3/4"	1 1/8"
53"	119"	127"	60 3/4"	1 1/8"
53"	119"	127"	60 3/4"	1 1/8"
53"	119"	127"	60 3/4"	1 1/8"
56"	130"	140"	64 1/2"	1 1/8"
56"	130"	140"	64 1/2"	1 1/8"
56"	130"	140"	64 1/2"	1 1/8"
56"	141"	146"	64 1/2"	1 1/8"
56"	141"	146"	64 1/2"	1 1/8"
56"	141"	146"	64 1/2"	1 1/8"
60"	161"	172"	75 1/4"	1 1/4"
60"	161"	172"	75 1/4"	1 1/4"
60"	161"	172"	75 1/4"	1 1/4"
60"	161"	172"	75 1/4"	1 1/4"
60"	173"	176"	75 1/4"	1 1/4"
60"	173"	176"	75 1/4"	1 1/4"
60"	173"	176"	75 1/4"	1 1/4"

STANDARD SPINDLE DIMENSIONS



TAPER A B C D E G H J K L M N

1.748	1.475	1 1/2	.513	1 1/2	7/8	3/4	.638	1 1/2	4 1/16	5 1/16	3/8	5
2.494	2.116	1 3/4	.638	2 1/4	1	1/2	.763	1 3/4	7	7 1/4	1/4	6

specifications

3a

4a

Column diameter	13"			15"			17"		
Arm length	4 ft.	5 ft.	4 ft.	5 ft.	6 ft.	5 ft.	6 ft.	7 ft.	
Face of column to center of spindle	max.	4'0"	5'0"	4'0"	5'0"	6'0"	5'0"	6'0"	7'0"
	min.	15"	15"	15"	15"	15"	13¼"	13¼"	13¼"
Spindle radius, max.	4'11"	5'11"	4'11"	5'11"	6'11"	6'1¾"	7'1¾"	8'1¾"	
Spindle radius, min.	26"	26"	26"	26"	26"	27"	27"	27"	
Spindle to base, max.	5'0"	5'0"	5'6"	5'6"	5'6"	6'0"	6'0"	6'0"	
Spindle to base, min.	10½"	10½"	10½"	10½"	10½"	14½"	14½"	14½"	
Working surface of base	Width	3'6"	3'6"	3'6"	3'6"	3'6"	4'2"	4'2"	4'2"
	Length	4'5"	5'5"	4'5"	5'5"	6'5"	5'5"	6'5"	7'5"
Height of base	8"	8"	8"	8"	8"	10"	10"	10"	
Vertical travel of spindle in head	18"	18"	18"	18"	18"	20"	20"	20"	
Bearing of head on arm	21⅞"	21⅞"	21⅞"	21⅞"	21⅞"	23¼"	23¼"	23¼"	
Bearing of arm on column	26¾"	26¾"	30"	30"	30"	34"	34"	34"	
Height over head, max.	10'1"	10'1"	10'7"	10'7"	10'7"	11'8"	11'8"	11'8"	
Height over column cap†	9'2"	9'2"	9'11"	9'11"	9'11"	10'10"	10'10"	10'10"	
Spindle dia. (driving dia.)	3⅝"	3⅝"	3⅝"	3⅝"	3⅝"	4"	4"	4"	
Morse taper in spindle	#5	#5	#5	#5	#5	#6	#6	#6	
Traverse of arm on column	2'7½"	2'7½"	3'1½"	3'1½"	3'1½"	3'1½"	3'1½"	3'1½"	
Traverse of head on arm	2'9"	3'9"	2'9"	3'9"	4'9"	3'10¾"	4'10¾"	5'10¾"	
Drills to center of circle	8'0"	10'0"	8'0"	10'0"	12'0"	10'0"	12'0"	14'0"	
Swing of arm	6'4"	7'4"	6'4"	7'4"	8'4"	7'6"	8'6"	9'6"	
Plain box table	Working surface of top	24"x30"	24"x30"	24"x30"	24"x30"	24"x30"	24"x30"	24"x30"	
	Working surface of side	17"x30"	17"x30"	17"x30"	17"x30"	17"x30"	17"x30"	17"x30"	
	Height	20"	20"	20"	20"	20"	20"	20"	
Universal table	Working surface of top	24"x30"	24"x30"	24"x30"	24"x30"	24"x30"	24"x30"	24"x30"	
	Working surface of side	18"x24"	18"x24"	18"x24"	18"x24"	18"x24"	18"x24"	18"x24"	
	Height	24"	24"	24"	24"	24"	24"	24"	
Feeds and tap leads	18 changes—.004" to .125" including 8 - 11½ - 14 - 18 thread tap leads								
Spindle speeds 36 (100 to 1 ratio)	10-1000, 12-1200 or 15-1500 rpm								
R.P.M. of motor	Constant speed	1800 recommended (1200 and 900 available)							
	Adjustable speed	optional to maximum speed 1800							
Horse power of driving motor	7½ to 20			7½ to 20			10 to 15		
Net weight of bare machine (less motor), lbs.	15,150	15,875	16,750	17,500	18,250	22,330	23,280	24,230	
Shipping weight of bare machine (less motor), lbs.	15,225	15,960	16,835	17,595	18,355	22,435	23,395	24,355	
Shipping weight of plain box table, lbs.	755	755	755	755	755	755	755	755	
Shipping weight of universal table, lbs.	1,100	1,100	1,100	1,100	1,100	1,100	1,100	1,100	

†Add 5" to this dimension when Coolant System is furnished.

4a

5a

5a

19"

22"

26"

6 ft.	7 ft.	8 ft.	7 ft.	8 ft.	9 ft.	10 ft.	*10 ft.	11 ft.	12 ft.
6'0"	7'0"	8'0"	7'0"	8'0"	9'0"	10'0"	10'0"	11'0"	12'0"
13¼"	13¼"	13¼"	15"	15"	15"	15"	16½"	16½"	16½"
7'1¾"	8'1¾"	9'1¾"	8'3"	9'3"	10'3"	11'3"	11'6"	12'6"	13'6"
27"	27"	27"	30"	30"	30"	30"	34"	34"	34"
6'6"	6'6"	6'6"	8'0"	8'0"	8'0"	8'0"	8'4"	8'4"	8'4"
14½"	14½"	14½"	18½"	18½"	18½"	18½"	20½"	20½"	20½"
4'2"	4'2"	4'2"	4'9"	4'9"	4'9"	4'9"	4'9"	4'9"	4'9"
6'5"	7'5"	8'5"	7'6"	8'6"	9'6"	10'6"	10'6"	11'6"	12'6"
10"	10"	10"	12"	12"	12"	12"	12"	12"	12"
20"	20"	20"	24"	24"	24"	24"	24"	24"	24"
23¼"	23¼"	23¼"	23¼"	23¼"	23¼"	23¼"	23¼"	23¼"	23¼"
38"	38"	38"	44"	44"	44"	44"	52"	52"	52"
12'2"	12'2"	12'2"	14'4"	14'4"	14'4"	14'4"	14'8"	14'8"	14'8"
11'9"	11'9"	11'9"	13'5"	13'5"	13'5"	13'5"	14'5"	14'5"	14'5"
4"	4"	4"	4"	4"	4"	4"	4"	4"	4"
#6	#6	#6	#6	#6	#6	#6	#6	#6	#6
3'7½"	3'7½"	3'7½"	4'5½"	4'5½"	4'5½"	4'5½"	4'7½"	4'7½"	4'7½"
4'10¾"	5'10¾"	6'10¾"	5'9"	6'9"	7'9"	8'9"	8'8"	9'8"	10'8"
12'0"	14'0"	16'0"	14'0"	16'0"	18'0"	20'0"	20'0"	22'0"	24'0"
8'6"	9'6"	10'6"	9'9"	10'9"	11'9"	12'9"	12'9"	13'9"	14'9"
26"x33"	26"x33"	26"x33"	26"x40"	26"x40"	26"x40"	26"x40"	26"x40"	26"x40"	26"x40"
17"x33"	17"x33"	17"x33"	17"x40"	17"x40"	17"x40"	17"x40"	17"x40"	17"x40"	17"x40"
20"	20"	20"	20"	20"	20"	20"	20"	20"	20"
28"x32"	28"x32"	28"x32"	28"x32"	28"x32"	28"x32"	28"x32"	28"x32"	28"x32"	28"x32"
18"x28"	18"x28"	18"x28"	18"x28"	18"x28"	18"x28"	18"x28"	18"x28"	18"x28"	18"x28"
24"	24"	24"	24"	24"	24"	24"	24"	24"	24"

18 changes—.004" to .125" including 8 - 11½ - 14 - 18 thread tap leads

6-600, 8-800, 10-1000, 12-1200 or 15-1500 rpm

1800 recommended (1200 and 900 available)

optional to maximum speed 1800

20 to 40			20 to 40				20 to 40		
26,210	27,340	28,470	39,950	42,260	44,600	46,900	56,690	58,950	61,250
26,335	27,475	28,620	42,950	45,260	47,600	49,900	59,690	61,950	64,250
830	830	830	1,025	1,025	1,025	1,025	1,025	1,025	1,025
1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280	1,280

*8 ft. and 9 ft. arm available on 26" column.

23

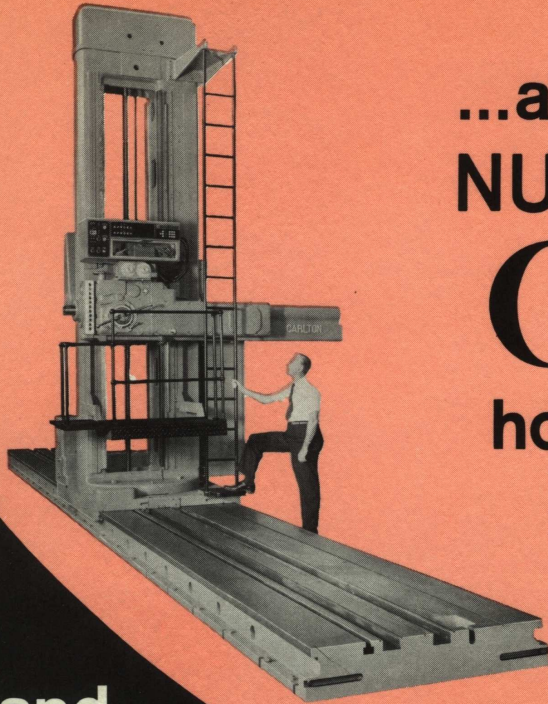
SAFETY DEVICES

safety devices for maximum protection of operator,
the radial drill and drilling equipment

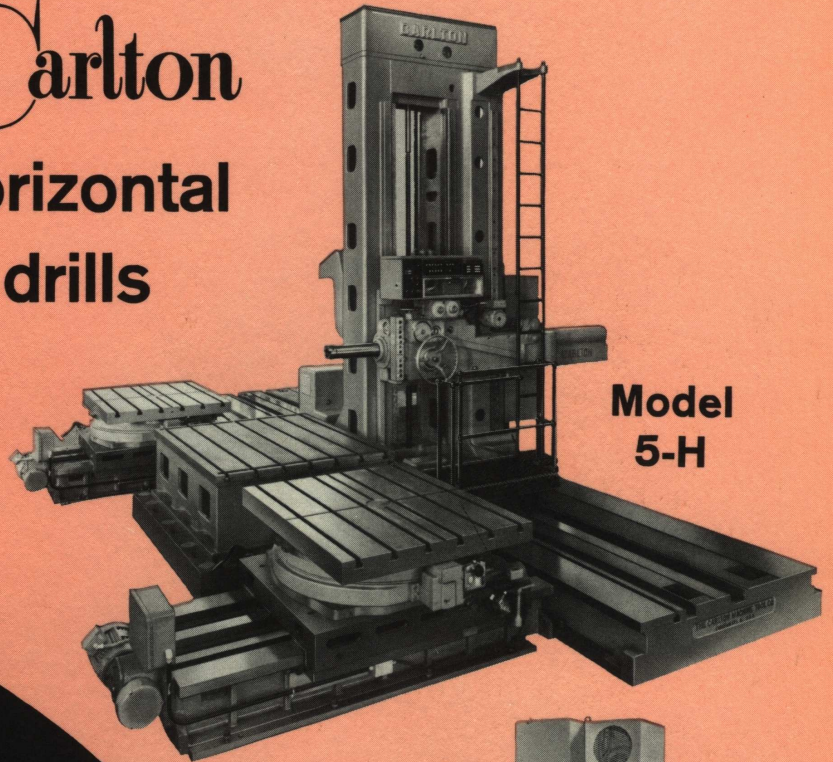
- 1 Automatic Lubrication** The Carlton lubrication system makes it impossible to actuate any moving part without first having the bearing surface adequately and automatically pre-lubricated.
- 2 Spindle Safety** Spindle is held securely in the head by means of a counterweight to which the spindle is geared through a solid, unbreakable pinion. This design does not require safety chains.
- 3 Gear Shifting Safe and Silent** Pre-selector machines equipped with oscillating mechanism that positively eliminates gear clash when shifting.
- 4 Safety Stop Button** A gentle nudge of the red, mushroom type pushbutton on head stops main drive motor.
- 5 Tapping Interlock** Prevents accidental engagement of power feed when hand tapping.
- 6 Safety Elevating Nut** In the event the threads of the main elevating nut should ever wear out, the safety elevating nut will become operative, holding the arm firmly in place so that it cannot move up or down.
- 7 Safe Support for Elevating Screw** Elevating screw safely supported in base of column casting. Maintains screw alignment.
- 8 Dual Work Lights** Ample light provided for drill and work surfaces . . . promoting greater safety.
- 9 Auxiliary Motor for Safe Elevating** A separate 4-5 hp motor is furnished at no extra cost solely for raising and lowering the arm. No danger of self-destruction as in radial drills that are overpowered by 40 or 50-hp main drive motors.
- 10 Safety stops prevent arm overtravel on column.**
- 11 Safety clutch disengages if arm strikes an obstruction while moving downward.**
- 12 Safety stops prevent overtravel of head on arm.**
- 13 Spindle power feed is automatically tripped at its limits of travel when feeding out of or into the head.**
- 14 Interlocking devices keep power traverse of head and arm inoperative as long as they are in clamped position.**
- 15 All pushbutton circuits are low voltage 110-v current.**
- 16 All motor starters are equipped with automatic reset thermal overload relays.**
- 17 Pre-select machines have interlocks that prevent starting spindle while gears are shifting.**
- 18 Pre-select machines will not start until the start-stop-reverse lever is in neutral position.**
- 19 It is impossible to run the spindle at the 9 highest speeds if any one of the tap leads with a high spindle speed is accidentally selected on pre-select machines.**
- 20 Neutral shift to spindle prevents damage to tools, jigs and material.**
- 21 Sight gauge on head indicates proper operation of oil pump.**
- 22 Clutch lever is long and readily accessible, operator needn't reach under arm to operate driving clutch lever.**
- 23 Hydraulic pressure in electro-hydraulic clamping lines maintained at a safe, low level. The only time electric power and hydraulic pressure are required on the arm and column clamping is during 2/5-second clamp and unclamp cycle.**

...also available with
NUMERICAL CONTROLS

Carlton horizontal drills

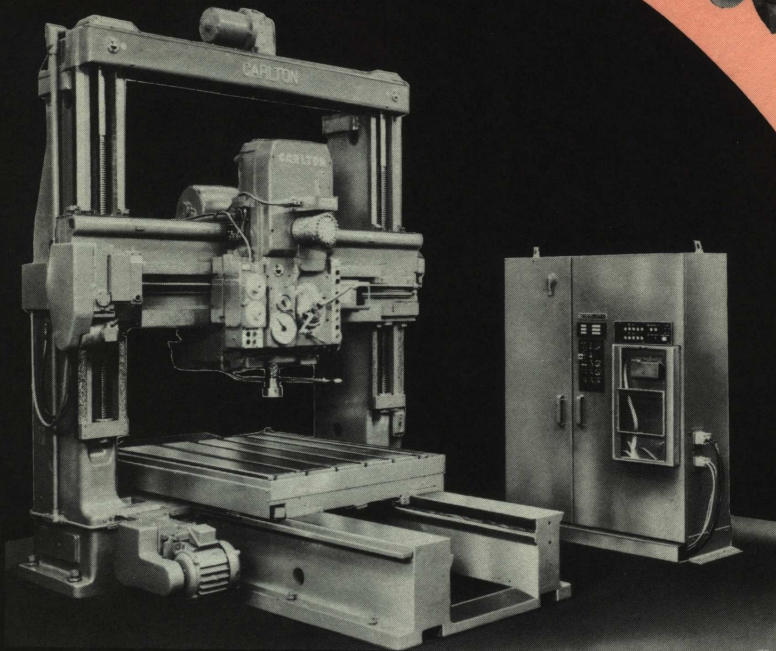


Model 4-H



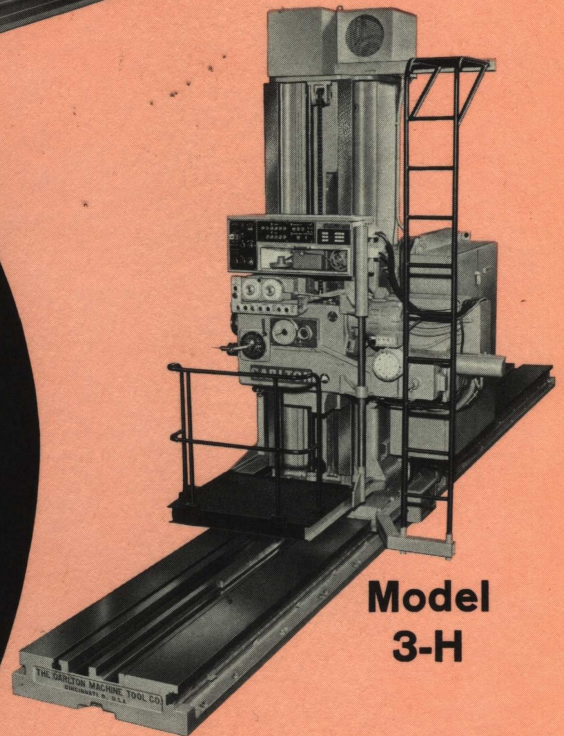
**Model
5-H**

...and
**Carlton
vertical drills**



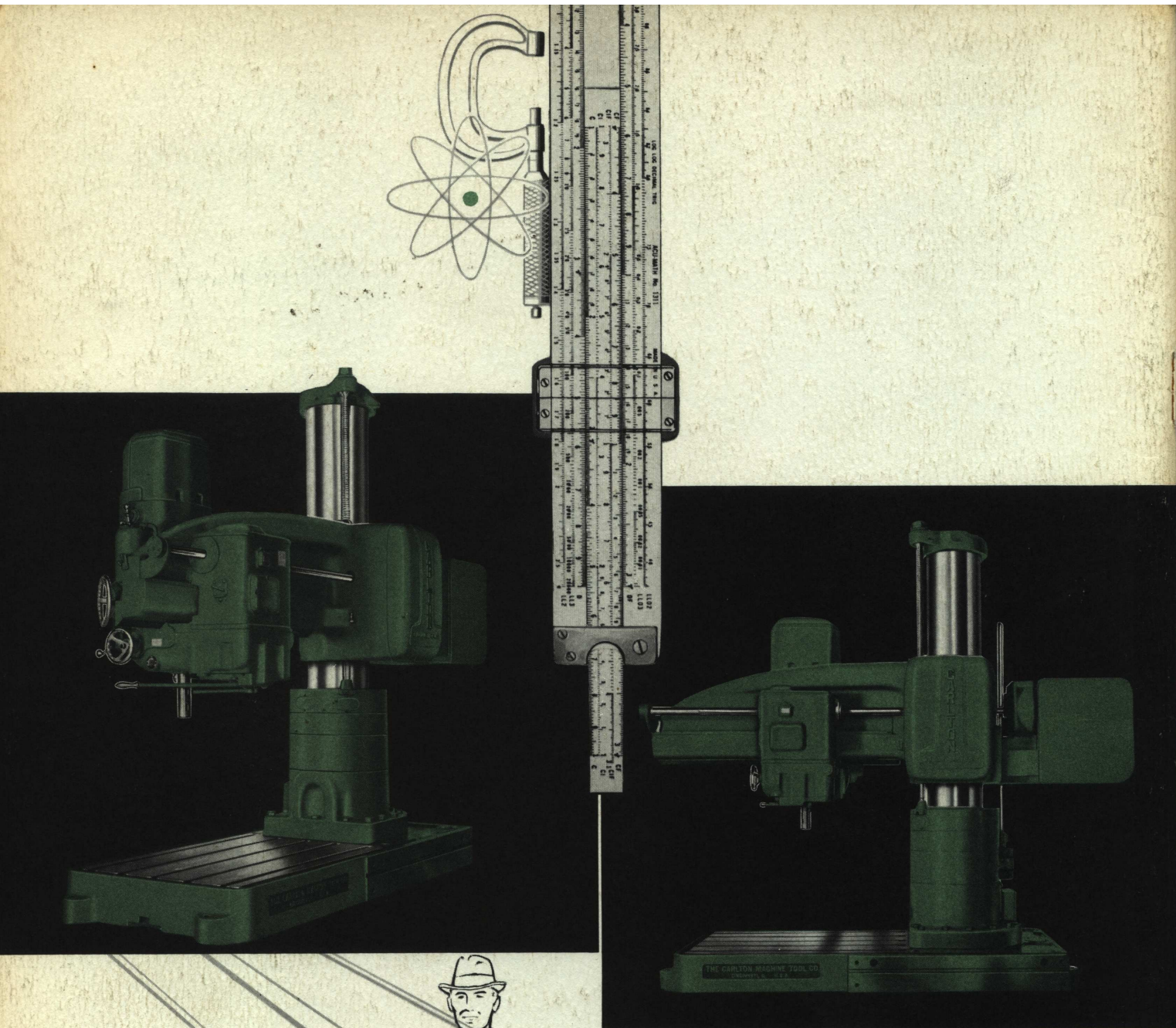
The new Carlton 3AR rigid vertical drilling machine brings you the advantage of automation as applied to heavy duty drilling and boring. It's the first double box column vertical drilling machine produced for use with automatic positioning (or spacing) tables.

With the new 3AR, Carlton introduces jigless heavy duty drilling and boring, puts it on a production basis for the first time. For detailed information, write for bulletin C 216.



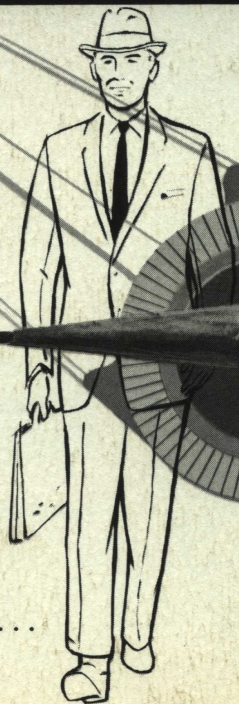
**Model
3-H**

The new Carlton 3H, 4H, 5H horizontal drills now apply production hole drilling, boring and horizontal milling principles to the huge, irregular shaped parts you can't handle under your regular machines. The secret is in the ingenious Carlton design which provides great rigidity and easy operation. For detailed information, write for bulletin C 217.



*Carlton offers the widest choice
of sizes, speed-feed controls, special
bases, tables and fixtures.*

*Our sales engineers will help you
select the right combination for your
hole drilling and boring production . . .*



Carlton

THE CARLTON MACHINE TOOL CO., CINCINNATI 25 OHIO