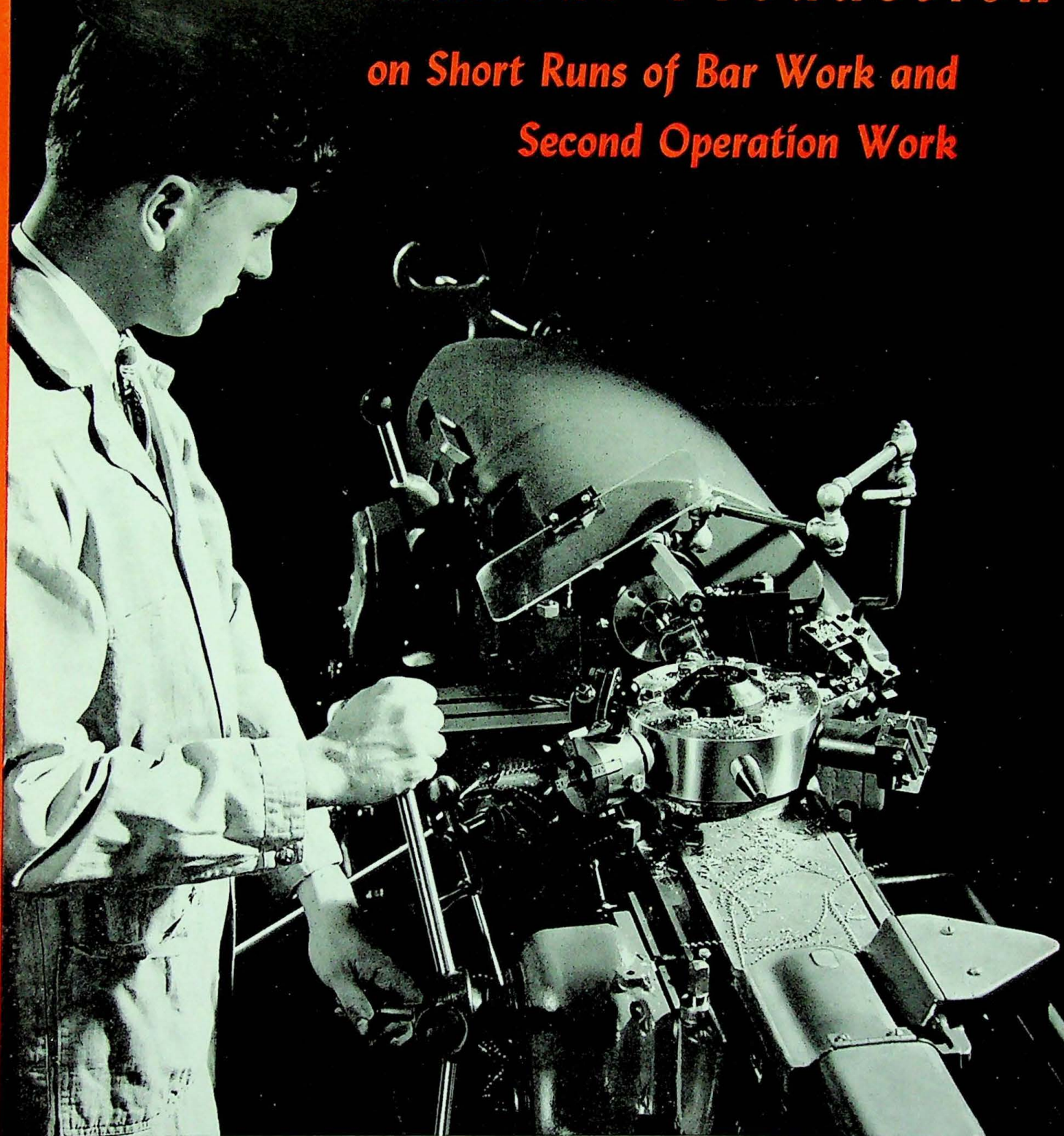


For Economical Production

**on Short Runs of Bar Work and
Second Operation Work**



No. 2 Hand Screw Machine

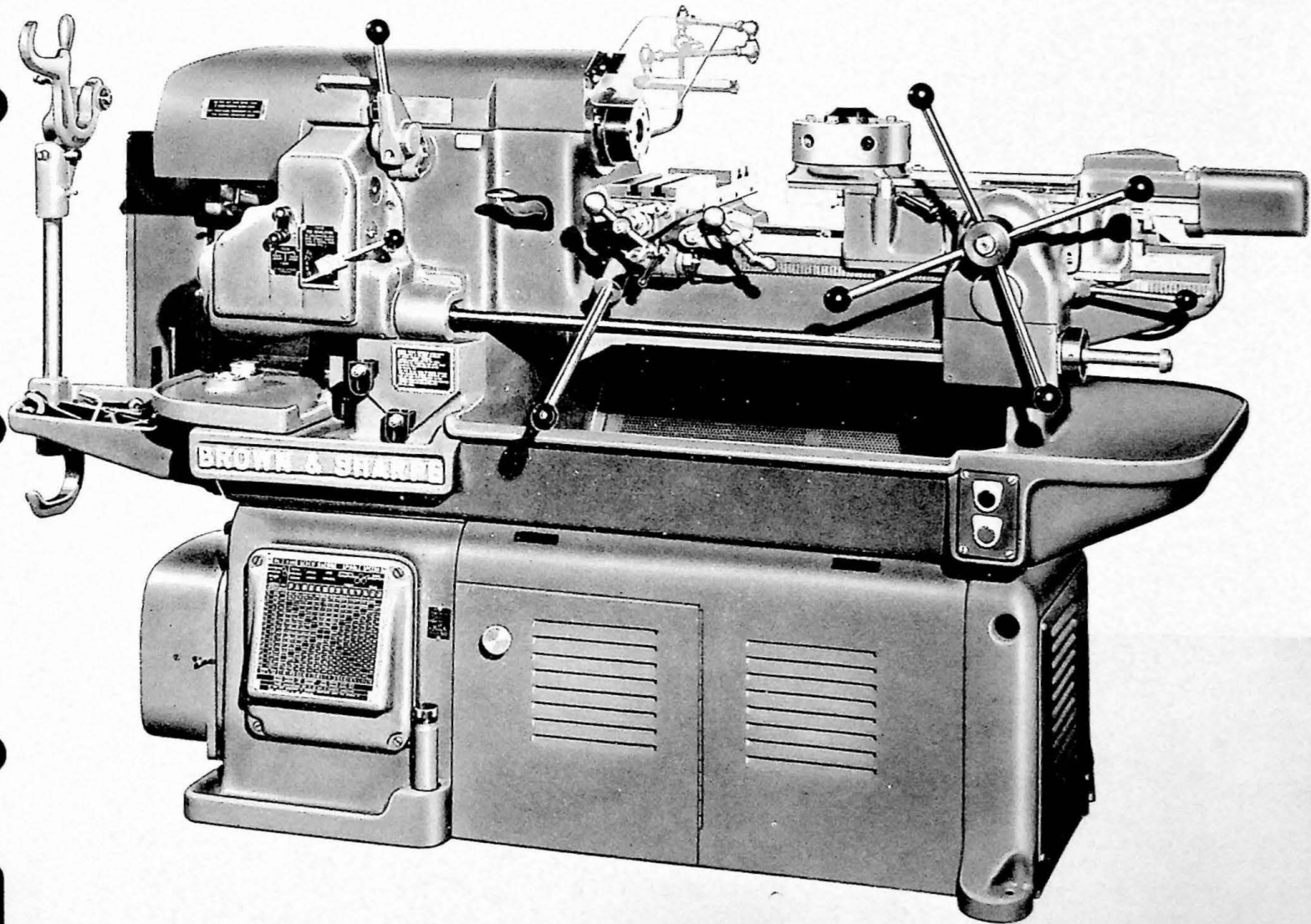


Brown & Sharpe

THIS hand screw machine, one of a series of three, combines the best features of the previous design "Wire Feed" screw machines with other time proven design features of the well known Brown & Sharpe automatics. Being fast and profitable for small quantities of bar work and second operations, it is a desirable addition wherever screw machine work is performed.

Below are listed worthwhile features of this machine —

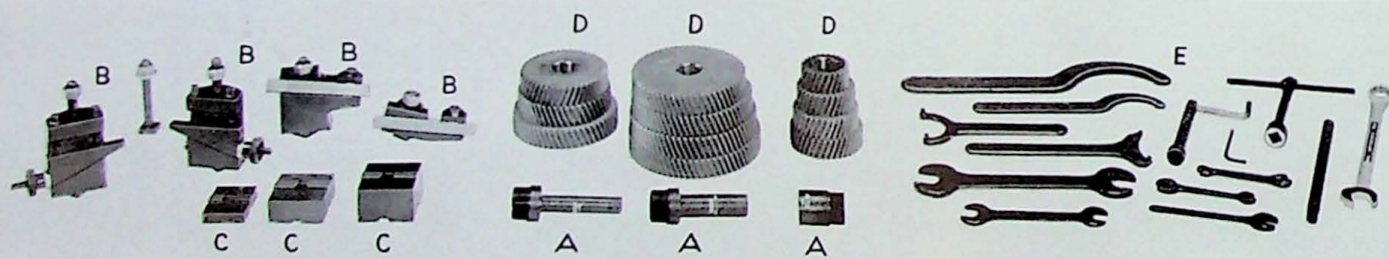
- Full antifriction-bearing spindle.
- Spindle chain-driven at all speeds.
- Short movement of spindle control lever gives high speed, low speed or stop.
- Wide range of high to low spindle speed ratios.
- Spindle speeds quickly changed by pick-off gears conveniently located near operating position.
- Compact driving mechanism completely enclosed and automatically lubricated.
- Automatic lubrication of practically all mechanisms and bearing surfaces.
- Turret slide has both manual and power feeds.
- Cross slide has fast-action lever feed and ball-crank screw feed.
- Trip lever provides quick convenient operation of collet and feeding mechanism.
- Adjustable stop for each turret tool.
- Electrical equipment conforms to Machine Tool Electrical Standards.



SPECIFICATIONS

No. 2 Hand Screw Machine

<p>CAPACITY</p> <p>Takes stock to, diameter 1" where work permits to, diameter *1 1/4" Turns any length to 6" Swing over bed 12 1/2" Swing over cross slide 5" *Note—Chuck nut and sleeve for No. 22C collet (furnished at extra cost when specified) required for use with stock over 1" diameter.</p>	<p>STOCK FEEDING MECHANISM</p> <p>Stock advanced by power as controlled by manual trip lever. One operating cycle feeds any length to 4" Greater lengths fed by successive cycles. Time required for operating cycle, seconds 3/4</p>
<p>MOTOR</p> <p>Constant-speed motor 5 H.P.</p>	<p>CROSS SLIDE</p> <p>Adjustable along machine bed. Has hand cross feed and hand longitudinal feed. Screw stops provided for front and back tools.</p>
<p>SPINDLE</p> <p>Mounted on precision antifriction bearings. Reversible. Chain-driven. Hole through spindle 1 9/16" Unit assembly, readily removed from machine.</p>	<p>TURRET</p> <p>Revolves in horizontal plane. Number of tool holes 6 Diameter of tool holes 1" Maximum diameter of stock that can be fed through turret 3/4" Independent screw stop for each hole in turret. Both manual and power feeds. Number of power feed rates 5 Range of power feed rates (per revolution of machine spindle) 0.0015" to 0.010"</p>
<p>SPINDLE SPEEDS</p> <p>Range 3025 to 25 R.P.M. 16 high speeds, range 3025 to 275 R.P.M. 12 low speeds available for each high speed. Ratios, high to low speeds 1.6:1 to 13:1</p>	<p>LUBRICATION</p> <p>Automatic.</p>
<p>COLLET</p> <p>Stock held in spindle by spring collet. Automatically operated in conjunction with feeding mechanism. Gripping power adjusted by nut.</p>	<p>COOLANT SYSTEM</p> <p>Brown & Sharpe No. 1 geared pump with pressure relief valve. Capacity of reservoir, quarts 20</p>



STANDARD EQUIPMENT

- A** Adapters to take Nos. 10, 11AA, 22 (not shown), and 22H feeding fingers
B 4 tool posts

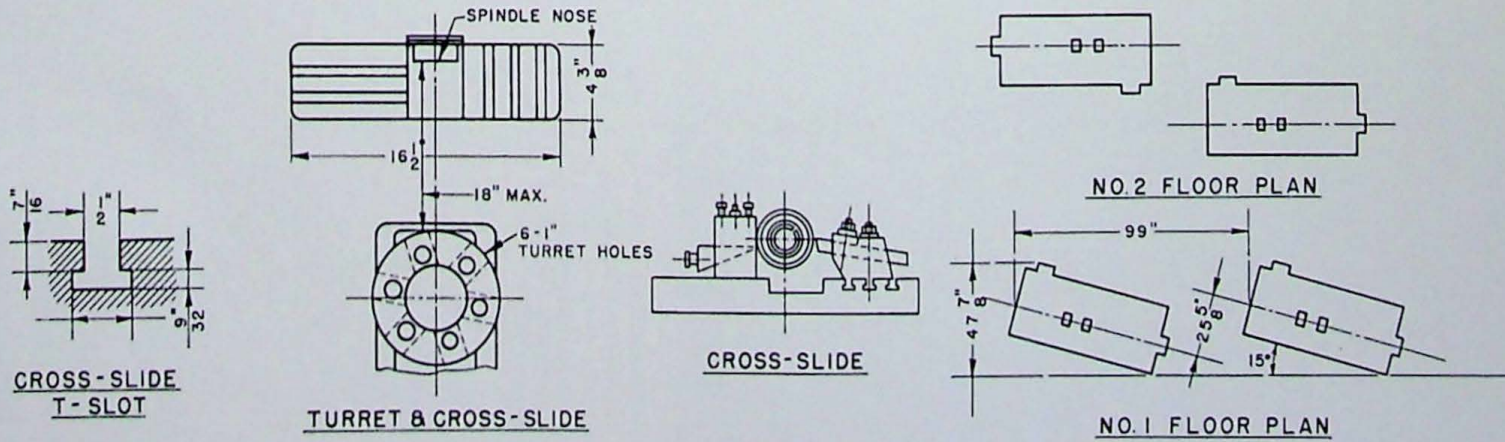
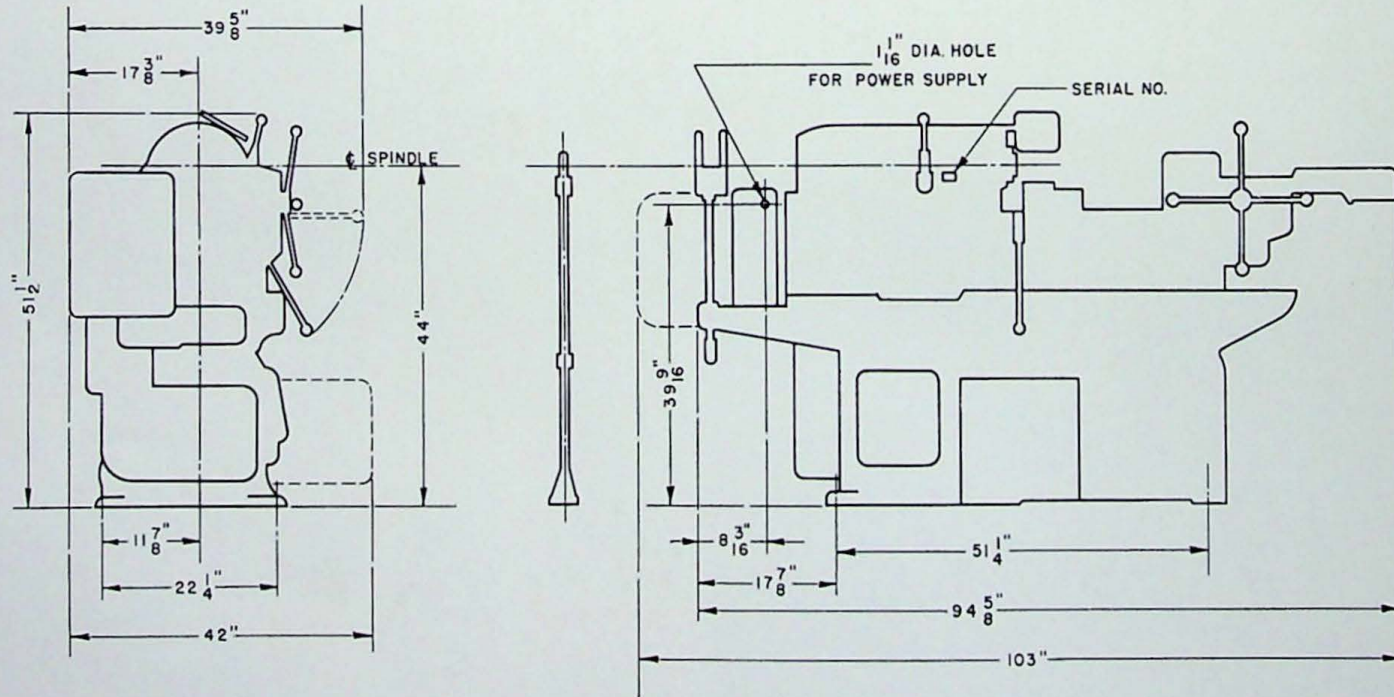
- C** 3 raising blocks
D Speed change gears
E Set of wrenches

Not shown above —
 Front and rear stock supports

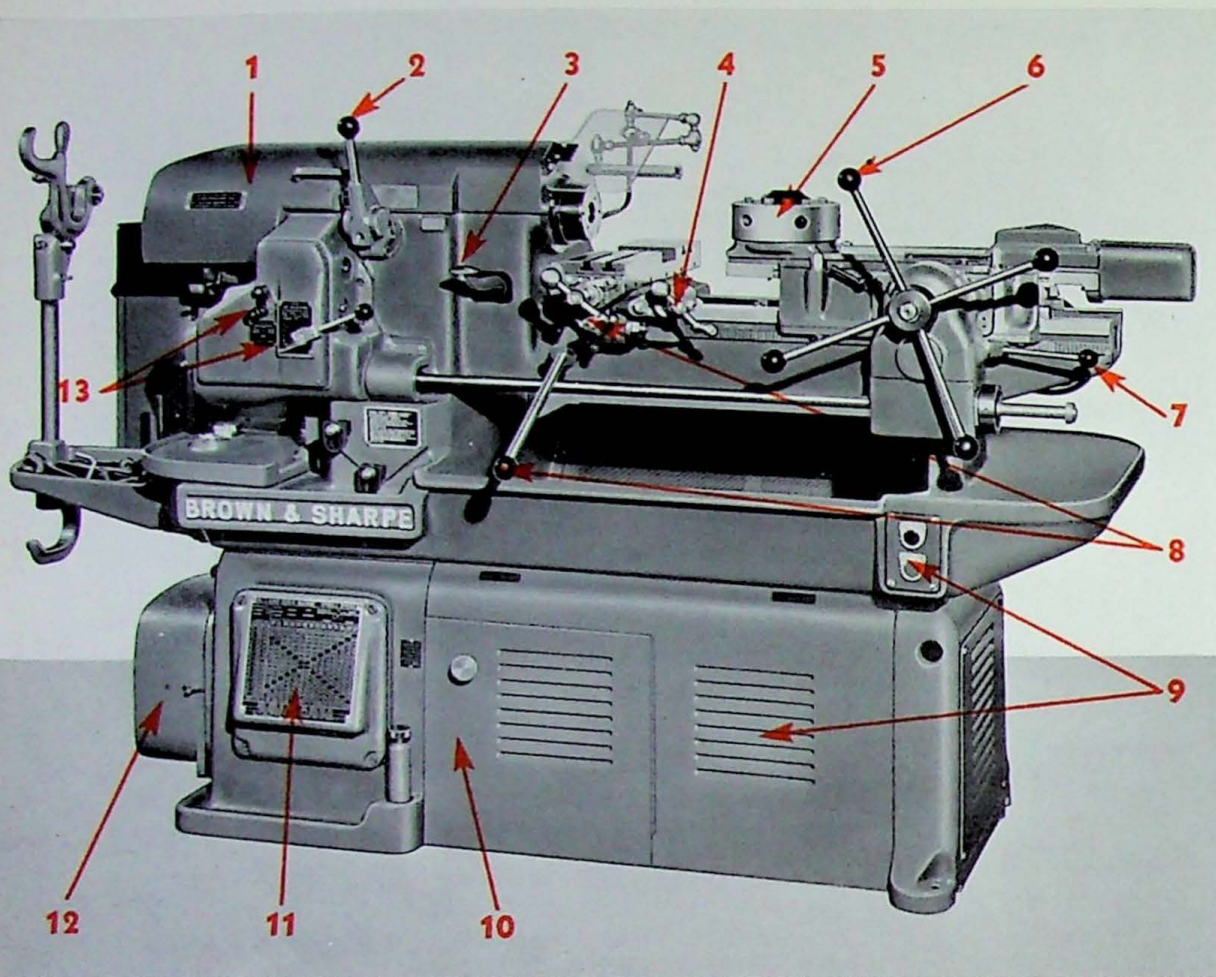
WEIGHTS AND SHIPPING DATA	Net Weight, Lbs. (Approx.)	Domestic Shipping Weight, Lbs. (Approx.)	Foreign Shipping Weight, Lbs. (Approx.)	Dimensions for Shipment, Inches	Space Occupied, Cu. Ft.
Machine fitted with motor	3150	3700	3800	94x42x58	132

Silent Stock Support can be furnished at extra cost. Detailed specification furnished on request.

Machine Dimensions



— FEATURES —



Unit-type full antifriction-bearing spindle (under hinged guard) has positive drive by chains at all speeds.

Short movement of spindle control lever gives high speed, low speed or stop. Brake can be applied only with clutch in neutral; remains on until released by lever.

Convenient trip lever opens and closes collet and engages feeding mechanism. For chucking operations, feed tube can be made inoperative so that lever controls only opening and closing of collet.

Longitudinal feed of cross slide permits undercutting, recessing and similar operations not readily accomplished with turret tools. Positive stops provided.

Turret automatically indexed on withdrawal, and automatically locked and clamped. Design provides for accurate alignment throughout long machine life.

Turret pilot wheel located for maximum operating efficiency. Length of arms assures steady, powerful hand feed with minimum operator fatigue.

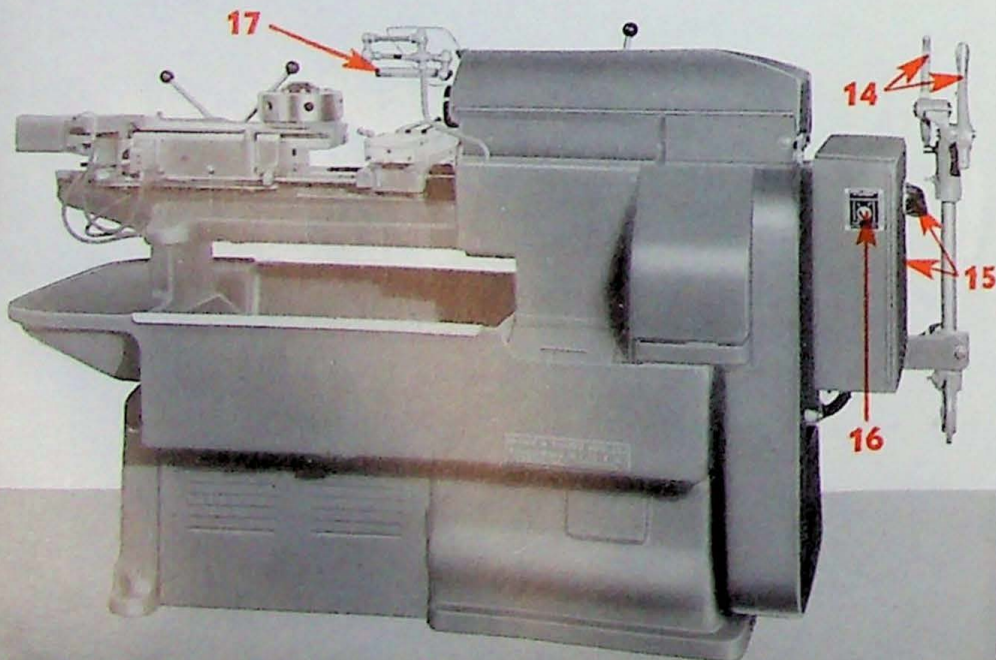
Power feed of turret engaged by conveniently located lever. Same lever can be used for disengagement, or feed can be automatically disengaged by settings of turret stop screws.

Cross slide has lever feed for regular operations, ball-crank feed for heavier cuts. Positive stops facilitate accurate duplication.

Convenient built-in start-stop push button. Constant-speed driving motor, mounted on bracket on base, is enclosed by removable louvered guards.

Spindle speed ratio change gears (for selecting low speed) are enclosed in base compartment behind guard. Changing two pick-off gears gives change in ratio. Wide range of ratios available. Direction of low speed relative to high speed changed simply by moving gear from one center to another.

Table shows gearing for spindle speeds desired. Gears furnished give 16 high speeds, with any one of 12 low speeds available for each high speed in ratios from 1.6:1 to 13:1—a total of 196 two-speed combinations. Speed range, 3025 to 25 R.P.M.



High speed of spindle is selected by changing two pick-off gears in base compartment. Gears not in use are stored in cover of gear compartment. Same set of gears is also used for changing high-low speed ratio.

Any one of five turret power feed rates selected by single lever. Adjacent lever gives change in direction of feed.

Spring-loaded clamping lever quickly locks stock pipe in position or releases it for restocking. Arm holds end of stock pipe elevated for convenience in loading stock.

Electrical controls compartment with felt-gasketed hinged door. Compartment door will not open unless disconnect switch lever is in "off" position.

Manual reversing switch for machine driving motor (for changing direction of high spindle speed). Wrench-operated to prevent accidental operation.

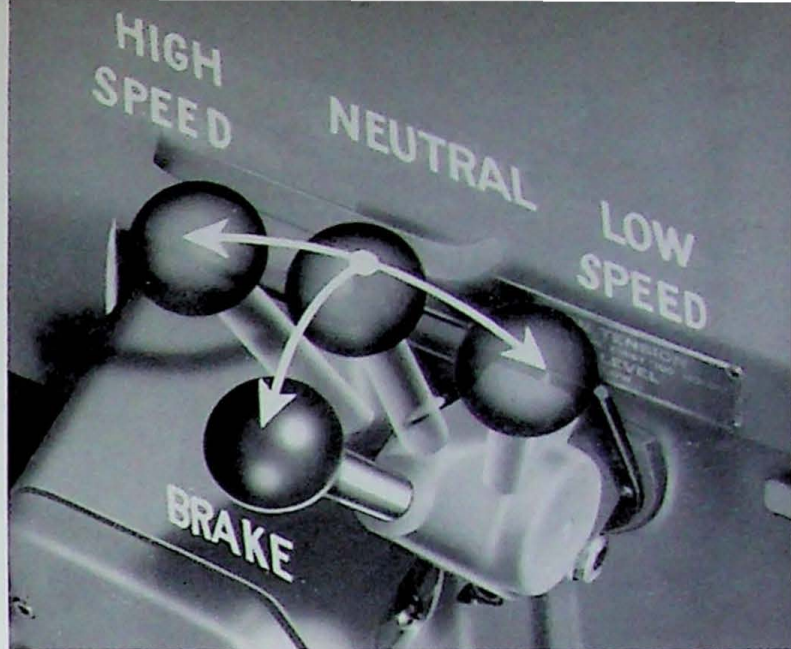
Coolant distributor quickly adjustable for width and location of oil stream. Valve in pipe controls volume.

One Lever Controls Spindle— Combined Spindle Clutch and Brake Lever

A FEATURE which contributes greatly to the facility and speed of operation of these machines is the concentration of control of spindle movement—high speed, low speed and stop—in a single control lever. Conveniently located within easy reach of the operator's left hand, it has a short throw (maximum of 40°, high to low) and its speed of operation is limited only by the speed of the operator.

A large brake shoe, which is applied to the under side of the spindle clutch sleeve by a 15° movement of the control lever toward the operator from neutral position, quickly stops spindle rotation, thereby facilitating the measurement of work and the insertion of work pieces into the chuck for second operations.

The design of the braking mechanism is such that the brake cannot be applied except when the spindle



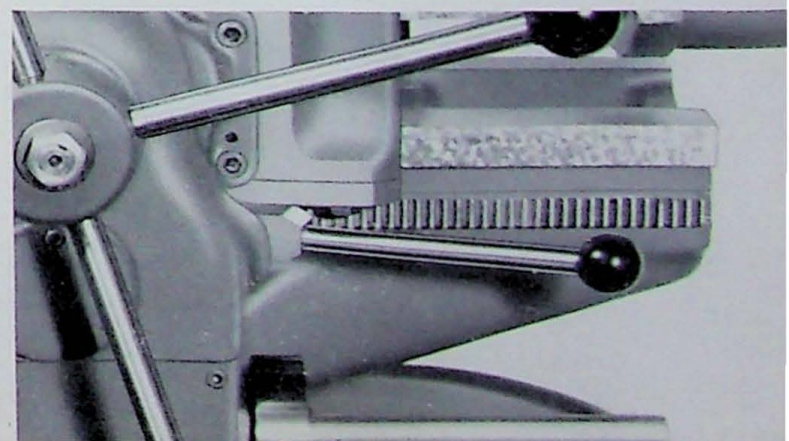
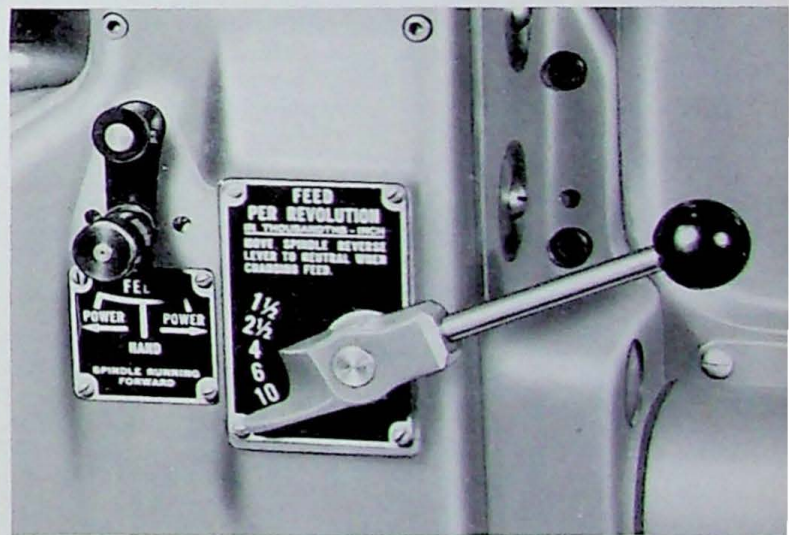
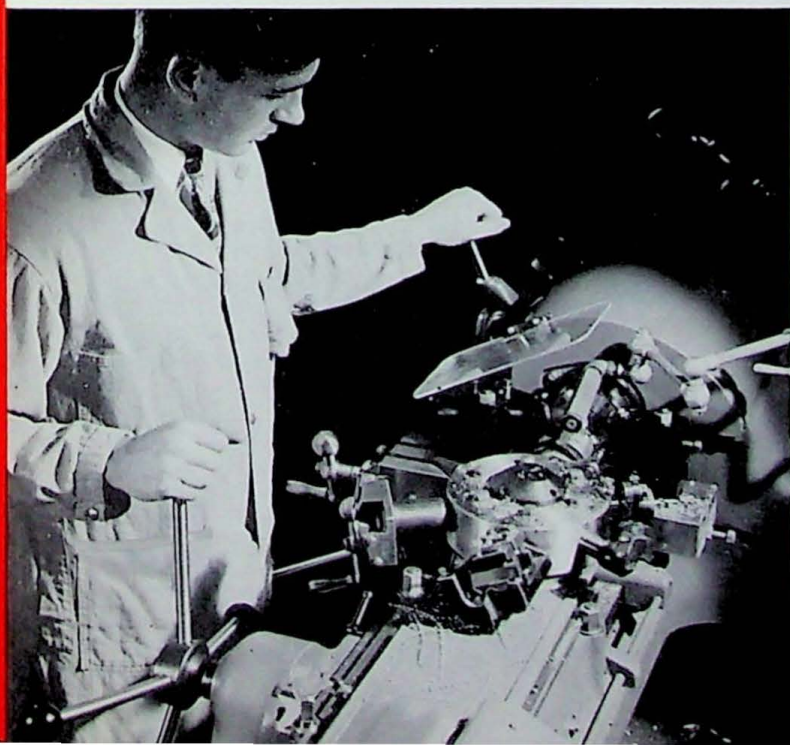
clutch is in neutral position and the spring construction holds the brake on until the lever is manually returned to neutral.

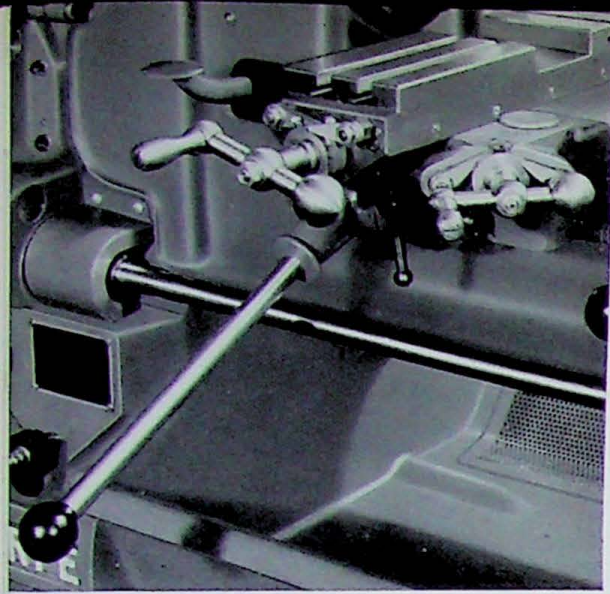
Both Manual and Power Feeds for Turret

MANUAL operation of the turret is by a pilot wheel designed and located to provide maximum convenience and speed of operation. The forward movement of the turret slide, because of the mechanical advantage of the leverage provided, is steady and powerful. Return movement of the slide automatically indexes the turret to a new tool position and the turret is then automatically locked in position by a vertical tapered pin located at the front of the turret slide and below the working tool. The illustration below shows the natural easy position which the operator can assume and yet be correctly balanced for efficient operation. This, and the fact that the turret lever is advantageously located in relation to the other controls, eliminates lost motion with resulting increase in production.

The turret power feeds provided are of value on work requiring long feeds of the turret tools, or where exact uniformity of feeding rate is required. Any one

of five feed rates (.0015" to .010" per revolution of machine spindle) are selected by a conveniently located lever (illustrated below) on the left front of the machine bed. An adjacent lever permits changing the direction of feed. Engagement of feed is by a lever at the right rear of the hand feed pilot wheel. Disengagement can be either automatic, with the throwout determined by settings of the turret stop screws, or manually controlled by movement of the engagement lever. A safety clutch is provided to prevent damage to the mechanisms through overload.





Both Lever and Screw Cross Feed

THE cross slide is provided with a fast-action lever feed for regular work and a ball-crank screw feed for the heavier work or more precise forming cuts. The lever is pivoted on the bed of the cross slide and a rack and pinion transform the angular movement of the lever into transverse motion of the slide. The lever has sufficient length to give adequate leverage for the heavy forming cuts and it may be positioned angularly on its stud to provide the correct relation between the chuck, the location of the cross slide tools and the amount of transverse movement of the cross slide.

The cross slide bed also is provided with hand longitudinal feed (rack and pinion) to facilitate the longitudinal positioning of the cross slide and to provide a means of performing turning, recessing and under-cutting operations not readily accomplished with turret tools.

Automatic Chuck and Bar Feed — Tripped Quickly by Hand

RAPID power advance of bar stock through the spindle and coincident opening and closing of the collet are responsible in part for the greater output to be realized from the use of this machine.

When the feed engagement lever is tripped as shown at right, two drum cams (one for controlling the feed and one for controlling the spring collet) revolve once and stop. As they revolve, (1) the collet is opened, (2) the stock, gripped by a feeding finger, is fed a predetermined amount, (3) the collet is again closed and (4) the feed tube and finger are withdrawn to the ready position. The cycle is unusually short — only approximately $\frac{3}{4}$ of a second being required regardless of spindle speed. The length of stroke is readily altered by an adjustment crank provided. An indicator and scale at the side of the feed slide guide (see illustration at top of page 7) facilitates setting. Lengths of stock greater than the standard feeding length can be fed through the spindle by holding down on the feed engagement lever, thus causing the machine to go through successive cycles.

As previously stated, the action of the chuck or spring collet on bar feed work is coincident with the feeding stroke. However, the feed tube can be disengaged by a handy latch and the chuck operated independently for working on separate pieces already cut to length, for performing second operations and for chucking irregular-shaped pieces held in special chucks or fixtures. Provision also is made for manual operation of the collet when setting up.



No. 2 HAND SCREW MACHINE - SPINDLE SPEEDS

SPINDLE CHANGE GEARS	RATIO CHANGE GEARS	OPPOSITE DIRECTION												SAME DIRECTION														
		UPPER LOWER						LOW SPEEDS						FRONT						REAR								
		28	31	35	39	42	48	49	53	56	60	64	67	70	73	87	84	80	56	53	49	48	42	39	35	31	28	25
73 - 22	3925	1695	1635	1575	1515	1455	1400	1340	1280	1225	1165	1105	1050	990	930	875	815	760	705	650	595	540	485	430	375	320	265	210
70 - 25	3550	1595	1535	1475	1415	1355	1300	1240	1180	1125	1065	1010	950	895	840	785	730	675	620	565	510	455	400	345	290	235	180	125
67 - 28	3180	1545	1485	1425	1365	1305	1250	1190	1135	1075	1020	960	905	850	795	740	685	630	575	520	465	410	355	300	245	190	135	80
64 - 31	2880	1495	1435	1375	1315	1255	1200	1140	1080	1025	965	910	855	800	745	690	635	580	525	470	415	360	305	250	195	140	85	30
60 - 35	2580	1445	1385	1325	1265	1205	1150	1090	1035	975	920	865	810	755	700	645	590	535	480	425	370	315	260	205	150	95	40	0
56 - 39	2310	1395	1335	1275	1215	1155	1100	1040	985	925	870	815	760	705	650	595	540	485	430	375	320	265	210	155	100	45	0	0
53 - 42	2070	1345	1285	1225	1165	1105	1050	990	935	875	820	765	710	655	600	545	490	435	380	325	270	215	160	105	50	0	0	0
49 - 46	1860	1295	1235	1175	1115	1055	1000	940	885	825	770	715	660	605	550	495	440	385	330	275	220	165	110	55	0	0	0	0
45 - 49	1680	1245	1185	1125	1065	1005	950	890	835	775	720	665	610	555	500	445	390	335	280	225	170	115	60	5	0	0	0	0
42 - 53	1530	1195	1135	1075	1015	955	900	840	785	725	670	615	560	505	450	395	340	285	230	175	120	65	10	0	0	0	0	0
39 - 56	1410	1145	1085	1025	965	905	850	790	735	675	620	565	510	455	400	345	290	235	180	125	70	15	0	0	0	0	0	0
35 - 60	1310	1095	1035	975	915	855	800	740	685	625	570	515	460	405	350	295	240	185	130	75	20	0	0	0	0	0	0	0
31 - 64	1230	1045	985	925	865	805	750	690	635	575	520	465	410	355	300	245	190	135	78	22	0	0	0	0	0	0	0	0
28 - 67	1160	995	935	875	815	755	700	640	585	525	470	415	360	305	250	195	140	83	24	0	0	0	0	0	0	0	0	0
25 - 70	1100	945	885	825	765	705	650	590	535	475	420	365	310	255	200	145	88	26	0	0	0	0	0	0	0	0	0	0
22 - 73	1050	895	835	775	715	655	600	540	485	425	370	315	260	205	150	93	28	0	0	0	0	0	0	0	0	0	0	0
APPROX. RATIO HIGH TO LOW		1.6	1.8	2.2	2.6	3	3.6	4.1	5	5.5	6.5	7.9	9.1	11	13													

SPINDLE RUNNING FAST BACKWARD OPEN DRIVING SHAFT BELT
 SPINDLE RUNNING FAST FORWARD CROSS DRIVING SHAFT BELT

* THESE COMBINATIONS NOT TO BE RUN IN OPPOSITE DIRECTIONS.

DO NOT RUN SPROCKETS IN OPPOSITE DIRECTIONS WHEN THE SPINDLE IS USED CONSTANTLY IN ONE DIRECTION.

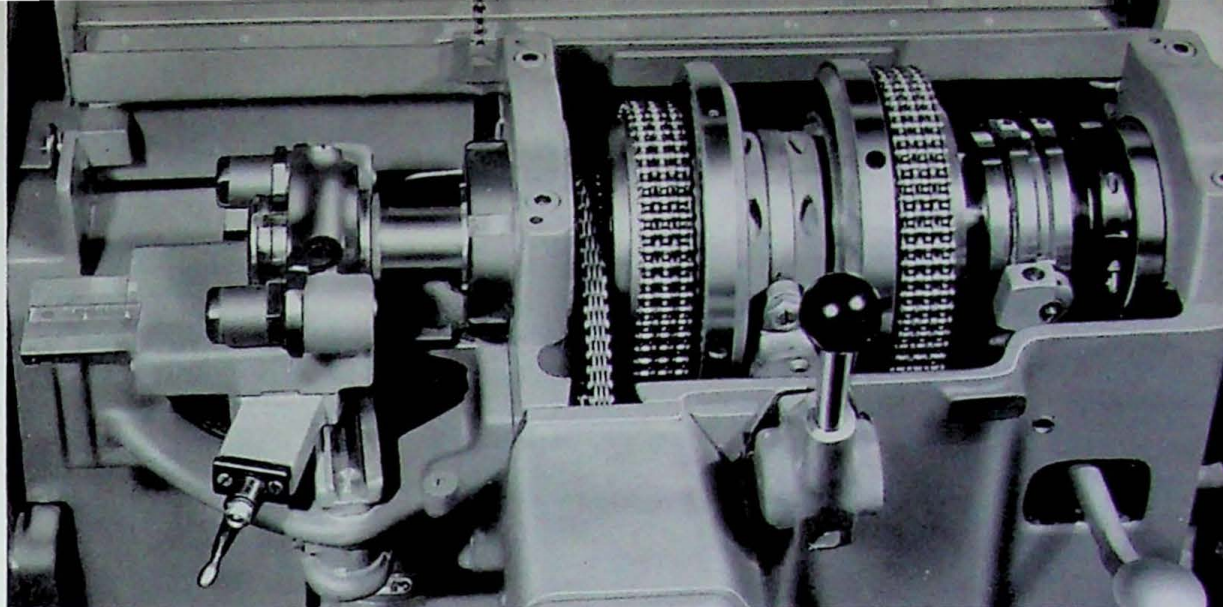
196 Combinations, 14 Ratios of Spindle Speed Provided; Range, 3025 to 25 R.P.M

ONE HUNDRED AND NINETY-SIX 2-speed combinations are provided, with a range from 3025 to 25 R.P.M. As shown on the chart on the front of the base (left), 16 high speeds are available, from 3025 to 275 R.P.M.; and for each high speed, any one of 12 low speeds can be used in combination. Ratios of high to low speed range from 1.6:1 to 13:1.

This broad range of high speeds, plus the exceptionally wide choice of corresponding low speeds, permits equally high cutting efficiency on materials ranging from tough alloy steels to free-cutting plastics, and on the widest ranges of work diameters.

High and low speeds can be either forward or backward; and all but the ten combinations giving highest total R.P.M. can be used in opposite directions.

Right — Close-up of spindle with guards removed. Spindle is compact and is mounted in precision anti-friction bearings at both front and rear. In the left part of the picture can be seen the adjusting crank and scale for making changes in the feeding length of stock.



Full-Antifriction-Bearing Spindle

SPINDLE is of unit construction, and may be readily removed if necessary. It is compact, without weighty mechanisms and is mounted in precision anti-friction bearings at both front and rear. Sprockets have hardened steel bushings and turn on precision roller bearings on spindle. End thrust is taken by preloaded precision ball bearings included in rear spindle bearing assembly. Spindle operates very successfully with a minimum amount of lift in the front

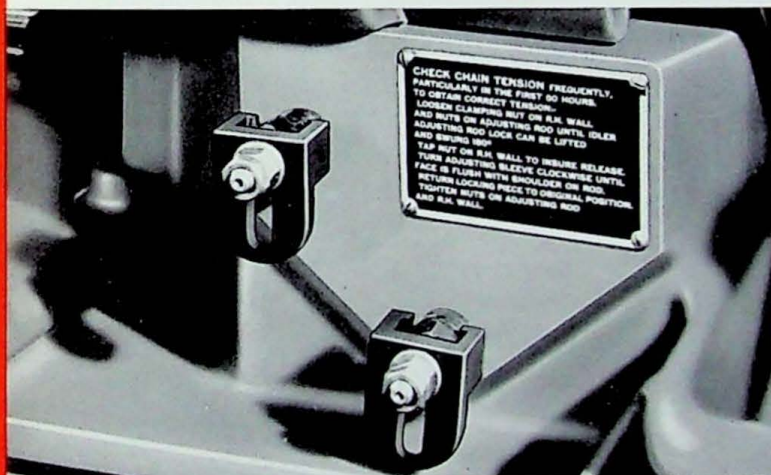
bearing. This bearing is adjusted by simply reducing the thickness of the box liner.

Spindle Has Powerful, Positive Chain Drive

POSITIVE drive of the spindle by chains at all speeds insures the delivery of required power throughout the full speed range for all operations within the tool capacity of the machine. The driving chains may be seen above in close-up of spindle with front guards removed.

Tension Adjustment Provides for Maximum Chain Life

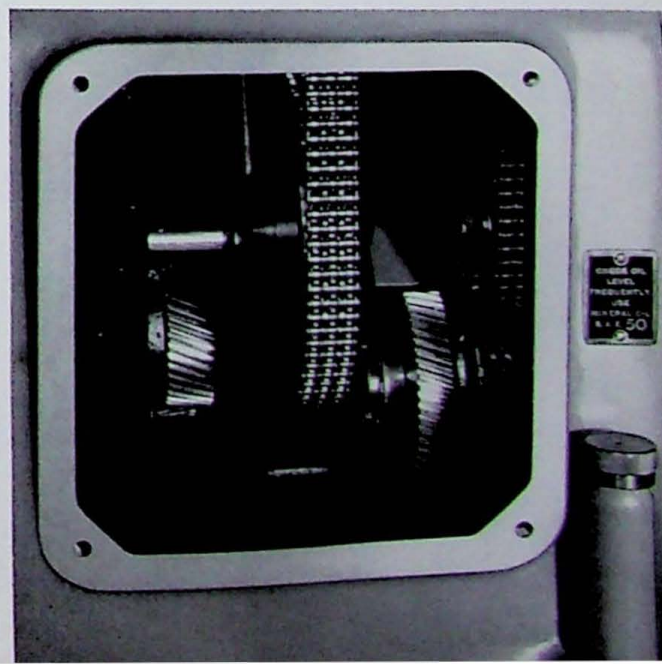
Tension in the spindle driving chains is readily checked by means of a simple adjusting device for each chain, located at the front of the machine as illustrated at left. By turning an adjusting sleeve, tension is very easily reset to the exact value required to give maximum duration of chain life. Provision is also made for tightening the chain in the driving mechanism in the base.

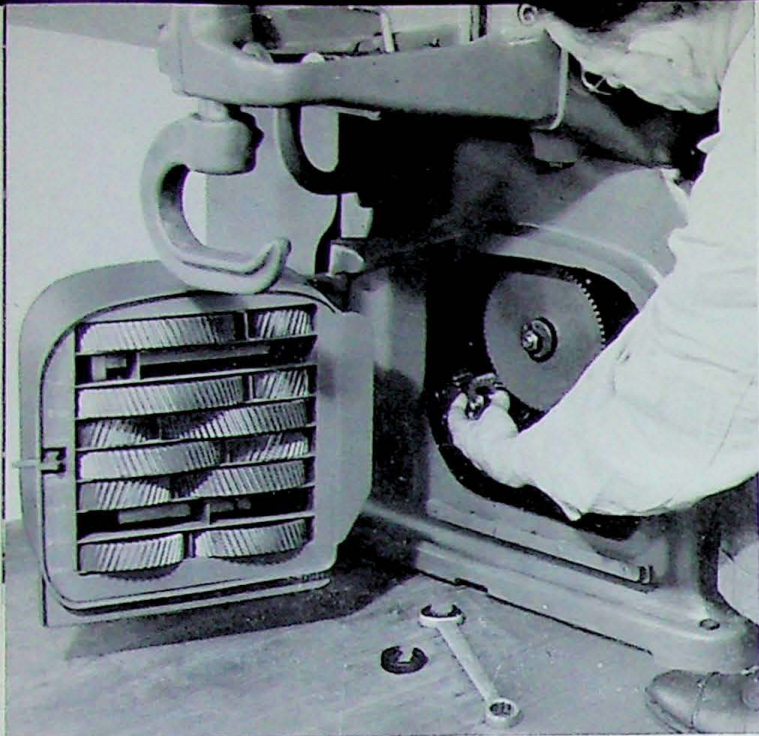


Compact Driving Mechanism Completely Enclosed and Automatically Lubricated

DRIVE is transmitted from the motor under the tank table through chain and gears in the base, thence by chains to the spindle. The speed and ratio change gears are located respectively in compartments at the left and at the right of the mechanism here illustrated. Bearings throughout are anti-friction.

The mechanism is completely enclosed; and all gears, chains and bearings, including the spindle driving chains, are lubricated by a splash system from an oil reservoir in the base, the oil being filtered before reaching the bearings. The oil gage (outside the base) is shown at right.





High Speeds Selected by Simple Change Gears

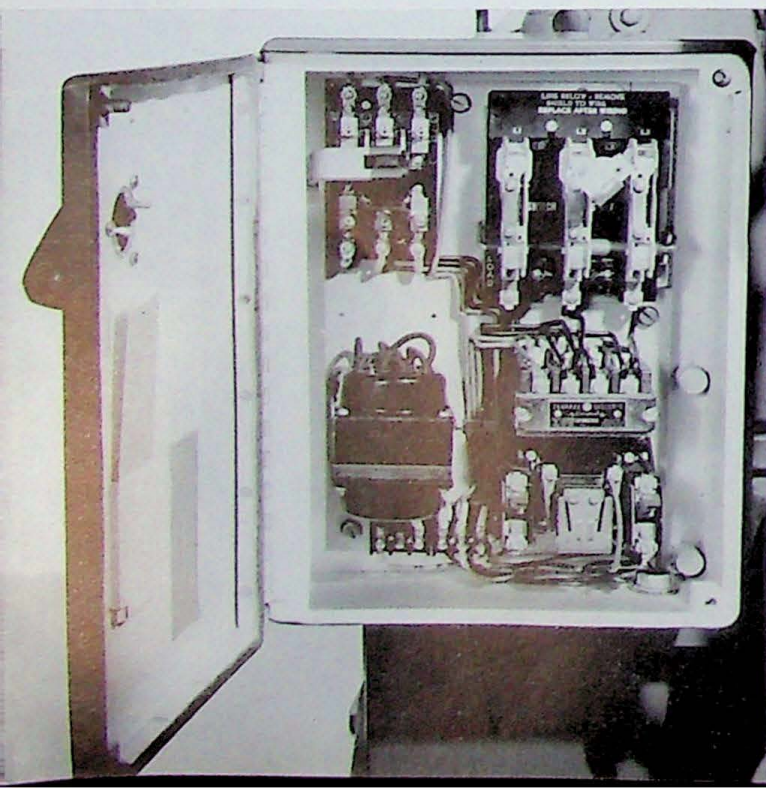
HIGH spindle speeds are quickly selected by changing one pair of pick-off gears in a compartment in the end of the base, as shown at left. Loosening a clamp nut releases a washer and permits the gear to be lifted off the splined shaft. Gears not in use are stored in the compartment door; while the speed plate (illustrated on page 6) is adjacently located on the front of the base.

The one set of 16 gears provides not only 16 high speeds, but all ratio changes as well.

Pick-Off Gears Give Ratio and Direction of Low Speed

CHANGE in spindle speed ratio — that is, selection of any one of twelve low speeds available for use with each high speed — is accomplished as easily as changing the high speed, requiring only the changing of a pair of pick-off gears; the driving sprockets and spindle driving chains remain untouched. As shown at right, these gears are in the base, and are reached simply by opening the cover and the compartment door at the front.

Selecting the direction of low speed relative to high speed is even simpler, and is done merely by placing the lower of the two change gears on the proper one of two centers.



Electrical Controls Built Into the Machine

THE electrical controls conform with Machine Tool Electrical Standards and are built into the machine where they are well protected, yet easily accessible.

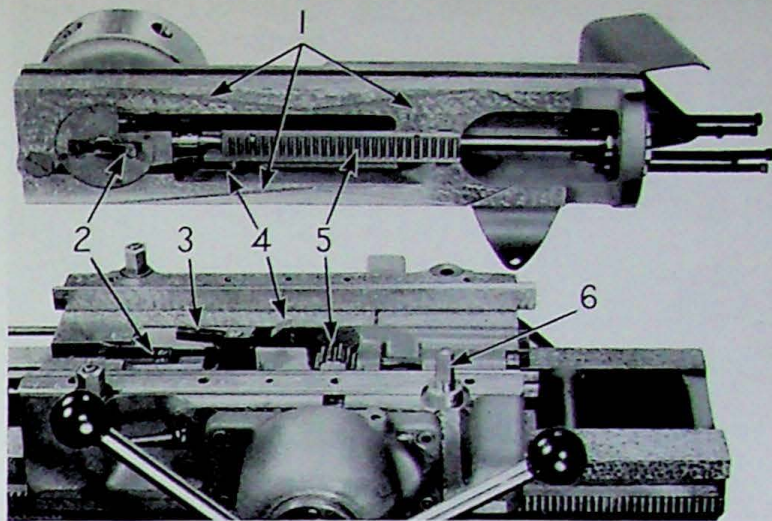
The unfused disconnect switch, transformer, spindle reversing switch, magnetic starter and overload relays are all mounted behind a felt-gasketed hinged cover in the compartment on the left end of the machine as illustrated at the left. The distance from the floor to the bottom of this compartment is 24". When the lever on the compartment door is turned to allow the door to open, a safety device operates the disconnect switch and shuts off the current.

Automatic Lock and Clamp for Turret

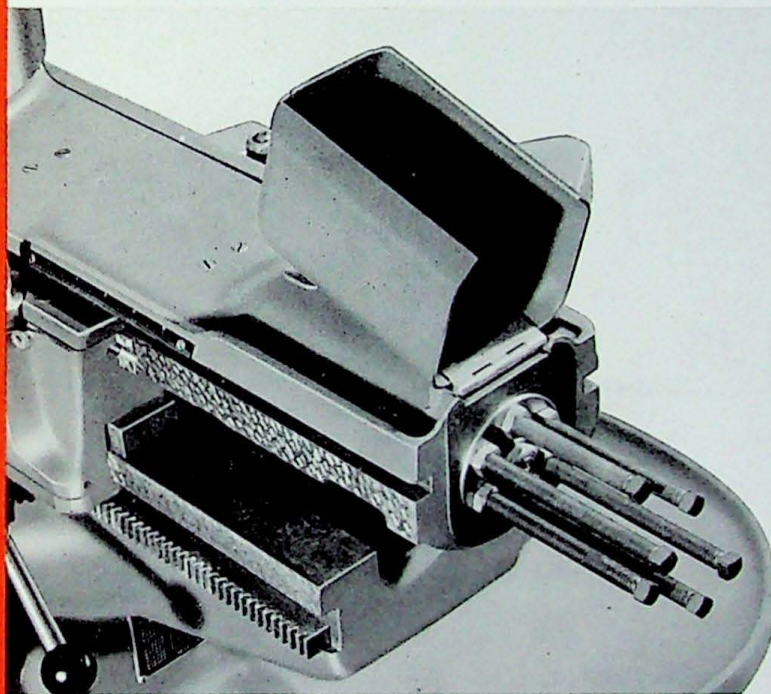
THE turret indexes—rotating upon a tapered bronze bushing—as the slide carrying the turret is drawn back from the work. When the new tool position is reached, the turret is automatically locked by a vertical tapered pin which assures the working tool being held accurately and securely in position and in positive alignment with the spindle. Additional stability for the turret—of advantage on the larger and heavier classes of work—is provided through a turret clamp which is operated automatically by the advance and return of the turret slide.

Means of adjustment to compensate for wear are provided through tapered gibs between the turret slide and the slide bed for transverse adjustment and by an elevating gib for vertical adjustment, thus permitting perfect alignment of the turret holes with the spindle to be maintained.

In the illustration at right, note: (1) The width and



length of the scraped bearing surfaces; (2) the turret clamp cam and lever; (3) the turret index trip dog; (4) the locking pin trip dog and lever; (5) the turret slide rack and pinion; (6) and the shaft that accommodates the handcrank for facilitating movement of the turret slide bed when setting up.



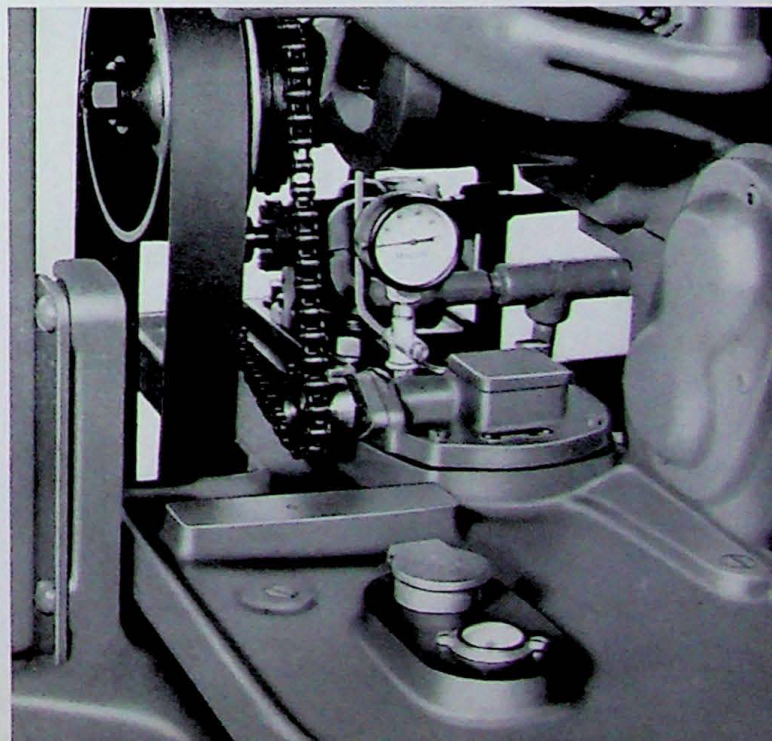
Each Turret Tool Has Adjustable Stop

AN independent stop is provided for the forward movement of each turret tool by means of individual screws (shown at left with cover raised) that permit fine settings, thus obviating the necessity of setting tools to exact distances. The stop for each turret hole is automatically brought into position with the indexing of the turret. The cover over the stop screws keeps them free of chips and dirt.

Recessing operations, as well as setting of the turret tools and stops are greatly facilitated by the use of the graduated scale shown attached to the side of the turret slide in view at left. A scale reading either to 16ths of an inch or to millimeters is furnished as desired.

Automatic Oiling Assures Long Machine Life

MAJOR mechanisms and bearing surfaces throughout the machine receive automatic lubrication. The entire driving mechanism in the base is oiled by a splash system, as described on page 7; while the main spindle bearings and other mechanisms receive forced feed lubrication from a chain-driven mechanical oiler, illustrated at right with all guards removed. The oiler operates whenever the machine driving motor is running. Note the convenient location of the oil-level gage and the filler opening for the forced-feed lubrication system.



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•

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