

GENERAL

Correct installation, levelling and maintenance are essential to successful operation and satisfactory performance. The lathe should rest on a good solid foundation to get the best results in accuracy and finish of work. Regardless of how strong a lathe bed may be made it cannot hold its shape unless it rests on a good solid foundation.

Each lathe carries a serial number stamped on the front surface of the bed at the tailstock end. This number identifies the machine and serves as a key to the manufacturer's records.

Levelling is most important. It should be done with a very sensitive level. Ordinary levels such as those used by carpenters are not satisfactory.

CLEANING

To prevent rust during shipment the exposed bright parts of the machine are given a coating of heavy grease or slushing compound. This may be washed off with kerosene or naphtha or some of the non-inflammable cleaning agents if preferred. The slushing compound may pick up dirt or grit in transit, so it is advisable when washing it off that any exposed oil holes be plugged to prevent dirt or grit from entering a bearing. The cleaning operation should be careful and thorough. Remove cover over rear part of

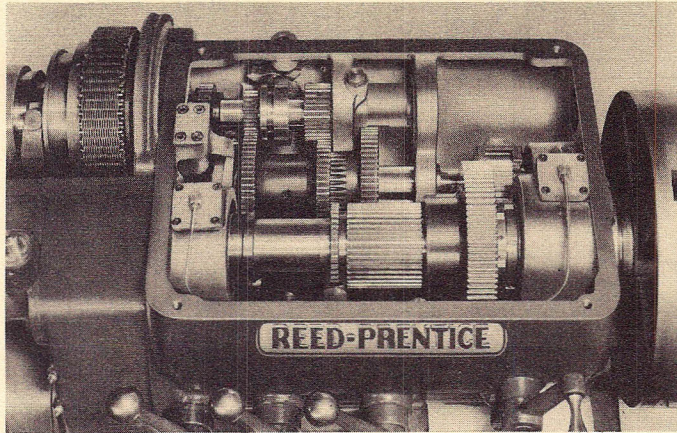
cross slide for cleaning the slide.


LEVELLING

Levelling aboard ship should be conducted while in water sufficiently still to cause no movement, or when the ship is in dry dock; otherwise a level cannot be employed satisfactorily due to sea movement affecting the steadiness of the ship. If the foregoing is impracticable, the machine should be set as level as circumstances will permit, care being taken that each foot of machine is properly chocked or wedged to support its proportionate load. If the machine fails to bore or turn true, wedges under the feet should be adjusted until this inaccuracy is corrected, since an unsatisfactory condition of this nature is likely due to misalignment. The lathe should be checked periodically for accuracy and correct alignment.

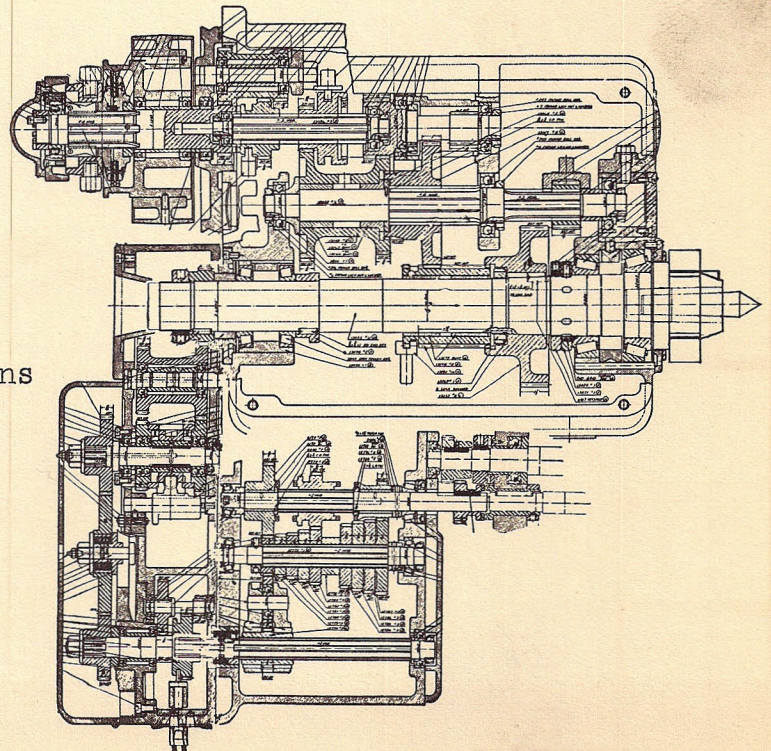
LUBRICATION

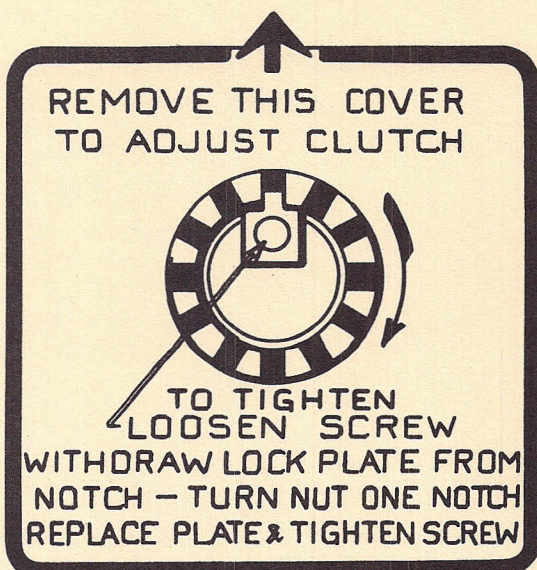
Use a good grade of medium machine oil. The headstock operates in a bath of oil with oil pump and filtration for main spindle bearings. Automatic oiling of the apron and the carriage ways is provided by a small oil pump and distributing system. The apron oil reservoir should also be drained, flushed out and refilled with a good grade of machine oil at least twice each year. At this time the filter in the bottom of the pump should also be replaced.



SLIDING GEAR HEAD	POSITION OF LEVERS ON HEADSTOCK	BACK GEAR LEVER	
		↗	↘
 DRIVING PULLEY 560 RPM.		18	110
		22	136
		29	171
		36	212
		47	276
		58	342
		73	432
		91	536

Sixteen spindle speeds are available, ranging from 18 RPM to 536 RPM. Changes are effected through sliding gears operated by levers on the outside of the headstock. Proper operation requires disengagement of the driving clutch before moving the shifting levers. A clutch operating lever is placed at the headstock end of the machine so as to be convenient for this operation. The headstock gears are made of Chrome Molybdenum SAE 4150 electric furnace steel properly heat-treated, shaved on Fellows Gear Finishing Machine and hardened. Engaging teeth are rounded to permit readily sliding into mesh. The gears slide upon multiple splined shafts mounted on ball bearings. The line diagram shows the arrangement of gears and shafts. Positions of the levers for each speed are shown on the easy reading bronze index plate attached to the headstock cover.



DRIVING CLUTCH

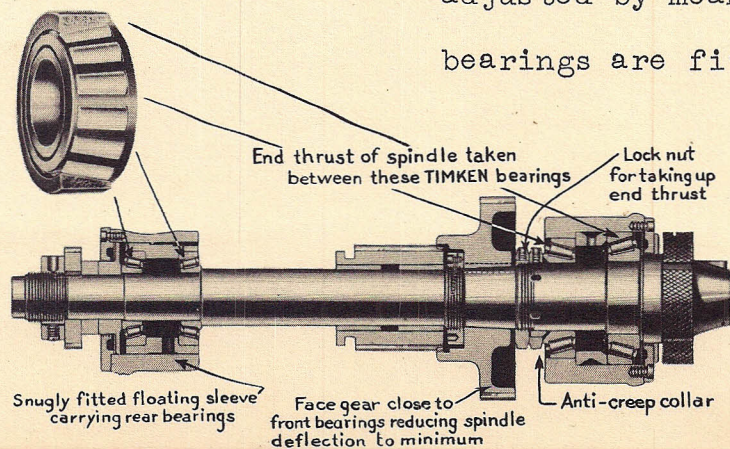
An extremely powerful driving clutch is provided. When properly adjusted it will not slip even under extremely heavy cuts. The discs are of steel faced with "Raybestos". There is but one point of adjustment, easily accessible and consisting of a nut and lock plate. Adjustment is effected by removing the lock plate and turning the

adjusting nut. Turn to the right to tighten and to the left to release. Re-engage the lock plate in one of the slots provided for the purpose.

A brake is provided for quickly stopping the machine. The clutch and brake are both operated by the clutch levers, one of which is provided at the quick change gear bank and the other at the right hand side of the apron. Both levers are attached to the same operating shaft and operate simultaneously.

SPINDLE

Due to its rugged construction and the ample size bearings used, the spindle will seldom, if ever, require bearing adjustment. All thrust is taken by the two front bearings, which are adjusted by means of locking collars. Rear bearings are fitted in a snugly fitting



floating sleeve, allowing compensation for varying headstock and spindle temperatures. Adjustment of the rear bearings is made by releasing the set

screw and turning the adjusting collar which is threaded onto the spindle.

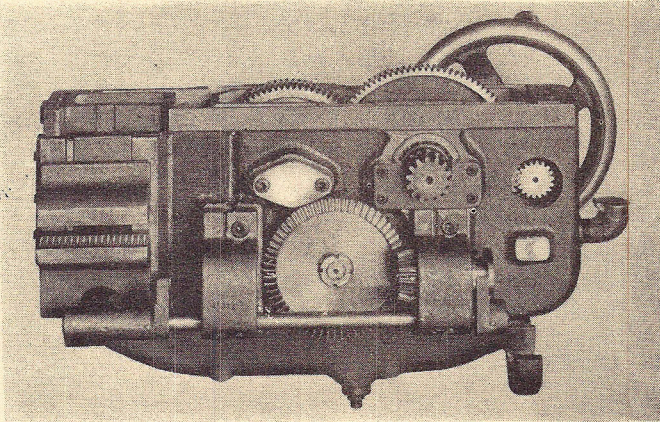
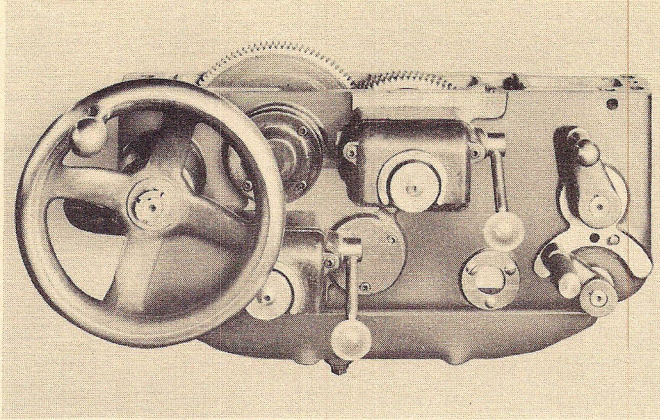
The spindle is SAE 6140 Chrome Vanadium alloy steel, heat-treated and hardened to Rockwell C36-40; spindle nose hardened to Rockwell C55-58. Care should be taken, when inserting centers or bushings into the taper spindle bore, to see that the bore is clean and that the piece to be inserted is clean and free from burrs. Spindles may be ruined by battering of the taper bores due to carelessness.

CHANGE GEAR MECHANISM

The line drawing showing the headstock gearing shows how power is taken from the end of the spindle to drive the feed works. End gears are mounted on anti-friction bearings with "Alemite" system of lubrication and the lower gears run in a bath of oil in an oil tight case provided with a sight oil level gauge. Changes of feed and setting for thread cutting occur principally in the quick change box. An easy reading index plate shows the positions of the various change levers for the thread or feed selected. This plate indicates the settings for feeds from .0025" to .160 per revolution of spindle and threads from 1-1/2-96 including 11-1/2.

THREADS PER INCH.												END LEVER
48	52	56	64	72	C	80	88	92	96			
24	26	28	32	36	B	40	44	46	48			
12	13	14	16	18	A	20	22	23	24			2
6	6½	7	8	9	C	10	11	11½	12			
3	3½	3½	4	4½	B	5	5½	5¾	6			
1½	1½	1¾	2	2¼	A	2½	2¾	2¾	3			
FEEDS IN THOUSANDTHS												END LEVER
5	4½	4¼	3¾	3½	C	3	2¾	2¼	2½			
10	9	8½	7½	7¼	B	6	5½	5¼	5			
20	18	17	15	14½	A	12	11	10½	10			2
40	37	34	30	29	C	24	22	20¾	20			
80	74	68	60	58	B	48	44	41½	40			
160	148	137	120	116	A	96	87	83	80			

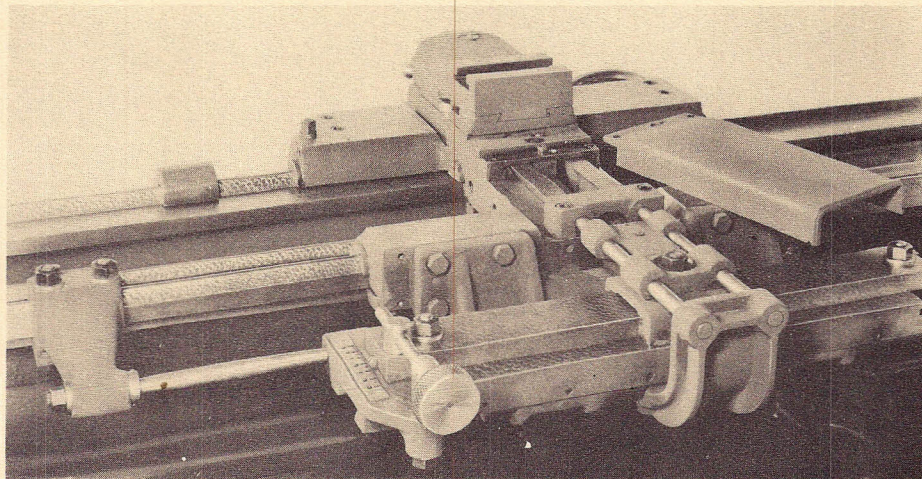
A reverse leadscrew mechanism operated from carriage permits cutting left hand threads when desired.



Apron is provided with thread chasing dial to indicate proper engagement of leadscrew nut for thread cutting. Full lines denote even and half lines odd pitches. Leadscrew Reverse Mechanism also furnished. A safety interlock prevents leadscrew nut being engaged when feed rod is engaged and vice versa. Feed lever must be brought to vertical position to engage leadscrew nut.

Lubrication of apron and carriage bearings is by means of a small oil pump immersed in an oil reservoir at the bottom of the apron. Oil tubes lead from this pump to the various lubrication centers.

Double disc clutches are used for longitudinal and cross feeds operated by independent levers. Adjustment of the feed clutch is made by releasing a set screw and turning the adjusting collar to the right to tighten and to the left to release. The feed rod and leadscrew are interlocked, making it impossible to engage one while the other is in use. A lever is mounted on the front of the apron for disengaging feed.

TAPER ATTACHMENT

Engagement of the taper attachment is by tightening the dog which is clamped to the bed and the nut on the sliding block over the taper bar. Scales at the ends of the taper bar are provided for quick setting. One scale reads in degrees of included angle and the other reads in inches per foot.

The cross slide and compound rest should be so set that the cross slide will move freely throughout the length of the taper to be cut. A telescoping type cross feed screw is provided, thus avoiding the necessity of disengaging the cross feed nut when turning tapers.

LEADSCREW AND FEED ROD

Engagement of both feed rod and leadscrew is prevented by an interlock. Thus when the feed rod is in engagement the leadscrew is at rest. Likewise, when the leadscrew is engaged the feed rod is at rest. The screw is mounted in radial ball bearings and is provided with hardened steel and bronze thrust washers.

Adjustable dogs are provided on the control shaft under the feed rod and may be set to disengage the feed rod or leadscrew at a predetermined point when the carriage is moving in either direction. A fixed collar acts as a safety at the limit

of travel, thus preventing jamming the feed works by running up against the headstock.

TAILSTOCK

The tailstock is of the massive two bolt type and is so designed as to permit setting the compound rest parallel with the bed of the lathe. Spindle is carefully fitted and is provided with an equalizing type of binder. A single movement forward or back, of a convenient lever at the top of the barrel locks or releases the spindle without affecting alignment.

Lateral adjustment is provided for turning tapers by offsetting the tailstock. When the tailstock is to be offset, it is of course necessary to release the two clamping bolts so as to avoid inaccurate setting due to strains.

MOTOR DRIVE

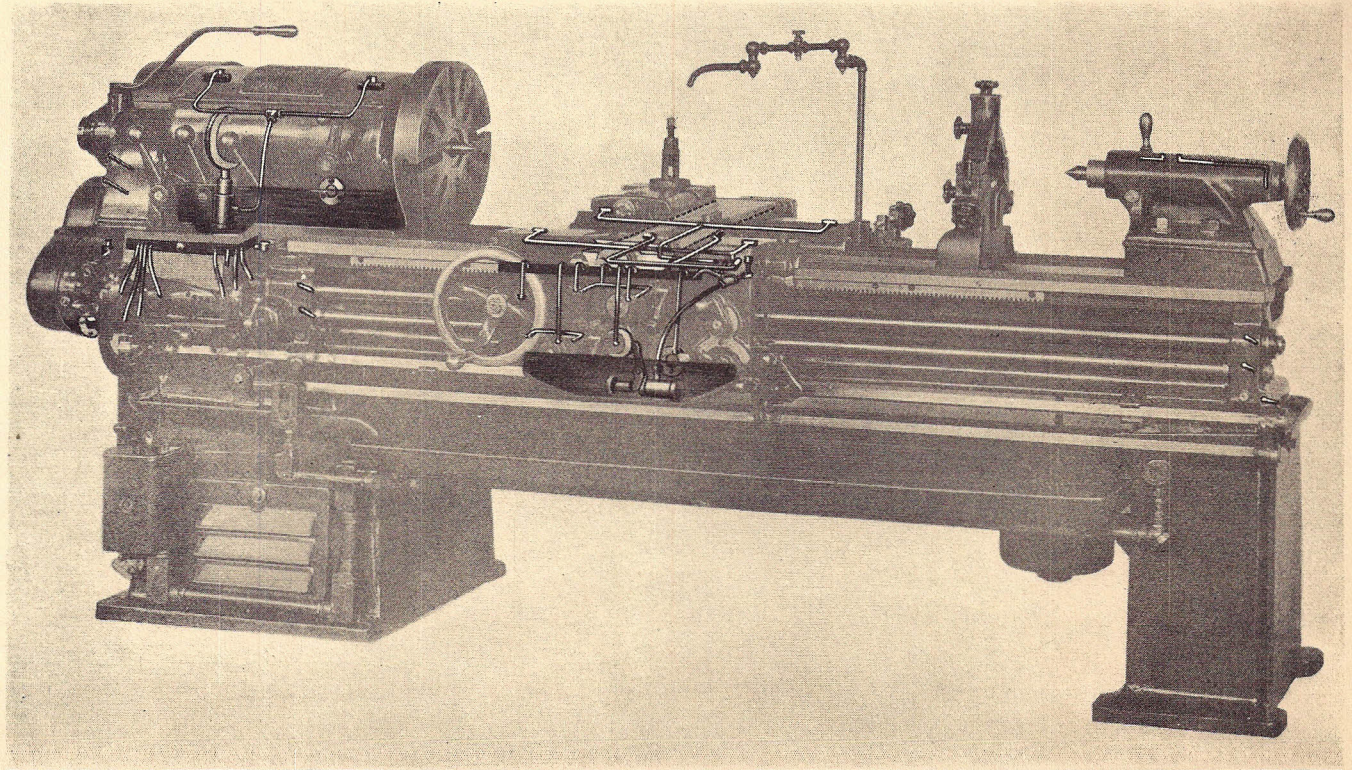
Adjustment of the driving motor to suit the driving element, whether it be chain, flat belt or multiple vee belt is by movement of a hinged plate upon which the motor is mounted. This adjustment is through a screw and nut at the front of the motor plate. In the case of belt drives it is necessary to avoid getting oil or grease on the belts when oiling the motor, as oil has a detrimental effect on this type of drive.

GENERAL

Keep the machine clean and well oiled. Avoid putting tools or wrenches and files across the bed of the lathe. If you must keep tools on the bed, a board should be provided so as to protect the finished surfaces of the vees.

Remember that the manufacturer has built precision into the machine and that the bed and carriage wings are not intended for use as anvils and that such use is detrimental.

Always use wrenches that are a proper fit on the various bolts and screws so as to avoid turning over the corners and finally getting a condition where a pipe wrench is necessary to get a grip. Suitable wrenches provided with machine.

OILING DIAGRAM

1. Combined oil pump and splash lubrication to headstock with filtration of oil to main spindle bearings.
2. End Works provided with reservoir for gear bath; bearings lubricated by Alemite system.
3. Quick Change Gear Mechanism provided with reservoir and "one shot" lubrication system.

4. Apron furnished with oil pump and reservoir providing automatic lubrication to all bearings, bed ways and carriage cross slide.
5. Oil cups for tailstock spindle, feed rod, leadscrew, etc.
6. All bearings, apron, quick change, end works and headstock anti-friction type either ball or roller.