INSTRUCTIONS

for the

ERECTION, OPERATION and MAINTENANCE

of

BARDONS & OLIVER

SADDLE TYPE UNIVERSAL TURRET LATHES

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PERFORMANCE, ACCURACY AND DEPENDABILITY are qualities built into the Bardons & Oliver Saddle Type Universal Turret Lathes. Experience and "know how" gathered during more than fifty years continuous engagement in the manufacturing of high quality machine tools are reflected throughout this machine.

Before being sent out into service the turret lathes are thoroughly inspected at the factory. To preserve the original qualities of accuracy and efficient performance it will be necessary to observe the following rules of operation and maintenance. All of the mechanisms are designed and built to function satisfactorily even under conditions of hard usage; however, neglect or abuse may cause permanent damage or make necessary extensive and costly repairs involving the replacement of certain parts. Thorough inspections are advisable at intervals depending on the type of work handled and the accuracy and finish desired.

LEVELING

To produce precision work the bed ways must be accurately leveled. For this purpose eight leveling screws, two in each foot, are provided. All four feet should be free from the bearing plates about 1/8 inch and all eight screws should be adjusted to bear equally. Use a high grade adjustable sensitive spirit level across the bed ways at right angles to the center line. A combination square against the front bed way will assist. This is important because a variation from the square will result in incorrect level reading. Use the level on top of the bed ways, alternately at the spindle end and the tail end. Adjust the leveling screws in the feet until the spirit level shows the same reading at both ends. Pull the eight holding screws down tight. Recheck the level readings at both ends, and readjust if necessary.

The maximum allowable variation in the readings of the level at the two ends of the bed is one half graduation on the glass tube. For very accurate work the machine must be leveled even closer. Periodic rechecks should be made in order to maintain the accuracy of the machine.

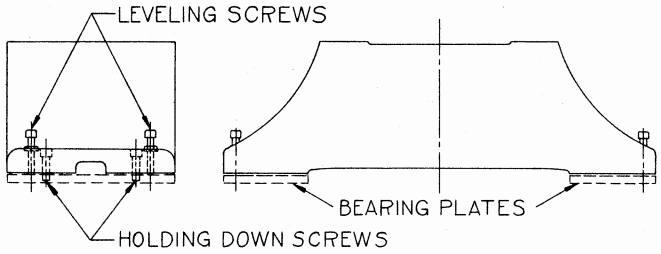


Fig. 1 BEARING PLATES AND LEVELING SCREWS

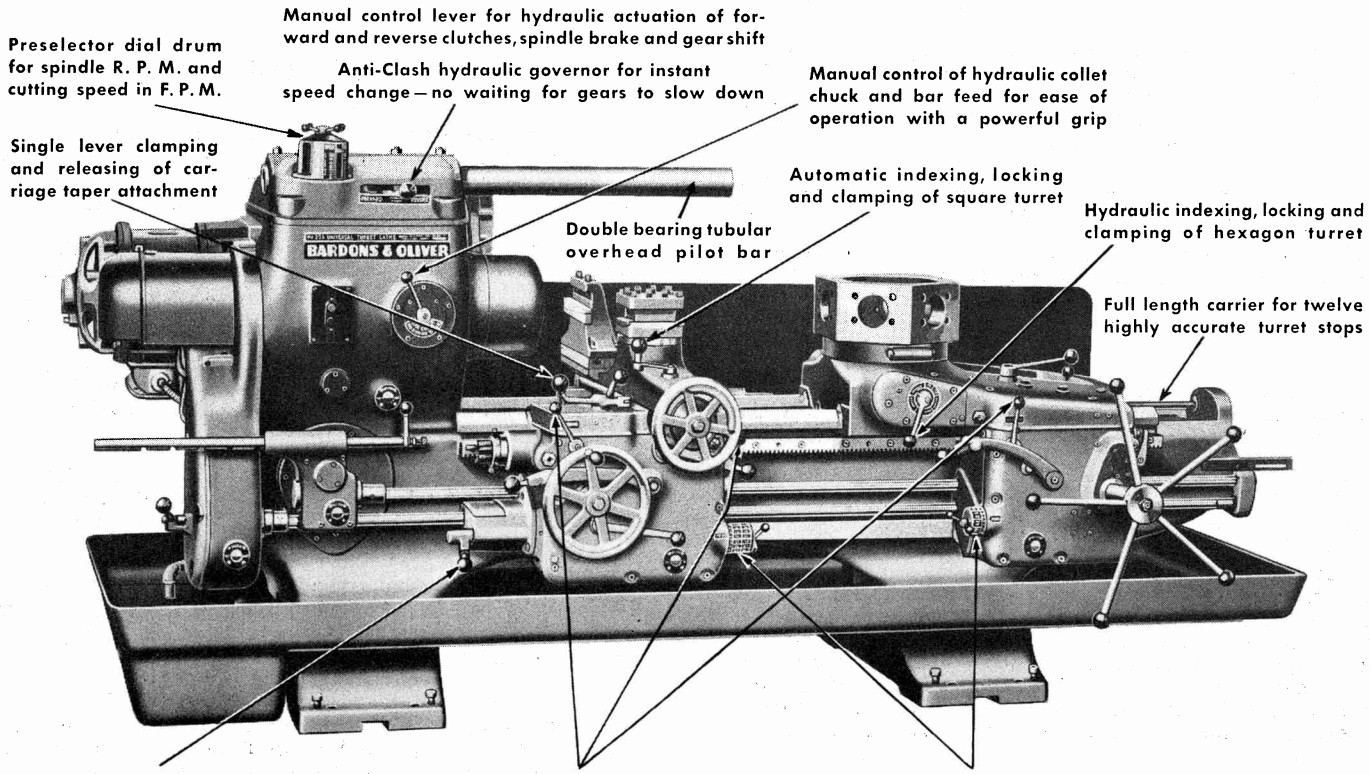


Fig. 2 NO. 22 SADDLE TYPE TURRET LATHE

ALIGNMENT TEST

For average work the alignment obtained by using a spirit level is satisfactory. However, where long work must be machined straight to within very close limits it is advisable to test the alignment between the center of the spindle and the bedways or rather the parallelity of the line of travel of the point of the cutting tool with the spindle center.

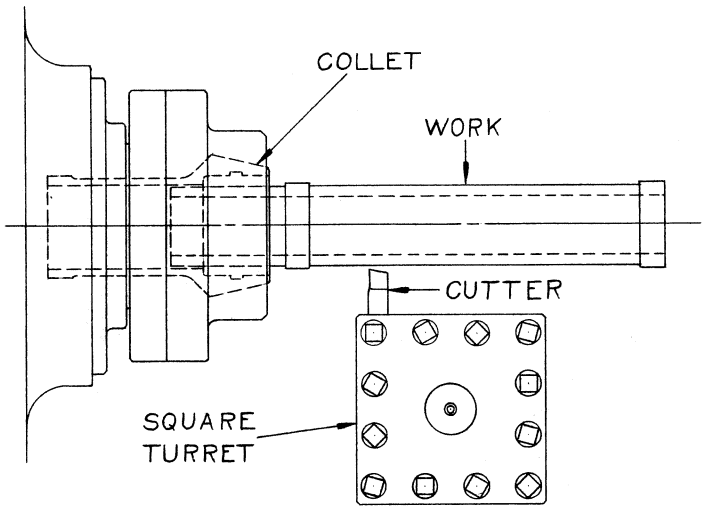


Fig. 3 ALIGNMENT TEST

Figure 3 shows a standard alignment test by turning with a cutter in the square turret. For best result use a tube, not a solid bar, since the latter will sag of its own weight and thus introduce an error in the result.

If the test piece is turned taper small at the right hand end, adjust the leveling screws in the back tail foot down slightly. This will raise the tail end of the rear bed way, and decrease the amount of taper turned. If the test piece is turned taper large at the right hand end adjust the leveling screws in the front tail foot down slightly and thus raise the tail end of the front bedway.

A similar turning test is sometimes made with hexagon turret saddle. Mount the cutter atop the test piece by means of a cutter head or slide tool.

ALIGNMENT OF TURRET HOLES WITH SPINDLE

The tool holes are bored from the spindle with the hexagon turret in place and the machine very accurately leveled. Attention is called to the fact that the turret hole alignment with the spindle varies with the headstock temperature. The turret holes are bored with the head stock at normal operating condition. At a higher than normal temperature the turret holes are slightly below the spindle center and at a lower than normal temperature the turret holes are slightly above.

ELECTRICAL CONNECTIONS

The main drive motor and the rapid traverse motor are wired to their separate magnetic contactors both mounted fully enclosed in the bed at the back of and underneath the head, see diagram figure 4. Both motors are inter-connected to the push

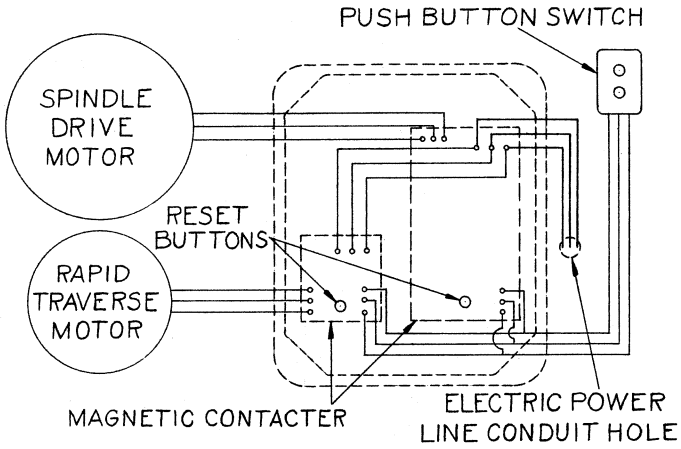


Fig. 4 WIRING DIAGRAM

button switch at the front of the head, and have overload and under voltage protection. The cover for the magnetic contactors carries two electric reset buttons.

When connecting the machine, remove the cover, carry the conduit through the hole provided at the side of the contactor opening, convey the electric power lines through and join them to the proper terminals at the main magnetic contactor. Check the direction of rotation of the spindle drive motor by the arrow on top or by the rotation of the spindle. If the direction of rotation is incorrect reverse any two line connections in the contactor. Be sure to replace the cover.

LUBRICATION

Do not operate the turret lathe until all the oil reservoirs, oil cups and grease fittings have been properly filled and the bedways lubricated. Before shipment all oil has been drained.

It is advisable to refer carefully to the following lubrication chart. Note the grades and quality of the oils and greases recommended for the various places.

HEAD Use highly refined straight mineral oil of turbine oil grade, S.U.V. at 100 degrees F. 145 to 165 seconds. Drain and refill about every 600 hours of running time.

APRONS, HEAD END GEAR BOX AND OIL RESERVOIRS Use gargoyle compound No. 1, S.U.V. at 100 degrees F. 310 to 320 seconds. Drain and refill about every 500 hours of running time.

GREASE PLUGS AND FITTINGS For the motor use best grade high temperature ball bearing grease of No.3 consistency. For other places use a high grade alemite gun grease of No. 2 consistency.

The gears and bearings in the headstock are lubricated by spray from several nozzles. The oil is circulated by a geared pump from the reservoir. A glass gage indicates the proper oil level and also shows (by dripping or by a small stream) whether the oil is circulating. A jet of oil pumped through the hole in the clutch plunger lubricates the friction discs from the center out and thus prevents the forming of carbon on same by overheating. The advantages of spray as compared with splash lubrication are, a cooler running head stock and considerably longer life of the lubricating oil.

A disc type oil filter in the bracket on the front end of the head stock is provided with a handle for cleaning the sludge from the filter discs. The handle should be given half turn at fairly frequent intervals to clean the discs. A drain plug underneath the filter chamber serves to drain off the sludge ladened oil.

A gear pump sprays oil thru nozzles to lubricate gears and bearings in each apron. Glass gages show the oil level in the reservoir. The hexagon turret seat, the saddle ways, the carriage ways, the cross slide bearings and the cross feed screw are all lubricated by small individual metering units delivering measured quantities of oil each time the rapid traverse is engaged for rearward travel. The geared pump is driven from the rapid traverse shaft and is self priming. Since the oil for lubricating the above points is taken from inside the aprons it is necessary to refill the reservoirs at fairly frequent intervals and to watch the gage carefully.

THE COOLANT SYSTEM

For work not requiring coolant, disconnect the pump drive by disengaging the sliding jaw clutch.

The coolant sump is divided into two compartments by a baffle wall. Small chips and dirt going through the screen plate will settle in the first compartment. Clean this out at reasonable intervals. The strainer located in the second compartment should also be cleaned periodically. Failure to do this will shorten the life of the pump and cause interference with the free flow of the coolant.

Two stand pipes one attached to the saddle and one to the carriage deliver the coolant to the cutting tool and work through flexible hose nozzles. Care should be taken to use a liberal flow and to have it play against the cutting edges of the tools. Do not let the oil-proof neoprene hose become damaged by too sharp bending or by heavy steel chips.

High grade water soluble oil coolants and cutting oils do not cause bright metal surfaces to rust. A poor coolant of caustic nature will in a short time cause serious damage to the machine by rusting exposed iron and steel surfaces and by attacking the lacquer finish.

HEAD FOR NO. 21 UNIVERSAL TURRET LATHE

The speed is selected by the dial drum in either R.P.M. or cutting speed in feet per minute. Turn the dial in either direction to the desired speed. The gears are shifted hydraulically. The control lever on top of the head starts and reverses the spindle, applies the spindle brake and changes the spindle speed. In neutral position the lever is locked against accidental starting. A direction plate underneath the lever shows the lever movements.

The powerful forward and reverse multiple disc clutches are set before shipment to maximum power requirements. They will, however, usually need to be readjusted after a few weeks operation. To do this loosen the socket head screw, give the split adjusting nut a fractional turn, try the "feel" of the control lever and tighten the binder screw. About 1/8 turn of the adjusting nut is normally sufficient.

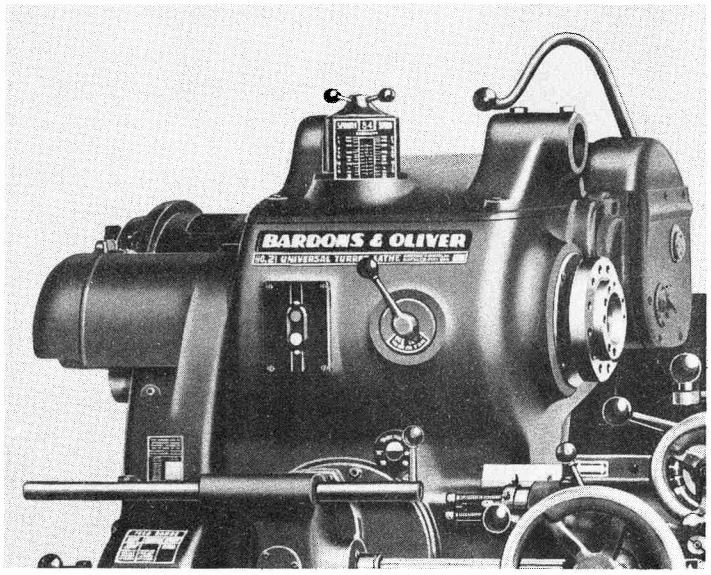


Fig. 5 FRONT VIEW OF HEAD FOR NO. 21 TURRET LATHE

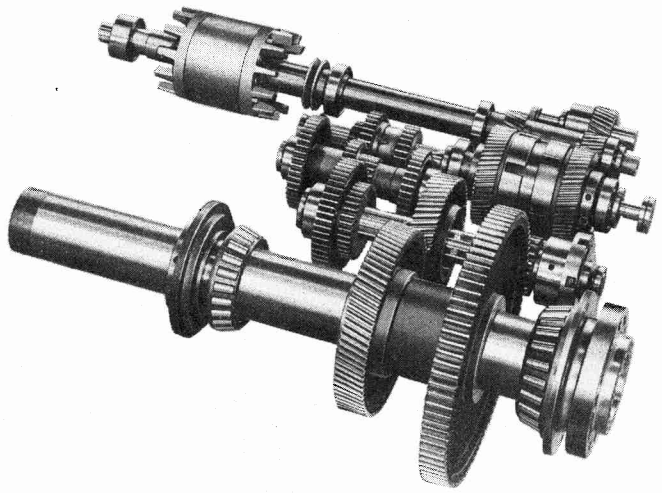


Fig. 6 HEAD GEAR TRAIN

The two opposed tapered roller spindle bearings are set at the factory to a slight pre-load. Being subject to wear they will normally need occasional adjustment. Remove the small cover on top of the head end gear box. Loosen the binder screw, give the split adjusting nut a fractional turn and retighten the binder screw. About a 15 degree turn is normally enough. Be careful not to adjust the bearings too tight as this would cause overheating and wear. All shafts and clutch gears are mounted on ball bearings. These need no adjustment.

The hydraulic geared pump is self priming. The oil is sucked from the reservoir. If the pump fails to start, it can readily be primed through a hole shown in figure 7.

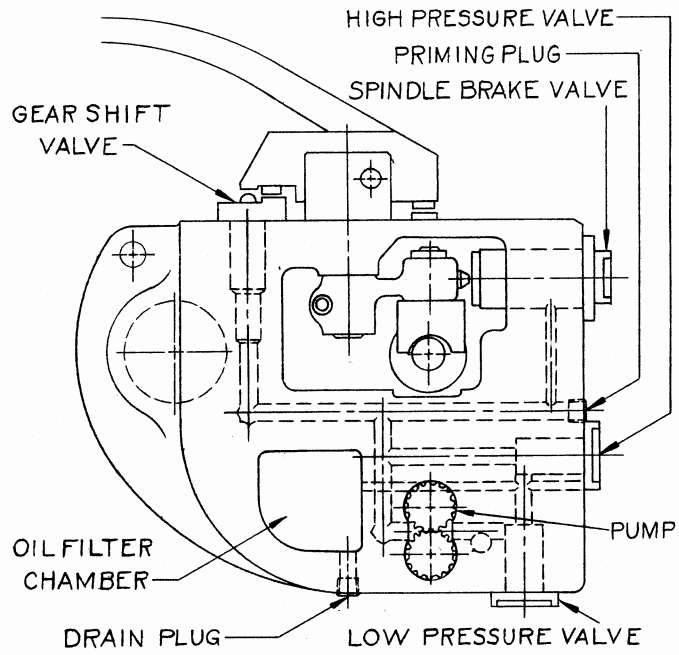


Fig. 7 HEAD PUMP BRACKET FOR NO. 21 TURRET LATHE

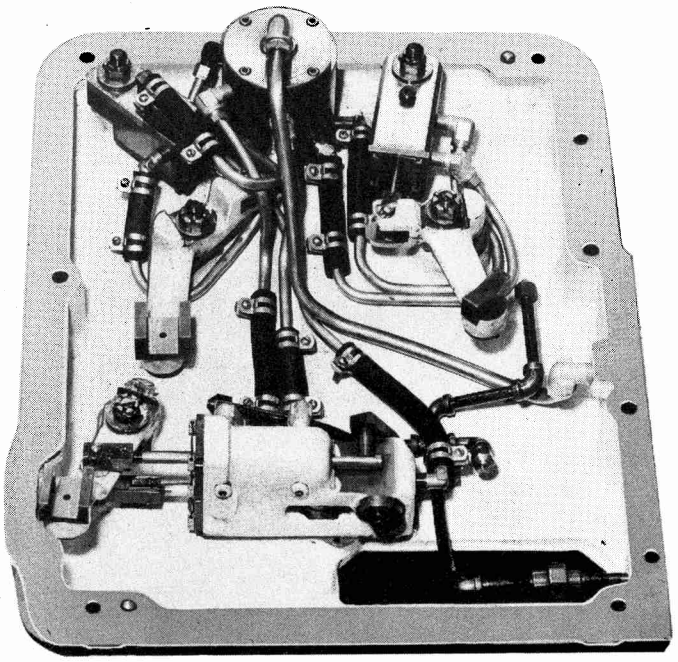


Fig. 8 HEAD HOUSING WITH GEAR SHIFTING MECHANISM FOR NO. 21 TURRET LATHE

The hydraulic brake valve is actuated by the clutch operating lever. If this valve should become clogged dismantel and clean same carefully in gasoline. The high pressure relief valve which regulates the hydraulic pressure for the brake, gear shifting, collet chuck and bar feed is built and set to maintain about 130 pounds pressure. The low pressure relief valve for the spray lubricating system is set for about 25 pounds. Should the gear shifting mechanism show sluggishness in action there is a probability of the high pressure relief valve being clogged up, or if the lubricating oil gage on the headstock ceases to show oil circulation, the low pressure valve should be washed and cleaned. Unscrew the valve body, remove the valve, clean carefully in gasoline and reassemble.

Sluggishness in operation of the gear shift or brake after a period of idleness of the machine is sometimes caused by air in the hydraulic system. This condition can be remedied by moving the control lever slowly back and forth a few times past the brake position while the motor is running.

The gear shift control valve is not subject to any appreciable wear and very rarely requires attention. By removing the screws securing it in place it can readily be taken out for cleaning if need be.

Figure 8 shows the hydraulic cylinders, piping and gear shift levers mounted inside the head housing. Ball detents in the shifter levers engaging detent holes in hardened steel plates hold the sliding gears in their operative positions. The detent springs are set to shift at about seventy five pounds per square inch hydraulic pressure in the cylinders.

If a gear should show a tendency of slipping out of engagement during a long and heavy cut this can be overcome by adjusting the tension of the detent spring to allow a greater holding force. Too powerful a detent would, however, result in failure to shift.

The electric motor is mounted so as to form an integral part of the head. The rotor is keyed and pressed to the main drive shaft. The starter and end bell can readily be dismounted by removing the screws securing them to the mounting bracket. When remounting be sure to check the uniformity of air gap.

HEAD FOR NO. 22 AND NO. 23 UNIVERSAL TURRET LATHES

The multiple disc clutch plunger is actuated by a pair of hydraulic cylinders and a toggle and link mechanism in the pump bracket. The toggle linkage between the actuating cylinders and the clutch plunger requires the full stroke of the cylinders.

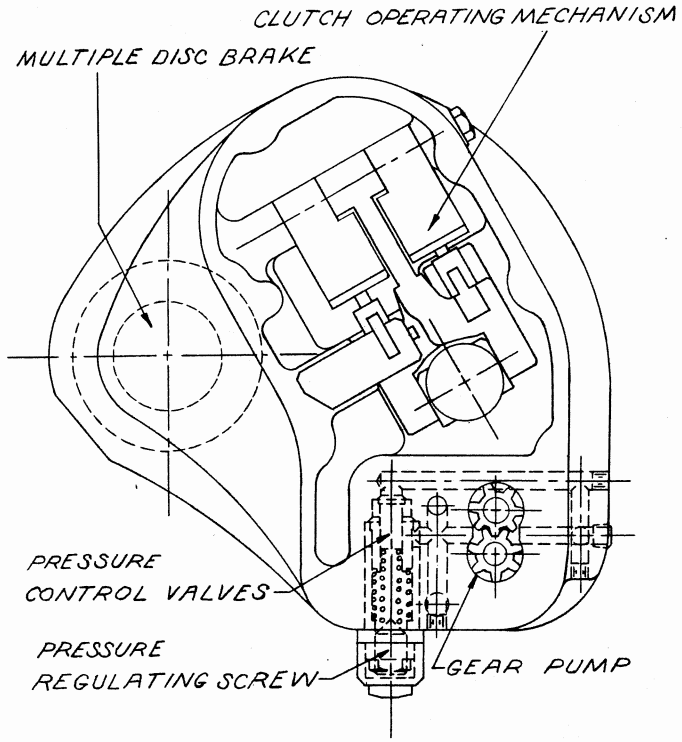


Fig. 9 HEAD PUMP BRACKET FOR NO. 22 TURRET LATHE

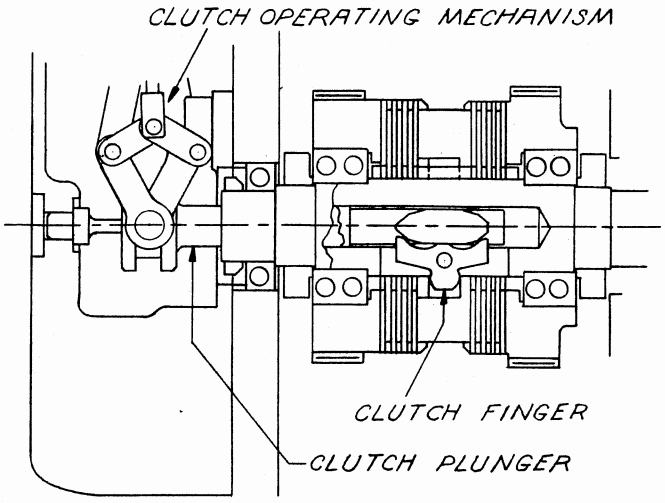


Fig. 10 FORWARD-REVERSE CLUTCHES FOR NO.22 TURRET LATHE

Do not adjust the clutch plates so tight that the cylinders do not complete their stroke. To service remove the pump bracket cover. If the multiple disc clutches slip and need adjustment, engage the forward clutch in driving position, stop the motor, remove the cover on the back of the head and tighten the adjusting nut moderately. Then give running test to check adjustment. Adjust the reverse clutch in the same manner.

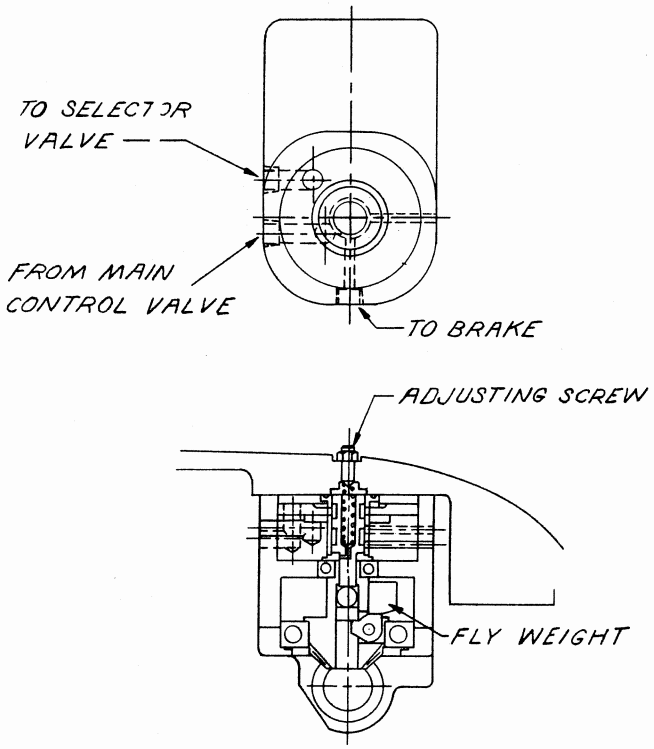


Fig. 11 HYDRAULIC GOVERNOR VALVE FOR NO.22 TURRET LATHE

The geared pump is self priming. If, nevertheless, it should fail to pick up, the cause of the trouble is probably that one or both of the poppet type of valves are held open by some dirt particles. The valves are accessible from the bottom for removal. Clean the valves thoroughly in gasoline. Also clean out the valve seats.

The hydraulic pressure should be 130 to 140 pounds. A pipe plug on the back of the pump bracket can be removed for the mounting of a hydraulic pressure gage. The pressure can be adjusted by the set screw underneath the valves. The set screw is protected by a screw cap.

The hydraulic control valve inside the housing, at the front, controls, by means of the hand lever, the forward and reverse clutches, the gear shifting and the brake. This valve unit is readily accessible for service in case of trouble after the removal of the housing from the head.

The multiple disc brake is mounted on the first shaft from the spindle and is actuated by a hydraulic cylinder in the pump bracket. It is applied by moving the control lever handle into the "brake" position. If the brake action is sluggish the hydraulic pressure is probably too low and should be checked and increased. Obstruction in the hydraulic line might also be a cause of sluggishness of the brake.

The hydraulic governor valve prevents the clashing of the gears when shifting at high speeds. Through the action of the fly weights the brake is applied for an instant when changing speeds to slow the gears to the right speed, after which the gear shifting action takes place. The speed at which the brake opens and the gears shift can be adjusted by means of a screw on top of the housing directly above the valve. The adjustment should not, however, be tampered with unless necessary. This screw is properly adjusted before the machine leaves our factory and should not be readjusted except on advice of our service department. The valve is easily reached for servicing if needed with the head housing off.

The selector valve is of similar design to the one used in the No. 21 Turret Lathe.

The part of the head not covered by the above paragraphs is similar to the head for the No. 21 Turret Lathe already described.

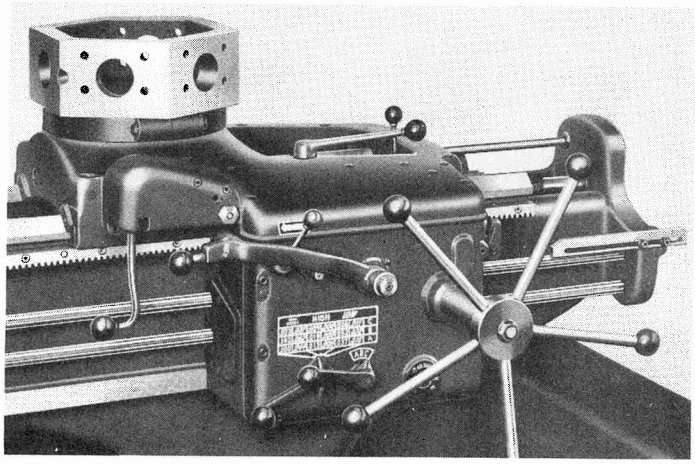


Fig. 12 TURRET, SADDLE AND APRON FOR NO. 21 TURRET LATHE

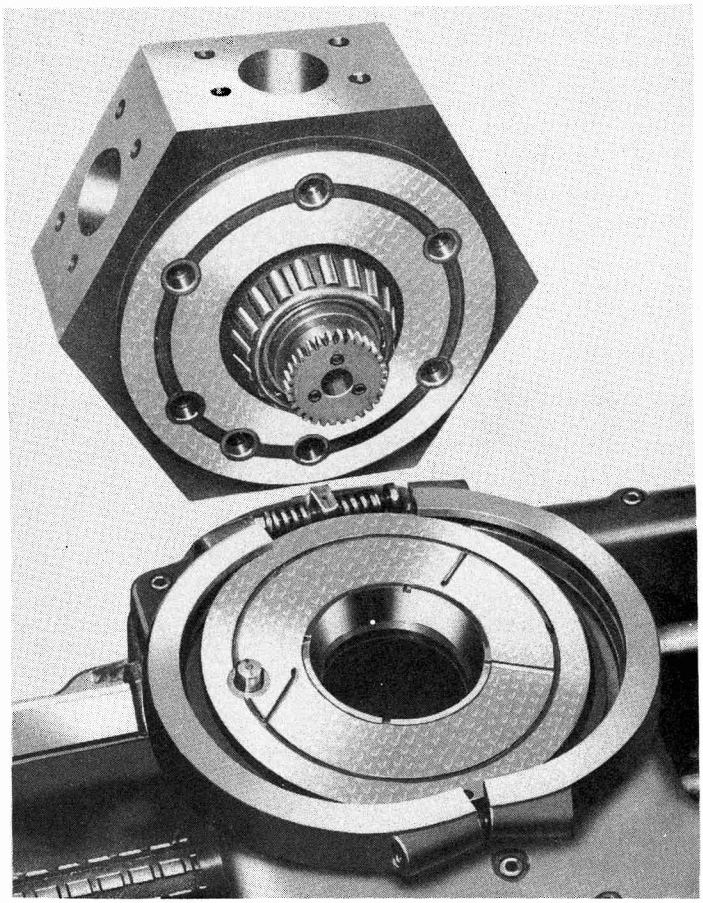


Fig. 13 TURRET AND CLAMP RING

HEXAGON TURRET AND SADDLE FOR NO. 21 TURRET LATHE

To index the turret move the lever on the front of the saddle upward to about vertical position. This action opens the turret clamp ring and withdraws the lockbolt. Revolve the turret to the new station and depress the lever.

The lockbolt is withdrawn by a sliding cam acting upon a lever inside the saddle. A spring lifts the lockbolt into engagement with one of the seven lockbolt bushings in bottom of turret. The seventh station is for the corner stock stop. The turret revolves on a large tapered roller bearing so set as to be pre-loaded by the action of clamp ring. This results in eliminating all looseness and contributes to the very high accuracy of the turret index. If the lockbolt spring should need to be replaced remove screw plug at lower end of lockbolt sleeve. Do not attempt to use a "home made" spring. Our lockbolt springs are made to carefully worked out specifications to deliver the correct working force.

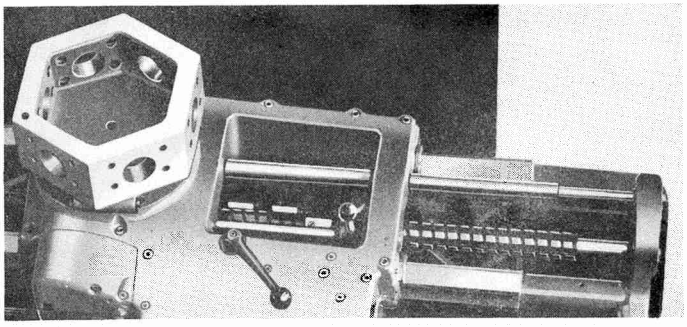


Fig. 14 SADDLE AND STOP CARRIER

The powerful clamping action is delivered by two coil springs contracting the ring. A spreader actuated by a lever and cam expands the ring releasing the clamping grip and allowing turret to revolve freely. The tension of the springs can be adjusted by the nut, see figure 13, thus increasing or decreasing the force of the clamp. This adjustment is seldom required as the springs compensate automatically for wear of ring or turret clamp seat.

The long rigid stop roll revolves with the turret by means of a gear train in the saddle, a telescoping shaft and a second gear train in the tail end bracket. The six standard and six auxiliary stop dogs can slide along the stop roll. A fine pitch screw in each stop dog provides means for accurate setting. Be sure to lock stop screw after adjusting by nut provided. The stop lever can be held by a plunger and spring detent in either of three positions, for the standard stop dogs, for the auxiliary stop dogs and to clear the stop dogs when desirable to do so. When using corner stock stop on seventh turret position an auxiliary stop dog takes the place of the standard. The stop lever can move about 1/8 inch lengthwise to abut a rigid stop on saddle. This movement is transmitted to feed knock out plunger disengaging the feed about .010 before rigid stop.

Be careful not to mount stop dogs behind the line of travel of stop lever. Doing so may cause damage when rapid traversing the saddle.

The angular position of the saddle binder lever can readily be adjusted to compensate for wear and to suit the operator's convenience. Loosen socket-head screw in hub, give lever a gentle tap to loosen friction grip, set to new position and tighten screw.

HEXAGON TURRET AND SADDLE FOR NOS. 22 AND 23 U.T.L.

The hexagon turret is indexed, locked and clamped hydraulically. The oil is supplied to the hydraulic cylinder in the saddle by a geared pump in the apron. By means of the control valve lever in front of saddle the turret can be indexed either automatically or manually. The hydraulic cylinder and valve can be reached for servicing by removing the front cover.

The lockbolt is pulled down by a flipper cam mounted on the reciprocating indexing bar actuated by the hydraulic piston. The turret is revolved by a ratchet mechanism mounted on the central hub and actuated by a rack on the indexing bar. This bar also has a cam which operates the clamp actuating lever. For servicing the indexing mechanism take off the clamp ring and lift the turret off the saddle. When reassembling be sure to get the index gear in its original relative engagement with the rack.

All other features not covered by the above paragraphs are similar to the No.21 Universal Turret Lathe described above.

SQUARE TURRET, CROSS SLIDE AND CARRIAGE

The square turret is unclamped, indexed and reclamped by the to and fro movement of the lever on the cross slide. An outer ledge around the bottom of turret protects the seat from dirt and small chips. The tapered roller center bearing is slightly pre-loaded by the turret clamping action. The consequent elimination of looseness contributes largely to the high accuracy of the index.

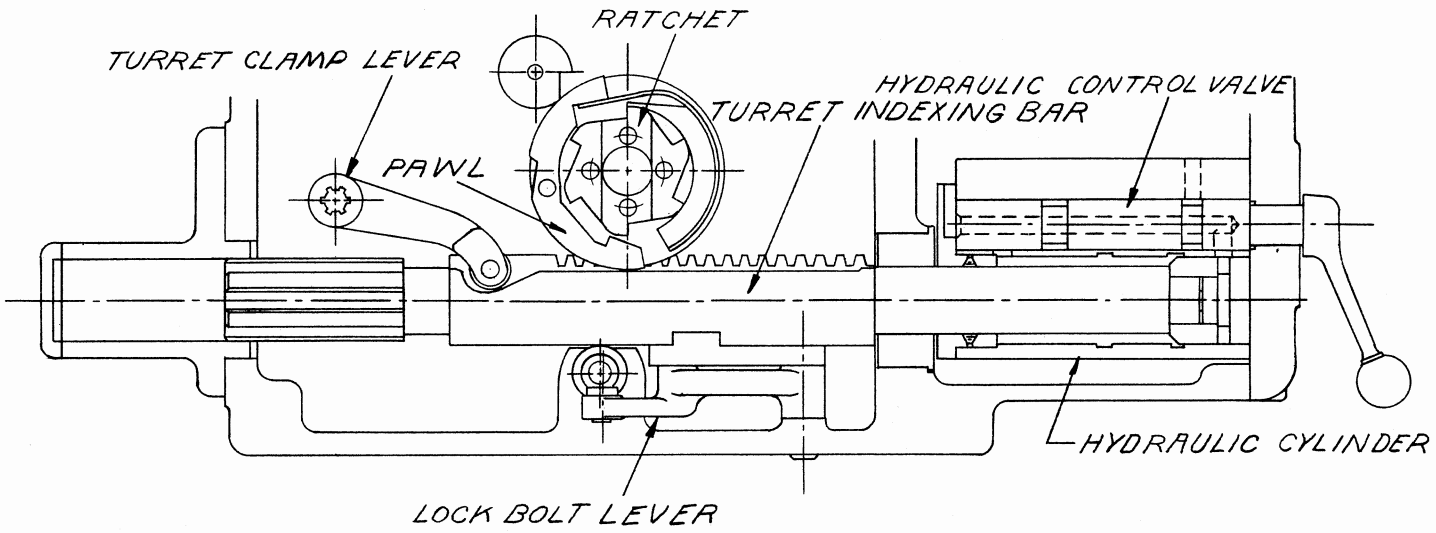


Fig. 15 HYDRAULIC TURRET INDEXING MECHANISM FOR NO. 22 TURRET LATHE

To gain access to the turret indexing and clamping mechanism for adjusting or cleaning dismount cross slide and disassemble the bottom plate. The lockbolt spring can be reached by removing screw plug from end of sleeve. The center gear which carries the index pin and lever cam can be removed by unscrewing it from the center binder bolt. When reassembling be careful to get the index plate, the lockbolt lever cam and the binder bolt back in the correct timed relationship. The operating lever can easily be readjusted on the gear stud to suit the convenience of the operator.

The cross slide is adjusted for wear by means of a taper gib from the rear. The ground thread cross feed screw is mounted in two opposed radial thrust ball bearings in the cross slide. These are slightly pre-loaded in assembling and require no adjustment. A binder screw on left side of cross slide locks the feed screw. The cross feed nut mounted in the carriage can be taken out for replacement by removing two screw pins. The large diameter graduated cross feed dial is equipped with clips for easy and quick duplication of diameters.

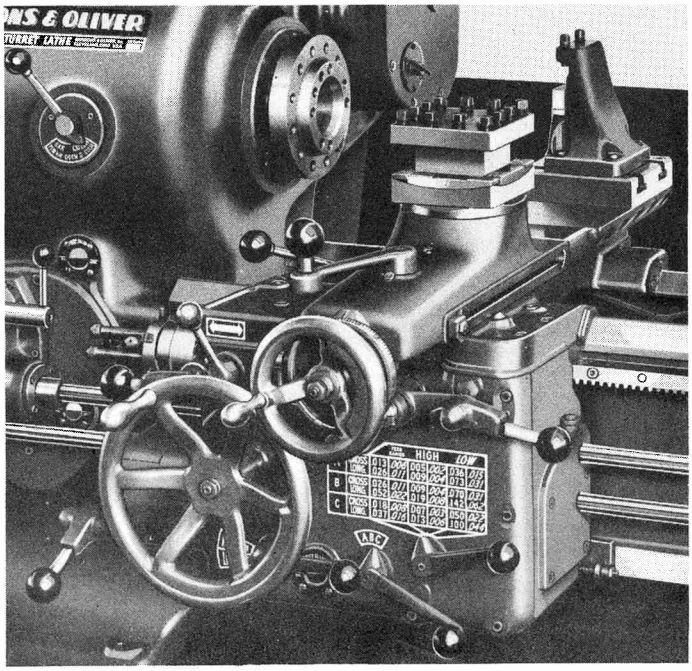


Fig. 16 SQUARE TURRET, CROSS SLIDE, CARRIAGE AND APRON FOR NO. 21 TURRET LATHE

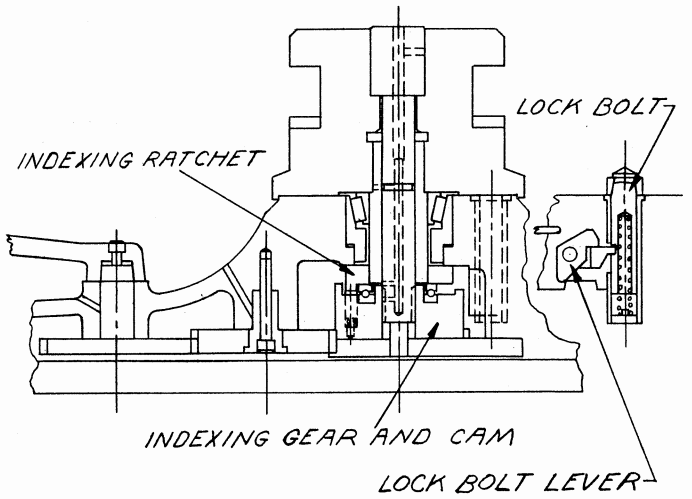


Fig. 17 SECTION THROUGH SQUARE TURRET

The carriage has two "L" type caps one bearing against the underside of the front and the other of the rear bedways. They are adjustable by socket head screws from the top. A taper gib bearing on the lower front bedway is readily adjustable from the end. The carriage binder lever to left of cross slide can be reset at the operator's convenience.

SADDLE APRON AND CARRIAGE APRON FOR NO. 21 UNIVERSAL TURRET LATHE

The cone type power feed friction clutches can be adjusted, when necessary, by the split adjusting nuts at the feed lever cams. It is important to keep the feed clutches properly adjusted since

slippage will cause undue wear and result in failure to release properly. When adjusting, work feed lever up and down while tightening split nut. About 1/8 turn is usually sufficient. If a cone friction should fail to release, it will be necessary to take off the apron cover, dismantle the clutch, refinish and lap the friction surfaces. Check bearing by using red lead. It is necessary to have at least a 75 per cent bearing uniformly distributed for satisfactory performance.

The forward and backward rapid traverse motions are obtained through double positive clutches inside aprons. The clutch shifting or operating mechanism is mounted on the inside of apron cover and with this removed can readily be reached for servicing. In the saddle apron the turnstile disconnecting clutch is operated with the rapid traverse clutch. An adjustable stop bar on tail end bracket arrests the backward rapid traverse of the saddle.

The sliding feed change gears are shifted by levers mounted in apron cover. The multiple splined shafts are mounted in ball bearings. These need no adjustments, but can be easily reached for replacement if necessary by removing the end plate. The hollow feed shaft is mounted on roller bearings and the hollow rapid traverse shaft on a combination of roller and ball thrust bearings. They are accessible when end plates are removed.

The aprons are sealed against the entrance of coolant by neoprene wipers at the ends of the hollow shafts and by gaskets on all flat surfaces. Care must be taken when re-assembling end plates and cover not to damage gaskets. Use new gasket when necessary. A damaged gasket means a leaky apron, poor lubrication and rapid deterioration of bearings and other parts.

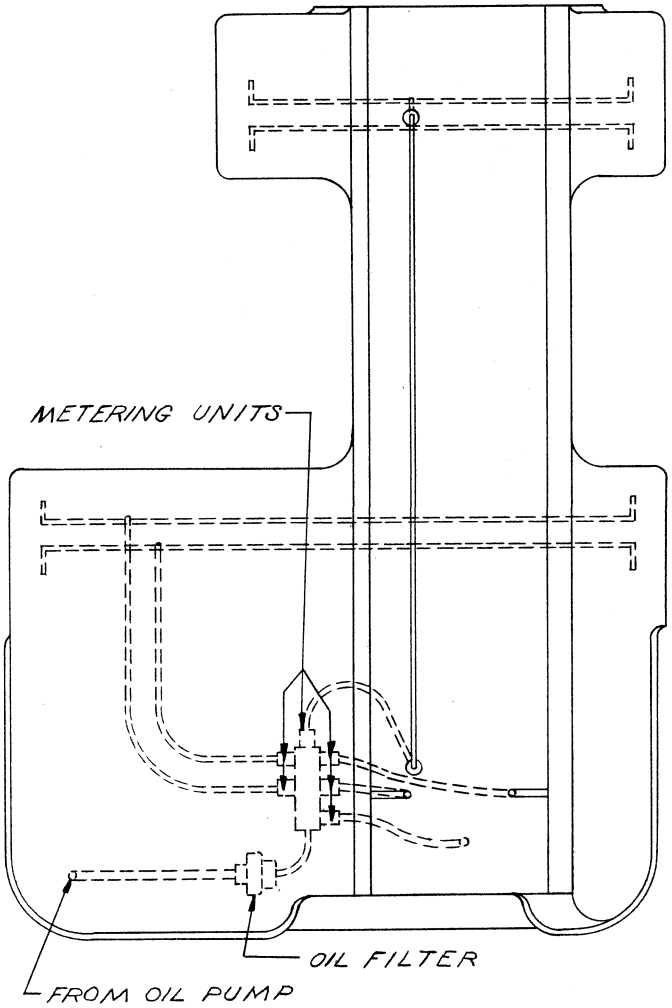


Fig. 18 CARRIAGE AND BED WAY OILING SYSTEM

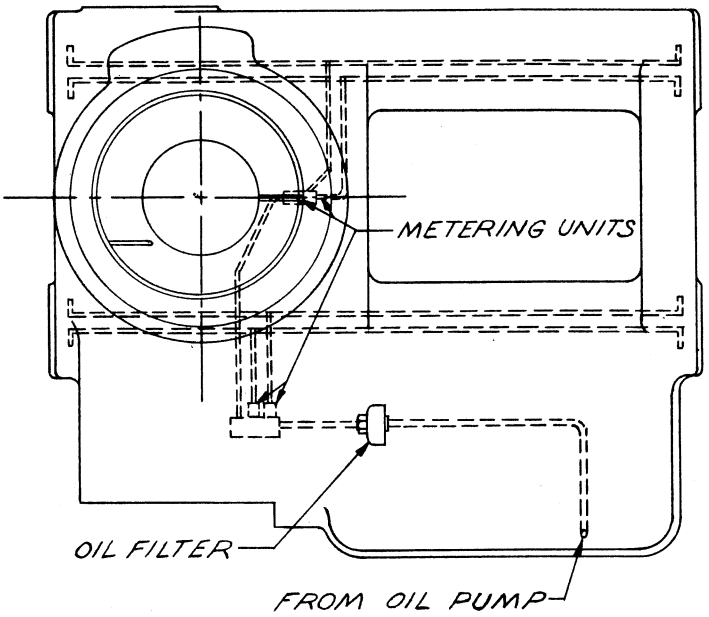


Fig. 19 SADDLE AND BED WAY OILING SYSTEM

SADDLE APRON AND CARRIAGE APRON FOR NOS. 22 AND 23 UNIVERSAL TURRET LATHE

The geared hydraulic pump is driven by the rapid traverse shaft. The relief valve in the pump housing is adjusted to a hydraulic pressure of about 120 pounds for indexing the turret and operation the gear shifting. The lubrication is also taken care of by the pump.

The feed can be pre-selected by a hydraulic selector valve in conjunction with the dial mounted on the apron cover. The hydraulic cylinders are bored in the same block with the selector valve. For servicing the hydraulic mechanism the apron cover can readily be removed. Be sure to drain off the oil before removing cover.

The saw tooth feed clutch is engaged by lifting the feed lever and can be disengaged either automatically by the stop dogs or by manually depressing the lever ball. If clutch needs adjusting give the split nut on the lever shaft a fractional turn. A spring loaded multiple disc slip clutch on the worm shaft prevents overloading of the gears and feed mechanism.

To drop the apron from the saddle mount wooden blocks in the pan directly under the apron. The top of the blocks should almost touch the bottom of the apron. Lower the apron gradually onto the blocks by loosening the top screws in saddle. Before dropping the apron be sure to remove the feed and traverse shafts by disconnecting the drive couplings and pulling the shafts out from the tail end.

RAPID TRAVERSE DRIVE

The gear train, driven by an independent motor, is housed in a bracket underneath the head. A spring loaded multiple disc slip clutch in the train absorbes the shock of sudden starting of carriage or saddle. For servicing or adjusting take off the front cover of bracket. If, because of wear, the clutch should slip too easily the pulling

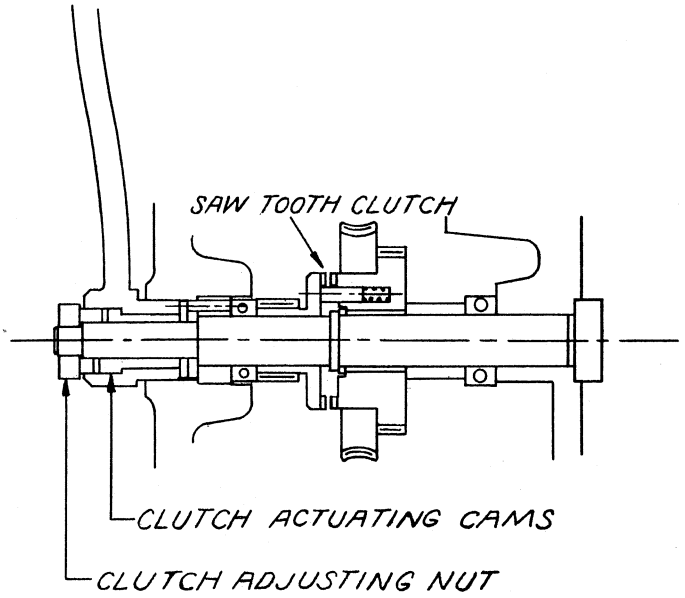


Fig. 20 SECTION THROUGH FEED CLUTCH FOR NO. 22 TURRET LATHE

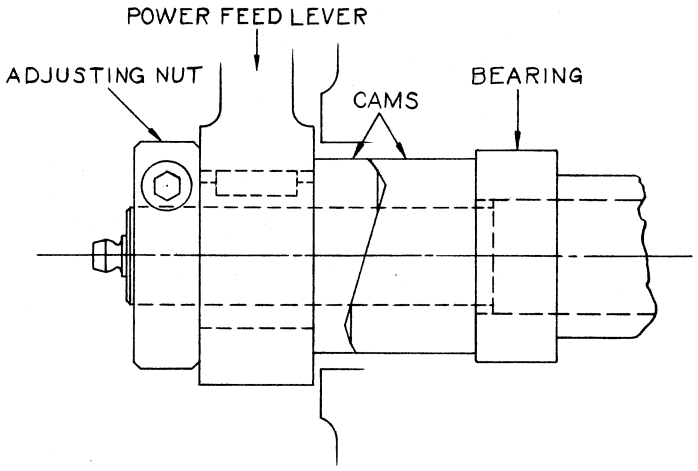


Fig. 21 CLUTCH OPERATING CAMS AND LEVER FOR NO.22 TURRET LATHE

power can be increased by putting a penny back of each spring thus increasing the pressure on the discs. Care should be used, however, not to tighten the clutch too much as doing so would put a heavy strain on the mechanisms in aprons.

HYDRAULIC COLLET CHUCK AND BAR FEED

To change collet false jaws remove the jaw screws from master collet. These can be reached through holes in the chuck hood. To avoid runout of stock and spoiled work, clean false jaws and master collet carefully and tighten jaw screws securely.

When changing collet hoods or chucks special care should be exercised to keep the pilot and the face of the flanged spindle end free from dirt, to protect the accuracy of this vital part of the machine.

The grip of the collet is adjusted at the rear end of the spindle by means of the spanner wrench holes in the end of the abutment sleeve. The finger holder should at all times abut tightly against the end of the spindle. A detent in the finger holder serves to keep the abutment sleeve from becoming loose. The rear end of the spindle guard cap is hinged and can easily be swung out of the way so as to afford free access to the finger holder.

To change wedge shoes the entire rear end spindle guard must be removed. Raise spindle guard cap to reach screws holding guard to head end bracket. By unscrewing the wedge shoe studs, one on each side of the yoke lever, the old shoes can be moved and new ones inserted.

The wedge and yoke lever are actuated by a toggle mechanism and a hydraulic cylinder which receives fluid from the oil pump in the head. The wedge travel must allow the finger roller to pass the highest point on the wedge and continue on the flat about 3-1/2 inch. At this time the operating toggle is past center, thus relieving the pressure on the wedge shoes. a turnbuckle type of link, preset at assembly determines the end relation between roller and wedge.

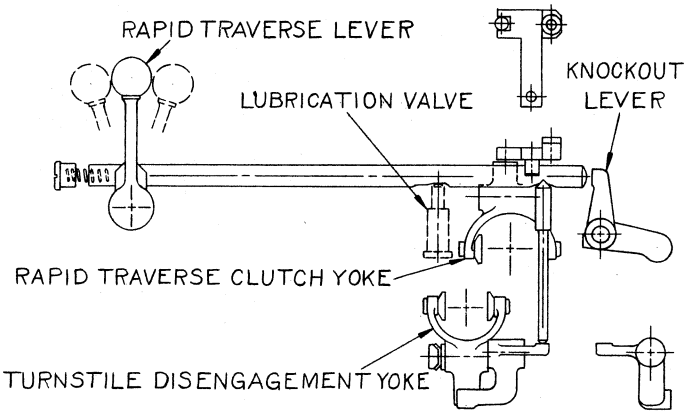


Fig. 22 SADDLE RAPID TRAVERSE MECHANISM

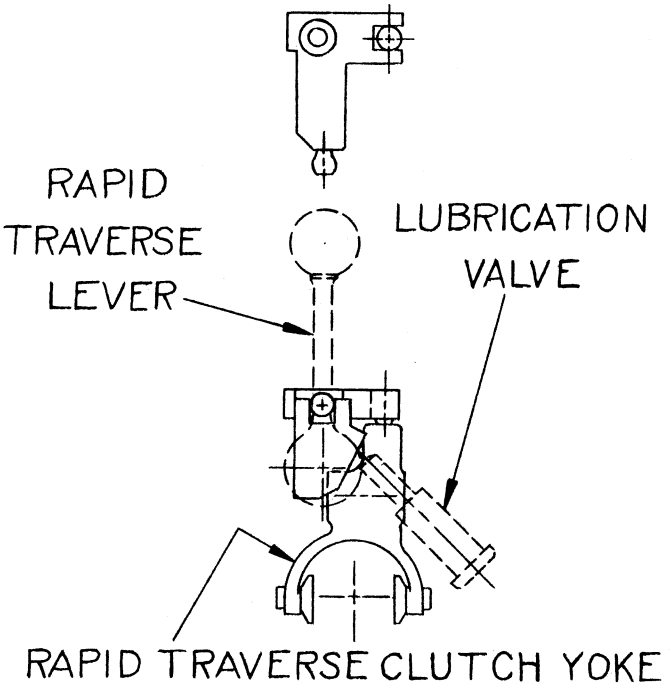


Fig. 23 CARRIAGE RAPID TRAVERSE MECHANISM

The ratchet sliding head type bar feed is actuated by a second hydraulic cylinder working in timed relation with the collet chuck cylinder. The control valve on front of the head is manipulated by a small hand lever. An instruction plate gives directions for operation. A spring and plunger type detent indicates the operating positions by "feel". The valve can be disassembled for cleaning by removing four socket head screws in front.

The bar is held by a two jaw revolving chuck mounted on ball bearings in the sliding head and movable along the support bars by pawl and ratchet. The chuck jaws are opened and closed by a double socket adjusting screw reached by raising the hinged guard. To load the bar swing front end of support tube out to allow clearance for machine.

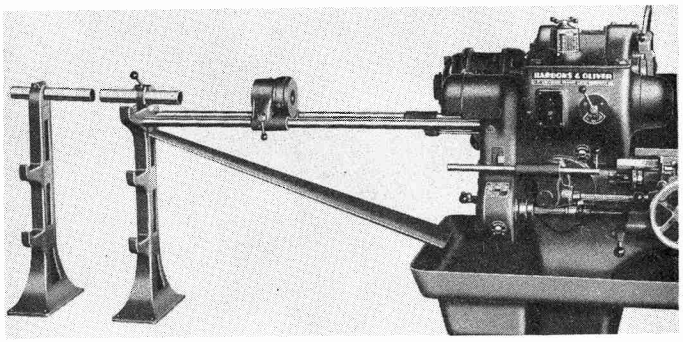


Fig. 24 CONTROL LEVER FOR HYDRAULIC COLLET CHUCK AND BAR FEED

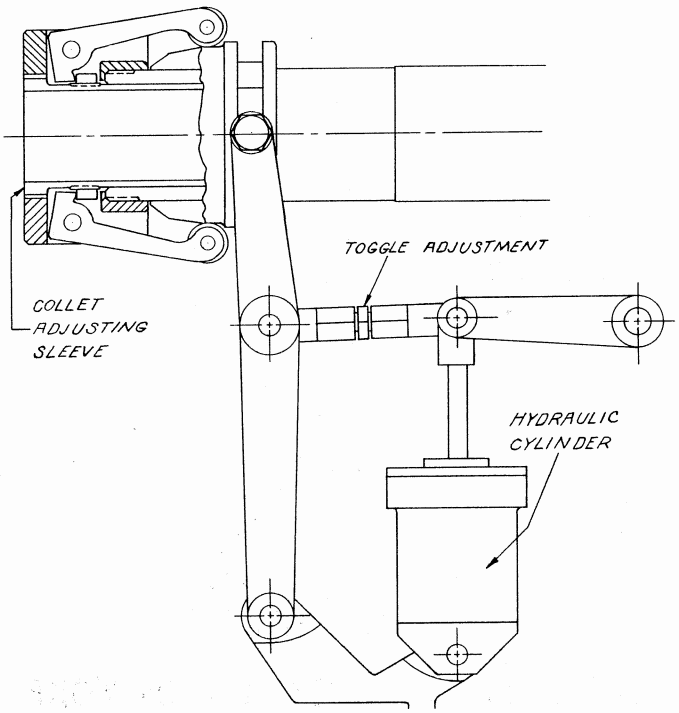


Fig. 25 HYDRAULIC ACTUATING MECHANISM FOR COLLET CHUCK

THREAD CHASING ATTACHMENT

If this unit is required it is advisable that it be installed at the factory as original equipment. However, it can be mounted on a machine already installed in the user's factory.

Remove the closer plate on the left end of carriage apron. This is jig drilled to fit the jig drilled flange of the attachment. Before the final tightening of the socket head screws and reaming of the dowel pin holes check the alignment of the leader on the feed shaft with the bearing hole in the attachment. It is important that these be in correct alignment, which may require a hand scrapping operation.

To mount leader disconnect feed shaft at the head end bracket. When tightening nut use two wrenches one on the leader and one on the nut. The follower is fully enclosed against chips and dirt.

To insert or change follower unscrew cover on top and mount follower with hole engaging ball end of lever. The follower can be adjusted in relation to the leader by a screw accessible from below. This adjusts the length of the leverage and thus the throw of the follower.

For thread cutting, lift lever until plunger engages hole in plug. For manual disengagement at end of thread depress lever ball. For automatic disengagement use any one of the six carriage stop screws against the longitudinal stop rod. A spring on the lever shaft enclosed in the bracket disengages follower from leader.

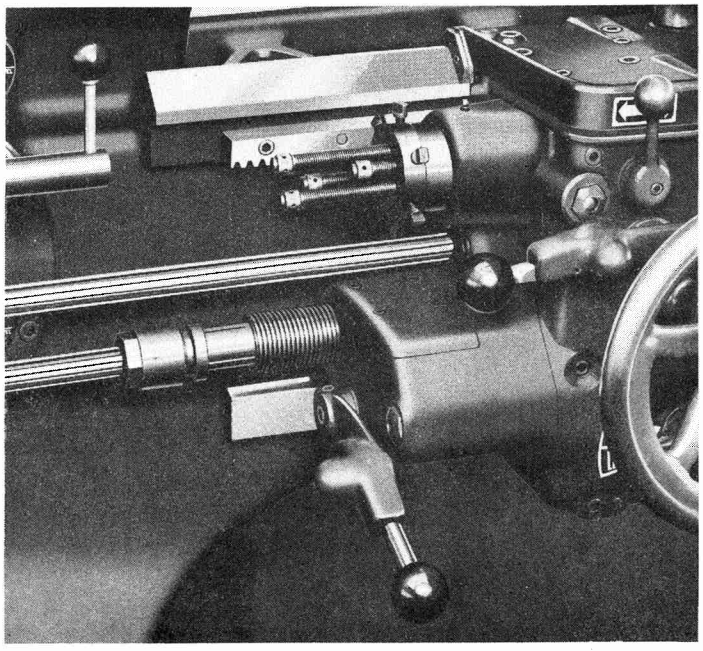
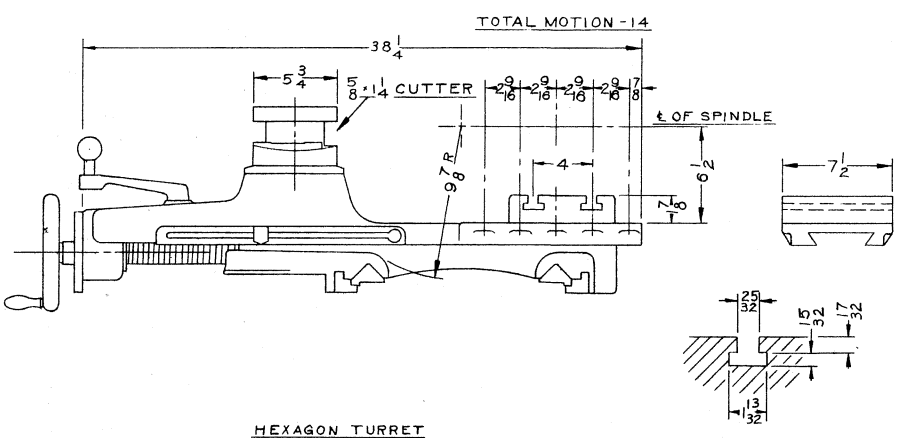
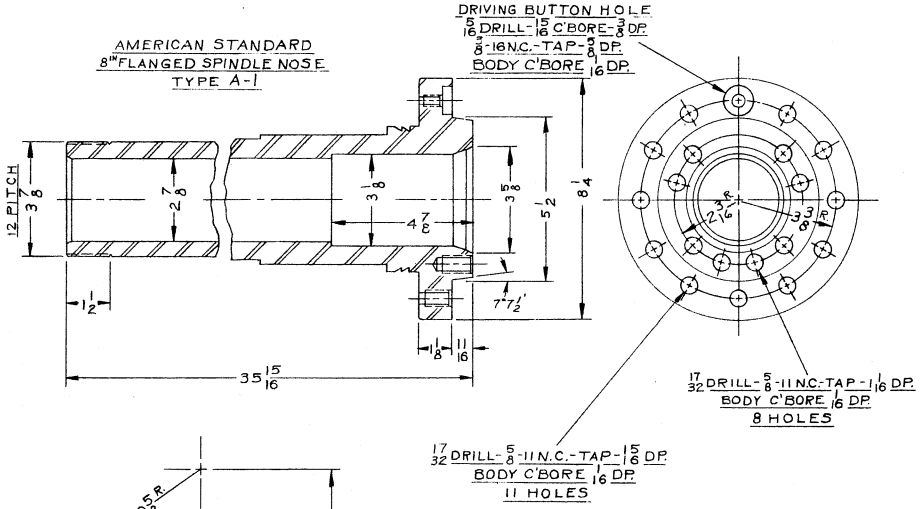
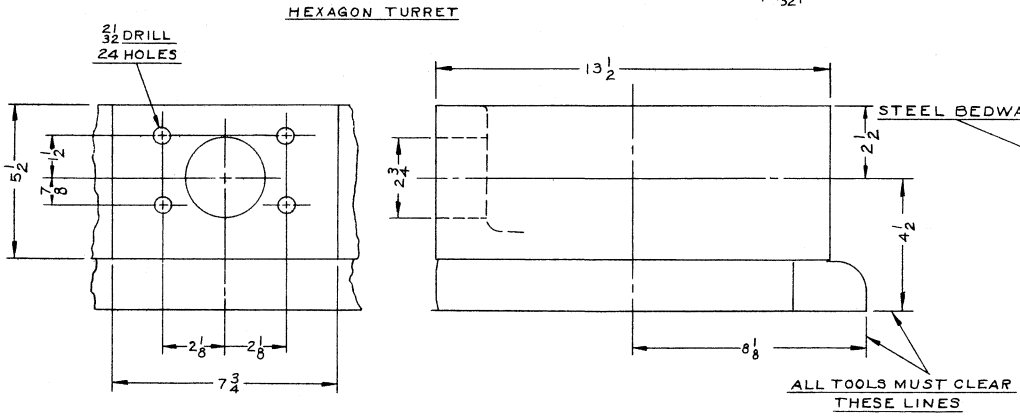
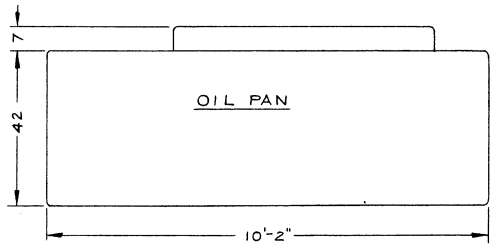


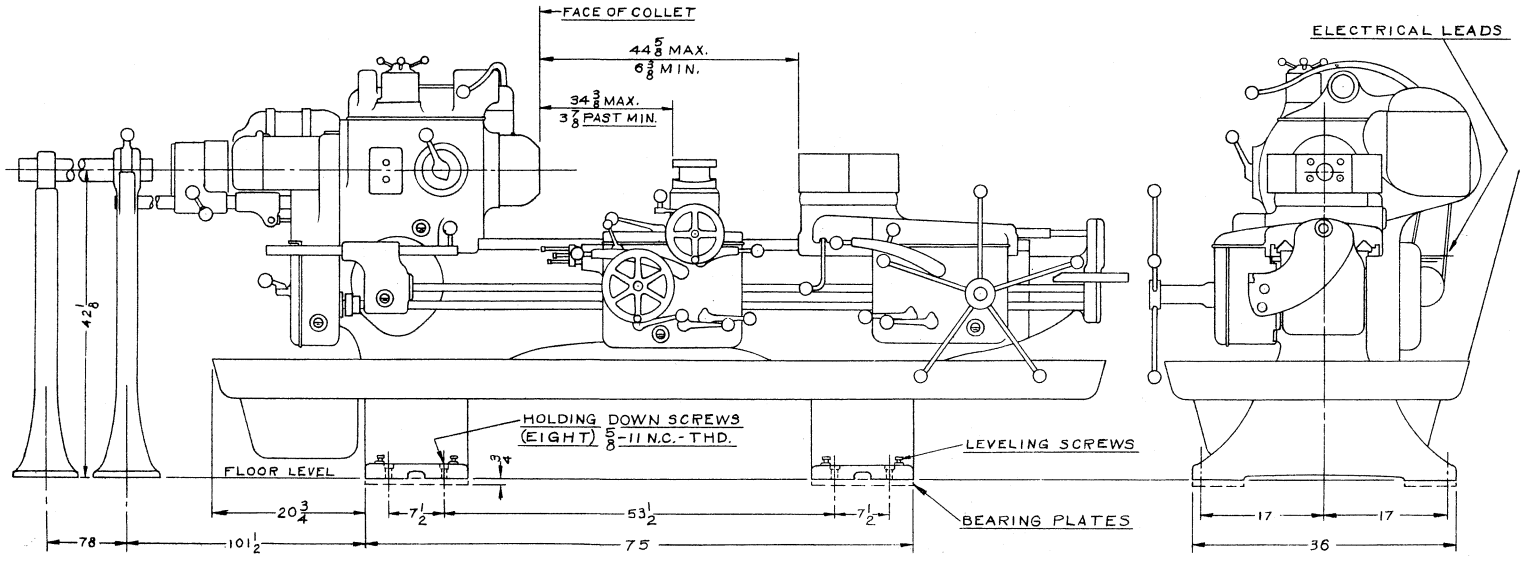
Fig. 26 THREAD CHASING ATTACHMENT











SPINDLE SPEEDS

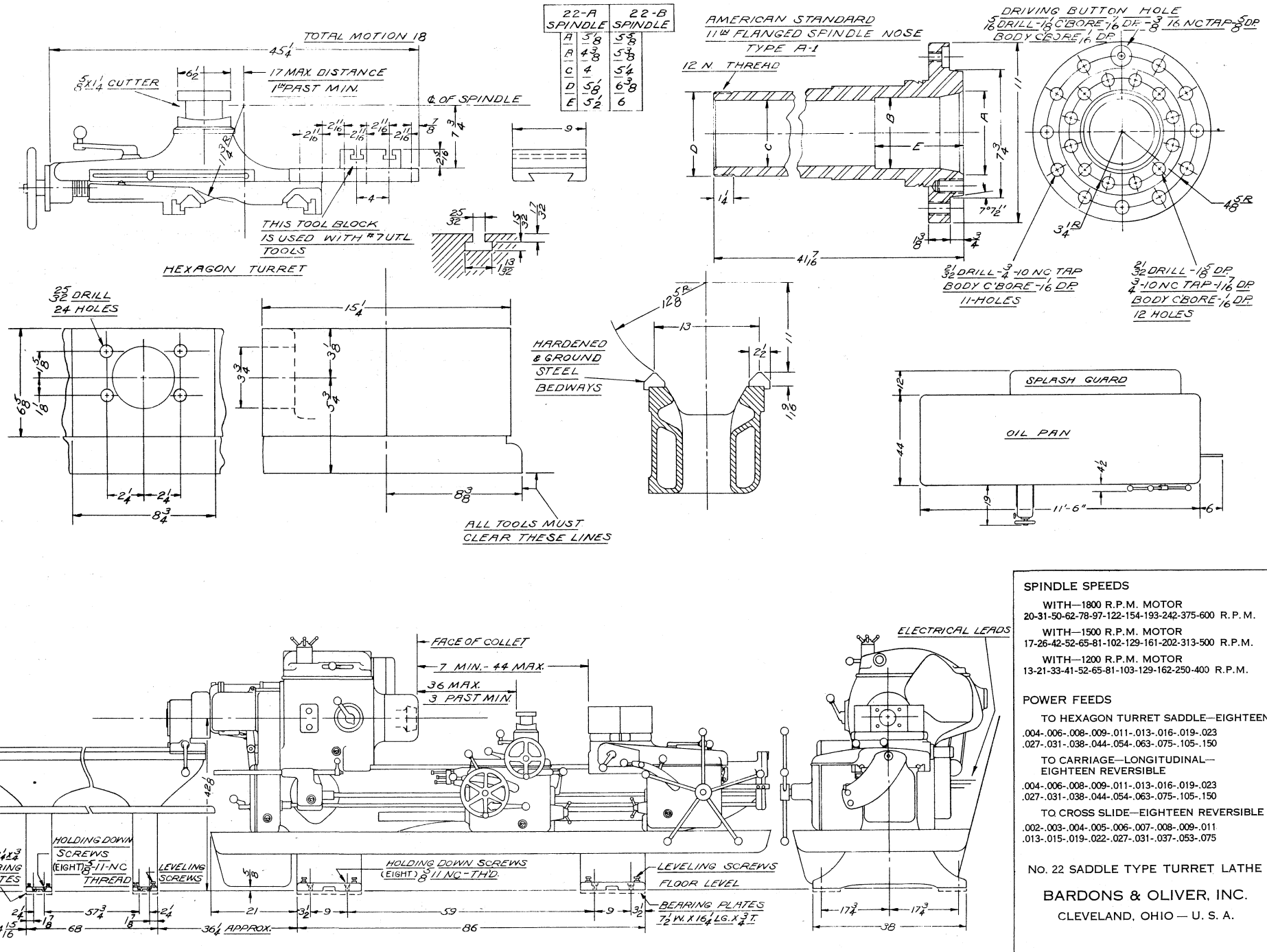
WITH—1800 R.P.M. MOTOR
28-45-68-84-101-134-161-206-247-305-482-743 R.P.M.
WITH—1500 R.P.M. MOTOR
23-37-57-70-84-112-134-172-206-254-401-619 R.P.M.
WITH—1200 R.P.M. MOTOR
19-30-45-56-67-89-107-137-165-203-321-495 R.P.M.

POWER FEEDS

TO HEXAGON TURRET SADDLE—EIGHTEEN
.004-.006-.008-.009-.011-.013-.016-.019-.022
.026-.031-.037-.044-.052-.062-.073-.100-.142
TO CARRIAGE—LONGITUDINAL—
EIGHTEEN REVERSIBLE
.004-.006-.008-.009-.011-.013-.016-.019-.022
.026-.031-.037-.044-.052-.062-.073-.100-.142
TO CROSS SLIDE—EIGHTEEN REVERSIBLE
.002-.003-.004-.005-.006-.007-.008-.009-.011
.013-.015-.018-.022-.026-.031-.036-.050-.070

No. 21 SADDLE TYPE TURRET LATHE

BARDONS & OLIVER, INC.
CLEVELAND, OHIO — U. S. A.



SPINDLE SPEEDS

WITH—1800 R.P.M. MOTOR
20-31-50-62-78-97-122-154-193-242-375-600 R.P.M.

WITH—1500 R.P.M. MOTOR
17-26-42-52-65-81-102-129-161-202-313-500 R.P.M.

WITH—1200 R.P.M. MOTOR
13-21-33-41-52-65-81-103-129-162-250-400 R.P.M.

POWER FEEDS

TO HEXAGON TURRET SADDLE—EIGHTEEN
.004-.006-.008-.009-.011-.013-.016-.019-.023
.027-.031-.038-.044-.054-.063-.075-.105-.150

TO CARRIAGE—LONGITUDINAL—EIGHTEEN REVERSIBLE
.004-.006-.008-.009-.011-.013-.016-.019-.023
.027-.031-.038-.044-.054-.063-.075-.105-.150

TO CROSS SLIDE—EIGHTEEN REVERSIBLE
.002-.003-.004-.005-.006-.007-.008-.009-.011
.013-.015-.019-.022-.027-.031-.037-.053-.075

No. 22 SADDLE TYPE TURRET LATHE

BARDONS & OLIVER, INC.
CLEVELAND, OHIO — U. S. A.

NO. 21-1M-2-49

LITHO. IN U. S. A.