THE BRADFORD MACHINE TOOL CO.

CINCINNATI, OHIO

LATHES AND HIGH PRODUCTION DRILLING AND TAPPING MACHINERY

Also Portable Electric Tools and Pedestal Model Grinders and Buffers

Metal Working Machinery Manufacturers For More Than A Century

Serial 8025 (Stamp)

Heavy Duty 12" X 6'

14. swing

~~360~~ 400.00

FOREWORD

The Lathe you are going to operate is a high-grade machine tool representing many hours of careful work by its makers and thousands of dollars of investment by your employer.

Upon you rests the responsibility for its successful performance and the fulfillment of the expectations of both maker and your employer, to give trouble-free service for a long time.

This lathe has been built to stand the strains and stresses of the work that will come within the range of its capacity. However, in many places there are very close fits, to fractions of a thousandth of an inch—small bearings have been used on shafts, etc., and these must be lubricated thoroughly and often. If too much oil is used, it will increase your maintenance costs slightly, however, not enough oil will result in big repair bills—**Hence Please Do Not Save Oil and Ruin The Lathe.**

Sure, this lathe will stand heavy loads. It has been designed and built to take deep cuts as well as take those fine finishing cuts which spell precision. It will not, of course, stand mis-use or abuse. Don't drop wrenches or tools on the bearing ways, or use these ways for an anvil for removing arbors from work, etc.

Take good care of your lathe and it will take good care of you by making your job easier because it will do the job so well.

Bradford Mach. Tool Co
722 Porter Street
Lansing Michigan 48905

Phone: 517-~~489-1471~~ 484-2100

Hoosier Bearing Richmond

9.00

IMPORTANT

READ CAREFULLY:

This BRADFORD LATHE is a precision machine and is built from especially selected material, thoroughly tested for accuracy and designed for adaptability. It has been carefully run-off in our factory by expert workmen, picked for their long experience and exacting work.

In crating for shipment, the utmost care has been taken to prevent damage in transit; occasionally however, due to rough handling, breakages for which the transporting agent is responsible do occur; therefore before accepting shipment be sure that the lathe is not damaged from such causes.

The serial number of this lathe is stamped in the bed at the tailstock end between the front "V" and flat way. Be sure to give this number in all correspondence regarding your **BRADFORD LATHE** to avoid delays.

ERECTION:

For best results from any machine, which depend to a great extent upon the skill of the operator, it is important that a well-lighted place be selected for its erection. The place selected should be comparatively dry to prevent corrosion and rusting of parts and while no special foundation is necessary, it is essential that the floor be firm to assure good work.

Upon receipt of shipment, remove crating carefully, but do not remove skids from under the legs until the lathe has been moved to the approximate place selected for its erection. Handle carefully to avoid injury.

If a crane is used in lifting, exercise care that none of the mechanism is injured. Ropes are always better than chains. Always see that blocking prevents the ropes from slipping, to prevent marring the finish or bending any parts of the lathe. The skids should not be removed until the lathe is placed in its permanent location.

CLEANING:

Before moving carriage and tailstock, clean slush oil from all bright surfaces, preferably with rags saturated with kerosene or naphtha, to be sure that all grit and foreign substances have been thoroughly removed, The screws and gears can best be cleaned with a brush and kerosene. After removing the slushing compound, apply a thin film of light lubricating oil on all moving parts and bearing surfaces.

INSTALLATIONS:

As with any piece of fine machinery, every lathe must be set-up properly. Accuracy cannot be expected unless this lathe is installed on a firm foundation, preferably concrete. To turn or bore straight the bed must be kept level; without twist or distortion.

After the foundation is properly prepared, remove skids from under legs and set down carefully. Leveling screws have been provided at the corners of each leg next to the holes for the hold-down bolts and it is advisable to place metal plates under them, especially on wood floors.

Leveling a lathe and keeping it level is one of the first essentials for accuracy of operation. Use only a precision level for this important part of the installation. DO NOT USE A CARPENTER'S OR MACHINIST'S COMMON LEVEL.

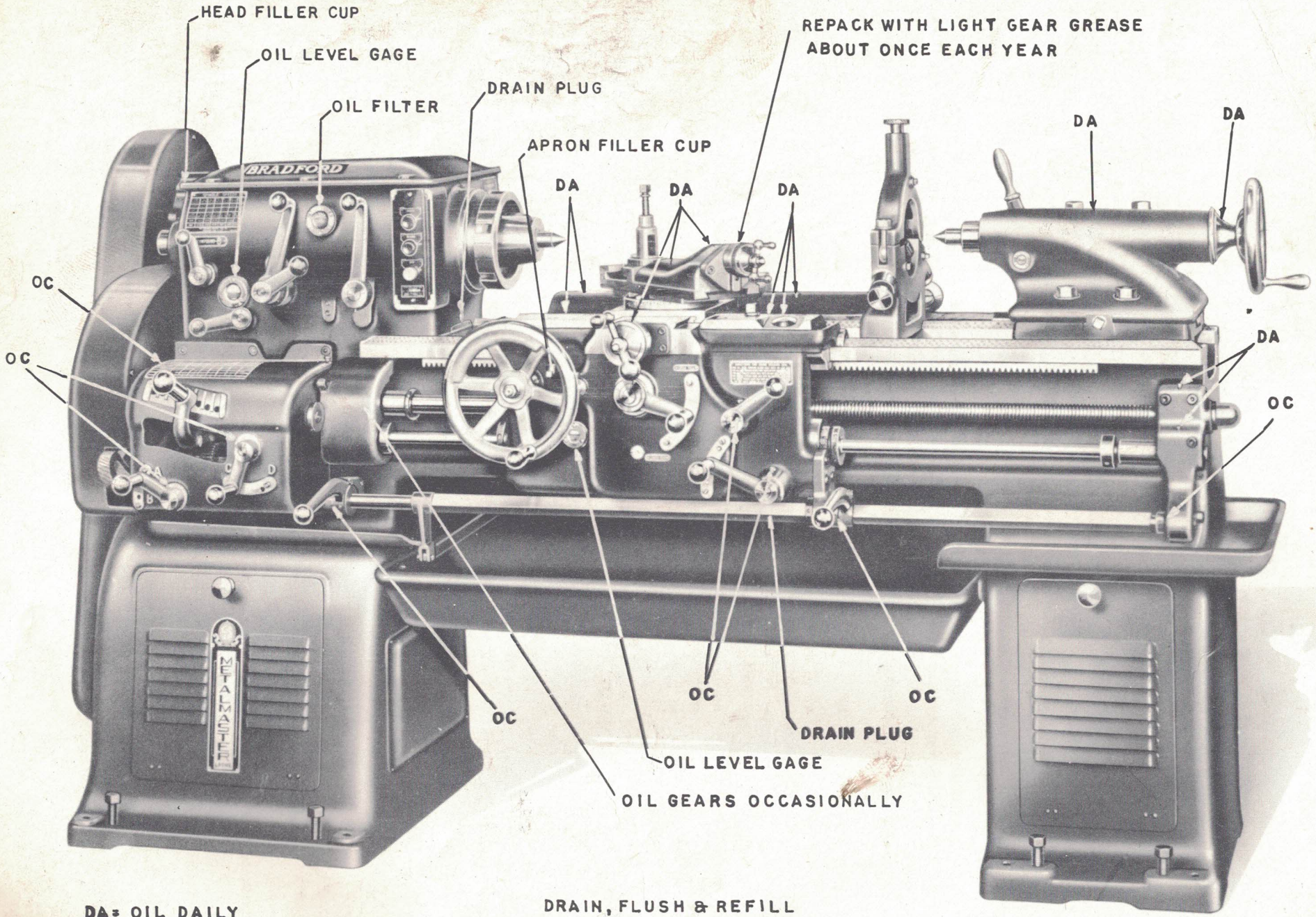
Place the level on accurate parallel blocks, one on the front and one on the rear flat bed ways, directly in front of the headstock. Adjust leveling screws in the leg under the headstock end of the bed until level, reversing the level as a check. Move the level and parallel blocks to the tailstock end of the bed and repeat the leveling operation. Recheck both ends. Bolt lathe to the floor and recheck after bolts are drawn down securely. It is not absolutely necessary that the lathe be level lengthwise but preferable. Place level on carriage lengthwise of bed and move the carriage along the bed and check for level at several points, then place the level on the carriage transverse of the bedways and repeat leveling check.

During the first few weeks of operation, or until the floor has taken a "set", the leveling should be checked frequently. If at anytime the lathe does not bore or turn true, check the leveling first.

TESTING:

This lathe has been thoroughly tested at the factory before crating for shipment; however, after setting-up it should be checked again for alignment. We recommend the use of a ground test bar with a taper shank, accurately fitted in the tapered hole in the headstock spindle and extending 12" to 18" beyond the end of the spindle. Of course, the bar should be accurate, and straight. By clamping an accurate dial test indicator in the tool post and running it along the test bar, both on top and along the front will indicate how well the lathe has been leveled and how accurately the lathe will turn and bore.

After checking the headstock spindle alignment, the tailstock should be checked. The same ground test bar should be inserted in the tailstock spindle and the dial test indicator should be run along the top and then the front of the test bar to test for alignment. To check the alignment of the headstock spindle with the tailstock, place a bar of stock about 18" long between the headstock and tailstock



DA= OIL DAILY
OC= OIL OCCASIONALLY
USE 20 SAE OIL

DRAIN, FLUSH & REFILL
HEADSTOCK & APRON
EVERY SIX MONTHS

centers and take several light cuts along the bar. Measure the diameters at both ends. If the diameters are not the same, the tailstock should be set over until the cut is straight, indicated by showing the same diameter at both ends.

LUBRICATION:

During testing operations at the factory this lathe was operated for several hours with full lubrication. Before leaving the factory, the oil was drained from the headstock and the apron, and they were thoroughly flushed. Be sure to fill the headstock and apron to the proper level as indicated by the sight gages. Saturate the felt pads in the oil reservoir on the top of the Quick Change Box, and oil other points as indicated on the oil chart. We recommend a high grade, acid free dehydrated oil of S A E 20 Viscosity. The head and apron should be drained, flushed thoroughly with a mixture of four parts kerosene and one part light lubricating oil and then refilled with clean oil every six months to one year, depending on the actual operating time the lathe is in use.

All shafts and the spindle have been provided with oil seals to prevent leakage; however, the seals may have dried out somewhat in transit and may show slight leaks at first, but they should gradually adjust themselves. A plunger pump in the headstock, operated from the spindle, forces oil through a disc filter to all the bearings, including the driving shaft and clutch housing. Dirt filtered out of the oil accumulates in the filter pocket and must be cleaned from time to time. To clean the filter, remove bezel and glass and clean out pocket and wipe outside of filter. When filter cartridge becomes clogged, it may be removed by unscrewing and cleaned by blowing out from the inside. Do not take cartridge apart as the discs may become damaged and destroy the efficiency of the unit.

The life and performance of a lathe, like that of an automobile or any other piece of mechanical equipment depends upon the attention and care it receives during the first three or four days—"the breaking in period."

Allow the spindle to run at low speed for a short period of time to see that the bearings do not overheat. Do not mistake dry oil seals for hot bearings. Squirt a liberal amount of oil between the seal leather and the shaft or spindle if these feel unduly hot.

The life of any machine depends on the care with which it is maintained. Before starting this lathe each morning, be sure that it is cleaned and oiled properly.

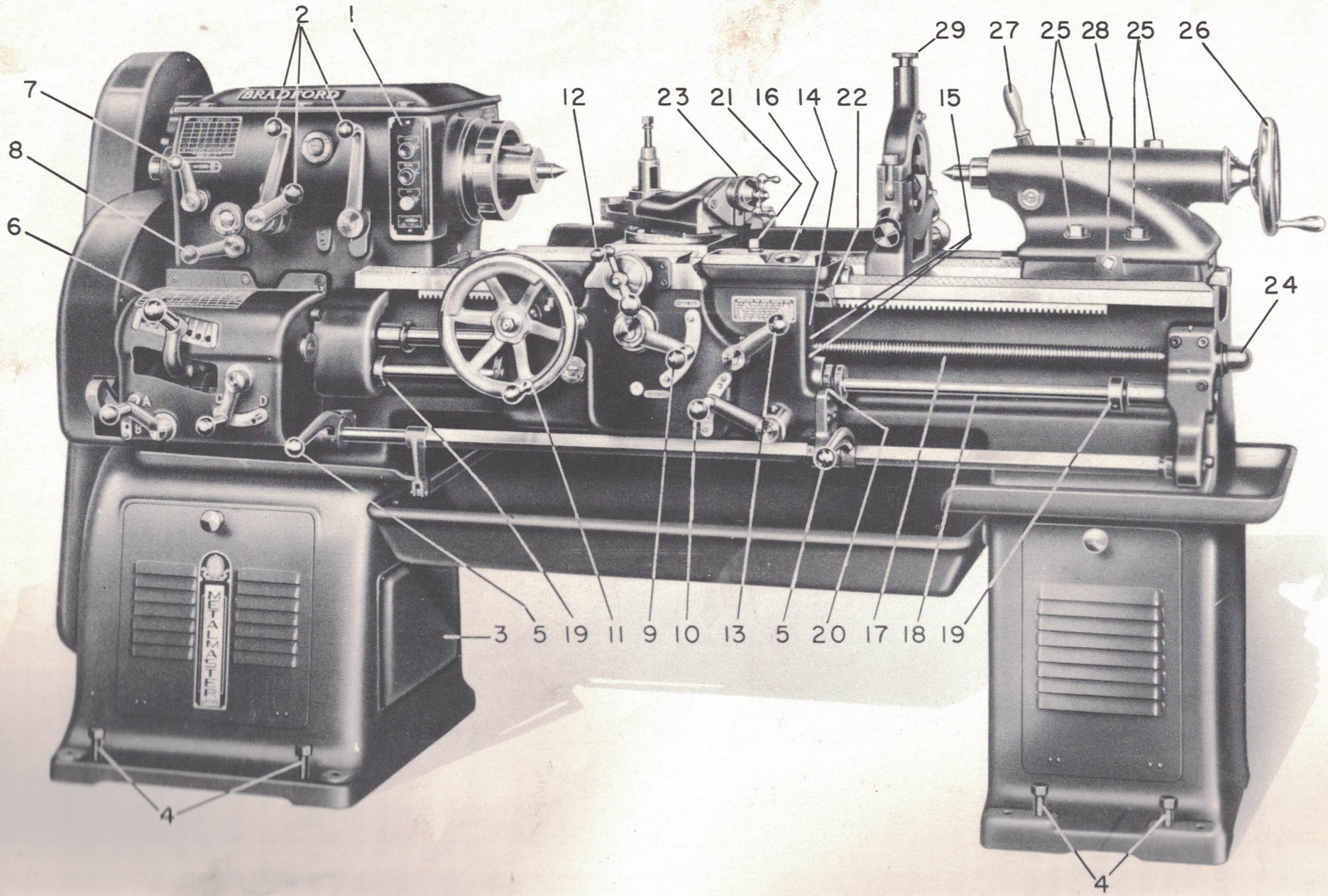
The lubrication of the headstock has been explained above. For draining dirty oil and flushing, a drain plug has been provided at the front of the head, just below the front spindle bearing. A pan should be provided to catch the drainage and to prevent the oil from running into the motor leg. An additional plug is provided in the bottom of the head toward the rear end of the spindle, accessible through the motor leg. This drain is provided to remove any sludge or dirt that may have accumulated in the gear pocket. After slushing be sure the drain plugs have been replaced securely to prevent leakage.

For adding oil, a filler is provided at the end of the head, just above and to the back of the rear spindle bearing.

The apron is also provided with a filler. It is located just in back of the hand wheel. The oil level gage is below the filler, in back of the hand wheel. A drain plug is provided on the under side of the apron on the right end beneath the feed reverse lever. As the feed reverse gearing runs in the oil reservoir, the feed rod must pass through this same reservoir. Seals are provided where possible to prevent leakage but a slight amount of oil may find its way out along the keyway in the feed rod. The oil should be replenished occasionally as required. When the oil in the sight gage shows decided discoloration, the apron should be drained, flushed and refilled with the same grade oil as is used in the steadstock.

CARE AND OPERATION:

The life of a machine depends upon the care with which it is maintained. Each unit of this lathe has been constructed from material best suited for its function and is built for efficiency and service. A good worker takes pride in his tools and we have tried to make a tool that he will be proud to operate. We have tried to make a tool that is easy to operate, is accurate and looks well. Great care has been used in the finish of the painted parts as well as the polished parts. If the machine is cleaned and oiled at the beginning of the day and care taken to prevent the marring of painted parts, it will look well throughout its entire life. Removing all oil stains (with a rag saturated with kerosene) about once a week will preserve the new appearance.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METALMASTER
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1. Forward, Reverse and Stop Push Button
2. Spindle Speed Change Handles
3. Magnetic Starter
4. Leveling Screws
5. Clutch and Brake Control Handles
6. Quick Change Box
7. Fine and Coarse Compound Lever.
8. Screw Reverse Lever
9. Length and Cross Feed Handle
10. Feed Reverse Lever
11. Hand Wheel
12. Cross Feed
13. Half Nut Operating Handle
14. Half Nut Adjusting Screw
15. Half Nut Gib Screws
16. Chasing Dial
17. Lead Screw
18. Feed Rod
19. Stop Collars
20. Stop Adjusting Nut
21. Carriage Clamp
22. Carriage Gib
23. Compound Rest Feed
24. Lead Screw Thrusting Adjustment
25. Tailstock Clamp Bolts
26. Tailstock Hand Wheel
27. Tailstock Spindle Clamp
28. Tailstock Set Over Screws
29. Steady Rest Jaw Adjusting Knob

The photograph shows the BRADFORD LATHE and enumerates the principal units and operating levers and handles.

MOTOR MOUNTING:

The motor sheave and the belts are furnished as standard equipment and will be found packed in a box fastened to the skids. They will be the correct size and ready for mounting when the motor data has been supplied with the order.

To mount the motor proceed as follows: Remove the belt guard, clutch sheave and guard back-plate from the lathe. Place the motor sheave on the motor shaft and tighten the set screws over the key, then slide the motor onto the hinged motor plate into the leg. Start cap screws through motor feet into motor plate and draw them down uniformly but not too tight, so that motor can be shifted a little. Replace the clutch sheave lock washer and nut on drive shaft. Adjust the nut carefully, as this adjusts the tension on the roller bearings. If too tight, the bearings will run hot and if too loose, will cause wear due to end play. Be sure to lock the adjusting nut by means of the lock washer.

Place a long straight-edge on the rim of the clutch sheave and align the motor sheave carefully, so that the belts will track properly without twist. Draw down screws securely so that motor cannot shift on the base.

Motor and base together can be shifted on the hinge rod if necessary. When the proper position has been found be sure to tighten the collars on rod to prevent further shifting.

Replace belt guard back-plate and fasten securely. Loosen upper adjusting nut at front of motor plate and tilt plate with motor upward until belts can be placed over sheaves. Adjust tension on belts by lowering motor plate by means of adjusting screw. Be sure belts have uniform tension, neither too tight nor too loose. Correct adjustment will prolong the life of the belts considerably.

ELECTRICAL CONNECTIONS:

All electrical connections have been made between the push button control at the front of the head and the magnetic starter in the leg, also from the starter to the junction box at the rear of the motor leg, just under the drip trough. When the motor is mounted by us, before shipment, all necessary motor connections are made and it is only necessary to make connection to supply line. When the motor is not mounted by us, it is necessary for the customer to make electrical connections to the leads supplied from the starter. Before making any electrical connections, be sure that the voltage in case of DC (direct current) or voltage, frequency (cycles) and phase in case of AC (alternating current), are correct as stated on the motor name plate, also that the lines are of sufficient size to carry the load.

After connections are made press start button to ascertain that motor is running in the right direction. If not, change line connections to suit. The motor should run (forward) clockwise when facing the sheaves from the head end of the lathe.

Check motor plate adjustment to be sure belts track properly and are under proper tension. Test starter for both forward and reverse rotation and for stopping before replacing the belt guard.

It is not necessary to depress the stop button before pressing the reverse button when the motor is running forward or vise-versa, as the motor can be reversed instantaneously. The stop button is used only to stop the motor completely. Before starting the motor be sure all oiling directions have been carefully followed.

The starter supplied as standard equipment is provided with overload protection and no-voltage release and when the motor specifications are furnished with the order, proper heaters are supplied. The starters have automatic reset and therefore require no reset buttons. Should the motor be stalled and the overload relays cut out, remove the cause; then after allowing a minute or two for the heaters to cool, start again in the usual manner.

SPINDLE SPEED CHANGES:

The spindle speed change levers are on the front of the headstock, and operate sliding gears and jaw clutches. Their correct position for various speeds is indicated on the speed plate on the front of the head. In changing spindle speeds we highly recommend that the driving clutch be first disengaged, especially when changing to higher spindle speeds, allowing sufficient time for the gears to synchronize.

With a large chuck on the spindle or heavy work between centers it is advisable to apply the spindle brake before changing speeds. With a little care and practice, the operator can soon learn to change speeds without clashing the gears or subjecting the head to sudden shocks. These slight precautions will keep the head running smoothly and avoid repair bills later on.

SPINDLE START AND STOP LEVERS: (See illustration Page 6)

One of these levers is located at the right of the apron and the other at the head end of the bed, just at the right of the quick change box. Pulling upward on the levers engages the driving clutch to start the spindle. Pushing down to the neutral or central position disengages the clutch allowing the spindle to be turned by hand. Depressing the starting handles farther engages the brake to stop the spindle quickly or hold it after stopping. When a heavy chuck is on the spindle nose or with heavy work between centers it is advisable to apply the brake gradually to avoid a sudden stop, as this may cause the chuck to spin off or loosen the driving dog on the work. With a little practice, jogging is easily effected to turn up to shoulders or for chasing threads.

The multiple disc clutch and brake have been carefully adjusted before leaving our factory and are of adequate size for the heaviest load, however, they are subjected to wear and may require adjustment from time to time. The clutch and brake are in the housing at the rear of the headstock, and partially submerged in oil, which is supplied from the pump in the head. The clutch and brake can be adjusted by removing the cover on the rear of the clutch housing. To adjust the clutch or brake (see drawing) follow directions carefully. Be sure to replace the cover plate (with gasket in place) to prevent oil leakage.

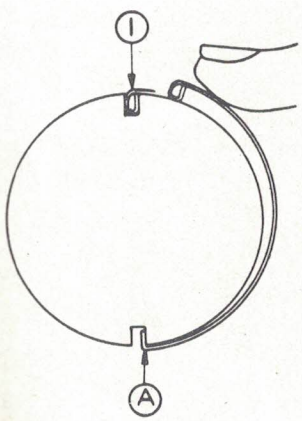
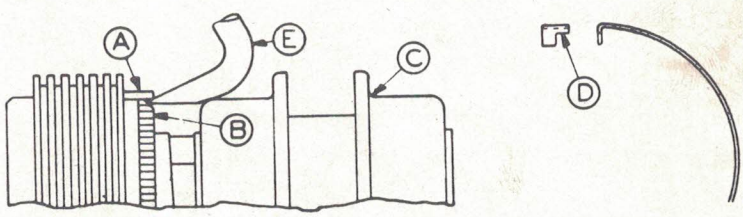


FIG. 2

Instructions For Assembling Adjustment Spring

1. First insert double width end A of spring in one slot of pressure plate.
2. Roll loop end into position 1 with the thumb.
3. Adjustment made by raising end A as per sketch below.



Instructions For Adjusting Pullmore Clutch

1. With shifter sleeve C in neutral lift end A with tool E resting on sleeve C as shown.
2. Lift spring just high enough for lip D to clear teeth on collar B.
3. Turn collar B one notch at a time—by hand.
4. Turn clockwise to tighten—counter-clockwise to loosen.

QUICK CHANGE BOX:

The quick change box provides sixty-four distinct changes. The index plate clearly indicates all the lever positions to secure any desired thread or rate of feed within the range. Compound A & B and compound C & D levers are located on the front of the box and the coarse compound lever is on the front of the headstock at the extreme left end.

To make changes with the tumbler yoke, pull out on the knob and allow the yoke to drop, slide it to the position indicated on the index plate for the thread or feed desired, raise the yoke into mesh with the gear required and allow the plunger to drop into the hole, which will hold the gears in mesh. To change compound levers A & B or C & D, pull out on knob and shift to position indicated. The compounding levers operate sliding gears and clutches, and therefore it is recommended that changes be made with the spindle clutch disengaged. It may be necessary to jog the spindle clutch slightly to engage the gears. To shift coarse compounding gears, move lever to position indicated.

The direction of rotation of the feed rod and lead screw can be reversed by means of the feed reverse handle on the front of the head, just below the coarse feed compounding handle. This handle operates single jaw clutches in the head. With moderate spindle speed and load, the feed may be reversed without first disengaging the spindle clutch, however; at higher speed it is highly recommended that the spindle be stopped before reversing the feed to prevent subjecting the gearing to severe and damaging shock.

A simple oiling reservoir has been provided on the top of the gear box to take care of all the bearings and gears. The reservoir is provided with felt pads so that grit and dirt cannot be carried to the bearings with the oil. Filling this reservoir once daily will provide filtered oil all day where necessary. Do not remove pads, except for cleaning when necessary.

The Feed Box is driven from the headstock through a quadrant gear at the end of the lathe. The gear is mounted on an adjustable quadrant plate that swivels on the end of the feed box and is held in position by means of two studs and nuts, and is accessible by removal of the gear guard. This quadrant gear rotates on a hardened steel stud bushing held in place by a T bolt. An oiler is provided in the hub of this gear and is accessible from the back of the lathe between the head and the belt guard without removing the gear guard.

The quadrant gear need not be removed unless it is desired to replace it with compound gears or with metric translating gears. The quadrant gear is provided with a long hub having a keyway for mounting such compound or translating gears.

When meshing the quadrant gear it is imperative that it mesh properly with the stud pinion and also with the feed box drive gear. To do this, place a piece of cellophane between the teeth of the quadrant gear and the feed box drive gear and hold gears in mesh while tightening the T Bolt. Next, place a piece of cellophane on the quadrant gear and raise the quadrant plate to mesh the quadrant gear and stud pinion and hold in place while tightening the stud nuts on the plate. Be sure to remove cellophane before operating. This procedure will assure proper clearance for the gear teeth.

APRON:

The apron is of double wall construction, carrying all the necessary gears for operating the carriage and cross slide. The feed movement of the carriage and cross slide is controlled by handle 9 just below the cross feed dial. By pulling out on the knob and pulling the handle upward as far as possible engages the cross feed gearing. By pushing downward on the handle as far as possible engages the carriage traverse gearing. The middle position is neutral in which position both feeds are disengaged.

The lever at the lower right and bottom of the apron is used to reverse the feeds, either the cross feed or the length feed. The center or neutral position is provided for disengaging the feed reverse gears when the lead screw is used. The lever (9) must be in the center or neutral position when the hand feed is used. The hand wheel at the left of the apron is used for feeding the carriage by hand. The cross feed may be operated by hand by means of the ball crank at the front of the slide. The cross feed is equipped with an adjustable micrometer dial for gauging the depth of the cut. Each graduation on the dial indicates a feed of one-half thousandth of an inch which is a reduction in diameter of one-thousandth of an inch.

For chasing threads, a pair of hair-nuts are engaged with the lead screw by means of a lever (13) at the right of the apron and can only be operated when the lever (10) is in the neutral position. Pushing downward on the lever, engages the half-nuts. A simple interference device prevents the engagement

of the feed gearing and the half-nuts at the same time, thus preventing damage to the gearing. The half-nuts are engaged easily and should not be forced. If seeming unnecessarily hard, investigate the feed reverse handle, it may not be in neutral.

A screw (14) at the side of the apron is used for adjusting the depth to which the half-nuts engage the lead-screw. Turning this screw in a counter-clockwise direction allows the half-nuts to grip the lead screw tighter and take up for wear. To adjust the half-nuts, press down on handle (13).with light but firm pressure and turn screw (14) counter-clockwise until half-nuts are closed on the screw.

The half-nuts should now be opened slightly by turning screw (14) clockwise slightly, but not enough that the half-nuts are loose on the lead screw. The half-nuts slide in a dovetailed slide having an adjustable gib. The gib is tightened by screws (15) on the side of the apron and should be adjusted to take all undue play out of the half-nuts, but allowing sufficient clearance for the half-nuts to slide freely but without shake.

The feed or the leadscrew may be reversed by the reverse gearing in the headstock by means of a lever (8) on the front of the headstock, just below the coarse compounding lever, so that either left or right hand threads can be chased.

A chasing dial for "catching" threads is built into the top of the carriage at the right and is used in the following manner: The carriage is brought to the starting point of the thread by hand, watching the graduations on the dial as they pass the index mark on the carriage. As one particular graduation, say zero, coincides with the index mark, the half-nuts are closed. The chasing dial will remain stationary until the half-nuts are again opened at the finish of the thread. Withdraw the tool from the thread and return the carriage again by hand to the start of the thread and as before watch the chasing dial, closing the half-nuts as some particular graduation coincides with the index mark. The graduation to use will depend on the thread being chased.

For any number of threads per inch divisible by four the half-nuts can be closed at any point without regard to the chasing dial. For all other even threads close the half-nuts on any line. For odd full threads close the half-nuts on any numbered line. For half threads, for example 11½, close half-nuts on every half revolution of the chasing dial, that is 0-2 or 1-3. For quarter threads, every full revolution. For eighth threads every second revolution.

When turning or boring, the half-nuts should be disengaged from the leadscrew and the feed rod used for moving the carriage. An automatic length stop is provided for turning and chasing in either direction. Stop collars are located on the feed rod on either side of the apron and may be slid along the feed rod and locked in position which will disengage the clutch at the proper instant. For close adjustment a screw collar is provided at each side of the apron. After setting the stop collars roughly to location, the screw collars are adjusted and locked by means of locknuts.

When facing, the carriage should be locked in position along the bed by means of the clamp screw on the top of the right front wing. The carriage is also provided with adjustable gibs to compensate for wear. One long gib is provided at the rear and a short gib at the outer end of both front wings.

COMPOUND REST:

The compound rest unit comprises a rest slide for holding the tool post and is movable on a dovetail slide by means of a feed screw and ball crank handle. A graduated dial is geared to the screw and indicates the slide travel. It is graduated in half-thousandths inches just as is the cross feed dial. The swivel base is mounted on the compound slide proper and is graduated in degrees and can be swung in a complete circle for turning or facing at any desired angle. "T" bolts are provided for locking the swivel in any desired position.

Both compound rest and cross slide are provided with adjustable gibs to take up wear. When such adjustment is necessary, tighten all gibs screws evenly but not too tight, yet sufficiently to take out unnecessary play.

The dial gears are packed in grease in their housing and should be repacked with a light high grade gear grease about once each year. This can be done by removing the gear housing supporting the dial shaft.

CARE OF BED:

The bed is the foundation of the lathe and is used to support all of the various units. The headstock and tailstock are supported on the inner "V" and flat which assures the centers being in perfect alignment regardless of the length of work between them, within the capacity of the lathe. The carriage is supported and slides on the outer "V" and flat. The vees and flats are planed straight and parallel at one setting and are then scraped to close tolerances.

Be sure the ways are always kept clean and free from chips and cuttings as the life of the ways is vital to the life of the bed and therefore the accuracy of the work that can be done on the machine. Do not use the bed as a tool try or an anvil on which to drive arbors in or out of work. A small wooden tray should be provided to hold tools.

The carriage wings are provided with synthetic rubber shear wipers to clean the ways as the carriage is moved; however, it is well to occasionally wipe the way carefully to remove chips and cast iron dust. Examine the ways occasionally to see if they have become marred or chipped in any way. If they have, file the spot carefully to a smooth finish but do not file holes which will cause the carriage to bump along. As the shear wipers wear, they may require a slight adjustment. To adjust: loosen the brass retainers slightly and with a thin piece of steel push the wipers down securely on the shears. Be sure to tighten screws after adjusting.

Whenever grinding is done on the lathe, be careful to cover the ways under the grinding wheel to prevent emery from falling on them, and when finished, always wipe the ways with a clean cloth saturated with oil to pick up loose dust and grit that may have accumulated.

Occasionally examine the feed rack to be sure that it is tight and that the teeth are free from gummy dirt.

STEADY REST:

The steady rest is used to support long and slender work when turning or chasing and to prevent it from springing under pressure of the cutting tool when turning between centers. It is also used when turning work that cannot be supported by the tailstock center in the usual manner, in which case the work is driven by a dog, clamped in the usual manner; but tied back to the face plate with a rawhide thong. The steady rest is supported on the inner ways and is secured to the bed by a clamp under the ways. It may be used at any desired position along the bed.

The jaws are round with replacable tips. Cast-iron tips are regularly furnished but bronze can be supplied when necessary. To replace tips; remove round jaws and drive out old tips and drive in new ones. In replacing jaws be careful that keyways are in line with the set screws.

When using steady rest, adjust the jaws carefully so that the work runs true but not too tight. When jaws are properly adjusted by means of the knurled knobs, lock with the set screws provided for that purpose.

FACE PLATES:

Two face plates are furnished with your BRADFORD LATHE. The small one, or dog plate; is used for driving work, such as shafts, mandrels, etc., by means of a bent tail dog clamped on the work. The dog tail is engaged in the open slot for driving.

The large plate performs the same function as the small one, except for larger work. Blocks, plates or small fixtures can be mounted on it and held by means of clamping screws in the slots.

These plates are screwed on the nose of the spindle for driving and are held central and true by a doweled fit at the rear of the threads. When a face plate or chuck is placed on the spindle, be sure that the bore and the threads are clean and free from dirt and chips and that the spindle nose itself is clean. Unless this precaution is taken, work will not run true. These plates are accurately fitted and should be maintained in good condition if accurate work is expected from your lathe. The face plates may be removed from the spindle and replaced by chucks or special fixtures as the work requires.

TAILSTOCK:

The tailstock unit consists of the stailstock top, tailstock bottom and tailstock clamp. The unit is movable along the ways of the bed to accommodate varying lengths of work within the capacity of

the machine and clamped in position by three clamping bolts. Before moving the tailstock, be sure the ways are clean and free of chips or any foreign matter that will throw the center out of alignment with the headstock center. The tailstock spindle is moved in or out of the tailstock barrel by a screw and handwheel. The front end of the spindle is bored and reamed to a Morse taper to hold the tailstock center, drills, drill chucks and reamers. To remove the tailstock center or tools as mentioned above, run the spindle back as far as it will go or until the inner end of their shank strikes the end of the screw, which will force them out of the tapered hole. Before replacing center, drills, etc., clean shank carefully and also the tapered hole in the spindle. Place a few drops of oil on the tool inserted in the spindle and spread over the surface to a thin film, then run the spindle out by a few turns of the handwheel and push center, drills, etc., in securely.

For turning tapers, the tailstock top can be set over by means of set-over screws in the tailstock bottom. The amount of set-over is indicated at the end by index lines. Before adjusting the set-over screws loosen the clamping bolts and tighten again after making the adjustment.

The tailstock spindle is clamped into position by a hand lever at the rear of the tailstock barrel. The locking position of the handle is adjustable by tightening or loosening the nut at the end of the handle screw.

FOLLOW REST:

The follow rest also is used for turning slender work as well as to prevent screws from springing when chasing. It is fastened on the side of the bridge of the carriage in the tapped holes provided and may be removed when not needed. The jaws are round with replacable tips. Cast iron tips are regularly furnished but bronze can be supplied when necessary. To replace tips; remove the jaws and drive out the old tips and drive in the new ones. In replacing jaws be careful that the keyways are in line with the set screws. When using the follow rest, adjust the jaws carefully so that the work runs true. After the jaws have been properly adjusted by means of the knurled knobs, lock with the set screws.

TOOL POST:

The tool post furnished with your BRADFORD LATHE is of the round pattern type with hardened ring and wedge. The square base is slid in the "T" slot to the desired position on the compound rest. After the tool is placed in the tool slot on top of the wedge, move back or forth on the ring to adjust the height of the tool nose to the center of the work. The tool post screw is then tightened which clamps the tool and the post in position.

Solid tools as well as tool bit holders can be used in the tool post. When it is desired to use special or multiple tools, special blocks can be clamped in the compound slide T slot.

APRON LEAD SCREW REVERSE:

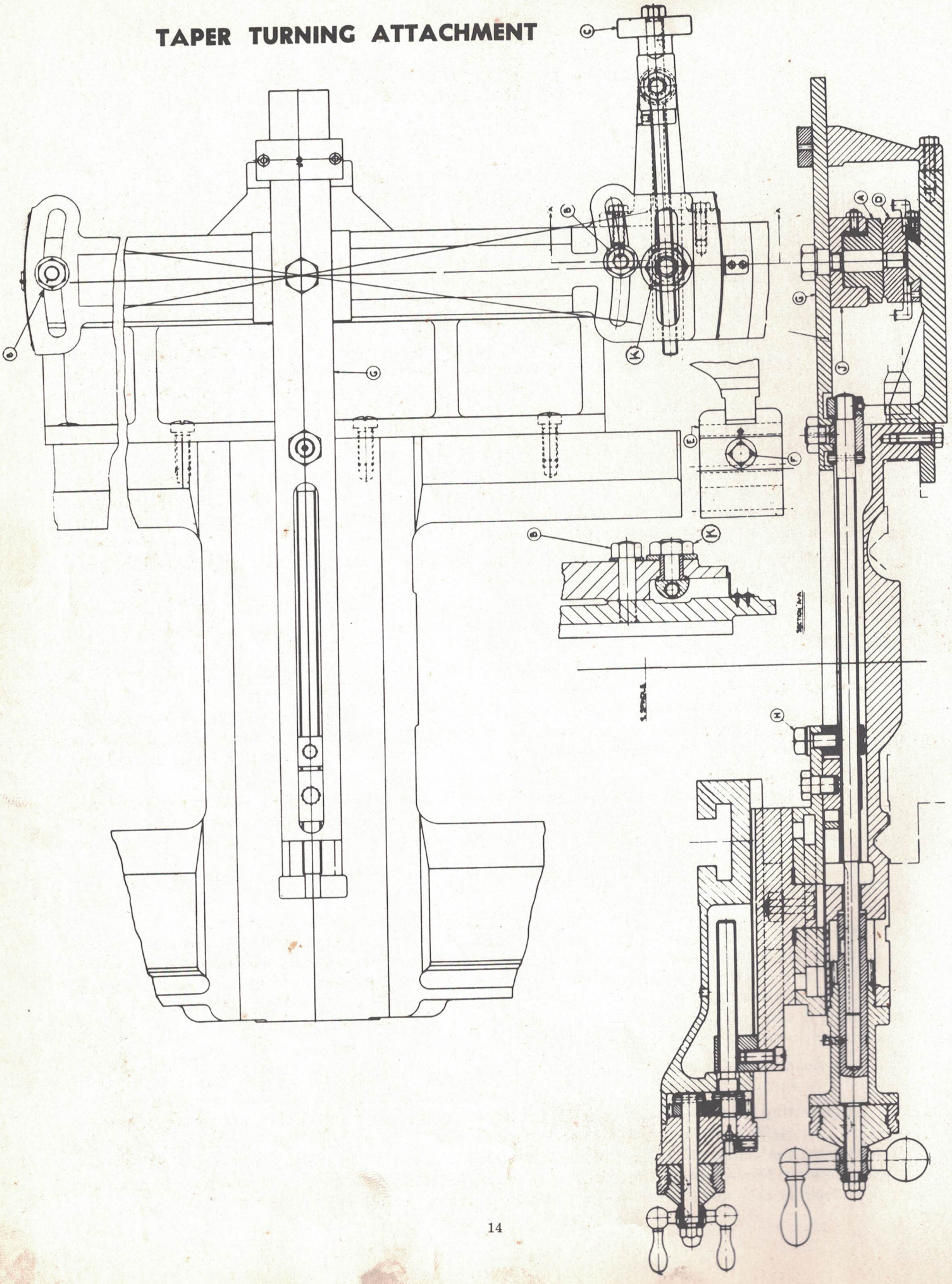
Operated from the right side of the apron, it is possible to reverse the leadscrew and feed rod to move the carriage or cross feed in either direction without changing the direction of rotation of the spindle.

When the half-nuts are engaged and the handle is raised as far as possible the carriage will move toward the tailstock and when pushed downward the carriage will travel toward the headstock. A central or neutral position is provided in which both forward and reverse clutches are disengaged and of course the movement of the carriage is stopped. By means of the apron control leadscrew reverse, it is possible to chase either right or left hand screws and it is especially useful for chasing threads hard to "catch" with the chasing dial; especially short threads.

Stop dogs on the operating rod can be set to automatically trip the clutches in either direction for chasing or turning up to a shoulder.

After setting the tool for the first cut, engage the feed clutch by pushing the operating handle downward (for right hand thread) allowing the carriage to travel until the full length of thread is cut. Pull upward on the handle to the neutral point, to disengage the clutch. Withdraw the tool from the cut, and pull the lever farther upward to reverse the feed to return the carriage to the start of the cut. Advance the tool for each successive cut and repeat the chasing operations until the screw is finished.

TAPER TURNING ATTACHMENT



When the spindle is operating at high speed it is not advisable to throw the reverse gearing "in" without first disengaging the drive clutch and slowing down the spindle. It is quite obvious that the entire feed gear train would be subjected to severe shock and may result in costly damage unless this simple rule is followed.

TAPER TURNING ATTACHMENT:

The taper attachment is securely bolted to the rear of the carriage and therefore always in position and ready for use at any point along the bed. It is quite simple in operation and easy to adjust.

The swivel slide is graduated in both degrees (left end) and inches taper per foot (right end) and has a micrometer screw adjustment. The maximum capacity is 4 inches taper per foot or about 9½° (19° included angle) either side of center and a length capacity of 16″ at one setting.

In operation, the swivel bar "A" is first roughly set to the desired angle by loosening the clamping nuts "B" and the nut "K." Tighten nut "K" and adjust by knob "C" to the angle as indicated by the graduated scales on either end of the bar. Finer adjustment can be made by means of the graduations on the extension of knob "C." Each graduation represents approximately one minute, therefore four complete turns of the knob will change the angle one degree. After setting the swivel bar, lock in position by means of nuts "B". When it is necessary to use the greater part of the length travel, the bottom slide "D" must be pulled or pushed to a position to allow for sufficient movement. This may be done by moving the slide by hand or by tightening clamp "E" to the bed by means of screw "F" and moving the carriage until the slide is in the proper position.

Loosen clamps "E" and screw "H", and set the tool in position for the first cut by means of the carriage and the cross feed or compound rest. Lock clamp "E" to the bed and lock the attachment bar "G" to the cross slide by screw "H". All subsequent tool adjustments for depth are made from the compound rest feed.

It is well to test all adjustments by moving the carriage by hand before applying the power feed.

As the carriage moves along the bed the shoe "J" with the attachment bar "G" moves the cross slide either toward or away from the work an amount depending on the angular adjustment of the swivel bar "A". Thus it can be seen that either right or left taper can be turned with the attachment.

The POWER cross feed must NEVER be engaged while the attachment bar "G" is clamped to the cross feed slide.

Adjusting gibs are provided to compensate for wear on the bottom slide "D" and the shoe "J". Care must be exercised in making adjustments of these gibs. If too loose, the attachment will not turn true tapers and if too tight will cause chatter in the work. Oil all working parts as needed and keep slides in clean condition.

When attachment is not in use be sure clamp "H" is loose. Clamp "E" may be loosened and allowed to slide along bed; however, it is better to remove the clamp from the attachment and secure it to the bed at some position out of the way. To remove the clamp "E" from the attachment, loosen screw "F" until the clamp can be raised clear of the projecting lip on bottom slide "D".

In tightening clamp to the bed, be sure it fits firmly and is not cocked on the flat way.

THREAD CHASING STOP: "Rapid In & Out Feed" (With Taper Attachment)

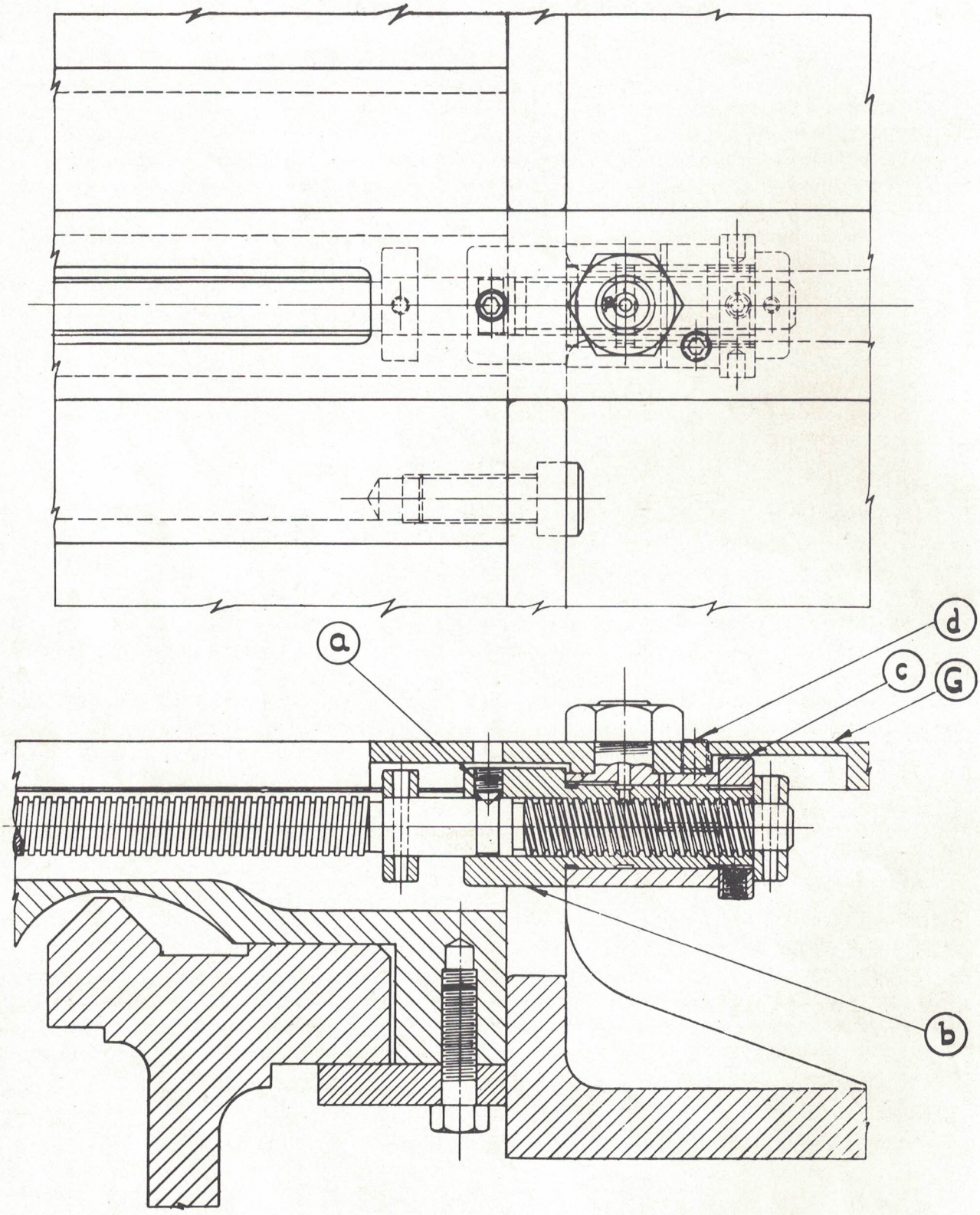
The thread chasing stop is quite simple to operate and can be used to advantage for chasing, or on repetitive turning operations since the cutting tool can be withdrawn from the work rapidly (three to one ratio) after each successive cut and returned to its previous position without changing the dial setting. The necessary adjustments are easy to make and can be accomplished in a few minutes.

Remove chip guard from rear of slide by loosening slightly the two round headed holding screws and slip the guard off the slide. This will expose the locking screws "a" and "d" in attachment bar "G".

When chasing, adjust tool in tool post to correct position for thread. Withdraw tool by cross slide handle about three-quarters to one inch or until screw "a" is in line with hole in attachment bar "G". Back off screw "a" until outer end is flush with top of hole in nut "b". Do not remove screw "a" or back it out so that it protrudes into the hole in the attachment bar. Leave wrench in socket head of screw "a" and through hole in bar, then advance cross feed to the stop collar. This position will be definitely noticeable when the wrench comes in contact with the side of the hole in the bar. Remove the

THREAD CHASING STOP

Rapid In and Out Feed with Taper Attachment



wrench from screw "a" and the bar, and advance the cross slide until the tool is at the full depth of cut or the bottom diameter of the screw to be chased.

With the same hex socket wrench tighten screw "d" in the bar, to lock nut "b" from rotation.

All further tool adjustments are made by means of the compound rest feed. Withdraw tool by means of the compound rest feed handle to the outside diameter of the work and set the feed dial to zero. Advance the compound rest to the cutting depth desired and take first cut. After taking each successive cut withdraw the tool by means of the cross feed sufficiently for the tool to clear the work. Return the cross feed each time to the stop and feed in on compound rest for depth of cut, noting dial readings. Each graduation represents one-half thousandth feed or a reduction in diameter of work of one-thousandth. For boring or internal chasing, the cross feed is fed outward before locking nut "b" by means of screw "d" and of course the feeding operations are the reverse of chasing or turning external work.

To disengage the chasing stop and return the cross feed to the conventional feeding arrangement. Withdraw the cross feed slide to the outward stop. Release nut "b" by loosening screw "d". Rotate feed handle counter-clockwise until the screw "a" is in line with the hole in the attachment bar and lock cross feed screw by means of screw "a". Tighten screw "a" securely to prevent any slipping during any future turning operation. Any unnecessary end play that may develop in nut "b" due to wear can be taken-up by means of collar "c". Oil nut and screw occasionally.

Several precautions must be taken when using the rapid chasing feed to avoid damage and repairs.

DO NOT USE POWER CROSS FEED.

DO NOT LOCK ATTACHMENT BAR TO CROSS SLIDE.

KEEP CHIP GUARD IN PLACE DURING CUTTING OPERATIONS.

The rapid chasing feed can be used in conjunction with the taper attachment by following the above proceedure.

THREAD CHASING STOP: "Rapid In & Out Feed" (Without Taper Attachment)

The thread chasing stop is quite simple to operate and can be used to advantage for chasing, or on repetitive turning operations since the cutting tool can be withdrawn from the work rapidly (three to one ratio) after each successive cut and returned to its previous position without changing the dial setting.

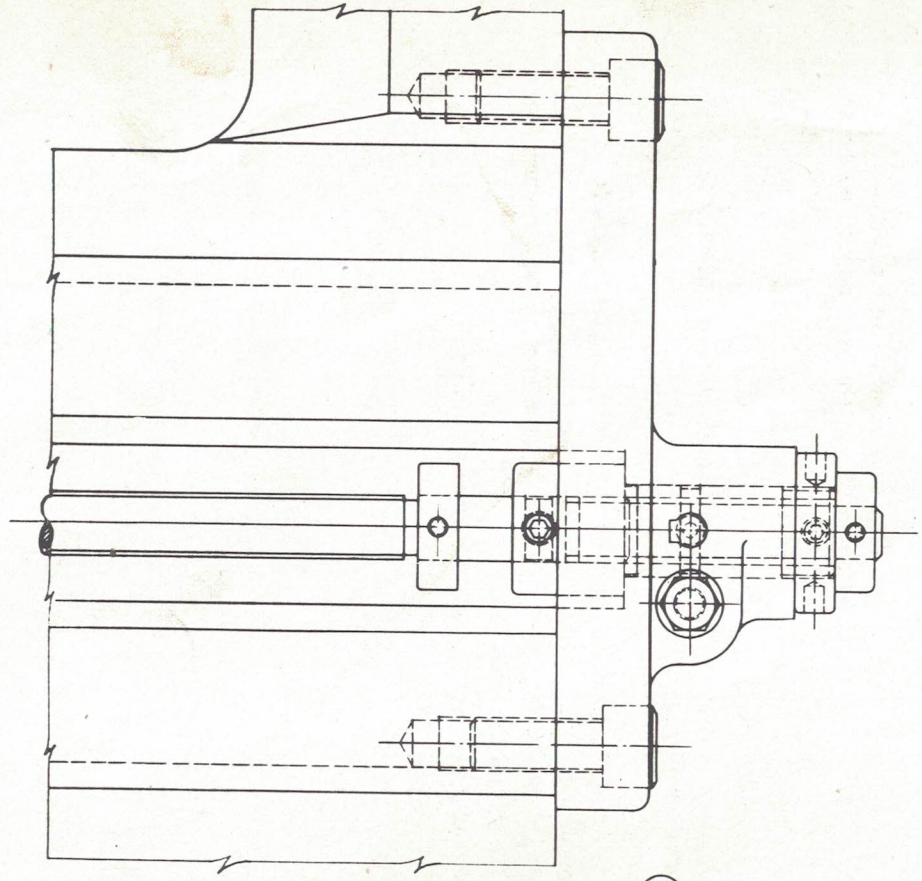
The necessary adjustments are easy to make and can be accomplished in a few minutes.

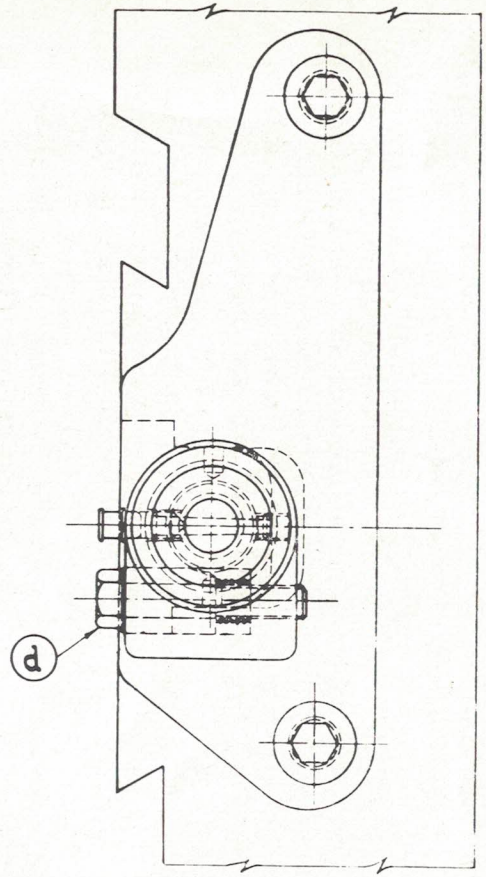
Remove chip guard from rear of slide by loosening slightly the two round headed holding screws and slip guard off side. This will expose the locking screws "a" and "d".

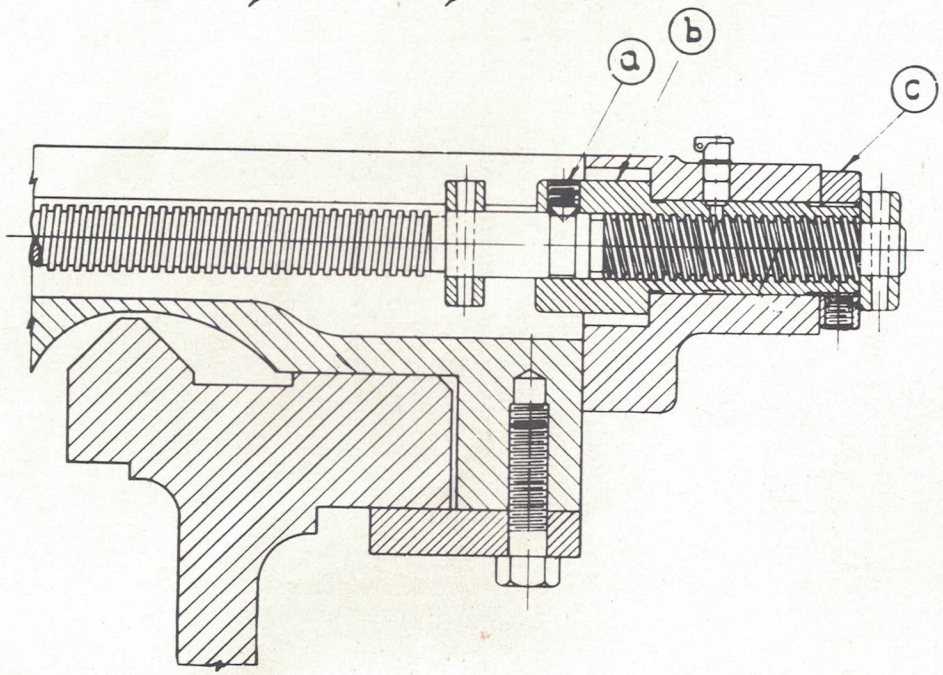
When chasing, adjust tool in tool post to correct position for thread. Withdraw tool by cross slide handle about three-quarters to one inch. Back off screw "a" until outer end is flush with top of hole in nut "b." Advance cross feed to the stop collar, then advance the cross slide until the tool is at the full depth of cut or the bottom diameter of the screw to be chased. Tighten screw "d" in the bracket to lock nut "b" from rotation.

All further tool adjustments are made by means of the compound rest feed. Withdraw tool by means of the compound rest feed handle to the outside diameter of the work and set the feed dial to zero. Advance the compound rest to the cutting depth desired and take first cut. After taking each successive cut withdraw the tool by means of the cross slide feed sufficiently for the tool to clear the work. Return the cross feed each time to the stop and feed in on compound rest for depth of cut, noting dial readings. Each graduation represents one-half thousandth feed or a reduction in diameter of work of one-thousandth. For boring or internal chasing the cross feed is fed outward before locking nut "b" by means of screw "d" and of course the feeding operations are the reverse of chasing or turning external work.

To disengage the chasing stop and return the cross feed to the conventional feeding arrangement. Withdraw the cross slide to the outward stop. Release nut "b" by loosening screw "d". Continue to rotate feed handle counter-clockwise until the screw "a" is at the top of the nut "b" and lock cross feed screw by means of screw "a". Tighten screw "a" securely to prevent any slipping during any







THREAD CHASING STOP
Rapid In and Out Feed
without Taper Attachment

future turning operations. Any unnecessary end play that may develop in nut "b" due to wear can be taken-up by means of collar "c". Oil nut and screw occasionally. Several precautions must be taken when using the rapid chasing feed to avoid damage and repairs.

DO NOT USE POWER CROSS FEED.

KEEP CHIP GUARD IN PLACE DURING CUTTING OPERATIONS.

DRAW-IN COLLET ATTACHMENT:

When parts are to be made from bar stock the Collet Attachment can be used to advantage and may be set-up for operation quickly at any time. With the draw-in type, stock in bar lengths may be fed through the spindle and finished before cutting off, advancing the bar again for the next piece. When it is preferable to use pre-cut pieces, the stock may be held in the collet for finishing.

An extension is slipped over the back end of the spindle and held in place by a set screw. This extension need not be removed when the attachment is not in use as it does not in any way interfere with the usual lathe operations. It is well to first mark the spot on the spindle where the set screw will come in contact with it, then file a small flat at that point. This precaution will prevent the set screw from raising a burr to hinder the removal of the extension if necessary.

The center bushing should be removed from the spindle nose by "bumping" it out from the back end. This bush is fitted into the tapered nose of the spindle, and can be easily removed.

The special hardened tapered bush supplied with the attachment is inserted in the spindle nose after screwing the knock-off collar on the threaded spindle nose. The draw-tube with the handwheel attached is now slipped through the spindle from the back end.

A collet of the correct size for the bar stock to be worked is now placed in the spindle bush, being careful that the keyway in the collet slips over the key in the bush.

Push the draw-tube forward until it contacts the collet and rotate the handwheel clockwise until the thread on the collet is caught, it will then draw the collet into the bush. If the tube screws against the shoulder of the collet without closing it, loosen the knurled locknut behind the handwheel and adjust the handwheel until it strikes the end of the extension and draws the collet tight.

Lock the handwheel by means of the locknut after adjusting.

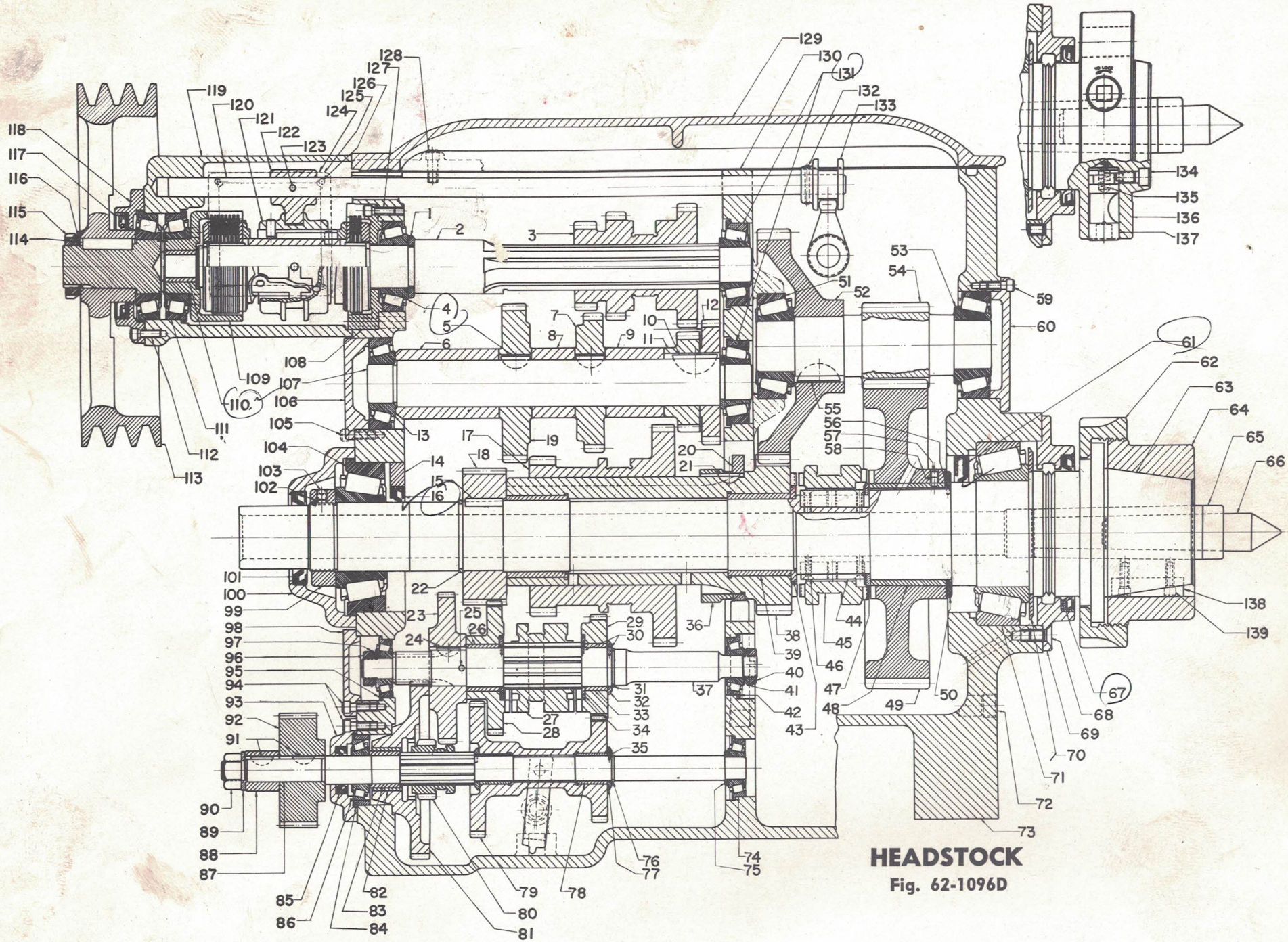
To place bars into the collet, loosen the chuck by rotating the handwheel counter-clockwise and to clamp the work rotate the handwheel clockwise.

Always use a collet of the correct size.

Collets for round, square and hexagon stock can be secured in standard sizes and collets for odd shaped stock can be made up on special order.

To remove Collet Attachment, rotate handwheel until tube is free and withdraw from spindle. Remove bush from spindle by backing off nut on spindle nose.

Keep collets and bush well oiled or greased when not in use to prevent rusting.



HEADSTOCK

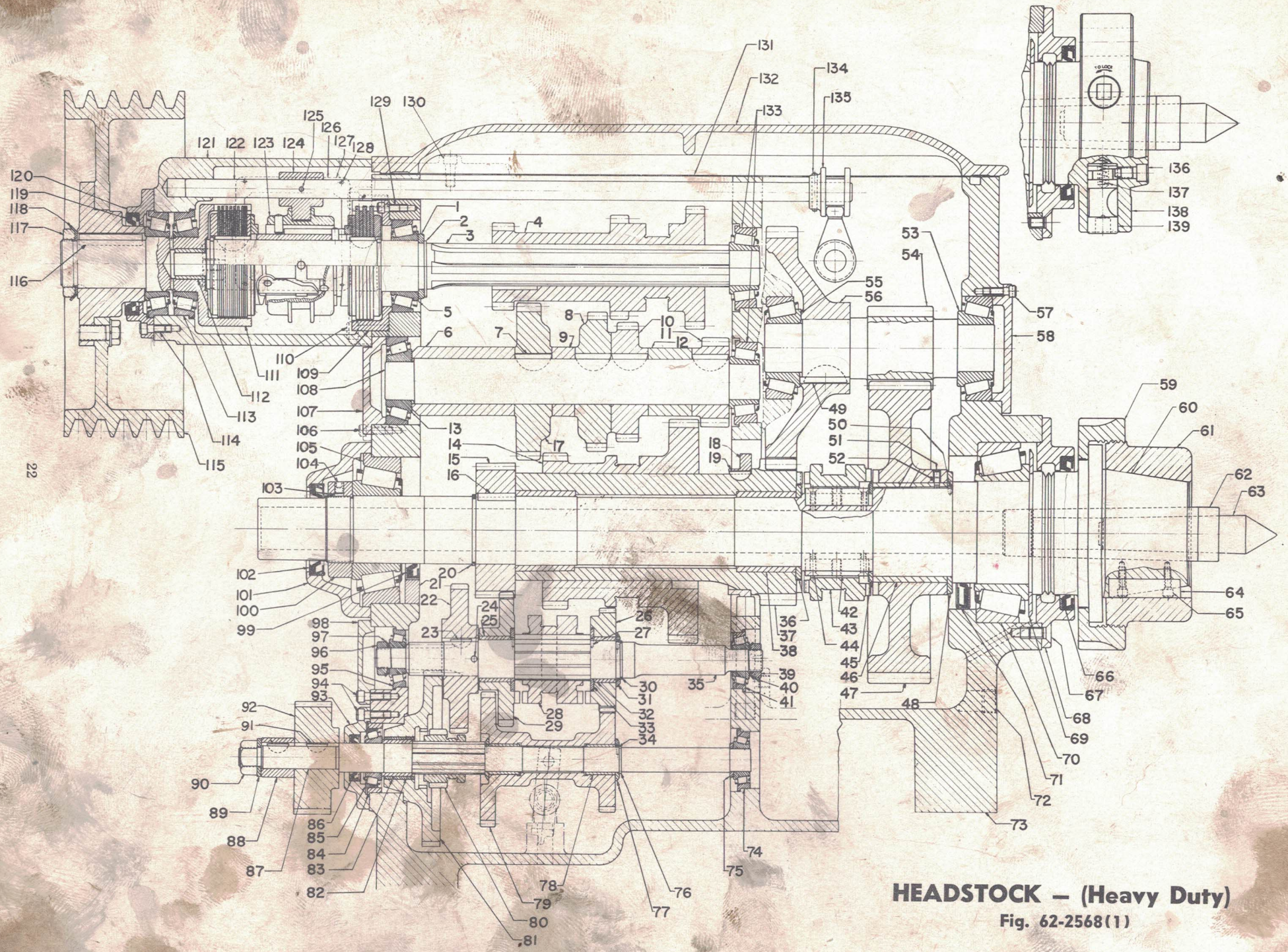
Fig. 62-1096D

HEADSTOCK (M.D.)

Fig. 62-1096D

DETAIL NO.	PART NAME	PART NO. 12"-14"-16"
1	Washer—Clust. Gear Shaft	12246-103
2	Shaft	42246-33B
3	Gear—Cluster	32246-34A
4	Tapered Roller Bearing	Timken #02877-02820
5	Woodruff Key	#B (1 x 5/16)
6	Spacer—3rd Inter.	22246-28A
7	Gear—Inter. (34T)	22246-29B
8	Spacer—2nd Inter.	22246-27A
9	Spacer—1st Inter.	22246-26A
10	Woodruff Key	#25 (1½ x 5/16)
11	Gear—Int. (23T)	22246-25A
12	Gear—Int. (30T)	22246-24A
13	Tapered Roller Bearing	Timken #02876-02820
14	Ring—Spind. Oil Seal (Rear)	22-2540
15	Key—Spind. Fd. Rev. Gear	12-1056
16	Oil Seal	Perfect #32526
17	Cluster Gear	32-12A
18	Gear—Feed Rev.—Spindle	22-1057A
19	Gear—Inter. (39T)	22246-30B
20	Eccentric—Pump	22246-11A
21	Woodruff Key	#9 (¾ x 3/16)
22	Snap Ring	12246-483
23	Gear—Feed Rev.	22-1042
24	Woodruff Key	#11 (⅞ x 3/16)
25	Taper Pin	#4 x 2¼
26	Bearing—Large Feed Rev. Gear	12-2435
27	Clutch—Feed Rev.	22-1036B
28	Gear—Feed Rev. (Large)	22-1038C
29	Gear—Feed Rev. (Small)	22-1039C
30	Pin	3/32 Dia. x ¼
31	Snap Ring	12-1041
32	Washer—Feed Rev. Shaft	12-1040A
33	Bush	Oilite #A-1512-14
34	Washer—Feed Rev. Sh.	12-1037
35	Pin	3/32 Dia. x ¼
36	Sleeve—Eccentric	22246-1309A
37	Shaft—Feed Reverse	32-1035A
38	Sleeve Gear	42246-10A
39	Bush—Sleeve Gear	22246-13
40	Lock Nut	#N-03
41	Lock Washer	#W-03
42	Tapered Roller Bearing	Timken #05075-05185B
43	Washer—Clutch	12246-14A
44	Key—First Gear Clutch	12-1477
45	Clutch—Spindle Gear	32-2515
46	Screw—Flat Hd.	10-32 x ¾
47	Washer—First Gear	22-640A
48	Bush—First Gear	22246-5
49	Spindle Gear	42-2514
50	Washer—First Gear	22246-8
51	Tapered Roller Bearing	Timken #HM502010 HM502049
52	Back Gear	32246-22B
53	Tapered Roller Bearing	Timken #3820-3875
54	Pinion—Back Gear	32-2516
55	Woodruff Key	#1212 (1½ x ⅜)
56	Pin	⅛ Dia. x 5/16
57	Set Screw—Hollow—Flat Point	¼-20 x ¼
58	Set Screw—Hollow—Dog Point	¼-20 x ¼
59	Screw—Soc. Hd.	¼-20 x ½
60	Bearing Cap	22246-20A
61	Oil Seal	Perfect #500310
62	Collar—Spindle	32-949
63	Spindle (Taper Nose)	32-1253A
64	Guard—Spindle Nose	32-948
65	Sleeve—Center	22-2541
66	Center	22-2530
67	Oil Seal	Perfect #5004
68	Screw—Soc.-Flat Hd.	⅜-16 x ¾
69	Bearing Cap (Front)	322-1368A
70	Oil Slinger	22246-19B

DETAIL NO.	PART NAME	PART NO. 12"-14"-16"
71	Tapered Roller Bearing	Timken #742-749
72	Screw	12246-62
73	Headstock	
74	Tapered Roller Bearing	Timken #05075-05185B
75	Washer—Feed Drive Shaft	12-1026
76	Snap Ring	12-1025
77	Washer—Feed Dr. Shaft	12-1023A
78	Bush	Oilite #A-1041-5
79	Gear—Feed Rev.—Double	22-1024B
80	Pinion—Feed Clutch	22-1022
81	Clutch Gear—Feed Drive	32-1021B
82	Bush	22-1825A
83	Spacer—Feed Drive Shaft	22-1826A
84	Bushing—Feed Dr. Shaft Bearing	12-1027
85	Oil Seal	Perfect #15030
86	Tapered Roller Bearing	Timken #07093-07196
87	Shaft—Feed Drive	32-1020A
88	Collar—Feed Drive	12-1064
89	Washer—Feed Drive	12-1065
90	Nut—Hex. (Hardened)	⅝-11
91	Woodruff Key	#9 (¾ x 3/16)
92	Stud Gear	22-1848 (12"-14"), 22-1849 (16")
93	Cap—Feed Dr. Shaft	22-2539
94	Screw—Soc. Hd.	¼-20 x ⅝
95	Tapered Roller Bearing	Timken #05066-05185B
96	Lock Nut	#N-03
97	Lock Washer	#W-03
98	Cap—Feed Rev. Shaft	22-2538
99	Nut—Spindle (Rear)	22-2547
100	Bearing Cap (Rear)	32-2532
101	Oil Seal	Perfect #3002
102	Plug—Brass	¼ Dia. x ⅛
103	Set Screw—Hollow—Cup Pt.	5/16-18 x ⅜
104	Tapered Roller Bearing	Timken #622A-612B
105	Screw—Soc. Hd.	¼-20 x ⅝
106	Bearing Cap	22-2537
107	Shaft (Inter. Gear)	32246-23C
108	Brake Cup	32246-35A
109	Clutch Cup—Drive	32246-36C
110	Bush	Oilite #A-1003-4
111	Tapered Roller Bearing	Timken #355-354B
112	Screw—Soc. Hd.	¼-20 x ⅝
113	Pulley—Drive (3 Groove)	42246-43
114	Key—Drive Pulley	12246-44
115	Lock Nut	#N-07
116	Lock Washer	#W-07
117	Oil Seal	Perfect #33528
118	Cap—Clutch Cup	32246-39
119	Clutch Housing	52246-37C
120	Rod—Clutch Shifter	12246-40
121	Pullmore Clutch	#3-Double-Special
122	Fork—Clutch Shifter	22246-41
123	Taper Pin	#2 x 1¼
124	Cover—Clutch Housing	22-2533
125	Gasket—Clutch Housing Cover	22-2567
126	Screw—Button Hd.	10-24 x ½
127	Screw—Soc. Hd.	¼-20 x ⅝
128	Screw—Soc. Hd.	5/16-18 x ¾
129	Head Cover	42246-860A
130	Gasket—Head Cover	32246-830A
131	Tapered Roller Bearing	Timken #2631B-2691
132	Taper Pin	#2 x 1¼
133	Spool—Cl. Shift. Rod.	22246-42B
134	Screw—Cam	12-2544
135	Spring—Cam	12-2545
136	Spindle (Cam Lock)	52-2509
137	Cam—Cam Lock	22-2542
138	Key	12-947
139	Screw—Soc. Hd.	¼-20 x ⅝
	Screw Nose (Not Shown)	52-1795A



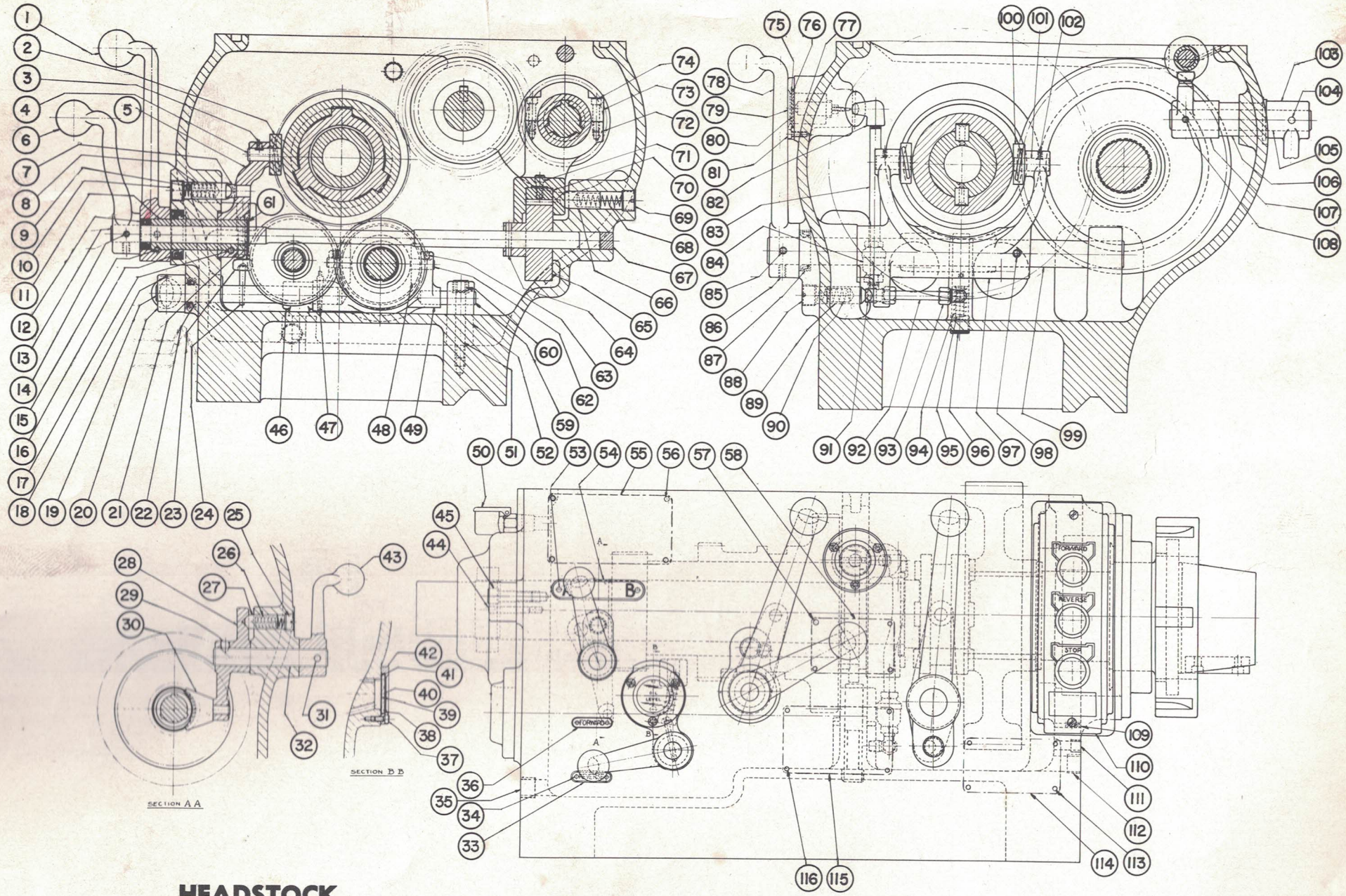
HEADSTOCK — (Heavy Duty)

Fig. 62-2568(1)

HEADSTOCK (H.D.)

Fig. 62-2568(1)

DETAIL NO.	PART NAME	PART NO. 12"-14"-16"
1	Washer	12-2527
2	Snap Ring	Truarc #5100-150
3	Shaft—Cluster Gear	42-2528
4	Gear—Cluster	32-2526
5	Tapered Roller Bearing	Timken #24780-24720
6	Spacer—3rd Inter.	22246-28A
7	Woodruff Key	#1010 (1¼ x $\frac{5}{16}$)
8	Gear—Int. (34T)	22-2522
9	Spacer—2nd Inter.	22-2524
10	Gear—Int. (29T)	22-2523
11	Gear—Int. (21T)	22-2520
12	Spacer—1st Inter.	22246-27A
13	Tapered Roller Bearing	Timken #02820-02876
14	Cluster Gear	32-2519
15	Gear—Feed Rev. Spind.	22-2549
16	Key—Spind. Feed Rev. Gear	12-1056
17	Gear—Int. (39T)	22-2521
18	Eccentric—Pump	22-2569
19	Woodruff Key	#9 (¾ x $\frac{3}{16}$)
20	Snap Ring	12246-483
21	Ring—Oil Seal (Rear)	22-2540
22	Gear—Feed Rev.	22-1042B
23	Woodruff Key	#11 (⅞ x $\frac{3}{16}$)
24	Taper Pin	#4 x 2¼
25	Bearing—Large Feed Rev. Gear	12-2435
26	Gear—Small Feed Rev.	22-1039C
27	Pin	$\frac{3}{32}$ Dia. x ¼
28	Clutch—Feed	22-1036B
29	Gear—Large—Feed Rev.	22-1038C
30	Snap Ring—Feed Rev. Shaft	12-1041
31	Washer—Feed Rev. Shaft	12-1040A
32	Bush	Oilite #A-1512-14
33	Washer—Feed Rev. Shaft	12-1037
34	Pin	$\frac{3}{32}$ Dia. x ¼
35	Shaft—Feed Reverse	32-1035C
36	Washer—Clutch	12246-14A
37	Sleeve Gear	42-2518
38	Bush—Sleeve Gear	22246-13
39	Lock Nut	#N-03
40	Lock Washer	#W-03
41	Tapered Roller Bearing	Timken #05075-05185B
42	Key—First Gear Clutch	12-1477
43	Clutch—Spind. Gear	32-2515
44	Screw—Flat Hd.	10-24 x ¾
45	Washer—First Gear	22-640A
46	Bush—First Gear	22246-5
47	Spindle Gear	42-2514
48	Washer—First Gear	22246-8
49	Woodruff Key	#1212 (1½ x ⅜)
50	Pin	⅛ Dia. x $\frac{5}{16}$
51	Set Screw—Hollow—Flat Point	¼-20 x ¼
52	Set Screw—Hollow—Dog Point	¼-20 x ¼
53	Tapered Roller Bearing	Timken #3820-3875
54	Pinion—Back Gear	32-2516
55	Tapered Roller Bearing	{ Timken #HM502049 { HM502010
56	Back Gear	32-2517
57	Screw—Soc. Hd.	¼-20 x ½
58	Bearing Cap	22-20A
59	Collar—Spindle	32-949
60	Spindle—Taper Nose	42-1253A
61	Guard—Spindle Nose	32-948
62	Sleeve—Center	22-2541
63	Center—Head	22-2530
64	Key	12-947
65	Screw—Soc. Hd.	¼-20 x ⅝
66	Oil Seal	Perfect #5004
67	Screw—Flat Soc. Hd.	⅜-16 x ¾
68	Bearing Cap—Front	322-1368A
69	Oil Slinger	22-19B
70	Tapered Roller Bearing	Timken #742-749
71	Oil Seal	Perfect #500310
72	Screw—Plunger	12246-62
73	Head Stock	
74	Tapered Roller Bearing	Timken #05075-05185B
75	Washer—Feed Dr. Shaft	12-1026
76	Snap Ring	12-1025
77	Washer—Feed Drive Shaft	12-1023A
78	Bush	Oilite #A-1041-5
79	Gear—Feed Rev.	22-1024B
80	Pinion—Feed Clutch	22-1022
81	Clutch Gear—Feed Drive	32-1021B
82	Bearing—Feed Dr. Gear	22-1825
83	Spacer—Feed Drive Shaft	22-1826A
84	Bushing—Feed Dr. Shaft	12-1027
85	Tapered Roller Bearing	Timken #07093-07196
86	Oil Seal	Perfect #15030
87	Shaft—Feed Drive	32-1020A
88	Collar—Feed Drive	12-1064
89	Washer—Feed Drive	12-1065
90	Nut—Hex.	⅝-11 R.H.
91	Woodruff Key	#9 (¾ x $\frac{3}{16}$)
92	Stud Gear	{ 22-1848 (12"-14") { 22-1849 (16")
93	Bearing Cap	22-2539
94	Screw—Soc. Hd.	¼-20 x ⅝
95	Tapered Roller Bearing	Timken #05066-05185B
96	Lock Nut	#N-03
97	Lock Washer	#W-03
98	Cap—Feed Rev. Shaft	22-2538
99	Oil Seal	Perfect #32526
100	Nut—Spindle—Rear	22-2547
101	Bearing Cap—Spind. Rear	32-2532
102	Oil Seal	Perfect #3002
103	Plug—Brass	¼ Dia. x ⅛ Long
104	Set Screw—Hollow—Cup Pt.	$\frac{5}{16}$-18 x ⅜
105	Tapered Roller Bearing	Timken #662A-612B
106	Screw—Soc. Hd.	¼-20 x ⅝
107	Bearing Cap	22-2537
108	Shaft—Inter. Gear	32-2525
109	Brake Cup—Drive	22-2535
110	Screw—Soc. Hd.	⅜-16 x 1¼
111	Clutch Cup—Drive	32-2534
112	Bush	Oilite #A-1003-4
113	Tapered Roller Bearing	Timken #355-354B
114	Screw—Soc. Hd.	¼-20 x ⅝
115	Sheave—Drive	42-2536
116	Key—Drive Pulley	25-2566
117	Lock Nut	#N-08
118	Lock Washer	W-08
119	Oil Seal	Perfect #335216
120	Cap—Clutch Cup	32246-39
121	Clutch Housing	52-2529
122	Rod—Clutch Shifter	12-2546
123	Pullmore Clutch	#4 Double-Special
124	Fork—Clutch Shifter	22-2531
125	Taper Pin	#2 x 1¼
126	Cover—Clutch Housing	22-2533
127	Gasket—Clutch Housing Cover	22-2567
128	Screw—Butt Hd.	10-24 x ½
129	Screw—Soc. Hd.	¼-20 x ¾
130	Screw—Soc. Hd.	$\frac{5}{16}$-18 x ¾
131	Gasket—Head Cover	32246-830A
132	Head Cover	42246-860A
133	Tapered Roller Bearing	Timken #2691-2631B
134	Taper Pin	#2 x 1¼
135	Spool—Cl. Shifter Rod	22246-42B
136	Screw—Cam	12-2544
137	Spring—Cam	12-2545
138	Spindle—Cam Lock	52-2509
139	Cam—Cam Lock	22-2542
	Screw Nose Spindle (Not Shown)	52-1795A



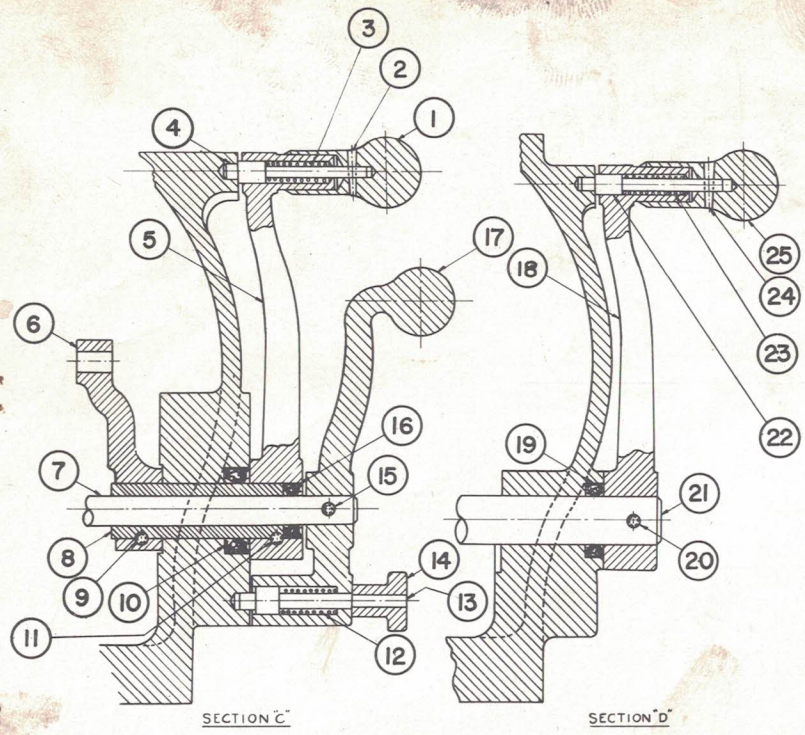
HEADSTOCK

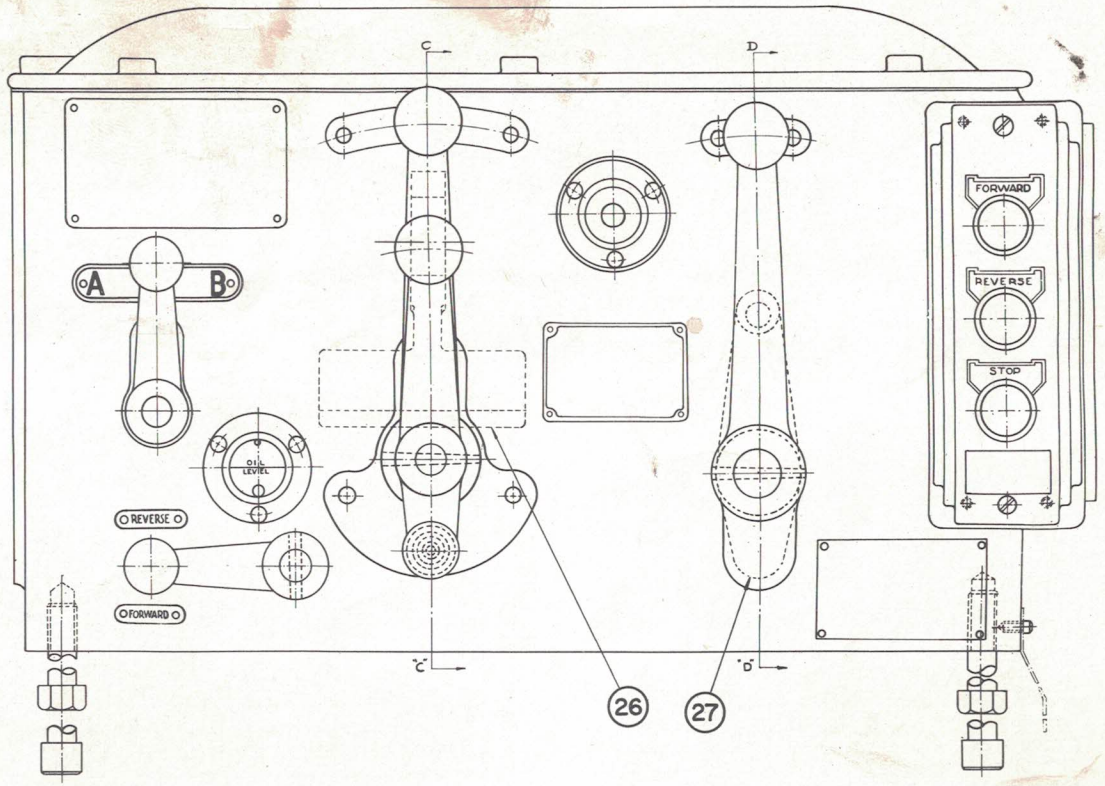
Fig. 62-2568(2)

HEADSTOCK

Fig. 62-2568(2)

DETAIL NO.	PART NAME	PART NO. 12"-14"-16" (M.D. & H.D.)
1	Handle—Spind. Gear Shifter	32246-615
2	Shoe—Spind. Gear Shifter	12-1047
3	Set Screw—Hollow—Cup Pt	10-32 x ¼
4	Stud—Spind. Gear Shifter	12-1046
5	Shifter—Spindle Gear	22-1480
6	Handle—Dr. Cluster Gear	32-1464
7	Stud—Shifter Lock	12246-63
8	Plunger—Cl. Gear Shifter	12246-59
9	Spring—Spind. Clutch Shifter	12246-61
10	Screw—Plunger	12246-62
11	Sleeve—Spind. Gear Shifter	12-1044
12	Oil Seal	Victoprene #60096
13	Shaft—Cluster Gear Shifter	12-1049
14	Taper Pin	#4 x 1½
15	Taper Pin	#4 x 1¾
16	Oil Seal	Victoprene #60318
17	Taper Pin	#4 x 1¼
18	Taper Pin	#4 x 1½
19	Shaft—Feed Rev. Shifter (Front)	22-1013B(12"-14") / 22-1465B(16")
20	Handle—Feed Rev. Shifter	22-1017
21	Spring—Plunger	12-1019
22	Oil Seal	Victoprene #60096
23	Plunger—Feed Rev. Shifter	12-1018
24	Taper Pin	#4 x 1½
25	Screw—Slid. Pinion Sh. Plung.	12-1066
26	Spring—Slid. Pinion Sh. Plung.	12-1034
27	Plunger—Sliding Pinion Shifter	12-1033
28	Shifter—Sliding Pinion	32-1031A
29	Set Screw—Hollow—Hf. Dog Pt.	5/16-18 x ⅜
30	Shoe—Sliding Pinion Shifter	12-1032
31	Taper Pin	#4 x 1½
32	Shaft—Sliding Pinion Shifter	12-1030
33	Indicator Plate (Reverse)	12-1681
34	Self Tapping Scr.—Butt Hd.	P-K #4 x ¼ Type Z
35	Pipe Plug—Hollow Hex	½" Pipe
36	Indicator Plate (Forward)	12-1680
37	Mach. Scr.—Fill Hd.	10-24 x ⅜
38	Washer—Fibre	12246-672
39	Oil Indicator (Decal)	14-1678
40	Indicator Glass	12246-671
41	Gasket—Cork	Lunkenheimer #165 / Fig. 1062
42	Indicator—Oil Level	22246-668
43	Handle—Feed Rev. Shifter	22-1017
44	Taper Pin	#4 x 1½
45	Screw—Soc. Hd.	⅜-16 x 1¼
46	Bearing—Feed Rev. Sh. Shaft	22-1827
47	Taper Pin	12-2576
48	Shoe—Feed Rev. Shifter	12-2276
49	Shifter—Feed Rev.	32-2273A
50	Oil Cup	Gits #1703
51	Screw—Soc. Hd.	5/16-18 x 1 (12"-14") / ⅜-16 x 2½ (16")
52	Bracket—Rear	22-2289 (12"-14") / 22-2274 (16")
53	Self Tapping Scr.—Butt Hd.	P-K #4 x ¼ Type Z
54	Indicator Plate (A-B Comp.)	12-1685
55	Speed Plate	22-1479 (12-14") / 22-2591 (16")
56	Self Tapping Scr.—Butt Hd.	P-K #4 x ¼ Type Z
57	Self Tapping Scr.—Butt Hd.	P-K #4 x ¼ Type Z
58	Instruction Plate	12-1817
59	Shaft—Feed Rev. Shifter (Rear)	12-2290 (12"-14") / 12-2275 (16")
60	Set Screw—Hollow—Cup Pt	¼-20 x ⅜ (12"-14") / ⅜-16 x ⅜ (16")
61	Snap Ring	Truarc #5100-62
62	Stud—Feed Rev. Shifter	12-1015A
63	Set Screw—Hollow—Cup Pt	10-32 x ¼
64	Taper Pin	#4 x 1¼
65	Segment—Cluster Gear	22-1051C
66	Plunger—Clust. Gear Shifter	12246-59
67	Plug—Clust. Gear Shaft	12-2564
68	Spring—Sleeve Gear Plunger	12246-344
69	Screw—Plunger	12246-62
70	Rack—Shifter	22-1063
71	Screw—Soc. Hd.	¼-20 x ⅝
72	Shifter—Cluster Gear	32-1472
73	Shifter—Cap	32-1473
74	Screw—Soc. Hd.	¼-20 x 1
75	Washer—Fibre	12246-672
76	Gasket—Cork	Lunkenheimer #165 / Fig. 1062
77	Filter Element	Zenith #F2 x 3 / 1 3/16" Long
78	Handle—Spind. Clutch Shifter	32246-614
79	Indicator—Oil Level	22246-668
80	Indicator Glass	12246-671
81	Mach. Scr.—Fill Hd.	10-24 x ⅜
82	Street Ell	⅛ Pipe
83	Pipe Nipple	⅛ Pipe x 4½" Long
84	Check Valve	Lunkenheimer #740 / ⅛ Pipe
85	Taper Pin	#4 x 2
86	Set Screw—Hollow—Cup Pt.	¼-20 x ½
87	Oil Seal	Victoprene #60245
88	Screw—Plunger	12246-62
89	Plunger—Spind. Clutch Shift.	12246-60
90	Spring—Spind. Clutch Plunger	12246-61
91	Stud—Shifter Lock	12246-63
92	Tubing	5/16 OD x 1/32 Wall / 3" Long
93	Elbow—Tubing	Imperial #69F-⅛ Pipe / 5/16 Tube
94	Spring—Clust. Gear Plunger	12246-345A
95	Pump Plunger	12246-45B
96	Pipe Plug—Hollow Hex	⅜ Pipe
97	Shifter Yoke—Spind. Clutch	32246-53
98	Taper Pin	#5 x 2
99	Shaft—Spind. Clutch Shifter	22246-50
100	Shoe—Clutch Shifter	12246-56
101	Stud—Cluster Shifter	12246-87
102	Set Screw—Hollow—Cup Pt.	10-24 x ⅜
103	Lever—Dr. Clust. Shifter	26246-705A (12"-14") / 22-1590 (16")
104	Taper Pin	#4 x 1½
105	Shaft—Clutch Shifter Finger	12246-704A
106	Bush—Cl. Shift Shaft	12-2548
107	Finger—Clutch Shifter	22246-703
108	Taper Pin	#4 x 1½
109	Plug—Brass	.2576 Dia x ½ Long
110	Push Button	A-B Bul. 800 / Type 3AH
111	Pipe Plug—Hollow Hex	¼ Pipe
112	Screw—Plunger	12246-62
113	Self Tapping Scr. Butt Hd.	P-K #4 x ¼ Type Z
114	Timken Bearing Plate	Timken #4
115	Oil Grade Plate	Socony Vac. Oil Co. / #D-1
116	Self Tapping Scr.—Butt Hd.	P-K #4 x ¼ Type Z



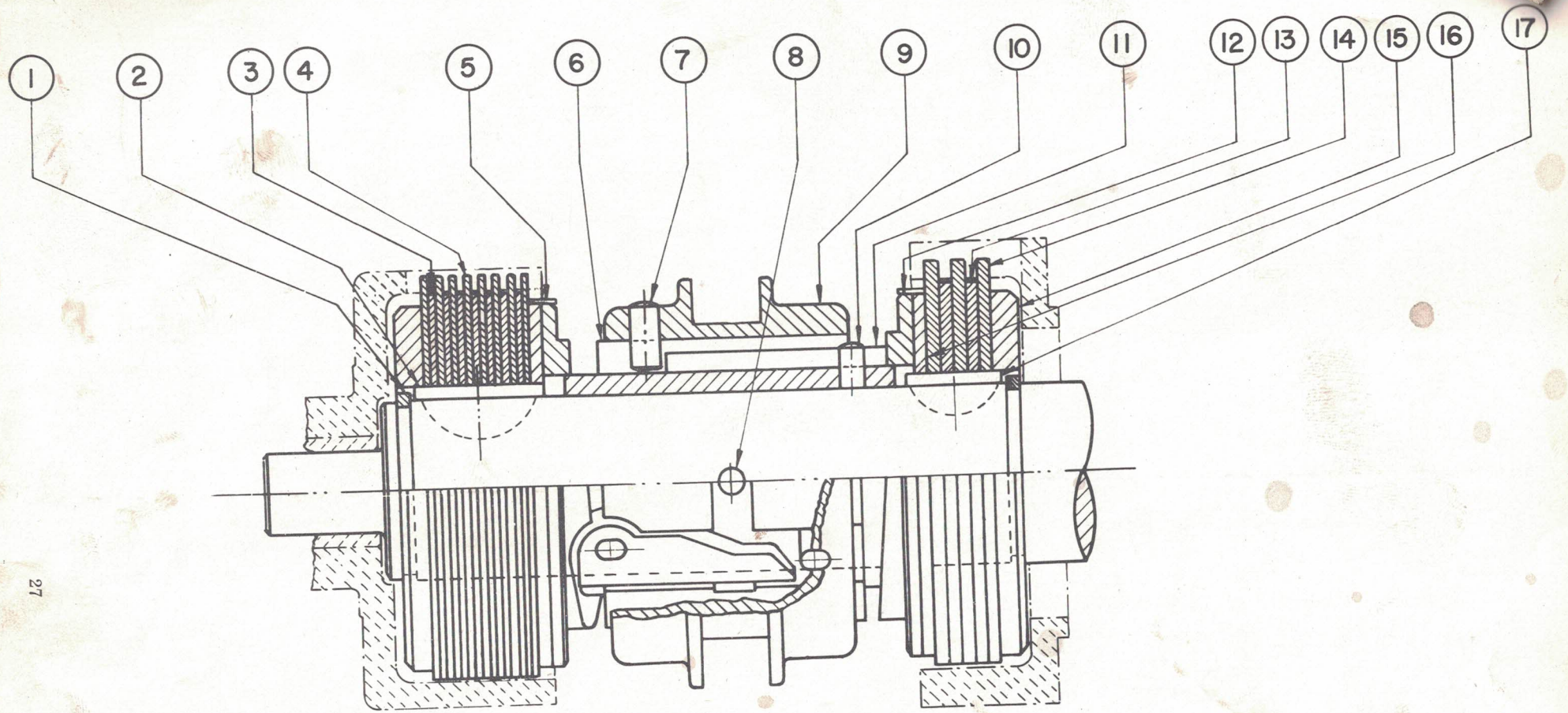


HEADSTOCK

Plunger Type Handles

Fig. 52-2629

DETAIL NO.	PART NAME	PART NO. 12"-14"-16"
1	Knob—Shifter Handle	12-750A
2	Taper Pin	#00 x 1"
3	Spring—Shifter Handle	12-748
4	Plunger—Shifter Handle	12-749A
5	Handle—Spind. Gear Shifter	32-1048
6	Shifter—Spind. Gear	22-1045
7	Shaft—Cluster Gear Shifter	12-1049
8	Sleeve—Spind. Gear Shifter	12-1044
9	Taper Pin	#4 x 1¼
10	Oil Seal	#60318 Victoprene
11	Taper Pin	#4 x 1¾
12	Spring—Feed Rev. Lever	1424-348
13	Plunger—Feed Rev. Lever	1424-385
14	Knob—Rev. Lever	1424-383
15	Taper Pin	#4 x 1½
16	Oil Seal	#60096 Victoprene
17	Handle—Drive Cluster Gear	32-1052
18	Handle—Spind. Clutch Shaft	32-1054
19	Oil Seal	#60245 Victoprene
20	Taper Pin	#4 x 2
21	Shaft—Spind. Clutch Shifter	22246-50
22	Plunger—Shifter Handle	12-749A
23	Spring—Shifter Handle	12-748
24	Taper Pin	#00 x 1"
25	Knob—Shifter Handle	12-750A
26	Shifter—Cluster Gear	32-1061
27	Shifter Yoke—Spind. Clutch	32-1053

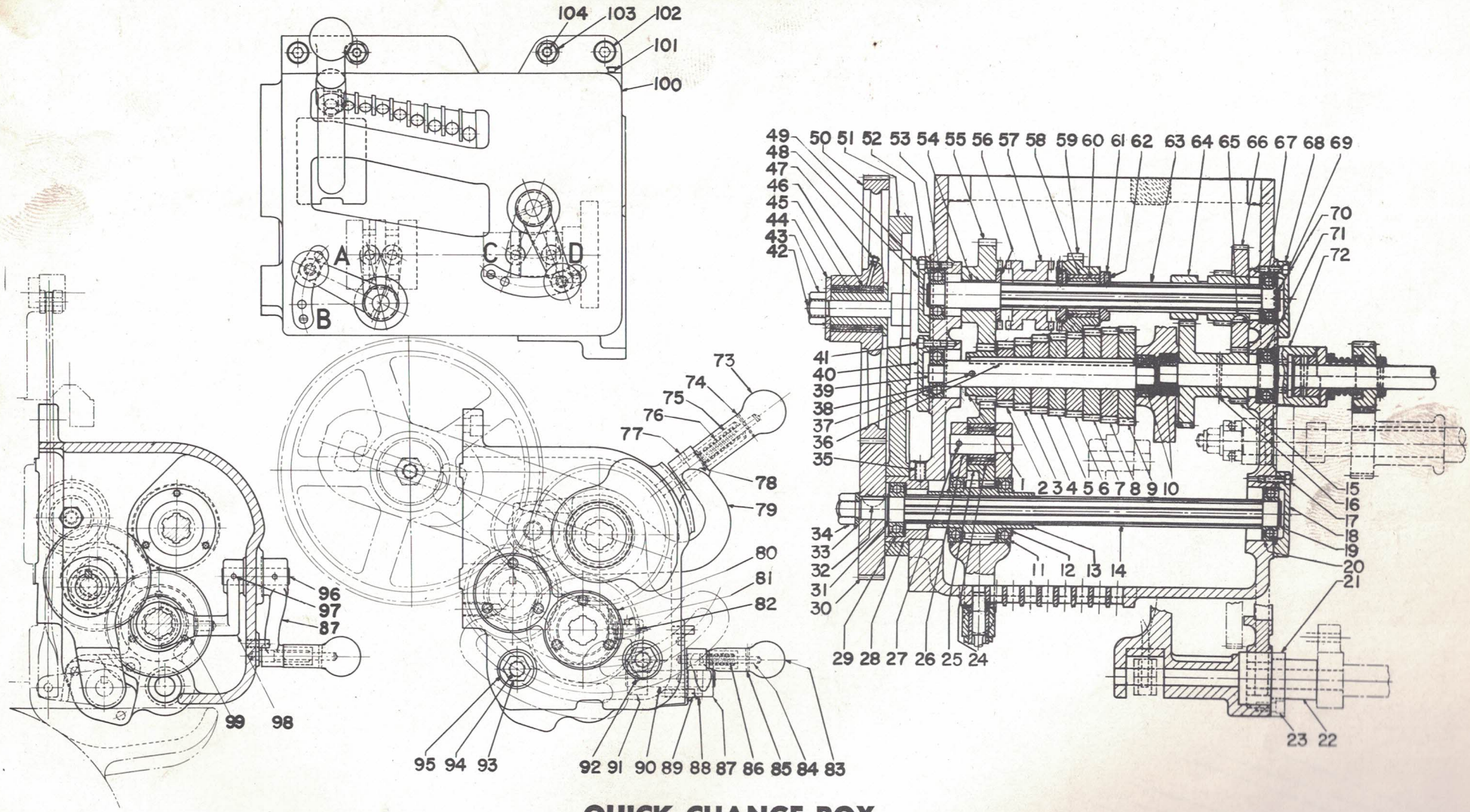


CLUTCH & BRAKE

(Pullmore)

Fig. 32-2630

DETAIL NO.	PART NAME	PART NO. 12"-14"-16" (M.D.)	PART NO. 12"-14"-16" (H.D.)
1	Split Ring	PM-308	PM-408
2	Hi-pro Key	#16	#18
3	Inner Disc	PM-306 & PM-319	PM-406
4	Outer Disc	PM-326	PM-426
5	Adjust Lock Spring	PM-322	PM-422
6	Clutch Body	PM-301	PM-401
7	Dog Pressure Pin	PM-305	PM-305
8	Anchor Pin	PM-303	PM-403
9	Shipper Sleeve	PM-302	PM-402
10	Dog Pivot Pin	PM-310	PM-310
11	Dog	PM-304	PM-304
12	Adjustment Collar	PM-307	PM-407
13	Inner Disc	PM-306	PMS4-1120
14	Outer Disc	PM-323	PM-423G
15	Thrust Plate	PM-311	PM-411
16	Pressure Plate	PM-321	PM-421
17	Hi-pro Key	#61	"A"



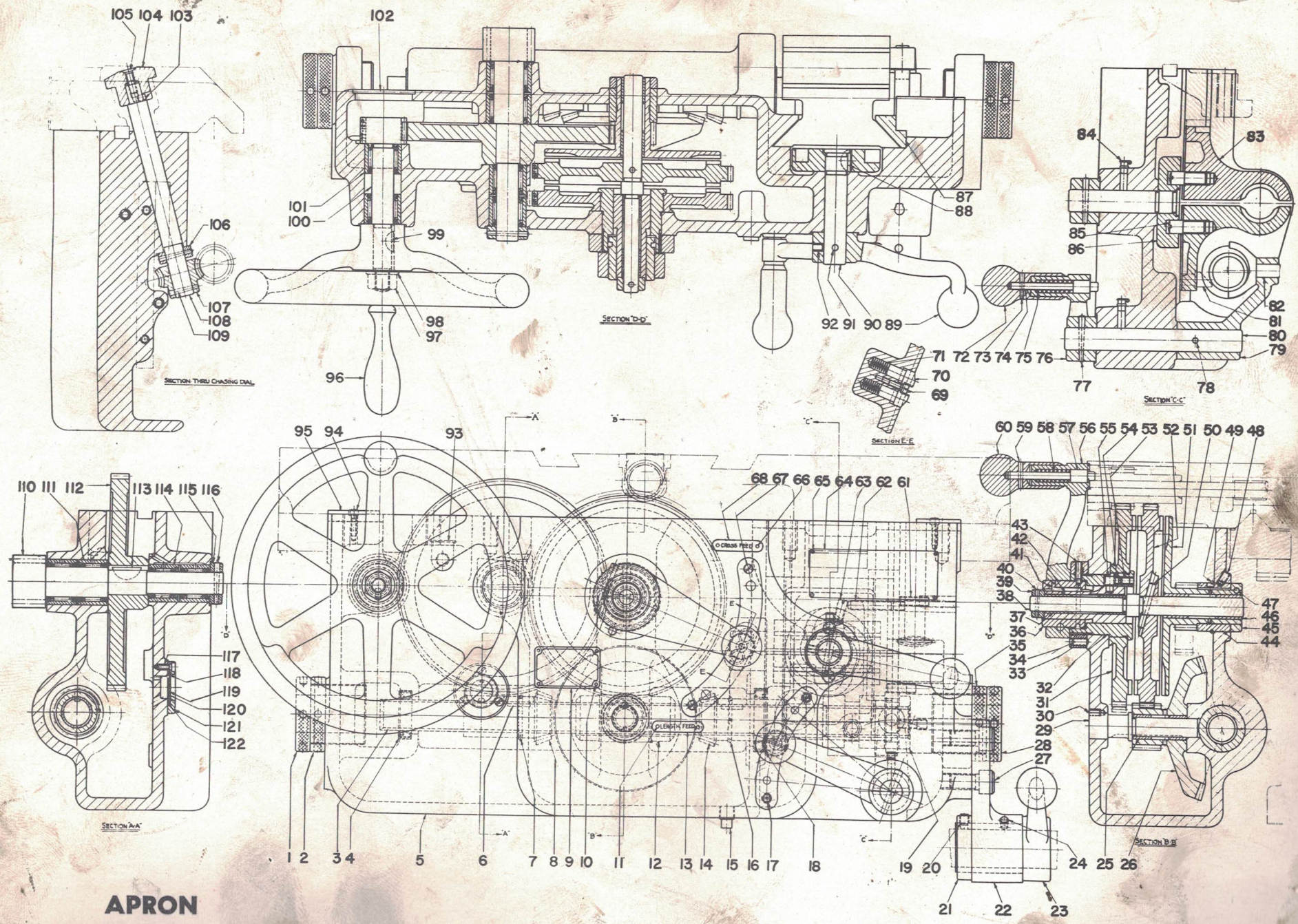
QUICK CHANGE BOX

Fig. 63-831E

QUICK CHANGE BOX

Fig. 63-831E

DETAIL NO.	PART NAME	PART NO. 12"-14"	PART NO. 16"
1	Gear—Cone	13-913A	13-1122A
2	Gear—Cone	13-912B	13-1121A
3	Gear—Cone	13-2583	13-1120A
4	Gear—Cone	13-911A	13-1119A
5	Gear—Cone	13-910B	13-1118A
6	Gear—Cone	13-909B	13-1117A
7	Gear—Cone	13-908A	13-1116A
8	Gear—Cone	13-907A	13-2587
9	Gear—Cone	13-906A	13-1115A
10	Ball Bearing	N.D. #5503	N.D. #5503
11	Ball Bearing	N.D. #4773L07	N.D. #4773L07
12	Snap Ring	Truarc #5100-137	Truarc #5100-137
13	Gear—Tumbler	33-894C	33-1112C
14	Shaft—Tumbler Gear	33-898C	33-898C
15	Gear—Feed Drive	33-1852A	33-1852A
16	Taper Pin	#2 x 1½	#2 x 1½
17	Screw—Soc. Hd.	¼-20 x ¾	¼-20 x ¾
18	Bearing Cap—Tumbler Shaft	23-2586	23-2586
19	Snap Ring	Truarc #5100-98	Truarc #5100-98
20	Ball Bearing	N.D. #47505	N.D. #47505
21	Cover—Auto Feed Trip Brg.	23-1807	23-1807
22	Bush—Control Rod	23-2584	23-2584
23	Screw—Soc. Hd.	5/16-18 x ¾	5/16-18 x ¾
24	Roller Bearing	Orange #E-7194-CT	Orange #E-7194-CT
25	Gear—Tumbler Idler	13-896C	13-1113C
26	Stud—Tumbler Gear	13-897	13-897
27	Taper Pin	#2 x 1½	#2 x 1½
28	Bush—Tumbler Gr. Sh. Brg.	23-899D	23-899D
29	Ball Bearing	N.D. #77505	N.D. #77505
30	Gear—Tumbler Sh. Drive	23-900	23-1114
31	Snap Ring	Truarc #5100-98	Truarc #5100-98
32	Woodruff Key	#11 (⅞ x 3/16)	#11 (⅞ x 3/16)
33	Washer	12-1065	12-1065
34	Nut—Hex (Hardened)	⅝-11 R.H.	⅝-11 R.H.
35	Set Screw—Hollow—Cup Pt.	⅜-16 x ¾	⅜-16 x ¾
36	Key	¼ Sq. x 6¼	¼ Sq. x 6¼
37	Taper Pin	#4 x 1¾	#4 x 1¾
38	Ball Bearing	N.D. #7603	N.D. #7603
39	Shaft—Cone Gear	33-905E	33-905E
40	Bearing Cap	23-2585	23-2585
41	Screw—Soc. Hd.	¼-20 x ⅝	¼-20 x ⅝
42	Stud—Quadrant Gear	13-2382	13-2382
43	Nut—Hex (Hardened)	⅝-11 R.H.	⅝-11 R.H.
44	Washer—Cone Shaft	1324-226	1324-226
45	Bush—Quadrant Gear	13-921B	13-921B
46	Roller Bearing	Orange #7234-CT	Orange #7234-CT
47	Oiler	Gits #501	Gits #501
48	Bearing Cap—Clutch Shaft	23-2585	23-2585
49	Screw—Soc. Hd.	¼-20 x ⅝	¼-20 x ⅝
50	Quadrant Gear	43-923	33-1475C
51	Quadrant Plate	43-920A	43-920A
52	Snap Ring	Truarc #5100-78	Truarc #5100-78
53	Ball Bearing	N.D. #7504	N.D. #7504
54	Bush	Oilite #A-1110-3	Oilite #A-1110-3
55	Gear—Clutch	33-891B	33-1111A
56	Washer—Clutch Gear	13-890A	13-890A
57	Clutch—Clutch Shaft	33-1110A	33-1110A
58	Bush	Oilite #A-1616-1	Oilite #A-1616-1
59	Gear—Clutch	33-889A	33-1109A
60	Sleeve—Clutch Gear	13-2115A	13-2115A
61	Set Screw—Hollow—Cup Pt.	10-24 x ⅜	10-24 x ⅜
62	Collar—Slip Clutch Gear	23-1821A	23-1821A
63	Shaft—Clutch	33-886B	33-886B
64	Pinion—Cluster Gear	23-1850A	23-1850A
65	Woodruff Key	#61 (⅝ x 3/16)	#61 (⅝ x 3/16)
66	Gear—Cluster (Large)	23-1851	23-1851
67	Ball Bearing	N.D. #7504	N.D. #7504
68	Bearing Cap—Clutch Shaft	23-2585	23-2585
69	Screw—Soc. Hd.	¼-20 x ⅝	¼-20 x ⅝
70	Snap Ring	Truarc #5100-78	Truarc #5100-78
71	Ball Bearing	N.D. #99505	N.D. #99505
72	Clutch—Feed Drive	33-1853B	33-1853B
73	Knob—Tumbler Yoke	23-904	23-904
74	Taper Pin	#00 x 1	#00 x 1
75	Sleeve—Tumbler Yoke Knob	13-901	13-901
76	Spring—Tumbler Yoke Knob	13-903	13-903
77	Dowel Pin	¼ Dia. x ⅜	¼ Dia. x ⅜
78	Plunger—Tumbler Yoke Knob	13-902	13-902
79	Yoke—Tumbler	43-835B	43-835B
80	Shoe—Clutch Shifter	12-1016	12-1016
81	Set Screw—Hollow—Hf. Dog Pt.	10-32 x ¼	10-32 x ¼
82	Stud—Clutch Shifter Shoe	13-2434	13-2434
83	Knob—Shifter Handle	14-750A	14-750A
84	Plunger—Shifter Handle	14-749A	14-749A
85	Taper Pin	#00 x 1	#00 x 1
86	Spring—Shifter Handle	14-748	14-748
87	Handle—Clutch Shifter	33-883	33-883
88	Taper Pin	#2 x 1½	#2 x 1½
89	Screw—Interlock	1424-607	1424-607
90	Shaft—Clutch Shifter	13-882	13-882
91	Shifter Finger—Clutch	23-881	23-881
92	Taper Pin	#2 x 1½	#2 x 1½
93	Nut—Hex Hardened	⅝-11 R.H.	⅝-11 R.H.
94	Stud	13-922	13-922
95	Washer	166-670	166-670
96	Shaft—Cluster Gear Shifter	13-885	13-885
97	Taper Pin	#2 x 1½	#2 x 1½
98	Shifter Finger—Cluster Gear	23-884	23-884
99	Shoe—Shifter	23-1854	23-1854
100	Q. C. Box	63-831G	63-831G
101	Oiler	Gits #501	Gits #501
102	Screw—Soc. Hd.	½-13 x 1¼	½-13 x 1¼
103	Nut—Hex	⅜-16	⅜-16
104	Dowel Pin	13-919	13-919



APRON

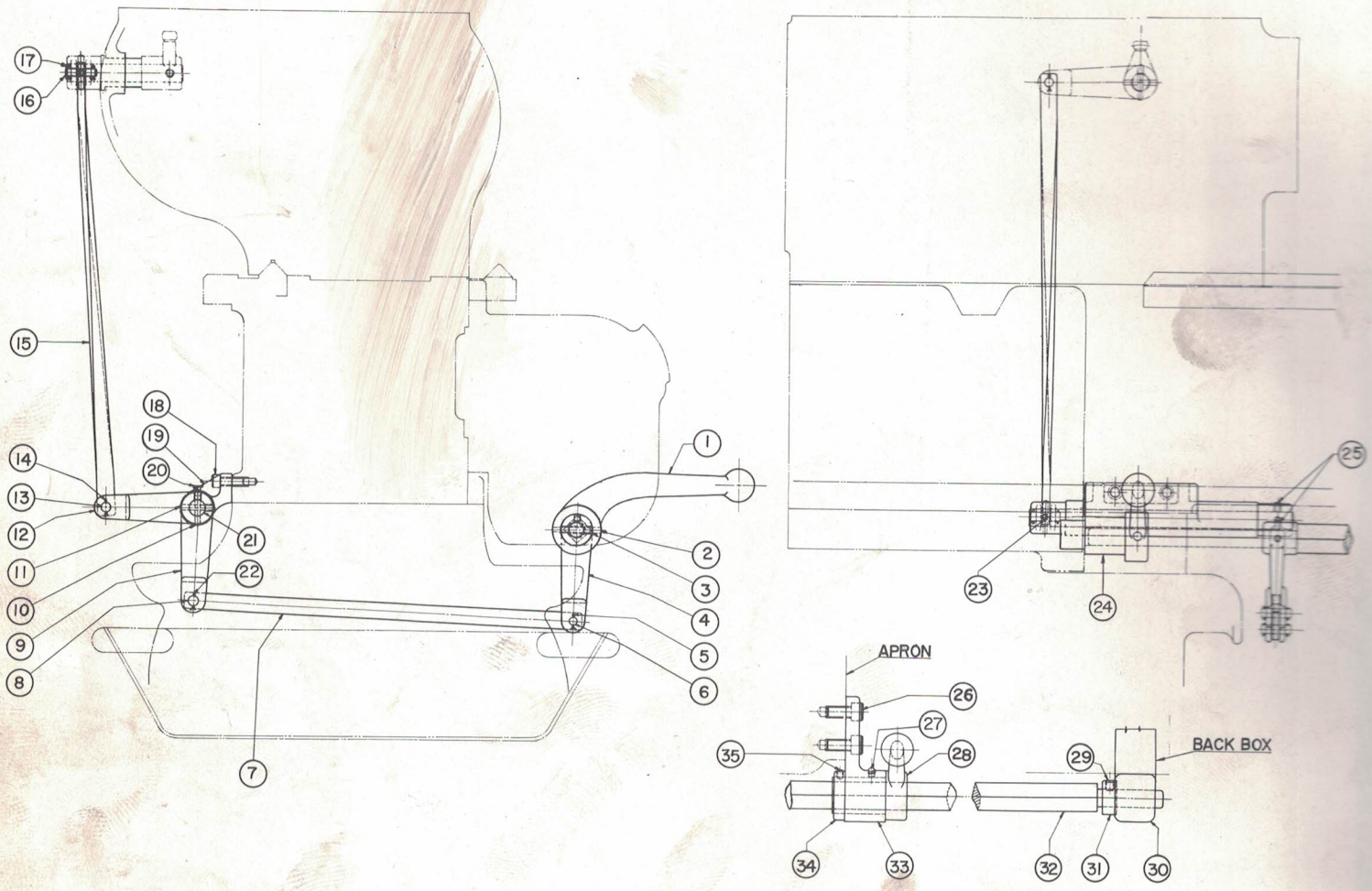
Fig. 64-737D

APRON

Fig. 64-737D

DETAIL NO.	PART NAME	PART NO. 12"-14"-16"
1	Bush—Auto Stop	24-771
2	Nut—Auto Stop	14-772
3	Sleeve—Bevel Pinion	24-740A
4	Oil Seal	Victoprene #60267
5	Apron	64-720D
6	Key	14-744B
7	Snap Ring	14-743
8	Bevel Pinion	24-742B
9	Instruction Plate—Oiling	14-1818
0	Screw—Self Tapping—Butt. Hd.	P-K #4 x ¼ Type Z
1	Screw—Self Tapping—Butt. Hd.	P-K #4 x ¼ Type Z
2	Bush—Bevel Pinion Sleeve	24-850
3	Indicator Plate—Length Stop	14-1682
4	Bevel Pinion	24-742B
5	Pipe Plug—Hollow Hex	¼"-Pipe
6	Snap Ring	14-743
7	Screw—Interlock	1424-607
8	Oil Seal	Victoprene #60454
9	Spool—Feed Rev. Shifter	24-741
0	Set Screw—Hollow—Hf. Dog Pt.	5/16-18 x 3/8
1	Collar—Handwheel	16246-714
2	Bracket—Clutch Control	34-728
3	Handle—Shifter	36246-713
4	Oiler	Gits #501
5	Bush—Bevel Gear	14-745
6	Bevel Gear	24-734B
7	Screw—Soc. Hd.	½-13 x 1
8	Bush—Auto Stop	24-771
9	Shaft—Bevel Gear	24-746
0	Set Screw—Hd'ls—Flat Pt.	¼-20 x ½
1	Gear—Cross Feed Drive	34-755 (12"-14") / 34-774 (16")
2	Bush—Feed Clutch	24-753
3	Nut—Feed Clutch Bush	24-756
4	Set Screw—Hd'ls Cone Pt.	¼-20 x 5/8
5	Nut—Auto Stop	14-772
6	Sleeve—Feed Clutch Cam	14-757
7	Bush—Feed Clutch Cam	14-752
8	Shaft—Traverse Feed Gear	24-763
9	Collar—Traverse Feed Shaft	14-764
0	Taper Pin	#2 x 1"
1	Key—Auto Stop Collar	11-1598
2	Cam—Feed Clutch	24-751
3	Set Screw—Hd'ls—Full Dog Pt.	¼-20 x ¾
4	Sleeve—Traverse Clutch	14-760
5	Collar—Traverse Clutch	14-761
6	Bush—Traverse Clutch	14-759
7	Taper Pin	#2 x 1¼"
8	Set Screw—Hollow—Dog Pt.	¼-20 x ½
9	Snap Ring—Trav. Cl. Sleeve	14-1788
0	Taper Pin	#4 x 1½
1	Clutch—Traverse	34-758
2	Gear—Traverse Feed	34-762
3	Set Screw—Hd'ls—Flat Pt.	¼-20 x 3/8
4	Plug	14-754
5	Set Screw—Hd'ls—Full Dog Pt.	3/8-16 x ½
6	Handle—Feed Clutch	34-732B
7	Plunger—Shifter Handle	14-749A
8	Spring—Shifter Handle	14-748A
9	Taper Pin	#00 x 1
0	Knob—Shifter Handle	14-750A
1	Set Screw—Hd'ls—Cone Pt.	5/16-18 x 1
2	Set Screw—Hd'ls—Dog Pt.	5/16-18 x 1½

DETAIL NO.	PART NAME	PART NO. 12"-14"-16"
63	Screw—Interlock	146-608
64	Instruction Plate—Chasing	14-1705
65	Screw—Self Tapping—Butt Hd.	P-K #4 x ¼" Type Z
66	Screw—Self Tapping—Butt Hd.	P-K #4 x ¼" Type Z
67	Screw—Interlock	1424-607
68	Indicator Plate—Cross Feed	14-1683
69	Screw—Handle Stop	14-2513
70	Stop—Feed Clutch Handle	14-2511
71	Spring—Stop Handle	14-2512
72	Knob—Shifter Handle	14-750A
73	Taper Pin	#00 x 1
74	Plunger—Shifter Handle	14-749A
75	Spring—Shifter Handle	14-748
76	Handle—Feed Rev. Shifter	24-729
77	Taper Pin	#4 x 1½
78	Taper Pin	#4 x 1½
79	Shifter—Feed Rev.	24-724
80	Shaft—Feed Rev. Shifter	24-747
81	Interference Pin—Half Nut	14-770
82	Shoe—Feed Rev. Shifter	24-725
83	Half Nut	34-721
84	Oiler	Gits #501
85	Stud—Half Nut Cam	14-769
86	Cam—Half Nut	24-722
87	Gib—Half Nut	24-723
88	Woodruff Key	#9 (¾ x 3/16)
89	Handle—Drive Cluster Gear	32246-616
90	Shaft—Half Nut Cam	24-768
91	Taper Pin	#4 x 1½
92	Set Screw—Hd'ls—Flat Pt.	¼-20 x 3/8
93	Oiler	Gits #1702
94	Screw—Soc. Hd.	10-24 x ½
95	Key—Carriage	14-773
96	Handwheel	46-767A
97	Nut—Hex	½-13
98	Washer	1424-279
99	Woodruff Key	#9 (¾ x 3/16)
100	Pinion—Hand Feed	24-766A
101	Roller Bearing	Orange #7154-CT
102	Welch Plug	2⅛ Dia. x .083
103	Pin (Dr. Rd.)	3/16 Dia. x ¼
104	Dial—Chasing	24-782A
105	Screw—Flat Hd.	¼-20 x ¾
106	Collar—Chasing Dial	14-785
107	Worm Wheel—Chasing Dial	24-786
108	Shaft—Chasing Dial	14-784A (12"-14") / 24-1396A (16")
109	Taper Pin	#2 x 1¼
110	Pinion—Rack Feed	24-765B
111	Roller Bearing	Orange #7194-CT
112	Gear—Rack Pinion	34-736A
113	Woodruff Key	#808 (1 x ¼)
114	Roller Bearing	Orange #7154-CT
115	Collar—Rack Feed Pinion	14-783
116	Taper Pin	#4 x 1½
117	Screw—Soc. Hd.	#10-24 x ½
118	Fibre Washer	Lunken'r Fig. 1025 Size 278
119	Glass—Oil Gage	6167
120	Oil Level Indicator (Decal)	14-1678
121	Plate—Oil Gage	6166
122	Cork Washer	Lunken'r Fig. 1062 Size 162

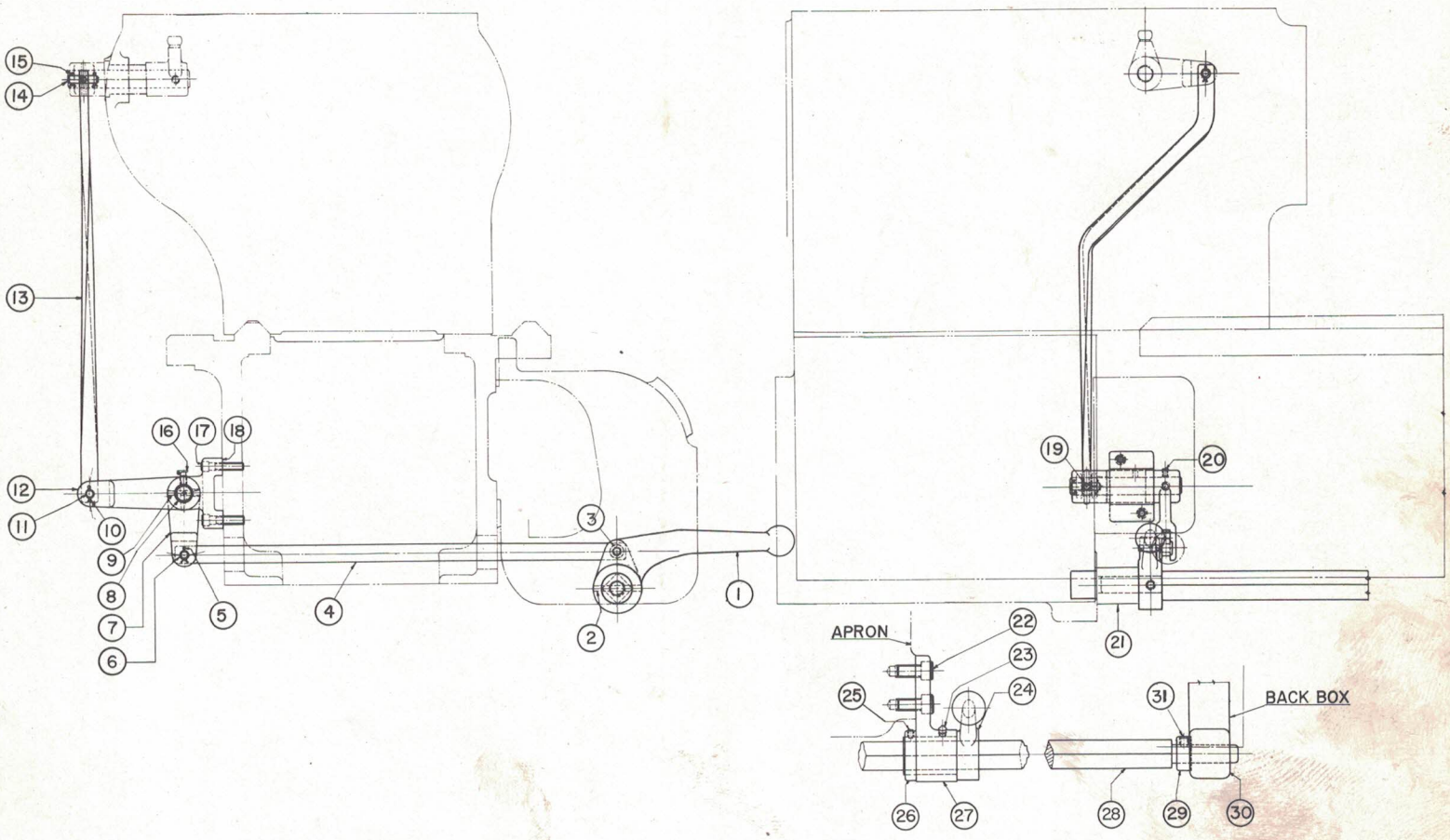


APRON CLUTCH CONTROL

Fig. 56-1318A

DETAIL NO.	PART NAME	PART NO. 12"-14"
1	Control Handle	36-1326
2	Taper Pin	#4 x 2¼
3	Taper Pin	#4 x 1½
4	Clutch Shifter Lever	26246-705A
5	Cotter Pin	3/32 Dia. x 1
6	Link Pin	16246-707
7	Cross Link	26-1325
8	Link Pin	16246-707
9	Clutch Shifter Lever	26246-705A
10	Taper Pin	#4 x 1½
11	Taper Pin	#4 x 1½
12	Clutch Shifter Lever	26246-705A
13	Link Pin	16246-707
14	Cotter Pin	3/32 Dia. x 1
15	Rear Link	262-706A (12" M.D.) / 36-2648 (12" H.D.) / 264-718A (14" M.D.) / 36-2649 (14" H.D.)
16	Link Pin	16246-707
17	Cotter Pin	3/32 Dia. x 1

DETAIL NO.	PART NAME	PART NO. 12"-14"
18	Screw—Soc. Hd.	3/8-16 x 1
19	Rear Bracket	36246-708A
20	Oiler	Gits #501
21	Lever Shaft (Rear)	16246-716A
22	Cotter Pin	3/32 Dia. x 1
23	Set Screw—Hollow—Flat Pt.	¼-20 x 3/8
24	Bush—Clutch Control	23-2584
25	Set Screw—Hollow—Flat Pt.	¼-20 x 3/8
26	Screw—Soc. Hd.	½-13 x 1
27	Oiler	Gits #501
28	Shifter Handle	36246-713
29	Set Screw—Hollow—Dog Pt.	3/8-16 x 3/8
30	Back Box	46-1324
31	Collar	11246-94
32	Operating Rod	36-1327 (M.D.) / 36-2651 (H.D.)
33	Clutch Control Bkt.	34-728
34	Collar	16246-714
35	Set Screw—Hollow—Dog Pt.	5/16-18 x 3/8

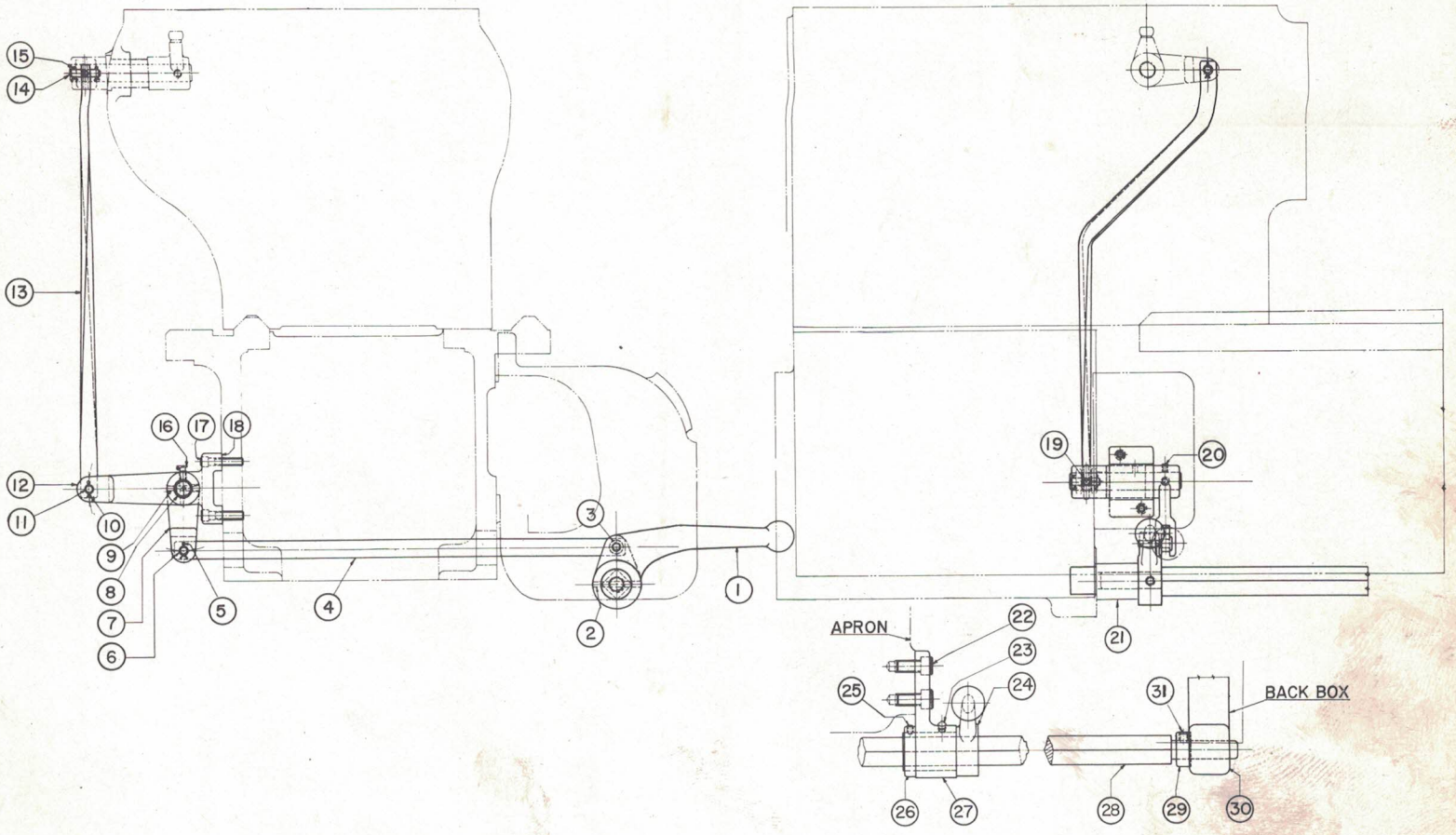


APRON CLUTCH CONTROL

Fig. 56-1320A

DETAIL NO.	PART NAME	PART NO. 16"
1	Control Handle	36-1576
2	Taper Pin	#4 x 2¼
3	Link Pin	16-1575
4	Cross Link	26-1574A
5	Cotter Pin	$\frac{3}{32}$ x 1
6	Link Pin	16246-707
7	Clutch Shifter Lever (Short)	26-1590 (M.D.) / 26-2652 (H.D.)
8	Lever Shaft (Rear)	26-1573
9	Taper Pin	#4 x 1½
10	Cotter Pin	$\frac{3}{32}$ x 1
11	Link Pin	16246-707
12	Clutch Shifter Lever (Long)	26246-705A
13	Rear Link	36-1571 (M.D.) / 36-2650 (H.D.)
14	Link Pin	16246-707
15	Cotter Pin	$\frac{3}{32}$ x 1

DETAIL NO.	PART NAME	PART NO. 16"
16	Oiler	Gits #501
17	Screw—Soc. Hd.	⅜-16 x 1¼
18	Rear Bracket	36-1572
19	Set Screw—Hollow—Flat Pt.	¼-20 x ⅜
20	Set Screw—Hollow—Flat Pt.	¼-20 x ⅜
21.	Bush—Clutch Control	23-2584
22	Screw—Soc. Hd.	½-13 x 1
23	Oiler	Gits #501
24	Shifter Handle	36246-713
25	Set Screw—Hollow—Dog Pt.	$\frac{5}{16}$-18 x ⅜
26	Collar	16246-714
27	Clutch Control Bkt.	34-728
28	Operating Rod	36-1577
29	Collar	11246-94
30	Black Box	46-1324
31	Set Screw—Hollow—Dog Pt.	⅜-16 x ⅜

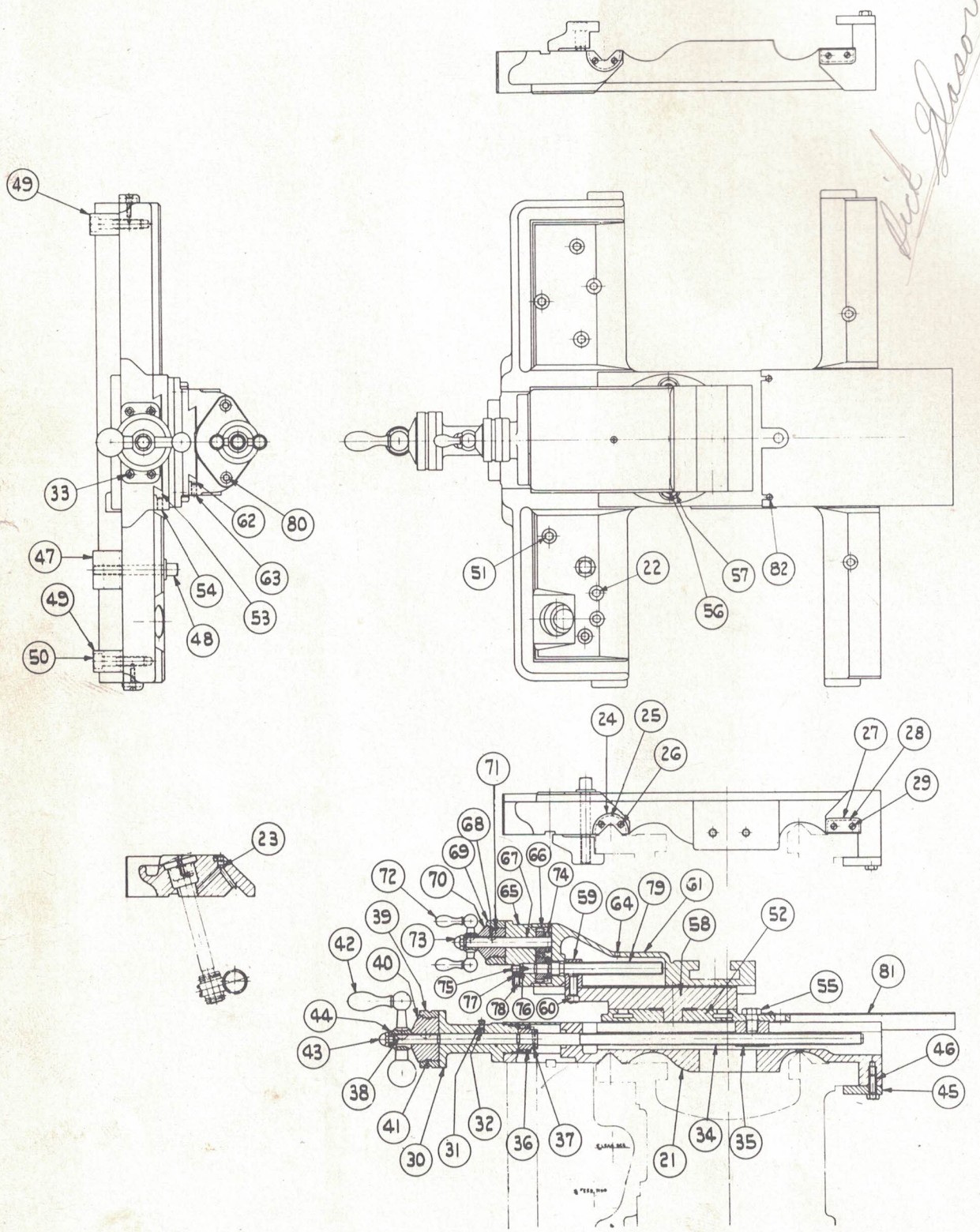


APRON CLUTCH CONTROL

Fig. 56-1320A

DETAIL NO.	PART NAME	PART NO. 16"
1	Control Handle	36-1576
2	Taper Pin	#4 x 2¼
3	Link Pin	16-1575
4	Cross Link	26-1574A
5	Cotter Pin	3/32 x 1
6	Link Pin	16246-707
7	Clutch Shifter Lever (Short)	26-1590 (M.D.) / 26-2652 (H.D.)
8	Lever Shaft (Rear)	26-1573
9	Taper Pin	#4 x 1½
10	Cotter Pin	3/32 x 1
11	Link Pin	16246-707
12	Clutch Shifter Lever (Long)	26246-705A
13	Rear Link	36-1571 (M.D.) / 36-2650 (H.D.)
14	Link Pin	16246-707
15	Cotter Pin	3/32 x 1

DETAIL NO.	PART NAME	PART NO. 16"
16	Oiler	Gits #501
17	Screw—Soc. Hd.	3/8-16 x 1¼
18	Rear Bracket	36-1572
19	Set Screw—Hollow—Flat Pt.	¼-20 x 3/8
20	Set Screw—Hollow—Flat Pt.	¼-20 x 3/8
21.	Bush—Clutch Control	23-2584
22	Screw—Soc. Hd.	½-13 x 1
23	Oiler	Gits #501
24	Shifter Handle	36246-713
25	Set Screw—Hollow—Dog Pt.	5/16-18 x 3/8
26	Collar	16246-714
27	Clutch Control Bkt.	34-728
28	Operating Rod	36-1577
29	Collar	11246-94
30	Black Box	46-1324
31	Set Screw—Hollow—Dog Pt.	3/8-16 x 3/8



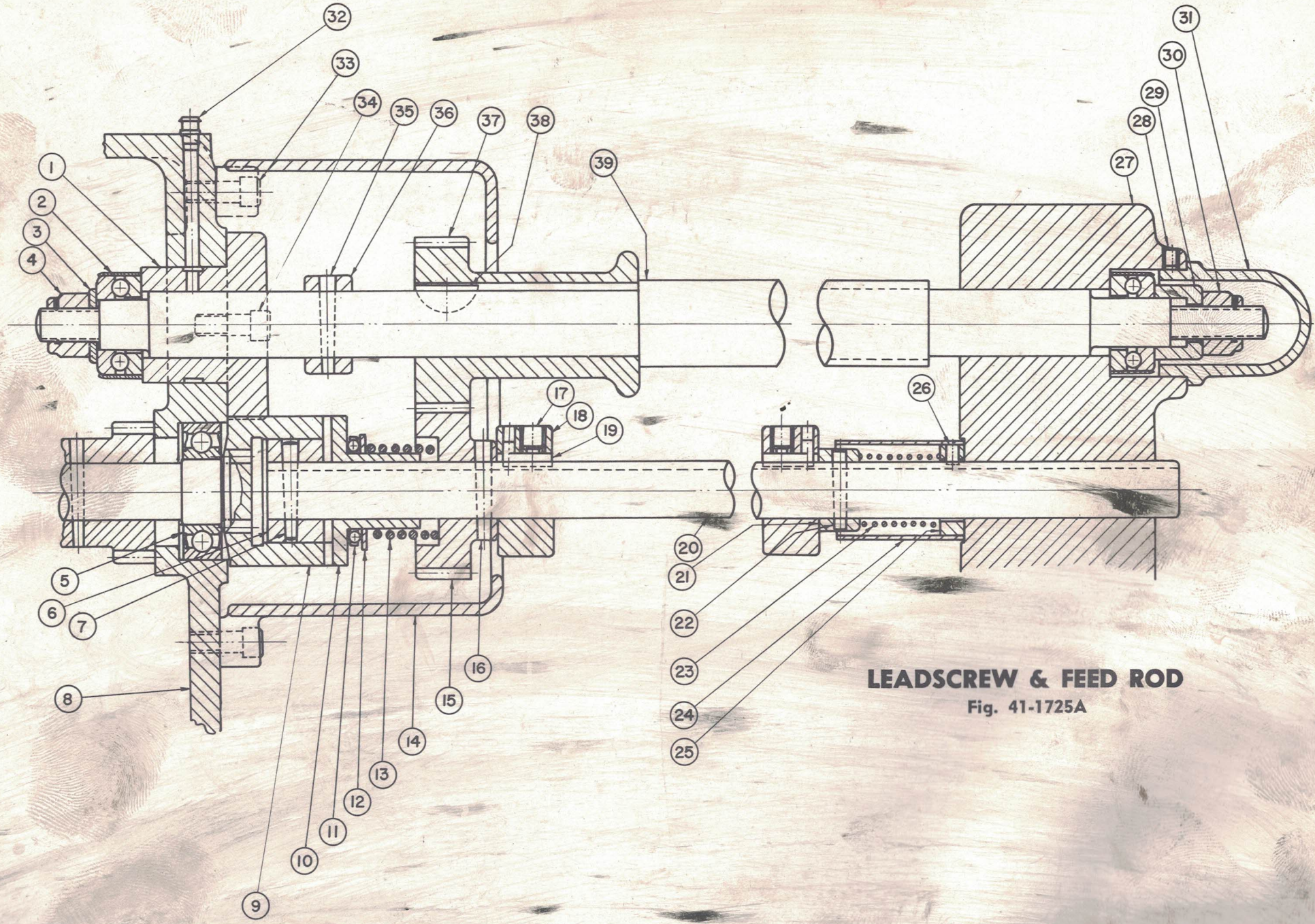
CARRIAGE AND COMPOUND REST

Fig. 64-883

CARRIAGE AND COMPOUND REST

Fig. 64-883

DETAIL NO.	NAME	PART NO. 12	PART NO. 14	PART NO. 16
21	Carriage	64-834A	64-834A	54-11127A
22	Oiler	Gits No. 502	Gits No. 502	Gits No. 502
23	Oil Wick	Gits 1/4 Dia. x 3/16" lg.	Gits 1/4 Dia. x 3/16" lg.	Gits 1/4 Dia. x 3/16" lg.
24	Shear Wiper (Front)	1424-488	1424-488	14-1391
25	Shear Wiper Pad (Front)	1424-493	1424-493	14-1392
26	Mach. Scr.-Fill Hd.	10-24 x 5/8" lg.	10-24 x 5/8" lg.	10-24 x 5/8" lg.
27	Shear Wiper (Rear)	14-787	14-787	14-1393
28	Shear Wiper Pad (Rear)	14-788	14-788	14-1394
29	Mach. Scr.-Fill Hd.	10-24 x 5/8" lg.	10-24 x 5/8" lg.	10-24 x 5/8" lg.
30	Bush-Feed Scr.	34-1447	34-1447	34-1395
31	Oiler	Gits No. 501	Gits No. 501	Gits No. 501
32	Oil Wick	Gits 3/16 Dia. x 1/8" lg.	Gits 3/16 Dia. x 1/8 lg.	Gits 3/16 Dia. x 1/8" lg.
33	Cap Scr.-Socket Hd.	3/8-16 x 1" lg.	3/8-16 x 1" lg.	3/8-16 x 1" lg.
34	Cross Feed Screw	34-778	34-778	34-1128
35	Cross Feed Nut	1424-274A	1424-274A	146-498A
36	Cross Feed Pinion	24-779	24-779	24-1129
37	Taper Pin	No. 3 x 1" lg.	No. 3 x 1" lg.	No. 3 x 1" lg.
38	Woodruff Key	No. 5 (5/8 x 1/8")	No. 5 (5/8 x 1/8")	No. 5 (5/8 x 1/8")
39	Cross Feed Dial	24-1468	24-1468	24-1470
40	Cross Feed Dial Bush	24-1469	24-1469	24-1471
41	Dial Spring	14-781	14-781	14-781
42	Ball Crank	24-1544	24-1544	24-1652
43	Acorn Nut	3/8-16	3/8-16	1/2-13
44	Lock Nut	14-1578	14-1578	14-1579
45	Rear Gib	24-780	24-780	24-1130
46	Cap. Scr. Hex Hd.	3/8-16 x 1 1/4" lg.	3/8-16 x 1 1/4" lg.	3/8-16 x 1" lg.
47	Carriage Clamp	24-731	24-731	24-731
48	Carriage Clamp Screw	2424-404	2424-404	2424-404
49	Front Gib	24-730	24-730	24-730
50	Cap Scr.-Soc. Hd.	1/2-13 x 1 3/4" lg.	1/2-13 x 1 3/4" lg.	1/2-13 x 1 3/4" lg
51	Cap Scr.-Soc. Hd.	1/2-13 x 2 1/2" lg.	1/2-13 x 2 1/2" lg.	1/2-13 x 3" lg.
52	Cross Slide	442-691	444-325	446-512
53	Cross Slide Gib	1424-326	1426-326	146-513
54	Set Scr.-Hol.-Cone Pt.	5/16-18 x 3/4" lg.	5/16-18 x 3/4" lg.	5/16-18 x 7/8" lg
55	Cross Feed Nut Screw	144-403A	144-403A	144-403A
56	Swivel Bolt	142-692	144-340	144-340
57	Hex Nut	1/2-13 Jam	1/2-13 Std.	1/2-13 Std.
58	Swivel	44-1554	44-1561	44-1552
59	Top Slide Nut	14-1555	14-1553	14-1553
60	Mach. Scr.-Fill Hd.	7/16-14 x 3/4" lg.	7/16-14 x 1" lg.	7/16-14 x 1 1/4" lg
61	Top Slide	44-1557	44-1558A	44-1511
62	Top Slide Gib	14-1559	14-1559	14-1512
63	Set Scr.-Hol.-Cone Pt.	5/16-18 x 5/8" lg.	5/16-18 x 5/8" lg.	5/16-18 x 3/4" lg
64	Oiler	Gits No. 521	Gits No. 521	Gits No. 521
65	Top Slide Bush	34-1560	34-1560	34-1515
66	Feed Pinion (Top-Slide)	14-1516	14-1516	14-1516
67	Dial Shaft (Top-Slide)	14-1517	14-1517	14-1517
68	Woodruff Key	No. 3 (1/2 x 1/8")	No. 3 (1/2 x 1/8")	No. 3 (1/2 x 1/8")
69	Top Slide Dial	24-1518	24-1518	24-1518
70	Top Slide Dial Bush	24-1519	24-1519	24-1519
71	Dial Spring	14-781	14-781	14-781
72	Crank Handle	14246-859	14246-859	14246-859
73	Acorn Nut	3/8-16	3/8-16	3/8-16
74	Taper Pin	No. 2 x 1" lg.	No. 2 x 1" lg.	No. 2 x 1" lg.
75	Set Scr.-Hol.-Flat Pt.	3/8-16 x 1/2" lg.	3/8-16 x 1/2" lg.	3/8-16 x 1/2" lg.
76	Ball	1/4" Dia.	1/4" Dia.	1/4" Dia.
77	Plug	1/4 Dia. x 3/16" lg.	1/4 Dia. x 3/16" lg.	1/4 Dia. x 3/16" lg
78	Set Scr.-Hol.-Flat Pt.	5/16-18 x 1/2" lg.	5/16-18 x 1/2" lg.	5/16-18 x 1/2" lg.
79	Top Slide Feed Screw	24-1520	24-1520	24-1520
80	Cap. Scr.-Soc. Hd.	3/8-16 x 3/4" lg.	3/8-16 x 3/4" lg.	3/8-16 x 3/4" lg.
81	Cross Slide Guard	2424-139A	2424-139A	346-518A
82	Mach. Scr.-Button Hd.	1/4-20 x 3/8" lg.	1/4-20 x 3/8" lg.	1/4-20 x 3/8" lg.



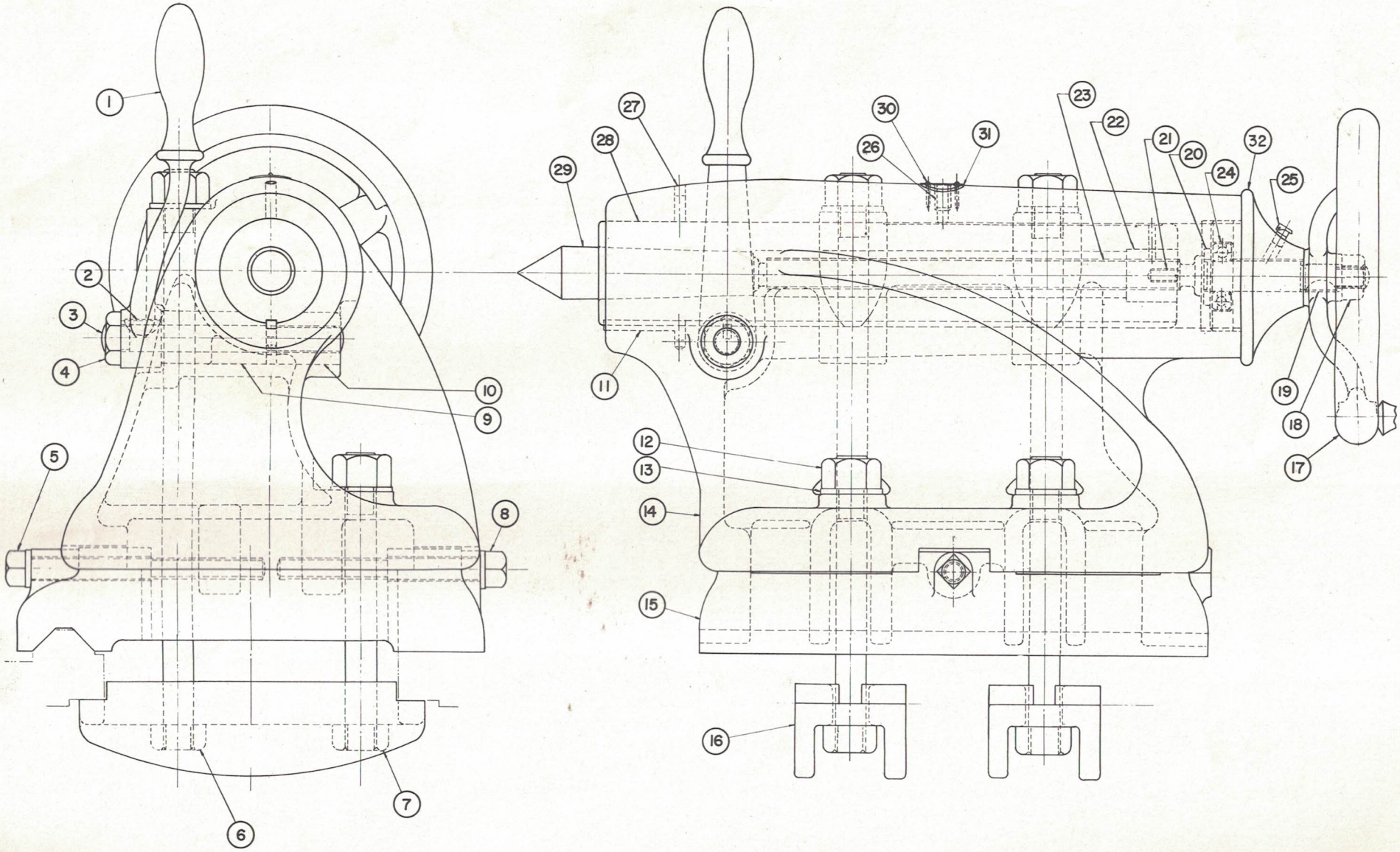
LEADSCREW & FEED ROD

Fig. 41-1725A

LEADSCREW & FEED ROD

Fig. 41-1725A

DETAIL NO.	PART NAME	PART NO. 12"-14"-16"
1	Bush—Lead Screw	21-971A
2	Thrust Bearing	#3 Type T-100 Auburn
3	Washer	1424-279
4	Nut	½-13-Unshako-Hex
5	Ball Bearing	#99505 New Departure
6	Clutch—Inner	21-966
7	Taper Pin	#4 x 1½
8	Quick Change Box	63-832G
9	Clutch—Feed Drive	33-1853B
10	Clutch—Outer	21-1448
11	Thrust Bearing	R-5777 Nice
12	Washer	11-1451
13	Spring—Feed Rod	21-1449
14	Gear Cover—Slip Gear	31-975A
15	Gear—Feed Rod	21-965
16	Taper Pin	#4 x 1½
17	Set Screw	⅜-16 x ½
18	Collar—Auto Stop	11-1567
19	Key—Auto Stop Collar	11-1596
20	Feed Rod	31-964
21	Collar—Feed Rod	11-968
22	Taper Pin	#4 x 1¼
23	Spring—Feed Rod	116-631
24	Cover—Spring	11-1277
25	Collar—Feed Rod	11-1276
26	Pin	3/16 Dia. x $\frac{5}{16}$
27	Back Box	46-1324
28	Set Screw—Hollow Hex—Cup Pt.	¼-20 x $\frac{5}{16}$
29	Collar—Lead Screw	11-973
30	Nut	½-13 Unshako—Hex
31	Cap—Lead Screw	21-1461
32	Oiler	#501 Gits
33	Screw—Soc. Hd.	$\frac{5}{16}$-18 x ¾
34	Screw—Soc. Hd.	$\frac{5}{16}$-18 x ⅞
35	Taper Pin	#4 x 1½
36	Stop Collar—Slip Gear	11-1460
37	Gear—Lead Screw	21-970
38	Key—Woodruff	#15(1 x ¼)
39	Lead Screw	31-969



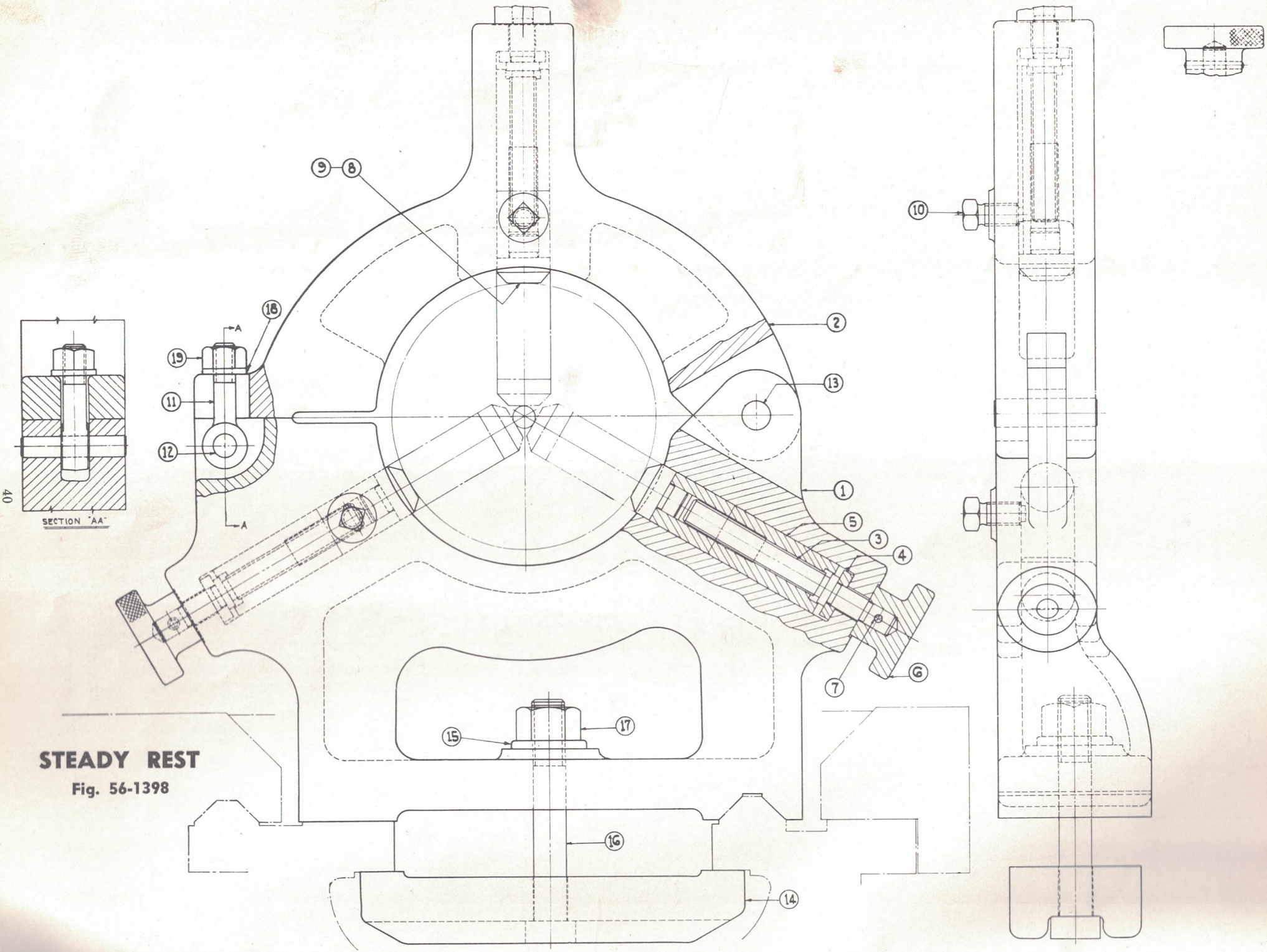
TAILSTOCK

Fig. 55-1312A

TAILSTOCK

Fig. 55-1312A

DETAIL NO.	PART NAME	PART NO. 12"	PART NO. 14"	PART NO. 16"
1	Handle—Spindle Clamp	35246-118A	35246-118A	35246-118A
2	Key—Woodruff	#11 (⅞ x $\frac{3}{16}$)	#11 (⅞ x $\frac{3}{16}$)	#11 (⅞ x $\frac{3}{16}$)
3	Screw—Clamp	25246-121	25246-121	25246-121
4	Nut—Hex. Jam	⅝-11	⅝-11	⅝-11
5	Set-over Screw	25246-116	25246-116	25-1385
6	Screw—Clamp (Rear)	252-112A	254-132A	256-174B
7	Screw—Clamp (Front)	252-111A	254-131A	256-175B
8	Set-over Screw	25246-116	25246-116	25-1384
9	Clamp Bush—Spindle	25246-119A	25246-119A	25-2579
10	Clamp Nut—Spindle	25246-120A	25246-120A	25-2580
11	Key—Spindle	15246-122	15246-122	15246-122
12	Nut—Hex.	¾-10	¾-10	¾-10
13	Washer	15246-475	15246-475	15246-475
14	Tailstock Top	552-106B	554-107B	556-178B
15	Tailstock Botton	45-1314A	45-1307A	45-1379A
16	Clamp—Tailstock	3524-110	3524-110	35-1380
17	Handwheel	35-1467	35-1467	35-1467
18	Nut—Hex.	½-13	½-13	½-13
19	Key—Woodruff	#9 (¾ x $\frac{3}{16}$)	#9 (¾ x $\frac{3}{16}$)	#9 (¾ x $\frac{3}{16}$)
20	Washer	15246-123	15246-123	15246-123
21	Set Screw—Headless—Flat Pt.	$\frac{5}{16}$-18 x ⅝	$\frac{5}{16}$-18 x ⅝	$\frac{5}{16}$-18 x ⅝
22	Nut—Spindle	15246-114	15246-114	15246-114
23	Screw—Spindle	15246-115A	15246-115A	15246-115A
24	Thrust Bearing	#607 Nice	#607 Nice	#607 Nice
25	Oiler	#501 Gits	#501 Gits	#501 Gits
26	Set Screw—Headless—Flat Pt.	$\frac{5}{16}$-18 x $\frac{5}{16}$	$\frac{5}{16}$-18 x $\frac{5}{16}$	$\frac{5}{16}$-18 x $\frac{5}{16}$
27	Plug			
28	Spindle	35246-113	35246-113	35-2578
29	Center	22-2530	22-2530	22-2530
30	Screw—Self Tapping—Button Hd.	#4 x ¼ P-K Type Z	#4 x ¼ P-K Type Z	#4 x ¼ P-K Type Z
31	Indicator Plate—Oil	15-1684	15-1684	15-1684
32	End Cap	35246-117	35246-117	35-2577



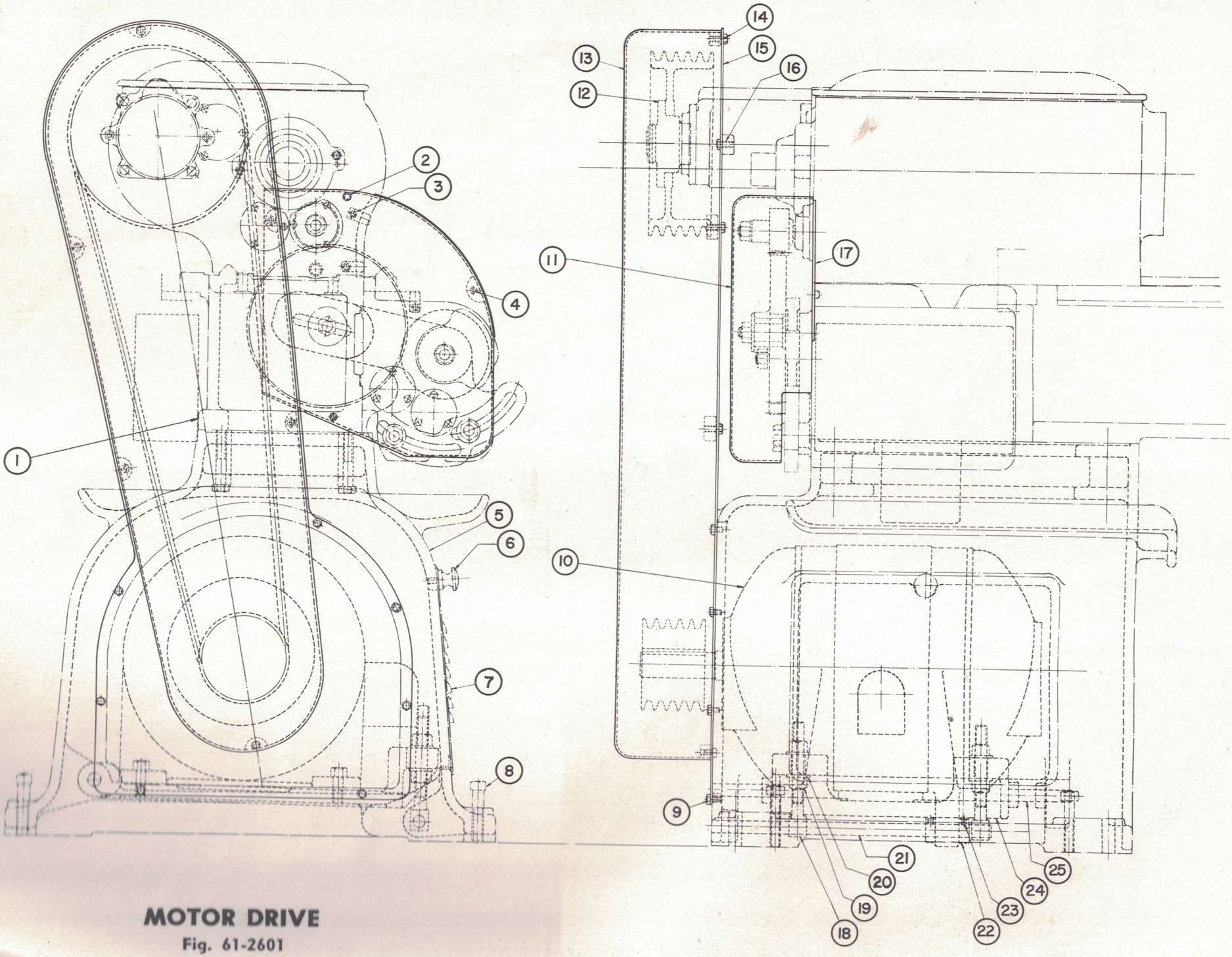
STEADY REST

Fig. 56-1398

STEADY REST

Fig. 56-1398

DETAIL NO.	NAME	PART NO. 12	PART NO. 14	PART NO. 16
1	Base	46-1494	46-1504	46-1399
2	Top	46-1495	46-1495	46-1400
3	Adjusting Screw	26-1496	26-1496	26-1401
4	Washer	16-1497	16-1497	16-1402
5	Jaw	26-1498	26-1498	26-1403
6	Adjusting Knob	26-1499	26-1499	26-1404
7	Taper Pin	No. 2 x 1" lg.	No. 2 x 1" lg.	No. 4 x 1 1/4" lg.
8	Tip-Renewable (CI)	16-1500	16-1500	16-1405
9	Tip-Renewable (Brz)	16-1551	16-1551	16-1488
10	Sq. Hd. Set Scr. (Dog PT.)	3/8-16 x 7/8" lg.	3/8-16 x 7/8" lg.	1/2-13 x 1" lg.
11	Latch Bolt	26-1501	26-1501	26-1501
12	Pin (Latch Pin)	16-1502	16-1502	16-1490
13	Pin (Hinge)	16-1502	16-1502	16-1491
14	Clamp	36-1503	36-1503	36-1492
15	Washer	166-670	166-670	12246-81
16	Clamp Bolt (Sq. Hd.)	5/8-11 x 4" lg.	5/8-11 x 5" lg.	3/4-10 x 5" lg.
17	Hex. Nut (Std.)	5/8-11	5/8-11	3/4-10
18	Washer	16246-477	16246-477	16246-477
19	Hex. Nut (Std.)	1/2-13	1/2-13	1/2-13



MOTOR DRIVE

Fig. 61-2601

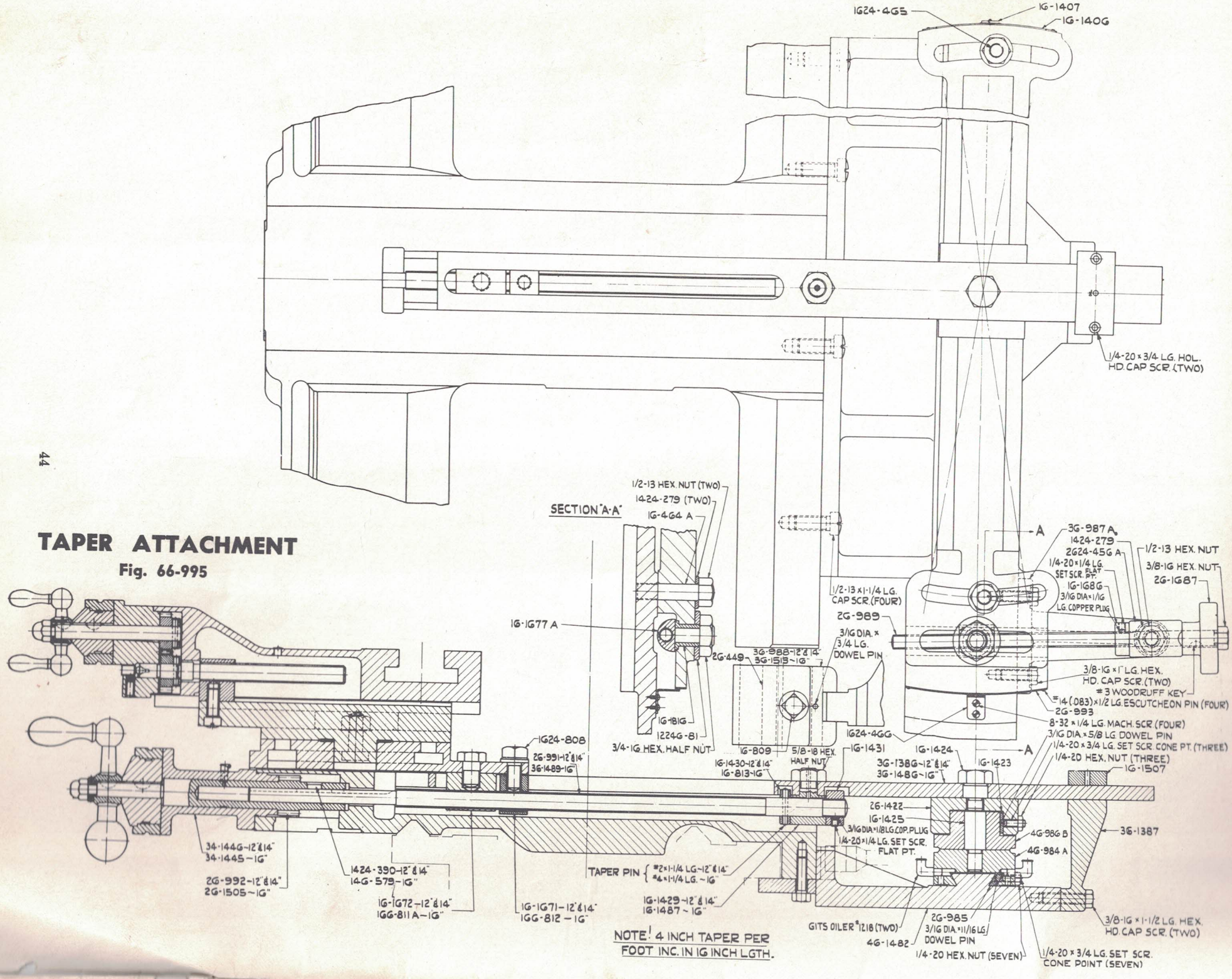
MOTOR DRIVE

Fig. 61-2601

DETAIL NO.	PART NAME	PART NO. 12" (M.D.)	12" (H.D.)	14" (M.D.)	14" (H.D.)	16" (M.D.)	16" (H.D.)
1	Bed	51-926A	51-2554	51-926A	51-2554	61-1373A	61-1373A
2	Screw	16-1644	16-1644	16-1644	16-1644	16-1696	16-1696
3	Screw—Soc. Hd.	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2
4	Screw—Fill. Hd.	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2
5	Motor Leg	51-1002	61-2553	51-1002	61-2553	61-1374	61-2550
6	Knob	13246-280	13246-280	13246-280	13246-280	13246-280	13246-280
7	Door—Motor Leg	31246-97	31-1377	31246-97	31-1377	31-1377	31-1377
8	Adjusting Screw	21-1584	21-1584	21-1584	21-1584	21-1584	21-1584
9	Screw—Hex. Hd.	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2
10	Motor						
11	Gear Guard	46-1533A	46-1533A	46-1098A	46-1098A	46-1566A	46-1566A
12	Head Sheave	42246-43	42-2536	42246-43	42-2536	42246-43	42-2536
13	Belt Guard	56-1599	56-2594	564-142	56-2644	56-1563	56-2594
14	Screw—Hex. Hd.	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2
15	Belt Guard Back	56-1600	56-2595	564-141	56-2445	56-1564	56-2602
16	Screw—Hex. Hd.	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2	5/16-18 x 1/2
17	Gear Guard Back	26-1534	26-1534	36-1097	36-1097	26-1565	26-1565
18	Adj. Screw—Motor Plate	21246-92	21-1435	21246-92	21-1435	21-1435	21-1435
19	Nut—Hex.	3/4-10	3/4-10	3/4-10	3/4-10	3/4-10	3/4-10
20	Washer	3/4-Std.	3/4-Std.	3/4-Std.	3/4-Std.	3/4-Std.	3/4 Std.
21	Rod—Motor Adj. Screw	21246-96	21-2571	21246-96	21-2571	21-1436	21-2571
22	Collar	11246-94	11246-94	11246-94	11246-94	11246-94	11246-94
23	Set Screw—Hollow—Cup Pt.	3/8-16 x 3/8	3/8-16 x 3/8	3/8-16 x 3/8	3/8-16 x 3/8	3/8-16 x 3/8	3/8-16 x 3/8
24	Motor Plate		To Suit Motor				
25	Hinge Pin—Motor Plate	21246-93	21-1437	21246-93	21-1437	21-1437	21-1437

TAPER ATTACHMENT

Fig. 66-995

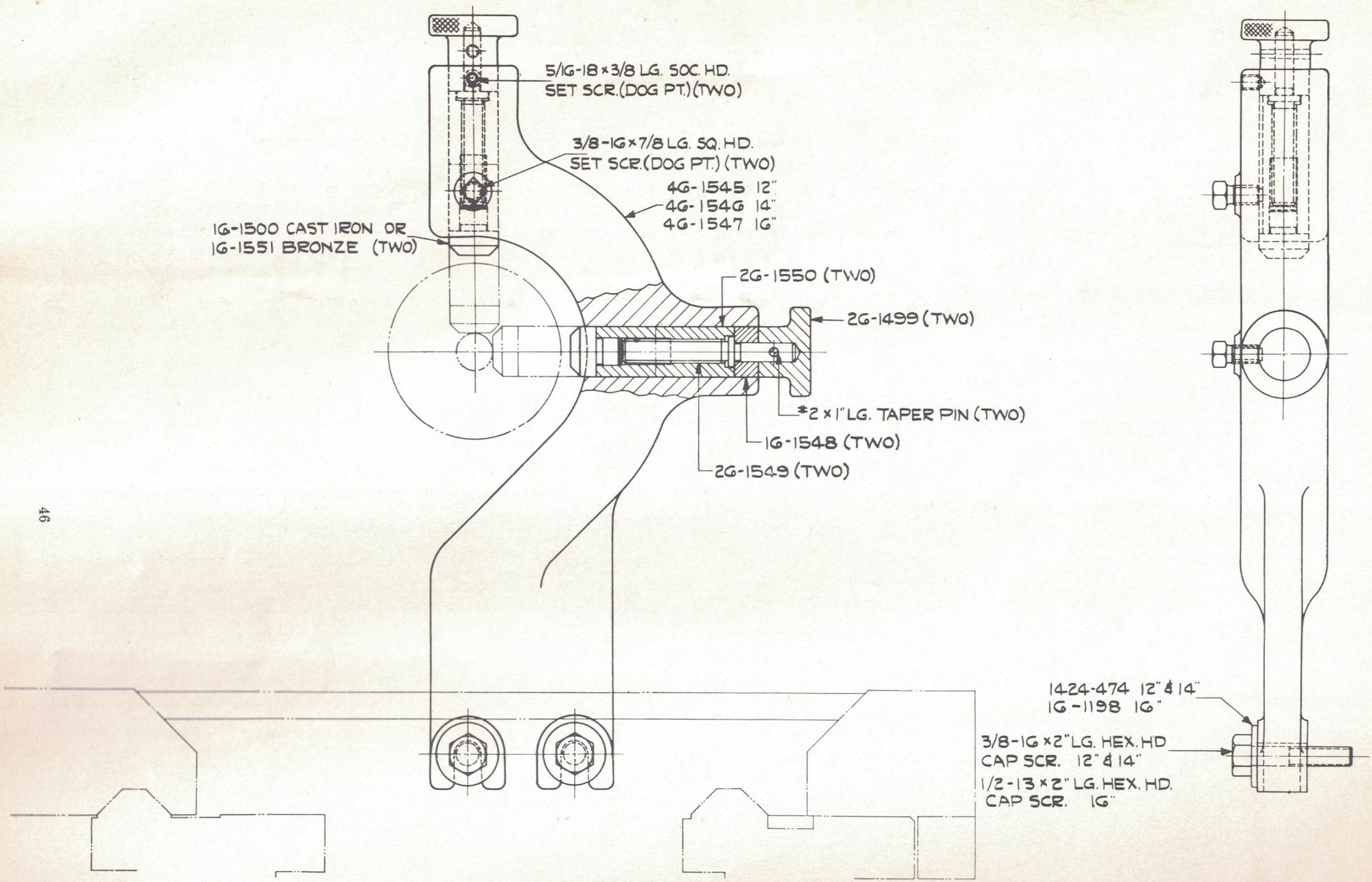


NOTE! 4 INCH TAPER PER FOOT INC. IN 1G INCH LGTH.

TAPER ATTACHMENT

Fig. 66-995

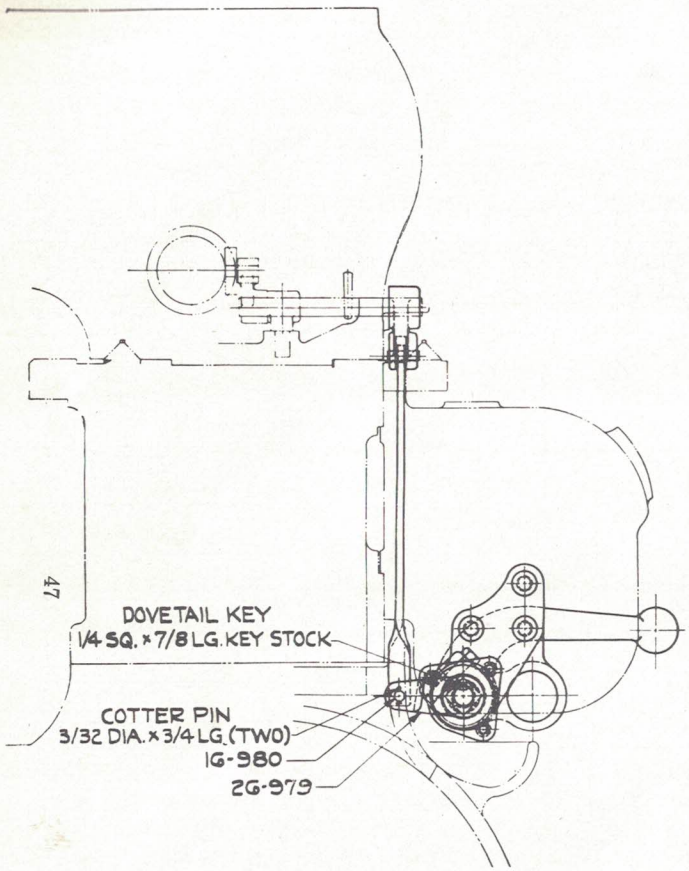
Part No.	Part Name
12246-81	Washer
14-279	Washer
1424-390	Key—Bevel Pinion (12-14″ only)
146-579	Key—Bevel Pinion (16″ only)
16-464A	Stud-Clamp (Long)
16-809	Screw-Locating Clamp
16-813	Collar-Cross Feed Screw (16″ only)
16-1406	Index Scale (Degrees)
16-1407	Pointer-Index (Degrees)
16-1423	Gib-Top Slide Shoe
16-1424	Screw-Shoe Clamp
16-1425	Stud-Swivel
16-1429	End Bearing-Feed Screw (12″-14″ only)
16-1430	Collar-Cross Feed Screw (12″-14″ only)
16-1431	Nut-Thrust Adjusting
16-1487	End Bearing-Feed Screw (16″ only)
16-1507	Car-Bar Support
16-1671	Clamp-Cross Feed Screw (12″-14″ only)
16-1672	Nut-Cross Feed Screw (12″-14″ only)
16-1677A	Nut-Index Screw
16-1686	Nut-Thrust Adjusting
16-1816	Bush-Index Screw
1624-465	Stud-Clamp (Short)
1624-466	Pointer-Index (Taper per foot)
1624-808	Screw-Bar Clamp
166-811A	Nut-Cross Feed Screw (16″ only)
166-812	Clamp-Cross Feed Screw (16″ only)
26-449	Cap-Locating Clamp
26-985	Gib
26-989	Screw Swivel
26-991	Screw-Cross Feed (12-14″ only)
26-992	Pinion Cross Feed Screw (12-14″ only)
26-993	Index Scale (Taper per foot)
26-1422	Shoe-Top Slide
26-1505	Pinion-Cross Feed Screw (16″ only)
26-1687	Knob-Swivel Adjusting Screw
2624-456A	Swivel-Index Screw
34-1445	Bush-Cross Feed Screw (16″ only)
34-1446	Bush-Cross Feed Screw 12-14″ only)
36-987A	Bracket-Index Screw
36-988	Clamp-Locating (12-14″ only)
36-1386	Bar (12-14″ only)
36-1387	Bracket Bar Support
36-1486	Bar (16″ only)
36-1489	Screw-Cross Feed (16″ only)
36-1513	Clamp-Locating (16″ only)
46-984A	Slide-Bottom
46-986B	Slide-Top
46-1482	Bracket

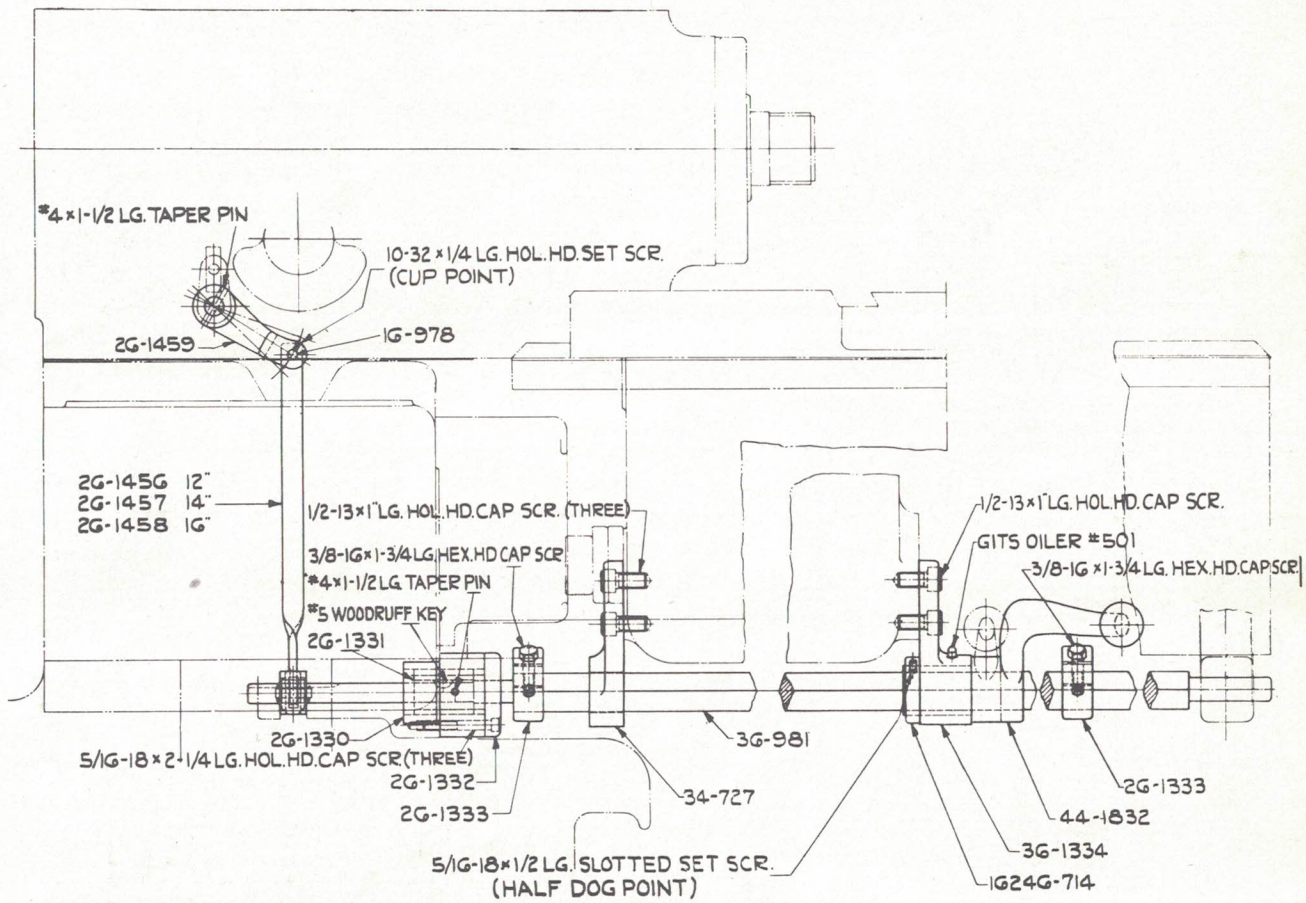


FOLLOW REST Fig. 56-1540

Part Name	12"	14"	16"
Washer	1424-474	1424-474	16-1198
Bushing	16-1548	16-1548	16-1548
Tip—Renewable (CI)	16-1500	16-1500	16-1500
Tip—Renewable (Brz)	16-1551	16-1551	16-1551

Part Name	12"	14"	16"
Adjusting Knob	26-1499	26-1499	26-1499
Adjusting Screw	26-1549	26-1549	26-1549
Jaw	26-1550	23-1550	26-1550
Rest	46-1545	46-1546	46-1547





APRON FEED REVERSE Fig. 56-1453

Part No.	Part Name
16-978	Lever Pin
16-980	Lever Pin
26-979	Lever (Q. C. Box)
26-1330	Auto Trip Nut
26-1331	Auto Trip Screw

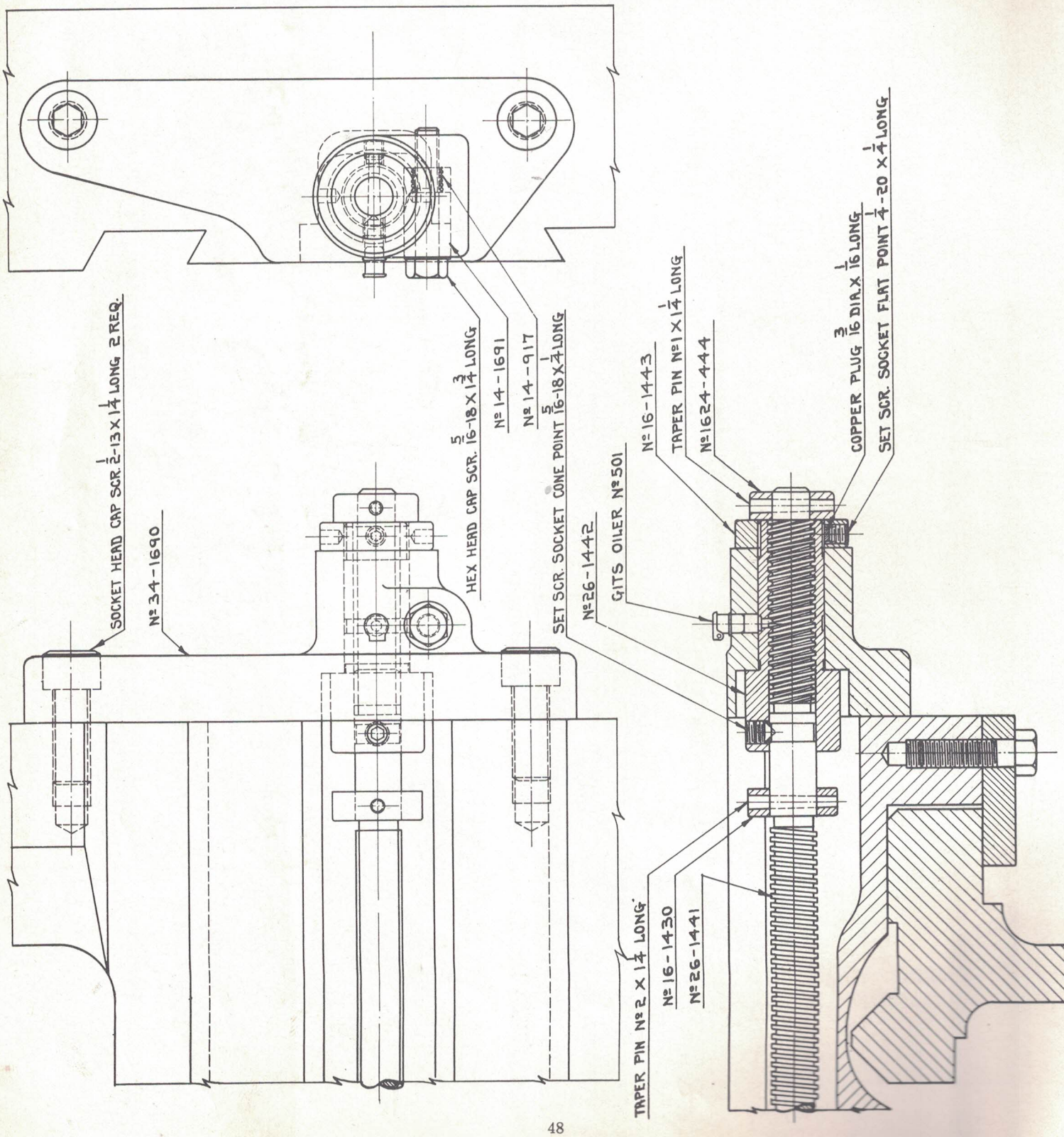
Part No.	Part Name
26-1332	Nut Cover
26-1333	Auto Trip Dog
26-1456	Reverse Link (12" only)
26-1457	Reverse Link (14" only)
26-1458	Reverse Link (16" only)

Part No.	Part Name
26-1459	Lever—Head
34-727	Bracket—L. H.
36-981	Operating Rod
36-1334	Bracket—R. H.
44-1832	Reverse Handle
16246-714	Collar

MICROMETER CHASING STOP Fig. 46-1692

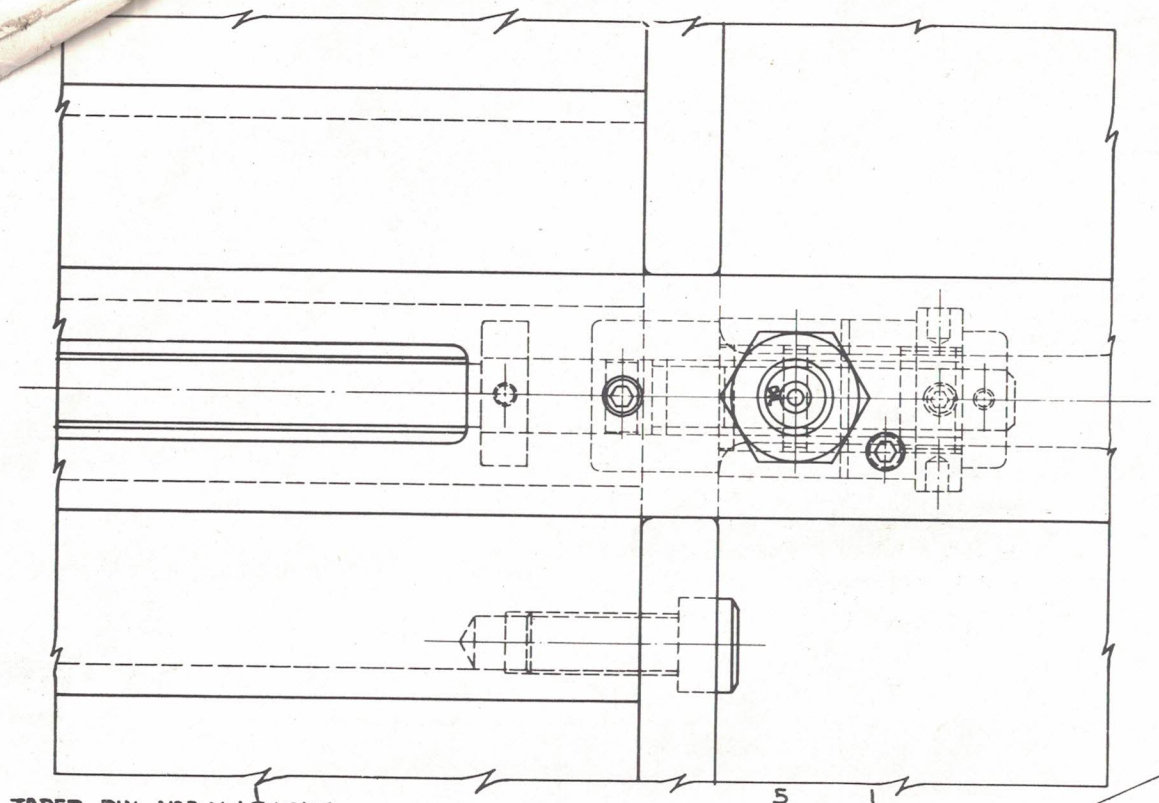
Part No.	Part Name
14-917	Clamp Screw Spring
14-1691	Clamp Bush
16-1430	Inner Stop Collar (12-14″ only)
16-1443	Adjusting Nut (12-14″ only)
16-1527	Adjusting Nut (16″ only)
16-1528	Inner Stop Collar (16″ only)
16-1529	Outer Stop Collar (16″ only)
26-992	Cross Feed Pinion (12-14″ only)
26-1441	Cross Feed Screw (12-14″ only)
26-1442	Rapid Feed Nut (12-14″ only)

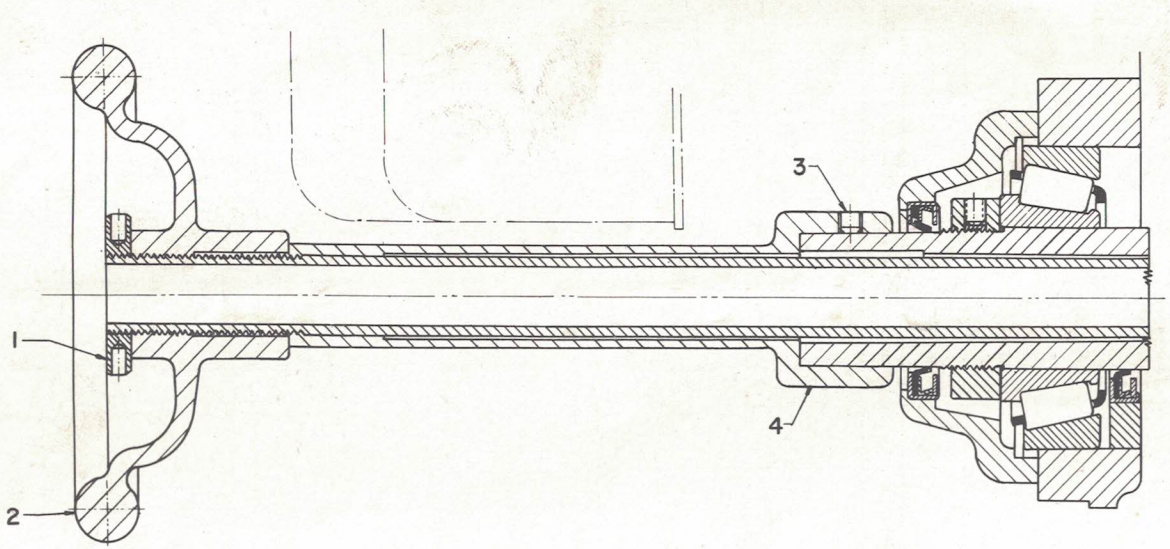
Part No.	Part Name
26-1505	Cross Feed Pinion (16″ only)
26-1526	Rapid Feed Nut (16″ only)
34-1445	Feed Screw Bush (16″ only)
34-1446	Feed Screw Bush (12-14″ only)
34-1690	Bracket (12-14″ only)
34-1802	Bracket (16″ only)
36-1525	Cross Feed Screw (16″ only)
146-579	Pinion Key (16″ only)
1424-390	Pinion Key (12-14″ only)
1624-444	Outer Stop Collar

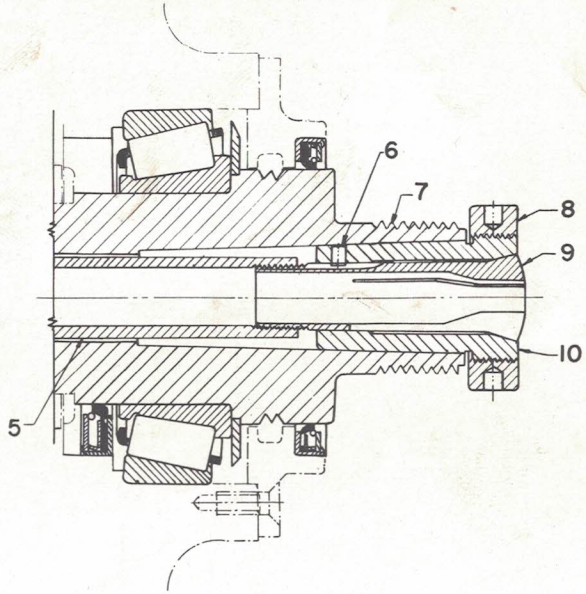


MICROMETER CHASING STOP
With Taper Attachment Fig. 46-1444

Part No.	Part Name
16-1430	Inner Stop Collar (12-14″ only)
16-1443	Adjusting Nut (12-14″ only)
16-1527	Adjusting Nut (16″ only)
16-1528	Inner Stop Collar (16″ only)
16-1529	Outer Stop Collar (16″ only)
26-1440	End Bearing (12-14″ only)
26-1441	Cross Feed Screw (12-14″ only)
26-1442	Rapid Feed Nut (12-14″ only)
26-1524	End Bearing (16″ only)
26-1526	Rapid Feed Nut (16″ only)
36-1439	Taper Attachment Bar (12-14″ only)
36-1523	Taper Attachment Bar (16″ only)
36-1525	Cross Feed Screw (16″ only)
1624-444	Outer Stop Collar (12-14″ only)





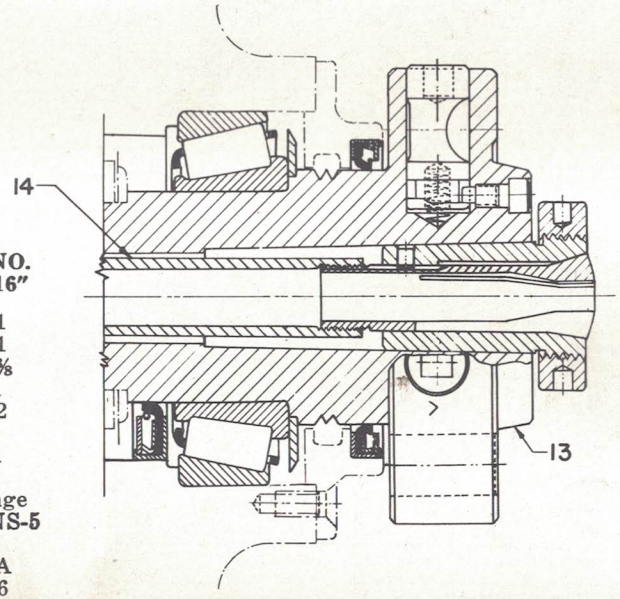


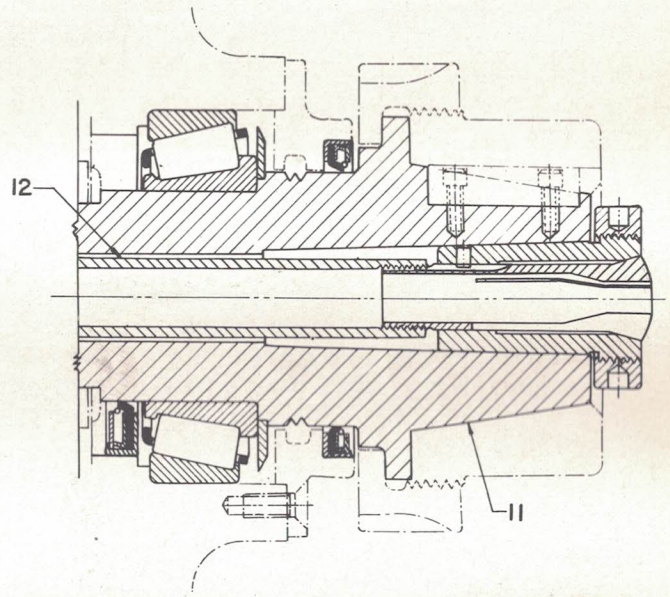
COLLET ATTACHMENT

Draw-in Type

Fig. 56-660A

DETAIL NO.	PART NAME	PART NO. 12"-14"-16"
1	Lock Nut	16246-851
2	Handwheel	36246-651
3	Set Screw—Hollow—Cup Pt.	⅜-16 x ⅜
4	Spindle Extension	36-1510A
5	Tube—Screw Nose	26246-652
6	Pin Key	16-1641
7	Spindle—Screw Nose	52-1795A
8	Collar	26-957
9	Collet	Hardinge Type NS-5
10	Sleeve	26-955-A
11	Spindle—Taper Nose	52-1253-A
12	Tube—Taper Nose	26246-956
13	Spindle—Cam Lock Nose	52-2509
14	Tube—Cam Lock Nose	26-2631



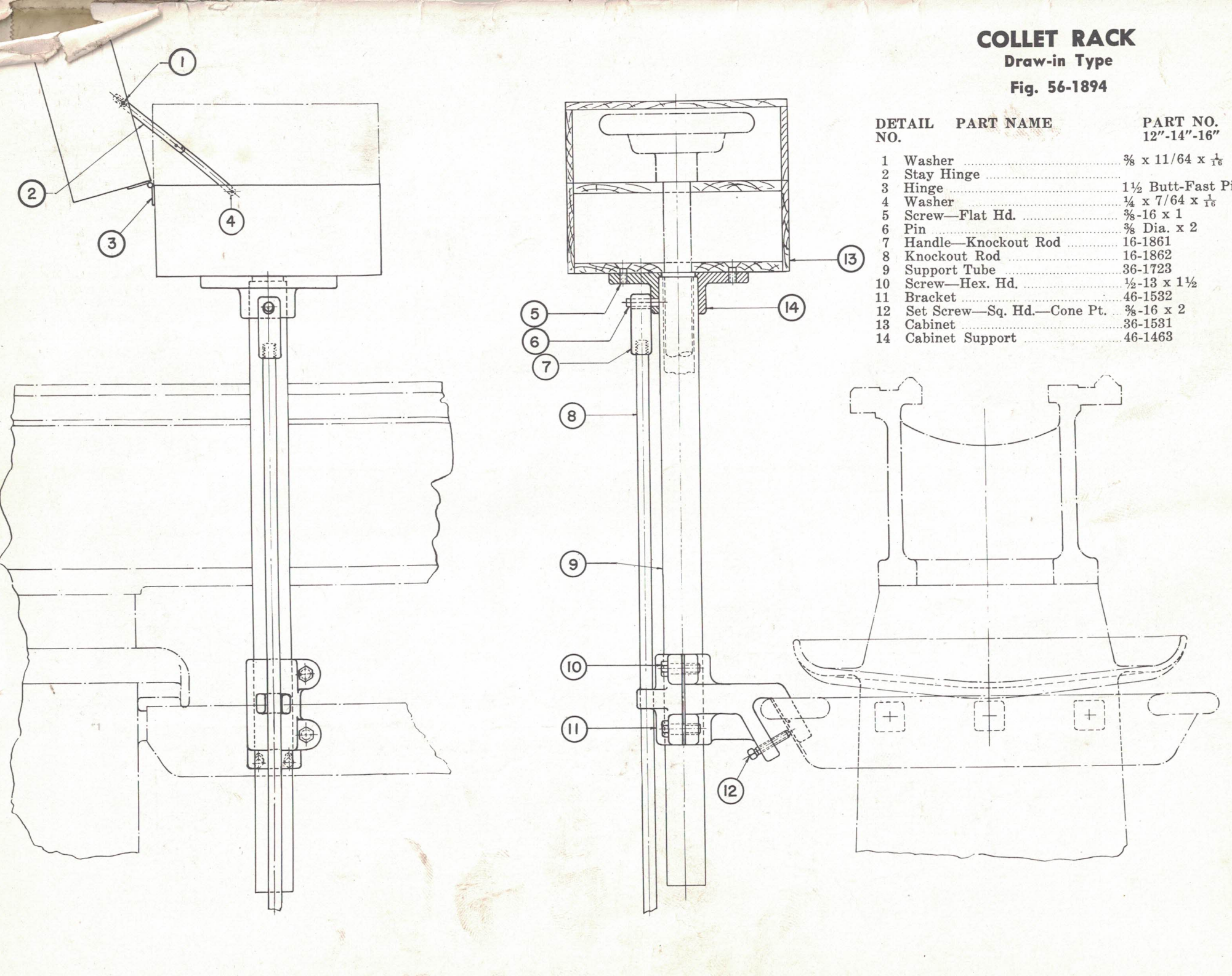


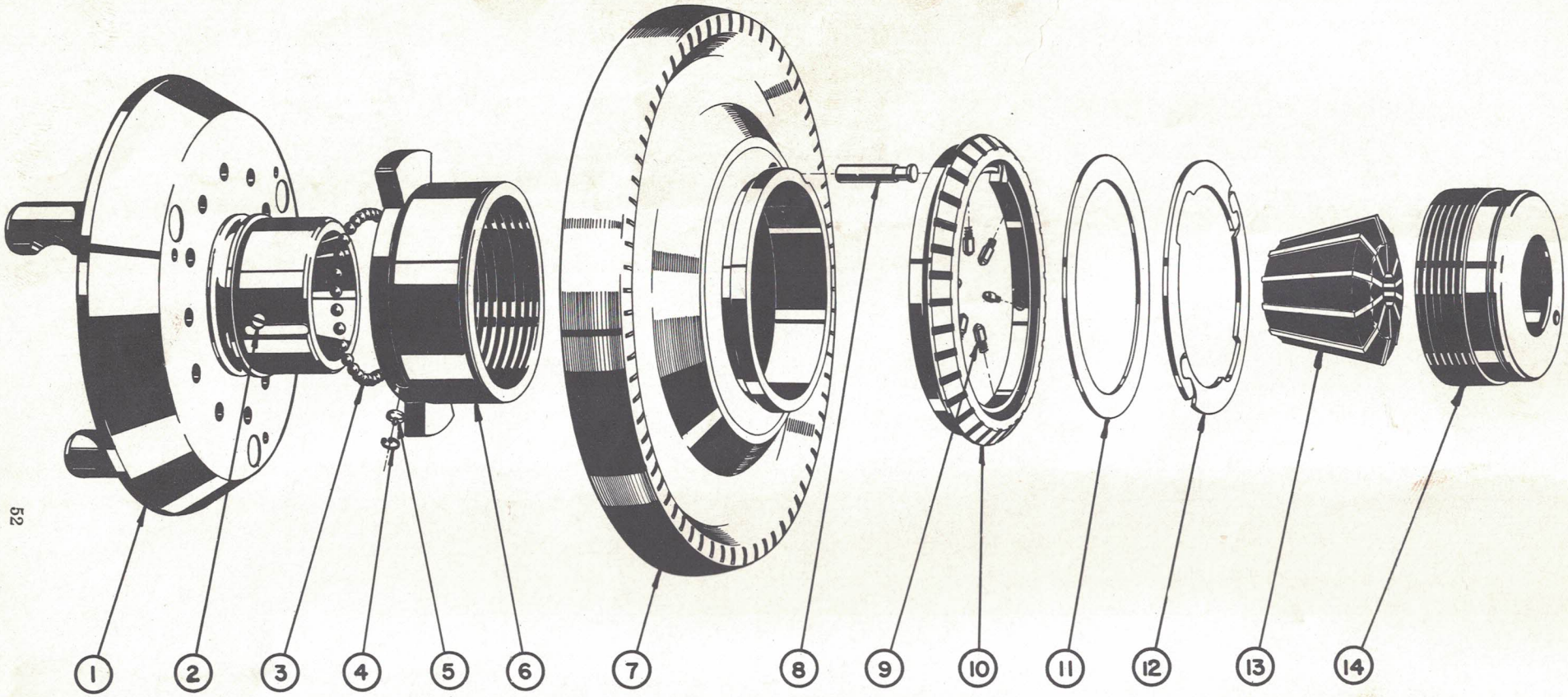
COLLET RACK

Draw-in Type

Fig. 56-1894

DETAIL NO.	PART NAME	PART NO. 12"-14"-16"
1	Washer	⅜ x 11/64 x 1/16
2	Stay Hinge	
3	Hinge	1½ Butt-Fast Pin
4	Washer	¼ x 7/64 x 1/16
5	Screw—Flat Hd.	⅜-16 x 1
6	Pin	⅜ Dia. x 2
7	Handle—Knockout Rod	16-1861
8	Knockout Rod	16-1862
9	Support Tube	36-1723
10	Screw—Hex. Hd.	½-13 x 1½
11	Bracket	46-1532
12	Set Screw—Sq. Hd.—Cone Pt.	⅜-16 x 2
13	Cabinet	36-1531
14	Cabinet Support	46-1463





COLLET CHUCK

Jacobs Rubber-flex

DETAIL NO.	PART NAME	PART NO. 12"-14"-16"
1	Body	Jacobs #B91-C6
2	Key and Screw	G-91
3	Ball Bearing	RP91
4	Disc Retaining Ring	
5	Loading Hole Disc	
6	Impact Sleeve	S91
7	Handwheel Assembly	HW91

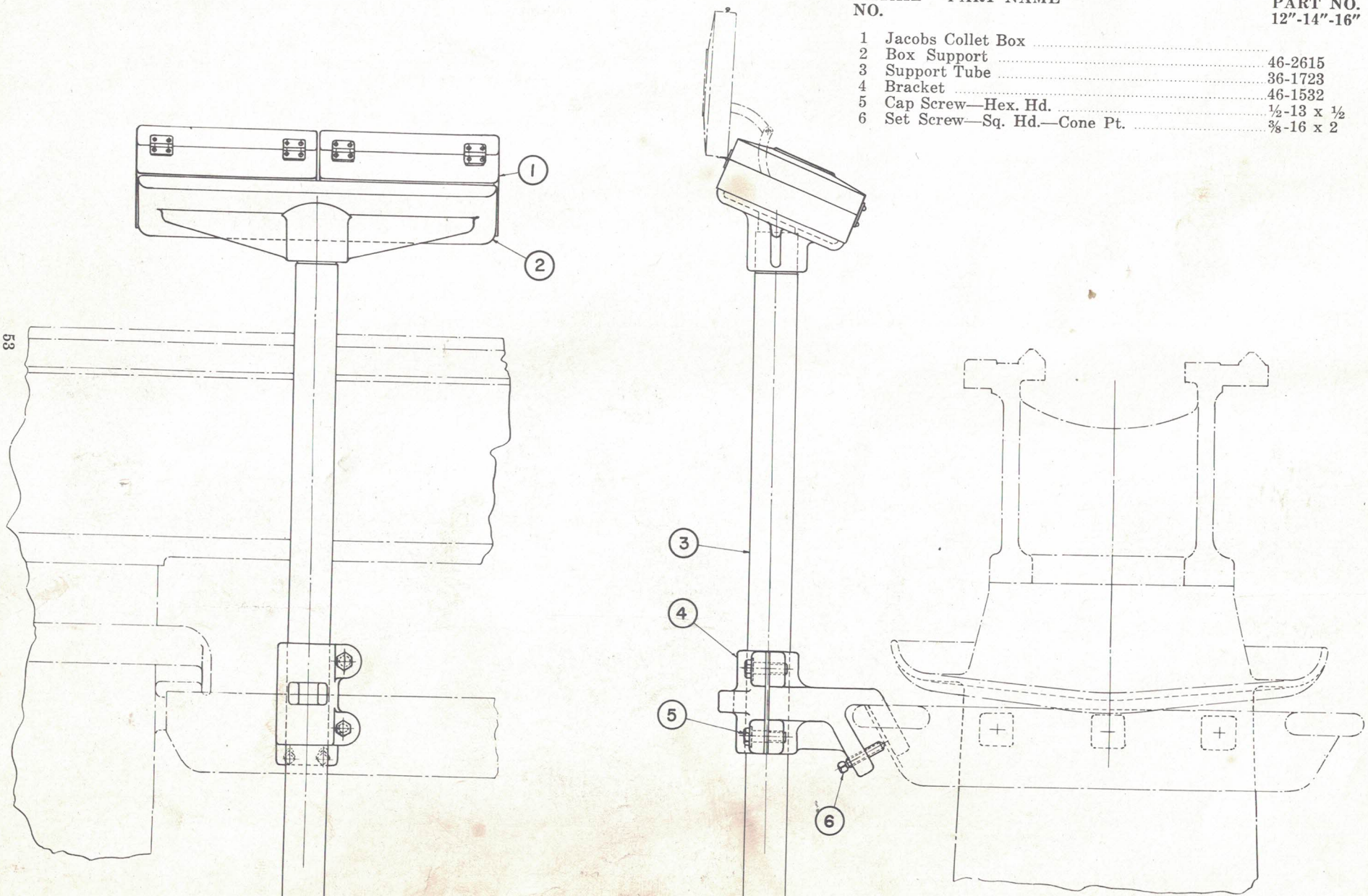
DETAIL NO.	PART NAME	PART NO. 12"-14"-16"
8	Lock Pin	SP91
9	Detent Pins & Springs	R91
10	Lock Ring	W-91
11	Washer	HR91
12	Truarc Handwheel Retaining Ring	
13	Rubberflex Collet	N91
14	Nose	

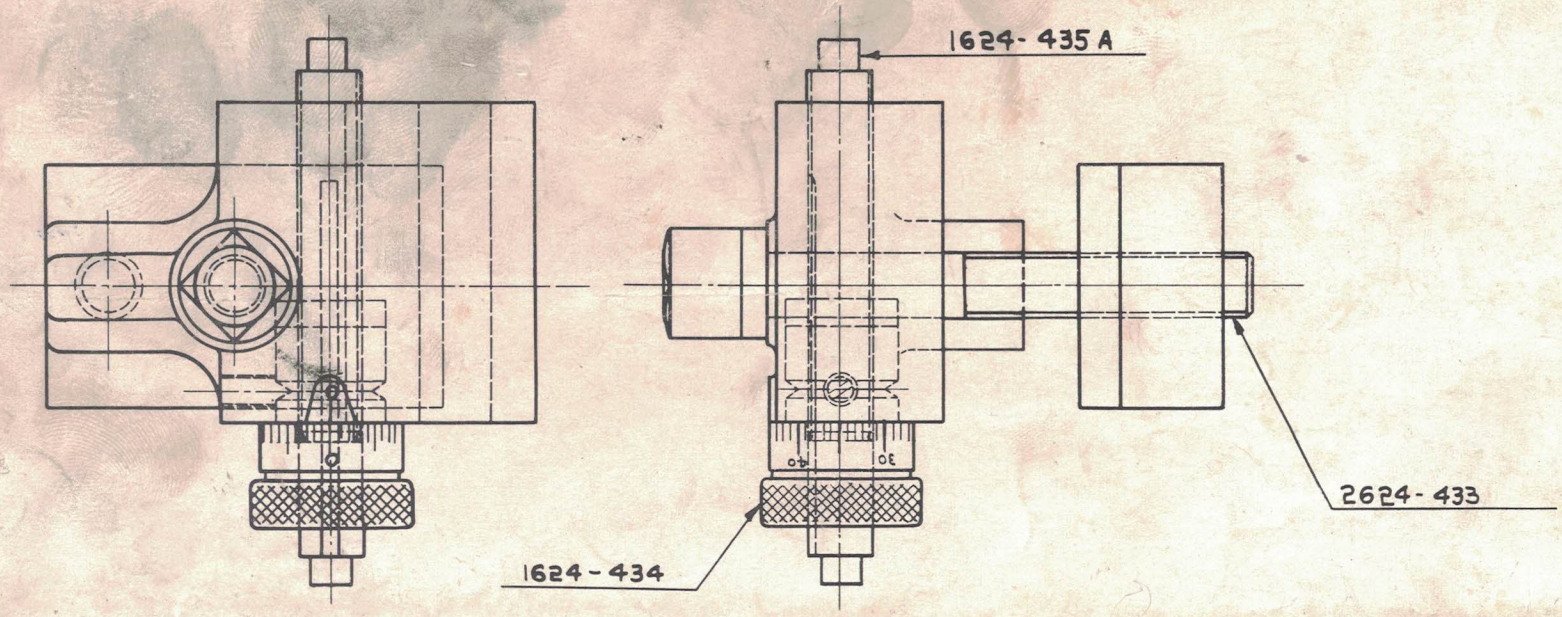
COLLET RACK

Jacobs Rubber-flex Collets

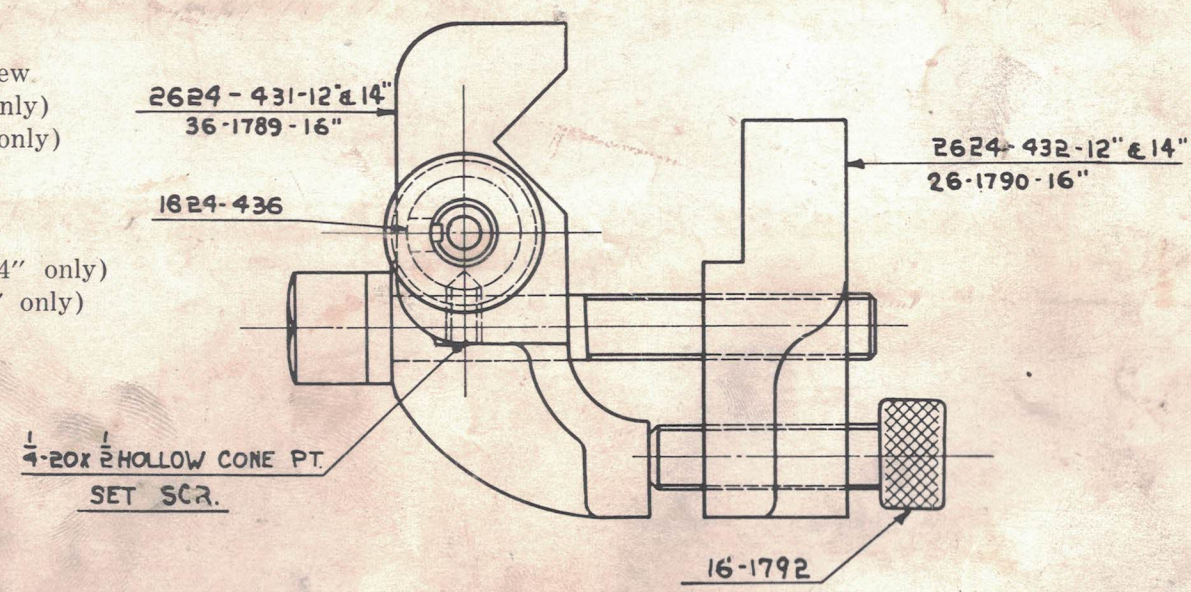
Fig. 56-2616

DETAIL NO.	PART NAME	PART NO. 12"-14"-16"
1	Jacobs Collet Box	
2	Box Support	46-2615
3	Support Tube	36-1723
4	Bracket	46-1532
5	Cap Screw—Hex. Hd.	½-13 x ½
6	Set Screw—Sq. Hd.—Cone Pt.	⅜-16 x 2





Part No.	Part Name
16-1792	Adjusting Screw
26-1790	Clamp (16″ only)
36-1789	Bracket (16″ only)
1624-434	Dial
1624-435A	Stop Screw
1624-436	Pin Key
2624-431	Bracket (12-14″ only)
2624-432	Clamp (12-14″ only)
2624-433	Clamp Screw



MICROMETER CARRIAGE STOP

14" Bradford Lathe Serial # 8025 NEW 1956

Hank

16-1672 Nut - Cross Feed Screw

26-991 Screw - Cross Feed (12-14 only)

216.00
340.00
556.00

~~92.00 48.20~~