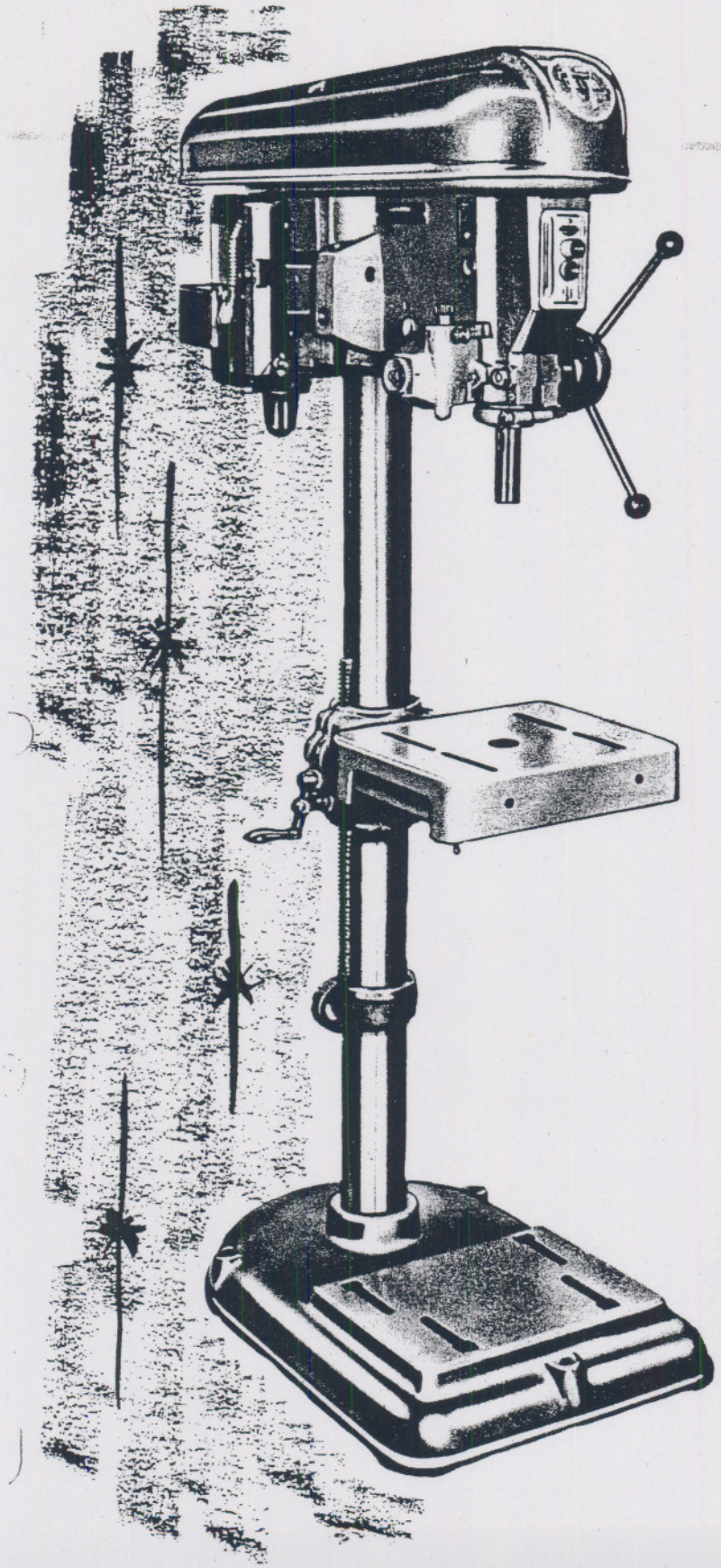

DELTA

17'' DRILL PRESS

Rockwell
MANUFACTURING COMPANY

PM-402-07-651-5004
DATED 1M-11-5-64

SETTING UP

Your 17" Drill Press was completely assembled and tested at the factory. The head and table of your drill press have been lowered on the column for convenience in packaging. To raise the head proceed as follows:

1. Place a block of wood, about 7" long, between the drill press head and the table, as close to the column as possible.

2. Make sure the collar at the bottom of the raising mechanism rack is tight on the column and unlock the table clamp. Then loosen the two bolts, located on the right hand side of the head, that lock the head to the column.

3. Turn the raising mechanism hand crank clockwise to raise the table and head simultaneously.

4. When the table approaches the top of the raising mechanism, lock the table and head to the column. Then loosen the raising mechanism collar and turn the raising mechanism hand crank counterclockwise. This will slide the rack of the raising mechanism further up the column.

5. Repeat Steps 2, 3, and 4, until the top of head casting is level with the top of the column.

6. With the head and table still loose, visually line up the spindle with the center of the base and lock the head to the column.

7. Position the table and raising mechanism to the desired position on the column and lock them in place.

The table and all other machined or unpainted surfaces of the drill press are protected with a coating of rust preventive. This coating may be removed with a soft cloth moistened with kerosene (do not use acetone, gasolene or laquer thinner for this purpose.) After cleaning, cover all unpainted surfaces with a light film of good machine oil.

MOTORS AND SPEEDS

We recommend that a 3/4 hp Rockwell 8 1/2" frame motor be used on hand feed models of this drill press. A 1 hp Rockwell 8 1/2" frame motor is recommended for power feed models.

With a 1725 rpm motor the spindle speeds are:

High Speed Models – 700, 1150, 1750, 2750, and 4250 rpm.

Slo Speed Models – 385, 600, 935, 1450, and 2240 rpm.

With a 1140 rpm motor the spindle speeds will be two thirds of those with the 1725 rpm motor.

When selecting a motor of any other make, be certain that it has the above specifications and is a NEMA 182 or 184 frame motor. Also be sure it is protected against loss of lubricant when operated in a vertical position.

When assembled to the drill press, the motor should turn in a clockwise direction as viewed from the top.

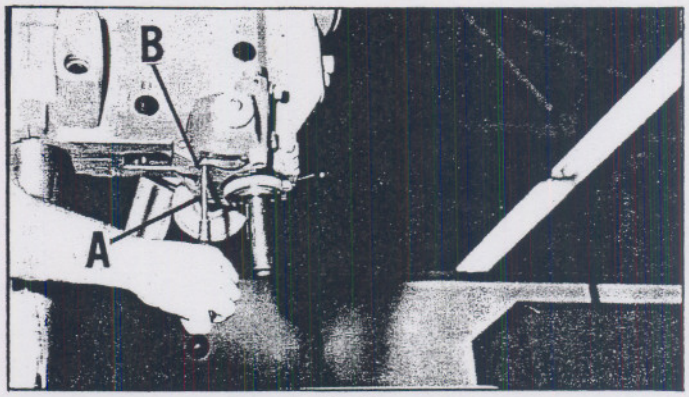

Fig. 1.

ADJUSTING SPINDLE RETURN SPRING

For the purpose of automatically returning the spindle upward after a hole has been drilled, a spring is provided enclosed in a case, and is located on the left side of the drill press head. This spring has been properly adjusted at the factory. If it should become necessary to further adjust it, proceed as follows:

1. Place a screwdriver (A) Fig. 1, in the slot (B), and turn the screw clockwise to increase or counterclockwise to decrease tension. CAUTION: BE CAREFUL NOT TO BOTTOM RETURN SPRING WHILE TURNING SCREW IN SLOT (B) FIG. 1, CLOCKWISE. THERE SHOULD BE ENOUGH SLACK LEFT IN SPRING TO PERMIT LOWERING THE SPINDLE THE FULL AMOUNT OF TRAVEL.

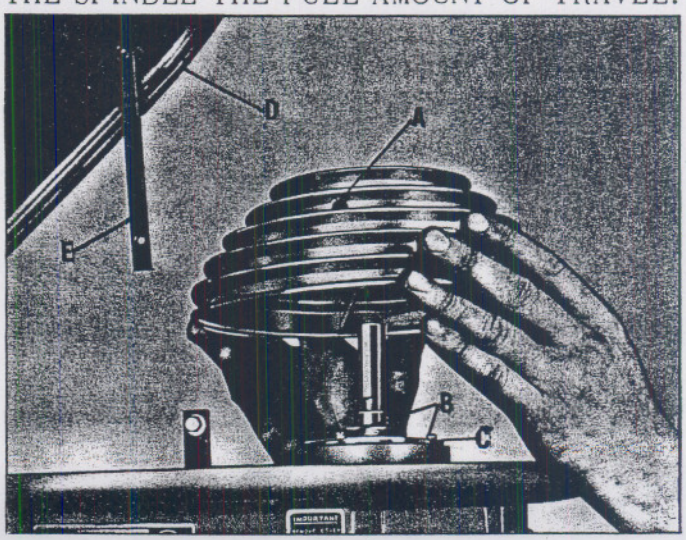

Fig. 2.

REPLACING BELT, SPINDLE PULLEY, AND UPPER SPINDLE ASSEMBLY

1. Raise belt guard, remove nut from bracket (E) and tilt guard back as shown in Fig. 2.

2. Release belt tension by loosening wing nut (B) Fig. 3, on left side of motor bracket.

3. Remove belt (A) Fig. 3.

4. Loosen set screw (A) Fig. 2, in spindle pulley, and slip the pulley off of the shaft.

5. Remove the three screws (B) and bearing retainer plate (C) Fig. 2.

6. Pull upper spindle assembly up and out of the head casting. For additional leverage it may be desirable to re-install the spindle pulley in an inverted position to aid in removing the upper spindle assembly.

7. Reassemble by reversing the above instructions.

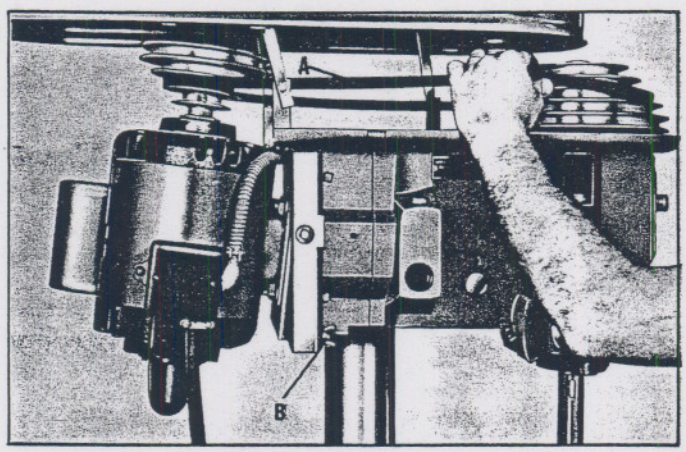

Fig. 3.

CHANGING LOWER SPINDLE ASSEMBLY

To replace the lower spindle assembly or to change drill presses fitted with #2 Morse Taper Spindle to 1/2" capacity key chuck spindle assembly, proceed as follows:

1. Lower the table to allow sufficient space between the table and head to remove the spindle.

2. Lower quill approximately 2" to 4" and lock quill securely with quill locking nut.

3. Using a spanner wrench remove bearing closure nut (A), and pull lower spindle (B) out of quill (C) Fig. 4.

4. Remove garter spring (D), and key (E), Fig. 4. Disengage sleeve (F) from spindle.

5. Reassemble in reverse order.

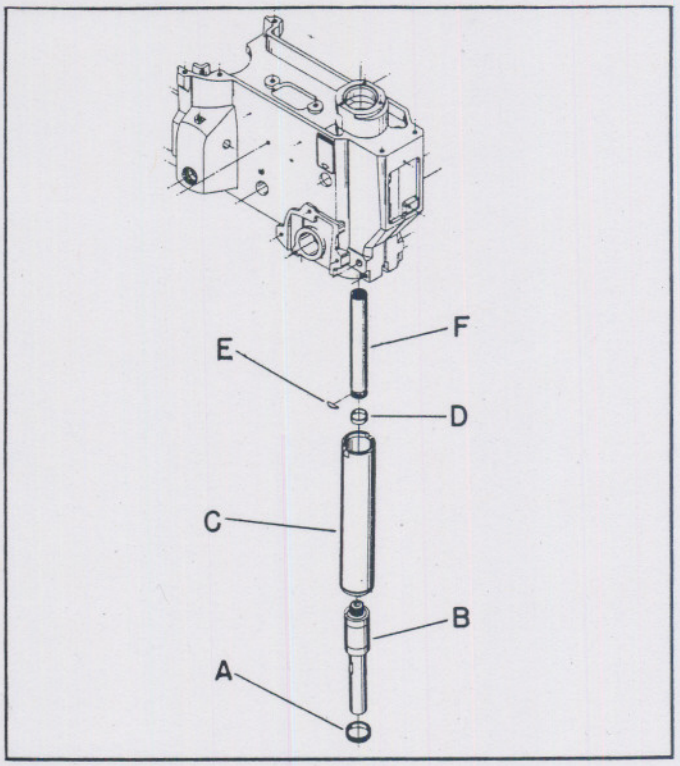

Fig. 4.

QUILL ADJUSTMENTS

The quill can be locked at any desired point in its travel by tightening the quill locking nut (A) Fig. 5. This is an especially desirable feature for set-up of tooling for production type operations.

After considerable use, Play might develop between the quill and the head casting. This play can be eliminated by loosening quill locking nut (A) and lock nut (B) Fig. 5. The screw (C) can then be turned clockwise which will draw the split halves of the head casting together to compensate for wear. When the final adjustment is accomplished tighten lock nut (B), Fig. 5.

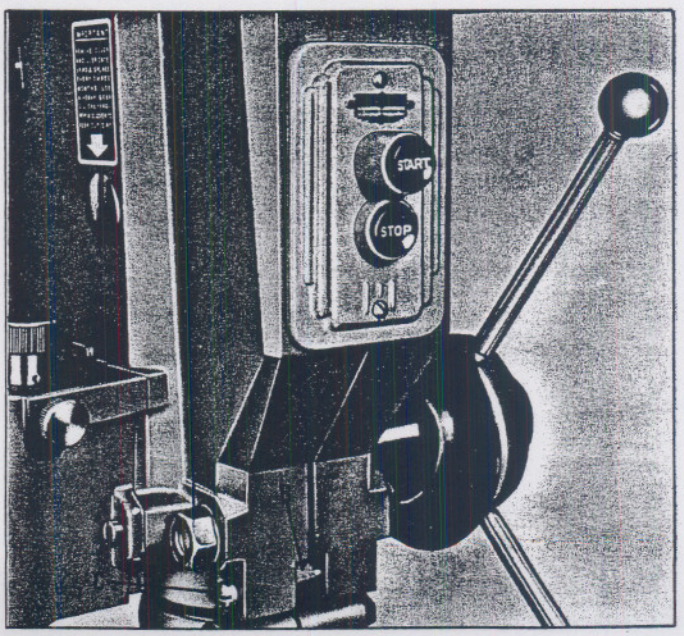

Fig. 5.

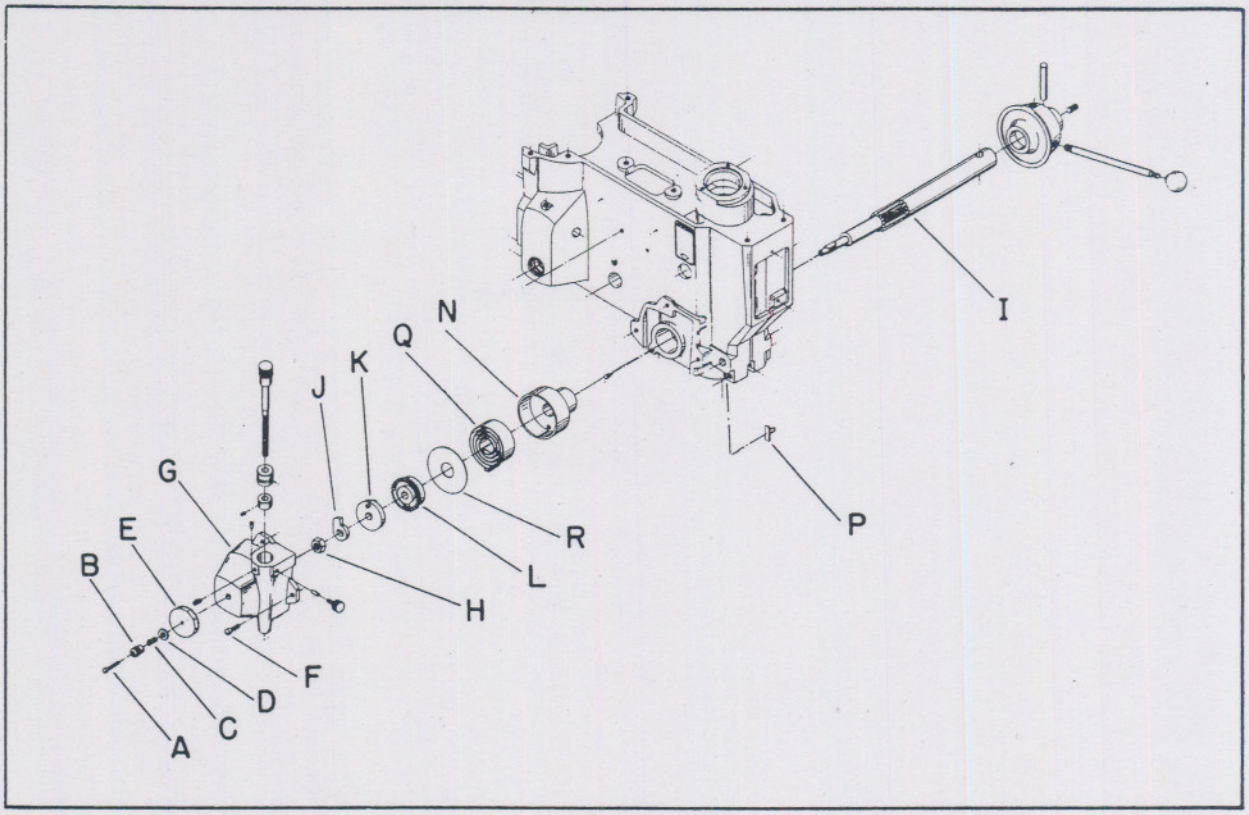

Fig. 6.

REPLACING QUILL, QUILL GUIDE KEY, PINION SHAFT, RETURN SPRING, OR DEPTH STOP ASSEMBLY

Disassembly:

1. Release tension on spindle return spring by placing a screwdriver (A) Fig. 1, in the slot (B) and turn the screw counterclockwise.

2. Remove screw (A), knurled knob (B), spring (C), washer (D), and feed dial (E) Fig. 6.

3. Remove three screws (F) Fig. 6, that hold the depth stop housing (G) to the head casting.

4. Lock the quill by tightening nut (A) Fig. 5.

5. Remove nut (H) Fig. 6, located at end of pinion shaft (I) and slip off stop finger (J), stop plate (K), and gear (L) from the end of pi nion shaft. Remove pinion shaft (I) from right side of head casting.

6. Release nut (A) Fig. 5 and remove quill assembly and quill guide key (P), Fig. 6.

7. Place a screwdriver (A) Fig. 1, in the slot (B) and remove the spring adjusting screw by turning the screwdriver counterclockwise. Then remove the spring (Q) with housing (N) Fig. 6.

Reassembly:

1. Replace quill assembly into drill press head, seating splines of upper spindle into sleeve of quill assembly. CAUTION: Before replacing the quill into the drill press head, be sure the guide key for the quill (P) Fig. 6, is inserted in the head from the inside of the head casting and engages the keyway in the quill.

2. Replace the pinion shaft (I) Fig. 6.

3. Replace the spring (Q) with the housing (N) Fig. 6. Care should be exercised to slide return spring (Q) into the slotted end of pinion shaft (I).

4. Replace spring cover plate (R), gear (L), stop plate (K) and stop finger (J), Fig. 6. Make sure the stop finger is correctly installed as shown in Fig. 6. Also the pin in the stop plate (K) must be seated in the groove of the gear (L).

5. Replace and tighten the nut (H) Fig. 6 on end of pinion shaft.

6. Replace the depth stop housing (G) Fig. 6, and tighten the three screws (F) finger tight. Check alignment of pinion shaft by lowering the quill. If binding occurs loosen the three screws (F) and gently tap the depth stop housing until the binding is eliminated. Retighten the three screws (F).

7. Replace the feed dial (E), washer (D), spring (C) knurled knob (B) and screw (A) Fig. 6.

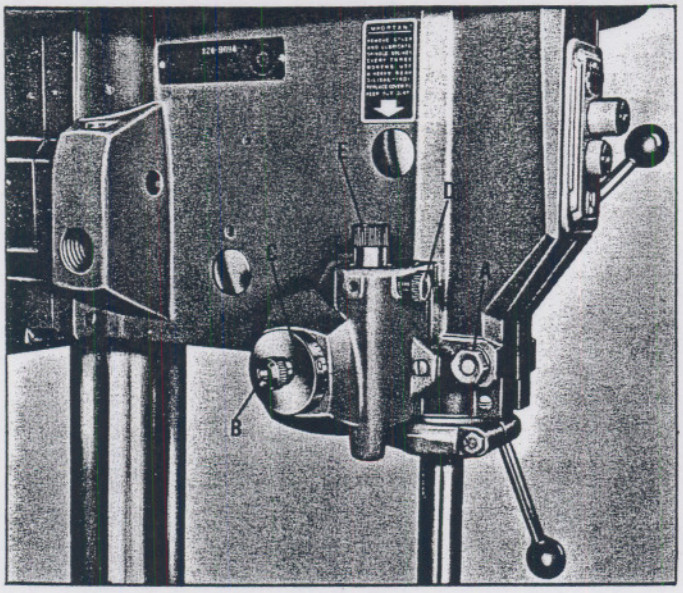

Fig. 7.

DRILLING HOLES TO DEPTH WITH HAND FEED DRILL PRESS

A. When drilling one or two holes to a predetermined depth, proceed as follows:

1. Lower the quill until the drill just touches the work and lock the quill by tightening the quill locking nut (A) Fig. 7.

2. Loosen knob (B), set the depth scale (C) at zero, and tighten knob (B) Fig. 7.

3. This will give you a direct reading, from the depth scale, in the work you are drilling.

B. When drilling a number of holes to a predetermined depth or if a more exact setting is required, proceed as follows;

1. Loosen lock screw (D) Fig. 7, and turn knurled thimble (E) clockwise while lowering the quill to the depth desired. Lock the quill with quill locking nut (A) Fig. 7.

2. Turn knurled thimble (E) Fig. 7, counterclockwise until no further turn is possible. Tighten lock screw (D) and loosen quill locking nut (A). NOTE: If at any time the quill does not return completely, even with proper spring tension, the thimble (E) has been backed off too far and should be readjusted counterclockwise a fraction of a turn at a time until full retraction of quill is obtained.

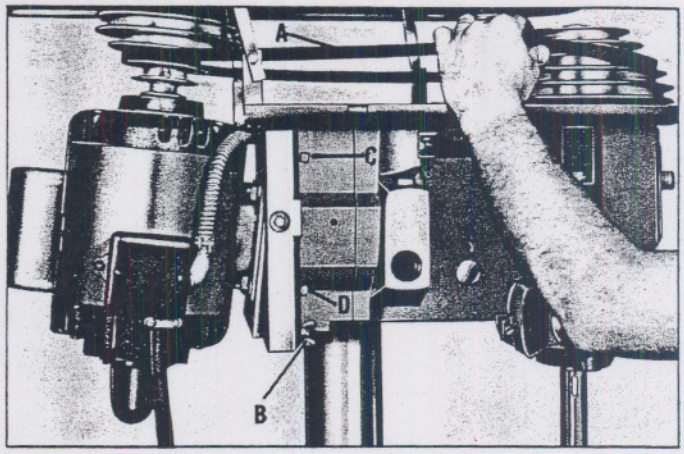

Fig. 8.

ADJUSTING BELT TENSION

To adjust belt tension, proceed as follows:

1. Raise the belt guard and tighten wing nut (B) Fig. 8.

2. Loosen the two screws (C and D) Fig. 8, and also loosen the screw on the right hand side of the head, which is directly opposite screw (C).

3. Pull the motor away from the head to increase or push the motor toward the head to decrease the belt tension. NOTE: CARE MUST BE TAKEN TO KEEP THE MOTOR SHAFT IN PARALLEL ALIGNMENT WITH THE SPINDLE.

4. When the desired tension is obtained, tighten the three screws loosened in Step 2.

CHANGING SPEEDS

1. Raise the belt guard.

2. Loosen wing nut (B) Fig. 8. The motor will then tilt forward, as shown in Fig. 8, releasing the belt tension.

3. Move the belt (A) Fig. 8, to the desired step on the motor pulley and retighten wing nut (B).

4. Lower the belt guard.

SLO AND HIGH SPEED MODELS

To change drill press from slo-speed to high-speed or vice-versa is an easy operation. Two kits are available for this purpose.

The Cat. No. 1391 Kit is used for converting drill presses from slo-speed to high-speed.

The Cat. No. 17-862 is used for converting drill presses from high-speed to slo-speed.

Included in the kits are the correct spindle and motor pulleys and V-belt. When removing pulleys always remember to loosen the set screws that hold the pulleys on the shaft or spindle. Be careful not to lose the keys.

LUBRICATION

The spindle return clock spring should be oiled twice a year using light machine oil.

The raising mechanism support collar should be lubricated with medium oil applied to periphery of the column.

NOTE: The bearings of Rockwell motors are grease sealed for life and need no further lubrication. DO NOT USE OIL ON MOTOR.

The quill and pinion shaft should be lubricated occasionally with medium oil, by squirting oil in the hole provided on the right hand side of the head and the oil hole on the left side of the head as shown in Fig. 9, except with the quill raised.

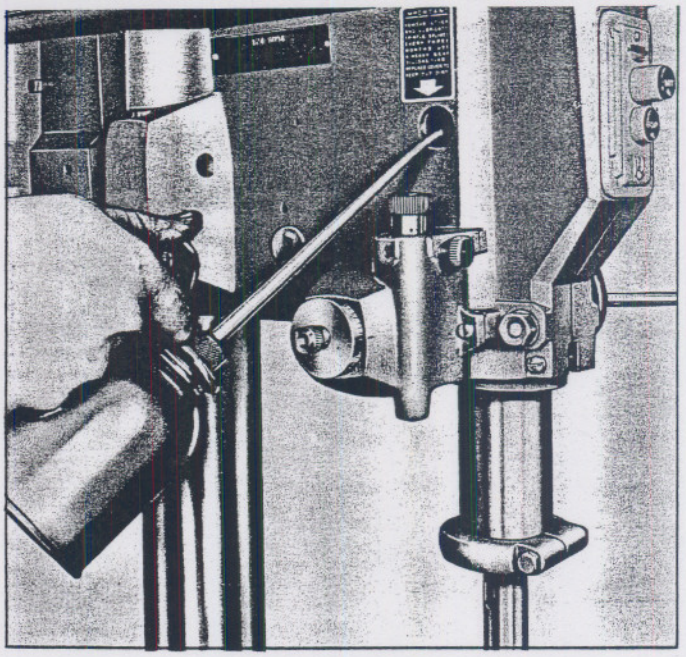

Fig. 9.

The spindle splines should be lubricated every three months with SAE-140 Gear Oil, as shown in Fig. 9.

POWER FEED MODELS

VARI-RATE POWER FEED

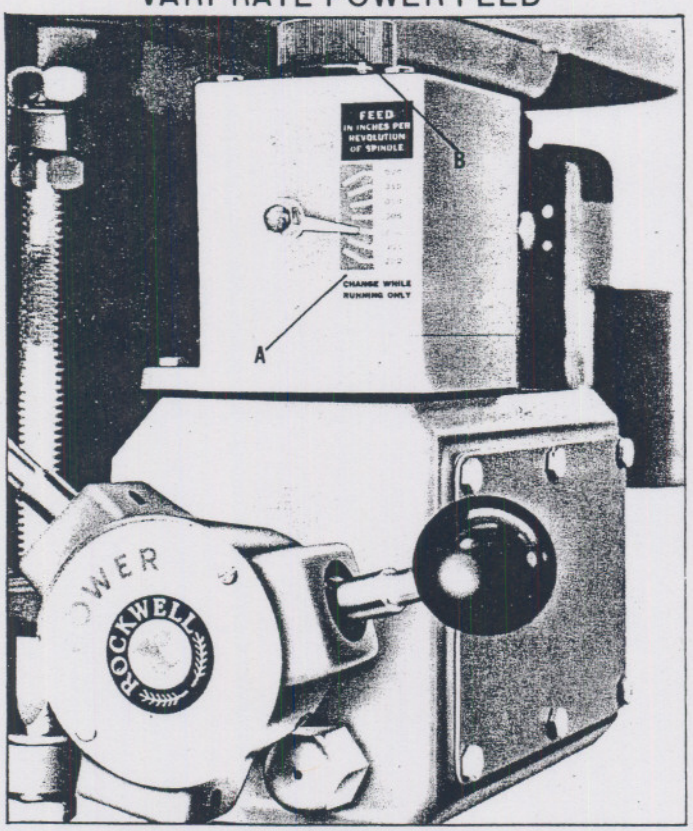

Fig. 10.

INTRODUCTION FOR VARI-RATE POWER FEED

The Vari-Rate Power Feed consists of a gear and clutch housing, and a countershaft assembly. An infinite number of spindle feeds, from .002 to .020 inches per revolution of spindle, provide the correct feed rates for any size drill within the capacity of the machine.

STANDARD POWER FEED

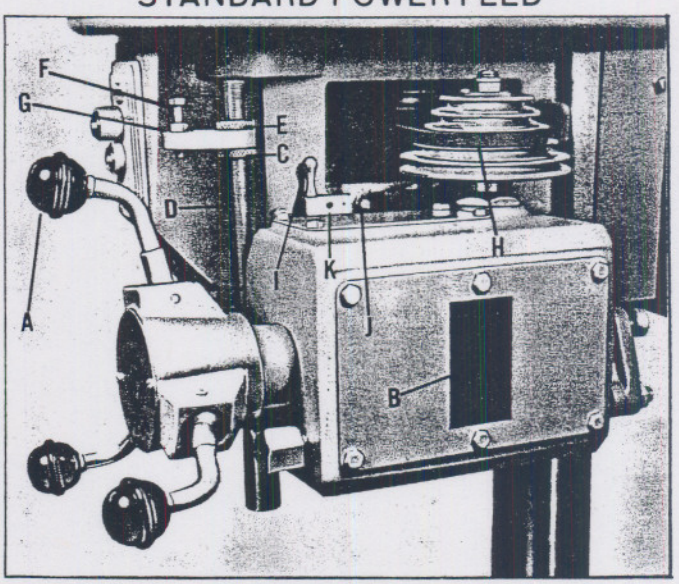

Fig. 11.

INTRODUCTION FOR STANDARD POWER FEED

The Standard Power Feed consists of a gear and clutch housing, belt tensioner, and countershaft assembly. The five rates of spindle feeds, .003, .006, .009, .012, and .015 inches per revolution of spindle, provide the correct feed rates for any size drill within the capacity of the machine.

OPERATION

Power Feed Drill Presses can be operated as follows:

Manual Feed for both Standard and Vari-Rate Models – To feed manually, grasp any of the three handles (A) Fig. 11, and rotate the pilot wheel in a counterclockwise direction.

Combination Manual and Power Feed for both Standard and Vari-Rate Models A very common method of operation is to use manual feed to rapidly approach the work and then engage the power feed for the actual drilling operation. The ease of engaging and disengaging the power feed is helpful in skip-drilling and other similar operations.

Power Feed for Standard Models – Set up the correct feed as shown on the feed chart (B) Fig. 11, located on the side cover of the power feed housing. To engage power feed, push any one of the three handles (A) Fig. 11, "in". To disengage power feed before completing cycle (or in an emergency) pull out any one of the three handles.

Power Feed for Vari-Rate Models – Start the machine and set the correct feed, as shown on the feed chart (A) Fig. 10, by turning the vari-rate knob (B). The vari-rate knob should be turned only when the motor is running. To engage power feed push any one of the three handles "in". To disengage power feed before completing cycle (or in an emergency) pull out any one of the three handles. The power feed speed may be increased or decreased at any time during the drilling operation.

Two set screws are provided with the vari-rate models and are set at the factory to allow the power feed to be operated through its full range to obtain any spindle feeds from .002 to .020 inches per revolution of spindle.

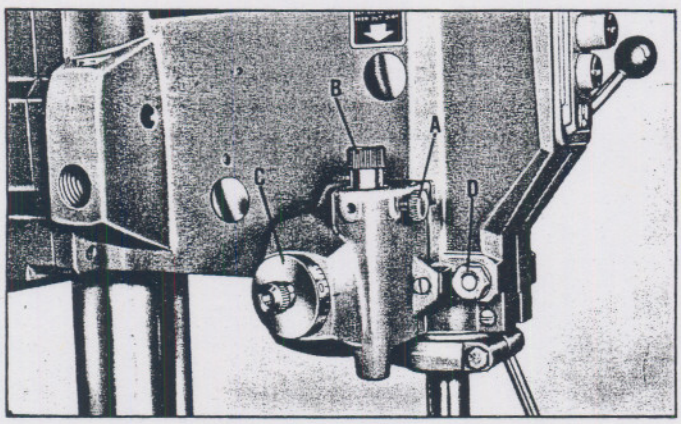

Fig. 12.

DRILLING HOLES TO DEPTH WITH POWER FEED (BOTH STANDARD AND VARI-RATE MODELS)

1. Loosen knurled lock screw (A) Fig. 12. With the power "off", turn knurled thimble (B) Fig. 12, clockwise and at the same time manually turn the power feed pilot wheel (A) Fig. 11, counterclockwise and lower the quill to the maximum depth of five inches.

2. Tighten knurled lock screw (A) Fig. 12, and release the power feed pilot wheel.

3. Check to make sure the quill returns to normal position in the head casting. If the quill does not return completely, even with proper spring tension, then the thimble (B) Fig. 12, has been backed off too far and should be re adjusted counterclockwise a fraction of a turn at a time until full retraction of quill is obtained.

4. Lower the quill until the drill just touches the work and lock the quill by tightening the quill locking nut (D) Fig. 12. Then set the depth dial (C) at zero. Loosen quill locking nut (D) Fig. 12, and lower the quill the desired depth you wish to drill reading from the depth dial, and lock the quill by tightening the quill locking nut (D) Fig. 12.

5. Loosen locknut (G) Fig. 11 and raise screw (F).

6. Lower the bottom knurled lock nut (C) Fig. 11, until it contacts the guide and tighten firmly with nut (E).

7. Turn screw (F) down until the trigger is depressed and the power feed is disengaged. Then lock screw (F) by tightening nut (G) Fig. 11.

8. Loosen quill locking nut (D) Fig. 12, turn on the power and drill several test holes. The screw (F) Fig. 11, can be further adjusted for more accurate depth control.

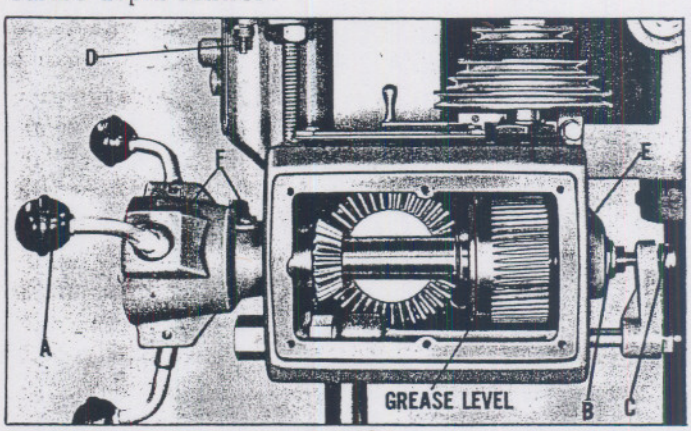

Fig. 13.

AUTOMATION AND REMOTE CONTROL (BOTH STANDARD AND VARI-RATE MODELS)

The plunger (C) Fig. 13, is an external extension of the clutch shaft, and is provided in order that automation devices can be interlocked with the power feed. It also provides a means for remote control.

When this plunger is pushed in the power feed cycle is started, the same as it is when any one of the three handles is pushed in. The feed then continues until this plunger is pulled out, or one of the three handles is pulled out, or until the screw (D) Fig. 13, actuates the trigger of the power feed. At this time the feed stops, and the quill automatically returns to the "up" or starting position.

One use of this plunger is to provide a means for remote control and simultaneous starting of the power feed on multiple spindle drill presses. Many uses for this Automation and Remote Control Plunger will occur to the user, according to his own needs. Available as an accessory for this drill press, are the 49-436 (220 V) and 49-437 (440 V) Automation and Remote Control Kit.

Air cylinders or other devices can be used to actuate the plunger, these cylinders or other devices being started from a single control station. Or the plunger can be used to interlock and synchronize automation devices (rotary tables, clamps, etc.) with the power feed cycle.

CLUTCH ADJUSTMENT (BOTH STANDARD AND VARI-RATE MODELS)

The clutch used on the 17" Power Feed Drill Press is a lathe type cone clutch, and it will be found to be extremely sensitive in operation. It may be adjusted to slip under any predetermined load to minimize breakage of small drills or to be positive in its action for regular or large hole drilling.

Adjustment for torque is made by first engaging the clutch by pushing in the power feed pilot wheel (A) Fig. 13. The torque adjustment nut (B) is a self-locking nut. As viewed from the rear, turning the adjustment nut (B) in, or clockwise, will increase the holding pressure or torque, while turning the nut (B) counter-clockwise will decrease it. This adjustment is extremely sensitive – – – do not turn the adjusting nut more than 1/16 of a turn at a time without checking the torque; the amount of torque can be checked by forcing the handwheel to move while the clutch is engaged. The force required to make the clutch slip is approximately equal to 1/12 of the pressure delivered at drill point. If the adjustment nut is drawn up too tight, it will not be possible to operate the clutch.

Fig. 14 shows the power feed, cut away, in cross section. This cut away illustrates the unit in the engaged position and shows the proper relationship between the clutch fingers (E) Fig. 14 and the flat of the cam (F). There are six fingers in the hub, but for the sake of clarity, only one is shown. When the handles are brought forward, the front portion of the clutch fingers slides down over the tapered portion of the cam (F) Fig. 14. When the power feed is engaged the handles must go far enough to the rear to bring the clutch fingers (E) up to a point where they are resting on the flat of the cam (F). If the clutch is improperly adjusted, the handles cannot be depressed far enough to the rear to bring the fingers to the top of the flat, and if they are resting on the taper, the power feed will slip out of engagement. If this occurs, it will then be necessary to increase the throw of the handles as follows:

1. Remove the power feed name plate (A) Fig. 14, which covers the hub.

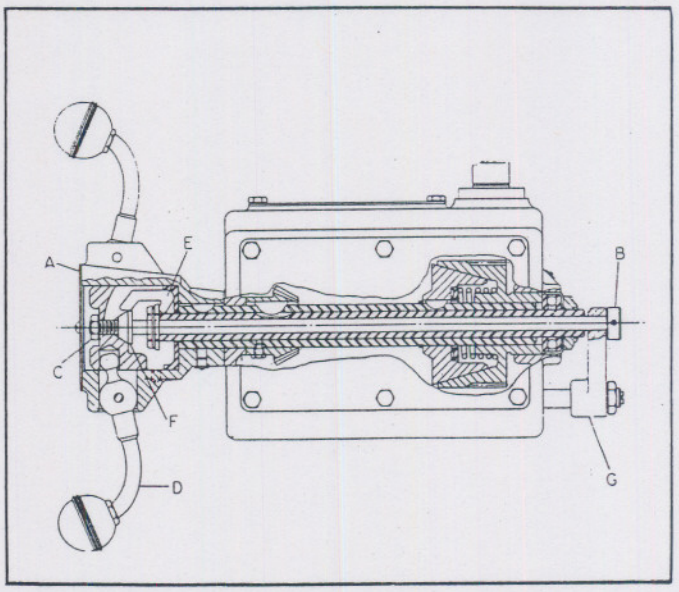

Fig. 14.

2. Hold the collar (B) Fig. 14 with a pair of pliers and loosen the 3/8" nut (C) about three turns at the front of the plunger in the hub, using a 9/16" socket.

3. Turn the collar (B) Fig. 14 counterclockwise about three turns.

4. Hold the collar (B) Fig. 14 again with pliers and tighten the 3/8" nut (C).

This adjustment will permit the handles (D) to be moved further to the rear and therefore permit the clutch fingers (E) to ride on the flat of the cam (F) when the unit is engaged.

Slight adjustment of the lower release lever (G) may then be necessary to properly engage the sear on the clutch release plunger.

REPLACING POWER FEED BELTS (STANDARD MODELS ONLY)

To replace the power feed drill press belt (A) Fig. 15, proceed as follows:

1. Remove the belt guard from the drill press.

2. Loosen two cap screws (B) Fig. 15, that holds countershaft assembly bracket (C), and move bracket (C) toward front of head to release tension on belt (A) Fig. 15.

3. Cut off old belt.

4. Refer to REPLACING BELT, SPINDLE PULLEY, AND UPPER SPINDLE ASSEMBLY and perform STEPS 2, 3, 4, 5, and 6.

5. Insert new belt through opening in rear of upper spindle boss (D) Fig. 15, of head casting.

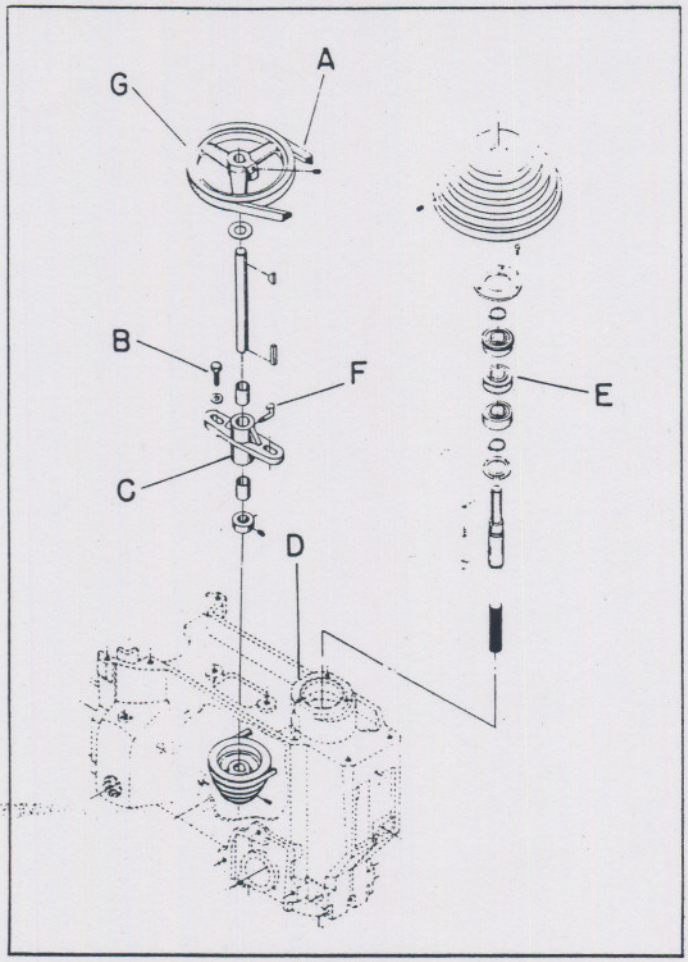

Fig. 15.

6. Replace spindle pulley assembly into the head casting. Make sure the power feed V-Belt (A) Fig. 15, is seated in groove of pulley (E) Fig. 15. The other loop of power feed V-Belt (A) is seated in the groove of pulley (G) Fig. 15.

7. Adjust belt tension by moving countershaft bracket (C) Fig. 15, toward motor. When correct tension is obtained, tighten the two screws (B) Fig. 15.

To replace power feed drill press belt (H) Fig. 11, proceed as follows:

1. Release pressure on belt tensioner by pushing handle (I) Fig. 11, in until screw (J) is engaged in hole of plunger (K).

2. Remove belt (H) Fig. 11.

3. Install new belt (H) and release screw (J) from plunger (K) to retension belt.

REPLACING POWER FEED BELTS (VARI-RATE MODELS ONLY)

The power feed belt (A) Fig. 16, is replaced the same on Vari-Rate Models as on Standard Models. Refer to instructions 1 through 7 under Replacing Power Feed Belts (Standard Models Only).

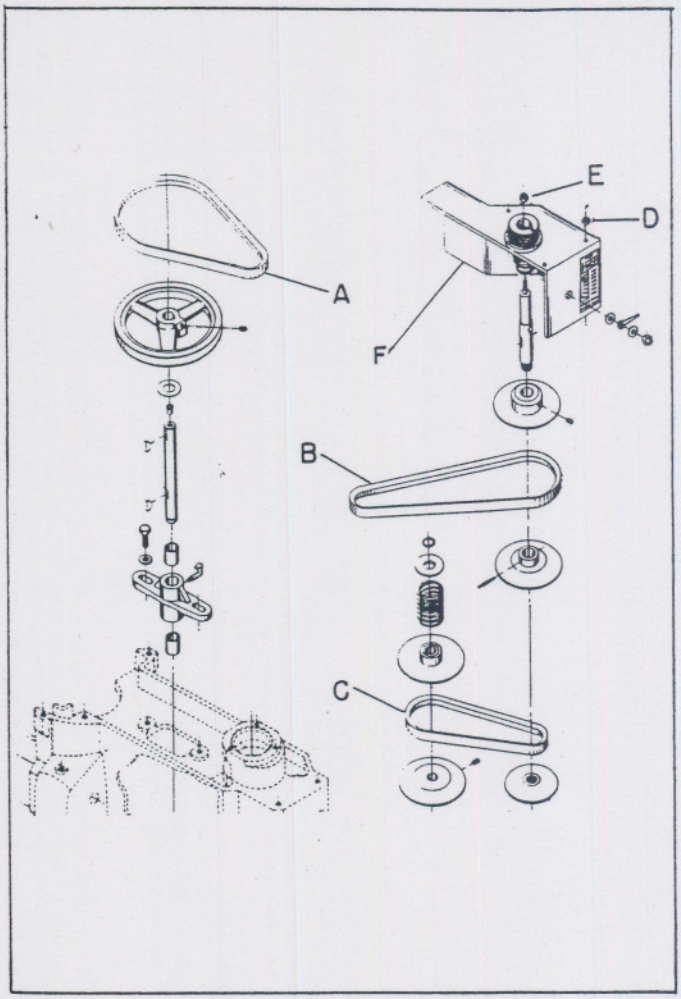

Fig. 16.

To replace the variable speed belts (B and C) Fig. 16, proceed as follows:

1. Remove three nuts (D) Fig. 16.

2. Remove nut (E) Fig. 16 and remove the cover housing for variable speed pulleys (F) from the power feed.

3. The variable speed belts (B and C) Fig. 16, are now easily accessible and can be replaced.

POWER FEED LUBRICATION (BOTH STANDARD AND VARI-RATE MODELS)

Oil countershaft bearing by filling oil cup (F) Fig. 15, once a week with medium machine oil. Oil rear clutch housing ball oiler (E) Fig. 13, and two clutch handle housing ball oilers (F) Fig. 13, daily with medium machine oil.

Power Feed Gears – Remove side housing cover, repack to grease level, see Fig. 13, using a tacky grease such as Sohio EP-110. This should be done twice a year.

Pack clutch handle hub cavity twice yearly with a tacky grease such as Sohio EP-110 Oil all power feed pulleys daily through oil holes at the top of pulley shafts, using light machine oil.

Repeat LUBRICATION information listed on Page 6.