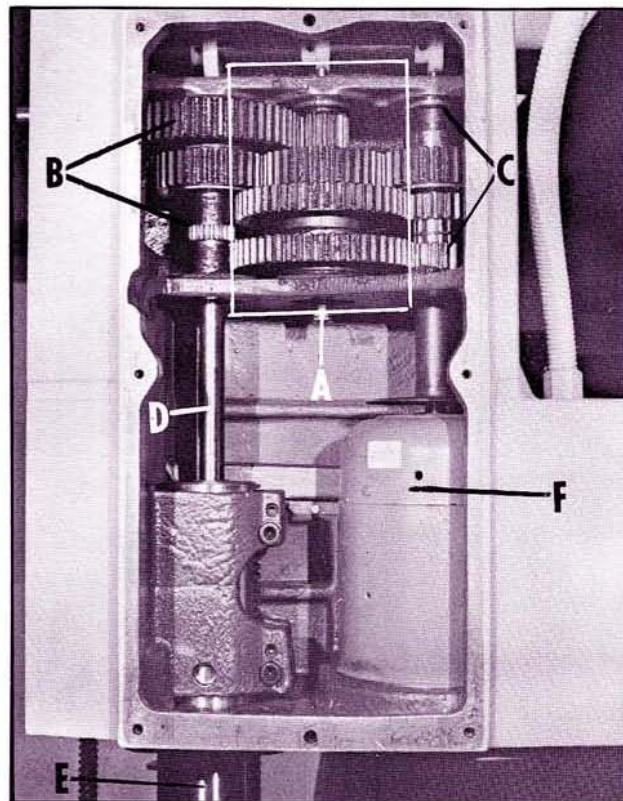


# **GEAR TRAIN DIS-ASSEMBLY AND ASSEMBLY INSTRUCTIONS FOR ROCKWELL 70-111, 70-121, 70-131, 70-151 GEARED HEAD DRILLING MACHINES**

These instructions cover the step by step procedure to follow when maintenance is required on the gear train of Rockwell Geared Head Drilling Machines. The instructions and photographs illustrate dis-assembly and assembly of the center gear train (A) Fig. 1, however, the same instructions will be similar for the front gear train (B) and rear gear train (C) with the exception of different parts involved. It should also be noted that if the front gear train (B) is to be dis-assembled, the spindle (D) and quill (E) Fig. 1, must be removed and if the rear gear train (C) is to be dis-assembled, the motor (F) must be removed.

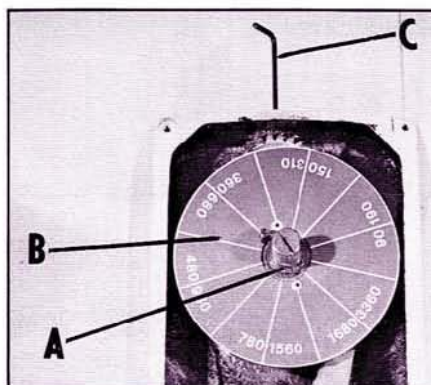
The 70-111 Drilling Machine is used as an example in the following instructions, however, the procedure will be the same, with few minor exceptions for the 70-121, 70-131 and 70-151 Drilling Machines.



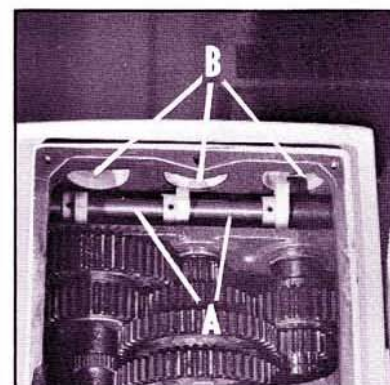
**Fig. 1**

## **DIS-ASSEMBLY OF CENTER GEAR TRAIN**

1. Remove the front and side cover of the drill press.
2. Remove snap ring (A) and remove speed chart (B) Fig. 2. Using wrench (C) loosen screw located on top of the head that fastens cam shaft in place.
3. Tap the rear end of the cam shaft (A) Fig. 3, at the rear of the head to free the cam shaft. Then remove the three oiler caps (B) by knocking them straight up and out.

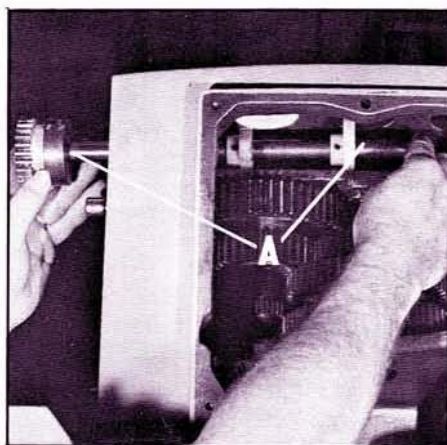


**Fig. 2**

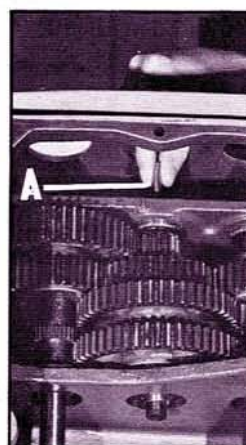


**Fig. 3**

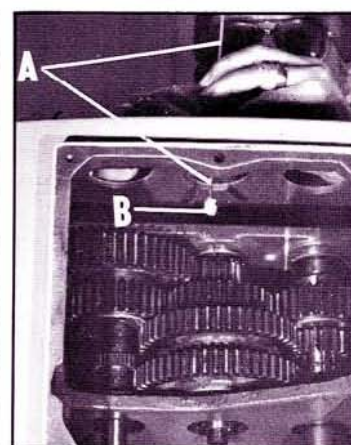
4. Remove the cam shaft assembly (A) Fig. 4, from the front of the head, as shown.
5. Remove push rod (A) Fig. 5, of the center gear train by pulling it straight out.
6. Using the scriber (A) Fig. 6, or a similar object with a point on one end, place the scriber down in the hole where the push rod was removed and stick it into the nylon plug (B) and remove the plug (B) as shown in Fig. 6.



**Fig. 4**



**Fig. 5**



**Fig. 6**

7. A spanner nut (A) Fig. 7, and a spanner locking washer (B) is located on top of the gear train. Unlock one of the tabs on the locking washer (B) and remove both the nut (A) and locking washer (B) Fig. 7.

8. Fig. 8. illustrates the spanner nut (A) and locking washer (B) removed.

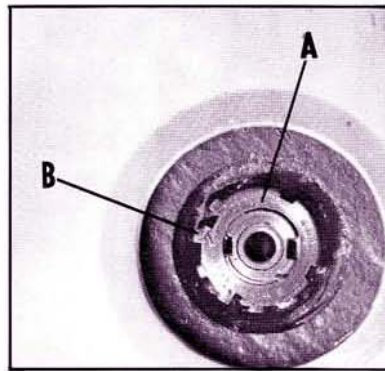


Fig. 7

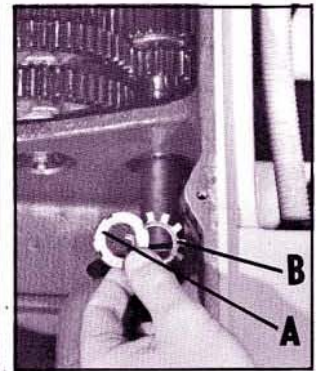


Fig. 8

9. Remove screw and lockwasher (A) Fig. 9.

10. Remove spring (B) Fig. 10. The Spring will fall out when the screw and lockwasher (A) Fig. 9, is removed.

11. Remove large snap ring (A) Fig. 11, from bottom of gear train.

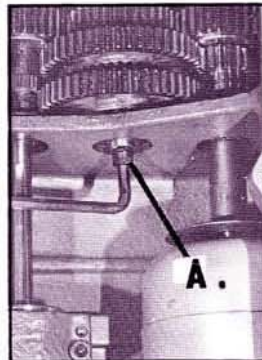


Fig. 9

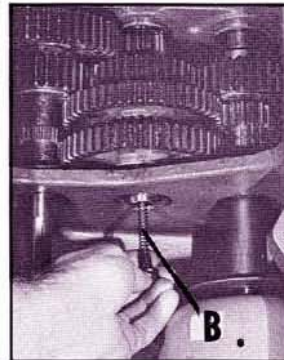


Fig. 10

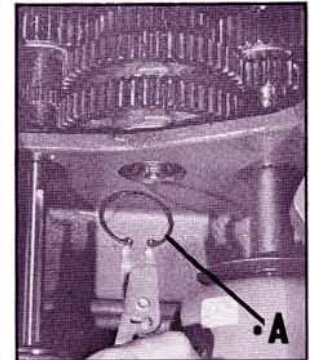


Fig. 11

12. Using a 5/16" diameter rod (A) Fig. 12, approximately 12" long, insert it into shaft in gear train and tap down shaft approximately 1/4" until it bottoms. DO NOT FORCE.

13. Using a rod (A) Fig.13, tap upper bearing (B) up about 1/4" as shown.

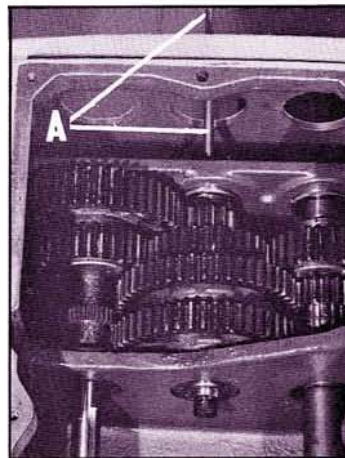


Fig. 12

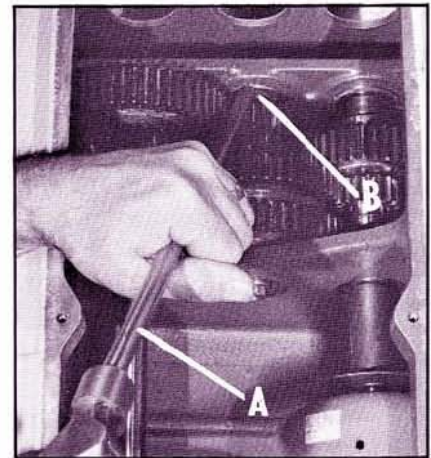


Fig. 13

14. With a wedge (A) Fig. 14, spread the two gears (B) and (C) apart, as shown.

15. With the two gears (B) and (C) spread apart, as shown in Fig. 15, use a small rod or allen wrench (D) and insert it up through the hole in the bottom of the shaft until the roll pin (E), located between the two gears (B) and (C), comes into view.

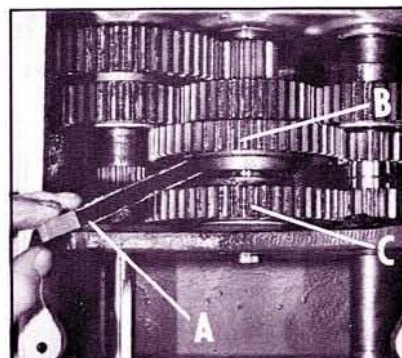


Fig. 14

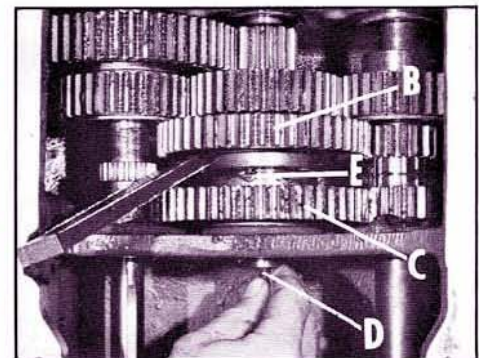


Fig. 15

16. Using a punch (A) Fig. 16, drive out and remove the roll pin (E) as shown.



Fig. 16

17. Replace screw and lockwasher (A) Fig. 17. These items were removed in STEP 9.

18. Using the same rod (B) Fig. 17, used in STEP 12, tap shaft (C) Fig. 17, down all the way, as shown, and remove the center gear train (D), from the machine.

19. Fig. 18, illustrates the individual parts of the center gear train that were just removed.

- 1 — Spacer
- 2 — Top Gear
- 3 — Long Keys
- 4 — Gear
- 5 — Spacer
- 6 — Gear
- 7 — Shifting Collar with 3 Balls
- 8 — Shifting Collar Keys
- 9 — Roll Pin
- 10 — Bottom Gear

### ASSEMBLY OF CENTER GEAR TRAIN

1. Fig. 19, illustrates the drill press head with the center gear train removed. Before assembling the gear train, it is first necessary to remove the top bearing (A) Fig. 19, by pushing it straight up and out.

2. Place bottom gear (A) Fig. 20, flat down on a table or bench, as shown. Using two roll pins (C) inserted in roll pin holes in shifting collar (B), place shifting collar (B) in place in gear (A) as shown. NOTE: One of the roll pins (C) was removed when dis-assembling the gear train and the other is used as shown and enables you to align the shifting collar in order to insert one of the roll pins after the gear train is partly assembled. Make sure the roll pins (C) are not inserted too far into the holes of the shifting collar. They must not be in past the inside diameter of the shifting collar (B). Also make sure the three balls, one of which is shown at (E) Fig. 20, are inserted into the three indents in the shifting collar (B). A little grease on the balls will hold them in place.

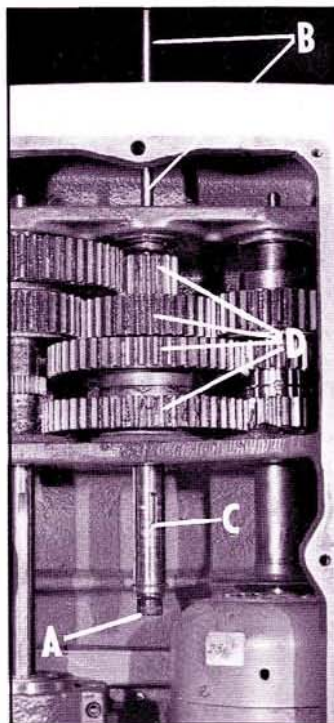


Fig. 17

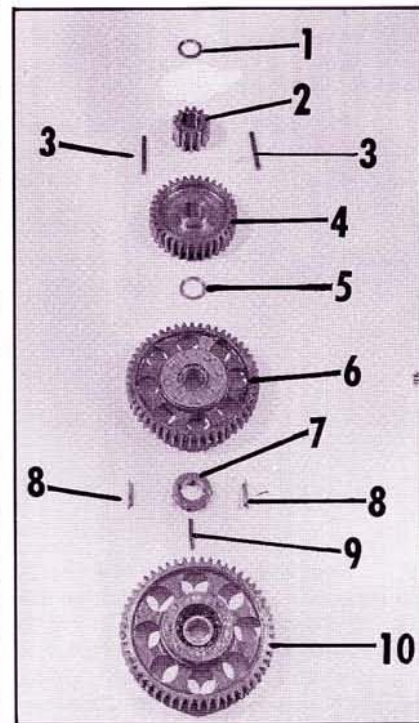


Fig. 18

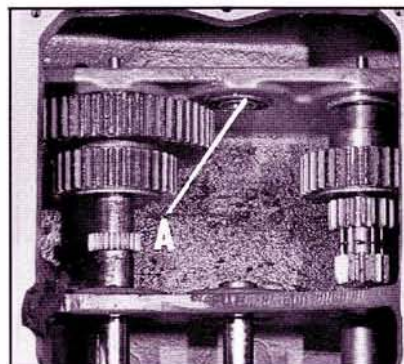


Fig. 19

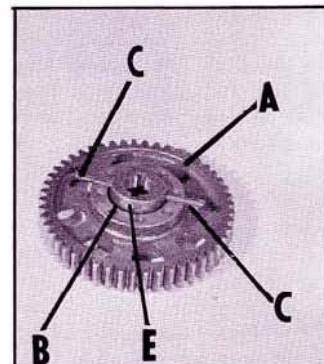


Fig. 20

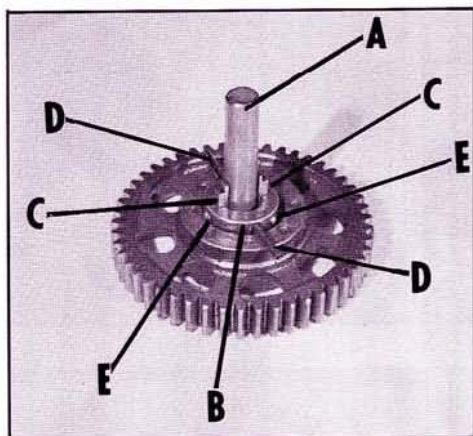


Fig. 21

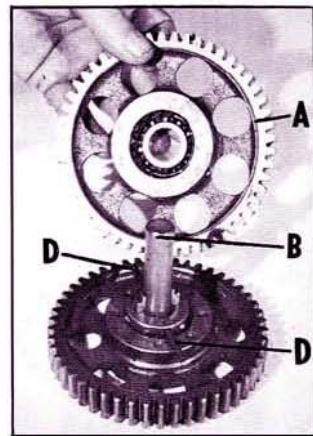


Fig. 22

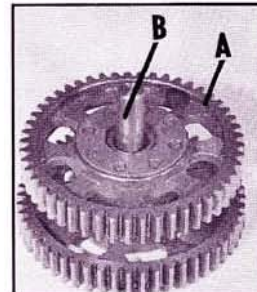


Fig. 23

3. Using a rod (A) Fig. 21, which is approximately  $\frac{1}{2}$ " in diameter and 4 or 5 inches long, insert the rod (A) down into the shifting collar (B) as shown. Insert the two keys (C) into the keyways of the shifting collar (B) as shown in Fig. 21. Make sure the two roll pins (D) are still in place and that the three balls (E) are still inserted into the indents of the shifting collar.

4. Assemble gear (A) on shaft (B) as shown in Fig. 22 and Fig. 23. Roll pins (D) Fig. 22, will keep assembly apart.

5. Position the gear assembly (A) with shaft (C) Fig. 24, in place in the head of the drill press, as shown. Remove snap ring located on bottom of shaft (B) Fig. 24.

6. Holding the lower bearing in place, drive shaft (B) Fig. 24, up through gear assembly until the top of shaft (B) is approximately  $\frac{1}{4}$ " above top gear of gear assembly (A) Fig. 24. Make sure keyway in shaft (B) engages keys in gear assembly and remove temporary shaft (C) Fig. 24.

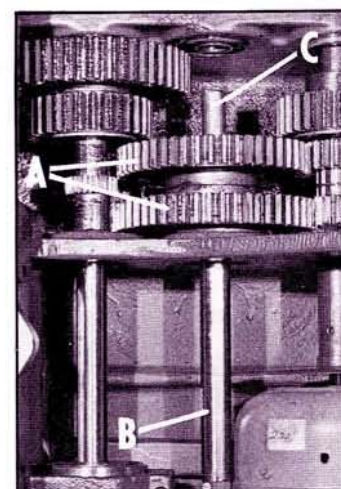


Fig. 24

7. Place spacer (A) Fig. 25, in position on top of shaft (B). Note that the two rollpins (C) and three balls (D) are still in place as shown.

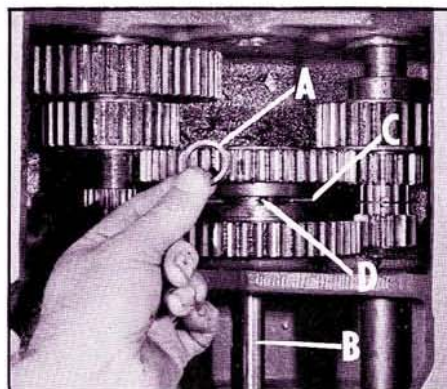


Fig. 25

8. Place gear (A) Fig. 26, in position as shown, and drive shaft (B) up through gear (A).

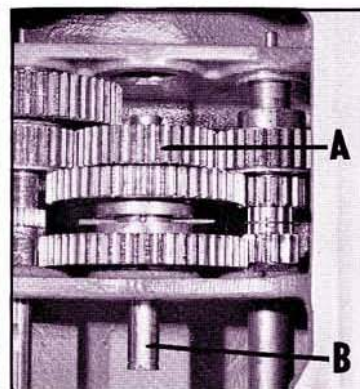


Fig. 26

9. Assemble snap ring (A) Fig. 27, to bottom of shaft (B), and drive shaft (B) all the way up as shown in Fig. 28. Make sure that the two roll pins (C) Fig. 28, and the three balls, one of which is shown at (D) Fig. 28, are still in place.

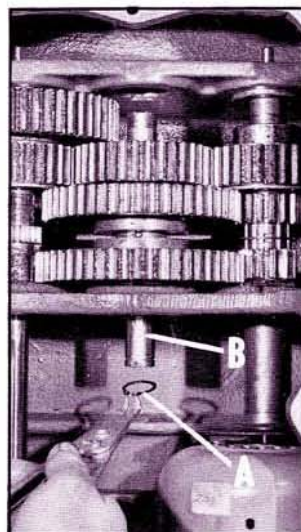


Fig. 27

10. Using a punch, drive one of the roll pins (C) Fig. 29, through the hole in the shaft and through the other end of the shifting collar. The extra roll pin will fall out when the roll pin (C) is driven in.

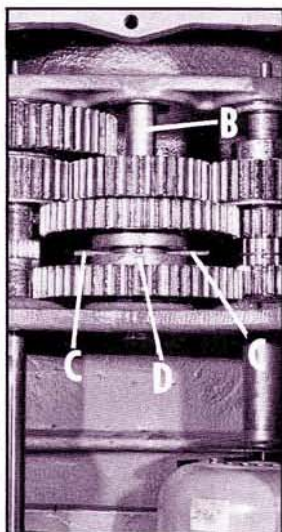


Fig. 28



Fig. 29

11. Insert the two long keys, one of which is shown at (A) Fig. 30, into the two keyways in the top half of the shaft (B), as shown.

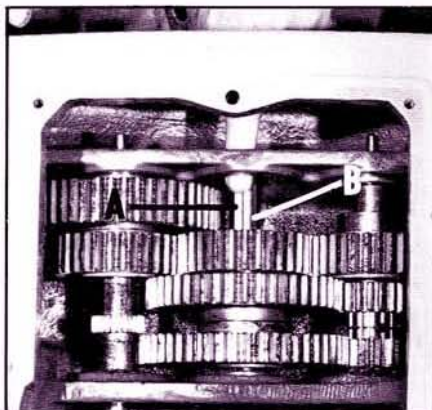


Fig. 30

12. Assemble the top gear (A) Fig. 31, to the shaft making sure the keys that were inserted in STEP II, engage with the keyways in the gear (A).

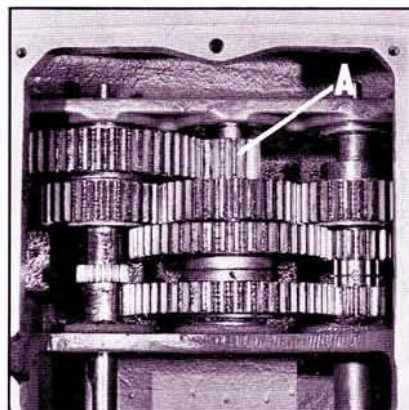


Fig. 31

13. Assemble top spacer (A) Fig. 32, to shaft (B) as shown.

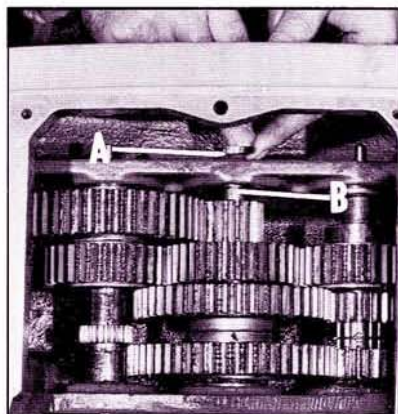


Fig. 32

14. Assemble top bearing (A) Fig. 33, by pressing it straight down on shaft as shown.



Fig. 33

15. Replace spring (B) Fig. 10, and screw and lockwasher (A) Fig. 9.

16. Assemble the large snap ring (A) Fig. 11, to bottom of gear train. Press down at the top of the shaft and gear so that the lower bearing is bottomed against the snap ring (A) Fig. 11.

17. Replace the nylon plug (B) Fig. 6.

18. Replace the push rod (A) Fig. 5.

19. Replace the spanner locking washer (B) and spanner nut (A) Fig. 7.

20. Replace the cam assembly (A) Fig. 4.