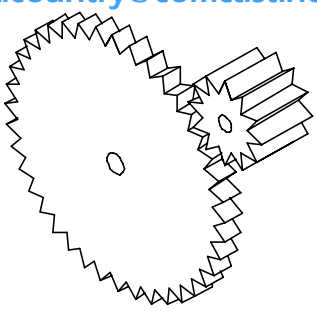
Chapter 10 GEARS



A. OPEN B FILE.

Step 1. When you start a new drawing away start with the B file. If you started this drawing as the B file go directly to Steps B. If your did not start as the B file complete these Steps: Click **Open** from the File Menu. Click **No** to save current part. Key in **a:b** for the filename and press ENTER.

B. TURN OFF GRID and SNAP.

Step 1. Turn off the Grid and Snap. Use **CTRL-G**. Hold down CTRL and press G.

Step 2. Click **Off** in Grid Properties Display.

Step 3. Click to **uncheck Active** in Snap Properties. Click OK.

C. CHANGE TO SIDE VIEW.

Step 1. Change to the Side View. Use **ALT-V 2**. Hold down ALT and press V. Key in 2 and press ENTER.

D. CREATE TWO BIG GEAR POLYGONS.

Step 1. ESC to Main Menu.

Step 2. F1 CREATE.

Step 3. F5 POLYLINE.

Step 4. F3 N-GON.

Step 5. Key in **40** for the Number of Sides and press ENTER.

Step 6. Key in 0 for Rotation Angle.

Step 7. Key in **.65** for Radius and press ENTER (big outside).

Step 8. F2 FLAT.

Step 9. F9 KEY IN.

Step 10. Key in:
Zero (0) for coordinate /X and press ENTER.
0 for /Y and press ENTER.
0 for /Z and press ENTER.

Step 11. Use ALT-A to center the polygon on the screen. Hold down ALT and press A.

Step 12. F10 BACK UP **two times** to key in a new radius.

Step 13. Key in **.58** for the Radius and press ENTER.

Step 14. F2 FLAT.

Step 15. Key in:
Zero (0) for coordinate /X and press ENTER.
0 for /Y and press ENTER.
0 for /Z and press ENTER.

E. CREATE TWO SMALL GEAR POLYGONS.

Step 1. ESC to Main Menu.

Step 2. F1 CREATE.

Step 3. F5 POLYLINE.

Step 4. F3 N-GON.

Step 5. Key in **12** for the Number of Sides and press ENTER.

Step 6. Key in 0 for Rotation Angle.

Step 7. Key in **.212** for the Radius and press ENTER.

Step 8. F2 FLAT.

Step 9. F9 KEY IN.

Step 10. Key in:
.65 for coordinate /X and press ENTER.
0 for /Y and press ENTER.
.53 for /Z and press ENTER.

Step 11. F10 BACKUP **two times** to key in a new radius.

Step 12. Key in **.142** for the Radius and press ENTER.

Step 13. F2 FLAT.

Step 14. F9 KEY IN.

Step 15. Key in:
.65 for coordinate /X and press ENTER.
0 for /Y and press ENTER.
.53 for /Z and press ENTER.

Step 16. Use **ALT-A** to center the drawing on the screen. Hold down ALT and press A.

Step 17. At this time it is a good idea to save the drawing. Click **Save As** from the File Menu. Key **a:gears** filename and press ENTER. Press ESC for Part Description.

F. CREATE BIG GEAR USING LINE ENDPOINTS.

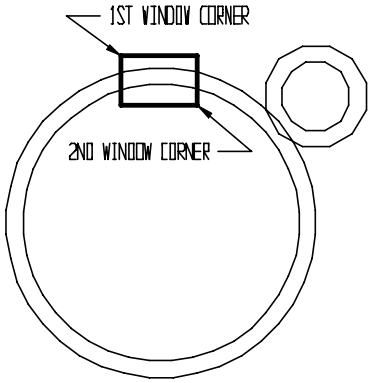


FIG. 1

Step 1. Use **ALT-W** to zoom in on the top of the big polygons. Hold down ALT and press W. Move the cursor to just outside the top of the big polygon, **Fig. 1**. Click to start the 1ST WINDOW CORNER. Stretch the window to surround the top of the polygons. Click to set 2ND WINDOW CORNER.

Step 2. Draw the big gear in a different color. Change the color to **red**. Click the color swatch in the side Tool Bar. Click the red, number 2.

Step 3. ESC to Main Menu.

Step 4. F1 CREATE.

Step 5. F1 LINE

Step 6. F1 ENDPOINTS.

Step 7. F4 CENTER.

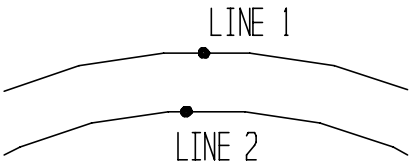


FIG. 2

Step 8. To indicate the Start Point, click Line 1, **Fig. 2**.

Step 9. F3 ENDENT.

Step 10. To indicate the End Point, click on the left end of Line 2, **Fig. 2**.

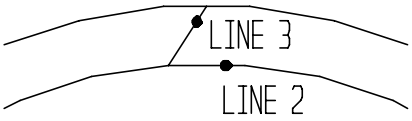


FIG. 3

Step 11. To indicate the Start Point, click on the top end of the red line, Line 3, **Fig. 3**.

Step 12. To indicate the End Point, click on the right end of Line 2, **Fig. 3**.

Step 13. Use **ALT-A** to center the drawing on the screen. Hold down ALT and press A.

G. CREATE SMALL GEAR USING LINE ENDPOINTS.

Step 1. Use **ALT-W** to zoom in on the top of the small polygons. Hold down ALT and press W. Move the cursor to just outside the top of the small polygon, **Fig. 4**. Click to start the 1ST WINDOW CORNER. Stretch the window to surround the top of the polygons. Click to set 2ND WINDOW CORNER.

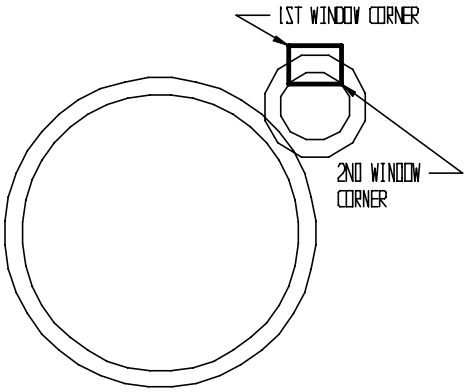


FIG. 4

Step 2. Draw the small gear in a different color. Change the color to **red**. Click the color swatch in the side Tool Bar. Click the white, number 15.

Step 3. ESC to Main Menu.

Step 4. F1 CREATE.

Step 5. F1 LINE

Step 6. F1 ENDPOINTS.

Step 7. F4 CENTER.

Step 8. To indicate the Start Point, click Line 1, **Fig. 5**.

Step 9. F3 ENDENT.

Step 10. To indicate the End Point, click on the left end of Line 2, **Fig. 5**.

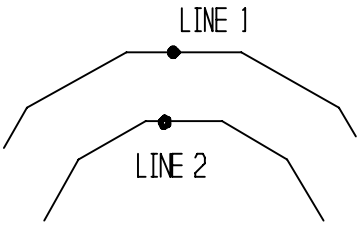


FIG.5

Step 11. To indicate the Start Point, click on the top end of the white line, Line 3, **Fig. 6**.

Step 12. To indicate the End Point, click on the right end of Line 2, **Fig. 6**.

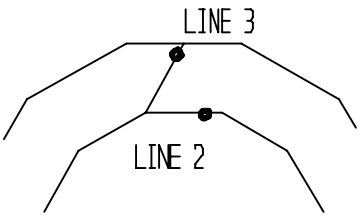


FIG.6

Step 13. Use **ALT-A** to center the drawing on the screen. Hold down ALT and press A.

Step 14. At this time it is a good idea to save the drawing. Use **CTRL-S** to save. Hold down CTRL and press S.

H. ROTATE GEAR.

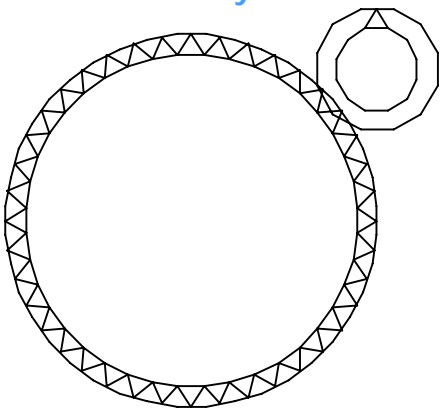


FIG. 7

Step 1. ESC to Main Menu.

Step 2. F4 X-FORM.

Step 3. F3 ROTATE.

Step 4. F2 COPY.

Step 5. F1 SINGLE.

Step 6. Click on the two red lines of the big gear and press ENTER.

Step 7. Key in **39** for the Number of Copies and press ENTER.

Step 8. F9 KEY IN.

Step 9. Key in:
Zero (0) for coordinate /X and press ENTER.
0 for /Y and press ENTER.
0 for /Z and press ENTER.

Step 10. Click ACCEPT to accept the point on axis.

Step 11. Key in **9** for the Rotation Angle and press ENTER.

Step 12. F10 BACK UP **three times** to choose option.

Step 13. F1 SINGLE.

Step 14. Click on the two white lines of the small gear and press ENTER.

Step 15. Key in **11** for the Number of Copies and press ENTER.

Step 16. F9 KEY IN.

Step 17. Key in:
.65 for coordinate /X and press ENTER.
0 for /Y and press ENTER.
.53 for /Z and press ENTER.

Step 18. Click ACCEPT to accept the point on axis.

Step 19. Key in **30** for the Rotation Angle and press ENTER.

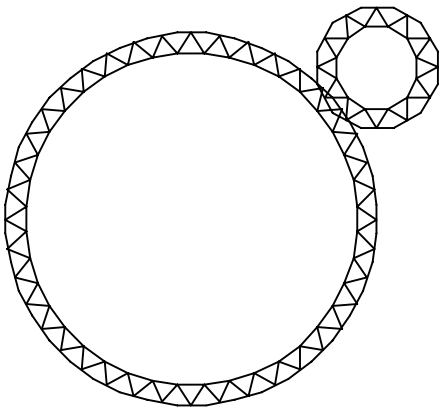


FIG. 8

Step 20. ESC to Main Menu.

Step 21. Delete the four blue polygons. Use **CTRL-Q** to delete the lines. Hold down CTRL and press Q. Select each polygon with a click and press ENTER.

Step 22. At this time it is a good idea to save the drawing. Use **CTRL-S** to save. Hold down CTRL and press S.

I. CREATE THE 3RD DIMENSION FOR BIG GEAR.

Step 1. Change to the Isometric View. Use **ALT-V 7**. Hold down ALT and press V. Key in 7 and press ENTER.

Step 2. Use **ALT-A** to center the drawing on the screen. Hold down ALT and press A.

Step 3. Draw the 3rd dimension for the big gear the same color as the big gear, red. Change the color to **red**. Click the color swatch in the side Tool Bar. Click the red, number 2.

Step 4. ESC to Main Menu.

Step 5. F4 X-FORM.

Step 6. F1 DELTA.

Step 7. F3 JOIN.

Step 8. F7 ALL DISPLAYED.

Step 9. F2 BY TYPE.

Step 10. Click the **red** color swatch and press ENTER.

Step 11. Key in **1** for Number of Copies.

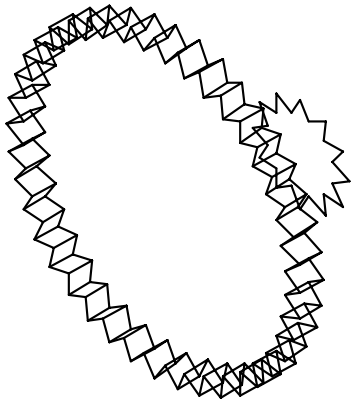


FIG. 9

Step 12. Key in:
0 for dX and press ENTER.
.1 for dY and press ENTER.
0 for dZ and press ENTER.

J. CREATE THE 3RD DIMENSION FOR SMALL GEAR.

Step 1. Draw the 3rd dimension for the small gear the same color as the small gear, white. Change the color to **white**. Click the color swatch in the side Tool Bar. Click the white, 15.

Step 2. ESC to Main Menu.

Step 3. F4 X-FORM.

Step 4. F1 DELTA.

Step 5. F3 JOIN.

Step 6. F7 ALL DISPLAYED.

Step 7. F2 BY TYPE.

Step 8. Click the **white** color swatch and press ENTER.

Step 9. Key in **1** for Number of Copies.

Step 10. Key in:
0 for dX and press ENTER.
.2 for dY and press ENTER.
0 for dZ and press ENTER.

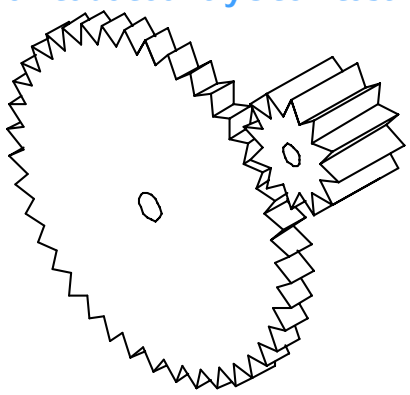


FIG. 11

K. ADD YOUR NAME AND THE PERIOD TO DRAWING.

Step 1. Use **Alt-H** to reduce the drawing half size. Hold down ALT and press H. Use: **Detail, Note, Key-In** commands to add text.

Step 2. Use **CTRL-S** to save. Hold down CTRL and press S.