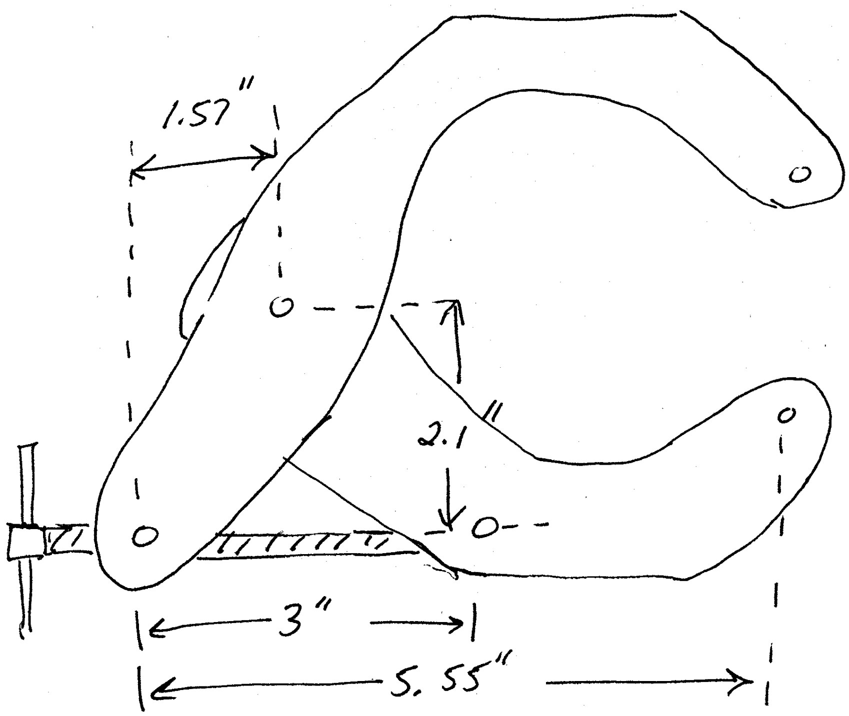
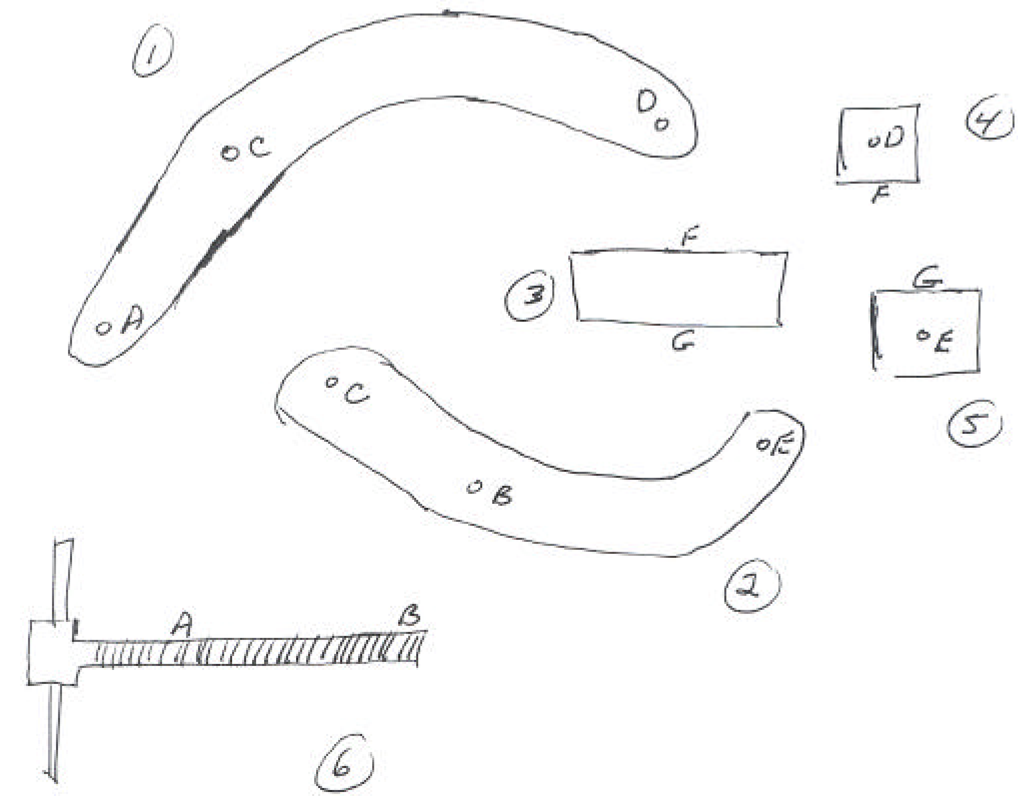
Solutions to Set #5, 24-261, Fall 2001

1. From diagram, can extract relevant dimension

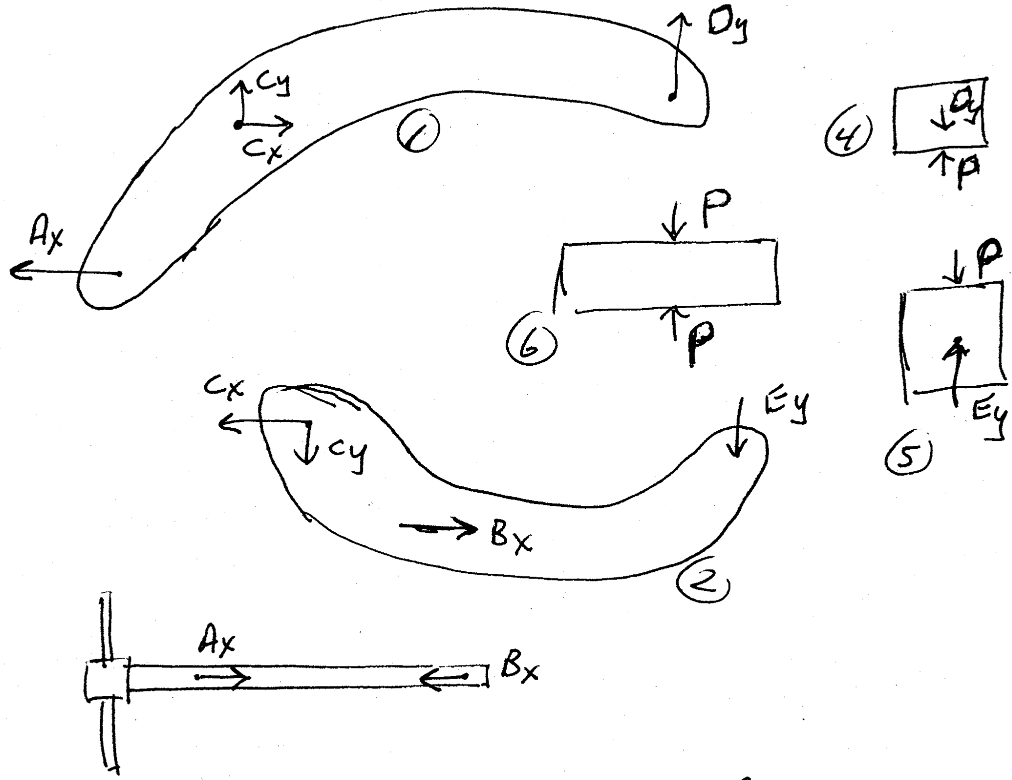




Each pin has only two forces acting on it. These forces must be equal + opposite to keep the pin in equilibrium.

Thus, the two members connected by the pin exert equal + opposite forces on each other.

Note that 6 is a two-force member
So are 3, 4 and 5



Since these bodies are two forces members, only included components that we knew would be non-zero

6 $\quad \Sigma F_x = A_x - B_x = 0 \qquad A_x = B_x$

4 $\quad \Sigma F_y = P - D_y = 0 \Rightarrow D_y = P$

5 $\quad \Sigma F_y = -P + E_y = 0 \Rightarrow E_y = P$

(1) $\Sigma M|_{C_z} = D_y(5.55-1.57) - A_x(2.1) = 0$

$$A_x = P\,\frac{(5.55-1.57)}{2.1} = 1.89\,P$$

$$\Sigma F_x = -A_x + C_x = 0 \Rightarrow C_x = A_x = 1.89\,P$$

$$\Sigma F_y = C_y + D_y = 0 \Rightarrow C_y = -D_y = -P$$

Body (2) is also in equil.