To do ...

• Quiz 4 *starts* Tues

• HW 14 PL due Tues

• HW 15 ME due Thurs

• Quiz 4 *ends* Sat

• WA 8 due Sun
Frames and machines

Frames and machines are two common types of structures that have at least **one multi-force member** (trusses have nothing but two-force members).

Frames are generally **stationary** and used to support various external loads. **Machines** contain **moving parts** and are designed to alter the effect of forces.
Find the force in the cable at the winch motor W and the horizontal and vertical components of pin reactions A, B, C, and D.
Determine the horizontal and vertical components of force at pins A and D.
If a 100 N force is applied to the handles of the pliers, determine the clamping force exerted on the smooth pipe $B$ and the magnitude of the resultant force that one of the members exerts on pin $A$. 
The pumping unit is used to recover oil. Determine the torque $M$ which must be exerted by the motor in order to overcome this load.
Assuming the blades are pin connected at $B$ and the surface at $D$ is smooth, determine the normal force on the fingernail when a force of 1 lb is applied to the handles as shown.