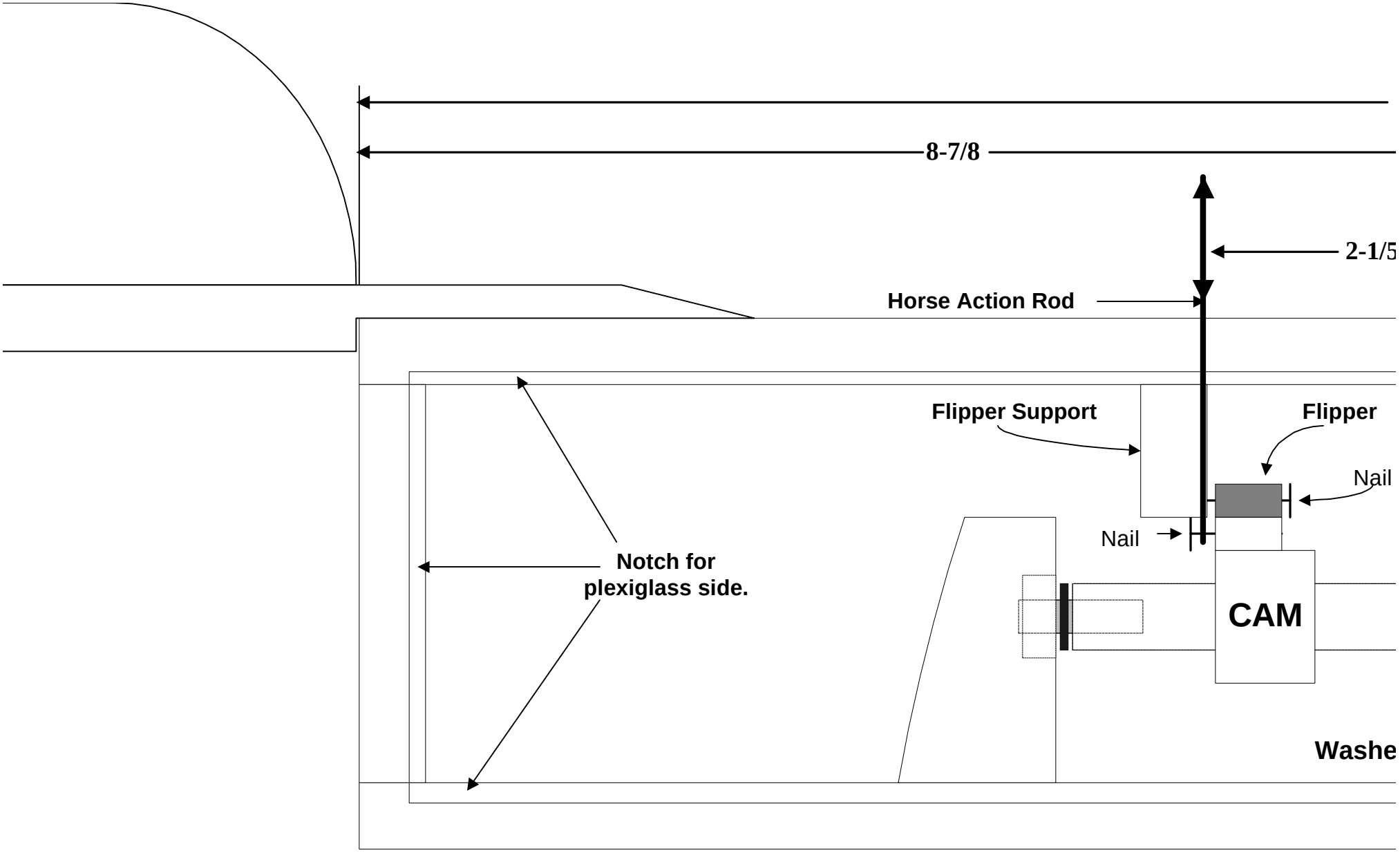

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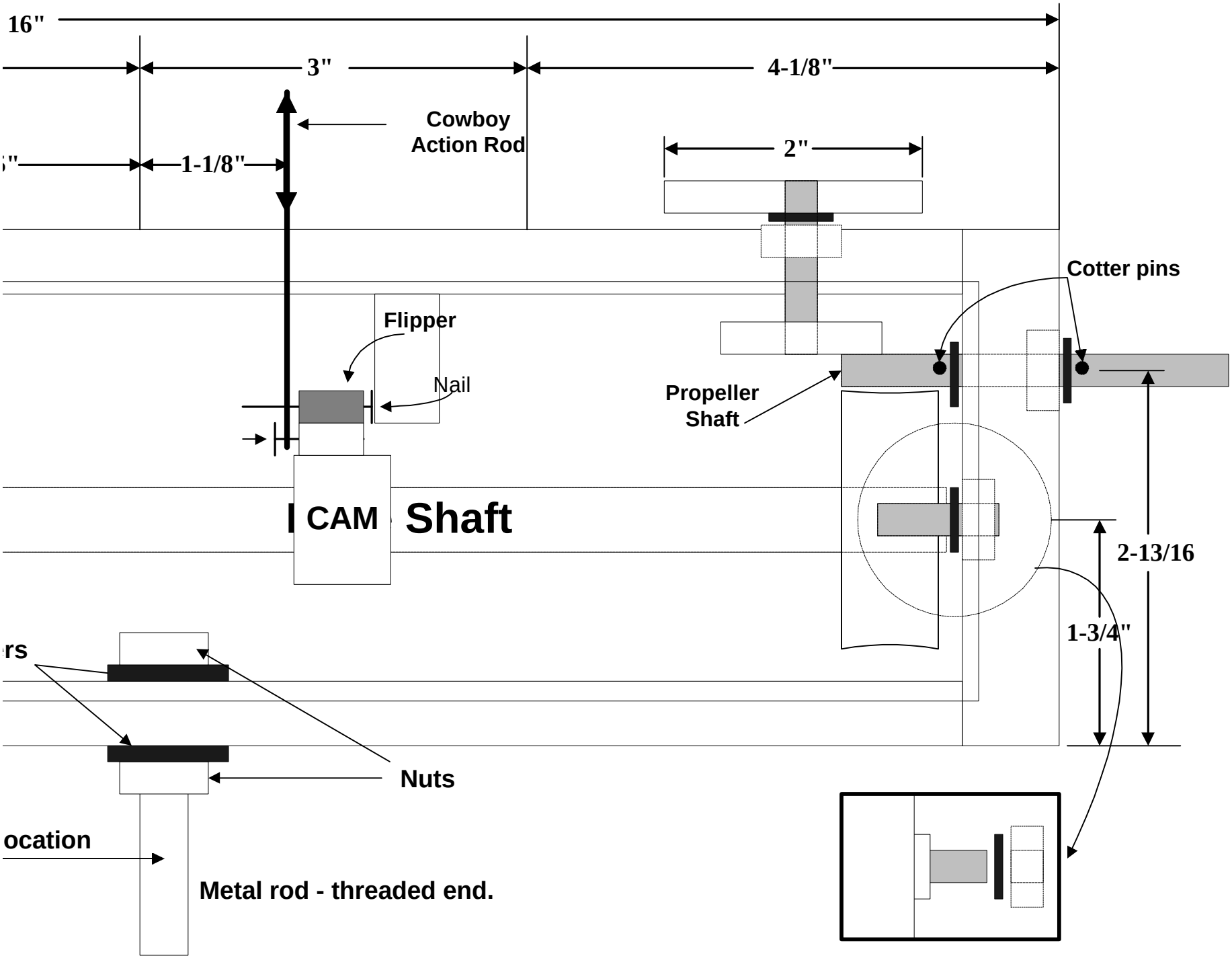
Test for balanced l


16"
3"
4-1/8"
Cowboy
Action Rod
1-1/8"
2"
Cotter pins
Flipper
Nail
Propeller
Shaft
CAM
Shaft
2-13/16
1-3/4"
Nuts
ocation
Metal rod - threaded end.

End View Top / Bottom -
Top view - Front & Back

1/8" notch for
plexiglas sides.

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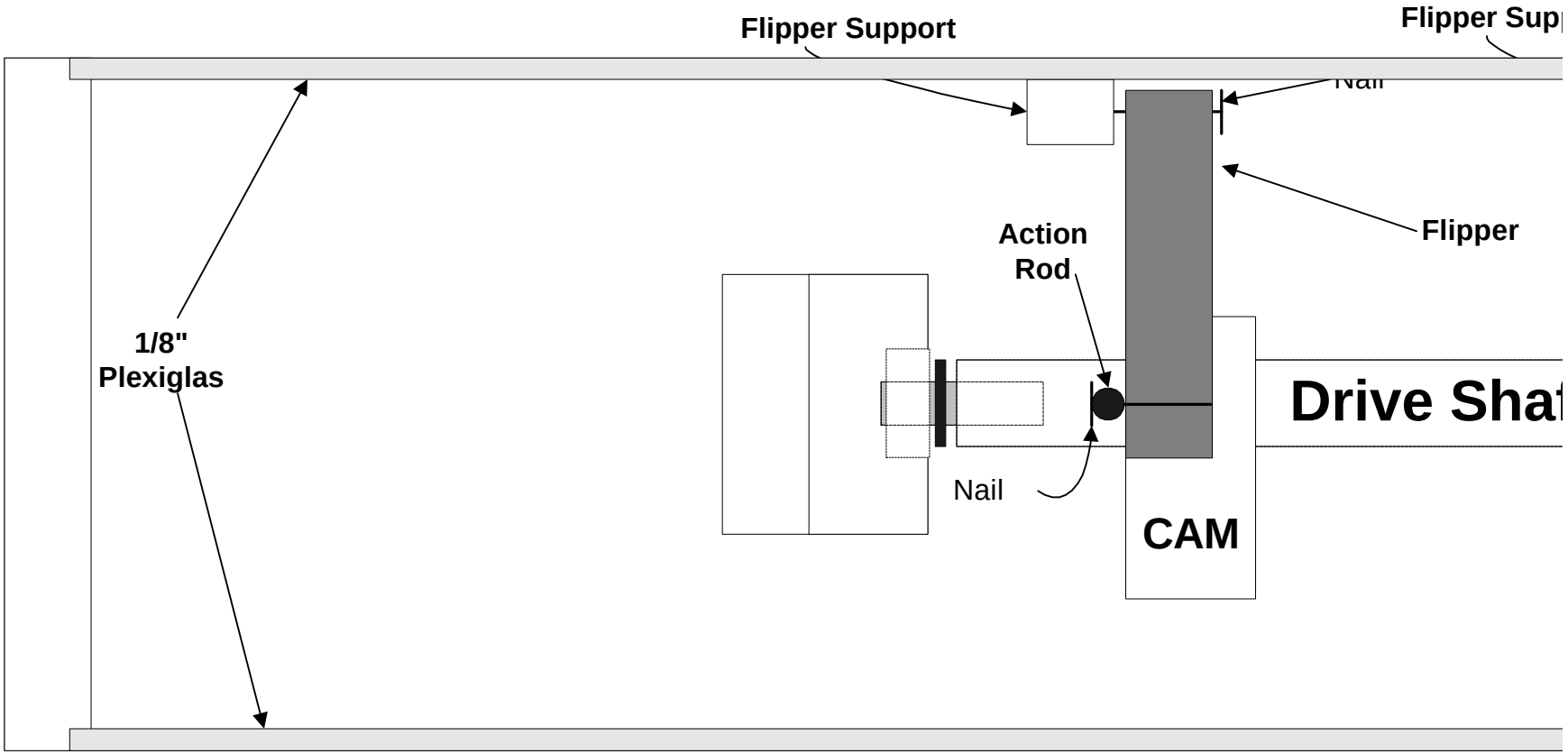
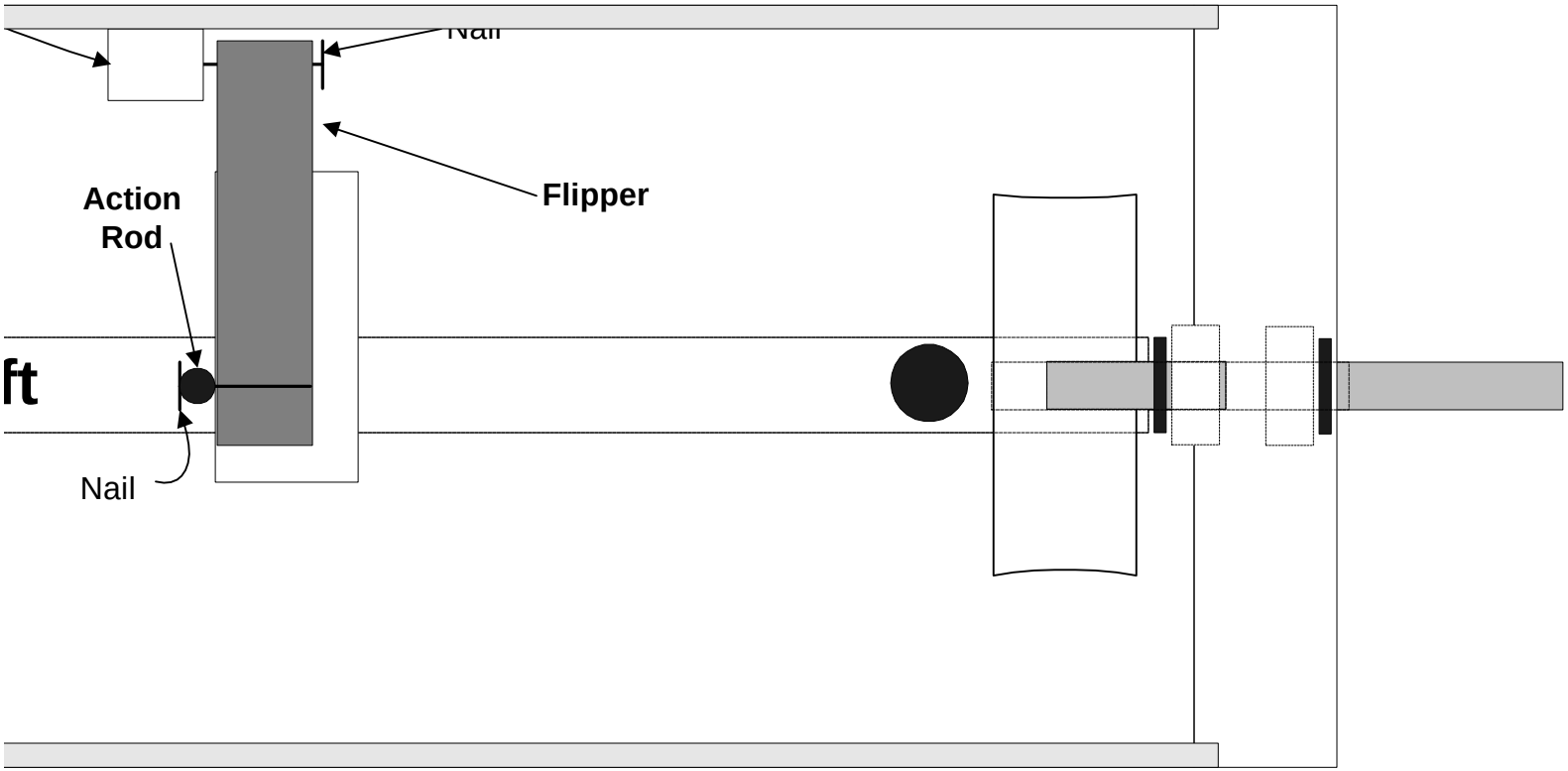


port



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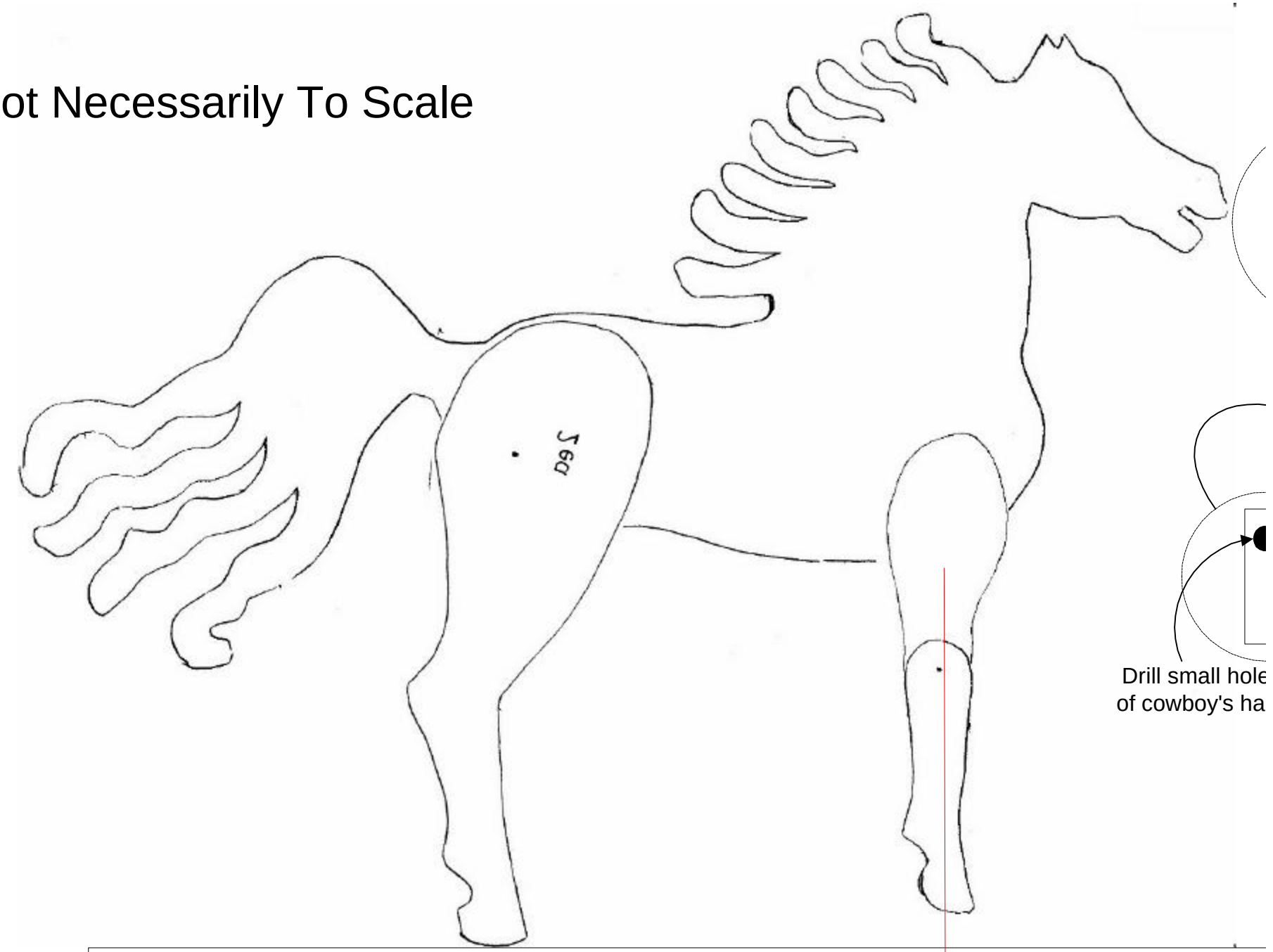
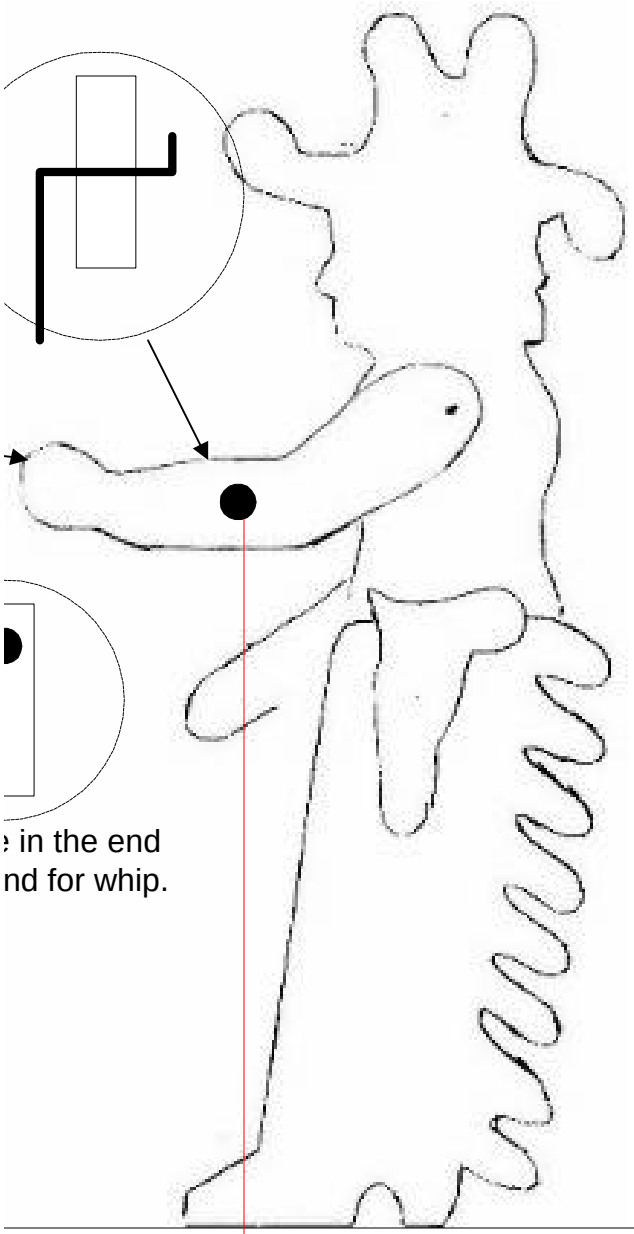
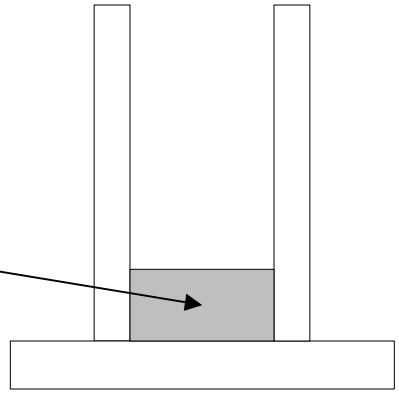
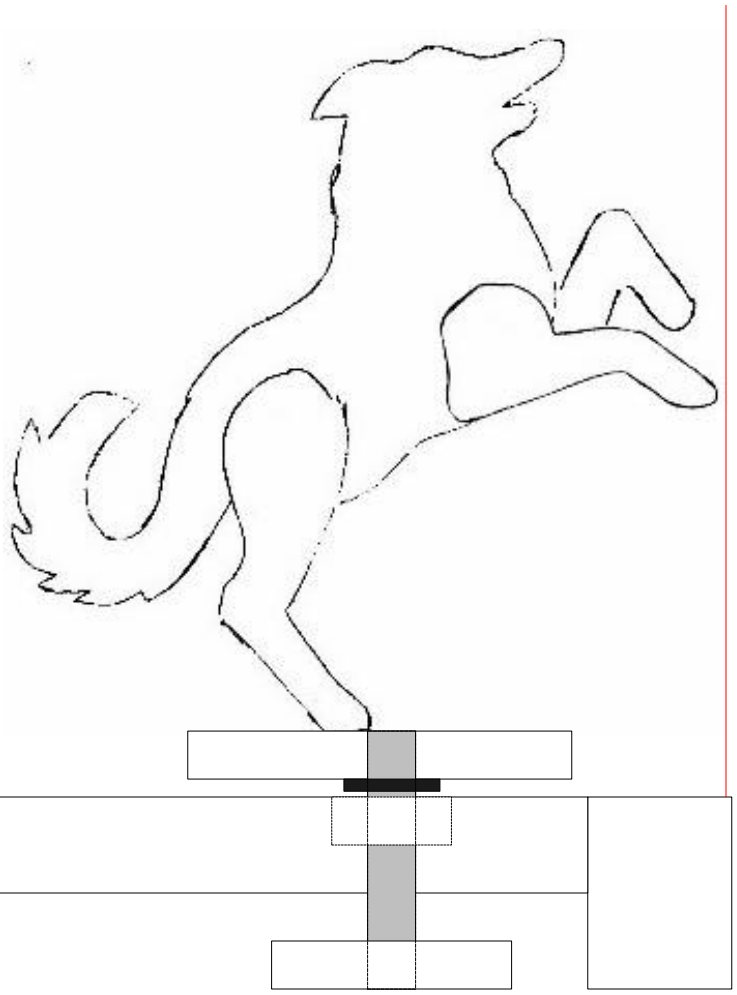




Mounting blocks for cowboy, dog & horse.





e in the end
nd for whip.

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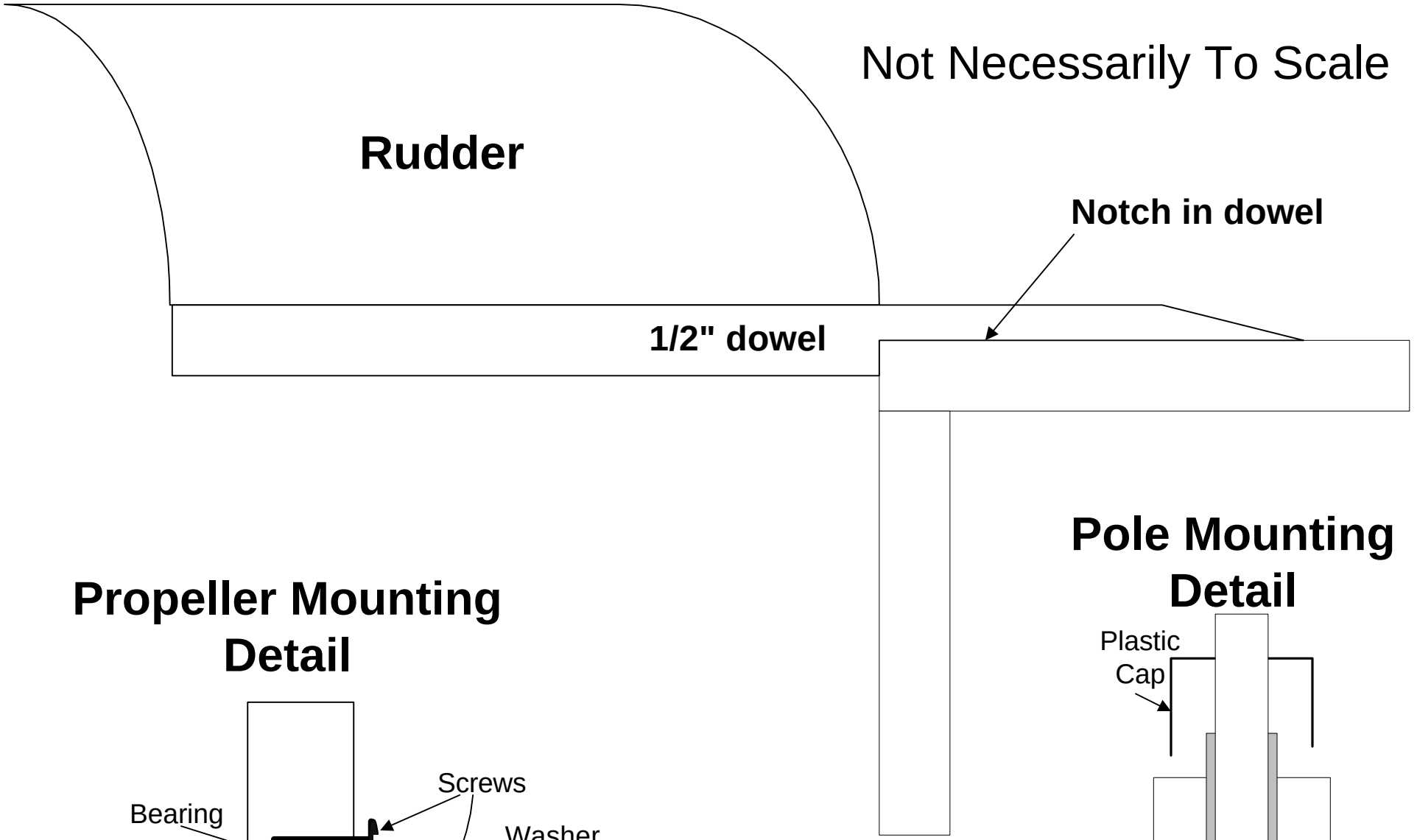
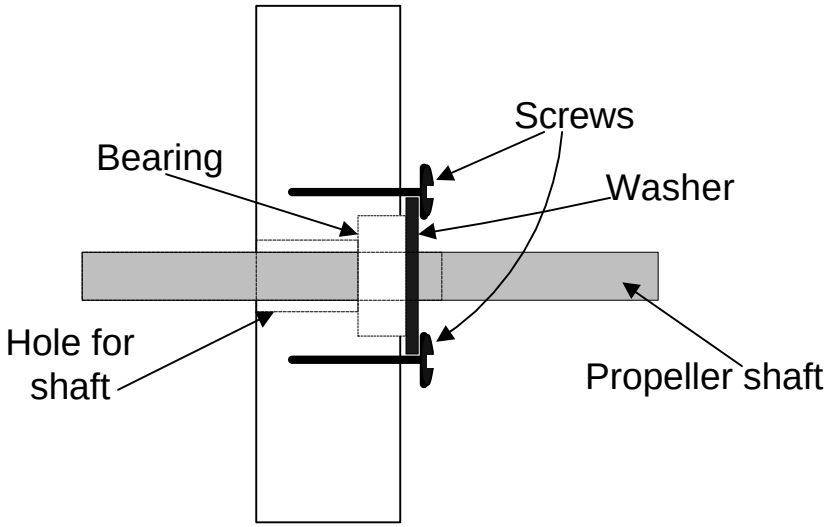
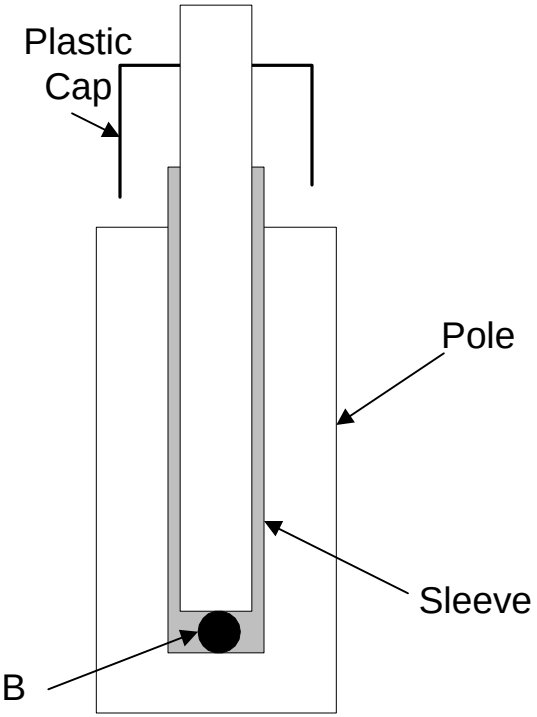


Propeller Mounting Detail



Pole Mounting Detail



This weathervane is based on an old fashion toy I saw many years ago.
On the toy, the animation was accomplished using a crank and toothed wooden gears.
As the crank is operated, the dog spins around in circles. The cowboy slowly lifts the whip in his right hand, he 'snaps' the whip downward, the horse rears up on its hind legs, and the horse slowly drops back down.
I saw a wonderful weathervane here and decided to replace the crank with a propeller.
Realizing the toothed gears would increase the operating friction and increase maintenance problems, I replaced them with friction drive from the propeller shaft.
The first version I made had painted wood sides. When I put in into service, I realized the best part of this item was hidden so I later constructed a new one and replaced the sides with Plexiglas to 'show off' the mechanics of the device.
I have toyed with the idea of adding a very small motor to serve as a generator to light a bulb so the internal works can be seen when running under the power of night winds.

Materials needed:

4ea - 1/4" ball bearings.
1ea - 6" long 1/4" metal rod.
1ea - 1/4' wide rubber band about 4" long.
1ea - 12" * 16" 1/8" thick sheet of Plexiglas.
1ea - 3/4' plank, at least 4" wide, totaling 3 board-foot or better.
2ea thin wire coat hangers or other rigid wire.
Wire for whip.
4 thin 1/4" flat washers.
12ea very thin, 1/8" flat washers.
1ea - 3/4" dowel, 16" long.
1ea - 1/2" dowel, 8" long.
1 BB (Daisy BB) or ball from an old bearing.
Broad head brads.
Finishing brads.
Latex paint for case.
Enamel paint for figures.
Small screw eyehook.
4" long 1/2" metal road with 1" threads on end.

Construction:

Due to the complexity of this project, I split the directions into two sections.
The first covers construction of the base and its mechanics.
The second is the construction of the propeller. It is covered in a special section on my **BASIC PROJECTS** page.

The base and its mechanics.

Critical construction is in the drive shaft. It must be symmetrical and true.
That is why you need to turn it down after mounting the metal rods in the ends of the shaft.
The round wheels can be turned on a lathe, cut with hole saws, cut from large dowels, or cut on a band saw.

1. First, print the templates and diagrams out. Trim & tape the two-page drawings together.
2. Next, make templates of all the parts on the FULL SCALE sheet (pg. 2 of the pdf file).
3. Cut all parts from a 3/4" pine plank.
4. The main body parts for the cowboy, the horse and the dog will remain 3/4" thick.
5. The 2 cams for the drive shaft will also remain 3/4" thick.
6. All the other parts will be 1/4" thick.
7. Re-saw (slice off) two of each part other than the main body parts.
   Saw each piece from the finished side of the wood in order to leave only one side with saw marks.

A. The Cowboy.

1. Glue both legs and the left arm to the Cowboy and secure with small finishing brads.
   Note *** To avoid splitting these thin pieces, dull the brad tip slightly by tapping it with the hammer. ***
2. Glue the gun & holster to the Cowboy and secure with small finishing brads.
3. Locate & drill the mounting hole in the cowboy's right arm. (Slightly larger than body of the broad head brads.)
4. Drill a hole in forearm of the cowboy's right arm. (Slightly larger than the wire to be used as action rods.)

5. Drill a very small hole in end of the cowboy's hand as shown in diagram. (Slightly larger than the wire to be used as the whip.)
6. Shape the whip & glue it into the end of the hand.
7. Seal and paint him with good enamel paints.
8. Clean out the pivot holes in the right arm, insert a tiny flat washer between the arm and the body, and nail the arm to the body.

B. The horse.
1. If you do not have a router, skip to step 7.
2. Hollow out the horse body as follows. This will make the system run better.
3. Slice a 1/8" side off the horse & keep the piece.
4. Hollow out the horse's body with your router. Do not hollow where all the legs fit.
5. If you want a really fine action, partially insert nails where the rear legs will mount then drill small holes in the horses tail and insert metal weights to get the horse to a nearly perfect balance.
6. Position and glue the 1/8" thick side back on the horse.
7. Screw the small eyehook into the horses chest where it will be hidden by the front legs.
8. Glue the top portions of the front legs to the horse and secure with small finishing brads.
9. Locate & drill the mounting hole in the lower parts of the horse's front legs. (Slightly larger than body of the broad head brads.)
10. Locate & drill the mounting hole in the horse's rear legs. (Slightly larger than body of the broad head brads.)
11. Seal and paint him with good enamel paints.
12. Clean out the pivot holes in the leg pieces.
13. Insert a tiny flat washer between each rear leg and the body, and nail the leg to the body.
14. Nail the lower front leg pieces to the upper pieces and trim off any extra length of the nail.

C. The dog.
1. Glue all the legs to the Dog and secure with small finishing brads.
2. Cut 2 round wheels to a diameter of 2" for the main drive shaft gear and for the dog platform.
3. Cut a round wheel to a diameter of 1-1/4" for the dog drive gear.
4. Re-saw the dog platform & drive gear pieces for 1/4" thick pieces.
5. Drill a 1/4" hole in the center of the dog base and in the center of the dog drive gear.
6. Cut a small mounting block to fit between the legs as shown in the diagrams.
7. Locate, glue and nail the mounting block to the 2" round platform. Use the drawings to locate the dog on the platform.
8. Locate, glue and nail the dog to the mounting block.
9. Cut a 1-1/4" length of the 1/4" rod for the dog base and glue it into the bottom of the base.
10. Seal and paint the dog with good enamel paints.

D. The Base.
1. Cut a 4" square for the front of the base from 3/4" stock.
2. Cut a 3" x 4" rectangle for the back of the base from 1/2" stock.
3. Cut two pieces to 4" by 15-1/4"for the top & bottom of the base from 1/2" stock.
4. Cut a 1/8" notch along each edge on one side of the top & bottom pieces to recess the plexiglas.
5. Locate the holes for the "action rods" for the cowboy & horse and drill 1/4" holes in the top.
6. Locate & drill a pilot hole in the base front EXACTLY 1-3/4" up from the bottom edge, 1/2" deep, and centered side to side.
7. Measure the outside dimension of your ball bearings and drill recess holes into the back side of the base front & the support block.
   Size the recess to fit the bearing without any play.
   The bearing should fit nearly all the way into the recess or perfectly flush, not below the surface.
8. Locate and drill a pilot hole through the base front EXACTLY 2-13/16" up from the bottom edge and centered side to side.
9. Drill a bearing recess hole into the front side of the base front.
10. Drill a bearing recess hole into the top 1-1/2" from the front edge and centered side to side.
11. Locate, glue & nail the front, top, bottom & back together being careful to keep them square.
12. Seal and paint the base.
13. Cut the two pieces of plexiglass to 3-1/4" by 15".
14. Test their fit into the sides.

15. Cut a piece of scrap wood to serve as a temporary side and 'tack' it to one side of the base to hold it square during the rest of the construction.

E. The Drive shaft.
1. Cut the rear bearing support block from a 2" x 2" block, 2-1/4" tall.
2. Cut 2 flippers to 1/2" x 1/2" x 1-3/4".
3. Cut 2 flipper support post to 1/2" x 1/2" x 1".
4. Locate and drill a pilot hole in the two cams then drill 1/2" holes.
5. Locate and drill a pilot hole in the exact center of the main drive shaft gear then drill a 1/2" hole.
6. Locate & drill a pilot hole in the rear bearing support block EXACTLY 1-1/4" up from the bottom edge, 1/2" deep, and centered side to side.
7. Cut a 12" length of the 3/4" dowel.
8. Locate the centers of both ends of the dowel.
9. Using a drill chuck in your lathe, drill pilot holes into both ends of the dowel.
10. Using a drill chuck in your lathe, drill 1/4" holes, 3/4" deep into the ends.
11. Cut 2 pieces of the 1/4" metal rod 1-1/8" long.
12. Gently drive the rods into the ends of the dowel. Glue with epoxy if not very snug.
13. Mount this assembly onto your lathe and turn the dowel down to EXACTLY 1/2" diameter.
14. Remove the drive shaft from your lathe and glue the main drive gear to it 1/8" from the edge.
15. Put the assembly back in the lathe and turn a very slight concave into the drive gear.
16. Remove the drive shaft from your lathe.
17. Drive a small finishing brad part way into the thin area of the cams. Do not let it protrude into the hole.
18. Slide the cams onto the shaft.
19. Keeping in mind the direction of rotation for your propeller, the cams should run along the gradual side and back down the straight side.
20. Locate the front cam (cowboy), glue and nail it in place.
21. Do not glue the other cam (horse) in place.
22. Insert the bearings into the rear bearing support block and the base inner front.
23. Place the wide rubber band over the drive gear.
24. Insert the drive shaft with 2 thin small flat washers between the shaft & the bearings on each end.
25. Glue & screw the rear bearing support block into place. Use screws here to allow you to remove the shaft assembly for maintenance later.
26. Drill holes in the flippers where the nails will be inserted to secure the flipper to the support. (Slightly larger than body of the broad head brads.)
27. Nail the flipper to the support being sure to not drive the nail so far the flipper binds. You may wish to insert a tiny flat washer between the flipper and the support.
28. Locate, glue and nail the flipper supports into place.

F. The rudder assembly.
1. Cut an 8" long piece of 1/2" dowel.
2. Bevel it as shown in the diagrams.
3. Cut the rudder surface to the shape indicated in the diagrams or any shape you like.
4. The thickness of the rudder surface should be 1/8".
5. Cut a 1/8" notch in the dowel to receive the rudder surface.
6. Glue and clamp the rudder surface into the notch in the 1/2" dowel.
7. Add small brads if desired.
8. Seal and paint the rudder assembly.

G. The final assembly.
1. Cut a small mounting block to fit between the cowboy's legs as shown in the diagrams.
2. Locate, glue and nail the mounting block to the base top. Use the drawings to locate the cowboy on the top.
3. Locate and glue the cowboy into place.
4. Cut a small mounting block to fit between the rear horse legs as shown in the diagrams.
5. Locate, glue and nail the mounting block to the base top. Use the drawings to locate the horse on the top.
6. Locate, glue and nail the horse to the mounting block.
7. Remove the temporary side and insert the plexiglass side. Secure it with several broad head brads along the edges.
8. Lie the base on its side.
9. Install the cowboy and horse action rods as follows.
10. Cut the wire longer than needed.

11. Bend a loop to fit over the shaft of the broad head brads.
12. Pass the wire though the hole in the top and insert the nail through the loop and nail it into the flipper.
13. Bend the wire as needed to reach the cowboy/horse.
14. For the horse cut the wire long enough for a loop through the eyehook then shape the loop in the wire through the eyehook.
15. For the cowboy, bend the wire to pass through the hole, cut it off leaving 1/8” inch, and bend the end up.
16. Stand the base upright.
17. Locate the horse cam on the driveshaft as follows:
18. Turn the driveshaft in its proper direction until the cowboy’s hand just drops back down (snaps the whip).
19. Hold the driveshaft in place and turn the horse cam to the point it just starts to push the horse up then glue and nail it in place.
20. Locate, glue and nail rudder onto the base.
21. Clean all traces of dirt and oil from the exposed shaft of the propeller.
22. Mount the propeller as shown in the diagrams with washers and cotter pins.
23. Find the balance point of the weathervane by balancing it on a thin piece of wood or the metal edge of a ruler placed in a bench vise.
24. Install the 1/2” rod at the balance point using flat washers and nuts.
25. Paint all unpainted surfaces.
26. Iinsert the other plexiglass side and secure it with several broad head brads along the edges.
27. Install the weathervane on a pole as indicated in the diagrams using a metal sleeve.
28. Place a greasy BB in the bottom of the sleeve to let it rotate more easily.
29. A small plastic cap drilled, inverted, and placed on the metal rod will help keep the rain out of the sleeve.