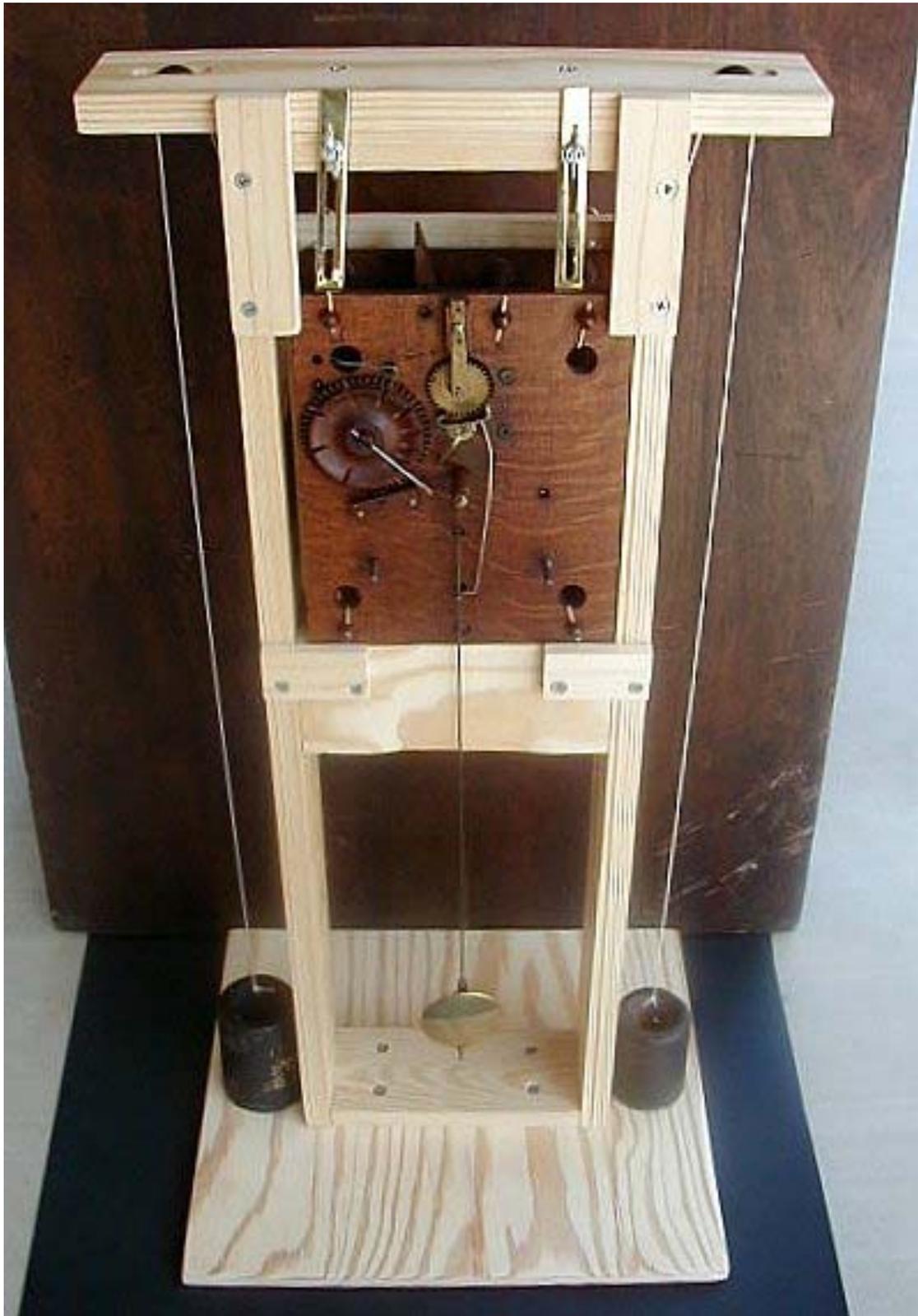


## Wooden Movement Test Stand



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This test stand is based on a design provided by Phil Gregory. Rather than using brass pins to secure the movement in place, the test stand was redesigned by Don Bugh and Terry Palmer to use braces as the method for supporting the movement.

Mary Ellen Bell supplied us with four wooden movements to ensure that the test stand would accommodate a range of dimensions. The plates of these movements ranged as follows:

Height – 8 1/16 to 8 1/4 inches  
Width – 6 3/8 to 6 5/8 inches  
Depth – 2 3/8 to 2 3/4 inches

### General construction notes:

- a. The clock stand was made from 1 x 4 white pine lumber and was ripped on a table saw to the required 3 inch widths or narrower as noted below.
  - b. All screw holds were countersunk using a countersink drill bit.
  - c. Pilot holds were drilled for each screw to prevent wood splitting.
1. Base – 14 inches x 12 1/2 inches – made from 1/2 inch plywood.



## 2. Frame:

Side pieces – 3 inches x 27 3/4 inches

Top and bottom pieces – 3 inches x 6 3/4 inches



Side openings – from top of side piece, mark drill points at 2 1/4 inches from the top (centered) and 17 1/4 inches from the bottom (centered). Center a 1 1/4 inch wood drill bit on each of the drill points and drill all four holes. Saw out the remaining portion of the side openings (a pencil line connecting the outer portions of each of the drilled holes is helpful in doing this – we used a jig saw).



**Note:** The slot shown in the accompanying photo is too short – the dimensions have been revised as shown above.

Make sure frame is square and secure with #10 x 1 1/4 inch screws.

## 3. Pulley Support Board – 3 inches x 13 1/2 inches

Openings for the two 7/8 inch wooden pulleys (Timesavers #12194). From each side of the pulley support board, mark drill points at one inch and two inches from the edge (centered). Center a 1/2 inch drill

bit on each of the drill points and drill out all four holes. Saw out the remaining portions of the openings. (Again, draw a pencil line connecting the two outer portions of the drill holes before sawing out the remaining portions.)

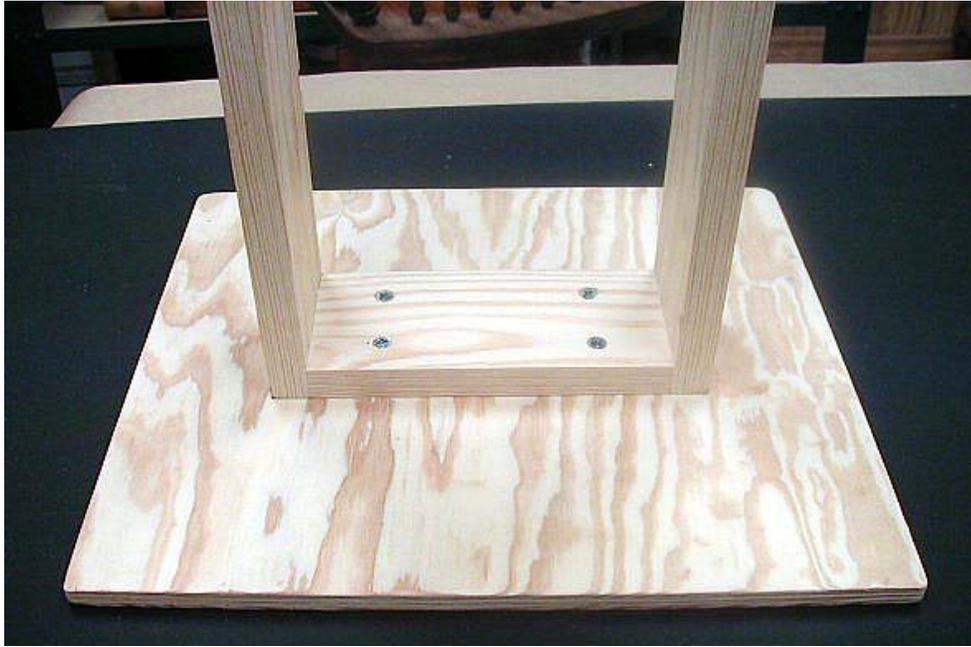


The arbors for the pulleys are made from 1/8 inch steel rod (Lowe's). Grind a point on one end. From the back side of the top piece, drill a 1/8 inch hole for the arbor in the center of each of the two pulley openings. Make sure that the drill is level in order to keep the hole centered on the opposite side of the opening. Drill through about 1/2 inch on the opposite side.



The pulleys will need to be opened up a bit with a 1/8 inch drill. Make sure the pulleys spin freely on the arbors before installation. Insert each arbor and slip on the pulleys. Tap the arbors to seat them in place. I recommend leaving about 1/2 inch of the arbor remaining in case it ever needs to be removed.

4. **Mount frame on base – Center frame on base and secure with Four #10 x 1 1/4 inch wood screws (Ensure that the 6 3/4 inch Section of the frame is parallel to the 14 inch side of the base).**



**The screws are a bit too long and will need to be cut down a bit to prevent them from extending through the base.**

5. **Front Support – 3 inches x 6 3/4 inches wide (from 1 x 4 material).**



**Sand an indentation about 1/8 inch deep into the middle four inches of the front support. (This will prevent interference of the suspension rod with the front support piece.) Mark 13 1/2 inches above the base on each side. Loosely secure the front support to the frame with 2 - # 10 x 1 1/4 inch wood screws on each side of the frame. The bottom edge of the front support should line up with this mark. After partially securing the front support, place test stand on a level surface. Make sure that the front support is level – adjust as needed. Complete the installation of the remaining two #10 x 1 1/4 inch wood screws.**

- 6. Side Supports – 2 1/4 inches wide x 1 1/2 inches high (from 1 x 4 material)**

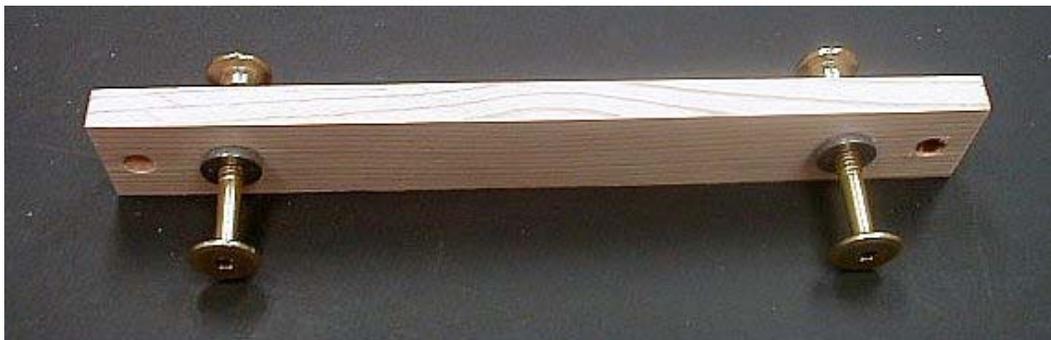


**Mount flush with top of front support with two # 10 x 1 1/4 inch wood screws (Before installing second screw, place test stand on a level surface and check to make sure side supports are level. Adjust as needed).**

7. **Pulley Support Board installation – Center pulley support board on top frame board and secure with two # 10 x 1 1/4 inch wood screws.**



8. **Back Brace – Made from a scrap piece of wood 1 1/4 inches high x 8 1/4 inches wide – approximately 3/8 inches thick.**



**The braces are made from:**

- 2 – Insert nuts (1/4 x 20 x 12.5 mm) Lowes**
- 2 – Connecting bolts (1/4 x 20 x 50 mm) Lowes**
- 2 – Connecting cap nuts (1/4 x 20 x 12 mm) Lowes**



**The drill point for the insert nuts are at 1 1/4 inch from each end of the back brace. Drill a 11/32 inch hole at each drill point. (Part of the insert nut is ground off to make it flush with the thickness of the back brace. Similarly, about 1/4 inch of the connecting cap nuts is ground off to allow more travel room for the bolt.)**



**Tap in the insert nuts and then install the connecting bolts and caps. Use Loctite to secure nut to bolt. (Cap nut is on inside of the back brace board.)**

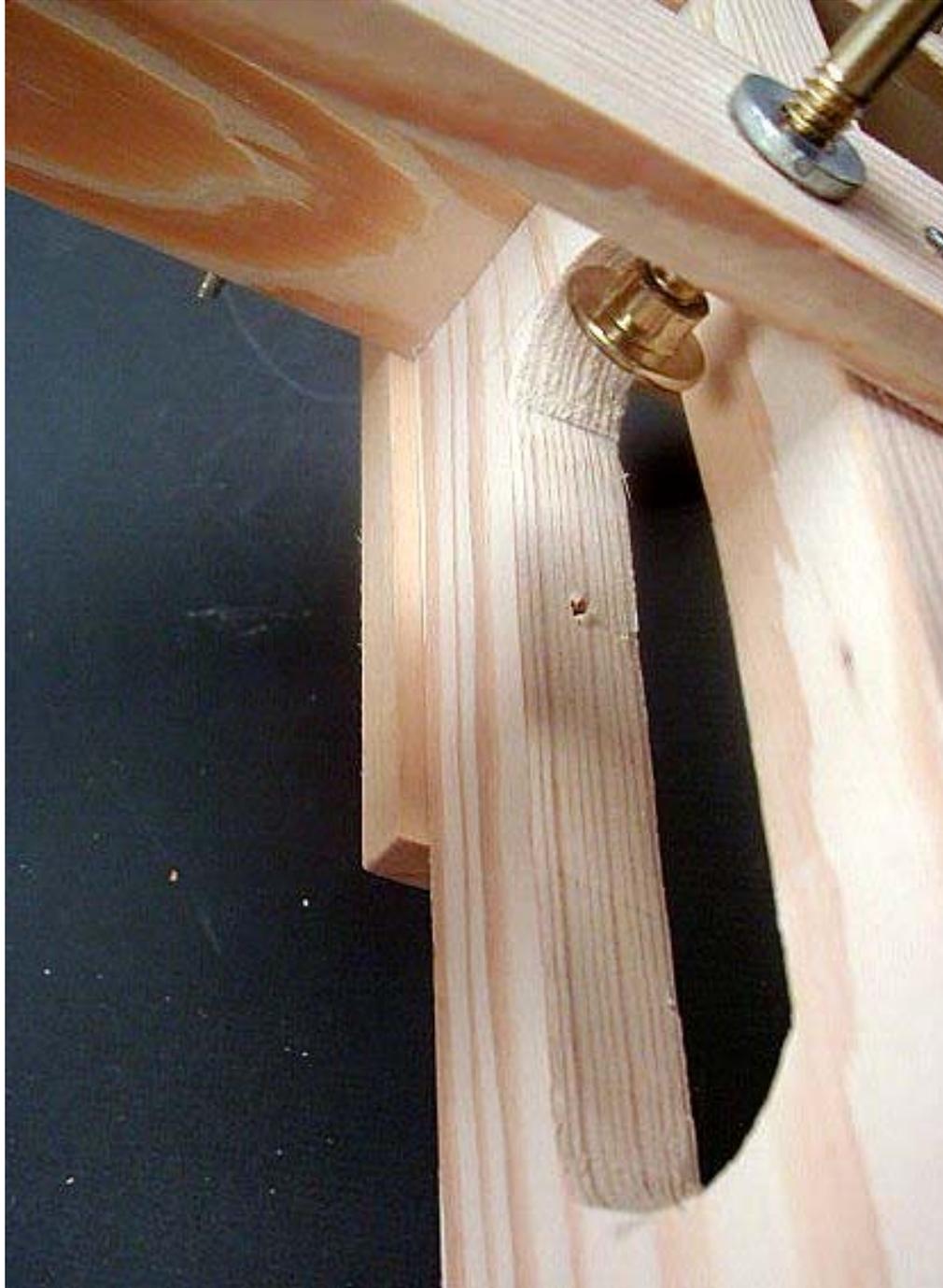
**Mark 3 1/2 inches down from the top on each side of the frame. Mount back brace such that the top of the brace is even with the mark. Install with two - # 8 x 1 inch wood screws.**



- 9. Upper Front Brace – made from two scrap pieces 1 1/4 inches wide x 4 1/2 inches high – approximately 3/8 inches thick.**



**Mount the braces with 2 - # 8 x 1 inch wood screws on the left and right sides of the frame such that a lip is formed of approximately 1/8 inch to 3/16 inch.**



**The upper and lower braces prevent the movement from slipping forward.**

- 10. Lower Front Braces – made from two scrap pieces 1 1/4 inches x 2 1/4 inches – approximately 3/8 inches thick.**



**Install with two - # 8 x 1 inch wood screws such that a bottom lip is formed of approximately 1/8 inch to 3/16 inch.**



11. **Top Braces (Brass)** – As nothing commercially could be found, these two brass braces were custom made from a piece of .064 x 1/2 inch brass strips (K & S Engineering – purchased at a local hobby shop).



**Cut two strips 4  $\frac{3}{4}$  inches long. Insert each strip into a vise leaving a little more than  $\frac{3}{4}$  inches exposed. Bend that portion to form a 90 degree angle.**

**In each strip, cut a slot beginning about  $\frac{5}{16}$ <sup>th</sup> of an inch from the “L” end of the brace ending about one inch from the remaining side.**



**Drill a 3/16<sup>th</sup> inch hole at each end of the marked slot. Scribe parallel lines to join the outer edges of the two drilled holes. Using a jeweler's saw, cut along the scribed lines to complete the slot. The slot should be about 3/16<sup>th</sup> of an inch wide and should clear the threaded ends of an 8-32 hanger bolt. File the slot edges smooth. Polish and lacquer the brass to prevent tarnishing.**

**Center and install two # 8-32 x 1 inch hanger bolts (Lowes) approximately two inches from the edges of the top frame board (not the pulley support board that is above the top frame board).**



**Place a washer on each of the hanger bolts, followed by the brass brace, another washer and finally an 8-32 wing nut (Lowes).**



**This test stand is still a work in progress. If you have any questions, you may contact Don Bugh at 979-690-2736 or email at [d-bugh@cox.net](mailto:d-bugh@cox.net)**

**Any suggestions for improving this design will be appreciated.**

**Good luck!**

**Don Bugh  
College Station, TX  
June 9, 2006**

**Wooden Movement Test Stand  
On Display at the April, 2006  
Great Southwestern Regional  
Chapter 15 -- Kerrville, TX**

