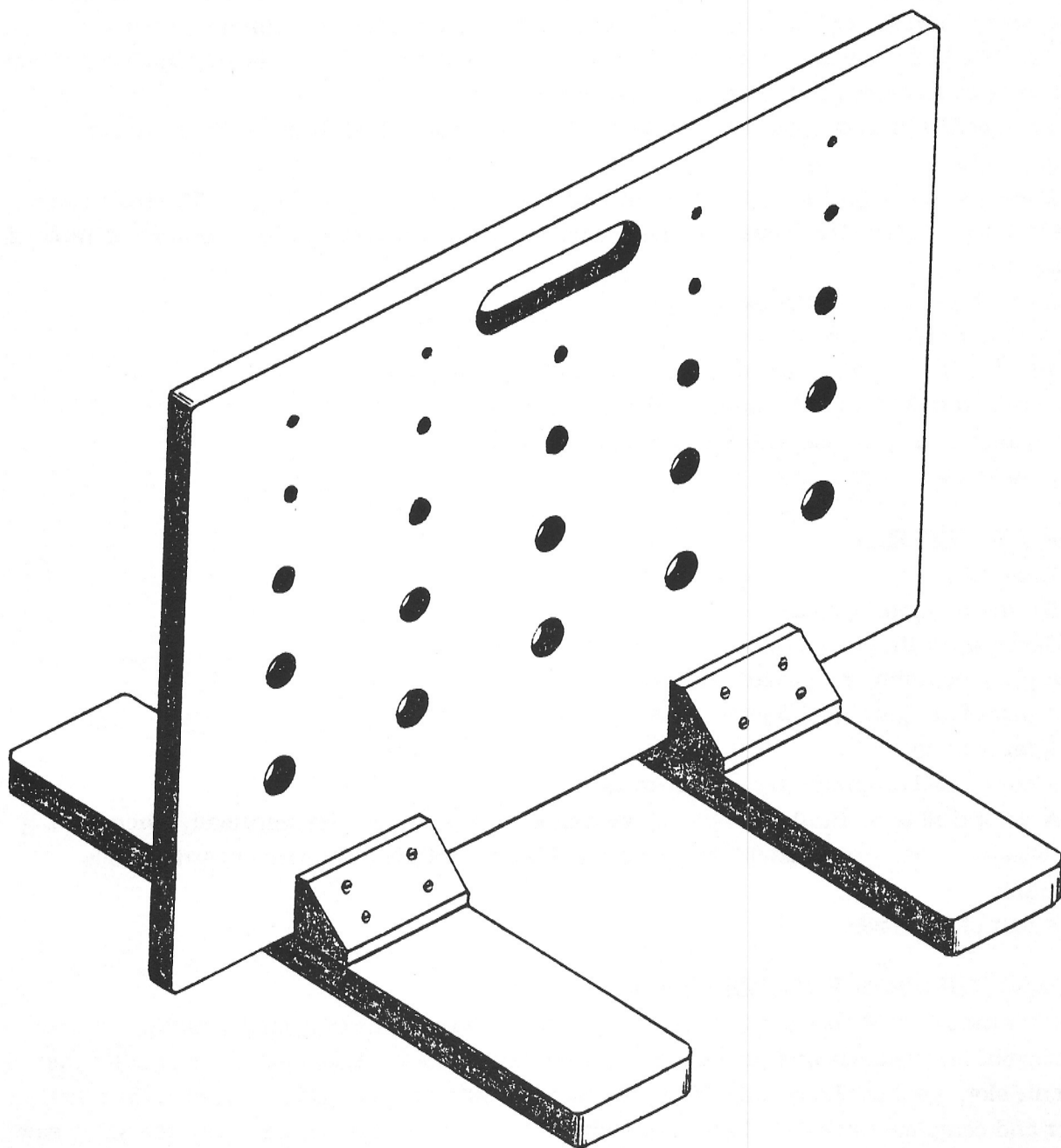


The String Puller offers the child tactile, cognitive and imaginary play opportunities and, as with the Clackin' Balls (#47), has the advantage of limiting the child's visual field to allow for easier focusing. The varied diameters and colors of the beads as well as the various textures of the strings or ropes provide the child with a variety of sensory experiences.

Imaginative narratives can be incorporated into play with this toy if another player sits on the opposite side of the board and pulls the strings from that side. Maybe the child can be the village hero when he or she pulls all the "people" (small, medium and large balls) to safety and they escape from the giant (a playmate) who prowls through the village on the other side of the wall. Let go a little; make it fun. Every child deserves to be a hero once in a while.



SHOWN WITHOUT STRINGS FOR CLARITY

The String Puller is not hard to make but the board layout work for the location of the holes is painstaking. Several steps in the directions may require the learning of new skills but they are not difficult to learn. These include cutting the "strings," drilling the holes in the wooden balls and gluing and nailing the strings in place.

MATERIALS NEEDED

- One 20" x 14" piece of 3/8" birch plywood
- Two 16" x 3 1/4" pieces of 3/4" plywood for the support shoes
- 16 pieces of birch plywood 1 1/2" x 3/4" thick for the support braces. Scrap pieces will do. (See Detail No. 3.)

- Four feet each of five different diameter " strings" are needed. See drawing Section A-A.)

The "string" is really nylon cord or nylon rope. This can be obtained from most hardware stores. The larger diameter rope may be available only at a yacht or sailboat chandlery. Hemp rope may also be used but nylon is the preferred material.

- Ten wooden balls of each of the following diameters and colors: Red- 2"; Yellow-1 1/2"; green-1 1/4"
- Twenty wooden balls of 3/4" diameter, half in blue and half in uncolored. The balls can be ordered from Cherry Tree Toys, Inc. (See Some Sources of Specialty Items at bottom of Table of Contents.)
- A small roll of 1" wide masking tape
- Varathane gloss varnish, or equal
- 16 - 1 1/4" #6 Phillips flat head screws (four for each brace)
- Non-skid material for the bottoms the the supports
- Contact cement to use with the non-skid material
- Elmer's Carpenter's Glue

TOOLS NEEDED

- Table saw
- Sander or sanding block
- Saber saw with fine teeth
- A propane torch or a gas kitchen range
- A pair of arc-joint or slip-joint pliers
- A razor knife
- A power drill or, preferably, a drill press
- A set of drill bits. Brad point bits make cleaner edges of the holes, especially when drilling the wooden balls. An expansive bit and a hand brace for the larger string board holes is desirable.
- A pair of old gloves

CONSTRUCTION SUGGESTIONS

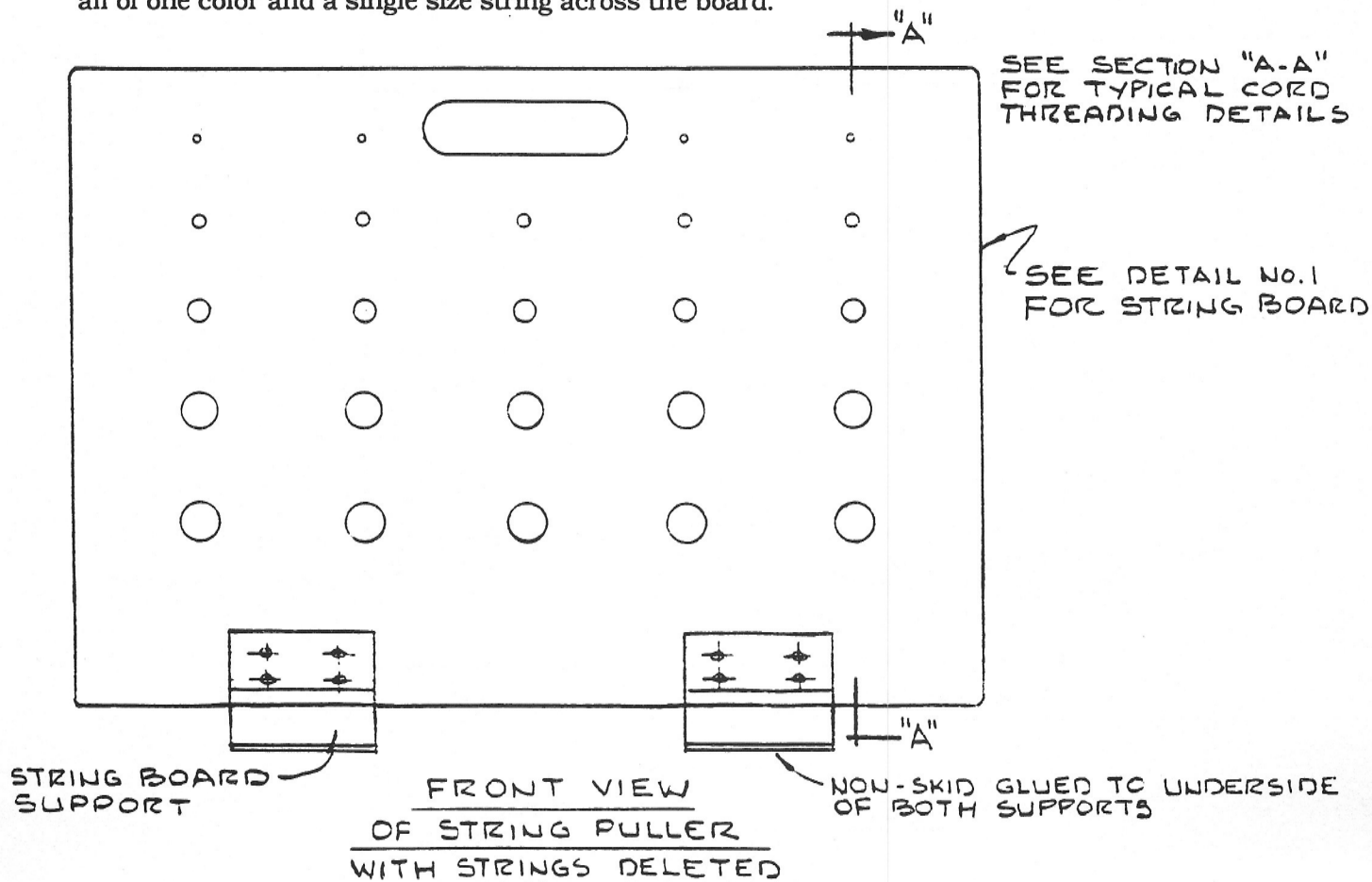
Cut out the 20" x 14" piece of 3/8" birch plywood. Following the drawing Detail No. 1, make the layout for the holes and note the size of each line of holes. Also make the layout for the handle slot. Drill the holes only 3/4 of the way through from one side, then turn the piece over and complete the holes. This avoids tearing the wood on the bottom. Use the saber saw to cut out the handle slot.

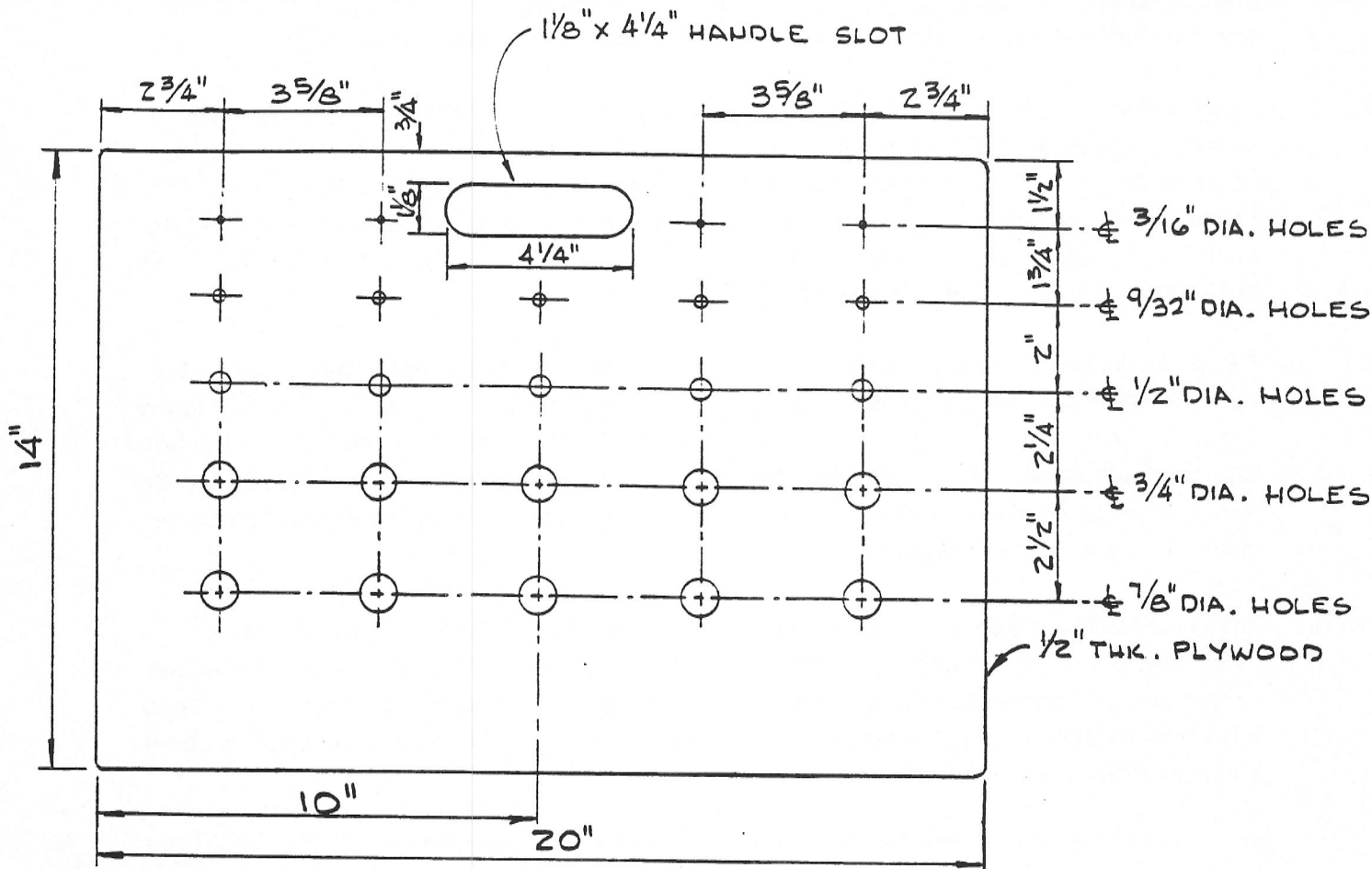
Use the sander or a sanding block to sand the sides and edges of the string board and the support shoes. Sand all edges of the handle slot. Varnish all the flat wood pieces.

Using a marking pen, mark off each 48" length of string into 9 1/2" pieces. Wrap a piece of masking tape around the string at each 9 1/2" mark. Then, using the razor knife, cut the nylon string at the 9 1/2" length. The tape will keep the nylon string from unravelling. Put on the old gloves and hold a taped cut end over a gas flame briefly to melt the fibers a little way back. Withdraw from the gas flame and roll the hot end to assure that the melted fibers will weld together as they cool. Remove the masking tape.

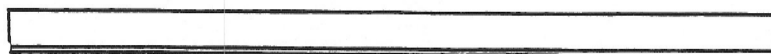
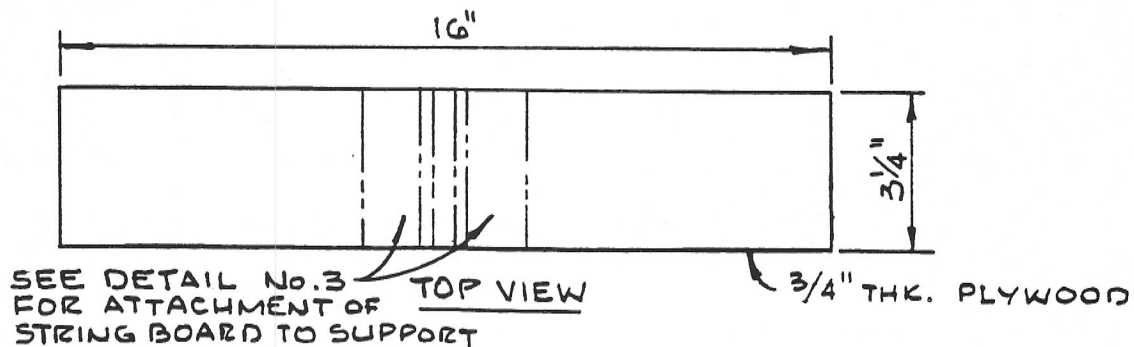
Detail No. 3 shows how to make the 16 braces that will hold the support shoes to the string board. Start each brace piece with four pieces of birch plywood 1 1/2" x 3 1/4" x 3/8" glued together. Then make a 45° saw cut as shown and drill 1/8" diameter holes and countersink to take the four screws. Glue and screw the braces into place to join the support shoes and the string board as shown in several drawings. Using contact cement, put non-skid material on the bottom and trim the edges.

Drill holes in the wooden balls as described on the Section A-A drawing. Dip one end of a welded section of string in Elmer's Carpenter's Glue and force it into the hole of a ball of the proper size and color. Slip the string through the proper size hole in the string board, dip the other end in glue and slip the end into the corresponding ball. The result will be lines of balls all of one color and a single size string across the board.





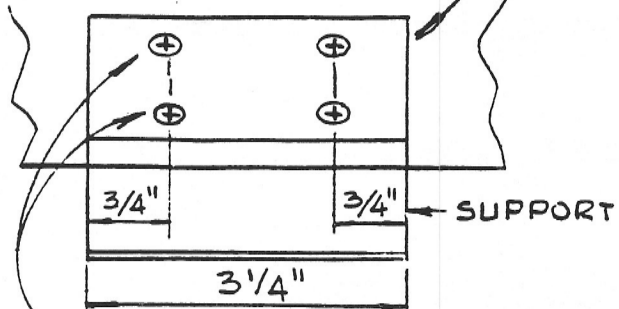
DETAIL NO.1 - STRING BOARD



SIDE VIEW

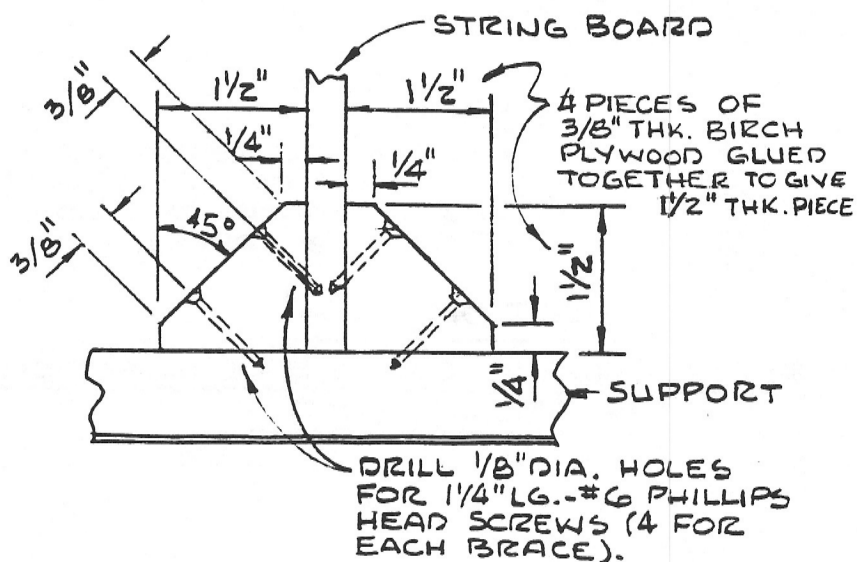
DETAIL NO.2 - SUPPORT
(2 REQ'D)

WOOD BRACE FOR STRING BOARD (DIMENSIONS SHOWN ON SIDE VIEW) - 4 REQ'D.



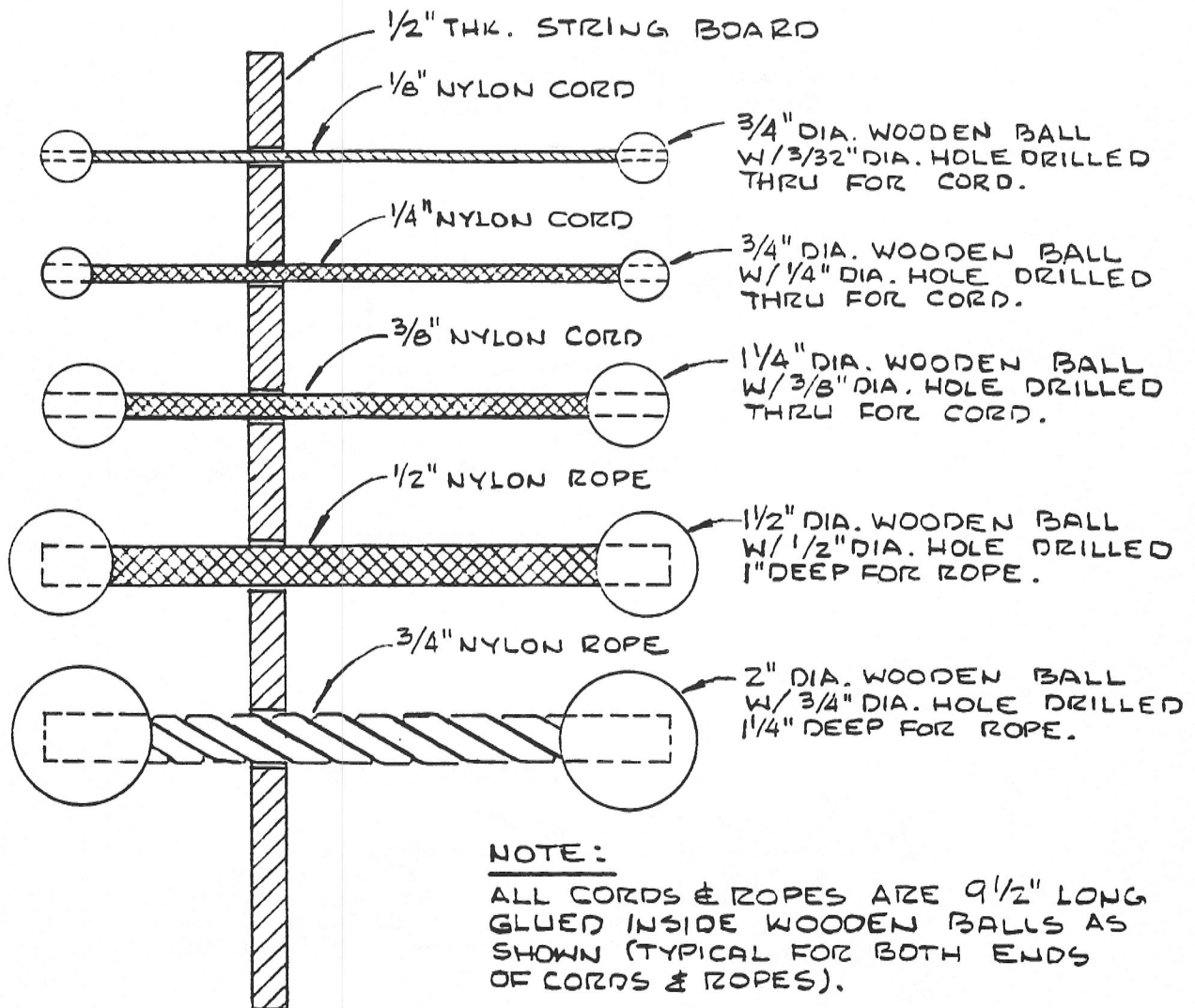
LOCATION OF PHILLIPS HEAD SCREWS (TYP) ALSO SEE SIDEVIEW

FRONT VIEW



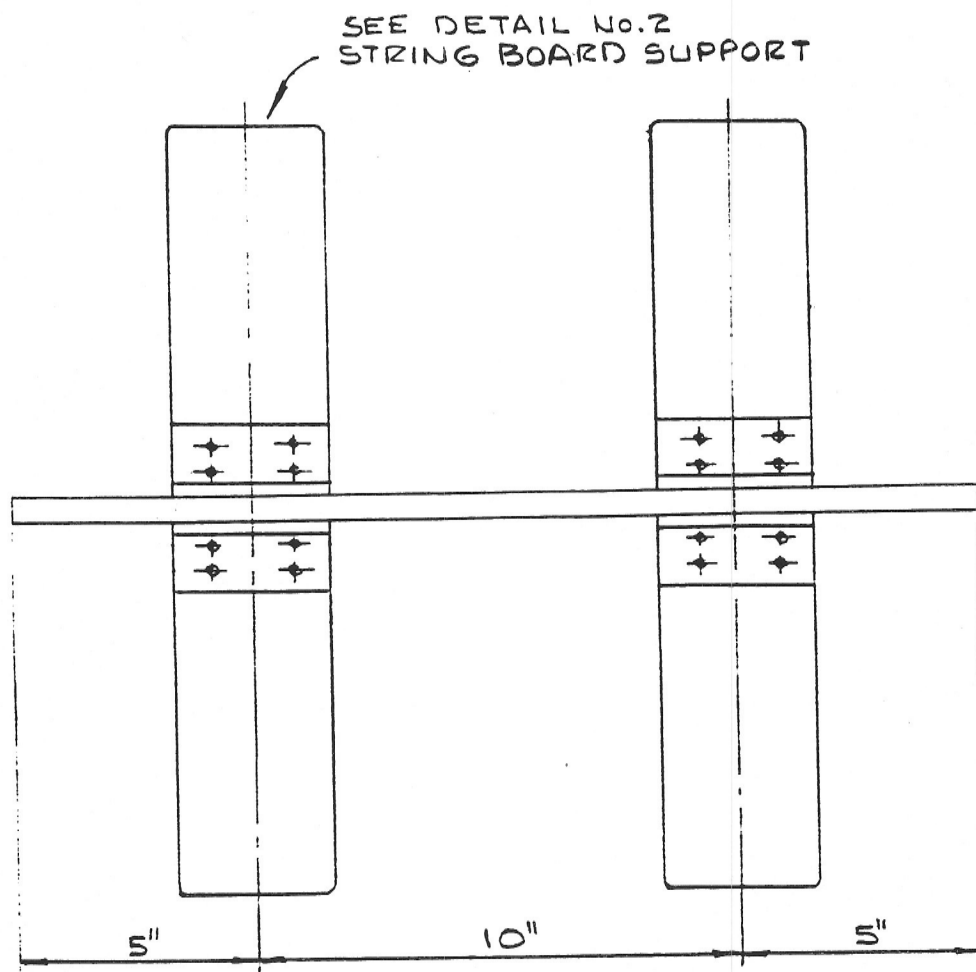
SIDE VIEW

DETAIL No.3 - STRING BOARD TO SUPPORT ATTACHMENT WITH WOOD BRACES



SECTION "A-A"

DETAIL SHOWING CORD & ROPE INSERTION
IN STRING BOARD



TOP VIEW
OF STRING PULLER
WITH STRINGS DELETED