Instructions for Plan #0208
Menagerie Top Design and Construction

SUPERINTENDET OF PLANS NOTE *(MARCH 2006)***:**

Please note that this plan was originally written in 1969. Products and manufactures listed may no longer exist and prices quoted are definitely higher. Please keep this in mind when reading the plan.

For ease of use, all Figures mentioned are on the Plan #0208 drawings and should be referred to as you read the text. Although this plan is for a 1/2" top, it can be modified for any scale.

INTRODUCTION

A menagerie top was chosen for the first try as this, to me is 90% of a circus. Without a menagerie I feel it is not a circus at all.

To you 100% scalers and detail hounds, this article can be skipped as it will not fill your needs. To the beginner and the model builder who wants a well constructed, serviceable, and detailed top the methods described here will give you just that.

When a show buys or makes a tent they do so with one purpose. This is to provide a temporary shelter over an area of ground of the size needed to fulfill their specific need. In this case to also take care of the housing of the menagerie and its contents.

Before we start construction a word of caution. After writing the first article several fellows wrote and told me they started by making the middle piece pattern first. This is starting all wrong. Your whole design hinges on the dimensions obtained from the preliminary drawings of the round ends. Because of this they wondered why their top didn't fit right. Better stick to this article and the sequence given or you will be having troubles. Maybe some fellows like to do it the hard way.

Another important preliminary procedure which some like to omit to their sorrow is to iron the cloth smooth, as when it is obtained, it is full of folds and wrinkles. This is very important. Be very sparing with the sprinkling water and sprinkle evenly. Now roll your cloth on something round like a large wooden dowel or rolled newspapers. **Do not fold. Until you have hemmed the cloth all around be very careful of wrinkles and when not actually working on it keep it rolled. Even the pieces when cut out.**

GENERAL INFORMATION ON THE MENAGERIE TOP

In **Figure 1** will be seen a typical ground plan of a menagerie of some large shows of the late twenties or early thirties. This could very well be found on Barnes, Hagenback, or Ringling. At that time they all used about the same type of layout varying it slightly to fulfill their particular need. The cages and bull line form the outside oval next to the sidewall with the giraffe corrals and lead stock picket lines in the center between the center poles. Certain exceptions to this was used as with Ringling in the thirties the space occupied here by the nut joint would be taken over by a stage used by the saucer-lipped Ubangis and in following years by the Giraffe-necked women of Burma. Here the nut joint would be moved to the other end by the giraffe wagons. These were always left in the menagerie after the animals were unloaded. Between the outside oval and the inside picket lines was the space for the crowds to walk around to view the animals on their way from the marquee to the connection to the big top.

Another exception to the picket line would be the Buffalo Bill show which had a corral consisting of two baggage wagons forming two sides and wooden fence forming the other two. This housed the Bison they had on exhibition. Cages of performing animals like sea lion and brown bear were placed next to an open area so the animals could be gotten out of the cage back door. This would also include the Lotus' cage on Al G. Barnes as this hippo pulled a cart during a walk around. Barnes also had another exception to this rule. In their years under Ringling ownership they had a three-section cage with the middle section wider than the two others. This would resemble vaguely an octagon with two squares butted onto its opposite ends. One square would be one section of the cage, the other the third section. The front section was used for monkeys and the rear section was used for the chimpanzees. The middle or octagon section housed an ostrich, which was ridden by a dwarf clown in one of the walk-arounds. The bars on one side contained a door through which he was let in and out by means of a wooden ramp. I can still picture two husky prop boys pushing the ostrich into his cage up the ramp after the spec. I do not believe in cat cages for the cat acts being placed in the menagerie as most of the shows at that time kept them in the back yard. The menagerie would contain a couple of examples of non-working cats in their respective cages. Other examples of cages not in the menagerie would be the dog wagon which contained the clown goose and clown pig, possibly a couple of performing monkeys and any other small animals used in the show not housed in the menagerie, I. E. Bobo Barnetts skunk. Other exceptions would be the sea elephant Goliath and the gargantua cage, during the first year on the road. These also were in the back yard not for public viewing. Any cages containing snakes were kept in the sideshow. I remember Ringling one year having a tiger they billed as a man-eater also in the sideshow. (1928.) On the drawing of **Figure 1** the marquee and connection is placed for reference only. They can be placed anywhere as this depended mostly on

the lot layout and was differed for almost every lot. Remember all cages were placed in an oval with fronts in the same direction. They should always point in a counter-clockwise direction. The back of the first cage is in a line nearly touching the front of the second cage and so on down the line. As the cage was brought in by horses the first in line was spotted directly with horse power. The pole was then pulled out of the front of wagon and placed under its cage. The next cage entering via horsepower was brought up behind the first until the horses were about to run into the first cage when they made a short turn and stopped. After they were unhitched, the front under-gear was turned by human muscle until it was straight in line with the first cage. The pole was pulled and dropped to the ground then one bull was used to move the cage into position while a second on the front left side pushed it sideways into line with the first.

DOWN TO BUSINESS

Now down to business and consider what we wish to build. To get the result I wished for (a 1/2" scale) it was decided upon a long narrow top containing two rows of quarter poles and five center poles. This with the aid of a 6" scale and some mathematics evolved into an 80 ft. round top with four 40 ft. middles. This also necessitated a 5 by 12 ft. baseboard to set it up, which is an odd size but to get what I wanted I could not change. Watch the fellows holler about two rows of quarter poles in so narrow a top and I will agree with them, but I still wanted two rows to obtain the effect I wanted. (Normally a top of this size used only one row of quarter poles.)

To get the cages in which were both three and four inch widths (in 1/2" scale) and still leave enough room between the red quarters and the side poles for both cages and a space directly in front for customer safety, a space of about seven inches was needed from the base of the red quarters to the base of the side poles. Next a space of seven inches (14') between the red and blue quarters for the customer walk around followed by a space of another seven inches (14'), between the blue quarters and center poles for the lead stock picket line, the giraffe corrals and any other attractions wished for in the menagerie. This called for a round top of 20" radius or 40" diameter or an 80 ft. round top which is a standard size. Again to get the area needed for the number of cages I would like called for four 20 inch middles scale or 40 ft. which again is a standard size. You who wish a three or four pole top just have to leave out the appropriate number of middles or in the case of a six pole or larger top just add onto the number of middles. From this information you will have to decide on the size needed to fill your requirements.

This will be the top which we will construct in this article.

Let us start by taking a look at **Figure 2,** which gives an end view of our tent from the center poles outward across the top. To date we have been dealing with dimensions on the ground only and those on the canvas should be ignored as they are just for reference. More on them later and at the appropriate time.

For a top this size there should be four round or pie-shaped sections, to make up the ends. Two on each end laced together. The middles should be laced along the ridge-line also from center pole to center pole, lacing in the required number of sections for the top of your length.

BASIC DESIGN AND LAYOUT

Now let's start the preliminary drawings. Any large piece of paper will do if large enough for a full-sized drawing. Above all do not scale as this drawing **must** be 100% accurate as the subsequent round end design depends upon what you do here. Fortunately, I am equipped with an 8' by 10' drawing board which I use for design and also cutting the cloth. You who haven't access to one will have to use the tried and true model-makers' workbench, the kitchen table or the kitchen floor. Do not punch holes in the floor unless you want to spend some time in the doghouse after your wife discovers them. A box of candy for a bribe will come in handy at this stage of the game. Take this paper and lay out two lines on it at right angles to each other as lines AN and MN of **Figure 3.** Each line must be OVER 20" long. Be accurate in laying out your 90 degree angle as this is important. Take a trammel (compass) homemade or bought, set it to 20" and draw an arc with point N as the fulcrum and connecting points A and M such as arc ABCDEFGHIJKLM. This figure will be the actual area covered by one-fourth of the round end. There must be 11 lines drawn into this segment exclusive of lines AN and MN (**Figure 3**).

These will be lines BN, CN, DN, EN, JN, KN, etc. To do this, take your 45 degree triangle and make triangle AGN by extending line GN from the triangle. Now take the 30-60 degree triangle and construct triangles AEN and AIN. Set the compass to distance GE and measure down to C from E and up to K from I. Draw these radial lines. Next set the compass to exactly half the distance EG and mark for lines BN, DN, FN, HN, JN, LN, along the radius. Draw in these radii **(all Figure 3)** and lay aside.

Now take another sheet of paper and draw a cross sectional view through a center pole as in **Figure 4.** For putting cages or any other wagons in any top in half-inch scale it is necessary to use a 7" side pole. To get a well proportioned top, I used a 20" center pole. This gives 2 1/2" on top for the bale ring chains, main falls (pull up block and tackle) guy ropes and ridge ropes. The ridge of the top will be 17 1/2" high at the

bale rings. In **Figure 4** QT and OU represent the side poles, P-P1 the center pole, R-R1 the blue quarter poles and S-S1 the red quarters. The quarter poles are just drawn in here to show proportion and are not needed on your drawing.

A word of caution here. **DO NOT SCALE** any of these drawings. They are purposely out of scale just to prevent this. If you try scaling any drawing for a top the size differential will promote too many errors and the end result will look like something the cat drug in. Again, make these drawings full scale and strive for accuracy or I will be getting a letter saying I am full of you know what, and do not know what I am doing.

For the next operation, which consists of drawing the actual template, you will need a good grade of stiff paper, or poster board. In my case I use artist's poster board obtained at a hardware, hobby, paint or artist supply stores. Maybe a piece of Masonite (hardboard) could be substituted by using light colored pencils, but I suggest the other method if at all possible.

LAYING OUT AND DRAWING ROUND END TEMPLATE

We will now start with **Figure 5** and will always refer to **Figure 5** for this step unless otherwise noted.

Draw line AB along one side of the template paper and at least 25" long. Draw line AD from pivot point A and at right angles to line AB. Set your trammel to length of line OP of **Figure 4**. Using A **(Figure 5**) as a pivot point draw are BCD. Part of arc BCD and line AD on this drawing is dotted. You may draw it in solid but is done here for clarity. More of this later.

Referring to **Figure 3** set dividers to distance AB or GF or any other segment of are AM. They should all be equal in length. Starting at point B of Figure 5 mark off on arc BCD same number of points as on arc AM of **Figure 3**. In this case 12 points and ending at point C. Draw line AC.

Note that this segment ABC falls somewhat short of being a full quarter circle.

This is represented by the line AC, the dotted section CD of arc BCD and the dotted line AD. These dotted lines were drawn in here just for explanation and will not be used in the template. This is the waste that takes care of the pitch of the canvas and would form a true cone if all four of the pieces you will have to make were laced together without the middle pieces to form a round top like in the days of the one center pole tent. Now back to our drawing. These places you have just marked on arc BC is now shown on the drawing as ends of lines EFGHIJKLMNO.

To avoid confusion later on, mark arc BC distinctly as this is the line on which the side poles will be placed.

At this time you may throw away drawings shown here as **Figures 3 and 4.** They were only used to establish lengths of line OP and length of arc AB. **(Figures 4 and 3 respectively.)**

I might add at this point, that angle A of Figure 5 will not be a true angle. This is as it should be for formation of conic section mentioned above.

Extend trammel 1/2" longer than line AB (Figure 5 again) and with point A as pivot draw arc 13. This will be the outer edge of the cloth and will be the 1/2" eave on the top. Extend lines AB and AC out to meet ARC 13.

Measure out 1/4" from line AB and draw line 3-4 parallel to line AB. Line AB will be the lacing eyelet line with line 3-4 the very edge. The grommets (eyelets) on a prototype tent, which have the lacing loops threaded through them, are called keyholes.

Now measure out 1/4" from line AC and draw line 1-2 parallel to line AC. Line AC will be the lacing loop line with line 1-2 the very edge. The lacing loops on a prototype are called keys. On the lots you will hear the various bosses saying "keys to the left". This means the loops are on his left when facing towards the center pole.

Set compass to 1" and with “A” for pivot point draw arc 1-3. This will be the bale ring opening on the cloth. Set compass to 10" and using "A" for a pivot point draw arc 5. Mark distinctly again as this will be the blue quarter pole line. Draw this arc and all contained between lines AB and AC. With a straight edge set at 90 degrees to line 1-2 draw the continuation of arc 5 to line 1-2. This will have to be done for all of the succeeding arcs drawn also. Do not use your compass to draw all of the way out to lines 1-2 or 3-4 but use a straight edge on that extra 1/4" of line. Repeat with all arcs along line AB.

Divide line A-5 into two equal parts. With the appropriate compass settings and "A" for pivot points draw arcs 7 and 8. Continue out to lines 1-2 and 3-4 as above.

Our next step will be drawing in the radii. Note that all radii do not extend all of the way in to the bale ring opening. This is to avoid a mess of lines at the bale ring opening which is according to prototype. Points EGIKMO only are drawn to meet are 8. Points NLHF only to meet line 7. Only lines AB, AC, AJ go all of the way to the bale ring opening.

Set trammel to 17 3/4" and with "A" as a pivot point draw arc 6. Mark distinctly as this will be the red quarter pole line. Divide line 5-6 into three equal parts and draw arcs 9 and 10 with "A" as pivot point and with appropriate trammel settings.

Divide line 6-C again into three equal parts and draw arcs 11-12 as above. Note that these arcs are not spaced equidistant. That is ok as they are that way on the prototype.

Arcs 2 and 6-12 inclusive will be sewed with colored thread on the canvas to simulate the rope reinforcements on the prototype. These will meet with mating arcs on the adjacent piece of canvas and if they were tied with cross ties as on the full-sized top would form the rope (rafters) of the top.

Radii “E” to “O” inclusive will also be sewed with colored thread for the same reason. On the round ends they will be the means of fastening to the bale rings and on the middles will cross over the ridge to meet the mating lines on the opposite middle. On a full size top they would again be tied together with cross ties at the ridge-line.

Mark point "A" on the template distinctly as this is an important point when transferring the template to the canvas. At the time of transferring I poke a needle through point "A" into the template, canvas, and into the drawing board, removing it only when drawing in the radii. A couple of needles placed elsewhere on the template at that time will hold it in place when the needle at point "A" has to be removed for drawing radii. More of this at the proper time.

Now cut out your template leaving excess stock at point "A" so it will be accurately on the template. This can now be laid aside and we will start on the template for the middle pieces.

LAYING OUT AND DRAWING MIDDLE PIECE TEMPLATE

We will not refer to **Figure 6** unless otherwise stated. Take another piece of template material and draw a rectangle on it. Two sides will be as long as line AB of **Figure 5** and the other two will be 20" (distance between center poles). This will be represented by rectangle ABCD of **Figure 6**. At corners A and D draw an arc 1" radius. These will again be the bale ring openings. From line AD measure out 1/4" and draw line 1-2. Line AD here will be for a lacing eyelet or loop on the mating section with line 1-2 the outer edge of the canvas. Repeat for line AB as shown on line 3-4 and for line CD as shown in line 5-6. Line CD will be the lacing loops line and line edges of the canvas. From line BC measure out 1/2" and draw line 4-5 parallel to it. Here BC will be the side pole line with 4-5 the eave line and outer canvas edge.

Set template of **Figure 5** on top of drawing board so that line AC of **Figure 5** is parallel to line AB of **Figure 6**. Transfer lines 5 to 12 inclusive from Figure 5 to Figure 6 with a straightedge locating them from line AC of **Figure 5**. These will then become lines 6 to 12 inclusive of Figure 6. Mark lines 5 and 6 again distinctly as they will be the blue and red quarter pole lines respectively. Lay aside **Figure 5**.

Divide line BC into two equal parts and draw line 13. Divide line B-13 and line C-13 each into three equal parts and draw lines 14 to 17 inclusive. There **must** be an uneven number of lines here again as in round end template.

Cut out template as before leaving excess stock at points A and D to keep these two corner points accurately located.

At this time no mention has been made of hems or hem turn-under. That will be taken care of when we transfer the pattern to the canvas.

In concluding this section let's discuss materials and tools, so that in the following articles we will be ready for actual construction.

MATERIALS FOR CONSTRUCTION

CLOTH: I use unbleached muslin. NOTE beginners: Canvas is too heavy. This is the nearest commercial we have found to simulate canvas. Do not make my mistake and get it too light as, after making the first top I found it just would not hang right. On the other hand, do not get it too heavy, as the top will be too heavy and bulky. We use what I can only describe as a light medium weight material. What I use sells for around 33¢ a yard (1969 price) and is known as Black Rock brand.

Some of you will want to make the inside of the ridges and the patches for the quarter pole socket out of contrasting color. This is Ok although I cannot see it myself as the ridge does not show from outside even when opened up. This material can be gotten at the same time as the muslin. The boss calls it a bright red percale.

EYELETS: Our eyelets, as well as the setting tool, come from the United Shoe Machine Co. (Supt. Of Plans Note: This company may no longer exist.) This is the only set we found to do a good job and well worth the money invested. This set uses a hammer for setting the eyelet. They have now made a pliers type setting tool but would not recommend it for setting eyelets under which a guy or jump rope it attached. Two sizes of eyelets are used one of which is a little longer than the other but both are set by the same tool.

Eyelets can only be gotten in lots of 10,000 per size. Only around 300 are needed of each size for a top so you could gang up with someone else to keep the cost down. 10,000 of each size eyelet and the setting tool will raise heck with a $20.00 (1969 Price) bill. Eyelets are:

SE 43 brass nickel plated
SE 44 brass nickel plated
(each size about $1.10 per 1,000) (1969 price)

The set consists of the following:
1 set Die E L 1 M
1 set cap EL 101 Y
1 set spindle EL 201 Y
1 Gifford set holder USMC
Total cost around $7.50.

ROPE: Guy ropes are made out of No. 6 seine twine. I have found this to be about the strongest material obtainable for its size.

Since writing the former article in which Irish Linen was recommended, it has become unavailable. In its place I obtained a cordage slightly smaller than the seine twine. This is used for lacing the top. However I would use the No. 6 seine twine for jump ropes instead of the lighter where in the former article I recommended Irish Linen.

THREAD: Two spools Coates mercerized No. 50 Color No. 155 (tan). Get the larger spool containing 400 yards per spool in order to get the right size thread. At the same time get one spool of No. 50 white.

MISCELLANEOUS MATERIAL

From a hobby store get a bottle of Testor's model airplane dope and a tube of Testor's model airplane cement as well as a small cheap artist's paintbrush. Use a new brush and not one that has been used for painting or you'll be sorry. Obtain some lacquer thinner to clean the brush. Very little of these items are used but very necessary. More on their use at the proper time.

TOOLS

SEWING MACHINE: This need not be a fancy or expensive machine. A small portable will do if you do not mind the narrow throat.

BLACK PENCIL: This should be a soft lead for making distinct marks on the cloth. **Keep it sharp.**

COLORED PENCIL: For marking the lines distinctly upon which the quarter poles and side poles are set.

YARD STICK AND SIX-INCH RULE

STRAIGHTEDGE: Anything over 30" long with a straight edge. **Do not use a yardstick.** To date I have not found one with a straight edge.

COMPASS AND DIVIDERS: Dime store variety is OK.

TRAMMEL: Here you will have to see your hardware or tool dealer for a set of trammel points. One of them must have provision for inserting a pencil for drawing. The yardstick will do for the beam for the trammel. Note: A trammel is just an overgrown compass for drawing large radii. **A string and pencil will not do.**

SCISSORS: A good one for cutting cloth and another one for heavy paper. Do not use your wife's good scissors for cutting paper. You have to live with her.

PINKING SHEARS: Not necessary but very good for cutting the cloth. Don't waste your money on those advertised for $4.95 as they are no good. I paid $7.50 for mine. Do not try to sharpen yourself unless you have $7.50 to throw away.

CLOTH PUNCH: Used for making holes for inserting eyelets. Some of the fellows use a punch that cuts the cloth. I prefer something like an ice pick. For 19c you can get an eyelet punch in the dime store at the sewing counter.

EYELET SET: Mentioned above under materials. Place on small 1" board to avoid marring oilcloth on kitchen table.

NEEDLES: One small needle for No. 50 thread and one with a large eye to handle the No. 6 seine twine.

NO. 8 CROCHET HOOK: Not necessary but useful for lacing top.

DIAGONAL PLIERS: (Cutters) Useful for removing eyelets when you pull a booboo.

NEEDLE NOSED PLIERS. Used along with the diagonals for the same reason.

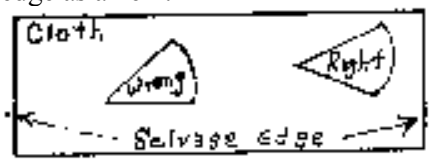
BRIBES TO GENERAL MANAGER: 1 lb. candy for using kitchen table and anything from 5 lbs. candy up to a mink coat for doing the sewing.

CONTINUING THE PROCESS

Now let's get down to business Take one end of the rolled-up clot[and pull it across the table. Hold it down with about six pieces of masking tape and stretch very **lightly.** In fact tape it down just about the way it lays on the table. There will be some loose spots in it but disregard these as it is impossible to pull them out. If you start trying to stretch the cloth you will run into trouble because it is impossible to stretch it each time with the same amount of tension. Therefore the pieces will be of different sizes.

ROUND END SECTIONS

Take your round end template and place it on the cloth as shown in sketch below. Don't be stingy and afraid to waste a little cloth. This is one wrinkle I had to learn the hard way. The threads must be as nearly parallel to each edge as possible. In a pie-shaped section like this it is impossible but the placement shown below is a compromise to make the top pull evenly when the time comes to set it up and guy it out. The first top I made had one end one inch shorter because I tried to save material and labor by using the selvage edge as a hem.



Now referring to **Figure 5** as your template, mark distinctly on the cloth the location of point "A." I place a small needle here through the template and cloth and into the drawing board to keep the exact location marked as long as needed.

Draw completely around the template. On line 1-2 on the cloth mark off positions where radii intersect as points 5-6-7-8-9-10-11-12. Along arc 13 on the cloth mark points where radial lines intersect as points E-F-G-H-J-K-L-M-N-O. Also show posi-tions of points B & C. Lines AB & AC will be the center lines of the lacings. Lines 3-4 & 1-2 will be the very outer edges of the cloth when it is hemmed. Line B-C the side pole center line with line 13 the eave edge after the cloth is hemmed.

From now on refer to **Fig. 7, 7A & 7B. Fig. 7A** is just an enlarged view of Fig. 7 at the bale ring opening (part A) **Fig. 7B** is an enlarged view of Fig. 7 at corner

"B". Corner "C" will be the same as corner "B" only reversed.

Referring to **Figs. 7, 7A & 7B** measure out 1/2" from lines 1-2 & 3-4 which is the edge of the pattern. Draw lines 16 and 17 each parallel to their respective pattern's edge or line 16 parallel to line 1-2 and line 17 parallel to line 4-3. This is the actual hem on each side along the lacing lines. From lines 16 and 17 measure out 1/4" and draw these lines parallel to the pattern edge. This last 1/4" will be the hem. Turn under so that no raw edge of the cloth will show.

From arc 13 measure out 3/4" and draw arc 20, parallel to it, using point A as the trammel fulcrum. This is the hem along the side pole line and is made larger than the other hems to give reinforcement to the side pole line. Arc 21 is drawn out 1/2" from arc 20. This again is the hem. Turn under so that no raw edge of the cloth will show.

Remove the pattern from the cloth by pulling it over the needle leaving it in place. Now, holding the cloth firmly in place and with the compass set to 1" radius and the point at A, draw the bale ring opening between lines AB and AC. Then reset the compass or divider and draw arcs 7 and 8. Replace the needle at point A. Using point at as a pivot point draw in all of the radii E-F-G-H-I-J-K-L-M-N-O remembering all of these radii do not go all of the way to arc 1-3 which is the bale ring opening but some terminate on arc 7 and some on arc 8. Two more lines. Measure into the cloth 1/4" from lines parallel to AB as line 22 and line 23 parallel to line AC. These are shown AB and AC and draw these two lines on the drawings as dotted lines. These lines will become important when the time comes to lace up the top. More on them at that time.

Now remove the needle keeping point "A" firmly in place, draw the balance of the arcs, at 5-6-9-10-11-12. On these larger arcs you will have to use a trammel with a pencil holder at one point.

With a square or draftsman's triangle set on line 1-2, extend the end of each arc out to line 18 from line 1-2. Do not draw a radius here but a straight line. Repeat this on line 19 extending the radii out from line 3-4.

Remove the cloth from the board and with a pinking shears cut around the cloth on lines 18-19-21. With a straight scissors cut out the bale ring opening which is arc 1-3.

This is now 1/4 of the round end top. Make three more pieces exactly as described above.

MIDDLE SECTIONS

Referring to **Fig. 6** place the template for the middles upon the cloth which has been taped out as for the round end pieces. This pattern must run parallel to the cloth edges. Whether it is placed lengthwise or across the cloth is immaterial. Remember to leave enough room around each edge for hems.

Place a needle in the center of each are which will be the bale ring opening on each side of the top of the piece. (Points A and D of **Fig. 6**.) This again should be accurately located and the needles kept in place after removing the pattern until the bale ring openings arcs are drawn as the last step before cutting out the cloth.

Mark with a pencil all around the pattern on the cloth. Also place a mark on the cloth where each line as AB-BC-CD-5-6-7-8-9-10-11-12-13-14-15-16-17 will be drawn on the cloth when the pattern is removed. AB-CD-AD will be the lacing center lines while BC will be the side pole line.

Refer to **Figs. 8, 8A, & 8B** for the following steps. **Fig. 8A** is just an enlarged view at one of the bale ring openings while **Fig. 8B** is an enlarged view at a corner at the eave.

From line 1-2 measure out 1/2" and 3/4" and draw lines 19-20 through these marks parallel to line 1-2. Repeat this same procedure for line V 3-4 drawing lines 22 and 23 parallel to line 3-4. Again repeat on line 5-6 drawing lines 25 and 26 parallel to line 5-6. From line 4-5 measure out 3/4" and 11/4" and draw lines through these marks parallel to line 4-5.

Remove the pattern from the cloth. Do this by pulling the pattern over the needles leaving the needles in place. Using a straightedge and with the marks you have made around the pattern draw in lines 5-6-7-8-9-10-11-12-13-14-15-16-17. Extend them out to the very last line on the cloth. From line A-D measure **into** the cloth 1/4" and draw line 18 as shown by the dotted line on the drawing. Repeat from line A-B drawing line 21 and from line C-D drawing line 24. We will use these lines when lacing up the top.

Holding the cloth firmly in place take out needle at point "A" and with the compass set at 1" radius draw the bale ring opening arc 2-3. With a square or draftsman's triangle extend the ends of this are out to lines 20 and 23. Repeat the above for the other bale ring opening at point "D."

With a pinking shears cut all around the cloth after removing from the board. This would be around lines 19-23-28-26. Then with a straight scissors cut out the bale ring openings at points A and D.

For a five pole top as described in this Article repeat the "Middle Sections" portion until you have a total of 8 sections. For a different number of center poles add or subtract middles in multiples of two to form your top.

SEWING IN THE SIMULATED ROPE NETWORKS

Again, keep your pieces rolled up and as wrinkle free as possible. When done sewing roll them up again to await the next operation. After the hems are in and the bale ring openings finished this extra care will not be needed any longer.

Thread up the sewing machine with the colored thread you wish to use to simulate your rope network and start with the round end pieces. Using Figure 7 as a guide start at the bale ring opening and sew radius J all the way to the outer edge of the cloth. Start at arc 7 and sew radii F-H-K-M from arc 7 to the edge of the cloth. Start at arc 8 and sew radii E-G-I-K-M-O from arc 8 to the edge of the cloth. We start with the radii first as by sewing arcs 7 and 8 later we sew in the ends of the threads of the radii and save tying them.

Now sew the arcs 5-6-7-8-9-10-11-12 and BC. Start at one edge of the cloth and sew to the other. The hems will hold the ends of the threads at each edge and prevent the stitching from coming loose.

Repeat as above for the other three round ends.

On the middle pieces Fig. 8 sew all, lines AB-BC-CD-AD-5-6-7-8-9-10-11-12-13-14-15-16-17. Sew from one edge to the opposite edge. Repeat for all of the other middles.

HEMS

The side of the cloth upon which you have drawn your lines will be the top on the finished article. When referring to the top in this article we will mean this side of the cloth.

Take one of the round ends and place on a fiat surface bottom side up.

Using **Fig. 7** as a guide start along line 19 and fold over and crease so that the crease is on line 17. Then fold over again so that the second crease is along line 3-4. Pin the hem as is and do not be stingy with the pins. Be sure your creases are straight and fall on their respective lines. On the opposite side along line 18 fold in so the crease is along line 16. Fold again so that the second crease is along line 1-2. Again pin as above. Repeat for all round end pieces.

On the middle pieces using **Fig. 8** as a guide, start with line 20 which will be along the ridge-line. Fold to line 19 and again fold to line 1-2. Pin generously. Remember again to place the cloth on the table bottom side up. Take one side as line 23 fold into line 22 so the crease is on line 22 and again fold in so the second crease is on line 3-4 and pin. On the other side with line 26 fold in so the crease is on line 25 and refold so the second crease is on line 5-6. Pin as above. Repeat on all of the remainder of the middle pieces.

Thread up the sewing machine with the white thread and sew the hems keeping as close to the edge of the hems themselves as possible without running off from the hems and leaving them loose in spots. Do this with every hem pinned over so far on all of the pieces, removing the pins as you sew. Going back now on what is now the very outside edge of the cloth as lines 3-4 and 1-2 of Fig. 7 and lines 1-2, 3-4 and 5-6 of **Fig. 8**. I like to sew down the hems along these lines as close to the outer edge as possible as this makes the cloth lay better and is neater looking. Do this on every hem sewed so far.

Now comes a tough one and one I cannot explain or draw, that will make sense so you will have to use your own judgment. When the hems along the side pole lines as points B and C of **Fig. 7** and points B and C of **Fig. 8** are turned over there will be 9 thicknesses of cloth at these corners That is too much as eyelets will be placed here with guy ropes and jump ropes. The cloth must be trimmed away so that there is never more than three thicknesses at any corner. **This is important.** Make sure you thin out the cloth at these points. Merely cut away parts of the various seams until it is thinned out.

Starting with **Fig. 7** turn in line 21 so the crease is on line 20 with the cloth upside down. Turn over again so the second crease is on line 13 which will be the eave of the top. Pin as you go along. Repeat on all of the round end pieces. Then sew as the other hems.

With the middle pieces of Fig. 8 turn under line 28 so the crease is on line 27 and turn under again with a second crease on line 4-5 and pin. Repeat on the remainder of the middles and sew as the other hems.

BALE RING OPENINGS

These are rather tricky but with a little care can be also done neatly. To finish these off you will need some 1/2" wide bias tape. You can buy white or if you prefer make your own out of scrap cloth. Fold the bias tape down the middle so it is 1/4" wide. Place it over the cloth of the tent at the various bale ring openings so that the cloth is in the fold of the bias tape and "work" it around so that it follows the contour of the bale ring opening. Rather than use pins it is best to baste this (sew) by hand to hold it in place. Then with the sewing machine and white thread sew around the edge of the bias tape so it is sewed on the cloth. Repeat on each bale ring opening. This basting should be the only hand sewing on the entire top.

If you have your eyelets and set by now, this is a good time to finish the bale ring openings entirely. With the short SE43 eyelets place as many in the bias tape as possible but not so close together they overlap. On one piece at every bale ring a long SE 44 eyelet will have to be used. On this eyelet place a piece of the rope you are going to use for lacing with an overhand knot in the end and around the eyelet. Set the eyelet on this knot but make sure you do not pound it hard enough to cut the rope. Here a little practice with some scrap material and rope is advisable. This will let you practice setting the eyelets with just the right amount of a hammer blow to set the eyelets and not cut the rope. Obviously if the eyelet is not set hard enough the rope will pull out from underneath. Cut the short end of the rope off right at the eyelet and dip the other end in the Tester's model airplane cement to prevent it from fraying.

This rope is used to lace the bale ring to the canvas and you will find a piece 28" long just about right. Obviously only one rope is needed per bale ring. More of this when we discuss bale rings.

STORM FLAPS (TRIM)

On the prototype just outside the side pole line and not on the edge of the eave there is a little piece of canvas hanging down loosely which has scallops on the bottom. As well as being trim this serves an important job. This piece of canvas serves to "button up" the top during a storm. If it wasn't for this flap, wind could easily get under the top with disastrous results as anyone who has ever witnessed a blow-down knows. This is to close the gap between the top itself and the side-wall. We shall now sew this in.

At one time this was a hand job and tedious, which was disliked by everyone making a tent. Beulah Johnson took one look at this job and came up with the best idea I have seen so far. For this you will need 1" wide bias tape and again I would advise making your own out of scrap to match the color of the top. Otherwise use white.

Take one of the round end pieces and turn it again bottom side up. In Fig. 7 draw a line half way between the eave edge and the side pole line, which is shown as line No. 13. Take the bias tape and fold it in half making it 1/2" wide. Crease it good with finger pressure so the crease will show. Fold one end over 1/4" as a hem so that the raw end will not show and starting at line 22 pin the bias tape to the canvas so that the crease in the tape will fall on the line you have lust drawn. Use plenty of pins. Notice I specify starting on line 22 **(dotted line Fig. 7**) and not at the edge. This is because the cloth from line 22 outward will lap over the cloth on the mating piece and needs no trim for that reason. Go all of the way to the outer edge of the cloth along the line you have drawn. Repeat on all the round ends.

Take one of the middle pieces and turn it bottom side up. Draw a line half way between the eave edge and the side pole line which is line B-C of **Fig. 8.** Then repeat as above with the bias tape starting 1/2 inch from the edge or on the dotted line 21 and go to the other edge all of the way. Repeat on all of the middles.

For the scallops on the bottom of the storm flap use rick-rack of the color of your choice. Personally I prefer blue as there is too much red around your show as it is but a lot of fellows prefer red. This is merely a matter of choice. Do not get rick-rack with too coarse a scallop or conversely with too fine a scallop. See what you prefer. Note - depending on your scale bias tape is available with rick-rack already attached.

Fold the bias tape over into half again with the crease along the thread where it is sewed on the can-vas. Insert the bias tape into this half way and sew it in place. This will make a neat looking storm flap and an easy one to make. Repeat on all of the pieces of canvas. For all of above use white thread.

LACING EYELETS

On **Fig. 7** along line A-B and **Fig. 8** along lines A-B and A-C start at the bale ring and mark off 3/4" spaces along the whole line until about 3/4" from the side pole lines. Of course on the middle pieces just do this with half of the middles as the other half will have the lacing loops. By this I mean along line A-D of **Fig. 8**. Along one side of every piece of canvas there will be lacing eyelets.

Using the SE54 (short) eyelets and the set, punch a hole in the cloth and set an eyelet on every mark which you have marked off 3/4".

LACING UP THE TOP

We now have the lacing eyelets set it is now time to take the pieces of cloth and form them into a top.

I start by lacing two of the pie shaped end sections together, to form the one end. Then the other two. Next I lace the middle pieces together where they fall along the ridge line (center pole line). After all of the pieces are laced together in pairs as above I start lacing the first two middles to one end. Then lace the second pair of middles to them. Switch over to the other end and lace the remaining middles to it. Then as a last step lace these two halves together. You may follow any order you wish but from experience I have found this to be the easiest by having to handle the largest volume of cloth only twice and that is on the final two laces. On the middle pieces along the lace line which forms the ridge line see that all of the pieces having the lacing eyelets fall on the one side of the ridge line and conversely all of the middle pieces having the lacing loops fall on the other side of the ridge line.

Now let's start the actual lacing, using **Figures 7, 7A and 7B** as a guide. Take two of the end pieces and place them together so that line 3-4 just touches line 1-2 of the mating piece. Line 33-4 should be the hems sewed in. Line 1-2 is shown as very edge of the cloth now with the dotted lines on the drawing and is the line drawn 1/4" inside of the lacing centerline. The way, this is placed line A-B which should have been the lacing eyelets in it should fall directly over line A-C of the mating piece.

Line up the pieces so that the hems on the outer edge and the bale ring openings of the two pieces match up. Then pin generously again using plenty pins. I pin where every arc intersects the hems and one pin in between.

Take your string, which is to be used for lacing purposes, and cut a piece 41/2 times the length of the lacing line. (From bale ring opening to outer hem.) Place an overhand

knot in one end and thread the other through a large needle.

Begin at the bale ring opening and push the needle up from the bottom piece and through the first eyelet.

Pull all the way through to the knot. Now push the needle back again through this eyelet and the cloth of the mating piece underneath; pull rope through until you have a loop remaining about 1 1/2" long. Start the needle up through the second eyelet, take the twist out of this loop and hold so that the loop lays flat, pull the rope through until you feel the loop you are holding starting to pull; then run the needle back through the eyelet and into the under piece of cloth and pull the rope through until you again have a second loop about 1 1/2" long. Leave these loops oversize for the time being and keep on lacing until you get to where the rope is too short for further work which should be about 1/3 to 1/2 way down the lace line.

Go back to the second loop and pull on the right side of the loop to start pulling the first loop out of its eyelet. Pull up until the first loop just ends over the second eyelet. Continue down the lace line in this manner until all of the loops so far sewn are pulled into their final position. **Do not pull too tightly.** This is a failing of the first timer. It will make your cloth gather and when set up will leave bulges in it. On the other hand leaving the loops too loose will let the piece of cloth pull away from each other when the top is guyed out. This will look like the suit coat on a man when the coat is too small and buttoned up.

For conformity and for ease in finding which side of the loop to pull on when tightening the previous loop I developed a system whereby in coming up through the eyelet I come up to the left as close to the side of the eyelet hole as the needle will get and going back down on the right side. This way a right-handed person will have the pulling side of the loop where it is handiest for him. However do this as you wish.

Leave the pins in while lacing and take them out when you go back and are pulling the loops up snug. Pull them out as you go along and just ahead of the loop you are snugging up. Be sure to take out each pin as you progress just ahead of a loop before snugging it up. If a pin is left in, the laces will not fit properly.

Now continue sewing in the lacing rope down the lace line as before and when you run short of rope go back and pull in the loops to their fit. You will probably have to go back three or four times. Continue until the last facing eyelet. Here push the needle up through and back o form the loop and leave the loop as long as the remainder of the rope. Go back to where you left off and pull the remaining loops up snug until the last large loop you just left. This last loop pull down until it is about 1 1/2" long, place an overhand knot in the rope on the under side to hold it in place, then again come through the under cloth and through the last eyelet but come up outside of the next to last loop. Cut the rope off about 1 1/2" long and seal the end with a drop of-model airplane glue to prevent fraying. You now have a long loop and an end of the lacing loop coming up through the last eyelet with the next to last loop in between them. Tie the last loop and the end together with a square knot to finish the lacing. This makes it convenient to open the lacing if desired at any time.

Lace the other two round ends together in like manner.

Take two middle pieces, one with the lacing eyelets along the ridge line and one without. Place them together (back to back' so the two ridge lines meet. Then overlap them so the one with the lacing eyelets are on top. Refer to the various us **Figures 8**. In placing them together line 1-2, which is now the outer edge, should just touch line 18 (the dotted line) on the other piece. This way lines A-D of the two pieces will be ore on top of the other. Again pin aid lace as above Repeat for all of the middles.

Start lacing the middles to the round end sections. Here line 3-4 of **Figure 8** will just meet line 23 of the round end. Lace together. Go to the other side where line 3-4 for **Figure 7** will just meet line 24 of **Figure 8.** Lace these together.

In lacing the various middles together refer to **Figure 8** where line 3-4 will just meet line 24 of the mating piece.

Continue lacing until the entire to is laced together.

Now, laying the tent upon the floor you will discover that it is impossible to make it lay flat. This is correct. In fact if it will lay flat something is wrong someplace in the design. It will not hang right when set up.

QUARTER FOLK LAYOUT

QUARTER POLE LAYOUT is something I tried to draw for this top but had to give up as the drawing would be too small to do any good find still be on paper the size of the LCW. So for their placement you will just have to rely on these comments and your own judgment.

This top, as previously stated was designed for two rows of quarter poles. At that time I stated that a top this narrow usually does not have two rows of quarter poles but I used them to obtain the result I wanted. If desired one row of quarter poles is sufficient.

The two quarter poles, as well as being of different lengths are usually designated by the color of the paint they are painted with. By this I do not mean some fancy scheme a model builder has dreamed up for color as it seems that one does try to outdo the other on color schemes. Poles are essential in a top and are usually painted a color which will not attract attention as to a spectator

they are a nuisance. The old time shows painted the set of quarter poles next to the center poles dark blue like the center poles. For this reason they were called blue quarter poles or just plain blues. The second row (smaller ones) were painted red and called the red quarter poles or just plain reds. As an added note the side poles were painted blue again like the center poles and blue quarters. To avoid repetition and here we will call them just plain reds or blues. In the single row quarter pole top they were painted blue again like the center poles.

Generally speaking each section of canvas had one blue and two red poles. They were never placed in line. The only exception to this was the modern Mills Bros. top. Otherwise I have never seen this. In the single quarter pole line top there was always two quarters to the canvas section.

Our pattern should have been **marked off** for two rows of poles and we will continue throughout this article as such.

Another thought. The quarter pole lines do not have to be spaced equidistant to divide the top into thirds from center pole line to side poles. There is usually a wider spacing from center poles to the blues to accommodate the rings. Then a narrow spacing for the hippodrome track between the blues and the reds. Lastly between the reds and side poles was the longest spacing to make room for the seats. Remember all quarter poles are slanted so they lean out from the center pole line. Usually the reds more than the blues. On the big top the reds can enter the canvas over the seats. The single quarter pole line top does not need the pole line spaced to divide the top into halves. Spacing here is for convenience and determined by what the top is to be used for.

Enough of the above. Now back to work. Determine how many quarter poles you need. Remember that each pole must fall on the intersection of the quarter pole line which runs parallel to the center pole line and one of the simulated rope reinforcements sewed with colored thread which runs at right angles to the center pole line or on the round ends is radial from the bale ring. Take some of the scrap muslin which you should have plenty and draw a bunch of circles, stars if you prefer, on it about 2" in diameter or point to point. Make a few more than the number of quarter poles you will need to take care of booboos.

In these circles or stars just inside the pencil line paint the cloth with model airplane dope. This is to prevent fraying. After drying take the straight scissors and cut out each patch on the pencil line.

Take the seine twine to be used for jump ropes and cut 28" long pieces, enough pieces so that there is one for each quarter pole. Dip one end of these ropes in model airplane cement to prevent fraying and let dry.

Turn your top upside down so you are working underneath. With the ice pick punch a hole in the top where you wish the quarter pole, place an SE 44 (long) eyelet on the eyelet set, work the canvas down over this. Find the center of one of the patches you just made, poke a hole through it at the center and work over the eyelet. Take the end of the rope you have just cut and in the end not doped place an overhand knot near the end. Force this over the eyelet and tighten around the shank with the hands and a needle nose pliers and set the eyelet. Give the rope a jerk to see if it has been cut and then cut off the surplus end (short end). If you have cut the rope start working out the eyelet with a diagonal cutters and needle nosed pliers, and start over again. After cutting one or two ropes and finding out the grief of removing the eyelet you will learn in a hurry not to be too heavy handed with the hammer. Conversely, too light a blow to set the eyelet will not set it properly and allow the rope to pull off. On the quarter poles I like to keep the knot in the rope on the side of the eyelet towards the side pole line. This tends to pull on the pole and hold it in place better.

Remember that the airplane dope, cement, and lacquer thinner is extremely explosive so be careful with the cigarettes. Better yet don't smoke here.

Keep the quarter pole sockets off of the lace lines.

Let's go into the purpose of these ropes for a minute. These are **jump** ropes. On the prototype this jump rope forms a very important purpose as anyone who has ever seen a top in a storm can testify. The jump rope is a rope, permanently fastened to the underside of the canvas. When the peg on the pole is pushed through its socket in the canvas this rope is threaded through a hole drilled transversely through the pole about 2 ft. down from the pole pin and tied to the pole itself near the bottom or at a height convenient for a man to reach. Sometimes two jump ropes are used per pole. These are wound around the pole and then tied again near the bottom. For looks in a model I prefer the single jump rope per pole. This is also according to prototype. This is for the purpose of tying the rope to the canvas so that if the wind gets under the top and bellies the canvas the top cannot pull off from the pole pin and let the pole drop. In a wind the butts of the pole will "dance" and shift around but the pole will not fall and the only thing preventing them is the jump rope. Watch a top in a storm sometime and note the poles. The jump rope plus the transverse hole also is used for letting the pole down easy at night instead of letting the end drop when it is pulled out of its socket.

These jump ropes are used on every pole with the exception of the

center poles on a bale ring top. Here they are not needed as a top properly guyed out could never pull off from the center pole. On a push pole top there must be jump ropes on each center pole also. To repeat there are jump ropes on every side pole, every quarter pole, and every center pole where the center poles are for a push pole top.

Was going into the guy ropes this month but this article is getting pretty long winded so will knock it off for this time. See you next month.

SIDE-POLE SOCKETS AND JUMP ROPES

Refer to Figures 7, 7A, 7B line B-C which is the side pole line on the round ends. **Figures 8, 8A, 8B** line B-C shows the side pole line for the middles. In this step we will refer to these lines.

After lacing up the top I never unlace it again as it can be finished now laced together. It is a little bulky to work with but you should have no trouble.

You will need about 90 jump ropes for the side poles. This should take care of any booboos you make and a few spares.

Out of the lighter twine you have purchased and which was used for lacing the top cut 90 jump ropes 14" long. Dip one end of each of these in model airplane cement and let dry.

Place the top upside down on your worktable. At one corner of any of the laced up sections punch a hole upwards with your ice pick on the piece which is now on top at the intersection of the side pole line and the lacing center line. Force this over a SE44 (long) eyelet which has been placed on the eyelet set with a diagonal pliers so there is room on the shank of the eyelet for the jump rope. This shouldn't be any trouble if the cloth at the corners had been "thinned out" as described previously.

Take one of the jump ropes you have cut and on the end opposite the cement tie an overhand knot in the rope. Place the knot over the eyelet shank and tighten with your hand on the long end and a pair of diagonal pliers on the short end. Then set the eyelet. Test the rope for cutting and cut off the short end. It is best to place the knot on the eyelet shank so that the knot itself is on the side of the shank towards the eave edge of the cloth. This way, when the jump rope is tied to the side pole it aids in holding the pole in place better.

On each corner of the cloth where the piece is now on top a SE 43 eyelet is placed just over the SE44 eyelet to accommodate the pin in the end of the side pole. Obviously a jump rope is not needed in this piece of cloth.

Each round end piece has a SE44 eyelet and jump rope placed wherever the side pole intersects a radian sewed in to simulate the rope reinforcements. The middle pieces have an eyelet and jump rope at every other intersection of the side pole line and line extending from the ridge to the eave only. Later we will deal with these.

DOUBLE GUY ROPES

Cut 90 ropes from the No. 6 seine twine 24 inches long. Dip every end in the model airplane to prevent fraying.

Starting at one corner of one piece with the top upside down punch a hole in this corner working the ice pick up from underneath at a point on the lacing centerline and half-way between the storm flap (trim) and the eave. Place an eyelet on the eyelet set and work the cloth down over this. Take one of the ropes just cut and place an overhand knot in the center of this rope. Work down over on the side of the shank opposite the eyelet so that the knot itself is eave edge. Pull the rope tight and set the eyelet

Whenever there is an eyelet and a jump rope repeat with the double guy rope. On the corners of the individual pieces place a double guy rope on both the top and bottom piece. This makes four ropes on each lace line. Again check the ropes for being cut with the eyelet.

SINGLE GUY ROPES

Cut 90 ropes out of No. 6 seine twine 12 inches long. Dip one end of each in model airplane cement and let dry.

Midway between every double guy rope and midway between the storm flap and eave edge is placed a single guy rope. On the middle pieces there will be no sewing with colored thread at this point. Again place a SE44 eyelet here with the guy rope only with the overhand knot again tied on the opposite end from the cement. Check for cutting and cut off the short end.

Your tent should now be ready for setup except for one more important item. Bale Rings.

BALE RINGS

On a full-scale top of the larger sizes it is estimated the weight of 50 elephants would represent the pull on each bale when the top is guyed out. From this statement it is obvious that the bale ring must be built to "Take it".

I use a bale ring 1 1/4" O. D. in diameter. Admittedly this is oversize but when you set up and start trying to thread center poles and main falls through it you will be glad it is oversize. For bale rings I use 3/32" welding rod. Wind this over a form as you would a spring and cut off to form the ring. Where the two ends of the ring are joined you **must silver solder.** Ordinary soft solder just will not hold.

You must obtain bale ring chain, which is strong enough to take the strain of the guyed out top. It is obtained from a local hobby and hardware stores.

Use the 11 links per inch size. Cut the pieces for each half of the bale ring 10 links long. With a piece of spring brass wire from a ring large enough to go around the bale ring and through one of the links of this

chain. Place on the bale ring itself and silver solder. Put one of these on each side of the bale ring. Join the two ends of the chain together by forming a ring out of spring brass and threading it through the two end links of each piece of chain. Silver solder. This is the ring into which the hook of the main falls engages for pulling up the top.

INITIAL SETUP

To set up the top described a baseboard 5 ft. by 12 ft. is needed.

For side poles cut 3/16" diameter doweling 7" long. Refer to the article center poles, rigging, and guying out for center pole description. It is not within the scope of this article to discuss construction of center poles here.

Set up your top in the usual way. Be sure to guy it out tight as it can take it. Now forget the top for the next two weeks except once a day go all the way around and tighten the guy ropes to give it a good stretch out. On the initial setup you will probably be disappointed with its looks. This is only natural because it needs a good stretch-out to pull it into its final shape. As the tent will stretch and give in spots I would recommend using nails for the first setup. Afterwards 1/8" wooden doweling can be used for stakes.

QUARTER POLES

After the top has been set up and stretched out for two weeks we can think about quarter poles. Your baseboard should have been marked where the butts of the quarter pole will stand. Measure the distance from this line to one of the quarter pole sockets in the tent. Add about 1" to this measurement and cut from a piece of 1/4" dowel. Set it in the top and check for length. They should cause the tent to "bug out" slightly at each quarter pole but not too much. Use your head and determine what looks right. Keep on cutting off the length of the pole until it appears to be the right length. Then cut the remainder of the blue quarter poles to this length. Set them in place and see how they look.

Repeat the above for the red quarter poles. Again use the same size dowels as for the blues.

Now you can start your sidewall. It is not the intent or scope of this article to go into sidewall construction so you will have to use your own idea. The model sidewall made as prototype sidewall is too hard to set up so I use a compromise type, which has an eyelet in the edge, which fits over the sidewall pole. Remember where sidewall joins there is an overlap the distance between two side poles. Sidewall comes in various lengths so do not make one continuous piece to go around the whole top. This will not look right.

One more thing in conclusion, mark your top at each intersection so that if you ever want to unlace it you can put it back together in the same order it was originally laced together in. Also by marking at the side pole line you can also mark the sidewall so it is always put together in the same position.

I have found it to be advantageous to place the stakes out from the side poles a distance equal to the length of the side pole minus one inch. This gives a more acute angle between the top itself and the guy rope and tends to aid in holding the side poles in place.

This completes this article on tents. I have tried to take it step by step and explain each step fully so it is clearly understood. Sometimes this has called for monotonous description and repetition. With the help of this plan you should be able to make any round end top using the design methods described in the of this plan. So happy sewing.

OMAR THE TENT MAN