

Plans and Instructions

for building a Miniature Model Napoleonic Coach in the Fisher Body Craftsman's Guild Competition (Canadian Section)

Learning the art of fine craftsmanship

Before you start work on your model Napoleonic coach, we have a friendly suggestion to offer which we believe will be helpful. Remember, that although you are working for one of the valuable Guild awards, the desire to excel in craftsmanship should be uppermost in your thoughts. For excellence in craftsmanship will determine who is to win the awards. So, while you are building your model coach, think only of making it the finest piece of work you have ever produced. The praise of your friends and recognition by the Guild will take care of themselves, if you have done your work like a real craftsman.

If you adopt this attitude toward your work, you will be surprised how much easier it will seem and how much more pleasure it will bring you. Think of the fun it will be to make each little part of your model a masterpiece in itself, and then to fit each into its proper place and watch the solid, handsome coach gradually take form.

You will receive encouragement, too, from all around you. Your parents know what a fine thing it is for you to be a member of the Guild. So does the principal of your school and the manual training instructor. They will all be interested in seeing you make progress. Many of the boys you know at school are also Guild members, or would like to be. It will be great sport to have friendly rivalry in your little group and to exchange ideas and information about your work and the Guild activities.

Perhaps you already know that model coaches similar to the one you are going to build are in great demand all over the country. Many people are using them as decorative pieces for their living rooms or libraries.

In some places, they are even more popular than ship models, and bring good prices, depending upon their workmanship and artistic merit. If you have ambitions of earning additional money in this way, let them spur you on to build a coach whose fine workmanship and appearance will command a good price.

CONGRATULATIONS TO YOU

CANADIAN MEMBER
OF THE FISHER BODY CRAFTSMAN'S GUILD

May you find many joyous hours through your membership in the Guild. May you grow in skill. May you learn to respect and to emulate the spirit of the guildsmen of old. May you become as sure of hand and eye as they, and abundantly prove your full right to the honorable title, Master Craftsman.

The surest way to get the greatest rewards from your work is to keep the ideal of fine craftsmanship always before you.

Your model coach

The model coach you are to build in the Guild is taken from the "Body by Fisher" emblem. The story of that coach is an interesting one. The design was made from two famous coaches used more than one hundred years ago by the Emperor Napoleon—one at his coronation, the other at his marriage to Princess Marie Louise of Austria. They were the finest coaches men knew how to build in those days, made by hand in little shops by master workmen. Until the advent of the closed automobile body, they were among the finest specimens of coach work in the world.

And even today these magnificent examples of the coach builder's art stand supreme as the finest products of human handicraft that the world has

produced. For the coach builders of Napoleon's time were almost literally handworkers. They had comparatively few tools. Steam or electric power machinery had not yet been developed. Precision instruments to guarantee accuracy were comparatively few.

It was the skilled fingers, the fine eye, and, above all, the stout heart of those master workmen of Napoleon's day that created these coaches. Their work days were long, their tasks of fashioning each part by hand were arduous, and their reward in money was slight in comparison to their efforts—as we today judge monetary rewards. But their pride was great—pride in having done as perfectly as possible the task that they had undertaken—and their reward was great also for it was the reward of respect from their fellow men that all ages have accorded master craftsmen.

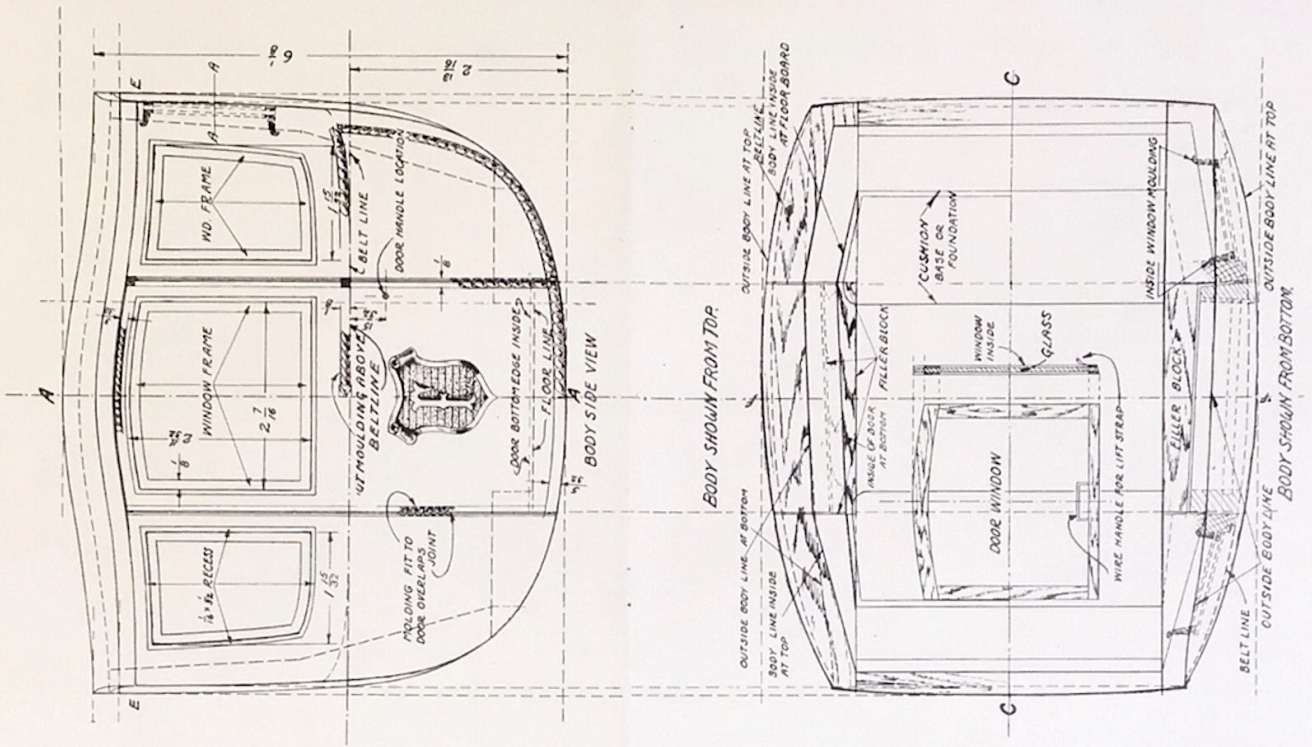
Every craftsman of today—young or old—has at his command those same facilities plus the added knowledge that more than 100 years of mechanical advancement have added to the world. And craftsmen can produce as splendid creations as those masters of old if they can bring to their tasks the same perseverance, the same sincerity, and the same determination to produce nothing but the best that is their heritage from the Guild craftsmen of yesterday.

The rewards of craftsmanship

It takes men who know how to work with their hands as well as with their brains to suggest and perfect better ways to do things. As a member of the Fisher Body Craftsman's Guild, you are doing more than building a strong, handsome, craftsmanlike model coach. You are learning a lesson in honest, sincere workmanship. You are learning to carry on for yourself, to depend on your own efforts, and to finish the job in every detail.

May every success attend you. Whatever your work in the future may be, may you be rewarded by achieving high rank as an able master of your craft—a man who has learned to work honestly and well.

Note: Be sure to read notice on page 22, regarding the scoring arrangement and age qualifications for 1934 competition



Before you start your model

BEFORE attempting to make your model Napoleonic coach, study all drawings and details carefully until you understand them thoroughly. This will save much time later when you are in the process of building your model.

While the instructions and drawings are complete in themselves, it is not the intention of the Guild that the instructions and suggestions given here be followed exclusively. If you feel that you have a better way of making up the various details, use it, the main consideration being that the final result will be a coach whose dimensions, color, and various design features will correspond to those given on the drawings and illustrations contained herein.

You will notice as you check over your drawings that you will need various materials such as paint, upholstery braid, ribbon, leather, various kinds of metal, small size screws and bolts, etc. Gather these materials together from time to time, so as to have them on hand when needed.

The building of the coach is not difficult if the step-by-step sequence given in the following pages is adhered to. However, one of the greatest tests of craftsmanship to be encountered in constructing a coach is the ability to finish the work on time. Due to the elaborate detail of the coach design, it is necessary that one make judicious use of spare moments from the very start.

Of second importance in modern day craftsmanship is accuracy of dimension. Many excellent models in our other competitions lost valuable points in this department because of variance in such important measurements as wheel base, wheel tread, window and door openings, outside roof contour, horizontal and vertical body sweeps or contours, and heights of each pole ends, steps, footman board, etc. from the floor.

The color prints are intended only as suggestions for painting the coach, and the photographic illustrations aim only to make certain assemblies more easily understood.

All drawings, except illustrations and perspective sketches, are made full size. Dimensions not given on the drawing may be measured directly from the drawing itself. Only the Guild drawings will be accepted as authentic, and the scoring of the coaches will be based on measurements, color scheme, and details as given on these drawings.

For your help and convenience, the Guild maintains a "Question and Answer" department. Feel free to write the Guild at any time concerning problems or questions that may come up in connection with the constructing of your coach model. Address all questions to the Technical Department, Fisher Body Craftsman's Guild, General Motors Products, of Canada, Limited, Oshawa, Ontario.

Coach Body

Illustrations No. 1 and No. 3 show a method of laying out the various coach body members on pieces of wood dressed or worked to the sizes indicated. Separate pieces may be used for the various parts, if difficulty is encountered in getting boards of required sizes.

Bottom board and ends

1. For the floor and end panels, the board should be $1\frac{1}{4}$ inch by 4 inches by 19 inches. (Ill. No. 1.)
2. Square both ends with a plane. Check with try-square.
3. Draw a center line lengthwise around board.
4. From each end of board, measure $3\frac{1}{2}$ inches for belt line and $4\frac{1}{4}$ inches for length of end panels.
5. Square three lines around board.
6. Find the center of the remaining piece and square the line around. From this center line, measure right and left $3\frac{1}{4}$ inches for length of floor panel (total length, $7\frac{1}{2}$ inches). Also mark off $1\frac{1}{2}$ inch on each side of this center line and square lines across surface for floor recess. Gauge depth of recess, $\frac{1}{2}$ inch, between these lines. Your board layout should look like the one in Ill. No. 1.



7. Make templates No. 6 and No. 7 out of cardboard. Mark ends of board with these templates and cut to shape.

8. Cut across lines indicated for floor recess to proper depth. (Have saw cuts come inside your lines.)

9. With a sharp chisel, carefully cut out stock for the recess. Finish with sandpaper. (Safety first—handle chisel carefully!)

10. Now cut off the two end panel boards, sawing between the lines marking limits of end panels and floor board. Square the ends carefully to the lines with a plane. These ends must be square.

11. Cut the inside of end panels to correct shape. This shape is indicated in front view drawing of coach with dot and dash lines, page 2. Also see Ill. No. 2.

12. Locate front and rear window openings on respective end pieces. This should be done very carefully, working from the center line of end panels.

13. Cut out window openings. This is easily done with a coping saw. Cut just inside of window lines. Drill small holes in each corner of window for inser-

tion of saw blade. File and sandpaper opening to exact shape shown on drawings. Check carefully so as to have openings correct size.

14. Glue end pieces on to floor board (Ill. No. 2). This may be done with hot, cold, casein, or airplane No. 3.

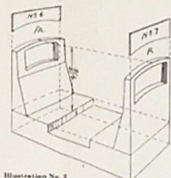


Illustration No. 2

glue. If clamps are at hand, the ends should be clamped in position until glue has set. A heavy weight placed on top of ends will do in the place of clamps. Do not nail ends to bottom, as the nails will interfere with the cutting of side of coach to shape.

15. Check with try-square to see if ends and bottom are square and at right angles to each other.



Sides and top

16. For the top and side pieces, a board $1\frac{1}{4}$ inch by $6\frac{1}{2}$ inches by 25 inches is needed. (Ill. No. 3.) Proceed as in step No. 2.

17. From the ends of board, measure length of side panels, $7\frac{1}{2}$ inches. Find the center of the panels.

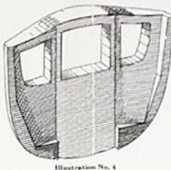


Illustration No. 4

($3\frac{1}{4}$ inches from ends.) From this center line, measure right and left $1\frac{1}{2}$ inch for door width. (3-inch door.)

18. Mark one edge of board bottom. From this edge, measure $2\frac{1}{2}$ inches and draw a line across panels for belt line. Your layout should be as indicated in Ill. No. 3.

19. Cut off side panel pieces and square ends carefully to line. The remainder of the board will be used for the top.

20. Shape the inside of side panels to correspond with drawing. This inside contour, or shape, is indicated

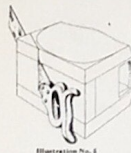


Illustration No. 5

on top view of drawing, page 2. Also note Ill. No. 4.

21. Cut top edge of side piece to correct shape. This shape may be traced directly from the side view of body, page 2 (or use template No. 2) and corresponds to shape of roof at this point. A coping saw or hand saw can be used to advantage for cutting top edge to shape.

22. Glue side panels to end and bottom assembly.

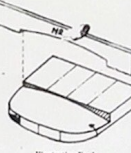


Illustration No. 6

Be sure that center and belt lines agree, or line up, through entire assembly.

23. Mark the bottom outline of side panels on side pieces. This is done by making a cardboard template of side panel shape and tracing onto sides.

24. Band saw to shape. If no hand saw is available, take a hand crescent saw and cut corners to rough shape. (Ill. No. 5.) Plane and sandpaper to line.

25. Now make cardboard templates for the hori-

zontal body sweep of sides. These are templates Nos. 3 and 4 on page 23.

26. Work sides to fit shape of template. Note that front of coach is slightly narrower than rear. In check-

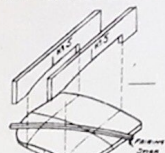


Illustration No. 7

ing your work, see that template is used correctly. Ill. No. 6 shows method of shaping and checking work.

27. Next, work side pieces to vertical sweep. For this, template No. 5 is used, and contour should be checked at hinge and lock line of floor opening. Ill. No. 7.

28. The front and rear panels above the belt line are rounded slightly, as will be noted from plan view. A small plane, wood rasp, or sandpaper can be used for this work.



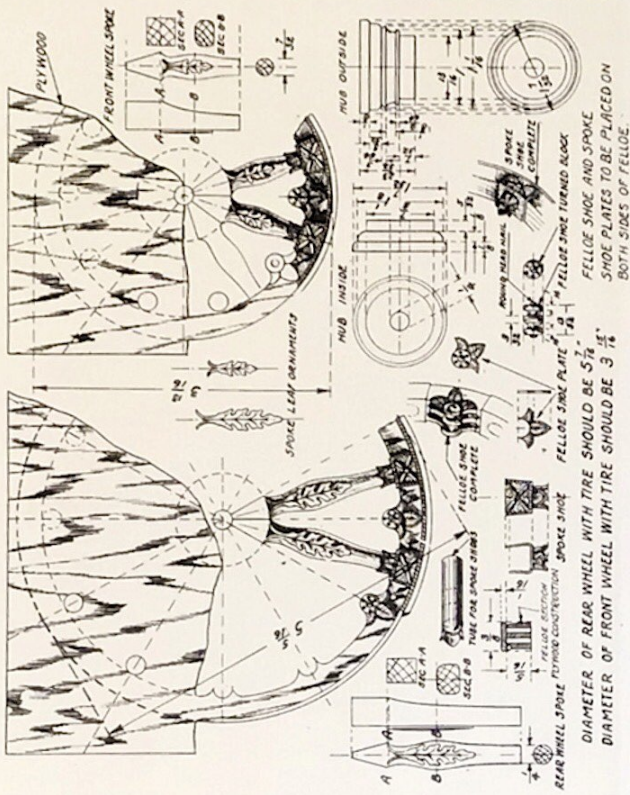
Illustration No. 8

29. Carefully check body measurements, length and width at top center, width of ends, etc.

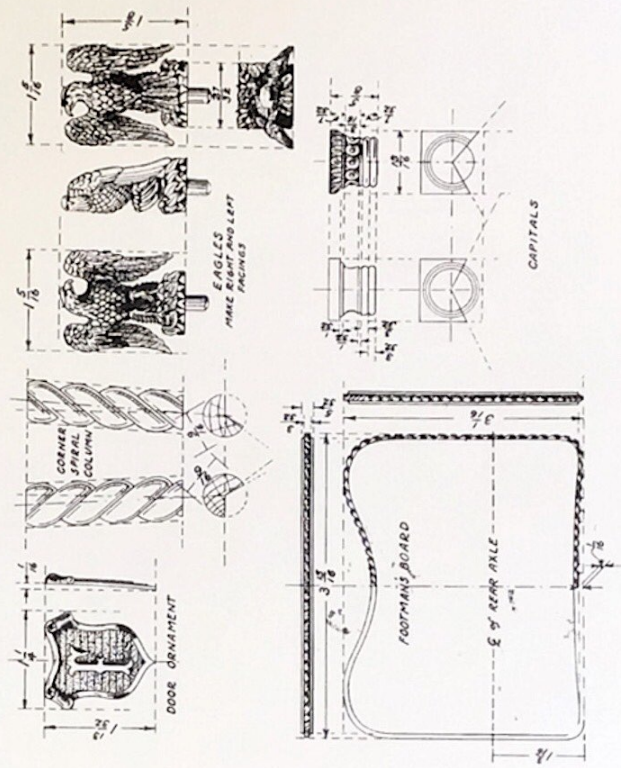
30. Shape underside of roof board, using templates No. 2 and Nos. 6 and 7 to mark off ends and sides as indicated in Ill. No. 8 of Guild drawing. This shaping should be done with a sharp gouge. Finish with No. 1 or No. 1 $\frac{1}{2}$ sandpaper.

31. Fit the roof board to side and end pieces until you have a tight joint all the way around. Gauge top board to thickness, $\frac{1}{8}$ of an inch. Work to shape and thickness—carefully check roof shape, or contour, and have it fit template No. 1 at center line C-C, lengthwise of coach.

32. Carefully locate side window openings. Width of windows should be measured from center line (vertical). Height of window openings may be measured from top edge of sides. Another way to locate the windows would be to make a cardboard template of the



DIAMETER OF REAR WHEEL WITH TIRE SHOULD BE 3 1/8"
 DIAMETER OF FRONT WHEEL WITH TIRE SHOULD BE 3 1/8"
 FELLOE SHOE AND SPOKE SHOE PLATES TO BE PLACED ON BOTH SIDES OF FELLOE.



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side panels and trace locations onto side pieces. Do not cut out door opening at this time.

33. Drill holes in each corner of the window. Insert coping saw blade and cut out window shapes. Do not try to force the saw; cut slowly and accurately to line. Finish the edges with sandpaper held or glued to a small piece of wood. A wood file or rasp may also be used. Care must be taken not to chip off edges around windows. File or sandpaper from outside of panels to inside. Inside surfaces will be covered with upholstery. (Tack top in place temporarily.)

34. Mark location of door on both side panels, working from center line. Measure right and left of this

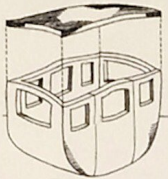


Illustration No. 8

center line, 1 1/2 inch for door width; total door width, 3 inches. This measuring should be done at both top and bottom of door. With a thin rule or piece of metal, connect point locations vertically.

35. Remove top and with a back, fine crosscut, or coping saw cut out doors. Your coach body at this stage should have the appearance of the one illustrated in Ill. No. 9. Notice that in shape it is much like the body of an automobile of today.

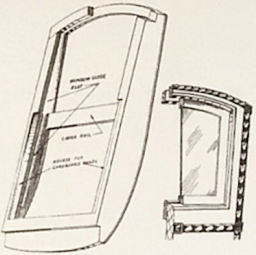


Illustration No. 9

Doors and Windows

36. In order to strengthen the doors, it is advisable to trim off 1/8 of an inch on each side of door and glue on a 3/4-inch strip of pine or other soft wood lengthwise.

37. Fit doors in openings, being careful to trim both edges equally so that door will fit in opening correctly. The lock side of door should be given a slight bevel for

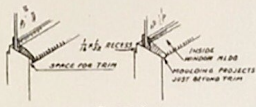


Illustration No. 11

clearance in opening and closing door. Cut in door window opening and window drop recess.

38. Study the door and window details carefully. Front, rear, and side windows remain stationary. Around each window opening, a small recess is cut. This recess is 1/2 of an inch deep and 1/4 of an inch wide. Use a sharp knife or razor blade to cut in recess line.

39. Cut thin pieces of glass to the shape of window and slightly smaller than opening. Old photographic plates make excellent coach window glass material.

40. Glue thin pieces of cardboard or wood veneer around outside of glass, both sides, as frames. These frames should be 1/2 of an inch wide and uniform on all windows.

41. Now locate position of windows in body window openings. This may be secured from plan view, page 2. Make mouldings to fit around windows inside, of stock 1/4 of an inch thick. Note from Ill. No. 11 and drawings that this moulding should project in from inner sides of coach far enough so as to lap over the upholstery material used, or project slightly beyond upholstery trim if just a round edge moulding is used.

42. The windows of the doors are made in the same way as the other windows, except that these windows should raise and lower. Study Ill. No. 10 for suggestions on construction of this feature. Notice that the side and top pieces of window frame will have to be slightly wider than 1/2 of an inch. This is due to the fact that windows must operate or slide in a recess cut out of the door. Have door windows operate freely. Remember, painting will add to thickness of pieces, so do not fit windows too tight.

43. There is no window moulding on outside of coach. The windows are held in place against the inside moulding by gluing frames in place.

Seat and back cushion forms

44. It may be well at this time to fit the seat and back cushion forms in place. Ill. No. 12 shows a method of making these forms out of wood, Balsa, soft pine, or any easily worked wood may be used. Since these

forms are to be covered with upholstery material, allowance should be made for the thickness of the velvet, velour, or material used.

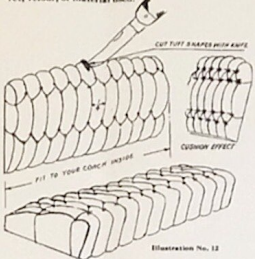


Illustration No. 12

45. After wood forms are shaped and fitted in place, cut in the tufts or pleats with a sharp knife. Pleat design may be obtained from Ill. No. 12, or drawing on page 21.

46. Holes may be drilled where French knots or buttons are to be placed. This will make it easier to sew through block when upholstery trim is put on forms.

47. Small, gilt, round-headed gimp tacks may be used instead of the French knots. These, however, do not produce as harmonious an effect as do the French knots. If tacks are used, it will not be necessary to drill holes suggested in step 46.

Wheel Construction

Now that we have the body of our coach completed, let us put it on wheels. This implies, of course, not only the making of the wheels but the making of axles and other parts of the undercarriage as well.

The wheel felloe rim may be built up of felloe sections as shown in Ill. No. 13, or the felloe rim may be cut out of a piece of veneer or ply wood as shown on page 4.

48. If the felloe is cut from a piece of veneer, carefully mark off all diameters needed. Locate felloe shoe positions. Be sure these are accurately spaced.

49. Cut and work outside diameter to size. (5 1/4 inches diameter for 3/4 inch thick tire rims.)

50. Drill 3/4-inch holes at proper location for felloe shoes.

51. Cut inside line of felloe with coping saw. Finish to correct diameter with file and sandpaper. It will probably be easier and help in accuracy if both wheels of same size are made at same time by nailing two pieces of veneer together.

52. Turn on a lathe or file to shape with a small,

round file the felloe shoes, according to design shown on page 4. The button or lead on ends may be a round-head nail instead of being turned on shoe. Notice that length of felloe shoe should be slightly longer than width of felloe. This will make a more pleasing effect and add life to the whole wheel.

53. Wheels made or "built up" the felloe block method will require some strips of wood 3/4 inch thick and 1 1/4 inch wide. In order to keep all parts of the wheel flat, or in the same plane, they should be built on a flat, true surface board. A small drawing board would do very nicely for this. See Ill. No. 13.

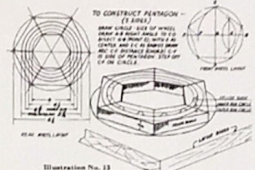


Illustration No. 13

54. Draw on your layout board a circle with 5 1/4 inches diameter. Divide the circle into six equal parts. This is done by using a compass, set as for drawing the circle, and stepping off or marking off the circle into six equal divisions.

55. Draw lines from the center of the circle through these six division points and extend them beyond the circle about 1 inch.

56. Now draw a circle with a diameter of 6 1/2 inches and one with a diameter of 4 inches, using the same center for all circles.

57. Where the inner circle cuts the division, or radial lines, connect the points of intersection. This will give you a six-sided figure called a hexagon.

58. Do the same at the intersections of large outside circles with radial lines. Ill. No. 13 will help to make this layout clear.

59. The width of wheel rim is 1/4 inch. Measure this distance from outside of wheel (5 1/4 inches circle) and draw a circle, this being the inner rim of the wheel proper.

NOTE—If the felloe shoes (the round ornaments between spokes) are to be a part of the wheel or rim cut out, it will be necessary to draw another circle 1/4 inch inside the inner rim circle to take care of these.

60. Cut out the six felloe blocks to the shape shown on your layout board. If a miter saw box is available, set the saw at 30 degrees for the cut of the angle where felloe blocks join together. Another way would be to set a level square at the proper angle (angle can be obtained from your layout) and mark out the cut or joint lines on the felloe stock. Cut the felloe sections a trifle long to allow for fitting.

61. Tack felloe sections on layout board; keep fitting the joints as you go along. If the joints of last felloe block do not fit properly, tack the block in place as near as you can. Take a saw (backsaw, preferably) and saw cut through the joints at joint lines. This will make a good joint if carefully sanded.

62. Glue the felloe sections together—keeping them in the order in which you have them laid out. Slip a small piece of paper under each joint to keep it from sticking to board.

63. Make a tire for the wheel, using a piece of brass or sheet metal 1/4 inch by 3/4 inch. Solder the ends together, using a spliced joint. Reinforce joint with rivet pins, if necessary.

64. Take a compass or pair of dividers and mark on the felloe blocks the wheel diameter, 5 1/4 inches, also the inside rim diameter. NOTE—If felloe shoes are to be a part of this construction, they must be laid out at this time. See step 59.

65. Cut wheel to outside and inside diameter. A coping saw will do this nicely if no hand or jig saws are at hand. Fit wheel tightly in tire. Check diameter carefully.

66. On layout board, mark wheel rim for 12 spokes (front wheel, 10 spokes).

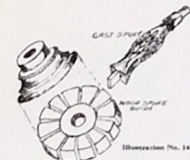


Illustration No. 14

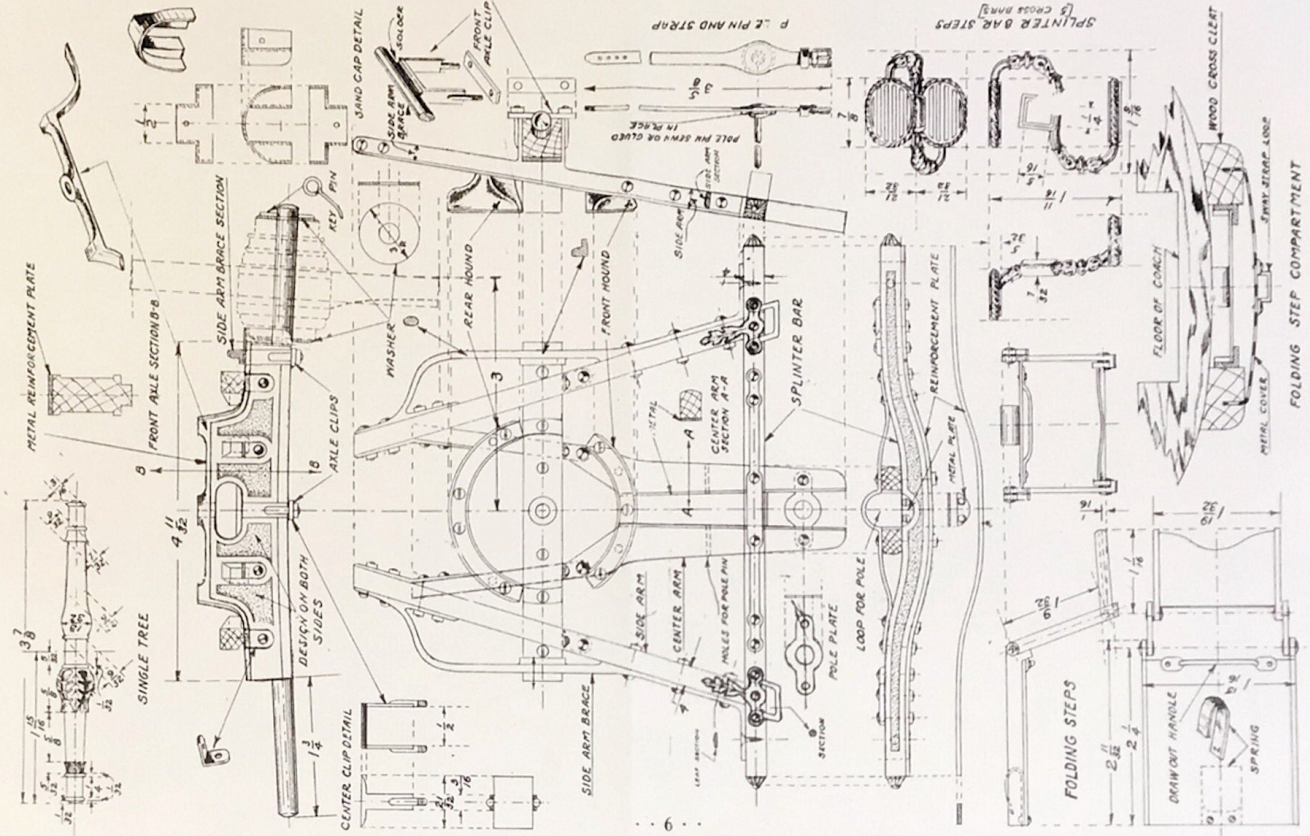
Spokes

Spokes may be most easily cut out of wood 3/4 inch thick. Some Guild members prefer, however, to cast the spokes from a wood pattern. In this case, the spoke leaf and the spoke shoe ornament at end of spoke are usually cast as part of the spoke itself. An advantage to the cast spoke is that all spokes will be uniform in shape. However, there is considerable work in cleaning and finishing a cast spoke. If cast spokes are employed, see Ill. No. 14 for a method of joining spokes at hub end. See also suggestions and illustrations on casting methods, page 22.

67. Wood spokes should be cut out of the stock to be used, with a coping saw or hand saw. A carefully made template of tin or heavy cardboard should first be made of spoke so that all spokes in a wheel will be of same size. Cut spokes a trifle long to allow for proper fitting of spoke assembly inside of felloe rim when all spokes are glued together. (Step 11.)

68. After spokes are cut from stock, shape them to correspond with sections at A-A, B-B, and C-C of spoke drawing. Sandpaper carefully and well. Be sure

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FOLDING STEP COMPARTMENT

all spokes are of uniform shape, and that front and rear spokes are of same pattern.

69. On your layout board, accurately locate radial lines for centers of spokes.

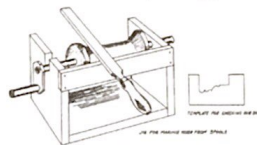
70. Finish and shape one spoke at hub, or "V" end. Tack temporarily in position on board, being careful to see that center of spoke at fellow end lines up with spoke radial line.

71. Shape, fit, and tack all the spokes of wheel assembly in place. When all are correctly fitted, glue spokes together at center, keeping entire set of spokes in place on layout board so front surface of spoke assembly will be flat and true when glue has set.

72. Both front and rear wheels are made in the same general way or method, and vary only in size, number of fellow sections, and number of spokes. Fit spoke assembly in fellow rim. Drive a small lead through the fellow into each spoke to hold it in place.

Hubs

In the method of wheel construction described herein, the hub will be made in two parts, one half for the outside of wheel and one half for inside of wheel. If a turning lathe is available, it will be quite a simple matter to turn these parts on the lathe. A template of brass or tin should be made to the shape and design of hub so that all the hubs will be alike. This shape may be obtained from hub drawing details on page 4.



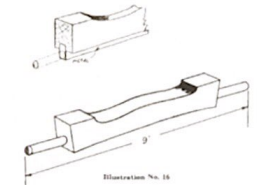
73. If you do not have access to a lathe, a spool of proper size can be worked to design with a file and sandpaper. A jig to hold the spool, as shown in illustration No. 15, will make it easier to work the design by this method. Hold file in position and turn spool. It may be an advantage to put a handle on the shaft. This would be much the same as making hubs on a turning lathe.

74. Still another method would be to cut out of wood of proper thickness discs to shape and diameter shown. These can then be glued together to form the hubs. See Ill. No. 15. Be sure to keep center of discs so

axle shaft hole may be properly drilled. For this method, a coping saw, file, or some sandpaper will be used.

Axle Construction

The axles of our coach are quite simple in design and construction. The entire axle may be cut and shaped from a piece of wood. Hard wood such as maple, walnut, birch, or gum should be used for this type of construction. Many coaches submitted in the Guild's state and national competitions are received with wheels broken off axles, due, in most cases, to weakness



of construction at point where wheel shaft joined the axle proper.

An excellent way of making the wheel shafts more substantial would be to make axle proper out of wood, most any kind that may be at hand will do. Drill a 1/4-inch or 3/8-inch hole in ends of axle about 1 1/2 inch deep and at proper angle to axle. Insert a 1/4-inch or 3/8-inch maple dowel rod or round metal rod for wheel shafts or spindles. A piece of metal tubing fitted over a wooden rod will also prove very satisfactory. Diameter of axle shaft may vary slightly, without affecting scoring or judging qualities of your coach.

Still another method of constructing a strong axle is shown in Ill. No. 16. In this construction, the bottom edge of the axle is rabbeted out. This rabbet is fitted with a piece of iron or steel. The wheel shafts may be turned or filed on the ends of this iron or the shafts threaded and screwed into axle ends. A round metal rod can also be fitted in the rabbet and left to project for shafts.

The design on sides of axles is first "cut in," as shown on cross section of front axle, page 6, and then modified with a sharpened nail, or the axle sides may be left plain and the design painted or striped with gold paint.

Rear axle

The all-wood, one-piece axle and shaft is described here.

75. Dress a piece of wood to the size of axle thickness, width, and length. In this case, this would be 3/4 inch by 1 1/2 inch by 9 inches.

76. Make a cardboard pattern of the entire axle, including the shafts. The pattern is easily made by tracing the shape on cardboard with carbon paper from the drawing on page 8.

77. Cut out pattern with a sharp knife.

78. Trace axle shape and design on the wood piece.

79. With hand saw, jig saw, or coping saw, cut out the axle stock to outline.

80. Smooth and finish your work with a wood rasp and sandpaper.

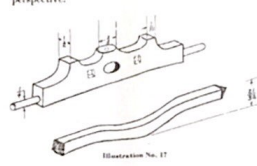
81. Carefully shape the axle shafts to a round surface 1/4 inch in diameter. In doing this, it will be well to drill a 1/4-inch hole in a scrap piece of wood and keep fitting the shafts to this diameter as you work them down to shape.

82. File recesses across ends for sand caps.

83. Cut out bottom edge recess, as shown on section view of axle, page 8.

Front axle

The front axle may be made in the same way as described for making the rear axle. It will add to the strength of both axles if the top side is fitted with a metal reinforcement piece. The drawings of the axle, pages 6 and 8, indicate such a metal piece by the double line around top. Ill. No. 17 also shows front axle in perspective.



84. For the front axle, you will need a piece of wood 1/2 inch by 1 1/4 inch by 7 1/2 inches.

85. Proceed as in steps 76, 77, 78, 79, 80, 81.

Gear Assemblies

The front gear of the coach consists of two assemblies—the upper front and the lower front. Turn to pages 6 and 8 and study the two assemblies carefully so that you will be familiar with the names and location of the different parts. Any part of the drawing not dimensioned may be measured direct from your plans, as they are drawn full size.

Lower gear assembly—splinter bar

The splinter bar is an important part of the lower front gear. To this bar is attached or fastened all the lower gear parts and the singletrees for the horses. This bar largely controls the movement of the coach in making turns.

86. For the splinter bar, work a piece of straight-grained wood to the size, 3/4 inch by 1 1/2 inch by 7 1/2 inches.

87. Make a cardboard pattern to the shape of bar, as shown on drawing, page 6.

88. Trace shape on splinter bar stock. Notice metal reinforcement plate at bottom of bar. Splinter bar may be made entirely of wood. If so, add thickness of metal to width of bar.

89. Cut to shape with coping saw, jig saw, or hand saw.

90. Finish with file and sandpaper.

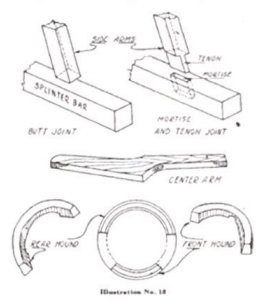
91. Cut or carve the ends of bar to design shown on drawing, page 6. This may be done with a sharp knife, file, and sandpaper. A set of carver's chisels could be used, if available.

This ornament could also be made separate by casting or shaping it of lead or plaster of Paris. It could then be glued to bar end. If these ornaments are made separate, the splinter bar should be cut to a shorter length, 6 1/4 inches, to allow for these additions. See Ill. No. 17.

Side arms

The side arms should present no difficulty, as they are made of pieces of wood 1/4 inch square and of the length shown on the Guild drawing. Make the pieces at least an inch longer than required length, so as to allow for cutting ends to proper angle. The joint at the splinter bar can be a plain butt joint. In this case, the side arms should be fastened to splinter bar with glue and nailed with 1/2-inch brads. The joint will be strengthened when the knife arm braces are fastened in place.

A mortise-and-tenon joint may be used for joining splinter bar and side arms. This type of joint will make a stronger construction. See Ill. No. 18 for method of making mortise-and-tenon joints and butt joints.



Center arms

In making the center arms, make first a cardboard pattern of these pieces, as shown on drawing, page 6. Work a piece of wood to the thickness of arms, 3/4 inch. The width and length should be larger than the sizes given on Guild drawings, to allow for arranging the pattern on the piece with grain of wood to best advantage. See Ill. No. 18.

After the arms have been traced or marked on the stock, they can easily be cut to shape with a coping saw, jig saw, or hand saw. Finish with sandpaper. The inside edges of the center arms should be hand sanded with strips of brass, as shown on the drawing.

Hounds, front and rear

The front and rear hounds are the two semicircular pieces of lower front assembly on which the fifth wheel and upper front assembly ride. The perspective sketch, page 22, of this assembly shows the location of the hounds. Study the drawings until you have this location clearly in mind.

Notice, in the side view of the hounds, that they fit on the center arms at an angle. This is for the purpose of leveling the two top surfaces of hounds with top part of front axle, due to the angle at which center arms set in relation to floor level.

92. Take the front axle and drill a hole 1/4 inch in diameter for king pin, as indicated on drawing.

93. Cut in the oval-shaped hole. This is easily done by drilling two 1/4-inch holes, one at each end of oval. The remaining portion of stock can then be removed with a knife or small chisel.

94. Fasten side arms to splinter bar. The back ends of the side arms may be held in place by tacking a small piece of wood across them. Check angles with Guild drawing.

95. Now locate on the top of the axle the position of the center arms. Square these lines down on both sides of axle. Locate the holes for center-arm ends on axle sides, keeping in mind that these holes must be cut at an angle to allow for tilt of the gear assembly. In working the holes square, first drill a hole 1/4 inch in diameter and finish to a square with small square file, or cut out with a chisel or knife.

96. Possibly a simpler and easier way to cut in the center-arm holes would be to saw from the top of axle to proper depth on sides. Remove stock with a chisel. Fit arms to correct angle by filing. When the arms are properly located and fitted to the axle, glue in the small pieces of wood cut from axle above the arms. See Ill. No. 19.

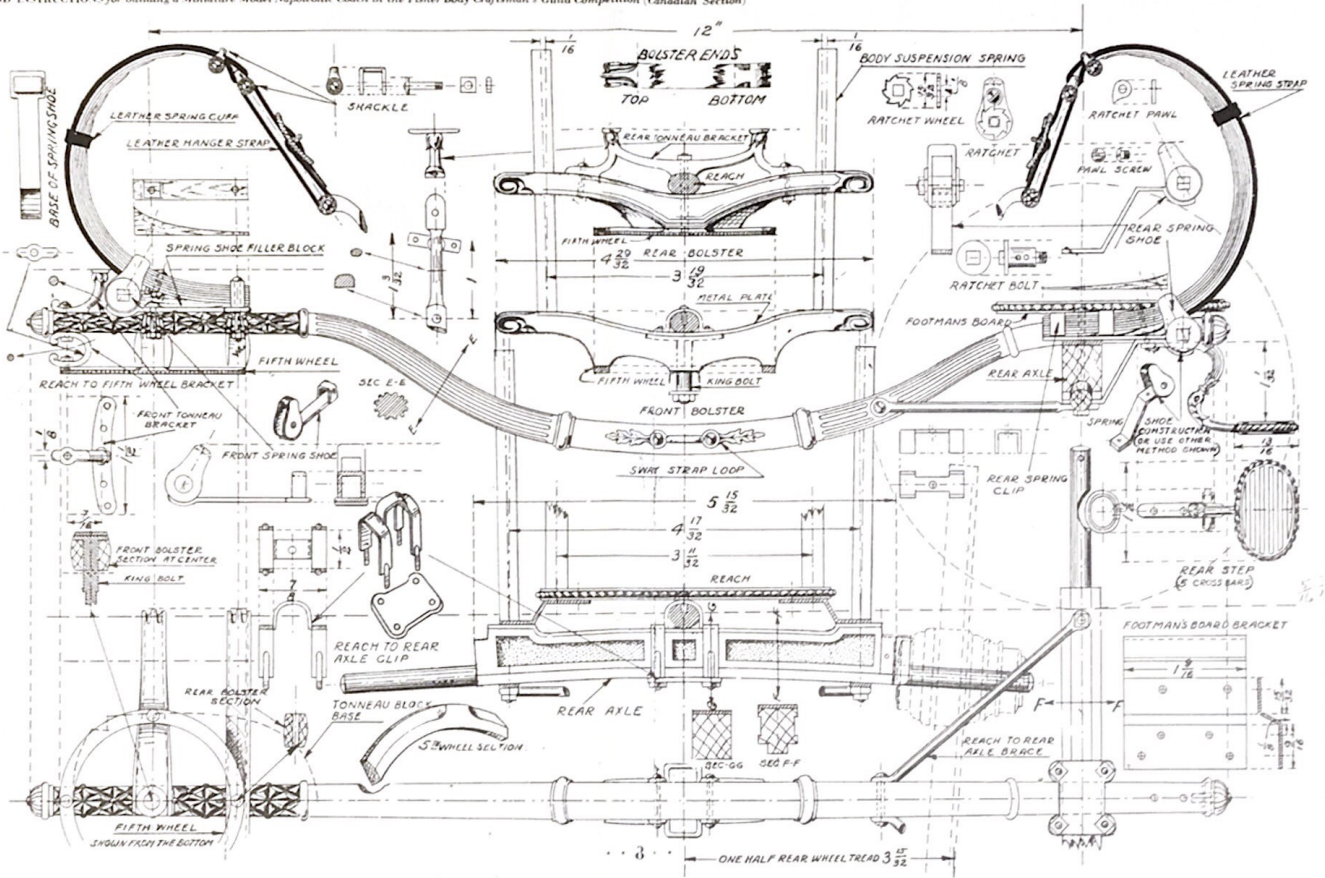
97. Fasten center arms to side arms.

98. Fasten front and rear hounds in place on center arms. In doing this, keep in mind that the hounds must be fit or cut at an angle so that top of hounds and axle are level or in same plane.

99. The angle and side braces should now be fastened in place.

100. The side-arm brace is cut from a piece of sheet brass 1/4 inch thick. Solder on a piece for the T-head at

PLANS AND INSTRUCTIONS for building a Miniature Model Napoleonic Coach in the Fisher Body Craftsman's Guild Competition (Canadian Section)



PLANS AND INSTRUCTIONS for building a Miniature Model Napoleonic Coach in the Fisher Body Craftsman's Guild Competition (Canadian Section)

rear end, as indicated in Ill. No. 19. Fill in angles with solder where needed for thickness.

101. Cut the fifth wheel out of 1/4-inch brass to diameters indicated. The outside of circle may be cut with hacksaw and filed smooth. The inside circle is best worked by drilling a series of holes completely around inside and breaking out remaining portions with a cold chisel. File smooth and to diameter.

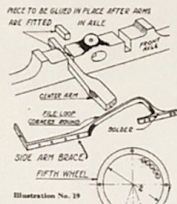


Illustration No. 19

Upper gear assembly

The front upper gear consists of the two bolsters, spring assemblies, tonneau brackets, fifth wheel, and king bolt.

Bolsters

The two bolsters are much alike in shape and design. The front bolster is a little wider through center, due to the king bolt having to pass through it. Pine, bass, birch, walnut, or mahogany are suggested as woods for the bolster.

102. For the front bolster, you will need a piece of wood 1/2 inch by 1 inch by 5 inches. For the rear bolster, the stock size is 3/4 inch by 1 inch by 5 inches.

103. Make cardboard pattern of bolster shape by tracing from Guild drawing.

104. Cut bolsters to shape with coping saw or jig saw.

105. Finish with file and sandpaper. Notice shape of each bolster on page 8, cross section view.

106. The ends of bolsters are to be carved as indicated on drawings. This may be done with a knife, small chisel or gouge, or filed in with a small round file.

107. The side design on bolster ends should be carved.

Tonneau brackets

Two brackets are needed to fasten the tonneau block to the upper gear assembly. Ill. No. 20 shows these details, and the making of them should present no difficulty.

108. The rear bracket should be cut out of metal 1/4 inch thick. Round all corners slightly.

109. Solder the plates at bottom, as shown in sketch. The front bracket may be made from a piece of wire bent and shaped as shown. A plate is then soldered to top, as indicated in Ill. No. 20.

Springs

The springs, together with the various clips, shackles, and the ratchets, are an interesting part of the coach detail to make. Notice that the free ends, except the outside leaf of springs, are shaped to a design, and also that each spring leaf is tapered or made thinner on free end. You will need ten strips of metal (brass or any other metal) 1/2 inch by 1/4 inch by 18 inches for the leaves of the springs, there being seven leaves in each spring assembly.

111. Bend an eye on one end of one of the long strips of spring stock. This will be the outside leaf of the assembly. The eye is easily formed by bending spring stock around a nail or piece of wire.

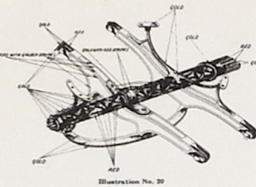


Illustration No. 20

112. Now bend spring stock to the shape of the spring. This is done by bending leaf around a cylindrical piece of wood, a bottle, or tin can of the approximate diameter of the spring shape.

113. Check shape with drawing detail. Cut off spring to length. Weight of coach body will draw springs down slightly, so diameter of springs can be a little larger at first than shown on drawings.

114. Make the rest of the leaves of the assembly. Edges of each spring should be slightly rounded.

115. When all leaves are shaped and cut to length, clamp assembly together. Drill a 1/8-inch hole at back of springs to receive the bolt holding the assembly and shoe together. Back of spring assembly may be soldered together also, if desired. This tends to make a neat job of the end joint of springs.

Spring shoes, clips, ratchets

Each spring assembly is fitted into a shoe. The front and rear shoes are slightly different in make-up. The rear shoe base piece is bent to fit or fasten to the bottom of the rear axle, while in the front shoe the bottom piece is straight and rests across top of bolsters.

Each shoe is equipped with a ratchet, the ratchet being a device for leveling coach body. This result is accomplished by winding ratchet end of spring strap around the ratchet bolt to desired tension. Study the drawings of these details, shown on page 8. Also note Ill. No. 21 for suggestions as to how to build up the shoes.

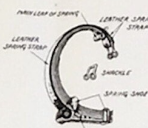


Illustration No. 21

When fitting springs into shoes, see that spring assembly fits tightly in shoe. There should be no space left between top of shoe and springs. A wooden filler block is used to fill in the space between shoe and spring at bottom, as is indicated in the illustration and drawing. Metal about 1/4 inch thick is best for making the shoes. The clips for springs can be made of lighter material.

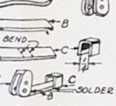


Illustration No. 22

Reach

The reach pole is the means of connecting the front and rear assemblies, thus holding the carriage together as a unit. The straight portion at the front end of the pole is a little longer than that at the rear. At the front, the reach is fastened to the front bolster by a small pin and strap, and onto rear bolster by a small machine screw (No. 2/56 x 1 1/4) or a long rivet.

A special bracket or clip is used to fasten reach to rear axle. See page 8 for drawing of these details.

The reach pole may be cast in aluminum or other metal from a pattern, or may be cut out of wood. If wood is used, considerable care should be taken to select a straight-grained piece. Boxwood, walnut, hickory, ash, gunwood, and pine are suggestions for woods to use, though any wood that will not split easily or break at the "necks" or bends may be used.

116. For cutting the reach out of wood, you will need a piece 3/4 inch by 2 inches by 16 inches.

117. Make a cardboard pattern of the side view of the reach. The ornamental ends may be omitted and added later. The four division bands or rings may be cut on the reach. However, it may speed up your work somewhat to shape the reach without these rings. After reach has been shaped, the rings or bands may be added by using a piece of wire.

118. Trace reach pattern on the stock to be used, and cut to rough shape with a coping, jig, or hand saw.

119. Work the piece down to correct dimensions, both thickness and width. This is best done with a wood rasp and sandpaper. Notice that the center of reach is thicker and heavier than the ends, both in width and thickness.

120. Round the corners with rasp and sandpaper until an elliptical shape is secured. Ill. No. 22 gives you the shaping idea.

121. Carve flutings on both "necks" or bends of the reach. Be careful to have flutings evenly spaced and in clear-cut, straight lines.



Illustration No. 23

Corner spirals

The corner spirals are easily carved out of wood. It will probably be somewhat easier to make a long piece of rope-effect moulding and cut corner spirals off as needed than to make each small piece separate.

122. Square up a piece of stock to the size 1/2 inch by 1/4 inch by 12 inches.

123. Shape to roundness, following the idea given in Ill. No. 23. This can be done very successfully with a plane and sandpaper.

124. Now take a piece of thread or cord and twist it around the stick at the proper angle, to give the spiral effect shown on Guild drawing. Mark this angle line on the stick with a pencil.

125. With a small saw or knife, cut this spiral line into the wood to approximate depth required.

126. Remove stock from both sides of the cut to form a "V."

127. Round the edges with a file and sandpaper.

128. Cut the stock to length.

129. Fit corner spirals to body by cutting away necessary stock, as shown in section view of spiral drawings. To do this, shape a piece of cardboard to the "V" cut-out required. Draw a line across the stock, lengthwise. On both ends of stock, mark the "V" angle, using the lengthwise line as a starting point. Connect other line of angle lengthwise across stock. See step No. 6 of Ill. No. 23. Remove stock with saw, knife, or chisel.

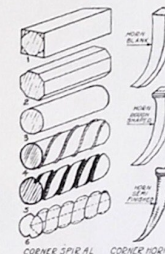


Illustration No. 24

130. Glue spirals in place. Check with drawing to have spiral lines going in proper direction.

Corner horns

The corner horns are also easily cut and carved from wood. Gunwood, pine, and walnut will prove excellent material for this sort of work. The sketches shown in Ill. No. 25 will help to make the work sequence clear.

131. In making the corner horns, first cut a cardboard template to the shape of the body curve or sweep.

132. Trace this curve on a piece of stock 1/4 inch thick and wide enough to take sweep of horn (approximately 1 1/2 inch wide).

133. Cut out horn blanks and work to rough shape.

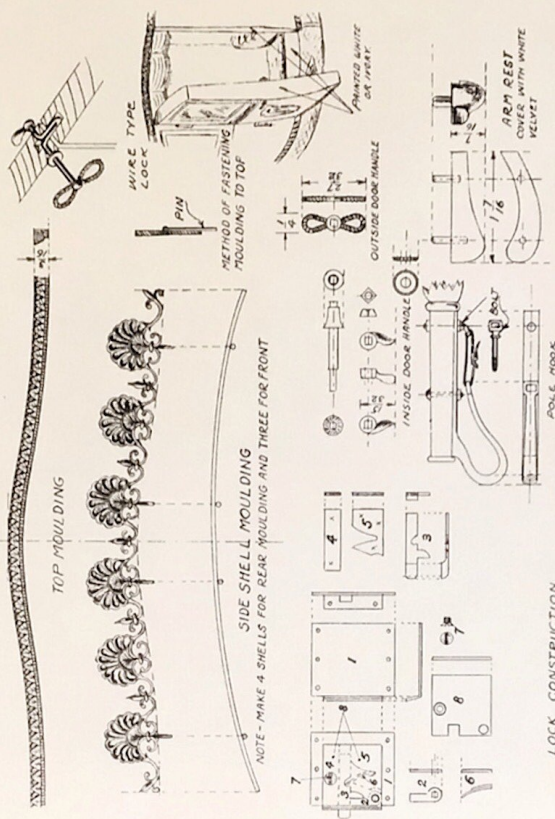
134. Fit blanks to corners of body by cutting out a "V"-shaped groove as indicated in illustration. A sharp pocketknife will do satisfactorily for this work.

135. File and sandpaper horn blank to a round shape and to proper diameter.

136. Carefully mark or lay off flutings.

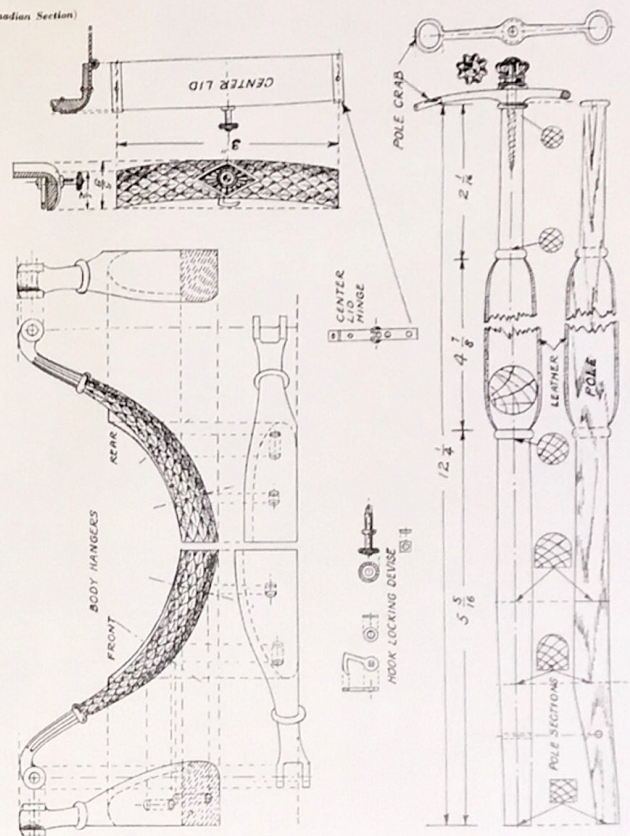
137. In order to hold the horns while cutting in the flutings, it will probably be necessary to either fasten horns in place on body or to fit horns to a special block of wood while carving.

138. Cut in flutings with small gouge. The Shank end of an old file can be shaped as a gouge very easily, if no gouges are at hand.



LOCK CONSTRUCTION

10



PLANS AND INSTRUCTIONS for building a Miniature Model Napoleonic Coach in the Fisher Body Craftsman's Guild Competition (Canadian Section)

139. Sandpaper each groove carefully so that flutings stand out clearly and distinctly.

Capitals

Illustration No. 21 shows two methods of making the capitals, one with the aid of a turning lathe, while a second method is illustrated wherein the capitals are built up in unit fashion, similar to suggestions given for hubcap.

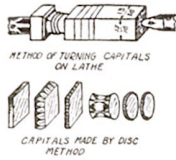


Illustration No. 21

140. After caps are shaped, they should be carved as shown on drawings of these details. Be sure that the design is carried around on all sides of the capitals.

Eagles

Undoubtedly, the best method of making the eagles is to carve them out of wood or some other easily cut substance or material. Many excellent hand-carved eagles were submitted on coaches in the various state

contests and in the national competition. The scholarship-winning coach of Donald C. Burnham of Indiana had hand-carved eagles of wood. Burnham says that the greatest difficulty he encountered in carving the eagles was to get all four to look alike.

141. For each eagle, you will need a piece of stock $\frac{3}{4}$ inch by $1\frac{1}{2}$ inch by $1\frac{1}{4}$ inch. It will be an advantage to have stock for all the eagles in a long piece, in order to handle better while carving.

142. Trace the eagle design from the drawing on page 4 onto this stock. Carbon paper should be used. Notice that the eagles have a right and left facing. In order to make the eagle which faces opposite the way shown on the Guild drawing, hold the drawing of eagle to window or electric light and trace the outline of eagle on back side of paper. Transfer to stock with carbon paper, as above.

143. With a coping or jig saw, cut eagle to outline.

144. Take a gouge or sharp knife and shape eagle body, wings, head, feet, and base.

145. Cut in feather, facial, and claw designs with small chisel or knife.

146. Another method would be to trace the designs on a thin piece of cardboard or wood and cut to outlines. Build up the body thickness and other features, using some such material as plaster of Paris, plastic wood, Savogran Crack Filler, etc. After these materials have set and are dry, carve and shape the necessary features.

Body mouldings

There is probably no one part which can either mar or enhance the beauty of the coach more than the rope

mouldings. They are the means of tying the whole coach design together. They tend to accentuate the graceful body sweeps and curves. Have the spiral divisions clear cut so as to give life to the moulding. Take care to have horizontal cross bands "line up" in a continuous line. The vertical mouldings of the door should be parallel to each other.

The body rope design mouldings may be carved out of wood, stamped into thin metal with a nail-shaped at end to produce "rope twist" effect, pressed into thin metal with a twisted wire form, cast in plaster of Paris moulds, or by twisting wire together and filing to produce the half-round effect required. Notice in making each moulding whether its spiral or twist effect runs right or left. All mouldings should be fastened to a foundation strip of thin wood, cardboard, or metal. Also notice that mouldings, including foundations, are not of same width but that bottom moulding is $\frac{1}{2}$ inch wide while left-line width is $\frac{1}{2}$ inch, and the moulding at top of door is $\frac{1}{2}$ inch wide.

If mouldings are made of wood, the method of making is shown in Ill. No. 25. If the moulding is to fit a

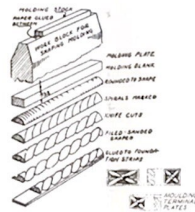


Illustration No. 25

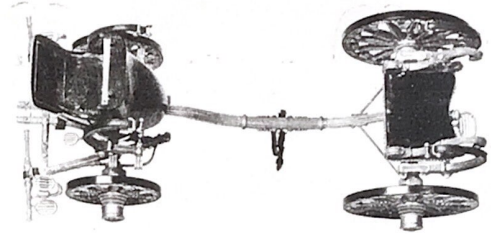
curved surface, cut foundation strip to shape first and then glue moulding in place on foundation. It may be necessary to steam the moulding in order to fit some of the curved surfaces.

All coach mouldings and other details should be fastened to coach so as not to show nails, screws, etc., except in cases where a roundhead nail is intended as part of the design.

Wood mouldings may be glued in place. Metal mouldings may be fastened by soldering short pins to back of mouldings and then pressing in place against body. A small amount of black airplane cement will help to hold moulding in place.

Moulding plates

Around the doors, the mouldings terminate or finish against a plate. These are made of metal pressed or punched to design or carved out of wood. The plates



PHOTOGRAPH OF ASSEMBLED COACH UNDERCARRIAGE

and mouldings around the doors are fastened to the door itself. Allow both the plate and moulding to project slightly beyond edge of door, to cover joints.

Roof moulding

The narrow moulding which fits around the coach at the roof line is best made of wood. It may be in a straight piece, steamed and bent to fit contour of top, or it may be cut to correct shape from the stock. It is probably easier to make this moulding in two pieces, glue these together, and then fit to coach. The drawing in Ill. No. 26 shows this idea quite clearly.

147. The total height of the moulding should be just a little wider than the roof thickness, so as to cover the joint where roof and body join.

148. Cut out moulding strips longer than required lengths to allow for fitting at corner posts.

149. First cut or plane several strips of wood to size ($\frac{1}{4}$ inch by $\frac{1}{2}$ inch by length required).

150. Plane one edge to the level or angle suggested in illustration. Round the edges, as indicated, with sandpaper.

151. With a pair of dividers, step off the divisional spaces of design. Sketch in design with pencil.

152. The leaf pattern is easily cut with a sharp knife. A fine piece of sandpaper (No. 00) or a triangular file will be useful in smoothing surfaces.

153. The beaded effect of the moulding is best made of a separate piece of wood ($\frac{1}{2}$ inch by $\frac{1}{2}$ inch by length). The beads are punched on the edge of this stock with a small sharp nail set.

154. For fastening this moulding to the edge of top board, a common pin works very nicely. Stick the pin in glue to make it hold in place better.

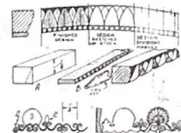
Shell moulding

Two methods of making the shell moulding are suggested in Ill. No. 26. Either method will be effective.

If metal and wire are used, as shown in Ill. No. 26, the shells can be made out of thin sheet brass or other metal. The shell design is easily stamped to correct effect with dies shaped from nails, bolt heads, etc.

If wood is used, the shell design should be carved.

The mouldings on sides have six shells; the back, four shells; and the front, three shells. The shell moulding should fit onto coach so as to be flush or even with roof moulding on the outside. These stems are placed on the side mouldings and two on the end pieces. These are necessary to fasten moulding to top.

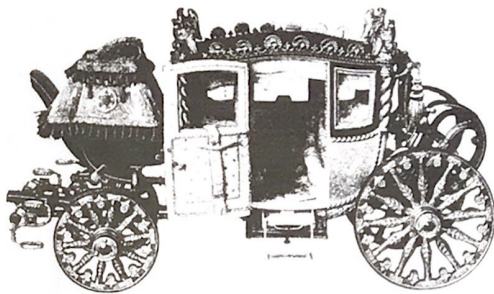


1. NAILS SHARP TO DESIGN
2. MAY NEED SOLDER OR GLUE TO HOLD MOLDING OUT OF PLACE
3. CUT OUT SHEET BRASS OR OTHER METAL TO MAKE MOLDING
HERE ARE SUGGESTIONS FOR MAKING FOUR TOP AND SMALL MOLDINGS

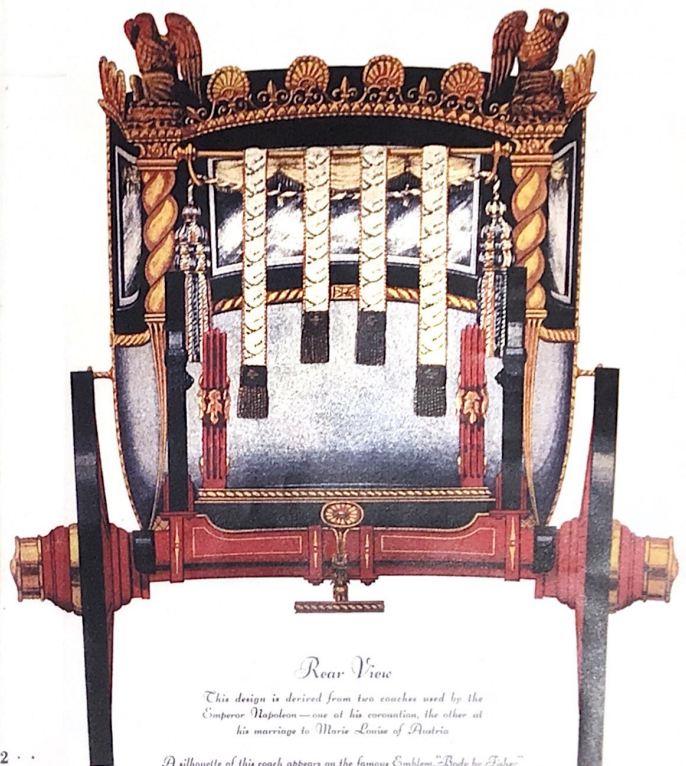
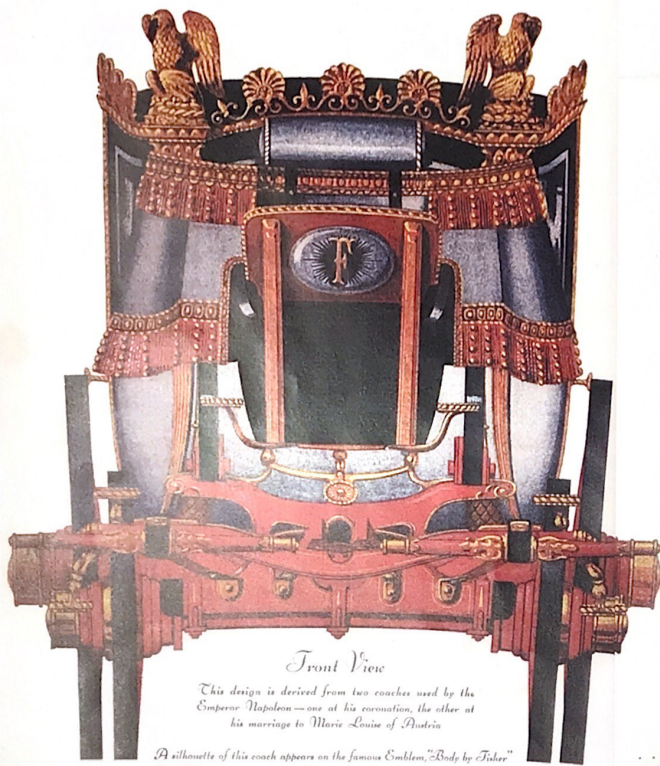
Illustration No. 26

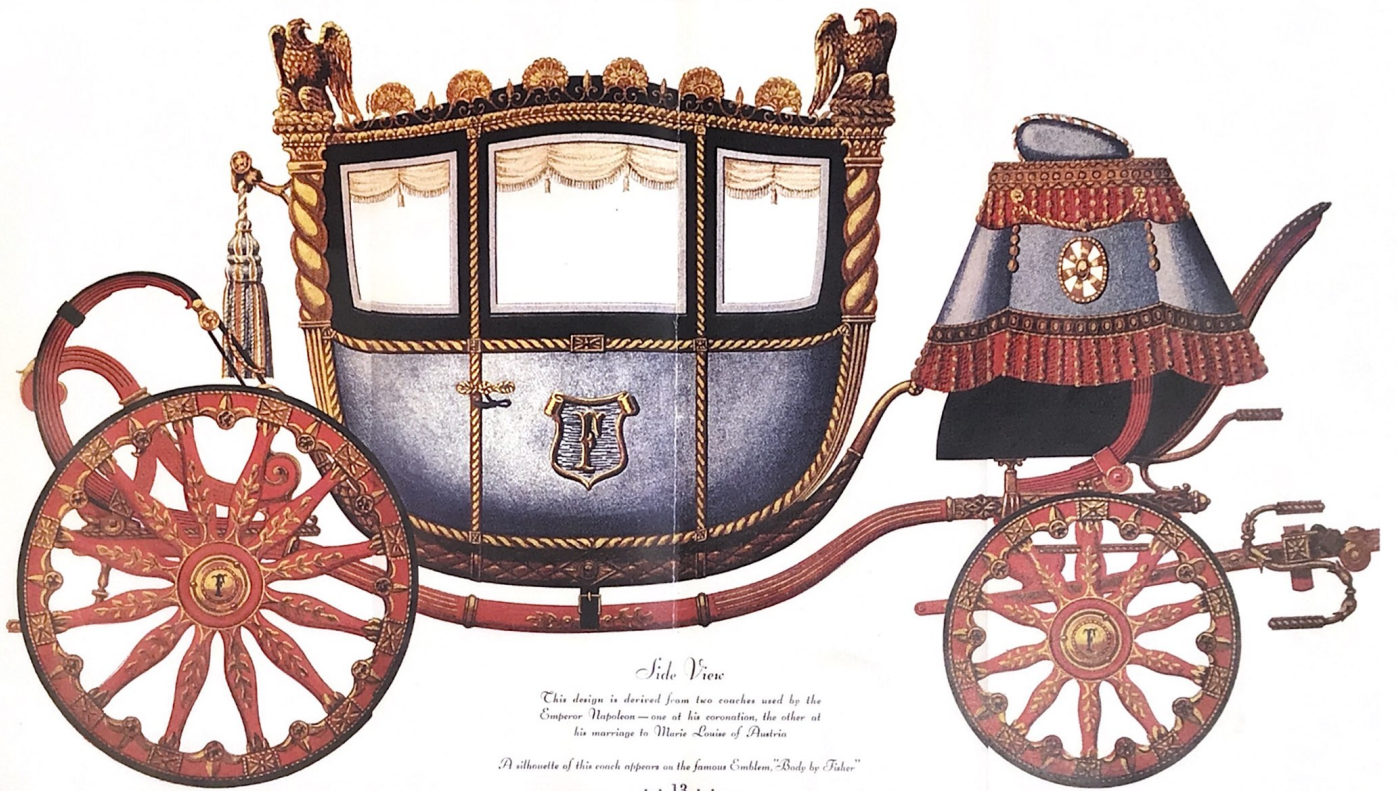
Body hangers and center lid

In order to suspend the coach body from the springs of the undercarriage, four body hangers are employed. The center lid connects the right and left hangers, acting also as a cover for the step compartment and as a means of carrying out the sweep or curve of the body



PHOTOGRAPH OF COMPLETED COACH





Side View

This design is derived from two coaches used by the Emperor Napoleon — one at his coronation, the other at his marriage to Marie Louise of Austria

A silhouette of this coach appears on the famous Emblem, "Body by Fisher"

and hangers. It will be noticed that the entire weight of the body is carried by these hangers. This will make it necessary to make two different patterns. Mark your patterns and work so that you will know which is the front and which the rear hanger.

155. From the Guild drawings, obtain a pattern of the hanger. Notice that there is a slight difference in the size of the front and rear hangers. This will make it necessary to make two different patterns. Mark your patterns and work so that you will know which is the front and which the rear hanger.

156. Trace pattern onto a piece of stock $\frac{3}{4}$ inch by 1 inch by $4\frac{1}{2}$ inches.

157. Cut out the hanger blank as indicated in Ill. No. 27.

158. Now mark the shape of the hanger neck on the blank. Cut and file to shape.

on the outside of the center lid operates the cam and lock bars. Note detail on page 19.

163. The center lid is hinged to the body by means of a special hinge made of a thin strip of metal $\frac{3}{8}$ inch or $\frac{1}{2}$ inch wide.

164. Fit strap around outside of center lid and shape end for hinge construction. The strap should be riveted to center lid and project beyond edges so as to cover joints between body hangers and center lids. Small purchased hinges may be used, if hinge construction suggested proves too difficult. In this case, straps will be used as joint cover strips only. Another method of locking center lid is suggested in the drawing, page 10. Here, a hook is fastened to inside end of a rod and is turned in or out of an eye to open or close lid.

Folding Steps

About the time of Napoleon, someone devised a step compartment idea whereby the coach steps, after being folded, slid underneath the carriage, out of the way. Previous to this invention, the steps folded against the inside of the door, thus being a source of annoyance to the occupants, as they occupied considerable foot room. On our coach model, there are two of these folding steps, one on each side, directly underneath the doors. The steps are housed in the compartment which is screwed to the underside of the coach body. The center lid acts as a cover and conceals the compartment from view.

Folding steps

165. The two cleats or cross bars can be made of most any wood. Work a piece of stock to size $\frac{1}{4}$ inch by $\frac{3}{4}$ inch by 12 inches. The length of each cross bar is best obtained by measuring distances on your coach between body hangers. The sketch No. 28 will give you a clear idea of the shape and position of these pieces.

166. For the steps and step guide pieces, some $\frac{1}{4}$ inch thick metal is used. The guide pieces are bent at right angles and screwed in place on inside surfaces of cross bars. At the ends of the guide pieces, a stop lug is soldered, or these may be cut out of the guide stock itself. These lugs act as stops and prevent the steps from being pulled out of compartment.

167. The steps are not difficult to make. The dimensions given on the Guild drawings and in Ill. No. 28 will make it easy for you to construct this feature of the coach. The steps are held in proper angle positions by small lugs on the sides of step arms. Notice where these items are located on the drawings.

168. Underneath, at the back of top step, two small lugs are soldered in place to strike against the lugs of guide pieces when steps are pulled out. The exact location of these lugs is best obtained by holding step in place in compartment and marking location points at places which will allow steps to fold properly outside of floor board.

169. A cover of tin or other metal is fastened to the cross bars. The sway strap loops, made out of $\frac{1}{4}$ inch

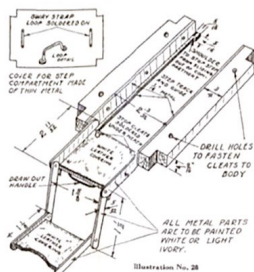


Illustration No. 28

wire, are soldered in place as indicated in sketch. The sway straps are fastened from these loops to loops on the reach.

Tonneau Block

The tonneau block is the foundation piece for the driver's seat. Before beginning the tonneau, it might be well to explain that, though the Guild drawings of this member of the coach show the block as a solid piece, tonneaus were usually constructed hollow. This made a large box-like compartment under the driver's

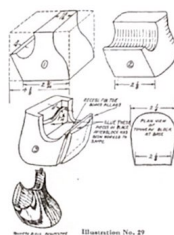


Illustration No. 29

seat, which was used for carrying repair parts for the harness and coach, and a supply of tools with which to do the repair work.

So even before the days of pneumatic tires and gasoline motors it was considered important to carry repair equipment.

The small board which is fitted across the tonneau

block under the driver's seat represents a part of the tonneau construction as made when the tonneau block was built hollow. This is the $\frac{3}{8}$ -inch by $1\frac{1}{8}$ -inch board shown in Ill. No. 29. It is called the heel board.

170. The tonneau block will require a piece of wood $3\frac{1}{2}$ inches by $3\frac{1}{2}$ inches by $4\frac{1}{2}$ inches. A piece of $\frac{3}{4}$ inch by 4-inch stock may be worked to the correct thickness and width, or several pieces of wood may be glued together to the size necessary.

171. Make a cardboard pattern of the side of the tonneau from the Guild drawings. Trace this shape or design on your stock, as indicated in step 1 of Ill. No. 29.

172. Saw to rough shape and finish to correct lines with wood file and sandpaper.

173. Plane the front of the block flat and true. This is important in order to have the toe-board pillars at the same angle of inclination when fastened in place.

174. Cut out the inside of block as shown in step 3, using a brace and a $\frac{1}{8}$ -inch drill for working out back portion. Finish with a sharp chisel and sandpaper.

175. Round the outside surfaces, sides, and back to shape. A chisel, coarse file, and sandpaper can be used for this work.

176. Glue in the $\frac{3}{8}$ -inch by $1\frac{1}{8}$ -inch heel board piece at back of tonneau recess.

177. Make the "fill in" piece for the front, which is to be fitted between the toe-board pillars. Glue in place. The stock required for this is $\frac{3}{4}$ inch by $1\frac{1}{4}$ inch by $2\frac{1}{2}$ inches. The toe-board pillars may be cut from one solid piece of stock and the design carved as indicated on drawings, or the base may be cut first and thin pieces glued to this for the raised center and the design.

Driver's Seat Cover Foundation Form

The finished appearance of the driver's seat cover will depend largely upon correctly making the foundation piece or form upon which the velvet, fringes, and braid are fastened. There are several ways in which this foundation piece may be made. One method involves the making of a wooden or molded form of the shape and size given on the Guild drawing. Over this form are fitted pieces of cardboard. The corner bonnets should be made of drawing paper or other similar paper so that they will conform to the shape of bonnets. Allow a $\frac{1}{4}$ -inch lap on each side of the bonnet cut-out to glue to the side and end pieces. A piece of white cloth, such as sheeting, muslin, or old linen, is now glued over the entire outside surface. In order to have sharp lines at the corners of bonnets where they join side and end pieces, tack strips of cardboard or wood along these joints. Do not remove the cover from the form until the glue has set.

Driver's seat cover

Another method, which will not necessitate making a form or block, would be to make a layout of the sides,

ends, and bonnets on a piece of tin. Cut out, fold at joints, round-shape the bonnets, and solder together at joint. Solder top piece in place. In order to sew the cover and trim material to this tin form, it will be necessary to punch a row of holes about $\frac{1}{4}$ inch apart along top and bottom edges. A sharpened nail will punch the holes. A piece of fine-meshed wire screen, such as is used in strainers, offers another possibility of material in the place of tin. Sewing can be easily done through the meshes of wire.

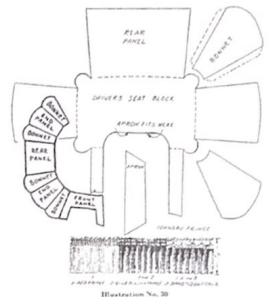


Illustration No. 30

178. Ill. No. 30 shows another method of making up the cover without the use of a wood or molded form. On a piece of cardboard, trace the top of the driver's seat block. This can be obtained from the Guild drawing, which is full size. Notice the addition of the rounded corner pieces on the top view. These will help to keep bonnets in shape.

179. Lay out the two end panels, the back panel, and two front pieces, using the full size patterns of layout given on Guild drawing, page 17.

180. Take a sharp knife and cut out this pattern.

181. Bend panels on dotted lines. A better fold can be made if a very light knife line is cut across edge to be folded.

182. Make a cardboard pattern of the bonnet and trace four of these onto a stiff paper such as a tag board or drawing paper. Allow a $\frac{1}{4}$ -inch or $\frac{1}{2}$ -inch lap on each side of bonnet to permit gluing to sides and ends. One side of the bonnet pattern is slightly shorter than the other. This is due to the fact that the end panels do not slant as much as the back and front panels. This also throws the longest part of bonnet pattern off the center line, as bonnet layout shows.

183. Glue bonnets in place. Bonnets will assume and retain circular shape if they are rolled around a pencil before gluing.

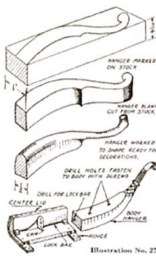


Illustration No. 27

159. The diamond design should now be carefully drawn on the hanger and the design cut in the wood with a knife and file.

160. The hangers are fastened to the body with screws, as indicated in the sketch. In fastening these to the body, care will have to be taken to have the distances between the hangers at the ends correspond to the distances between the spring ends of the under-carriage. This will be approximately $3\frac{1}{4}$ inches between hanger centers at the front and $4\frac{1}{2}$ inches in the rear. Before the hangers are fastened to the body, holes should be drilled for the spring-eye shackles.

161. The center lid will not be difficult to make. After the shape and design have been worked on the lid stock, cut out the inside portion, as suggested in Ill. No. 27, to receive the lid locking device.

162. The lock is easily made, following the suggestion given in Ill. No. 27. Two $\frac{1}{2}$ -inch wires are fastened to a cam. The cam moves these lock bars backward and forward. Holes are drilled in the ends of body hangers to receive the lock bar ends when lid is closed. A handle

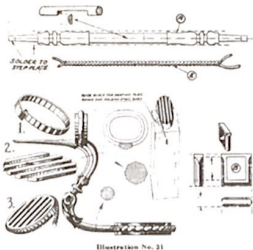
184. Glue front panel piece in place.

185. Cover with white cloth as suggested in introductory paragraph. When doing this, fit form over driver's seat block. Tack end and side panels to edge of seat board. This will give correct angle to these pieces. Work in joints of bonnets and panels with thumb nail so that these corners will be sharp. Allow to dry before removing the seat block. The cover is now ready for the upholstery material.

Front or Splinter Bar Steps

On both ends of the splinter bar are the front steps, and fastened to the tonneau block are the tonneau steps, the means of ascending to the driver's seat. At the rear is a step attached to the end of the reach pole, permitting easy access to the footman's board.

The gooseneck or bent rod which supports the front step plates should first be turned or filed as a straight piece to the shape shown in Ill. No. 31.



A piece of wire solder, copper, or soft iron wire is the best material for making this part of the step. At the center of the bar, a flattened place is filed into the wire to receive the splinter bar frame. A piece of wire, $\frac{1}{8}$ inch diameter and $3\frac{1}{2}$ inches long, is needed for each of these step arms.

The splinter bar frame is easily made by bending a piece of $\frac{1}{8}$ inch by $\frac{1}{2}$ inch by $1\frac{1}{2}$ inch brass or other metal to fit snugly over the splinter bar end. This form is then soldered in place in the recess filed in the step bar arm. The outside of the frame is slightly round, as indicated in sketch B.

The leaves which are a part of the bar arm design may be cut from sheet lead, brass, copper, galvanized iron, or heavy tin and soldered in place, or they may be cut of cardboard and cemented in place.

For each of the step plate rims, a piece of brass or other metal $\frac{1}{4}$ inch by $\frac{1}{2}$ inch by $2\frac{1}{2}$ inches is required. Before bending the strips to shape, scratch two

lines across each piece lengthwise to mark the width of the recess for the twisted wire rope moulding.

In order that the shape of the four plates may be alike, a wood form should be made on which to bend the rim. This may be done by working a small piece of hard wood down to an elliptical shape, the outside dimensions of which correspond to the inside dimensions specified for the step plate rims. Then bend the rims around the form. Solder the ends of the rim together. File the groove between the scratched lines with a small rat-tail file or a triangular file.

The cross bars should be set in slots which are cut in the rim, equally spaced as shown in Ill. No. 31. Probably the easiest way to do this will be to lay out and cut slots in the wood form which has been used for shaping the rims. The slots in the wood form would then act as guides in cutting the rim slots. Solder the bars in place, file and smooth the joint.

Twist two pieces of any soft wire together for the rope effect and solder in place in the groove, or file a twisted wire moulding flat and solder to outside of step rim. An easy way of twisting the wires is to double a length of wire and fasten one of the ends in a vise. The other end of the wire is tied to a hand-drill chuck. By turning the hand drill, the wires will weave together evenly and tightly.

Rear step

The rear step is made in the same manner as the front steps. The upper elliptical ring should fit tightly over the end of the reach pole. Two rivets or set screws are fitted into the reach through the back tongue, which fits just under the reach. The reach pole cap is fitted on the end of the reach after the step is in place.

Tonneau steps

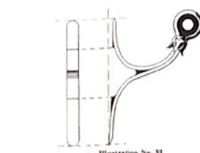
There are two of these steps and they are made as indicated for rear and splinter bar steps. The drawings, pages 19 and 21, show the shape and sizes of these steps. Fasten to bottom of tonneau with wood screws.

Footman's rail and rail brackets

The footman's rail, from which hang the two large tassels and the four white streamers, will present no difficulty. The rod itself is simply a piece of wire $\frac{1}{2}$ inch diameter by $4\frac{1}{2}$ inches long. The ends are threaded for the caps. If it is impossible to thread the ends of the rod, a heavy metal cement or solder will hold the caps in place. A wooden rod may also be used for the hand rail. In such a case, a small dowel rod such as is used on "all-day sucker" candy will be about right. The caps for the ends may be turned on a lathe, or the caps of tooth paste, cement, or other tube containers, if not too large in diameter, will make an excellent substitute. A small stop washer or plate is glued or soldered near each end of the rod, as shown on drawing, page 17.

Two methods of making the brackets are suggested. In Ill. No. 32, a piece of wire is bent to the "S" shape shown. Another piece of wire is soldered to this to make

the other leg of the bracket. The ends of the wire are flattened, drilled, and countersunk for $\frac{1}{4}$ inch flathead wood screws. The upper outer end of the bracket is also flattened and drilled for the hand rail. The small leaves may be made of cardboard or thin lead and glued in place. Fill in joints where needed with solder. The drawing on page 17 shows the brackets made of

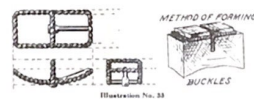


thin strips of metal $\frac{1}{8}$ inch thick and $\frac{1}{4}$ inch wide. This is bent and filed to the shape shown. These metal bands are soldered together at the neck and "built up" with solder at joints or where thicker material is needed. Round off the edges slightly with a file. The bracket can also be cut out of a piece of solid brass and filed to proper shape.

The cord on which the tassels are fastened hangs from two holders fitted on the ends of the rail between the brackets and the small stop washer. They should "toe in" so that the large tassels will hang away from the springs.

Buckles

The buckles for the various leather straps are made by twisting wire together and then bending and shaping to sizes for different buckles. This is done by twisting two wires together, bending and soldering to shape. The sizes given in illustration No. 33 are for the larger buckles, used on the leather spring straps. The buckles for the away straps are smaller, as the drawings show, while the buckle for the pole pin strap is still smaller.



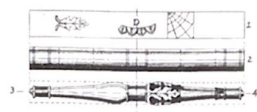
as indicated on pole strap drawing. House-bell wire twisted together will be about right for the smaller buckles, while stovepipe wire can be used for the body hanger strap buckles. See page 19 for buckle details.

Singletrees

If one has access to a lathe, either metal or wood-working, the singletrees will present no difficulty. Either

metal or wood will be satisfactory as a material for the trees. The procedure is indicated in Ill. No. 34. In step No. 1, the stock is turned to maximum diameter plus $\frac{1}{8}$ inch, or a total diameter of $\frac{1}{4}$ inch. Step No. 2 shows the turned stock marked off for the various design features, while step No. 3 shows the stock turned to correct diameters and shapes. The turned tree is shown in step No. 4. The leaf design is easily cut out of this metal or cardboard and glued or tacked in place.

Sketch D shows a method of laying out a pattern for



the small decoration which fits on the ends just back of the second ring or bead. See detailed drawing on page 6.

The same general method described above may be used for making the singletrees without the aid of a lathe. First, make a round piece as in step No. 1. Mark off the center divisions. Shape both ends to a round taper, omitting the beads. This can be easily done with a knife, file, and sandpaper. The beads may be put on at the desired locations, after shaping has been done. Wire will work nicely as bead rings. For the small rounded ends of the trees, an excelsior pin or common pin-head will be satisfactory.

Sketches on page 19 show the details of the metal clamp used to hold the leather loop strap together at the center. One end of the strap is fastened around the splinter bar tree loop and the other around the center of the tree itself.

The perspective sketch, page 21, will help to give the idea of the method of fastening.

Door initial shield

The door initial shield may be made of thin metal. Cut the various pieces needed to the shapes shown in



Ill. No. 35. These are then glued or soldered together. The total thickness of the shield should be $\frac{1}{4}$ inch. The shield should be held in place by means of glue and three small leads, or "cut off" ordinary pins. If

the ornament is made of metal, short pins may be soldered to back of shield. The shield is then held in place by pressing pins in door.

Wheel Decorations

The leaves of the spokes, the spoke and fellow ornaments and shoes themselves may be made in one of several ways. Many Guild coach builders prefer to cast these details in plaster of Paris molds. Excellent results are also obtained by making dies of the various designs needed, and stamping the design in thin metal.

Do not make features of design too delicate. The gold paint tends to "fill up" and thus obliterate such lines.

An excellent method of making the leaf part of the spoke shoe is shown on the drawing on page 4. A piece of thin tubing is filed to shape on one end and then cut off to length with a hacksaw. Repeat operation for as many parts as needed.

Another good method for making this detail is indicated in Ill. No. 36. Here, a pattern layout is folded up



and around spoke end. The rest of the spoke shoe should be made of one piece of metal, stamped with design and bent over fellow, as is shown in sketch and drawing on page 4. A small roundhead nail or common pinhead will serve as central part of the design, and will also be a means of fastening side of shoe to fellow rim.

Fellow shoes may be made by one of the two methods suggested under the item "Wheel Construction," page 5. In either case, a metal plate will be required to complete the shoe design. If a turned fellow is used, the plate will be of the shape shown on drawing, page 4. Where the fellow shoe is cut out as part of fellow rim, the plate will cover the side of shoe completely.

The fellow shoes may also be cast as a complete unit. This would include the shoe itself and the inner and outer plates. File or cut out between plates to fit over fellow.

Spoke leaves may be made of either thin brass or other metal, or sheet lead. Any piece of lead may be pounded to a flat surface with a hammer. Printers' space bars are excellent for the leaves and other wheel decorations. Thin sheet aluminum will also prove very satisfactory.

The leaves may be punched out of thin metal with a die, in the same manner as the other wheel ornaments. If sheet lead or aluminum is used, trace design on a piece of paper from full size drawing. Glue the design on a piece of metal. Cut to shape with a jeweler's saw blade or very fine coping saw. Several leaves may be

PLANS AND INSTRUCTIONS for building a Miniature Model Napoleonic Coach in the Fisher Body Craftsman's Guild Competition (Canadian Section)

cut at one time by clamping or pasting several metal strips together.

A twisted wire rope moulding is soldered to inner edge of rim or tire. Notice, in the cross section view of the felloe on page 4, that this wire is set halfway into the felloe rim. This result is easily accomplished by filing a short bevel or slant on outside edge of felloe before fitting rim or tire in place.

Pole or Tongue

The pole will present no difficulty in construction, it being a single piece of wood shaped as shown on the drawing, page 10. The pole is detachable from the body, and is held in place between the center arms by means of a pole pin. The pole pin, in turn, is held in place by a leather strap, which prevents the pin being jarred out of place. Also notice on the drawing of the strap that the pinhead is sewn or glued to strap itself.

A small round piece of leather, through center of which pin is forced, is glued or sewn to strap.

186. For the pole, use a piece of stock 1 inch by 1 inch by 14 inches.

187. Turn on a lathe or cut and file front and center of pole to size and shape shown on drawing.

188. With a straightedge, draw a center line lengthwise of pole.

189. Now measure on both sides of this center line one half the thickness of back of pole at its widest point.

190. Carefully saw, file, and sandpaper to line.

191. Now take pattern of side view of pole and lay off on the flat surfaces.

192. Cut, file, and sandpaper to shape.

193. Check pole for alignment, end to end, by sighting; that is, see that pole is straight and true.

194. Cover the large, central round part of the pole with black leather. The heads on either end may be turned on pole, or narrow strips of leather may be glued over the ends of leather cover.

Pole crab

For the crab, a piece of brass, iron, or aluminum $\frac{3}{8}$ inch by $\frac{1}{2}$ inch by $2\frac{1}{2}$ inches is needed. If $\frac{3}{8}$ -inch metal is difficult to obtain, a thinner metal may be used and the thickness obtained at center of crab by building up with solder. Raymond Doerr, national winner from Michigan, used this latter method in making his crab.

195. Carefully lay out, from center lines, center hole and center of oval ends.

196. Drill $\frac{1}{8}$ -inch holes for ovals; file smooth and to shape. The metal forming ovals should be round. A piece of $\frac{1}{2}$ -inch wire may be bent to oval shape and soldered in place at ends as another means of making end ovals.

197. Round all edges of crab so that no sharp corners remain.

198. Bend to fit curve on drawings.

Pole hook

The hook is made from a piece of $\frac{3}{8}$ -inch wire.

199. Flatten one end of wire to fit pole, and drill for small bolts.

200. Bend and shape hook to fit drawing, side view.

201. Flatten end and drill for strap. Strap is of black leather, $\frac{3}{8}$ inch wide.

Pole and reach caps

The ornamental caps at ends of reach and at front of pole are either filed and worked to shape out of a piece of metal or they may be cast of lead in molds. If cast, a pattern of wood or wax is first made and the molds made from this pattern.

Brass or iron bolt heads can be easily filed to the shape of pole and reach caps, if these details are being made rather than cast.

Pole crab and cap are held in place by a small roundhead screw. Drill a hole in end of pole just a little smaller than screw diameter, to keep end from splitting when screw is fastened in place.

Reach caps are glued to ends of reach, if these members are made of wood. If made of metal, caps should be made with a round dowel or pin on back. Drill end of reach and solder or glue caps in place.

For the footman's board, a piece of $\frac{1}{2}$ inch by $3\frac{1}{2}$ inches by $3\frac{1}{2}$ inches wood is cut to the outline given on the Guild drawings. The edge has a rope moulding.

Refer to paragraph on body moulding for the method of laying out and making the moulding itself.

Footman's Board Retainer Arms

202. The retainer arms may be cast in metal from a pattern, or they may be cut out of a piece of wood as indicated in illustration No. 37. The patterns are full size, as given on the Guild drawings.

203. After the arm blanks have been cut from the stock, round the corners with a file and sandpaper.

204. The decorations at the ends may be carved or the surfaces may be left flat and the scrolls cut out of

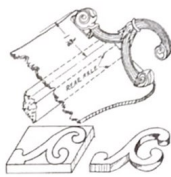


Illustration No. 37

cardboard. These are then glued in place. The same method may be used in making the leaf design at the center.

205. The arms are fastened to the board with a thin $\frac{3}{8}$ -inch flathead wood screw, the head of screw being underneath the board, out of sight.

206. The board is fastened to the carriage by means of the two footman's board angle brackets, illustrated on Guild drawings. One end of the bracket is fastened underneath the rear spring assembly, the board being fastened to the other end.

Upholstery

The upholstery work of the coach will require careful attention to detail and cleanliness. The entire interior of the coach is trimmed in white silk velvet, chifon, velour, or other materials of similar nature.

The floor carpet or covering may be a heavy white velour, white fur, or imitation fox cloth. Refer to the item "Seat and cushion forms," page 5, for a method of shaping the seat and back cushions in wood. Cover the forms with white velvet. A thin layer of cotton batting put over the wood form before covering is put on will help to emphasize the tufting effect. Use an old gold color silk thread or floss for French knots. Draw each knot well down into cushion. See that all knots are approximately of the same size. Leave seat cushion looses—backs may be glued in place.

1. Cardboard form for upholstering seat.
2. Cotton cloth glued on lower half.
An cardboard strip to keep cotton from being displaced.
3. White silk velvet glued on piece. Pad very lightly with cotton batting. French knots for buttons.
4. Upper half covered with white silk velour.
5. Gimping or more ribbon binding under cushions.
6. Finished seats to be glued in place in coach.
C—Old gold or gold cord—how seated cord should sit.

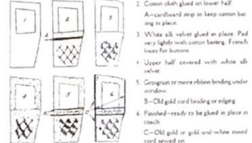


Illustration No. 38

III. No. 38 shows you step by step, just how to go about building up side panel trim. This same idea is used for the door and upper trim of front and rear panels.

207. Patterns of the parts to be trimmed are cut from cardboard or thick paper. Trace this pattern direct from your coach body. Do not have patterns too full, since you must allow for turning the trim material around edges.

208. The trim is glued to the paper pattern and the whole is then glued in place in the coach. Use a white glue or cement so that material will not become soiled by the glue soaking through. Rubber cement works well, as it does not soak through materials.

209. If a heavy, thick trim material is used for the

interior trim material, such as velour, this may be glued direct to the inside of coach sides and ends without first gluing to a paper pattern.

Headlining

The headlining, as the covering for the inside of the top is called, is built up on a cardboard form. This should be about $\frac{1}{4}$ inch thick so as to allow for pressing the cloth into the creases to produce the sunburst effect. Study drawing on page 17 for method of construction.

In order that the cardboard fit the contour of inside of roof in the best possible manner, wet cardboard and press to fit roof shape. Hold cardboard in form until paper has become dry.

Refer to the drawing of the headlining and note in the cross section view that the central oval is padded slightly to make it the thickest part of the design.

Sew or glue a mixed gold and white or old gold color cord in spaces cut out for the ovals and rectangular frames.

Glue whole headlining assembly in place inside top.

Miscellaneous trim

The curtains should be draped as shown on side and end views of coach assembly or color prints. A white or pale ivory color silk or chifon should be used. The narrow curtain fringe may be sewn on to edge of curtains, or the edge of curtain itself combed out to a fringe effect. Make the small tassels out of silk thread or floss.

Beads for the tonneau fringe may be purchased in most any store. Glass beads are easily gilded gold by dipping them in gold paint. An excellent substitute for the bead fringe is a metallic bullion fringe, and may be secured in the dress trim department of stores.

A white silk fringe may be dyed red, if a red fringe is difficult to secure. Do not fluff this fringe, but leave in strings so as to hang tightly and neatly to tonneau cover.

The white and gold ornaments on either end of the driver's seat cover can be cut from old lace curtains, doilies, or embroidery work. These should be white. Gold-colored embroidery floss can be worked into design to produce general effect shown on color prints.

The grip or toggle cords hanging on both sides of the door inside may be made by using a white silk cord. Slip a small white bead over the cord and glue in place about $\frac{1}{4}$ inch from the end. Fray end for tassel effect. An excellent toggle grip may be made from a small, round stove bolt or machine screw. Solder a small wire ring in screw slot as a means of hanging grip to sides. Glue silk thread or floss on other end of bolt for tassel. Paint bolt white.

The window lift straps and the footman rail streamers are made of white gimping or more ribbon. This ribbon should be edged with an old gold cord and have a total width of $\frac{1}{4}$ inch. Back of ribbon should be lined

with a thin piece of white leather or cloth; or the ribbon may be doubled. Shoulder-strap ribbon will also do nicely for strap ribbons.

Make up the large tassels hanging from hand rail at back of coach according to suggestions given on drawing, page 17. The top part of wood form can be covered with blue silk cloth and the colored cords sewn or glued on.

The footman's board and inside of toe board are covered with a thin, black leather. Your drawing, page 19, shows the size and location of these pieces.

For upholstering the tonneau cover, first make a paper pattern layout of the entire cover, as suggested in III. No. 30. Check this pattern with your cardboard foundation for fit. If correct, cut the blue silk velvet, or cover material used, to this pattern. Allow enough width to turn material under for gluing, top and bottom. Glue cover piece in place, making certain that intersections of the side and end panels are sharp and distinct. Top of tonneau form is also covered with blue material.

The driver's seat cushion may be made out of a piece of wood and covered with blue velvet, or a piece of sponge rubber may be used in place of the wood form. The cushion is held in place by means of two hooks which fit or hook in the staples on top of seat board.

The front is held down by the two leather straps which are buttoned over nail or escutcheon pins on front edge of seat board. See the drawings on pages 15 and 21 for details of these items.

Painting

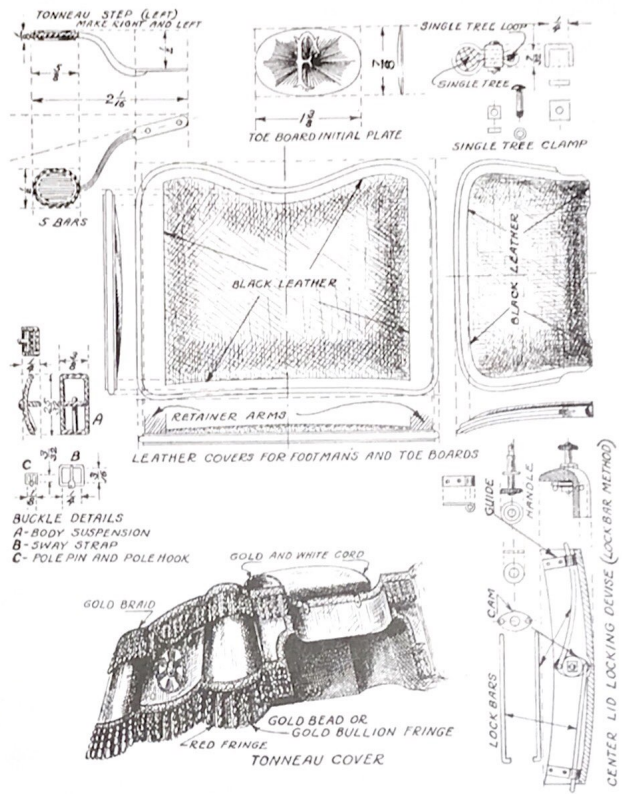
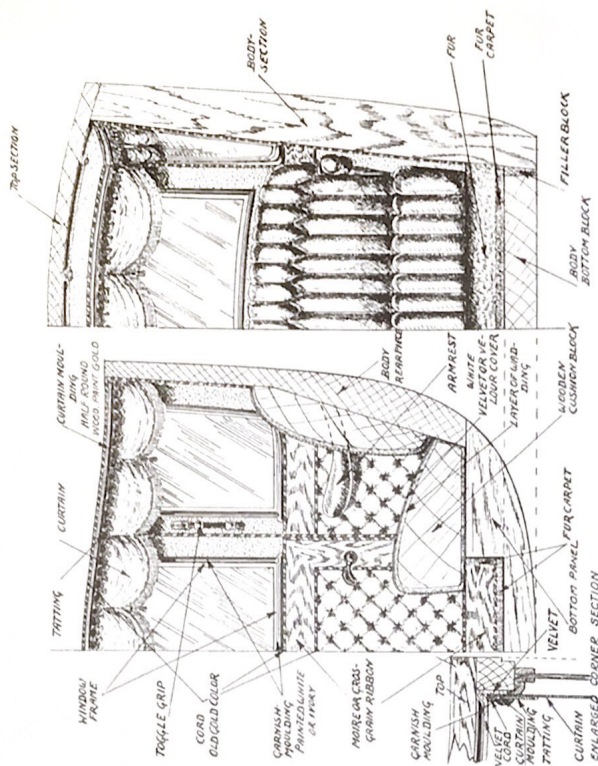
A successful paint job will, in the first place, depend upon a carefully prepared surface. This implies carefully sanded wood parts, and filed, cleaned, and smoothed metal parts. All traces of glue should be removed from surfaces to be painted. Don't think for a moment that paint will hide defects. Paint only tends to emphasize defects so they stand out more prominently.

The second essential to a good paint job is fresh, clean materials, brushes, and containers. Two or three fine camel hair brushes will be needed. A flat brush about half an inch wide will do for the larger surfaces, and a tiny, pointed brush for mouldings, etc. Do not allow paint or lacquer to harden in the brushes. Do not mix in, with the rest of the paint, the "skin" or thick scum which forms on top of paint left uncovered.

If paint is lumpy or full of "skin" particles, strain through a piece of muslin. Keep unused paints tightly covered. Three types of paint material may be used for finishing your coach—lacquer, enamel, and paint. Each has its advantages and its disadvantages.

Lacquers are of two kinds, one for spraying and the other for brushing. If one has the equipment necessary for spraying, it may be possible to spray some parts of the coach. In doing this, all surfaces not to be sprayed with the particular color being used should be covered with paper or tape. Spraying will require possibly ten

PLANS AND INSTRUCTIONS for building a Miniature Model Napoleonic Coach in the Fisher Body Craftsman's Guild Competition (Canadian Section)



PLANS AND INSTRUCTIONS for building a Miniature Model Napoleonic Coach in the Fisher Body Craftman's Guild Competition (Canadian Section)

to fifteen applications in order to "build up" a good surface.

Brushing lacquer is thicker and so will require only two to four coats. Lacquer dries very quickly. This feature is both an advantage and a disadvantage. A quick-drying material will not collect dust while drying and permits of handling the painted parts quickly. Lacquer, however, cannot be "brushed out" and "evened" as can enamel or paint. It must be applied with a full brush. If you have never used lacquer before, a little practice may be necessary before you can do the best kind of a job. When lacquer becomes too thick, add a small amount of thinner. Do not use turpentine, oils, or other such material for thinning lacquer.

CAUTION—Lacquer and lacquer products are highly inflammable. Do not use these materials near an open flame.

Enamel is probably the next best material to use. Get the quick-drying (four-hour) kind. Enamel can be "brushed out" to an even surface, because it does not dry as quickly as do lacquers. If enamel is used, the painting should be done in a room as free from dust as possible. Air and light aid in the drying process, so do not put freshly painted coaches in tightly covered boxes.

Carefully clean all wood surfaces with very fine sandpaper. Coat them with a thin coat of orange shellac, which may be thinned with alcohol. Do not shellac the metal parts. Secure a special metal surface or primer, such as "Dux" as put out by the du Pont Co. Have undersurfaces smooth and free of all imperfections. If necessary, add a second coat of shellac and primer to secure the right surface before putting on the paint.

Paint the body colors first. Sandpaper smooth after each coat. Finish final coat with a fine powdered pumice stone and water, applying pumice as shown in illustration No. 39. Avoid rubbing corners and other projections too much, as these wear through very easily. Put on as many coats of enamel as are necessary to produce a clear, smooth finish.

After the body colors have been applied, decorate the coach as needed with gold paint. Mix up only as

too heavy. A heavy gold paint will "fill up" designs and cause a "blurred," indistinct result.

Ordinary house paint may also be used for painting the coach, but possesses a great disadvantage in that it dries so slowly. If it is used, proceed as with enamel. After the final coat, coat all surfaces with a thin good grade of varnish. Rub down and finish with pumice and water when dry, and then polish with furniture polish.

Paints and enamels may be thinned and brushes cleaned with turpentine. Brushes used in lacquer should be cleaned with thinner. Above all, do not try to hurry your paint job. Allow ample time for drying between coats.

Countersink the screw heads level with the board. Screwing on the top prevents damage to the coach through driving of nails, and also makes it easy to unpack and repack the box.

The sketch shows how the coach is held securely in place in the box. The weight of the body is supported on the two center blocks, "C." The top of each block is fitted with sponge rubber, felt, or pads made of cotton or cloth. The total height should be such as to have the body weight entirely taken off the undercarriage.

The blocks "C" should be just long enough to fit snugly between the front and rear wheels. This prevents coach rolling forward or backward. Nail or screw the cleats securely to the floor board.

Supports for the front and rear axles are indicated at "A" and "B." These are intended to relieve any strain on the axle shafts. They should be made of such a height as to just carry the weight of the undercarriage. Locate points on the box sides opposite the hubs. At these points, nail the blocks "F." Pad these blocks with rubber, felt, or cotton pads so that the coach wheels will fit tightly between pads. This will keep the coach from moving sideways.

A block and pad, "G," is fitted to the underside of the top board and so made and placed that the pad fits on the top of the coach with a light pressure. In order to find out the amount of space between the top of the coach and the top of the box, set the coach in the proper position in the box on cleats or supports "C"; drill a small hole through the top board in the center. Place the cover or top on the box. Through this hole, measure with a piece of wire or a thin stick of wood the distance to the coach top. Subtract the thickness of the top board. The remaining distance is the space to be filled with block and padding "G" which, however, should be thick enough to exert a slight pressure on the coach top at all times. The pole (tongue) is fastened to one of the sides as shown. The back part of the pole is slipped into the loop of leather or cloth, which should button, buckle, or snap over the pole. This will make it easy to remove the pole from the box. A piece of felt or padding placed underneath the pole will keep it from being marred. Fill spaces between coach and box sides and ends with paper pads or padding.

Suggestions
Do not mount the coach on a baseboard or other mounting device.
Have the pole (tongue) detached from the coach.
Do not send the coach with a glass protective case.
Do not pack the coach in loose excelsior, hay, or similar materials. These offer no protection to the coach and tend to scratch painted surfaces.
Do not have your name stamped, printed, or painted on your model.
Do not pack the model until paint has thoroughly dried.
Do not add any extras, such as horses, canopies, etc.

A piece of waxed paper applied to surfaces which come in contact with rubber or other padded supports will keep the paint clean and help prevent possible sticking of pads to paint.

Pads made of excelsior, paper, etc., wrapped in fine tissue or waxed paper, should be placed between parts that are apt to strike against each other, and between coach and box sides and ends.

A piece of wrapping paper placed over and around the model will help to keep it clean.

Handles of rope or wood put on the ends of the box will facilitate proper handling of the boxes.

Upholstery and Trim Materials

Much of the upholstery trim material needed for your coach can, perhaps, be salvaged from scraps about the house. Here is a list of materials needed, with suggestions as to departments in stores handling such items, if purchased.

- 1 1/3 yd. 12" x 39" white silk velvet or chiffon for interior trim and seat and back covers. (Dress goods department.)
- 1 piece blue velvet, 9" x 21", for tonneau block and seat covers. (Dress goods department.)
- 3 40" red fringe, 3/4" skirt for top and bottom tonneau trim. (Dress trim—furniture trim.)
- 42" gold bead head, 1/4" wide, edging for red and gold bead fringe. (Lamp shade trim.)
- 42" gold bead fringe or bullion fringe, 3/4", skirt, top, and bottom tonneau trim. (Lamp shade trim—dress trim.)
- 52" white moire or grosgrain ribbon, 1/4" wide, for interior trim edging, window lifts, and footman straps. (Ribbon department.)
- 1 piece fur carpet or substitute, 4' x 43/2". (Dress and suit department.)
- 2 1/2" tating or lace, 3/4" wide, edging around curtains inside at top of coach. (Lace department.)
- 2 1/2" white or pale ivory silk, 2" wide, for curtain material. (Silk department.)
- 2 skeins D.M.C. No. 3, color No. 437 (old gold) or equal, edging for moire ribbon and French knots. (Fancy-work department.)
- 1 skein No. 3 D.M.C. white or equal, embroidery floss for curtain tassels, and to mix with No. 437 for gold and white cord. (Fancy-work department.)
- 1 skein blue No. 3 D.M.C. or equal, embroidery floss for footman's tassels and cord. (Fancy-work department.)
- 1 piece 3/4" x 12" black or black patent leather (this for footman's, the toe board, and pole cover. (Shoe repair shops—upholstery shops.)

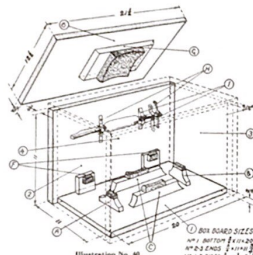
- 14 1 piece 2" x 6" white leather, folding step covers. (Shoe repair shops.)
- 15 1 piece 1/2" x 13/2" x 8" black leather for spring and body hanger straps. (Shoe and harness shops.)

Wood Stock List

- 1 pc. pine, 13/4" x 4" x 19"—bottom and ends.
- 1 pc. pine, 13/4" x 6 1/2" x 24"—sides and top.
- 6 pc. pine, 3/4" x 1 1/2" x 18", felloe blocks or 1 pc. ply wood, 3/4" x 6" x 24"—wheel or felloe rims.
- 1 pc. pine, 1 1/2" x 1 1/2" x 10"—hub stock.
- 9 pc. pine, 3/4" x 3/4" x 18"—spoke stock.
- 1 pc. pine, 3/4" x 3/4" x 7 1/2"—splinter bar.
- 1 pc. pine, 3/4" x 4" x 12"—side arms.
- 1 pc. pine, 3/4" x 1 1/2" x 12"—center arms.
- 1 pc. maple, 3/2" x 1" x 2 1/2"—rear hound.
- 1 pc. maple, 3/4" x 3/4" x 2"—front hound.
- 1 pc. maple, 3/2" x 1 1/2" x 18"—front and rear axle.
- 1 pc. maple, 3/2" x 1" x 6"—front holster.
- 1 pc. maple, 3/2" x 1" x 6"—rear holster.
- 1 pc. pine, 3/2" x 3 1/2" x 4"—footman board.
- 1 pc. pine, 1 3/4" x 1 3/4" x 14"—pole.
- 1 pc. pine, 3/4" x 1 1/2" x 3 1/2"—toe board.
- 1 pc. pine, 1/4" x 1 1/2" x 9"—toe-board pillars.
- 3 pc. pine or cardboard, 1/2" x 3/4" x 15"—window frames, body moulding, foundations.
- 1 pc. pine, 3 1/4" x 4 3/4" x 3 1/4"—tonneau block.
- 1 pc. pine, 1/4" x 2 1/4" x 4 1/4"—driver seat block.
- 1 pc. balsa or pine, 3/2" x 12"—seat cushions.
- 1 pc. balsa or pine, 1" x 12"—back cushions.
- 1 pc. maple, 3/2" x 2" x 16"—reach.
- 1 pc. pine, 1/4" x 1/4" x 12"—corner posts.
- 1 pc. pine, 1 1/2" x 1 1/2" x 10"—corner horns.
- 1 pc. pine, 3/4" x 1 3/8" x 12"—cagles.
- 1 pc. pine, 1 1/2" x 1 1/2" x 6"—capitals and pillar caps.
- 6 pc. pine, 3/4" x 3/4" x 12"—body rope mouldings.
- 2 pc. maple, 3/4" x 1" x 10"—body hangers.
- 1 pc. maple, 3/2" x 1" x 7"—center lids.
- 1 pc. pine, 3/2" x 2 3/4" x 8"—retainer arms.
- 1 pc. maple, 3/4" x 3/2" x 8"—singletrees.
- 2 pc. maple, 3/4" x 1 1/2" dowel rod—felloe shoes.
- 1 pc. pine, 3/2" x 3/4" x 10"—cross cleats for step box.

Shipping Box and Suggestions

When the time comes for the submitting of models for judging, you will want a good strong box for your coach, to insure your model reaching judging headquarters in good condition. Ill. No. 40 shows how to

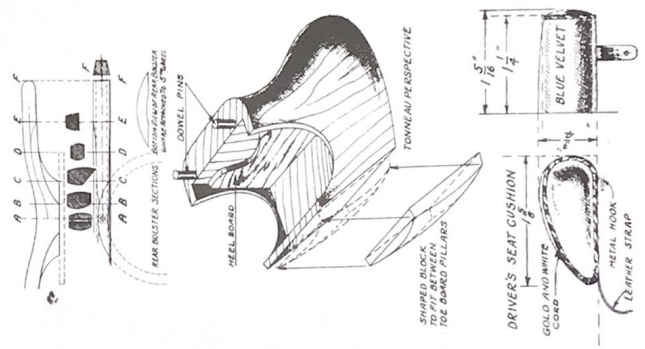
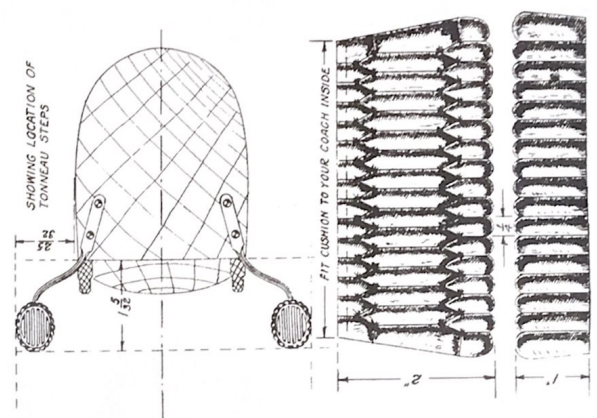
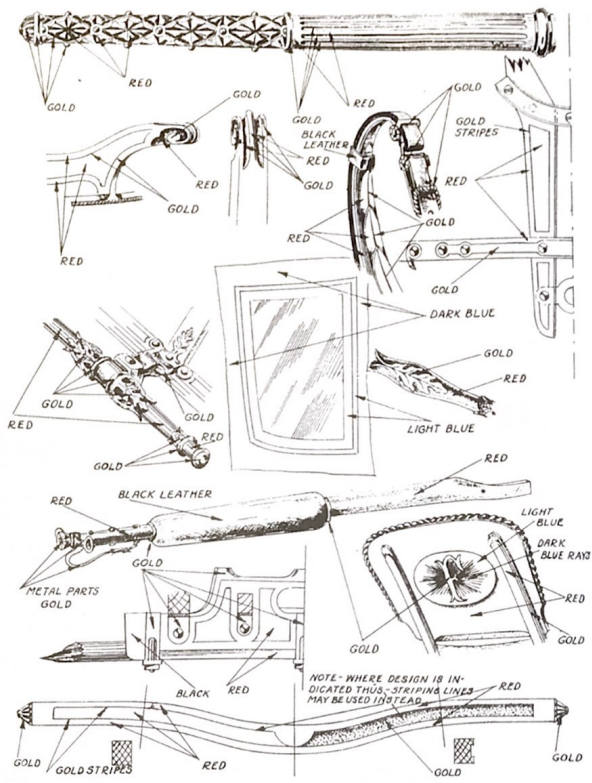


construct such a box, and how to hold your coach in place in the box. The box is simple and easily made. The construction permits of easy packing and unpacking.

Almost any box or crating lumber may be used. This stock should be about 3/4 inch thick. Boards that have been matched or jointed together with tongue and groove are suitable. The sizes of the various parts of the box are shown in the accompanying sketch. The sides, bottom, and ends should all be nailed together with 8-penny or 10-penny nails, which may be coated with resin to prevent loosening or pulling out. The top should not be nailed on but, rather, screwed down with a dozen or more Bathead wood screws, about 1 1/4 inch long—size 13 or 14.



much gold powder and banana oil as will be needed each time. Have outlines and designs neat and clear-cut. Use a thin banana oil, so gold paint will not be



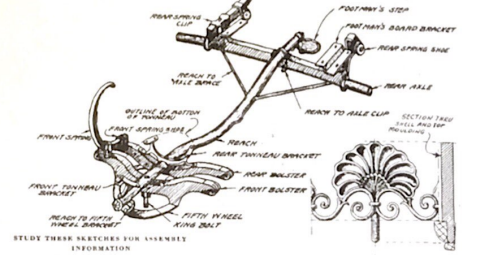
PLANS AND INSTRUCTIONS for building a *Miniature Model Napoleonic Coach in the Fisher Body Craftman's Guild Competition (Canadian Section)*

Metal Requirements

- 10 pc. brass or other material, $\frac{1}{8}$ " x $\frac{1}{4}$ " x 18"—springs.
- 1 pc. brass or other material, $\frac{1}{8}$ " x 6" x 6"—small decorations.
- 1 pc. brass or other material, $\frac{1}{8}$ " x 6" x 6"—small fittings and ornaments.



LEATHER SPRING STRAPS



STUDY THESE SKETCHES FOR ESSENTIAL INFORMATION

- 1 pc. brass or other material, .005 x 4" x 72"—ornaments.
- 1 pc. brass or wire rod, $\frac{1}{8}$ " diameter x 15"—fittings and ornaments.
- 2 pc. brass or steel, $\frac{1}{8}$ " x $\frac{3}{4}$ " x 18"—rear wheel rims.
- 2 pc. brass or steel, $\frac{1}{8}$ " x $\frac{3}{4}$ " x 13"—front wheel rims.

Paint

- $\frac{1}{4}$ pt. bright red (vermilion) undercarriage and wheels.
- $\frac{1}{4}$ pt. dark blue (blue black) tonneau, top, and upper body.

- $\frac{1}{4}$ pt. light blue (diaz blue) body and window frames.
- 1 pt. thinner (for lacquer) turps for varnish and paint.
- 1 oz. gold powder.
- 2 oz. bronzing liquid or banana oil (for mixing with gold powder).
- $\frac{1}{4}$ pt. undercoating material (primer).
- $\frac{1}{8}$ pt. white (interior windows and mouldings, door edges, etc.)

Suggestions and Helps

Sources of material

WOOD—Scraps from manual training shops—boxes, crates, cabinet or pattern shops—old furniture, etc.
METAL—Scrap iron dealers—old auto gaskets for thin metal—old toys, lead boys for casting metal—watch and clock parts—large nails, bolts, etc.—for making of dies, 5 and 10 cent store jewelry, trinkets, etc., telephone and bell wire, stovepipe and haling wire.
LEATHER—(Black)—old belts, old auto cushions, shoes, leather jackets, skate and suitcase straps, patent leather shoes, purses, belts, etc.
(White)—belts, shoes, gloves, purses. Imitation leather—cellulose, auto tops and seats.
TOOLS—Small chisels, gouges, and casting cleaning tools can be quite easily and readily made by using old files and filing to shapes required. Files for cleaning flutings and grooves are also easily made from round, half-round, triangular, and other shaped files broken to short lengths and handles of wire soldered to these pieces for ease in working. One boy used ordinary nut picks for cleaning castings, with excellent results. Spring clothes pins make good clamps for holding parts together while the parts are fitted, being glued, assembled, etc.

Cleaning castings

If purchased castings are used for any parts of the coach, they will come in "the rough" or as cast in the foundry. Considerable craftsmanship is involved in "cleaning up" these castings in the best possible manner. First, file off largest rough places and projections. Clean up each piece carefully, taking care that corners are left sharp and distinct for the design features. The gold paint will tend to fill up and obliterate the design unless each face is deep, sharp, and clear-cut. Fill holes or other imperfections with lead, putty, or other filling material. Before castings are painted, clean them with gasoline so that primers and paint will cling to surfaces properly.
 The top shell moulding should be cut out to the open design shown on drawings and color charts. This is done by drilling small holes where required and then cutting with jeweler's saw or fine coping saw. File

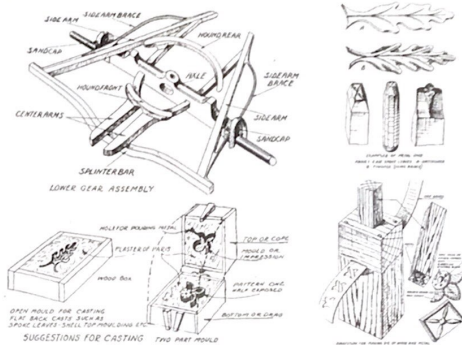
smooth. Fine sandpaper or emery cloth can also be used for finishing surfaces to smoothness.

Molds and casting

The process of making a casting for any of the various metal parts of the coach will not be difficult to understand if you will think of the method employed by your mother in the making of a fancy jello form. The

pattern. Your spoke leaves could be made in this manner.

Make patterns a little larger than required size, to allow for the shrinkage of metal when it cools and for filing and finishing casting to correct size. Vertical sides, edges, and ends of patterns are "drafted," i. e., they are tapered so bottom of pattern is a little smaller than the top surface. This permits



SUGGESTIONS FOR CASTING

dish in which the liquid jello is poured is the mold, while the fancy-shaped serving of jello you receive is the casting.
 Molds for the casting of metal parts are usually made in sand or plaster of Paris. Before the mold is made, a pattern of the article wanted is made of wood, metal, wax, etc. The pattern is then used to make the impression or mold in the sand or plaster. It is also quite possible to cut or carve the design in a block of plaster of Paris, thus eliminating the making of the

removing the pattern easily and without breaking walls of the mold. Some pattern contours are round and will require no draft.
 Where a casting is wanted on which a design is necessary on both top and bottom surfaces, a two-part mold is necessary.
 One half of the design is then made in upper part of mold and one half in lower mold. The two molds are clamped together and the metal poured in through a small hole leading to mold shapes inside.

Scoring valuations to be used in 1934 competition

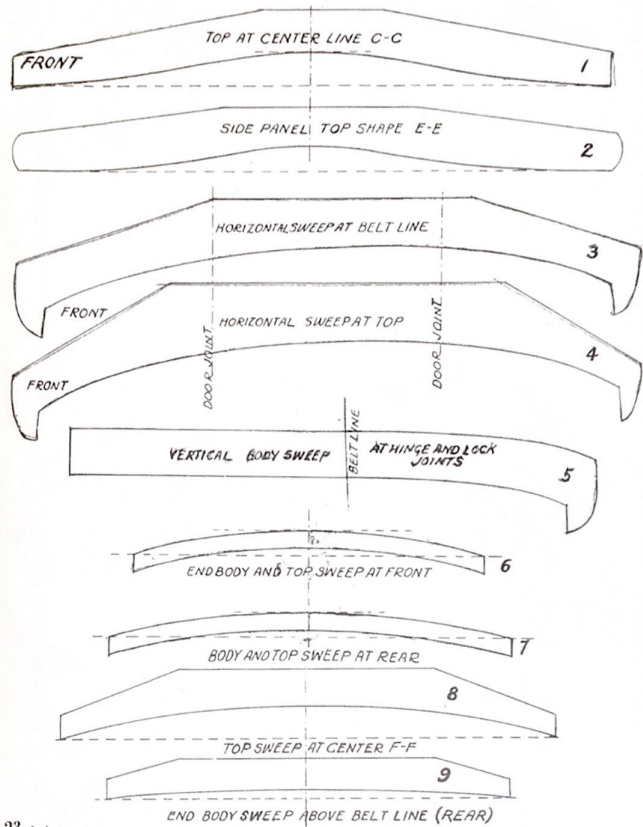
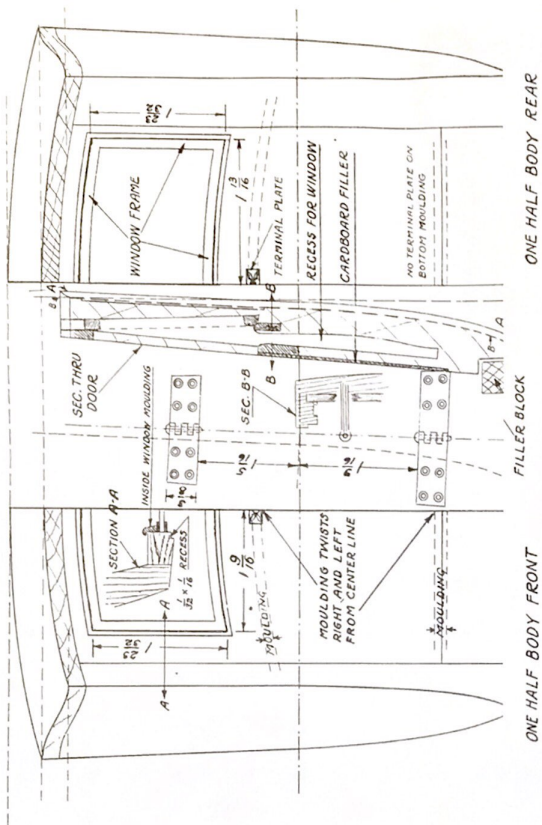
The following are the divisions of craftsmanship by which all models are scored and the total points which a perfect score will earn in each division:

Eloquence to scale.....	100 points	*Castings—home made and hand carved.....	25 points
Woodcraft.....	25 points	or purchased castings.....	50 points
Metalcraft.....	25 points		
Trimmercraft.....	25 points	*This division includes only those parts which can be secured in ready cut form or which may be made directly by hand.	
Paintercraft.....	25 points		

It is the desire of the Guild to always reward handicraft and to place a premium upon fine workmanship. In the scoring arrangement

above, it will be noted that 25 extra points of credit are allowed for hand carved or home made castings, as compared to the possible total score one may receive by using purchased castings. Experience in judging hundreds of coach models in previous Guild competitions has shown this score adjustment for the two types of work involved under the item marked "Castings" to be fair and equitable to all contestants.
 The craftsmanship required to finish rough purchased castings is, in the opinion of the Guild judges and technical staff, almost as great as that which is necessary to carve or construct these parts out of many materials. In fact, in many models, the finished product revealed a much greater skill where rough castings had been thoroughly cleaned,

filed, and brought up to finished perfection than in models where handwork had been done in a mediocre manner.
 A word of caution and warning can well be mentioned here in reference to materials for parts that are made of metal in the master models and so specified in the plans. As heretofore, the Guild sets down no specifications as to materials, but it should be remembered that the rigors of shipping models in for judging, the handling of them in judging, and for exhibition purposes make it desirable that all carvings and castings be made of a durable material. While no penalty attaches to breakage in transit or handling, it is sometimes very difficult for judges to place a proper craftsmanship value upon a broken part.
AGE QUALIFICATIONS—The Guild competition is open to all boys in Canada and the United States between the ages of 12 to 19 years, inclusive. There is a slight change regarding the age qualifications being placed in effect this year which should be noted carefully.
 A junior contestant is one who at the time of enrolling is 12 years old or older and who will be less than 16 years old on July 1, 1934.
 A senior contestant is one who will be 16 years old or older and less than 20 years old on July 1, 1934.
 These age qualifications are primarily for the purpose of dividing the workmanship of the younger boys from that of the older or senior boys. It is important that you understand to which classification you belong, in order that your coach model be properly entered in the award competition. The awards are identical for both senior and juniors, as you will note in the award announcement.



THE *New* GUILD AWARDS ❀ HERE THEY ARE!

1933-34 International Awards

*Twenty-four Scholarships to be awarded to boys
in Canada and the United States as follows:*

- 6... Four-year Scholarships valued at \$5000 each
- 6... Scholarships valued at \$2000 each
- 6... Scholarships valued at \$1000 each
- 6... Scholarships valued at \$500 each

In each of the above scholarship groups, two awards will go to boys in Canada, one to a junior (12 to 15 years, inclusive) and one to a senior (16 to 19 years, inclusive).

Four scholarships in each of the above groups will be awarded boys in the United States, two to juniors (12 to

15 years, inclusive) and two to seniors (16 to 19 years, inclusive).

Any Guild member winning any of the above awards will be considered a Guild graduate.

Every Guild member who submits a completed coach in the competition will receive the Guild certificate of craftsmanship.

For the equal protection of all participating in Guild competitions, it is necessarily understood and agreed that the rules and regulations of all Guild competitions and the decisions and awards of the judges are final and inviolate.

AGE CLASSIFICATION

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FISHER BODY CRAFTSMAN'S GUILD
(Canadian Section)

An Educational Foundation

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DIVISION OF GENERAL MOTORS

and
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PLANS and INSTRUCTIONS

for building a Miniature model Napoleonic Coach

1933-1934 Competition



FISHER BODY CRAFTSMAN'S GUILD

(CANADIAN SECTION)

AN EDUCATIONAL FOUNDATION