HISTORIC Gettysburg

How to Construct a Scale Model

EVERY model builder who is interested in old cannon or in the Civil War will want to add to his collection this accurate model of one of the guns preserved on the Gettysburg battlefield. The model is made on a scale of 1/32 in. equals 1 ft., and is 11 1/2 in. long. It is mounted on a mahogany base 10 by 13 in.

This particular gun stands on Barlow's Knoll, where Battery G, Fourth United States Artillery, was stationed under the command of Lt. Buayard Wilkeson. The fire of thirty-six Confederate cannon was turned on this position. Wilkeson's leg was almost severed by a shell, and he completed the amputation with his own hands and a penknife. The knoll was finally captured, and during the night Wilkeson crawled back to the Alms house building, where he died.

The wheels of the model are not dished, but flat. The folioes are cut in one piece from 1/4-in. plywood (or you can make seven folioes, if you prefer). The spokes are 3/32 in. thick and taper in width from 1/4 in. at the hub to 3/16 in. at the rim. They are rounded as shown except for the 3/4 in. that extends into the hub.

The hubs are turned in one piece and banded with four metal bands 1/4 in. wide and 1/16 in. thick. The dimensions given for the hubs include the 1/16-in. thickness of the bands. It will be well worth the extra time it takes to bush the hubs with 1 5/16-in. lengths of 3/16-in. inside diameter tubing.

Make a jig by laying the wheel out on a board and boring a 1 1/4-in. hole 17/32 in. deep to hold the hub's 5/8-in. spoke groove flush with the surface of the jig. By drilling a 3/16-in. hole the rest of the way through the jig, the hub can be bolted firmly in place. Drive small brads in the jig on each side of the spokes about 1/4 in. from the circle where the spoke enters the rim. Now taper the spokes in place in the hub and let the ends rest between the brads. Drill small holes through the folioes and into the spokes for 3/4-in. brads.

The tire should be pressed on while the wheel is still on the jig. The tire can be made of 1/16 by 1/4-in., strips of metal by filing a 3/4-in. taper on each end and soldering the tapers together. The small 3/32-in. square nuts in the center of each folio are made of cardboard and glued in place.

The wooden part of the axle is 3/4 by 1/4 by 9/16 by 4 1/4 in. The 9/16-in. side is tapered on each end to 3/4 in. square at the ends, leaving a 2-in. flat surface at the top for the two sides and the tongue to rest...
Cannon

of a Picturesque Civil War Gun

on. The underside has a 3/16 by 3/16-in. slot or groove running its entire length to accommodate the square part of the metal axle, which is merely a 7/32-in. length of 5/16-in. square rod turned or ground to 5/16 in. round where it extends past the wood. The tips also are rounded on the ends. The wood and iron part of the axle are held together by a ¼ by 1/16-in. band on each end of the wood, filed from a piece of ½-in. metal.

Pins for retaining the wheels in place are 1/16-in. roundhead rivets with two sides of the head filed flush with the shank. The locking strip is cut from 1/32-in. sheet metal; it is 1/16-in. wide and slightly larger and rounded at the end where it is riveted to the pin. Rivets may be made from ⅛-in. pins cut off to the desired length. The ½ by 1/16-in. washers go behind the wheels, and the ½ by 1/16-in. washers go between the wheels and the locking pins.

The tongue is 11/16-in. thick. Cut it to the shape shown, being very careful to have the ½-in. offset at the head square with the sides. Also drill the three holes for No. 4 bolts exactly square with the sides of the tongue.

Next drill and file the towing ring to the shape shown from a 11/16 by 11/16-in. square of ½-in. metal. The top and bottom plates are 1/16-in. sheet metal bent to shape and riveted to the ring by two 1/16-in. rivets, countersunk at top and bottom.

The two blocks with the tapered rings can be made as follows: First prepare the flat bases. Then solder two ½ by ½-in. lugs, rounded at the top, to the block near the ring. Now put the towing ring and plates in position on the tongue, clamp the two small blocks on the top plate, and drill a 1/16-in. hole in each end of both blocks. These holes are drilled all the way through the top and bottom plates. The 1/16-in. roundhead rivets that hold the blocks in place also hold the top and bottom plates in position on the tongue. The bottom plate is countersunk. To hold the ring and plates tight against the wood while drilling, run a piece of wire through the ring and around the end of the tongue and draw it tight with a small turnbuckle.

The tapered rings can be shaped by rolling metal strips around a tapered stick, and filing them to the desired shape. Leave an extension on the largest ring to be placed under the lugs on the block. This completes the larger ring, and the smaller ring can now be soldered to hold it in place with a tapered stick passed through the larger ring.

For lifting, make the grips of 1/16-in. stock to shape and hammered flat on the ends, where they are drilled and fastened to the wood by small brads. The two clamps, clip for the chain ring, and rub plates are made of 1/16-in. sheet metal and fastened as shown in the side view.

The disassembled model with carriage. straps are shown to show the strap and axle of the tongue. The strap plate, which has a No. 2 countersunk screw extending from its surface, is 1/32-in. metal, fastened on the tongue with small heads or cincutchoon heads.

Working drawings of the tongue, sidepieces, bearings, axle, straps, and all the smaller fittings.
The slotted piece (also 1/32-in. metal) with the metal strap linked to its looped end is slipped over the screws and fastened by the wing nut. The screw was taken from an old dollar watch, and the nut was also part of the watch filed down to 1/32-in. with a small piece of metal soldered to it to serve as a wing. The strap is made of wire links holding the 1/32-in. square links together, each link having the end bent over a piece of wire to form a loop at each end. The top loop of each link is bent out, and the bottom link is bent in the opposite direction. The long link that is bradded to the underside of the tongue has a loop on both ends to hold the straps for both sides of the tongue. All the fittings are duplicated on both sides of the entire carriage except the chain, the hook near the axle, and the clip for the chain ring.

The tongue strap (1/16 by 1/32-in. metal) is bent around the axle and drilled as shown. To make this look as though it is bolted on, make 1/32-in. squares of 1/16-in. metal, drill 1/16-in. holes in the center, and nail them in place with 1/32-in. head rivets or escutcheon pins. By drilling holes in the wood slightly smaller than the rivets or pins, the imitation bolts can be driven without danger of splitting the wood.

The elevator screw is made by soldering a tube 7/16-in. long around the end of a 1/16-in. machine screw and drilling four 1/16-in. holes evenly spaced around the circumference for the grips or handles, which are 1/16-in. lengths of 1/16-in. wire filed to shape in a lathe chuck. The plate can either be built up by soldering a piece of metal to the 1/16-in. plate or filed to shape from a solid piece of 1/32-in. stock. The solid piece is best; it will not come apart when drilled and fitted to the No. 10 screw. The angle can be obtained by laying the plate in place on the tongue and filing the rounded part to horizontal. The plate is best drilled and tapped after being nailed in place so that its center is 1/32-in. from the flat end of the barre when the barre is raised to its highest point.

The sides of the carriage are cut from 1/32-in. wood, and rounded at the rear. These sides are fastened with 1/16-in. by 1/16-in. strips of sheet metal as shown. The top is held in place by imitation bolt heads made by cutting flathead nails off short and filing them down to 1/32-in. diameter in a lathe chuck. The front end is held in place by six 3/16-in. roundhead rivets. (See front view.) The band is flattened at the end where it bends around the 1/32-in. radius at the bottom. The rear ends of the top and bottom bands are rounded the same as the wood.

The bearing caps are metal stripes 1/16 by 1/32-in., bent around a piece of 7/16-in. round stock to form a semi-circle, and the ends are bent out and cut off 1/32-in. from the inside edge of the circle to form caps measuring 1 3/16-in. from end to end. The rounded ends of the caps can be made by soldering small pieces of wire across each end and filing to the desired shape. Each end of the bearing has a 1/16 by 1/32-in. slot cut in it to hold the hand-eye nuts, which are filed to the shape shown from 1/16-in. sheet metal and put in place by drilling 1/16-in. holes through the bands and the wood to receive them.

The rings for the chains are made of 1/16-in. round metal, filed to shape. One is soldered to each bearing cap and two are driven into each wooden side, just a little below and to the sides of the bearing-cap edges. The caps are chained to the rings below the hook, and the eye pins which project through the caps are chained to the rings below the pins. Four small pieces of chain about 1 in. long are needed. The eye pins are pieces of 1/32-in. wire with a small loop on the end for fastening the chain.

A is 3/4 by 5/16-in. piece of 1/16-in. metal with a 1/32-in. length of 1/16-in. outside diameter taking soldered to it. This is bradded in the space indicated on the drawing.

B designates the hand rings on each side of the carriage, which are made of 1/16-in. wire bent to form the letter D and are held in place by two pieces of wire flattened at the end and bent around the straight part of the D to form a hinge. These hinge wires are driven into holes as indicated. The offset hooks are made by bending 1/16-in. wire to the shape shown and soldered in the holes drilled in plates of 1/16-in. sheet metal to shape and with holes drilled in the center to receive the No. 4 bolts. The chain hook fastened to the No. 4 bolt near the axle is filed to the desired shape from 1/16-in. sheet metal.

PLACE one side in position on the axle, tight against the tongue, and drill the holes for the No. 4 bolts, using the holes in the tongue as a guide to insure getting the holes in line. Remove the drilled side and repeat the same process with the opposite side.

You are now ready to bolt the sides in place. For bolts use 3-in. nails after filing the heads down to 3/16-in. diameter and threading the ends well back with a No. 4 button die. For nuts use No. 4 hexagon nuts filed square. Put both sides on the axle, leaving a 1/4-in. space between the tongue and the sidespeices. This 1/4-in. space is taken care of by 1/4-in. lengths of 1/32-in. dowels with a hole drilled in the center so they can be slipped on the bolts and used as spacers. Six of them are needed. The bolts are put in place with the nuts on the right side of the carriage. The front bolt has a small washer under the nut; the chain hook is placed under the nut of the center bolt; and the last bolt has an offset hook on each end.

The bottom straps for the sidespeices are put on in the same way as the tongue strap was, using imitation bolt ends with square nuts. The wire loops, which hang on the loops bent on the ends of the side-piece bands, are fastened with 1/16-in. rivets with a small imitation hexagon nut on each end to represent small hexagon bolts and nuts. These hexagon nuts should not be more than 3/16-in. across the greatest diameter.

The gun barrel can be cast from a wooden pattern, or turned from solid stock on the lathe. The latter method of construction was chosen for the model in the photographs because it is easier to get a good even finish on the metal, especially if the wood is to remain unpainted. To build up the barrel from brass, use 7/16-in. rod for the pivots, turn it down to 1/8 in. on the ends, and thread the pieces to fit in holes drilled and tapped in the barrel. The 3/4-in. diameter shoulders on the pivots are brazed in place, and the barrels are chamfered at the holes. They must be set to fit closely against the curved sides of the barrel.

The chain fastens to the clip on the tongue by a small ring. The other end is linked to the hook arrangement shown in the side view. The hook is made of 1/32-in. wire and measures 1/4-in. over all. Another length of chain, both ends of which are linked to the other end of the hook, is hung on the hook just back of the axle.

The pile of cannon balls and the mounting board are optional. The balls are 7/16-in. ball bearings soldered together. It is necessary to make a frame to hold the first layer together while soldering. To fasten the balls to the board, solder a No. 8 machine screw to the bottom of the pile and tighten it down with a nut on the underside. The wheels are fastened to the board by small clips bent over the rim and bolted to the board, and the tongue is drilled and tapped for a No. 8 machine screw, which is screwed into it from the bottom of the board.

All the wooden parts are light gray; the metal parts, black. The barrel in the model illustrated being brown was polished and given a coat of clear lacquer.

HINTS ON CONSTRUCTING MINIATURE LINERS

Building small models of ocean liners like the Queen Mary, Bremen, and Normandie, is, perhaps, the type of model-making in which it is easiest to get really good results. As shown in the drawing, decks can be built up of alternate layers of wood and either thin cardboard, wood veneer, or still, heavy paper. Care should be taken upon the scale of the model. Cut the pieces of wood that represent the decks in such a way that the actual, but cut the pieces of cardboard, veneer, or paper so that they reach right to the edge of the ship and, if the model so indicates, project a short distance over the end of the thicker wooden piece. It is advisable to paint the edges of the narrower decks black before pasting the paper or cardboard pieces on. Details such as portholes and doors may be indicated on the black edges with white paint, while thin pieces of wood may be put in along the edges to represent the deck supports, if desired.

Sewing needles make good masts for miniature ships. Beads are useful; they make good crow’s nests, winches, and antennas installed. Port holes and small letterin can be added with an ordinary pen and black and white inks. Rigging of fine silk thread will add greatly to the ship’s appearance, and it is easily put on with transparent cement.