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RAILROAD FOR
OCEAN LINERS... Page 43

NEW INVENTIONS • MECHANICS • MONEY MAKING IDEAS
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**CONSTRUCTION KIT FOR
MAKING A BATTLESHIP
MODEL AT LOW COST**

TO ENCOURAGE you to build our new ship model, the battleship "Texas," described on pages 67, 68, and 69 of this issue, the Popular Science Homecraft Guild is offering a complete construction kit of materials for \$6.95, shipped postpaid to any address east of the Mississippi River. To points west of the Mississippi it is necessary to charge 50 cents extra because of the high shipping costs.

The amount of material required to make a model as large and elaborate as this—the hull is 3 ft. long—is surprising. Experienced model makers, most of whom have spent untold hours shopping for hard-to-get supplies, know this, but beginners often have the idea that they can go out and get whatever is necessary in the course of a Saturday afternoon. They quickly discover that the materials used in ship model making are not so easy to obtain, especially in small quantities.

Each kit for making the battleship contains five pieces of soft, straight-grained pine for the hull, $\frac{3}{4}$ by $6\frac{3}{8}$ by 36 in.; all the necessary wood for making the superstructure, turrets, boats, and other parts, each piece being cut to the approximate thickness, width, and length; wooden rods $\frac{1}{16}$, $\frac{1}{8}$, $\frac{3}{16}$, $\frac{1}{4}$, and $\frac{5}{16}$ in. in diameter for masts, guns, searchlights, and the like; sheet brass in three thicknesses; three sizes of brass wire; two sizes of brass rod; $\frac{3}{8}$ -in. brass tubing for the funnel; brass tubing for the propeller tubes; soft metal and very small chain for the anchors; silk thread; large and small glass beads; nails, pins, and escutcheon pins—in fact, everything required for making an exhibition model except the paints. If a working model is desired, the machinery, of course, must be obtained separately. The kit also includes a complete set of blueprints showing the model full size. Bought separately, they alone cost \$1.

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Please send me all the materials (except paints) required for building a 3-ft. exhibition model of the U. S. S. *Texas*, and also Blueprints Nos. 197 to 200.

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THE HOME WORKSHOP

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A Matchless New Model for You to Build

The Battleship TEXAS

HERE is a model of one of the finest and most powerful battleships afloat—the U. S. S. *Texas*, flagship of the Atlantic fleet. It has been simplified to such a degree that anyone interested in model making can build it without difficulty and at relatively low cost for materials; and no special tools are needed.

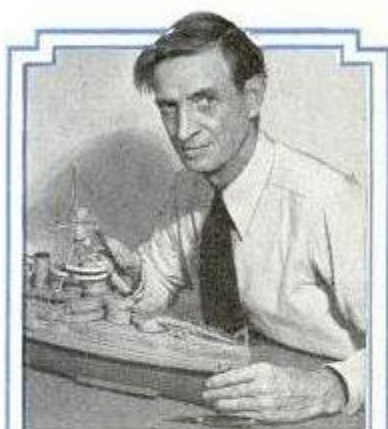
This great modern battleship is ideal from the model maker's standpoint. Though beamy, she has fine lines. On deck there is a variety of parts of an unusual character—objects that are good looking in themselves—instead of a monotony of cabin structures and handrails such as are found on a passenger ship. She therefore makes a magnificent exhibition model. As a power-

driven working model, she is equally desirable. Having a large displacement, the hull will carry with ease all the necessary machinery and is quite stable in the water.

To those who have heretofore built only sailing ship models, I suggest that they try their hands at this battleship by way of a change as well as to learn the technic employed.

The *Texas* has been chosen because she has been modernized and now constitutes the last word in American capital ships, and also because she has tripod masts, which are better looking and easier to make than the "wastepaper basket" lattice masts of most of the American battleships.

As reconstructed, she



Captain
E. Armitage McCann
gives plans for making
a 3-foot model of the

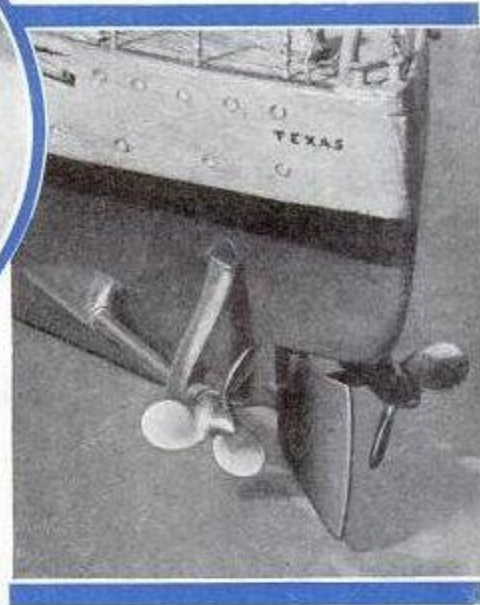
*Flagship of the
Atlantic Fleet*



Working scale model of the U.S.S. *Texas*, one of our best capital ships. Her beamy hull gives ample room for machinery, if you wish to install it



The model under way, plowing through a calm sea. Without anything to give away her size, she looks for all the world like her big sister. Below: A close-up of the stern showing the rudder and twin screws. Compare with the drawings on the next page



is so new and so important that the Navy Department will not furnish any plans, hence this model had to be worked out without official aid, but the lines and details may be taken as essentially correct. The bridge work is so complicated that it has been simplified to retain the correct effect, and many minor details, such as mushroom ventilators, have been omitted.

Though the model is specifically the *Texas*, it would serve almost as well for the U. S. S. *New York*. Both were built from the same plans, the former at Newport News and the latter at the New York Navy Yard. The differences are minor.

The *Texas* carries the ranking Admiral's flag and is so powerful that she could be miles out of sight of the coast yet blow a city to bits in short order. Her great 14-in. guns, 53 ft. long, will pierce armor plate so far away that it cannot be seen aboard. She has enough electric power to light a small city.

The real ship has a displacement tonnage of 27,000 tons and an allowance of 1,315 men, and she cost about \$11,000,000. Her length on the water line is 565 ft., and the over-all length is 573 ft. The beam, without blisters, is 100 ft. On the scale of 1/16 in. equals 1 ft., this gives us a model almost 3 ft. long and 6 1/4 in. wide.

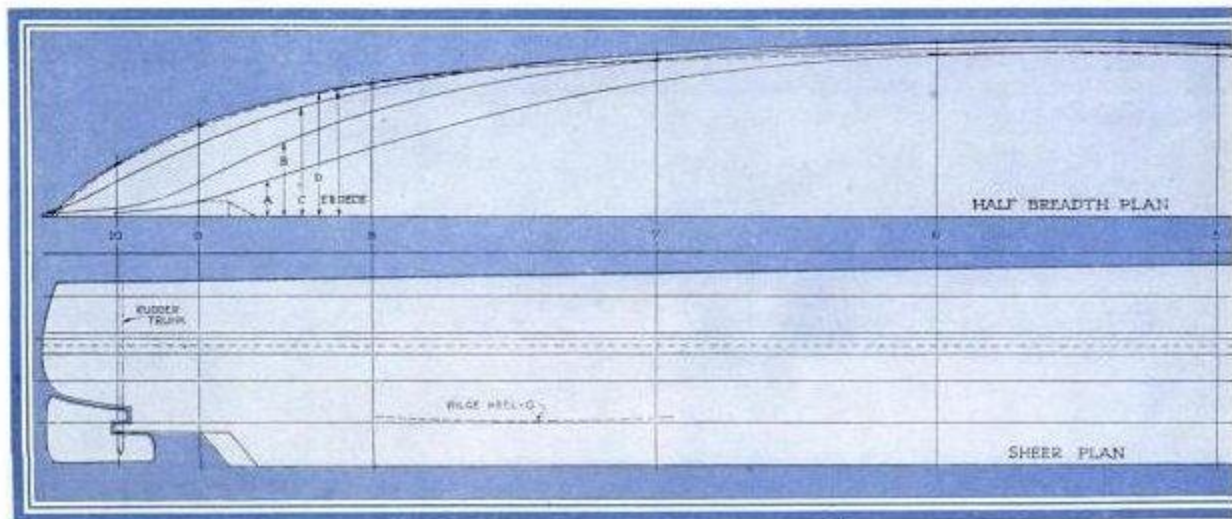
It will be seen on the sheer plan that the hull has been divided vertically into five water lines or lifts, each 3/8 in. thick and 6 1/4 in. wide. On each piece of board (white or sugar pine or other soft wood) mark the corresponding outline from the half-breadth plan. This can be done by pinning the plan on the wood with two pieces of carbon tissue, back to back, between the wood and the paper, then cutting the plan down the center line and turning it over to get the other half. I prefer, however, to take off the lines on a piece of tracing paper and turn it over to get the other half. Draw the center line right round the board, as well as the construction lines Nos. 1 to 10.

With a compass saw, jig saw, or hand saw, cut the wood to these shapes. Then, as the model is to be hollow, jig-saw out the center of lifts B, C, and D to about 3/8 in. thick, leaving plenty at the ends. It is better also to leave in crossbars somewhere about the middle to prevent spreading until the hull has been glued up. Glue these lifts together, except the top lift, being careful that all the construction lines correspond. This is essential.

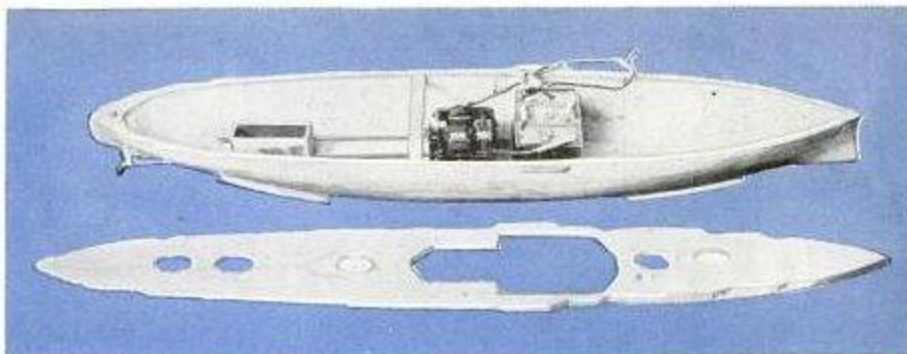
The top lift E must be planed down to

3/4 in. thick at the stern. It is straight from end to end with no sheer, but a camber, or curve, of 1/8 in. from the edges to the midship line can be given. This, however, is a nuisance on a working model, so I left the surface flat. If you wish to add this camber, have it rise above the line shown on the drawings. Next mark on the wood the deck outline and draw the center and cross construction lines.

Screw this top lift temporarily in place and proceed to shave the sides of the hull to match cardboard or tin templates made from the lines of the body plan. It will be noted that the widths given on the half-breadth plan do not correspond throughout with the widths on the body plan at that position; that is, because the lifts have to be left wide enough to cut the extreme width, wherever it happens to come. Thus D is bigger amidships at the bottom



The hull with the power plant installed. The motor was taken from an old automobile horn, and the small but efficient storage battery is homemade



than the top, and *B* bigger at the top than the bottom.

These ships, as modernized, have in addition to the hull proper what are called "blisters"—vacant inclosed spaces built onto the hull below the water line as additional protection from torpedoes. They are about 4 ft. wide amidships, tapering from the water line to the turn of the bilge and from about line No. 3 to No. 8. As they are ugly and not an integral part of the ship, they have been omitted.

Note that the stem is quite sharp until near the bottom where it has a "bulb" or roundness which flows into the body of the hull.

The body plan gives the shape the hull is first to be made. The upper part then has to be cut to represent the top edges of the armor plate and the casemates for the guns. The lowest cut-in is $\frac{3}{4}$ in. down from the deck, extends from line 3 to the bridge wing, and is $\frac{1}{16}$ in. deep at the middle, tapering to the ends. Above that the three recesses for the casemates are cut $\frac{3}{8}$ in. down. Aft there is a cut-in $\frac{5}{16}$ in. down from the bridge wing to the foremost casemate, a full $\frac{1}{16}$ in. deep.

Having shaped the outside, remove the deck piece and, if it is to be a working

model, shave down the inside as thin as possible, but leave the bottom lift intact as a stiffener and platform for the machinery. Some of the waste wood from the deck pieces may well be cut away from underneath. If preferred, the entire hull can be hollowed out and a thin deck laid.

Cut away the cross struts and put in a deck beam at each end of the opening.

The next thing to do is to install the power, if you intend to make a working model rather than merely a scale model for exhibition purposes. As there is plenty of room, any type of drive can be used—clockwork, steam, or electric. The average model maker will find the last to be the most satisfactory. I was advised by Mark A. Cooper, of Rome, Ga., who gave me some valuable suggestions, to try a motor from an automobile horn, and got one for a few cents. This works quite well, but I think a high-grade motor made for the purpose would be even better.

For power I built a storage battery as described by Mr. Cooper in a previous article (P.S.M., June '31, p. 108). This was made from standard size battery plates sawed in four, with two positive and three negative plates in each of the three cells. It is $3\frac{1}{2}$ by 3 by $2\frac{1}{4}$ in. high, weighs 3 lb., and drives the motor under full load for about an hour.

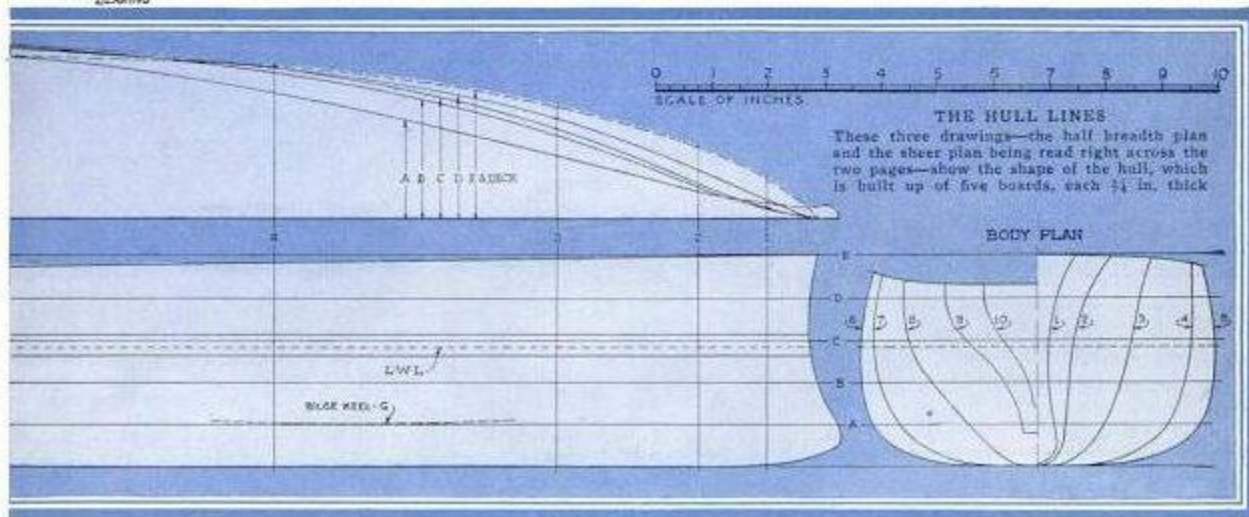
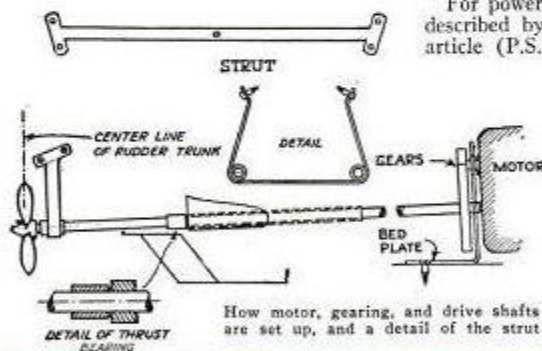
The motor, of whatever type, must be fastened to a plate of stiff

metal, the bottom of which is turned up and drilled so that it can be screwed to the bottom of the vessel to form a stand. If the motor is at all heavy, it should also have a leg fastened to the back end. Through this plate a hole is drilled through which the motor shaft may project. To find the height of this shaft it will first be necessary to adjust the propeller shafts.

The vessel has twin screws or propellers of about $1\frac{1}{8}$ in. diameter. The shafts are $\frac{1}{8}$ in. brass rod about 16 in. long. For the shaft tubes, two pieces of brass tubing about 4 in. long and of a diameter to fit easily on the shafts are required. First cut the double strut to the shape shown; that is, to screw to the raised part of the keel, extend horizontally $\frac{3}{8}$ in., then turn upward to screw to the hull about $1\frac{1}{8}$ in. up, ending in cross flanges for that purpose. Cut a $\frac{5}{16}$ -in. piece off the tube and solder it into the bend of the strut for a bearing. Put the propeller on the shaft, reeve the shaft through this bearing, and temporarily fasten the strut so that the center of the blades will be in line with the line of the rudder post, previously marked.

Before you can do this, holes will have to be drilled in the hull through which to pass the shafts. It is best to make the holes amply large and then, when the tubes are finally in position, to wedge them and fill in with plastic material. Cut another $\frac{1}{4}$ in. off each tube, reeve them on the shafts, then place the remainder of the tubes and reeve them through the hull.

In the next article the installation of the motor will be described, and we shall begin to add the details to the hull.



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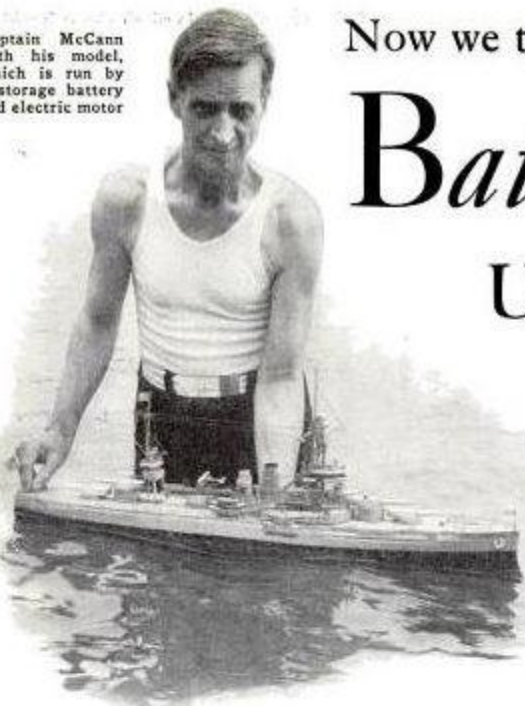
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SEE PAGE 49

NEW INVENTIONS • MECHANICS • MONEY MAKING IDEAS
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Captain McCann with his model, which is run by a storage battery and electric motor



Now we tackle the DECK FITTINGS of our new

Battleship Model

U.S.S. TEXAS

By Capt. E. Armitage McCann

MOST of those who read last month's article on the U. S. S. *Texas* (P.S.M., Nov. '32, p. 67) and intend to build our new 3-ft. model of her—she is flagship of Battleship Division I of Battle Force, U. S. Fleet, and was long famous as flagship of the Atlantic fleet—will construct it for exhibition purposes. For those, however, who wish to make a working model, a few suggestions in regard to the power plant should be added.

If an electric motor is to be used, it is well to gear the speed down to about one third. For this a $\frac{3}{8}$ -in. spur gear (cog wheel) on the motor shaft and a $1\frac{1}{8}$ -in. gear on each shaft will serve. Put the $\frac{3}{8}$ -in. gear on and lay the other two on the bedplate so that their teeth engage each other but only one engages the small gear. They will therefore turn in opposite directions, either above or below the center shaft. Drill $\frac{1}{8}$ -in. holes at these positions. Turn up the bottom of the bedplate to a little less than a right angle so that gear wheels and motor are clear of the bottom, and drill it for wood screws. Now bring up the shafts to go in their holes. Fasten down the motor, noting that for the shafts to be parallel the motor will be slightly to one side and tilted towards the stern. It will go at the rear end of the opening which is to be cut as shown in the deck.

Get the tubes accurately in line so that the shafts turn quite freely, and fasten them there, leaving about $\frac{7}{8}$ in. projecting outside and filling in between them and the hull. The inner ends of the shafts should be threaded for nuts or have holes drilled for wire cotter pins. The gears are either soldered or keyed to the shafts.

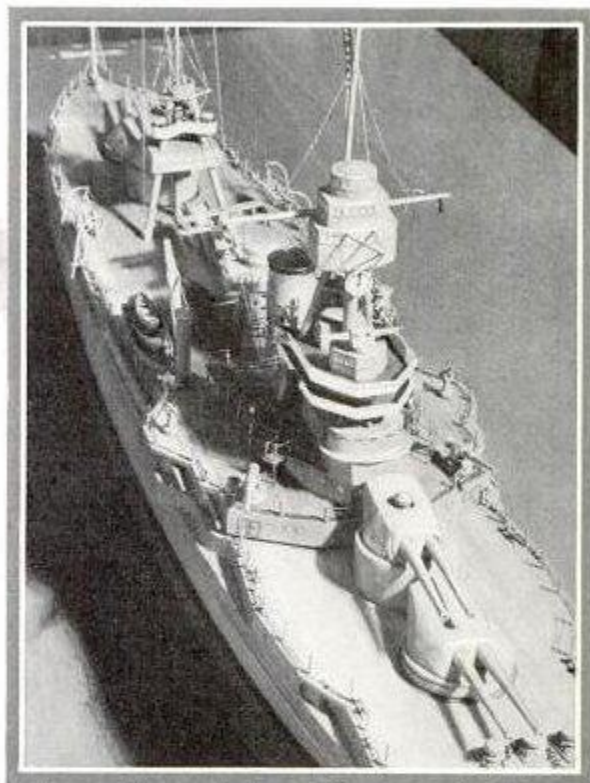
The outside ends of the tubes should be filed quite flat and smooth, and the small pieces previously cut off are bored inside to a conical shape so they will

engage the ends of the tubes and act as stuffing boxes to keep the water from entering. Solder these in position when the gears are engaged and the inner ends of the shafts run free in their bearings. Cut off the outer ends of the shafts to the right lengths so that the propellers will not quite touch the struts and their centers will be in line with the rudder trunk. This latter is important to allow the rudder to swing.

For a switch, I used a small revolving car switch and placed it in the second barrette with the end projecting through the turret, where it looks like a ventilator. The wires lead through the deck to the battery and motor.

The bilge keels may now be fitted. The position of these was indicated on the sheer plan last month. It will be noted that there are two short ones on each side. I cut mine from sheet brass, leaving a long prong at each end as shown at *G* in the drawings on page 72. A knife cut is made along the hull in which to fit them, and a cut is run right through for the prongs, which are bent up inside. They should be $\frac{1}{4}$ in. wide, although I gave mine an extra $\frac{1}{8}$ in. for stability. Although actually straight, they form a stream line when on the hull.

Before putting the deck lift back in position, a hole must be cut in it to get at the machinery (for a working model). The area of this can conveniently be made just a little less than the upper deck and



A view of the superstructures, deck fittings, and forward turrets. Note the casemates cut into the upper part of the hull

engine-room fiddley. I cut the opening with a fret saw, held at a slight angle, to the line shown on the deck plan. If cut with a fine saw, this joint, considering the overhang of the deck above, will be sufficiently tight. I then cut away the waste as indicated by the inner line, to save weight. This rim later will be glued to the upper deck and will lift out with it.

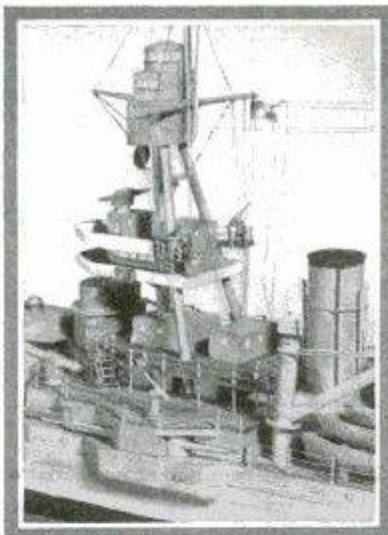
The deck lift should now be glued and nailed on, the position of all the fittings marked, the casemates in the sides cut, and the projecting midship wing pieces *J* cut and fastened.

The rudder *H* (shown last month) is next added. The post is a piece of $\frac{1}{8}$ -in. rod, for which a hole is bored through the skeg and up through the deck. The lower end is cut down the center, and the sheet brass rudder is placed in position through the slot in the post and soldered. To hold it in any position, as is necessary with a working model, I threaded the top end and on it fitted a little capstan (*64*). If it is not to work, then shift the capstan to its right position just forward of station line No. 9, and do not bring the rudder-post through the deck.

The hawse pipes should be large enough to take the shanks of the anchors—about $\frac{1}{4}$ in. Make small holes first and bore up and down to get both ends at the right position. The hawse pipe lips can be rims of brass tube or be fashioned from plastic material. The upper ends (3) can be of similar material or brass plate. It will be noted that there are two anchors on the port side and one on the starboard. The anchors themselves should be of the Navy (stockless) type as shown in detail 62. They may be purchased or made from lead or brass. The cables should be black chain with about 11 links to the inch.

The towing collars (2) are $\frac{3}{32}$ -in. holes cut through the hull at the deck level, the upper part of the rim extending above the deck level. They are made of plastic material or of brass tube filed to shape.

The three capstans should be turned from brass or wood to the shape shown at 4. The lower part is in reality a gypsy to hold the chain as the capstans turn; this can be disconnected and the top used for a rope. They work on beds in which

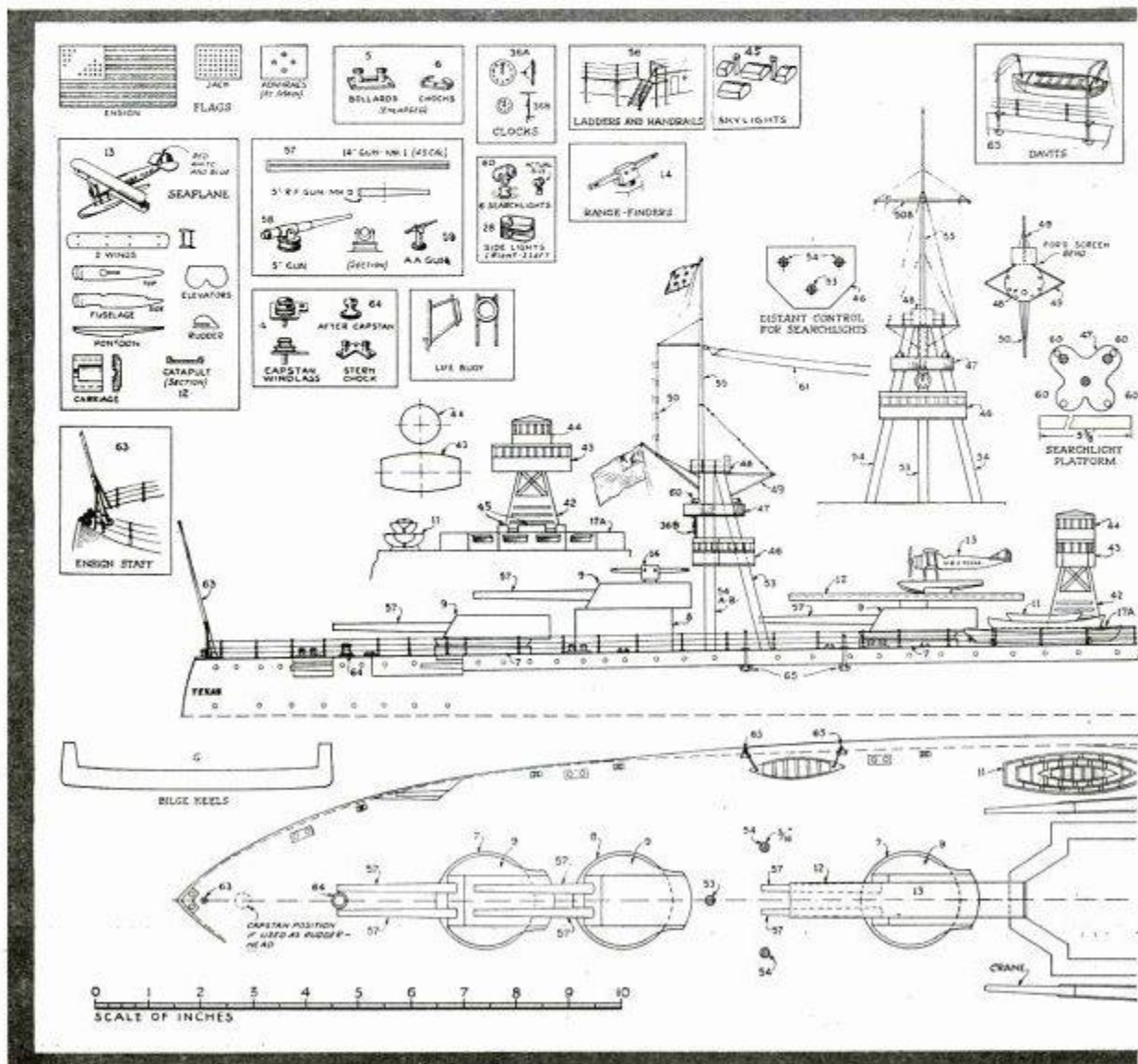


Foremast with plotting and radio rooms, pilot house, control stations, and battle tops

there is a hole (chain pipe) through which the chain goes below. After putting the chains down, I closed the holes with plastic material to look as if they had covers on.

The deck should be lined to represent deck planks before putting anything on it. I do this with a very sharp, hard pencil and straightedge. Lines about $\frac{1}{16}$ in. apart look best.

The lower bridge houses (captain's quarters) and upper deck 17 are cut from a piece of $\frac{1}{2}$ -in. wood. The deck should be plank-marked. The three casemates on each side are cut, and the portholes and doors are indicated as in the drawings. For portholes on this model, I sharpened the edge of two pieces of tube of the right size— $\frac{1}{16}$ in. for the outboard ports and $\frac{3}{32}$ in. for the inboard—and lightly tapped these in the wood to make circular indentations, afterwards painting the rims and filling the space inside a light blue color. The model undoubtedly would look better, however, with real air ports, either made or bought. There are 36 large and 146 small. I just painted on the doors and windows.

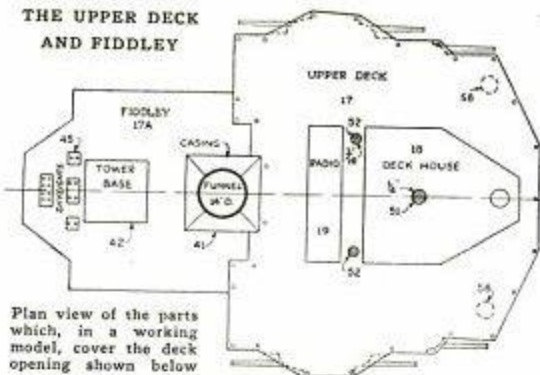


On this deck there are two nouses 18 and 19, also cut from 1/2-in. wood. They should be painted before the deck above is set in place.

The next bridge deck (20) I made from 1/16 in. fiber board, but 24-gage brass would have been better, because with it you can have the stanchions closer to the edge and solder them in position, if necessary. Its shape will be seen in the detail. It should be drilled for the stanchions before being placed. On it goes the conning tower support (21), a little deck (22), and above that the conning tower (23), which instead of ports has narrow slots and three small ventilators on top. Aft of that are the plotting room (24) and the radio room (25). All these are cut to shape from 1/2-in. wood.

Next we have two flying bridges made from 28-gage sheet brass cut to the shape shown in details 26 and 29. The edges are turned up and soldered at the corners to form weather screens. The wing extensions

THE UPPER DECK AND FIDDLEY



Plan view of the parts which, in a working model, cover the deck opening shown below

of 29, however, have stanchions instead of screen, as shown. For these the deck is bored and the stanchions put in, the ends being cut off short and fixed with a touch of solder underneath. The edge of the screen should have holes, and in the corner of the house there should be staples to which some No. 33 wire is fastened and rove through the two-ball, 1/4-in.

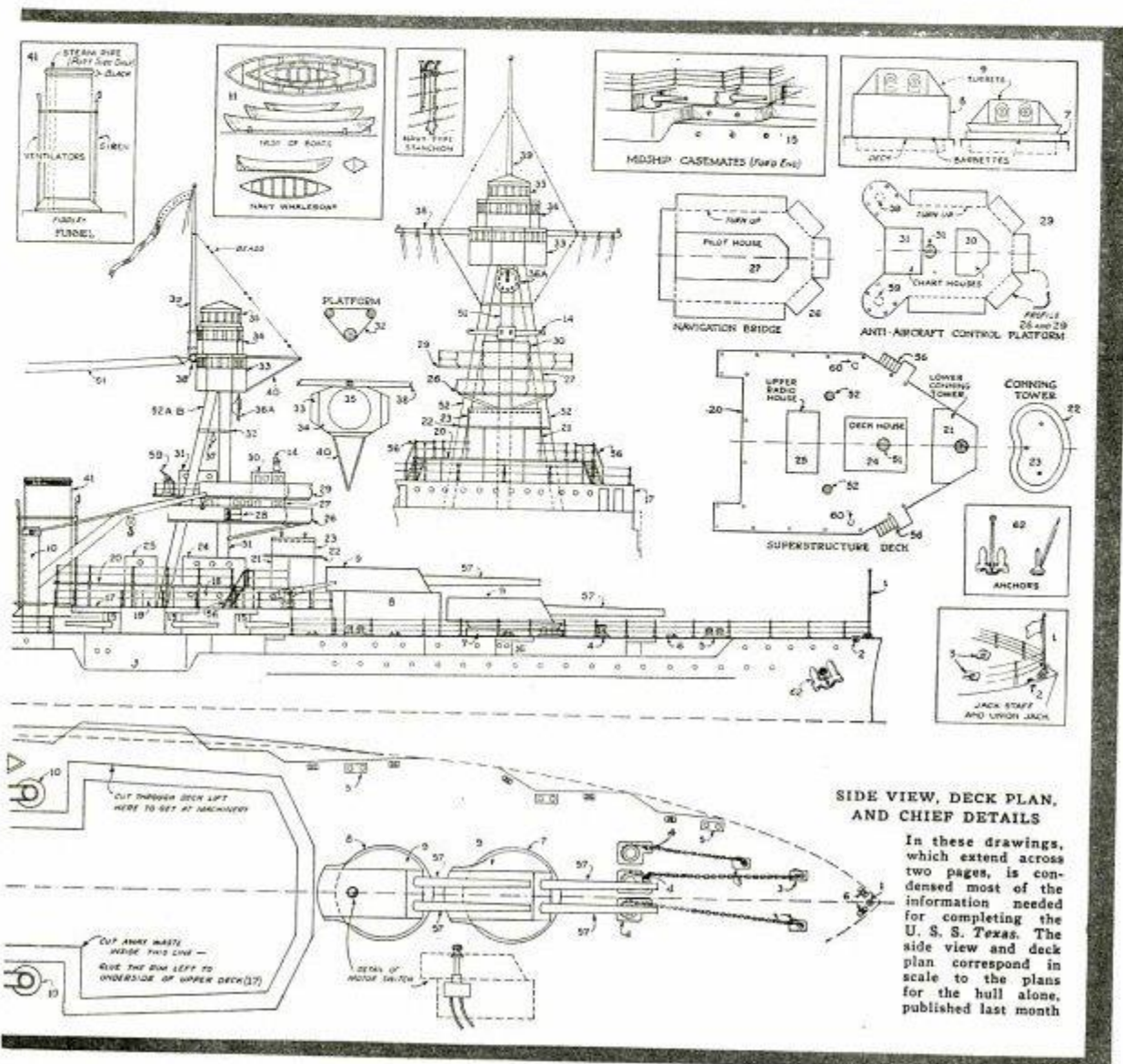
stanchions. Around the front part, the screen is peculiarly shaped to form a wind shield; this can be indicated by fastening on carved plastic material or wood.

On the lower of these decks there is one house (27) and on the upper two (30, 31), and on 30 again is a range finder, the construction of which will be found in detail 14.

Each of these decks and houses (27, 24, and 18) needs a 1/4-in. hole through which the vertical part of the tripod (51) will pass, and the three decks require 3/16-in. holes for the after struts (52). These must be carefully bored.

The tripod may now be erected. The best way to fix the legs at the top is to cut a piece to the shape of the main battery control station (33) about 1/8 in. thick and nail this onto them. Reduce the depth of 33 by a like amount and glue it on.

The description of the deck fittings will be continued in the next issue.



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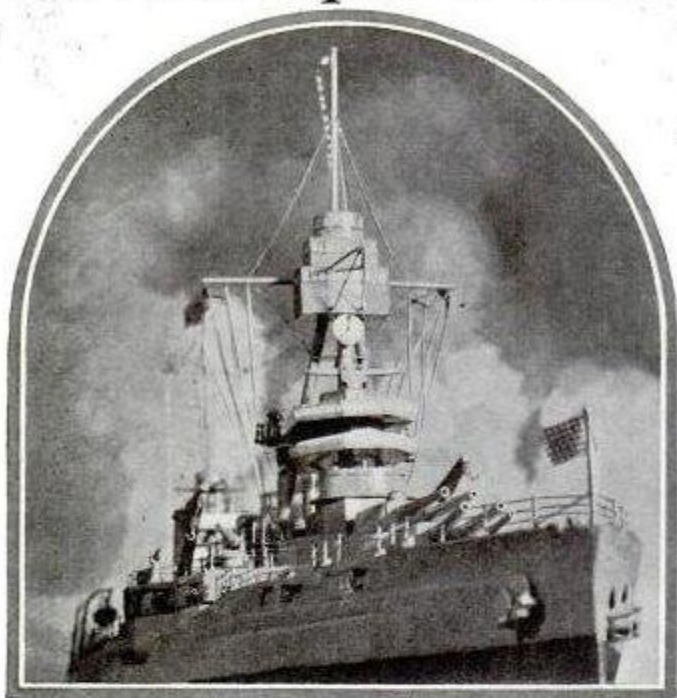
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NEW INVENTIONS • MECHANICS • MONEY MAKING IDEAS
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Picturesque Deck Structures make our

Battleship Model *more warlike*



A striking camera study of the new model taken from an unusual viewpoint, and a close-up of the foremast and deck structures with which this article is mainly concerned

By Capt. E. Armitage McCann

OUR new 3-ft. model of the United States battleship *Texas* has been carried in previous installments (P. S. M., Nov. '32, p. 67, and Dec., p. 71) to the point where the tripod of the foremast is in place, capped, as it were, by the main battery control station.

The *Texas* is one of the most powerful battleships afloat. How high she ranks among American ships is indicated by the fact that she is the flagship of Battleship Division 1 of Battle Force, U. S. Fleet. She is therefore a particularly good subject for the model maker and can be built with equal satisfaction as an exhibition model for display purposes or as a power-driven working model.

Resting on the main battery control station, which is marked 33 in the drawings published last month, are the secondary battle top (34) and the main battery and direction top (35). On all three (33, 34, and 35) I merely painted the windows.

Underneath this structure there is a platform (32), cut to fit half around each leg of the tripod. This platform and the other deck can be kept in position by driving pin points into the struts. From the platform hangs the bell (37), about $\frac{1}{8}$ in. in diameter.

Vertically under the front edge of 33 there is a clock with one black hand and black figures 1 to 10, called the "concentration dial." This is a thin sheet of brass with an arm soldered onto the back and nailed to the tripod (see 36a).

Abaft the tops are the yard (38) and the mast (39). These are fastened to the back with staples. In front there is a forked wire (40) with the ends driven in-

to the top edge of 33, and to the end of it is soldered another thinner forked wire with its ends set into the bottom of 33.

The mast proper and the signal mast, or topmast, are made in one. It is stayed with a thin wire from the position shown, having six very small beads rove on. The wire is soldered into a hole at the point of the forked wires (40). The breast stay, which comes from the same position, has six beads, passes through a hole in the yard, has six more beads, and is fastened to a staple in the tripod—on both sides, of course. A touch of glue will hold the beads in their proper positions.

AT THE top of the signal mast there may be either a plain glass bead, representing a light, or an ordinary truck, which had better be left off until the flag goes up.

The projections at the side of deck 20 are for ladders, metal or wood, with No. 24 brass wire posts and a handrail bent to shape and soldered to the rail stanchions.

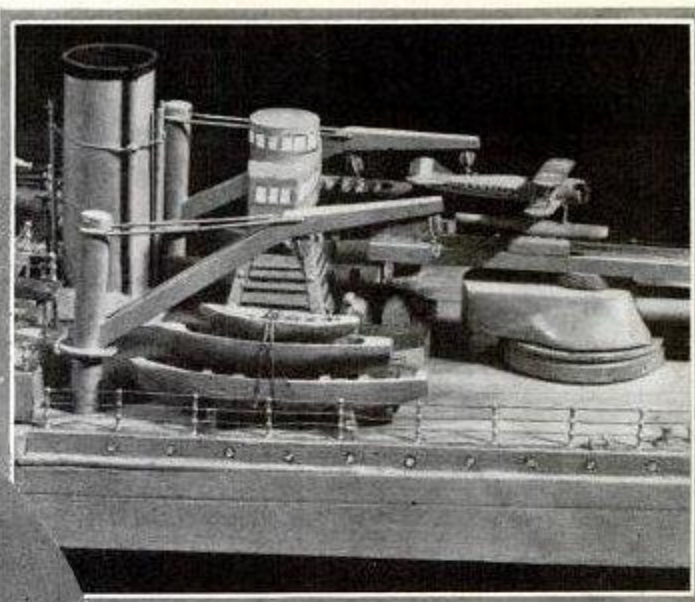
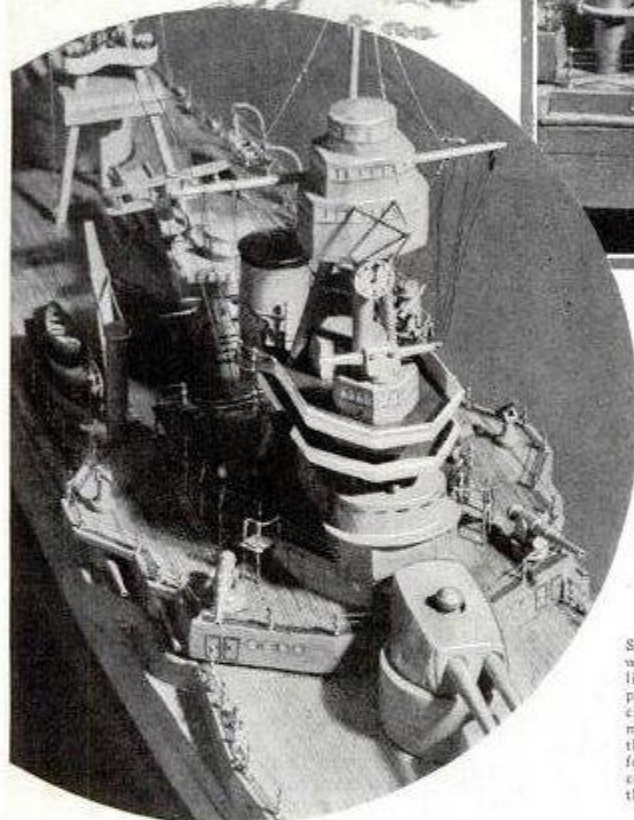
These rail stanchions should be the two-

ball, $\frac{1}{4}$ -in. size with shanks long enough to stick in the deck below to support the edge of the deck as illustrated above.

The guns and other fittings for these decks will be described later.

While all this work is under way, the painting of the hull should be carried on. The model should have the usual three or four coats of flat white, rubbed down; then, below the water line, several coats of Indian red (red iron oxide). Everything above the water line should be painted a light blue-gray (battleship gray) except decks 17a, 20, 27, and 29, which are Indian red, the rim around the top of the funnel, which is black, and the weather screens, which are white. The gray is merely white paint with a little black added and a touch of blue to brighten it.

The main deck and deck 17 are left a natural light wood color and varnished, but with no gloss or shine. If desired, a stripe about $\frac{1}{8}$ in. wide can be stained brown (to represent hard wood) around the edge of the main deck and all erections on it.



This instructive side view of the deck fittings between the masts shows the funnel, the strange, slat-like potato locker with auxiliary fire control stations mounted on top of it, the catapult and seaplane, the two large cranes, and nested boats

Studied in conjunction with the drawings published last month, this photograph brings out clearly the various elements built up around the foremast. Note the forked wires above the concentration dial and the yard and its rigging

The actual water line is not shown, but instead there is a black stripe representing the boot-topping, $\frac{1}{4}$ in. above and $\frac{1}{8}$ in. below the water line. The simplest way to get an even stripe is to let the red and the gray meet; then, when quite dry, mark the position of the boot-topping and fasten above and below it a strip of gummed paper or tape, painting all between with one or two coats.

FITTED into the after edge of the upper deck is another deck, called in the merchant service the "fiddley." This covers the fire room (17a). It is $\frac{3}{8}$ in. thick and has vents painted on the sides, and the deck is red. At the fore end is erected the funnel (41). This can be made from thin metal tubing or by soldering a piece of shim brass around a stick and then withdrawing the stick. In the second case, place a disk about $\frac{1}{2}$ in. thick in the lower end to preserve the shape of the funnel and to aid in gluing it down. The top can be curled over or have a narrow band soldered on. At the base a square piece of wood should be fitted for the cas-

ing; it is $\frac{1}{4}$ in. thick with a hole bored for the funnel, and from this hole it slopes down to nothing. If preferred, it can be made from several pieces or shaped from plastic material.

On the foreside is a siren; abaft are two thin exhaust pipes; and on the port side, a $\frac{3}{32}$ -in. funnel as high as the main funnel. These can all be held in position with a piece of thread or wire around the funnel; pass a turn behind each piece. The funnel should be painted gray outside, black inside, and black around the rim.

The base of the next little tower (auxiliary fire control) is built of a $1\frac{1}{2}$ in. square piece of wood $\frac{3}{4}$ in. thick, tapered toward the top. Nailed to the corners of this—it is marked 42 on the drawings—are four angle irons. The cross strips of metal preferably should be on the inside of the angle irons.

Houses 43 and 44 are made of wood to the shapes shown and are glued together. Cuts are made underneath 43 so that it can be pressed onto the angle irons. This part is all gray except the windows, and the base 42, known as the "potato locker,"

has black lines on it to represent ventilating slots as in the photograph above.

Just abaft this there may be four little skylights—just oblong blocks with sloping tops (45), and between them two cow-ventilators.

In the corner between the upper deck and the fiddley there is a crane (10) on either side. The position of this has been moved out a little to allow the decks to lift off. The upright is a piece of $\frac{1}{4}$ -in. dowel, set well into the deck. Around this at a point $\frac{5}{8}$ in. up is a $\frac{1}{32}$ -in. platform. This should have a tiny motor and levers on it and a handrail around, but these details have been omitted. From the post extends an arm, which I made of two solid pieces of wood. This is supported as shown with a wire, the ends of which are driven into the angle of the arm. Under the angle is a very heavy block, three- or fourfold, for lifting heavy weights. By rights it should be a heavy iron gin-block, but any roundish block will do. At the end is a small twofold block. Each block should have a hook attached. For falls I used thin wire, reeving them through the arm but not so as to show on top. The ends lead down inside.

THERE are three boats, nested, on each side of the fiddley—a motorboat, motor sailer, and whaleboat. The shapes of these will be seen in detail 11. I gave them all thwarts and in the lower ones added propellers and blocks to represent the motors. These nested boats are placed on chocks, nailed down, and held with a lashing around all. You may, in addition, correctly have Admiral's barges, punts, and other small craft on the fiddley.

Next month we shall erect the mainmast and complete practically all the deck fittings.

It should be remembered that most of the small fittings required for this model may be bought ready-made, if desired, from model supply houses. When time is an object, this is advisable and, in some cases, less expensive than making them oneself. The larger dealers publish well-illustrated catalogs.

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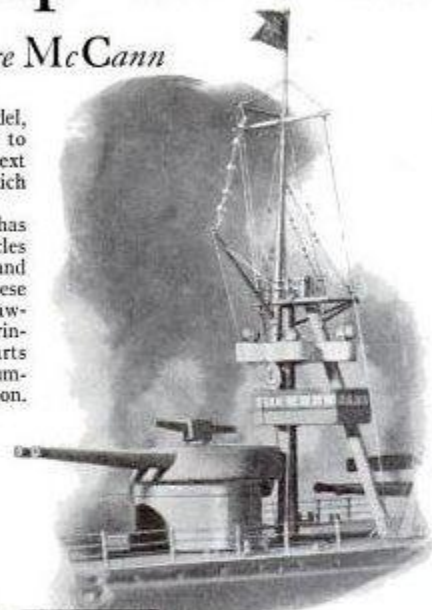
Adding the Armament to Our Model of the Battleship TEXAS

By Capt. E. Armitage McCann

IN BUILDING our battleship model, the U. S. S. *Texas*, we now come to the remaining mast. It is the next erection aft, omitting the armament, which we shall take up a little later.

The construction up to this point has been covered in three previous articles (P.S.M., Nov. '32, p. 67, Dec., p. 71, and Jan. '33, p. 68). In the second of these (Dec., pp. 72 and 73) the complete drawings of the side view, deck plan, and principal details were given with all the parts indicated by numbers. These are the numbers used in the following description.

The mast tripod is like the foremast, but not so high. The legs spread at the same angles and are each 3/16 in. in diameter. The control house (46) is made as shown in the drawings just mentioned. It must be carefully bored for the legs. The four-leaf clover above (47) for holding the searchlights is made,



Mast and the No. 4 turret with range finder on top

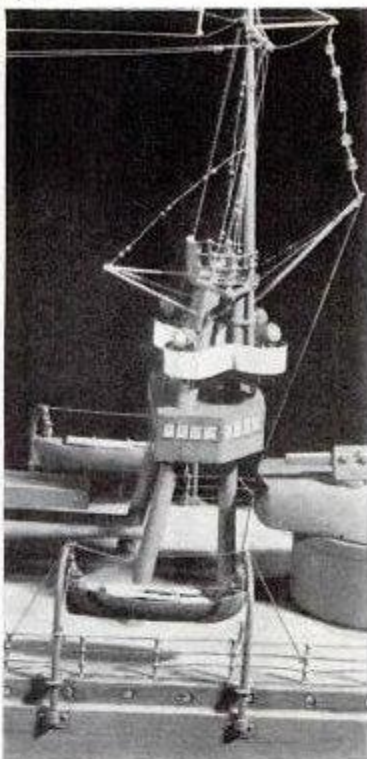
like the flying bridges of 24-gage sheet brass. The weather screen is a strip soldered on.

The lookout-platform above (48) is circular, but with a high screen at the fore edge. This I also made of brass, bending the screen up. Aft it has two-ball stanchions soldered on, with the usual wires running through them. Extending from this at the sides are wires for the backstays (49). These are made in one piece and soldered under the forward and after rims of platform 48. At the after edge is a scant 1/8-in. hole for the signal mast. This platform is nailed onto the top of the tripod struts.

The mast is barely 1/2 in. in diameter and tapers to about half that. At the position shown is a yard (50B). This is so small that I made it of brass rod, binding it in position with wire. From the same position a short arm extends aft, horizontally. This I also bound



A bow view of the model. This shows the first two turrets, one mounted on a low barbette, the other on a high barbette



Navy whaleboat and davits and a clear side view of the mast described in this article

on with wire through a hole in the end. From above come the yard lifts, passing first to the yardarms and then to the end of the horizontal arm where they are fastened with solder.

The mast ships through the hole in platform 48 down to the second platform. It can be fixed with a nail, if of wood. However, as the mast is quite slender and likely to be accidentally knocked if the model is a working one, it is better to make it of brass rod, for which the process will be substantially the same.

From halfway between the platforms extends the flag gaff, made of brass wire. At the yard-lift position I passed the bight of a thin wire, twisted the parts together, and carried them over the end of the horizontal arm, fastening them with solder. Then I threaded four glass beads over both parts, opening the two wires to hold the beads at equal intervals. The bight was now soldered to the gaff, and from there the two separate ends of the wire were run back on each side to the wires for the backstays (49).

From the yard position thin wires run through the ends of 49 to staples in the struts. From a point on the mast halfway between the yard position and platform 48, similar wires go to the ends of 49. Still another wire runs from the same halfway point to a heavier wire which extends from the fore edge of the platform. Two supporting wires are soldered at an angle to this horizontal wire and are driven into the after struts. All the thin wires mentioned have six beads spaced in pairs at intervals along them.

In stepping the main tripod, you must be sure
(Continued on page 93)



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BATTLESHIP TEXAS

(Continued from page 89)

that the distance along the deck between the after struts and the fiddle is not less than 4 3/16 in. or the guns will not swing.

The emergency boats are kept in davits at the afterdeck. The davits are round, tapered to the end, and about 1 1/2 in. high. They are set into sockets on the armor plate and are supported by brackets from the deck as shown in detail 65. The sockets are pieces of tube soldered to plates, the latter being drilled as shown for nails. The brackets, which extend some way out to keep the davits vertical, are brass plates drilled for nails. The boats are navy whaleboats. They should have a few oars in each and be hung with two double blocks as small as you can make them. All are gray except the oars. They are usually kept swung out, but they are less likely to be damaged if swung in.

THE seaplane is shown in detail 13. The fuselage is cut from a piece of 1/4-in. dowel, the wings from 1/16-in. plywood, fiber board, or brass. Holes are drilled through both for the struts, but nailing them to the fuselage is what really holds them. The propeller is cut from wood or brass and fastened with a pin. Four struts (brass wire) come from the fuselage to hold the pontoon. Side pontoons are omitted. The tail is brass or cardboard nailed on, and the rudder is the same. The ship's name should be lettered on the sides, and the tail painted red, white, and blue, the red being forward. The plane rests on a carriage running on the catapult, and the catapult is set on a round turntable on the third turret, as shown.

The full armament of the *Texas* consists of:

Ten 14-in. 45-cal. guns in turrets, mark I; twelve 5-in. 51-cal. rapid-fire guns, mark VII; six 3-in. anti-aircraft guns, mark III; three 3-pounder saluting guns, 50-cal. (length 99 in.); two 1-pounder semiautomatic guns (length 30 in.); two 3-in. 23.5-cal. landing guns.

The "caliber" of a gun is the diameter of the bore at the muzzle. Thus a 14-in. gun will have a bore of 14 in. The designation "45 caliber" denotes that a gun is 45 times its caliber in length, or in the case of a 14-in. gun, 52 ft. 6 in., to which is added the breech. The "mark" is the design, or modification from the original "mark I."

OUR 14-in. guns will be 3 1/2 in. long by 3/16 in. (full) diameter at the breech, with 2 3/4 in. projecting from the turrets. All ten of them are mounted two to a turret.

The guns can be cut or turned from wood or brass. Note that the muzzles have only a slight flare (see 57).

The turrets (9) should be cut to the shape shown. The holes for the guns must be carefully made halfway up the turrets so that the guns will be horizontal and parallel. Any divergence will look bad, and all the guns must project the same amount.

These turrets rest on the barbettes, three of which (7) are low, and two (8) considerably higher. The barbettes should be turned or (Continued on page 95)

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BATTLESHIP TEXAS

(Continued from page 93)

cut round. The second and fourth should be left long, the extra part being turned smaller to fit tightly in holes in the deck. This is because the second contains the motor switch and the fourth should lift off to allow ballast to be placed in the hull to balance it. I built a small box between the propeller shafts to hold the ballast. The amount required will depend upon the distribution of other weights. If it is not a working model, the barbettes can be glued right on the deck. The switch, of course, may be placed somewhere else.

THE guns are put in the turrets, which are fastened with a long nail. Turret No. 3 at least will have to turn, so that the fiddley deck can be lifted off. On this turret the plane catapult is fastened. Turret No. 4 should have a range finder on top to the port side, as should No. 2 if there is no switch in the way, but this one will be to starboard.

On the upper deck there is a 5-in. rapid-fire gun at each side pointing forward. These should be mounted as shown in detail 58. The other ten 5-in. guns project from casemates in the ship's side, therefore only 13/16 in. of them will project and no mounting is necessary. These guns are shown in the profile plan, detail of the upper deck, and detail 58. The casemates are marked 15. They are triangular cuts carved into the side of the hull, in the angles of which are semicircular revolving plates through which the guns project. The guns, when at rest, should be horizontal and parallel to the fore-and-aft line of the ship. Forward there are three similar casemates (16), but the guns have been removed from these and windows put in the first, ports in the second, and nothing in the third—under the bridge.

The small guns, with the exception of four anti-aircraft guns have been omitted. They would go on the first bridge deck, and the field guns would be lashed on the afterdeck. I put an anti-aircraft gun (59) in each wing of deck 29, and one on each wing of the upper deck 17.

The remaining details will be described next month in the final article of the series.

OLD RULING PEN AIDS IN MODEL MAKING



For fastening wire parts to an extremely small ship model, I utilized a discarded ruling pen of the type used by draftsmen. Unlike tweezers, the ruling pen can be clamped on the wire or other small part, thus allowing it to be held firmly in until the glue has set.—FRANK E. CRANE, JR.

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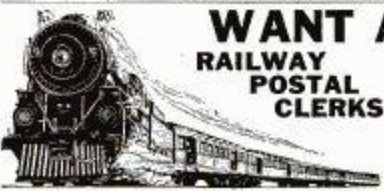
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SEE PAGE 49

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THE OLD "ROCKET"



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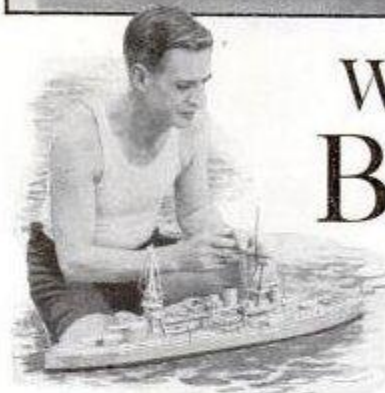
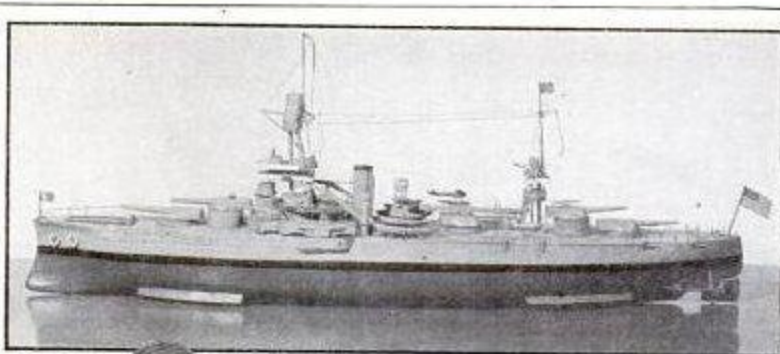
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Completed model of the *Texas* and how she looks in the water

We Launch Our Battleship Model

By

Capt. E. Armitage McCann

LITTLE work now remains to complete the model of the battleship *Texas*, if you have kept up with the instructions published in the preceding four articles in this series. The identifying numbers mentioned in the following description of the few parts still to be made refer to corresponding numbers on the assembly and detail drawings that appeared in the second article (P.S.M., Dec. '32, pp. 72 and 73).

Six large searchlights are placed on the model, but I omitted the four or more small ones which go on deck 20. Detail 60 shows how to make a searchlight. A piece of dowel is cut as indicated, and a strip of brass bent to shape and fastened with a clinched pin swivel. I fastened four of the searchlights to the wings of platform 47 by drilling a hole through it, and through this I flowed a spot of solder. The two which are placed on the wings of deck 20 have a small round base and are fastened with a pin.

To the weather screens of deck 26 should be fastened the side lights, green to starboard and red to port. They should be double as shown in detail 28. Metal or wood screens with head lamps may be used to give a good representation of them.

At the stem stands the jack staff (1) to carry the union jack. It can be of wood, but is better if made of brass rod, because it is so slender and so likely to be knocked. It is set in a hole in the deck or in a little socket. About 3/4 in. up, to steady it, there should be a brass band to which is soldered a forked wire, the ends of which are set in the deck. The staff should stand upright. The ensign staff (63) is similar but longer; its band and support are about 3/4 in. high, the legs sloping slightly aft. Both should have trucks and be painted gray.

At the foremast head there can be a commission pennant—a swallowtail, which I have exaggerated somewhat in length. At the main there might be the admiral's flag of four

stars on a blue ground. Just by way of decoration I hoisted a flag at each yardarm—the corner to starboard because that is the crew recall and our ship seems to lack only a crew, the admiral being, let us suppose, in his cabin; and, to port, the battle efficiency flag. Of course, when she is under way, the jack should come down and the ensign go to the gaff.

At the positions shown there should be bitts or bollards (5). These are best cast from metal with holes for nailing down, but can be cut from wood or indicated with a 1/2 in. long plate and two escutcheon pins. On each side of the bitts are chocks or leads (6) made from a piece of metal bent to shape and filed up. Right aft there is a pair of bitts cut in half and nailed on each side, in line with the hull; this forms a towing lead.

The radio antennas require careful work. Have a double wire on each side from yardarm to yardarm. Solder a fork of the thinnest wire to the ends of a 1/2-in. length of stiff wire. Make two of these and pin them on a board not quite as far apart as the distance between the yards. Start a thin wire at the after stretcher, go around the forward one, and leave enough to stretch down to the radio room (25). Solder the wire in position. Repeat for the other side. Lash the forward fork to the extreme yardarm and make a little hook at the other end to hook onto the after yardarm, so that it can be undone when you want to remove the center portion to adjust the machinery, if there is any. Bore holes in the sides of the radio room and peg the wires in position.

The emergency antenna running to the top of the after tripod is omitted, as is the wire from the fore crow's nest to the jack staff and the wire from the searchlight platform to the ensign staff.

I also omitted a number of mushroom and other ventilators, ammunition hoists and small hatches, and a varied collection of small rung ladders and tubes running here

and there, but all the prominent features are embodied—everything that is essential. The edge of the shell plating rises about 9 in. above the deck level, and inside that there is a 12-in. waterway. To represent this I ran the side painting 1/16 in. onto the deck.

I had first thought of leaving off all the deck stanchions because they are made to lie down when the ship is in action, but she looked bare without them so I set in standard three-ball 5/16-in. stanchions (3/8-in., however, will do). These are set 3/32 in. in from the edge. I spaced them somewhat widely apart, averaging 3/4 in. Eighty are required. It is customary for ship model makers to buy their stanchions from dealers in ship model supplies. Stanchions can be made, however, by drilling brass rod at the correct intervals and turning down between the holes in a lathe. This is a tedious job, and various substitute methods are possible, such as using thin twisted wire or very thin split cotter pins. It is all a matter of personal preference and ingenuity. A sketch was given in the December issue of the regulation battleship stanchions, but they are much harder to make.

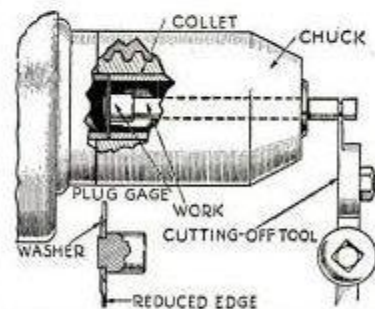
On the stern at the position indicated, the name of the ship TEXAS should be painted in 1/8 in. high block letters. This lettering is black. Then your model will be complete.

She has been quite a bit of work to make, but worth it. When she is ready to launch, whether figuratively on the mantelshelf or actually in the water, you will have the satisfaction of knowing that you have constructed an accurate, good-looking scale model of one of the finest and most powerful American battleships.

UTILIZING SHORT STOCK IN A SCREW MACHINE

A HAND screw-machine job that called for a large quantity of steel rods, uniform in length, was turned out in an economical way by using a lot of waste pieces that were available instead of cutting them from long stock. Because these pieces were short, it was found necessary to chuck them by the "work" ends and insert them from the tool side of the chuck. To facilitate this, a simple gage or plug was made as shown.

A short piece of stock was turned down to fit the hole in a large washer, a shoulder

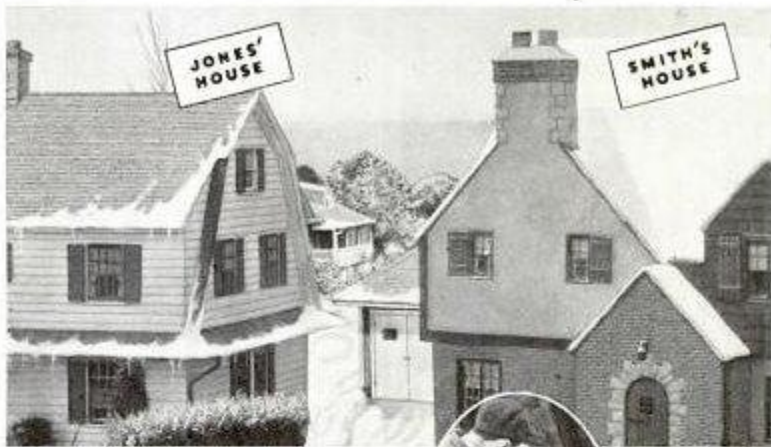


Screw-machine chuck broken away to show how a gaging plug was inserted behind the collet

being left to keep it from slipping through the hole. The turned down end was then riveted over to hold the washer in place. Once more the plug was chucked and the washer turned down to the inside diameter of the spindle in the screw machine. The thickness of the washer also was reduced around the edge.

The plug was placed in the spindle, followed by the collet in the usual manner, and it then served as a dependable gage for length.—JOHN E. SERAFIN.

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KIT NO. 3



KIT D



KIT NO. 4

BY SENDING \$1 to the Popular Science Homecraft Guild, you can obtain a construction kit of raw materials for making a highly simplified 12 in. long model of the new American built liner *Manhattan*. The kit contains a piece of white pine for the hull, sawed to the approximate shape but otherwise unfinished; wood of the correct thicknesses for making the various deck units, bridge, funnels, lifeboats, and similar parts; sheet metal for the rudder, anchors, propellers; soft wire for the masts, ventilators, and davits—in fact, everything but the paint. A blueprint showing all parts full size is included.

Because of the small size and unusual simplicity of this miniature model, it is an excellent one for beginners and will serve as a pleasant introduction to the fascinating hobby of ship model making.

This new kit is marked F in the list below. It will be mailed postpaid to any reader in the United States for \$1, but cannot be sent C.O.D. The other kits available are also listed. Each is accompanied by instructions or blueprints.

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- E. Battleship model, U. S. S. *Texas*, 3 ft.



KIT E



NO. 2



KITS BAND C



KIT A



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- EE. Same with hull lifts sawed.... 7.45
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