

ing raised, shows the characters that it bears, and that are stated to have been written by an invisible spirit that slipped in between the two slates.

Our readers will not ask us how we manage to know in advance what should be written upon the slate. It is useless to say that deceit is allowable in prestidigitation; loaded dice always turn up the same number, and nothing is easier than to know the name of the card that a spectator will draw from a pack composed of thirty-two similar cards, if one is not skillful enough to cause him to take the forced card.

Tricks with a Hat.—Prestidigitators frequently borrow from their spectators a hat that serves them for the performance of very neat tricks which are not always easily explained. We shall describe some of the most interesting of these.

The operator will begin by proving to you that the felt of your hat is of bad quality, and, to this effect, he will pierce it here and there, with his finger, his magic wand, an egg, and with a host of other objects.

This is all an illusion, the mystery of which is explained by Fig. 3. See the finger B. It is either of wood or cardboard, and terminates in a long slender needle. The prestidigitator, who has concealed the finger in his left hand, thrusts the point into the top of the hat, whose interior is turned toward the spectators. Afterward, raising the right hand, the forefinger of which he points forward, he seems to be about to pierce the top of the hat, but, instead of finishing the motion began, he quickly seizes in the interior, between the thumb and forefinger, the point of the needle, wiggles it around in all directions, turns the hat over, and the cardboard finger, which moves, seems to be the prestidigitator's own finger. The same operation is performed with the wooden half egg, C and the rod A, which, like the finger, appear to traverse the hat, in the interior of which are hidden the true rod and egg. We may likewise solder a needle to a half of a five franc piece, and thus vary the objects employed for this recreation to infinity.

In order to take from a hat a large quantity of paper in ribbons, and then doves, and even a duck or a rabbit, there is no need of special apparatus nor of a great amount of dexterity, and still less of the revolving bobbin or of the mysterious machine whose existence is generally believed in by the spectators when they see the paper falling regularly from the hat, and turning gracefully of itself as the water from a new sort of fountain would do.

Nor is there here any need of a high hat; a simple straw hat (or a cap, at a pinch) will suffice. The prestidigitator holds close pressed to his breast and hidden under his coat a roll of the blue paper prepared for the printing apparatus of the Morse telegraph, and which is so tightly wound that it has the aspect and consistence of a wooden disk with a circular aperture in the center. In turning around after taking the hat, the opening of which rests against his breast, the operator deftly introduces into it the roll of paper, which has the proper diameter to allow it to enter by hard friction as far as to the top of the hat, and stay where it is put even when the hat is turned over.

Were it needed, the paper might be held by a proper pressure of the left hand exerted from the exterior. The introduction of the paper is effected in a fraction of a second.

"Your hat, my dear sir, was doubtless a little too wide for your head, for I notice within it a band of paper designed to diminish the internal diameter," says the prestidigitator, while, at the same time, he draws from the hat the end that terminates the paper in the center of the roll. Then he reverses the hat so that the interior cannot be seen by the spectators. The paper immediately begins to unwind of itself and to fall very regularly and without intermission (Fig. 4, to the right).

When the fall of the paper begins to slacken, that is, in general, when no more than a third of the roll remains, the prestidigitator turns the hat upside down, and, with the right hand, pulls out and rapidly revolves in the air the paper ribbon, whose capricious contours, succeeding one another before the first have

had time to fall to the floor, produce a very pretty effect (Fig. 4). The quantity of paper extracted from the hat appears also in this way much greater than it really is, and at length forms a pile of considerable bulk.

This experiment may be completed in the following manner: The operator, approaching his table, which, upon a board suspended behind it, carries a firmly bound pigeon, quickly seizes the poor animal in passing, and conceals it under the pile of paper, while he puts the latter back into the hat, in order to see, says he, whether all that has been taken out can be made to enter anew.

Having thus introduced the pigeon or any other object into the hat, the paper is taken out, and it is at the moment that the hat is restored to its owner that he pretends to discover that it still contains something.—*La Nature.*

THE GALAPAGAS TORTOISES.

If the visitor to the Central Park menagerie will pass into the house behind the lion quarters, and walking past the stalls where the graceful antelopes of South

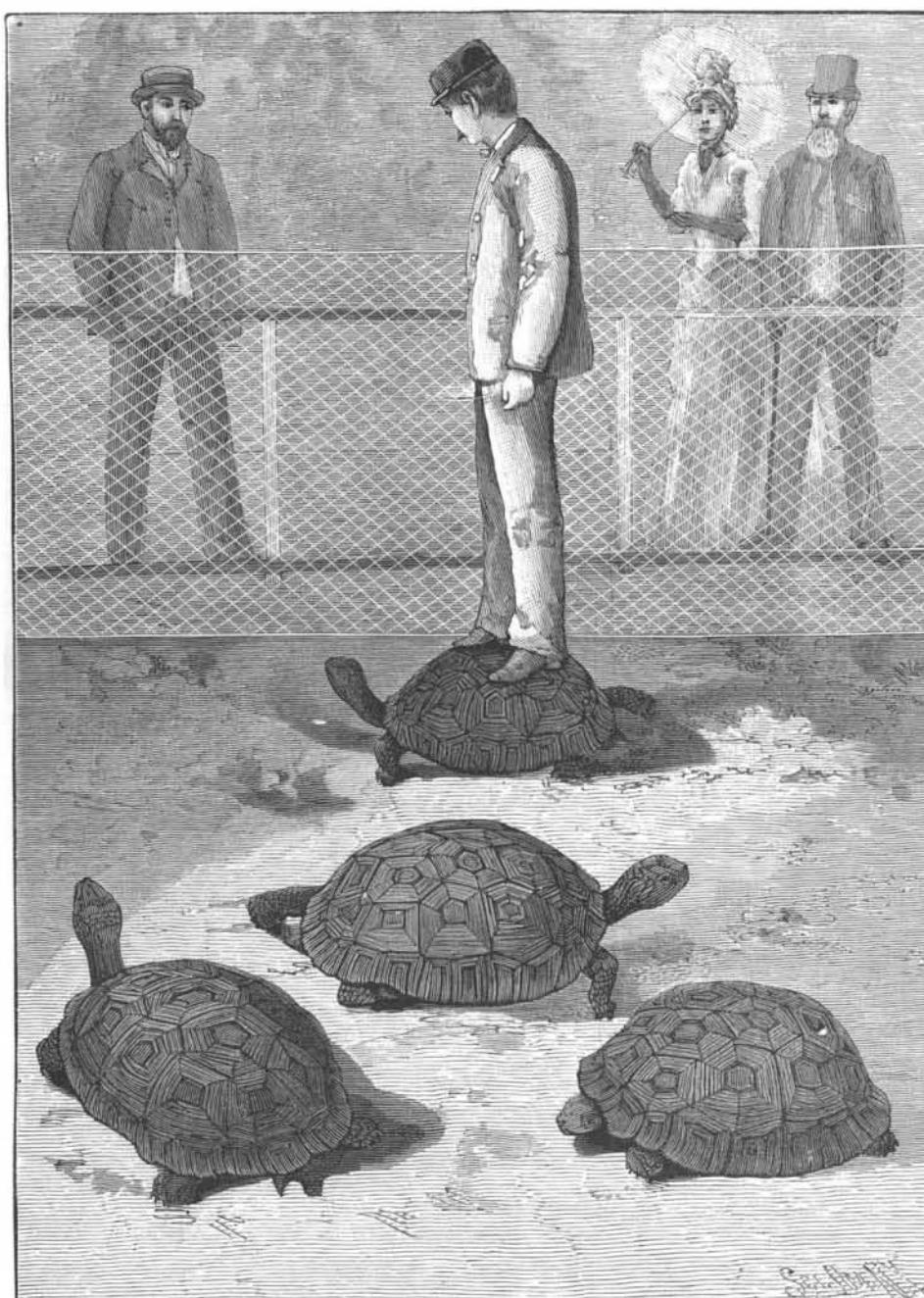
name Galapagos alludes to them, which is seen more clearly in the German translation, *Schildkröteninseln*, and in the French, *îles des Tortues*, both designations being literally the islands of the tortoises. Chas. Darwin has devoted a chapter in his "Voyage of the Beagle" to a description of these curious reptiles, and they have been made the subject of many sketches by the chance tourists or wandering visitors of this remote region. Dr. A. Gunther also prepared a masterly paper on these animals for the *Philosophical Transactions*, of England, and their discussion is a wide and tempting field in the subject of animal distribution and variation.

The Galapagos Islands are volcanic in their origin and present desolate surfaces of scoriae, rugged and black surfaces of blistered and splintered lava. Here these immense tortoises were found by some of the earliest navigators, and were long resorted to as food by the buccaneers of the Spanish Main. Their flesh, especially that upon the breast bone, as instanced by Darwin, is very delicious, and as they retain their size and sweetness after months of confinement, they afforded a very convenient source of food for the provisioning of ships which would be for a long time away from means of supply of fresh meat. The great numbers of these reptiles in the islands before they had become reduced by men were surprising. They had multiplied in unchecked fecundity, and this, combined with their length of life, resulted in an enormous population. In 1680 Dampier said of them:

"The land turtle are here so numerous that five or six hundred men might subsist on them alone for several months without any other sort of provision." As early as Admiral Porter's visit to these islands (1813) the difference between the occupants of the different islands had been noticed. Dr. Gunther has separated the tortoises from this group into five different species, each restricted to its own island, and assumes their derivation from some typical ancestor whose characters have gradually diverged into these subordinate races by reason of the varying features of food and habits. Darwin has given some of the most interesting observations about these strange creatures. They live by preference on the higher and more moist portions of the islands, though found in the arid and lower coast country. They are forced to travel considerable distances toward the center of the islands to secure water, and in this connection Darwin makes one of the most suggestive and entertaining statements in his account of his visit to the Galapagos Islands.

He says ("Voyage of the Beagle"), "The tortoise is very fond of water, drinking large quantities, and wallowing in the mud. The larger islands alone possess springs, and these are always situated toward the central parts and at a considerable height. The tortoises, therefore, which frequent the lower districts, when thirsty are obliged to travel from a long distance. Hence

broad and well beaten paths branch off in every direction from the wells down to the seacoast, and the Spaniards, by following them up, first discovered the watering places. When I landed at Chatham Island, I could not imagine what animal traveled so methodically along well chosen tracks. Near the springs it was a curious spectacle to behold many of these huge creatures, one set traveling onward with outstretched necks, and another set returning, after having drunk their fill. When the tortoise arrives at the spring, quite regardless of any spectator he buries his head in the water above his eyes, and greedily swallows great mouthfuls, at the rate of about ten in a minute. The inhabitants say each animal stays three or four days in the neighborhood of the water, and then returns to the lower country; but they differed respecting the frequency of these visits. The animal probably regulates them according to the nature of the food on which it has lived. It is, however, certain that tortoises can subsist even on those islands where there is no other water than what falls during a few rainy days in the year." A most surprising peculiarity of this creature is the retention of water in its urinary bladder which subserves the purposes of the animal, and can even be imbibed by men, Darwin asserting that when the bladder is full, the liquid is quite limpid and only



THE GALAPAGAS TORTOISES.

Africa, the pretty gemsbok (*Oryx gazella*), are confined, look over the last bin on the right hand side, he will see a group of interesting objects—the Galapagos tortoises. If the temperature, the character of the day, and their own dispositions are in accord, he will find them taking some interest in their surroundings, and may be able to observe their stiff and strained attitudes, their inane, staring eyes, their gaunt, wrinkled necks, and the comical protrusion of their legs. But if it is dark, or the surfeit of a late dinner has thrown them into post-prandial reflections, he will observe nothing but a bundle of dirty brown box-like humps, which are marked on their outer surface by a series of sculptured and raised ridges, while dimly seen within the gaping edges of their front and back margins, the folded limbs and withdrawn somnolent heads of their inmates are provokingly described, motionless and torpid. These lumps of bone have, however, to the naturalist a great interest. They have been brought from that remarkable group of islands which lie some seven hundred miles from the west coast of South America, opposite Ecuador, beneath the equator, and belong to a fauna which, from its remote and insular position, has assumed an indigenous and unique character. Indeed, the Galapagos Islands have received their name from these large tortoises. The

slightly bitter. The Galapagos tortoise appears to be quite deaf, and gives but few audible indications of life. These are limited to the deep hiss it emits when disturbed, as it withdraws its head within its hard integument, and the roar given by the male in the breeding season. The female deposits its eggs in the sand and covers them up, but in rocky places drops them "indiscriminately in any hole." The eggs are white and spherical and are found 7 inches in circumference.

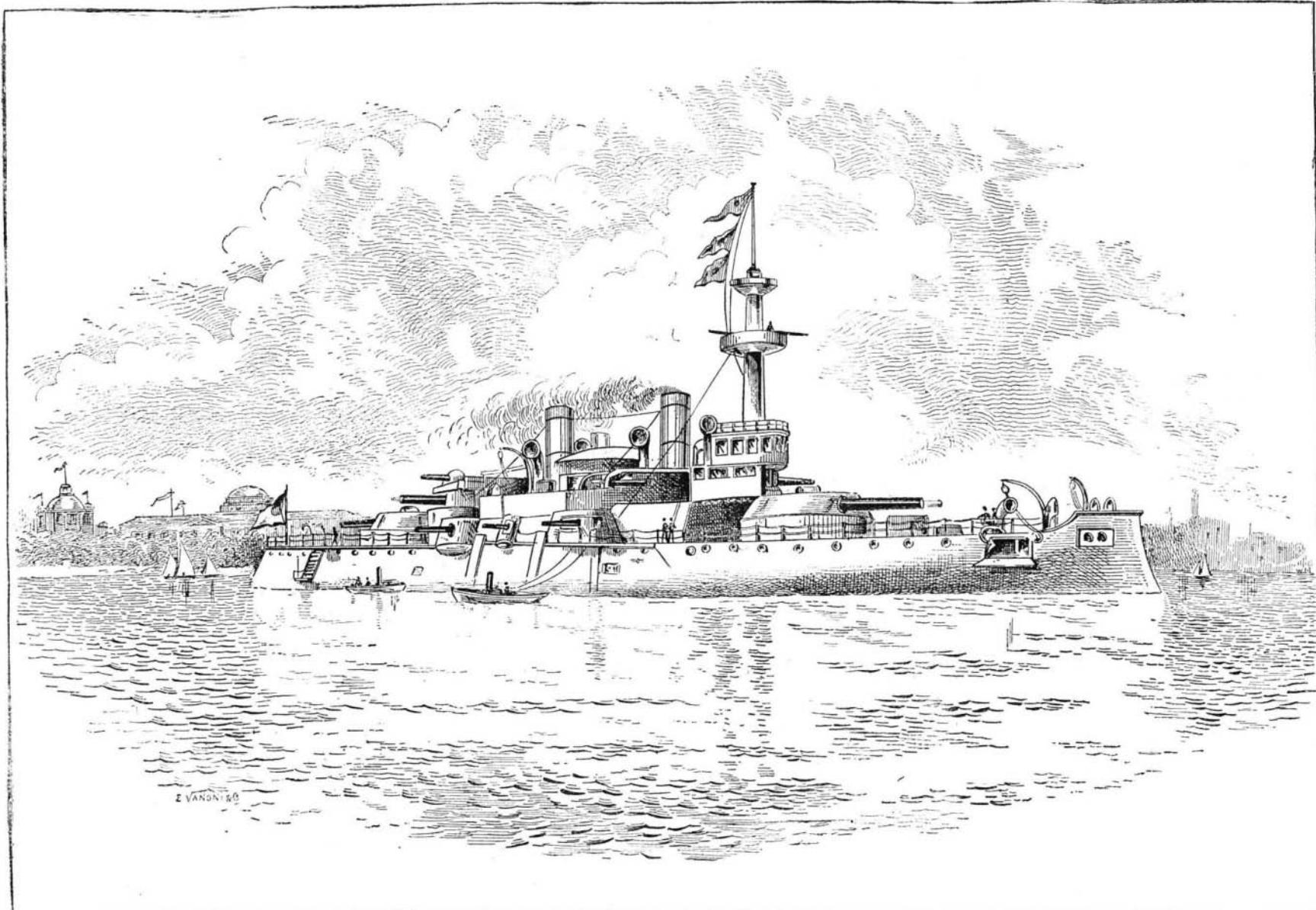
The young become the prey of the flesh-eating buzzards, while those who escape and reach maturity die from accidents, as a natural death from disease or age seems almost unknown. They can be handled with impunity, but from their enormous size they frequently require the united efforts of five or seven men to lift them. They feed upon cactus or the leaves of various trees. They appear to be aboriginal inhabitants of these islands, and, therefore, have an almost exciting interest to naturalists; but they are also representatives of a wider distribution, for allied forms and even fossil remains of congeneric species are found in Mauritius and its neighboring islands. They may be remnants of a tribe which over a broad Pacific continent has had an extreme easterly and westerly dis-

tribution to have expert janitors and showmen for the valuable public property. It is expected, however, to give certain drills—especially boat, torpedo, and gun drills—as in a vessel of war.

The structure will, therefore, serve the double purpose of housing the naval exhibit and illustrating the manner in which the men of the United States navy live. The dimensions of the structure will be those of the actual battleship, to wit: Length, 348 feet, and width amidships, 69 feet 3 inches. From the water line to the top of the main deck, 12 feet, on top and in the central position of which is a superstructure 8 feet high, with a hammock berthing resting on the same, 7 feet high, and above these will be the bridge, chart house, and the boats. At the forward end of the superstructure there will be a cone-shaped tower, called the military mast, near the top of which will be placed two circular tops as receptacles for sharpshooters, and rapid-firing guns will be mounted in each of these tops. The height from the water line to the summit of this military mast will be 76 feet, and above it will be placed a flag staff for signaling; the staff will be 24 feet long. The battery, mounted, will be four 13 inch breech-loading rifle guns, eight 8

inch breech-loading rifle guns, four 6 inch breech-loading rifle guns, twenty 6-pounder rapid-firing guns, six 1-pounder rapid-firing guns, two Gatling guns, and six torpedo tubes or torpedo guns.

coated with cement. The ends are to be shaped with iron plates. On the inside of the walls, and over the concrete on the berth deck, there will be a coating of cement, thus making the structure fireproof and free from moisture. Along the top and bottom, and taking the shape of the superstructure, are heavy angle irons, to which vertical T-irons are fastened, spaced about 4 feet apart, and braced diagonally. The walls, outside and inside, are to have a thick coat of cement on metal lathing, well secured to the vertical framing. The main and superstructure decks will have a rise of 6 inches in 69 feet. The deck plank will be yellow pine 6 inches wide and 2 inches thick, the seams of which will be caulked. The main deck beams will be steel, T-bulb pattern, 7 feet by 5 feet, and 26 pounds per foot, the ends turned down and fastened to bearing plates on brick piers in the sides of the hull. The superstructure deck beams will be steel, T-bulb, 7 pounds by 5 pounds and 10 pounds per foot, the ends fastened to the top angles at the sides of the superstructure. Iron tube pillars are to be used further to support the beams. Gutters of galvanized iron are carried around the waterways, rolling over and forming a bead finished on the outside, from which numerous conductors carry the water



MODEL BATTLESHIP, WORLD'S COLUMBIAN EXPOSITION, CHICAGO, 1893.

persion, and now separated from their western allies have, in conjunction with these latter, undergone varietal changes which have become inherited, and established separate generic groups. L. P. G.

MODEL BATTLESHIP AT THE WORLD'S COLUMBIAN EXPOSITION.

A model man-of-war is to be exhibited by the United States government. This, to all appearance, will be a faithful full-sized model of one of the new coast line battleships designed by the Bureau of Construction and Repair of the Navy Department, and now being built at a cost of about \$3,000,000 each, by Cramp & Son, Philadelphia, and the Union Ironworks, San Francisco. This imitation battleship of 1893 will be erected on piling on the lake front in the northeast corner of Jackson Park, at the pier which forms the prolongation of Fifty-ninth Street. It will thus be surrounded by water, and will have the appearance of being moored to a wharf. The structure is to have all the fittings that belong to the actual ship, such as guns, turrets, torpedo tubes, torpedo nets and booms with boats, anchors, chain cables, davits, awnings, deck fittings, etc., together with all the appliances for working the same. Officers, seamen, mechanics, and marines will be detailed by the Navy Department during the Exposition, and the discipline and mode of life on board naval vessels will be completely shown. The detail of men will not, however, be so great as the complement of the actual ship, the object being main-

inch breech-loading rifle guns, four 6 inch breech-loading rifle guns, twenty 6-pounder rapid-firing guns, six 1-pounder rapid-firing guns, two Gatling guns, and six torpedo tubes or torpedo guns.

The 13 inch guns are to be placed at each end of the superstructure, six feet above the main deck, mounted in pairs within a circular turret that revolves within redoubts 36 feet 7 inches in diameter; the redoubts extend below through the main deck, and rest on the berth deck. The 8 inch guns rest upon the superstructure deck, and are also mounted in pairs within turrets and redoubts, from which large circular ammunition tubes pass down to the berth deck. The 6 inch guns are on the main deck, within the superstructure, and have ports cut through the sides of the same, with automatic shutters. The 6-pounders are placed along the sides, on top of the bridge and hammock berthings. The 1-pounders are on the forward and after ends of the berth deck, and in the "lower top" of the military mast. The Gatling guns are in the "upper top" of the mast, and the torpedo tubes are on the berth deck—two on each side amidships and one at each end of the vessel, with ports cut through the sides and ends for the torpedoes.

The structure will, as stated before, rest on piles as a foundation. The berth deck will be composed of thick plank laid upon the foundation, on top of which there is to be a substantial layer of brick concrete. The sides of the hull are to be of brick, stepped to give contour, over which there will be a filling of concrete, thickly

that may fall on the deck down the scuppers close to the water line. The turrets and redoubts for the 8 inch and 13 inch guns are to be made up of cement on metal lathing fastened to a wood framing, and are to have all the appliances for operating them. A 13 inch gun is 44 feet long, and weighs with its carriage 115½ tons. The transportation and placing of so much weight upon a structure such as is described being impracticable, the difficulty of showing what the real battleship carries has been overcome by building the gun of cement over a wooden tube, to be rifled, and fitted with a breech plug complete, the finish of the cement being such as to give it the appearance of an actual gun.

The military mast and conning tower are to be framed with gas tubing, to which will be secured a metal lathing, with a coat of cement on the outside. The tops of the military masts are to be made of iron, securely fastened to the framing of the mast. The exterior of the entire structure will be tinted in accordance with the navy regulations, so as to give it the exact appearance of a vessel of war.

Beneath the berth deck, and directly below the turrets of the 13 inch guns, are to be the magazines, showing the stowage, lighting, and flooding, according to the navy regulations. The superstructure will show the cabins, state rooms, lavatories, mess rooms, galley and fittings, mess table for crew, lockers, berthings, etc., also the methods in which officers and enlisted men live, according to the rules of the navy.