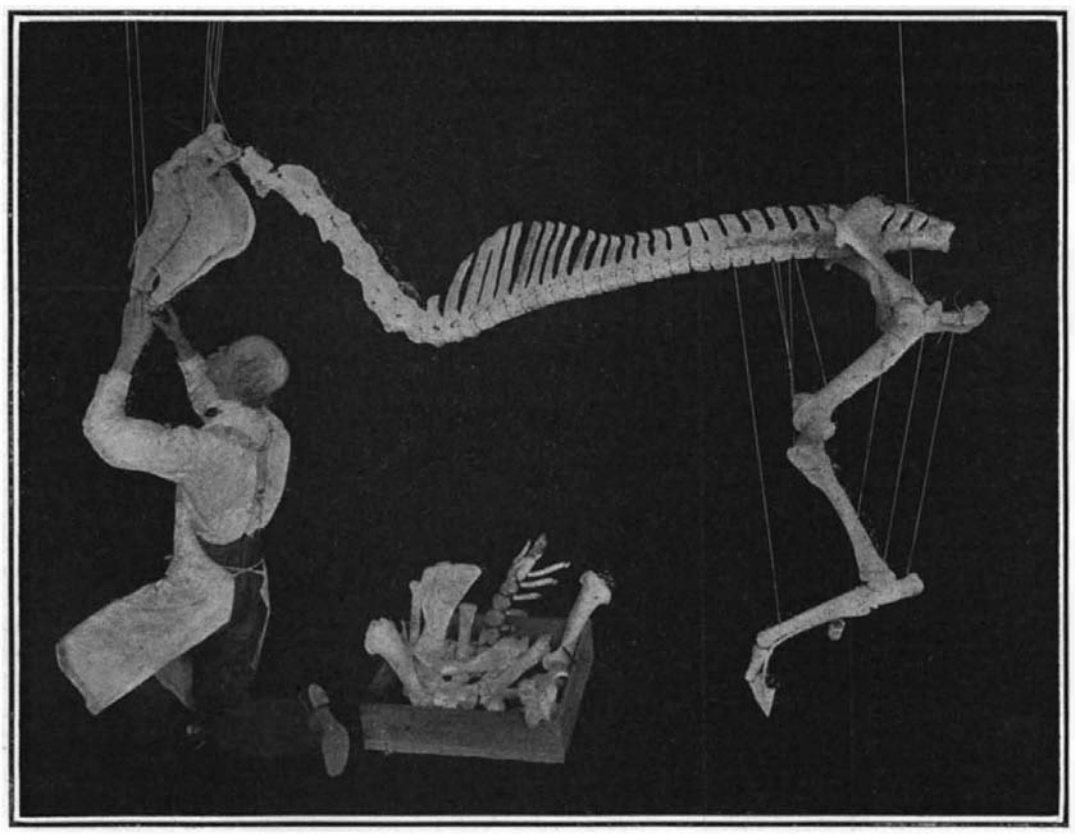
A SCIENTIFIC STUDY OF THE RACEHORSE, AND ITS USE IN MOUNTING THE SKELETON OF SYSONBY.

Sysonby is the name of one of the greatest racehorses. His skeleton is to be mounted in running position in the American Museum of Natural History. To further that purpose, a series of new and very remarkable instantaneous photographs will be used in furnishing important and accurate details for the final mounting of this great runner. Mr. James R. Keene, his owner, presented the skeleton, as well as the sum of $2,000 for the purpose of preparing it for exhibition. Aside from his long list of money victories, amounting to $200,000, one of the largest sums ever won by a racehorse in the United States, Sysonby is of scientific interest because his skeleton typifies, more than any other turf champion, the highest and speediest type of the American thoroughbred horse.

Prof. Henry F. Osborn, Curator of the Paleontological Department of the Museum, the most brilliant historian and explorer of the horse in America, is directing the scheme of presentation, and Mr. S. H. Chubb, a well-known expert on the Museum's staff, has been entrusted entirely with the difficult and intricate task of mounting Sysonby's skeleton. Mr. Chubb is recognized as the highest authority in this particular line of work. Prof. Osborn has decided to mount Sysonby in the most original and realistic manner, just as the animal was winning one of his principal races, something never attempted before.

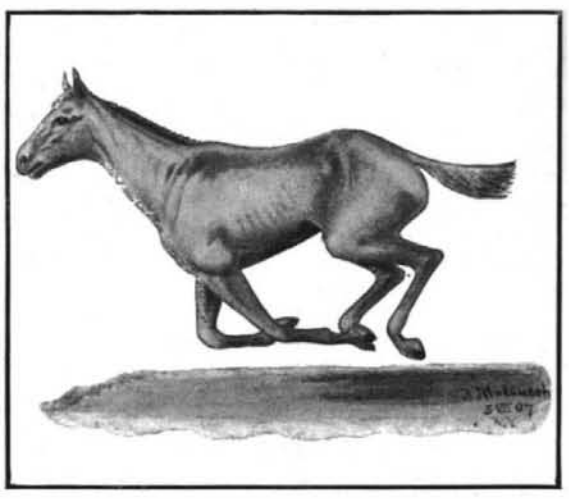


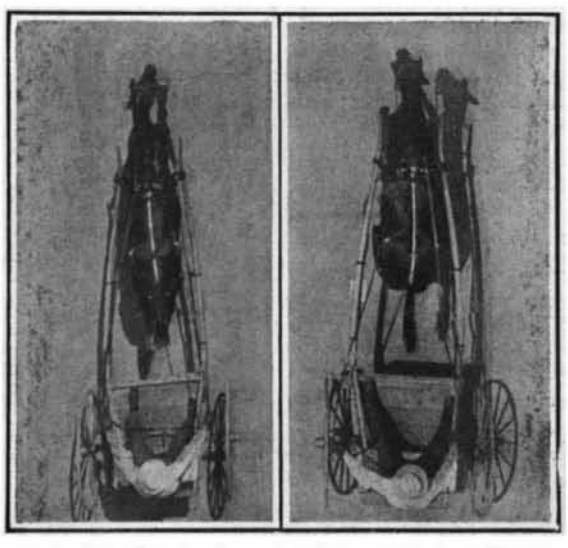
The Bones Will Be Temporarily Tied to Cords and Counterweighted. By Manipulating the Cords the Bones Can Be Moved Until the Correct Position is Obtained.

Sysonby's death, at the early age of four years, occurred at the Sheepshead Bay track on June 17, 1906, after an illness of three months, due to a mysterious and baffling malady, diagnosed as septic poisoning. The combined skill of four veterinarians, a physician, and a skin specialist composed the medical staff which fought hard to save the life of their noted turf patient. An autopsy showed that the heart and lungs were of usual proportions. The liver furnished the greatest surprise, since it was three or four times larger than the normal size. Sysonby was buried in a plot in the training quarters at Sheepshead Bay. One month later, during which interval Mr. Keene was undecided as to the final disposition of the remains, he concluded to present the skeleton for permanent mounting in the Museum, together with the fund named for carrying out this purpose.

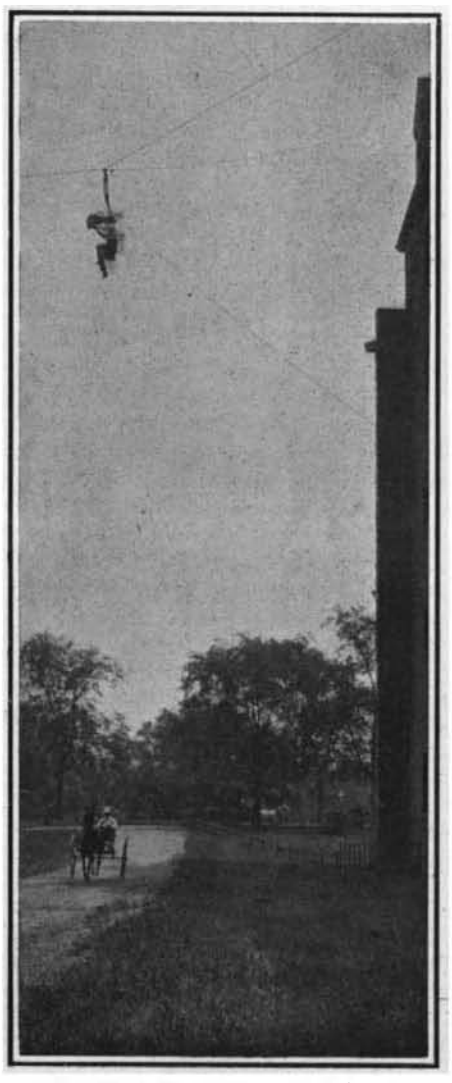
Mr. Chubb and his assistants disinterred the body. Decomposition had left a few traces on the skull; otherwise the bones were in perfect condition. By soaking the bones in water at a temperature of between 90 deg. and 100 deg. for two weeks, and afterward in an immersion of benzine for two months, and by a subsequent exposure to sunlight, all the flesh and grease were removed, leaving the bones polished and snowy white. The one hundred and fifty or more bones are preserved, tabulated, and incased in a series of bureau-like drawers in Mr. Chubb's laboratory. To aid in carrying on his research work, Mr. Chubb has in his laboratory an extensive and varied study collection, at present representing over thirty specimens, ranging from the young two-day colt to the thirty-nine-year-old veteran. The first photograph, showing a glimpse of the experimental stage and the manner of mounting Sysonby, is here seen in one of the accompanying illustrations.

The most novel features used to obtain study material for the mounting are the series of remarkable overhead instantaneous photos now being made by Mr. Chubb. Ordinary side views have been taken before by Muybridge and others, but up to the present no top views have ever been secured. This serial photography is necessary in order to obtain pictures of the spinal column of the horse when moving at full speed. All previous investigators, such as Muybridge and others, did not work along this line. There are no pictures which show this specialized and unknown phase of the fast horse. By special courtesy of Prof. Osborn and Mr. Chubb, the writer was afforded special facilities for witnessing and obtaining some photographs showing the striking and daring manner in which Mr. Chubb, suspended fifty feet or more in the air, in a narrow rope-sling seat, is obtaining some wonderful snap-shots of a trotting horse below. One of these, the first overhead photograph to be published, showing the lateral movement of the spinal column of a running horse, is here reproduced. The horse used is an ex-racer of fine proportions, furnished by a nearby riding academy. In order to follow the movement of the spine, so that it will be perfectly visible on a photographic plate, a white line is painted along the vertebral column; three other spots are painted on the hip and flank, designed to outline the various movements of the pelvis and hip-joints. After these preliminaries, Mr. Chubb climbs into his rope-sling seat, and is hoisted up fifty feet or more. The lens of the instrument is pointed downward, mirrors being employed to reflect the image in a vertical plane, so that the operator keeps the ground glass before his eye exactly as if he were taking a picture in the usual way. In order

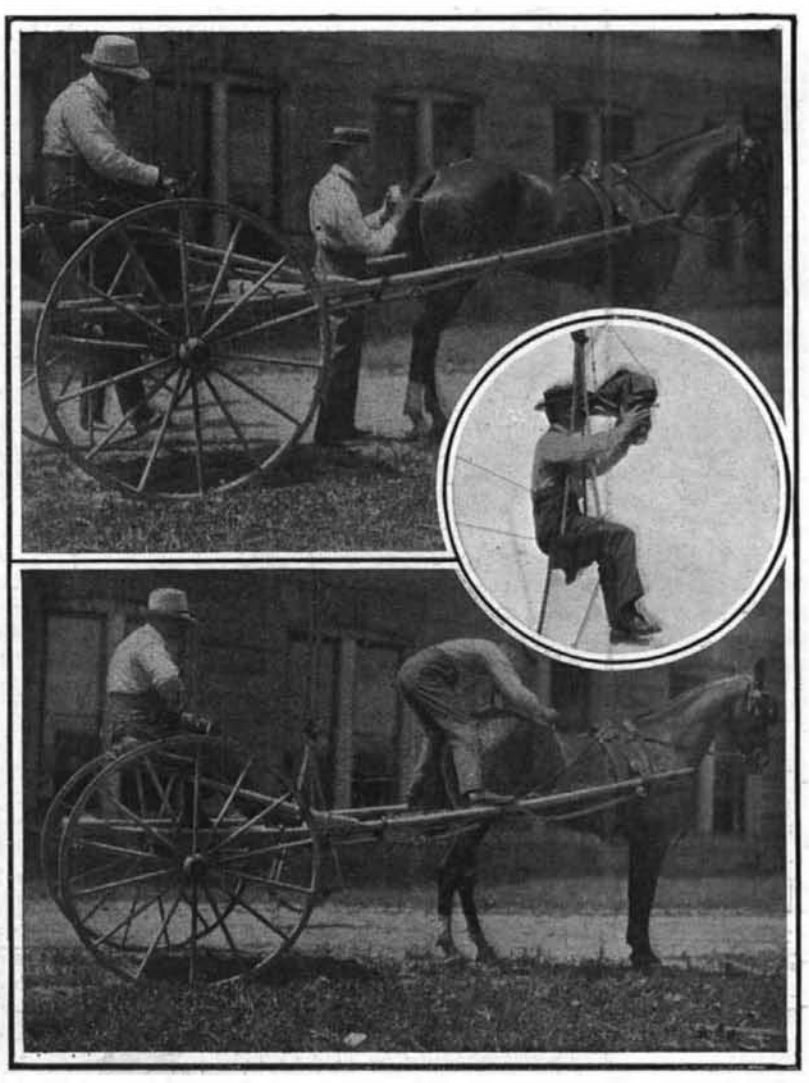




The White Mark Along the Spine Affords a Clue to the Change in the Vertebral Column's Position.



The Horse is Photographed from a Height of Fifty Feet.



The Spine is Painted White and Two White Marks are Placed on the Hips, in Order that the Movements of the Spine May Be Photographed.

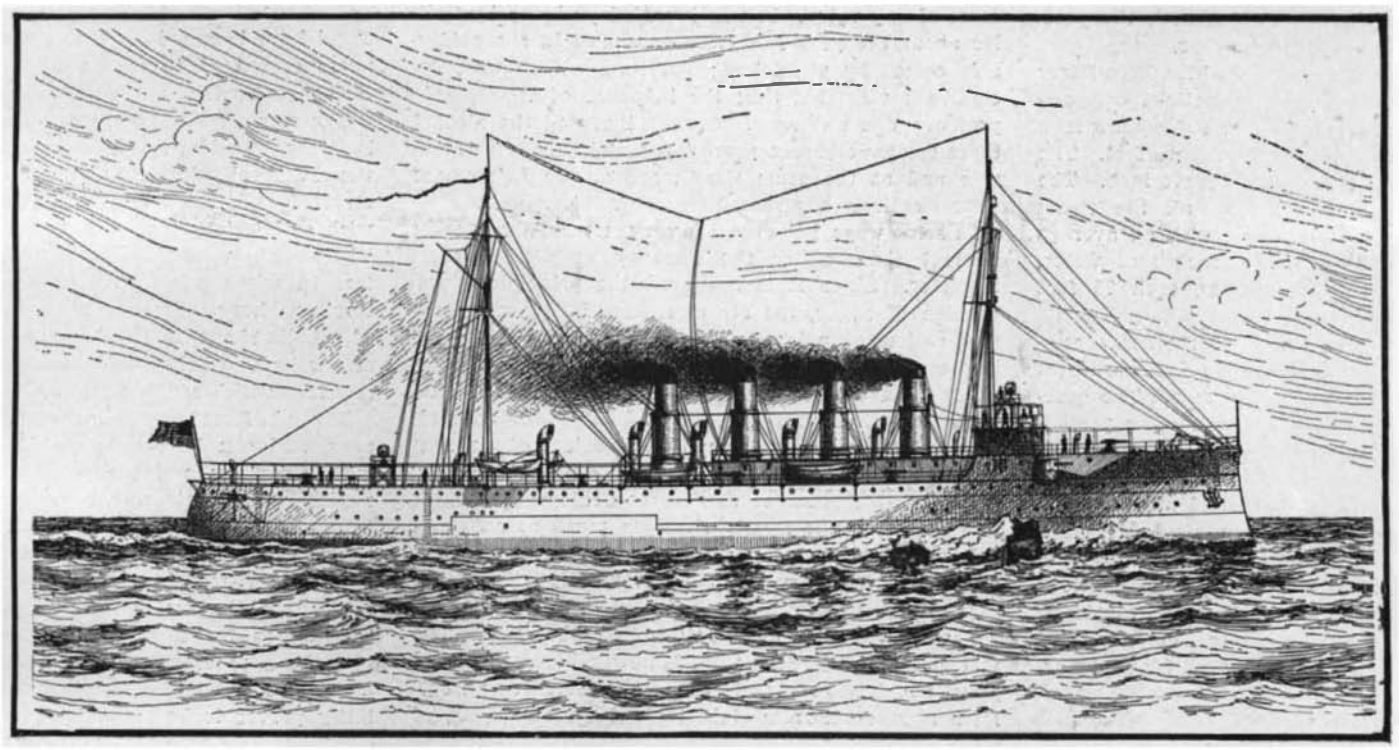
to relieve the strain from the operator and allow free control of the hands, the weight of the box is held by two cords attached to an overhead pulley. The horse and sulky are driven directly beneath, and a sharp focus is obtained on the top of the back. Then comes the actual taking of the picture. The driver sends his steed at full breakneck speed along the roadway, and at the crucial moment, when the animal appears on the reflected mirror of the camera above, the shutter is sprung. The camera used for this high speed is a 4-5 Graflex fitted with a Goertz-Celor lens and focal plane shutter. The exposure is one-thousandth of a second.

In life Sysonby stood 15 hands 3 inches high (that is, 5 feet 3 inches). The length of the mounted skeleton will be a little over 8 feet. One of the accompanying photographs shows the working process and scheme of mounting. After the present series of overhead photos have been studied to advantage, the white mark along the back affording a clue to the approximate change in position of the spine of a moving horse, and after consulting a large number of the best sideview pictures taken of Sysonby in life on the race-track, a characteristic pose will be determined upon. The various bones will be temporarily tied to a series of strings with weights attached, which can be raised or lowered. By manipulating the cords, all the parts can be moved and changed until the final and correct attitude is reached. The approximate running position in which the skeleton will be finished is outlined in the accompanying drawing by Mr. Ignaz Matausch, of the Museum, which drawing however is subject to modification. It will probably take six months or a year, owing to the extensive and painstaking amount of experimental research and labor, before the skeleton is ready for exhibition. When that times comes, it will be a masterpiece from a technical standpoint, illustrating the realistic and up-to-date mounting of the skeleton, as well as fittingly perpetuating the memory of one of the swiftest thoroughbreds ever produced in America. It may be suggested that a chronophotographic camera, mounted on a trolley directly over the moving horse and arranged to travel with him, would more adequately answer Mr. Chubb's purpose. In this manner about forty pictures could be taken every second, and the entire series would record the minutest change in the spine's position for each fleeting moment. The limited means at Mr. Chubb's disposal probably prevent him from carrying out this plan.

Covering for Steam Pipes, etc.—225 parts water, 20 parts potter's clay, 39 parts fossil meal, 7 parts horse or cow hair, 3.5 parts linseed oil, 3.5 parts sifted rye flour, 2.5 parts beet sugar molasses (ultimately, if desired, also 3.5 parts flaxseed meal).

THE NEW UNITED STATES SCOUT CRUISER "SALEM."

The launch on July 27 at the yards of the Fore River Company, Quincy, Mass., of the scout cruiser "Salem" marks the introduction into the U. S. navy of a new type of warship. Her estimated speed, 24 knots, is greater than that of any other cruiser of the navy, and is exceeded only by that of the torpedo boats and destroyers; and while it is a knot less than that of the English scouts now building, the difference in speed is more than compensated for by the ability to maintain the high speed in all conditions of weather, by a coal capacity more than double that of the English scouts, and consequently a greatly increased radius of action.



Length, 420 feet. **Beam,** 46 feet 8 inches. **Draft,** (mean) 16 feet 9⅛ inches. **Displacement:** (normal) 3,750 tons; (full load) 4,640 tons. **Horse power,** 16,000. **Speed,** (at trial displacement of 3,750 tons) 24 knots. **Coal,** (maximum) 1,250 tons. **Guns:** Two 5-inch; six 3-inch. **Torpedoes,** two 21-inch.

The Fastest Ship in the United States Navy.

The leading characteristics of the "Salem" are as follows: Length between perpendiculars, 420 feet; length over all, 423 feet 2 inches; breadth, molded, 46 feet 8 inches; draft, fully loaded, 19 feet 1½ inches; depth amidship, molded, 36 feet 5 1-16 inches; displacement, fully loaded, 4,640 tons; displacement on trial, 3,750 tons; draft on trial, 16 feet 9½ inches; total coal capacity, 1,250 tons; coal on trial, 475 tons; maximum speed, average of 4 hours' run, 24 knots; steaming radius at 10 knots per hour, about 6,250 knots; steaming radius at full speed, about 1,875 knots; maximum brake horse-power, main turbine engines estimated, 16,000; indicated horse-power, auxiliaries, 400.

The freeboard of the vessel is greater than that of any other vessel in the navy, being, at the normal draft, 19 feet 8½ inches amidships, 34 feet at the stem, and 21 feet 6 inches at the stern. The high freeboard insures good sea-going qualities, gives great range of stability, and provides a safe and dry vessel under all conditions of weather. On account of the high freeboard it has been possible to provide commodious quarters for the officers and crew, well above the waterline. A forecastle has been provided above the main deck, for about one-quarter of the length, and deck houses have been arranged abaft the forecastle.

Ample subdivision has been made to insure the vessel keeping afloat with no resulting serious change of trim or loss of stability if several of the compartments are pierced. In planning the structural details the greatest care has been exercised to provide a hull which shall combine with lightness the strength and stiffness necessary to successfully withstand the severe shocks which the vessel may be called upon to undergo, and particular attention has been paid to the longitudinal strength of the vessel and to the strength of the watertight bulkheads, that they may be able to withstand the pressure due to the flooding of any compartment and thus avoid endangering the vessel as a whole.

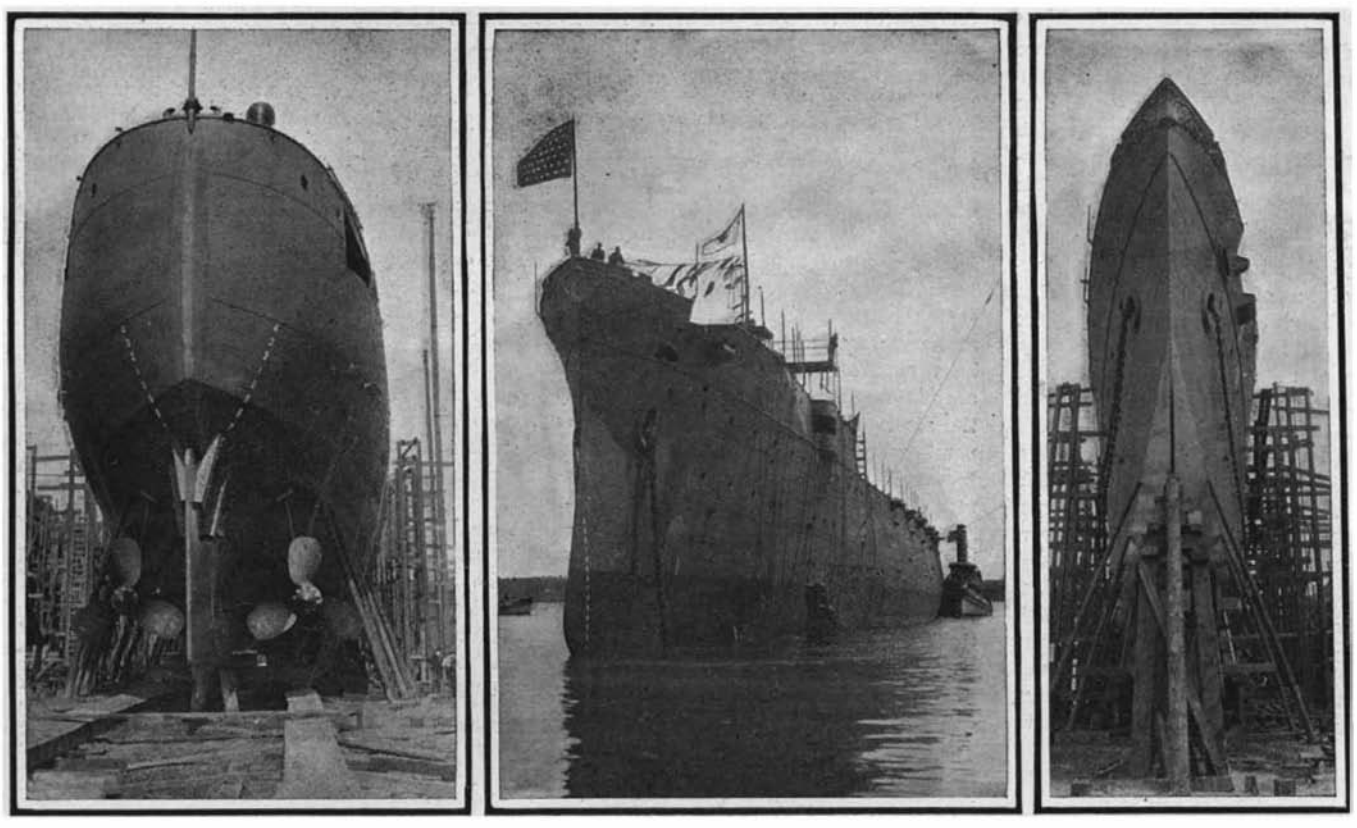
The hull is built of steel throughout; two longitudinal bulkheads are worked continuously throughout the engine and boiler spaces, one on each side, extending from the bottom of the vessel to the main deck, and inclined slightly inboard at the top, In order to avoid any break in the continuity of the strength of the vessel, the upper and lower strakes of these bulkheads extend well beyond the limits of the machinery spaces, forming large brackets gradually tapered off. Between these longitudinal bulkheads, and extending throughout the boiler and engine room, an inner bottom is worked, so that the vessel is well protected from injury in case of grounding.

There are five decks, designed as forecastle, main, berth, orlop and platform, respectively, the main and berth decks being continuous from stem to stern. Nickel steel protection of 80 pounds per square foot is worked on the shell plating for the length of the machinery space including the dynamo room, extending from about 3 feet 4 inches below the waterline to about 9 feet 6 inches above, abreast the engine and dynamo rooms, and 6 feet 6 inches above, abreast the boiler rooms. At the forward end of the machinery space and the after end of the dynamo room, partial athwartship bulkheads of 40 pounds nickel steel are fitted, of the same depth as the adjoining side protection. Nickel-steel protection is fitted in wake of the steering engine.

The battery consists of two 5-inch and six 3-inch rapid-fire guns and two 21-inch submerged torpedo tubes.

Two submerged torpedo tubes of the side-loading type with all necessary accessories, including air compressors and accumulators, are installed in the torpedo room forward, one on each side. Four torpedoes will be carried for each tube.

The magazines



On the Ways. **After the Launch. Note the Great Freeboard.** **The Lofty Bow.**

A NEW TYPE.—THE UNITED STATES 24-KNOT SCOUT CRUISER "SALEM."