

**THE UNITED STATES BATTLE SHIP IOWA.**

One of the new battle ships now being constructed at the Cramps' ship yards, the Iowa, is represented in the accompanying illustration. She is one of the most formidable of our war vessels now in course of construction, and the tests of the heavy Harveyized nickel-steel armor with which she will be plated were described and illustrated in the SCIENTIFIC AMERICAN of November 9.

The first keel plate of the Iowa was laid August 5, 1893, and it gives one some idea of the great amount of labor required to build such a vessel when it is estimated by the Bureau of Steam Engineering that she will not be ready for final delivery to the government until about July, 1897. It is expected that the Iowa will be launched in February or March.

The Iowa was designed by the Navy Department to meet the requirements of the naval appropriation bill of July 19, 1892, and her cost was not to exceed \$4,000,000. The dimensions are as follows:

Length on load line.....	360 ft.
Beam extreme.....	73 ft. 2¼ in.
Mean draught.....	24 ft.
Displacement.....	11,296 tons.
I. H. P.....	11,000
Speed, in knots, per hour.....	16
Coal bunker capacity.....	2,000 tons.

break up before entering the vessel. On top of the 14-inch armor a horizontal deck 2¼ inches thick is worked, and from the ends of the side armor to the extremities of the vessel a similar deck 3 inches in thickness is provided. Above the armor decks, belts of cellulose to prevent the inrush of water in the event of the vessel being injured are provided. The hull is built on the cellular system, with inner bottom, and great attention has been given to the subdivision of the vessel into a large number of watertight compartments, each provided with its own means of pumping and draining. The machinery and boilers are arranged in six watertight compartments. The engines are of 11,000 horse power, of the inverted, direct-acting, triple expansion type, driving twin screws.

The smoke pipes are in height 100 feet above the grate bars, and the performance of the boilers under natural draught is expected to be a great improvement over boilers in existing naval vessels.

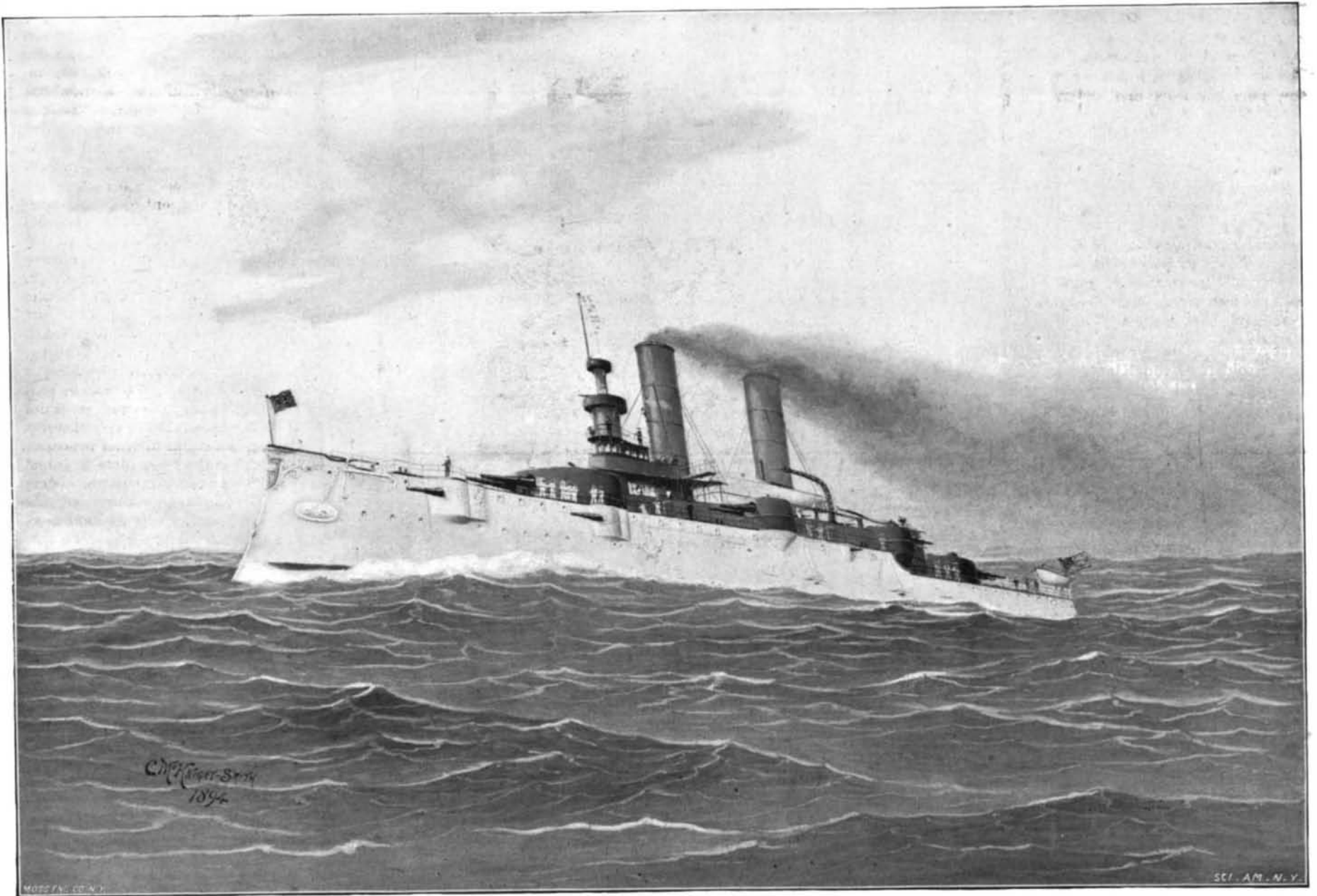
The ventilation and incandescent lighting plants of the vessel have been especially studied, in order to insure comfort and health to all on board.

Electric search lights of great power are provided, capable of lighting up a zone about the vessel through which no torpedo vessel can pass unnoticed, and the machine guns are so disposed as to bear upon all por-

to give cocaine again to make sure of his speed. The action of cocaine grows more transient as the use increases, and when a long period of scoring follows before the race begins, drivers give a second dose secretly while in the saddle. Sometimes the horse becomes delirious and unmanageable, and leaves the track in a wild frenzy, often killing the driver, or he drops dead on the track from the cocaine, although the cause is unknown to any but the owner and driver. Some horses have been given as high as twenty grains at a time, but this is dangerous and only given to worn-out animals, who may by this means win a race. It appears that cocaine is only used in running races, and as a temporary stimulant for the time. It is claimed that the flashing eyes and trembling excitement of the horse is strong evidence of the use of cocaine.—Quarterly Journal of Inebriety.

**The Advantage of Being a Blacksmith.**

Among the seven trades which a student in mechanical engineering must learn at Cornell is that of the blacksmith. Occasionally there is a protest, but it is never heeded. One dude ten years ago was unusually averse to soiling his hands. But he had to work at the forge just the same. Last fall he went to Professor Morris and thanked him for being compelled to



**THE UNITED STATES BATTLE SHIP IOWA.**

The main battery consists of four 12-inch breech-loading rifles and eight 8-inch breechloading rifles mounted in turrets. The 12-inch gun turrets are armored with solid Harveyized nickel-steel plates of 15 inches thickness, and the 8-inch guns are protected by armor of 8 and 5½ inches in thickness. All this armor is treated by the Harvey process, which gives the plates a casehardened surface, gradually shading off to a soft back.

The secondary battery is made up of six 4-inch rapid-fire breechloading rifles. These rifles throw a shell weighing thirty-six pounds, and are capable of being fired ten times per minute. These guns are protected with light armor against machine gun fire, and are disposed so as to have as great a range of fire as possible. The auxiliary battery consists of twenty 6-pounder and nine 1-pounder machine guns, with six torpedo tubes.

The protection to the hull and machinery is afforded by a steel belt of 14 inches maximum thickness, covering over seventy per cent of the load line. This belt extends from 4 feet 6 inches below the load line to 3 feet above it. Above this belt to the main deck level between the 12-inch gun turrets, a belt of 4-inch armor is worked to cause shell loaded with high explosives to

tions of this zone; and should a craft by any means get through this area of light and gun fire, stout torpedo nets reaching from water line to keel are ready to receive the torpedoes discharged.

**Use of Cocaine on the Race Track.**

Within a recent period cocaine has come into use on the race track, as a stimulant. Horses that are worn and exhausted, or are uncertain as to speed and endurance, are given ten to fifteen grains of cocaine by the needle under the skin at the time of starting, or a few moments before.

The effects are very prominent, and a veritable muscular delirium follows, in which the horse displays unusual speed, and often unexpectedly wins the race. This agitation continues, and the driver has difficulty in "slowing down" the horse after the race is over; not unfrequently the horse will go half round again before he can be stopped. The exhaustion which follows is not marked, except in the great thirst and loss of appetite. Sometimes diarrhea and trembling follow. But good grooms give unusual attention to rubbing and bathing the legs in hot water and stimulants. The general effect on the horse is depression, from which he soon recovers, but it is found essential

learn blacksmithing. "Why?" asked the professor. "Why, you see," replied the former dude, "I am now superintendent of a mine away back in Colorado. Last summer our main shaft broke, and there was no one in the mine but myself could weld it. I didn't like the job, but I took off my coat and welded that shaft. It wasn't a pretty job, but she's running now. If I couldn't have done it, I'd have had to pack that shaft on mule back and send it 300 miles over the mountains to be fixed, and the mine would have shut down till it got back. My ability to mend that shaft raised me in the eyes of every man in the mine, and the boss raised my salary."

**Water Vapor in the Atmosphere of Mars.**

When Professor W. W. Campbell, not long ago, reported that he found no water vapor in the atmosphere of Mars, by careful study, by the aid of the spectroscope at Lick Observatory, astronomers were generally surprised, because that matter was supposed to be settled quite conclusively. Now it turns out that M. Janssen has recently informed the French Academy of Sciences that he has determined the existence of water vapor in the planet Mars by means of the spectroscope.