

electricians will be much in evidence at the Exposition, and it is estimated that the manufacturers of American electrical machinery will expend over one million dollars in their exhibit in 1900. American artists, too, will be well represented, and the products of the earth—agricultural, horticultural, forestry, fisheries, food stuffs, textile fabrics, placer mining, and metallurgy—will all receive complete attention from American exhibitors. The United States will also have an immense department of hygiene and one of public and organized charities.

The need of space is so great that two and a half acres of ground have been made by the French commissioners by filling along the banks of the Seine. The gardens and terraces on both sides of the river will be utilized and exhibits will be made on each side of the river Seine.

As the Exposition will occupy so much space on the Seine, it will be necessary to build several foot bridges across the river. One foot bridge will be situated near the Pont des Invalides, which will be built entirely of iron, decorated with electric lamps disposed in groups, forming luminous flowers. The pillars supporting the bridge will also be brightly lit up, adding a fine effect to the Fair at night.

Another foot bridge will cross the Seine near the Pont de l'Alma. It will be constructed of barges supported by pilasters decorated with maritime symbols. The entire bridge will be covered with a large awning. Still another foot bridge—a suspension bridge—will cross the river in front of the Palais des Armées de Terre et de Mer.

The municipality of Paris will do all in its power to make the city more beautiful than ever in 1900. The Municipal Council has already sanctioned the outlay of large sums of money for the rearrangement of many public gardens and squares and for the brushing up and cleaning of numerous monuments. The Bois de Boulogne, one of the finest promenades in the world, will be improved at great expense.

It is more than likely that horse traction will disap-

THE NEW AMERICA CUP DEFENDER.

When it was announced last year that another challenge for the "America" cup had been made and accepted, the hearts of all yachtsmen were greatly rejoiced, for there is no event in the annals of yachting that approaches these international contests in respect of the amount of care, skill, expense, and enthusiasm with which they are arranged and carried out.

When the two rival cutters cross the line for the first race, on October 3 next, four years will have elapsed since "Defender" and "Valkyrie III." contested for the historic cup. It was feared that the unfortunate squabbles that characterized the last attempt of Lord Dunraven to secure the trophy had killed the sport for at least a decade to come, and it was therefore in the nature of a pleasant surprise when Sir Thomas Lipton opened negotiations for another series of races.

The "Shamrock," as the new challenger is to be called, will, like the "Valkyrie," be owned by an Irishman; for Sir Thomas, although he has long been resident in England, is Irish by birth. It was originally intended that the "Shamrock" should be Irish not merely in name and ownership, but in design, materials, and workmanship, and, accordingly, the construction was to have been intrusted to the famous yard of Harland & Wolff, at Belfast. For some reason or other, a change of plans occurred, which resulted in the yacht being built by the torpedo boat builders Yarrow & Company, of Poplar, London. The plans, moreover, have been drawn up by Fife, the noted Scotch designer, whom many Englishmen believe to be superior to Watson, the designer of "Thistle," "Britannia," and the "Valkyries." So that the "Shamrock" will be truly British, with an Irish name, Scotch in design, and English in materials and construction.

Very little has leaked out as yet regarding the new vessel, but it is known that she will be built fully up to the limit of length (90 feet on the water line), and that she will be largely constructed of nickel steel.

The new "Defender" is being built from plans of

to produce a more powerful boat without making any great increase in displacement, the new boat carrying nearly 14,000 square feet of canvas, against 12,640 square feet for the "Defender," although her displacement is only 6½ tons more. The "Defender's" strongest point was reaching, her weakest, running with the wind dead aft. In windward work she was not quite up to expectations, and it is a question whether in this respect "Valkyrie III." was not superior. Running with spinnaker set, she was inferior to "Vigilant." In reaching she was unapproachable, and if in the new "Defender" Herreshoff has succeeded in retaining the magnificent reaching qualities of the 1895 champion, at the same time bringing up her windward and leeward work to the same level, there is very little probability of the cup being carried to England at least for another year.

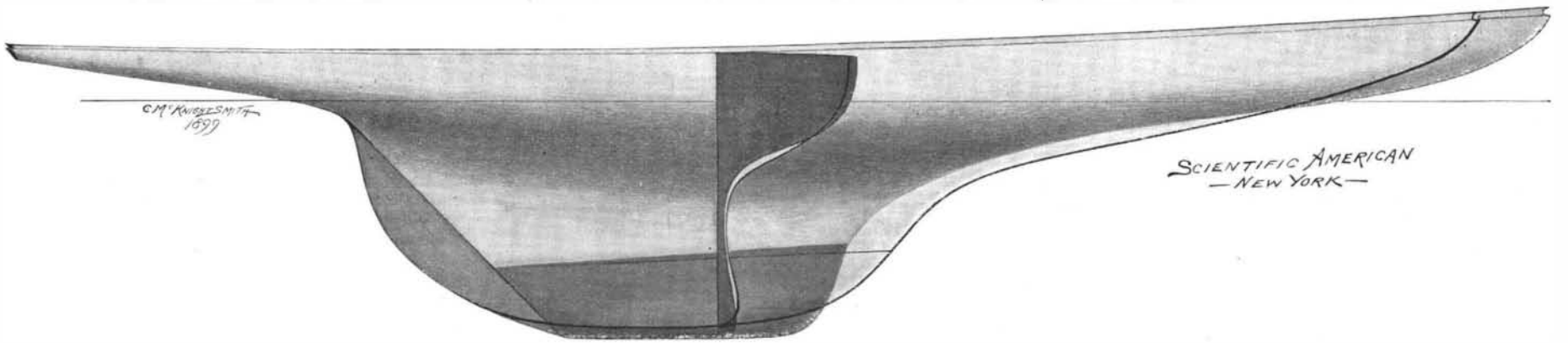
A Victim of Automatic Gas Meters.

The automatic gas meter or prepayment meter, as it is termed, has claimed its first victim. A grocery clerk in Brooklyn went out leaving his gas burning, and the one jet exhausted the small remaining quantity of gas which had been paid for and the meter cut off the flow of gas. The man returned and went to sleep. Another member of the household dropped another quarter of a dollar in the meter, and the gas poured into the man's room, asphyxiating him. He had been dead over an hour when the accident was discovered.

An Electrical Cooking School.

At the Oread Institute, Worcester, Mass., there is an electrical cooking school. The current for the purpose of heating and lighting is furnished by the 37½ kilowatt Westinghouse direct 110-volt dynamo, driven by a belt from a Westinghouse engine.

The practice kitchen where instruction is given is a circular apartment 35 feet in diameter. In the center there is a fountain and around this is a circular slate-topped bench upon which the students can work at gas or electrical stoves. Each pupil has an independ-



THE NEW CUP DEFENDER.

Heavy line shows old Defender; shaded hull and section show new Defender.

pear in Paris during the Exposition year, in the way of omnibuses, tramways, cabs, and carriages—electric motors taking the place of the horse. It is estimated that more than ten thousand horseless vehicles will be in use in Paris in 1900.

The United States will have the largest and most important display at the Paris Exposition of any foreign nation. The Hon. Ferdinand W. Peck, U. S. Commissioner-General, in an interview says:

"The United States exhibit is not to be made for the French people. The eyes of the whole world will be upon us on that occasion in the great metropolis of France. There will then be assembled in Paris the exhibits of fifty-seven nations and the representatives of five hundred million consumers. Millions of people coming from all parts of the world will visit the Exposition. It will be the great opportunity in our history to present our resources and products to all these people with a view to increasing our export trade. In my judgment every hundred thousand dollars expended in the creation of our display will bring millions in return to our producers and manufacturers.

"Our national pride, as well as our material interests, demand that the United States, the greatest of all, should be a prominent participant among other nations at that International Exposition.

"Our national pride also demands that the great United States of America, recently splendid in war, should stand alongside of her sister nations grandly displaying her arts of peace, and the world expects this of us."

The Exposition is to open April 15, 1900.

Probable Opening of the Chicago Drainage Channel.

The Drainage Board officials are trying to have the channel opened by October 9. The contractors have been instructed to increase their forces in every unfinished section and to push work night and day. The entire channel is practically finished with the exception of the two sections at Joliet, where the Desplaines River empties into the canal. 1,800 men are at work night and day in two sections.

the Herreshoffs in their yard at Bristol, R. I. This famous firm has been identified with yacht construction from the very first, and in the year 1893 they became prominently identified with international yacht racing by designing and building three famous singlestickers—the "Navahoe," which crossed to England in quest of the Brenton's Reef cup, which was carried home by "Genesta" in 1885, and the "Vigilant" and "Colonia," the former of which was the successful cup defender in 1893. In 1895 the Herreshoffs designed and built the "Defender," and it was inevitable that in the present instance the genius of the Bristol yard should again be invoked to guard the coveted trophy.

"The new 'Defender' will be built upon the general lines of the 1895 boat, with such improvements in the way of model, materials, and sail plan as were suggested by her performance in the trial and the cup races. The changes in dimensions, etc., are shown in the table herewith given, and the form of the two boats is shown in the accompanying drawings. It will be seen that the beam and draught have both been increased by one foot, while the water line length is greater by about a foot and a half. Looking at the midship section, it will be seen that the new boat, in addition to greater draught and beam, has a fuller bilge, the area of the section being greater by about a dozen square feet. The lead keel, while not so long by several feet, is deeper, and there is more of it; in shape it is less bulbous than 'Defender's' and approximates more nearly that of the 'Valkyrie III.'

THE OLD AND NEW CUP DEFENDERS.

	"Defender."	"Valkyrie III."	New "Defender."
Length over all	126 feet.	130 feet.	131 feet 4 inches.
Water line length	88 feet 5¾ inches.	88 feet 10¾ inches.	89 feet 10 inches.
Beam	23 feet 3 inches.	26 feet 2 inches.	24 feet 2½ inches.
Draught	19 feet.	20 feet.	20 feet.
Displacement	143 tons.	158 tons.	149½ tons.
Sail area	12,640 square feet.	13,028 square feet.	13,940 square feet.

Altogether it is evident that Mr. Herreshoff has aimed

ent stove, and the teacher can walk around in the space between the fountain and the bench and inspect the work of each pupil. There are twenty-four plug sockets connecting with the stoves and heaters by flexible cords. In another part of the room, against the wall, is a slate-topped table on which various special heating devices are arranged. There is also an electrical oven, a chafing dish, and other culinary appliances. Two adjoining demonstration classrooms and a special laboratory are also provided. The cooking appliances were furnished by the American Electric Heating Corporation.

The Current Supplement.

The current SUPPLEMENT, No. 1211, is a very attractive number. The first article is the new Japanese cruiser "Chitose," built by the Union Iron Works, of San Francisco, Cal. It is fully illustrated with views showing the construction and the completed vessel. "Submarine Surveying" is an article by Charles Bright. "Concerning the Theory of Evolution" is a lecture by Charles Shaw. "Paris Metropolitan Railroad" describes the new rapid transit system of Paris. The second installment of "Trade Suggestions from United States Consuls" is published in this issue and consists of eleven interesting announcements of opportunities for American trade. "Cast Iron" is an important paper by Dr. Moldenke.

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