

tions; thus a constant current of air can flow through the section, entering the bottom and passing out through the grill work at the top.

The exterior of the car has very much the appearance of the standard railroad coach, except that it is much shorter. It has deck lights, broad double windows and extended vestibules. The dimensions of the car are as follows: Length of car over all, 56 feet 4 inches; height from rail, 13 feet 4½ inches; clear head-room inside, 6 feet 5¼ inches. There are six longitudinal wood sills, 7 x 7 inches in section, in the floor made in two pieces with a half-inch steel plate sandwiched between.

The construction of the trucks is much the same as that for regular railroad service. They have four wheels each, and each axle is supplied with a 150-horsepower motor built for a speed of 60 to 70 miles an hour. The details of the construction of the electric sleeping car were worked out by M. F. Holland, and the cars built by the Harlan & Hollingsworth Company, of Wilmington, Del.

A SIMPLE LABORATORY BLOWPIPE APPARATUS.

The following article is a description of a simple and inexpensive vaporizer for laboratories without the convenience of a gas supply; its chief advantages being its even operation and the ease with which the pressure can be varied. One of the size given is suitable for almost all laboratory work.

The foot bellows is 15 inches long by 11 inches wide, and is expanded by a coiled spring within. The inlet valve is of the clapper type, and takes air from the underside. The outlet valve is of the same class, and exhausts the air into a small tin dome, from where it is conducted by tubing to the gasometer or holder.

The entire gasometer is built of galvanized iron. The outer cylinder or water tank is 12 inches high by 14 inches in diameter. The inlet pipe extends from the outside half way toward the center of the tank upon the bottom, where it is bent at a right angle and reaches perpendicularly to a level with the top of the tank. The outlet pipe is a counterpart of the inlet, with the exception that it has an upright branch outside of the tank which leads to the vaporizer, the other branch leading to the air blast of the blowpipe. The inner inverted cylinder or gasometer is 12 inches in diameter by 14 inches high. At diametrically opposite points at both top and bottom are affixed guide wheels with concave faces. The wheels upon each side, being perpendicularly in line, run upon guide rods extending along the sides from the base of the outer cylinder or tank to a height of 14 inches above it. The guide rods are made separable from the tank to facilitate removal of the gasometer. The latter must rise and fall freely without hitching, otherwise the supply of gas and air to the blowpipe will be jerky. When in use, the

outer cylinder is filled with water to within an inch of the top.

The vaporizer is a galvanized iron vessel 6 inches in diameter by 10 inches high, which is half filled with gasoline when in use. The inlet pipe extends from the outside through the top to within a quarter of an inch of the bottom. The outlet pipe extends just

serviceable with any blowpipe, and is useful for other purposes where a supply of gas is necessary.

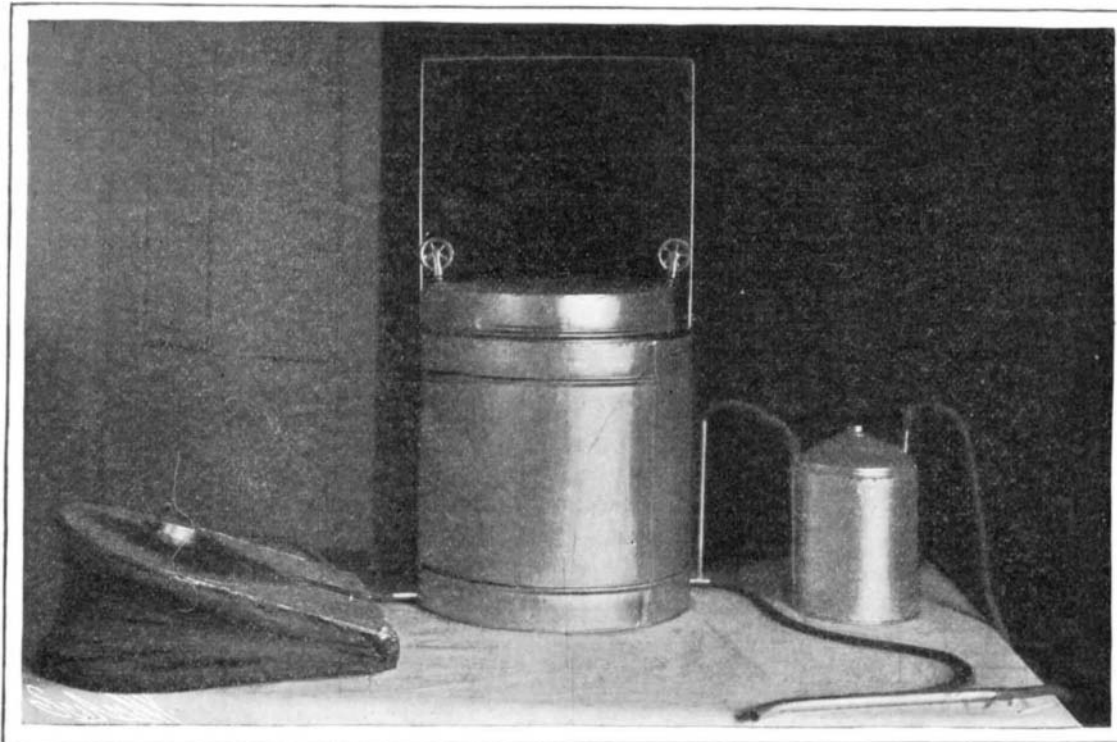
NEW JAPANESE ARMORED CRUISERS "KASAGA" AND "NIASIN."

The recent agreement of Chile and Argentina to reduce their armaments has resulted in a very important accession to two of the leading navies of the world, those of Great Britain and Japan. At the time when the more pacific relations were established between the two South American republics, there were building for Chile two very fine war-ships of 11,800 tons displacement, the "Constitucion" at the Armstrongs', and the "Libertad" at the Vickers' yard, while two equally efficient and up-to-date armored cruisers of 7,700 tons displacement were under construction for Argentina at Ansaldo, Italy. When it became known that these four formidable vessels were on the market, the agents of the Russian government commenced negotiations for their purchase. These negotiations progressed so favorably that it seemed pretty certain that Russia was about to make an addition to its navy of four first-class fighting ships. This would have been more than suffi-

cient to turn the balance of naval power in the Far East completely in her favor in the struggle that now looks to be so imminent between her and Japan. At the eleventh hour, however, agents representing the British and Japanese governments made such extremely liberal offers for the four vessels that the deal was closed, and the two battleships hoisted the British flag, and the two cruisers the flag of her possible ally, Japan.

The "Rivadavia" and "Moreno," as the two cruisers were known, have been rechristened the "Niasin" and "Kasaga," have hoisted the Japanese flag, and, with full crews aboard, are now making all speed by way of the Suez Canal for far eastern waters. The new cruisers are of the same general type as that most efficient vessel, the "Cristobal Colon," whose wreck still lies on the southern coast of Cuba, where she was headed off and driven ashore by the guns of Admiral Schley's flagship, the "Brooklyn," and the battleship "Oregon." The "Kasaga" and "Niasin" are identical in every respect but one; the one difference being that the main battery of the "Niasin" consists of one 10-inch gun and two 8-inch guns, while that of the "Kasaga" consists of four 8-inch guns. The accompanying very striking photograph of the "Kasaga" was taken when that vessel was on her trial trip, in which she averaged a

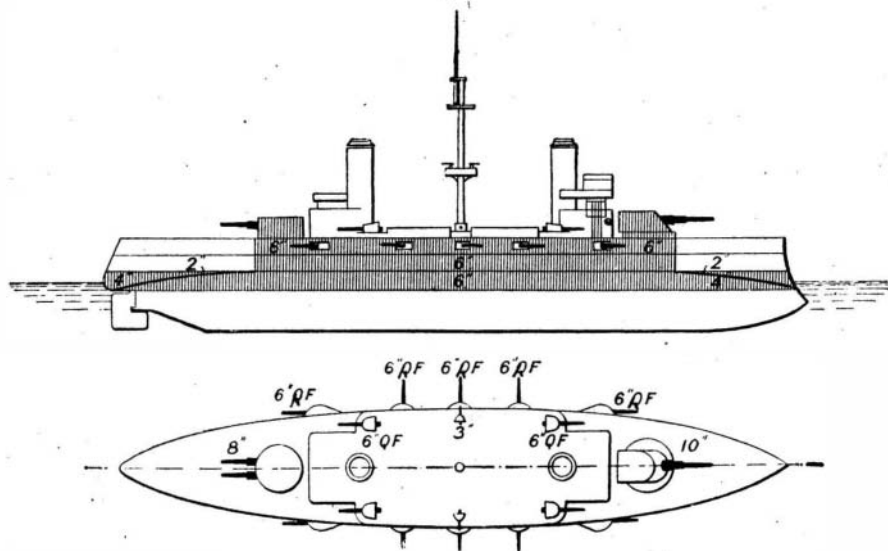
speed of 20.2 knots, over a course 12 miles in length. While the speed is not a high one as speeds go in armored cruisers to-day, it is very creditable if we bear in mind the heavy armament and excellent protection that are secured on the limited displacement of 7,700 tons. The "Moreno" is 357 feet in length, 61½ feet in breadth, and draws 23 feet of water. She is driven by two sets of triple - expan-



A SIMPLE LABORATORY BLOWPIPE APPARATUS.

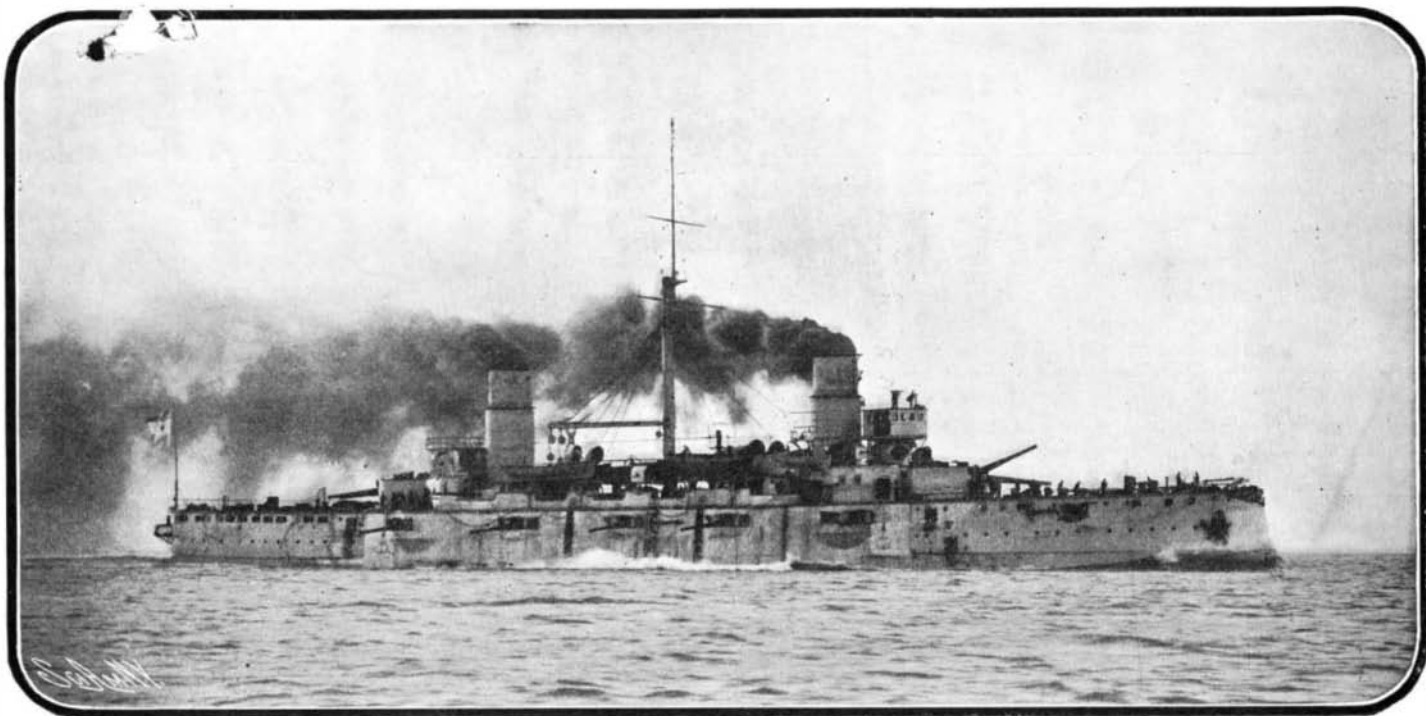
within the dome. The inlet should be marked to prevent mistake in coupling up.

Each downward stroke of the bellows raises the gasometer, which feeds air to the vaporizer and air blast. The quantity of air or gas is regulated in the usual way by stopcocks at the blowpipe. The machine gives a steady, even pressure, which can be increased at will by placing weights upon the gasometer. It is



"Kasaga" has two 8 in. in place of one 10 in. gun forward.

GUN AND ARMOR DIAGRAM OF THE "KASAGA" AND "NIASIN."



Displacement, 7,700 tons. Speed, 20.2 knots. Bunker capacity, 1,100 tons. Armor: Side, 6 in. to 4½ in.; turrets, 5½ in.; battery protection, 6 in.; two armored decks, 1½ in. and ¾ in. Armament: Four 8 in.; fourteen 6 in.; ten 3 in.; four small guns. Torpedo tubes: Four above water and behind 6 in. armor. Complement, 625.

NEW JAPANESE ARMORED CRUISER "KASAGA"; ALSO SISTER SHIP "NIASIN."