THE WILLSON AUTOMATIC GAS BUOY-Continued

(2) Compression buoys require for their maintenance a generating and compressing plant. In the case of acetylene this could be placed on the deek of a lighthouse tender or scow; with oil gas it had to be located on shore, and the gas transported in holders to the buoy.

(3) The elimination of compression, and the fact that autematic buoys may be recharged from a small boat, if necessary, permits the installation of gas buoys in isolated positions where it was not practicable before.

(4) An automatic gas buoy, fully charged, can carry from 9,000 to 10,000 feet of gas in the form of carbide. The standard compression buoy (180 cubic feet per atmosphere), at 15 atmospheres will contain about one-quarter as much gas. It is seen that an automatic buoy can be charged at the opening of navigation and will require no attention in so far as gas supply is concerned, until navigation closes, or sufficient, if necessary, for one year.

(5) The adoption of this principle permits the lighting of other classes of buoys, such as whistling and bell buoys.

The automatic system of acetylene gas lighting has been satisfactorily adapted to whistling buoys, Mr. Willson having perfected a very complete type of combination whistling and automatic gas buoy. In the buoys of this type, for the sounding of the whistles, the Courtenay principle, with certain very important modifications, has been adopted. Instead of a single central tube for compressing the air to sound the whistle, as in the old standard whistling buoy, twin tubes are made use of, their axes, and that of the generating tube, being in the same plane.

No less than seven distinct types of automatic gas buoys have been designed by Mr. Willson, three of them being also whistling buoys. The types are distinguished by the numbers 5, 6, 7, 8}, 9, 11 and 11x14}, these numbers representing roundly the diameters of the flotation chambers in feet. The flotation chambers are cylindrical in all the types except the 8½, which is spheroidal in shape, and the 11x14½, which is of elliptical form. The draft of the buoys when fully charged varies from 6 feet in Nos. 5 and 6, to 26 feet 8 inches in the two largest types. The carbide charges vary from 1,000 pounds in the two smallest types, to 3,000 pounds in the three largest. The diameters of the lenses of the lanterns vary from 200 m.m. in the three smallest types to 500 m.m. in the largest, while the height of the focal plane above water varies from 7 feet 4 inches in the two smallest types to 30 feet in the two largest. No. 9 has a whistle 10 inches in diameter, the two larger types being equipped with whistles 18 inches in diameter.

So rapid and successful has the development of the automatic gas buoy been that it is already disputing with the lightship the important place it has hitherto held as an aid to navigation, and the No. 11x14½ type is avowedly designed for positions hitherto considered to be of sufficient importance to call for lightships. Carrying at the height of 30 feet above the water a lantern with a lens of a diameter of 500 m.m., it is practically a lightship or floating lighthouse of an order superior to 75 per cent. of the lighthouses in Canada. And it will show its powerful light and sound its warning whistle without the aid of a crew, or in fact even a single attendant.

The contrast between this powerful and automatically operating aid to navigation and the gas buoy used before the introduction of acetylene, which needed constant attention, was at the best weak in power, serving only a local purpose, and was easily obscured in thick or hazy weather, is simply marvellous.