ing trays, then to the heating section. The coldest point in the unit is where the water leaves the spray pipe, so the flow of steam carrying the noncondensable gases is to this point. The continued flow pushes the noncondensable gases into the vent hood from which they are vented from the system.

Test work was started on this new design in 1945 and exhaustive testing established the final arrangement and materials to be used in a standardized unit. This design results in savings in headroom requirements, maintenance, and weight.

The elimination of the vent condenser marks a big advance in deaerating heater design. In many cases it eases the problem of headroom, reducing this factor as much as 2 to 3 ft, depending upon the size of the unit.

Another saving, of particular importance in operation, is the elimination of vent condenser maintenance. This factor alone more than justifies this new Elliott development, in which an inlet spray pipe and a simply designed vent collecting hood do the work of the many small tubes and other parts comprising the vent condenser formerly required.

Another valuable and unique design feature is the use of stainless steel in the heating section. This applies to all baffling, vent collecting hood, inner head—in fact everything but the outer shell which cannot be touched by undeaerated water. Corrosion is no problem in the new Elliott spray-tray deaerating heater.

Weight too is decreased, through the elimination of the vent condenser, the use of the spray heating section in place of heating trays, and the use of stainless steel for baffling and trays.

Since stainless steel is used in the heating section, no maintenance is necessary. Inspection of the inlet spray assembly, when desired, may be made by simply withdrawing it from the inlet nozzle.

The stainless steel trays are inspected or removed through the access opening, shown on the left of the shell in the facing picture. Trays, inlet spray assembly, and access opening cover are the only removable parts in the entire unit. All baffling, nozzles, etc., are permanently welded to the shell since no maintenance or adjustment is ever required.

The operation of the deaerating heater is simply explained. Water enters through the inlet spray assembly and is sprayed across the opening of the vent collecting hood into the heating compartment. Traveling from the spray assembly, striking the inner head baffling, and dropping to the bottom of the heating section, the water is continuously passing through an atmosphere of steam and is thereby heated to within a few degrees of steam temperature.

Flowing over the distributing weir and through the opening in the bottom of the heating section, the heated water falls onto the top of the deaerating trays. Passing over the trays, the water is divided into thin sheets and small drops which are constantly agitated in falling from shelf to shelf before dropping into the storage section.

Steam, entering the heater through the large nozzle on one side of the shell, passes directly through the deaerating trays, sweeping out the air and noncondensables released by the heating and agitation of the water. As very little heating is done in this section, most of the steam is available for sweeping away the released gases. The steam, carrying with it the released noncondensable gases, then passes through the several baffled openings into the heating section. Actual test results show that 98 to 99 per cent of the total steam required by the deaerating heater enters the heating section. In this section the steam is condensed in heating the entering water and the movement of steam to the coldest point, where the water leaves the spray pipe, pushes the released noncondensable gases into the vent collecting hood to the vent opening.

An installation view of the new Elliott spray-tray deaerating feedwater heater, which requires no tubular vent condenser.