(drift eliminators) are attached at regular intervals from top to bottom, these louvers extend outward and upward at an angle of 45 to 50 deg. In most designs the top edge of each louver extends above the bottom edge of the one above. These louvers serve the same function as a louver fence around a spray pond, namely to stop the water drops carried by the air beyond the open area of the tower, and to control the quantity of air permitted to pass through the tower.

The efficiency of a deck tower is improved primarily by increasing length or height, or both, within limits; the length and height increase the area of tower exposed to the wind. The improvement is not directly proportional to the change made in either case. Neither does a certain percentage

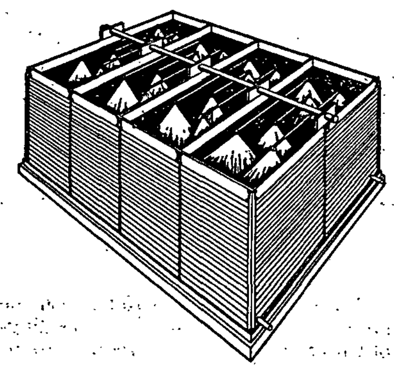

Fig. 5. Spray Filled Atmospheric Cooling Tower

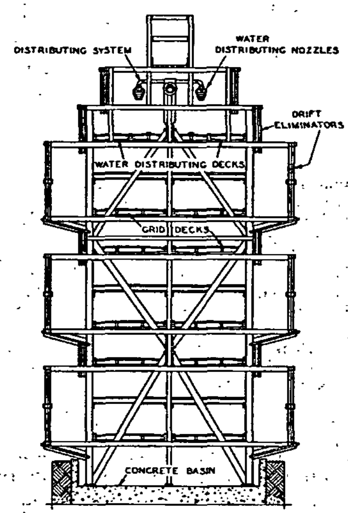

Fig. 6. Atmospheric Deck Tower

change of one dimension make an equal improvement in efficiency on two equal towers of different original lengths or heights. Since the range of efficiency varies through wide limits, it is impracticable to attempt to list data here on the area required per unit quantity of water. Improved efficiency due to added height is obtained at the expense of additional pumping head and increased weight per unit of area, whereas improvement gained by greater length or width will increase the area and consequently the foundation required.

Drift loss in a properly designed deck tower is considerably less than in the spray pond, but the drift nuisance may be considerable and for this reason atmospheric deck towers are unsuitable for downtown building roofs, locations adjacent to buildings, or near expensive mechanical equipment in industrial plants. They must be located in an open area, broadside to the prevailing wind. They are inefficient with less than 3 mph wind velocity and with wind directions other than broadside. These

towers are long and high in proportion to width and must be securely anchored to prevent uplift or overturning during high winds. High pumping requirements (30 to 60 ft) and total dependence upon atmospheric caprice, especially wind (quantity and direction), are disadvantages.

Due to new uses and growth of demand in recent years requirements for water-cooling equipment have become increasingly varied and exacting, necessitating refinements and specialized adaptations. The principal demand for large water-cooling systems in recent years has come from the petroleum industry and steam power plants. Refrigeration, air conditioning, and engine-jacket cooling service today employ a large percentage of the medium sized and small water-cooling towers installed.

MECHANICAL DRAFT TOWERS

The mechanical draft tower consists usually of a vertical shell constructed of wood, metal, transite, or masonry. Water is distributed near the top,

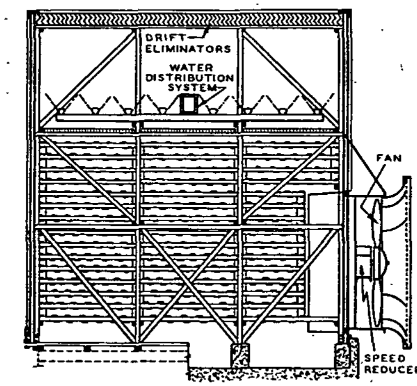

Fig. 7. Forced Draft Cooling Tower

uniformly over the area, and falls to the collecting basin in the bottom, passing through air which is being circulated in the tower from bottom to top by forced or induced draft fans, or which is circulated horizontally in crossflow towers by induced draft fans.

In vertical towers the air passes counterflow to the water and is in contact with the hottest water just before leaving the tower; hence a given quantity of air picks up more heat than the average equal quantity of air on natural draft equipment. This permits the water to be cooled with the least quantity of air required by any type of cooling equipment. As movement of air through the towers is obtained by power-consuming fans it is essential that this air quantity and the draft loss be reduced to a minimum so as to secure low operating cost.

The inside of a mechanical draft tower may be spray filled, i.e., the water surface is presented to the air by filling the entire inside of the structure with water droplets from the spray nozzles, or it may be packed with wood