

boiler feed. The type of heater, whether open or closed, is most important, and as a general rule, it will be found best to make use of the former on account of its greater and continuous efficiency. The study of oil removal, made necessary by the use of the open heater, is not now a serious problem on account of greater knowledge on the subject and the higher efficiency of the apparatus procurable. A very necessary precaution, seldom provided for, is treatment of boiler feed water. This provision is invariably omitted until the condition of the boilers makes it necessary. The proper procedure is to have samples of water analyzed by a competent chemist and treatment arranged for before the starting up of the plant.

In this connection, reference should be made to a means which is apparently effective in overcoming all pitting or corrosion of boilers, condensers, piping, etc. The method is one devised by an Australian inventor, and consists in making use of the well-known principle upon which the primary electric battery depends, *i.e.*, of the greatest chemical action taking place at the positive pole and the liberation of hydrogen at the negative electrode. By connecting the negative pole of a direct current source of power to the metal of the boiler and the positive to an insulated electrode of any suitable substance, an electro-chemical means of effectively protecting against all corrosion is now available. It is stated that results obtained with bad boiler waters, and especially with salt water condensers, have been exceptionally good. A further claim is also made that a material softening of all hard scale or deposits is made in this way.

The boiler feed pump is an item deserving attentive consideration. In small plants, in order to reduce initial outlay, an injector is too often used. This should only be for emergency use. When a pump is installed it is generally too small, owing to its having been purchased on a catalogue rating. As makers give the highest possible rating, *i.e.*, one which can only be obtained with the pump in the best of order pumping cold water, it is wise to specify a size having the required capacity, at a maximum speed of 25 strokes per minute. Where the supply of exhaust steam is plentiful for heating feed water, it is a good plan to instal a triplex plunger pump, or equivalent, driven by a small steam engine, so as to obtain a greater economy by the expansive working of steam than is possible in the usual feed pump. A very necessary precaution also is to specify that the pump be properly fitted, packed, and adjusted for hot water.

The steam trap is another piece of power plant apparatus which has received too little study. In a number of instances, in older plants, traps have been discarded, it having been reported that they