and water-glass drips, 93 lbs, per hour, which was the average amount used by a Barrus calorimeter, and a portion amounting to 230 lbs. per hour, which was drawn from a dead end in the live-steam pipe leading to the low pressure cylinder.

The first quantity was determined by collecting and weighing the leakage during a certain time. The second quantity was determined by calibrating the orifice of the calorimeter. The latter quantity was determined by the calculation given on page 3.

The detailed data of the test are shown in Tables I. to XIII. The results show a water consumption of 13.50 lbs. of steam per hour per indicated horse power with 125 lbs. boiler pressure, 0.30 cut-off in high cylinder, steam 14.6 degrees of super-heated at the throttle-valve, and 65.2 revolutions of the engine per minute.

The feed water for the engine was drawn from the city supply at forty degrees Fahr., and passed through a nest of tubes, aggregating 400 square feet of surface, lodged in a cylinder through which the exhaust steam was discharged into the condenser. By means of this exhaust heater the temperature of the feed water was raised to 131.3 degrees. The feed water then passed through a drip tank, in which it was mixed with the steam from the dead end of the steam pipe, whereby its temperature was raised to 142.7 degrees.

In the ordinary operation of the mill the condensed steam from the slashers, etc., also mixes with the feed water in the drip tank, whereby a temperature upwards of 160 degrees Fahr. is given to the feed water. At this temperature of feed water the boilers, which were of the Bigelow-Manning type, evaporate $10\frac{1}{3}$ lbs. of water per pound of Pocohantas bituminous coal.

The plant as a whole, therefore, affords the remarkable economy of $1\frac{1}{3}$ lbs. of coal per indicated horse power per hour, with an unjacketed compound engine expanding steam about thirteen times.

The writers are indebted to the courtesy of Mr. Chas. C. Diman, Superintendent of the mill, for the opportunity to test the engine, and for his cordial co-operation in dispensing with the use of live steam in the mill, during the period of the measurements, for all purposes except the operation of the engine.