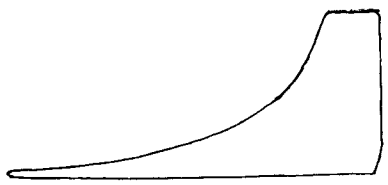
QUESTIONS AND ANSWERS.

"Constant Reader" writes: 1. What is the loss of pressure in a 3-inch pipe, 100 feet long, at 100 lbs. pressure per square inch, supplying steam to an engine doing 50 horse power? 2. What would be the loss in the same pipe supposing there were four elbows and two globe valves in it.

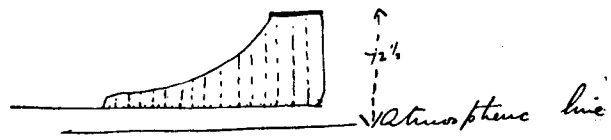
ANSWER: 1. Loss of pressure in steam pipes is due to three causes: (*a*) The pressure required merely to overcome friction in the pipe. (*b*) The pressure required to produce the required discharge of steam through a pipe of given diameter. (*c*) That loss of pressure which is due to the difference in temperature of the steam at opposite ends of a long pipe, caused by radiation of the heated pipe surface into the surrounding atmosphere. With the data given, the combined losses of pressure due to the two first causes will be, with a straight pipe, about one-third of a pound per square inch; the globe valves will make no difference practically; the entire drop due to friction of pipes and bends and velocity through same would be one-half a pound per square inch. The drop due to difference in temperature is likely to be more appreciable, but with the data given it is not possible to more than approximate to it. Assuming 100 lbs. pressure at boiler; 100 feet of 3-inch pipe, bare pipes, and an atmospheric temperature of 60°—there would be a difference of temperature of about 10° Fahr., corresponding to a loss of pressure of about 15 lbs. per square inch. What the actual drop is, depends on the material with which the pipe is covered, and upon the actual temperature of the outside air.

"Fireman" writes: Please explain to me how to find the mean pressure on this card, also what horse power is the engine if the card on the other end is the same.



Steam, 72½; revolutions, 94; spring, 40; cylinders, 13"x30".

ANSWER.—The mean steam pressure of an indicator card can best be found by running a planimeter round the card If you have not such an instrument, then divide up the horizontal line representing the length of the stroke, into a considerable number of equal parts; draw from each point of division a vertical line cutting the steam line. Then add the lengths of the verticals between the stroke line and the steam line together, and divide by the number of division. To this result



add the vertical distance between the stroke line and the atmospheric line (which you have not shown), and the figure you get will represent mean pressure in lbs.

A MODERN SAW MILL.

IN the old-fashioned saw mill each man worked for all he was worth, wrestled with logs and packed lumber out of the mill. Things are somewhat different to-day; in setting up a mill the machinery should be so arranged that the log is not touched by the man's hand after it enters the mill. It is rolled, carried and handled entirely by machinery; and after being cut into boards, dimension stuff or timber, it is automatically carried out of the mill and separated into lengths, widths, and thicknesses each side being put by itself outside the mill. Success or failure in the lumber milling business depends largely upon this point; it is then in order to arrange the mill so that it will be as nearly automatic as possible.

THE Argentine capay tree furnishes a richly veined and very fragrant wood, fitted for cabinet purposes.

IN the forests of Paraguay and Misiones is found the famous evergreen tree, *Ilex paraguayeniis*, which produces the yerba-mate, the general beverage of the natives, the duty on which affords the national revenue of Paraguay, the government having the exclusive monopoly of the trade.