THE CANADIAN

the column of steam and the height represented by the pressure of air or other vapor into which the steam is passing. One exception to this is that the velocity of steam flowing into a vacuum is constant at all pressures.

To calculate the velocity with which steam of any given pressure passes into a medium having a pressur- equal to the atmosphere, the following process may be followed. The required height of the column of steam is estimated by its proportion to a column of water, due to a certain pressure. The square root of the height multiplied by 8, that wellknown rule regarding falling bodies, gives the velocity of steam due to the pressure. Suppose we wish to find out the velocity of steam of 10 pounds pressure above the atmosphere. It is well known that one pound of pressure represents a column of water 2.3 feet high, and 10 pounds pressure will represent a column of water 23 feet high. At that pressure above the atmosphere one pound of steam occupies 1,0008 times the volume of a pound of water. So 23×1,008=23,184, the height of the column of steam. Then $\sqrt{23.184 \times 8} = 1.218$, the velocity in feet per second of steam of the pressure given. A small fraction is omitted, but the result is correct enough for practical purposes.

The quantity of steam of any pressure that will pass out of a safety valve, a whistle slot or other opening can be calculated by this rule; but it is found that when the opening is made in a thin slot the escaping jet of steam suffers a contraction, so that its area is reduced from 30 to 50 per cent.

To calculate the velocity with wh' '1 steam will pass into a cylinder or other vessel that is already

212