Mr. Gubbins in a Fog

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This is another delightful H. E. Dudeney puzzle ([1], p.18).

102. MR. GUBBINS IN A FOG.

Mr. Gubbins, a diligent man of business, was much inconvenienced by a London fog. The electric light happened to be out of order and he had to manage as best he could with two candles. His clerk assured him that though both were of the same length one candle would burn for four hours and the other for five hours. After he had been working some time he put the candles out as the fog had lifted, and he then noticed that what remained of one candle was exactly four times the length of what was left of the other.

When he got home that night Mr. Gubbins, who liked a good puzzle, said to himself, "Of course it is possible to work out just how long those two candles were burning to-day. I'll have a shot at it." But he soon found himself in a worse fog than the atmospheric one. Could you have assisted him in his dilemma? How long were the candles burning?

Solution

The figure at right depicts the information in the problem. This produces the following relations where L is the length of the candles and T is the time they were burning:

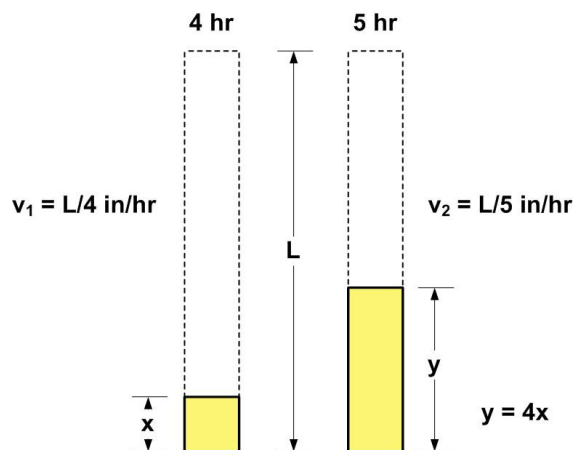$$x = L - v_1 T \quad \text{and} \quad y = L - v_2 T$$

But y = 4x means

$$L - v_2 T = 4(L - v_1 T)$$

$$L - \frac{L}{5} T = 4(L - \frac{L}{4} T)$$

$$1 - T/5 = 4 - T$$

$$T = 15/4 = 3\,\tfrac{3}{4}\ \text{hr}$$

References

[1] Dudeney, Henry Ernest, *Amusements In Mathematics*, 1917