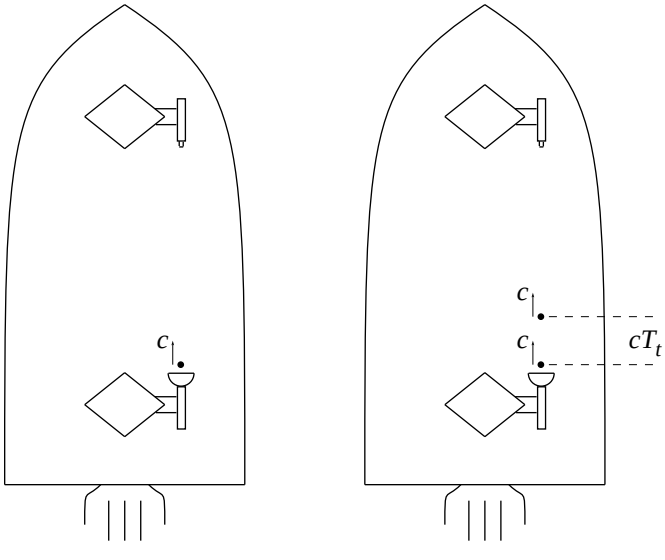
T_n = time ticked off by nose clock

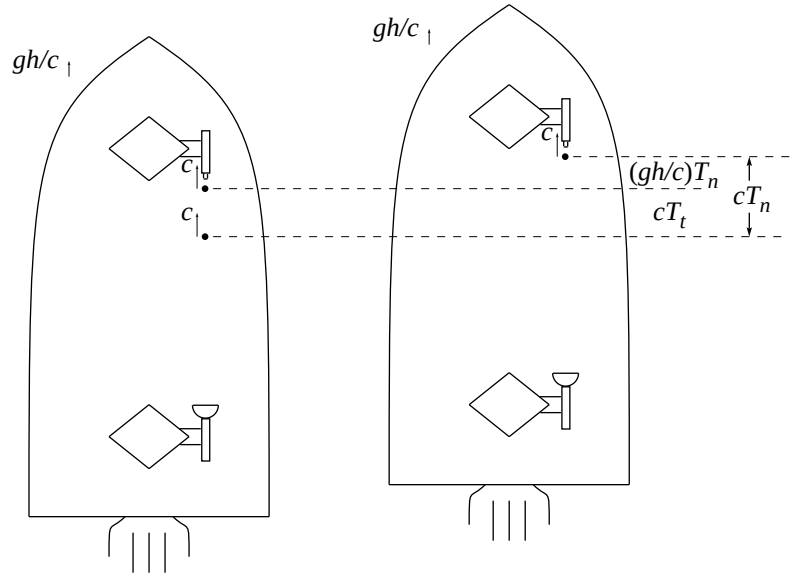
T_t = time ticked off by tail clock

Assume T_n, T_t, and h are small enough that special relativistic effects can be ignored.
Pictures drawn in frame at rest with respect to rocketship when first light burst emitted.
Time elapsed between "pair emitted at tail" and "pair received at nose" is h/c, so
speed of rocketship at "pair received at nose" is gh/c.

Pair of light flashes emitted at tail.
Speed of rocketship = 0.



Pair of light flashes received at nose.
Speed of rocketship = gh/c.



$$cT_n = cT_t + (gh/c)T_n$$

$$T_n\,(1 - gh/c^2) = T_t$$