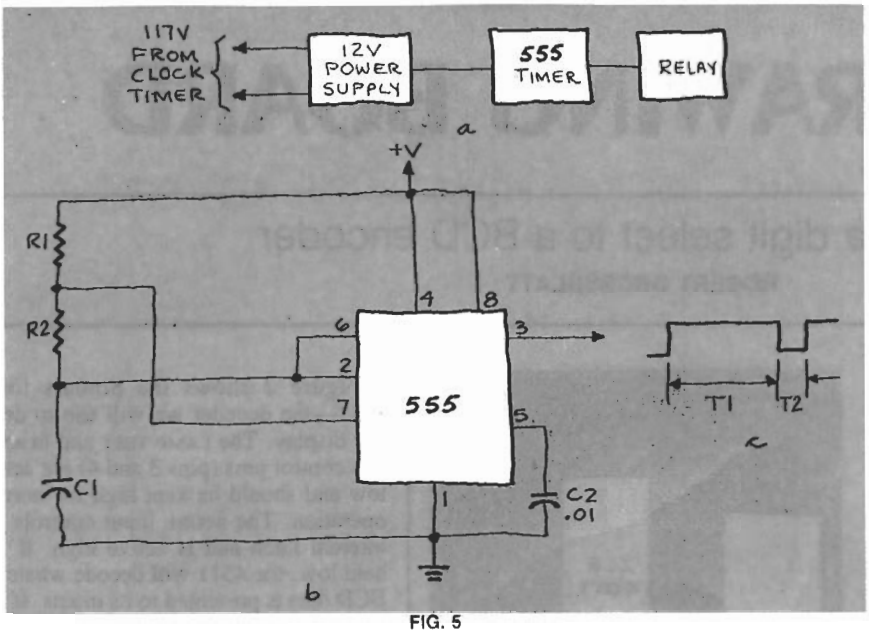

FIG. 5

come from any number of locations.

John should be sleeping soundly now that he knows no one else can solve his problem either. Thanks to all of you who responded to John's question.

Touch plate timer

Robert Allen of Washington has a low-voltage "touch plate" wiring system in his home. That is one in which momentary switches operate 24-volt latching relays which control lights, outlets, and so on. You should note that any number of parallel switches can control any one relay. That is a very effective system for several reasons but it does have a disadvantage.

With the setup as shown in Fig. 4-a, what kind of timers can you use to turn lights on and off at preselected hours? Robert's best solution to date is to use a 120-volt relay between the timer and the touch-plate circuit as shown in Fig. 4-b. It does the job but not with complete dependability. In the absence of frequent contact cleaning, it gets out of synchronization and turns the lights on when they should be off and vice versa.

Well, Robert, why not use the familiar 555 IC timer to produce the controlling pulses? As shown in Fig. 5-a, a clock timer would control a 12-volt power supply for an astable 555 timer set to pulse the latching relay at the desired hours. That relay itself is a SPST latching-type that closes with the short pulses from the 555.

The 555 circuit and its output waveform are shown in Fig. 5-b. The values of R1, R2, and C are determined by the desired times. The relay contacts will close when it sees the leading edge of the pulse (low-to-high transition). Time t_1, the length of the pulse, can be determined by the formula: $t_1 = 0.693 \times (R1 + R2) \times C$. Time t_2, the length of time between pulses, can be determined by the formula: $t_2 = 0.693 \times R2 \times C$.

The length of time that your light will be on is the sum of t_1 and t_2 and is equal to $0.693 \times (R1 + 2R2) \times C$.

Set the clock timer to apply 12V to the 555. When power is first applied to the 555, the lights turn on. The next low-to-high transition (after time t_2) turns the lights off. Set the clock timer so that it goes off and removes power from the circuit before the 555 produces a third pulse (the third pulse would turn the lights back on).

Depending upon the intervals desired, you may need to cascade a couple of 555 IC's or insert a counter IC between the 555 and the relay.

That is an effective but fairly cumbersome approach to the problem. Next month I'll show you how to do the job in a much simpler way with a digital clock. Stick around. **R-E**