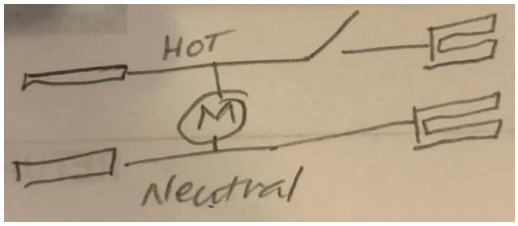
Converting a Mechanical Timer to a Countdown Timer, Version 1.0

By R. G. Sparber

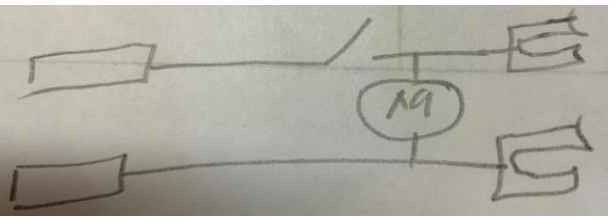
Over the years, I have accumulated many of these mechanical timers. Pull up the orange pegs to define when the output is live every 24 hours.

What I don't have, but need, is a timer that will turn on when I start it and turn off after some hours.

OK, so how do I take the junk I have and turn it into the valuable device I need?



The circuit for this timer isn't complicated. AC power comes in through prongs (left rectangles) on the back and runs the motor (M). The neutral wire connects to the output plug's neutral slot (on the right). The hot wire connects to a switch. The output of the switch connects to the output plug's hot side.



All I need to do is move the hot lead on the motor to the other side of the switch. Then, I will manually close the switch, and the motor will run until the movement of the dial opens the switch. At that time, the motor will stop running.

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It didn't take me long to find the Torx screw next to the input prongs.

After much gentle prying, I figured there must be another screw holding the unit together.

I eventually removed the timer dial and associated gears and found the second screw.

But how did I remove the dial and gears?

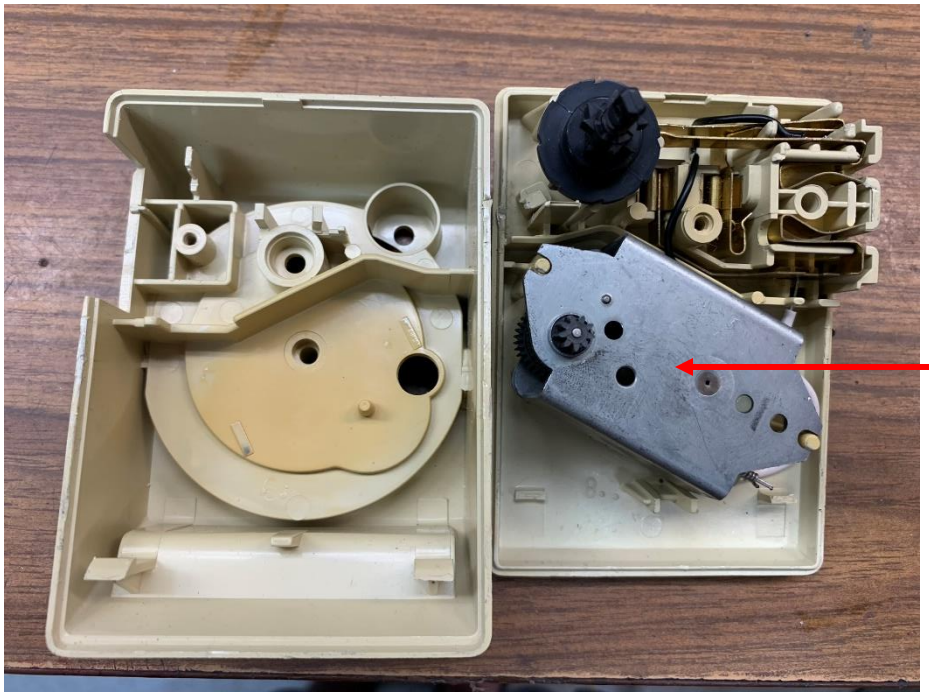
Using a thin-bladed screwdriver, I gently pried up on the center disk. Two tines on the end of the center rod grab to hold the disk in place. I broke one as I pulled off the disk, but the disk still holds well enough.

The disk with the orange fingers plus hour markings lifts off.

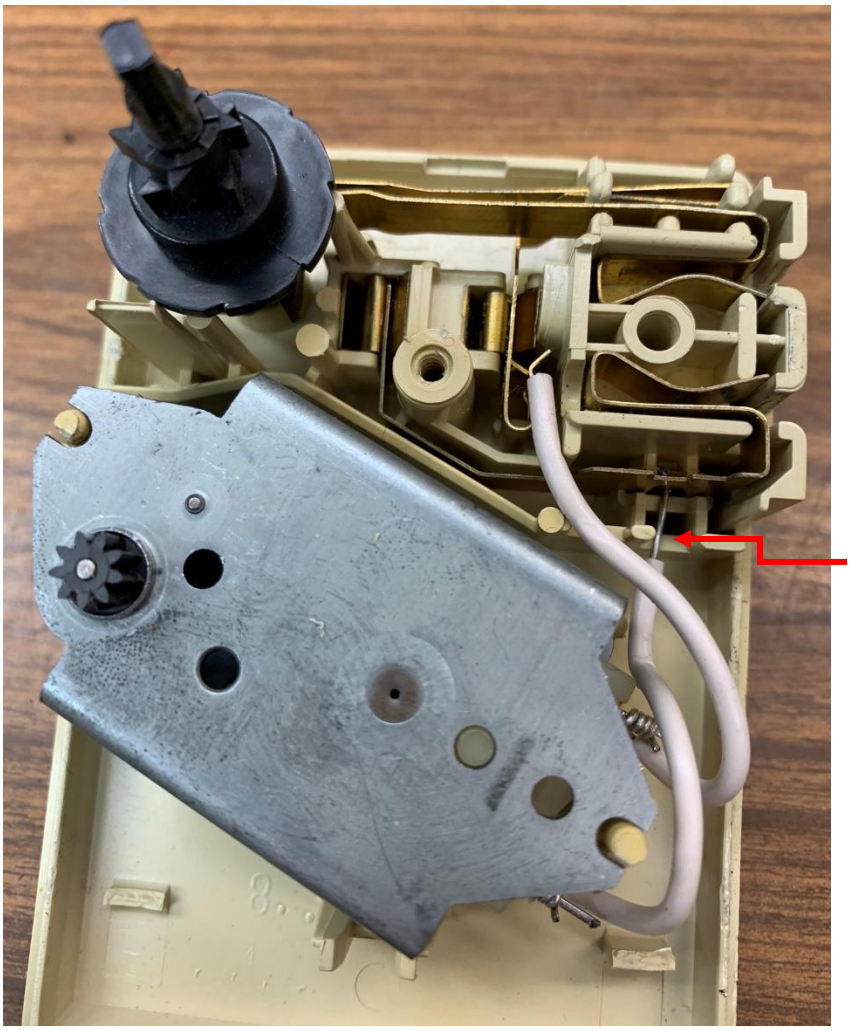
The disk with the three arms lifts off next

to expose the gear, which also lifts off.

Now you can remove the screw with a TORX bit and pry open the case using thin-bladed screwdrivers. Depending on the age of the plastic, you might break off a few clips.

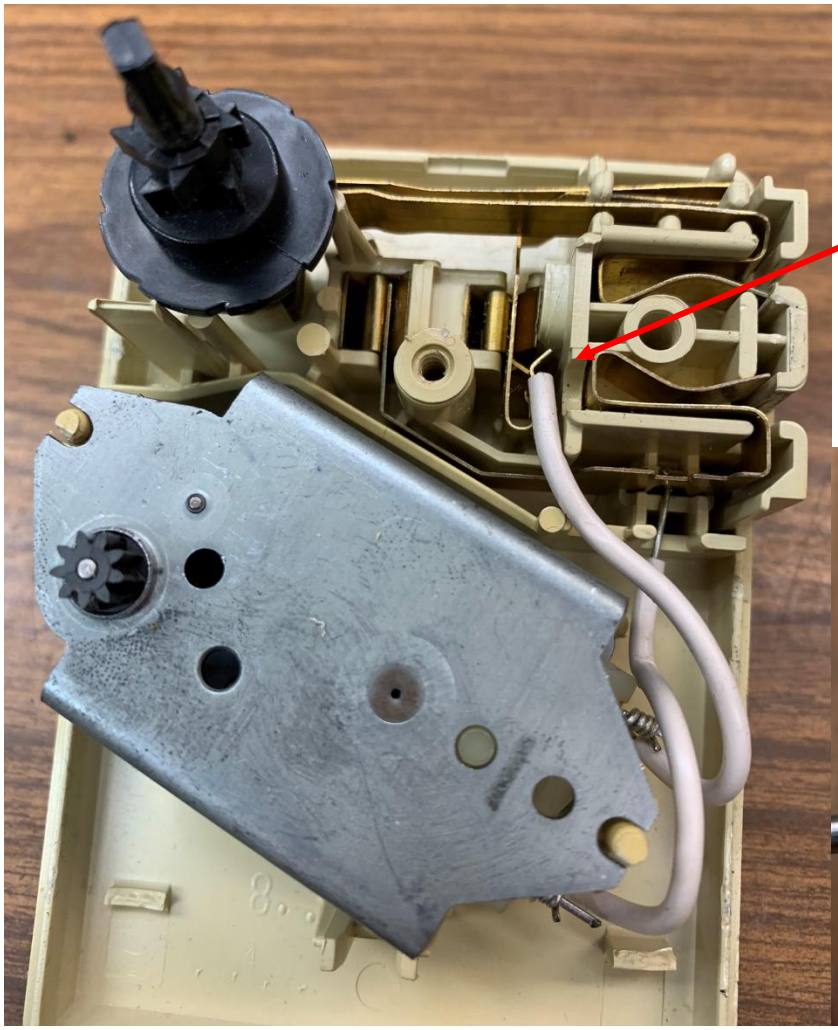


With the front cover off, you can see the motor. It rests on two pins; I will lift it off when I rewire it.

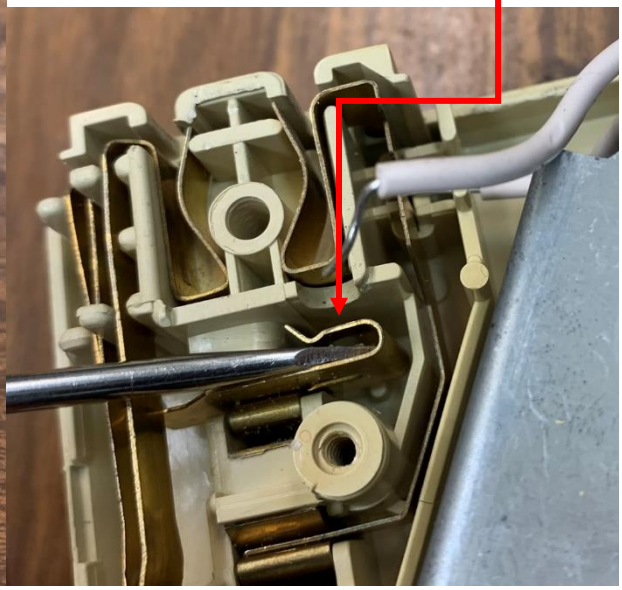


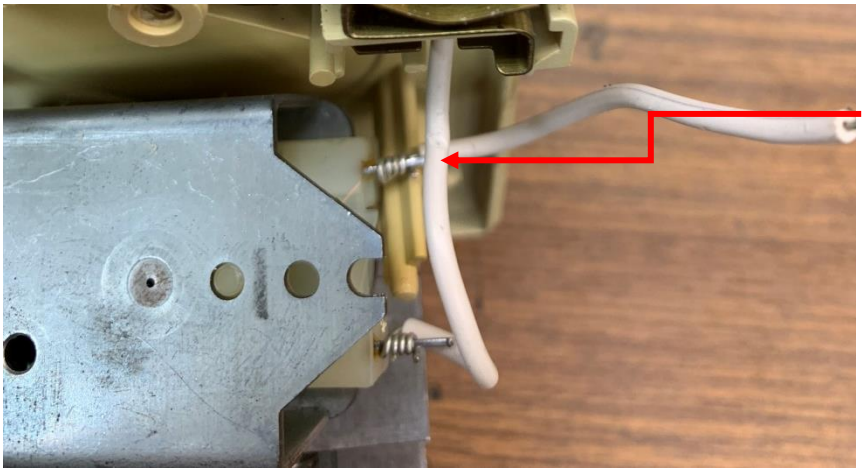
The remaining conductors are formed pieces of spring steel with a copper coating or are phosphor bronze. The only wires present are to the motor.

This wire connects to Neutral.

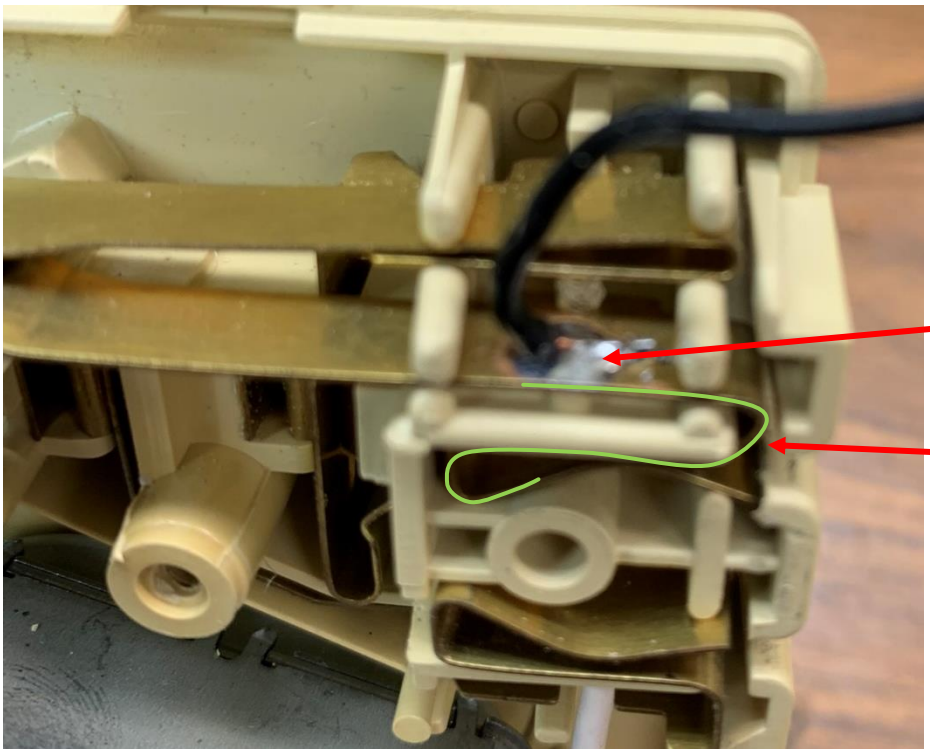


This wire connects to the hot input and is attached with a spring clip. Prying back on the clip with a small blade screwdriver releases the wire.





Following this wire around to the motor, you will find the end wrapped around a peg. It unwraps without using tools.

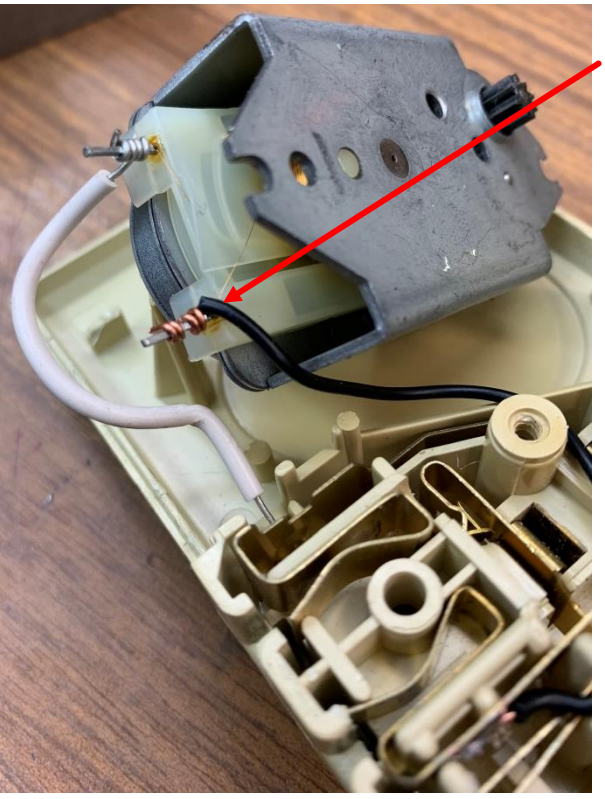


I cut off about 3 inches of insulated solid copper 24-gage wire. Next, I stripped about ¼ inch of insulation from one end and "tined[2]" the bare wire.

I then soldered the wire to the output side of the switch.

You can identify the output side of the switch because the metal connects to the output socket.

I dressed the wire so I would not catch in when I closed the case.



I stripped about ¾ inch of insulation from the other end of the wire and wrapped it around the pin on the motor. And finally, I soldered the wire to the pin.

[2] Dip the end in solder paste if you have it and heat the wire with a soldering iron. Coat the bare copper with solder. This makes subsequent soldering much easier.

Time to reassemble the timer, being sure not to catch the new wire in the case.

If your timer is rather old, I suggest you put a tiny dab of lithium grease on all moving plastic parts except ***not*** on the paws that contact the metal fingers of the switch. Friction between these paws and switch fingers lets the switch stop in the off position.

I didn't realize I had the friction problem until I buttoned up the timer. Then, the motor would move the dial, but I didn't have enough torque to advance the paw as it overcame the excess friction. Later, I discovered that I could not stay in the off position until I cleaned off the contact area.

To use my new countdown timer, I turn the dial clockwise until the pointer is on one of the 12s. Then, I pull up all the orange pegs where I want the timer to run and the output to be hot. Push all pegs down where you want the timer to stop and the output zero. For example, if the pegs are pulled out from 12 to 4, I will get power for 4 hours.

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Rick Sparber
Rgsparber.ha@gmail.com
Rick.Sparber.org