

Calculagraph – Model No. 33

This information is offered in conjunction with the calculagraph calibration keys that I've made, and how to avoid any possible problems with the key and the calibration gear into which the key inserts to conduct a time calibration change.

The square tip of the calibration key inserts into a square hole on top of a "floating" calibration gear.

The calibration gear is positioned at one of two vertical points by the calibration key. The first, or highest position, is accomplished using the shortest steel shaft on the key, and positions the calibration gear to adjust the minutes and hours. This is also the adjustment that requires the most force to perform.

The second, and lowest vertical position of the calibration gear, is obtained using the longest steel shaft on the key, and positions the calibration gear to adjust the second hand on the clock. This adjustment takes the least amount of force to achieve the desired results.

After many years of service, and probably many years of sitting on a shelf somewhere, dried up lubricant, coupled with the fact that due to the lack of a calibration key, the mechanical clutch that allows the minutes and hours to be adjusted, without moving the gears in the clock mechanism, is most likely a lot tighter than it originally was at the time of manufacture.

I would strongly suggest that when the calibration key is used for the first time to set the hours and minutes, great care is taken to make sure that the calibration key isn't used to "force" the hour and minute hands to turn in the event that the mechanical clutch is, for the reasons mentioned, too tight.

This situation could cause the tip of the key, and / or the square socket at the top of the "floating" calibration gear, to be destroyed in the process.

I've included a photograph, and labelled the 3 gears and the mechanical clutch that are driven by the calibration gear during the process of adjusting the hours and minutes.

Fresh lubricant should be applied to these gears, and to the mechanical clutch, and allowed to soak in for an hour or so.

The mechanical clutch is the most critical of all the parts when it comes to the amount of force needed to adjust the hours and minutes.

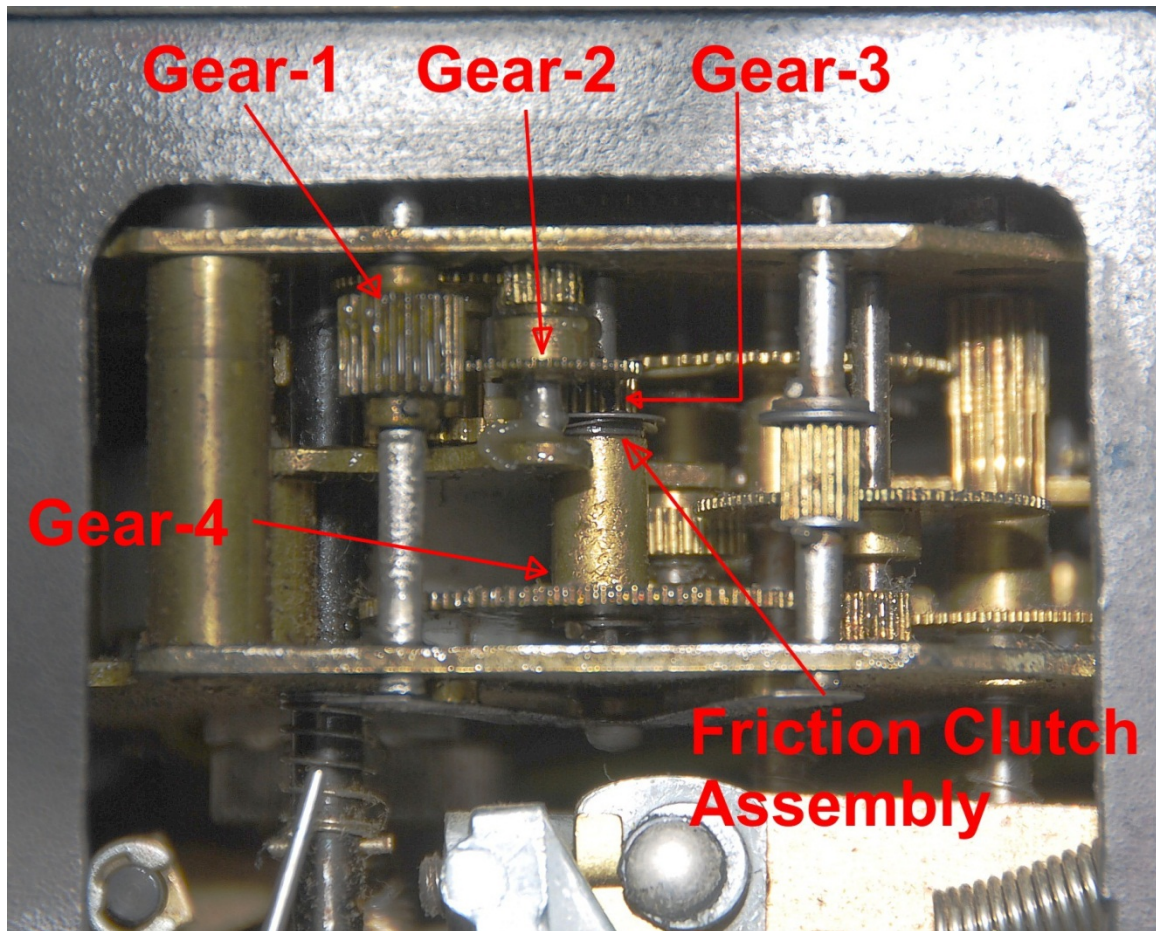
As mentioned, adjusting the second hand of the clock requires very little effort, and is usually not a problem.

The mechanical clutch is constructed using “curved” spring washers, which exert a constant pressure between themselves, the gear against which they rest, and the retainer pin which inserted through the shaft upon which they’re mounted.

Adjustment to lessen the spring pressure being applied by the “curved” spring washers can usually be accomplished without dis-assembly of the mechanical clutch, by using a very small jeweler’s screw driver inserted between the washers, and twisting slightly to remove some of the spring tension in the washer(s).

Here’s a picture of what the set up. Gear-1 is driven indirectly by the “floating” calibration gear which is driven by the calibration key. Gear-1, drives gear-2, which drives gear-3. Gear-3 turns the shaft upon which it’s mounted. Directly below gear-3, are the curved spring washers which make up the mechanical clutch. The mechanical clutch curved spring washers press against the top of gear-4, which does not move during calibration.

The picture showing the gear and mechanical clutch set up :



Insofar as the clock mechanism and workings are concerned, the various pivot points for all of the gears and shafts in the clock itself, can be lubricated with clock oil using a small pencil tipped artist's brush.

The small electric motor which drives the calculagraph's clock runs on 20 Volts alternating (AC) current, and requires very little amperage to drive it.

Small chassis mount step down transformers are available, and there are also plug in power adapters available at Radio Shack (U.S.A.), and "The Source" (Canada).

The Radio Shack Part No. is 273-331 @ \$25.99, and "The Source" Part No. is (Nexxtech Brand) 2731675 @ \$29.99. Both have dual selectable output of 18

volts AC, and 24 volts AC. Use the 18 volt AC setting, because in actual fact, it puts out 21 volts AC. The current output for the power supply is 1.0 amps. I am using one at the moment on one of my calculagraphs, and it's been running now for over 2 weeks and hasn't gained or lost a minute on the clock.

Jeff Lamb

ATCA & TCI

4031jal@cogeco.ca