Stopwork Mechanisms

Stopwork mechanisms have a long history in both watches and clocks and are associated with those pieces of higher quality since it costs extra to add it as a finishing touch. In the days when all of the parts were hand made, each part added significantly to the cost. It may be argued that the movement, whether watch or clock will work without a stopwork so why bother. Most of us in the trade have certainly come across at least one piece in our lives in which the stopwork had been removed. It usually occurs when the repairer takes it off and does not know how to properly reinstall it. We will discuss that in this issue.

First, I would like to mention briefly the rationale for the use of the stopwork. We can think of them simply as limitation gears. They not only limit the degree to which the piece can be fully wound, but just as important, it also limits the degree to which it can be unwound.

In the case of the spring-wound mechanism, overwinding can cause two problems. First, the mainspring can be broken or pulled out of either end to which it is attached. Second, an overwound spring causes the piece to run much more rapidly in the first 24 hours. This is a common

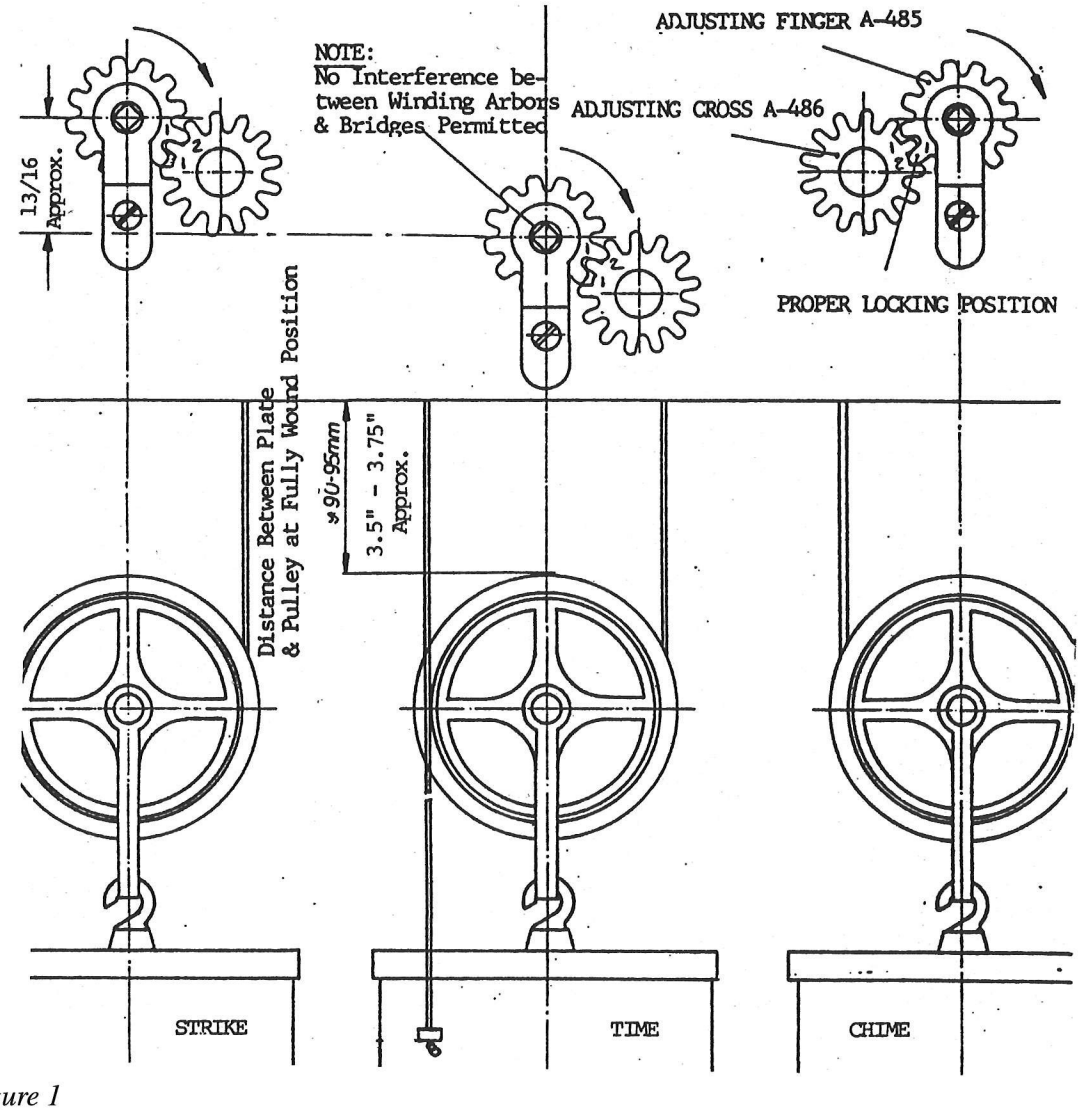

Figure 1

complaint those of us in the distributing business hear about spring-wound movements and it is a customer problem and not a movement problem. The customer must be taught to wind the clock on the same day of each week and also how many turns to turn the key. Unwinding is not an issue unless it is a fusee mechanism in which case there is a possibility that slack in the fusee chain could be a problem.

For weight-driven units the stopwork is a real asset and all three of the modern makers use it. Without the stopwork the weight can be wound up until it jams against the seatboard (think about the house calls in which the clock is chain driven and it takes a half-hour just to get it safely freed), the pulley jams against the winding drum and slips off the cable (of course the weight falls off the pulley!), or the cable winds off the end of the drum on the arbor and gets tangled and often breaks. The value of the stopwork in limiting the unwinding of the clock is also valuable as it does not allow the cable to unwind to the point where it might be possible to come out of the drum due to lack of tension (the hole in the drum for the cable would naturally be in the down position) or lose the proper starting position.

Now that you are convinced of their value, we will discuss the three major systems used today. I might mention, in repairing the mechanism, if the stops were working properly to begin with, it would be helpful to wind the clock fully and measure the amount of cable exposed. It would be helpful at this point to define the winding stop as that on the winding arbor and the driven stop as that which is attached to the movement via a rivet. Also, I would like to give credit to Franz Hermle & Sohn for the Hermle and Urgos drawings, and to the Kieninger Clock Co. for its drawing.

Before detailing the individual installations, there are some guidelines common to working on all of them. First, check the cable carefully for any frays or kinks. If it is frayed, it might also indicate a nick on the drum so check the drum for damage and also replace the cable. It is much cheaper to replace the cable now than to buy a new set of weights and/or case repair due to a broken cable. If it is kinked, it may not wind properly on the drum. Also, the manufacturer recommends winding under tension (even a small weight is fine) so that the cable will track onto the drum properly. The cable guard generally is not tight enough to allow this.

We will begin with the Hermle system shown in Figure 1. With the driving stop OFF the winding arbor, wind the cable until the top of the pulley is about 3.75" from the bottom of the movement. At this point install the driving stop such that the longest projection on the stop fits into the most clockwise shallow indent on the driven stop. That is to say that there are two shallow indents or valleys on the driven stop side by side

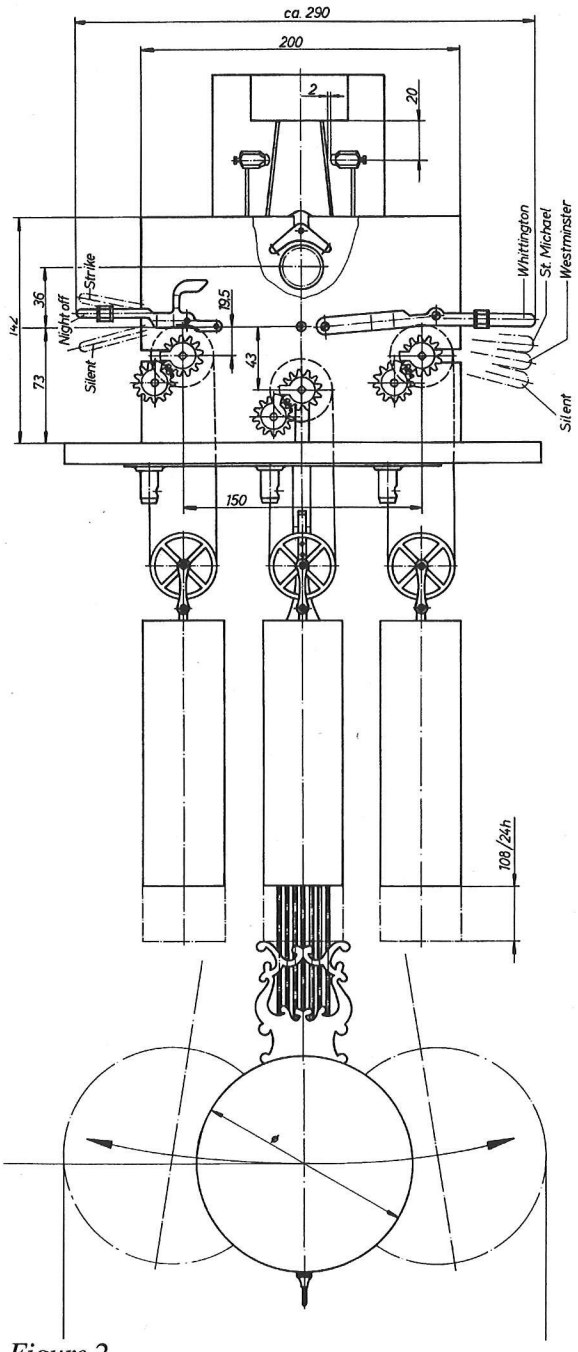

Figure 2

and the long finger of the driving stop must go into the most clockwise of the two. It is labeled #2 in the drawing. It may be necessary to turn the arbor as much as an eighth of a turn to make this alignment. Since all three arbors wind clockwise they are all done the same way. Speaking of cable drums, it may be useful at this point to mention that Hermle is unique in shipping their movements with an orange "keeper"around the drum so that the cable stays on the drum. It is important to take that off when installing a new movement and also to check for that on a setup job to see that it was removed at the factory before installing in the clock case. Failure to do so often causes the clock to malfunction.

The idea on the Kieninger is even simpler, although I should mention that the Kieninger unit is wound counterclockwise. Please see Figure 2. Wind the cable to about the same height as above (or to where you measured before removing). Although the drawing is not as clear as I would like, the driving stop has a dimple or indent punched in one of its teeth. The driven stop has a dimple on each of two adjacent teeth. Install the driving stop so that the tooth with the dimple is between the two dimples on the driven stop. Again, you may need to turn the arbor as much as an eighth of a turn to allow this alignment.

The Urgos arrangement is definitely the most unusual to set up. Please see Figure 3A. You must start with the cable fully UNWOUND and insert the cable end into the drum as shown with the slot in the drum at about the 8 o'clock position. Wind the drum clockwise one revolution so that the cable will just start to lap. Please see Figure 3B. At this point install the driving stop on the arbor such that the dash marks on the driving and driven stops align to each other. Again you may need to turn the arbor up to an eighth turn to allow this. You may now wind the cable fully. Please see Figure 3C.

Final tip: It is a nice touch to make certain the hooks all face the same direction when hanging the weights.

Hopefully these tips will make your life much easier and less frustrating when it comes to the reassembly of cable units.

Final thought: I'd rather apologize for being expensive than for doing a poor job.

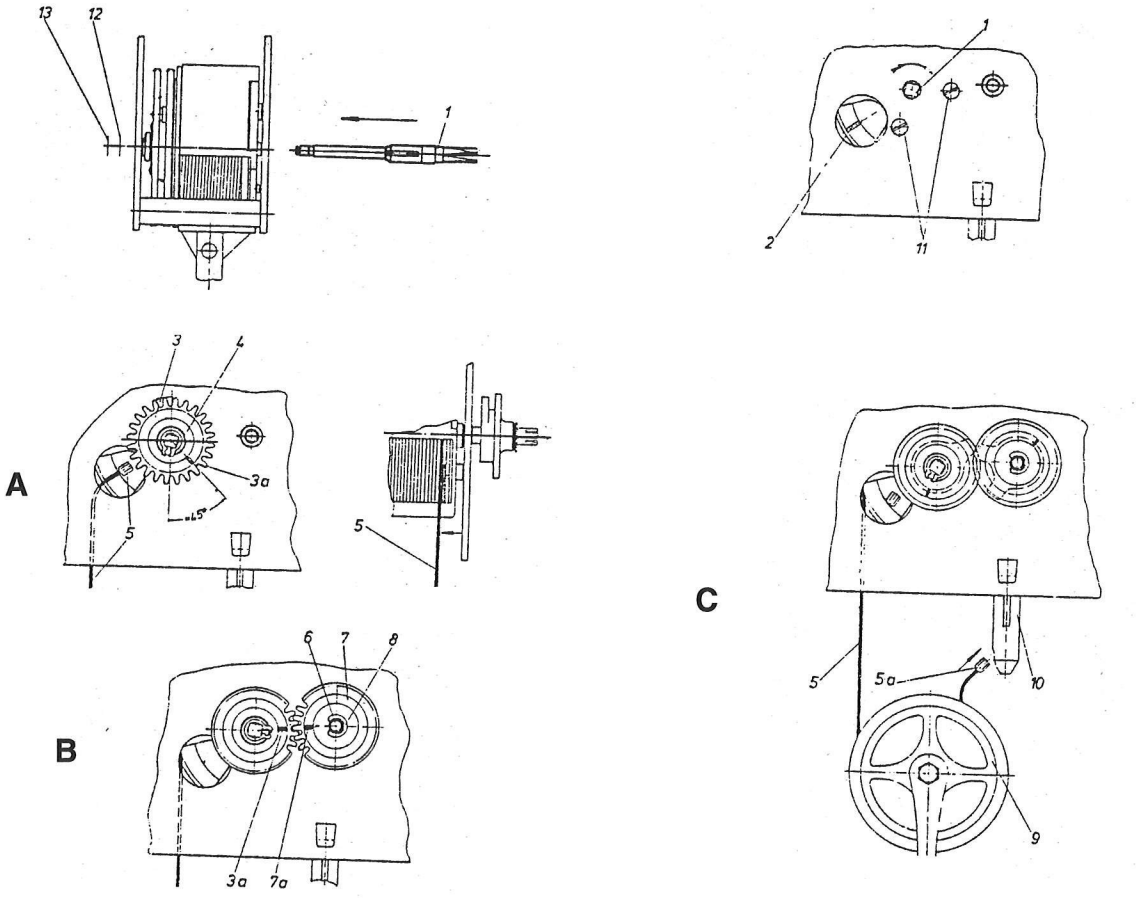

Figure 3

Movement Identification: Franz Hermle & Sohn

Identifying the modern German clock movements is an inexact study. In the first place, the movement manufacturers made the movements for case makers such as Howard Miller, Ridgeway, etc., and did not market in the U.S. under their own names. These case makers in the past wanted the name of the actual maker to remain unknown and have the customer believe the entire clock including the movement was made by them. Today that is not as much an issue although the "private label" stamping is still done for the most part.

The actual maker can usually be identified by both construction features in the movement and quite often by the information on the rear plate of the movement. This is the first in a series of articles which will describe how to identify the movement and also what the information on the rear plate allows us to learn.

We are going to start with those made by Franz Hermle & Sohn because they are the most numerous and also the easiest from which to get a lot of good information due to their unique coding system. This article could be subtitled "Deciphering the Hermle." Since Hermle or FHS as it is also known, made movements for virtually every manufacturer in the U.S. as well as for manufacturers in 80 countries around the world, there are a great array of names found on their movements. In most cases (the exception being Seth Thomas), those movements made from around 1960 and after will have the information laid out on the rear plate like this:

80
Howard Miller Clock Co.
1161-853BS
114cm
60

The top number is a date code for the year of manufacture, in this case 1980. Starting in the year 1988, this was replaced with a letter code starting with the letter "A." As a result, if the letter was "B," it would mean it was made in 1989. This is very helpful in dealing with customers who claim the clock is only "a couple of years old" and cannot possibly require the work or restoration stated.

The second line states for whom the movement was made. If it is made in the U.S. and was not private labeled, it will state "Hermle Black Forest Clocks."

The third line is what is called the execution number and will always have six or seven numbers with a dash in the middle and on occasion some letters at the end. These letters also give important information and repair people often neglect to mention them when ordering a movement or parts for one. All of this information is vital. The letter "S" always stands for second hand and this unit is made both with and without it. The letter before, in this case a "B" is the code for the fact that engineering changes are made from time to time in these units and this is the "B" model. Sometimes these changes are external and sometimes internal and it explains why these units are nearly always interchangeable as a complete unit, but the internal parts do not necessarily interchange. That explains why it is critical that all the information, both numbers and letters, be stated when ordering parts or a movement.

The fourth line tells us the length of a theoretical pendulum for which this unit was designed. I think it is important to mention several points. First, the measurement is in centimeters. Second, the measurement (in the case of Hermle) is from the suspension post to the tip of the