ENEM (Dutch Master Clock)
Patent No. 4604 No. on back & on armatures, 1032
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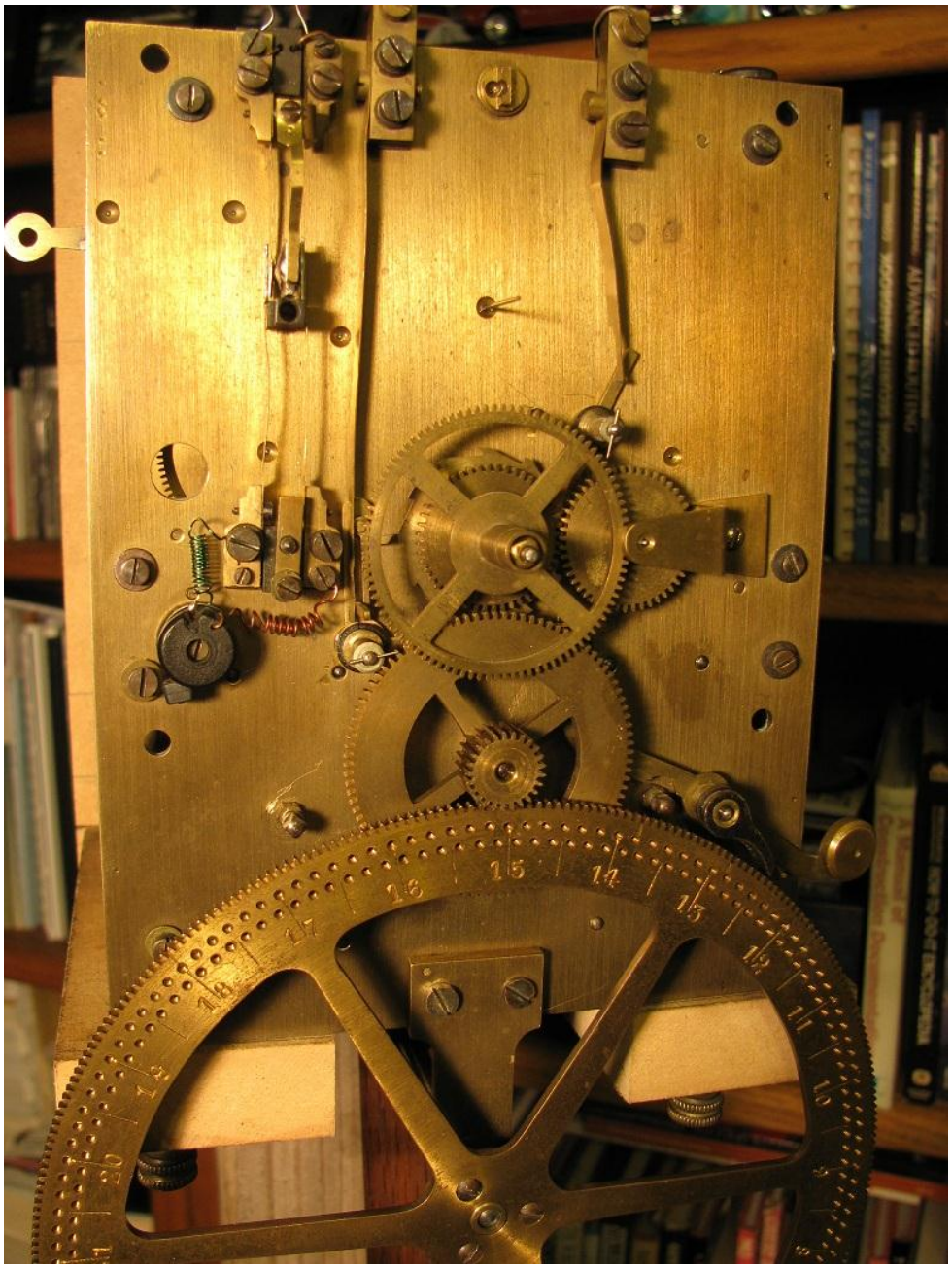
This picture shows the ENEM Master Clock.

I am trying to find information about this clock: What is the history of this clock company. Did they make the movement or did they purchase it from others? Is the winding mechanism unique to ENEM? Did they manufacture slave clocks also? This winding coil and armature look much like the one shown in the ENEM slave in "from Bain to Shortt" the cd by Bosschieter with a unique addition of two wheels that wind the spring arbor in the same direction with each teeter-totter of the armature. This is all very clever. I need to figure out how to get a copy of this Dutch patent, NED.OCT NO. 4604 which is stamped on the back of the movement. (I now have patent)

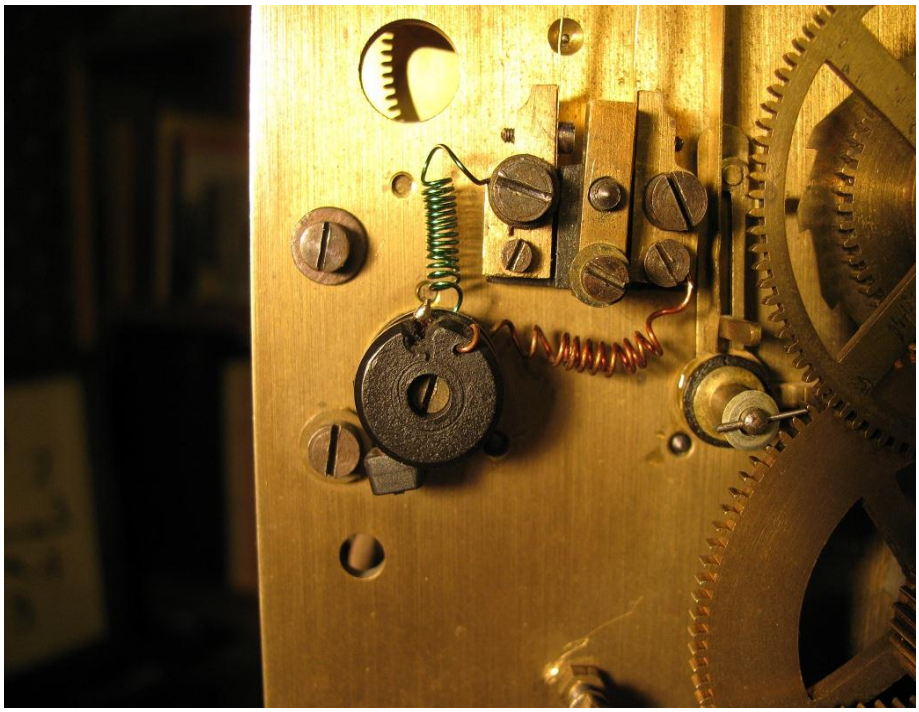
This clock will run for four hours without any power if I manually wind the springs by rolling the ratchet wheels forward until the springs feel fully wound. The two springs (one for the time train and one for the +/- voltage train) are very small ones, inside two barrels. There is no clutch between the ratchet wheels and the winding wheels and levers; the higher the voltage applied, the further the springs get wound. Twenty-four volts will wind the springs about ¾ of maximum. Maximum is how far I can manually wind the springs without damage.



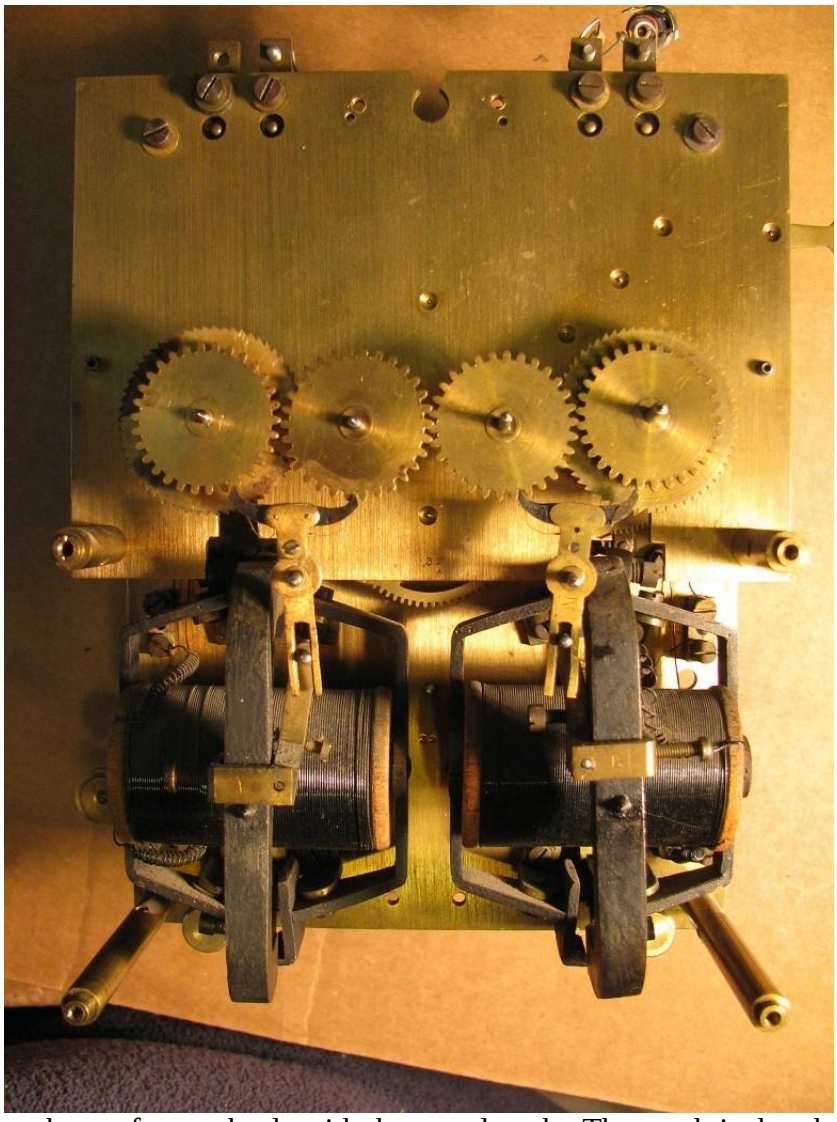
This clock has two trains. The time train drives a one second pendulum and trips the +/- DC voltage train. The DC voltage train (see upper left two terminals and rotary switch) delivers a +/- voltage and then a -/+ voltage once a minute. The +/- & the -/+ voltages are used to titer-totter the armature which ratchets the wheels on the spring arbor and moves the minute hand on the slave clock. Those familiar with the European type bi-polar slave units will immediately understand how this works.

The drum below has spaces for twelve pins per hour. The pins trip the little lever with the weight (right side bottom). That closes a contact located behind the motion works for ringing bells. The two terminals at top and center are for connecting the power to the bells. The wheel has spaces for 24 hours and ability to ring a bell on ten minute intervals.

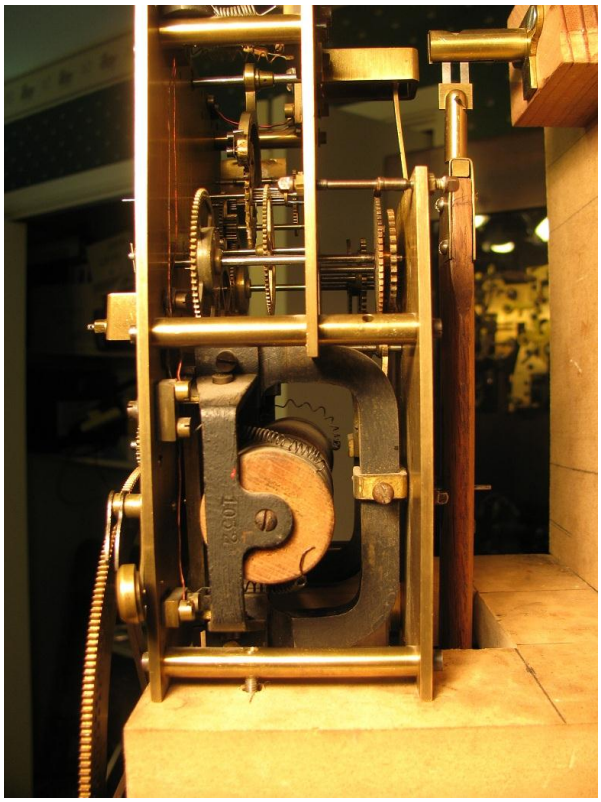
This is a picture of the rotary contact which delivers a +/- pulse and then a –/+ pulse once each minute. The rotating commentator has a contact riding on the back side and one riding on the front side delivering current. When it quickly rotates 180 degrees, it delivers the polarized pulse to the two contacts located on the right and the left hand side.

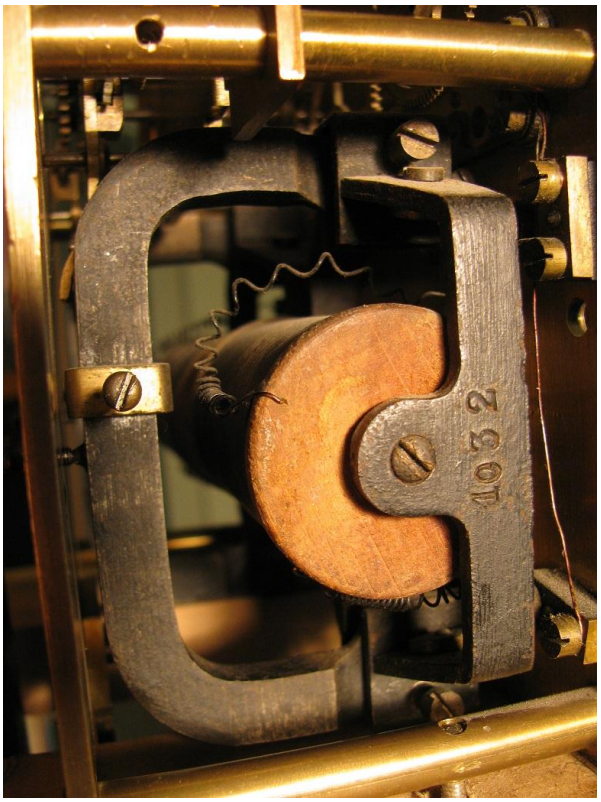


Located at the bottom of the commutator assembly is this small black coil. I am guessing that it is a wire wound resister to limit sparking at the contacts. I believe that this is a non-inductor with side by side wound coil. The center screw is only a mounting screw and not for adjusting.



The movement has three plates. With the rear plate removed, one can see just how the wind mechanism works. The left arbor is the spring arbor for the time train and the right arbor is the spring arbor for the +/- train. The two arbors in the center are for the two idler wheels that go in opposite direction of their companion wheels. The two wheels on the left work together for winding the time train and the two wheels on the right work together to wind the +/- train. The two wheels in the center are a little out of position and should be apart from each other. Each time the armatures go back and forth they move the little arms that ride on each set of two wheels with the round teeth. The result is that the arbors with the springs rotate one tooth of the ratchet wheel in the clockwise direction regardless of which direction the armatures move. The ratchet wheel is located behind the wheels with the round teeth. The ratchet arms are missing in the picture. The two black iron bars are the armatures and they rock back and forth maybe 10 degrees. The rear pivots that go into the back plate are visible in the center of the black bars. The black bars go all the way around the coils and have pivots on the back also.





The first picture show the side view of the time train. Note the little barrel on the wind arbor with the master wheel. That little drum contains the spring that can run the clock for four hours if wound manually with out the aid of electric power. However the little spring gets wound once each minute by the armature as it rocks either forward or backward each minute. On the other end of this arbor is the ratchet with its arm in place and the little wheel with the round teeth that gets it rotation from the armature as it rocks either back or forth. The second picture shows the coil and armature for the +/- train. Both have 1032 stamped on the end.

I have sent information to my many contacts in Europe and have not found many that have ever heard of an ENEM clock or have ever seen one. Any information on this clock would be appreciated.

Thank you, Ernie Jenson

(Clock is now running on 24 vdc)

I received some information from the Hall of Records in Utrecht thanks to Hans Vrolijk.