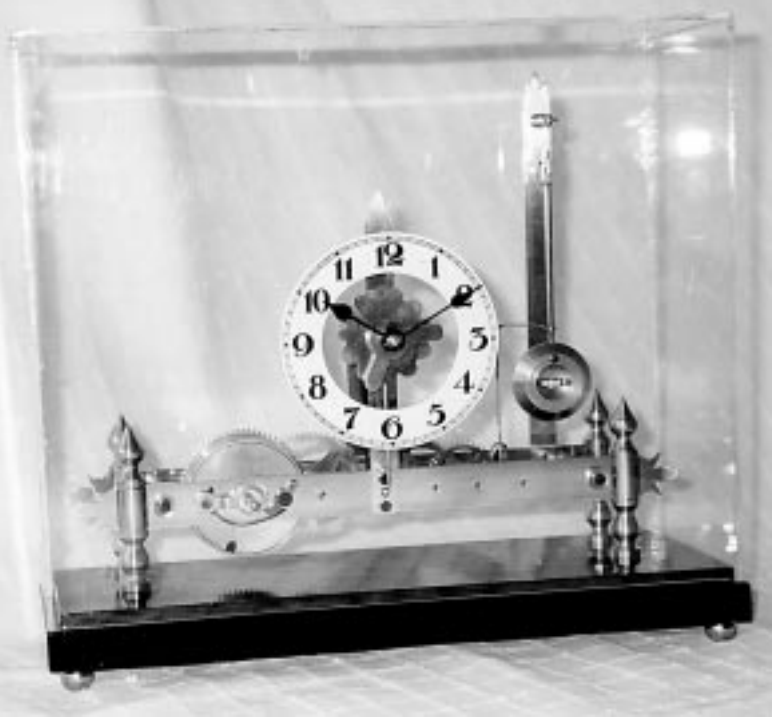
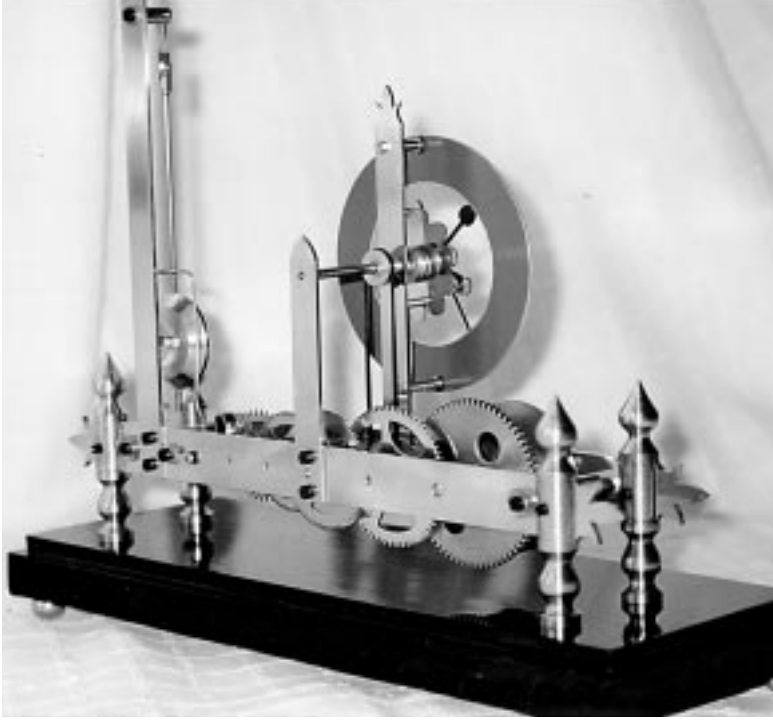




*The completed clock*

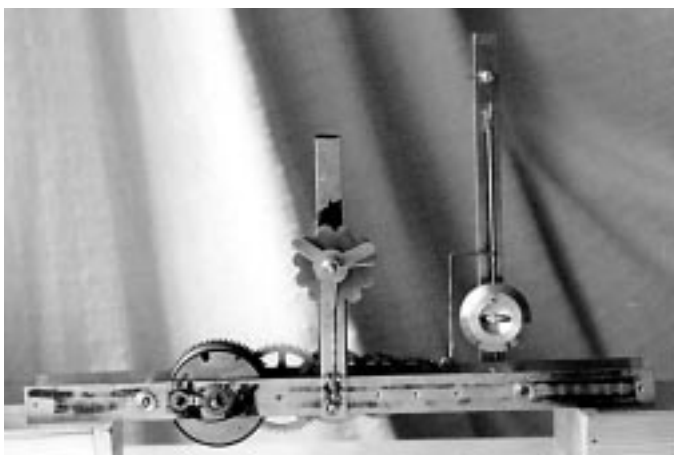
# A Clock with Daisy Wheel Motion Work

## **Nick Andrews** explains why he made one, an excellent project for beginners

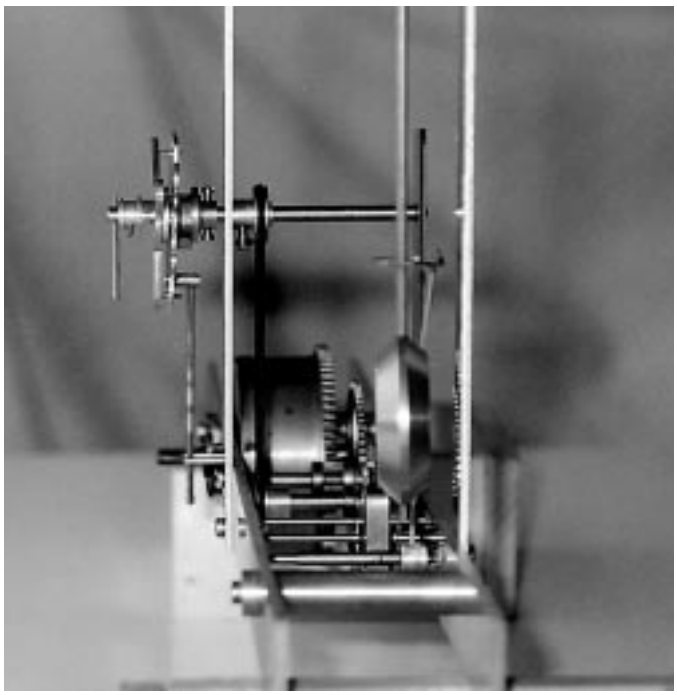
IN THE RECENT series on converting his egg timer to a clock (*HJ* Vol.144 Nos.8,9&10), John Wilding expressed his fascination with the action of the daisy wheel motion work that he was using. His enthusiasm was infectious so I studied John Wilding's usual excellent drawings and photographs but could not picture exactly how the motion work functioned. The only answer was to make the motion work and see what it did.

To make this a more substantial project, I decided to use the motion work in a simple clock that I had been planning to make for some time. This was going to be based on a flat bed frame and would utilise the wheel work from a scrap movement for speed of construction. A 1930s HAC 8-day striking movement had already been bought at the BRUNEL CLOCK FAIR with this project in mind. Features of the clock would be a pendulum mounted above the movement (just for fun) and a dial with an open centre to show the daisy wheel motion work. The dial would also be mounted above the movement to add visual interest.

The first step was to draw the clock full size using the wheel dimensions and pivot hole centres as measured from the scrap movement. A wheel count was done so that the effective length of the pendulum could be calculated. This process meant that the appearance of the clock and its decorative features could be designed and the materials list prepared. Having the dial above the movement posed the problem of how to connect the movement to the hands. After sketching various awkward arrangements involving bevel gears, a simpler solution dawned on me. This involved two purpose made V-pulley wheels and a light rubber belt. The belt was actually cannibalized from an old cassette tape recorder (which proves the wisdom of never throwing anything away!). Care had to be taken in ensuring that the effective diameters of the pullies were identical. A toothed or bead-belt system (as on some blind rollers) may be preferable.



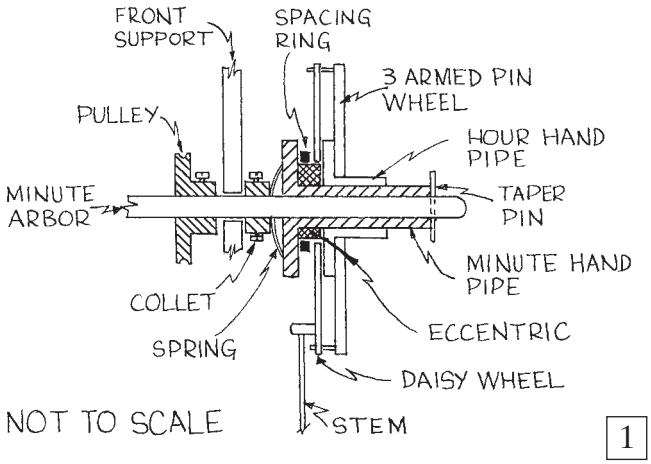
*The test rig with the motion work and the drive band and pulleys fitted. The re-oriented pendulum crutch worked well.*



The basic frame for the movement was made next and the positions of the pivot holes were transferred to it from the original scrap movement using the John Wilding depthing tool as a sort of precision calliper. The pivot holes were then drilled and broached to fit the pivots of the wheels. When the train was assembled it was found to run smoothly so work was continued with increasing confidence. The components of the pendulum were bought in and assembled to give the calculated effective length. It was mounted above the movement which was put on test while the daisy wheel motion work was made.

Rather than design the motion work completely from scratch with all the uncertainties that would be involved, the basic dimensions given by John Wilding for the daisy wheel, eccentric and pin wheel were used*. Their size also fitted in well with the design of the clock. However, the motion work in John Wilding's egg timer clock was mounted on a stub arbor whereas mine would be driven from a conventional minute arbor. Also, the hand setting on the egg timer was done by disengaging the motion work but my clock would need a friction clutch to achieve this. I have included a diagram of my modified daisy wheel motion work, **1**, which uses a friction clutch similar to that found on an English dial clock.

The components of the motion work were made and fitted together. The eccentric was fixed to the minute wheel pipe with a grub screw (as described by John Wilding) but the three armed pin wheel was glued to the hour hand pipe. The action of the motion work was then tested. Before a smooth and free action was obtained, three eccentrics had to be made, each with a slightly different throw. Also, the shape of some of the 'petals' had to refined by filing and burnishing them. Eventually, when everything appeared to be working correctly, the motion work was added to the test rig for an extended trial.



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With the trial successfully concluded, the movement was dismantled and the decorative parts of the clock were made. A painted aluminium dial was bought and its centre pierced out to show the motion work. Commercially available hands were modified with purpose made collets to fit the minute and hour pipes. The hour hand is a conventional friction fit but the minute hand is held with a screwed collet.

The completed clock is provided with a simple acrylic case to keep out the dust. The overall dimensions of the clock are only 280mm x 100mm x 250mm. This means that it sits nicely on a shelf in my workshop where it is often used to explain the mysteries of the daisy wheel motion work to fellow clock enthusiasts who have been puzzling over it! ❐

*For a detailed discussion of the Daisy Wheel Mechanism, with dimensions, see: Hastings, Peter. *Horological Journal* **138** (8) [August, 1997] pp 268–271.