Bentima synchronous mantel clock

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Figures 1 and 2 show a Bentima synchronous chiming mantel clock. It was probably manufactured circa 1955. The clock is marked Made in Great Britain. It is for a 230-250 V supply. The oak veneer case is 23 mm high × 28 cm wide. As found some decorative moulding was missing. The remaining moulding was removed and the case re-varnished. The dial is 14 cm diameter with a brassed bezel, black Roman numerals and brassed hands. The tiny seconds hand at 12 o’clock is not original. The brand on the front is Bentima. Rear views are shown in Figures 3 and 4. One of the gongs is missing. The brand on the back, with the door open is, Perivale Clocks. The clock is fitted with a Perivale self starting movement. The seconds hand acts as a tell tale. British Patent information on the clock is ‘437609, 489855, 636753, 643751, others pending’.

Figure 5 shows a front view of the Perivale movement, and Figure 6 a rear view. A top view is shown in Figure 7 and a view from underneath in Figure 8. A detail rear view with the rear part of the motor casing removed is shown in Figure 9. The Perivale movement has a magnetised motor. There are 30 poles on the stator so the motor rotates at 200 rpm. Adjacent poles on the stator are of opposite polarity and are interleaved with an air gap between them. The magnetised rotor has six pairs of poles (Figure 9). The pairs are alternately N and S. The reduction gear is similar to the going train of a conventional mechanical clock. Perivale patent 489855, issued in August 1938, describes the differential mechanisms used in striking and chiming synchronous clocks. There are two differentials (Figure 7), one for the striking work and one for the chiming work. In a differential, one sun wheel is driven by the synchronous motor and the other sun wheel is connected to the striking or chiming work. When the planet carrier is free to rotate there is no drive to the striking or chiming work. The planet carrier is locked by the reduction gear at the appropriate time to provide a drive to the striking or chiming work. Improvements to the striking and chiming work are described in Perivale patents 636753 (May 1950) and 643751 (September 1950).