

After automatic translation...

The drive of the pendulum is one, the signalling of time and the advancing the secondary clocks the other task. The pendulum activates a pawl-wheel by a ratchet, that via a suitable gear activates the hands and the contact arrangement to advancing the secondary clocks. At the master clocks, the hands are often not activated mechanically but the dial is already formed as the first secondary clock and is therefore also driven by means of the trigger pulses (Jumping minute). The principle of the pawl-wheel did recently an important come back with the "Bulova-Accutron" tuning fork watch.

The electric vigour for supply the drive and advancing the secondary clocks occurred over in most cases from a 24V accumulator which is permanently at the public mains (buffer battery operation). The power reserve is also secured in this way during power failure.

A further enormous advantage of the direct pendulum drive lies in power transmission. By a weight or spring driven clock the whole gear, from the centre wheel to the escapement wheel, is burdened by the whole load. At every pendulum half wave, the escape wheel and the pendulum is driven over the whole gear train and stopped again. All journals are always burdened in full. In the case of the direct pendulum drive, only the hands and the contact system are activated by the pawl mechanism. Propulsion comes from the pendulum itself and is not transmitted via gear train. Virtually no bearing pressures are existing. The same also applies to the modern quartz crystal clocks of all sizes. The construction of the clocks will simplify fact essentially through these, because no more extensive jewel bearings and high polished axes those need to resist the pressures of the main-spring may be.

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Driving the pendulum is one task, while signalling the time and advancing the secondary clocks is another. The pendulum activates a pawl wheel by means of a ratchet, which via a suitable gear activates both the clock's hands and the contact arrangement for advancing the secondary clocks. The hands of the master clock are often not activated mechanically—instead the first secondary clock is used as its dial. It is therefore also driven by means of the trigger pulses once a minute. The pawl wheel principle recently made an important comeback in the Bulova Accutron tuning-fork watch.

Electrical power for supplying the drive and advancing the secondary clocks is usually taken from a 24V accumulator which is trickle-charged from the public mains supply. This acts as a buffer battery to supply a power reserve in the case of mains failure.

A further enormous advantage of direct pendulum drive lies in power transmission. In a weight or spring-driven clock the whole movement, from the centre wheel to the escapement wheel, must be driven. For every half oscillation of the pendulum the escape wheel and the pendulum are driven through the whole gear train and stopped again. All journals are therefore always fully loaded. In the case of direct pendulum drive only the hands and the contact system are activated by the pawl mechanism. Propulsion comes from the pendulum itself and is not transmitted through a gear train, so virtually no bearing loads exist. The same applies to modern quartz crystal clocks of all sizes. These factors simplify the construction of such clocks, removing the need for expensive jewelled bearings and highly polished journals such as those that are required to withstand the loads caused by a mainspring drive.