

# The Crystal Palace clock

James Nye\*

*A notable turret clock, by Dent, installed for much of its life at Crystal Palace in Sydenham, south of London, disappeared along with everything else in the conflagration of 1936. Its three-quarter-century life story is retold here, based largely on a text by T.R. Robinson published in the Watch and Clockmaker in 1935.*

How many are they who've once taken stock  
Of the time announced on the Palace Clock,  
High in the roof at the end of the Nave,  
O'er the crowned heads of the royal and the brave.

On what happy scenes has the great face looked down  
On gay thronging people from country and town  
Along the green vistas of court and arcade  
And around the great basis where glass fountains played.

Through times of great pageantry, festival, glory,  
Down through long years it has ticked out time's story  
Through Palace prosperity, and, alas, trial,  
The hands have moved onward o'er the great dial.

Emperors, kings, and the great of all nations  
From earth's four ends, from all life's stations,  
Have passed by the heroes and sons of the brave  
And under the clock at the end of the Nave.

It proclaimed when the sad time had come to pass  
Dissolving, the dear old Palace of glass,  
And saw an inferno nothing could save  
From ending the great clock high up in the Nave.

Tis said that near the ruined site,  
If one stands quietly at dead of night,  
Through the breezes that over the ruins sway  
You can hear the old clock ticking away.<sup>1</sup>

When the Great Exhibition opened in 1851 in the purpose-built Crystal Palace in London's Hyde Park, the space dedicated to clocks and watches was surprisingly large. Horology was still an important British industry, though it was entering the final phase of its long existence, as foreign competitors modernised

and forged ahead. Chief among the clockmaking hierarchy represented at the exhibition was Edward John Dent, a powerful advocate for the traditionalist London trade. A large turret clock designed by Edmund Denison (later Lord Grimthorpe) and made by Dent's firm, won a Council Medal and was later

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1. Poem signed L.A.S. Laar, otherwise unattributed, discovered by Melvyn Harrison of the Crystal Palace Foundation.



Fig. 1. View of the East Entrance to the International Exhibition Building, South Kensington, 1862, photograph, Victoria and Albert Museum, 41: 219 © V&A, 2014.

installed at Kings Cross station, where it remained until replacement by a synchronous electric clock in 1965.<sup>2</sup> Within a short time Dent also won the contract to provide the clock we all know as Big Ben, though the firm lost Edward John in person with his death in 1853.

In the follow-up Great Exhibition of 1862, held in South Kensington, the firm of Dent was once again well represented, providing the clock that drove the hands on a huge stained glass dial at the east end of the nave of the main building (Fig. 1). Charles Frodsham, a major competitor to Dent, sat on the committee of judges for the horological section of the 1862 Exhibition, and the uncharitable might see this as a reason for the

remarkably brief reference the committee made to the Dent exhibits in its report.

What happened to the Great Exhibition of 1862 clock movement over the next thirteen or fourteen years is unclear, but with the Crystal Palace re-established in its new home in Sydenham, Dent's eventually moved their massive clock to the new Palace where it was set up and running in November 1876.<sup>3</sup> A new dial was created, but it was on the same scale as before, at close to 40 feet in diameter, sited in the south end of the central glass span. The name Dent, and their new address of 61 Strand, were added in bold letters above the top middle of the chapter ring.

Writing in the *Watch and Clockmaker* in 1935, T.R. (Robbie) Robinson revisited this

2. *Antiquarian Horology* 28/2 (June 2004), 269. Pictures on the Internet (March 2016) suggest the wooden cabinet, the main cast iron frame and very limited numbers of parts may remain in the clock tower.

3. J.E. Preston Muddock, *The Romance and History of the Crystal Palace* (London: Upcott Gill, 1911), p. 65.

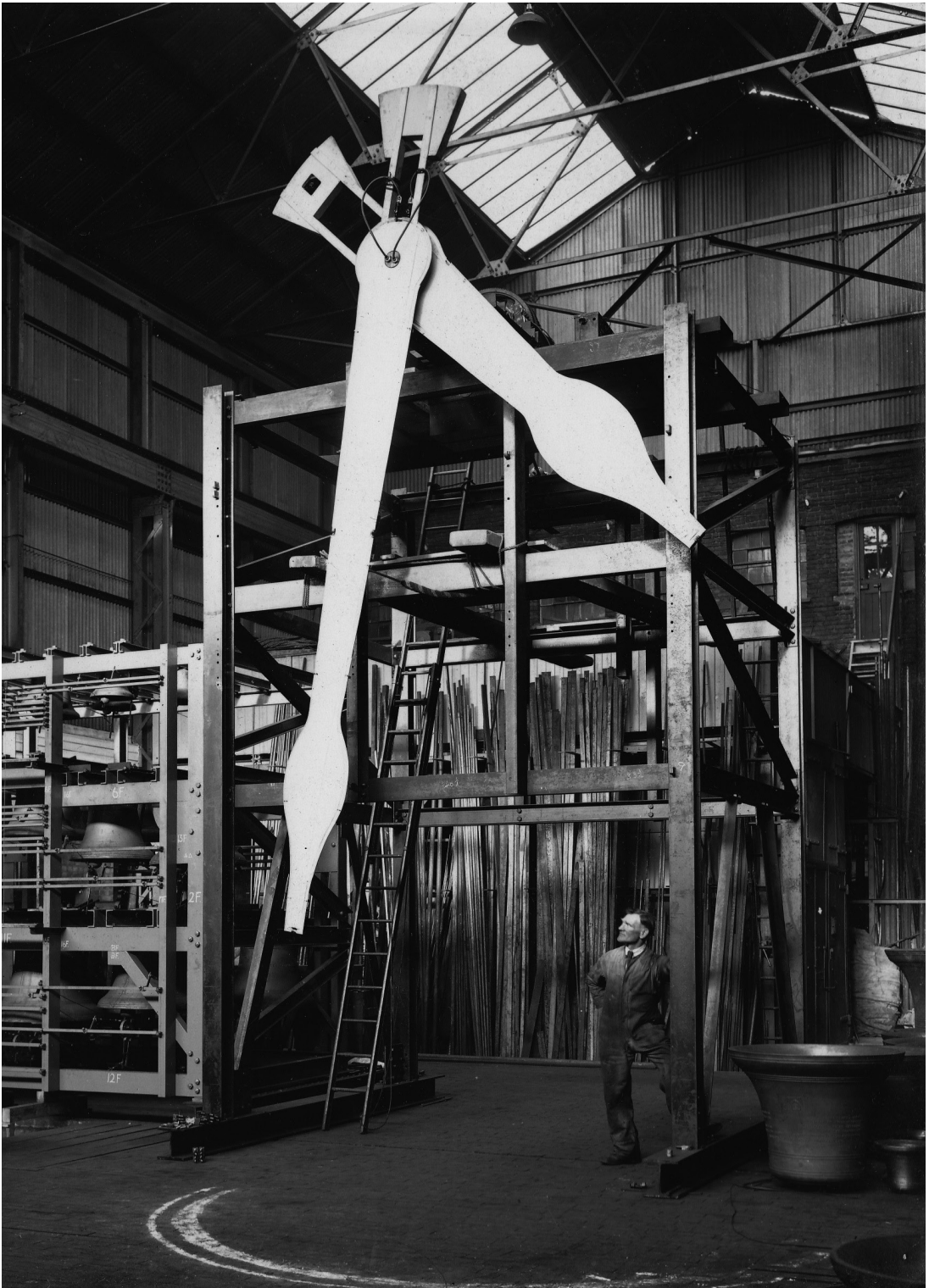


Fig. 2. Robinson's picture of the Bile Beans movement, Gillett & Johnston's workshop, courtesy of Keith Scobie-Youngs. Installed in early 1933, the date of its removal remains unknown. It was no longer there in the late 1940s, and might well have been removed at the outbreak of the Second World War.



Fig. 3. The state opening of South Africa House on Trafalgar Square (22 June 1933), with the Bile Beans in the distance. Press photo.

extraordinary clock in detail, but soon after the clock would have formed one small part of the mass of twisted metal left by the 1936 fire, and will have ended up as scrap. It thus passed into legend and appears to have been largely forgotten. Robinson's detailed article is reproduced below, with a small elision.

The claim to the title of "London's Largest Clock" has always been keenly contested, and many public clocks have held the coveted position at one time or another. Big Ben, the Shell-Mex giant, and the Bile Beans electric timepiece in Trafalgar Square, London (Figs 2 and 3), have all in turn made their claims to the distinction. But in all argument on the point, one huge clock seems to have been forgotten, although, if dial size is the standard taken, it is the mightiest of all.

It is the gigantic timepiece in the Crystal Palace, the single forty-foot dial of which is a conspicuous feature of the main hall of the building. How this clock has come to be overlooked in horological history seems to need some explanation, for it is seen by many thousands of people yearly, and has by no means an obscure past [...] the clock's timekeeping is still admirable, and its condition good.

Its position is high above ground level, in the arched end of the great central glass span, and, as our illustration shows (Fig. 4), it nearly fills this space. The dial itself is of somewhat unusual construction, for it has a main framework of heavy wooden beams, on the front of which are mounted the figure ring, the external ornamentation, and the pierced-work centre, these also being of wood. The method of painting and the colour-scheme chosen remind one of theatrical scene-painting, and give an attractive appearance to the dial, especially as the piercings allow daylight to pass through from the rear, which provides a contrasting effect. At night the clock is floodlit, and has an almost startling appearance against the night sky seen through the glass behind.

To clockmakers, however, the main interest lies in the movement, which is in keeping with the great dial. Our second picture shows the mechanism and it will be seen that it is of unusually heavy form (Fig. 5). It follows the general lines of a flat-bed clock, but the main portion really consists of two short and heavy girders, bolted to the supporting foundation. The other parts are either bolted to these girders or span the space from one to the other. The barrel, which runs in plummer blocks bolted to the bottom faces of the frame girders, has a geared-down winding jack, the spindle of which can be slid into and out of mesh with the winding wheel on the barrel, and, when pushed into winding position, automatically brings into action a maintaining power depending on the reaction to the winding effort.

The rear pivot of the jack spindle operates a lever and click which engages with a crown-ratchet on the main wheel and thus, in a simple and efficient manner, keeps the clock going during winding. To prevent the winding jack wheel from being meshed with the barrel wheel unintentionally, two grooves are turned in the front end of the spindle and a locking latch is provided. This maintaining arrangement appears very similar to that used for Big Ben.

The train wheels are mostly cast-iron, and the pinions are of lantern form.



Fig. 4. View of the 40 foot new dial for the clock, at Sydenham, after the 1862 Great Exhibition. *Watch & Clockmaker* (November 1935).

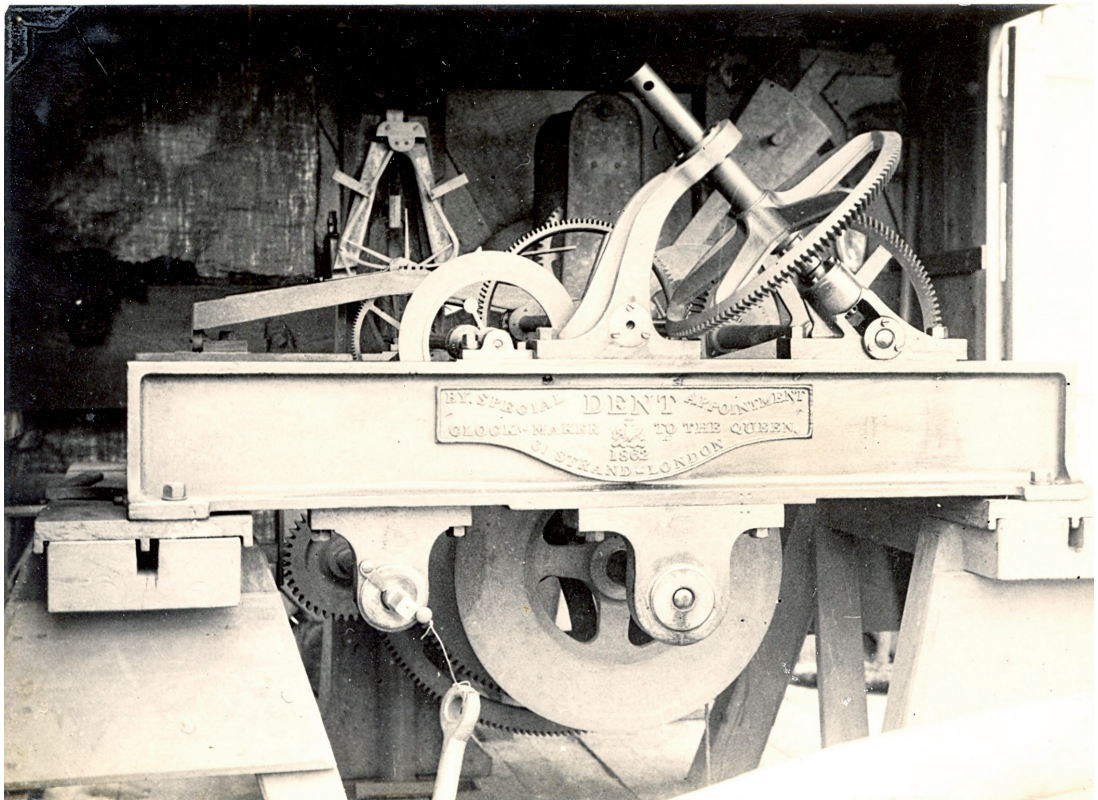


Fig. 5. Detail of the movement of the Dent 1862 Exhibition clock, moved to the Crystal Palace. *Watch & Clockmaker* (November 1935).

Both wheels and pinions show remarkably little wear, considering the number of years the clock has been at work. The movement is now fixed directly behind the dial, and this makes the large bevel work and provision for an inclined lead-off superfluous, but apparently in the Exhibition for which it was made it either drove a dial through the bevels or was fitted with them to show the method of leading-off to a dial.

The double three-legged gravity escapement of the clock has its inner escape wheel pivot running in a block bolted to a strangely shaped bar, which, as the picture shows, is unusually long. The reason is to give clearance for the very large fly. The proportions of this seem correct, for the escape wheel raises the arms steadily with no jar in locking on the pads. As the clock must have been one of the earliest to have the gravity escapement, this attention to details is interesting, for it

shows how soon correct design of escapement was achieved. It will be noticed that the arms have additional weights, their own weight being apparently insufficient.

#### *The Grimthorpe Tradition*

The pendulum hangs from a large bracket bolted to the floor, forming a separate unit from the clock frame. In many of these details one can see Lord Grimthorpe's influence. The clock conforms with practically all the stipulations laid down in his book, unlike some clocks made under his guidance in later years.

The pendulum of the Crystal Palace timepiece beats  $1\frac{1}{2}$  seconds, and not 2 seconds like its big brother at Westminster. There would have been room for a longer pendulum in the present position, but the shorter type was necessary because of the limited space available when shown on a stand.

### *Daily Winding*

As one would imagine, the motion work is heavy. The hand counter balances are on two arms arranged like a V, the relative positions of arms and hands being like a Y, with the hand as the vertical part of the letter. Rollers, or rather, plain wheels, support the minute-hand spindle and hour-hand pipe, and the action is smooth, despite the weight of the assembly.

A large setting dial is provided, and another, even larger, enables the clock to be set for seconds. This can be seen in the illustration, and it will be noticed that it is inside the frames, with the hand fitted to the arbor of the appropriate wheel. The clock is wound every day, for the space available for weight fall is limited. It is, of course, in a favourable position, for its hands do not have to contend with wind pressures and bad weather conditions, but at the same time there is an ample margin of power. The counterbalances need slight adjustment, for the hand drops over slightly from one side to the other at the hour, but to correct this would be simple. At the conclusion of the Exhibition for which it was built, the clock became the official timekeeper of the Crystal Palace, an office which it has held ever since. Although inside a building, it can hardly be called a domestic clock, but it must be the largest “English dial” in existence. The mechanism is housed in a case which completely hides it, and is not normally accessible, but it seems a pity that it cannot be shown to the public on occasion, for it is a remarkably fine example of British craftsmanship.

Here ends Robinson’s article in the *Watch & Clockmaker*. Attempts to locate further references to the clock either in the technical journals or wider press have so far been unsuccessful, with one exception. Robinson noted the need for daily winding, and by chance one reference did emerge, from the *Crystal Palace District Advertiser* which in 1930 wrote about Henry John Wilson (1834–1932) that ‘for 35 years he was responsible for the winding and tending of the big clock. He walked up the 163 steps each time that task was carried out, and this means that he walked up about 1,315,800 steps – and down again [the journalist miscalculated, since the figure should exceed 2m]. After he left the Palace service he went (for Messrs Dent) once a week to regulate the clock until June 8 1920, and on this day he gave up the keys.’<sup>4</sup>

It is clear the clock was remarkable, largely for the scale of its dial. The current UK record lies with the Shell-Mex Building clock, on the Strand, at 25 feet—clearly substantially smaller. Indeed the Crystal Palace clock would rank high in a modern worldwide list of record dial diameters. The mechanism was also a fabulous example of the high art of the public clock at the height of operations of one of the best known of all makers. Its pedigree was impeccable, out of the same stable as Big Ben, its very close contemporary in time. Somewhere, it will have left more traces, whether in newspapers, technical accounts, or as part of the backdrop of works of fiction. With luck, these traces will eventually resurface.

4. *Crystal Palace District Advertiser* (9 May 1930). See also Ian Taylor, ‘Henry John Wilson’, *Friends of West Norwood Cemetery Newsletter*, no. 84 (September 2015).