

## The 1861 William Wheatstone patent 'English' Concertina – a rare survival

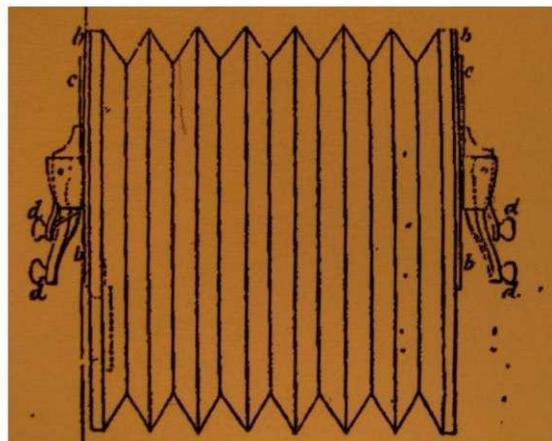


The William Wheatstone 1861 patent prototype concertina

A highly unusual 'English' concertina was recently acquired for the Concertina Museum,<sup>1</sup> which appears to be the only known prototype instrument of those described in the 1861 patent of William Wheatstone (Charles Wheatstone's brother), who was by then managing the Wheatstone family business. The design and internal construction of concertinas, invented in the early 1830s and patented by Charles Wheatstone in 1844, had long been standardised by the Wheatstone manufactory at 20 Conduit Street, London, and also by the many rival concertina makers in London during the 1840s and 1850s. This prototype design, a hitherto unrecorded example of one of the variants claimed in William Wheatstone's 1861 patent, is radically different, even eccentric, in its construction, internal layout and design from all preceding concertinas.<sup>2</sup>

The concertina was invented by Charles Wheatstone in the early 1830s as a bellows-powered free-reeded instrument in which individual notes and chords may be sounded by pressing the array of buttons or 'keys' on each end of the instrument. Though Charles Wheatstone's first bellows-powered and reeded instrument is merely hinted at, but not named 'concertina' in his 1829 patent for the Symphonium (see below), in Wheatstone's 1844 patent the full specification and internal design of his 'English' system Wheatstone concertina was announced.<sup>3</sup>

### The free-reeded bellows instrument hinted at in Wheatstone's 1829 Symphonium Patent<sup>4</sup>



<sup>1</sup> [www.concertinamuseum.com](http://www.concertinamuseum.com)

<sup>2</sup> British Patent No.2289 (1861): William Wheatstone: Improvements in Concertinas, &c. [www.concertina.com/wheatstone/Wheatstone-Concertina-Patent-No-2289-of-1861.pdf](http://www.concertina.com/wheatstone/Wheatstone-Concertina-Patent-No-2289-of-1861.pdf)

<sup>3</sup> British Patent No.10041 (1844): Charles Wheatstone: Improvements in the Action of the Concertina, &c. by Vibrating Springs [www.concertina.com/wheatstone/Wheatstone-Concertina-Patent-No-10041-of-1844.pdf](http://www.concertina.com/wheatstone/Wheatstone-Concertina-Patent-No-10041-of-1844.pdf)

<sup>4</sup> British Patent No.5803 (1829): Charles Wheatstone: Improvements in the Construction of Wind Musical Instruments [www.concertina.com/wheatstone/Wheatstone-Concertina-Patent-No-5803-of-1829.pdf](http://www.concertina.com/wheatstone/Wheatstone-Concertina-Patent-No-5803-of-1829.pdf)

The manufacture of concertinas at the Wheatstone family's manufactory at Conduit Street proceeded apace from the 1830s to 1850s, and throughout these decades, craftsmen and outworkers who had worked there often set up on their own, inevitably labelling their concertinas as 'improved', 'new model' and other such claims. These new makers included Joseph Scates, George Jones, F Nickolds, and Rock Chidley, a nephew of Charles Wheatstone who was later to return to manage the Conduit Street workshops. However, in spite of their vain claims, these new makers rarely achieved the quality of Wheatstone-made instruments, merely offering slight so-called 'improvements' to areas such as fret patterns, reed-frame profiles, bellows patterns, the tuning and temperament of the reeds, and the internal 'actions' (the system of levers, pivots, reed-pads and lever-supports within the instrument). Chris Flint has documented the myriad small changes to the internal features of concertina 'actions' on his website.<sup>5</sup> His research greatly assists in determining just who made many of the minor makers' 19<sup>th</sup> century concertinas.

By the 1850s, Charles Wheatstone was almost exclusively involved in his scientific research as a professor at King's College, London. The 'C Wheatstone & Co' workshops, instrument dealerships and concertina factory had long been managed by his brother William (1804-62). Furthermore, the great influence of Louis Lachenal in the 1850s as the highly-paid engineering manager at Wheatstone's led to a measure of mass-production techniques, machine-cut fretwork, and machine-stamped reed-frames: his entries in the Post Office *London Directory* for the period 1850-1853 read 'machinist, iron planer, small screw & piano rivet manufacturer'.<sup>6</sup>

Even though Charles Wheatstone did create some alternative designs and fingering systems for his concertinas at Conduit Street – for instance the 1848 'Double System Duet',<sup>7</sup> (see below, left) and the 1854 'Duett'<sup>8</sup> (see below, right) – neither proved popular with the small but enthusiastic (and well-off) amateur concertina-playing community. Few were made and sold, and Wheatstones concentrated on marketing an increasing range of 'English' concertinas, making instruments of different compasses such as tenor-trebles, baritones, basses and extended trebles, piccolos and even miniatures, to enable ensemble playing.



**Left: Charles Wheatstone 67-Key 'Double System Duet', No 12 (c.1848). This rare system, with 4 columns of reeds in a new 'duet' format, is known from about 5 surviving models, and has many pre-1848 features. Concertina Museum Collection Item C.100 Right: Charles Wheatstone 1854-period 'Duett' concertina. Concertina Museum Collection Item C.094**

<sup>5</sup> Chris Flint, 'Re-actions, or Thinking inside the Box', [www.scatesconcertinas.com/re-actions-or-thinking-inside-the-box.html](http://www.scatesconcertinas.com/re-actions-or-thinking-inside-the-box.html)

<sup>6</sup> Steven Chambers, 'Louis Lachenal: Engineer and Concertina Manufacturer' [www.concertina.com/chambers/lachenal-part1/index.htm](http://www.concertina.com/chambers/lachenal-part1/index.htm)

<sup>7</sup> Robert Gaskins, 'The early Wheatstone Double System Duet Concertina' [www.concertina.com/double/index.htm](http://www.concertina.com/double/index.htm)

<sup>8</sup> Robert Gaskins, 'Early Wheatstone Duett System Duet Concertina' [www.concertina.com/duett/index.htm](http://www.concertina.com/duett/index.htm) Items C.092 to C097 in the Concertina Museum are Wheatstone 'Duett' system concertinas [www.concertinamuseum.com/CM00092.htm](http://www.concertinamuseum.com/CM00092.htm)

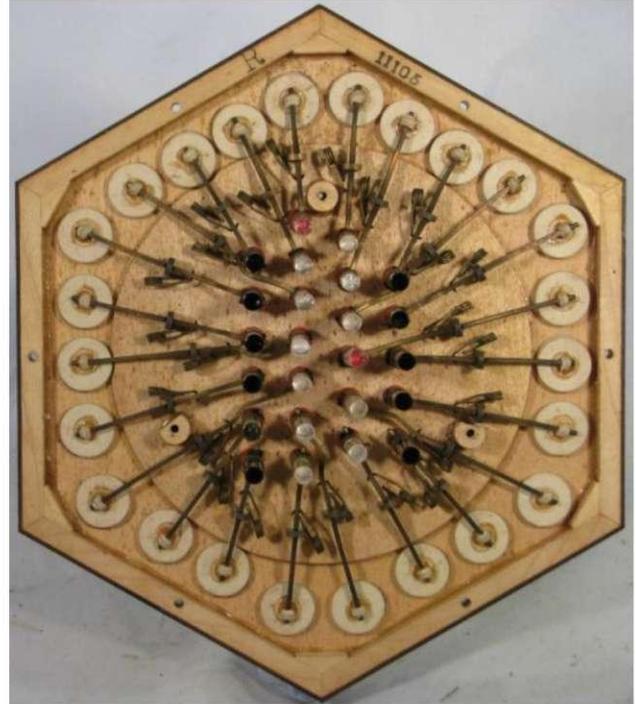
Given the continuing success of Wheatstone's original design, substantially unchanged in both their own instruments and those of their many competitors, why did William Wheatstone create this complex, novel and, more to the point, unsuccessful, 'Improved' concertina design, patent it together with two other fingering systems, and actually make one?

To assist an analysis of the reasoning behind William Wheatstone's instrument (WW) let us compare it with the standard Wheatstone & Co 'English' concertina (CW) in production in late 1860, using side-by-side images of the 1861 WW instrument (left) and the 1860 CW 'English' concertina (right).



**Layout of keyboard areas, on the ends of the 1861 WW (left) and 1860 CW 'English' concertina (right)**

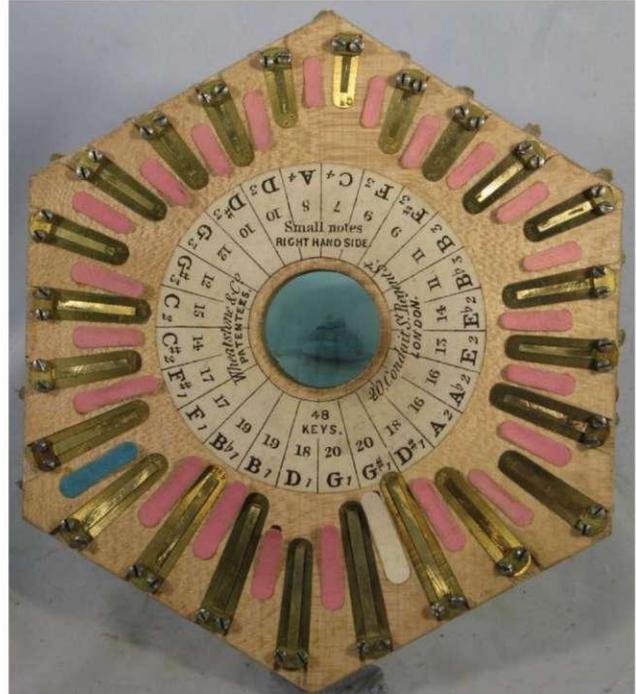
William's reason for shifting forward the array of buttons that form the keyboard area, and similarly moving the thumb-strap forward, was to achieve more of a horizontal balance when the instrument is held by thumbs alone, removing the need for the little-finger rests. This liberates all four fingers of each hand for the playing of notes on each end. The relocation of the keyboard has necessitated the moving of the label embouchure to the lower fretwork area. The keys themselves are not the simple ivory or metal columns as used in CW instruments, but complex domed push-studs that operate through the frets and act upon the various levers in the WW action board.



**The arrays of levers, pivots and pads (the ‘Action’) on the 1861 WW (left) and 1860 CW ‘English’ concertina (right)**

Owing to the grouping of the keyboard area close to the top edge of each end, the WW instrument does not have space for conventional levers to operate the four or so top-row keys on the outer edge of the instrument. An array of spring-loaded plungers has therefore been mounted on the inner face of the action board to admit air to the reed-pan. The rest of the levers are complex, hand-made wooden levers, all individually carved and numbered, and all have carved grooves lubricated with graphite at the points where the brass springs apply pressure to the tops of the levers. The levers are pivoted on cut-brass U-shaped support posts, and Chris Flint, expert on the action varieties used by makers of early concertinas, has commented that ‘it is beautifully made, but can only be a prototype built for the patent, as the potential for wear on the underside of the levers would give it a very short life – wooden levers rubbing across metal posts’.<sup>9</sup>

<sup>9</sup> See footnote 4; The [Concertina.net](http://www.concertina.net) discussion site: A number of leading concertina researchers (inc. Jim Lucas, Chris Flint, Geoff Crabb, Wes Williams and others) have discussed the 1861 Instrument within [Topic 14240](http://www.concertina.net/forums/index.php?showtopic=14240) on this website [www.concertina.net/forums/index.php?showtopic=14240](http://www.concertina.net/forums/index.php?showtopic=14240)



**The arrangement of reeds, reed-tongues and valve flaps on the inner face of the hexagonal reed-pan of the 1861 WW (left) and 1860 CW ‘English’ concertina (right)**

It is perhaps in the construction of the reeds and reed-pan that the WW instrument varies most from the long-established C Wheatstone & Co designs. All ‘English’ concertinas, whether by Wheatstone or the many minor makers, had a double-sided arrangement of reeds, the outer side of the reed-pan having single-tongued reed-frames secured in routed chambers, and an array of similar reeds in routed grooves on the pan’s inner face (see above, right). By the 1860s, the provision of a radial paper label around the central hole of the pan was a standard feature. This label carried information about the reed-frame size, and the musical pitch to which the reed-tongue was to be tuned, as a guide to the tuners (who were often out-workers). However, an examination of the reed-pan of the 1861 WW instrument (see above, left) reveals a complex single-sided pan, with a variety of reed styles, a wealth of numberings near each reed, and an array of long brass springs, secured by an annular wooden disc, each of which bear down upon the valve-flaps glued to each reed. Furthermore, the reeds themselves are of a hitherto unrecorded form, with reed tongues for both the press and draw direction of play being secured onto the same reed-frame, and all reed-frames screwed onto (not routed within) the inner face of the reed-frame. While the larger, lower-pitched reeds have steel reed tongues, secured to the inner and outer faces of a rounded-end brass reed-plate by means of a single steel rivet, some of the smaller, higher-pitched reeds appear to be ground out of a single sheet of mild steel, with the reed-tongues to front and rear face ground out of the sheet of metal. There is no evidence of separate reed tongues being added in some way over grooves in the steel frame plate. Since the reeds to the inner face of the pan deliver notes for both press and draw, there are no reeds in the chambers on the outer face of the reed-pan, just an array of single valve-flaps over the apertures to the reeds that are visible in each exterior chamber.

Clearly, the huge amount of both completely new and heavily-modified features that are embodied in the WW 1861 patent 'English' concertina do appear to be over-complex, unnecessary, and make little actual improvement to the standard and widely accepted designs inherent in the vast majority of 'English' concertinas being made in the 1860s.

Might there have been an element of rivalry between Charles (now well away from musical activities, as a Professor, an inventor, and on his way to an 1868 Knighthood) and his brother William, just two years his junior, who had elected to maintain his involvement with the family firm? It seems not: in a personal communication, Brian Bowers, Wheatstone's biographer, informed us that there was no evidence of such rivalry. In any event, William was managing a busy and successful business at Conduit Street, and in creating the 1861 patented designs may have genuinely been attempting to add useful improvements to his brother's designs. William died in early 1862, and was thus unable to continue any plans he may have had for further new variants of his brother's invention.

But which, if any, of these attempted improvements were valid or useful? What would today's concertina makers consider useful in the 1861 patent designs? We were able to discuss the prototype in great detail with Geoffrey Crabb, and also to consult his contributions to the online discussion about the 1861 patent.<sup>10</sup> Mr Crabb is a fourth generation concertina maker whose great-grandfather worked for Wheatstones in the 1830s. His comments centred on the fact that the forward positioning of the keyboard to achieve 'balance' appeared to be William Wheatstone's prime reason for developing this design.

Mr Crabb felt that the instrument was mainly redesigned to shift the centre of gravity of the instrument, but with no thought in regard to the cost of production, ease of assembly and inevitable ongoing maintenance. He stated 'In my opinion, purely as a maker, most of the improvements put forward by William Wheatstone in the patent were unnecessary changes of design both in components and overall construction. I fail to see the employment of the changes bettering what was a simple, working design in use at the time and, in fact, still used today by some makers'.

One final fact sent to us by Geoffrey Crabb remarked upon the huge increase in extra parts needed for this 'new' action system within the 1861 concertina. His rough count of the total left and right action parts (button top, lever, spring, pivot, pad, etc) needed in the 1861 Patent instrument is around 478. When this is compared with the 384 parts needed within the 48-key Wheatstone 'English', as in the 1844 Patent, an extra 94 parts were needed.

Perhaps the best conclusion to our studies of this rare survival, rather than to criticise and demean the efforts of William Wheatstone and his workshops, would be to pay tribute to the craftsmen and inventors who created occasional weird and wonderful 'new' instruments, many destined to sink without trace. But let us not forget Charles Wheatstone's transformation of a scientific toy mouth organ in 1825 into a bellows-powered curiosity in 1844, and into an instrument that is today still widely made, played and avidly collected all around the world, the 1844 design of which may truly be claimed 'The First, and the Best' concertina.

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<sup>10</sup> See footnote 8, also personal communication: Geoffrey Crabb [www.concertina.net/rd\\_crabb.html](http://www.concertina.net/rd_crabb.html)