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The Invention of the Concertina

Introduction

Having outlined the concertina's place within the broad history of modern free-reed instruments, I now discuss in detail the circumstances surrounding its appearance and first commercial production. I seek to identify the intentions of its creator, the influences upon its form and the degree of innovation involved. In doing so I hope to address two popular, yet contrasting, views on the invention of the concertina.

Firstly, I wish to challenge the view commonly held by enthusiasts of the instrument, including many of my informants, that its invention was the one-off, brilliant creation of an eccentric scientific genius. The concertina was first produced some time during the 1830s by Wheatstone and Co. of London and it is clear that its conception and design were the responsibility of Charles Wheatstone. It is, however, too easy to apply a "heroic" view of invention which clouds proper understanding of innovation in the nineteenth century and over-elevates individual achievements. As the previous chapter described, the concertina was just one of a number of new free-reed products to emerge from an extended period of research and innovation in musical instrument design and manufacture. I wish to emphasise here that it was also just one part of a line of innovations by its creator, who was also an outstanding teacher, experimenter and pioneering inventor in acoustics, optics, electricity, telegraphy and other fields.

Secondly, while popular tradition privileges this single aspect of Wheatstone's work, writers on scientific matters have tended to regard his activities in the musical field as an interesting sideline, engaged in while bearing early responsibility for the family music business but abandoned on maturity for pressing work in other, more important fields. However, if one accepts the view that the scientific investigation of acoustical phenomena and their practical application in musical instruments was part of the "nexus of communication technology research"¹⁴⁰ being sought and worked for, then Wheatstone's practical interest in vibration, transmission of sound etc... are inextricably linked to his work in electricity, telegraphy and other areas.

It is not my intention to describe in detail the physical development of the instrument, this being covered in depth by Wayne.¹⁴¹

¹⁴⁰ Middleton, Studying Popular Music, p.84.

¹⁴¹ Wayne, The Wheatstone...

Sir Charles Wheatstone 1802-1875

Charles Wheatstone was born in Gloucester into a family involved in the music trade and was apprenticed in 1816 to his uncle William Wheatstone who operated a music business in London. From the information available it would appear that the company was involved in a wide cross-section of commercial musical activities. William Wheatstone is recorded as a maker and improver of the flute¹⁴² whose innovative work included two new mouthpieces, one of which attracted the attention of Boehm who was “much taken with the idea”.¹⁴³ Langwill¹⁴⁴ notes several of his products. Although a number of surviving early nineteenth-century instruments carry the name of the company, these may have been made by others and “stencilled” or “labelled” by the shop before retail. These include examples of the classically inspired hybrid harp-lute, an instrument popular among middle and upper-class amateurs of the time, and can be taken as an indication of the company’s involvement in the expanding amateur market.¹⁴⁵ William Wheatstone’s patent for improvements to the pianoforte¹⁴⁶ is further evidence of the firm’s concern for development and innovation in musical instruments. They were also involved in music publishing.¹⁴⁷

Working with his uncle, Charles Wheatstone gained an early knowledge of the trade and developed a wide range of musical contacts. On his uncle’s death in 1823, he took charge of the firm with his younger brother William.¹⁴⁸ He maintained and developed an interest in the acoustics of musical instruments, investigating and exhibiting practical applications based on his findings. A desire to understand the properties of sound led to the study of its mechanical transmission, visible demonstrations of vibrations, and investigation of the properties of the vibrating air column. Other work included studies of hearing and the production of vowel sounds.

¹⁴² DSB Vol. XIV, pp.289-290. See also Rycroft, David “The Wheatstones” The Galpin Society Journal XLV (1992) pp.123-130.

¹⁴³ Fairley, Andrew Flutes, Flautists and Makers (London, 1982), p.134. Fairley suggests that the mouthpiece was patented but I can find no record of this. This device is described and illustrated in Rockstro, R.S. A Treatise on the Construction, the History and the Practice of the Flute. (1928 edition, London, 1890), Item 534, Plate 49, pp.286-7. See also Spohr, Peter Kunsthawerke im Dienste der Musik: Transverse flutes down the centuries from all over the world (Nürnberg, 1991), p.23.

¹⁴⁴ Langwill, Lyndesay G. An Index of Musical Wind- Instrument Makers (5th. edition, Edinburgh, 1972), p.186.

¹⁴⁵ Victoria and Albert Museum, London Catalogue, No. 252-1882 (Non Keyboard Collection No. 13/9). Invented by Edward Light c1811. Wheatstone published a tutor for the instrument c1815 and added a 2nd. keyboard to form the Regency harp-lute. Sotheby Highly Important Clocks, Watches etc... Sale Catalogue (London, 4 and 5 October 1990), Item 357.

¹⁴⁶ Patent 4994, “New method for improving and augmenting the tones of piano-fortes, organs and euphons”, 29 July 1824.

¹⁴⁷ Humphries, C. and W. Smith Music Publishing in the British Isles (Oxford, 1970) pp. 329, 388, and Krummel, D.W. and Stanley Sadie Music Printing and Publishing (London, 1990) p.476.

¹⁴⁸ Kassler, The Science of Music..., p.1066.

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Despite the lack of a formal scientific training, his work became known both in England and abroad,¹⁴⁹ and, through correspondence and the emerging scientific press, he kept abreast of international developments in the field. He acknowledged a debt to Chladni¹⁵⁰ and adopted his sand pattern technique for displaying the vibrational nodes of plates.¹⁵¹

Around 1825 he began a fruitful association with the Royal Institution, London, which, as shown by Kassler,¹⁵² held regular meetings to encourage a cross fertilisation between the scientific and musical communities of the city. In 1834, he became the first Professor of Experimental Physics at King's College, London and in 1836 he was elected a Fellow of the Royal Society. He received honorary degrees from the University of Oxford in 1862 and Cambridge in 1863 and was knighted in 1868. The family firm¹⁵³ continued throughout the nineteenth century and after 1840 would appear to have been concerned almost solely with free-reed instruments. After the mid 1840s, Charles became less concerned with acoustics, musical applications and the running of the business, as his research in other fields was by then firmly established. Following his brother's death in 1862, he once more became directly involved in the company affairs. He died in Paris in 1875.

Experimental Musical Inventions

Although it has been suggested by Bowers¹⁵⁴ and repeated by Wayne¹⁵⁵ that Wheatstone's first recorded experimental musical device was the keyed flute harmonique of 1818, there is no confirmation of Wheatstone's involvement in its invention and nothing is known of its nature or purpose.¹⁵⁶ More is known of his enchanted lyre or acoucryphon of 1821 in which an instrument in the form of an antique lyre was activated by vibrations from a remote piano transmitted to it along a wire. This project, which he exhibited at premises in Pall-Mall, London, looked

¹⁴⁹ His first papers on sound were "New Experiments on Sound", published in (Thomson's Annals of Philosophy 6 (1823), pp.81-90, Annales de Chimie et de Physique 23 (1823), pp.313-22 and Journal für Chemie und Physic...vom Dr. J.S.C. Schweigger 42 (1824), pp.185-201.

¹⁵⁰ Kassler, The Science of Music..., p.1071.

¹⁵¹ "On the Figures obtained by strewing Sand on Vibrating Surfaces, commonly called Acoustic Figures" Philosophical Transactions of the Royal Society of London (1833), pp.593-634.

¹⁵² Kassler, Jamie Croy "Royal Institution Lectures 1800-1831: A Preliminary Study" in Research Chronicle 19 (London, 1985), pp.1-30.

¹⁵³ According to Bowers, Brian Sir Charles Wheatstone F.R.S. 1802-1875 (London, 1975) it went under the following titles:1829-1837 Wheatstone & Co. music sellers and publishers.1837-1842 Wheatstone, Charles and William musical instrument makers and music sellers.1842-1847 Wheatstone, Charles and William.1847-1862 Wheatstone, William & Co.1862- Wheatstone & Co.

¹⁵⁴ Ibid.

¹⁵⁵ "The Wheatstone English Concertina", p.119.

¹⁵⁶ There is a French instrument of this name in the Concertina Museum collection. Stephen Chambers (personal communication) has suggested that the confusion arises from a report of one of the Wheatstone/Faraday lectures at the Royal Institution which includes this instrument along with other free-reed devices created by Wheatstone in a list of devices demonstrated.

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forward to his later interest in the transmission of sound and preoccupation with the development of the telegraph. The diaphonicon of 1822 was another obscure sound transmitting device. In the kaleidophone or phonic kaleidoscope, a “new Philosophical toy for illustrating several interesting and amusing acoustical and optical phenomena”,¹⁵⁷ dating from around 1827, “the free end of a vibrating rod was illuminated to provide a visual display of vibration. Because of persistence of vision, one saw intricate curves characteristic of the vibrating nodes”.¹⁵⁸ In the terpsiphone¹⁵⁹ of circa 1828, he demonstrated the reciprocation of columns of air when acted upon by a “sonorous body” such as a tuning fork of appropriate resonant frequency. This practical understanding of acoustic phenomena found fruit in his more commercial musical inventions.

Practical Musical Inventions

In keeping with the activities of the firm, Charles Wheatstone was also concerned with the production of practical musical inventions. As noted by Bowers:

It was a characteristic of Wheatstone that he was always alert to both the scientific lessons which might be learnt from everyday things and to the practical applications of scientific discoveries... He studied the transmission of sound because he was interested in the working of the instruments he made, and in particular the processes by which sound created by the vibration of the strings of a piano or violin is transmitted to the sound board. His work on the transmission of sound, and also that on the development of an artificial voice, may be regarded either as pure research or as a potentially viable commercial venture...¹⁶⁰

His business background, combined with his scientific interests and personal qualities, brought him close to the profile of the typical inventor of the Industrial Revolution as described by Asa Briggs:

One necessary level of change... was invention. It owed little directly to science and much to empirical efforts, including rule of thumb, although interest in science inspired many of the inventors and led them to believe that nothing was impossible. Moreover, bodies like the Royal Society for the encouragement of the Arts, Manufacture and

¹⁵⁷ According to Kassler in The Science of Music..., p.1071. See “Description of the Kaleidophone, or Phonic Kaleidoscope; etc...” in Quarterly Journal of Science, Literature and Art 2 (1827), pp.344-51 and [Poggendorf’s] Annalen der Physik 10 (1827), pp.470-80.

¹⁵⁸ “Charles Wheatstone” DSB Vol. XIV, p.289.

¹⁵⁹ “New Musical Instrument” The Mechanic’s Magazine (8 March 1828).

¹⁶⁰ Bowers, “Sir Charles Wheatstone...”, p.32.

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Commerce of Great Britain, founded in 1754, directed the spirit of inventiveness into (useful) channels. Ingenuity itself was not enough.

The success of the inventors themselves, who came from varying social backgrounds and ranged from millwrights to clergymen, required qualities other than inventiveness. Business acumen was one of those.¹⁶¹

An early commercial musical invention of Wheatstone's was the harmonic diagram¹⁶² of around 1824, a kind of mechanical computer for explaining harmonic theory produced as a response to the rising demand for popular musical education.

By the mid 1820s, the first phase of research and experiment in the use of the free-reed had largely given way to one of commercial application to exploit identified demands. The activities of Charles Wheatstone bridged the gap between both phases but can be located most securely in the second.

The aeolina (circa 1828) was Charles Wheatstone's version of the small, resonatorless, free-reed mouth organs which were produced commercially in a number of European centres during the 1820s. Wheatstone used such instruments, and their oriental predecessors, in public lectures in February and May 1828,¹⁶³ part of a series delivered on his behalf by Michael Faraday. The Harmonicon of February 1829 carried a valuable description of the device noting that it:

Consists of three chords of ten notes each [i.e. triads with several doubled notes, see figure 3.1], tuned, so as to form the perfect major chords on the tonic, dominant, and subdominant keys of A. By this arrangement a complete diatonic scale, extending through three octaves, is obtained; any unmodulating melody may, therefore be performed upon it, and be accompanied by the three simple harmonies of the key. Some, more limited in compass, are constructed only of two chords and others again consist but of a single one. The latter are confined to the imitation of the modulations of the Aeolian Harp, and to the performance of bugle-horn airs. The instruments under the improved form we have described are manufactured only by Mr C. Wheatstone, by whom they were first introduced to the public at the Royal Institution in May last [1828]; but in less popular forms, similar instruments are universally popular on the Continent. Those made by Mr W., with two or three chords, are set in ivory frames, and all of

¹⁶¹ Briggs, Asa A Social History of England (London, 1983), pp.186-8.

¹⁶² Examples of the diagram are held in the Science Museum, London. Wheatstone published An Explanation of the Harmonic Diagram Invented by C. Wheatstone the text of which is contained in Wheatstones's Scientific Papers published by the Physical Society, 1879.

¹⁶³ Kassler, The Science of Music pp.325-326 and The Royal Institution Lectures...

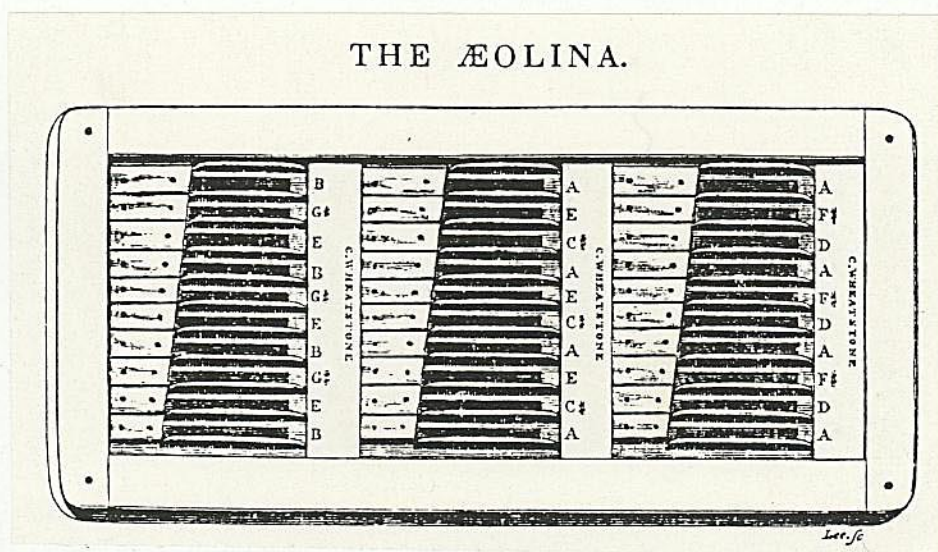


Figure 3.1 The Aeolina.

Source: Harmonicon (February 1829) p.27.

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them are made of argentum, or German silver, a new metallic alloy, possessing many valuable properties.¹⁶⁴

The same source gives details of performance technique:

To perform on the instrument, the side on which the separating ridges are placed should be pressed against the mouth, and it should be held so that the springs may be horizontal, and that the one corresponding with the gravest sound may be the lowest in position. To produce the tones a gentle breath alone is necessary; but to give then every degree of intensity, so as to render the crescendos and diminuendos perfectly effective, some management is requisite. The clearest sound is obtained when the internal cavity of the mouth is enlarged to its greatest extent by the depression of the tongue; or, which is the same thing, when the mouth is in the position proper for producing the vowel o. The lips must be sufficiently open to allow the breath to pass through one, two, or three, or more apertures, as may be required, and the free ends of the springs must be placed opposite the middle of the aperture of the lips, so that the breath may be directed against those more readily vibrating parts.¹⁶⁵

The Harmonicon article carried an engraving of an instrument (Figure 3.1) which is similar to one of several held in the private collection of Stephen Chambers of Dublin. Other versions of the aeolina were illustrated by King Hall¹⁶⁶ (Figure 3.2) who shows five very small instruments and their ranges (including two with the reeds on two plates as in the modern harmonica), and Libin¹⁶⁷ reproduces an illustration of two performers of the instrument taken from a tutor published in 1829.¹⁶⁸ In 1839, this mouth organ was described as “a little instrument now very common in London”.¹⁶⁹ Such evidence counters the claim that “its value for artistic purposes was nil; its only interest is a historical one”.¹⁷⁰ It was, however, Charles Wheatstone’s first free-reed instrument from which his other inventions developed, including the symphonium.

¹⁶⁴ Pp.37-38.

¹⁶⁵ Ibid., p.38.

¹⁶⁶ Hall, King The Harmonium (London, n.d.), p.8.

¹⁶⁷ Libin, Lawrence The Art of Music: American Paintings and Musical Instruments 1770-1910 (New York, 1984), p.29.

¹⁶⁸ Instructions for the Aeolina or mund-harmonica, with a selection of popular melodies, expressly arranged for the instrument. (New York?, 1829). Copy in New York PublicLibrary.

¹⁶⁹ OTPOMSFMS (19 October 1839).

¹⁷⁰ “Aeolina” GDMM Vol. VI (1890), p.40.

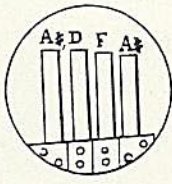
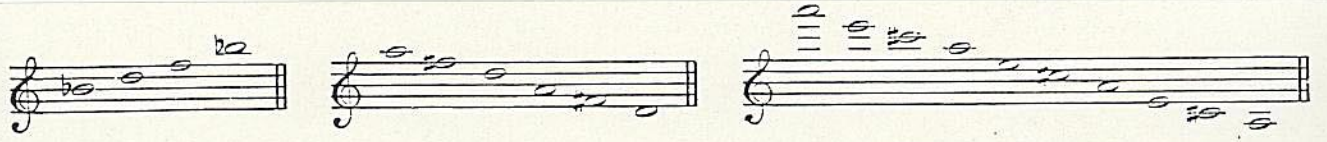


FIG. 1.

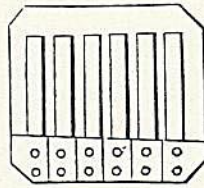


FIG. 2.

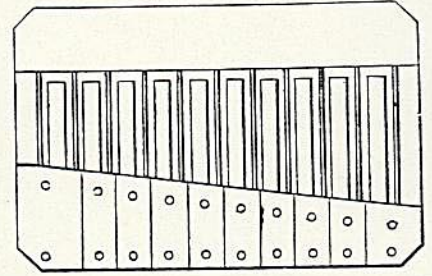


FIG. 3.

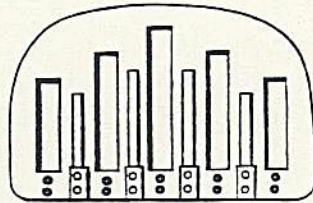


FIG. 4.

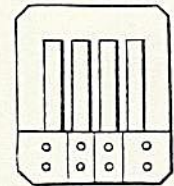


FIG. 5.



Figure 3.2 The Aeolina.

Source: Hall, King The Harmonium (London, n.d.) p.8.

The Symphonium and the Patent of 1829

In 1829, a patent¹⁷¹ was granted to Charles Wheatstone covering “A certain improvement or certain improvements in the construction of wind instruments”. The specification was restricted to instruments of the free-reed type and made reference to the existing mund-harmonica, his own aeolina and to attempts which had already been made to add finger keys to such mouth organs in the manner of existing woodwind instruments. Wheatstone’s patent proposed radically different keyboard layouts and mechanisms to improve the portability, versatility and ease of learning and performance of the free-reed mouth organ. Fundamental to his designs was the employment of two separate manuals, one on either side of a small case, each bearing parallel rows of buttons arranged in such a manner that they could be:

...progressively and alternately touched or pressed down by the first and second fingers of each hand, without the fingers interfering with the adjacent studs, and yet be placed so near together that any two adjacent studs may be simultaneously pressed down, when required, by the same finger.¹⁷²

This unique fingering system involved an “ascending and descending” action rather than the “sideways” motion of existing wind instruments and was almost certainly suggested by the manuals of oriental free-reed mouth organs with which Wheatstone was fully familiar. Terry Miller has described how with the kaen of Laos:

One must bear in mind that it is difficult to play more than three neighbouring pipes in succession in a given mode since the fingers are wider than the pipes. Kaen makers and players over time created a system in which the pitches of the five modes came to be arranged in such a way that the playing of four consecutive pipes is avoidable. The kaen’s pitch arrangement might be compared to a typewriter keyboard whose order of letters makes as much sense as the kaen’s pitch arrangement but fits the fingers for a given language. Similarly, the pitch arrangement of the Kaen fits the Lao musical language.¹⁷³

As shown in Figure 3.4, the left hand manual carried the notes of the lines of the treble stave while the right carried the notes found in the spaces.¹⁷⁴ This allowed convenient performance of fifths and thirds, permitted playing of scales without the need for the use of adjacent fingers and facilitated sight reading. Figure 3.3 is a view

¹⁷¹ Patent 5803 (19 December 1829).

¹⁷² *Ibid.*, p.8.

¹⁷³ Miller, Traditional Music..., pp.192-3.

¹⁷⁴ This interest in efficient keyboard layouts stayed with Wheatstone and was put to good effect in his later designs for telegraph, typewriter and other “communications” hardware. Drawing a. of Figure 3.3 shows the instrument with its fascia and mouthpiece (b.) removed. Drawing c. is a side view of the instrument.

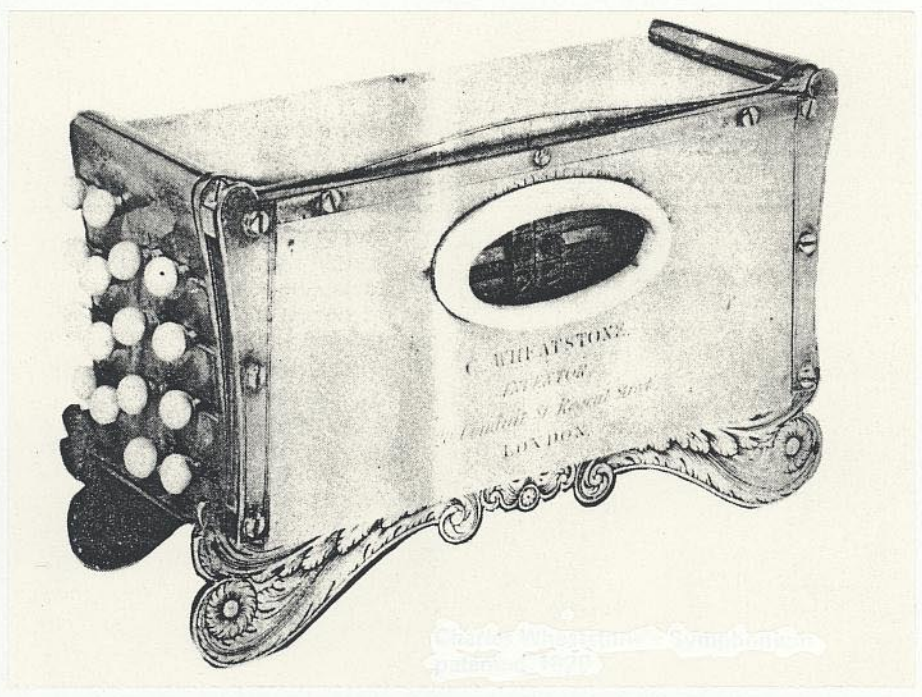


Figure 3.3 The Symphonium.

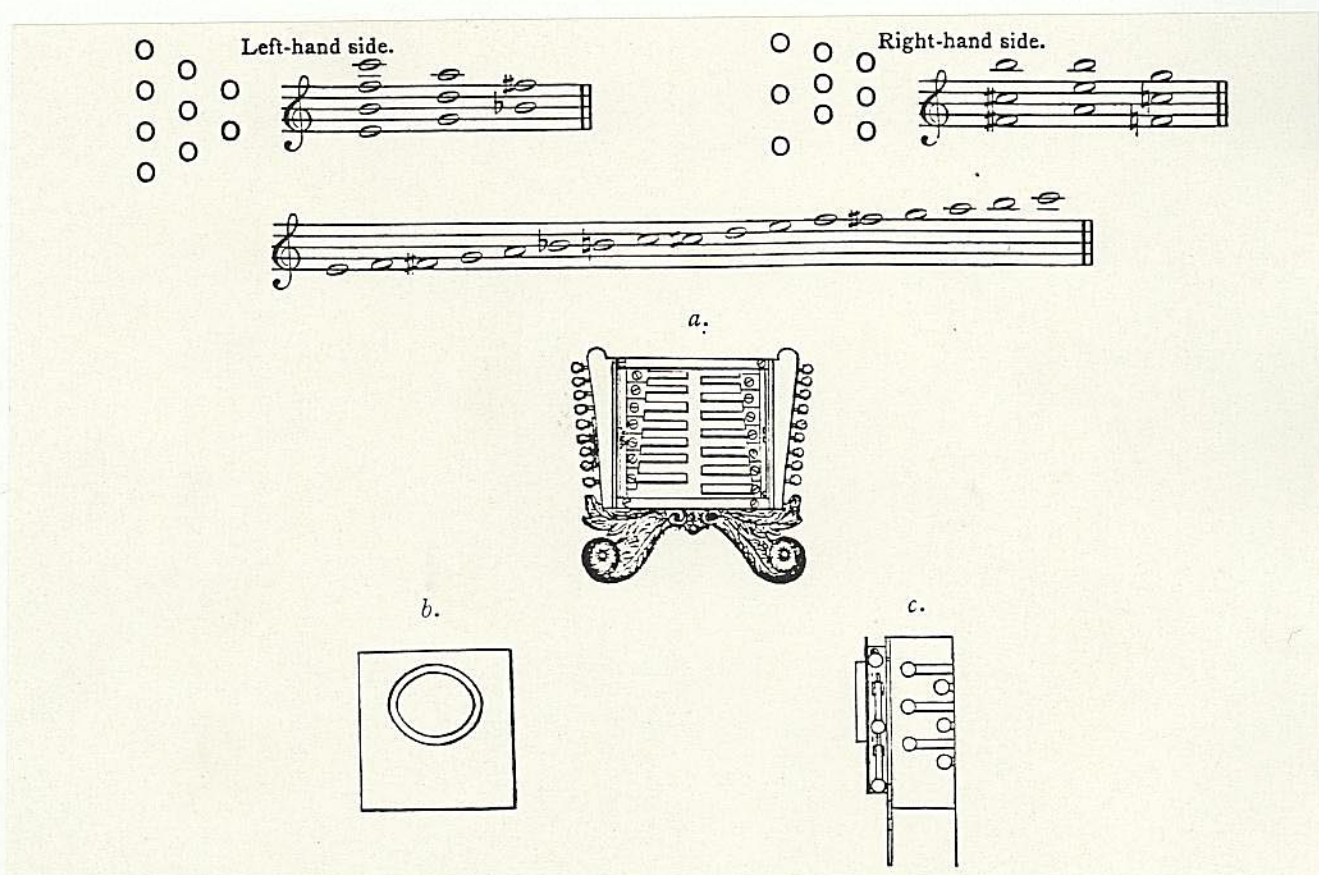


Figure 3.4 The Symphonium.
Source: Hall, King The Harmonium (London, n.d.) p.10.

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of a typical instrument. Wheatstone also claimed the introduction of additional rows of buttons on each manual to allow semitones to be added and proposed key mechanisms to alter the tone of the reeds. He offered several designs for this keyed aeola and a number were commercially produced in the late 1820s and early 1830s as the symphonium or symphonion. The patent also suggested adaptations of the Chinese sheng through the application of his novel keyboard layout and proposed the inclusion of bellows as a substitute for the mouthpiece in both the sheng and symphonium. In the latter we find the embryo of the concertina (Figure 3.5).

Wheatstone presented the symphonium at The Royal Institution¹⁷⁵ where it was used in his demonstration of the transmission of sound and, along with other free-reed instruments, in the explanation of the principle of sound production of their “intermitter” reeds. Howarth¹⁷⁶ has noted that Wheatstone attempted to employ the best alloys for his reeds and I would suggest that his working relationship with Michael Faraday, “Director of the Laboratory” of the Royal Institution and “the first to engage in systematic research concerning the preparation of alloys of steel”,¹⁷⁷ was particularly fruitful in this respect.

It is thought¹⁷⁸ that no more than 200 examples of the symphonium were made and of these around 12 survive. Instrument No. 18¹⁷⁹ has a slightly trapezoid body of nickel with scrolling feet engraved with foliage and an oval ivory mouthpiece. The reeds are of silver and there are 13 ivory-tipped buttons and 2 further externally mounted ivory-tipped accidental keys on each side. Another,¹⁸⁰ has 36 ivory-tipped buttons and contains gold reeds.¹⁸¹ Their appearances bear out the description published in the Harmonicon in 1831:

The Symphonion is a remarkably pretty instrument, in size and shape resembling a silver snuff-box, such as may be carried in the waistcoat pocket and possessing capabilities of a very extraordinary nature.¹⁸²

The writer of the article, one I.P. -probably John Parry -noted that:

A vast deal may be made of this small instrument in skillful hands; and, what adds materially to the effect is, the great command the

¹⁷⁵ (5 March, 21 May 1830).

¹⁷⁶ Free-reed Instruments, p.321.

¹⁷⁷ Hadfield, Robert A. Faraday and his Metallurgical Researches (London, 1931), p.v.

¹⁷⁸ Wayne, The Wheatstone English Concertina, p.123.

¹⁷⁹ Stephen Chambers Collection, Dublin. Illustrated in Galpin Society, Made for Music (London, 1987) item 164. A similar instrument is illustrated in Howarth, Free-reed Instruments, p.322. there is an excellent photograph of a symphonium in Sotheby's catalogue, Early Musical Instruments, (London, 18 November 1993).

¹⁸⁰ Stephen Chambers Collection, Dublin. Illustrated in Galpin Society, Made for Music, item 165.

¹⁸¹ Galpin, A Textbook..., p.202, described the gold reed version as the symphonium regal. There is a symphonium in the British Museum, ref. L. 1884.10.

¹⁸² P.56.

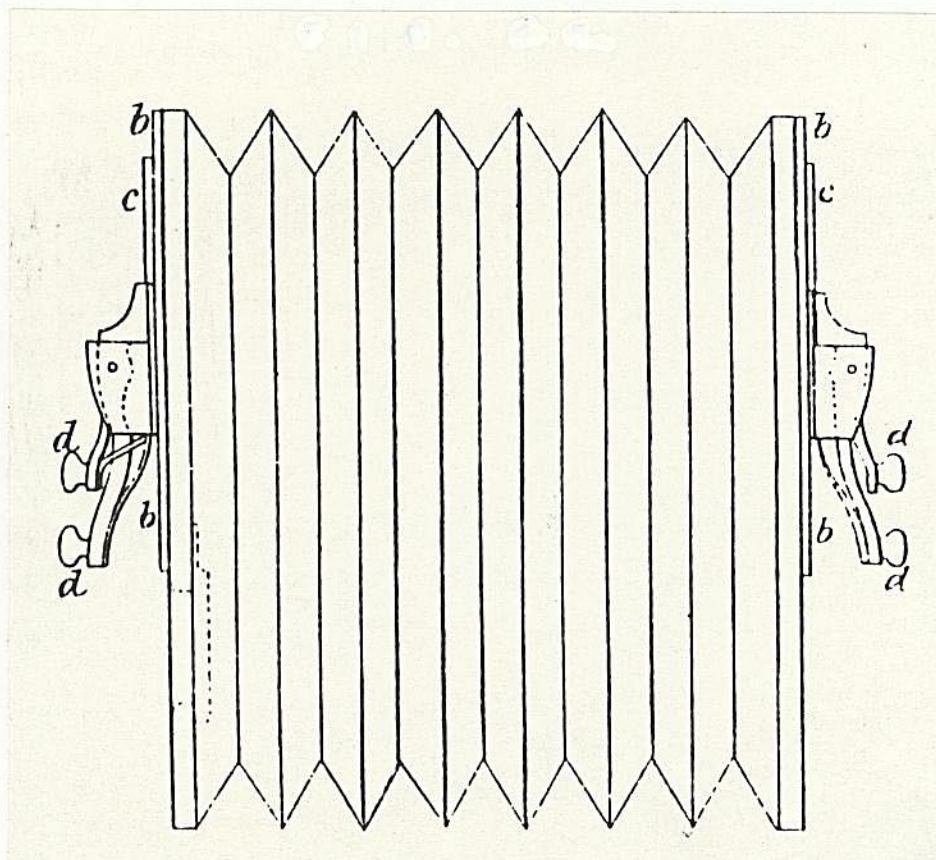


Figure 3.5 The Symphonium with Bellows Applied.
Source: Patent 5803 (London, 19 December 1829).

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performer has over the tone by management of the breathing. When blown strong, the tone is very powerful, and of course, the reverse when blowing gently; the crescendo and diminuendo are beautiful, and such airs as “The Last Rose of Summer” and “Had I a Heart for Falsehood Framed” or, indeed, any expressive melodies, are exceedingly effective on the Symphonion while the facilities it affords to execution are very great.¹⁸³

The writer confirms the suitability of the instrument for bourgeois amateur use in his own “The Symphonion Waltz”¹⁸⁴ (Example 3.1), written with harp or pianoforte accompaniment. The piece takes full advantage of the instrument’s potential for playing 3rds and 5ths. A passage from another piece¹⁸⁵ (Example 3.2) also demonstrates the instrument’s potential for chordal use. The instrument was still being manufactured and played in the 1850s, as evidenced by published music for the instrument (by Parry) and Wheatstone’s inclusion of a sophisticated model in the Great Exhibition of 1851.¹⁸⁶

The symphonium was intricate and obviously expensive to construct. It is an example of the same high standards of craftsmanship and materials found in all Charles Wheatstone’s musical and scientific creations. This concern for precision has led to the suggestion that Wheatstone was “essentially a designer of delicate apparatus”¹⁸⁷ and Kassler’s view that:

While both the Aeolina and Symphonium were playable musical instruments, they were invented by Wheatstone for acoustical purposes. Indeed, like Sir William Hescel, Wheatstone used music as a means for studying and experimenting with non musical phenomena.¹⁸⁸

Such writers, concerned mainly with the inventor’s scientific background, have tended to ignore his commercial interests gained through the family firm and expressed in his patents. Evidence of Wheatstone’s commercial motivation is his production of the bellows blown concertina as the novelty of the symphonium wore off and it was abandoned through being “extremely fatiguing to the performer”.¹⁸⁹

¹⁸³ Ibid., p.57.

¹⁸⁴ Ibid., pp.56-7.

¹⁸⁵ Hall, The Harmonium, p.10.

¹⁸⁶ MacTaggart and MacTaggart, Musical Instruments in the 1851 Exhibition (Welwyn, 1986) p.60.

¹⁸⁷ W.H. Pearce quoted in Bowers, Sir Charles Wheatstone..., p.216.

¹⁸⁸ The Science of Music..., p.1066.

¹⁸⁹ Hall, The Harmonium, p.11.

THE SYMPHONION WALTZ,

(VIDE PAGE 56)

Composed by I. P.

THE HIGHEST NOTES OF THE UPPER LINE MAY ALSO BE PLAYED ON THE FLUTE OR VIOLIN; OR, (A FEW NOTES BEING PLAYED AN OCTAVE ABOVE;) BY A THIRD HAND ON THE PIANO-FORTE.

SYMPHONION.

HARP OR PIANO.

Example 3.1 Symphonion Waltz (extract).
Source: Composed I.P.. Published in Harmonicon (1831) pp.56-7.



Example 3.2 Music for Symphonium.
Source: King Hall, The Harmonium, p.8.

The First Concertinas

Little is known of how and precisely when the principles contained in the patent of 1829 and manifest in the symphonium were first transformed into instruments of the bellows blown concertina type, although it is highly likely that Wheatstone would have created a prototype at the time of his patent. There is an early concertina by Wheatstone in the Stephen Chambers Collection, Dublin, which is thought to be an experimental version and clearly shows, in its constructional details and materials, the influence of Demian's early accordion. This would suggest that Wheatstone, who was certainly aware of the accordion very early in the 1830s,¹⁹⁰ was attempting to apply his unique keyboard layout and mechanism to form an "improved" version in response to a favourable public reaction to his symphonium and the high level of interest in the continental instrument. As a music dealer, Wheatstone understood the potential market for such instruments and probably imported and sold accordéons for it is known that his company published one of the first tutors for the instrument in English.¹⁹¹

It has also been suggested that Wheatstone's instrument was a direct response to the German konzertina, a small square instrument with buttons on two separate manuals, first produced by Uhlig of Chemnitz, in 1834¹⁹² or 1835,¹⁹³ although Dunkel¹⁹⁴, the leading authority on the history of the German instruments, is silent on this.

The early instruments in the Stephen Chambers Collection and Concertina Museum display the polygonal shape (hexagonal in the case of the earliest instruments but octagonal and twelve sided later) which came to typify all concertinas of English design and manufacture, as opposed to the square and rectangular cased instruments of Germany. Howarth¹⁹⁵ suggests that the basically circular shape was adopted as it lent itself to cutting out the reed chambers on the lathe before the advent of suitable milling machines and it allowed an economic layout of reeds to suit the unique keyboard layout. Hexagonal and octagonal shapes were also commonly employed in furniture, clocks and architecture of the 1820s and 1830s when "the Grecian Style was supreme throughout the Western world"¹⁹⁶ and was "not only fashionable, it was the very criterion of architectural distinction".¹⁹⁷ Polygonal shapes from Hellenistic

¹⁹⁰ It is recorded in A Catalogue of the Library of the London Institution (London, 1835), p.xxxviii, that the accordéon and seraphine were presented in 1829 at a lecture on "some newly-invented musical instruments" delivered at the London Institution by George Birkbeck. The accordéon was also used by Wheatstone and Faraday in their lectures of 1830. According to Wayne in The Wheatstone English Concertina..., p.132, the concertina was also demonstrated but I can find no evidence of this.

¹⁹¹ Mitchell Library, Glasgow. In, The Wheatstone English Concertina..., p.126, Wayne suggests that Wheatstone and Co. made simple accordions during the 1830s.

¹⁹² Pilling, "Concertina", p.459.

¹⁹³ Robson, 'Pat' "Mainly about Concertinas" Folk Dance and Song 45, No.2 (1983), p.4.

¹⁹⁴ Bandonion und Konzertina...

¹⁹⁵ Free-Reed Instruments, p.322.

¹⁹⁶ Crook, Mordaunt The Greek Style (London, 1968), p.13.

¹⁹⁷ Ibid., p.17.

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culture were held as ideal forms. Buildings such as the “The Tower of the Winds” or “Horlogium of Andronikos Cyrrestes” at Athens (an appropriate model for the creation of a new wind instrument) were widely known in the early nineteenth century through engravings and were copied in buildings throughout England. Mention has already been made of the fashion for Greek names for new free-reed instruments and it should be noted that Wheatstone had already employed the name of Æolus, legendary keeper of the winds,¹⁹⁸ for his *aeolina*. Wheatstone and Co. also used the name later in their *aeola*, a high quality concertina model. Polygonal shapes were also revered by design theorists of the Italian Renaissance¹⁹⁹ who, in recognising the relation of such shapes to the circle, saw them as reflecting harmony and perfection and as an effective means of bringing together many separate parts (as in a town or building plan) into a whole. As demonstrated by Wittkower,²⁰⁰ such writers and designers were also greatly concerned with the employment of musical proportion in the “harmonic” arrangement of physical forms and it is unlikely that these associations would have escaped the designer of goods for the upper class market operating under the neo-classical fashion of the first decades of the nineteenth century. Wheatstone, as acoustician, would no doubt be aware of “form follows function” philosophy which holds that efficient musical devices generally have a rational, functional form. It would follow that in the concertina, where the musical mechanism is hidden, he would have sought to dress the instrument in a manner which would still suggest this aesthetic. Another possible precedent for the instrument’s shape is the soundbox of the Chinese bowed *erhu*, which is typically constructed of dark rosewood in a hexagonal form remarkably similar to that of the early concertina. The decorative fretwork patterns on the reverse of the instrument suggest further influence. Wheatstone was, of course, familiar with a full range of oriental musical instruments and had employed them in his lectures on acoustics.²⁰¹

The precise date of first manufacture of the concertina has not been established. Many writers regard the date of the 1829 patent as that of the first appearance of the concertina. George Case, concertina virtuoso and maker, who knew Wheatstone, stated that it appeared “about 1830; but it required both time and experience before the Instrument attained its present perfection”²⁰² while G.T. Pietra gave “around 1833”.²⁰³ Chahuras records that “it was submitted to public notice in June 1833 and on December 27 of that year was renamed the ‘concertina’”.²⁰⁴ There is evidence in

¹⁹⁸ Son of Poseidon and ruler of the seven Æolian isles. Zeus gave him control of the winds. In *The Odyssey*, Odysseus is entertained by Æolus who gave him a bag of winds. *The Shorter Oxford English Dictionary* (3rd edition, London, 1968) gives: “Æolo- combining form of Æolus, the impersonator of the wind”

¹⁹⁹ See, for example, Alberti’s *De re Aedificatoria* (1550), Serlio’s *Quinto libro d’architettura* (1660), Leonardo’s church plans etc..

²⁰⁰ Wittkower, Rudolf *Architectural Principles in the Age of Humanism* (1973 edition, London, 1949).

²⁰¹ Kassler, *The Science of Music*, p.326.

²⁰² Case, George *Instructions for Performing on the Concertina* (London, c.1848), p.3.

²⁰³ Pietra, Guiseppe T. *The National Tutor for the English Concertina* (London, n.d.), p.1.

²⁰⁴ Chahuras, *The Accordion*, p.10.

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the Wheatstone company records²⁰⁵ to confirm that the instrument was in commercial production around 1836. According to the Oxford English Dictionary²⁰⁶ the first recorded use of the name was in 1837 when performances by the infant prodigy Regondi were described in the May and June editions of The Musical World.²⁰⁷ Although there is no evidence as to how the name “concertina” became attached to the instrument, it has been suggested²⁰⁸ that this happened accidentally as the German konzertina became known in Britain during the 1830s and it has also been noted that Debian of Paris had constructed a reed organ termed concertina around 1838.²⁰⁹ Whether invented consciously by Wheatstone or adopted through the acceptance of popular usage, the name offers further evidence of the intentions of the creator of the instrument. The use of the root “concert” suggests that it could be used in public performance at a time when, as Weber has shown,²¹⁰ public concerts were coming into their own. It could also suggest that the instrument was suitable for “concerted” music. The pseudo-Italian of the suffix “ina” gives it an air of fashionable respectability. The use of the feminine, diminutive form suggests accessibility to would-be learners, those unfamiliar with the instrument or women and children.

The first commercially produced concertinas were sober in appearance, again suggesting their anticipated role as “serious” and “respectable” instruments which would not appear out of place alongside other instruments in the upper class amateur’s home or in the orchestra or concert hall. The similarity of their finish to Wheatstone’s scientific devices suggests that the same craftsmen were involved and reflects the high quality output of a number of trades whose skills would have been readily available at the time. The “ebonising”, polishing and fretwork of the wooden ends, for example, is also commonly found in clock and furniture making of the period, similar fretwork is found on the fascias of contemporary square pianos²¹¹ and the leather work and tooling of the bellows reflects the contemporary bookbinder’s craft.

It is likely that Wheatstone enjoyed the cooperation and encouragement of active musicians in developing his first concertinas. As already discussed, musicians and composers had already endorsed his symphonium. The influence of the Royal Institution brought musicians and scientists together and Wheatstone must have had a wide circle of musical acquaintances through the activities of the family musical instrument and publishing company and as a result of his other musical inventions.

²⁰⁵ Wayne, The Wheatstone English Concertina, p.123, Butler, Frank “The First Ten Years of Wheatstone Concertinas” NICA 321 (November 1984).

²⁰⁶ Shorter Oxford English Dictionary (3rd. edition, 1968).

²⁰⁷ The Musical World V, No.LXI (12 May 1837), pp.135- 6, V, No.LXVI (2 June 1837), p.190.

²⁰⁸ Pilling, “Concertina”, p.459. He also suggests (p.461) that it was originally termed melophone, as in the early French free-reed instrument, but I have no evidence of this. Early continental reports of the concertina virtuoso Regondi, however, describe him as a player of the guitar and melophone.

²⁰⁹ Dunkel, Bandonion und Konzertina, p.17.

²¹⁰ Weber, Music and the Middle Class.

²¹¹ For example, Item W33-1964, The Victoria and Albert Museum, London.

The Patent of 1844

In a short period, any connections with the design of the early continental accordions were lost, Wayne having identified over 30 refinements carried out by Wheatstone by the mid 1840s.²¹² In a patent of 8 February 1844,²¹³ Charles Wheatstone sought to protect “Improvements on the Concertina and other Musical Instruments, in which the sounds are produced by the action of wind on Vibrating Springs”. This covered eight main areas, viz:

1. Various forms of arrangement of the fingerboard buttons.
2. The separation of the bellows into two chambers by a partition as a means of obtaining a different degree of loudness for each side of the instrument.
3. Means of arranging and constructing the reed cavities to enhance the “portable dimensions” of bass concertinas.
4. A mode of valve construction whereby the same reed could be made to sound in both directions of bellows movement.
5. The mode of varying the pitch of a concertina through apparatus capable of altering the effective length of the reed spring.
6. Designs for the key lever mechanism of the concertina.
7. An additional means of setting the tongue into vibration in addition to wind.
8. The modification of the tone of the free-reed through the use of tuned resonating chambers.

Of these, the first was to prove forward looking, for in only a short time a variety of alternatives to the “English” concertina system were being promoted. These included duet forms which divide the range of the instrument into bass (left hand) and treble (right hand) manuals. The 1844 patent can be seen as the consolidation of ideas generated through almost a decade of concertina production and an awareness of the potential demand for the instrument in the face of competition from other products and manufacturers. Wayne has summed up the patent’s importance thus:

²¹² “The Wheatstone English Concertina”, pp.145-7.

²¹³ Patent 10,041.

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In it, the standard 48-key, 6 sided instrument, with its double action reed pan, lever and pallet action, fret pattern and of course the so-called “English” fingering system is described and claimed as patented and this elegant design henceforth becomes the one copied by almost all of the 20 or so other makers who were later to make “English” system concertinas of varying quality throughout the rest of the nineteenth century. Though these copyist manufacturers invariably labelled their instruments “improved” or “newly improved”, their claims have little substance since the original Wheatstone design was nearly always followed exactly.²¹⁴

The patent also marked a reduction in the involvement of Charles Wheatstone in the family music business until his brother’s death in 1862.

During the 1830s and 1840s the level of production was small and was largely dependent on “outwork” by which individual craftsmen, working at home, would each undertake a separate part of the production process before central assembly and checking at the factory. As Butler has described,²¹⁵ this led to a number of workers gaining considerable skills and knowledge of the manufacture of the instrument and soon separating from Wheatstone to form their own manufacturing concerns in direct competition.

Discussion

In conclusion, it can be said that Wheatstone drew upon his scientific and business interests and backgrounds in developing instruments of both an experimental and commercial nature. In the case of the latter, his inventiveness found expression in the application of ingenious improvements and adaptations to existing devices. Although his major contribution to the design and manufacture of musical devices was in the area of free-reed instruments, he was only one of a large number working in the field. As a relative late-comer, he took advantage of almost 50 years of research, development, evolution and market testing by others.

The foregoing has also shown how an instrument thought to be “invented” was, in fact, the result of evolutionary development. Having established the research and development behind the conception, design and first production of the concertina, I now consider the principal areas of first adoption and use of the instrument.

²¹⁴ “The Wheatstone English Concertina”, p.124.

²¹⁵ Butler, The Concertina.