

## THE EVOLUTION AND TECHNICAL REFINEMENT OF THE HARMONIUM IN THE 19th AND 20th CENTURIES<sup>1</sup>

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**SUMMARY.** This study examines the evolution and technical refinement of the harmonium during the nineteenth and twentieth centuries. Originally inspired by the construction principles of the pipe organ, the harmonium gradually developed into a complex and expressive instrument. The paper highlights the contributions of important builders such as Alexandre-François Debain, Aristide Cavallé-Coll, the Mustel family, Dumont-Lelièvre & Cie, Johannes Titz, and Mason & Hamlin. Their innovations significantly improved the mechanical structure, sound quality, and expressive possibilities of the instrument. The study also discusses the development of both pressure and suction wind systems and their influence on harmonium construction in France, Germany, and the United States. Finally, the article emphasizes the historical importance of the harmonium and its continued appreciation in modern restoration and performance practice.

**Keywords:** harmonium, reed organ, harmonium builders, nineteenth-century instruments, organ construction

### Introduction

The harmonium developed significantly during the nineteenth and twentieth centuries, finding a place in churches, concert halls, and private salons. Numerous builders contributed to its refinement, improving its mechanisms, sound, and expressive capabilities. Although initially based on principles similar to those of the pipe organ, by the end of the nineteenth century it had evolved into a sophisticated instrument capable of a wide range of dynamic and timbral nuances.

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<sup>1</sup> This article represents a shortened English translation of a section from the author's doctoral dissertation *Revirimentul armoniului în secolul al XXI-lea* (The Revival of the Harmonium in the 21st Century), defended in October 2025.

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One of the pioneers of the harmonium was Alexandre-François Debain<sup>3</sup>, who in 1842 patented the name Harmonium and introduced important improvements in airflow control and register mechanisms. In the decades that followed, builders in France, Germany, and the United States further developed the instrument, contributing to the diversification of models and its growing popularity.

**France** became one of the main centers of harmonium production, where the instrument was refined for both sacred and chamber music. Most French harmoniums were built using the pressure system.

- Mustel – one of the most prestigious manufacturers, known for the Harmonium d'Art, a concert instrument with advanced expressive mechanisms.
- Alexandre & Fils – a major French manufacturer recognized for reliable and expressive instruments.
- Dumont-Lelièvre & Cie – an innovative firm that introduced several improvements in harmonium construction.

**Germany**, by contrast, became known for technical precision and mechanical innovation. German builders produced robust instruments with strong sound quality, using both pressure and suction systems.

- Mannborg – a respected German firm producing durable suction-system harmoniums.
- Schiedmayer – a well-known keyboard manufacturer building both pressure- and suction-system instruments.
- Johannes Titz – a master builder whose instruments rivaled those of Mustel.

In the **United States** the harmonium quickly gained popularity in domestic music-making because of its relatively affordable price. At the same time, several companies produced high-quality instruments capable of competing with European models, most of them using the suction system.

- Mason & Hamlin – a leading American manufacturer known for well-constructed harmoniums.
- Estey Organ Company – the largest American producer of reed organs, exporting instruments worldwide.

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<sup>3</sup> Ádám Sándor Fazakas, "The Evolution of the Harmonium: From Ancient China to Beloved Instrument in France," *Studia UBB Musica*, LXIX, no. 1 (2024): 229–240, <https://studia.reviste.ubbcluj.ro/index.php/subbmusica/article/view/7272> (accessed March 14, 2026).

The work of these builders significantly influenced both the technical development of the harmonium and the repertoire written for it. Composers such as César Franck, Sigfrid Karg-Elert, and Louis Vierne explored its expressive possibilities. Although the instrument declined in the twentieth century, many historical harmoniums continue to be restored and appreciated today.

The following sections examine several of the most important harmonium builders and their contributions to the development of the instrument.

### **The Mustel Family**

With the development of the classical four-stop harmonium, the demand for an instrument with more advanced expressive possibilities gradually increased. The Mustel family, one of the most important in the history of the harmonium, played a decisive role in the refinement of this instrument.

Charles Victor Mustel (1807–1890), a renowned harmonium builder, introduced the double expression system (*Doppelexpression*) in 1854, an innovation that allowed a much more detailed control of sound dynamics. His son, Charles Henry Mustel (1840–1890), continued his work and contributed significantly to the further development and refinement of the harmonium.<sup>4</sup>

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<sup>4</sup> Willem van Buuren, “De harmonium van Cavallé-Coll,” *VOX Humana*, vol. 20, no. 2, Harmoniumvereniging Nederland, p. 7.  
<https://www.harmoniumvereniging.nl/images/pdf/vox-20-2%20De%20harmonium%20van%20Cavaille%20Coll-Willem%20van%20Buuren.pdf>(accessed February 11, 2025).

Picture 1



***Harmonium d'Art* – Victor Mustel, 1875<sup>5</sup>**

Auguste Victor Mustel (1842–1919), the youngest son of Charles Victor Mustel, patented the celesta in 1886, a keyboard percussion instrument whose sound is produced by striking metal plates. Soon afterward, experiments combining the celesta and the harmonium led to the creation of the hybrid instrument known as the *Harmonium–Célesta*.

His son, Alphonse Mustel (1873–1937), continued the family tradition and further developed the *Harmonium d'Art*.

Depending on the geographical context of a musical work or the instrument itself, the refined version of the harmonium designed and patented by Mustel under the name *Orgue-Mustel* is known in the Francophone world as *Harmonium d'Art*, in the German-speaking world as *Kunsthharmonium*, and in the English-speaking world as *Art Harmonium*. Interestingly, this category also has an established name in Hungarian: *Mesterharmónium*.<sup>6</sup>

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<sup>5</sup> From the collection of Simon Buser, Marburg, Germany.  
<http://www.buser.org/> (accessed April 7, 2024).

<sup>6</sup> Term already used in 1914 by the Hungarian organist **Aladár Zalánffy**.

This instrument was specifically designed for artistic performance, offering refined control over both dynamics and timbre. According to Alphonse Mustel, this type of harmonium incorporated several technical innovations, among which the most significant were:<sup>7</sup>

- *Doppelexpression* – This system allows the performer to control separately the amount of air supplied to the bass and treble sections of the keyboard. For example, the bass section can use all registers simultaneously, while the treble can be reduced to a single register. This feature makes it possible to highlight specific voices without disturbing the overall balance of the sound.

- *Métaphone* – marked as *Mét.* – a three-layer shutter system that opens and closes the small compartment of the rear registers, usually affecting registers (3), (4), (5), (7), and (8). Unlike the ordinary shutter (*F*), it does not primarily reduce the volume but rather produces a more covered and muted sound.

- *Prolongement* – marked as *Prol.* – a mechanism that allows a note to be sustained without the key remaining depressed. This function is activated by a register drawstop or a heel lever (*Talonnrière*), allowing the performer to hold certain notes while playing other melodic lines. Mustel described this mechanism as “a third hand”, enabling greater expressive possibilities in performance.

- Extended stop disposition – In comparison with the classical harmonium (four ranks of reeds plus the two 16' stops in the treble), the *Harmonium d'Art* includes additional stops that enrich the instrument's timbral palette. Among these are:

- *Harpe Éolienne* (2') – added in the bass section to produce a clearer and more expressive sound.

- *Baryton* (32') – introduced in the treble section to compensate for the lack of a balanced sonic extension. This combination provides equilibrium between the two sections of the keyboard, transforming the instrument into a truly polyphonic system.

Through these innovations, the Harmonium d'Art clearly distinguished itself from the standard harmonium, offering an exceptional range of sonic and expressive possibilities. Composers such as Sigfrid Karg-Elert explored these features extensively, establishing the instrument as a distinct musical category rather than simply an improved version of the classical harmonium.

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<sup>7</sup> Alphonse Mustel, *L'Orgue-Expressif ou Harmonium (\*The Orgue expressif or Harmonium\*)* vol. 1, p. 58.  
[https://imslp.org/wiki/L'Orgue-Expressif\\_ou\\_Harmonium\\_\(Mustel%2C\\_Alphonse\)](https://imslp.org/wiki/L'Orgue-Expressif_ou_Harmonium_(Mustel%2C_Alphonse))  
(accessed September 20, 2024).

## Dumont-Lelièvre & Cie

The company Dumont-Lelièvre & Cie, founded in Les Andelys, France, played an important role in the development of keyboard instruments, specializing in organs and harmoniums intended primarily for liturgical use and music education. Founded in 1855, the company expanded significantly after being taken over by Dumont and Lelièvre in 1873, a period marked by technical innovations and international recognition at major exhibitions.

One of the distinctive technical features of the company was the use of the “*soufflerie rivée*” technology, which reinforced wooden structures with metal elements, increasing the resistance of the instruments to humidity and temperature variations.<sup>8</sup> This technology proved essential for the durability of the instruments and influenced the broader field of organ construction.

Dumont and Lelièvre were pioneers in developing instruments adapted to the needs of their time. Among their most notable creations were:

- *Tableau Solfège Automatique et Chantant* – an educational system that allowed students to visualize and hear musical notes.
- *Choriphone-Contrebasse* – an instrument for choral accompaniment combining the low range of a double bass with organ-like sonority.
- *Orgue-Médiophone* – a hybrid instrument combining features of the pipe organ and the harmonium.
- *Harmoniphase Dumont* – an instrument designed primarily for liturgical accompaniment.

The *Orgue-Médiophone* produced a deep, powerful sound similar to that of large pipe organs, while remaining compact enough for churches and educational institutions.

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<sup>8</sup> “Havre-Exposition, Revue Hebdomadaire Illustrée de l'Exposition Maritime Internationale du Havre” (*\*Havre Exhibition: Illustrated Weekly Review of the International Maritime Exhibition of Le Havre\**), 1887, pp. 81–82, <https://gallica.bnf.fr/ark:/12148/bpt6k9122330d.item> (accessed February 11, 2025).

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**Picture 2**



**Decorative façade with pipes<sup>9</sup>**

Characteristics:

- Reeds placed in separate resonance chambers, producing a broad, harmonically rich sound.
- The presence of 32' stops, including in the bass register, is a rare feature in harmoniums.
- Considerable weight compared with most harmoniums.
- A decorative façade with dummy pipes imitating the appearance of a pipe organ.

These instruments were primarily used in churches for liturgical accompaniment, and no repertoire was composed specifically for them.

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<sup>9</sup> Orgue-Médiophone Dumont-Lelièvre, 1921, Saint-Pierre Church, Manicamp, France. <https://harmonium.forumactif.org/t1934-mediophone-monumental-dumont-lelievre-a-2-claviers> (accessed February 8, 2022).

Another notable instrument developed by the company was the *Harmoniphrase* Dumont. Although externally similar to a classical harmonium with one or more ranks of reeds, it differed in several important respects:

- The absence of the “*Expression*” stop, indicating a liturgical rather than concert function.
- An automatic system capable of generating harmonic accompaniments without requiring multiple keys to be pressed simultaneously.
- A transposing keyboard that allowed the tonal center to be adjusted for liturgical needs.

Picture 3



**Keyboard and stops of the Harmoniphrase;  
the lower register activates the automatic system.<sup>10</sup>**

Dumont-Lelièvre instruments were widely appreciated and received several distinctions at international exhibitions:

- Paris Universal Exposition (1878) – where the *Médiophone* attracted particular attention.
- Antwerp Exhibition (1885) and Liverpool Exhibition (1886) – recognition for technological innovation and craftsmanship.
- National Academy in Paris (1887) – an award for contributions to the development of musical instruments.

Today, Dumont-Lelièvre instruments are valued as collector’s items, and many are carefully restored. Their innovations remain an important chapter in the history of French and European instrument making.

<sup>10</sup> *Harmoniphrase* Dumont, ca. 1880. Photograph and instrument from the collection of João Santos, Leiria, Portugal.

## Johannes Titz

The name of Victor Mustel is closely associated with the concept of the *Harmonium d'Art* and he is still considered one of the greatest harmonium builders. However, through a curious turn of fate, a German rival emerged whom many prominent musicians of the time claimed even surpassed Mustel. This man was Johannes Titz.

Johannes Titz was born on April 5, 1844, in Märzdorf am Bober, Silesia (today Marczyce, Poland). From a young age he showed a curious and ambitious personality, although his professional path was far from straightforward. He initially studied at the teacher training seminar in Breslau but soon realized that this career was not suited to him and abandoned his studies. He then experimented with several professions — working as a forester, gunsmith, and watchmaker — yet none of these occupations fully satisfied him.

His interest in mechanics and craftsmanship eventually led him to attempt building his own piano. To everyone's surprise, not only did he succeed, but the instrument proved to be of exceptional quality and was purchased immediately. This success gave him the confidence to dedicate his life to the construction of musical instruments.

A decisive turning point in Titz's career occurred during a visit to an estate in Kleppelsdorf, where he encountered a harmonium manufactured by Victor Mustel. Fascinated by the complexity of the mechanism, he studied the instrument carefully and concluded that he might be able to build a similar—perhaps even superior—instrument.<sup>11</sup>

He worked for fourteen months to construct his first harmonium. The result was so impressive that it attracted the attention of the Carl Simon company in Berlin, which offered him an exclusive ten-year contract. Under this agreement, all harmoniums built by Titz were sold under the Simon brand, although each instrument carried Titz's signature and serial number inside the case, serving as a mark of authenticity and craftsmanship.

Titz did not simply reproduce existing harmoniums; he introduced innovations that distinguished his instruments from others. One of his most important developments was the Doppel-Expression system, which allowed separate control of the volume between the bass and treble sections. This provided musicians with significantly greater expressive flexibility.

His meticulous attention to detail and masterful craftsmanship transformed his harmoniums into true works of mechanical art.<sup>12</sup>

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<sup>11</sup> Baumert, Doris. \*Der Harmoniumbauer Johannes Titz in Löwenberg.\* Stadtoldendorf, 2014. [https://harmonium.gdo.de/fileadmin/\\_migrated/content\\_uploads/Baumert\\_harmoniumbaue\\_r-titz\\_03.pdf](https://harmonium.gdo.de/fileadmin/_migrated/content_uploads/Baumert_harmoniumbaue_r-titz_03.pdf) (accessed February 8, 2025). p.1

<sup>12</sup> Ulrich Aversch, *Titz-Kunst-Harmonium*, Wuppertal, 2000, p. 3.

The instruments built by Titz quickly became widely known and highly appreciated. The composer Sigfrid Karg-Elert considered them particularly valuable and wrote compositions specifically intended for these instruments. However, the manufacturing process was extremely meticulous and expensive. Since each instrument was built entirely by hand, production remained limited. Nevertheless, music enthusiasts were willing to purchase them—even from America, despite their high price.

A significant difference between the instruments of Victor Mustel and Johannes Titz lies in the fact that Mustel produced not only *Art Harmoniums* but also numerous smaller harmoniums and Harmonium-Célesta models. In contrast, Johannes Titz built far fewer instruments, all of which were exclusively *Kunsthharmoniums*.

On April 5, 1924, Titz celebrated his 80th birthday with a festive harmonium concert in Löwenberg. One year later, on July 31, 1925, he passed away.

**Picture 4**



**Titz Kunsthharmonium, circa 1905  
– an exact replica of the Mustel Art Harmonium<sup>13</sup>**

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[https://harmonium.gdo.de/fileadmin/\\_migrated/content\\_uploads/Titz-Kunst-Harmonium.pdf](https://harmonium.gdo.de/fileadmin/_migrated/content_uploads/Titz-Kunst-Harmonium.pdf)  
(accessed February 8, 2025).

<sup>13</sup> [https://de.wikipedia.org/wiki/Kunsthharmonium#/media/Datei:Titz\\_Harmonium.gif](https://de.wikipedia.org/wiki/Kunsthharmonium#/media/Datei:Titz_Harmonium.gif)  
(accessed March 25, 2025).

His workshop was taken over by his son-in-law Martin Schlag, an organ builder from Schweidnitz. Schlag had worked alongside Titz since 1911 and had learned all the secrets of the craft, which enabled him to continue harmonium production at the same level of excellence.<sup>14</sup>

Today, although Titz harmoniums are no longer produced, they continue to be highly valued by collectors. Johannes Titz was not merely an instrument builder but a visionary who significantly influenced the development of the harmonium and left a legacy that endures to this day.

### **Mason & Hamlin**

Mason & Hamlin was one of the most successful American manufacturers of musical instruments, specializing in pianos and harmoniums. Founded in Boston in 1854, the company quickly gained recognition for the exceptional quality of its instruments, particularly its suction-system harmoniums and highly regarded pianos.

During the late nineteenth century, the company expanded internationally, opening stores in cities such as New York, London, Melbourne, Chicago, and Vienna. Through technological innovation and careful craftsmanship, Mason & Hamlin became one of the most respected instrument manufacturers of its time.

From the second half of the nineteenth century onward, Mason & Hamlin became a leading producer of harmoniums. The models introduced in 1861 improved earlier melodeons and gained popularity for their clear sound and reliability. Despite the presence of more than 250 harmonium manufacturers in the United States, the company maintained a dominant position and received numerous awards at international exhibitions.

Mason & Hamlin harmoniums were admired and used by some of the most prominent musicians of the period, including:<sup>15</sup>

- Franz Liszt, president of the jury at the Paris Universal Exposition
- Johann Strauss, the famous Viennese composer and master of the waltz

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<sup>14</sup> Baumert, Der Harmoniumbauer Johannes Titz in Löwenberg (\*The Harmonium Builder Johannes Titz in Löwenberg\*), [https://harmonium.gdo.de/fileadmin/\\_migrated/content\\_uploads/Baumert\\_harmoniumbaue\\_r-titz\\_03.pdf](https://harmonium.gdo.de/fileadmin/_migrated/content_uploads/Baumert_harmoniumbaue_r-titz_03.pdf) (accessed February 8, 2025). p. 4.

<sup>15</sup> Mason & Hamlin Catalogue, 1880, p. 9. [https://s9.imslp.org/files/imglnks/usimg/a/ac/IMSLP304691-PMLP492999-Mason\\_%26\\_Hamlin\\_Catalog\\_1880.pdf](https://s9.imslp.org/files/imglnks/usimg/a/ac/IMSLP304691-PMLP492999-Mason_%26_Hamlin_Catalog_1880.pdf) (accessed March 25, 2025).

- Charles Gounod, composer of the opera *Faust*, who used a Mason & Hamlin harmonium in his London concerts
- Theodore Thomas, American composer and conductor, who stated that “Mason & Hamlin harmoniums were the finest in the United States and Europe”

**Picture 5**



**American harmonium with suction wind system<sup>16</sup>**

In addition to the careful selection of materials and impeccable craftsmanship, Mason & Hamlin introduced numerous patented innovations that significantly improved both the sound quality and reliability of their instruments. Among the most important innovations were:<sup>17</sup>

- Vox Humana – a device producing a tremulant vibrato effect
- Octave Coupler – an automatic coupling system adding the same note an octave higher

Mason & Hamlin instruments were constructed from high-quality woods, such as black walnut, mahogany, and ebony, and some models were decorated with elaborate gilded bronze ornaments.

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<sup>16</sup> Artis Wodehouse, “*The American Harmonium and Arthur Bird*,” **The Diapason**, 2015. <https://www.academia.edu/17554293> (accessed March 25, 2025).

<sup>17</sup> *Ibid.*, p. 5.

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Mason & Hamlin established itself as a benchmark in the world of musical instruments, setting standards of excellence in the production of both harmoniums and pianos. Thanks to the combination of tradition and innovation, its instruments were admired by musicians around the world.

Today, the company Mason & Hamlin still exists, although it now focuses exclusively on the production of pianos, continuing its long tradition of quality and craftsmanship. Its legacy in the field of harmonium construction remains an important reference point in the history of classical music and keyboard instruments.

## Conclusion

The development of the harmonium during the nineteenth and twentieth centuries represents an important chapter in the history of keyboard instruments.

Through the innovations of builders such as Debain, Cavaillé-Coll, the Mustel family, Dumont-Lelièvre, Johannes Titz, and Mason & Hamlin, the instrument evolved from a relatively simple reed organ into a refined and expressive musical instrument. These technical advancements expanded both its mechanical possibilities and its artistic potential.

Although the harmonium gradually declined in popularity during the twentieth century, many historical instruments continue to be restored and appreciated today.

The growing interest in historical harmoniums and historically informed performance practice has further emphasized their significance within modern musical culture.

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