

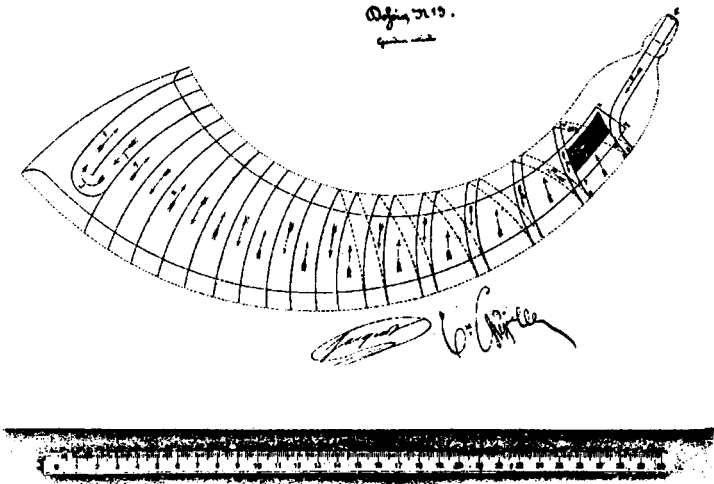
## BRIEF STUDIES AND REPORTS

THE TROMPE DE LORRAINE:  
A POSTSCRIPT**B. Kenyon de Pascual**

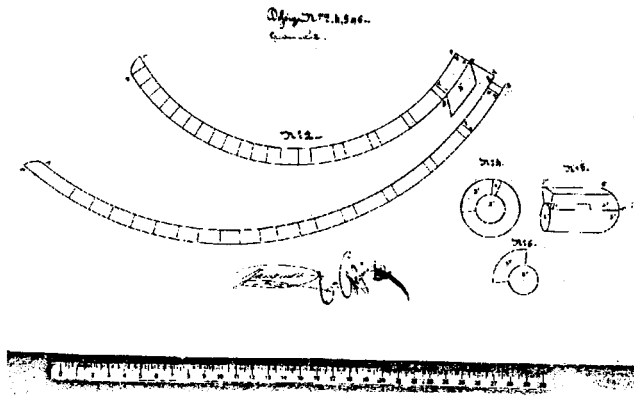
An article on the trompe de Lorraine was published in last year's issue of *HBSJ*.<sup>1</sup> For reasons for which the author was not responsible information published by V.C. Mahillon<sup>2</sup> on Grégoire's patent for the instrument and the process of galvanoplasty was omitted from the printed text. As the text of the original patent has become available in the meantime, it seems worth adding a few more lines on the subject of this intricate and intriguing instrument.

The patent for a "hunting horn in the shape of a conch" was applied for by Pierre Théodore Grégoire, represented by Charles Jacquot, on 8 May 1867 in Nancy. It was granted by the relevant ministry in Paris on 6 July 1867 to run for fifteen years from 8 May of that year and was numbered 76072. Subsequently two additions to the patent were applied for. In his last application Grégoire was described as a man of private means (*rentier*) living at 23, rue Héré, Nancy, and Jacquot as a luthier living in the rue de la Poissonerie, Nancy.<sup>3</sup> As will be seen below, the first addition seems to imply that the construction process described in the original patent may not have been 100% foolproof, while the second addition sought to patent the general concept of a wind instrument where the air circulates within the instrument wall.

The layout of the instrument as described in the patent application (see Figure 1) coincides with the description given in the 1993 *HBSJ* article. Grégoire, however, emphasized two points that were not considered there. Firstly, the curved shape of the instrument would normally cause the width of the air column to be disproportionately greater on the convex side. To ensure that the cross-section area of the windway increased regularly, the distance between the inner and outer walls was reduced proportionately on that side (see Figure 2). This can be observed in the lateral X-ray of the Metropolitan Museum of Art's instrument (Figure 4 of the 1993 article). Secondly, to produce a horn in D, Grégoire calculated that the length of the air column should be 4.62 m. However, factors such as the thickness of the "tubes" and the bell could lead to divergencies. The exact location of the "window" (the shaded parallelogram in Figure 1) through which the air flow entered the bell flare was therefore a matter of trial and error. For this reason Grégoire reserved the right to use a constructional variant if it proved preferable, namely, a coude or U-tube (see Figure 2), one end to be attached by soldering to the exit of the spiral windway and the other to the entry to the bell flare. The length of this tube could, if necessary, be shortened for tuning purposes before soldering.



**Figure 1**  
Path of the air inside the walls of the *trompe de Lorraine* (patent diagram)



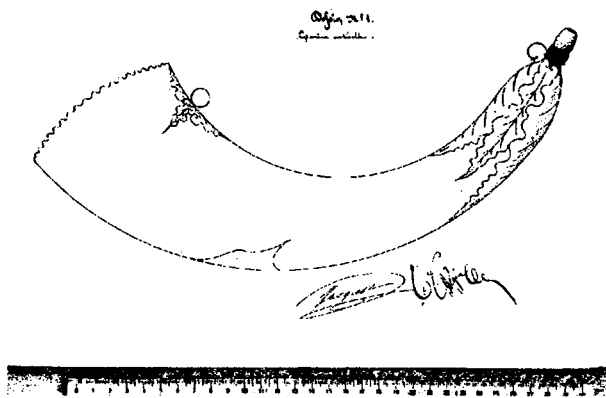
**Figure 2**  
Longitudinal section of the *trompe de Lorraine* bell and details of the U-tube (patent diagram)

Grégoire claimed that it was impossible to produce his horn by the usual processes. It was only feasible using electro-metallurgy, i.e., galvanoplasty. The internal spiral was to be formed by winding a strip of conductive plastic matter (representing the descending or

ascending air column) around a conventional bell and coating both sides with copper or brass in an electrolytic bath. Subsequently the plastic matter would be melted and removed. The outer wall was similarly formed in a second operation. This method, according to the inventor, economized in the use of metal, made the instrument lighter, and improved the tone and ease of play because "the resistance or influence of the casing of the air column is reduced in the same proportion as the metal surfaces [i.e.] by about one-half compared with the instruments in use today."<sup>4</sup>

The part of the spiral division exposed near the mouthpipe in both the New York and the Berlin trompes appears to be of copper but, as mentioned in the 1993 article, the outer wall of these two instruments consists of soldered strips of metal (brass). One suspects that Grégoire encountered some difficulty when it came to putting his ideas into practice, which probably accounts for the first addition to his patent. There he specified that the innovation in his patent was to make the air circulate via quadrilateral spirals between two bell walls, irrespective of the means used to realize this industrially. It could be achieved by the method described in the patent (originally claimed to be the only feasible one) or by assembling separately produced bell walls and spirals or by any other feasible and economical means. The object of the patent was a new form of instrument, not its method of construction. Such an instrument could be of any shape, could incorporate valves (pistons), keys, or holes to provide semitones, and would result in an orchestral instrument that was simplified, light, portable, cheap, and resistant to wear.

With the second addition to the patent, Grégoire asked (and obtained) the exclusive right to manufacture any type of instrument, without visible tubes, in which the air column circulated between two concentric bells (i.e., within the instrument wall), no matter what the shape, proportions, thickness, and route of the air column. There was no longer any reference to quadrilateral tubes!



**Figure 3**  
Exterior of the *trompe de Lorraine* (patent diagram)

Grégoire would appear to have been an amateur with more imagination than practical skill. It seems doubtful that he himself had actually made a musical instrument. His acoustical arguments in favour of rectangular tubes were unfounded and his initial manufacturing process was probably not entirely successful. His concept, although aesthetically pleasing (see Figure 3) was not extended in practice to the construction of orchestral instruments, while the trompe de Lorraine itself underwent several metamorphoses. Indeed, its late-19th- and early-20th-century form, with visible tubes wrapped around a single bell, no longer corresponded to the trompe de Lorraine described in the July 1868 patent addition.

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#### NOTES

1. B. Kenyon de Pascual, "Small Is Beautiful: the *trompe de Lorraine*," pp. 280-287.
2. In his *Catalogue descriptif et analytique du Musée Instrumental du Conservatoire Royal de Bruxelles* (Brussels, 1922), 5: 125-126: facs. ed., Brussels, 1978.
3. The Jacquot family of Nancy produced several renowned luthiers. At this date Pierre-Charles Jacquot was living at 19, rue de la Poissonerie.
4. "Enfin inutile de faire ressortir l'économie de métal qui résulte de la construction de cette conque; la simple inspection des dessins en fait apprécier tous les avantages, tant au point de vue de la légèreté des instruments, qu'au point de vue de la qualité et de la facilité d'émission des sons, la résistance ou l'influence de l'enveloppe de la colonne d'air se trouvant réduite dans la même proportion que les surfaces de métal; de moitié environ sur les instruments usités jusqu'aujourd'hui."