Alex Schölkopf

Romantic Bell Making

This paper explores the challenges and methodologies involved in recreating a tenor trombone bell from the Romantic era, focusing on the influence of material properties and craftsmanship techniques. The author emphasises a "gentle transformation" approach, advocating for careful shaping and multiple annealing processes to maintain the brass's integrity and achieve the desired tonal qualities. By examining historical practices, such as the use of wooden hammers and specific alloy compositions, this study highlights the complexities of replicating instruments that are both visually and sonically faithful to their originals. Ultimately, this paper acknowledges that while exact replication is unattainable due to variations in material and craftsmanship, a respectful, informed approach can yield approximations that honour the spirit and sound of the original Romantic-era trombones.

Our initial situation is this: How can we reproduce a tenor trombone gold brass bell from the Romantic era today? What do we have to know, and why in the end it will only be an approximation? How much does the material we use influence the production possibilities?

At this point, it is important to know that sheet brass is reshaped when cold, and becomes harder in the process. If it gets too hard, it has to be made more ductile again. This is done by stress-relief annealing at approximately 600 degrees Celsius. To make a bell the right size for a trombone, the metal has to be annealed about thirty times between the different shaping steps. But learning to anneal brass perfectly is another story!

This article discusses my idea of gentle transformation in order to determine the wall vibrations in brass instruments. But why should I want to be gentle to the material? This is because I believe I can influence a mechanical process by means of an amiable act. In my opinion, it is necessary to be gentle to the material that I want to transform, because if I am compelling it into a new shape, it will be impossible to work against its own will. To be gentle is my first principle as an instrument maker. Otherwise, I will stress the material too much, which will result in micro-cracks. My second principle is to transform the metal over several small steps, thereby finding the right heat treatment. There are many other ideas about how to create a bell with 'perfect' wall vibrations such as we can find in some Romantic instruments. We can see in Rainer Egger's article that we can measure how we influence and transform the material.[1] For this reason, I do not want to leave any stone unturned in gaining a direct influence over it.

This is the basic idea. However, the initial challenge is to get the material into a shape that nearly looks like a bell.[2] All the other ideas of how to transform the material and the process involved depend on your skills of craftsmanship, because every bell is a little different from

1 See Egger 2016.
2 See Fresh Wind 2019.

Fig. 1 The steps of bell-making from left to right: the sheet metal, after soldering, the symmetrical shape, the opened bell, after shaping on the mandrel, and the finished Egger Romantic tenor trombone bell (Foto: AS).

the next, just as the materials can differ slightly. The instrument maker needs experience to deal with this.

When reproducing the approximate form and sound of a tenor trombone gold brass bell from the Romantic era, first I have to be aware of the makers who made the original historical instrument. What tools did they have, and what materials? What were the homogeneity of the alloy, the shape and the size of the bell, and the other parameters? In our case here, we are dealing with a tenor trombone by Eduard Kruspe from circa 1910–1920. The instrument has a lovely warm sound, and just 'works'. The bell has a diameter of 23 cm, and the wall thickness after polishing is around 0.3 to 0.15 mm. It is very thin, but sounds big. How could they achieve such thin bells?

In what follows here, we shall only discuss the different steps of shaping the bell. Figure 1 shows the transformation from the flat sheet to the final bell. There are three important steps I want to look at more closely, concerning the symmetry, the size and the exact form of the bell.

After cutting, bending and soldering the originally flat sheet, we encounter our first problem: the bell is not yet symmetrical. The material has to be hammered into a symmetrical shape, for which I have to choose which hammer is most suitable (Fig. 2). This big bell needs a lot of reshaping. If I want to have a thin bell, and start out with thin material, then I use a wooden hammer for this work. The alloy in the Romantic period was good and the soldering was strong enough not to burst. A bell with a small diameter and an almost straight shape, such as we find in sackbuts, does not require major reshaping, so I could achieve a symmetrical bell in just a few steps. For this I would use a steel hammer, because the alloy is brittle, the seam might not be perfect, and so it is better to work with many small blows. For a modern bell, I

Fig. 2 The hammers (Foto: AS).

could use all kinds of hammers, because the diameter is a bit smaller than Romantic bells, and the material and the seam are almost perfect. The material is also thicker, and I can use even a plastic hammer. This is gentle on my wrist, but not necessarily gentle to the material structure. I might transform it too quickly, simply because I can. But when I resist the temptation to work too quickly, I can be just as gentle with a plastic hammer as with a rubber hammer. It is a pleasant tool and the benefit of it is that one gets a smooth surface (which is important today). However, in the present case, I shall use the wooden hammer, not least because it is more authentic for making a replica of a Romantic bell.

I have to choose how fast I want to form the metal, and how strong my hammer blows should be. This is another moment when I can choose to engage in 'gentle transformation' or not. In principle, it is always gentler to transform the metal slowly, in many little steps. But this is not always practicable, because the material and the seam could endure fatigue. So I have to find a good balance between speed and effect when shaping the metal. To my mind, the early brass instrument makers might have had more time, but they needed it because their alloys needed to be treated differently (which often took more time).[3] The newer the alloy, the better and more homogeneous it became, and they could work faster and make bigger bells out of it. The late-Romantic alloys were good, and in our case they did not include any lead. This helps a lot, and allows me to make a thin, large bell.

Another fact is that material costs have reduced greatly since the days of the early brass instrument makers, though the salary of a worker today is much higher than it was back then.[4] Nowadays, the time invested makes up most of the price of an instrument. Nobody willingly works

3 See Egger 2016, p. 469.

4 See also the contribution by Jean-Marie Welter in this volume, pp. 43–64 (Welter 2026).

slowly if the work itself can be done faster, and I can't travel back in time. Nevertheless, I should try to work in the same way as instrument makers in the period in question. But if my respect for the material means I work slower than I could with a modern alloy, how slow should that be?

To find out, I listen to the material while I'm hammering it. That way, I can hear how far I can go. The tinnier and lighter the sound, the harder the material. I will stop right away if it sounds unpleasant. Then I have to anneal again and 'waste' time. But is this really wasting time, or am I instead investing time in a better wall vibration and a better sound?

It might be enough just to check for mistakes with your eyes without listening. To be sure, this will not result in cracks or overlaps, but the structure of the material can be damaged if I go too far. You might not see this on the surface with your eyes, but you might well hear it. When modern instruments are shaped too quickly, the sound isn't necessarily bad, but it is sometimes boring. If I try to compress the material instead of stretching it too much, I will get a more colourful, warm sound.

But now we come to the second step, where we want to 'open up' the bell and bring it to the size we need. What tool can I use for this transformation? It depends on the thickness of the material. For a Romantic bell, we use material of 0.4 mm thickness. Given the large size of the bell, the material will thin down to 0.2 mm at the end of it. You have to use different hammers to open the material up to this size, though it is not easy to keep the metal thick enough and even, which is also important for the sound. It is also possible to open it up using a hollow spindle. This means using a pole of wood or polished steel, or different rolls that enable you to pull out the material from the inside and enlarge it. This technique was already known during the Romantic period. Without revealing all the 'Egger secrets', you have to be careful and gentle when using any combination of these different methods.

In the third step, bringing the bell into the correct form, I press the material on a steel mould. Here, I can influence the material characteristics for the last time. If I use a wooden pole, for example, the material stays softer. If I use a hard tool with a lot of pressure, I will get a hard material; the longer I press on the material, the harder it gets, too. We have here a gold brass bell with a big diameter. Gold brass is rather soft, but hardens very quickly when it is formed, and the large diameter takes a lot of time to be pressed.

The tool I use for this remains a trade secret. But it guarantees that the surface will be even, close to the required shape, and stable. This gives me the result I wanted: a gently formed, thin bell with good vibration properties.

It is difficult to say to what extent the process is ultimately dictated by the material, or determined by the instrument maker. You have to delve into the physical properties and characteristics of an alloy, and learn to assess how gently you should shape it. The taste of the musician who wants to play the historical replica is also decisive. The extent to which today's players can implement their sound ideas on a replica can be a selling point, and we, the instrument makers, have to be able to work with this.

It is a Romantic notion that one might be able to reproduce instruments identically. There are numerous parameters that influence each other, especially the material, its treatment and shape. It is impossible for a replica to match the original in all its parameters, so we have to be clear about the primary goal of such a replica. Should it be as identical as possible to the original in its manner of production, visually, or in its sound?[5] For us as instrument makers, it is vital that we create instruments that musicians can work with, and that they like. But we do our best.[6]

5 See also Kirnbauer 2017.

6 Editor's note: See also the video *The Trumpet Maker* (Fresh Wind 2019), which documents Alex Schölkopf ma-

Bibliography

All weblinks in this article last consulted 28 May 2026.

Egger 2016 | Rainer Egger: Zur Frage der Wandvibrationen von Blechblasinstrumenten. Wie wirkt sich das Vibrationsmuster der Rohrkonstruktion auf die Spielcharakteristik eines Blechblasinstruments aus?, in: *Romantic Brass. Französische Hornpraxis und historisch informierter Blechblasinstrumentenbau. Symposium 2,* ed. by Daniel Allenbach, Adrian v. Steiger and Martin Skamletz, Schliengen: Argus 2016 (Musikforschung der Hochschule der Künste Bern, Vol. 6), pp. 469–478.

Fresh Wind 2019 | Fresh Wind: *The Trumpet Maker* [video], online, 16 October 2019, https://youtu.be/hvTX0DPDiNo.

Fresh Wind n.d. | Institute Interpretation: *Fresh Wind. Wind Instruments and Research,* online, n.d., www.fresh-wind.ch/en/.

Kirnbauer 2017 | Martin Kirnbauer: 1:1 oder 0:3 – Von der Quelle zur Kritik. Ein polemisches Plädoyer im Andenken an Rainer Weber (1927–2014), in: *Le Basson Savary. Bericht des Symposiums "Exakte Kopie" in Bern 2012*, Schliengen: Argus 2017 (Musikforschung der Hochschule der Künste Bern, Vol. 8), pp. 8–15.

Welter 2026 | Jean-Marie Welter: Copper and Copper-Alloy Sheets for Musical Brass Instruments, Made in the Kingdom of Saxony, in: *The Sound of Brass. Blechblasinstrumente im 19. Jahrhundert/Brass Instrument in the Nineteenth Century. Romantic Brass Symposium 5,* ed. by Adrian v. Steiger, Daniel Allenbach and Martin Skamletz, Baden-Baden 2026 (Musikforschung der Hochschule der Künste Bern, Vol. 21), pp. 43–64, https://doi.org/10.5771/9783987402821-43.

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king a bell, and includes an interview. This video was produced for the research communication project "Fresh Wind" at HKB (2018–2020) that included a website (Fresh Wind n.d.) as well as a touring exhibition (shown in Bern, Willisau, Bad-Säckingen, Interlaken and elsewhere).