

The Making of a Trumpet

In this In Tune field trip, we watch skilled artisans turn raw metal into precision musical machines

Eastlake, Ohio's Conn-Selmer facility turns out professional, amateur and student instruments, made from materials ranging from clean lacquered brass to sparkling silver-plate. It's a bustling place filled with talented craftspeople. It's also one of only a few factories in the world that produces a wide range of brass instruments, from professional horns like the famous King Jazz trombones

and C.G. Conn Vintage One trumpets to the largest sousaphones in the world—and everything in between.

A fine trumpet is a thing to behold, but all horns, from beginner models to top-of-the-line masterpieces, start life as raw metal that must be carefully crafted into the musical instruments we love to play. Our thanks to Conn-Selmer for letting us inside the factory walls to see how trumpets are made.

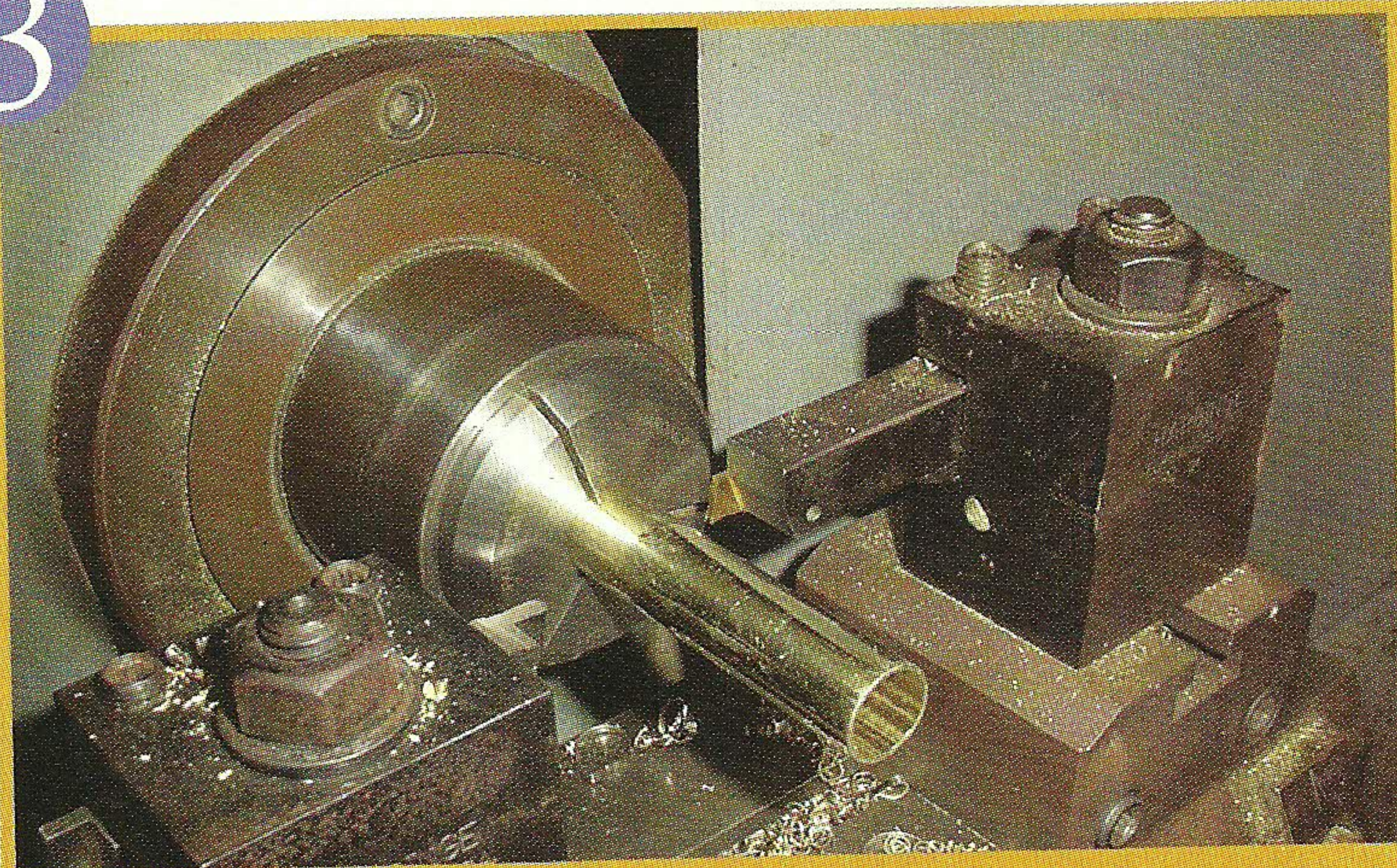
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SHEET BRASS RAW MATERIAL

A trumpet starts out as many small metal parts. These parts include flat sheets of raw brass, drawn tubes and many smaller parts.

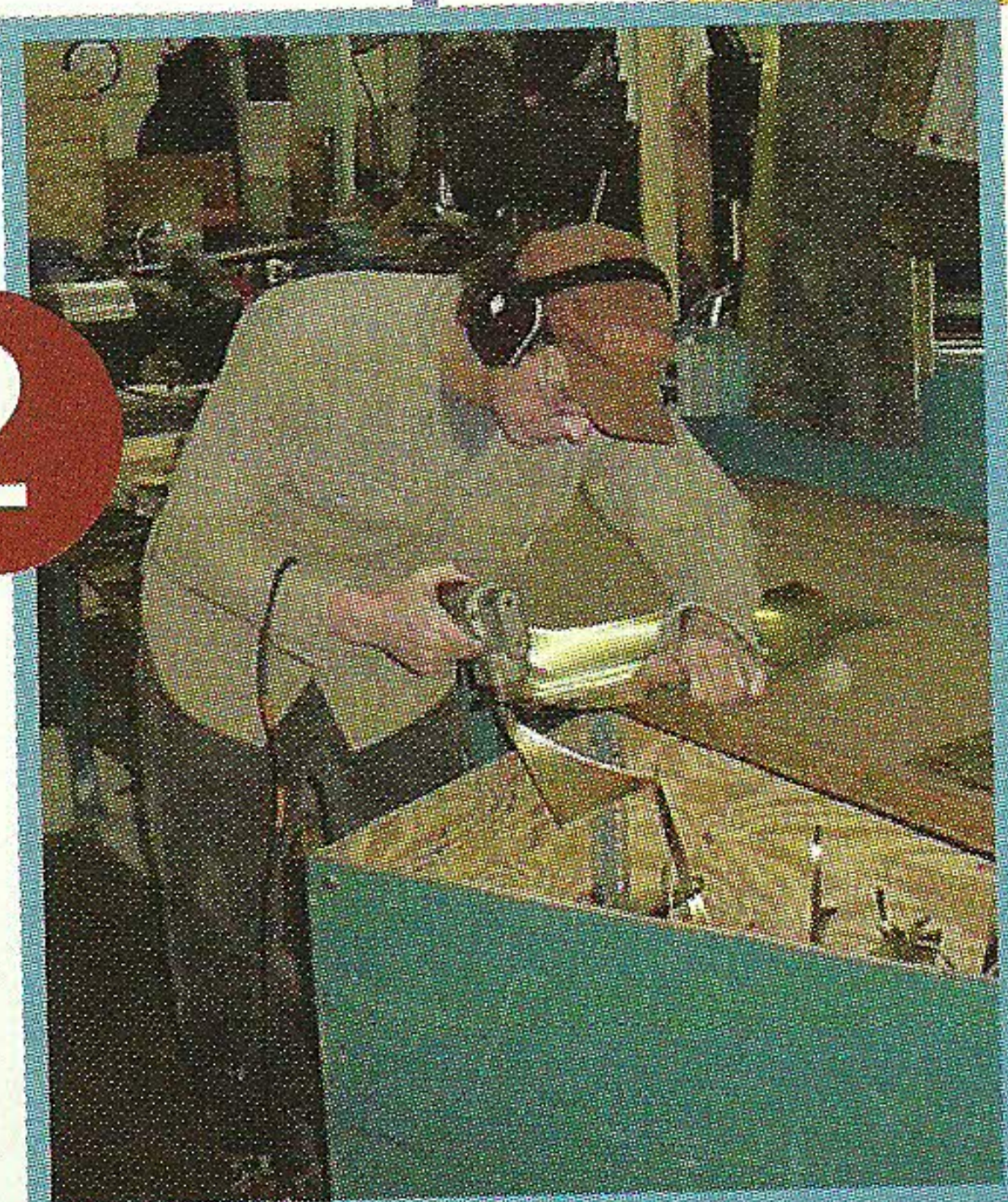
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TUBE CUTTING

Each part is cut to a specific measurement and will be processed in a variety of ways.

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PATTERN CUTTING

Professional trumpet bells are hand cut from sheets of brass according to specific patterns.

Danny Barber
Chicago Jazz
Orchestra

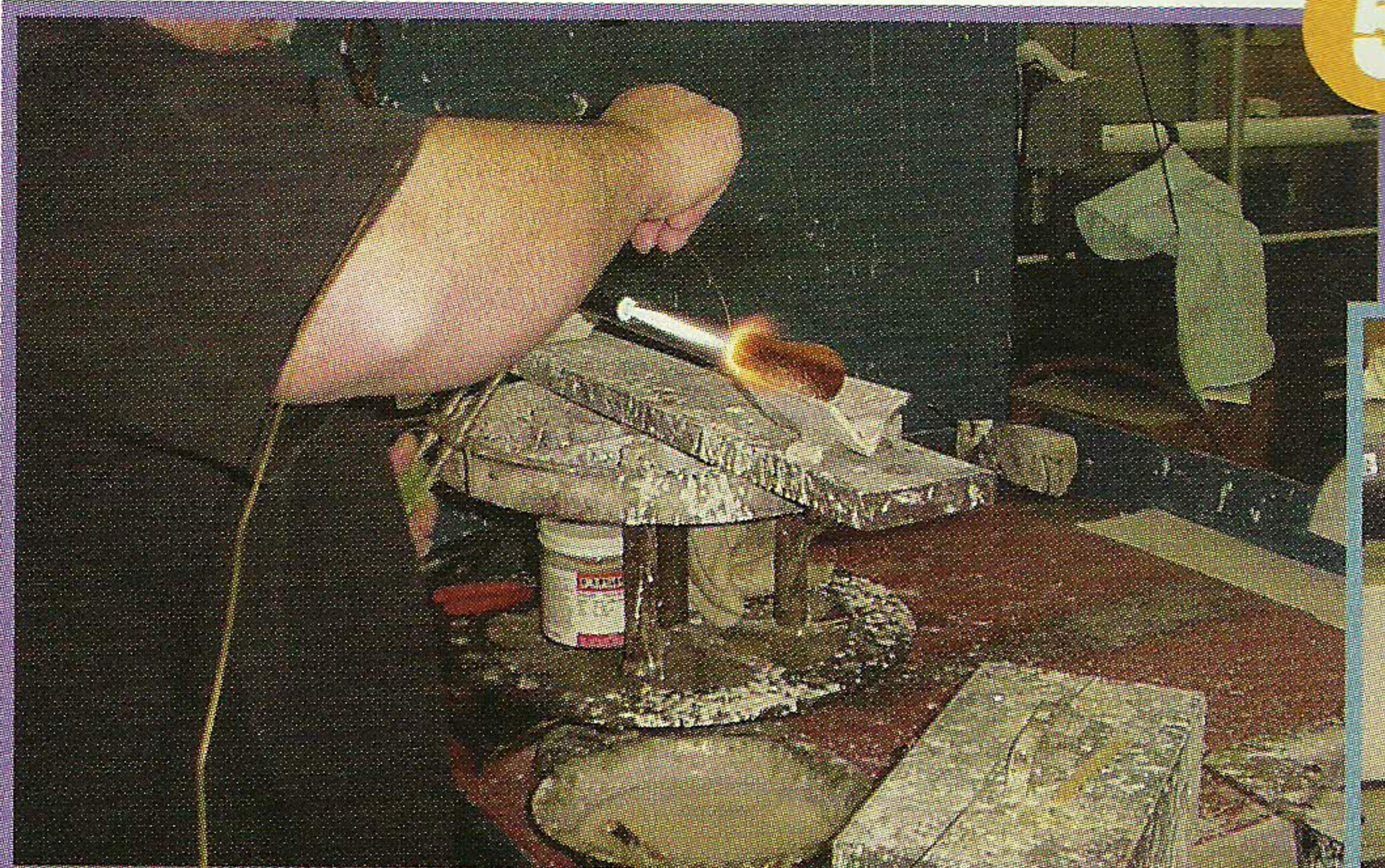


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HAND HAMMER

Once the bell has a very general shape, it must be formed around a device called a *mandrel* to bring it closer to the final tolerances. Professional trumpet bells are formed from a single piece and hand-hammered to the proper dimensions. This process allows for a great deal of forming to be completed without undo stress on the bell. Student bells are formed from two pieces and fused together in a special process called *plasma-welding*. After the bell is created, it is *annealed* to return it to a more malleable form.



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BELL BRAZE

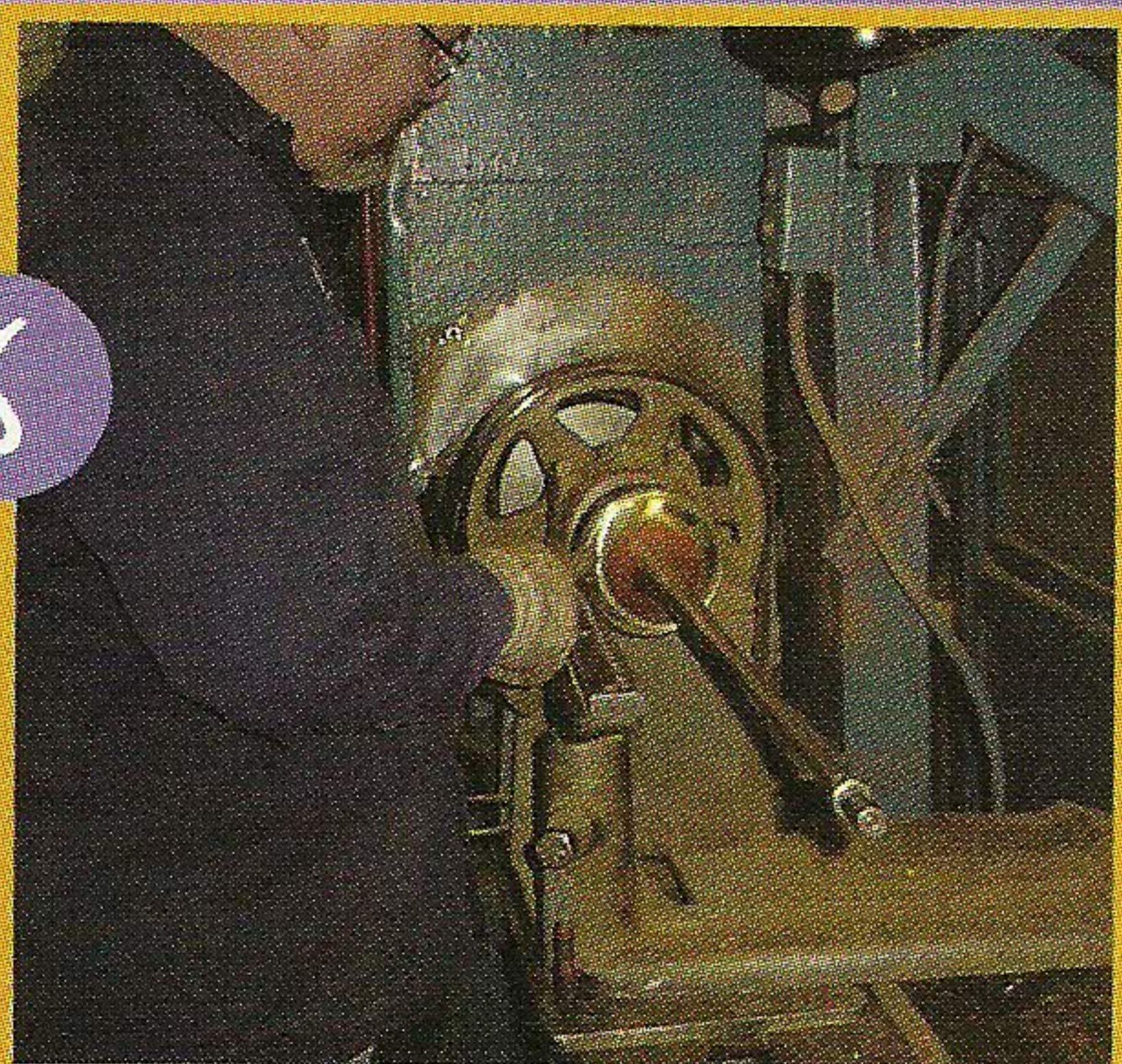
After material for a bell is cut and shaped, it must be *brazed* to seal the seam. Brazing includes heating the bell and the use of *spelter*, a special agent that bonds the brass without the use of filler material.



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CNC BELL SPINNING

Student instrument bells are spun on computerized equipment which mimics the craftsman's process. While the computer is unable to fully define the "feel" that the craftsman possesses, the computer-controlled machinery provides for a very consistent bell at a lower cost.



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BELL SPIN

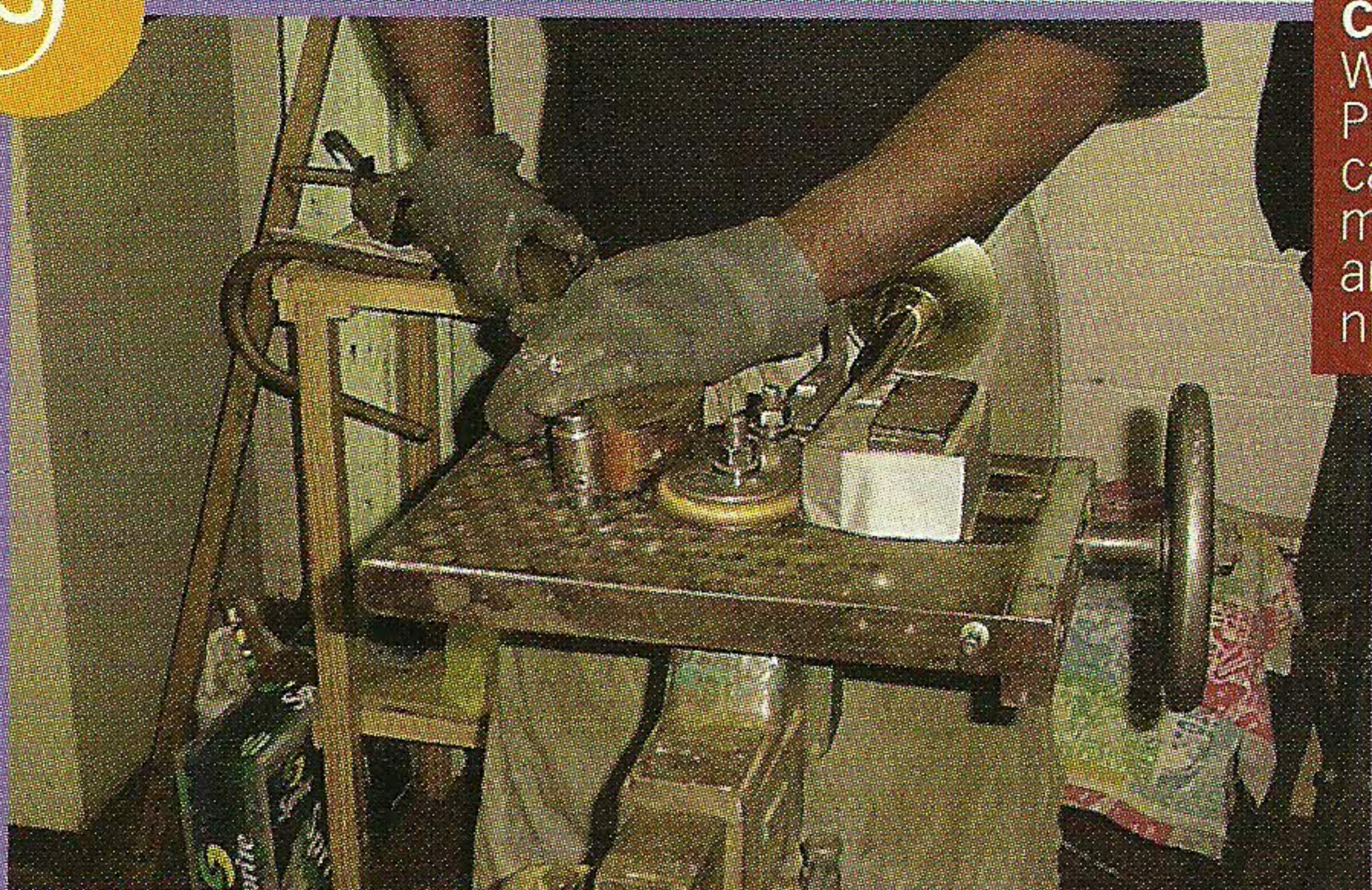
Spinning brings the trumpet bell to its final specific shape and tolerance. There are two processes for bell spinning. Professional level bells are spun by hand using a lathe and a variety of tools. The experienced craftsman can determine the exact amount of pressure needed to lay the bell firmly against the mandrel without damaging the brass.



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CASING ASSEMBLY

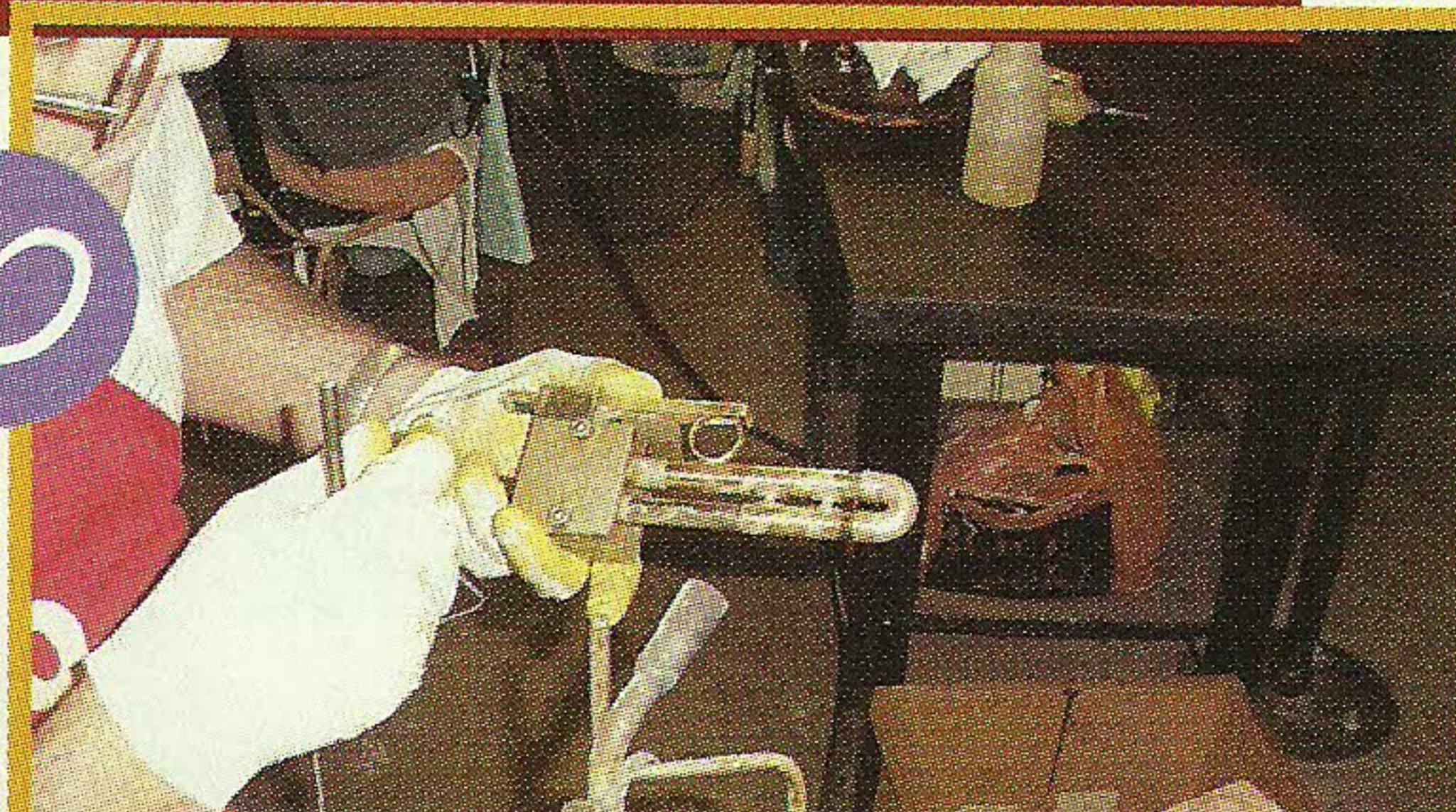
While bells are being crafted, pistons and piston casings are being created. Professional pistons are created out of Monel (mo-NEL), a very durable alloy that can be machined to very close tolerances. Many high-quality pistons are also made by nickel plating over nickel silver, which has provided for excellent tolerances for many years. Some student instruments use nickel silver pistons without nickel plating, a lower cost option.



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FREEZE BEND 2

Bending the trumpet tail, while keeping a specific bore size, can be difficult. Conn-Selmer craftsmen use a special mixture of soapy water and freeze it in the bell tail. When the tail is bent, the mixture holds the bore size true and can be easily removed once the process is complete.



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SLIDE ASSEMBLY

Slide assembly is an arduous process as the craftsman must bring together a number of very small parts and then solder them together very cleanly and carefully. Special tooling must be created for every individual slide so that each part is held in exactly the right place.



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MOUNTING

Mounting the slides, receivers and bell to the valve casing, and "rough fitting" the slides is a complex job. Fixtures help to guide the craftsman, but the fitting and hand soldering of each small area takes time and experience.



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SOLDERING

Soldering the braces is another sensitive issue. Braces hold the trumpet together, but they cannot be used to "pull" the trumpet together. Stress-free bracing can only be accomplished when the rest of trumpet is assembled properly.

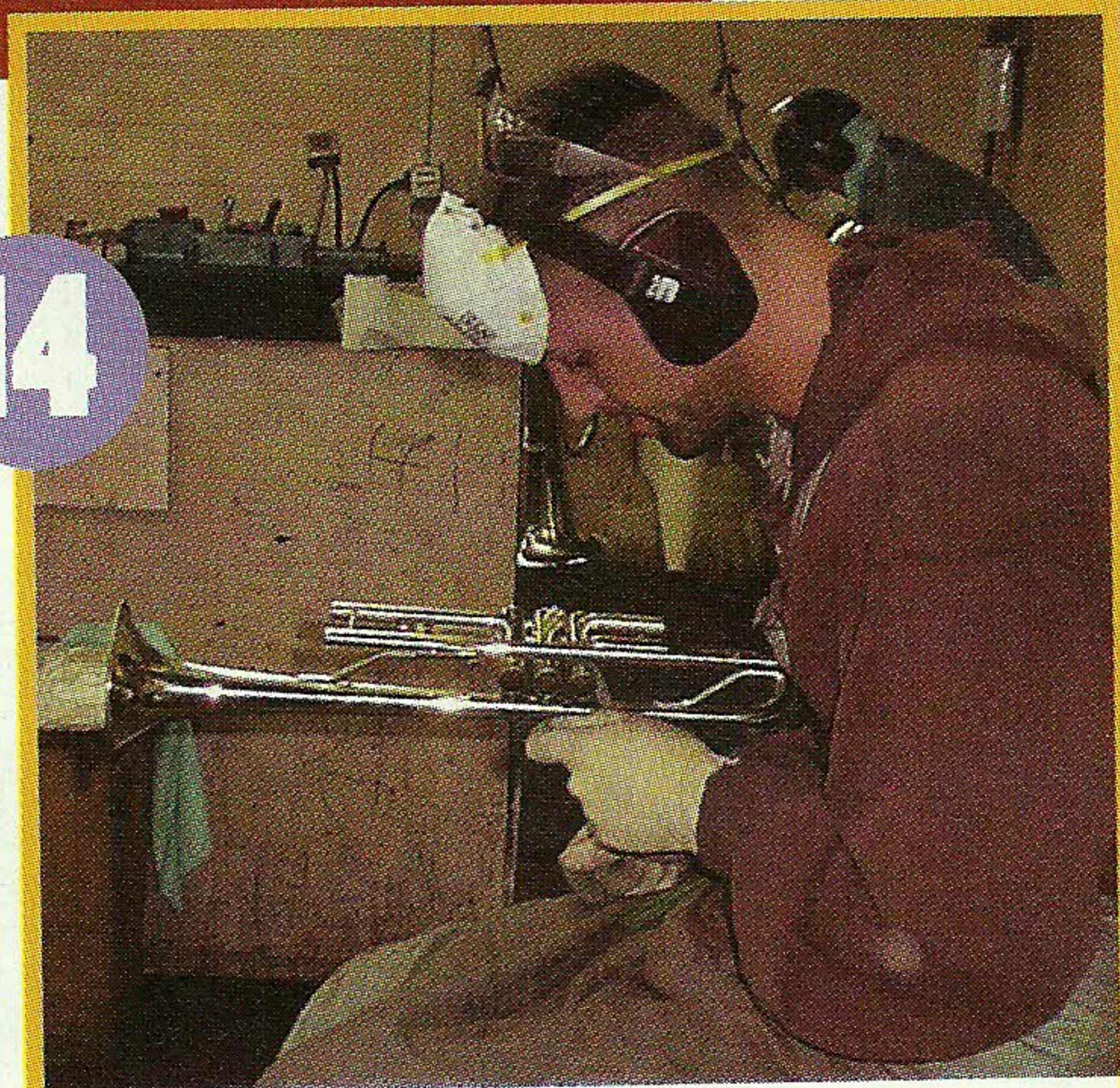


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BUFFING

After the instrument is assembled in its rough form, it is buffed to a clean, even finish. Actually, there are two buffing processes. The first "rough buff" removes general imperfections in the overall finish. The final "color buff" brings out the shine and luster throughout the horn.

Mark Zauss
Clinician/
Bandleader



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COLOR BUFF RAG

After the majority of the instrument is color buffed, the craftsman hand-rags small areas that machinery cannot reach. Once again, experience is the best teacher in this detailed and important job.

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PISTON LAP

Pistons are built to exact tolerances but with enough room for "hand-lapping," which custom-fits the piston to the piston casing. From this point on, the piston and casing travel together through the final processes.



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FINAL ASSEMBLY

Final assembly is where it all comes together. The trumpet's parts are individually cleaned and assembled. An air test assures that all solder joints are air-tight and the instrument is play-tested as a final check.

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FINISHED HORN

The finished trumpet! Ready to be packed and shipped, this new King trumpet will provide years of satisfying performance.