



## Joint Preparation: A Job for Pneumatics

Proper joint preparation is at least as important as the actual repointing work. Joint preparation consists of carefully removing deteriorated or inappropriate mortar from between the masonry or stone units. Deteriorated mortar, by nature, is not difficult to remove: The challenge is to remove it carefully to a sufficient depth. Inappropriate mortar, on the other hand, is typically hard portland-rich mortar, which can cause irreversible damage to the surrounding masonry.

Keep two things in mind: (1) all materials eventually fail and (2) historic mortar does not keep bricks together, it keeps them apart. With historic masonry, soft lime-rich mortar acts as a sacrificial material protecting surrounding brick. The point to repointing is to replace this material in-kind without changing its purpose. It is inexcusable for masons to sacrifice the bricks rather than mortar by using the wrong materials and techniques.

There are two prevalent methods of raking out mortar joints: the hand method and the use of electric grinders. You would do well to consider a third option: We've had great success with certain pneumatic carving tools described below.

### Hand Tools

Many contractors consider the use of hand tools (a mason's hammer and chisel) as the best way to remove mortar. If you are among those, you'll have plenty of time to consider other options while using this slow, imprecise method. Laborious hand tooling is not simply a matter of time and expense but—more importantly—of worker fatigue. A weary body and mind are prone to mistakes, here in the form of irreversible damage.

### Electric Grinders

At this point electric grinders might seem a viable option. Perhaps they are, but only on moderately wide horizontal joints uninterrupted by decorative elements such as brick window lintels or decorative terra cotta. And only if you have the skill to match the power of this tool.

Rotary electric grinders are frequently dangerous to both the building and the builder. Work cannot be properly viewed under the clouds of dust and fast-moving debris generated by a blade spinning at speeds as high as 6,000 rpm.

A major limitation of electric grinders is that they tend to overcut into neighboring courses when used on vertical mortar joints. Also the depth of removal is limited by the working radius of the blade. A 4-inch blade offers only 1-1/2 inches maximum raking depth. Yes, grinders have their place, but it is usually as second or third fiddle to other methods, and always in conjunction with these preferred methods.

### Pneumatic Tools

The use of pneumatic tools has had a tremendous impact on the restoration of historic masonry. Why? Exactly because of the precise manner and controlled impact of these air-powered instruments. They remove mortar by causing it to crumble and fall. First let's distinguish those tools that are just "full of hot air" from the precision instruments that can be employed for masonry restoration.

When most people think about pneumatic chiseling tools, they envision the implements used to remove mufflers from cars, or to scale steel, or worse yet, to drill post holes into sidewalks for "No Parking" signs.

We wish to separate the pneumatic tools described above, which are totally unacceptable for any restoration work, from the tool described below.

### Trow & Holden "Barre" Pneumatic Carving Tool

You might think there is a choice of proprietary pneumatic tools on the market. Not so. While there is a wide range of tools and the opportunity to have any tools custom-made, they are all made by one company, the Trow & Holden Company, a firm that has specialized in tools for the stone industry since 1890. The company is located in Barre, Vermont, the center of the world's largest granite quarry and home to this country's finest stone sculptors.

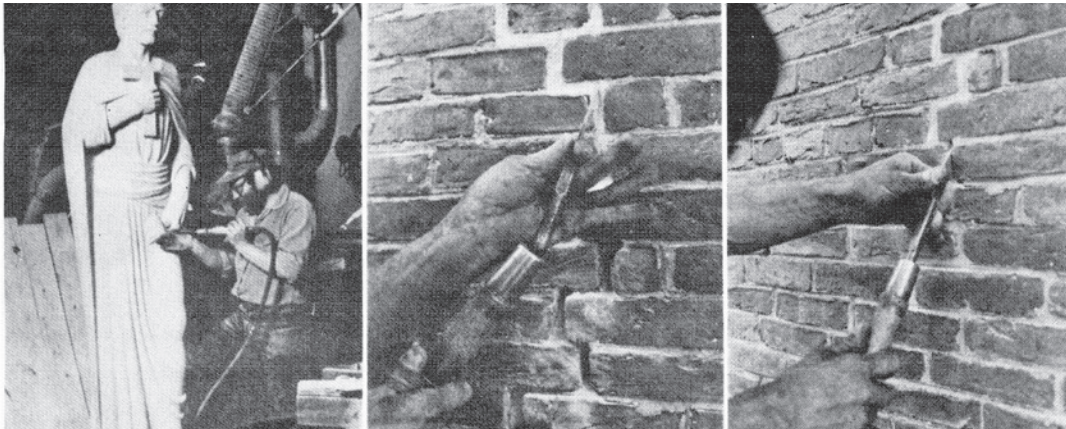
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# TROW & HOLDEN COMPANY

## FINE STONEMWORKING TOOLS



*The Trow & Holden pneumatic chisel was developed for sculpture (left), but can also remove old mortar quickly and with little fatigue to the worker. The worker maintains precise control by manipulating the loose-fitting chisel (center), and controlling the pneumatic back-pressure with his other hand. Vertical joints are easily cleaned (right), without harming adjacent brick — a real problem with grinding equipment.*

The Trow & Holden pneumatic carving tool was designed as a precision sculpting instrument and has been used by the arts and industry since 1890. It made its debut to the public at the World's Columbian Exposition of 1893 in Chicago; it carved Daniel Chester French's Lincoln Memorial in 1922. Today it details limestone figures at the Cathedral of St. John the Divine in New York, and it carves granite angels in Vermont. It is also employed by restoration masons for removing mortar on properties listed in the National Register.

The reasoning behind its application to restoration work is simple; if the tool is precise enough to sculpt the face of Abraham Lincoln, why shouldn't it be able to rake out loose mortar from masonry?

The difference between the "muffler remover" and the "countenance carver" tool is this. The Trow & Holden tool has neither a retainer nor a throttle. This is somewhat at odds with conventional tool design but does provide for some unique control characteristics not available with other pneumatic tools.

The Trow & Holden tool has a chisel with a round shank, hand-held in place in the carving tool with no retainer. A round shank permits the chisel blade to be oriented independent of the tool, an essential feature that is impossible with square-shank tools. The absence of a retainer, or any mechanical connection, enables the mason to defeat the power of the tool immediately by pulling the chisel away from the piston, without any other action. Precision is effected by the tool design which enables one hand to operate the tool while the other controls the chisel. The

elimination of retainer and throttle hardware has resulted in a surprisingly light tool. Remember, this tool was developed as a finishing instrument to sculpt stone for hours at a time without fatigue to the artist.

The chisel blades are tempered and available with carbide tips. They can be custom-made to any length or width. Even very thin "butter" joints can be cleaned, and a joint whose width is the distance between the lines on this page can easily be raked out. As with other raking tools, the width of the chisel should not exceed three-quarters of the width of the mortar joint.

This pneumatic tool is available in a range of sizes from those suitable for fine stone sculpting (or removing mortar) to those suited to heavier and more demanding jobs such as roughing-out blocks of masonry (or removing failed units). All tools require a compressor with only 8 cmf at 110 psi for full power.

Once mortar joints have been carefully raked out, any remaining debris can be easily cleaned with a regulated, light application of compressed air.

The Trow & Holden pneumatic carving tool is about three times faster than hand raking in removing loose mortar, hard mortar, and damaged bricks. Keep in mind, the object of masonry restoration is to restore only that material that actually requires work, with as little "intervention" as possible.

As with any instrument, it takes time and practice to master the correct use of this tool and its potential. For product and technical information, contact Trow & Holden Company. — MW and PM

45 South Main Street, Barre, Vermont 05641 • 1-800-451-4349 • [www.trowandholden.com](http://www.trowandholden.com)

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