Aids to Making:

Jigs and Fixtures

One of my primary objects is to form the tools so the tools themselves shall fashion the work and give to every part its just proportion.

Eli Whitney

We shape our tools and afterwards our tools shape us.

Marshall McLuhan

Purposes

Increase force/power applied to work

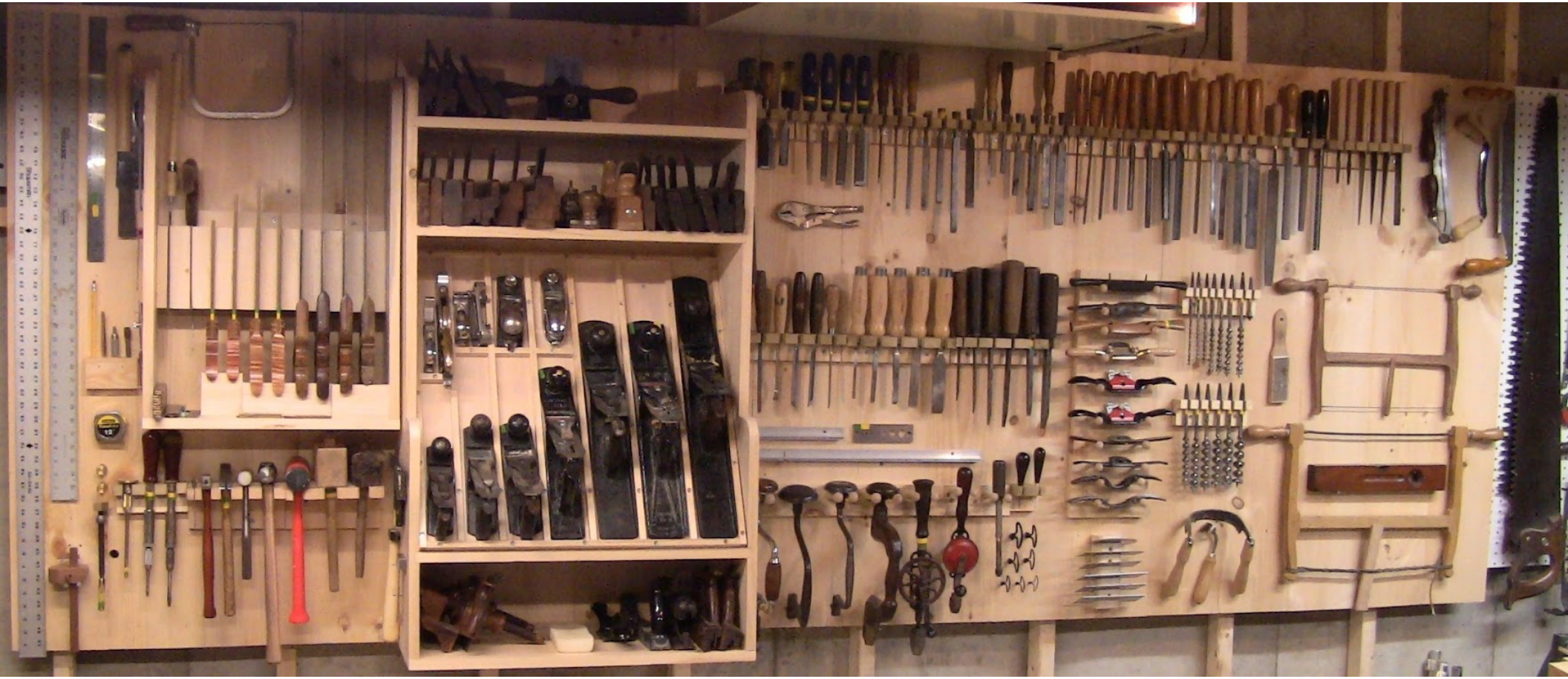
Reduce time to make something

Increase precision and accuracy

Repeatability

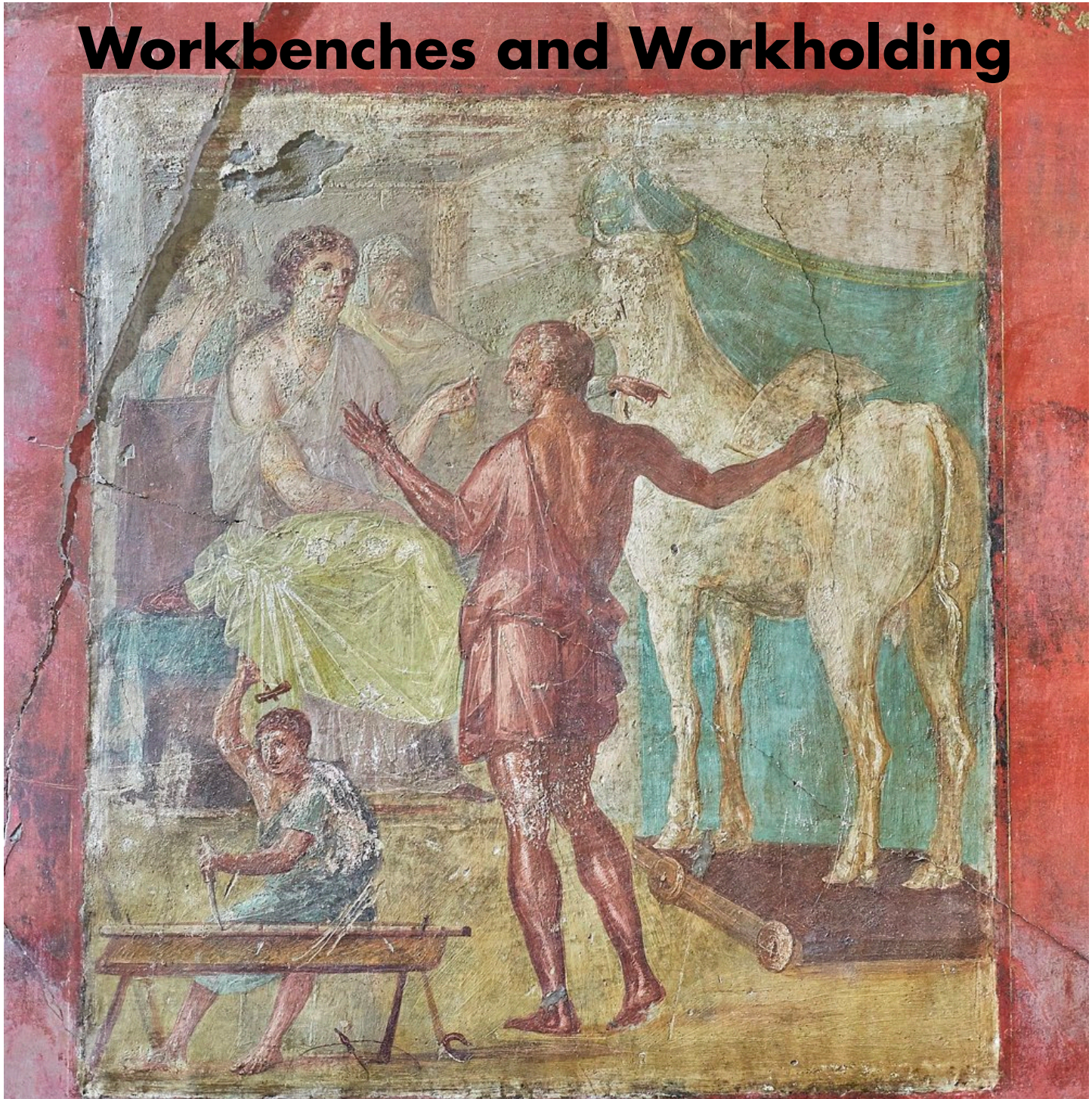
Safety

Different Tools for Different Jobs

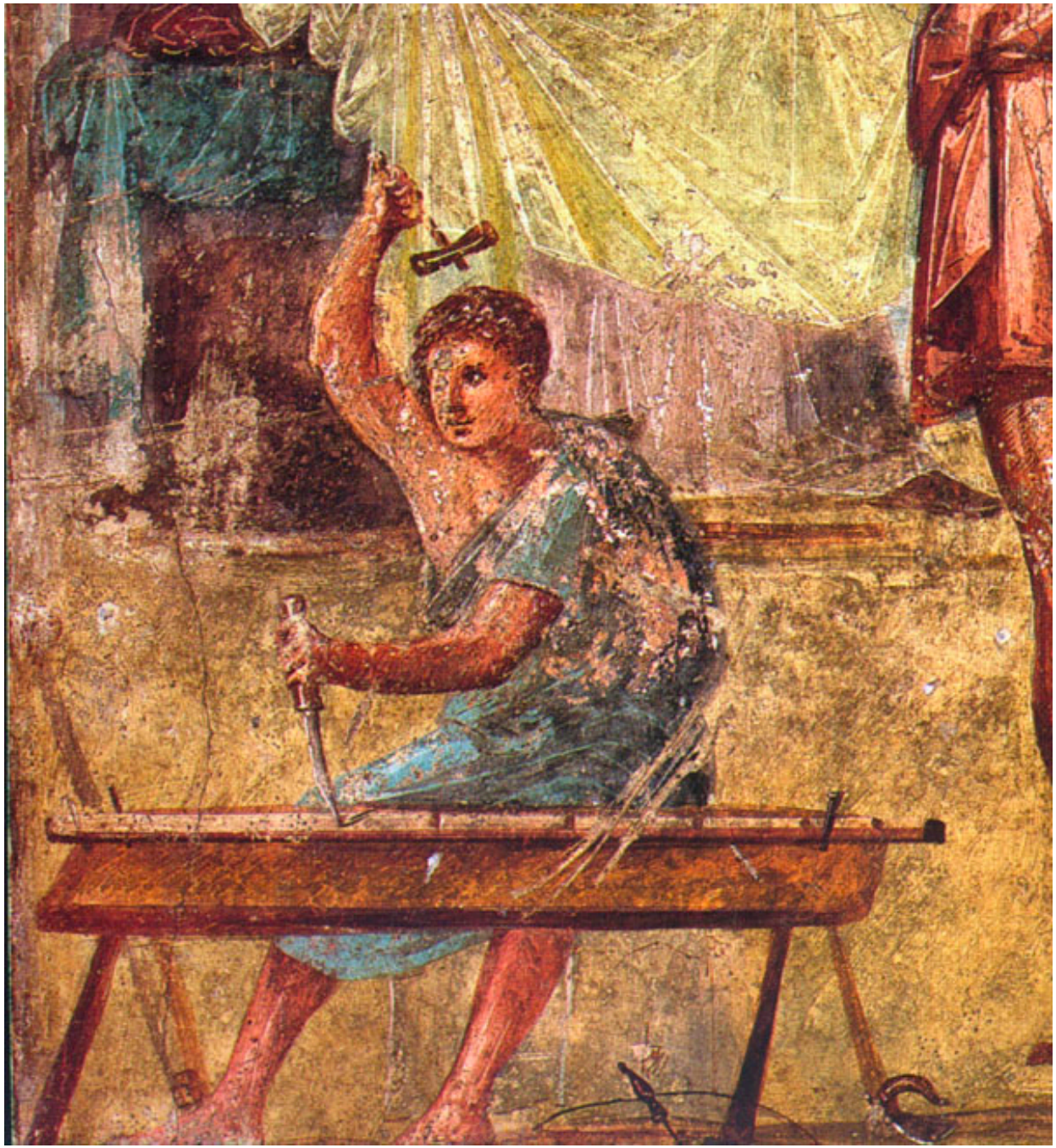


http://dans-woodshop.blogspot.com/

Workbenches and Workholding

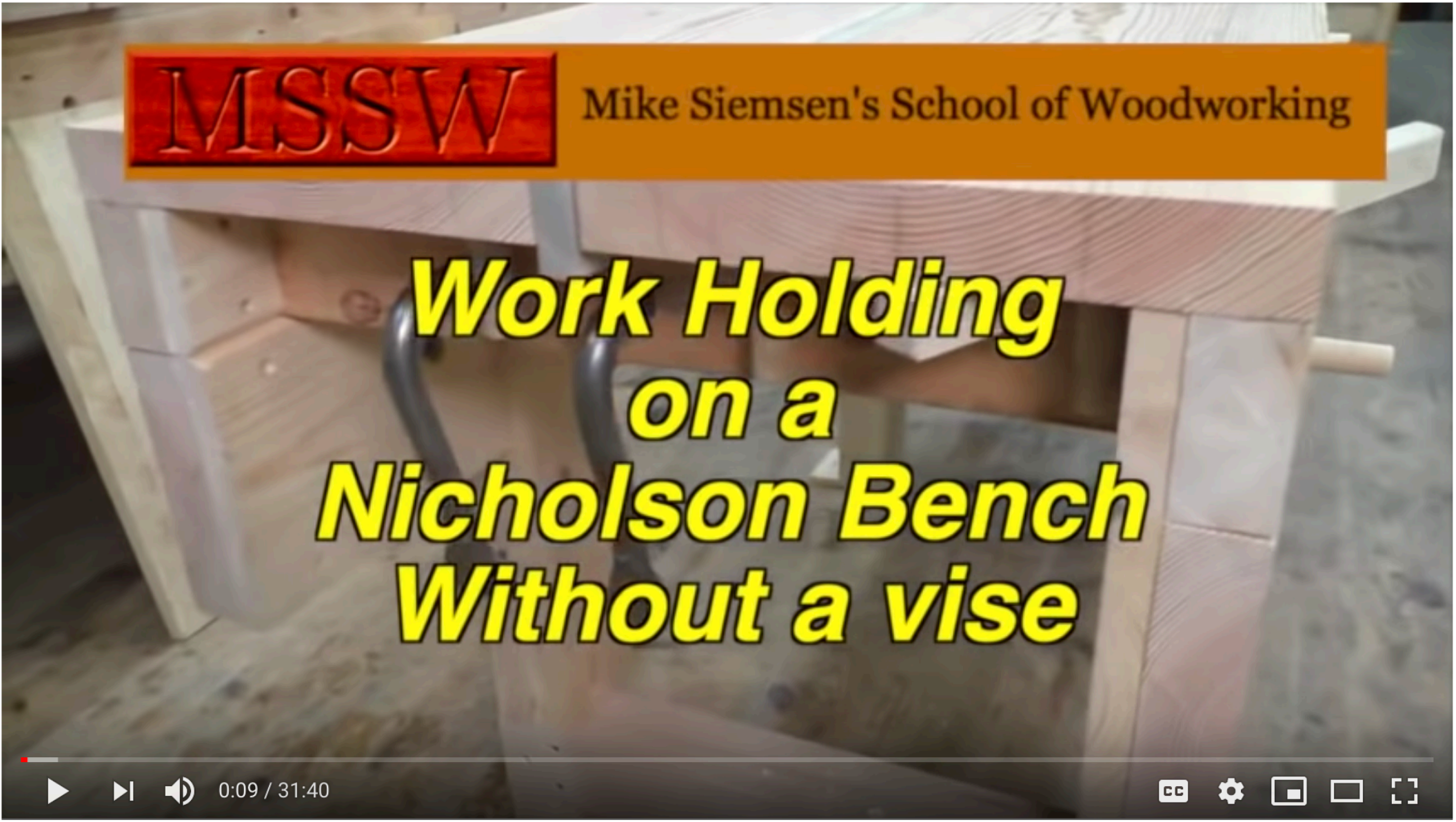


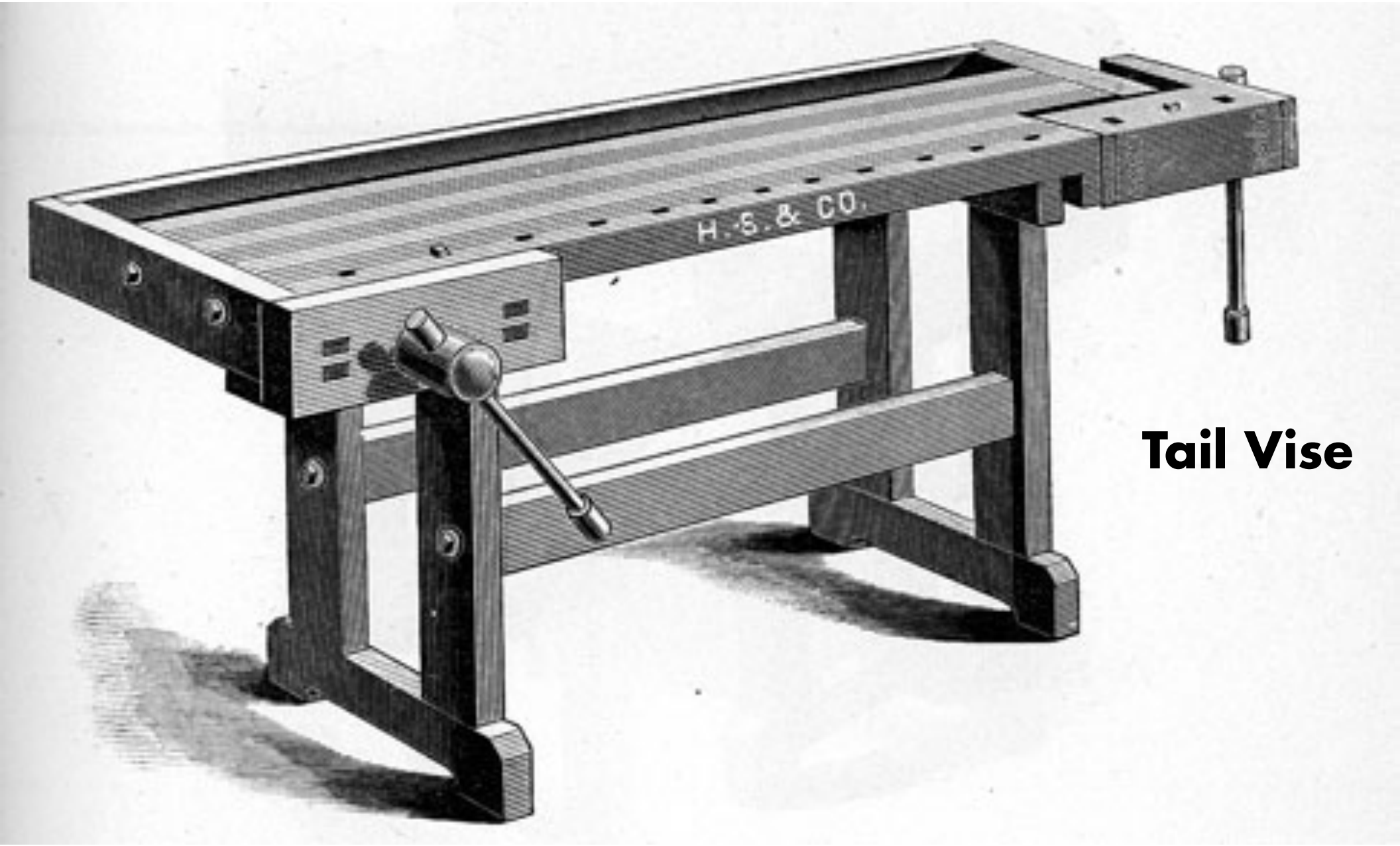
In the House of the Vetti, this dining room fresco is perhaps the earliest depiction of a workbench in the West. From Ingenius Mechanics, Christopher Schwarz



https://www.popularwoodworking.com/workbenches/schwarz-workbenches/the-first-recorded-workbench/

My Workbench


MSSW
Mike Siemsen's School of Woodworking
Work Holding
on a
Nicholson Bench
Without a vise
0:09 / 31:40



Tail Vise

Face Vise

https://www.popularwoodworking.com/woodworking-blogs/case-tail-vises/

Power Tools Designed Around Workholding

Table Saw (Rip)

Sliding compound miter saw (Cross-cutting)

Track Saw

Fixture

A fixture is a device which supports and locates a workpiece.

This increases the accuracy, precision, reliability, and interchangeability of the work.

https://en.wikipedia.org/wiki/Fixture_(tool)

Jig

A jig guides and controls a cutting tool

Hand tool users call these "appliances"

https://en.wikipedia.org/wiki/Jig_(tool)

Plane = Guided Chisel

Router Plane

Stanley/Bailey Planes

Molding Planes

Combination Planes Stanley #45

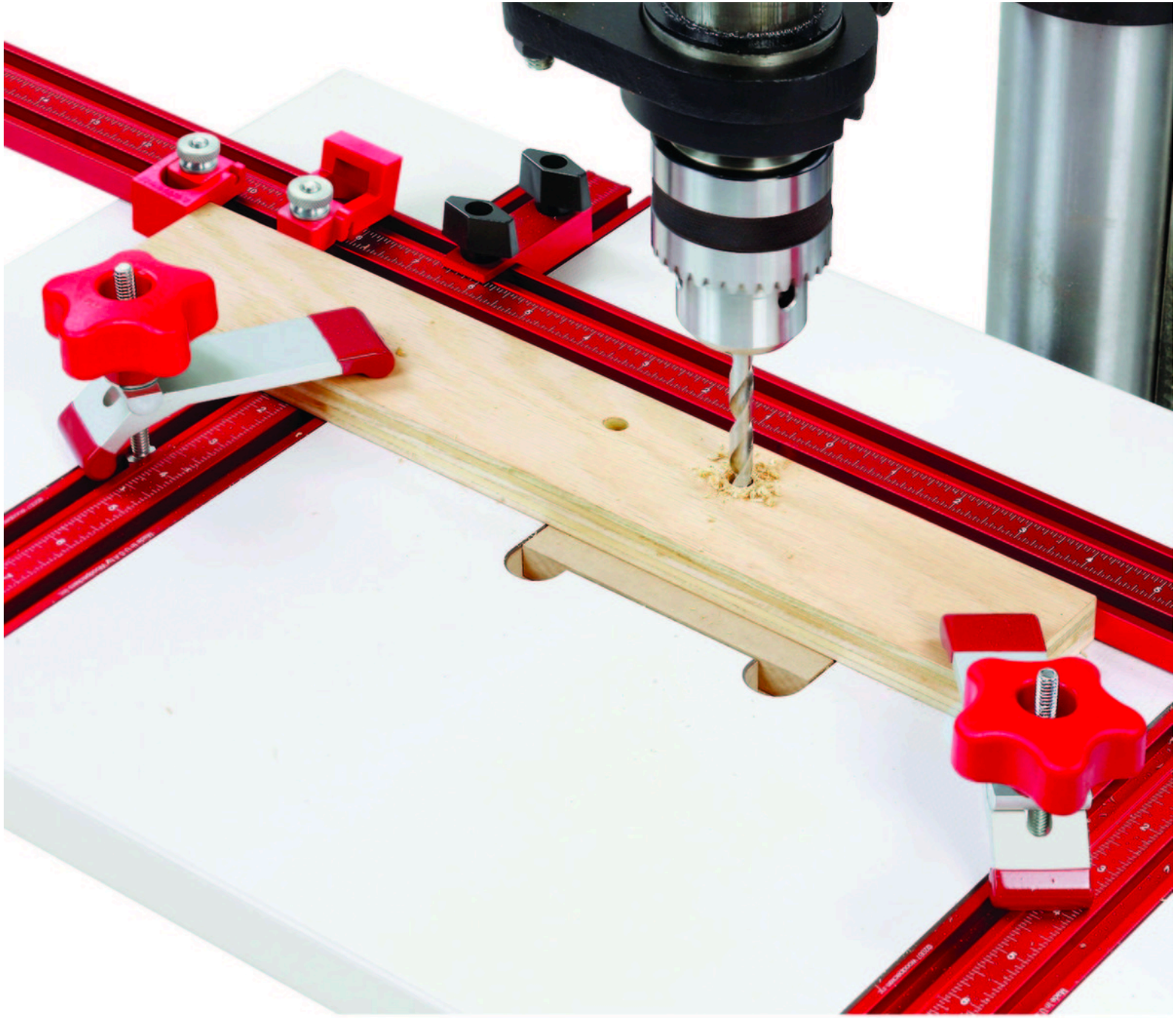
https://www.popularwoodworking.com/projects/choosing-hand-planes/

Gator Drill Jig

Craftsman Miter Box

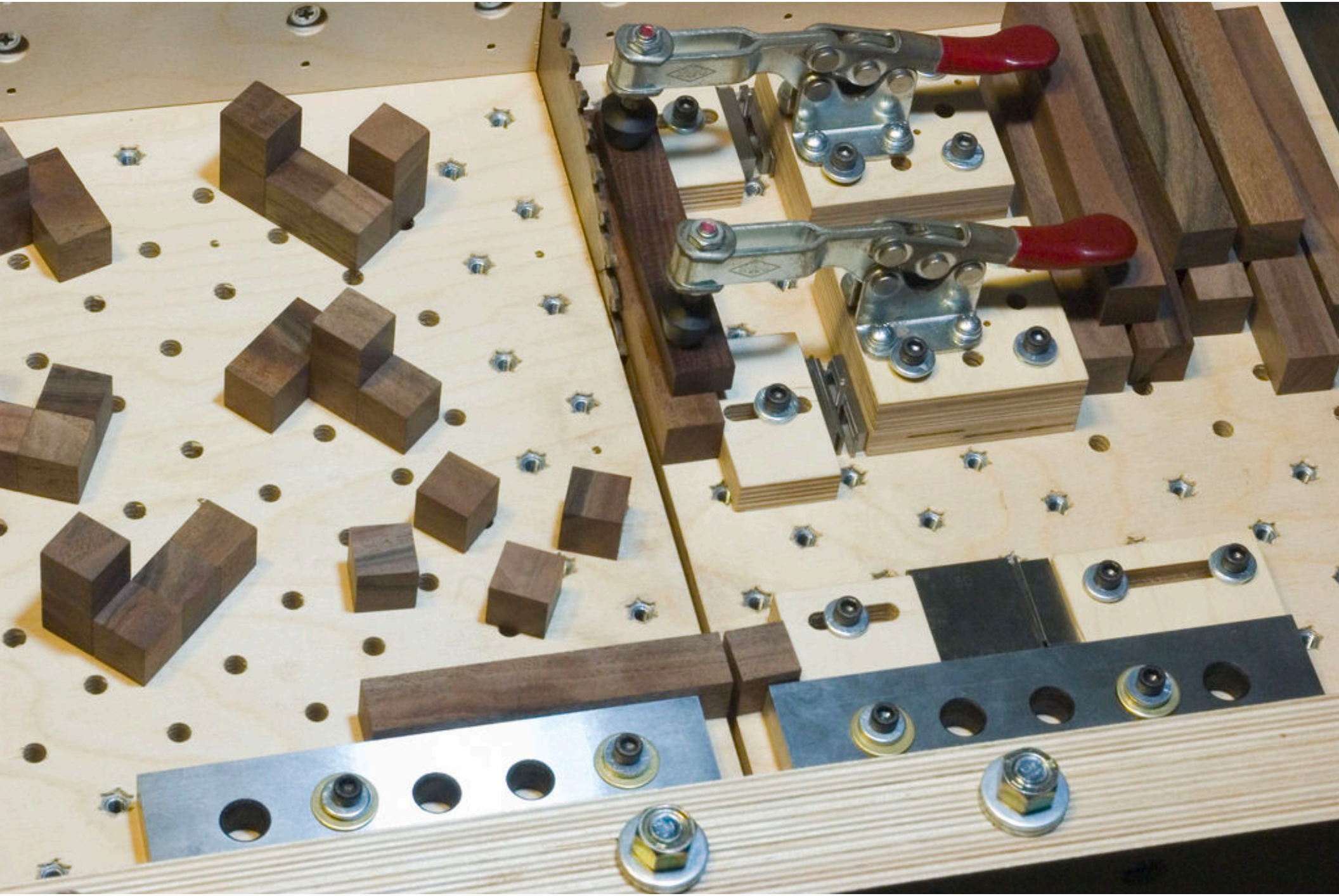
Fence

Ripping Wood on A Table Saw



Woodpeckers Drill Press Table and Fence

Fesstool MFT/3



Lee Krasnow, Puzzle Making Saw

Constrained Process

Make sure can hold the part during all steps

Minimize number of times the work is relocated

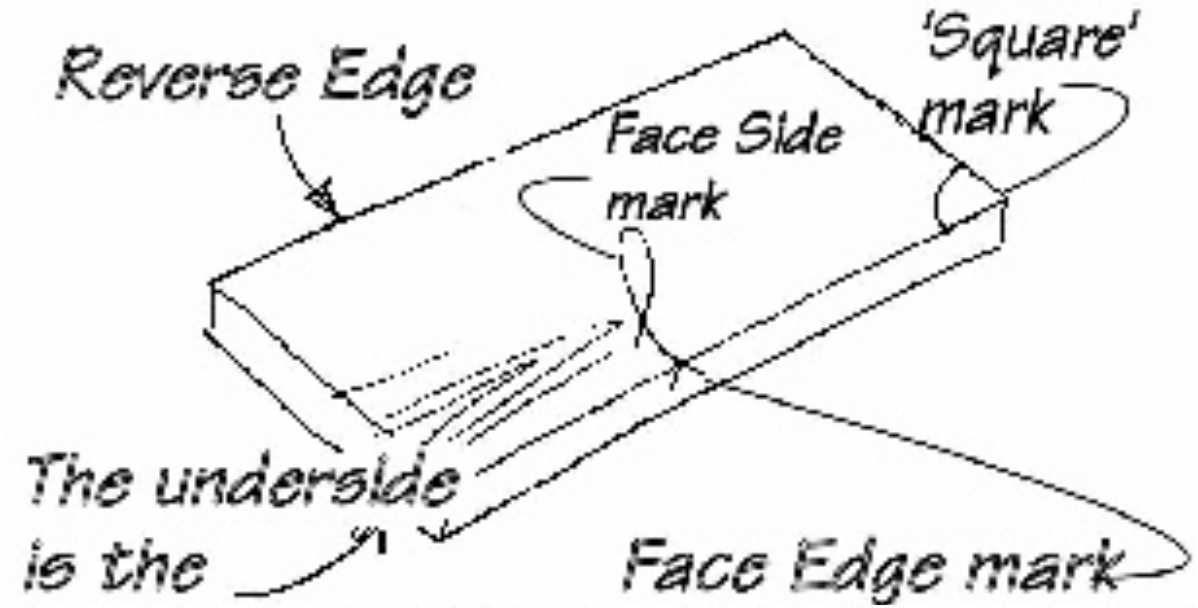
Repetitive operations in the same location guarantee precise alignment

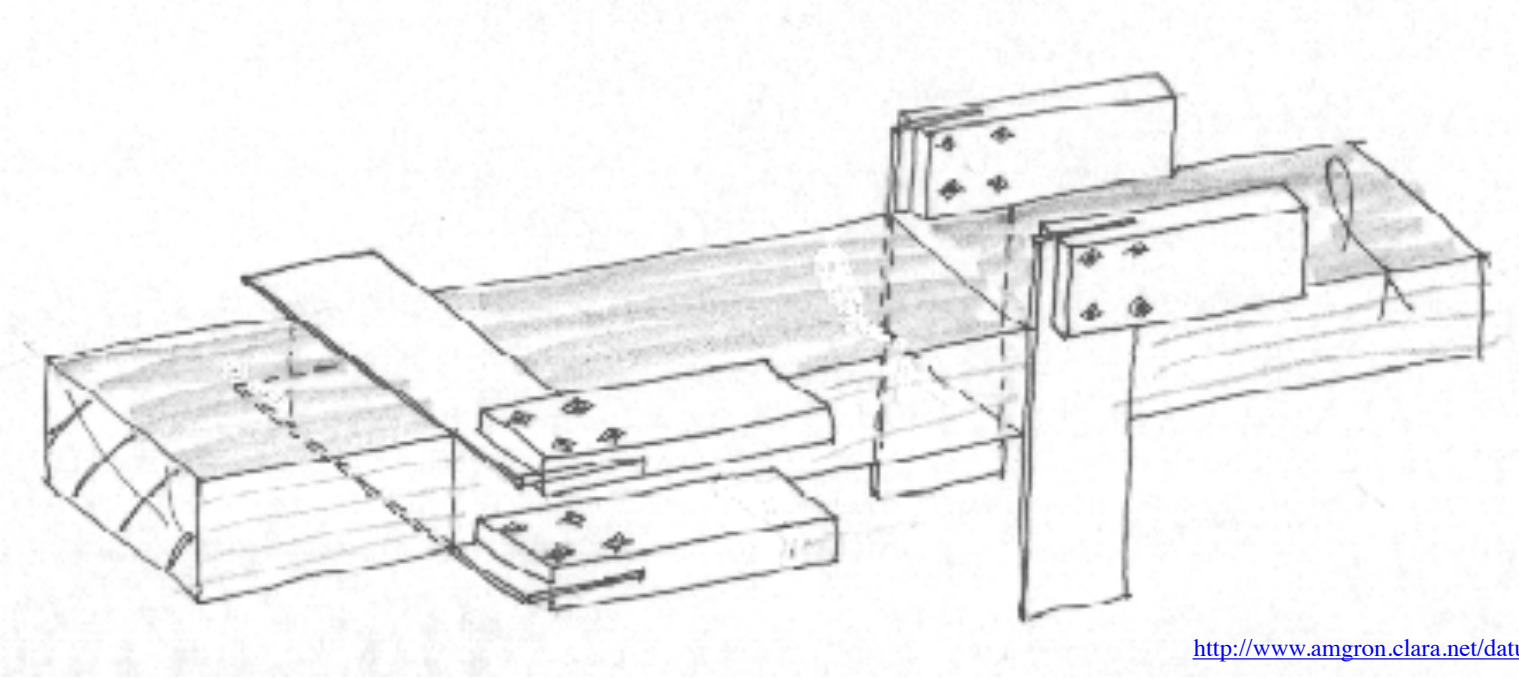
- **E.g. drill increasing sized co-axial holes**

Same operation on multiple parts gives precise alignment, e.g. cutting or drilling multiple pieces

Use guides and stops for reproducibility

Squareness





http://www.amgron.clara.net/datum%20marks%203.html

Milling

1. Flatten one face on jointer

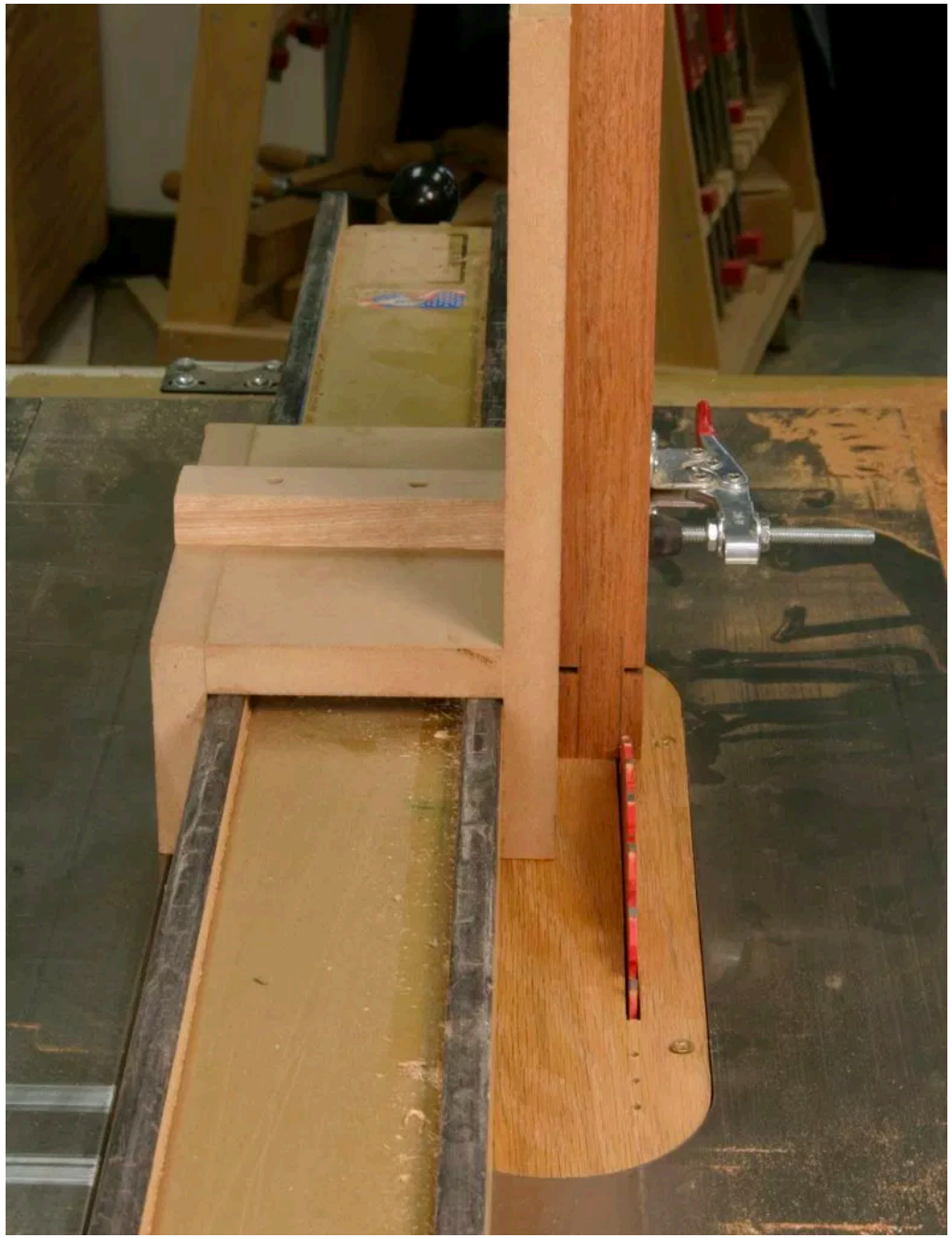
2. Plane second face on the thickness planar

3. Square one edge on the jointer

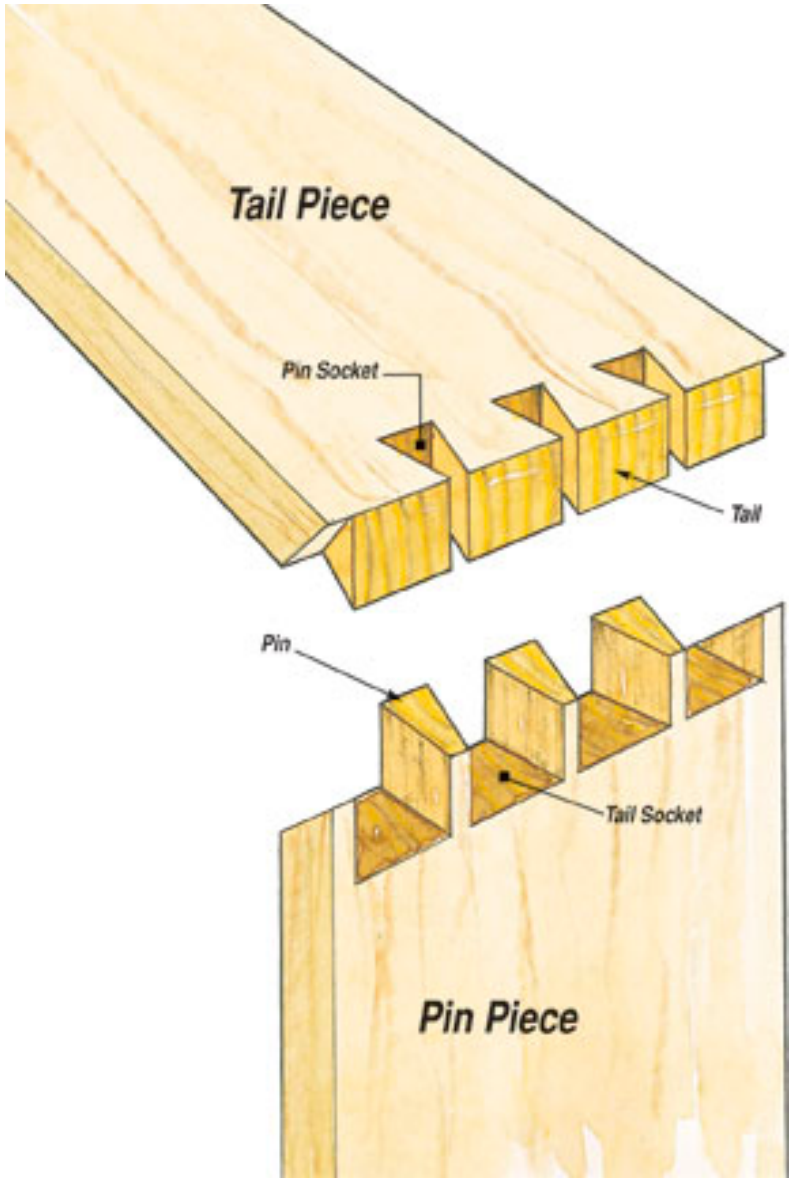
4. Square second edge on the table saw

5. Cut to length

Centered Tenon or Groove



Dovetail Joint



First cut tails

Mark matching pins

https://www.woodbywright.com/blog/the-simplest-way-to-hand-cut-dovetails

Leigh Dovetail Jig

Readings and Watchings

History of the sewing machine

Interactive machines

- **The Wise Chisel**
- **Interactive Fabrication: New Interfaces for Digital Fabrication**
- **Interactive Construction: Interactive Fabricationof Functional Mechanical Devices**

Projects

Schedule change

Project proposal

Project github repo

Team building ...