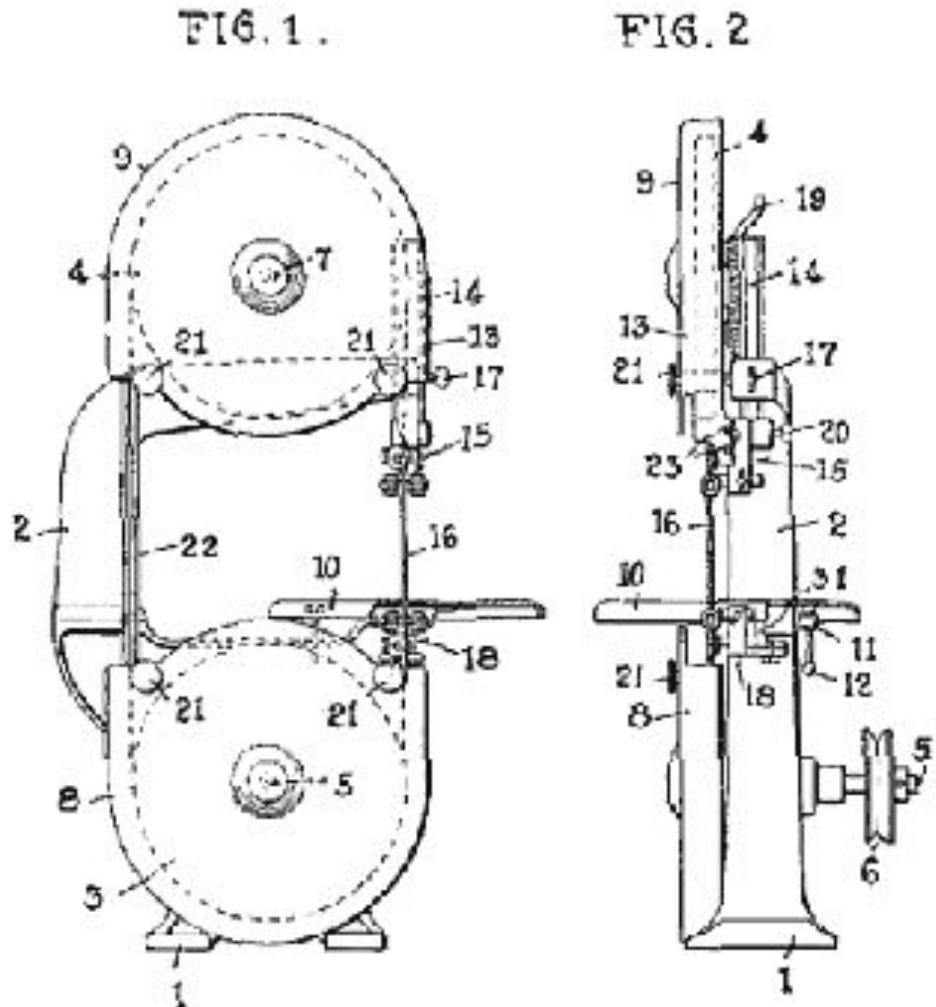


# The Band Saw

Powered saws are more efficient requiring less skill to operate. This makes band saws ideal for fast and cheap manufacturing.

A sketch from a 1933 patent document shows that the bandsaw is a steel band with saw teeth around two pulley wheels with one main function.... to cut circular patterns.



1840's

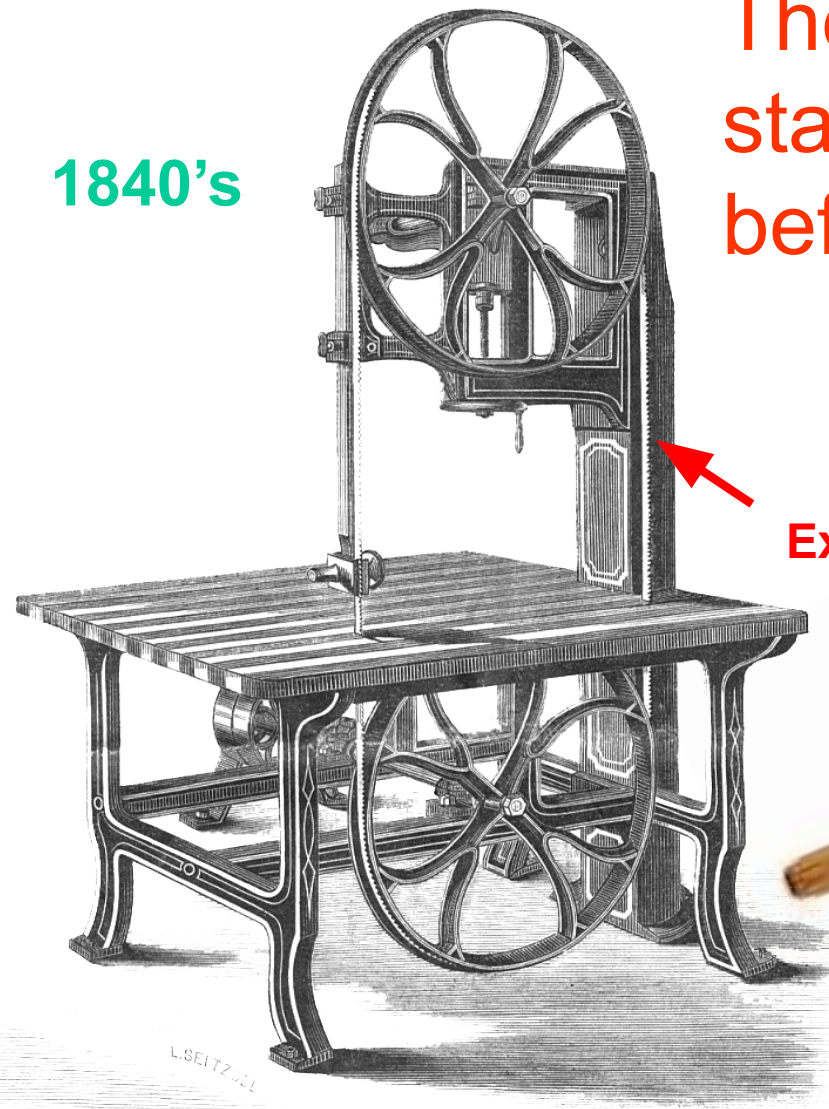
The power bandsaw actually started out more than 100 yrs. before that patent.

Everything used to be tediously cut with hand tools.

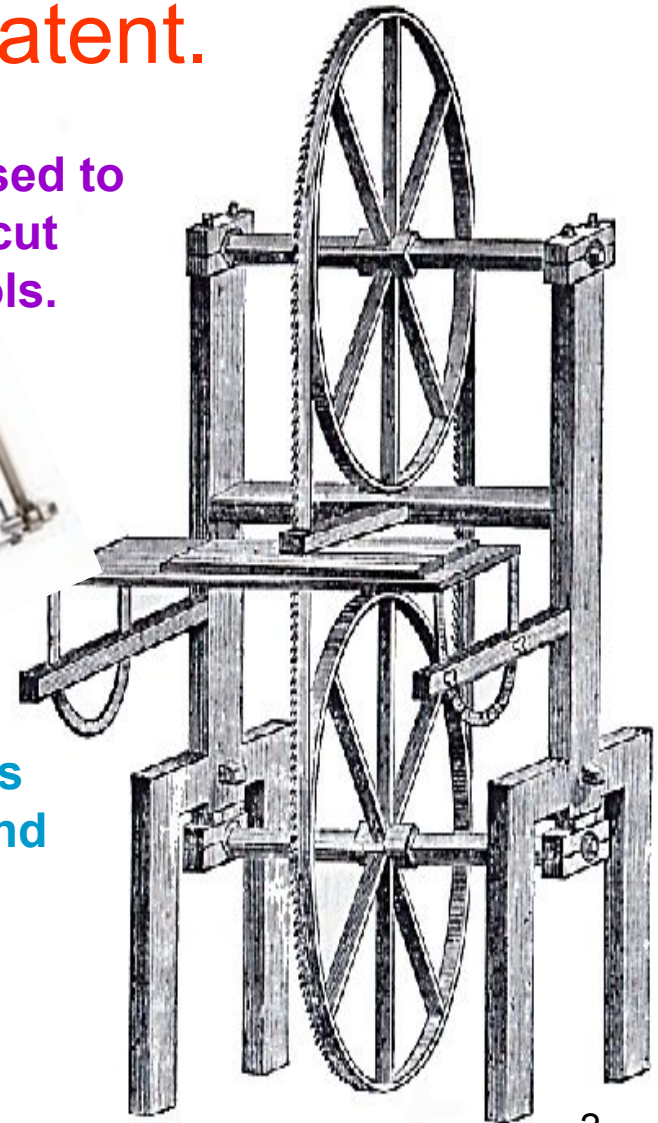
Exposed blade

This 1808 sketch shows a definite band sawing machine.

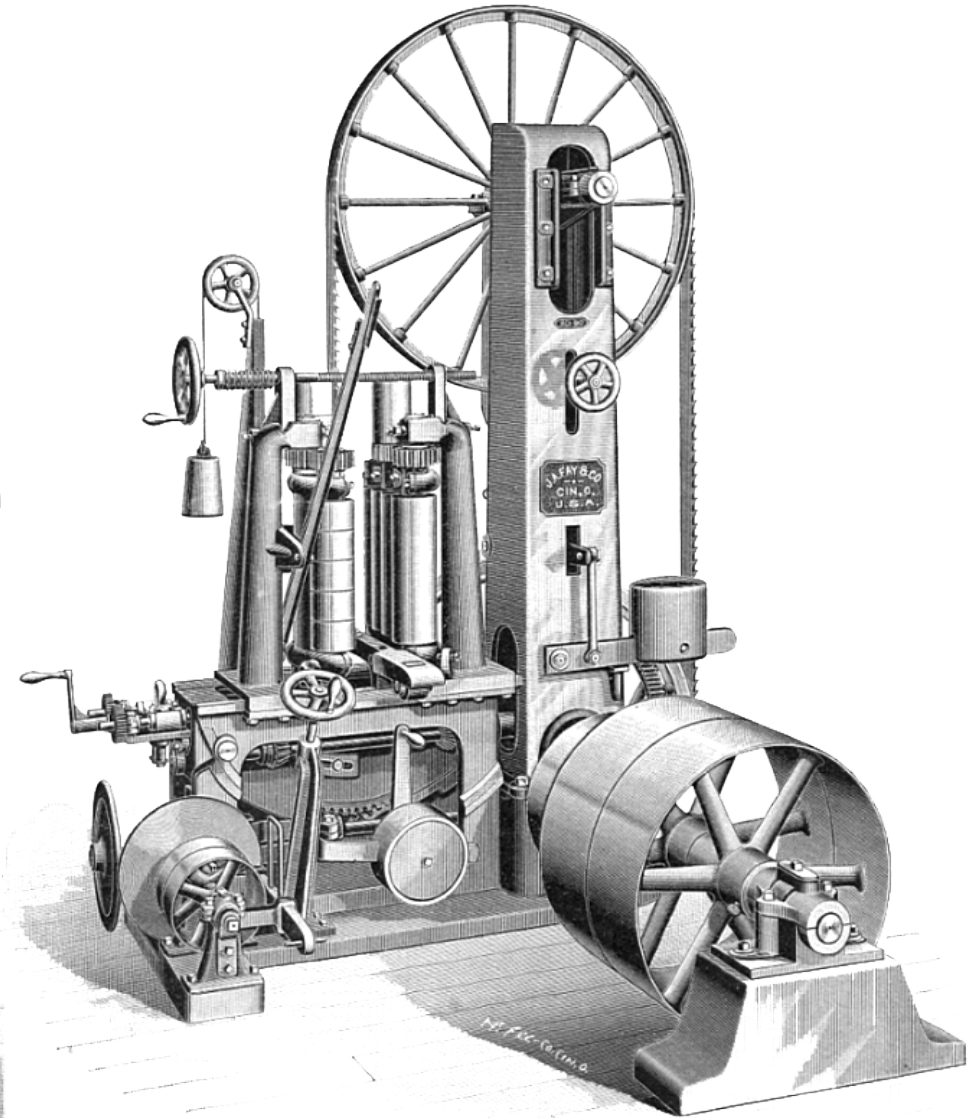
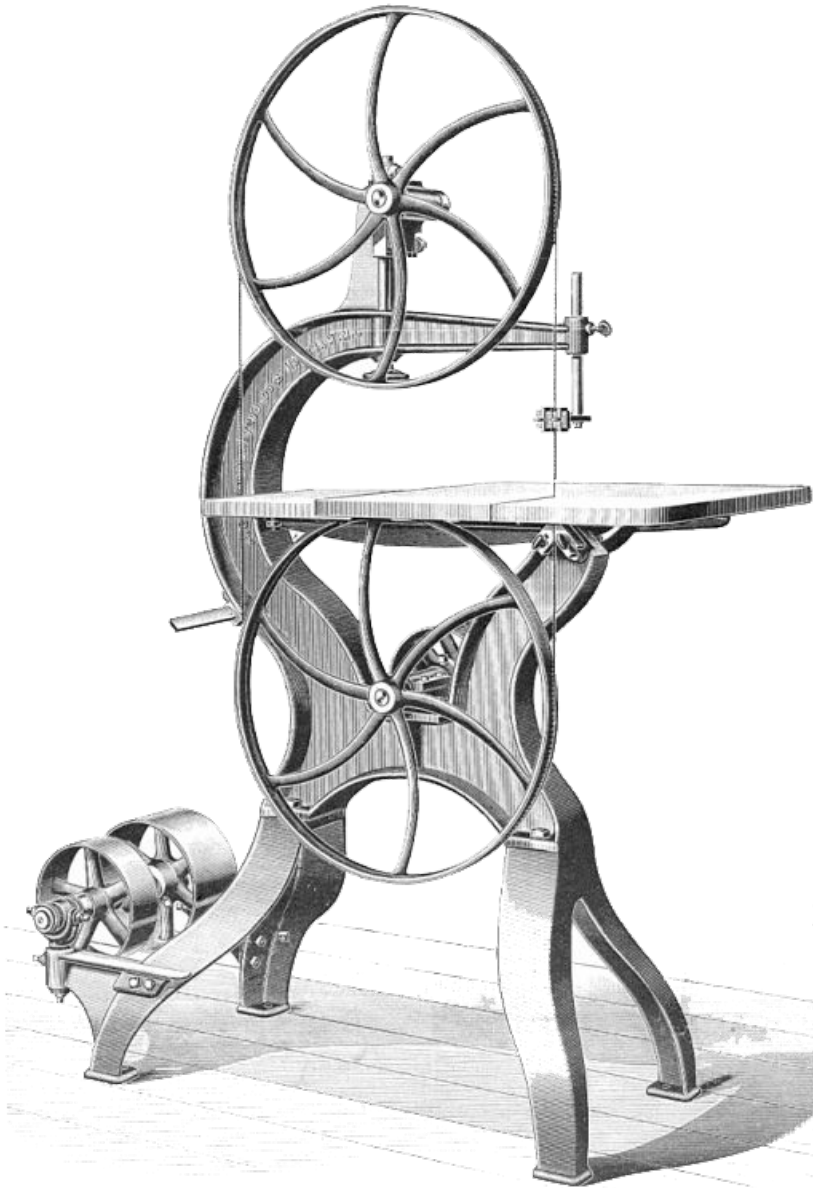
It is obvious that safety was not a major consideration in any of the early machines. This was a catastrophe waiting to happen.



FIRST & PRYIBIL'S PATENT BAND SAW.



# 1850's steam powered



BAND RE SAWING MACHINE.

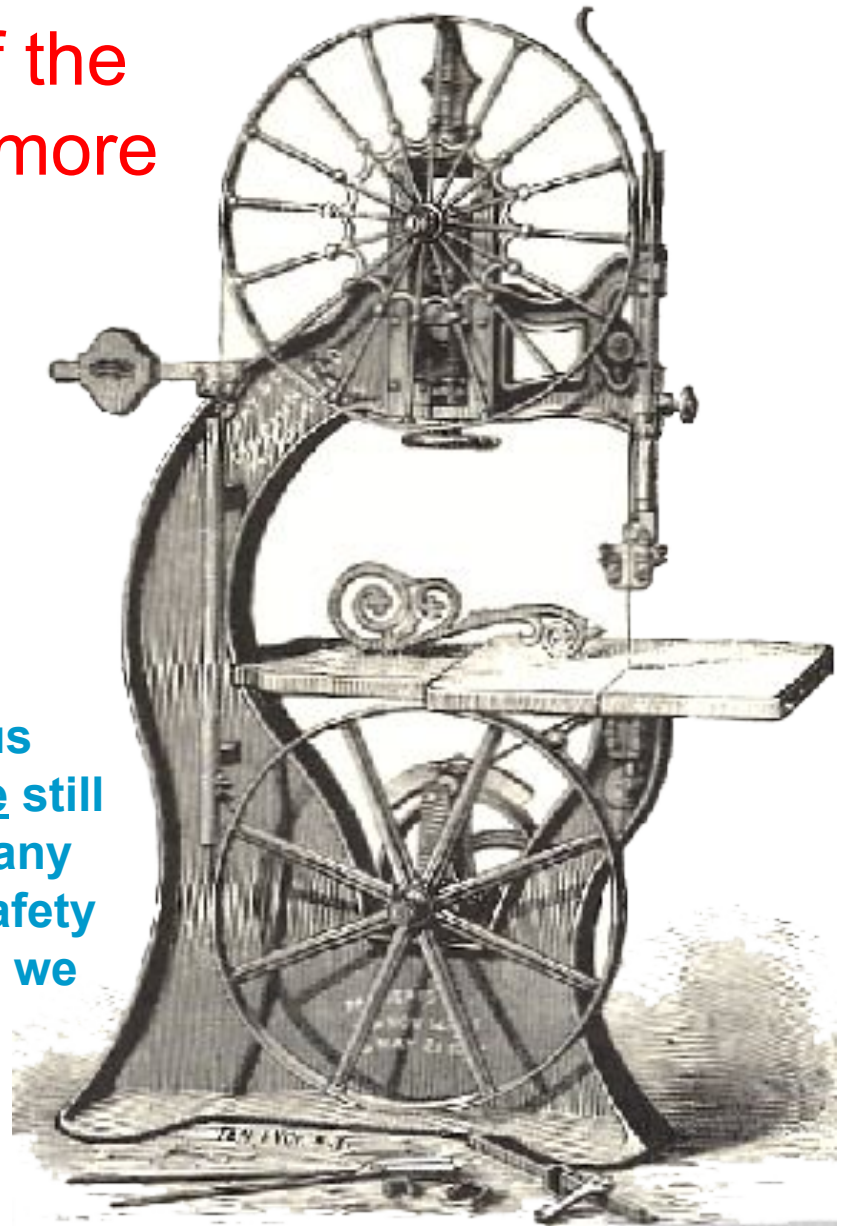


By 1878 the only noticeable additions were in the Victorian styling of the machine. What makes it look more beautiful seemed to take precedent... but there does seem to be a limited blade guard on the return (left) side.

**J. A. FAY & CO.** CINCINNATI, OHIO, U.S.A.  
BUILDERS OF IMPROVED  
**WOOD-WORKING MACHINERY**  
Embraces nearly 400 Machines for  
**PLANING & MATCHING**  
Surfacing, Moulding, Tenoning, Mortising, Boring, and Shaping, etc.  
Variety and Universal  
**WOOD WORKERS.**  
Band, Scroll and Circular Saws, Resawing Machines, Spoke and Wheel Machinery, Shafting, Pulleys, etc.  
All of the highest standard of excellence.  
W. H. DOANE, Pres. D. L. LYON, Sec'y.

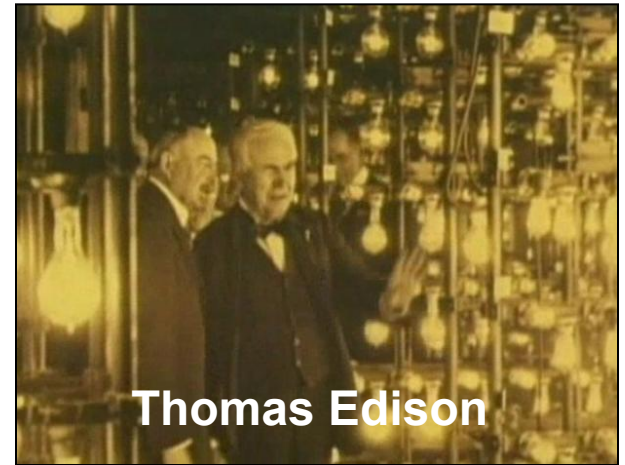


This gorgeous machine still lacks many of the safety features we take for granted today.



By 1900, little had changed except maybe electricity and the removal of the Victorian gingerbread.

Thanks in large part to Edison Electric Company, electricity was in full scale use.

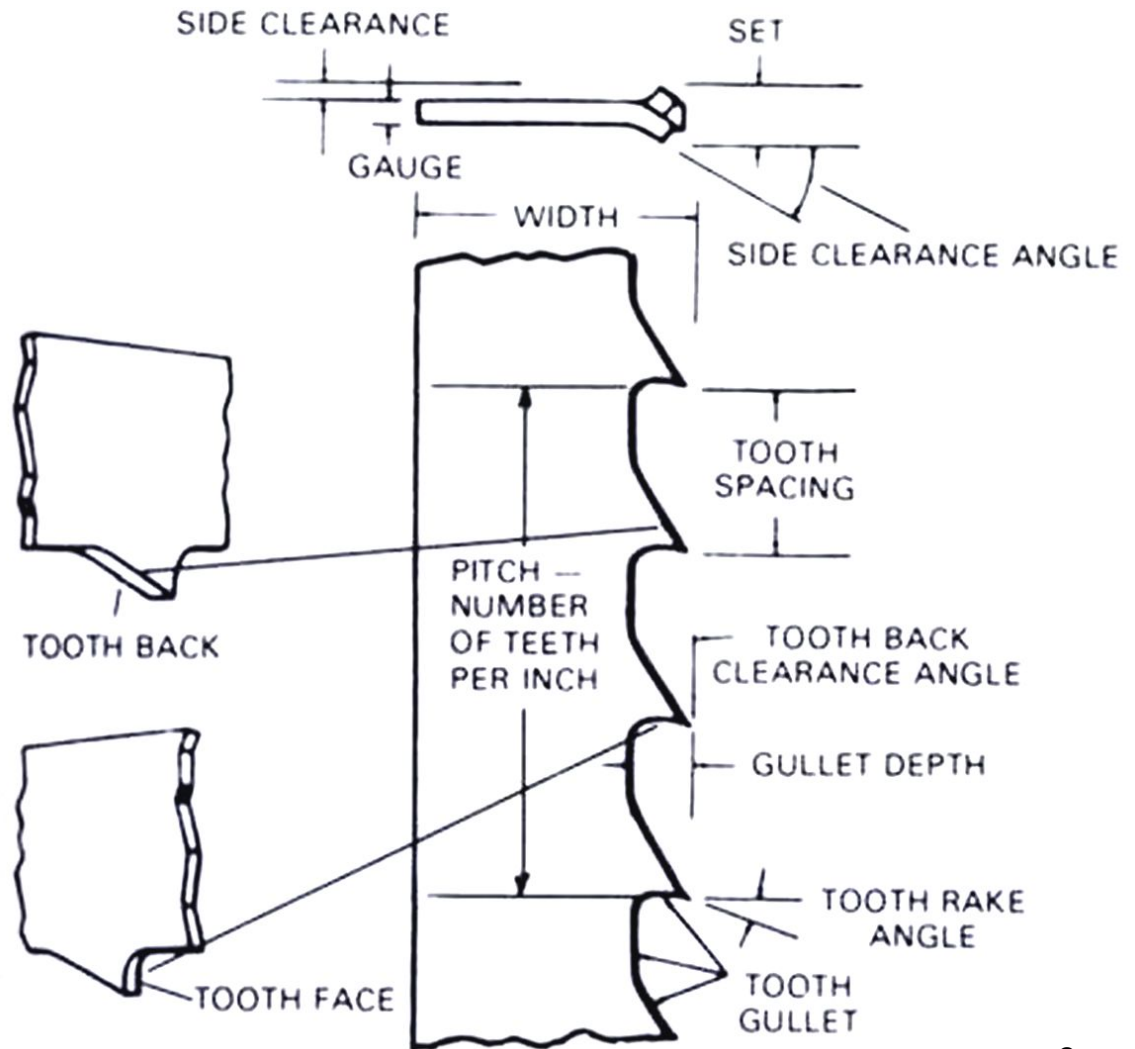


Forget the guarding situation for a moment... let's talk about keeping work spaces clean. How about this turn of the century shop?



# Let's talk teeth...

Crosscut teeth are set (bent alternately side to side) and band saws leave a thinner kerf (space) than other saw teeth.





# Don't these bandsaw blades look harmless?

Regular Tooth



Skip Tooth

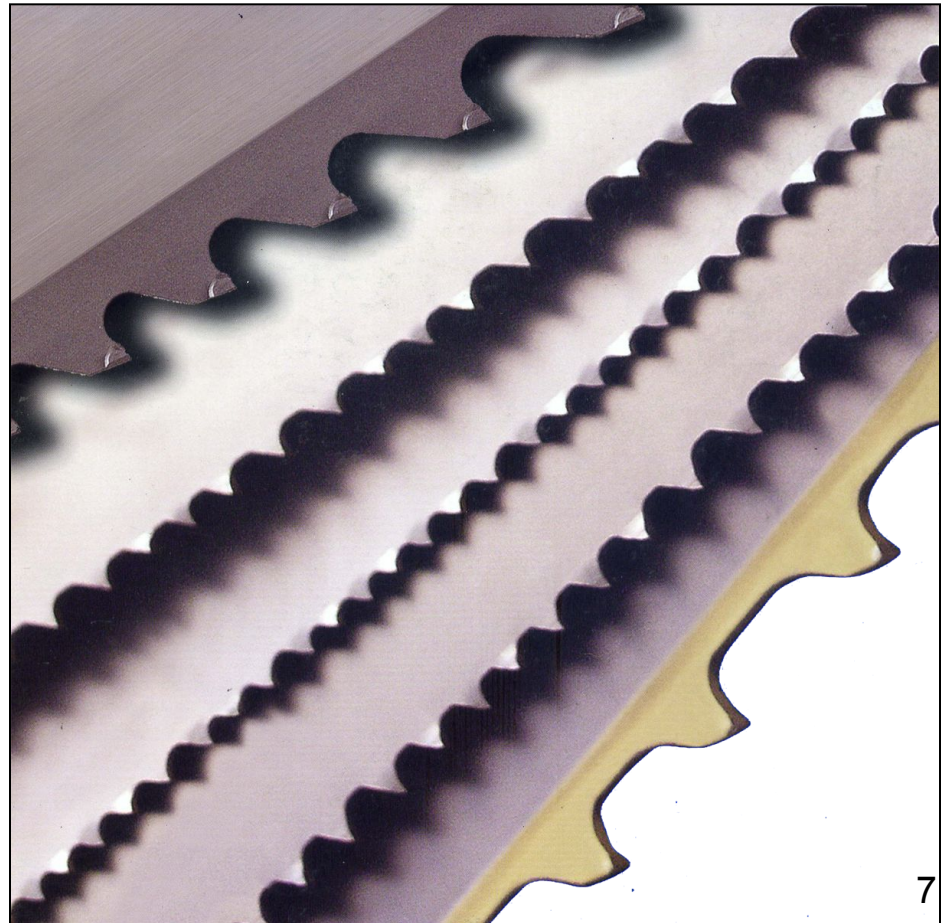


Hook Tooth



**Band saw teeth  
are designed to  
cut efficiently!**

**Forget the fact  
that butchers  
use these to cut  
up meat...**



# This guy was kind enough to post his bandsaw injury on the Internet so others could learn from his mistake.

The perfect case for the 4" safety margin and also for using guards. Look closely and you can see where in a split second, he nearly cut through the bone.

Bandsaw Injury 2004/11/28



T + 3 hr



T + 17 days



T + 2.3 yr

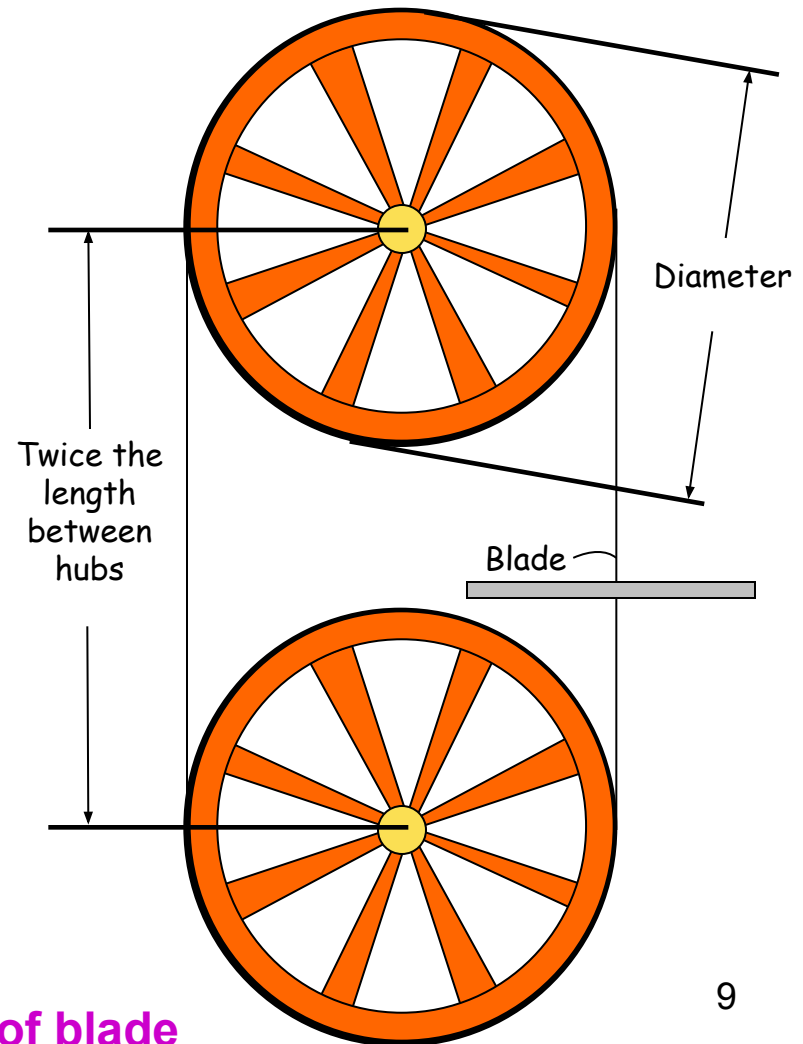
## There are almost 4000 reported (and usually avoidable) injuries each year.



# Calculate the Length of a Bandsaw Blade.

$\pi$  (3.14) x diameter of wheel equals the wheel circumference, added to twice the length between hub centers, equals the bandsaw length.

1. Find the wheel circumference using  $\pi$  (3.14)
2.  $3.14 \times d$  (diameter) = circumference
3. Measure the distance between hubs
4. Multiply that distance times 2
5. Add that to the circumference
6. The result is blade length



## Formula

$$\pi d + 2(\text{distance between hubs}) = \text{Length of blade}$$

Now... back to that  
1930's patent...  
here's the machine.

Sears  
state of  
the art  
model  
for the  
1930's.



Looking a little  
more like today's  
bandsaw, the  
designer Tautz  
knew that the  
future would  
demand safer  
equipment.



# Safety Rules.

1. **Wear safety glasses.**
2. **Make all adjustments with the machine at a dead stop.**
3. **The top guide should be as close to the work as possible, at least 1/8".**
4. **Allow the machine to reach full speed before beginning a cut.**
5. **Plan your cutting to avoid backing out of a kerf.**
6. **Feed the material at a moderate rate.**
7. **Keep a 4" safety margin.**



8. Make relief cuts to avoid pinching the blade.
9. Stock should be flat on one side. Use a V- block when cutting round stock.
10. Have the teacher check special setups, angle cuts & resawing operations.
11. If the blade hangs up or breaks, turn off the machine and tell the teacher.
12. When finished, shut off machine and let it come to a stop before cleaning.
13. Clean up the surrounding area.

# The Guide Assembly

Nomenclature

**Guard  
removed  
for clarity!**

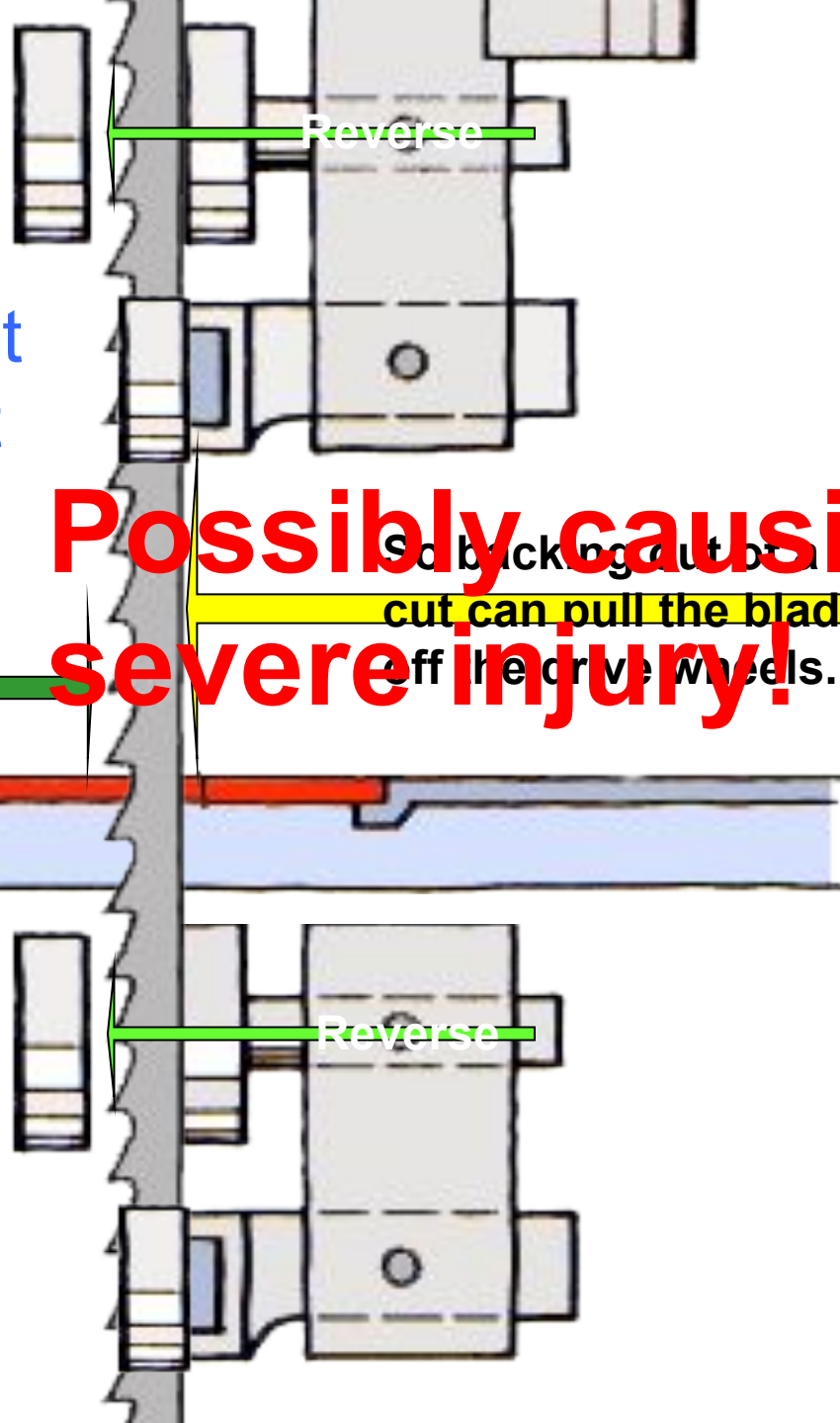
There is really no way to provide *reverse* thrust bearings at the front of the blade since it would interfere with the teeth.

THrust DIRECTION

**Possibly causing severe injury!**

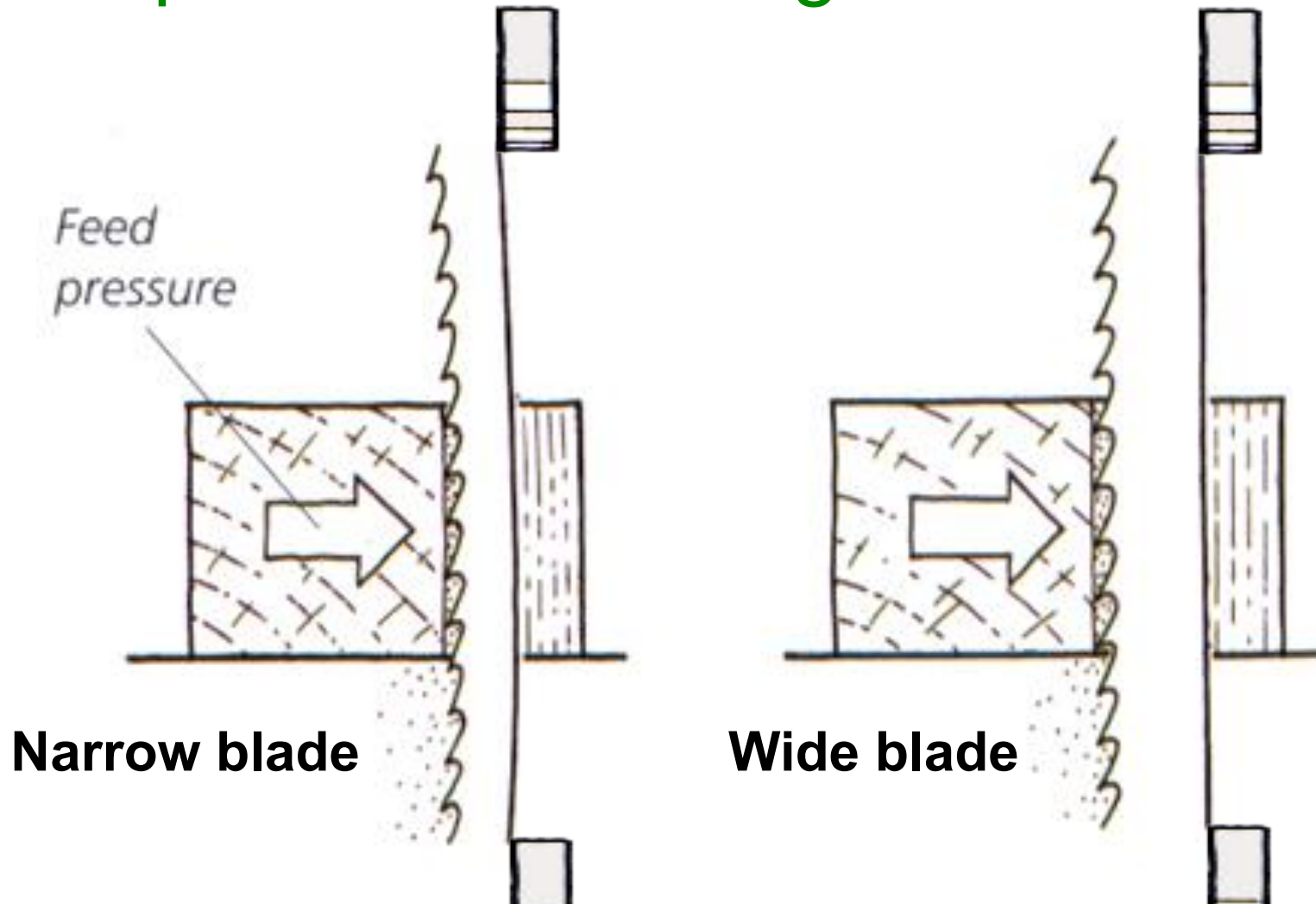
So backing out of a cut can pull the blade off the drive wheels.

**Be careful backing out of cuts!**



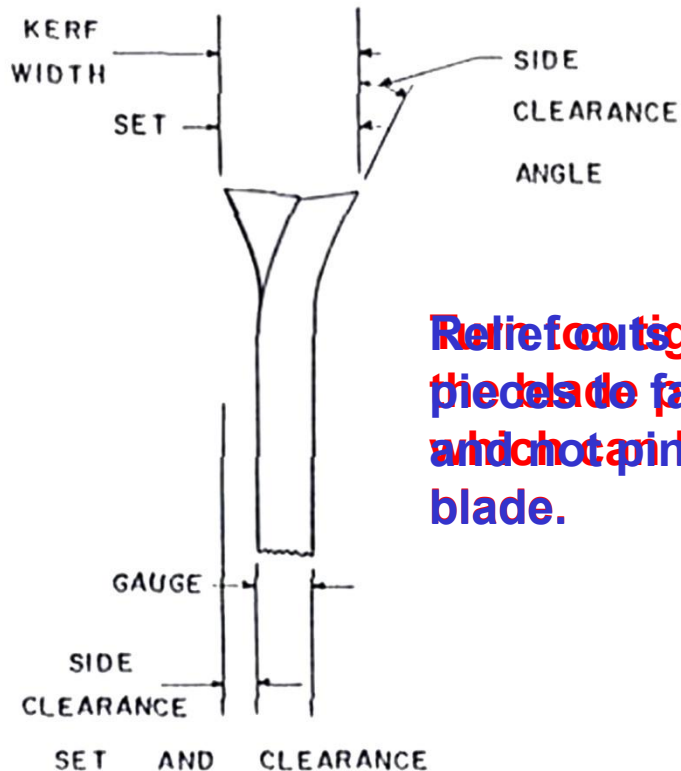


Even with good thrust bearing placement, narrow blades can give and bend. Wider blades don't turn corners as well, but they hold up better in the long run.

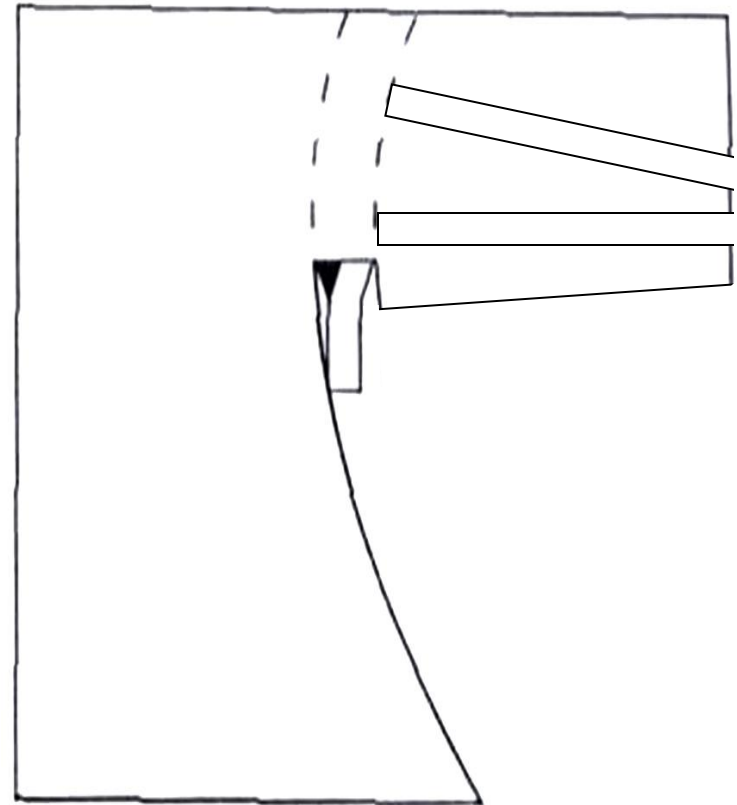


# Make relief cuts to avoid pinching the blade.

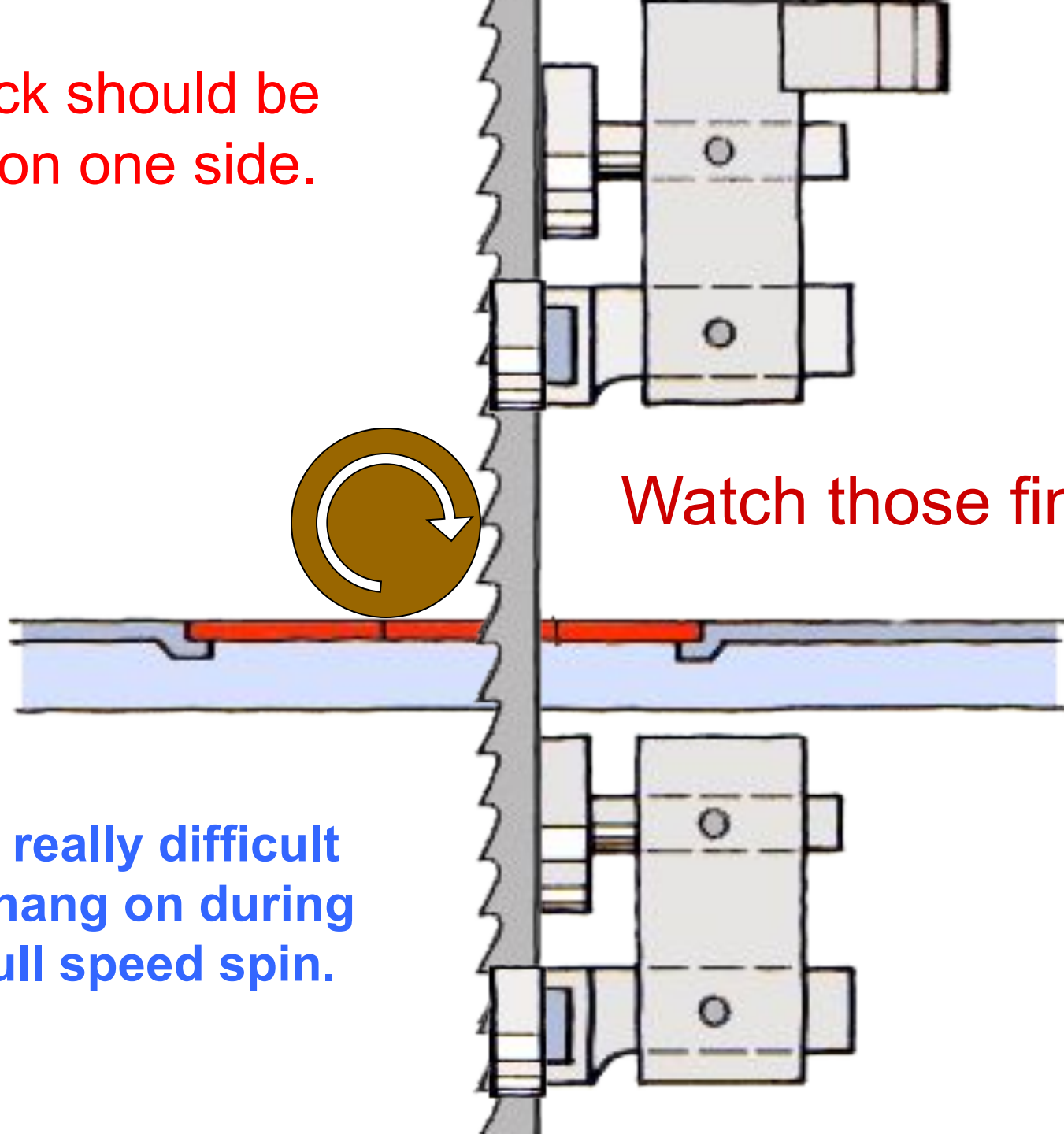
The set and side clearance determines how tight a turn a bandsaw blade can make.



Relief cuts allow  
pieces to fall away  
and not pinch the  
blade.



Stock should be  
flat on one side.

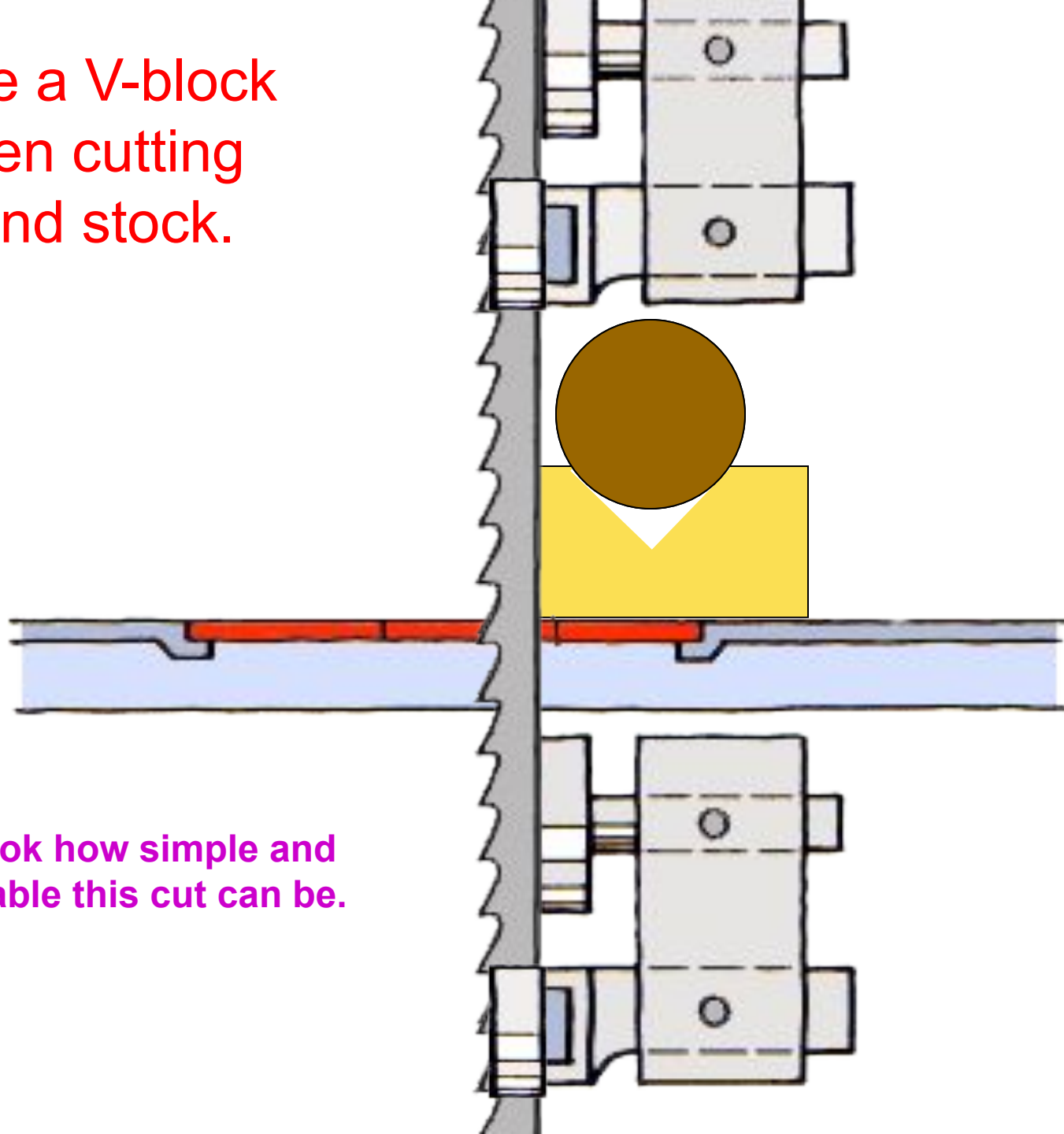


Watch those fingers!

It's really difficult  
to hang on during  
a full speed spin.



Use a V-block  
when cutting  
round stock.



Look how simple and  
stable this cut can be.

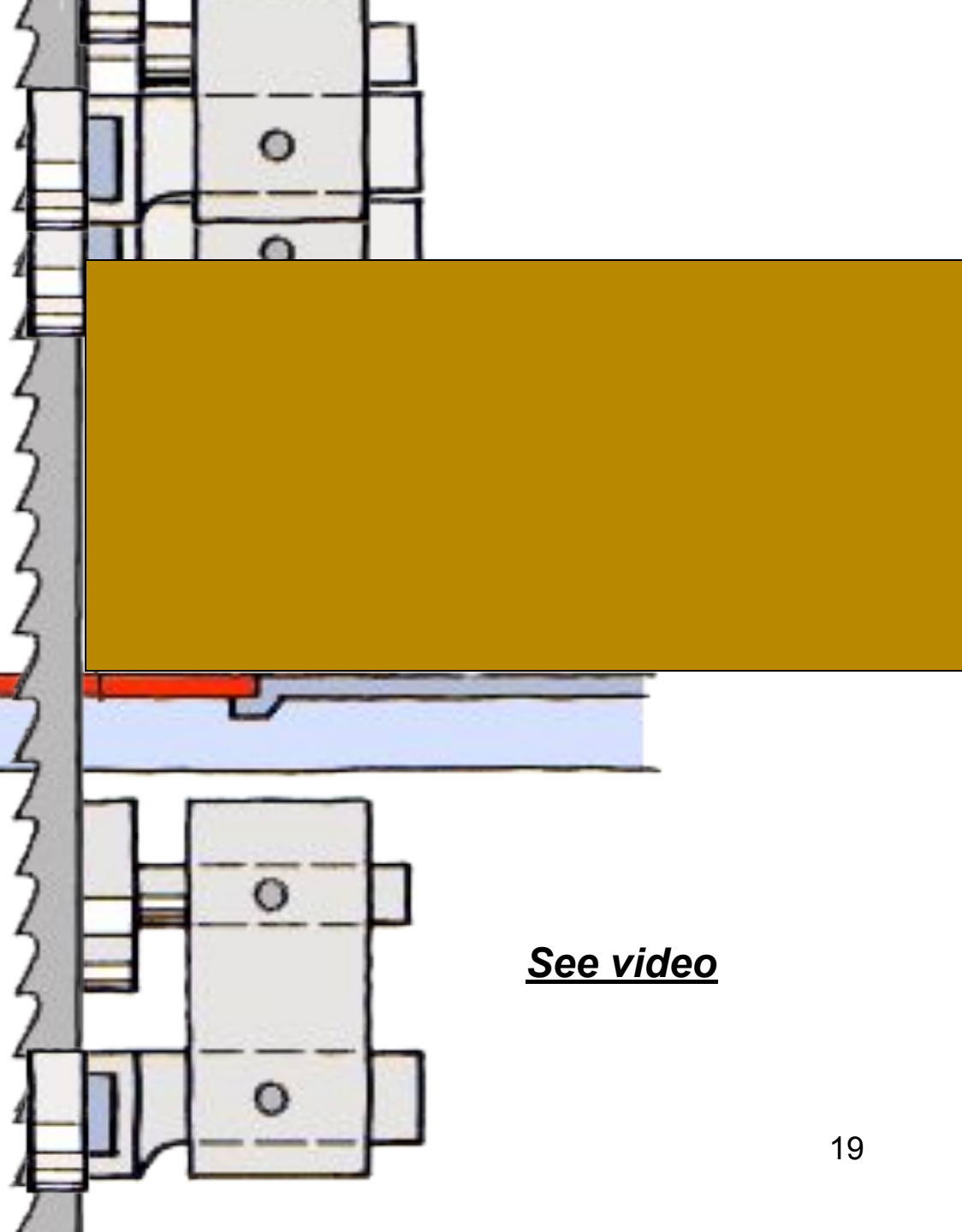
# Re-sawing

Raise the top  
guide and  
stand the  
stock up on  
edge ...

Resawing blade physics

... to make  
thinner pieces  
Choosing a blade  
from thick  
stock.

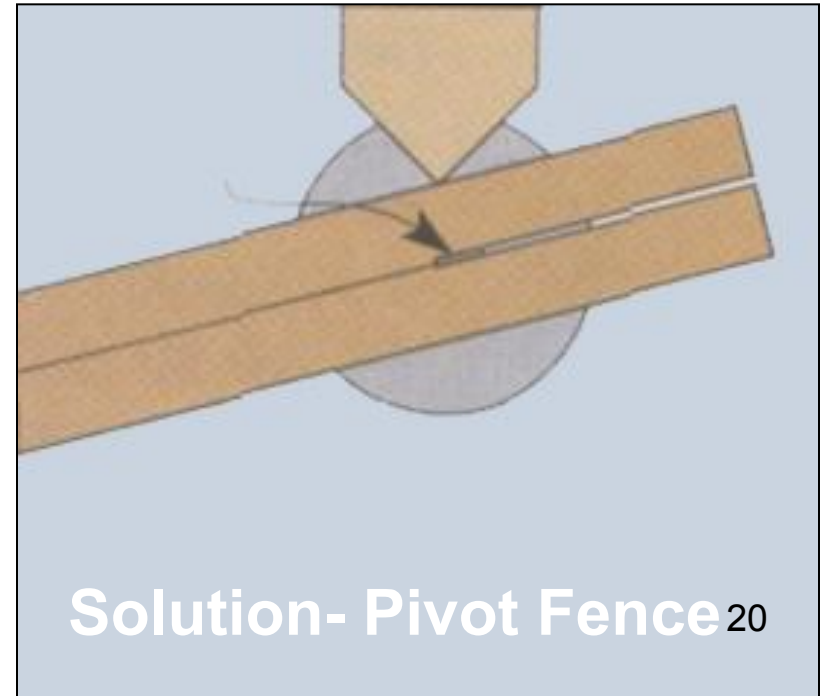
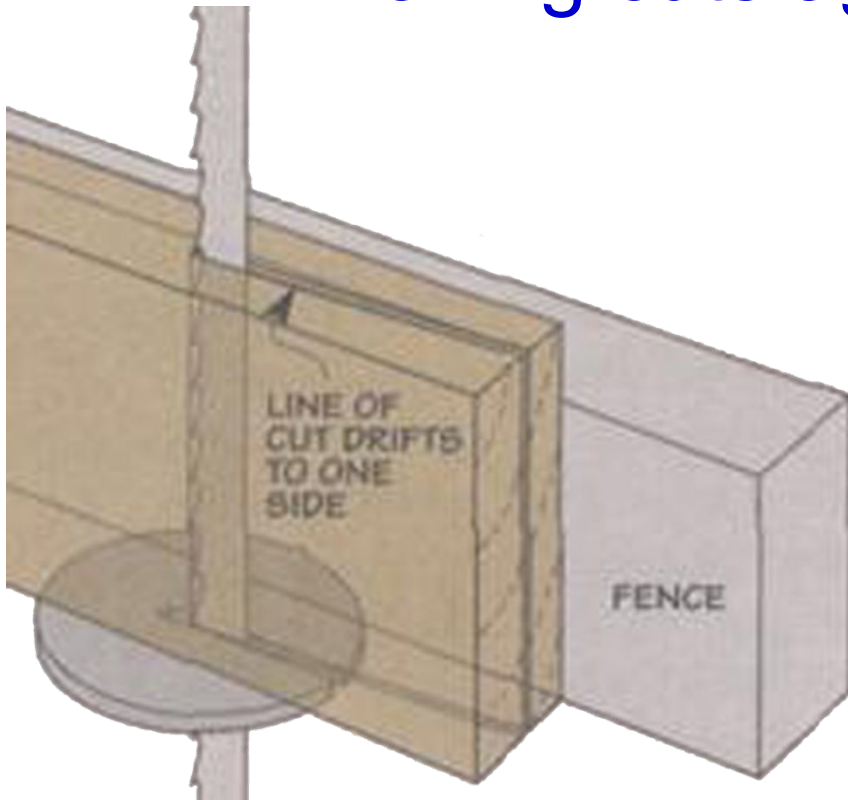
See video



# Troubleshooting

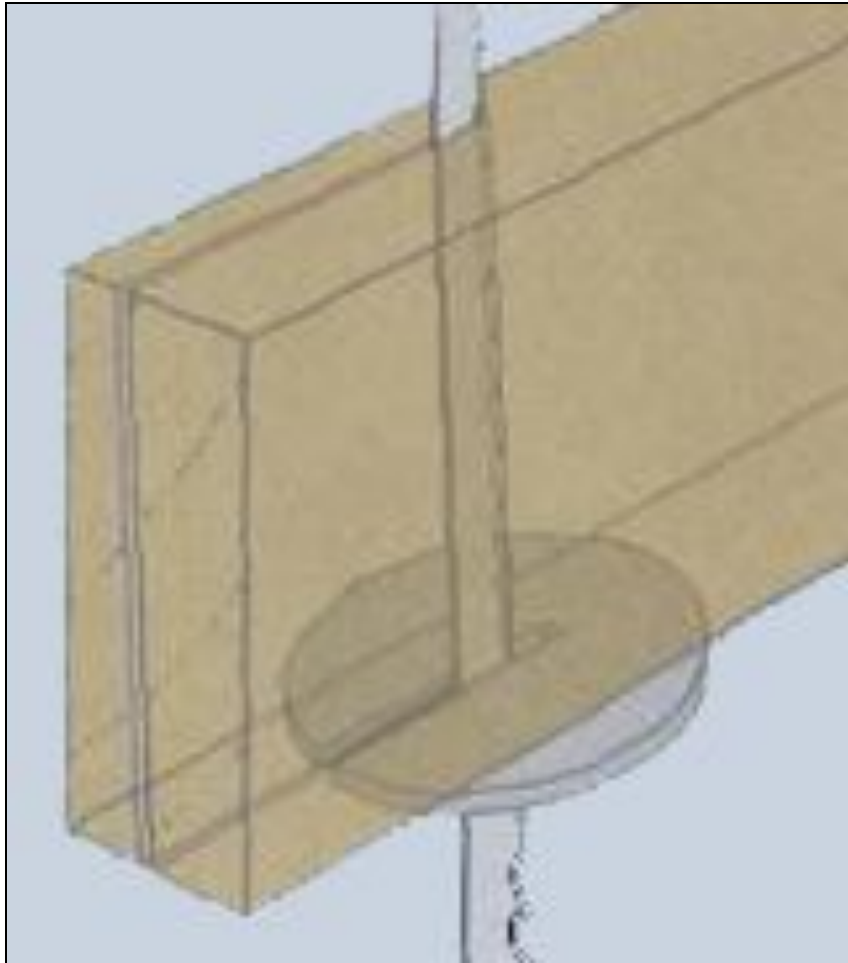
## Problem- Blade Drift

The blade drifts off course when making cuts against a straight fence.



# Troubleshooting

## Problem- Angled Cuts



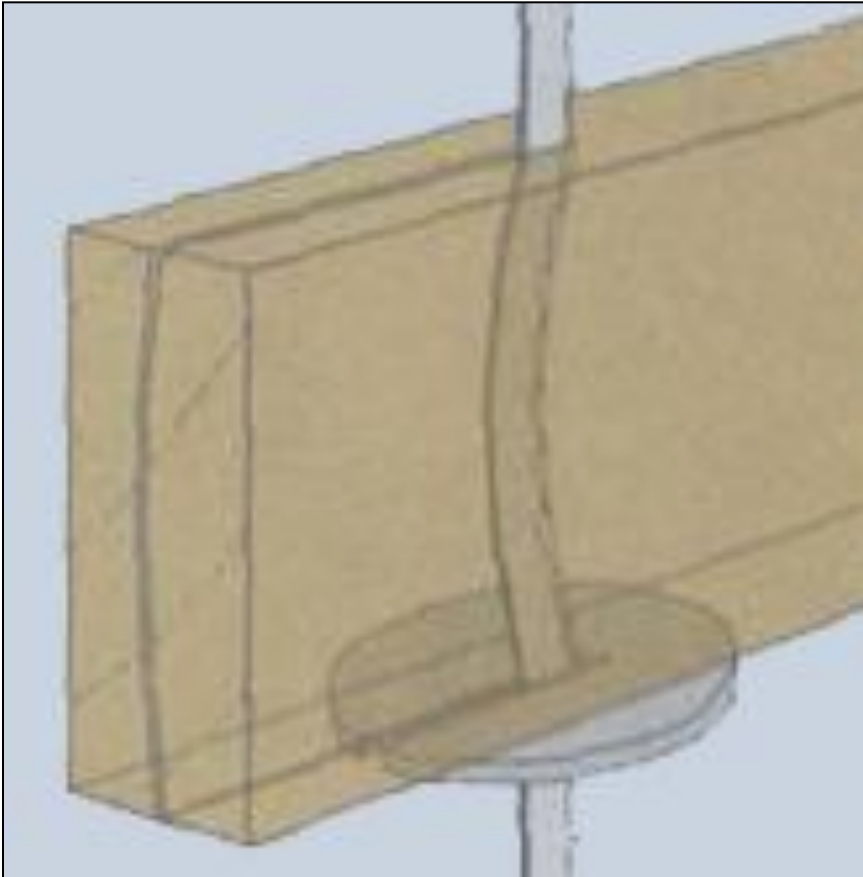
The blade doesn't cut perpendicular.

Solution- Table is at a tilt. Straighten out the table to correct the problem.



# Troubleshooting

## Problem- Barrel Cut



The blade bends and makes a curved cut.

Solution- The blade may be worn and loose. Replace and or tighten the blade tension to correct the problem.

Adhere to lockout /tagout rules and procedures

Malfunctioning  
machines  
must be taken  
out of service  
and not be  
used.

DO NOT USE any  
machine that has a  
locked switch with a  
DO NOT OPERATE  
tag on it.



## ***Copy down the vocabulary words from this slideshow...***

***Personal protective equipment-*** protective equipment including eye & ear protection, v-blocks, push sticks, machine guards, first aid kits and eye wash stations.

***Clutter-*** items left in unsafe disarray within a workspace.

***Kerf-*** space left as a saw blade cuts, band saws usually have a thin kerf.

***Hub-*** the center of a wheel.

***Top guide-*** upper guide that keeps the blade from drifting.

***Relief cuts-*** misc cuts in the waste side that allow excess waste wood to fall away keeping a blade free from pinching or binding in a cut.

***Stock-*** material being used, usually refers to wood.

***Safety margins & safety zones-*** space between hands and cutters and around machines and other workers for the purpose of safe operation.

***Re-sawing-*** cutting stock that is standing on edge to obtain thinner stock.

***Trust bearings-*** bearings at the rear of the blade (non-tooth side) that provide stability during a cut.

***Lock out Tag out-*** disconnecting and safely locking out the power to malfunctioning machines.

***Horseplay-*** inappropriate & immature reckless behavior, acting with disregard of self and others personal safety.

# The End