Simple Machines

The building blocks of modern technology.

Left click to move forward, right click to exit.

Mention the word technology and most people today think only about computers, but computers are advanced technology.

What about basic technology?

Simple Machines continually impact today's world.

Simple Machines are used to expand technology.

Simple Machines make work easier.

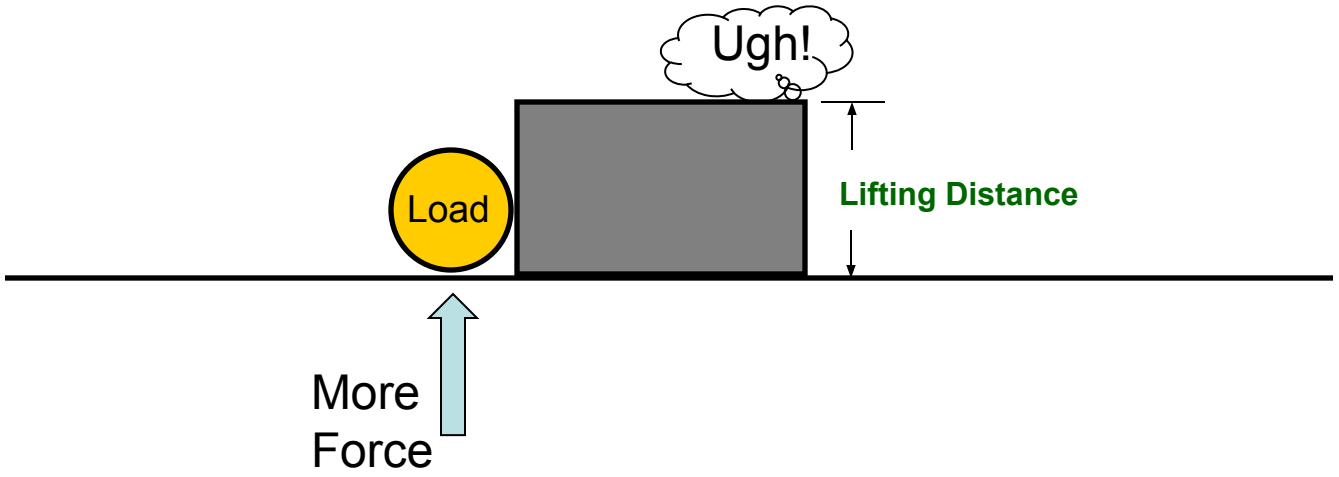
Simple Machines have few or no moving parts.

Simple machines combine to form complex machines.

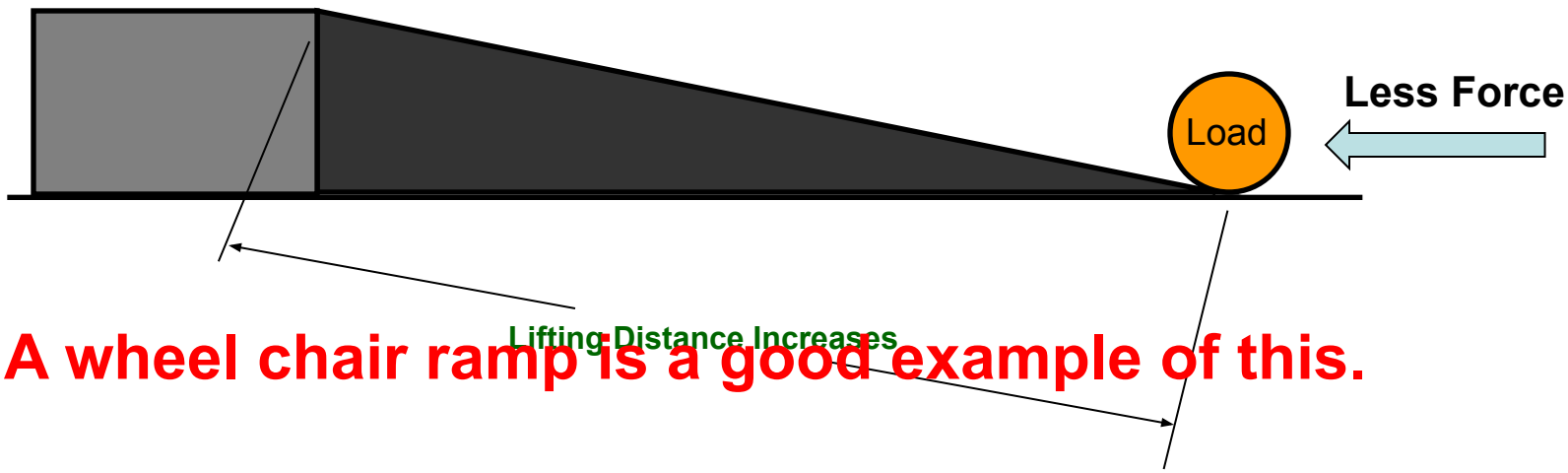
So what are Simple Machines?

The Wedge & Inclined Plane

Without help, a load can be difficult to lift.

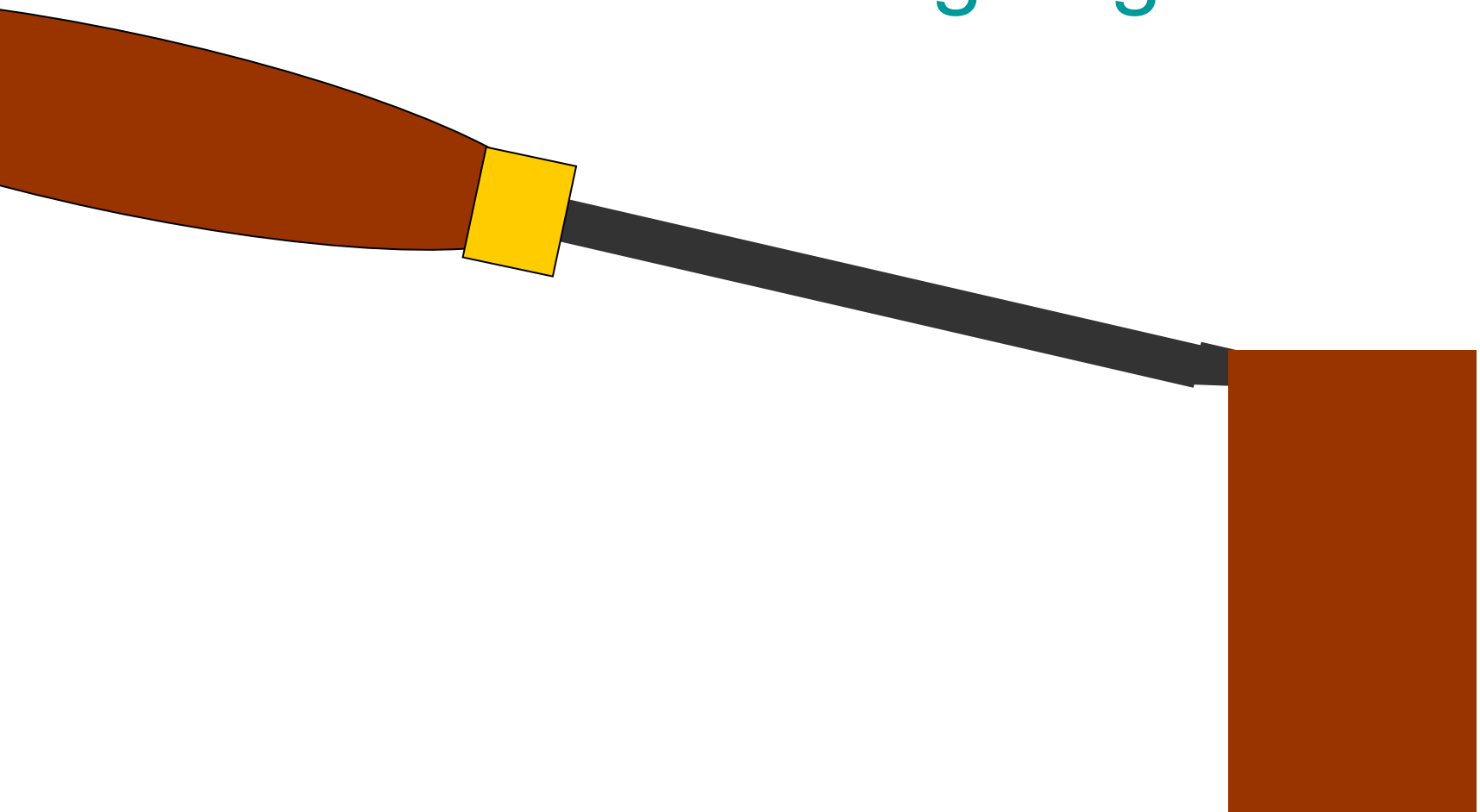


The Inclined Plane makes the load easier to lift.



A wheel chair ramp is a good example of this.

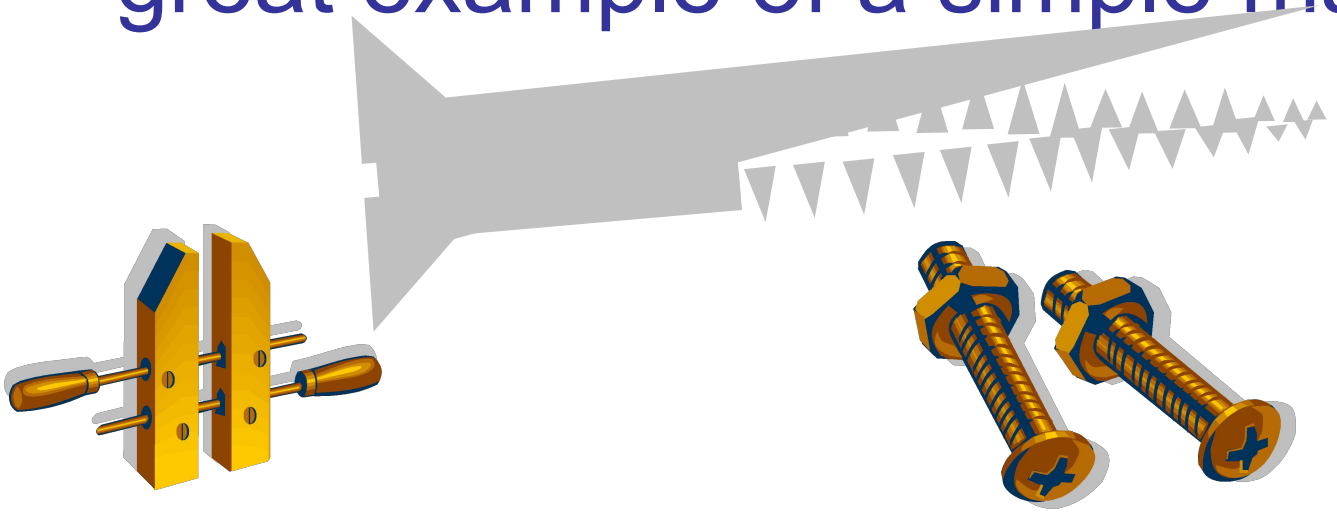
A wedge is also used as a cutting edge.



A good example would be a hand plane, chisel or the teeth on a saw blade.

The Screw

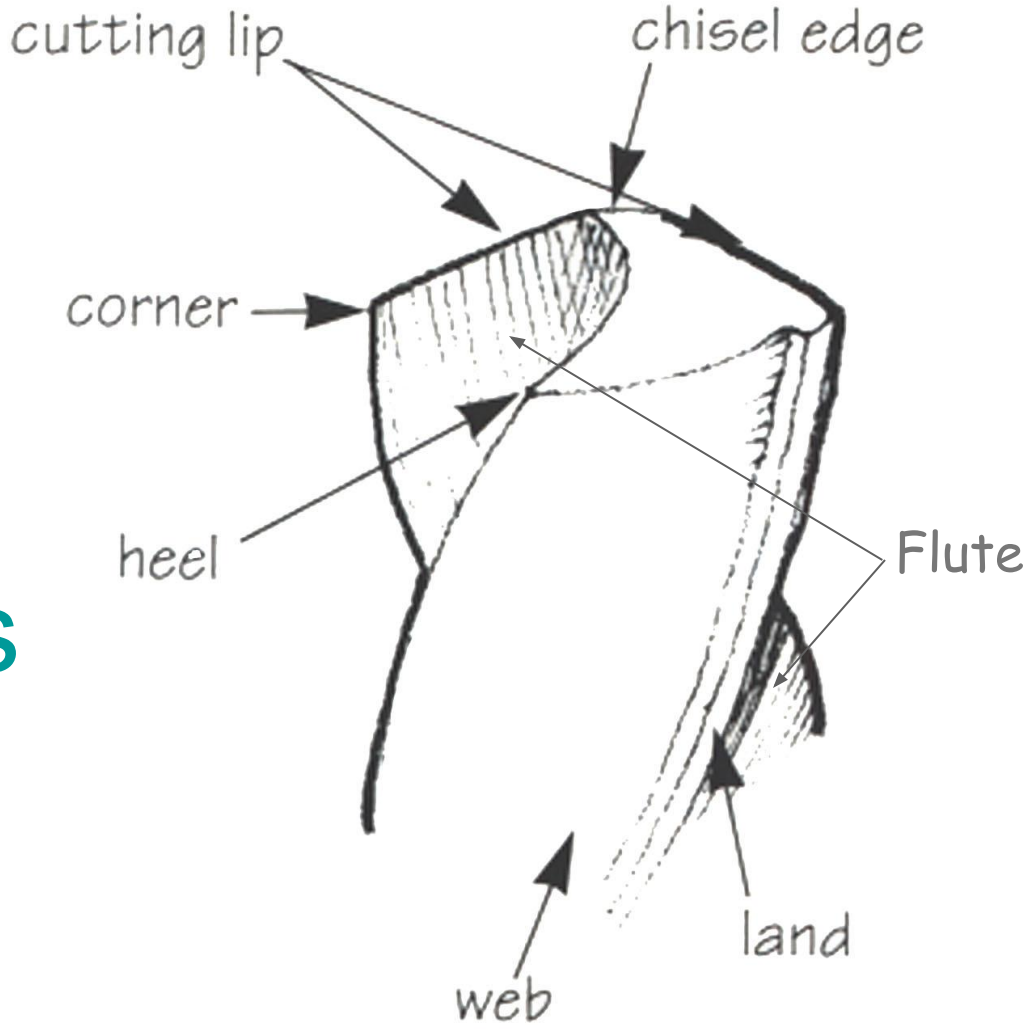
The screw is an inclined plane wrapped around an axle and is a great example of a simple machine.



Click here to learn more about wood screws

The twist drill would be another example.

The flute runs spiral around the bit.



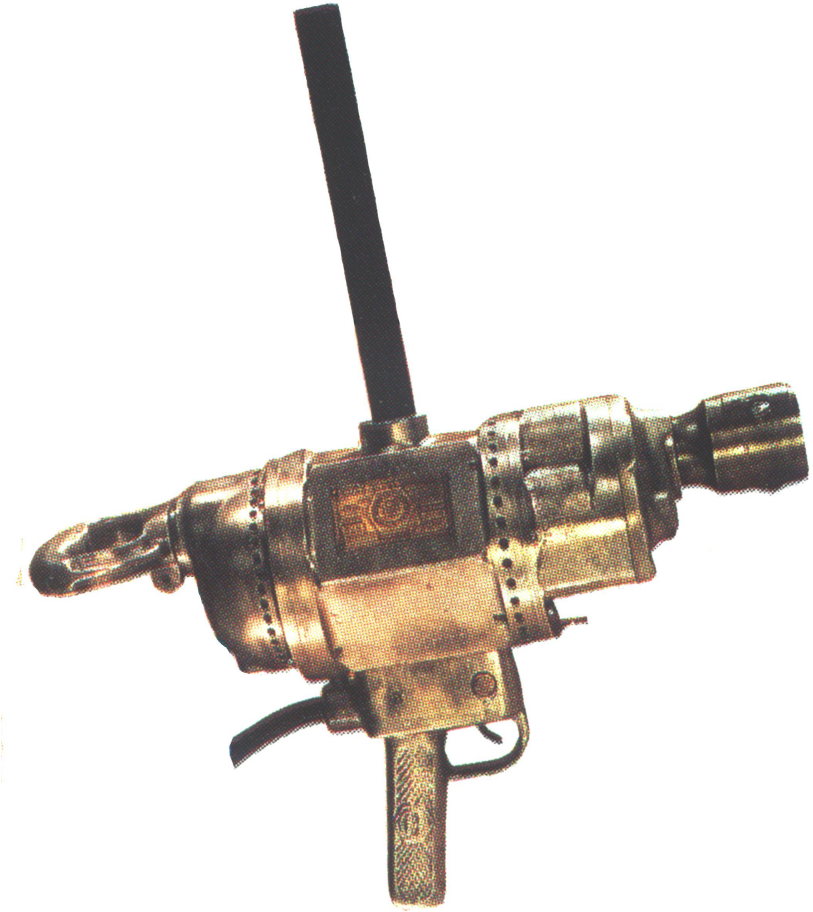
Some Early Hand Drills

Early 1800's Brace
& Straight Bit

Early 1900's Crank Drill
Brace & Bit

Some Early Electric Drills

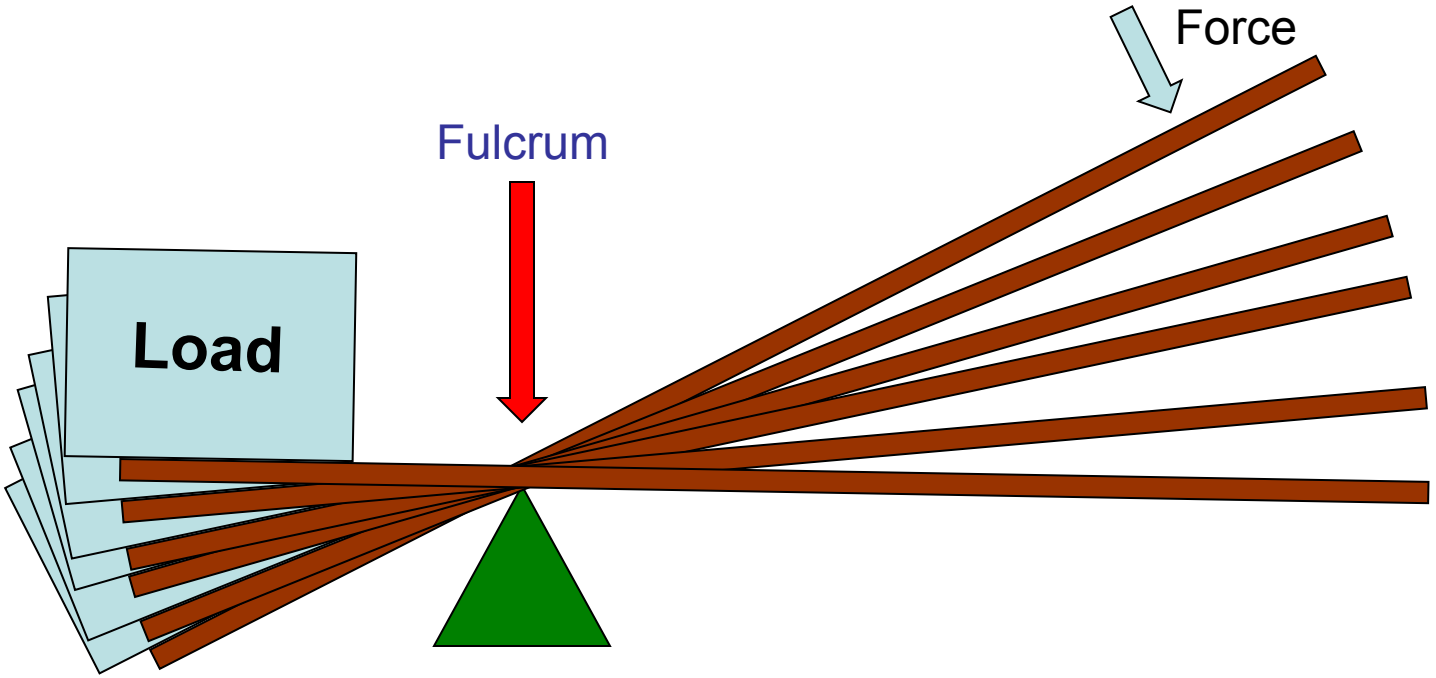
Fein's first electric drill 1895



Black & Decker first pistol grip electric drill 1916

The Lever

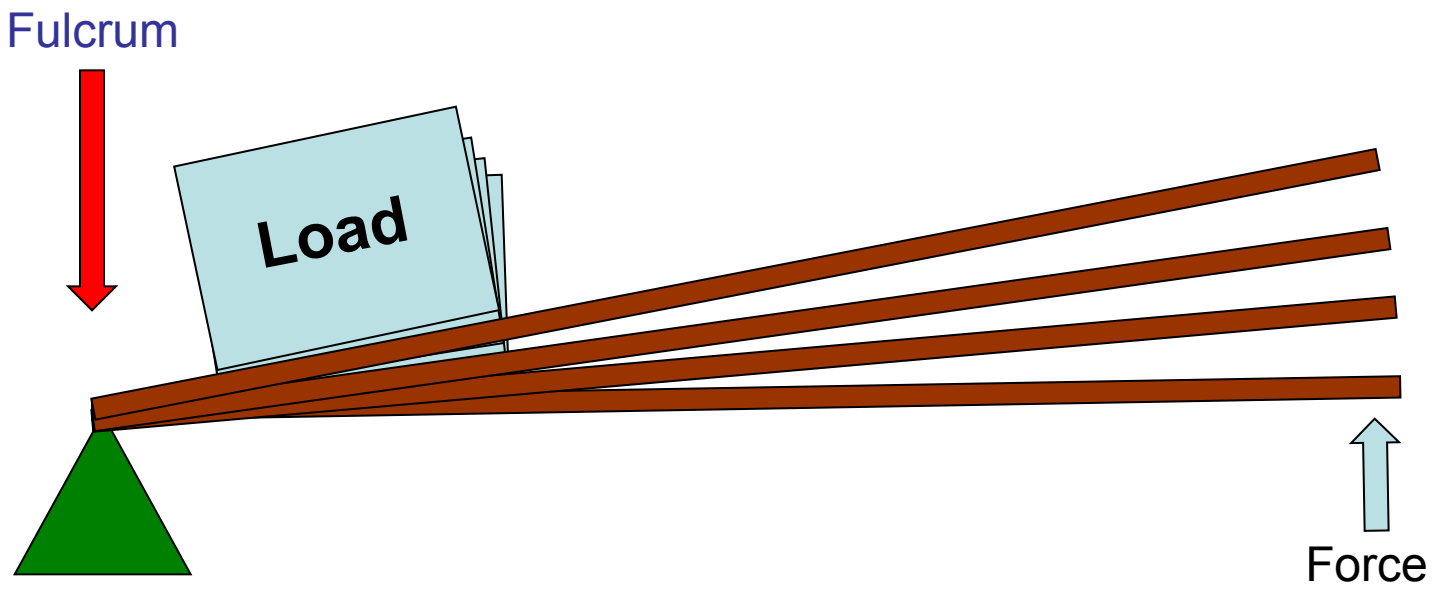
The lever combined with a wedge or pivot point makes the load easier to lift.



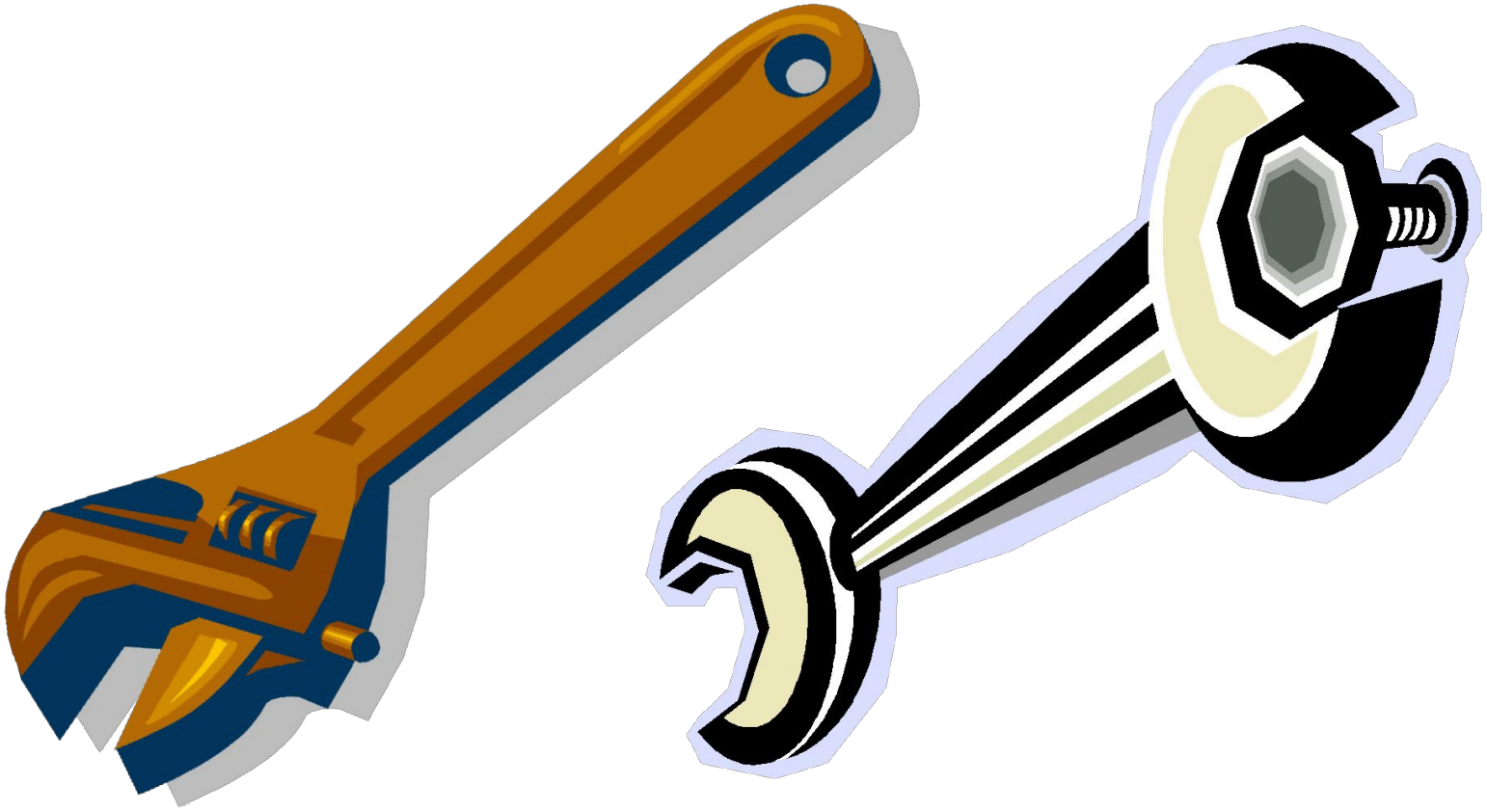
A good example would be a hammer and pliers.

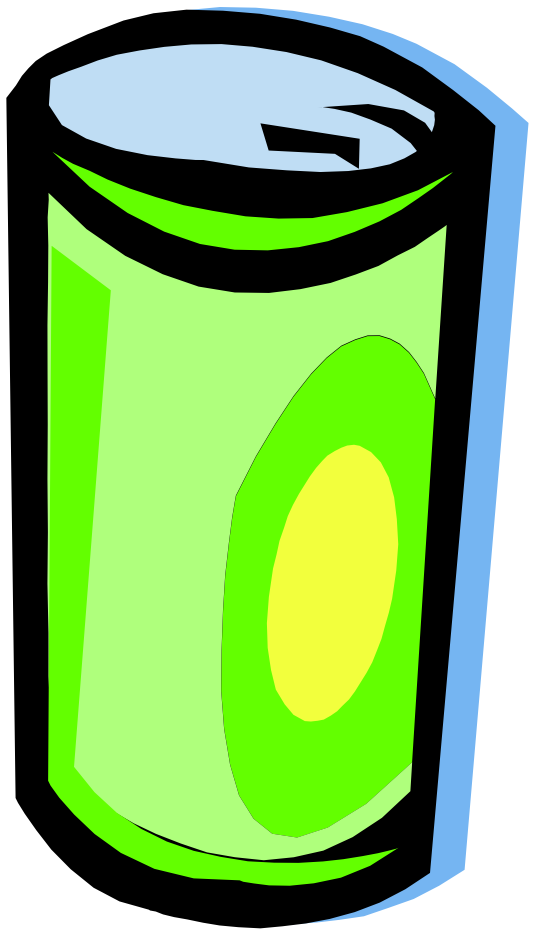
The first vice grips

Moving the fulcrum changes the load position.



A wrench is a good example of this.

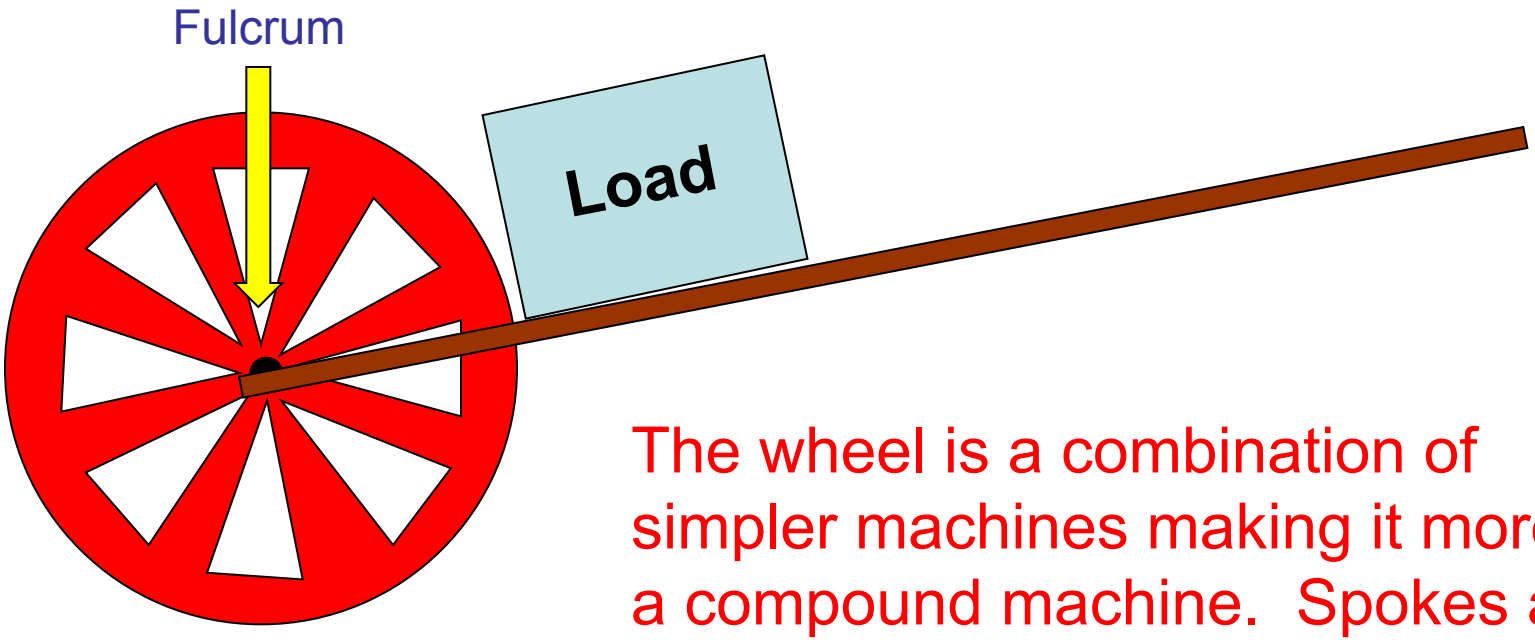




So is opening a pop.

We rely on simple machines to do just about everything.

The Wheel & Axle



The wheel is a combination of simpler machines making it more of a compound machine. Spokes are levers and the axle is the fulcrum.

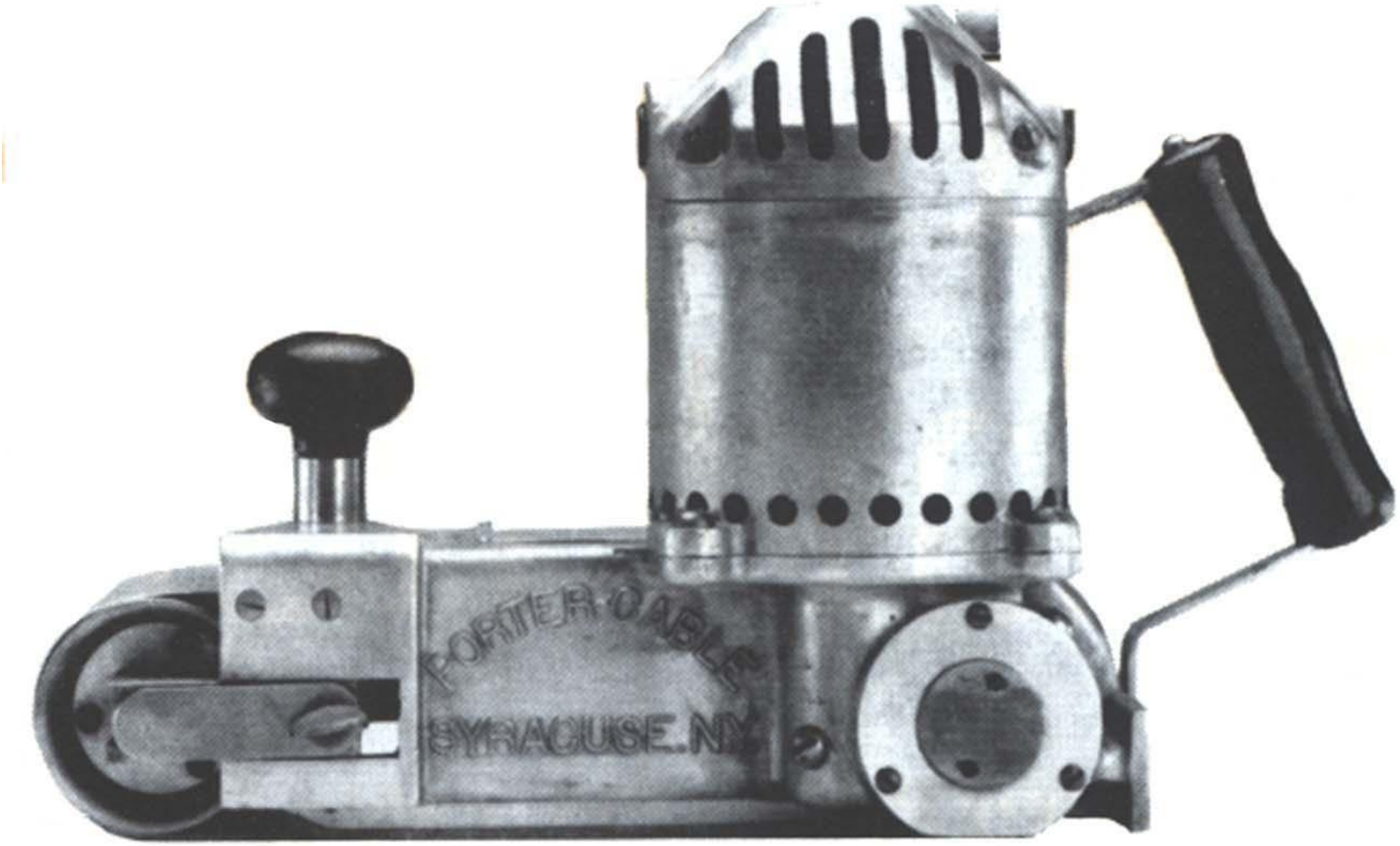
Adding another lever makes a wheelbarrow.

Gears

Gears are a series of levers protruding from wheels & axles.

Many machines rely on gears to drive their parts.

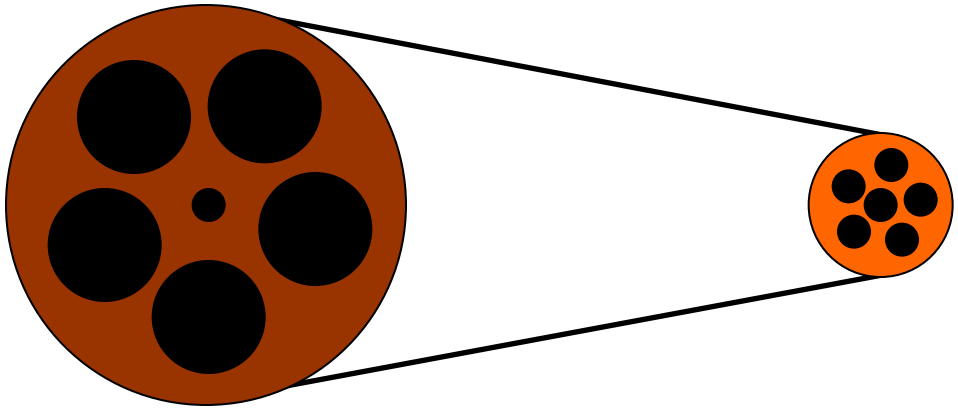
Like this vintage belt sander.



Porter Cable’s first Belt sander 1920’s

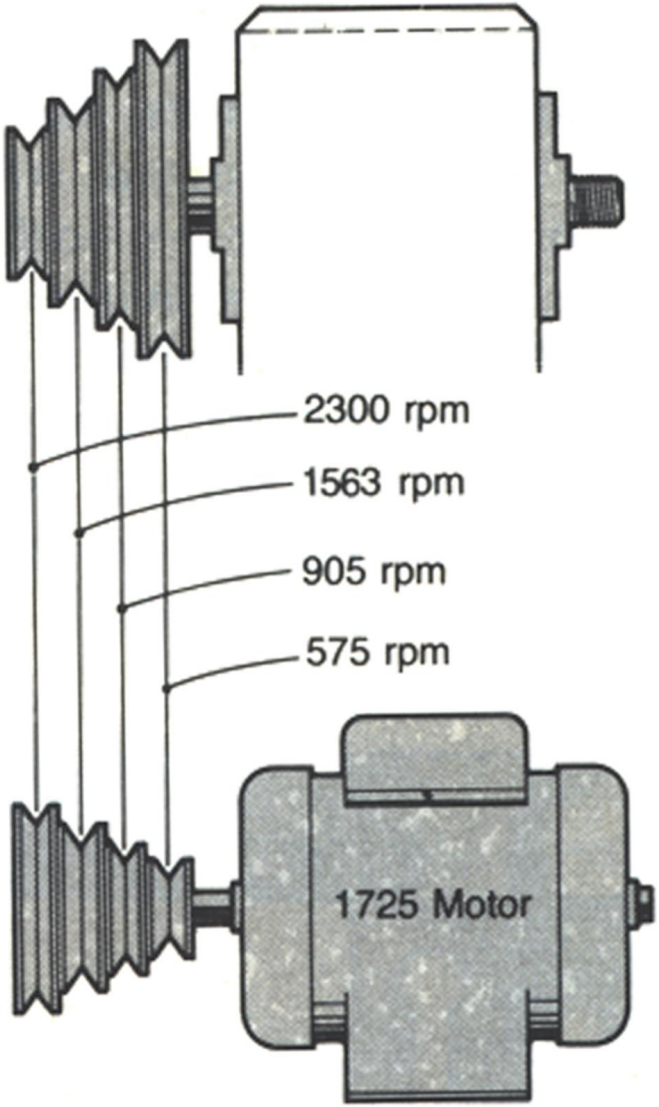
The Pulley

The Pulley is a combination of simpler machines making it a compound machine. It is a Wheel & Axle combined with a belt.



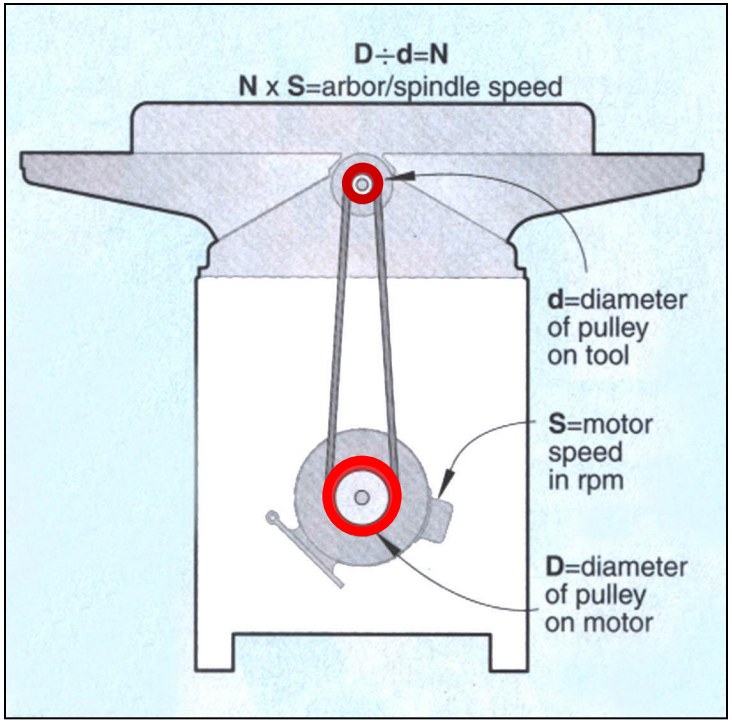
Most complex machines use this system to drive or power from an electric motor. Notice that pulley size determines speed.

SPEED CHART



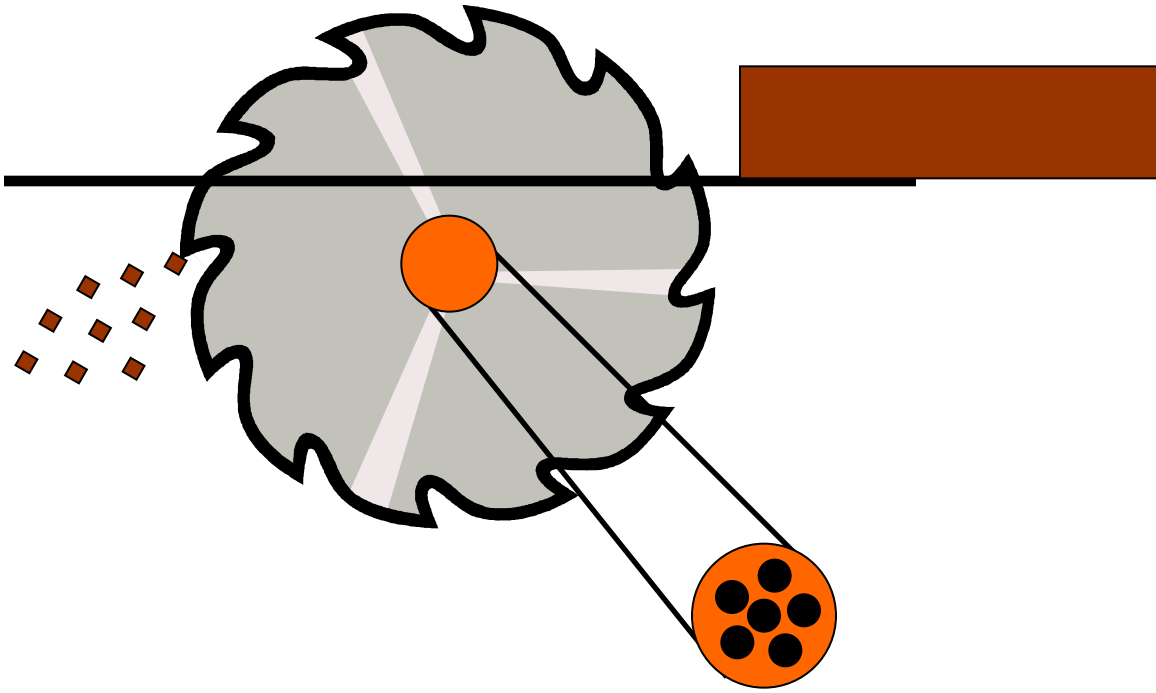
COMMON SPEEDS FOR WOODWORKING MACHINERY

Machine	Motor RPM	Blade/Spindle RPM
Jointer	3,450	5,000 - 5,550
Planer	3,450	6,000
Tablesaw	3,450	4,000 - 4,500
Bandsaw	1,725	300 - 1,000
Sander	1,725	1,800 - 2,400



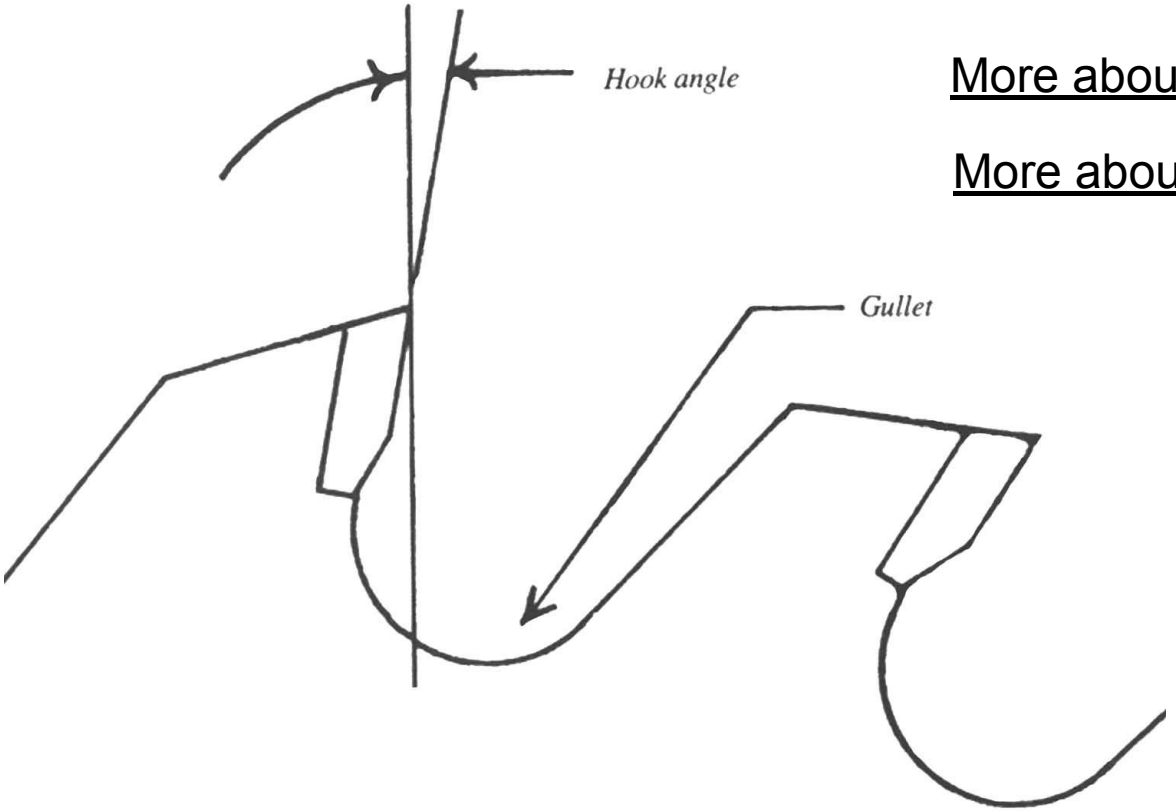
The tablesaw is a complex machine.

A circular saw blade is like a gear. The teeth are wedge shaped cutting levers around a wheel & axle.



The circular saw blade was invented by a woman over one hundred years ago.

The wedge shape of carbide Saw Teeth.

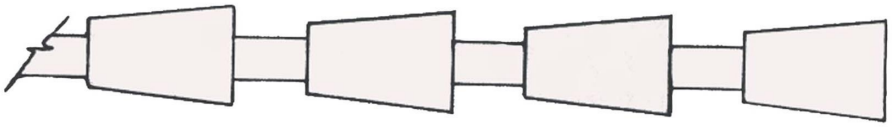


More about saw blades

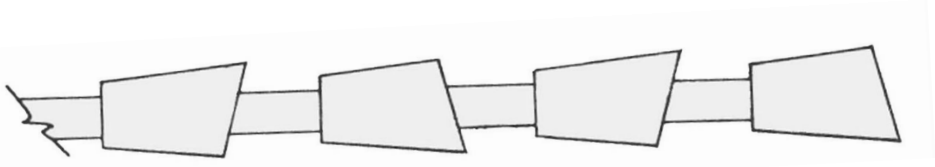
More about Table saws

Gullets separate each tooth with a space for sawdust.

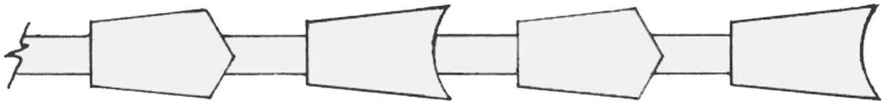
Saw Teeth come in a variety of shapes.



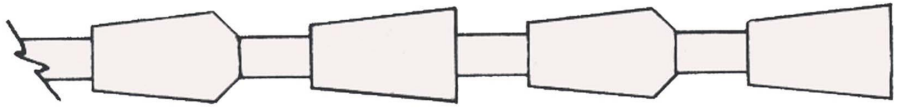
Flat top



Alternating top bevel



Hollow Ground



Triple Chip

An early electric saw

First Skillsaw 1924

Look closely at any tool. Simple machines are everywhere working together to make work easier.

Levers, screws, wheels, axles, pulleys and gears combine together to form complex machines.

The End