THE DRILL PRESS

Durham Woodworking Club

January 25, 2016

THE DRILL PRESS

- The drill press has primarily been a metal working machine since its first incarnation.
- The purpose of the modern day drill press has been to provide woodworkers with accurate perpendicular drilling.
- The drill press comes in to basic configurations, a floor model (up to 7' tall) and bench top models (generally under 3' tall).
- A drill press consists of four basic parts: the base, the column, the table and the head.
- The base must be heavy to provide a solid foundation for the table and the head and to lower its center of gravity which prevents it from tipping over during use.

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- The work piece to be drilled is supported on a table mounted to the column, and this table moves up and down the column on a rack and pinion system.
- The table on the drill press can be adjusted up and down on the column to allow for various thicknesses of material.
- The table can also be tilted side to side to facilitate drilling holes at an angle.
- To adjust the height of the table, loosen a locking lever and then crank the table up and down with a handle.
- The head of the drill press contains all of the mechanical and electrical elements in addition to the pulleys and belts.

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- Speed control is essential. As the outer diameter of the bit increases, the RPM should decrease.
- This is especially important when using Forstner bits, as the continuous outer rim is prone to overheating.
- Keeping the belts properly tensioned and free of sawdust helps maintain power transmission from the motor to the bit under tough drilling.
- The device that allows the bit to rotate while moving up and down is called the quill and it is made up of a rack and pinion gear in a sleeve.
- The amount of vertical travel that the quill is capable of is called the stroke and is usually in the 3" range.

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- The quality of the quill mechanism can be measured by checking the run-out.
- Run-out is defined as the amount of radial variation from a true circle, and is the result of a less than exact fit in the quill.
- This less than exact fit allows the bit to move horizontally ever so slightly as it rotates and if you have a machine with substantial run-out the hole will end up being larger than intended and it will not have very crisp edges and sidewalls.
- Depth stop settings come in two different forms, a pair of collars which are rotated on the handle shaft and this is what sets the maximum depth of the hole. These collars are locked in place on the shaft with set screws

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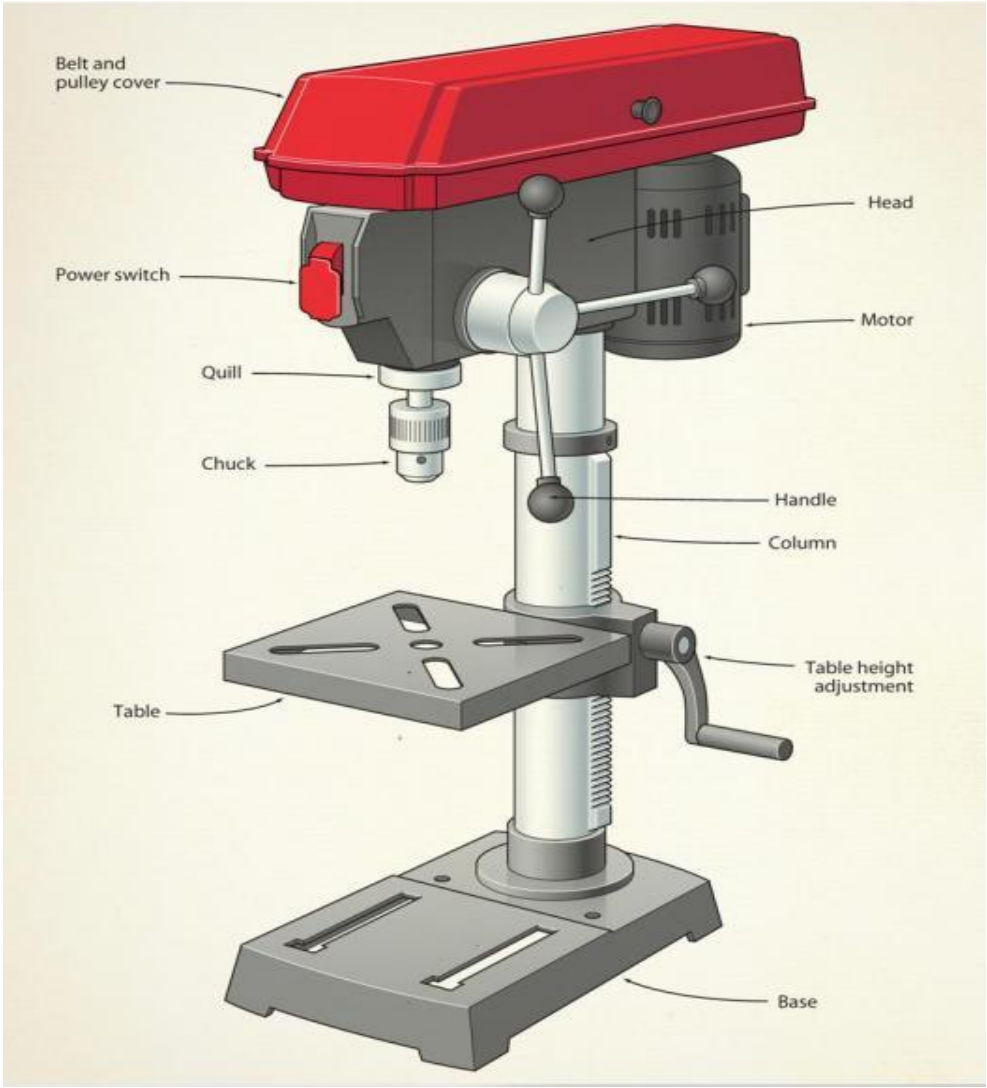
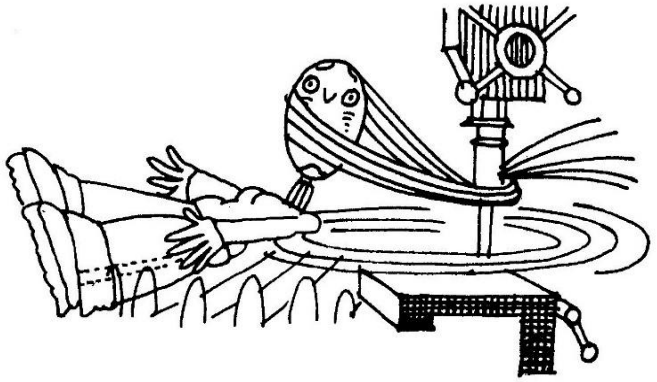
- A more substantial depth stop system involves the use of a threaded rod and a couple of nuts mounted to the side of the head.
- When the nut on the rod hits a limit stop, the downward travel of the bit is arrested.
- If the mechanism is not sufficiently robust or if the lower stop is even slightly flexible then it can be possible to overshoot the intended depth.
- Swing, is the maximum diameter disk you can drill the center of – basically the distance from the center of the chuck to the closest edge of the column (throat distance) times two.

COMPONENTS OF A DRILL PRESS



DRILL PRESS SAFETY



- Ensure that your face shield or glasses are in place before you start the drill press.
- Always wear an approved shop cap to contain long hair and keep your head up, well away from all moving parts of the drill press.
- Select drill bits carefully, ensure bits are sharp, good condition and suitable for the job.
- Make sure that chuck wrenches have been removed from the drill before you start the machine.
- Clamp the work securely to the table before starting the machine, attempting to hold the work under the drill with one hand can result in serious or painful injuries.

DRILL PRESS SAFETY

- Ensure sure that the drill is running at proper speed and feed. Forcing or trying to feed too quickly can cause drill bits to break or splinter with the chance of serious injury.
- If work should slip, do not attempt to stop with your hands.
- Never reach around or in back of a rotating drill.
- Always ensure that the drill comes to a complete stop and has been switch off before you attempt to change the belt for speed regulation.
- If the drill sticks in your work, stop the motor and rotate the drill by hand to free the work.
- Always clear away chips and curls with a brush and not by hand.

Thank you