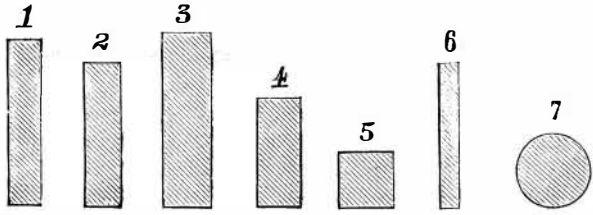


FILES AND RASPS.*

As there are features of files and rasps that are not familiar to many of our readers, we present the leading characteristics of these important tools.

Files and rasps have three distinguishing features: 1, their length, which is always measured exclusively by their tang; 2, their kind or name, which has reference to their shape or style; and 3, the cut, which has reference to the character and relative coarseness of the teeth. The length of a file bears no fixed proportion to its width or thickness.

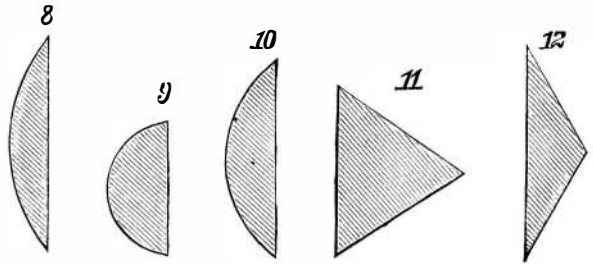
Some of the technical names by which the different shapes of files are designated are derived from their cross section, but many receive their names from the purpose for which



they are to be used; for example, mill files are for filing mill saws, pitsaw and hook tooth files are for filing saws designated as such. Other files have names of unknown origin.

To these names are added terms representing peculiar features of the file; a file that is reduced in size toward the point by a curved taper is called a taper file; files that are of a uniform size throughout their entire length are called blunt, and files having an exceedingly slight belly or curvature extending from point to tang are equaling files.

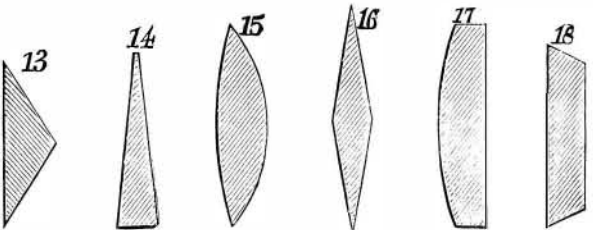
Figures 1 to 19 inclusive represent the cross sections of files showing the different forms for various purposes. Figures 1 to 6 inclusive represent files of quadrangular section. In these cuts Fig. 1 is a mill saw file; 2, flat; 3, hand; 4,



pillar; 5, square; 6, warding; 7, round; 8, cabinet; 9, pit-saw; 10, half-round; 11, three-square; 12, cant; 13, lightning; 14, knife; 15, cross; 16, feather edge; 17, shoe rasp; 18, reaper; 19, tumbler. These forms are made in various sizes.

There are three distinct forms of cut, known as single cut, double cut, and rasp, and each form of cut has degrees of coarseness, designated by the terms rough, coarse, bastard, second cut, and smooth.

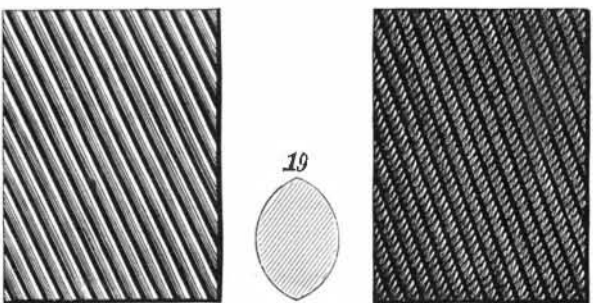
The single cut files are those which have a single course of chisel cuts across their surface, arranged parallel to each other and extending diagonally across the face of the file.



A portion of the face of a coarse single cut file is shown in figure 20.

Single cut files of the coarser grades are sometimes called floats.

Files having two courses of chisel cuts crossing each other are called double cut. This form is shown in figure 21. The first course is called the over-cut, and the second, which crosses the first, is called the up-cut. These two courses fill the surface of the file with teeth inclining toward the point, which resemble when magnified the diamond shaped cutting



tools in general use. Double cut files are of more general use than other forms. The engraving shows the coarse cut.

Rasps differ from single or double cut files as their teeth are disconnected and made in a peculiar form by a single pointed tool, called a punch. The teeth thus formed are arranged so as to produce the smoothest possible work consistent with the number of teeth in the surface of the rasp.

* From a "Treatise on Files and Rasps," published by the Nicholson File Company, Providence, R. I.

Rasps used by horse-shoers have coarse teeth, as shown in figure 22; those used by carriage-makers and wheelwrights have the bastard cut. Shoe rasps are second cut, and smooth rasps are used by cabinet makers.

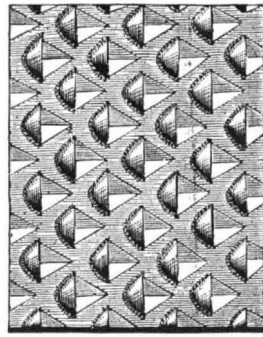


Fig. 22.—RASP.

The beautiful, small Swiss and French files for dentists,

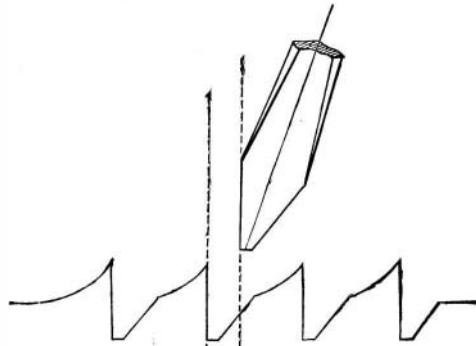


Fig. 24.

watch-makers, and similar uses, now sold in this country, are said to be made by machinery.

The difficulty attending the introduction of machinery in



Fig. 25.—RIFFLER.

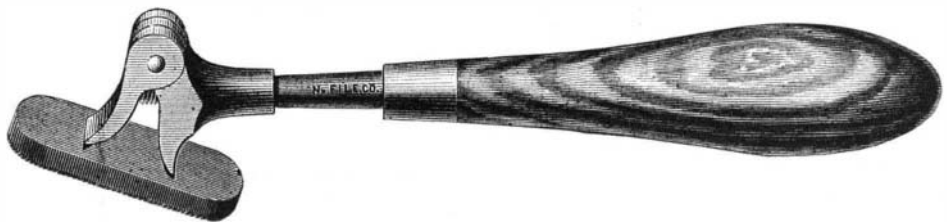


Fig. 26.—STUB AND HOLDER.

cutting the larger files in general use was not practically surmounted until within the past fifteen or twenty years. Now, however, much the larger proportion of files made and used in this country are machine cut.



Fig. 27.

Cutting files by machinery has arrived at such perfection that there are no peculiarities in the formation or shape of the tooth of a file as made by hand that cannot be made by machinery.

In economizing the wear of files intended for general purposes, consideration should be given to the kind of material to which they are applied in the different stages of use.

The first wear of these files should be in finishing the lar-

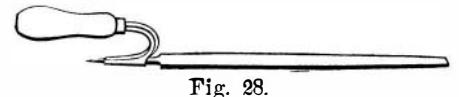


Fig. 28.

ger surfaces of cast iron, bronze, or brass, all of which require a keen cutting tooth; they may after such use be made to do good execution upon narrower surfaces of these metals, also upon wrought iron and soft steel; although



Fig. 29.—SURFACE AND FILE HOLDER.

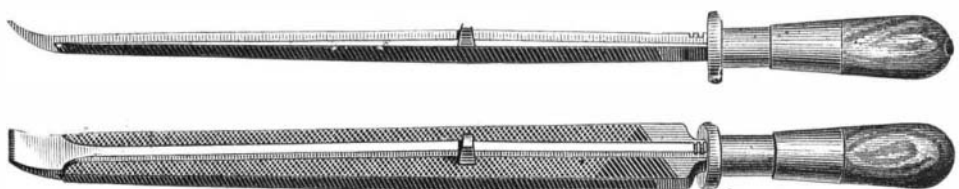


Fig. 30.—VISE FILE HOLDER.

A mistaken idea prevails with some that a good tooth can only be produced by hand and with a chisel which is ground to a sharp knife edge, as represented in figure 23; but this is not the case, as it is not the bottom but a very small fraction of the top of the tooth that does the cutting, and if a proper shape be given to the top of the tooth, its base and the bot-

tom of the cut should be made with a special view to prevent pinning. One of the principal causes is found in the extreme acuteness of the chisel cut at the bottom, which permits the filings to become so firmly wedged as to require considerable labor in removing them.

The proper form of tooth, which is shown in figure 24, is produced by a chisel of peculiar form shown in the same figure. This chisel is driven straight down into the steel blank by the cutting machine, and it throws up a tooth and forms a space of the most advantageous shape. In addition to the shapes already described, there are rifflers (one of which is shown in figure 25), which are simply files of the various kinds bent to adapt them to peculiar work. Rifflers are

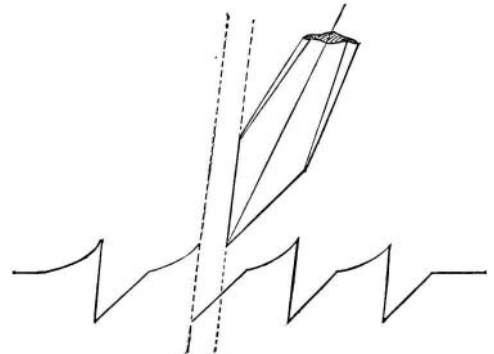


Fig. 23.

used principally by carvers in wood, metals, marble and stone; also, in shaping and finishing in and about the many irregular places in pattern work.

Stubs or short files are very useful and economical in finishing in and around depressions where an ordinary file could not be used. A stub, and holder adapted to it, is shown in figure 26.

In filing large flat surfaces the tang is frequently bent as shown in figure 27. Sometimes a curved holder (Fig. 28) is employed. The surface file holder shown in figure 29, and the vise holder shown in perspective and side elevation in figure 30, are employed in holding files for surface work. By means of these devices files may be sprung so as to give more or less convexity to their working faces.

file should be entirely free from oil when it is applied to smooth glassy surfaces, but when it is used on narrow pieces of fibrous metal oil may be applied to advantage. Good workmen often fill the teeth with oil and chalk, thus lessening the disposition of the file to "pin."

One of the most destructive customs among a large number of mechanics is that of loosely throwing their files, fine and coarse, small and large, into a drawer filled with cold chisels, hammers, turning tools, etc., and then throwing chisels, hammers and other tools on the files.

When we consider the small portion of the points of the teeth that is worn off by use; and that to effectually dull them for some kinds of work requires but the slightest rubbing upon a hard substance, it will be admitted that the evils of this habit should be more carefully considered.

Rosin and Beer.

The veteran temperance leader, Neal Dow, favors us with a communication in which the serious physiological results attending the use of beer containing rosin are dwelt upon at considerable length. Mr. Dow neglects, however, to offer any evidence to show that brewers ever use rosin in the manufacture of beer. It may be that Mr. Dow, like many others, labors under the erroneous impression that every article embraced in brewers' supplies is somehow made an ingredient of beer. Only the other day an apparently intelligent gentleman endeavored to convince us that brewers put oil of vitriol into beer. He knew they did, for he had seen carboys of the acid set down at the brewer's door. The observation was correct, but the inference was wild, the acid being used simply in cleaning the brewer's coppers. So with rosin. Because it is largely employed by brewers, it by no means follows that it goes into beer. It is used for coating the insides of beer barrels to prevent the escape of the gas or "life" of the beer, a purpose for which it would be worthless were it not insoluble in beer.

A SIMPLE PHONOGRAPH.

This simple instrument, which is shown in perspective in Fig. 1, in section in Fig. 2, and in plan in Fig. 3, consists of a mouthpiece, A, to which is attached a thin ferrotype plate diaphragm, B, by means of a good quality of sealing wax or cement.

Upon the outer face of the diaphragm and at opposite edges there are guides, C D, for receiving the wooden strip, F. These guides present only a slight bearing surface to the strip. The guide, D, is rounded to receive the spring, E, which is secured to it by two screws, by which also the spring is adjusted so as to bear with more or less force on the small rubber block which rests upon the center of the diaphragm.

A needle, which is sharpened like a leather sewing needle or awl, is soldered to the spring, and is located directly opposite the center of the diaphragm. The guides, C D, are placed so that the median line of the strip, F, is at one side of the needle. The strip, F, has four slight longitudinal grooves, two on each side, which are made with an ordinary carpenter's gauge. These grooves are located so that when the strip is moved through the guides, one or the other of them will pass over the needle. A piece of beeswax is rubbed over the sides of the strip to give it an adhesive coating for receiving the foil used in recording the sounds.

The foil, which should be rather heavy, must be cut into strips wide enough to extend beyond the grooves in the wooden strip. The foil is laid on the wooden strip and burnished down with the thumb nail, so that it will adhere. The strip thus prepared is placed in the guides, C D, and the needle is adjusted so that it indents the foil slightly as the stick is moved along.

By talking in the mouthpiece and at the same time moving the strip along with a smooth steady motion, the sounds are recorded on the foil. By passing the strip again through the guides, so that the needle traverses the same groove, and applying to the mouthpiece a paper funnel or resonator, the sounds or words spoken into the instrument will be reproduced. It is even possible to record the sounds on a plain strip of wood so that they may be reproduced. The engraving is about two thirds the actual size of the instrument.

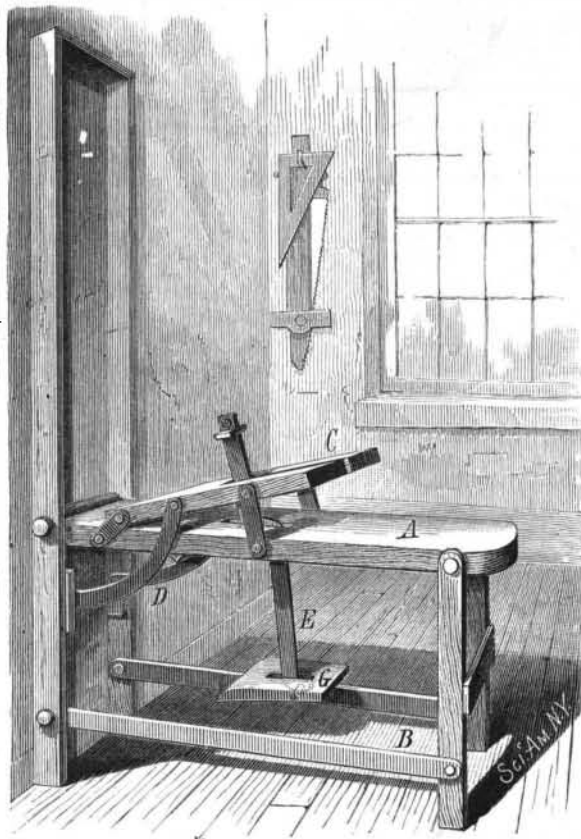
Restoration of Faded Handwriting.

Von Bibra reports (*Jour. Pract. Chem.*) that a moderately concentrated aqueous solution of tannin (gallo-tannic acid) will render legible writing which has faded through age, with none of the destructive effects on the paper occasioned

by the use of hydro-sulphate of ammonia. He applies the tannin solution with a brush, removes the excess by a current of water, and dries the document at a temperature of 50°-60° R. The writing developed in this manner remains clear and black after the lapse of several months. Of course only manuscripts written with ordinary ink can be restored in this way.

FOLDING SHAVING HORSE.

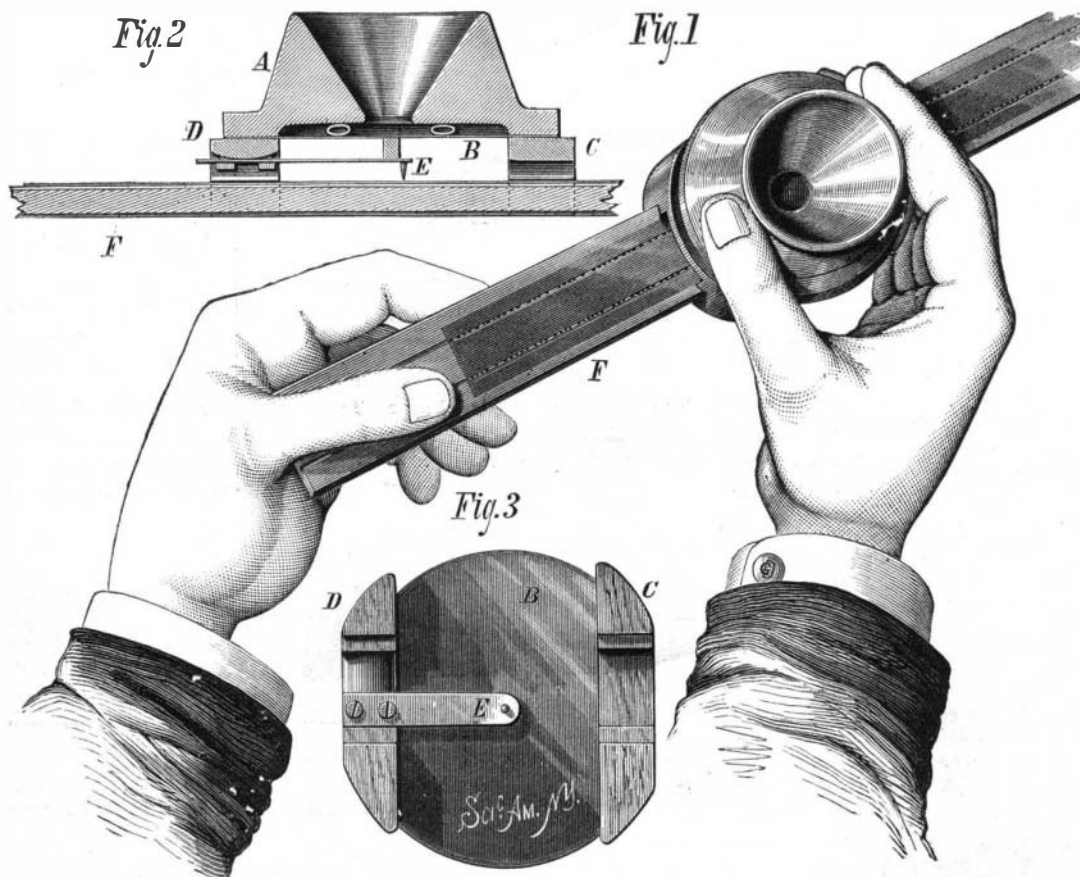
We give herewith an engraving of a novel folding shaving horse, the invention of Mr. Samuel E. Cress, of Hillsborough, Ill.



FOLDING SHAVING HORSE.

This horse is designed for the use of coopers and others who require a convenient device for holding work while it is shaved.

The bench, A, is pivoted at one end between vertical studs, and has at the other end two legs that are connected with the vertical studs by rods, B. An inclined work support, C, is connected with the bench by two straps at each



A SIMPLE PHONOGRAPH.

side; it is also connected with one of the vertical studs by a curved bar, D, which serves to move the support, C, into a working position when the bench is let down, and it brings the support into a position parallel with the bench when the latter is folded up.

The clamping lever, E, is bent twice at right angles upon opposite sides of its pivot, and the work support, C, is slotted, so that when the bench is folded up the upper end of the lever lies in contact with the upper face of the bench,

and its lower end rests against the lower surface of the bench. The lower end of the lever, E, is bent at a right angle, and to it the foot board, G, is pivoted.

All of the parts of the horse may be folded up between the two vertical studs, so that the floor may be used for other purposes when the horse is not in use.

This invention was patented through the Scientific American Patent Agency July 16, 1878. For further particulars address the inventor as above.

Little Mothers.

The little world of petite humanity has been sorely tried of late in the pathetic death of Minnie Warren and the scarcely less pathetic saving of Fannie Burdette through the sacrifice of her child. Had the first been properly treated her life also might have been saved; but her physician would not destroy the child without the mother's consent, and that could not be obtained until it was too late. It will be remembered that Minnie was married some years ago to "Major" Newell, better known as "General Grant, Jr.," at the same time that her diminutive sister Lavinia was married to General Tom Thumb. The latter pair have had one child, which died in its third year. Fannie Burdette, or, more correctly, Mrs. W. H. Bristol, is perhaps the smallest of living mothers, her height being only 2 feet 8 inches, and her weight 50 pounds. She has been married two years and has lost one other child, stillborn. Her husband, formerly doorkeeper to the circus with which Mrs. B. traveled, is of full size.

New Agricultural Inventions.

Messrs. Robert B. Wright and Parvin Wright, of Rock Creek, Wyoming Ter., are the inventors of an improved Hay Rake and Baling Press, which is so constructed as to collect the hay and press it into bales while the machine is being drawn forward through the meadow.

Mr. Richard N. B. Kirkham of Kansas, Ill., has patented an improved Horse Hay Fork, which is constructed so that it may be easily thrust into the hay and will hold a load securely.

Messrs. James H. Barley and Thomas K. Barley, of Sedalia, Mo., have patented an improved Fastening for securing Harrow Teeth to the side of the bars of a harrow frame, in such a way that the teeth may be held in a vertical, inclined, or horizontal position parallel with the bars.

An improved Seed Planter has been patented by Arnold J. West, of West's Mills, Mich. This invention consists essentially in a series of rotating arms carrying pivoted buckets that lift the seed in suitable quantities and at proper intervals, and deliver it to the hollow drill teeth. The machine is provided with markers or stampers of novel construction, which press the earth on the planted seed and at the same time produce a distinct mark, which indicates the location of the hill.

An improved Corn Dropper has been patented by Mr. Hiram H. Hartsock, of Clear Creek, Ill. The marker arms carry at opposite ends adjustable feet or markers, having sleeves for receiving the marker arms and set screws for clamping them in any desired position, the object being to adapt the marker to different kinds of soil. The markers and the dropper cam are attached to the same shaft, so that they will always bear the same relation to each other, and must therefore be accurate.

Mr. Thomas Delany, of Geneva, N. Y., has patented an improved Strawberry Protector, which consists of a saucer for protecting strawberries and other small fruits against being covered with sand and dirt. The saucer will also accelerate the growth of the plants and berries by shedding the water to the roots, and concentrating the rays of the sun immediately upon or about them.

Mr. William A. Woodward, of North Tunbridge, Vt., has patented an improved Draught Adjuster for Plows, intended to be used in land containing stumps or large stones. The object is to enable the plowman to avoid said stumps or stones by shifting the draught to either side of the beam instead of lifting the heavy plow by muscular power.

Mr. Theophilus Harrison, of Belleville, Ill., has patented an improved Thrashing Machine Frame, which is so constructed that it may be turned in a very small space and readily arranged or set in the desired position for use.

Mr. Homer T. Rector, of Clinton, Mich., has patented an improved Attachment for Plows for use in keeping them clear of stubble, stalks, weeds, grass, and other rubbish, without having to stop the team to clear the plows of the said rubbish.