

## Science and Art.

## Setting and Sharpening Saws.

There is great variety in the methods adopted by sawyers in preparing saws, even when they are intended for manufacturing the same kind of lumber. Nothing can be more palpable than that all cannot be right, yet it is likely that no method of shaping and working saws can ever be proposed which will be accepted by all, and some degree of diversity must always be endured.

Messrs. Hoe & Co., of this city, (a firm which has been long known as comprising within itself mechanics of no common order, and as particularly successful in the manufacture of saws,) furnish the following directions for setting and sharpening circular saws:—

Before the saw is set, the side towards the log should be perfectly flat, and all the difference in thickness between the outer edge and the middle of the saw must be on the side next to the board, so that the log may pass without pressing against the body of the saw; therefore, the flange that is fast on the mandrel should be a little concave, and the loose flange perfectly flat. If the saw is not in the required shape when screwed up between the flanges, it may be adjusted by packing between the flanges and the saw with writing paper.

After the saw has been made to run as true as possible sidewise, turn it backwards slowly against a file that is held firmly on an immovable bearing. This operation will trim off the longest teeth, and leave the points all equally distant from the center; then file off the top of the tooth until the facet made by the jointing file is but just perceptible at the point, and the saw is prepared for setting.

To set the saw, we use a crotch punch of hardened steel, and a riveting hammer that weighs about a pound. The angle of the punch should be a trifle greater than that of the point of the tooth, and a little convex lengthwise of the groove—as denoted by the curved line in the annexed cuts, Figs. 1 and 2 being two views of the punch—so as to spread

Fig. 1



Fig. 2



the point of the tooth from the center both ways. Hold the punch against the point of the tooth parallel with the side of the saw, and with repeated moderate blows of the hammer upset the points of the tooth equally on both sides to the required breadth. To support and strengthen the cutting edge after the teeth are upset enough, we may with considerable advantage draw out the top of the tooth with the riveting hammer, while a piece of iron fitted into the space below is held firmly with a perfect bearing under the hammer.

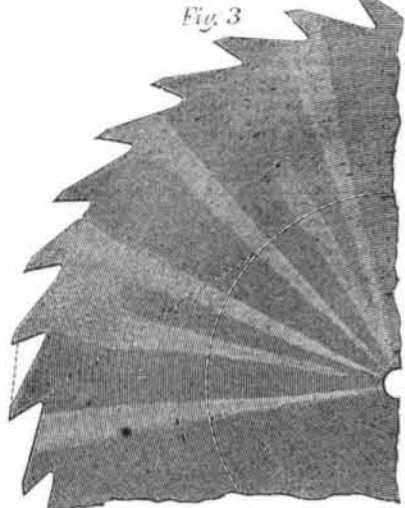
The teeth of circular saws for ripping should be pitched forward as much as they can be, and leave sufficient strength of tooth and space for sawdust; and the number of teeth should be proportioned to the hardness of the timber to be sawed, say for a 48-inch saw 30 teeth for hard wood, and 24 for soft.

For a saw of 48 inches diameter and 30 teeth, the pitch (by the pitch of saw teeth we mean the inclination of the face of the tooth up which the shaving ascends; the distance from point to point, we call the space) of the teeth may be determined in the following manner:—Describe a circle from the center of the saw equal to one-half of its diameter, and a line drawn from the point of the tooth across the saw, touching the outside of the circle, will give the pitch. For 24 teeth, the circle may be five-eighths of the diameter of the saw.

The back or top of the tooth for about an inch back from the point, should be on a line drawn from the point back to the next tooth,

and as much below the point of that tooth as each tooth is required to cut. For instance, if your feed is equal to  $1\frac{1}{2}$  inches to one revolution of the saw, and the saw has 30 teeth, each tooth must cut one-twentieth of an inch. After the saw is set as directed, the teeth must

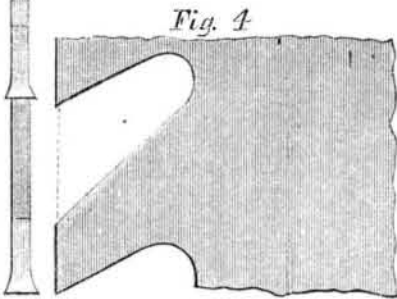
Fig. 3



be filed up sharp, finishing with a fine, single-cut file. The cutting edge of each tooth should be parallel with the center of the mandrel, and the front and back of the teeth kept on the lines as described, and shown in Fig. 3.

Mill saws, with teeth such as are shown in Fig. 4, after being straightened on the edge,

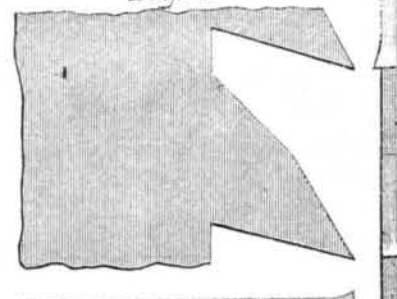
Fig. 4



must be set and sharpened in the same manner as circulars. The pitch of the teeth is 60 degrees.

Fig. 5 is another form of tooth and plan of setting and sharpening, not so good as No. 3, but a great deal better than the old plan. In this case, after the saw is straightened on the

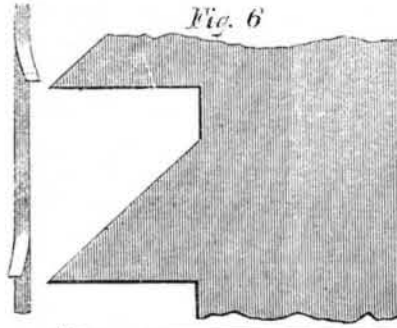
Fig. 5



edge, the teeth are filed sharp at the points, like a cross-cut saw, alternately highest on the outside, and then upset with the punch.

Fig. 6 is the oldest, most in use, and we think, the most objectionable plan for setting a circular or vertical mill saw, and is so well

Fig. 6



understood among sawyers as to require no description from us. In this case, after the tooth is worn off so as to be thinner at the point, it may be spread out to its original thickness with the crotch punch.

Fig. 7 is a crotch punch, for widening the points of saw teeth, and Fig. 8 is a tool made in three pieces. The parts A and B are made of steel, nicely fitted and hardened, and are

Fig. 7

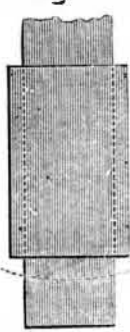
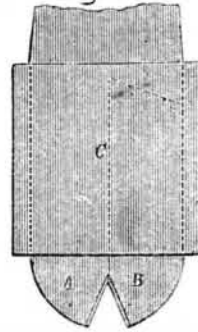


Fig. 8



bound together with the iron band, C. It is used to widen the points of saw teeth when they have become worn and blunted on the corners, and may be used without the necessity of filing the saw afterwards.

Figs. 1 and 2 represent a punch somewhat similar to the last, made in one piece. It is stronger, and on that account better adapted to upsetting heavy saws.

If these rules are strictly observed, the saw will always balance, and there will be no occasion for using a gumming machine.

## The Right of Expatriation.

It not unfrequently happens that natives of the United States remove to the adjoining provinces, and remain there without taking any legal measures to sever their former political connection. Sometimes inventors have applied to us to know what rights they possess under such circumstances. The following opinion from the United States Attorney General will enable all to decide for themselves how far removal has effected their citizenship. He says:—

"There is no statute or other law of the United States which prevents either a native or a naturalized citizen from severing his political connection with the government, if he see proper to do so, in time of peace, and for a purpose not directly injurious to the interests of the country. There is no mode of renunciation prescribed. In my opinion, if he emigrates, carries his family and effects with him, manifests a plain intention not to return, takes up his permanent residence abroad, and assumes the obligation of a subject to a foreign government, this would imply a dissolution of his previous relations with the United States, and I do not think we could or would afterward claim from him any of the duties of a citizen."

## Parlor Laboratory.

*Astonishing Experiment.*—Into a small retort place an ounce of strong liquor of potash—that is, pure potash dissolved in water, together with about a drachm of phosphorus. Let the neck or beak of the retort dip into a saucer of water, say half an inch deep; now very gently heat the liquid in the retort with a spirit-lamp until it boils. In a few minutes the retort will be filled with a white cloud, then the gas generated will begin to bubble at the end of the retort; a minute more, each bubble as it issues from the boiling fluid will spontaneously take fire as it comes into the air, forming at the same time the philosopher's ring of phosphoric acid. Care is required in handling phosphorus; but our young chemical readers will, we think, not forego this wonderful experiment for the want of due attention, for, without proper care on their part, we must give up showing them wonders, even greater than these. S. PIESSE.

## The Late Commissioner of Patents.

In our notice of Judge Mason, ex-Commissioner of Patents, last week, we alluded to his preparation of a code of laws for Iowa, and stated that this service was performed while he was Commissioner. It should have read "before his appointment as Commissioner."

## Literary Notices.

WELLS' NATURAL PHILOSOPHY, for the use of schools, academies and private students; introducing the latest results of scientific discovery and research, and arranged with special reference to the practical application of physical science to the arts and experiences of everyday life. By David A. Wells, A. M., author of "Science and Common Things," "Annual of Scientific Discovery," etc., with nearly 400 illustrations. New York: Ivi on & Phinney, 1850; \$1. In our opinion this work is better adapted for elementary instruction than any other now before the public. As it is fully up to the times as regards modern research, it will also be found most useful as a book of reference in private libraries. A distinguishing characteristic of the work is the number and beauty of its illustrations. They are different from the old stereotype figures that have been used for the last fifty years in every educational work, and most clearly explain the subject-matter, almost independently of the text. We believe we do good service to the cause of science and education by recommending teachers and others to examine this book.

CHARLESTON MEDICAL JOURNAL AND REVIEW.—C. Happold, M. D., Editor and Publisher.—This is the organ of the allopathic school of medicine in the South, and is an able and learned work. The present number contains a likeness of Dr. Kane, with a memoir; also the conclusion of an instructive article on "Life and its Relations," by Dr. Burns. The Journal is published bi-monthly, at \$4 per annum. It appears to have an international circulation.

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