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LUMBERMEN'S HAND-BOOK.

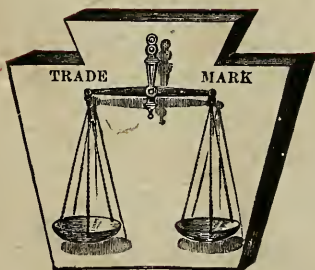
HENRY DISSTON & SONS'

KEYSTONE

SAW, TOOL, STEEL, AND FILE WORKS,

FRONT AND LAUREL STREETS.

PHILADELPHIA, PA.



6 LIPPINCOTT'S PRESS

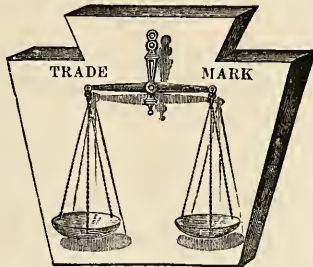
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SAW, TOOL, STEEL, AND FILE WORKS, PHILADELPHIA.

HENRY DISSTON & SONS'

HAND-BOOK FOR LUMBERMEN.

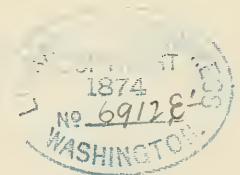


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PREFACE.

THE following pages have been compiled with a view to prevent, as far as possible, the constant annoyance of the Saw-Maker by the apparent want of knowledge on the part of many persons using Saws, and at the same time to convey such information as will be of lasting benefit to the Lumberman.

The manufacturers, who spend thousands of dollars annually in improving and perfecting Saws for the purpose of producing lumber in quantity and quality, with economy and profit, are frequently perplexed by the return of Saws for repairs (a large percentage of which are of the best make), in such a condition as plainly to indicate that few persons appreciate where the real secret of success lies, and proves that failure must ensue without the knowledge which we here endeavor to convey.

To such persons, the "Lumberman's Hand-Book" is probably as valuable as the Saw itself, for without it your Saw will soon cut your pocket-strings.

The hints and instructions contained in this little work are the result of the anxious study, experience, and careful labor of years; with these for a guide, you will be better able to compete with your more experienced rival. Most of these hints and instructions have been issued, from time to time, in circulars, but are now compiled in pamphlet form, so they can be kept on hand for reference.

Very respectfully,

HENRY DISSTON & SONS.

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TO THE LUMBERMEN OF THIS COUNTRY.

THERE is scarcely any business more attractive for the investment of capital than the production of Lumber.

Princely fortunes have been realized by many persons engaged in it; and, to the experienced man, it is a safe, sure, and speedy road to fortune. So rapidly, indeed, has it increased of late years, as to far outstrip the supply of competent Sawyers, Saw-makers, and mill-builders; and, as a natural consequence, many men are employed as Sawyers who are totally unfit for such positions.

Then comes the rub. The mill flags, from some cause or other—the Saw is not true, or not in order, and is not capable of performing half the work required—more work is put upon the engine than it was ever built for—Saw too thick—Teeth in bad shape—Saw not properly hung, etc., etc. How can such a man without experience know anything about sawing Lumber? He is unable to discover the cause of his dilemma, and, to hide his ignorance and shield himself from blame, the Saw-Maker is made the scape-goat—the Saw is condemned—the mill stopped, until another Saw is procured—only to meet the same fate.

We regret to state that we have received many complaints of Circular and other Saws not performing the work for which they are intended. The reasons for these complaints are so numerous that we deem it our duty to mention a few of them. At the same time, we do not wish to state that the Saw is never in fault, but in nineteen cases out of twenty it is not; and we think it hard to bear the blame for an inexperienced Sawyer or for a bad mill. We have had so many cases of this kind, that we should not be surprised if we were to hear some of these days that a man had his mill burned, his boiler exploded, or his wife deceased, and that the unfortunate Saw was the cause of all these woes. We have, in fact, heard of a man who died in consequence of his mill not performing properly, on account of the inexperience of his Sawyer. But he died through grief, as he lost all he possessed.

Some time ago we sent a pair of Saws to a man some three hundred miles up the country, and were informed by letter that they would not work—they trembled. Shortly afterwards he sent for us to come up and see him, as he had come across a man that was pulling one Tooth to one side and another Tooth to the other side. *He did not even know that a Saw required to be set before using it.*

Another person returned us a Saw because he could not *re-gum it with a cold chisel*, without too much trouble; he thought it must be too hard.

We have instances of this kind too numerous to mention, and in many such cases the parties want new Saws or their money refunded at once. If we were to take back Saws from inexperienced men, without first seeing and ascertaining the actual cause, how liable we should be to be imposed upon.

In many cases a Saw condemned by one party will be resold (although at a loss) and pronounced perfect. How is this to be accounted for? Why, simply because some men excel others in their *knowledge of running Saws*.

On visiting several extensive Saw-Mill building establishments with which we have had trouble on account of the Saws not being true, we observed that the Saws were straight before being put on the Mandrel, but when put on and screwed up they had sprung considerably, and when taken off they were perfectly straight. This seemed to astonish the proprietors greatly. But the fact was easily accounted for—the Collars were not true; and we regret to state that many good machinists think the Saw-Collar but a very small item with regard to the Saw running correctly, while it is just as important for it to be kept true as it is for the slide or safety-valve of a steam-engine to be kept in order.

With a view to obviate some of these difficulties, we will mention a few of the causes which may tend to produce dissatisfaction with the best Saws in the world.

A very general cause is a *Dull Saw*, not only dull on the extreme point, but the cutting portion of the Tooth under the points, as illustrated, Fig. 1, page 12.

The points of Saw-Teeth are the only portions of the Saw which should come in contact with the lumber. They must be kept sharp by frequent use of the file, and set by springing, swaging, or spreading when necessary, so as to clear the blade of the Saw nicely and thus prevent friction. As the points of the Teeth do all the work, they speedily become dull and round, the sides of the points wearing away as well as the points themselves. Now, for your own sake and our sake, take care that these points are kept right, as the reverse of this will keep a poor man always poor, and give a bad reputation to the Saw, Saw-Mill-BUILDER, and Saw-MAKER.

Too Thin a Saw—Teeth too Coarse.—A Saw *not properly hung*; that is *not evenly set*; that is *not filed square or true*; a Tooth that has *not enough pitch*, or that has too much pitch (but this can be regulated with a few strokes of the file); a Tooth whose *back is higher* than the point; that has not a free chamber for the dust; a Saw not properly balanced on the Mandrel. To balance properly, a Saw must be perfectly round; must have Teeth of equal size and shape, and Gullets of equal depth, or one portion of the Saw will be heavier than another, causing it to leap and tremble. If some Teeth are long and some short, the long ones will do more work than necessary; thus an undue strain will be put upon that portion of the Saw, and will have a tendency to crowd the Teeth out of their due course, and thus make rough and uneven lumber, and cause the Saw to heat. A Saw too thick in the centre will sometimes heat. A *Carriage that springs*; a *Carriage not on a line* with the Saw; a *Mandrel that springs*; *Collars not true*, and many other causes will give rise to complaint against Saw and Saw-Maker. A fence too long is frequently the cause of great trouble. See subjoined letter.

“Keystone Saw, Tool, Steel, and File Works, Front and Laurel Sts.

“Philadelphia, May 5, 1871.

“MR. H. A. BUTTERWORTH:

“Dear Sir,—Yours of the 24th, together with Saw, have been received.

“We regret to learn that you have had so much trouble in running your Saw, but are satisfied that no blame can be attached to the Saw itself. The whole trouble arises from having your fence run beyond the edge of your Saw. The guiding of the work to be cut is done before it strikes the edge of the Saw, and if there is no fence back of the Saw there can be no jamming, consequently no friction or heating.

“We cannot guarantee any Saw to run satisfactorily when the fence runs beyond the edge of the Saw, and there are more Saws condemned from this cause than any other known.

“Truly yours, etc.,

“HENRY DISSTON & SONS.”

A good Sawyer can tell, with a file or set, whether he has a good Saw, as he knows about what temper he wants, and by a straight-edge can see if it is true and ground to his liking. Let the Saw always be tried before tightening up the Collars, and you will see if it runs true; should it not do so, let us know at once where the fault is, and we will remedy it;

but do not, in any case, attempt to run a Saw that you are doubtful of, as by so doing you may spoil the best Saw ever made.

The points of a Saw should be kept in order with a Jumper (see pages 18 and 19). A Saw often improves in temper with use, as the extreme points of a new Saw are sometimes a little soft.

A tolerably good workman may run a mill and produce fair work; but this is not always satisfactory, for even in this advanced age there are parties whose lumber invariably commands from \$3.00 to \$5.00 per thousand more than that of others; but in almost every instance these prices are obtained by old and experienced lumbermen. Thus it will be seen that an experienced man will cut lumber for less money than the difference in its value when ready for market. To insure success, the first thing required is a good and well-fitted SAW—for with such a Saw a poor mill will produce better lumber, and at a less cost than a good mill with an imperfect, badly-dressed, and ill-fitted Saw. At the same time you will save fully one-half your power, and, of course, an equal amount of wear and tear.

The inexperienced mill-owner or Sawyer will find it to his advantage to make this "Hand-Book" his constant companion, for a timely hint may save him days of trouble and annoyance. A few weak points about a mill will sometimes consume one-half its power. Endeavors have been made in the following pages to demonstrate some of the causes of such weak points, and close attention to the advice given will enable you to remedy many defects, and add the requisite power to your mill, and thus turn your otherwise laborious occupation into one of comparative pleasure and profit, and probably be the means of prolonging your life. We seldom have any fault found with our Saws if they are properly handled and have not been altered in the hole or tooth.

Our perfect mode of Grinding, together with strict examination and tests as to truth, temper, material, etc., compel the Saw to go if placed in proper hands. Every mill-owner should have duplicate Saws on hand, in case of accident; he may lose more by stopping the mill one day than will pay for an extra Saw.

HINTS TO SAWYERS AND SAW-MILL MEN.

A GOOD MILL.

In the first place, you want to make sure of a good mill; those who buy for the least money do not always buy the cheapest. A few hundred dollars is a small amount compared to the time and money lost by a poor mill. Two or three hundred dollars at the start may decide your success or downfall, so far as this is concerned, for life.

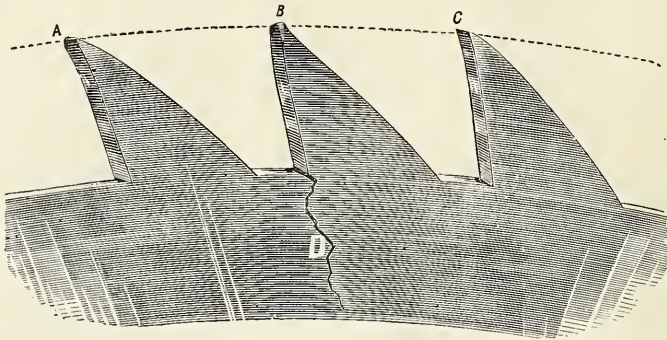
A GOOD SAW.

In the second place, you must be certain to procure a good Saw. It is astonishing that so few Sawyers know what a good Saw is. They are governed too much by prejudice to arrive at the truth. We are often annoyed, after taking special pains to send out Saws perfect in every respect, by having them returned in such a condition that it is impossible they should go through the wood, from the miserable way in which they have been filed and set; some jammed all to pieces; some not half filed; some not filed true on the face or back; while others are all shapes but the right one in the throat, leaving no chamber-room for dust or chip.

Some Saws have a bad pitch, and others no pitch at all; next, we find a Saw out of round, then one with irregular, or long and short teeth—one up and one down. The neglect of any of the above points must cause trouble, and the first impulse is to return the

Saw. Why is this? Not because the Saw is bad, but because you will not or do not take pains to keep it in proper order. In many cases they are returned broken, as shown in Fig. 1 at D.

Fig. 1.



What is the cause of this? Look at the points *A* and *B*, and see if you cannot tell what has broken the Saw. If not, make a calculation how many times this point goes through the wood per minute, hour, or day, and you will begin to see why it must break. The Tooth of a 24-inch Circular Saw passes through the wood 2000 times per minute, 120,000 times per hour, and 1,200,000 times per day; and, if not sharp, the Saw is strained at the root of the Tooth thus often, which frequently not only closes the set, but must eventually break the Saw; for although steel is strong, continual straining will make it tender, and it must break. Point *C*, Fig. 1, represents the condition the Tooth should be in for work. Point *B* shows a tooth that is dull, and a great many Saws are returned broken, as shown at *D*, from this cause.

Your Saw-Tooth becomes dull on the side or under the point in proportion to the amount or extent of feed; for instance, if your Tooth takes one-eighth of an inch hold on your log at each revolution, it will become dull for one-eighth of an inch below the point, or more or less as you increase or diminish your feed.

A diamond will not cut when dull. Why should a Saw? A few minutes' filing two or three times a day will save ten-fold the amount of time and labor expended in running an imperfect, dull Saw, also making a saving in the power consumed, which, in some mills, is a very important consideration, and a heavy percentage in the quantity as well as the quality of lumber cut in a day, month, or year.

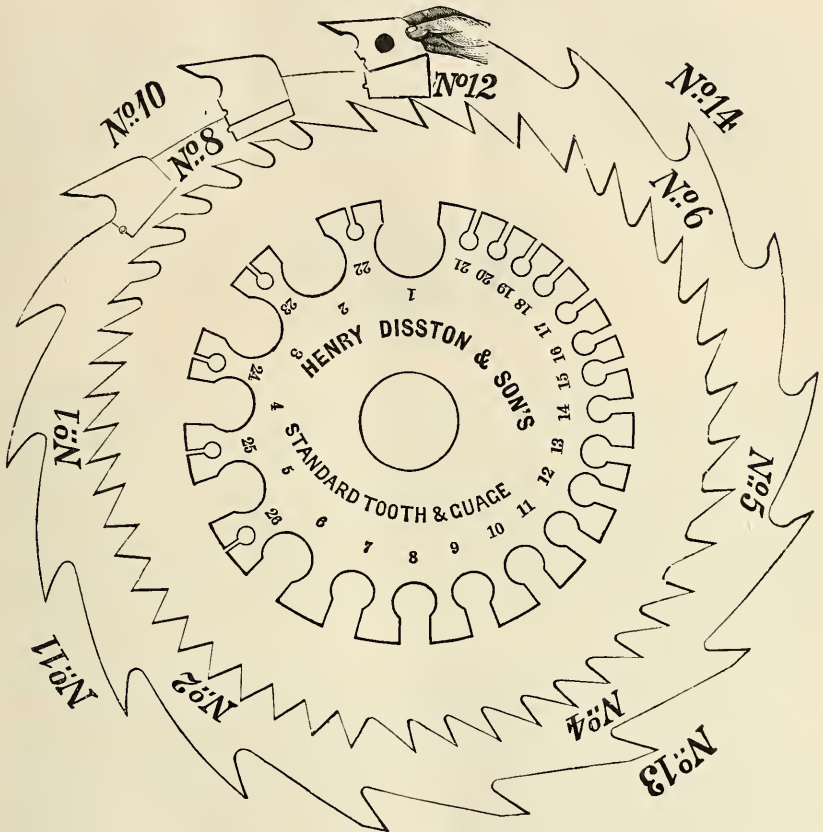
It is a mistaken idea that there is a saving by not taking time to sharpen the Saw. If a Saw was a razor, and the man that works it was obliged to shave with it, then the Saw would be kept sharp. It is quite as essential that a saw be sharp as a razor or plane, or any other cutting instrument, and when proud, or full and sharp, it does not require one-half the set or power on the same feed.

Having already treated of the importance of selecting a good mill, and given a few general hints, we will proceed to some suggestions in regard to

ORDERING SAWS.

It is impossible for every mill to have a first-class Sawyer, from the fact that there are but two or three in every hundred; we therefore suggest that in ordering a Saw you inform us what amount of experience your man has had, for an inexperienced hand ought to make a point of ordering a thicker Saw, as he can run it more easily than a thin one, because it is stiffer. Some men will run a sixty-six-inch Saw, one-eighth-inch thick, successfully, while others cannot run one one-quarter-inch thick. A thin Saw, in proper order, will run better than a thick one in bad order.

STYLES OF TEETH AND STANDARD GAUGE.



The above illustration represents our various styles and sizes of Saw-Teeth, combined with which will be found our Standard Gauge, by consulting which a person will be enabled to inform us the size and style of Tooth, and also the Gauge, of any saw he may desire.

Always give the diameter of Saw, and state the size of hole, naming distance from centre to centre of tug pins. A good way to ascertain this is to lay a piece of paper on the old Saw and rub your hand, slightly soiled, over it, which will leave the necessary marks or impressions. State whether the Saw must be beveled (some parties prefer the bevel divided), or taper-ground, and how much; also kind of timber and amount of feed. In cutting hard wood with slow feed, a Saw requires a different Tooth from one used in cutting soft lumber with heavy feed.

STANDARD GAUGE.

Gauge No. 4	$\frac{1}{4}$ inch scant.	Gauge No. 9	$\frac{5}{8}$ inch scant.
" " 5	$\frac{7}{8}$ "	" " 10	$\frac{1}{8}$ " full.
" " 6	$\frac{3}{16}$ " full.	" " 11	$\frac{1}{8}$ " scant.
" " 7	$\frac{3}{16}$ " scant.	" " 12	$\frac{3}{8}$ " full.
" " 8	$\frac{5}{8}$ "		

RELATIVE POWER AND PRODUCT OF A GOOD MILL.

The next thing wanted is a good SAWYER. Failures frequently occur from the want of sufficient power to drive the mill; and of course the power used depends much on the judgment exercised by the Sawyer. It has been laid down as a fixed rule, that for 10,000 feet per day about twenty-horse power is required; for 20,000 feet, thirty-horse power; and for 30,000 feet, forty-horse power. These are the powers and products that experience proves to hold the proper relations to each other. We, however, make Saws that take much less power.

Suppose, now, you have a good mill, Saw, man, and ample power, for without the latter everything flags, and one turn per minute makes a great difference, yearly, in a pile of lumber. This is one of the SMALL LOSSES referred to in a preceding page.

COLLARS FOR SAWS.

To have a perfect-running Saw it is indispensable to have the Collars perfect and well fitting, but, as a general thing, there is nothing more defective about a mill, and any deviation from perfection in them is multiplied as many times as the Saw is larger than the Collars. They should fit exactly. Test the Saw with a straight-edge, and if it is found correct, place it on the Mandrel, tighten up the Collars by hand, slowly revolve the Saw, and if found true, all right so far; now tighten up the Collars with a Wrench, test again with straight-edge and see if the position of the blade has been altered, revolve the Saw as before, observing whether it runs true; if not, be sure the fault lies with the Collars, and you will be likely to ruin your Saw, and certainly get no good out of your Mill until the defects are remedied.

For large Saws we prefer Collars that have a perfect bearing of about one-half an inch on the outer rim, the other part clear, as they hold tighter than a solid, flat-faced Collar, because they are more apt to come fair against the Saw.

Examine these Collars with a delicate straight-edge (which we furnish at a trifling cost), to see if they are true, for it often occurs in turning a pair of Collars the tool springs from many causes, some of which are through pins, or hard and soft places, in the iron, tool being too light, and from many other causes. In order to be certain that none of these causes shall affect the Saw, our advice is, in all cases, before the Mandrel is taken out of the lathe, a fine file of just the proper spring be held against the face of the Collars; this will take off any of the proud or uneven points that may have been left on them. Where there is any doubt as to the truth of the Collars, there should be put upon every Saw a pair that are perfectly true, independent of the Mandrel Collars, and so stiff that screwing up the Collars cannot affect the Saw.

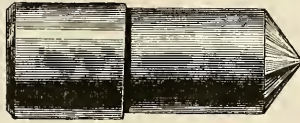
We are now finishing all our Circular Saws by a new and improved process, which ensures each side of the Saw-Plate being perfectly true; by this invaluable process, every particle of unevenness is removed; the Saw never requires packing (providing the Collars are true), and all the annoyance and trouble which have hitherto surrounded and perplexed the Sawyer in this particular are permanently and forever removed.

SAWS OUT OF ROUND.

To remedy this defect, a piece of grindstone or a cobblestone should be held against the points of the Teeth while the Saw revolves, and thus reduce or wear down the most prominent teeth; or a piece of red chalk may be held against the points, which will mark the Teeth in proportion as they are long or short. The long Teeth should then be reduced by filing.

HANGING THE SAW.

In this matter too much care cannot be exercised. First, the Mandrel should fit as tightly as possible in the boxes, so that it will run without heating. Secondly, we recommend, where flat Collars are used, the steadying pins to be made with a shoulder (see cut below), for it frequently happens where any other kind of pin is used, a burr or bunch is raised at the corner where the pin enters the Collar. This is avoided by using the pin as shown in illustration, the bottom of which is smaller than the top.



Steadying Pin.

Few persons appear to know the exact point at which a Saw becomes dull, or they would file the Tooth on the front, instead of the top. It is the edge under the point (see Fig. 1, page 12, Tooth A), on the proud side of Tooth with spring set, and on both extreme points on the under side of Tooth with spread set. The best and fastest cutting we ever witnessed was done by a Saw with spring set, filed perfectly straight or square, top and under face of Tooth. We, however, prefer the point of the Tooth swaged or jumped, to help keep the corner full, and if the power be light, the inside point of the Tooth should be filed on an angle from the upper side or back; the under side or front of the Tooth having first been filed square or level. With this Tooth, the Saw will run much lighter, and thus ease Engine, Mill, and Saw.

Some time ago, a friend who had not sufficient power to carry his Saw through the log (hard wood) put this point on his Saw, and had no further trouble.

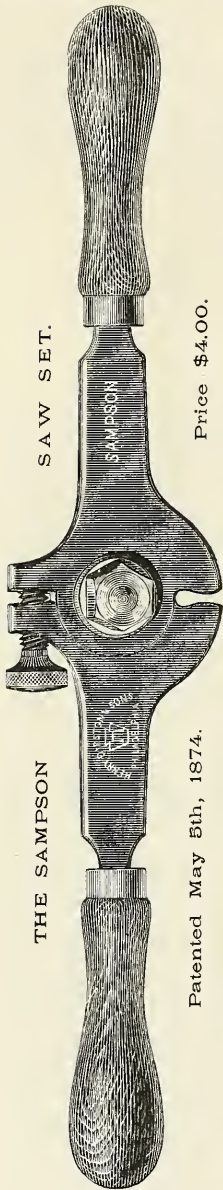
As a matter of course, those who have sufficient power can run any shaped point they please, but in all cases the less strain put upon the Saw the better.

Every man has his own idea of putting a Saw in order, but they cannot all be right. We have a customer that will run his Saw with an extreme bevel on the under side of the Tooth; and goes so far as to say that a man running any other kind of Tooth cannot be in his right mind. We do not see this in the light he does, but believe it might have a better result by beveling in his way, if some few teeth were left straight and swaged to fill up the gap, or to take out the core left between two such Teeth. But, in filing teeth on an angle, great care should be taken that the bevel on each Tooth be alike, or the Saw will not run even, but will incline to the side where the Teeth are most beveled. To insure regularity, we recommend the use of Parker's Patent Automatic Filing Machine (see page 46); otherwise, a pattern or jig should be used. But what astonishes us most is that this man is a Southerner, and using a spring set and a big bevel, which is going to the extreme of all our Southern customers, for they generally require a kind of bull-nosed Tooth with a three-eighth spread, which also seems wrong to us. By getting over this extreme spread, we could afford to make our Saws 20 per cent. harder in temper, which would be a great benefit to them. At all times we can run these Saws with much less set when we get the chance. To do this, a thin-centred Saw with a larger Collar is necessary, and then, as we have before stated, we could make our Saws harder, and not spall as much as they do now, because not half the strain would be put on the grain of the steel. It is the over-straining that makes the Saw-Teeth spall in spreading.

The sweetest running Saw we have ever seen was a sixty-six-inch straight Saw, running for slabbing, and a forty-four-inch bevel for stripping the boards. It was a source of great pleasure to see this Mill work. It ran off 24,000 feet per day. But we think nothing is gained by running a bevel Saw, unless it be for stripping boards.

HINTS FOR FROSTY WEATHER.

In frosty weather, dip a sponge in hot water, wring it dry, and apply it to the Tooth you intend to set. This will take out the frost, and may prevent the Tooth from breaking, if inclined to be brittle. Never file square chambers at the root of the Tooth. Square corners are liable to start cracks or breaks in your Saw, just as a shoemaker would file a square corner in the glass he desires to break. See cut on page 21.



Price \$4.00.

Patented May 5th, 1874.

THE SAMPSON SAW SET.

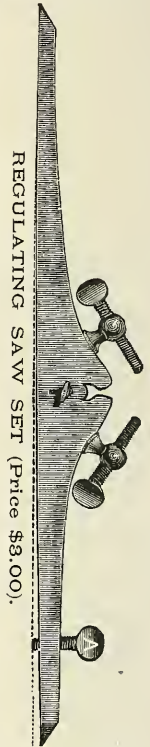
This improved Saw Set we recommend as being the most useful, powerful, and desirable in existence.

It is made of the best refined cast-steel, in two sections, and united in the centre by a bolt, which serves as an axis; thus it can be readily adjusted by means of the set screw to suit the thickness or gauge of any Saw. We pronounce this Saw Set to be superior to any we have ever seen.

REGULATING SAW SET.

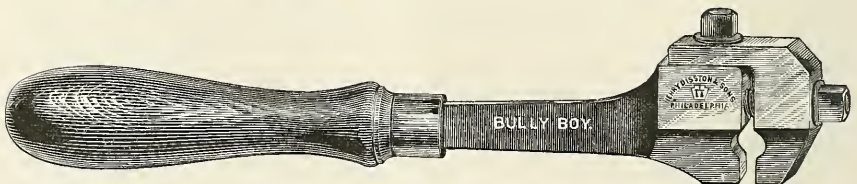
The accompanying illustration represents a very superior Saw Set. It can be so adjusted as to give any width and depth of set required.

The slide in the opening is for the purpose of regulating the DEPTH, while the screws on either side adjust the WIDTH of set required. Place the Set fair on the Saw-Tooth, the point of which must touch the adjustable slide. Bend the Tooth over until the side screw strikes the Saw-Plate. As each Tooth is successively bent over, the accuracy of the set can be tested by using the tool as a gauge on its straight edge (see dotted lines) in conjunction with screw A.

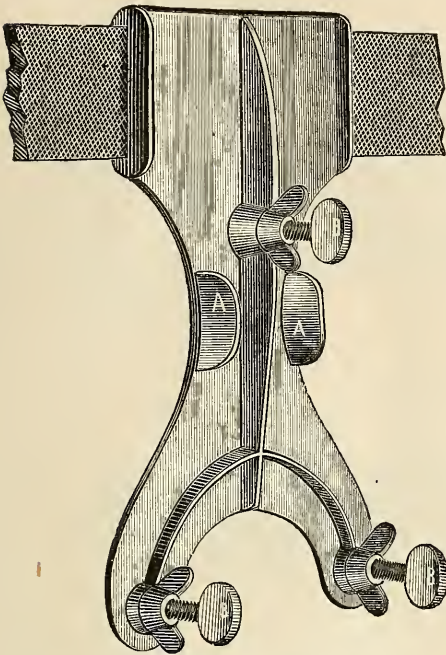


THE BULLY BOY

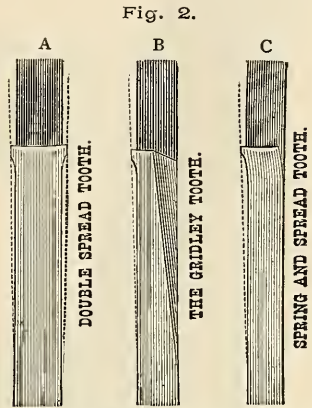
is a really good Set, and can be relied on to give satisfaction.



Price \$4.00.



SIDE FILE (Price \$1.50).

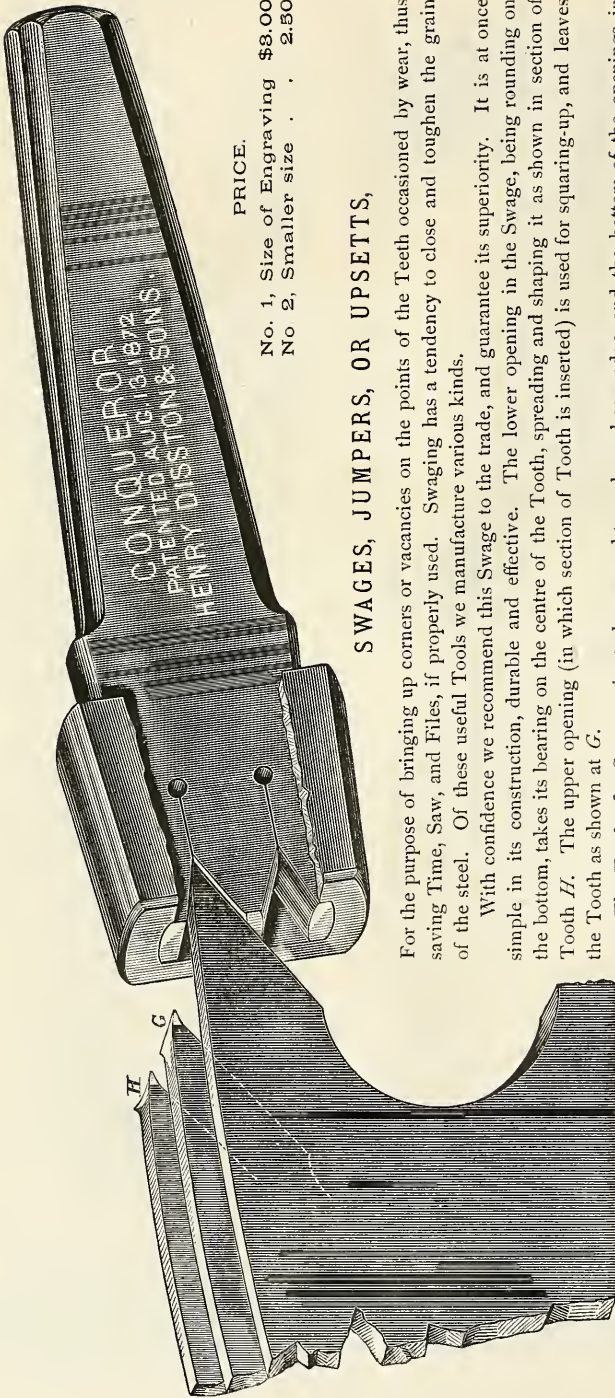


Showing the different set for Saw-Teeth.
Dotted lines show the under-cut.

It is impossible to set a Saw so that some of the Teeth do not overhang, or are not bent over more than others. The slightest difference in the temper or variation in shape causes the Teeth to set mild or rigid; this defect in the set, no matter how slight, must produce rough lumber. The difficulty can be overcome by the use of our Side File, an instrument worth its weight in gold to every sawyer or lumberman. It is used for the purpose of regulating Saw-Teeth after they have been set, and can be adjusted to any width of set required. It removes the extreme points, and brings every Tooth in perfect line on a firm foundation and true cutting-edge.

Every point is brought up to its work, leaving no vacant corners; no weak, flimsy, or extreme points, such as are left by the ordinary way of setting and sharpening. By the use of this tool, the set of every Tooth is made even, and a Saw thus regulated will run twice as long without sharpening. The File must be so adjusted by means of the Set Screws as to conform to any width of set desired. The Jam Nuts are for the purpose of securing the Set Screws in the desired position. When the Side File has been properly adjusted, it must be held in position by means of the clips *A*, against the Saw Blade, the points of the Set Screws *B* only touching the blade. Each Tooth in succession must be filed until the set of the Tooth conforms to the gauge of the Set Screws. Thus, all uneven or overhanging corners will be removed.

Shortly after the introduction of this invaluable tool, a customer sent to us for the machine which we had to help the Saw to "*Plane Lumber.*" We had some little difficulty to find out what he meant, but at length discovered that he wanted the "*Side File.*" The immense demand for this useful little tool, and the testimonials we are constantly receiving, fully prove its value.



PRICE.

No. 1, Size of Engraving \$8.00
 No 2, Smaller size . . . 2.50

SWAGES, JUMPERS, OR UPSETTS,

For the purpose of bringing up corners or vacancies on the points of the Teeth occasioned by wear, thus saving Time, Saw, and Files, if properly used. Swaging has a tendency to close and toughen the grain of the steel. Of these useful Tools we manufacture various kinds.

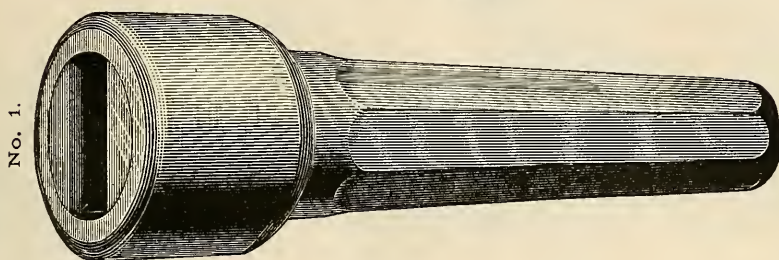
With confidence we recommend this Swage to the trade, and guarantee its superiority. It is at once simple in its construction, durable and effective. The lower opening in the Swage, being rounding on the bottom, takes its bearing on the centre of the Tooth, spreading and shaping it as shown in section of Tooth *H*. The upper opening (in which section of Tooth is inserted) is used for squaring-up, and leaves the Tooth as shown at *G*.

The Teeth of a Saw require to be swaged to a sharp, keen edge, and the bottom of the openings in the Conqueror being slotted, it is impossible to blunt or injure the fine-cutting edge of the Tooth, which is frequently done by other swages. One of the principal drawbacks in the manufacture of solid swages has been the difficulty experienced in properly hardening them at the BOTTOM OF THE OPENING, which portion of the Swage does all the work, and requires to be hardened in the most perfect manner.

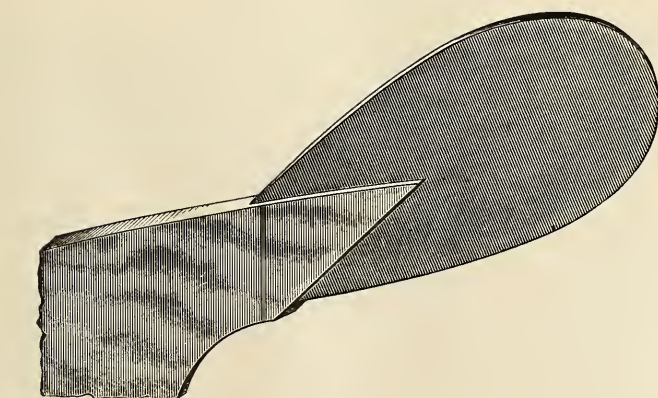
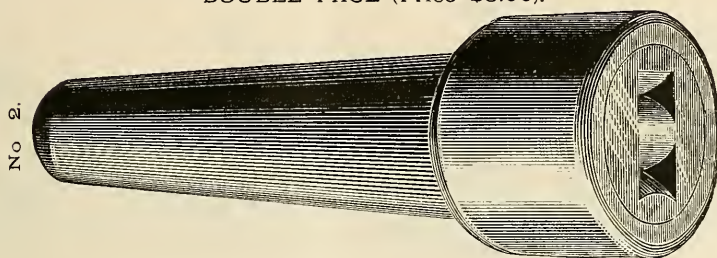
The Conqueror is hardened before the sleeve is driven on, and the hardening composition passes freely through the slots at the bottom of the openings, thus insuring an even and correct hardening in that portion of the Swage where it is most required. Parties desiring the old-style Swage are referred to engravings 1 and 2 on the next page; we believe them to be the best of their kind.

SWAGES, JUMPERS, OR UPSETTS.

OPEN FACE (Price \$3.00).



DOUBLE FACE (Price \$3.00).

GAUGE BY WHICH TO FILE AND REGULATE THE SHAPE OF
SAW-TEETH.

A Tooth cannot be jumped to advantage unless filed in proper shape. To do this without a gauge, requires a large amount of practice and experience. Taking for granted the back of the Tooth is in good shape, the jumping must be done from the *under side*; this gives the proper rake and saves the Saw. After the Teeth are swaged, a few touches with the ordinary file and side-file complete the work. This useful little tool will be furnished gratuitously on application.

FIG. 1.

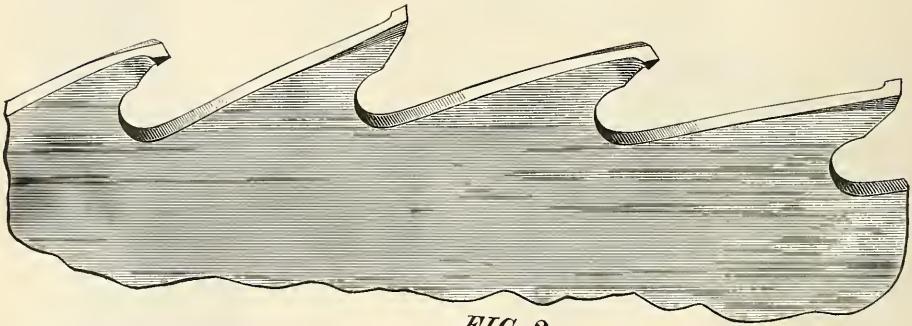
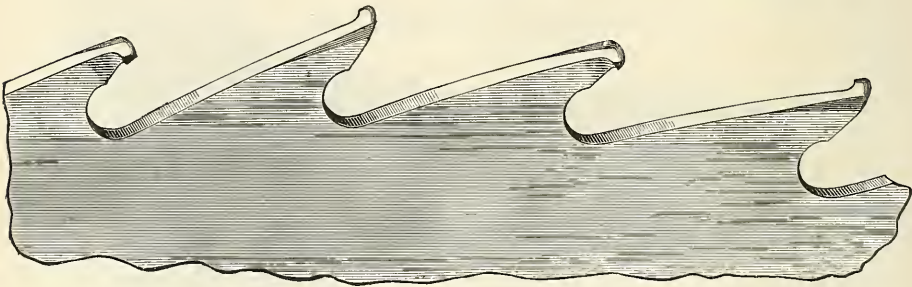


FIG. 2.



THE GRIDLEY TOOTH.

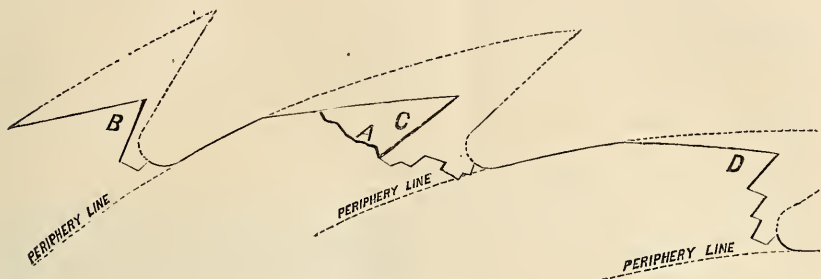
The attention of our readers is specially called to Figs. 1 and 2. They are representations of the Gridley Tooth, spring and spread set. Fig. 1 represents a portion of a Saw in proper order for work, and Fig. 2 shows how the Teeth become worn and rounded by use. Where the power is light and the sawing tough, this Tooth, kept in proper order, will accomplish wonders. *The cutting-points must be kept up square and full, as shown in Fig. 1; for, when they become dull and rounded, as shown in Fig. 2, it consumes twice the power to run the Saw, and makes inferior lumber.*

In sharpening this or any other Tooth, the filing should be done almost exclusively on the **under side**; the top should be filed only just sufficient to keep the Tooth in proper shape. The points of the Teeth should **never** be filed to a keen, proud edge, but must be brought up by the use of the swage and a light hammer, and care should be taken to elevate rather than depress the point of the Tooth during this process. After swaging, a few touches of the file will complete the work, and a great saving in Saw-Plate, Files, and Labor will be the result. Thousands of dollars are annually wasted by the old method of filing and getting up the points of Saw-Teeth. The best saws we make are so high in temper that we often find it *necessary* to both spring and spread to get the set; and a Saw must be hard, indeed, which cannot be set by this method. Our Saws are ground in the exact position in which they are used in the mill, and subjected to the same strain. Both sides being ground at the same time between two stones revolving rapidly, a **true, even, and uniform** surface is the certain result, less set is required, and friction wholly avoided.

Many persons lose sight of the fact, that if the engine flags, everything about the mill flags in the same proportion, and the loss from this cause is immense. Flagging is generally the result of friction, or the Saw not running freely.

HOW TO FILE CIRCULAR SAWS.

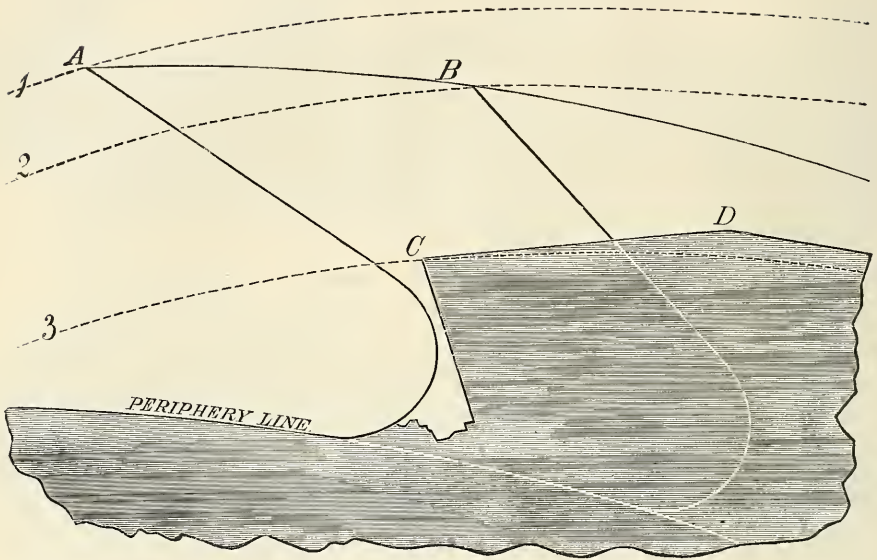
In a great many instances the persons who file Circular Saws pay no regard to the shape of the Teeth; they get them into all kinds of shapes but the right one, as shown in engraving.



The dotted lines on the above engraving represent the Teeth in proper shape as they leave the factory; and the lines at *B*, *C*, and *D* show the condition in which they are frequently sent to us for repair. In these Teeth there is no chamber for the circulation of dust. At the same time this kind of filing wears away the Saw five times as fast, and consumes three times as many files as would be required to do the work properly. But these are only a portion of the evil results. Teeth filed with sharp, square corners at the bottom frequently break, as shown at *A*, tooth *C*. It is lamentable to see this state of things when they can be so easily avoided.

We have thousands of dollars' worth of Saws come to be repaired, that break in cold weather by reason of these sharp corners. They are ruinous to the Saw in more ways than one. If you will see to having your Saw's Teeth kept in the shape they leave us, you will do away with this trouble and expense. The moment the Teeth commence to get in bad shape, your Saw begins to suffer in diameter, from the fact that the filer, wishing to get his points sharp too soon, files from the top instead of the face of the Tooth. This does not help him one particle, but rather the reverse; and every stroke of the file on the top wears the Saw away more than five strokes on the face or under side of the Tooth.

The engraving of the **Jones Tooth**, on page 22, will fully illustrate the evils of this pernicious and destructive practice.



JONES TOOTH.

This engraving represents a full-sized Tooth, accurately traced from a Saw sent to us some time ago for repair. The Teeth of this Saw had been filed from the top instead of the face. Dotted line 1 strikes the point of the Tooth at *A*, and shows the size or diameter of the Saw when it left the factory. Dotted line 2 strikes the point of the Tooth at *B*, and shows the size the Saw would have been by filing back on periphery line, according to our directions. Dotted line 3 strikes the point of the Jones Tooth at *C*, and shows how much he has reduced the Saw by his fearful mode of filing. Take a pair of compasses and measure from *A* to *B*, and you will find exactly the same distance as from *A* to *C*; this, of course, presents the same amount of cutting surface in each instance, and yet in one case the Saw has been filed down in size three times as much as the other.

Now, what has caused all this loss and trouble? Why, Mr. Jones has been filing from the top instead of from the face of his Tooth. He has filed away and destroyed the useful portion of his Saw, and retained that part which is of no earthly use to him, but is a positive injury. He has done three times as much filing as was necessary, and has consumed three times as many files as were required. He has left no chamber for circulation of dust; his Tooth is higher at *D* than at *C*, thus instead of cutting his lumber with the point of his Tooth, he scrapes it with the back.

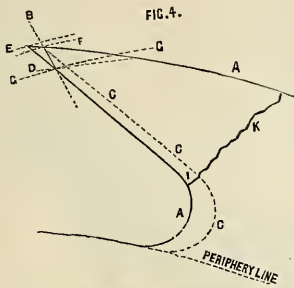
If his Saw never commenced to heat before, it will do so now. Mr. Jones sent it back to us with the remark, "*It won't saw.*" Now, Sawyers are doing this almost every day, but seldom with the same perseverance as Mr. Jones. They generally stop about half way, and then send the Saw to the manufacturer to be put in order.

The Chambering Machines (represented on subsequent pages) are furnished with different sized Cutters, and with them you work out your Gullet or Chamber for whatever sized Tooth you may require; but the deeper your Tooth the quicker your Saw wears out.

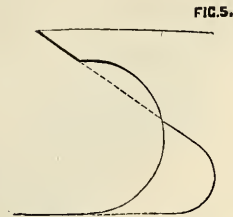
If you can do your work with a Tooth one and one-fourth inches deep, your Saw will last more than twice the time that it would if your Tooth was three inches deep.

We find that some mills sawing hard and soft woods carry only about one-inch feed. In this case a very shallow Tooth is required. A shallow Tooth will cut the smoothest lumber; but, if you carry five-inch feed, as they do in some sections, you want a deeper Chamber or more Teeth certain, and the Saw must wear down that much faster. What we wish to do is to give a Tooth, where we can, to suit the feed and kind of work, for hard wood requires a different Tooth from soft, in more ways than one.

A great saving in your Saw-Plate, Time, and File is effected by taking a good, deep, full cut, instead of a light, scraping cut. As stated in a previous article, a Tooth becomes dull on its face in proportion to the depth of cut taken at each revolution of the Saw; for instance, with a thirty-second of an inch feed, it takes thirty-two Teeth to cut one inch of lumber, whereas with one-eighth feed it takes only eight Teeth to cut the same amount. In other words, the fibre or grain of the lumber has to be broken thirty-two times in one instance, and only eight times in the other; and when your Tooth starts to break the fibre one-eighth of an inch in your log, it will do it with nearly as much ease and consume very



Filing back on the Periphery Line.



Showing Old and New Style Tooth.

little more power than if the cut was a thirty-second of an inch. Of course one Tooth, in this example, becomes dull for one-eighth of an inch under the point, and the other only one thirty-second of an inch, but it consumes as much Saw-Plate, Time, and Files to bring up one Tooth as the other; it is, however, easy to overdo the thing; there is reason in this as well as in anything else.

On Tooth, Fig. 4, dotted line *B* shows where the point first wears; dotted line *CC C* shows how it should be filed back on the periphery line; but, too frequently, on account of the long surface to be filed, and the sharp corner in the Gullet made as at *I* (which cause the Teeth very frequently to break, as shown at line *K*), they go to the top of the Tooth, as represented by the dotted line *D*. You will see that by filing back on the dotted line *CC C* you have only diminished your saw from dotted line *E* to *F*, while by filing from the top you have diminished your Saw, as shown by dotted lines from *E* to *D*.

This shows that by filing on top you have wasted five times as much of your Saw as by a proper filing. This, added to both sides of centre, shows you have actually diminished your Saw ten times as much as you would have by proper filing. This difficulty is overcome by the introduction of our new Tooth, as represented by cut, Fig. 5.

You will see in Fig. 5 (same shape Tooth as Fig. 4) by using the Gumming Machine (page 30) you have but a small surface left to file, which gives no excuse for filing on top of Tooth.

DISSTON'S PATENT GULLET-TOOTH CIRCULAR SAW.

One of the most Valuable and Useful Improvements of the Age.



By reference to the above engraving, it will be observed that the back or point line of each Tooth is the continuation of the spiral lines *Z*, and the sharpening is mainly done by the reduction of the Gullet or Throat only. This is readily accomplished by the use of our Patent Gummers. (See pages 30 and 33.)

The course pursued by this cutter is spiral, and while it is in the act of reducing the front or throat of Tooth *D*, it is prolonging the back or point-line of Tooth *C*. The engraving represents a two-inch Tooth or Gullet. The Saw *B* is the Saw *A* worn down. When the Saw has been reduced on centre line from *G* to *F*, it has been worn away but six inches, yet has presented a cutting surface on spiral line *Z* from *G* to *Y*, a distance of twenty-four inches. But this is only one of the advantages claimed for our patent Gullet-Tooth. The Throat or Gullet being chambered out on a half circle, forms a larger receptacle or chamber for dust, and thus a one-and-a-half-inch Tooth of this pattern will keep a Saw as free from choking as a two-inch Tooth of the ordinary shape.

The saving of the Saw-Plate by the use of a smaller Tooth is evident to the most casual observer. In wearing a fifty-four-inch Saw down to a forty-two, a loss of twelve inches has been sustained in the diameter of the Saw-Plate, which is six sets of two-inch Teeth, or eight sets of one-and-a-half-inch Teeth, an advantage of two sets in favor of our new Patent Gullet Tooth, independent of the immense gain by gumming on spiral lines. The

crowning triumph of this Saw is the fact that it can be kept in order with one-tenth the labor of any other Saw, and is bound to preserve its true circular shape; whereas, by the old method of filing both on back and front, it is impossible to keep a Saw round.

The gumming of our Improved Saw is accomplished without removing it from its bearing; when, as ordinary Saws have frequently to be removed and sent a great distance to a manufacturer in order to be gummed or re-toothed, by cutting or punching pieces from the plates, thus occasioning a great loss in time, trouble, and expense, re-hammering, etc., etc., which cost from twenty-five to fifty dollars, according to distance and time lost; it will be seen that these important ends can be accomplished by a proper regard to the shape and equality of the Teeth first cut.

One great fact must be borne in mind: the new Gullet-Tooth always retains the same shape, while the old Tooth is getting less in depth all the time, until finally you get it to half its original depth. Now, had you not better have a Tooth that is always the same thing, and just as you want it, than have a full chamber at one time and a half chamber at another? Let us here impress upon your mind, that a short Tooth with a good throat will do better work, and more of it in the long run, than a large throat at one time and a small one at another. There is every advantage in using a throat or chamber as small as possible.

Let us impress upon you the fact, that all the metal is required in the plate you can possibly have, if you wish a stiff Saw; any portion of the plate being cut away must necessarily tend to weaken the Saw without taking any less kerf. Stiffness of the plate and Tooth being the great desideratum when you want to make good lumber and quick work without trouble. Every one who has used this Saw pronounces it the most profitable one in use; the value of the Saw is in the outer rim, hence the great necessity of retaining its diameter, which is accomplished by this improved process.

From the numerous testimonials which we are constantly receiving in favor of our Patent Gullet-Tooth Saw, we select the following; they are from gentlemen of large experience in the lumber business, and tell their own story:

Delanco, N. J., June 1, 1868.

“MR. HENRY DISSTON:

“Dear Sir,—I have been running one of your 54-inch Circular Saws with the Patent Gullet-Tooth, since last March, and, so far, it has proved itself far superior to any other Saw that I have yet had in the Mill, and I would, with confidence, recommend any one who wants a good Saw to take no other.

“I have had about a half-dozen different patterns of Saws with inserted Teeth; have had the old style of gumming done in every style, that the Saw might be run free, and clear itself of the saw-dust; and none, till we received your last pattern of solid-plate round-Gullet Saw, answered the purpose.

“It runs much easier than any other one that I have yet had; fifty pounds of steam will drive the Mill along without any trouble; before, I was using from seventy-five to eighty pounds to do the same work. I find by using the Patent Chambering Machine about once each month, I am saved the time and expense of sending the Saw to the shop to be gummed out by machinery, and besides the cost of labor, lose one-half inch in the diameter of my Saw, which is another very important item. This does not take one-half of the time to file and keep in order that the other solid-plate Saws do, consequently use less files. The Tooth being short and stiff, it is not liable to run in the log, and makes very nice, smooth lumber. I find that the solid-plate round-Gullet Saw, with the Chambering Machine and the Jumper, are three Tools that work together well, and are, in every respect, worthy the consideration of any person who wants a good, economical Saw and Tools to keep it in order, and one that I am confident will give satisfaction after a fair trial.

“Previous to this, I never run over seven-eighths to one-and-one-half-inch feed, and am now feeding two inches. I use a spring set, therefore have only one-half the number of points to keep up, and these points, if graveled, will still run, and not affect the Saw as much as a

spread point will when graveled. When sharpening, I file off the back of Tooth, beveling two-thirds the thickness of the Saw; this gives a shearing cut instead of chopping, consequently there is less strain.

"Very truly yours,

"T. E. BELDING,

"Delanco Steam Saw-Mill, Delanco, Burlington Co., N. J.

"E. HAMILTON, Sawyer."

"Edinburg, Va., March 4, 1871.

"MESSRS. DISSTON & SON:

"Dear Sirs,—Yours of the 2d inst. is at hand. In reply, tender you my thanks for your valuable 'Hand-Book,' and will again thank you for my magnificent Saw and Gummer; one hundred dollars in gold would not buy it, if I could not get another just like it. It is perfection; can't see that it could be improved. I will say that not one Sawyer in ten knows that such a Machine (Gummer) is in existence, or every Sawyer would have one; and I must say, that if any other Saw-maker in the world would give me a Saw for nothing, I would not have it if I could buy one from you at any price.

"Gentlemen, I can't say enough about my Saw; it is the sweetest-running Saw that was ever hung on a Mandrel; it whistles through the guides like lightning, with guides within the thickness of a sheet of tissue paper; in fact, it is the only true Saw that I have ever owned, and I have owned many. You will please send me one of your Great American Cross-Cut, six and one-half feet; one Regulating Set or Side File; your little Gauge to keep the point of Tooth in proper shape; one of your No. 1 Swage or Jumper; and one of your Saw Sets, as represented on page 16 in 'Hand-Book.'

"I am, sirs, your obedient servant,

"J. F. FITZSIMONS.

"P.S.—My Saw is not too hard, is not too soft, is not too thick, is not too thin; but the very thing."

"Tioga Centre, N. Y., June 5, 1871.

"MESSRS. H. DISSTON & SON:

"Gentlemen,—I have been running one of your fifty-four-inch Circular Saws, Patent Gullet-Tooth, since the 1st of May, and to say that I am pleased with its work, and that it gives good satisfaction, would be saying but very little. It has proved itself so far superior to any other Saw I have ever yet had in the Mill, that I do not hesitate to say that I would not take five hundred dollars for it, providing I could not obtain another like it. Previous to this, I had been running both solid- and inserted-Teeth Saws of different patterns; I have had two Middletown Saws, solid Tooth; one Pittsburg Saw, and one New York Saw, both inserted Teeth; but none of them gave good satisfaction, and I had almost despaired of ever getting one that would, until I received this one from you. I gave it a fair trial in pine, hemlock, and maple, on two-inch feed, in a twenty-four-inch cut, not in one log alone, but right along all day, sawing boards, and it ran perfectly true and straight, not varying a hair's breadth in any cut taken, and cutting apparently as easy as any of the other Saws would in a twelve-inch cut on inch feed, and this with a forty-inch wheel under six-foot head. Its advantages over any other solid-Tooth Saw are plain to be seen, while any one at all acquainted with the working of Circular Saws cannot fail to discover at a glance that it is a decided improvement on the inserted-Tooth Saws, from the fact that it possesses all of the advantages hitherto claimed for them over the solid Tooth, while the Teeth are permanent in the plate, thereby saving the strain that there must necessarily be on an inserted-Tooth Saw; an objection that I have always had against them. I would with confidence recommend these Saws of yours to all wanting Saws, as being far superior to any other now in use. They will do more work, and do it better, in a given length of time, with two-thirds the power it requires to drive any other Saw I ever run, a fact that should recommend itself to every Mill-owner where a saving of power is necessary. I consider one of these Saws and one of your patent Gummers, two indispensable articles, that should be in the hands of every Mill-owner and Sawyer throughout the land.

"Respectfully yours,

"JOHN G. SMITH.

"A. G. HILL, Sawyer."

"Volant Mills, Rusk Co., Texas, Dec. 4, 1873.

"MESSRS. HENRY DISSTON & SONS :

"Sirs,—Examining your Hand-Book, I notice some Tools I wish to purchase. Your Side File, Set, and Tooth Gauge.

"I have been using your Circular Saw of old-style Tooth, but since I got your Gummering Machine I use the Gullet-Tooth, which is the greatest idea you ever introduced. I have run all make of Saws, but would not give one of Disston's Patent Gullet-Tooth for all of them. They run lighter and cooler than any Tooth I have ever seen. We have a good many Mills here, and I wish you could see the Saws. With the same engine, other Mills run with 110 lbs. steam to drive their Saws on two-inch feed, while I drive with the same feed with 60 to 80 lbs. I ran a bad Tooth before I received your Hand-Book. My Saw Mandrel heated, next the Saw; I abused your Saw, and even laid one of them aside. I got your Hand-Book in August, bought one of your Machines (Gummer), chambered out the Teeth; have taken the heat out of my Saw Mandrel, and now, what do you think? I *never* have a hot Saw, *run* on less steam, and cut better lumber. Other Mill men want to know how I cut such nice lumber and run my Saw so cool. I tell them *by taking your advice*. Some parties say that a Saw should never be so neglected as to need a Gummer. I have tried to get along without one, but find it to advantage to give way to later improvements. They say, to give me one of your machines, that I could run an oven lid and make good lumber. I do not wish to weary your patience with this long letter, but you have made me the *master sawyer* of this country. I want you to send me one of your Hand-Books, as mine is getting considerably worn. Do not think me flattering you when I say you make the best Saws and Gummer in the United States.

"Yours most respectfully,

"JAMES T. LANTRIP,

"Sawyer for Carter & Wilkins, Volant Mills, Texas."

"Caddo Mill, Clark Co., Arkansas, Oct. 13, 1873.

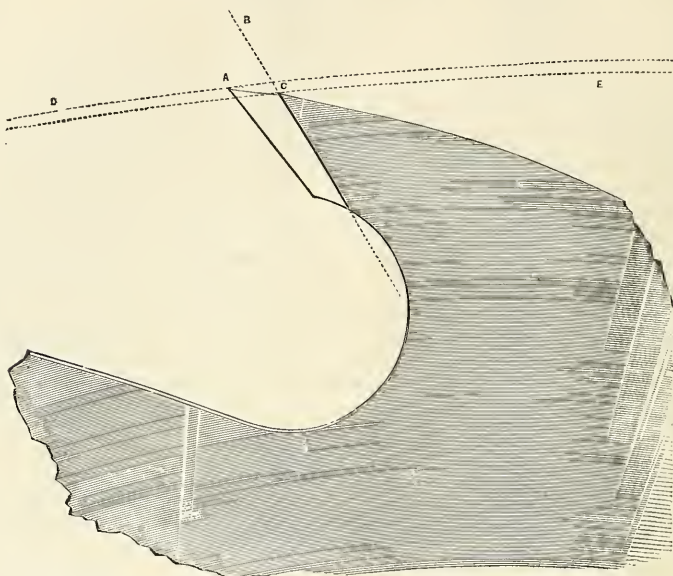
"HENRY DISSTON & SONS :

"Gents,—Some three months since I received one of your 56-inch Circular Saws, with 56 Teeth, ordered by Samuel P. Boozer, of Newberry, South Carolina. I cannot say enough in praise of my Saw. It is everything. In the first place, it is the best piece of metal ever made. Then the 56 Teeth enable it to run through any log, especially oak, almost without any steam. This Saw has done more in the way of advertising for your Factory than anything else could have done. You will sell all the Saws ordered from this time on, in South Arkansas. Quite a number of Mill men have come for a considerable distance to see this Saw run. It makes the most beautiful lumber ever made. Not the print of a Tooth can be seen. The dust is as fine as good corn-meal. I now write for a Gummer. Send in care of James Carder, Arkadelphia, Arkansas.

"Very respectfully,

"KAY BURTON."

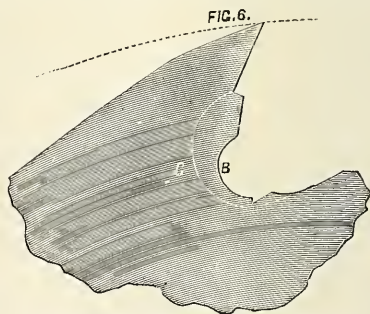
The cut below represents a section of our Gullet-Tooth Saw (kept in order by Chambering Machine) after cutting 300,000 feet of hemlock lumber. Dotted line *D* and point *A* show the original diameter of the Saw; dotted line *E* and point *C* show the Saw after cutting the above amount of lumber, only reducing the diameter of Saw about three-sixteenths of an



Engraving of Tooth after cutting 300,000 ft. of Lumber, see Belding's Letter, page 26.

inch, as can be plainly seen between dotted lines *D* and *E*. According to this, a fifty-four-inch Saw will cut 9,600,000 feet, and only reduce the diameter of Saw to forty-eight inches. You will thus perceive the great advantages derived by using our Patent Tooth and Gummer.

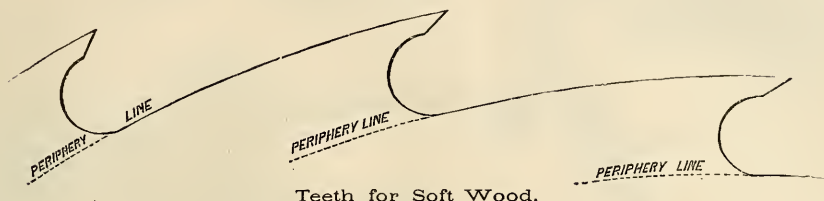
The following cut is a fac-simile of the condition of the Teeth of a large Circular Saw sent to our factory to be gummed. The parties had been using some Gummer upon the Saw, which actually did more harm than good; the reason we will explain: the line *B* shows where the Cutter had been at work, but, being entirely too small, not even reaching the bottom of Tooth, as it originally was (leaving a ragged throat), and having so much depth to file at top that the filer stopped before he reached the Chamber, the consequence was, after a few filings there was a lump left in face of Tooth, which so obstructed the circulation of saw-dust that the parties were compelled to send it to the factory to be gummed out. Dotted line *C* shows the condition the Tooth would have been in had our Chambering Machines (as shown at pages 30 and 33) been used upon it.



Bad Chambering (reduced, half natural size).

Figs. 7 and 8 show, by periphery lines, the difference in the wear of the Saw. We will here remark that is of the greatest importance to file back on these periphery lines. You will see by this Tooth the point on the face is very small. Well, the smaller it is the less filing it takes to keep it sharp. One stroke of the File on this point will effect more than ten strokes on the face of a Tooth that you have to keep back from point to bottom of

FIG. 7.



Teeth for Soft Wood.

Gullet; and when you have so little point to keep back, you will find it easier to sharpen the Saw from the face than to file from the top, and thereby you retain the diameter of your Saw to a very great extent, as shown in Fig. 4, page 23; so much so, that you will not wear out one-third the Saw-Blade in one year that you do by the old process and old Tooth.

If you could let us know what kind of lumber, and the speed and feed used, we could then give you the Tooth you want, and, in many instances, save you waste of Saw and the

FIG. 8.

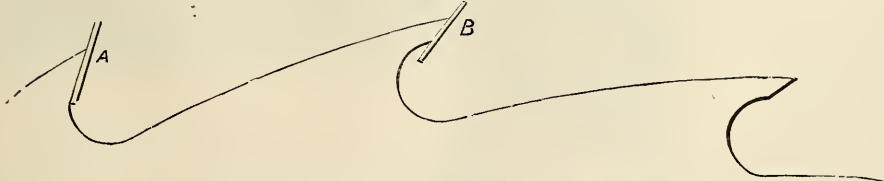


Teeth for Hard Wood.

extra time it would require to keep a larger Tooth in order. For instance, for one-inch feed, we should not (where you use our Gummer) give over one and a quarter depth; for a five-inch feed, not less than forty Teeth, and depth to correspond; for a three-inch feed, we should give thirty-two Teeth, and depth to correspond.

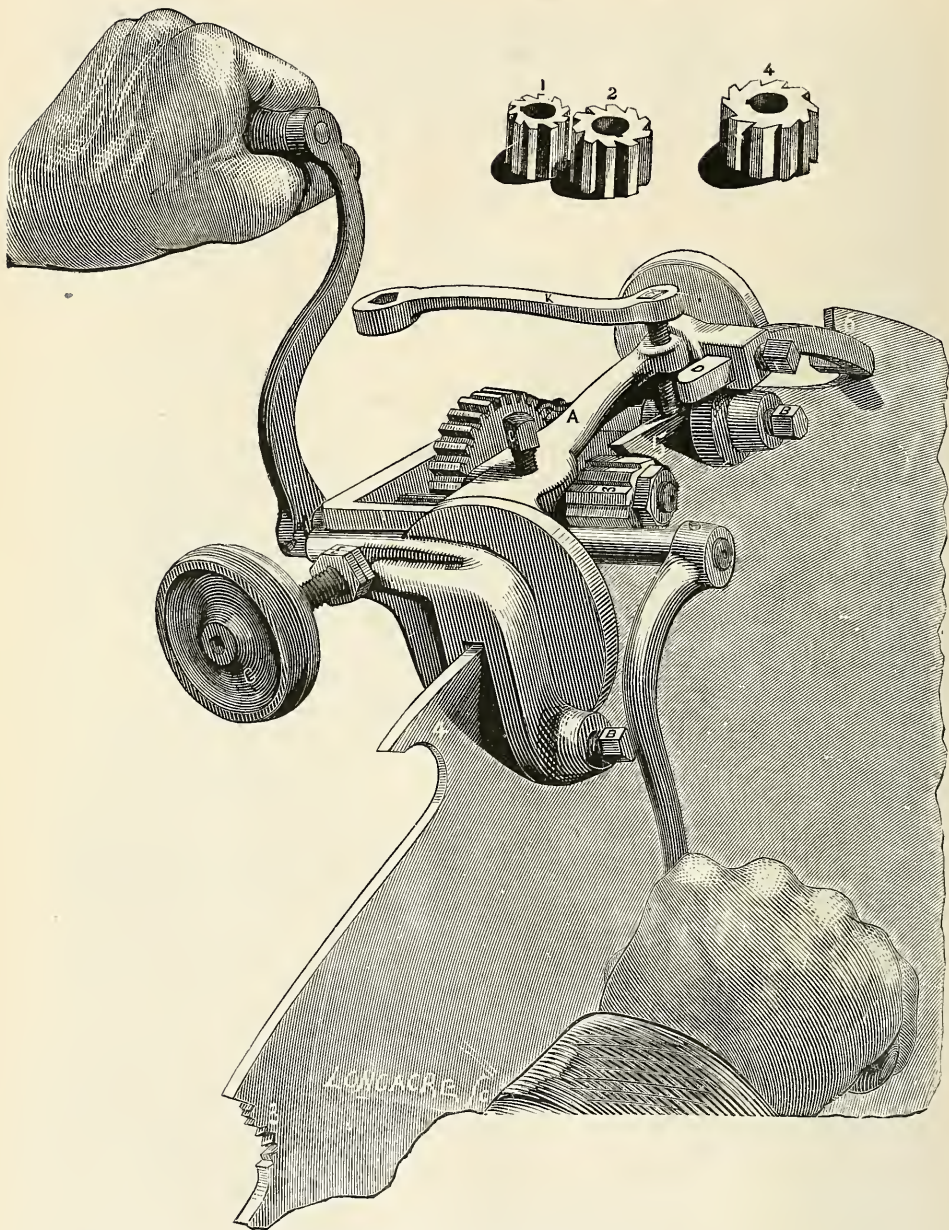
The Chambering Machine ought to be put upon your Saw every time that the File strikes the back of the Chamber, as shown in Fig. 9, Tooth A.

FIG. 9.



When your Tooth wants Chambering.

Tooth B has just been chambered, A wants chambering. By filing your Saw back on this small point line, you wear your Saw back on the periphery instead of (as is too much the case) on the centre line. Observe, if you file on the top of the Saw, you go down towards the centre so much faster than when you keep back on the periphery line.



THE ABOVE CUT REPRESENTS OUR
PATENT GUMMER OR CHAMBERING MACHINE.
 Specially adapted for Circular Saws.

A—The Frame.
 B B—Screws for fastening Machine to Saw.
 C C—Screws for adjusting Frame to pitch of Teeth.
 D—Gauge for spacing off the Teeth.
 E—Jam Nuts to give depth of Chamber required.
 F—Screw for fastening Gauge D.

G—Screw for feeding Cutter.
 K—Wrench.
 3—Tooth that requires Chambering.
 4—Tooth Chambered.
 5—Tooth in process of Chambering.
 3—Cutter in operation.

In using this Machine (page 30), first run the Cutter back by means of screw *G*, as far as necessary, then place the Machine on the Saw, with the Cutter close in chamber of Tooth to be gummed.

If the Teeth of the Saw are regular and the same distance apart, you may start the Cutter in any Chamber; but if they are irregular, you make them even by commencing in the smallest Tooth. After gumming the Saw a few times, the Teeth must become regular.

Fasten the Machine to the Saw by means of the screws *B B*, set the jam nuts *E* as far back on screw *G* as you wish to recess the Chamber, proceed to gum the first Tooth, feeding with screw *G* until the jam nuts *E* strike the frame, and, when completed, run the Cutter as far back as necessary, and move the Machine to the next Tooth towards you, then fit gauge *D* (which can be bent to suit any Saw) into the chamber of the Tooth that has been gummed, and proceed as before. The jam nuts must not be moved after being set until the Saw is finished. Keep the Machine well oiled, but not the Cutters; **they should never be oiled.**

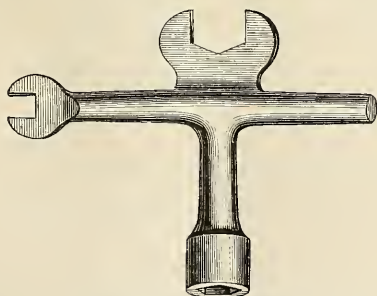
In converting an old-style Tooth into the new Patent Gullet-Tooth, be careful not to proceed too fast or put too much pressure on the work. Do not attempt to do too much at one operation, or you will have too fine a point on your Tooth.

In the first gumming only a slight impression should be made. Proceed by gradual process, which will take two or three gummings. These remarks apply also where sharp corners or angles have been left by bad gumming or filing. See cut, page 21, and Fig. 6, page 28.

The Cutter is so arranged as to slide on its axis; and when one portion becomes dull, remove a washer from back to front, and thus present a new sharp cutting surface, and so continue changing the washers until the whole face of the Cutter becomes dull.

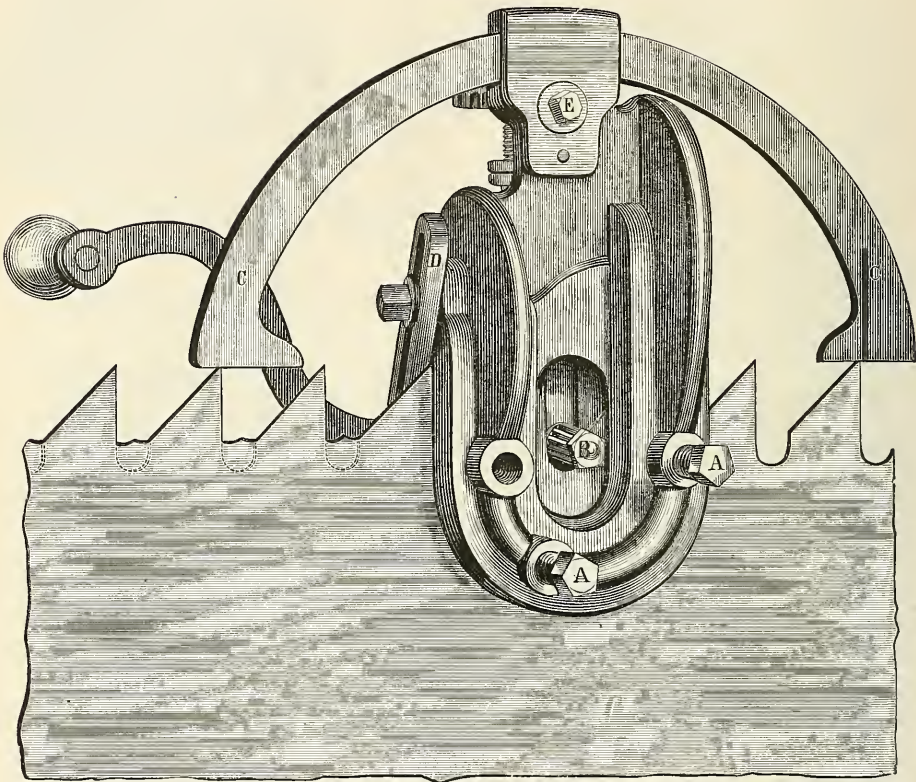
This Gummer is a most invaluable Machine, and should be in the hands of every millman. Its advantages are numerous: it saves power, files, and filing. It is so simple in its mode of operation that one of your laboring men can be taught to use it; and, when your Saw requires gumming, you have only to say to Tom, Dick, or Harry, "If you gum that Saw after the mill stops, I will give you fifty cents," or the Sawyer himself can gum it in the dinner-hour, for it can be done in twenty minutes, thus leaving him twenty minutes to eat his dinner, and the remaining twenty minutes to kick foot-ball, talk politics, or read the paper.

If this Machine is properly used, we never expect to have a Saw returned for repairs after it has once left our hands; and this is the reason why Saw-Makers are so everlastingly down on it.



Gummer Wrench.

Fig. 3.



Figs. 3 and 4 represent Obverse Views of the same Machine,

ADAPTED FOR GUMMING EITHER STRAIGHT OR CIRCULAR SAWS.

Fig. 3 shows Gummer in position for gumming a Straight Saw. Place the Cutter *B* in the gullet of the Tooth to be gummed, the gauge *C* resting on the points of the Teeth. Secure the Gummer in position by means of screw *A*; run the Cutter back as far as necessary, by means of screw *H* (seen on Fig. 4); set the jam nuts *L* (Fig. 4) to correspond with the desired depth of gullet, and proceed to gum the first Tooth, feeding with screw *H* (Fig. 4) until the jam nuts strike frame *K* (Fig. 4). When this Tooth is sufficiently gummed, remove the Machine to the next Tooth, and proceed as before, until the Saw is gummed completely.

This machine has recently been much improved, an extra gauge *D* having been attached to the opposite side of the Gummer, the two gauges *D* being used in place of the circular gauge *C* for the purpose specified. The Cutter has also been furnished with a bearing on each side, which greatly adds to its strength and effectiveness.

Fig. 4.

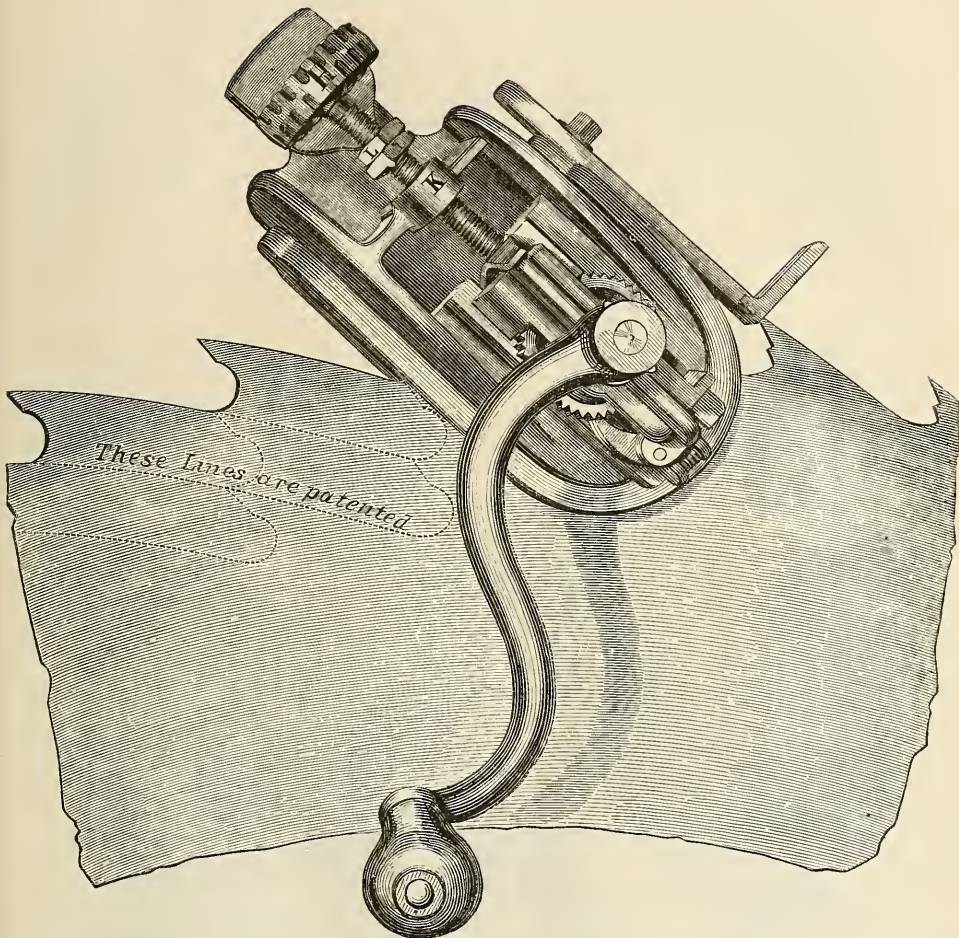


FIG. 4 SHOWS THE OBVERSE SIDE OF FIG. 3,

WITH GUMMER IN POSITION FOR GUMMING A CIRCULAR SAW,

The Gauge C being removed.

Screw the Gummer in proper position by means of screws *A* (Fig. 3); run the screw *H* as far back as necessary; set the jam nuts *L* to correspond with the desired depth of gullet. Gauge *F* must now be placed so as to strike the point of Tooth in front of it; then proceed with the gumming until the jam nuts *L* strike frame *K*. Remove Gummer to next Tooth, and repeat the operation until the whole is completed.

From the many testimonials we have received in favor of our Gummers, we select the following:

"Warren, Pa., October 14, 1870.

"MESSRS. HENRY DISSTON & SON:

"Gentlemen,—Permit me to call your attention to the fact that you are ruining our trade in Mill Files almost entirely by the introduction of your Patent Burr Gummer, as where we formerly sold *one hundred dozen* Mill Files we do not now sell *ten dozen*; yet we supply more customers than formerly. This state of things is all owing to the fact that we have been selling your Gummer to our customers, and the result is, a Gummer, costing \$30, saves more than nine-tenths of the filing necessary to keep a Saw in order before the introduction of the Gummer; besides, by the use of the Gummer, the Saw is always in order, and that without taking off the Mandrel or out of the Gate.

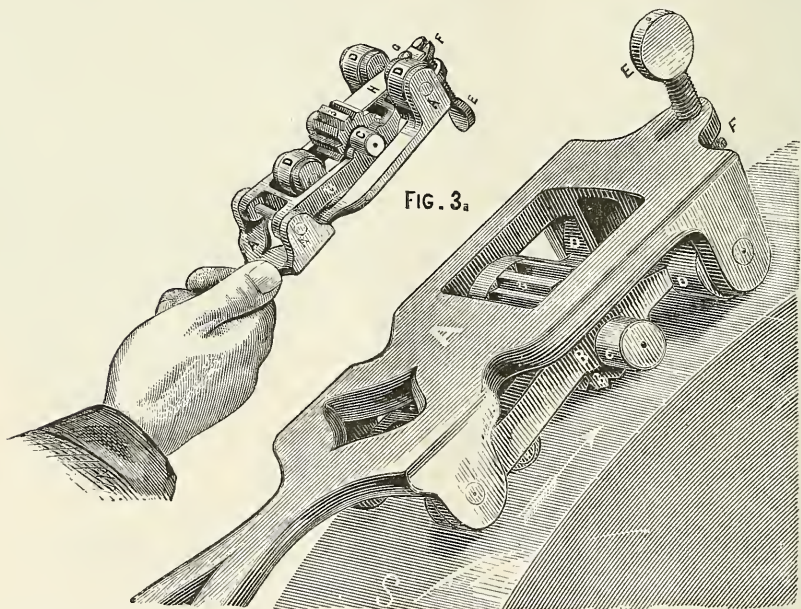
"Very truly yours,

"J. H. MITCHELL & CO."

"Our experience leads us to agree with the above, and we would not now be without this Gummer on any consideration.

"S. W. & E. D. SPRINGER,

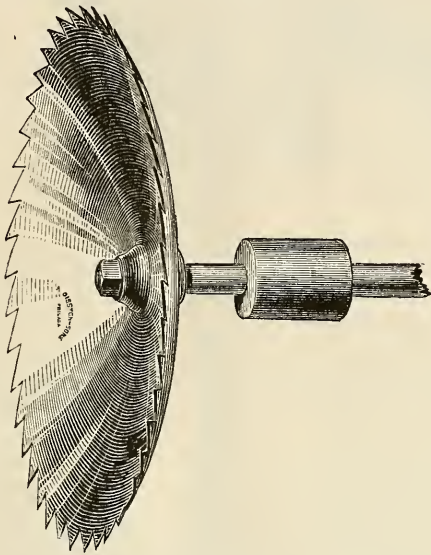
"Oregon Mills, Beaufort Co., North Carolina."



DEVICE FOR HOLDING THE CUTTER OF CHAMBERING MACHINE IN POSITION DURING THE PROCESS OF SHARPENING.

A is the main frame; *D*, the rollers; *B*, the adjustable frame; *3*, the cutter; *C*, the cutter shaft; *E F*, the screw for regulating the adjustable frame *B*; *G*, the screw for tightening spring *H*, which holds the cutter *3* in a proper position while grinding; *S*, is the grindstone. The stone should have a perfect straight face and run through in the direction of the arrow. In using this Machine care should be taken to hold it in line with stone.

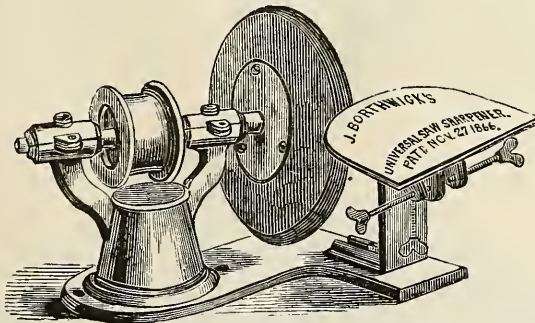
Screw the adjustable frame (which can be adjusted to any pitch) down till the cutter touches the stone; then see if the cutter is in its proper position; if not, it can be adjusted by spring *H*, by moving the spring either backward or forward.



CONCAVE SAWS.

The attention of the manufacturers of chair- or wheelwright-lumber, barrels, etc., is respectfully called to Concave Saws, of which we are manufacturing large quantities. They are dished and tempered by an entirely new and patented process, and guaranteed to be of superior quality in every respect. We furnish these Saws considerably cheaper in consequence of our new mode of manufacture.

Fig. 1.



BORTHWICK'S PATENT UNIVERSAL SAW-SHARPENER (Price \$20.00).

Fig. 1 is for the bench, and is of course stationary. The Saw being laid on the platform, shown in cut, during the process of sharpening. These Machines will be found well adapted to the purpose.

BORTHWICK'S PATENT SAW-SHARPENING MACHINE.

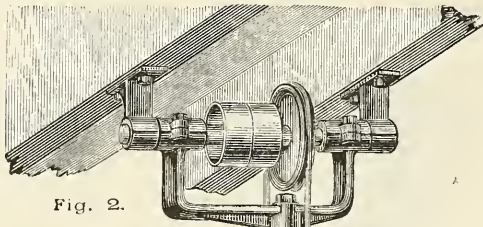


Fig. 2.

This useful Machine is for the purpose of sharpening the Saw without removing it from the Mandrel. When the Machine is required to be used, the operator grasps the handle *B*, and adjusting the frame *C*, as may be necessary, applies the cutter *A* to one of the Saw-Teeth, which is speedily sharpened or reduced to any desired shape; the Saw is then turned so as to bring the next Tooth to the proper position, and the operation is repeated.

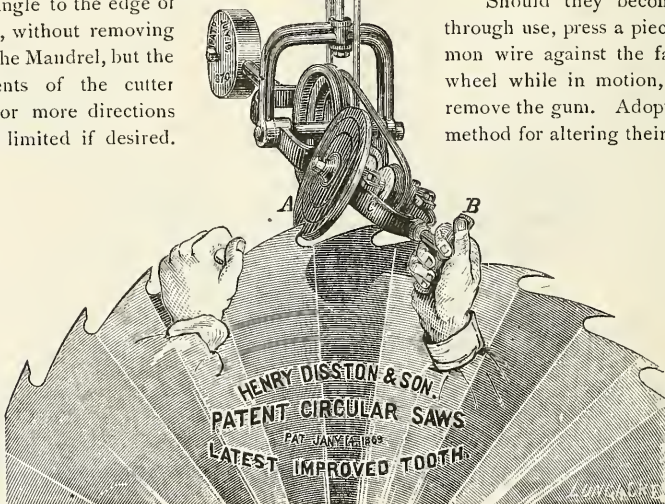
Owing to the numerous joints in the hanging frame of the Machine, the cutter may be turned to any position, and may be passed in any direction over, or applied at any angle to the edge of the Saw, without removing it from the Mandrel, but the movements of the cutter in one or more directions may be limited if desired.

The entire frame may be freely swung in any position required to apply the cutter properly to the Teeth of the Saw.

The extension arm *D* may be lengthened or shortened to accommodate the size of any Saw, or to suit the tension of the belt. When not in use, the Machine may be swung upwards and secured in a position near the ceiling, and thus be entirely out of the way, and yet can be brought into instant service whenever the Saw requires to be sharpened.

A few light slivering cuts will put the Saw in order. The wheels ought to run about 1200 turns per minute.

Should they become glazed through use, press a piece of common wire against the face of the wheel while in motion, and thus remove the gum. Adopt the same method for altering their shape.



INSERTED- *vs.* SOLID-TOOTH SAWS.

We are occasionally in receipt of letters from customers asking our opinion about Inserted-Tooth Saws. We state in reply that we have spent thousands of dollars and experimented for years in trying to produce an Inserted-Tooth Saw which would answer the purpose for which it was required, but without success. We believe we have made the best Saws of that description which have ever been produced. Our enlarged experience in the manufacture of Saws has given us advantages possessed by no other firm, and our verdict is decidedly in favor of Saws with **Solid Teeth**.

Lumber in all sections of the country is daily becoming more and more scarce. Immense forests are disappearing year after year, and no effort is being made to reproduce them. Under these circumstances our watchword should be **Economy in the production of Lumber**.

To attain this end, thin Saws *must* be used; and it is astonishing to see the progress Lumbermen are making in this direction. The kerf taken out of a log by a thick Saw is so much lumber wasted, to say nothing of the extra power required to run the Saw. An Inserted-Tooth Saw can never be made as thin as a Solid-Tooth Saw, and stand up to its work properly,—the plate must be sufficiently thick to hold the Teeth in place.

Our opinion on this subject is confirmed by the statements of many of the most experienced Sawyers and Mill-men, a few letters from whom we subjoin:

“Northampton, Mass., January 21, 1868.

“HENRY DISSTON, ESQ.:

“Dear Sir,—Your favor, enclosing plans for different kinds of Inserted Teeth and Saw Sets, was duly received. In reply would say, my experience is not favorable to the Inserted Teeth of any kind, when it is practicable to replace the main part. If you could get all the facts relative to the cost of sawing lumber with Inserted Teeth for the last year, I have no doubt it would show a net cost of more than twenty per cent. over the Solid Teeth.

“I would as soon think of putting false edges to all other cutting instruments as to Saws. My reason for this opinion is this: there is no cutting instrument in use so liable to be affected by an undue strain at any point as a Circular Saw, and it is impossible to fasten an Inserted Tooth without producing a strain which the Solid Tooth is not subject to, therefore the plates with Inserted Teeth are more liable to get untrue than the Solid-Tooth Plates. I think you will agree with me in saying that the main trouble in running Circular Saws is in keeping them true; therefore we must come to this conclusion, viz., not the Saw that is easiest filed, but the one that is easiest kept true should be used.

“The Saw Sets are very good if you use a Spring Set. I think the Inserted Teeth in No. 3 are best, but subject the Saw to a strain not produced in the Solid Tooth.

“Yours truly,

“W. HERRICK,

“Saw-Mill Builder.”

“Northampton, Mass., March 23, 1870.

“H. DISSTON, ESQ.:

“Dear Sir,—The cut of new style of Inserted Saw-Tooth was duly received and carefully considered. In reply would say, all the Inserted-Tooth Saws so far are, to a certain extent, subject to the same objection, viz., extra tension on the Saw-Plate to hold them in. This has always been my objection to an Inserted-Tooth Saw.

“Yours truly,

“W. HERRICK.”

"Salado, Bell Co., Texas, May 29, 1870.

"MESSRS. DISSTON & SON:

"Gentlemen,—The extra Saw-Teeth which you sent me through Messrs. Moody, Brady & Co., of Galveston, some months ago, are being considerably worn, and I have to-day written, requesting them to order for me, by express, fifty others. The Saw is a fifty-inch Saw, three-sixteenths Plate, twenty-four Teeth.

"I have owned and been running Circular Saws for twenty years, and this one is superior to any one I ever used. My only objection to it is the expense of the Teeth. In view of this objection, I thought to inquire of you whether they might not be abandoned, and have Teeth cut in the Plate. Is the Plate of a temper to justify it?

"I saw, a short time since, a small Gummer with forty-six-inch Saw, which was furnished by you to my son, Isaac V. Jones, of Austin, which cost him much less than my Saw, even considering the difference in size, and, with the use of the Gummer, gives him much less trouble than mine gives me. If you think the temper of my Plate will answer for hard woods, oak, elm, etc., I should prefer to get a Gummer similar to his, and cut Teeth in the Plate.

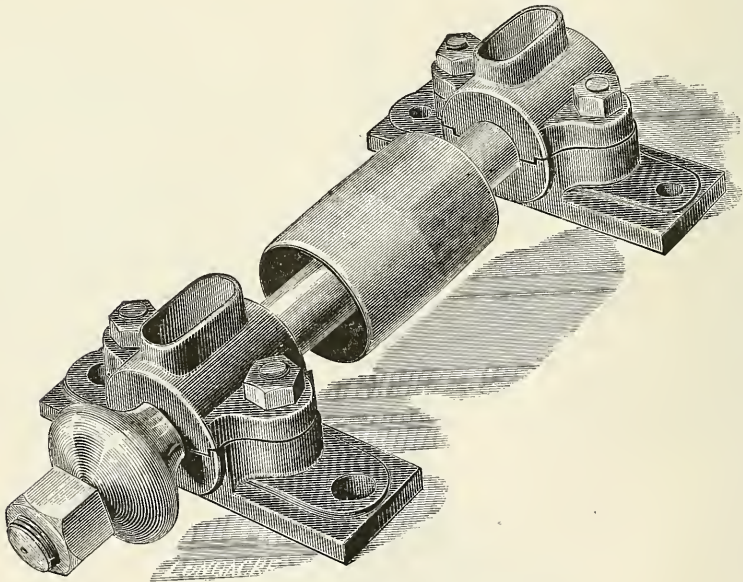
"Yours respectfully,

"THOMAS H. JONES."

"My experience leads me to agree with above statements as to Inserted- and Solid-Tooth Saws in every particular.

"N. DIXON,

"One of the firm of DIXON & JOHNSON, Savannah, Georgia."



MANDRELS FOR SAWS.

A Mandrel that heats is the cause of great trouble, for when the Mandrel heats the Saw will, by transmission, heat also, and thus expand in the centre. You must then either stop the mill or injure your Saw. We do not warrant a Saw to run upon a Mandrel that heats, although if we knew to what degree of heat you get your Mandrel, we could help you by making a Saw which would admit of that amount of expansion. If you cannot keep the Saw cool, the sooner you throw it out the better, for no mill can pay under such circumstances.

It seems strange that some Mandrels will heat, do what you may to prevent it. There seems to be something in the metal that causes it. We have sometimes stopped the heating by applying a composition of beeswax and tallow, in which a little black lead had been introduced, the preparation to be well mixed and stirred together while hot. This preparation will make a body and bear a heavy pressure; whereas, either oil or tallow would run off the journal. It occasionally happens that the box fits the shaft so tightly that it scrapes off all the grease; in this case, we have found that cutting channels in the bearings, to allow the lubricator to run to the point required, has proved to be of great advantage.

Sometimes the heating may be stopped by having the bearers composed of brass or cast iron, intersected with Babbit metal.

A Mandrel crowding against a Collar is sometimes the cause of heating. A short bearing or a short, tight belt will have the same effect. But a long, free belt with long bearings, and a Saw cutting freely, are the best remedies.

Great advantage is obtained by having the stress or tightening pulley so rigged as to make the belt lap the Mandrel pulley as much as possible, for the more the belt laps the less strain you will have on the Mandrel. The Arbor or Mandrel must be perfectly level and at right angles with the carriage; the next shaft must be parallel every way, or it will throw the Arbor one way or the other, and thus cause it to heat.

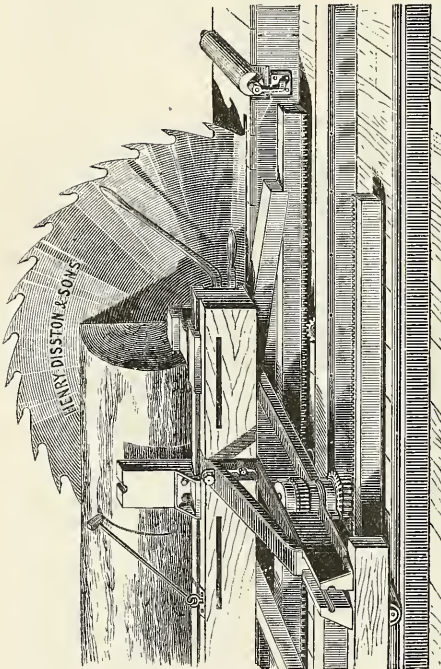
If your Saw runs out of its course and from the log, it will scratch on its return; this may proceed from the Arbor not being level with the next shaft, drawing it endwise from the log when working, or it may proceed from a warped edge (caused by previous heating), which, when cutting, works true, or nearly so, but as soon as free assumes its warping or staggering edge.

The adage,—“Necessity is the Mother of Invention,”—is particularly applicable in Saw manufacturing. You will not have read this far without sympathizing with the Saw-maker in his years of study to overcome the mountains of difficulties which ignorance compels him to travel over, but they can't make him use their Saws for carriage wheels, or the journey would never be made successfully, as you will see by reference to Mr. Jones and others.

GANG SAWS.

We desire to call attention to the superior quality of the **Gang Saws** of our manufacture, also to state some of the advantages to be gained by their use. First, we make our own cast steel, specially adapted for the purpose. Secondly, the Saws are tempered by an improved patent process, which insures an evenness and regularity of temper so much desired. Thirdly, they are ground on patent machines in the position in which they are used in the mill, and are bound to be of uniform thickness, and are guaranteed to run more freely than gang saws of any other make. The following incident will tend to prove the latter assertion. Some time ago we visited a large gang mill in this State, which was run by two engines, each of one-hundred-and-fifty-horse power. The engines were flagging, and the owners were considering the propriety of putting in more power. We induced them to try one gang of Saws of our make, and the result was so convincing that they immediately ordered *three thousand dollars' worth* of our Saws, and abandoned the use of all others.

They have since informed us that the change increased the capacity of their mill 33,000 feet per day, with power to spare. This saving of power was effected by furnishing them with Saws made perfectly true and properly ground, thus overcoming all unnecessary friction.



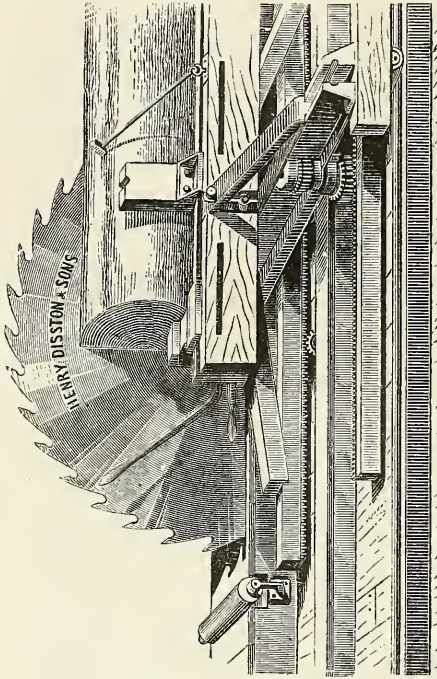
RIGHT-HAND SAW.

By observing the above cuts and the directions, you will be enabled without difficulty to order just the kind of Saw you require.

Give diameter of Saw in inches; thickness of Saw at rim, gauge; thickness of Saw at centre, gauge; number of Teeth in Saw; kind of Tooth and No., on cut, page 13; whether spring or spread set; Mandrel hole, in inches; Mandrel hole, in inches; distance between Pin holes from centre to centre, in inches; right- or left-hand Saw (see engraving); greatest feed at each revolution of Saw, in inches; kind of lumber to be sawed; speed of Saw, about — revolutions per minute. DIRECTIONS FOR SHIPPING.—By Express, Steamship, or Regular Freight.

N.B.—All our Stock Saws above 40-inch diameter have a 2-inch mandrel hole, and $\frac{3}{8}$ -inch tug pin holes, 3 inches from centre to centre. If wanted different, please send full pattern of holes.

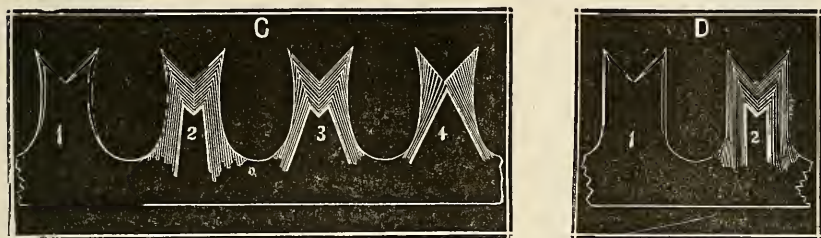
When sending Saws for repair, be sure to observe the following directions: Mark the name and address of the sender plainly on the board. Do not tack a letter or card on the package; they are frequently torn off in transportation. We are constantly in receipt of letters from our customers, asking why we do not return Saws sent for repair. The reason is we do not know where to send them, because the sender does not mark the Saws with his name and address. Parties frequently write us "we ship you to-day a Saw for repair," and neglect to say if it is a hand-saw, a cross-cut, or a six-foot circular. We receive hundreds of Saws for repair from all parts of the country, and unless they are marked with the sender's name and address, it is impossible for us to guess where or from whom they come.



LEFT-HAND SAW.

IMPORTANT TO THE LUMBER TRADE AND TO ALL PARTIES INTERESTED IN CROSS-CUT SAWS.

We desire to call special attention to our various styles of Cross-Cut Saws. In the manufacture of all our Fast Cutting Saws, we have carefully avoided the pernicious and destructive practice of making *Under-Cut Teeth*. All Saws made on this principle are miserable failures; it is simply applying a Rip Tooth to the purpose of cross-cutting, an idea which has been long ago exploded. To get an *under cut*, the Tooth must be wider at the extreme point than at any other part, and each successive filing must result in rapid reduction in the width and ultimate loss of shape, as shown in the annexed diagrams.

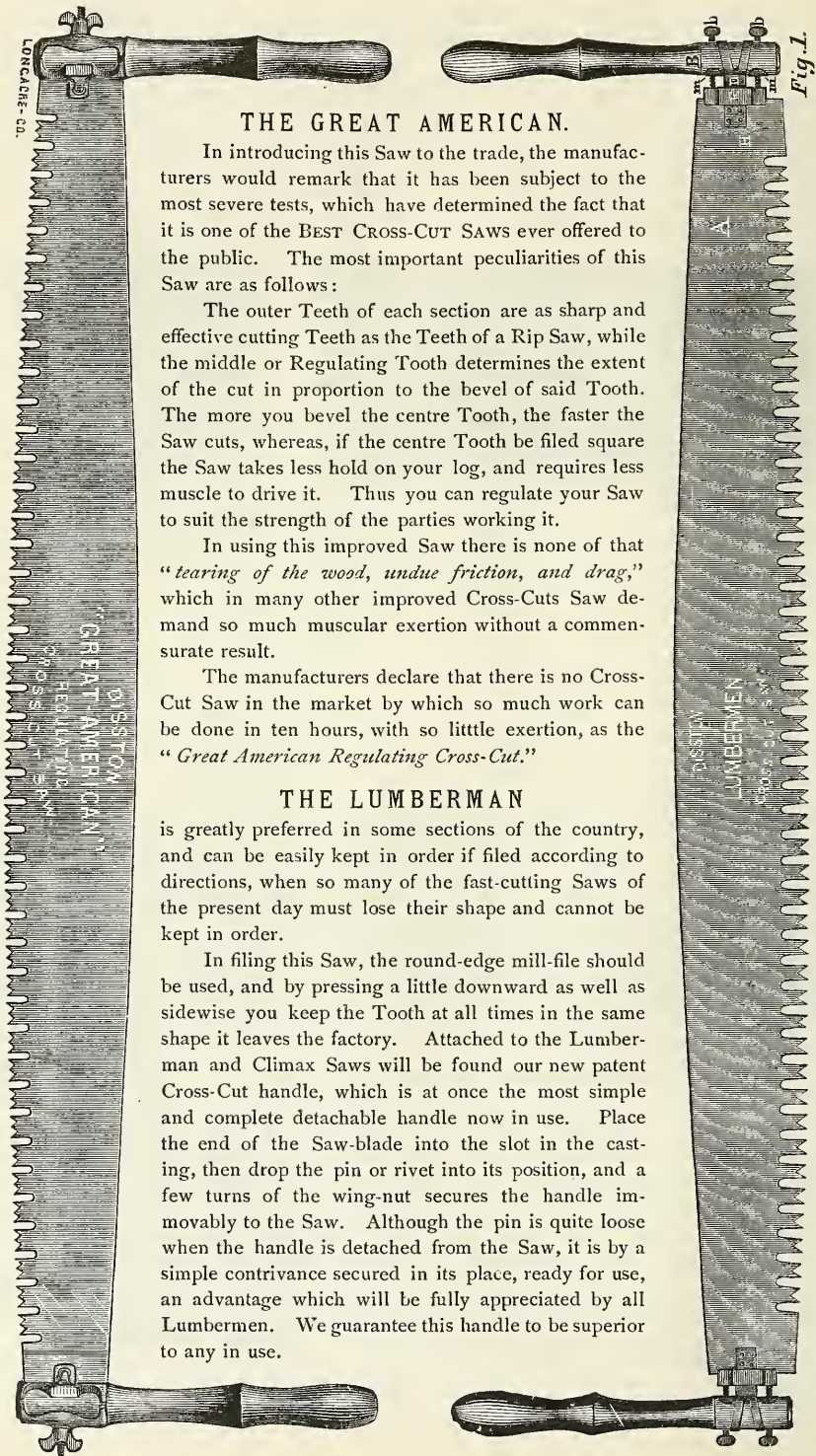


No. 1, Fig. C, represents the under-cut Tooth as it leaves the factory; Nos. 2, 3, and 4, Fig. C, show how it must ultimately become, under any style of filing you may please to adopt. No. 1, Fig. D, shows a Tooth with parallel edges, and No. 2, Fig. D, shows the shape of said Tooth after several filings.



On the other hand, the annexed engraving represents a section of Lumberman Cross-Cut Saw with File specially adapted for keeping said Saw in order. By using the File here illustrated, with the edge made to fit Gullet or space between the Teeth, and pressing downward while filing, you will preserve the original shape of the Teeth, as described by dotted lines and notch in engraving. You pay for the edge of the file as well as the flat, then why not use it? and thus keep your Saw always gummed and in order, and avoid the risk of breaking or buckling the Saw by gumming in the old method.

This file is manufactured expressly for the purpose of keeping in order the Teeth of our improved Saws, known as the Climax and Lumberman, and can be used with equal facility on either Saw. If the File be used according to our instructions, viz., pressing down in the Gullet at the same time the edge of the Tooth is being filed, the effect will be so convincing that persons will never return to the use of the old-style File, or any other of the so-called improved Teeth. We also manufacture a File for keeping in order.



THE GREAT AMERICAN.

In introducing this Saw to the trade, the manufacturers would remark that it has been subject to the most severe tests, which have determined the fact that it is one of the BEST CROSS-CUT SAWS ever offered to the public. The most important peculiarities of this Saw are as follows:

The outer Teeth of each section are as sharp and effective cutting Teeth as the Teeth of a Rip Saw, while the middle or Regulating Tooth determines the extent of the cut in proportion to the bevel of said Tooth. The more you bevel the centre Tooth, the faster the Saw cuts, whereas, if the centre Tooth be filed square the Saw takes less hold on your log, and requires less muscle to drive it. Thus you can regulate your Saw to suit the strength of the parties working it.

In using this improved Saw there is none of that "*tearing of the wood, undue friction, and drag,*" which in many other improved Cross-Cuts Saw demand so much muscular exertion without a commensurate result.

The manufacturers declare that there is no Cross-Cut Saw in the market by which so much work can be done in ten hours, with so little exertion, as the "*Great American Regulating Cross-Cut.*"

THE LUMBERMAN

is greatly preferred in some sections of the country, and can be easily kept in order if filed according to directions, when so many of the fast-cutting Saws of the present day must lose their shape and cannot be kept in order.

In filing this Saw, the round-edge mill-file should be used, and by pressing a little downward as well as sidewise you keep the Tooth at all times in the same shape it leaves the factory. Attached to the Lumberman and Climax Saws will be found our new patent Cross-Cut handle, which is at once the most simple and complete detachable handle now in use. Place the end of the Saw-blade into the slot in the casting, then drop the pin or rivet into its position, and a few turns of the wing-nut secures the handle immovably to the Saw. Although the pin is quite loose when the handle is detached from the Saw, it is by a simple contrivance secured in its place, ready for use, an advantage which will be fully appreciated by all Lumbermen. We guarantee this handle to be superior to any in use.

THE CLIMAX.

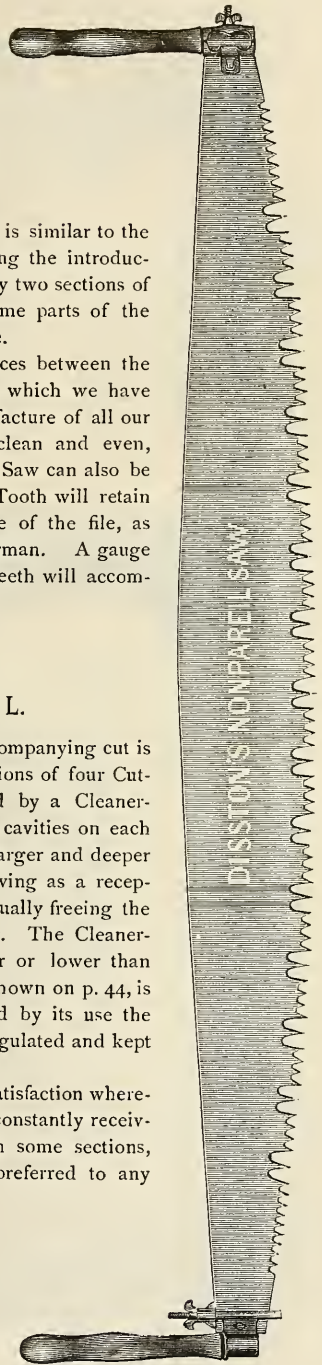
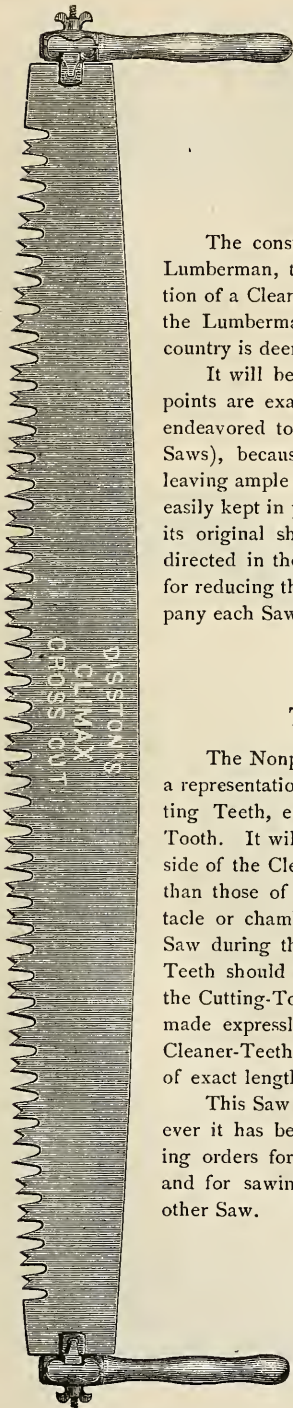
The construction of the Climax is similar to the Lumberman, the only difference being the introduction of a Cleaner Tooth between every two sections of the Lumberman Tooth, which in some parts of the country is deemed to be an advantage.

It will be observed that the spaces between the points are exactly alike (a principle which we have endeavored to preserve in the manufacture of all our Saws), because it makes the cut clean and even, leaving ample room for dust. This Saw can also be easily kept in perfect order, and the Tooth will retain its original shape by the proper use of the file, as directed in the article on the Lumberman. A gauge for reducing the length of Cleaner-Teeth will accompany each Saw.

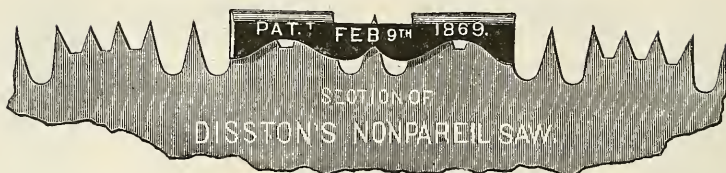
THE NONPAREIL.

The Nonpareil, of which the accompanying cut is a representation, is composed of sections of four Cutting Teeth, each section intersected by a Cleaner-Tooth. It will be observed that the cavities on each side of the Cleaner-Teeth are much larger and deeper than those of the Cutting-Teeth, serving as a receptacle or chamber for dust, and effectually freeing the Saw during the operation of cutting. The Cleaner-Teeth should always be kept shorter or lower than the Cutting-Tooth. (The Gauge, as shown on p. 44, is made expressly for this purpose, and by its use the Cleaner-Teeth of any Saw can be regulated and kept of exact length.)

This Saw has given unbounded satisfaction wherever it has been used, and we are constantly receiving orders for the same; in fact, in some sections, and for sawing soft lumber, it is preferred to any other Saw.



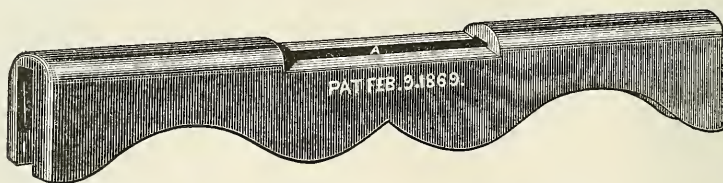
GAUGE FOR REGULATING CLEANING-TEETH.



SHOWING THE GAUGE IN POSITION
FOR FILING THE CLEANER
TOOTH.

The Cleaning-Teeth of all Saws should be somewhat sharper than the Cutting-Teeth, and, although shortened, they should be of uniform length throughout.

The inner edge of the Gauge rests on the points of the Cutting-Teeth, the Cleaning-Teeth projecting through the opening in centre of Gauge. Reduce the projecting points, by means of a File, until arrested by the edges of the Gauge, which is made of hardened steel. Thus Tooth after Tooth can be rapidly and correctly reduced to an even length by any unskilled operator.



GAUGE BY WHICH TO FILE CLEANER-TEETH.

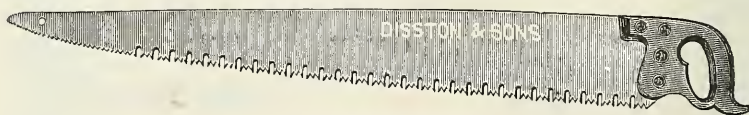


THE CHAMPION.

The above engraving is a section of the Champion Cross-Cut Saw, which we keep in stock and manufacture to order.

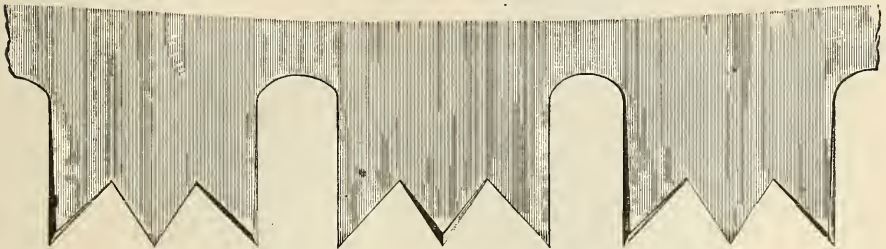
ONE-MAN CROSS-CUT.

The annexed engraving represents a Cross-Cut Saw, specially adapted to the use of one man. With this Saw four times as much work can be performed as with the ordinary Saw.



Length of Saw, four feet.

Bridge-builders, mill-men, railroad and other contractors—in fact, all large establishments will find this a very useful tool, and easily worked. For cutting off girders, joists, blocking, or heavy lumber of any kind, it is just what is required. As it is now becoming a general practice to saw lumber with one man instead of two (from the fact that one good man will at all times do more work than two poor ones), the Saw will pay for itself in a few days, as the labor of one is saved. The engraving illustrates the “Great American” Tooth, but any kind of Tooth will be substituted to suit the various localities.



SECTION OF GREAT AMERICAN, FULL SIZE.

The most casual observer will not fail to understand the superiority of our Saws when kept in order according to our instructions; and we guarantee, nay, we pledge our reputation, that a man can do more work, day in and day out, and with greater satisfaction, than with any other Saw in the market. An experience of nearly forty years is our guide, and our success in business is our guarantee.

SAW FILES.

The consumption of Files is looked upon by many mill-owners as a very insignificant matter. The File bills usually come in for small amounts; hence they are considered of no account. If they will take the trouble to look over their bills at the end of each year, they will be astonished at the sum thus spent.

A poor File is a most worthless article; yet it is astonishing how many such are manufactured; and why?—simply because inferior stock is used. Many Saws are made from worthless steel, but *some* Files are made from even worse material. We have known them to be made of iron and case-hardened. It is impossible for such a File to be of any service, even on a poor Saw. Then what chance would it stand on one of our best Saws?

A File is one of the most expensive tools used by us in the manufacture of Saws, and we know all about the disadvantages and loss resulting from the use of poor and worthless Files. We have at this time over one hundred hands daily employed in filing Saws, each hand consuming or wearing out from six to twelve Files daily. This enormous annual consumption being such an important item to us, the necessity of having a first-class File will be apparent. We were unable to purchase Files fully up to the standard, and so commenced the manufacture for our own use, not expecting to place them on the market for sale. Our patrons, learning of this, insisted on being supplied. The result is, the demand so far outstripped the supply, that we have been compelled to largely increase our facilities.

We are now prepared to supply the trade with every description of Files for keeping Saws in perfect order, and we guarantee them to be superior for the purpose to those of any other manufacture. We have labored for years to make the best Saw in the world, and the world knows we have succeeded. We are doing the same with Files. Our motto is, “Upward!” “ONWARD!” “EXCELSIOR!”

PARKER'S AUTOMATIC SAW-FILING MACHINE.

Patent applied for.

Fig. 1.

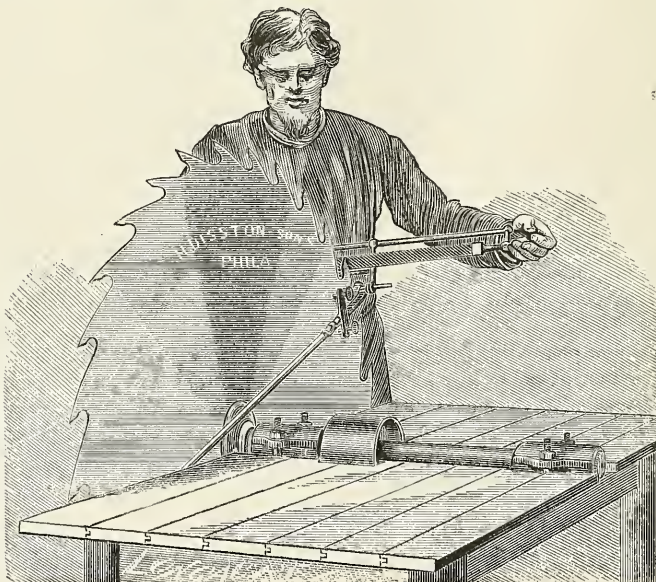


Figs. 1 and 2 represent obverse views of the best Filing Machine we have ever seen. Every Saw-Mill must have one. It won't pay to be without it. With this machine an inexperienced man can file a Saw with accuracy and dispatch, as well as the most practiced hand. You cannot get wrong if you try. It can be used with equal facility on both Circular and Straight Saws. It will file a Tooth perfectly square, top and bottom, or it will file a bevel-point and square-back, or a square-point and bevel-back, without changing the machine.

It is adjustable, and enables the Sawyer to file from either right or left, giving the Saw-Tooth any required pitch, bevel, or angle, with perfect accuracy.

With this machine every Tooth can be filed the exact counterpart of its fellow, thus insuring that regularity and evenness in shape so much desired.

Fig. 2.



READ AND REFLECT!

WHAT ENERGY, APPLICATION, AND PERSEVERANCE CAN DO.

HONESTY AND INDUSTRY A SURE ROAD TO WEALTH.

A LESSON TO THE YOUTH OF THE PRESENT DAY.

THE KEYSTONE SAW, TOOL, STEEL, AND FILE WORKS cover an area of nearly eight acres, and give employment to eleven hundred hands, the average weekly wages bill amounting to thirteen thousand dollars. Mr. Henry Disston, the senior member of the firm, commenced business in the year 1840 in a small cellar in the vicinity of Second and Arch Streets, Philadelphia; and the first coal used in his business was wheeled by himself from Willow Street Wharf (a distance of six squares) to his little workshop.

The consumption of coal in this vast establishment now amounts to ten thousand tons per year, and business is steadily increasing. Saws of every description, from Huge Circular or Mammoth Mill Saws, used in reducing the giants of the forest into useful and merchantable shapes, to the delicate and fairy-like Jig Saw, together with innumerable useful and labor-saving tools for keeping Saws in perfect order, are made in these works. Not only Saws, but all their constituent parts, together with all machines and tools used in their manufacture (many of which are peculiar in this establishment), are planned and fashioned here in a scale of unsurpassed magnitude.

One of the great secrets of Mr. Disston's success is his practical knowledge of every department incident to the manufacture of Saws. There is not a process, even the most minute, through which a Saw passes from the crude and raw material to its finished state, but what can be successfully accomplished in a mechanical point of view by Mr. Disston.

The works are now producing upwards of forty tons of sheet steel per week, nearly the whole of which is consumed in the establishment, the finest qualities being made into Saws which far excel those of foreign manufacture.

HENRY DISSTON & SONS.



MANUFACTURERS OF

WARRANTED CAST-STEEL

Patent Ground and Tempered Hand, Panel, and Rip Saws,

Disston & Sons' Patent Improved Combination Hand Saws,
 "Mechanics' Own" Hand and Back Saws, to run without Set,
 Gent's Half-Back Bench Saws,
 Cast-Steel Compass Saws,
 Cast-Steel Table and Pruning Saws,
 Improved Quality Cast-Steel Back Saws, with Steel Backs,
 Butcher's Bow-Back Saws,
 Turning or Chair Webs,
 Felloe Webs,
 Butchers' Saw Blades,

Improved Reversible Hack Saws,
 Hack Saw Blades,
 Patent Ground and Tempered Cast-Steel Wood Saws,
 Wood Saw Frames,
 Saw Handles, all kinds,
 Patent Ground and Tempered Circular Saws,
 Circular-Top Saws for Double Mills,
 Warranted Extra Cast-Steel Shingle Saws,
 Concave Saws,
 Circular Saw Mandrels of the latest and most approved styles,
 Warranted Extra Cast-Steel Patent Ground and Tempered Mill, Mulay, Gang, and Drag Saws.

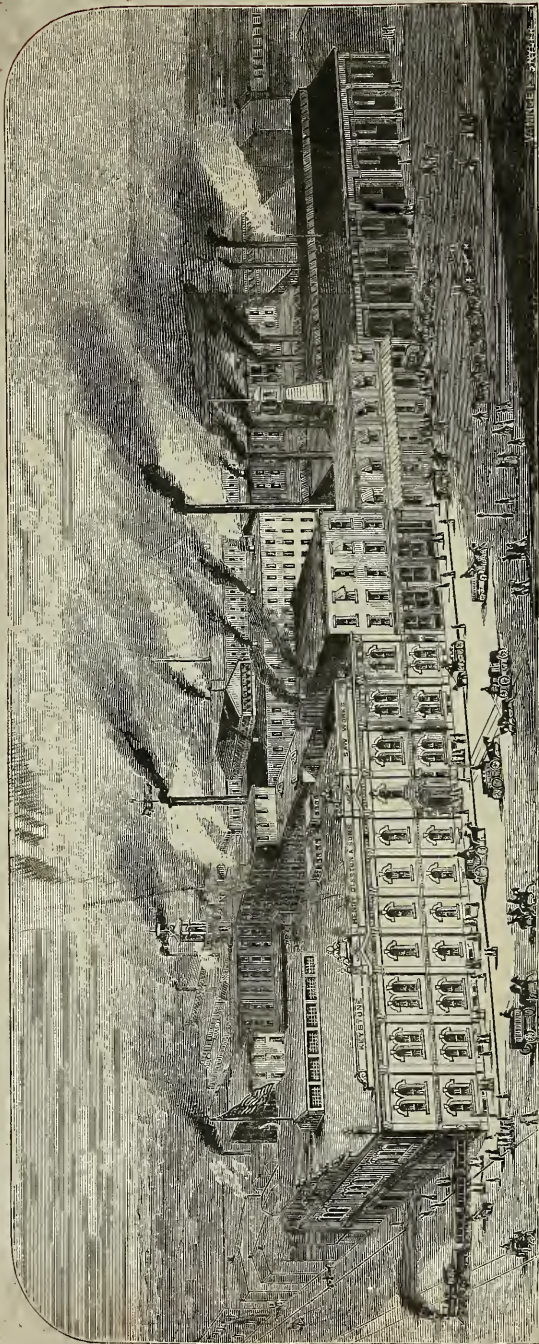
DISSTON'S "GREAT AMERICAN"	CROSS-CUT SAW.
DISSTON'S "LUMBERMAN"	CROSS-CUT SAW.
DISSTON'S "CLIMAX"	CROSS-CUT SAW.
DISSTON'S "NONPAREIL"	CROSS-CUT SAW.

Extra Spring-Steel Plain Tooth Cross-Cuts, Set and Sharpened,
 Hook-Tooth Cross-Cut Saws No. 2, Set and Sharpened,
 Hook-Tooth Cross-Cut Saws No. 3, Set and Sharpened,
 Cast-Steel Plain Tooth Cross-Cuts Nos. 2 and 3, Set and Sharpened.

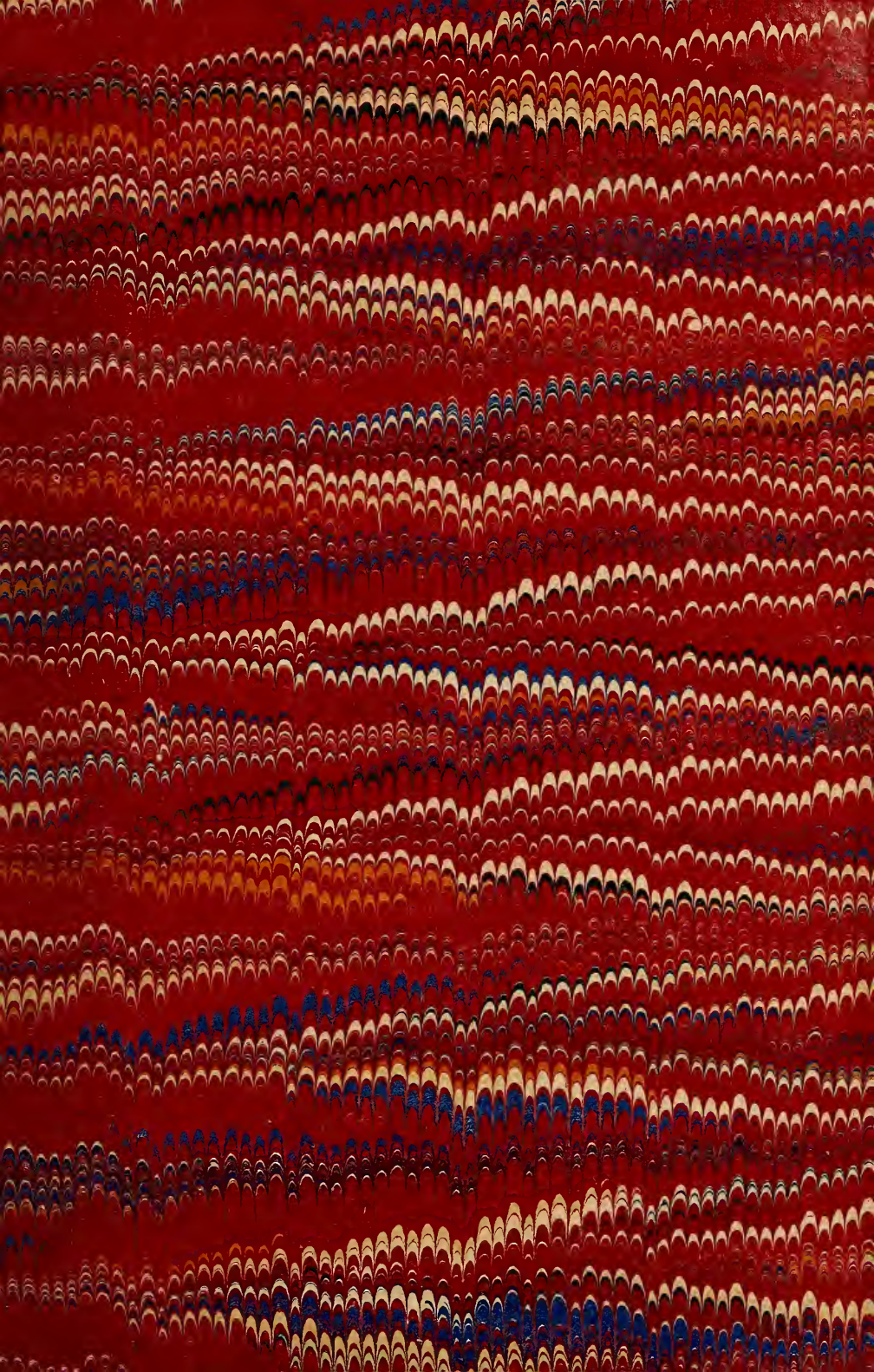
HENRY DISSTON & SONS' WARRANTED SAW FILES.

We also manufacture Files specially adapted for keeping in order the Teeth of our Improved Cross-Cut Saws,—“The Great American,” “The Lumberman,” “The Climax,” “The Nonpareil.”

NOTICE.—Our No. 7 Hand Saws have attained a national reputation for uniform excellence of manufacture, of which we are justly proud; and we take this method of assuring the trade that these Saws will in future exceed in point of finish all previous efforts to meet the wishes of our friends.







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