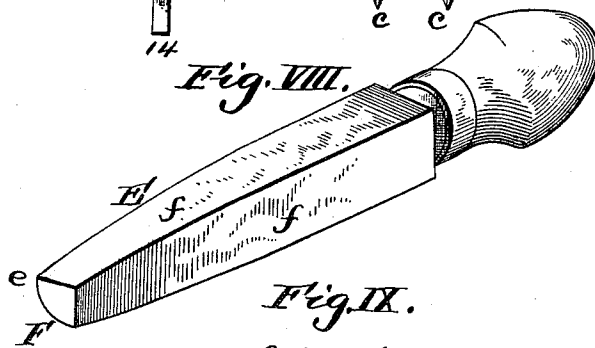
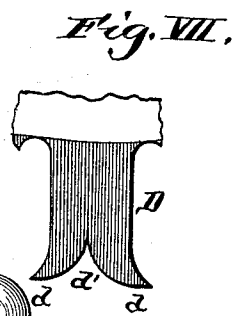
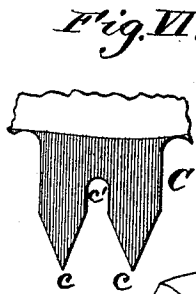
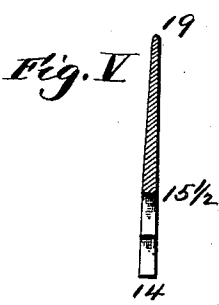
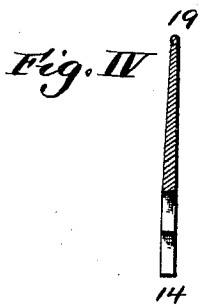
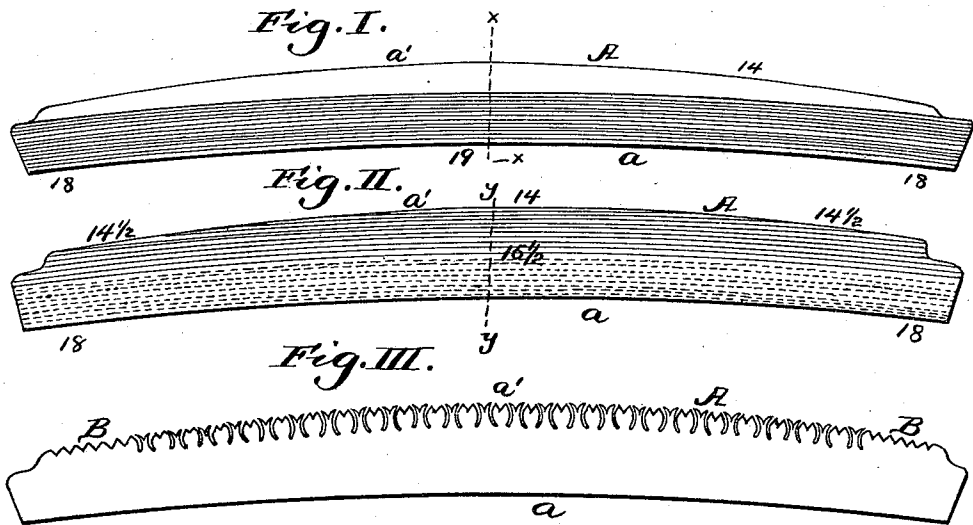


(No Model.)

C. PROUTY.
ART OF MANUFACTURING SAWS.

No. 461,509.

Patented Oct. 20, 1891.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHESTER PROUTY, OF BIG RUN, PENNSYLVANIA.

ART OF MANUFACTURING SAWS.

SPECIFICATION forming part of Letters Patent No. 461,509, dated October 20, 1891.

Application filed April 28, 1891. Serial No. 390,746. (No model.)

To all whom it may concern:

Be it known that I, CHESTER PROUTY, a citizen of the United States, residing at Big Run, in the county of Jefferson and State of Pennsylvania, have invented certain new and useful Improvements in the Art of Manufacturing Saws; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My present invention relates to an improvement in the art of manufacturing crosscut-saw blades; and the objects are, first, to produce an improved saw which will not pinch in the kerf; second, to provide an improved raker-tooth to lift the sawdust out from the bottom of the kerf and discharge it at each stroke, and, third, to improve the manufacture of the raker-teeth in the first-quality saws.

My invention consists in the manufacture of crosscut-saws, which will be hereinafter fully described, and particularly pointed out in the claims.

To enable others to understand my invention, I have illustrated the same in the accompanying drawings, in which—

Figure I is a side view of an embryonic saw-blade, showing one method of grinding the blade. Fig. II shows another method with two bevels. Fig. III is a side view of a completed or finished saw constructed in accordance with my invention. Figs. IV and V are transverse sectional views on the lines xx and yy of Figs. I and II, respectively. Figs. VI and VII are enlarged detail views of cutter and raker teeth, respectively; and Figs. VIII and IX are detail views of the swage.

Referring to the drawings, in which like letters of reference denote corresponding parts in all the figures, A designates the blank of a saw-blade, which blank is made of the best tempered steel and is curved longitudinally, so that the upper edge or back a is concaved and the lower or cutting edge a' is convex. The convex edge a' of the blade or blank has the teeth formed thereon, as will be more fully described hereinafter, in a line substantially concentric or parallel with the concaved back. Thus the cutting-edge a' is curved, and at the center the blade is wider than it is at the ends; but the cutting and raking teeth are all of the

same depth and thickness, and there are the usual small teeth B at the ends of the blade.

It has been found by practical use that the ordinary tapering which is given to the saw-blade is not sufficient to reduce it to a uniform gage throughout its length nor to secure a proper degree of smoothness on its surfaces, and in some instances the saw-blade has been partially ground, the grind extending from the base of the teeth to the back of the blade, to produce the desired gage; but I have found it very desirable that the lower part of the saw-blade, on which the teeth are formed, should also be ground, and the results thereby obtained are highly beneficial and useful in a device of the kind to which this invention relates.

As indicated in Figs. I and IV, the blank or plate is cut, teeth and all, out of a sheet of the best steel and tempered and ground throughout from end to end, the grinds extending in parallel curved lines from the back edges to a line beginning at the small teeth at the ends of the blade and extending throughout the entire length of the saw-blade parallel with the concaved back. This grind leaves the cutting-edge about 14 gage, and, as it extends from the base of the back to the front or concave edge and from end to end of the blade, the teeth themselves are all of the same gage throughout the length of the saw. The bevel or grind decreases in thickness from 14 gage to about 18 gage at or near the ends of said blade and 19 gage in the center, where the blade is somewhat wider.

The grinding and the beveling of the blade, as herein shown and described, enable me to produce a saw having many advantages over prior devices, as the saw-blade will not bend or hang in the kerf, thus obviating the common defect in other saws, which have their effectiveness impaired and easy practical sawing rendered impossible by binding in the kerf and the inability to rapidly and thoroughly carry off the sawdust.

In Fig. II I have shown another method of grinding the saw-blade, which consists, essentially, in first grinding that portion of the blade in which the teeth are formed and then grinding the other portion on beveled lines, the bevel of the latter grind being slightly greater than the former, as shown in Figs. II

and V. In practicing this latter method I have the saw-blade made of the best steel, as before described, and then temper it in the usual manner, the teeth and general contour of the saw being stamped out in embryo. The blade is then ground from end to end in curved lines parallel with the back edge, and the bevel of the grind extends from the cutting-edge a' to a line drawn parallel with the back edge a about midway between the cutting and back edges. This bevel leaves the gage at the ends of the main teeth about 14, and near the ends it diminishes to $14\frac{1}{2}$, and the bevel at the other end of the grind is about $15\frac{1}{2}$, thus leaving a gradually-diminishing bevel from the points of the teeth to the center of the blade. The other bevel begins where the first bevel terminates—about the longitudinal center of the blade—and for the purpose of better illustrating these bevels I have shown the first in solid curved lines and the second in dotted lines. The second grinding is substantially similar to the other, as it runs from end to end of the blade in regular curved lines parallel with the curved back edge a of the saw, and the bevel diminishes gradually from $15\frac{1}{2}$ gage, where it adjoins the first bevel, to about 18 gage at or near the ends and about 19 gage in the center, where the blade is widest. These two grinds produce a blade with a bevel of from 14 and $14\frac{1}{2}$ gage to $15\frac{1}{2}$ gage, extending from the points of the teeth back to a median line parallel with the curved back edge a , about the center of the saw, and another bevel of from $15\frac{1}{2}$ gage to 18 and 19 gage, adjoining the first bevel and extending to the back of the blade. This improved method of grinding produces a saw-blade which will not pinch in the kerf and gives a blade with a gradually-diminishing thickness from the points of the teeth to the back edge a , which will wear uniformly in gage at all points instead of wearing out of gage, as with ordinary saws. The bevels are substantially those which should be used on all saws; but as the blades used for different purposes vary considerably the bevels must also vary proportionally.

In order to overcome the disadvantages arising from continually recutting sawdust which is not removed from the kerf, I provide improved raker-teeth, by which the sawdust is removed from the kerf at each stroke of the saw, which teeth are shown in Figs. VI and VII, respectively.

The cutter-teeth C are provided with double-cutting pointed teeth c , separated by a circle-crotch c' , and they are set and ground to suit different styles of saws to saw different kinds of timber. The raker or cleaning-tooth D is also double-pointed, and the ends of each point d overhang the opposite cutter-tooth, respectively, and the gumming d' of these teeth extends nearly half-way down the raker. These rakers can be made in half-form or cut to plate in any way to produce the same effect, and as the gumming divides the two points of

the raker they require less filing to keep them in order, and at each stroke of the saw the rakers take up the sawdust and discharge it. The small teeth B at either end of the saw are to be properly regulated, so the large teeth will be distributed correctly. They may vary from three to eight teeth, if required; but I prefer to have five at each end, and they are to be cut deeper than in ordinary saws, and the adjoining teeth are to be cut rounding with that of the rakers and filed beveling, and this bevel is to run about one-fourth of an inch back on both edges of each cutting-tooth, thus bringing it to a point, and every other tooth of the saw is to be provided with this bevel. The raker-teeth D are to be cut a trifle shorter than the adjoining cutting-teeth and are to be filed sharp from the inside, so as to let them strike the wood as a plane and cut away the wood instead of tearing through it, as in the ordinary raker-teeth. The cutting-teeth C are to be set to suit the kind of timber to be cut, and they are pointed and have a true bevel on each side of the point, as hereinbefore stated, and the grinding of the blade makes the saw true along the entire edge, or nearly so, thus giving it a tendency to wear in gage instead of out of gage, and cuts faster and truer than the ordinary saw until it is worn out. These saws are to be made of the best steel plate and are to be properly tempered before finishing. The teeth can be cut by dies of any improved style in common use, so as to punch out the desired sizes and shapes; but in the first-quality saws I prefer to make the rakers temper-drawn, so that they can be swaged with the swage E. (Shown in Figs. VIII and IX.) This swage is tapered slightly toward its point e , and one half of its periphery F is curved substantially concentric with the center, and the other half has two angularly-disposed sides f meeting at a point in a line with the center of the tool. These sides f , while substantially straight, also have a slight longitudinal taper. The square parts of the swage are to be placed against the square edges of the cutting-teeth, and the round curved side of the swage is of the proper form to give the raking-teeth any desired overhang. A number of different bevels can be given to the raking-teeth by using this swage by changing its position. When in the desired position, where the teeth are to be bent, the swage is held firm and struck with a hammer, which will thus bring the raker to the proper shape. This swaging can be carried on until the saws are worn out. This swaging process can be done with the saw-blade at an ordinary temper; but in the more costly saws of the first class I prefer to re-temper the raker-teeth to prepare them for heavy swaging, which result can be accomplished by drawing the raker-teeth individually with hot tongs. To temper the raker-teeth separately from the cutting-teeth, the rakers can be heated by gas-jets or perforated pipes and gas-light burning against or below

one or more of the raking-teeth and not permit the cutter-teeth to be exposed to the heat. This process renders all the raking-teeth of uniform temper and will give them a proper temper for the continued or repeated process of swaging; but in ordinary saws this is not necessary, as the raking-teeth are filed narrower than on other saws and can be swaged when of uniform temper with the cutting-teeth, which latter teeth have a proper temper for setting.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

15 1. The improvement in the art of manufacturing a crosscut-saw, which consists in grinding a saw-blade from end to end in curved lines parallel with the back concaved edge of the saw-blade, said grind extending from the points of the teeth to the longitudinal center or median line of the saw-blade, substantially as described.

25 2. The improvement in the art of manufacturing crosscut-saw blades, which consists in grinding the plate from end to end in parallel lines extending from the points of the teeth to the longitudinal center of the blade and then again grinding the blade in beveled longitudinal lines extending from the terminus of the first grinding to the back edge of the blade, substantially as described.

30 3. The improvement in the art of manufacturing crosscut-saws, which consists in grinding the plate with two bevels extending from end to end in curved lines parallel with the back edge thereof, substantially as described.

35 4. The improvement in the art of manufacturing crosscut-saw blades, which consists in twice grinding the blade from end to end in curved lines parallel with the back edge thereof, the first grinding having a bevel extending from the points of the teeth to the median line of the blade and the second grinding being on a greater bevel extending from the terminus of the first grinding to the back edge of the blade, substantially as described.

40 5. The improvement in the art of manufacturing crosscut-saw blades, which consists in tempering and drawing the raker-teeth independently of or separately from the cutting-teeth, substantially as described.

6. The improvement in the art of manufacturing crosscut-saws, which consists in stamping the blade out of a piece of metal, tempering the blade and forming the teeth thereon, grinding the blade, then retempering and drawing the raker-teeth, and finally finishing the blade and teeth, substantially as described.

7. A crosscut-saw blade stamped from a piece of metal and having its raker-teeth tempered and drawn separately from the cutting-teeth, substantially as described.

8. A crosscut-saw blade stamped from a piece of tempered steel and having its raker-teeth tempered and drawn independently of the cutting-teeth and swaged to give the desired overhang to said raker-teeth, substantially as described.

9. The improvement in the art of manufacturing crosscut-saw blades, which consists in stamping the embryonic blade out of a sheet of tempered steel and forming the raker and cutting teeth thereon, subjecting the raker-teeth to the action of heat without affecting the cutting-teeth, drawing out the raker-teeth, and then swaging said raker-teeth to give the same the desired overhang, substantially as described.

10. In the manufacture of crosscut-saw blades, a swage for forming the raker-teeth, having a segmental surface and the angular sides, substantially as and for the purpose described.

11. In the manufacture of crosscut-saw blades, a longitudinal tapered swage having a rounded side substantially concentric with its axis and the two straight sides arranged in an obtuse angle to each other, substantially as described.

12. A crosscut-saw blade ground in longitudinal parallel curved lines with two bevels of different gages and having its raker-teeth retempered and drawn, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

CHESTER PROUTY.

Witnesses:

THOS. H. SIMON,
JNO. J. BREFALL.