(No Model.)

H. C. KNOWLTON.

CUTTER HEAD.

No. 341,149. Patented May 4, 1886.

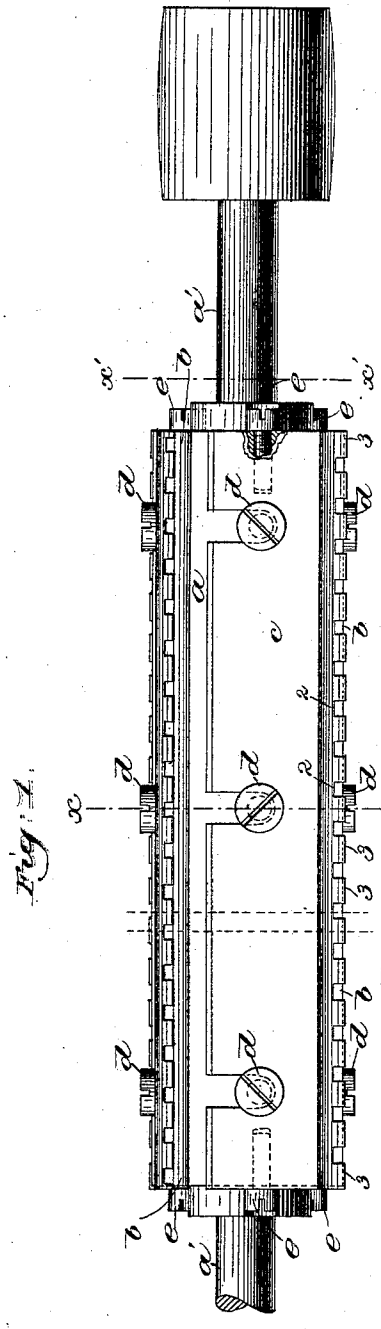


Fig. 1.

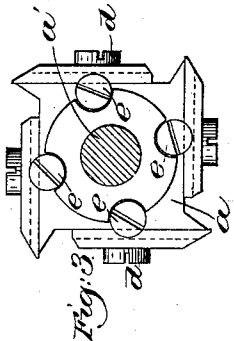


Fig. 3.

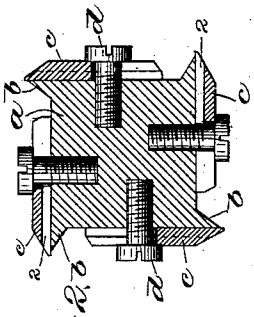


Fig. 2.

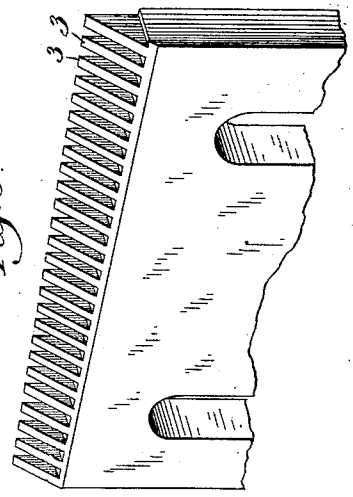


Fig. 5.

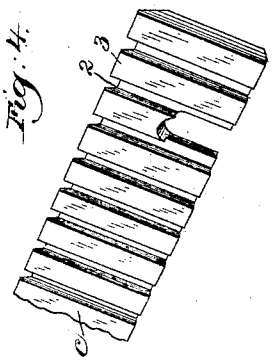


Fig. 4.

Witnesses.
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UNITED STATES PATENT OFFICE.

HENRY C. KNOWLTON, OF WEST GARDNER, MASSACHUSETTS, ASSIGNOR TO AUGUSTUS KNOWLTON, HENRY C. KNOWLTON, AND ALEC E. KNOWLTON, ALL OF SAME PLACE.

CUTTER-HEAD.

SPECIFICATION forming part of Letters Patent No. 341,149, dated May 4, 1886.

Application filed December 14, 1885. Serial No. 185,602. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. KNOWLTON, of West Gardner, county of Worcester and State of Massachusetts, have invented an Improvement in Cutter-Heads for Wood Planing or Dressing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to provide a cutter-head by which either flat, concaved, or convexed surfaces of wood may be planed or dressed smoothly, either with or against the grain, the cutter-head being applicable not only to machines for planing boards or lumber, but also to planing curved pieces, such, for instance, as used for chair-backs and in the manufacture of furniture.

To plane cross-grained wood or curved surfaces in the best possible manner and leave a smooth surface, the surface of the wood should be removed in small particles or bits, or as very small and narrow rectangular strips or shavings, so narrow and small that they have not sufficient strength to lift the grain of the wood below the cut surface, as fully explained in United States Patent No. 327,203, dated September 29, 1885, the cutter-head herein described and claimed being especially applicable to that machine.

My improved cutter-head consists, essentially, of a body having attached thereto a series of plates cut through at their beveled edges to leave a series of short cutting-blades with spaces between, the edges of the blades so formed projecting beyond the edge of the body, all the cutting-edges of each blade being in the same horizontal plane and all being parallel to the axis of rotation of the body, the plates attached to the body and provided with cutting-blades, as described, being so arranged therein that the narrow spaces of one knife or blade will be overlapped by a cutting-blade of a succeeding plate, as will be described.

As the short cutting-blades referred to meet and act upon the surface of the wood to be planed or dressed smoothly, the said blades act upon and remove a portion of the surface, leaving, however, unacted upon between each blade and the one next to it a small portion of the surface which is not removed by the said blades, the portion of the surface of the wood so left opposite the spaces below the edges of the cutting-blades very materially serving to prevent the lifting of the grain of the wood, except at the exact points where it is attacked by the cutting-blades.

I am aware that knives or blades have been serrated, leaving wedge-shaped or pointed teeth, as in United States Patent No. 273,304; but such a blade leaves, as it will be obvious, a minutely-grooved surface.

The cutting-edges on my improved blade have each two corners with a cutting portion between, all the cutting portions being parallel with the body of the cutter-head and parallel to the surface of the wood being planed.

My invention also consists in the combination, with the body of a cutter-head having a chip-breaker or cap, of a series of plates each having a series of narrow cutting blades or edges parallel to the body of the cutter-head and the edge of the chip-breaker or cap, the plates being adjusted upon the body of the cutter-head in such manner that the narrow spaces between the narrow cutting blades or edges of one plate are opposite and overlapped, as it were, by the narrow cutting blades or edges of a succeeding plate, the cutting-edges of two plates thus co-operating together to cut across the entire surface of the wood to be planed, leaving a flat and smooth surface, substantially as will be described.

Figure 1 shows in elevation, with one end partly broken out, a cutter-head embodying my invention; Fig. 2, a section of Fig. 1 in the dotted line *x x*; Fig. 3, a section thereof in the dotted line *x' x'*. Fig. 4 shows a portion of one of the knives or blades removed, and Fig. 5 a modification to be referred to.

The body *a* of the cutter-head and its journals *a'* are of usual construction.

My improved knife is composed of a metal plate, *c*, shaped externally substantially as other knives used on cutter-heads in planing-machines, the plate being beveled at one edge to give to the same the proper cutting inclination. The plate is then cut through at its cutting-edge, so as to leave a series of narrow cutting-blades, the edges 3 3 of which are all in the same line as shown in the drawings, there being left between adjacent blades nar-

row spaces 2. These plates may be provided with these narrow blades having edges such as described, either by grooving the face of each plate, as shown in Figs. 1 to 4, the said grooves being of such depth as to cut through the beveled edge; or I may cut the beveled edge of the plate through from its face to its back, as shown in the modification, Fig. 5. In Figs. 1 and 4 these grooves are marked 2, and they are of such depth as to leave (as in Figs. 1 and 4) narrow cutting-edges.

The cutting-edges of the blades have preferably two substantially right-angled corners with a straight cutting portion between, all the said narrow cutting-edges 3 of one knife being in the same straight line and also parallel to the axis of rotation of the said body and to the chip-breaker *b* if used.

The plates referred to have slots for the reception of usual screws, *d*, by which to attach them to the body of the cutter.

To slightly adjust the knives or blades, and to maintain them in the same position longitudinally, and to facilitate the resetting of the said knives when they have been removed to be ground and sharpened, I employ a series of screws, *e e*, which may be screwed into or out from the body of the cutter-head, leaving the outer sides of the head of the said screws in proper positions to define the positions desired for the end of each blade.

Referring to Fig. 1, it will be seen that the cutting-edges of each blade are a little wider than the grooves or spaces between adjacent cutting-edges, and it will also be seen that the plates are so attached that the cutting-edges of one blade will follow and so as to cover the space of another blade.

The cutter-head herein shown has a chip-breaker or cap, *b*, attached to it, and I prefer to use the same; but if desired I wish it to be understood that the said chip-breaker may be entirely omitted.

The cutting-edge 3 of each blade is made enough wider or longer than the space or groove next to it as to compensate for any end-play of the cutter-head when rotating in its bearings in the machine.

With a knife grooved as shown it may be kept sharp by simply grinding the beveled edge, as in usual planer-knives.

With a series of blades such as described it is possible with the greatest ease and with little or no care to plane cross-grained wood, and with a surface either concaved or convexed, and either with or against the grain, leaving a flat smooth surface.

I claim—

1. An improved cutter-head for planing or dressing wood, consisting of a body having attached thereto a series of plates cut through at their beveled edges to leave a series of short cutting-blades with spaces between the edges of the blades so formed projecting beyond the edge of the body, all the cutting-edges of each blade being in the same horizontal plane, and all being parallel to the axis of rotation of the body, the plates attached to the body and provided with cutting-blades, as described, being so arranged therein that the narrow spaces of one knife or blade will be overlapped by a cutting-blade of a succeeding plate, substantially as described.

2. The body *a*, combined with the knives or blades *c*, grooved or cut away to leave a series of narrow, straight, and alternate cutting-edges, 3 3, the straight cutting-edges of each knife or blade being in the same line and parallel to the axis of rotation of said body, and its chip-breaker or cap, the narrow spaces of one knife or blade being overlapped by the narrow cutting-edges of a succeeding knife or blade, to operate substantially as described.

3. The body *a*, and the knife or blade *c*, having grooves 2, to leave cutting portions 3 3, with their edges parallel to the axis of rotation of the said body, and the screws to confine the blades to the body, combined with screws *e* to position the cutting-edge longitudinally of the knife or blade, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY C. KNOWLTON.

Witnesses:

G. W. GREGORY,

C. M. CONE.