W. M. Hutton,

Cutter Head,

No. 988, Patented Oct. 26, 1838.

Fig 3

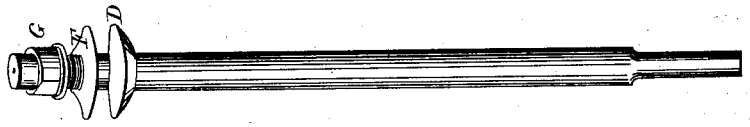


Fig 5

Fig 6

Fig 7

Fig 2

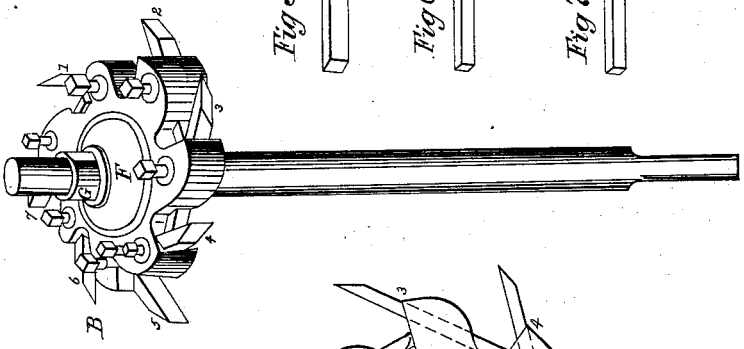


Fig 4

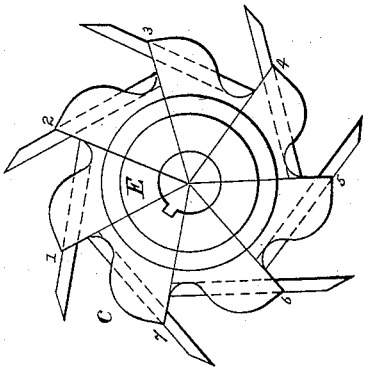
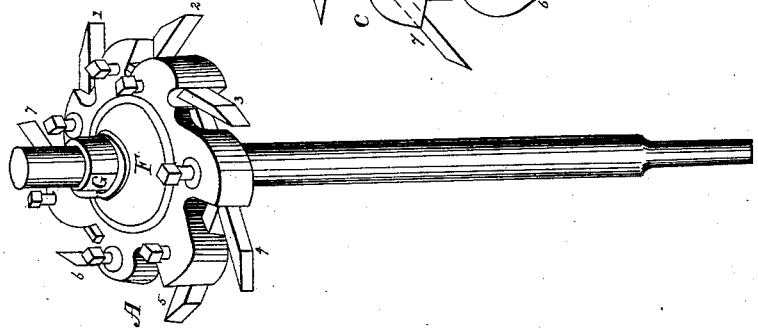


Fig 1



Witnesses:

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UNITED STATES PATENT OFFICE.

WALTER M. HUTTON, OF TROY, NEW YORK.

SIDE CUTTER-HEAD FOR JOINTING, TONGUING, AND GROOVING BOARDS.

Specification of Letters Patent No. 988, dated October 26, 1838.

To all whom it may concern:

Be it known that I, WALTER M. HUTTON, of the city of Troy, in the county of Rensselaer and State of New York, have invented a new and useful improvement in planing-machines, called "Hutton's Side Cutter-Head," for jointing, grooving, and tonguing boards, plank, and other material, of which said improvement the following is a description, as by reference to drawings thereof hereto annexed will appear.

The aforesaid "side cutter head" is composed of two principal parts; to wit, an "arbor" or "shaft" and the "cutter head." The shaft is made of cast steel or iron, about two feet long, and from an inch and a quarter to an inch and a half in diameter. The lower end of this shaft for about three inches is cut or turned down to a diameter of about one third of the diameter of the shaft; forming the foot of the shaft; which said foot is inserted into a socket or step; when the cutter head is placed or fitted into the machine. About six inches from the upper end a shoulder is turned upon the shaft of about one quarter of an inch wide and of the same depth. A circular cheek of about half an inch thick and four inches in diameter is made and fitted or shrunk upon the shaft; resting upon the aforesaid shoulder. The under side of this cheek is then turned down from the shaft with an angular bevel, until its edge or rim is about one eighth of an inch thick; the upper side is also cut or turned so that its plane is at right angles to the center of the shaft. This circular cheek may also be turned or made with the shaft. The cutter head when placed upon the shaft in the manner hereinafter described rests upon and is supported by this cheek. A screw is cut upon the aforesaid shaft of about an inch and a half in length, leaving a space of the shaft between the lower end or thread of said screw and the upper plane of the circular cheek of about an inch. The use and design of said screw will be hereafter explained.

The "cutter head" is cast solid and round, of brass, bronze, or other metal of sufficient strength, about an inch thick and with a diameter of seven inches, having a hole in the center, the diameter of which corresponds to the diameter of the shaft directly above the aforesaid cheek. The plane of this head cutting its lateral center, called the "center" plane is at right angles to the center of the shaft when the cutter head is placed upon in the manner hereinafter described. Upon the under side of this head a circular space with a center corresponding to the center of the head and with a diameter corresponding to the diameter of the circular cheek is recessed about an eighth of an inch; the plane of this space is parallel to the aforesaid center plane. Upon the upper side of the cutter head a similar space with like dimensions is also recessed; the plane of this space being likewise parallel to said "center plane." Another cheek with dimensions corresponding to the last aforesaid space is made to fit into the same when the cutter head is placed upon the shaft. The rim or periphery of this cutter head is divided into seven equal parts by means of cavities cut in the head of about an inch in length and an inch and a quarter in depth. The face of each of said sections corresponds with the radius or diameter of the head at that point. The back of each section being cut with such a convex curve as shall give a free passage for the chips or shavings cut or detached by the succeeding knife. These parts or sections may be increased to nine or eleven or any number by increasing the size of the wheel or "cutter head." Upon the upper side of any two of the aforesaid sections, that are as nearly opposite each other as the aforesaid division will allow, projections are raised of size and shape sufficient to form about one half of the mortise, hereafter described. These sections are called the "upper side cutter sections." The under side of the two sections nearest at right angles to the two former sections is made in the same manner and for the same purpose. These sections are called the "under side cutter sections." The three remaining sections are called the "center side cutter sections." Through all these seven sections mortises are cut or made at an angle of exactly fifty-one degrees with the face of the section. This angle is increased or diminished with the increase or diminution of the diameter of the "cutter head." It may also be varied with the same diameter of the head to give strength to the head of the section. The mortises through the center sections are about three-eighths of an inch square. The mortises in the upper and lower sections are about three-fourths

of an inch wide and three-eighths of an inch thick. The "center plane" of the cutter head cuts the center of the mortises made through the "center sections." The lower side of the mortises in the upper side cutter sections is in the same plane with the upper side of the mortises in the "center sections," and the upper side of the mortises in the lower side cutter sections is in the same plane with the lower side of the mortises in the center sections. The planes bounding the sides of the upper and lower side cutter knives must approximate so much toward the center plane, as that the action of the knives in these sections may meet the action of the knives in the "center sections."

There are three kinds or species of knives, the upper and lower side cutter knives, called the jointing knives; these are inserted into the upper and lower side cutter sections; the knives that give length to the tongue and cut or make the groove, called the tonguing and grooving knives, and the knives that cut off the corners of the tongue called the cornering knives. The two last mentioned species of knives are inserted into the "center sections." The jointing knives are between three and four inches in length corresponding in width and thickness to their respective mortises; these knives are ground to an edge with an angular bevel, with the face of the knife, more or less acute, and when inserted into their respective places are there confined by means of a "set screw" inserted into the respective sections at right angles to the plane of the head pressing upon the knife about in its center behind the ends. The edges of these knives all act in the same periphery of a circle. The purpose of these knives is to joint the edges of the plank or board above and below the groove; and to cut away the particles of the plank or board, and joint the edges above and below the tongue. The grooving and tonguing knives are brought to the same bevel as the jointing knives. These knives perform different offices and give different names and characters to the cutter head into which they are respectively inserted. The tonguing knife is inserted into the mortise of one of the center sections, and there confined by means of a set screw as above described. The edge of this knife describes a circle with a diameter the length of the tongue, less than the diameter of the circle described by the edges of the jointing knives. The use or office of this knife is to give length to the tongue and consequently the head into which it is inserted is called the "tonguing head." Into the mortises of the other two center sections cornering knives are inserted and confined as above described. One of these knives is brought to an edge with an acute angular bevel with the lower corner, and the other with an acute angular bevel with the upper corner. The office of these knives is to cut off the corners of the tongue.

Into the center sections of another head knives of the dimensions as the tonguing knife, are inserted. These knives are all of the same length and describe a circle, the diameter of which is the depth of the groove intended to be cut longer than the diameter of the circle described by the jointing knives. The office of these knives being to cut the groove, the cutter head into which they are inserted is consequently called the grooving head. These knives are also confined in their place by means of set screws. The cutter head being thus constructed is placed upon the shaft, the recessed space above described fitting into and resting upon the aforesaid cheek. A cheek of like dimensions and shape of the lower cheek is placed upon the shaft, sinking into the aforesaid recessed space upon the upper side of the cutter head; a nut is then run upon the shaft and screwed down upon the aforesaid upper cheek. The cutter head is confined upon the shaft and prevented from turning by means of a steady pin. When the side cutter head is finished as above described a pulley is placed or fitted upon the shaft below the head; upon which a band or strap is run, that gives motion and velocity to the cutter head.

The side cutter head is placed or fitted into the frame attached to and made a part of the planing machine with which the head is intended to be used; and into which said frame cutter heads that have performed or do perform the office or work that these heads are intended to do, have been or are placed. The foot of the shaft is placed or rests in a movable box or socket. Upon the under side of this box or socket a gage screw is so placed that by turning it the box and consequently the cutter head may be elevated or depressed in order to fit or adapt the cutter head to the thickness of the plank and to meet other emergencies. When thus fitted into the machine, the shaft of the cutter head is at right angles to the plank or board upon which the cutter head acts. The groove and tongue head, are placed respectively in a right line upon the opposite edge of the board or plank and act upon the board simultaneously. A band or strap from the drum or power that propels the planing machine passes around the aforesaid pulley, by means of which the cutter head is made to revolve from two to four thousand times a minute. The head thus revolves upon its axis in a plane at right angles to the edge of the board upon which it acts. The groove and tongue heads thus placed opposite each other revolve in opposite directions from the center of the plank. The pulley may be fastened or con-

fined upon the shaft by means of a feather or in any other manner as may best suit the mechanic. The head also may be confined in its position upon the shaft by inserting the steady pin into the shaft just above the upper face of the lower cheek, or otherwise as may suit the occasion. The foot of the shaft and also that part of it that runs or turns in the box confining the upper end of the head, is kept oiled by means of a small box made for that purpose and attached to the socket that holds or sustains the foot, and also another to the said box that steadies or confines the upper end of the shaft.

One of the advantages that this cutter head possesses over all others that performs the work that this head is intended to perform is that the knives act upon the plank successively, *i. e.* as one knife ceases, its successor begins to act, so that there is a continued or perpetual action upon the plank by the successive knives. The consequence is that the friction caused by the action of the knives is very much diminished, hence requiring less power to propel the head. The joint, tongue, and groove are cut at different and distinct periods of time, a single chip or shaving is cut or detached at a time by the action of the knives, and that so small and light that it cannot clog or be confined in the throat of the knife or otherwise impede the action of the head. Another advantage of this head is, that if any knife is broken or becomes dull it may be removed without disturbing the others; the same head also will wear out any number of knives. The cornering knives cut or take off the corners without binding or otherwise injuring the tongue. The friction is never so great as to split or otherwise injure the plank.

What I claim as my invention and desire to secure by Letters Patent is—

The above described mode of arranging the cutters or knives separately in a head constructed in the manner described.

In testimony whereof I have hereto subscribed my name in the presence of the witnesses whose names are hereto subscribed on the 11th day of October in the year of our Lord one thousand eight hundred and thirty eight.

WALTER M. HUTTON.

Witnesses:
A. THOMAS,
WM. P. HARKIN.