

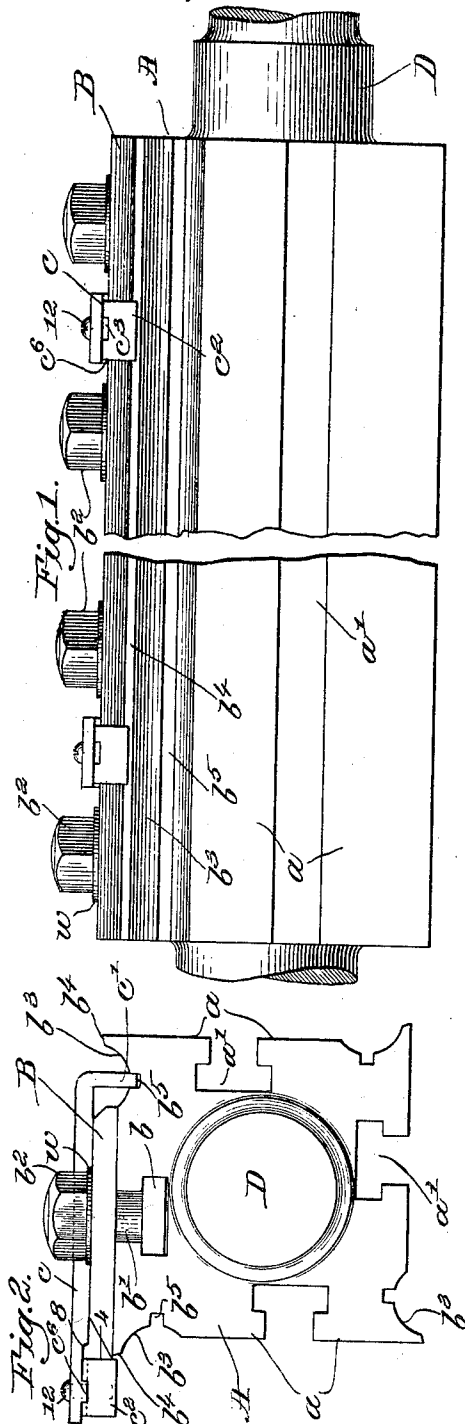
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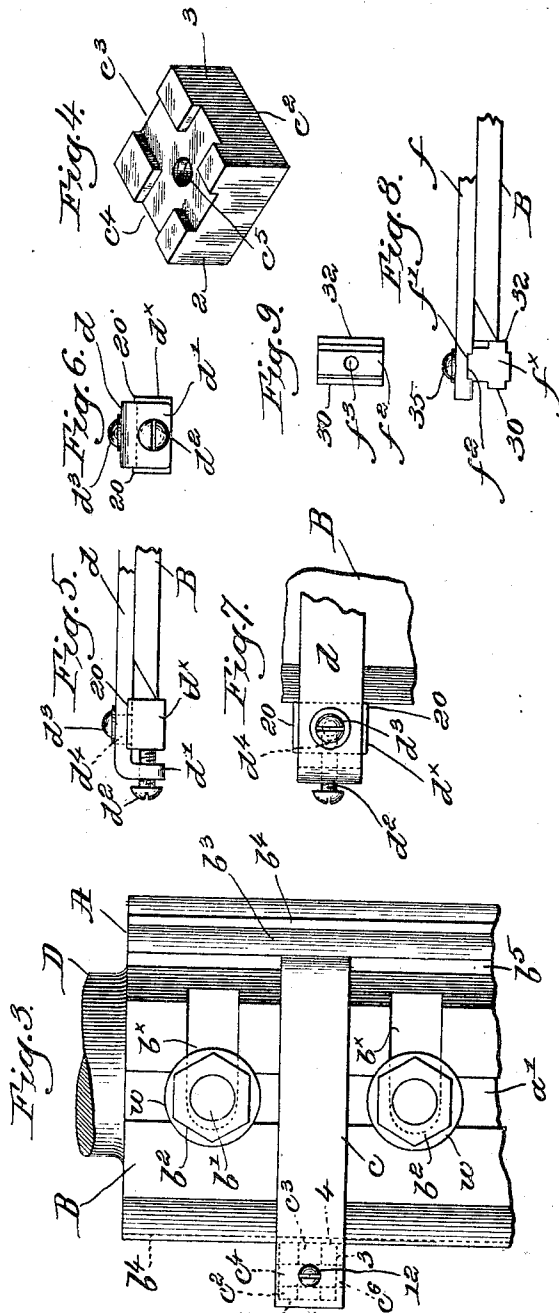
C. W. H. BLOOD & F. F. WOODS.
GAGE FOR SETTING CUTTER HEAD BLADES.

(Application filed Dec. 10, 1900.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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GAGE FOR SETTING CUTTER-HEAD BLADES.

SPECIFICATION forming part of Letters Patent No. 678,712, dated July 16, 1901.

Application filed December 10, 1900. Serial No. 39,255. (No model.)

To all whom it may concern:

Be it known that we, CHARLES W. H. BLOOD, a resident of Boston, in the county of Suffolk, and FRANK F. WOODS, a resident of Brookline, in the county of Norfolk, State of Massachusetts, citizens of the United States, have invented an Improvement in Setting Cutter-Head Blades, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

The setting of the blades on rotary cutter-heads—such, for instance, as are used in planers and other woodworking-machines—must be very accurate in order that each blade on the cutter-head shall have exactly the same clearance or projection beyond the lip of the blade-seat, so that the cutting edge of each blade shall travel in the exact path of all the other blades, such path being termed the “cutting-cylinder.”

Our present invention has for its object the production of simple and effective means for readily setting the blades of a cutter-head with the greatest accuracy, so that the adjustment desired may be accomplished with rapidity and precision, the cutting edge of each blade being located exactly in the cutting-cylinder.

Various novel features of our invention will be hereinafter described, and particularly pointed out in the following claims.

Figure 1 is a front elevation, centrally broken out, of a cutter-head and one of the blades in place thereon with one embodiment of our novel setting-gage in operative position. Fig. 2 is a right-hand end elevation of the cutter-head, blade, and gage illustrated in Fig. 1. Fig. 3 is a part top or plan view of the head, showing the gage in position to set the blade. Fig. 4 is an enlarged perspective view of the abutment forming a part of the gage. Fig. 5 is a side elevation of a modified form of gage to be described. Fig. 6 is an end view thereof. Fig. 7 is a top or plan view of such modification. Fig. 8 is a side elevation of yet another modification to be described, and Fig. 9 is a top view of the abutment shown in Fig. 8.

The cutter-head A is herein shown of usual

construction in its general features, provided with plane faces or seats *a* for the cutter-blades B, four of such seats being illustrated, each seat having a longitudinal undercut groove *a'* to receive the heads *b* of the blade-holding bolts *b'*, which pass up through transverse slots *b^x* in the blade in usual manner, suitable nuts *b²*, when set up tightly against washers *w* on the blade, holding the latter in operative position. The head is provided with a longitudinal groove or throat *b³*, arranged adjacent the lip *b⁴* of the next blade-seat, such throat affording a clearance for the chips which are taken off by the cutting edge of the adjacent blade.

So far as described the structure of the cutter-head is not novel with us, the said head being mounted on a shaft D, which is rotated in usual manner well known to those skilled in the art, and it is to be observed that the number of blades which the cutter-head is adapted to carry is immaterial so far as our invention is concerned.

The distance which the cutting edge of the blade projects beyond the lip *b⁴* determines to a certain extent the character of the cut to be made, and manifestly on a cutter-head carrying a plurality of blades the cutting edge of each must traverse exactly the same circular path or cutting-cylinder traversed by all of the other blades, and our invention provides simple and conveniently-operated means by the use of which each and every blade may be so set up that its clearance, or, in other words, the distance its edge projects beyond the lip of its seat, will be precisely equal to the clearance of every other blade. We have herein shown the gage forming a part of such means as comprising a carrier adapted to be removably applied to the cutter-head in a predetermined position and an abutment on the carrier overhanging the lip of the seat a distance equal to the desired clearance for the blade when the edge of the latter is set up against the abutment, the carrier being herein shown as an elongated flat metal bar *c*, adapted in the present instance of our invention to rest upon the blade to be set and extending transversely across the same, the rear end of the carrier being adapt-

ed to engage a part of the cutter-head a fixed distance from the lip of the corresponding seat and within the body of the head. Here-
 in the rear end of the carrier is shown as
 5 downturned at c' to enter a longitudinal setting groove b^5 , shown as made in each of the throats b^3 at the back of the blade to be set. At its other or front end the carrier is provided with an abutment c^2 , which depends
 10 from the lower side of the carrier, and in Figs. 1, 2, and 3 the abutment is shown as a rectangular block of preferably some soft metal, an enlarged perspective view of the abutment being shown in Fig. 4. The abutment
 15 is shown as provided with two grooves c^3 c^4 in its upper face, intersecting each other at right angles, a threaded hole c^5 being made in the abutment at the intersection of the grooves, but it will be noted that the grooves
 20 are not equidistant from the sides of the abutment, which is shown as square. The groove c^4 , for instance, is nearer the face 2 of the abutment than its opposite face and the groove c^3 is nearer the face 3 than the
 25 opposed face.

A transverse lip c^6 is made on the under side of the carrier, the latter being also cut away, as at 8, (see Fig. 2,) and this lip or
 30 rib fits snugly into one or the other of the grooves in the abutment, a screw 12 passing through the carrier into the threaded hole c^5 of the abutment and holding the latter securely in place. Now if the rib enters the groove c^4 there will be a certain distance between the downturned end of the carrier and
 35 the innermost face, as 4, of the abutment, and the latter will overhang the lip b^4 and be separated therefrom a distance just equal to the desired clearance for the blades when set
 40 up. If, however, the abutment should be turned half-way around, bringing the face 2 into position to engage the edge of the blade, obviously the clearance of the latter when set up will be greater, because there is a less
 45 distance between the screw 12 and said face 2 than between the screw and the face 4. Different adjustments can also be made by turning the abutment around to enable the lip c^6 to enter the groove c^3 .

50 It will be understood that once the abutment has been adjusted for the desired clearance all of the blades will be set up with such adjustment.

The operation of the device will be obvious
 55 from the drawings, the said nuts b^2 being loose until the blade is set up with its cutting edge against the abutment, the gage being in the position shown in Figs. 1, 2, and 3, after which the nuts will be screwed home
 60 and the blade firmly secured in properly-set position. The cutter-head will then be turned around to bring another face uppermost, and its blade will be set in similar manner.

We prefer to use a pair of gages, particularly on cutter-heads of considerable length,
 65 one located near each end of the head in setting up the blade, the carriers then being in

parallelism and held so by the engagement of the ends c' with the setting-groove b^5 .

Even when the last blade of the series is
 70 reached it can be set in precisely the manner described and with the same accuracy as the preceding blades have been set.

Of course the several setting-grooves must be accurately positioned in the cutter-head
 75 so that every groove will be the same distance back of the lip of the corresponding seat.

In Figs. 5, 6, and 7 we have shown a modified form for the gage, the carrier d being
 80 downturned at its front end, as at d' , to receive an adjusting-screw d^2 , which bears against the outer face of the abutment d^x , the latter in this instance being grooved in its upper face to receive lips 20, which embrace the sides of the carrier, a set-screw d^3
 85 passing through an elongated slot d^4 in the carrier and into the abutment. When the set-screw d^3 is loosened, the abutment can be moved in or out, according to the amount which the adjusting-screw d^2 is set up, in
 90 order to give the desired clearance for the blade, the gage being used as hereinbefore described, it being understood, of course, that after the desired position of the abutment has been attained the set-screw d^3 is set up
 95 firmly.

In Figs. 8 and 9 yet another modification is shown, the carrier f having a transverse
 100 groove f' in its under side near its outer end to receive a lip f^2 on the top of the abutment f^x . This abutment has two faces 30 and 32, parallel to each other, but unequally distant from the center, the latter being held in place on the carrier by a set-screw 35, which enters a threaded hole f^3 . By turning the abutment
 105 so that one or the other of its faces 30 or 32 is turned inward the clearance for the blade is adjusted. The relatively soft material of which the abutment is made prevents the edge of the blade from being turned when it
 110 is moved up against the abutment to be set.

It will be observed that the positioning of the carrier when the gage is in use does not depend in any way upon any blade, except
 115 so far as the carrier rests on the top of the blade to be set, the fixed point with which the gage coöperates being a part of the cutter-head itself and on a line within the body of the head parallel to its longitudinal axis.

In actual practice a set of gages would go
 120 with each cutter-head, the latter being properly machined to bring the groove b^5 in exactly the right position for coöperation with the corresponding set of gages.

The face of the abutment which determines
 125 the positioning of the blade to be set is located in a plane which intersects the cutting-cylinder in the line of intersection of such cylinder by the cutting edge of the blade when properly set.

130 It will be observed that the thickness of the blade is of no moment in using the gage herein described, as the part of the cutter-head engaged by the rear end of the gage will be in

a plane vertical to the seat of the blade to be set.

Our invention is not restricted to the precise construction and arrangement herein shown, as the same may be modified and rearranged without departing from the spirit and scope of our invention.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A setting-gage for the blade of a cutter-head, consisting of a carrier adapted to rest upon the blade to be set, and having a downturned end to engage the cutter-head at a fixed distance behind the lip thereof, an abutment on the carrier overhanging the lip at a predetermined distance therefrom, to act as a stop for the blade when the desired clearance thereof has been attained, means to connect the abutment and carrier, and a positioning-rib on one to enter a cooperating groove in the other.

2. A setting-gage for the blade of a cutter-head, consisting of a carrier adapted to be removably applied to the cutter-head in a predetermined position, and to extend transversely across the blade to be set when on its seat, an abutment having two opposite par-

allel faces, mounted on the carrier overhanging the lip of the cutter-head with the acting face at a distance therefrom equal to the desired clearance for the blade, the abutment serving as a stop when the blade is set up, and means passed through the carrier and into the abutment unequally distant from the two faces of the latter, to connect the abutment and carrier with one or the other face in position to cooperate with the blade to be set.

3. A blade-setting gage consisting of a carrier having a transverse rib on its under side at one end, a rectangular abutment having in its upper face intersecting grooves unequally distant from the two faces parallel to each groove, the rib on the carrier entering one or other groove to position the abutment, and means to connect the abutment and carrier.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CHAS. W. H. BLOOD.
FRANK F. WOODS.

Witnesses:

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