No. 843,498. PATENTED FEB. 5, 1907.

E. S. SHIMER.

CUTTER HEAD.

APPLICATION FILED SEPT. 11, 1906.

2 SHEETS—SHEET 1.

Fig. 1

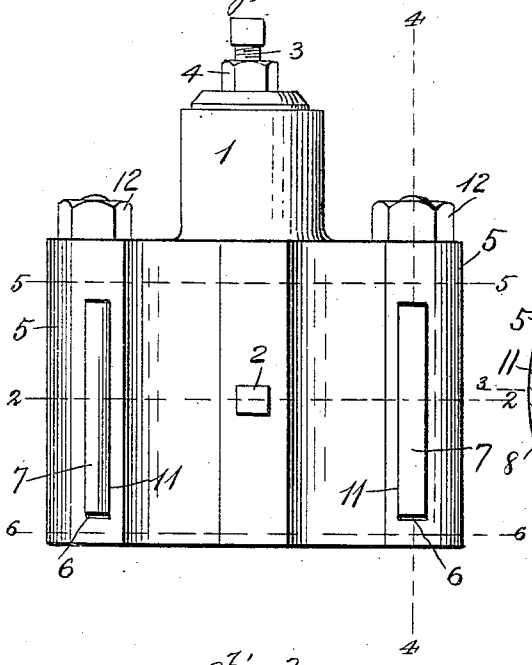


Fig. 2.

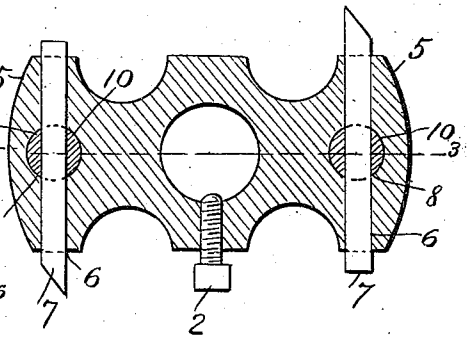


Fig. 3.

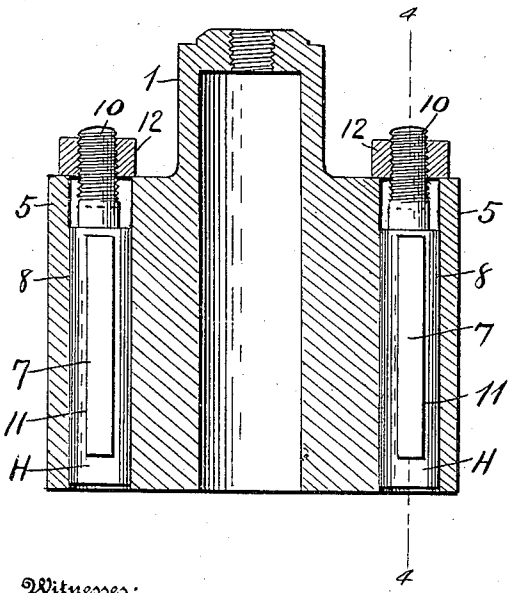
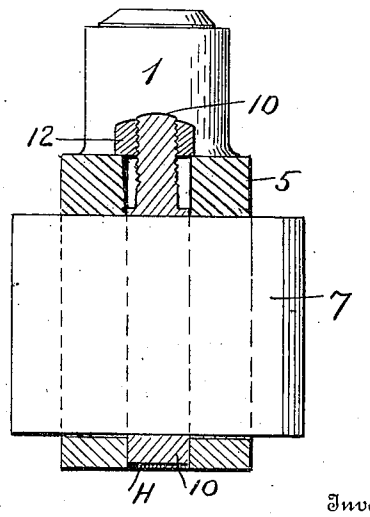


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5.

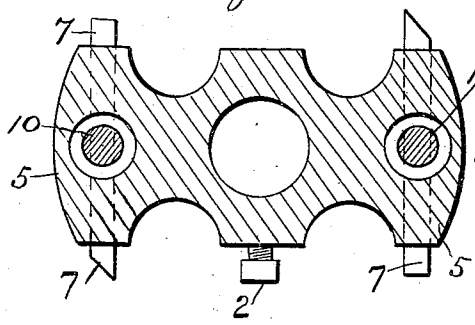
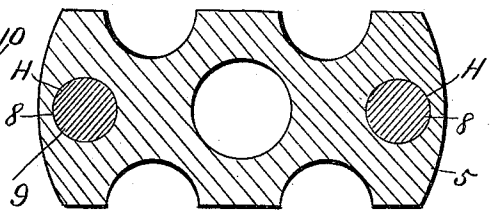
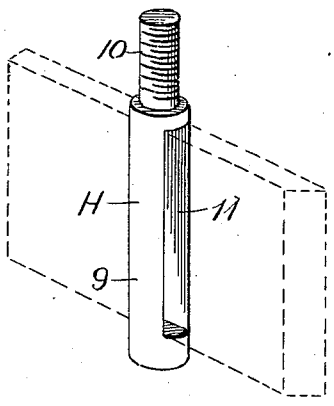


Fig. 6.





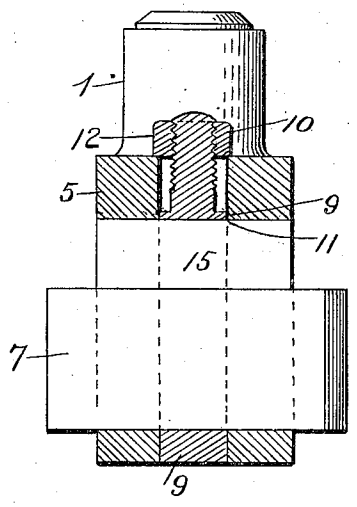


Fig. 7.

Fig. 9

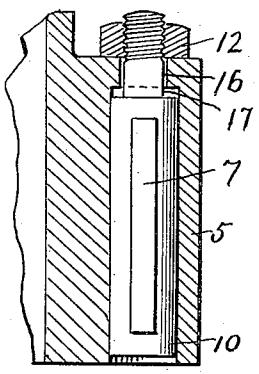


Fig. 8.

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UNITED STATES PATENT OFFICE.

ELMER S. SHIMER, OF MILTON, PENNSYLVANIA, ASSIGNOR TO SAMUEL J. SHIMER AND SONS, INCORPORATED, OF MILTON, PENNSYLVANIA.

CUTTER-HEAD.

No. 843,498. Specification of Letters Patent. Patented Feb. 5, 1907.

Application filed September 11, 1906. Serial No. 334,097.

To all whom it may concern:

Be it known that I, ELMER S. SHIMER, a citizen of the United States, residing at Milton, in the county of Northumberland and State of Pennsylvania, have invented certain new and useful Improvements in Cutter-Heads, of which the following is a specification.

This invention relates to cutter-heads for woodworking-machines, and it has particular reference to that type of cutter-heads manufactured by Samuel J. Shimer and Sons, of Milton, Pennsylvania, which are known to the trade as "wing-mortised" heads.

Cutter-heads of this type consist of a central hub having radially-extending wings that are provided with transverse mortises for the reception of the knives or cutters which have heretofore been secured in the mortises by means of set-screws inserted through the upper ends of the wings and bearing against the upper edges of the cutters, the latter being thus forced downward into the lower ends of the mortises, where they are securely bound by tightening the set-screws.

Further distinguishing characteristics of the particular cutter-heads to which the present invention or improvement is particularly applicable are that the cutting edges of the blades or cutters, which project radially beyond the circumference of the cutter-head, are disposed parallel with and in the vertical plane of the axis of rotation of the cutter-head, each blade being confined between solid metallic portions forming the top and bottom of the cutter-head, and not merely seated in a groove formed in the latter, as is sometimes the case in other makes of cutter-heads. It is desirable that the cutters be disposed as close as possible to the lower end of the cutter-head, and for this reason the thickness of the metal between the lower ends of the mortises and the bottom of the cutter-head is limited. No reason exists, however, why the thickness of the metal between the upper ends of the mortises and the top of cutter-head should not be as great as may be desired.

It has been found in practice that the downward stress or strain exercised by the set-screws upon the cutters and through the latter upon the material at the lower ends of the mortises, plus the working strain to which the cutters are exposed is sometimes so great as to cause the comparatively thin material between the lower ends of the mortises and the bottom of the cutter-head to be ruptured, thus releasing the cutters, thereby sometimes seriously injuring the machinery and endangering the attendants or operators. Again, it has been customary to make the set-screws of a diameter not exceeding the thickness of the cutters or the width of the mortises, and this being usually only three-eighths or, at most, seven-sixteenths of an inch gives no opportunity for securing a strong grip or hold, it being found that the threads are frequently twisted off the screws in tightening the latter.

The object of the present invention is to overcome these disadvantages by providing means for securing the cutters without forcing them downward against the comparatively weak portion of the cutter-head, and also to provide for the use of holding screws or bolts of ample diameter, so that the parts may be securely tightened together without danger of stripping the threads from the screws or bolts.

With these and other ends in view, which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations, and modifications within the scope of the invention may be resorted to when desired.

In the drawings, Figure 1 is a side elevation of a cutter-head embodying the invention. Fig. 2 is a horizontal sectional view of the same, taken on the plane indicated by the line 2 2 in Fig. 1. Fig. 3 is a vertical sectional view taken on the plane indicated by the line 3 3 in Fig. 2. Fig. 4 is a vertical sectional view taken on the plane indicated by the line 4 4 in Fig. 3. Figs. 5 and 6 are horizontal sectional views taken on the planes in-

dicated by the lines 5 5 and 6 6, respectively, in Fig. 1. Fig. 7 is a perspective detail view of one of the cutter-securing slotted bolts detached from the cutter-head, the cutter being outlined in dotted lines. Fig. 8 is a vertical sectional detail view taken through one of the wings of the cutter-head and illustrating the use of a filler in connection with the slotted bolt and a cutter of less than the regular width. Fig. 9 is a vertical sectional view through one of the wings, illustrating a modification.

Corresponding parts in the several figures are denoted by like characters of reference.

The cutter-head comprises a sleeve or hub 1, adapted to be mounted in the usual manner upon a spindle or arbor, (not shown,) said hub being provided with a set-screw 2, whereby it may be secured upon the spindle, and said hub being also equipped with the usual adjusting-screw 3, having a jam-nut 4.

The hub is provided with radially-extending wings 5 5, wherein are formed the mortises 6 for the reception of the knives or cutters 7, it being observed that said mortises are formed transversely intermediate the upper and lower ends of the heads and relatively near the lower ends of the wings, the thickness of the material between the upper ends of the mortises and the top of the cutter-head being considerably in excess of the thickness of the material between the lower ends of the mortises and the bottom of the cutter-head. In fact, the material at the upper ends of the mortises may be reinforced to any desired extent.

The mortises 6 are intersected by bores 8 of a diameter considerably exceeding the width of the mortises, said bores extending vertically through the wings of the cutter-head. These bores are for the reception of the cutter-securing bolts or members H, each of which comprises a body 9, preferably of cylindrical shape, to fit the bore or aperture 8, and having at its upper end a screw-threaded shank 10, which, as shown, may be of a diameter somewhat less than that of the body 9, although this is not necessary or essential. The body 9 is provided with a slot 11, adapted to register with the mortise in the wing wherein the cutter-holder is placed, the cutter 7 passing through the mortise 6 and through the slot 11 in the body 9 of the holding member. The threaded shank 10 of the latter is provided with a nut 12, which may be tightened against the top of the cutter-head.

It will be apparent from the foregoing description that when the parts are assembled and the nuts 12 are tightened the holding members H will be drawn upward, thus drawing the cutters into binding engagement with the reinforced upper portion of the cutter-head, where said cutters will be held with great security, the relatively thin and weak lower portion of the cutter-head being relieved from all strain except the ordinary working strain. The cutters will thus be held by drawing them into intimate relation with the material of the cutter-head, and the wedging-apart or pressing-apart action caused by the holding means customarily employed is totally avoided.

A decided advantage of the present invention resides in the facility with which the cutters may be released and exchanged when desired, and another important advantage lies in the fact that the threaded shanks of the holding members may be made of a size to insure great strength and little liability of stripping or injuring the threads when the nuts are tightened to such an extent as to assemble the parts with absolute security.

The improved holding device does not preclude the use of blanks or fillers when knives or cutters of less than regular width are to be used, as will be understood by reference to Fig. 8 of the drawings, where a blank or filler has been shown at 15, said filler being placed adjacent to the lower edge of the cutter.

While the bores 8 for the reception of the holding members are preferably and usually made of one diameter throughout, the upper ends of said bores, extending through the top of the cutter-head, may be reduced, as will be seen at 16 in Fig. 9 of the drawings, said modification being obviously within the scope of the invention.

From the foregoing description, taken in connection with the drawings hereto annexed, the operation and advantages of the invention will be readily understood by those skilled in the art to which it appertains.

The construction is simple and thoroughly efficient for the purposes for which it is devised.

Having thus described the invention, what is claimed is—

1. A radial-arm cutter-head having wings provided with mortises and vertical bores intersecting the mortises and of a diameter exceeding the width of the mortises, movable members seated in the bores above and below the mortises and having slots registering with the mortises, cutters extending through the slots and mortises, and nuts threaded upon the upper ends of the movable members and bearing upon the cutter-head.

2. A radial-arm cutter-head having wings provided with mortises disposed relatively near the lower end of the cutter-head, the material of the latter being of greater thickness above than below the mortises, said wings being also provided with vertical bores intersecting the mortises, movable members seated in the bores above and below the mortises

and having slots registering with the mortises, cutters extending through the slots and mortises, and nuts threaded upon the upper ends of the movable members and bearing against the relatively thick or reinforced portion of the cutter-head above the mortises.

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

ELMER S. SHIMER.

Witnesses:
FRANK LONGMORE,
WM. P. WENDLE.