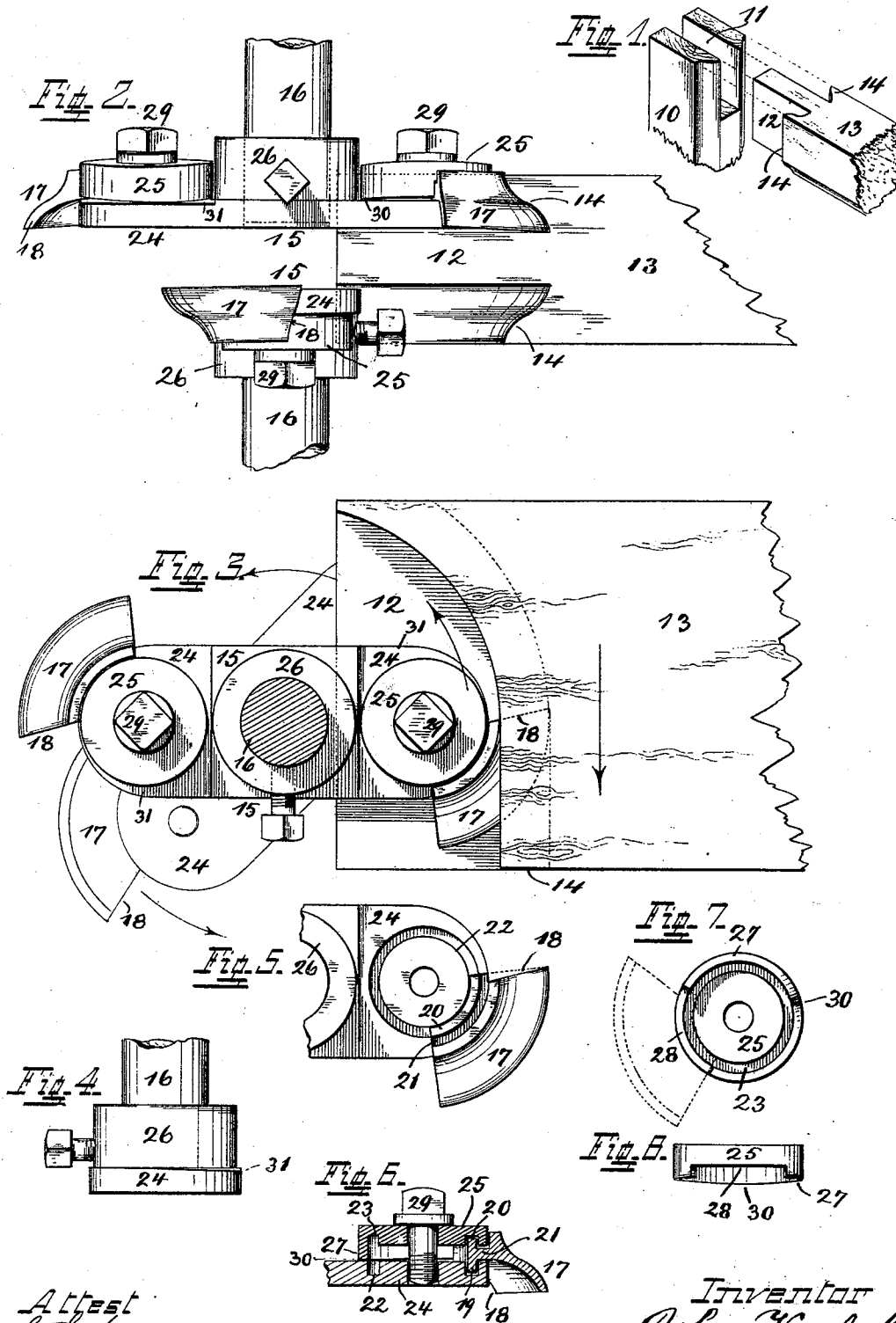


(No Model.)

J. KUEHNLE.
COPING HEAD AND BIT.

No. 541,100.

Patented June 18, 1895.



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UNITED STATES PATENT OFFICE.

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COPING HEAD AND BIT.

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To all whom it may concern:

Be it known that I, JOHN KUEHNLE, a citizen of the United States, and a resident of Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Coping-Heads; and I do 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, attention being called to the accompanying drawings, with the reference-numerals marked thereon, which form a part of this specification.

This invention relates to improvements in cutter-heads and bits for coping and tenoning machines, to which latter they form usually attachments. They are particularly intended for such work where parts with moldings on their edges are to be mortised together and where for such reason the shoulders on the tenons have to be cut under on a line which is the reverse of the molding on the mortised part, in order to permit the two parts and the moldings thereon, to come fully together and meet on a close joint.

The novel features comprise first a cutter-head which is so constructed that it permits the attachment of the particular form of bit which I use by a particular form of locking collar, in a manner that the bit may be adjusted and moved up to the cutting line as it wears off, whereby the life of such bit is extended and the same may be almost completely used up.

The other novel feature consists of this specifically constructed locking and clamping collar whereby the bit is secured to the cutter-head and held thereon in its adjusted position. All parts are constructed in a manner to permit their manufacture by turning on a lathe whereby a considerable reduction in expenses is attained.

The bit is improved in a manner that none of its parts, (shoulders) whereby it is held in position, project outside or above the line on which it cuts, so that none of such parts interfere when the cutter is used on long tenons and deep under-cuts where it has to reach far out for such purpose.

In the following specification and particu-

larly pointed out in the claims at the end thereof, is found a full description of my invention, its operation, parts and construction, which latter is also illustrated in the accompanying drawings, in which—

Figure 1 shows in a perspective view at a reduced scale parts of a wooden construction where it is necessary to use coping cutter-heads and bits. Fig. 2 shows in an elevation a set of coping-heads in operation. Fig. 3 is a top view of such a set of two coping-heads as shown in the preceding figure. Fig. 4 is an end view of one of the coping-heads with bit removed. Fig. 5 is a part of Fig. 3 with the locking and clamping collar which holds the bit removed. Fig. 6 is a central vertical section through the locking and clamping collar when in position with the bit on the cutter-head. Fig. 7 is an under side and Fig. 8 a side elevation of the said locking and clamping collar.

One of the most commonly occurring cases where these cutterheads are used is illustrated in Fig. 1, where 10 represents the upright rail or stile of a door, which is mortised at 11, to receive the tenon 12, of a cross-rail 13. The inner edges of these rails and cross-pieces which receive the door-panels are usually provided with a molding and in order to let the parts come together and obtain a completely closed joint, and nice finish, it is necessary that the shoulders 14, of the tenons be cut under, on a line in reverse to the molding on the stile 10, as may be readily understood. The shaping of this under-cutting, in addition to forming the tenon, is the work which these cutter-heads and their bits perform. Two of the former, designated by 15, are secured opposite each other to spindles 16, usually upright, whereby they are rotated, while the work is held on a sliding table, or support and moved through between them. The cutter-heads are adjustable to and from each other, to cut tenons of various thicknesses. Their bits 17 are usually formed by turning the required profile for the reversed molding on a circular piece of steel, which is then quartered to make four bits, one of the edges on each, arising from such division, forming the cutting edge 18. As this latter wears

back and the bit is reduced by resharpening, the proper profile of the cutting edge is always readily preserved. On the inside these bits have two shoulders 19 and 20, extending down and upwardly from a neck 21, which forms the connecting member between them and the bit proper and beyond the face of which latter, that is above and below, they do not project. These shoulders are cut on a circular line and fit into circular grooves 22 and 23 respectively, the former cut into arms 24, of the cutterheads, the latter into the inner surface of locking and clamping collars 25. There are two of these latter, each holding a bit to each of the two arms 24, of the two cutter-heads which work together while on each, between said arms, a hub 26 is provided whereby they are secured to their spindles. The clamp-collars have a vertical flange 27, which is partly cut out at 28, to clear neck 21 of the bit, the length of such cut-out corresponding exactly with the length of neck 21, so that when the bit is in position, it may not move laterally on said collar. These latter are secured and held in position by screws 29, passing centrally through them and into arms 24, clamping the bits between them and preventing them from receding from their position when cutting against the wood. In order to make this clamping action as effective as possible and concentrate it upon shoulders 19 and 20 of the bit, the edge of flange 27 of the collars from a point 30, diametrically opposite the center of cut-out 28 and to each side therefrom toward said cut-out, is slightly cut down, see particularly Fig. 8, so that only this highest part of the collar at 30, rests on the cutter-head and the whole pressure of screws 29 is thrown by its other part, opposite from 30, upon the shoulders of the bit. The cutting edge of the latter readily clear themselves while in operation by reason of the circle of the edge of the bits being smaller than the circle on which they are carried around by the arms of the cutter-heads. The lower circular edge of the bit is prevented from rubbing against the work, by giving the upper surface of arms 24, on which the bits rest, a slight lateral inclination, as shown at 31, see particularly Fig. 4, whereby only the front corner of said edge, being coincident with the lower corner of the cutting edge of the bit, comes in contact with the wood.

As the cutting edge wears back and the bit diminishes by use and resharpening, it may be moved up and adjusted again to its proper position (about like shown) on the cutter-head, by loosening and re-tightening collars 25. Neck 21 of the bits occupying cut-out 28 of the collars is not reduced by the wear of their cutting edges, so that irrespective of the reduction of these latter, the parts by which the bits are held in position remain

always intact, to be clamped down by the locking-collars. In this manner the cutting part of the bits may be almost completely consumed, so that their useful life is greatly prolonged.

In small bits for light work, the groove in collar 25, and the upper shoulder 20 on the bits may be omitted, the collar simply bearing down upon necks 21, but in most cases it will be found preferable to construct these parts as shown.

Part of grooves 22, 23, (about half) is never occupied by the shoulders on the bits, and for this reason is practically not needed, but the cutting of the other half, being on a true circle, is very much facilitated by cutting them out clear around whereby the work may be readily done on a turning lathe.

In addition to the uses described these cutter-heads when provided with bits properly shaped for the purpose may also be used on molding, frizzing and similar machines for cutting moldings.

Having described my invention, I claim as new—

1. A cutter-head for coping machines, adapted to be attached to a spindle for rotation and provided with laterally extending arms 24, in combination with bits to be attached to the outer ends of these latter which are provided with projections extending rearwardly of their cutting face, clamping collars reaching over and engaging with these rearward projections on the bits, screws 29 passing through these collars and into arms 24 for the purpose of clamping the bits between the collars and arms below, parts of the collars being reduced in height to prevent them from resting fully on arms 24, except at a point at 30, diametrically opposite from where they engage with the bits for the purposes explained.

2. A cutter-head for coping machines, adapted to be attached to a spindle for rotation and provided with laterally extending arms 24, bits at the outer ends of these arms, having rearwardly projecting necks back of their cutting face, individual, circular locking collars for each bit, each collar having the vertical flange 27, which is cut out at 28, to receive the neck of the bits, whereby these latter are prevented from receding from their adjusted position and bolts to hold the locking collars to arms 24 with the bits clamped between.

3. A cutter-head for coping machines, adapted to be attached to a spindle for rotation and provided with laterally extending arms 24, bits at the outer ends of these latter, having a rearwardly projecting neck back of their cutting face, combined locking and clamping collars reaching over and engaging with these necks on the bits and having flanges

27, which are cut out to receive said necks whereby the bits are held in position and prevented from receding while cutting, bolts passing through the collars and into arms 24, clamping the necks of the bits between them, parts of flange 27, of the collars being reduced in height to prevent it from resting fully on arms 24, except at a part at 30, dia-

metrically opposite from where said flanges are cut out.

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

JOHN KUEHNLE.

Witnesses:

C. SPENGEL,

C. FINN.