This invention relates to saddle miter square and level attachment for a hand saw and has particular relation to attachments designed to cooperate with the saw blade in producing angle control characteristics such as will permit the marking on work of indications usable in subsequent sawing and other activities with the indications relating the development of “square” and/or “miter” conditions on the work.

Attachments of this general type have heretofore been contemplated, these using the non-toothed edge of the saw blade to present one side of the angle with the attachment presenting the other side. This type generally has the attachment adjustable to permit variations in the included angle to thereby permit variations in the angle of the indication marking relative to the work, with the variations ranging from those of a right-angular relation suitable for producing the conditions of a square cut and including angles less than a right angle. In some forms the range is also extended to provide for indications beyond the right angle and into the obtuse angle range. The present invention pertains to attachments limited to the right angular and lesser or acute angle field.

All of these assemblies, in preparing for marking the indications, adjust the attachment relative to the blade edge to produce definite angular relations therebetween to set the assembly in such condition that one of the controlling faces of the saw or attachment may cooperate with a face of the work to form the base line while the control face of the other serves to guide the marking of the indication. Where the included angle thus produced overlies the saw blade, the attachment is generally so mounted to present the maximum included angle as that of a right angle with the adjustments such that the value of the included angle grows less as the attachment is advanced in its adjusted direction, thus producing the conditions of an acute angle within the assembly itself. In such assemblies, the marking line inclines away from the face of the work with which the base face of the assembly is in contact, in all of the adjusted positions other than the square, thus providing the characteristics of an included angle of acute type between the base face and the marking line, while the portion of the work face beyond the line presents the included angle between the marked line and the base line as of obtuse type.

Among the disadvantages of such assemblies is the fact that to properly secure the attachment in either of its adjusted positions, it is necessary to use a screw or bolt formation for maintaining the adjusted position, a condition which requires that the securing means must be released prior to making the adjustment and after the latter has been made, a second manipulation of the securing means must be had to secure the attachment in its adjusted position, thus requiring dual manipulation for each adjustment. This is due to the fact that the securing means must be located within the blade zone itself, and the securing means must be of such form as to not lend to weaken the saw blade for its normal sawing service. A similar condition, in more intensified form, is also present in the type of assemblies in which the service included angle base face is located beyond the marking edge, since such face is normally housed within the attachment in overlying relation to the blade and must first be moved to its active zone, adjusted and secured in the adjusted position before marking can take place, and later returned to the housed position.

The present invention, while employing some of the features common to all assemblies of this type, provides an arrangement of its members such as to present a number of conditions which are in more or less contrast with those found in the prior structures of this art. One of these is the fact that when the attachment is movedpivotally out of its normal position, the position in which the base face and the marking edge present the right angle or “square” relation, the included angle between face and edge is always greater than a right angle thus forming an angle of obtuse angle type, although the base face carried by the attachment remains permanently in overlying relation to the saw blade. This condition is in direct contrast with the usual practice where the included angle is of the acute angle type under similar conditions.

This contrasting fundamental provides a number of advantages, both structural and in operation, as heretofore pointed out in detail, amongst which is the fact that the position securing means for the attachment is made cooperative with the blade edge which forms the marking edge, thus greatly facilitating the movement of the attachment between its adjusted positions and properly locating it in its new position.

The structure and arrangement of the attachment, and its mounting on the saw blade, are of comparatively simple type, readily manipulated in service, and capable of being produced at moderate cost.

To these and other ends, therefore, the nature
of which will be set forth and more clearly defined as the invention is hereinafter disclosed, said invention consists in the improved constructions and combinations of parts hereinafter more fully described in the following specification, illustrated in the accompanying drawings, and more particularly pointed out in the appended claims.

In the accompanying drawings, in which similar reference characters indicate similar parts in each of the views,

Figure 1 is a side elevation of the handle zone of a hand saw and showing the attachment positioned thereon, with the attachment shown as positioned in its normal inactive position in which the base face and the marking line extend in direct right angular relation.

Fig. 2 is a sectional view taken on line 2-2 of Fig. 1.

Fig. 3 is a sectional view taken on line 3-3 of Fig. 1.

Fig. 4 is a sectional view taken on line 4-4 of Fig. 5 with the parts on an enlarged scale, the view illustrating, in full lines, the attachment as moved from its normal inactive position (shown in dotted lines) to one of its adjusted positions.

Fig. 5 is a transverse sectional view of the saw blade with the attachment in elevation, the view having the latter in the full-line position shown in Fig. 4 with the view looking toward the base faces of the attachment.

Fig. 6 is a sectional view taken on line 6-6 of Fig. 1. In the drawings, 1 indicates the blade of a hand saw, the handle being indicated at 1a. The saw has the usual toothed edge and planar opposite edge, the latter being indicated at 1b. In connection with the invention, the edge 1b is serviceable as a marking edge and is hereafter referred to as such. The showing of the saw and the head 1c of the element permanently projecting beyond the marking edge 1b. The segmented portion 1e of the element is kerfed longitudinally as at 1ε (Fig. 3), the element thus straddling the saw blade. The boxing divisions 1f and 1fε and the element portion 1e are provided with complementary configurations serving as key-ways extending in the direction of length of each of these, shown as grooves in the boxing and ribs on the element portion, to permit free telescoping movement of the element portion longitudinally of the boxing. The boxing divisions 1f and 1fε and the element portion 1ε may be connected to the group of units telescopically connected for service activities.

To assemble the attachment with the saw blade, the latter carries a square shaft 7 having a length to extend into opposite side walls of the boxing divisions, that portion of the shaft which lies within the side walls being of circular contour. The shaft is thus held against rotation in the saw, while the boxing divisions are capable of turning on the circular portions of the shaft, the latter being positioned below the lower end of the telescoped portion 1ε and in the lower zone of the saw blade closer to the toothed edge than to the marking edge, as well as in the vicinity of the handle zone of the blade of the boxing thus approaches the toothed edge of the blade, but is not close enough to materially interfere with sawing operations with the blade.

The lower end of the telescoped portion 1ε is connected with shaft 7 by a tensioning spring 17 (Figs. 2 and 6), the spring tending to move the element toward the housed position of the telescoped portion 1e, the latter being practically completely housed when the attachment is in its normal or inactive position (Fig. 1 and in the dotted line position of Fig. 4) in which the attachment has a face that is at exact right angles with the marking edge of the blade and adapted to serve the purpose of a square should occasion arise for use as such. However, spring 17 permits outward movement of element 1e under increasing tension conditions when it is desired to use the space for marking miter indications.

Each of the divisions of the boxing or casing carries a planar member 4 of suitable length, shown as extending to the lower end of the boxing and approaching the upper limits of the divisions, the member having an exposed face which forms the angle control face of the attachment. In service, this angle control face is brought into contact with a face of the work which is at right angles, cross-sectionally of the work, to the work face which is to receive the marking indications, and thus provides the base face of the included angle between such face and the marking edge of the blade.

The marking edge of the blade is provided with a number of spaced apart notches 18, each of which is adapted to cooperate with a plate 3 carried by the portion 1ε through the engagement of the lower edge of the plate with a notch. The number of notches which may be employed in such edge will depend somewhat upon the character of service which the equipped saw is to perform. Four notches are shown in the drawings, but the number may obviously be increased. Each notch represents a definite angle relation to the marking edge, the particular angle depending upon the service to be performed, the notch engaged by plate 3 in the normal inactive position indicating a 90° angular relation, while the remaining notches indicate angular relations greater than a right angle.

As will be understood, when it is desired to produce a miter marking, the element 1ε is drawn outward relative to the boxing or casing, thus releasing plate 3 from the right angle notch, the attachment then being rocked about shaft 7 to the notch representing the desired angle, spring 17 permitting the needed yield of the element to compensate for the needed increase of length of the element. When the desired position is reached, the element is permitted to move in the direction of its housed position until plate 3 engages the bottom of the notches of the attachment at the desired angle relative to the marking edge. To permit ready withdrawal movements, the head portion 1εε is provided with one or more depressions 19 which permit the fingers to firmly grip such head portion. In the case of certain types of the shaft, preferably of the leaf type, is mounted on shaft 7 (Figs. 2 and 6) with the free portion of the spring contacting the wall of the boxing opposite that carrying faces 4, the spring 8 tending to move the
attachment in the direction of its normal or inactive position. The spring 8 will assure that the plate edge will engage the proper face of the notch, and will tend to retain the attachment in its normal position. The spring 17 is in service. In practice, the tension value of spring 8 is always less than the similar value of spring 17 to assure that the plate 3 will not be withdrawn from the selected notch by the action of spring 8. If desired, a spirit level 9 may be mounted by brackets 10 and 11 on one of the side faces of the boxing, this being of advantage in some classes of work for which the assembly is adapted for use.

As will be understood, the assembly is simple in construction and efficient in service. The saw blade has but the single opening for shaft 7, the notches 18 are on the edge of the blade, so that the blade is not weakened. The two unit form of attachment with the units telescopically arranged, enables the position securing means, the notches carried by the blade edge and the plate 3 carried by the head 16a, to be located in the edge zone of the blade and exterior of such edge, and so arranged as to permit movement of the attachment pivotally at will and without the necessity of releasing or fastening screws or the like, the securing means efficiently locking the attachment in adjusted position other than intentional movement. While the divisions 15 and 15a are on opposite sides of the blade and individually pivoted, the telescoped arrangement compels movement of both divisions concurrent and, since the angle control or base faces 4 are accurately aligned, the included angle on the opposite sides of the blade has the same angular value in each of the adjusted positions. As heretofore pointed out, the assembly is so arranged that the included angle between the base face and the marking edge, which overlies the saw blade at all times, is equal to or greater than a right angle in all of the adjusted positions, thus placing the adjusted angle as of obvious type. This not only permits of the simple form of attachment described and the readiness with which adjustments may be had, but provides other advantages when in service.

For instance, assume the mitering of a rafter, at either or both ends. The rafter is positioned with the side which is to be marked as uppermost. After the attachment is adjusted to the desired angular position, the base face 4 of the under side of the blade is positioned against an adjacent edge of the rafter with the blade overlying the face to be marked, and in an end zone of the rafter. Due to the obtuse angle form of the included angle, the marking edge will approach the rafter end closer at the remote edge than at the near edge of the rafter, the marking edge being inclined toward the near edge. This places the marking edge as completely exposed to the operator while holding the base side in position and assuring an accurate marking of the miter indication. Where the included angle is of the acute angle type, the inclination of the marking edge is away from the near edge of the work so that its edge face is partially hidden to the operator in such position.

In service for miter indication marking, the assembly is positioned adjacent one end of the work which then receives its indication marking. If the opposite end of the work is to receive a marking of equal value, the assembly is simply shifted to the opposite end zone and applied to the opposite edge of the work. If the mitering markings are to be of opposite but of equal angularity, the assembly is simply shifted to the opposite end of the work and then reversed to bring the other base face 4 as the active control face. In either case, the inclination of the marking edge will be toward the operator, thus affording the clear vision of such edge.

As will be apparent, the attachment construction is of simple type and highly efficient in operation, capable of production at reasonable cost, and adapted for mounting on the hand saw in simple manner and without weakening the saw blade for sawing service.

While I have herein shown and described a preferred form of the invention, it will be readily understood that changes and/or modifications therein may be found desirable or essential in meeting the exigencies of service or the individual desires of a user. I, therefore, reserve the right to make any and all such changes and/or modifications therein as may be so found desirable or essential, inferring as the same may fall within the spirit and scope of the invention as expressed in the accompanying claims, when broadly construed.

1. A device of the character described comprising, in combination with a blade having a handle affixed to one end thereof and provided with a straight back edge, said blade having a non-rounded opening therethrough adjacent the junction of said handle remote from the straight edge of said blade, and said straight back edge having a plurality of notches formed therein, the provision of a mitering attachment for said blade comprising a shaft extending through said non-rounded opening and a rounded portion at each end thereof, a casing member revolvably mounted upon each of said rounded portions, a bifurcated member having a head at its outer end and a pair of legs formed integrally with said head and each snugly slideable in one of said casing members, a tension spring interconnecting the inner end of one of said legs and said shaft, a plate affixed to said head on that side thereof remote from said handle and selectively engageable in said notches, and a planar marking plate affixed to each of said casing members on that side remote from said handle.

2. A device of the character described comprising, in combination with a blade having a handle affixed to one end thereof and provided with a straight back edge, said blade having a non-rounded opening therethrough adjacent the junction of said handle remote from the straight edge of said blade, and said straight back edge having a plurality of notches formed therein, the provision of a mitering attachment for said blade comprising a shaft extending through said non-rounded opening and a rounded portion at each end thereof, a casing member revolvably mounted upon each of said rounded portions a bifurcated member having a head at its outer end and a pair of legs formed integrally with said head and each snugly slideable in one of said casing members, a tension spring interconnecting the inner end of one of said legs and said shaft, a plate affixed to said head on that side thereof remote from said handle and selectively engageable in said notches, and a planar marking plate affixed to each of said casing members on that side remote from said handle, and a flat spring affixed to said shaft and having its free end portion bearing
against the inner side of that portion of one of
said casing members adjacent said handle.

SAMIE W. WAINWRIGHT.

REFERENCES CITED

The following references are of record in the
file of this patent:

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>734,922</td>
<td>Kohler</td>
<td>July 28, 1903</td>
</tr>
<tr>
<td>948,059</td>
<td>Larson et al.</td>
<td>Feb. 1, 1910</td>
</tr>
<tr>
<td>1,187,650</td>
<td>Rasmussen</td>
<td>June 20, 1916</td>
</tr>
<tr>
<td>1,277,443</td>
<td>Larson</td>
<td>Sept. 3, 1918</td>
</tr>
<tr>
<td>1,285,513</td>
<td>Wheeler</td>
<td>Nov. 19, 1918</td>
</tr>
</tbody>
</table>