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MAY 11, 1943.

SAW WITH A FREELY PROJECTING SAW BLADE

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BY A. P. C.

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2 Sheets-Sheet 1

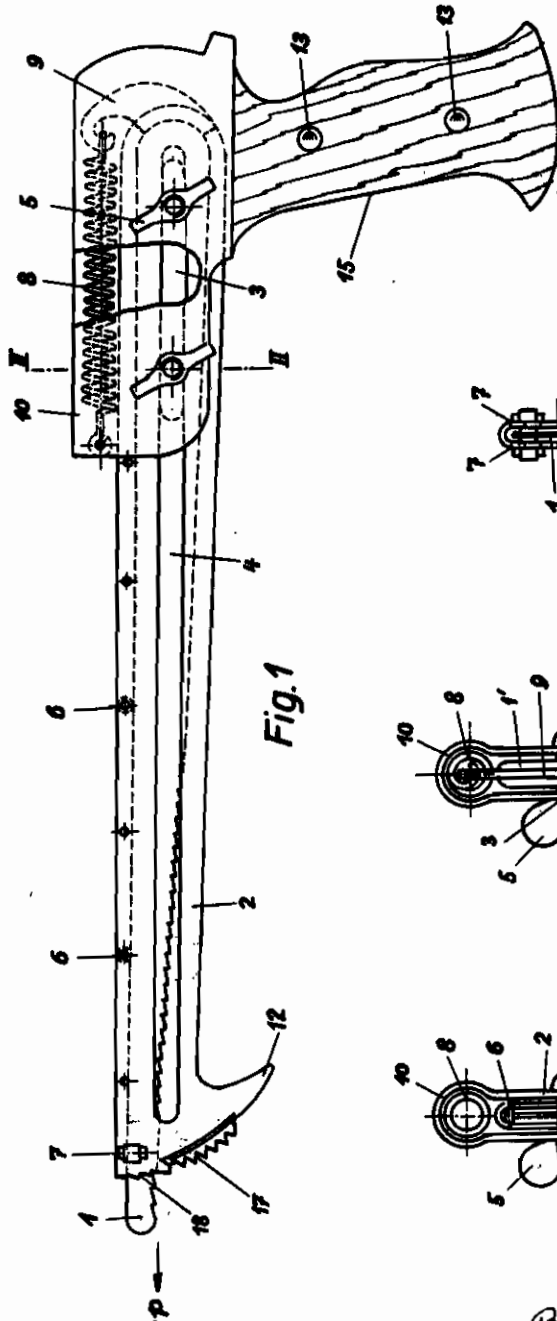


Fig. 1

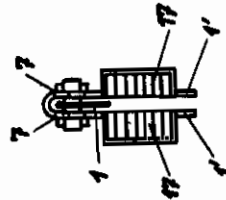


Fig. 4

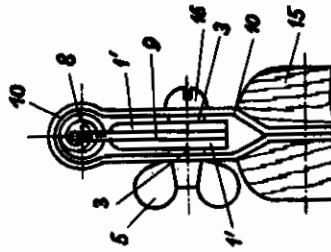


Fig. 3

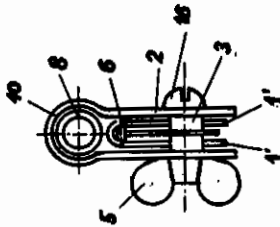


Fig. 2

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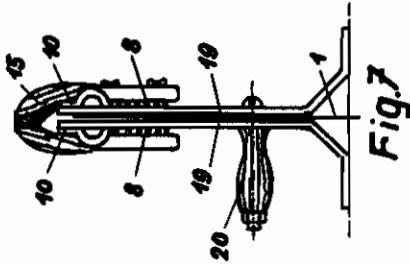


Fig. 7

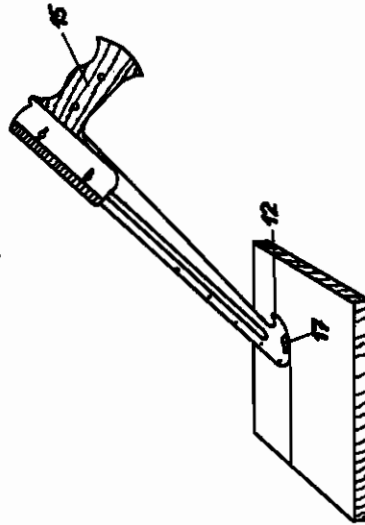


Fig. 9

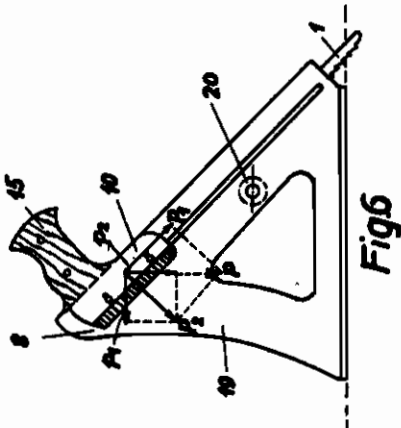


Fig. 6

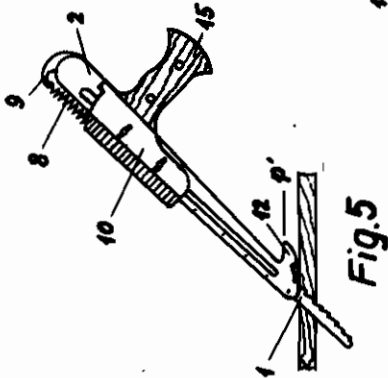


Fig. 5

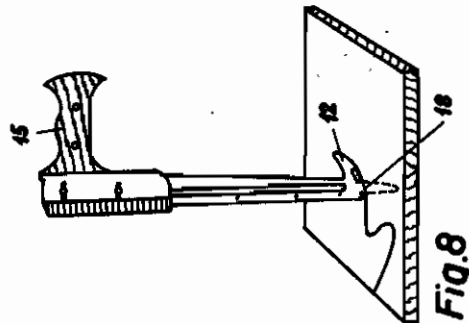


Fig. 8

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ALIEN PROPERTY CUSTODIAN

SAW WITH A FREELY PROJECTING SAW BLADE

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Application filed January 16, 1941

The object of the present invention is to provide a saw having a freely projecting saw blade and requiring, owing to its peculiar construction, less effort to operate than the hitherto known types. In addition, the invention solves the problem to prevent the saw blade from running out and from bending, so that injuries of the operator are rendered impossible, due to the fact that, in its position of rest, the saw blade as a whole is enclosed in a sheath-like casing, and that the part of the saw blade handled by the operator while sawing is covered by the casing.

The hitherto employed types of hand saws are not suitable for curving because, as a rule, the width of the saw blade rapidly increases in the direction from the projecting end towards the handle, and because the saw blade has to be rather thick to prevent it from bending. The known types of frame saws and band saws, owing to the fact that they have no projecting saw blade, are not suitable for sawing exclusively from one side of the work piece, for example for sawing off a boarding fence, or for sawing through a box, or for cutting out holes in a wall, etc.

The above mentioned disadvantages of the known types of saws are obviated by the invention by providing the saw with guiding means movable with respect to the saw blade.

The subject of the invention is illustrated by way of a number of constructional examples in the accompanying drawings, in which:

Fig. 1 is a side view of the saw;

Fig. 2 is a section on line II—II of Fig. 1;

Fig. 3 is a view of the device according to Fig. 1, seen from the right hand side;

Fig. 4 is a view of the device according to Fig. 1, seen from the left hand side;

Fig. 5 is a side view of the tool in the constructional form having the handle below during operation;

Fig. 6 is a side view of the tool in a constructional form having the handle above;

Fig. 7 is a front view of the tool according to Fig. 6;

Fig. 8 shows the tool in the position while curving;

Fig. 9 shows the tool in a position while sawing in a straight line.

In Fig. 1, the saw blade 1 is enclosed in a sheath-like casing 2. Guided in longitudinal slots 4 of the casing are two sliding pieces 3, which are rigidly connected by means of wing nut screws 5 with the shell 10 and thereby with the saw blade. In the casing 2 surrounding the saw blade there are provided pins 6 guiding the saw

blade along its back. Rolls 7 disposed in the casing 2 guide the saw blade in the casing near the place of cutting. Instead of the rolls 7 and the pins 6, there may be provided rollers or balls to prevent the teeth of the saw from jamming at the casing when curving, and to reduce or prevent sliding friction. A draw spring 8 is attached at one end to the rear part 9 of the casing 2, and at the other end to a shell 10 slipped over the casing, which shell has the handle 15 attached to it. Two rivets 13, 13 hold the two scales of the handle together.

From Fig. 2 will be seen that the two lateral sliding pieces 3 are rigidly connected with the saw blade 1 by means of bolts 16 of the wing nut screws 5 and with the shell 10.

In Fig. 3 will be seen the handle 15, the shell 10 surrounding the draw spring 8, the rear part 9 of the casing 2, and the side walls 1', 1' of the casing. The bolt 16 of the wing nut screw 5 passes through the saw blade 1 and the two sliding pieces 3 at the sides of the saw blade.

Fig. 4 shows the saw blade 1, which is guided between the two rolls 7, 7. At the front of the tool there are attached rubber coverings 17. Adjoining the latter is a roughened or toothed part of the front wall of that part of the casing 2 which rests on the work piece where it is cut (Fig. 1).

Fig. 5 shows the saw blade 1, the shell 10 with the handle 15 attached thereto, and the casing 2 which accommodates the saw blade. A pointer 12 is attached to the tool.

The action of the device is as follows:

In the position according to Figs. 5, 8, and 9, the tool is placed with the pointer on the marked cutting line of the work piece. When cutting, the handle is moved, for example with the right hand, from its upper position down towards the work piece. As the tool is held by the holding means 17 or 18 resting on the place of cutting, and as the edge of the saw forms a certain angle α with the moving direction (Fig. 1) of the saw blade, the saw blade, in being moved in longitudinal direction, penetrates with its teeth the work piece, the draw spring 8 being tensioned at the same time. At the end of the stroke, the saw returns to its initial position and at the same time the casing is pressed by means of the spring 8 against the place of cutting, the saw blade remaining continuously covered from outside. At the same time, the tool is moved with the hand along the marked cutting line in the direction of the arrow p' in Fig. 5, whereupon the next operating stroke is effected.

In the constructional form shown in Fig. 6, the tool is connected according to the invention with a bearing support 19 shiftable along the tool, the handle 15 being arranged at the top of the tool. The handle 20 serves to take hold of the tool, or as a support for the left hand while sawing, or to facilitate the guiding of the tool in curving, as the case may be.

When pressing down the handle 15 in the direction of the force P, the latter is resolved, as will be seen from the diagram of forces, into the two partial forces P_1 , P_2 . The partial force P_1 effects the parallel motion of the handle 15 with respect to the bearing support. The partial force P_2 acts perpendicularly to the bearing support. The partial force P_2 is resolved into the two partial forces p_1 and p_2 . The partial force p_2 is transferred by the bearing support to the work piece, whereas the partial force p_1 causes the saw blade to penetrate the work piece. During the operating stroke, the bearing support moves automatically along the cutting line marked on the work piece in the direction of the partial force p_1 . The bearing support may also be moved during the operating stroke over a space corresponding to the cutting depth (the feed).

From Fig. 7 will be seen that the bearing support 19 provides with its widely projecting legs a secure guide for the tool along the work piece. On both sides of the tool there are arranged draw springs 8.

Fig. 9 shows the saw effecting a straight cut at the start of the operating stroke. In this position, the tool is held at the place of cutting by means of the rubber covering 17. In Fig. 8, the tool is held by pressing the roughened or toothed part 18 of the tool against the work piece.

Since the device according to the invention permits to employ saw blades of any desired thinness, it is possible to effect curvings with very small radii, and the saw blade is prevented by the guiding means from running out. The saw blade can-

not be damaged, nor can the operator of the device be injured, since the saw blade remains in the casing during the operating stroke as well as in the position of rest.

The scope of the invention also comprises all saws of similar construction with a freely projecting saw blade driven by means of a motor arranged either on the tool itself or separately, or driven by means of a hand operated crank.

For example, it would be possible to arrange the driving motor for the saw on a bearing support attached to the work table. In this case, the saw or the tool would have the position with respect to the work piece shown in Fig. 8. To let the lower part of the freely projecting saw blade pass through, the work table would have to be provided with an opening. The motor-driven saw blade would then move upwards and downwards in longitudinal direction and would thus replace the usual band saws. In this case, the work piece would be fed by hand to the upwards and downwards moving saw blade along the work table according to the desired cutting direction.

The saw according to the invention also has considerable advantages of an economical nature as compared with the known types of frame, band, and felling saws. In the manufacture of the saw, permitting to employ exceedingly thin, narrow, and short saw blades, expensive material is saved and the costs of production are reduced. The saw, being constructed so as to take up little room, is easy to transport and will save labour and material owing to its comprehensive possibilities of use as compared with the known types of saws. Hitherto, different kinds of saws were required for the most of the occurring saw work, especially the frame saw for straight cutting, the curving saw, and the hand saw. All these operations can be effected by the saw according to the invention.

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