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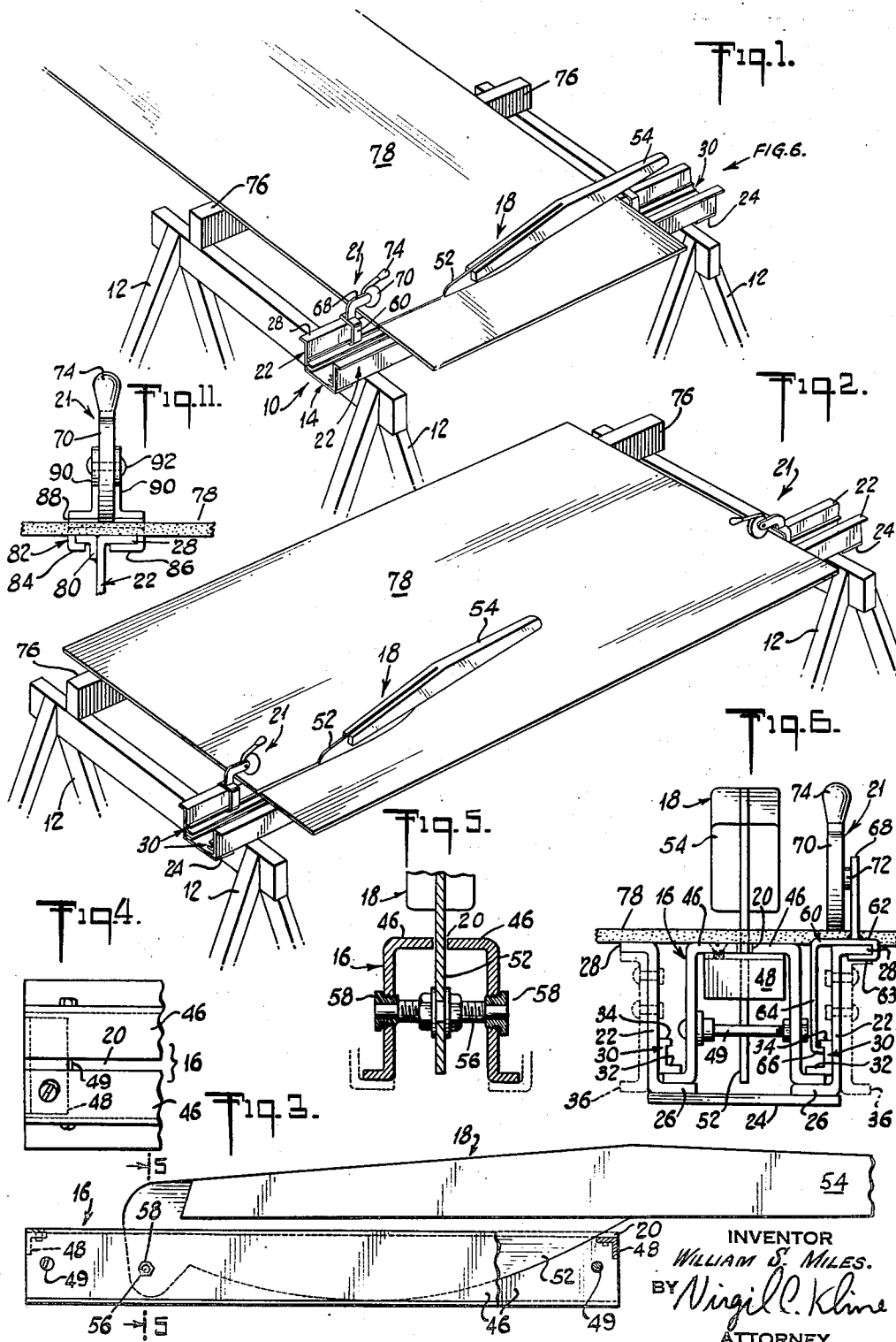
W. S. MILES

2,643,720

APPARATUS FOR CUTTING SHEET MATERIAL

Filed May 27, 1948

2 Sheets-Sheet 1



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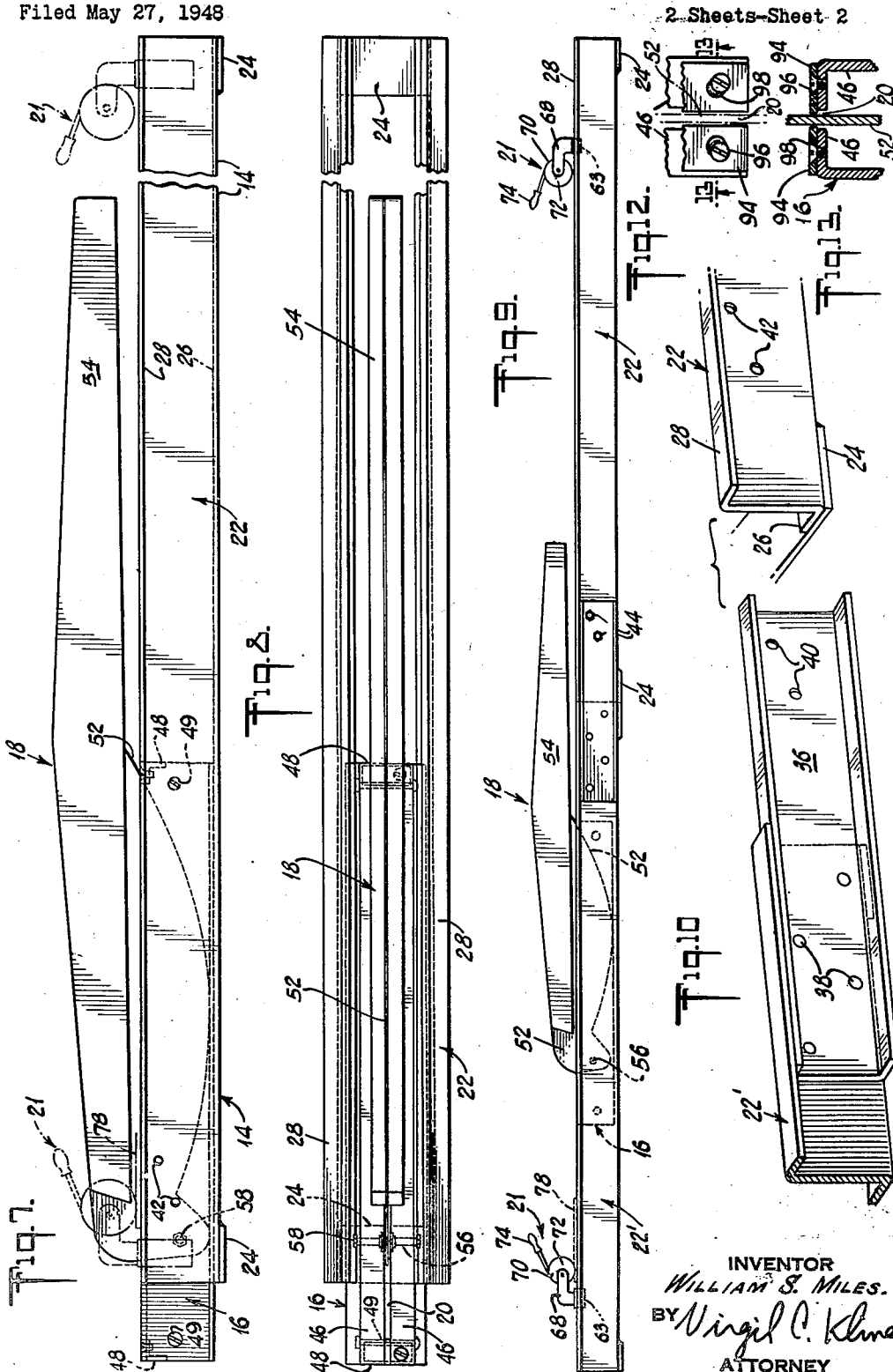
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UNITED STATES PATENT OFFICE

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APPARATUS FOR CUTTING SHEET MATERIAL

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4 Claims. (Cl. 164-73)

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The instant invention relates to portable machines for cutting sheet materials and more particularly to an easily manipulatable, lightweight apparatus having special utility for severing sheets of hard, frangible materials of the types of compressed and densified asbestos cement, and the like, but applicable to other materials.

The principal object of the invention is the provision of portable apparatus of the above type of relatively simple and inexpensive construction which can be readily transported from place to place and set up on the job, and which will insure accurate and clean cuts on materials of the kinds referred to. The device is hand operated and can be set up and used by the ordinary mechanic with a minimum of instruction.

Another object of the invention is the provision of an apparatus of this type which may be disassembled for easy transportation.

Briefly stated, the invention resides in an apparatus including a sectional base adapted to be supported on horses or other suitable means and to underlie the material to be cut. The base defines a track for a carriage which supports a swingable cutting blade whereby a continuous cut through a sheet of substantial length can be made by a series of swinging movements of the cutter blade with progressive movement of the carriage along the track. The base is of sectional construction as stated above, the individual sections being of a length for easy handling and transportation. The sections are also adapted to be readily joined to form a base of the length required to accommodate the particular sheet to be cut. The base carries adjustable clamping means to secure the sheet against movement during the cutting operation.

My invention will be more fully understood and further objects and advantages thereof will become apparent when reference is made to the more detailed description of a preferred embodiment of the invention which is to follow, and to the accompanying drawings in which:

Fig. 1 is a perspective view illustrating the construction and operation of the device when used in making a relatively short cut;

Fig. 2 is a perspective view illustrating the construction and operation of the device in making a relatively long cut;

Fig. 3 is an elevational view, with parts broken away for clearness of illustration, of the carriage and cutter device employed in the instant invention;

Fig. 4 is a top plan view of an end portion of the device of Fig. 3;

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Fig. 5 is a sectional view, on an enlarged scale, taken on the line 5-5 of Fig. 3;

Fig. 6 is an end elevational view, on an enlarged scale, of the apparatus illustrated in operation in Figs. 1 or 2;

Fig. 7 is a side elevational view of the apparatus with a base of one section length;

Fig. 8 is a top plan view of the apparatus of Fig. 7;

Fig. 9 is a view similar to Fig. 7 but illustrating a base composed of two sections;

Fig. 10 is a detail view, on an enlarged scale, illustrating the manner of connecting the sections of the base;

Fig. 11 is a detail end view illustrating a modification of the clamping device;

Fig. 12 is a top plan view similar to Fig. 4 illustrating a modification; and,

Fig. 13 is a sectional view taken on the line 13-13 of Fig. 12.

Referring now to the drawings, the invention is embodied in a lightweight, portable apparatus or jig adapted to be supported from the ground or floor on horses 12, for example. The device consists essentially of a base 14 which may be of single section length (see Fig. 1) or multiple section length (see Fig. 2), a cutting device comprising a carriage 16 mounted for traveling movement on the base and including a swingable or rockable cutter 18 operating in a slot 20 of the carriage, and sheet clamping devices 21.

The specific construction of the base sections may vary but each preferably is made of metal parts including side elements 22 supported in spaced relationship by straps 24 adjacent the ends of the elements. Elements 22 include lower flanges 26 resting on straps 24 and secured thereto suitably by welding or the like. Elements 22 also include upper, outwardly directed flanges 28 for a purpose later to be described. Above the flanges 26 and secured to the side elements by welding or the like, are channels 30 having lower flanges 32 defining tracks or guides with flanges 26. In the embodiment illustrated in Fig. 6 channels 30 carry a second leg or flange 34 somewhat shorter than leg 32 and for a purpose later to be described.

The base sections are made in suitable lengths which will permit them to be readily transported and handled. For example, where the apparatus of the instant invention is to be employed with sheets of conventional size; i. e., 4' x 8' sheets, the length of the section is preferably between 4½' and 5'. Where the apparatus is to be used for making only transverse cuts, as illustrated in Fig. 1, only a single section of the base is

necessary. On the other hand, where the cuts are to be made lengthwise of the sheet, a base of multiple section length is used. Inasmuch as in the ordinary case two sections of the base are all that are required, in the preferred embodiment one section (see particularly Figs. 9 and 10) has fish plates 36 permanently attached to both side elements as by rivets, bolts or the like 38, the fish plates extending beyond one end of the section. The extending ends of the fish plates include preformed bolt holes 40 positioned to correspond with preformed bolt holes 42 in the end of an adjacent section when the latter is brought into contiguous relationship to the first-mentioned section. It will be appreciated that with this construction bolts 44 may be readily inserted in the aligned holes and nuts threaded thereon to connect the sections rigidly together.

Referring now particularly to Figs. 3, 4, 5 and 6, the cutting device includes a carriage 16 and a movable cutter member, as previously mentioned. Carriage 16 in its preferred embodiment includes opposed metal members 46 of Z cross-section, the members being secured adjacent their ends by angles 48 and spacer bolts 49 (see Figs. 4 and 6). Angles 48 may be secured to one of the members by welding or the like and to the other by a screw or the like in a manner to permit adjustment if desired. The upper flanges of the Z members are spaced apart to define the slot 20 which is of a width slightly greater than the thickness of the blade of cutter 18. The upturned flanges at the lower ends of the Z members are adapted to ride within the tracks defined by flanges 26 and 32.

Figs. 12 and 13 illustrate a modification of one part of the carriage. In this instance members 46 are spaced a substantial distance apart and slot 20 defined by blades or strips 94 adjustably secured to the upper flanges of members 46 by screws 96 threaded into the flanges with their heads lying in elongated slots 98. This construction permits ready adjustment of the width of slot 20 and also allows special steels to be used for the strips 94, if desired.

Rockably or swingably mounted on carriage 16 is the cutter 18 consisting of a shearing blade 52 made of a hard cutting steel and an elongated operating handle 54 which may be made of wood, metal, or the like, as desired. The handle extends rearwardly from the blade for a sufficient distance to provide adequate leverage for the cutting operation. The cutter member is pivotally secured to carriage 16 to provide for the rocking or swinging movement within slot 50. The pivotal connection may, as shown particularly in Fig. 5, comprise pivot pin or pintle 56 carried by the blade and having ends rotatable in bushings 58 threaded into members 46. The pivot pin is adjacent an end of carriage 16 and the blade is so proportioned relatively to the length of the carriage that all, or substantially all of the cutting edge of the blade may enter slot 50 in the downward movement of the blade.

Clamping devices 21, previously mentioned, are adapted for sliding movement on the flanges 28 of the base whereby they may be moved into position to exert a clamping action adjacent the margins of the sheets, irrespective of the particular dimensions of the sheet. For this purpose they include an arm 62 (see Fig. 6) having a hook 63 for engagement over the edge of flange 28 of a side element 22 and a downwardly extending leg 64 having a toe or flange 66

for engagement under flange 34 of channel 30. Flanges 34 and 66 are relatively narrow in order that leg 64 can clear the ends of pivot pin 56 and spacer bolts 49 when the carriage is moved past the clamp. Extending upwardly and then forwardly from arm 62 (see particularly Figs. 1, 2 and 6) is a pedestal 68 on which a disc or cam 70 is eccentrically mounted by pivot pin 72. The disc or cam carries an operating handle 74. It will be readily observed that in one position of the disc on its eccentric mounting it will be elevated out of contact with the sheet but may be rotated to engage the sheet to press it firmly against the base.

Referring to Fig. 11, modifications of the clamping device and associated parts will be described. In this case angles 80 are secured by welding or the like to the inner faces of elements 22 to define flanges for engagement by hook 84 forming a part of a C-shaped member 82 having an opposite hook 86 engaged under flange 28. The C-shaped member supports the pedestal carrying the eccentrically mounted clamping disc. With this construction the flanges 34 of channels 30 may be omitted if desired. A modified construction of the pedestal is also illustrated by Fig. 11. Instead of a single member, opposed members 90 are employed of similar shape to the single member 68. The forwardly extending portions of the members support the disc 70 on eccentrically mounted pivot pin 92.

In preparation for the operation of the apparatus described above, base 14 consisting of but one section (see Fig. 1) or of two sections bolted together as previously described (see Fig. 2), depending upon the use to which the apparatus is to be put, is supported on horses 12 or the like. Preferably a member 76 such as a two by four, is also laid on the horses at a distance from the base 14. A sheet 78 is then laid to span the base and member 76 with the line of cut overlying the centerline of the base. Clamps 60 are then mounted on the base adjacent each end thereof by sliding them endwise onto side elements 22. For purposes of economy in manufacture, the clamps used at the opposite ends of the base are preferably identical in form. Inasmuch as they must be oppositely directed, the clamp at one end of the base is mounted on one of the side elements and the clamp at the opposite end is mounted on the other, when the construction shown in Figs. 1, 2 and 6 is employed. If the construction of Fig. 11 is used, both clamps may be mounted on the same side element if desired. The clamps are moved forwardly until their discs or cams overlie the margins of the sheet and the cams are then rotated to bind the sheet against flanges 28. Although two clamps are preferably employed, as shown in Fig. 2, only one may be required, particularly where the sheet is relatively narrow, as illustrated in Fig. 1. Carriage 16, with its cutter 18 in raised position is then inserted endwise onto the base with its lower flanges riding in the track, until the edge of the cutter blade 48 is in contact with the sheet. Handle 54 is then swung upwardly and downwardly with a chopping movement and at the same time the carriage is drawn forwardly to perform successive shearing operations, as illustrated diagrammatically in Figs. 1 and 2, until the cut is completed.

The apparatus described above is simple and economical, both in construction and operation. All the parts are of relatively lightweight construction and the apparatus may be readily dis-

assembled into parts of a size that may be easily moved from place to place on the job and may be transported from job to job. Cuts may be made accurately at any desired location in both large and small sheets and for any distance on the sheet.

Having thus described my invention in rather full detail, it will be understood that these details need not be strictly adhered to but that various changes and modifications may suggest themselves to one skilled in the art, all falling within the scope of the invention as defined by the subjoined claims.

What I claim is:

1. An apparatus for cutting hard frangible sheet material comprising, a base including opposed members defining a generally channel-shaped track, said track having laterally directed flanges providing flat substantially co-planar upper surfaces for supporting the sheet material, a carriage including opposed, laterally directed flange strips providing flat substantially co-planar upper surfaces and the opposed edges of which define a slot, said carriage having additional laterally directed flanges engaging the track and supporting the carriage for traveling movement on said track with the upper surfaces of said carriage flange strips substantially co-planar with the upper surfaces of the track flanges, a cutting blade, and means supporting said cutting blade from said carriage for swinging movement in said slot and shearing cooperation with said opposed carriage flange strips.

2. The construction defined in claim 1, in which means are provided on said carriage for the lateral adjustment of said flange strips and hence the width of said slot.

3. An apparatus for cutting sheet material comprising, a base including opposed members defining a generally channel-shaped track, a carriage mounted for traveling movement on said track, said carriage including laterally directed flanges and having opposed sections defining a slot, a cutter blade, means supporting said cutter blade from said carriage for swinging movement in said slot, said track having a first, laterally directed flange providing a flat surface for supporting the sheet material, a clamping member, means including flanges and hooks longitudinally slidably adjustably mounting said clamping member on said first track flange with the clamping member in spaced relation thereto for clamping engagement with the sheet material, said track including a second flange engaging a flange and

hook of the means mounting the clamping member on said first track flange to hold the clamping member against lateral displacement in adjusted position, said track including additional laterally directed flanges engaging the flanges on the carriage to guide the carriage in its movement.

4. An apparatus for cutting hard frangible sheet material comprising, a base including opposed members defining a generally channel-shaped track, said track having a laterally directed upper flange providing a flat upper surface for supporting the sheet material, a carriage including opposed laterally directed upper flange strips providing flat substantially co-planar upper surfaces and the opposed edges of which define a slot, a cutter blade, means supporting said cutter blade from said carriage for swinging movement in said slot and shearing cooperation with said upper carriage flange strips, said track including laterally directed lower flanges, said carriage having laterally directed lower flanges engaging said lower track flanges to support and guide the carriage for traveling movement along the track with the upper surfaces of said upper flange strips of the carriage substantially co-planar with the upper surface of said upper flange of the track, a clamping member, means including flanges and hooks longitudinally slidably adjustably mounting said clamping member on said upper flange of the track with the clamping member in spaced relation thereto for clamping engagement with the sheet material, said track including an additional flange engaging a flange and hook of the means mounting the clamping member on said upper track flange to hold the clamping member against lateral displacement in adjusted position.

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