

Oct. 20, 1953

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2,655,821

JIG

Filed Oct. 29, 1951

3 Sheets-Sheet 1

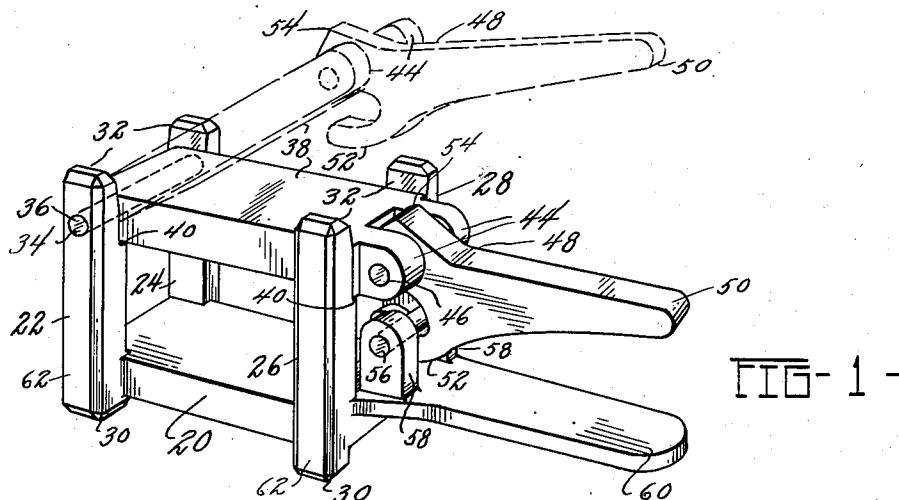


FIG-1-

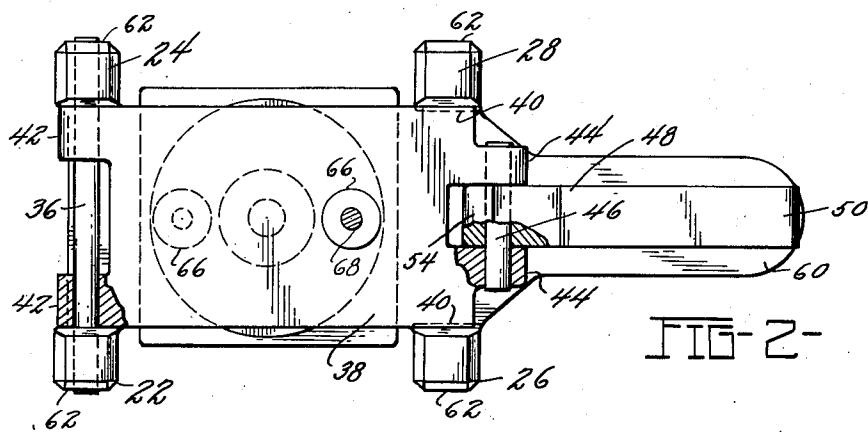


FIG-2-

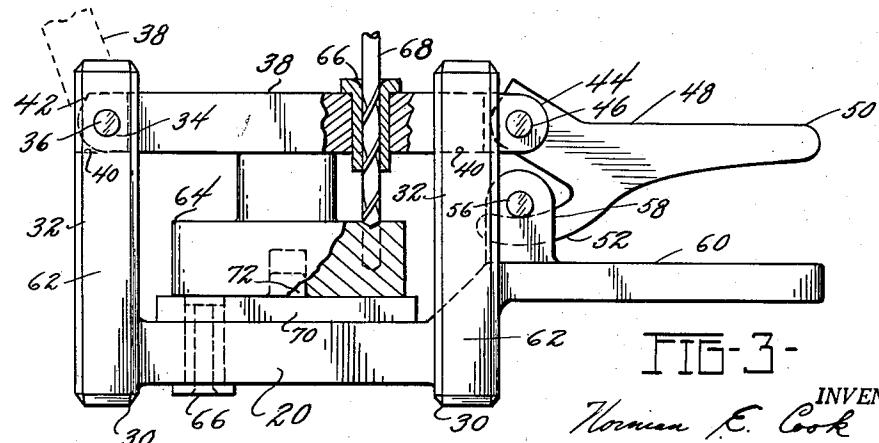


FIG-3-

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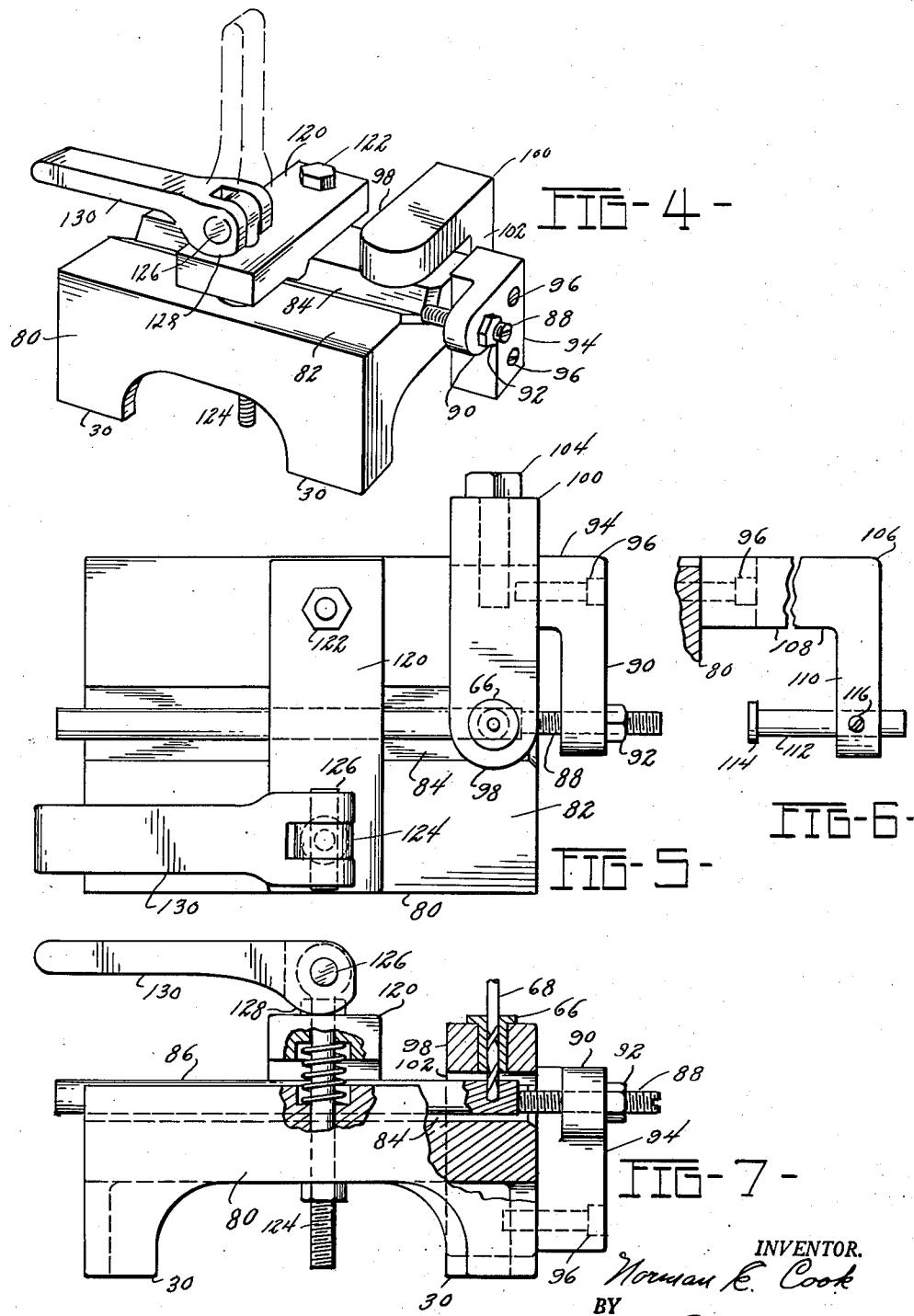
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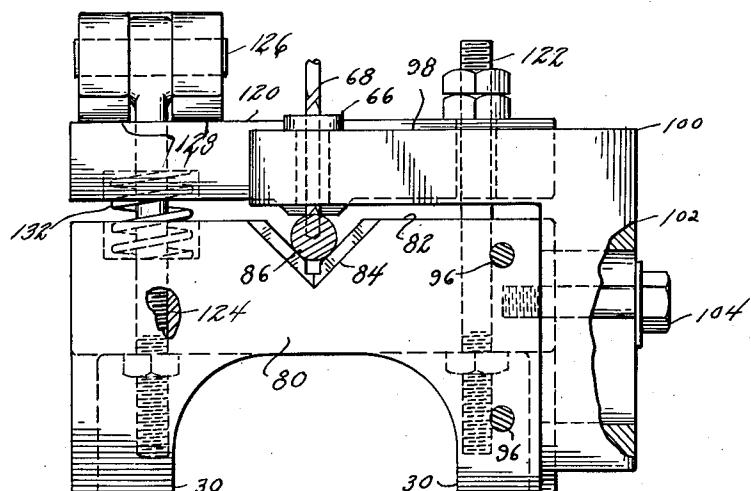


FIG-8-

FIG-10-

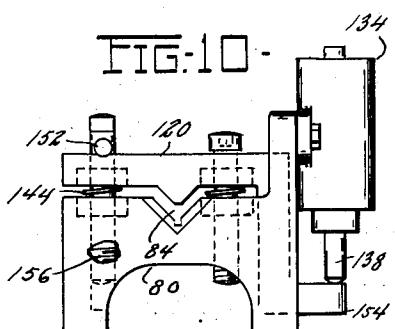


FIG-11-

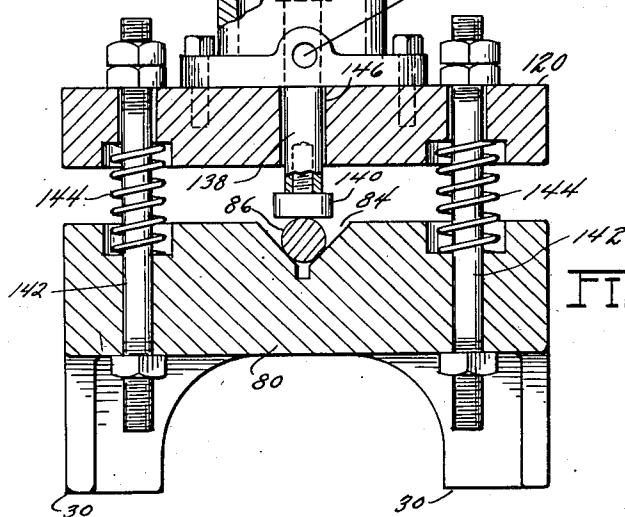


FIG-9-

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## UNITED STATES PATENT OFFICE

2,655,821

## JIG

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2 Claims. (Cl. 77—62)

**1**

This invention relates to jigs.

An object of this invention is to provide a basic jig which may be readily adapted to meet the requirements of a specific operation.

Another object of this invention is to provide a basic jig adapted to receive fittings which in turn provide a finished jig for a specific tool operation.

Another object of this invention is to provide a foundation jig, including a simple and positive quick locking device, which may readily be converted into a production jig for one or more specific operations upon work mounted therein.

Another object of this invention is to provide a jig adapted to cooperate with a wide range of tools and readily mounted to cooperate with said tools in the performance of a predetermined specific operation.

Another object of this invention is to provide a structure embodying the base elements of a jig which elements may be readily transformed and converted or have attachments secured thereto to produce a finished jig for some specific operation.

And another object of this invention is the elimination of delays in tooling and production by the use of the basic jig construction herein disclosed wherein a jig of the disclosure may be adapted on the job to a specific operation by the use of regular tools and the addition of simple parts thereto.

Other objects and advantages of this invention relating to the arrangement, operation and function of the related elements of the structure, to various details of construction, to combinations of parts and to economies of manufacture, will be apparent to those skilled in the art upon consideration of the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Referring to the drawings:

Fig. 1 is a perspective view of one form of the basic jig;

Fig. 2 is a plan view of the jig of Fig. 1, with a set of accessories added to adapt the jig to a specific operation;

Fig. 3 is a side elevation of the jig of Fig. 1, parts being broken away, to show a typical treatment of the jig to meet a predetermined requirement;

Fig. 4 is a perspective view of a modified form of the basic jig;

Fig. 5 is a plan view of the jig of Fig. 4;

Fig. 6 is a plan view of a work positioning element adapted for use with the jig of Fig. 4;

Fig. 7 is a side elevation, parts being broken away, of the jig of Fig. 4;

Fig. 8 is an end elevation of the jig of Fig. 4, parts being broken away;

**2**

Fig. 9 is a section vertically through a jig of the general type shown in Fig. 4, including a power operated clamp for the work mounted therein;

5 Fig. 10 is an end view of a modified form of the power clamping feature for the jigs; and

Fig. 11 is a plan view of the adjustment for the fulcrum of the power operated clamp element illustrated in Fig. 10.

A simple adaptation of the invention is illustrated in Figs. 1, 2 and 3, wherein the main frame element provides base plate or bed 20, herein shown as rectangular in form and having integral corner posts 22, 24, 26 and 28 extending from the faces of the bed-plate in opposite directions. These corner members provide legs 30 extending from one side of the plate and posts 32 extending in the opposite direction.

The extensions 32 of the parts 22, 24, have aligned openings 34 therethrough providing bearings for mounting hinge pin 36 spaced from and parallel to the plate 20.

The hinge pin 36 swingably mounts the cover or clamp plate 38 between the supports 22 and 24 to provide a gate for the region between the supports 26 and 28. The plate 38 is swingable into spaced parallel position with the bed plate 20 as limited by stops 40 on the inner sides of the four supporting posts. The rear edge of the plate 38 may be bifurcated with the rear edges vertically contoured to engage the stops 40 when the plate 38 is swung to its open position and limits this rearward movement as shown in Fig. 3. The forward edge of the plate 38 is provided with a pair of lugs 44 mounting pin 46 as a hinge pin for a combined lock and grip element 48 including the grip extension 50 and a depending cam or hook portion 52. The inner edge of this element 54 is also contoured to limit its upward swing relatively to the plate 38.

When the plate 38 is thrown forward from its open position, the handle 50 is centrifugally thrown to cause the cam 52 to firmly engage the pin 56 mounted by lugs 58 from a second grip portion 60 outwardly extending from the plate 20. This provides a fast action locking mechanism operable by a minimum effort upon the part of an operator and the combined grips 50 and 60 provide a handle for ready maneuvering of this box-like jig as formed by the plates 20, 38 and the connecting posts 22, 24, 26 and 28, which jig may be set into position adjacent a tool, either supported by the feet 30 or the posts 32 on their termini or on flattened sides 62 of the posts.

A piece of work 64 may be clamped between the plates 20 and 38 and locked therebetween by the action of the hook 52 engaging the pin 56. One of the elements serves as a work support and the other element being movable relatively thereto serves as the clamping member.

Either element, the plates 20 and 38, or both, may be fitted with various type accessories such as bushings to act as locators for tools 68 in the nature of drills, reamers, broaches and the like.

If the work piece 64 is of such dimensions, a replaceable riser plate 70 may be attached to a plate together with a centering pin 72, if needed or desirable, or other locators may be added. At once, a work operation on the piece 64 is completed, the grip 50 may be grasped and the cover or gate clamp 38 released by a single movement of the grip to release the work. The jig may be turned to position a guide 66 for an additional operation. The placement of the accessories 66, 70 and 72 may be predetermined according to the work to be performed and the basic jig is fitted accordingly. The box-like construction affords ample chip control and sufficient mass to firmly hold the work.

The rapid clamping and release features may readily be incorporated into a form of the basic jig particularly adapted to handle cylindrical stock to be fabricated. As an example, the bed plate may be in the form of a block 80 having the legs 80 integral therewith. The block 80 is provided with planar face 82 longitudinally intersected by a seat such as a V-groove for mounting cylindrical stock 96 to rest therein while receiving a tool operation. Longitudinal positioning is determined by a set screw stop 88 adjustable in arm 98 and locked therein by nut 92. The arm 98 is an extension from a minor block 94 adjustably attached to one end of the base 80 by screw means 96.

A locator or guide bushing 66 for a tool 68, may be selectively mounted in arm 98 overhanging the groove 84, which arm is one leg of an L-shaped fitting 100, the other leg mounted in a vertically adjustable manner by bolt means 104 to one side of the block 80.

In the event the piece 86 is to be positioned on the block 80 with a relatively long overhang, or in other words, the work operation is to be performed a considerable distance from the terminus of the piece 86, a fitting 106 may replace the minor block 94, which fitting has a relatively long extension 108 from the block 80 and carries arm 110 mounting rod 112 slidably adjustable therein to provide a stop 114, locked in position by set screw 116.

The means for clamping the work 86 in the groove 84 against the gage 88 or 114 includes a bridge strap 120 across the groove 84 with one end of this element engaged by bolt 122 to be vertically adjustable toward and from the face 82 of the block 80 intermediate its length. The opposite end of the strap 120 engages a bolt 124 which is also vertically adjustable in the body 80, the upper terminus of this latter bolt mounting pin 126 as a fulcrum for cams 128 which are parts of a handle element 130. These cams 128 operate against the upper face of the strap 120 as controlled by the handle 130 to provide a manual cam locking device, whereby the strap can be clamped against the work 86 or released therefrom.

A spring 132 may be disposed between the strap 120 and block 80 to automatically raise the clamp from the work when the cam lock is opened.

The jigs herein can be readily adapted to have the clamping element power controlled as by a fluid operated piston and cylinder device. The strap or clamp 120 may directly mount a cylinder 134 with piston 136 therein movable to

reciprocate piston rod 138 carrying a terminal work engaging head 140. The strap 120 can be positioned relatively to the block 80 by guide bolts 142 having springs 144 thereabout between the clamp element and the block. The clamp 120 is provided with aperture 146 through which the piston rod 138 may extend to mount the head piece 140. The piston 136 is controlled by fluid pressure flowing through lines 148 to the opposite ends of the cylinder 134 as determined by valve 150 suitably located adjacent an operator's station.

The strap 120 may have one end thereof bear against fulcrum 152 with the piston rod 138 operating directly against extension 154 from the remote end of the strap. The fulcrum 152 is vertically adjustable by rotation of its mounting bolt 156 threaded into the block 80.

It is obvious, the basic jig, with its work support and cooperating clamp is susceptible to wide variations to accommodate various types of work and the accessory additions readily added to adapt the jigs to some specific operation.

It is to be understood that the above detailed description of the present invention is intended to disclose an embodiment thereof to those skilled in the art, but that the invention is not to be construed as limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of being practiced and carried out in various ways without departing from the spirit of the invention. The language used in the specification relating to the operation and function of the elements of the invention is employed for purposes of description and not of limitation, and it is not intended to limit the scope of the following claims beyond the requirements of the prior art.

What is claimed and desired to secure by United States Letters Patent is:

1. In a basic jig adapted to be fitted with selected locators, a base plate, corner posts attached to the edge surfaces of the plate and extending above and below the plate, a clamping element pivotally mounted between a pair of the posts below the upper ends thereof and movable into and from a position overlying the base plate and swingable between the corner posts, stop means on the other pair of corner posts for limiting the swinging movement of the clamping element relative to the base plate and means carried by the base plate and clamping element for releasably locking the clamping element in such arrested position.

2. The structure set forth in claim 1 wherein the releasable locking means between the base plate and the clamping element comprises a pin fixedly mounted on one of such elements and a cam swingably mounted on the other element, said cam comprising a hook adaptable to engage said pin and frictionally retain its contact therewith.

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