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POSITIONING AND HOLDING DEVICE

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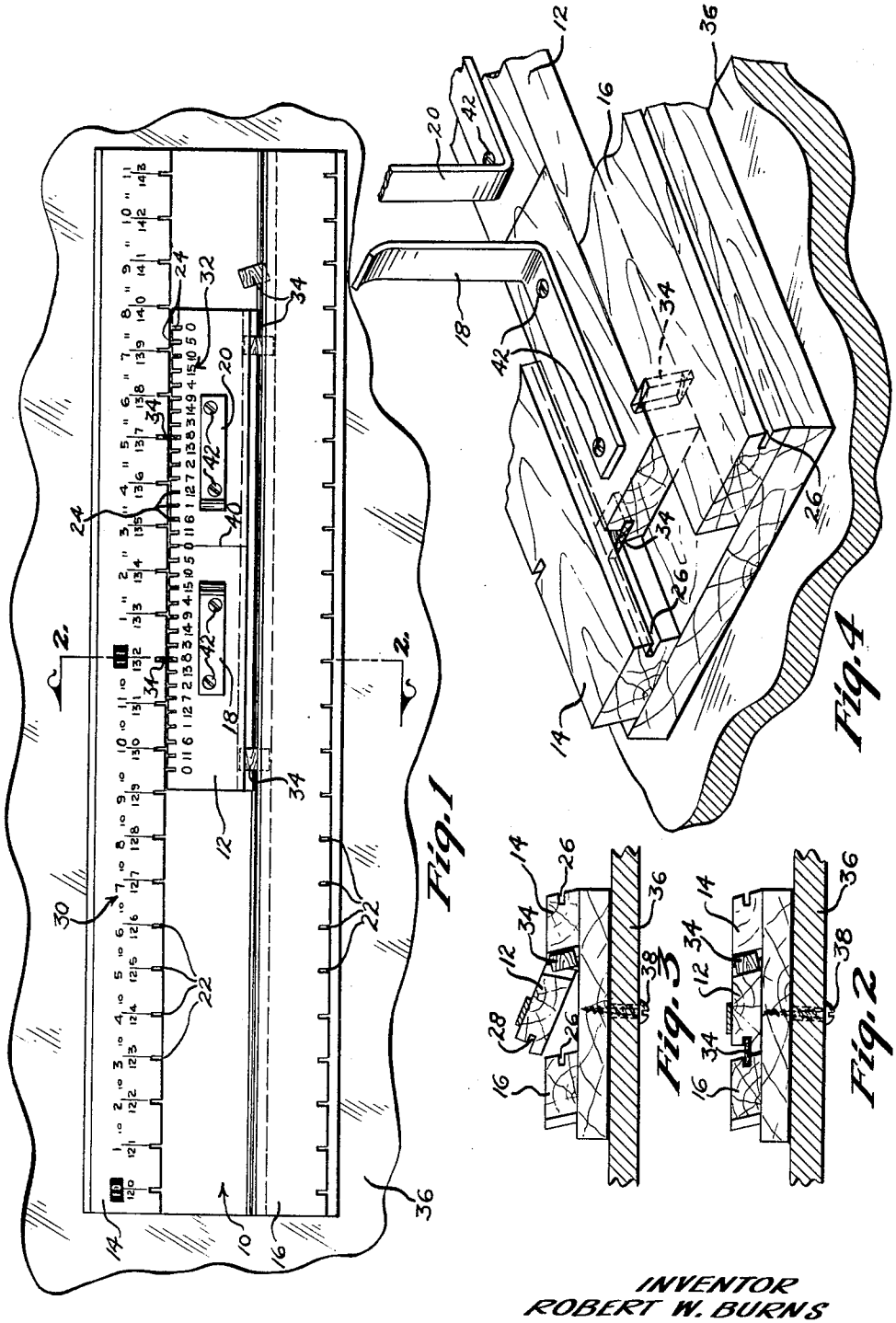


Fig. 1

Fig. 4

Fig. 3

Fig. 2

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POSITIONING AND HOLDING DEVICE

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6 Claims. (Cl. 269—74)

This invention relates to positioning devices and, more particularly, to adjustable positioning and holding devices especially suitable for construction applications.

Many structures and articles of manufacture are assembled by a predetermined arrangement of the component parts thereof with respect to one another. It is often advantageous to construct holding or positioning devices, such as templates or jigs, for arranging the parts in their predetermined positions to insure proper relative positioning with a minimum of time and effort. In the construction of frame buildings, for example, such templates or jigs are often used to prefabricate various parts such as wall panels, window and door frames, partitions, etc. In some construction jigs the holding or positioning portions are adjustable to allow adaptation of the jig to several applications. However, the adjustment of the jig from one position to another is often difficult, awkward and time consuming.

It is therefore a principal object of the present invention to provide a novel holding and positioning device which is easily and quickly adjustable among a wide variety of positions.

It is a further object to provide an adjustable construction jig having improved means for releasably locking the movable portions thereof in a fixed position.

Another object is to provide a construction jig having an adjustable portion bearing indicia movable with respect to a set of fixed indicia in such a manner as to allow rapid and exact relative positioning of a number of parts or objects held by said jig.

Still another object is to provide an adjustable holding and positioning means which is simple and economical in manufacture and durable in use.

Other objects will in part be obvious and in part appear hereinafter.

The invention accordingly comprises the apparatus having the construction, arrangement and relationship of parts described in the following detailed disclosure and the scope of the application of which will be indicated in the claims. For a fuller understanding of the nature and objects of the invention, reference should be had to the accompanying drawing, wherein:

FIG. 1 is a top plan view of a preferred embodiment of the invention,

FIGS. 2 and 3 are end views in vertical section on the line 2—2 of FIG. 1 and show the adjustable portion of the apparatus in different positions, and

FIG. 4 is an enlarged, fragmentary, perspective view of a portion of the apparatus of FIG. 1.

The apparatus comprises basically a stationary portion 10 and a movable portion 12 adapted to be slidably mounted between members 14 and 16 of stationary member 10. Movable portion 12 has mounted thereon upstanding brackets 18 and 20. A series of vertical notches 22 are cut at predetermined intervals in members 14 and 16, and a like series of notches 24 are cut in movable portion 12. Also, horizontal notches 26 are cut in members 14 and 16, and a horizontal notch 28 in movable portion 12. A first set of indicia 30 appears on member 14, and a second set of indicia 32 on movable portion 12. Locking elements 34 are adapted to be releasably inserted in notches 22 and 24 to prevent lateral sliding movement of movable portion 12 with respect to stationary portion 10, and in notches 26 and 28, as seen in FIG. 2, to prevent upward movement of movable portion 12 with respect to stationary portion 10. Preferably, stationary portion 10 is affixed to a supporting surface such as a work table, a portion of which is shown at 36, by any appropriate means such as screws 38. A scribe line 40 bisects the distance between brackets 18 and 20.

The manner of operation of the device is as follows: an object or part which is to be positioned is placed between brackets 18 and 20. If all objects to be positioned by the device are of substantially the same dimensions, the position of brackets 18 and 20 may be fixed with relation to movable portion 12 as by mounting with screws 42. If objects of different dimensions are to be positioned, the position of brackets 18 and 20 may be made adjustable with respect to movable portion 12, in which case it is desirable that scribe line 40 remain centered between the brackets as they are adjusted. A second movable portion (not shown), similar in all respects to movable portion 12, may be mounted between members 14 and 16, and a second object to be positioned placed between the brackets thereof. In fact, stationary portion 10 may be made long enough to accommodate any desired number of movable portions. When a movable portion has been inserted between members 14 and 16 it may be prevented from being removed from stationary portion 10 by insertion of a locking element 34 in notch 26 of member 14 and notch 28 of movable portion 12, and by the oppositely sloping sides of members 16 and movable portion 12, as seen in FIG. 2. When the locking element has been removed from notches 26 and 28, movable portion 12 may be removed from between members 14 and 16 as seen in FIG. 3. The movable portions are laterally positioned with respect to stationary portion 10 by aligning one or more of notches 24 with corresponding notches 22. The lateral position is then fixed by inserting locking elements 34 in the aligned notches 22 and 24. Locking elements 34 are preferably so dimensioned that they do not protrude above the upper surfaces of member 14 and movable portion 12 when inserted therebetween, as seen in FIG. 2. Also, the material of which locking elements 34 is made is preferably somewhat resilient so that if lateral force is exerted on movable portion 12 while the locking elements are in place, the sides of notches 22 and 24 will not be damaged or deformed. For example, locking elements 34 may be made of wood and so dimensioned that when inserted in notches 22 and 24 lateral force exerted on movable portion 12 will be against the grain of the wood, thus making it more difficult to shear the locking elements than if the force were exerted across the grain while still providing a measure of resiliency.

Notches 22 are cut at predetermined distances from one another, as are notches 24, and there is also preferably a predetermined ratio between the two sets of notches. For example, in the illustrated embodiment notches 22 are cut at one inch intervals in members 14 and 16. Notches 24 are cut at five-sixteenth (5/16) inch intervals in movable portion 12 for a distance of ten inches; then sixten (16) notches 24 are cut in each five inches. If scribe line 40 is aligned with one of the notches 22, then notches 24 five inches on either side of scribed line 40 will also be aligned with a notch 22 since notches 22 are cut at one inch intervals. If it is desired to align scribe mark 40 five-sixteenth (5/16) inches to one side of one of the notches 22, then the notches 24 marked "5" on indicia 32 are aligned with notches 22. If it is desired to align scribe mark 40 one-half (1/2) inch to one side of one of the notches 22, then the notches 24 marked "8" (corresponding to 8/16" or 1/2") on indicia 32 are aligned with notches 22, and so on. Thus, scribe line 40 may be aligned to the nearest one-sixteenth (1/16) inch with respect to any of the notches 22 on indicia 30. If two movable portions 12 are used the scribe lines thereon may be accurately spaced

at any desired distance from one another, and the two portions locked in place with locking elements 34, to the nearest one-sixteenth (1/16) inch. Since brackets 18 and 20 are at equal distances from scribe line 40, an object placed between the brackets will have its center over scribe line 40. Again, if two movable portions as used, the distance between the scribe lines will define the center-to-center distance between two objects held between the brackets of each movable portion. If relatively long objects, such as boards, are to be positioned at both ends thereof an additional device, similar in all respects to the one illustrated if desired, may be employed at the opposite end of table 36. In fact, any number of stationary portions 10, each having several movable portions 12 mounted thereon may be employed, depending on the number and size of pieces which are to be positioned relative to one another.

In most situations wherein an assembled rectangular frame is required, at least one base unit with at least two longitudinally spaced slide units 12 will be mounted at each end of a table or like 36. After the four slide units 12 have been properly positioned and locked by the keys 34 in notches 22 and 24 and in horizontal notch grooves 26 and 28, there will result two pairs of longitudinally aligned brackets on each side of the table 36. If the frame is to be made of wood, the two side members to make up the frame are laid in parallel relationship in the two in line bracket means, respectively. The required distance between the centers of the two side frame members has previously been determined and this distance requirement has been determined by reading the scales and positioning the members 12 accordingly. With the two side members of the frame or like being properly positioned and held, it is a simple matter to attach the two end members to the respective ends of the two side frame members. Once the jig has been set, any number of like frames may be produced without any change of the parts of the jig. When complicated frames, panels, or like are to be produced, any number of units 10 and slides 12 may be used on a table or like surface by having the forward side edge of the member 12 extending forwardly and downwardly under an overhanging side edge of an adjacent member 16 as best viewed in FIG. 4. By this arrangement the member 12 cannot move upwardly relative to the member 16. When one or more keys are in the slots 26 and 28, the rear side of the member 12 will be prevented from moving upwardly relative to the base 10. However, once the keys 34 are slid from the grooves 26 and 28, the rear edge of the member 12 may be lifted upwardly, thus detaching the keys 34 in the vertical slits 22 and 24, as shown in FIG .3. The keys, when in locking positions in the notch slits 22 and 24 are completely embedded therein so as to not interfere with the work at hand. The upper rear edge of the member 12, above the slot groove 28 is cut-away as shown in FIG. 1 and FIG. 2, in order to provide an open channel exposing the keys 34 in the grooves 26 and 28. A pin, nail or the like may be inserted through this channel for engaging the keys and sliding them laterally from engagement with the groove 28 of the member 12.

If the members 12 and 14 are of wood, the keys 34 should be of fragile material so that they will break before the jig is damaged if unexpected impact is delivered to the frame or like being fabricated. Thin rectangular strips of grained wood make excellent key means. If an extra rigid securing means is desired for the slits 22 and 24, the grain of the wood of the keys should extend horizontally. If a weaker means is desired, the grain of the wood of the keys should extend vertically.

Some changes may be made in the construction and arrangement of my positioning and holding device, without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims, any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim:

1. A positioning and holding device comprising, in combination:
   (a) a stationary portion including guide means,
   (b) a movable portion adapted to coact with said guide means,
   (c) first means for releasably holding said movable portion in slidable engagement with said guide means,
   (d) second means for releasably fixing said movable portion and said guide means in a predetermined position relative to each other, and
   (e) third means mounted on said movable portion and defining a space adapted to receive an object to be positioned and held thereby.

2. The invention according to claim 1 wherein said first means comprises first notches in said guide means and said movable portion and at least one first locking element adapted to be inserted in said first notches.

3. The invention according to claim 2 wherein said second means comprises a plurality of second notches in said guide means, a plurality of third notches in said movable portion, and at least one second locking element, any one of said second and any one of said third notches being alignable with respect to each other to provide for insertion of said second locking element therein and therebetween.

4. In a positioning and holding means, comprising, in combination,
   (a) a base unit having an elongated groove,
   (b) spaced apart slit openings in said base unit and communicating with its groove,
   (c) a movable member slidably detachably mounted in the elongated groove of said base unit,
   (d) spaced apart slit openings in said movable member capable of selectively communicating with at least some of the slit openings in said base unit,
   (e) a part holding means on said movable member,
   (f) and at least one key member capable of selectively detachably engaging one slit opening of said base unit and one slit opening of said movable member.

5. In a positioning and holding means, comprising, in combination,
   (a) a base unit having an elongated groove,
   (b) spaced apart slit openings in said base unit and communicating with its groove,
   (c) a movable member slidably detachably mounted in the elongated groove of said base unit,
   (d) spaced apart slit openings in said movable member capable of selectively communicating with at least some of the slit openings in said base unit,
   (e) a part holding means on said movable member,
   (f) at least one key member capable of selectively detachably engaging one slit opening of said base unit and one slit opening of said movable member,
   (g) a horizontal groove in the side of the elongated groove of said base unit,
   (h) a horizontal groove in the side of said movable member and in communication with the first mentioned horizontal groove, and
   (i) a key detachably slidably engaging both of said horizontal grooves.

6. In a positioning and holding means, comprising, in combination,
   (a) a base unit having an elongated groove,
   (b) spaced apart slit openings in said base unit and communicating with its groove,
   (c) a movable member slidably detachably mounted in the elongated groove of said base unit,
   (d) spaced apart slit openings in said movable member capable of selectively communicating with at least some of the slit openings in said base unit,
   (e) a part holding means on said movable member,
   (f) at least one key member capable of selectively

detachably engaging one slit opening of said base unit and one slit opening of said movable member,

(*g*) a horizontal groove in the side of the elongated groove of said base unit,

(*h*) a horizontal groove in the side of said movable member and in communication with the first mentioned horizontal groove, and

(*i*) a key detachably slidably engaging both of said horizontal grooves;

(*j*) said last mentioned key having a portion of its area observable between said base unit and said movable member.

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