

[54] **DRAFTING DEVICE**

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33/101; 30/289, 293, 292; 83/829, 455

[56] **References Cited**

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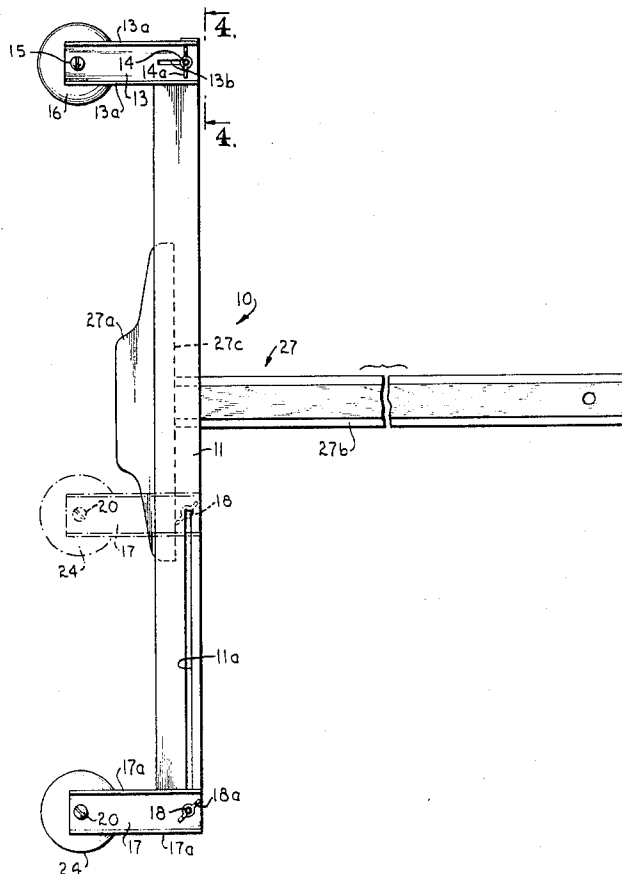
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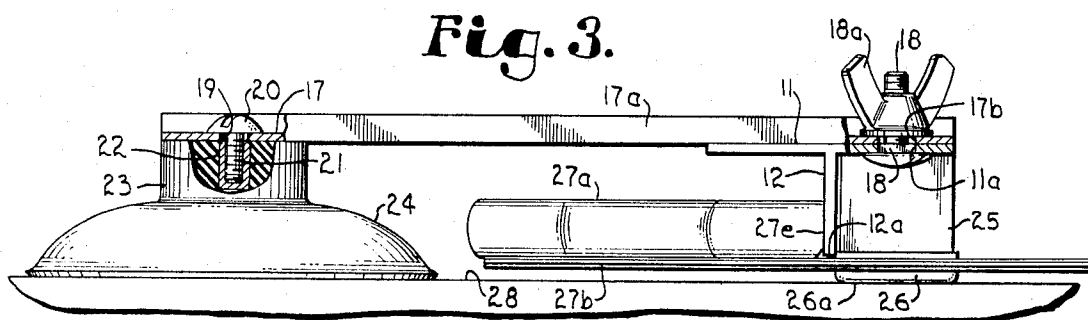
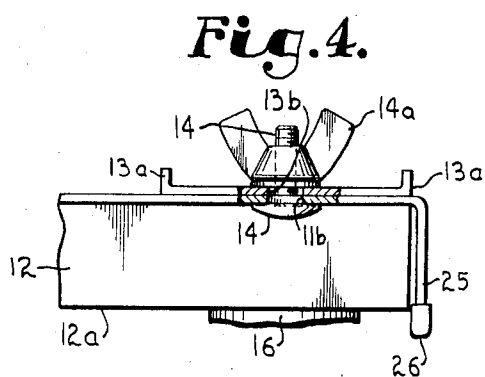
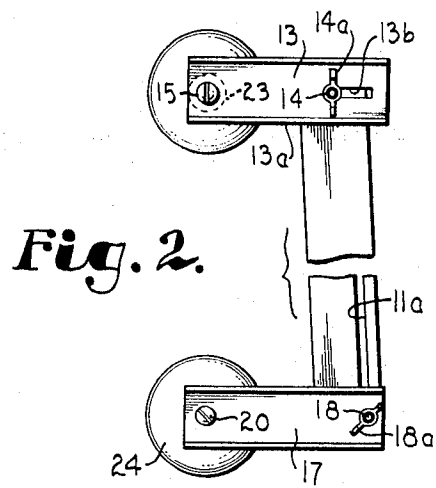
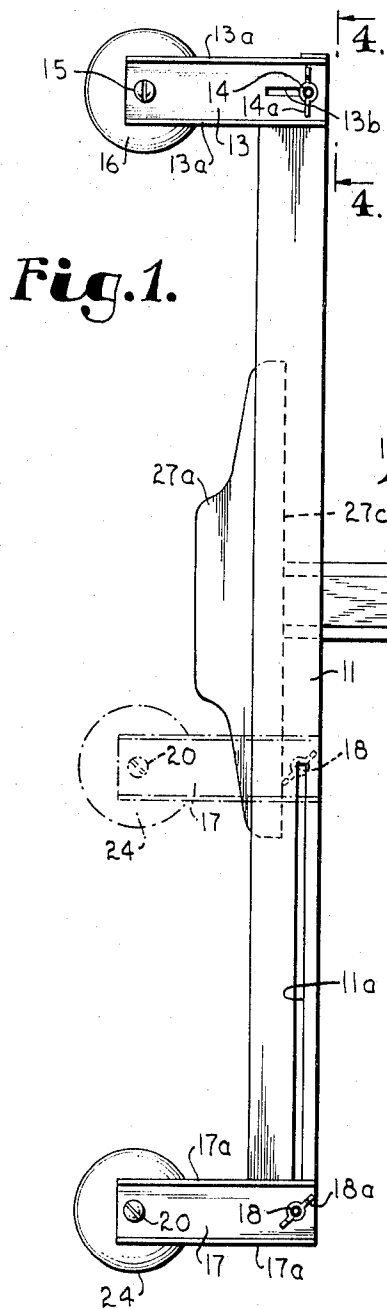
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ABSTRACT

A novel drafting device and drafting aid; a device comprising removably attachable means for accurately guiding a T-square across any available flat work surface; a removably attachable, size adjustable U-shaped frame providing an elongate straight edge to receive and guide a conventional T-square across and over any conveniently available flat work surface; a T-shaped section beam member and mounting means therefor which are removably adjustably securable to any flat surface, table, wall, window or the like and co-operate with a conventional T-square engageable therewith to permit drawing of straight lines necessary and critical to drafting work; the combination of an elongate, straight beam member T-shaped in transverse section, a pair of mounting members adjustably secured to the T-section beam thereby to provide a U-frame and means on each of the mounting members for removably securing same to a flat working surface, whereby the vertical leg of the T-section beam will operate as a straight edge in cooperation with an inverted, conventional T-square.

2 Claims, 4 Drawing Figures





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DRAFTING DEVICE

PRIOR ART

I am aware of the following prior art patents:

Herman U.S. Pat. No. 950,696, Issued Mar. 1, 1910 for "STRAIGHT EDGE;"

McLaren U.S. Pat. No. 1,246,629, Issued Nov. 13, 1917 for "SIGN;"

Walters U.S. Pat. No. 1,422,629, Issued July 11, 1922 for "DRAFTING INSTRUMENT;"

Hooper, U.S. Pat. No. 1,600,545, Issued Sept. 21, 1926 for "HOLDER AND RULING DEVICE FOR TABLETS;"

Hooper U.S. Pat. No. 1,679,084, Issued July 31, 1928 for "PAD HOLDER AND RULER;" and

Lundberg U.S. Pat. No. 2,009,407, Issued July 30, 1935 for "NAVIGATING TABLE."

SUMMARY OF THE INVENTION

The instant invention relates to an attachment for guiding drafting T-squares which may be used in conjunction with substantially any flat surface of reasonable size. Prior to this development, in drafting practice with conventional T-squares, it has been necessary to have or provide a board on a table with a pair of smooth, vertical, parallel side edges. The latter was required for the head of a conventional T-square to depend thereover and move therealong and, thus, allow the drawing of those parallel, horizontal base lines both critical and necessary in drafting practice. This requirement for the smooth, vertical, parallel side edges has thus previously limited the permissible size of the drawing to the available area of the drafting board or table. In many instances, however, it has been and is desirable to be able to make drawings of larger or even very large size, and, in the prior art, this has called for and required a long, unwieldy T-square (and drafting board) or an expensive, sometimes unstable and sometimes unreliable drafting machine. Additionally, the requirement of the presence of the drafting board with its smooth, vertical, parallel side edges, is an undesirable limitation which has made and makes impractical all "field" drafting of an accurate sort.

OBJECTS OF THE INVENTION

An object of the invention is to provide a drafting device (removably attachable means for guiding a conventional T-square) which allows the use of a conventional drafting T-square over larger drawings (and on almost any flat base) by allowing the guide and the T-square to periodically be shifted across the drawing surface and also be easily aligned and fixed relative thereto.

Another object of the invention is to provide an improved drafting device (removably attachable means for guiding a conventional T-square) which allows the draftsman to work without requiring the presence of the conventional drafting board or a table or other surface having the conventionally required pair of smooth, vertical, parallel side edges.

Another object of the invention is to provide a drafting device (removably attachable means for guiding a T-square) which is easily constructed, versatile, durable, cheap and which readily adapts to use on both any existing drafting surface of conventional type and any convenient clean, flat surface.

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Another object of the invention is to provide an improved drafting device (removably attachable means for guiding a conventional T-square) which is readily and effectively usable with substantially any flat, clean, surface for drafting purposes, whether or not the drafting surface is horizontal, slanted or substantially vertical. Thus, for example, in the field, the slanted, flat (if clean) trunk of a car or the hood of a car very well may suffice when used in conjunction with the instant improved drafting device.

Yet another object of the instant invention is to provide the instant improved drafting device (removably attachable means for guiding a conventional T-square) which is easily, conveniently and reliably attachable to many conventionally available surfaces, thereby to permit the drawing of horizontal, slanted or vertical straight lines on a variety of flat surfaces, such as chalk boards, truck side panels, glass windows or other areas and even some building exteriors for many useful purposes such as lettering, design, or the like.

Still another object of the invention is to provide an improved drafting device operable to permit drawing of horizontal, slanted or vertical straight lines with the entire conventional range of T-square designs and constructions without the need for redesigning or replacing conventional T-squares in existence, commercially available or in hand for a given draftsman.

Still another object of the instant invention is to provide a new drafting device which does not necessarily replace or obsolete any commercially available drafting equipment, but rather makes conventional drafting techniques available in locations and upon surfaces where same were not previously available or only available with great inconvenience, cost or effort.

Another object of the instant invention is to provide an improved drafting device readily adaptable to and usable by both or either left and/or right handed draftsman without any change or modification whatsoever to the device itself.

Another object of the instant invention is to provide an improved drafting device which is easily broken down for packaging, shipment or storage and further easily assembled from its component parts for use.

Other and further objects of the invention will appear in the course of the following description thereof.

DESCRIPTION OF DRAWINGS

In the drawings, which form a part of the instant specification and are to be read in conjunction therewith, an embodiment of the instant invention is shown and, in the various views, like numerals are employed to indicate like parts.

FIG. 1 is a plan view from above of the improved drafting device set up for operation with a conventional T-square shown aligned therewith for use. (In the entire full line showing, the device is shown adjusted for the greatest height of drawing for which the device may be used; in the dotted line showing, the minimum height adjustment is shown.)

FIG. 2 is a fragmentary view of the device of FIG. 1 (omitting the central portion thereof and the showing of the conventional T-square associated therewith for space reasons), with the arcuate angle adjustment for alignment purposes varied from the showing of FIG. 1.

FIG. 3 is a view of the subject device from the bottom of FIG. 1 looking upwardly (with slight cutaways in the

upper right and left hand corners thereof), that is, an end view of the device of FIG. 1.

FIG. 4 is a view taken along the line 4—4 of FIG. 1 in the direction of the arrows.

STRUCTURAL DESCRIPTION

Referring now to the drawings, and particularly FIGS. 1 and 3, there is first provided a basic elongate beam member of T-shape section. Beam member 10 is comprised of two parts. The first portion is normally horizontal elongate strip 11, same of typical (but not limiting) dimension 32 inches long and 1 $\frac{3}{4}$ inches wide. Member 11, with respect to the T-section, represents the horizontal bar of the T.

Depending at substantial right angles to the under side of member 11, there is provided an elongate flange 12 of typical height one-half inch to three-fourths inch. Flange or strip 12 extends, preferably, the entire length of the strip 11. The purposes of the T-section are multi-fold. In the first place, as will be described, one side of the section is adapted to receive in sliding translation therealong the inverted head of a conventional T-square. The structural configuration (to be described) of the instant apparatus, particularly including the T-section permits this longitudinal translation even beyond the bounds of the edges of the beam member 10 itself to provide the very maximum area of effective and controlled work with the associated T-square. Secondly, the T-section enables an elongate slot (to be described) to be provided or formed in the other side of the horizontal T bar (from that which overlies the head of the conventional T-square in work of the device). Still further, the width of the strip 11 permits flat abutment of considerable areas of the strip 11 itself and the mounting members (to be described for rigid, stable positioning of the beam member 10 for work with a T-square. Finally, at one or both ends of the T-section beam 10, the end portion of the horizontal bar of the T away from the side which overlies the T-square head may be flanged or bent downwardly for a support to provide a three point structural mounting of the device with respect to the work surface. Alternatively, both ends of said strip 11 may be provided bent down at right angles for supports.

Returning to flat strip 11, an elongate slot 11a is provided in strip 11 running parallel to the side edges thereof and also parallel to downwardly depending flange 12. A typical length of such slot (in a 32 inch beam 10) would be 12 inch. However, such slot may be of greater or shorter length. As may readily be seen in FIG. 4 positioned at the opposite end of strip 11 and close to said end edge, there is provided a perforation or opening (hole) 11b. Same is preferably provided on the same side of the depending flange 12 as slot 11a.

It particularly should be noted that an L-section beam, including only the right hand horizontal bar of the T section in FIG. 3 (carrying slot 11a and hole 11b) and depending flange 12, may be used as the basic beam member to guide the conventional T-square. This configuration also permits the provision of the support legs to be described. On the other hand, this structure is not as strong or as rigid, nor is the structural connection with the support members to be described as effective. Yet further, in such case the entire head of the T-square is exposed and may be more readily displaced, which is not desirable.

Referring now to the upper parts of FIGS. 1 and 2, therein is shown a first support member generally designated 13, same preferably of U-shape in transverse section with side flanges 13a. A typical dimension of such member 13 (employable with a 32 inch beam member) would be 5 $\frac{1}{2}$ inch long and 1 $\frac{3}{4}$ inch wide with one-fourth inch height flanges. An elongate slot 13b is provided adjacent the end of member 13 to be attached to beam 10. A typical length of slot (in the universe of dimensions given as a specific example) would be 1 inch. A flat headed bolt 14 is provided having a readily adjustable wing nut 14a removably threaded thereon, the shaft of the bolt 14 passing through the hole 11b and slot 13b.

The basic purpose behind the provision of the slot 13b (which is at right angles to the axis of the elongate member 10) is to provide arcuate adjustment of the elongate beam member 10 around the pivot point of the opposite support member bolt. This permits a very precise and minute adjustment of the parallelism of the depending flange 12 with the base line, side edge, vertical axis or the like of a piece of work, drawing or surface on which the device is positioned. This means that once the drafting device has been set into position by setting the suction cups (to be described) on a surface, the suction or attachment does not need to be broken or readjusted for fine realignment or alignment of the longitudinal axis of member 10. FIG. 2 shows the extreme arcuate adjustment of the beam member 10 with respect to the slot 13b once the suction cups (to be described) are set along a given line. Of course, the connecting bolt going through the slot 11a to the other support member must be loosened to permit this, as will be described.

An opening (not seen) is provided through member 13 adjacent the other end thereof to receive a threaded bolt 15 which removably connects into the central top post of a suction cup generally designated 16, to be described in greater detail with respect to the opposite support member 17.

Turning to member 17, seen in the lower portions of FIGS. 1 and 2 and detailed in FIG. 3, same has flanges 17a and hole 17b therethrough adjacent the end which is to be slidably attached to the strip 11. A flat headed bolt 18 (FIG. 3) receiving a wing nut 18a on the upper end thereof for easy loosening and tightening thereon, engages together support member 17 and the portion of strip 11 of member 10 which includes slot 11a.

Whatever the dimensions of members 13 and 17, they are preferably precisely the same for precision adjustment of the parts of the device with respect to one another and the position of the opening 17b is preferably precisely positioned with respect to the right hand end of slot 13b (in the view of FIG. 1) so the end edge of member 17 precisely aligns with the side edge of strip 11 when bolt 14 is at the end of slot 13b as seen in FIG. 1.

At the opposite end of member 17 there is provided a hole or opening 19 through the member 17. This hole permits the passage therethrough of an externally threaded bolt 20 which is removably and threadably engageable with the internally threaded metal sleeve 21 fixed in a hole or passage 22 in the top center support post 23 of a conventional suction cup member 24. The opening 19 through member 17 is preferably precisely aligned with the like opening (not seen) which receives

the bolt 15 through member 13. Members 16 and 23-24 are preferably identical in size and shape.

At least at one end of the device (particularly see FIGS. 3 and 4) there is provided a downwardly extending leg or support member 25 which must be of greater length than flange 12 or have thereon an extension or pad-bumper 26 which extends below the lower edge 12a of flange 12. The purpose of this downwardly extending leg is to space upwardly flange 12 from the surface of the work a distance at least equal to the thickness of a conventional T-square bar and further to provide at least a three point support system for the device when it is being used on a flat work surface. The pad or bumper 26 prevents scarring, marking or denting of a work surface in heavy use.

FIGS. 1 and 3 show a conventional T-square 27 positioned for work with respect to the subject invention and, particularly, downwardly depending flange 12. Such T-square typically includes a head 27a and an elongate beam or ruler member 27b. Head 27a is typically fixedly mounted on top of ruler 27b whereby to provide a flat bearing surface 27c at right angles to the axis of ruler 27b and the side edges thereof. As seen in FIGS. 3 and 4, the T-square is inverted from its customary head down orientation for use with this device.

FIG. 3 shows a flat work surface 28 with the beam or ruler 27b lifted slightly thereabove to show the flat abutment of the shoe or bumper 26 leg 25, as well as the clearance spacing under edge 12a.

In order for there to be the optimum working relationship of the parts of the device in operation thereof, the following are specified, particularly with respect to FIG. 3. First, suction cups 16 and 24 are flattened, attaching same to the work surface 28. This, of course, may be through a sheet of paper resting on the work surface. The axes of bolts 20 and 15 are then vertical. With the suction cups fully depressed on the work surface, the elongate bearing surface 26a of bumper 26 or the lower edge of leg 25 are horizontal and against the surface. Simultaneously, member 17 is either horizontal or parallel to the work surface. Finally, flange 12 is at right angles to the work surface, but spaced upwardly therefrom a greater distance than the thickness of ruler No. 27b so that same can slide thereunder without frictional contact therewith.

OPERATION

In operation, the device may be used upon a conventional drafting table or any flat horizontal desk or table surface available. Additionally, it may be positioned upon a slanted or angled flat surface. Still further, it may be employed upon vertical or over-vertical flat surfaces for drafting work. With respect to the flat surface, same may or may not have a piece of paper mounted thereon or attached thereto upon which to work. That is, lines may be drawn directly upon the flat working surface itself, if desired.

At any rate, when the working surface is determined and the directions of the lines which it is desired to draw or superimpose thereon, then the instant device, either in the full line or dotted line showing of FIG. 1 (or any alternate positioning of member 17 desired) may be placed upon the work. The draftsman then exerts downward pressure, simultaneously or successively, upon the suction cups 16 and 24 by pushing on the members 13 and 17 immediately thereabove. This provides a basic attachment and aligning of the U-

shaped frame. It is presumed in such first positioning that the position of member 17 is first determined along the slot 11a, whereby, at first positioning of the device on the work surface, both of the members 13 and 17 are positioned at right angles to the axis of the elongate T section member 10. The way this desirable relationship (to provide an adjustment base line of great precision) is obtained is not by sight estimate, but rather by having the end of slot 13b and the opening 17b in members 13 and 17, respectively, as well as the positions of opening 11b and 11a, so that the end edges of members 13 and 17 precisely may be aligned with the side edge of the strip 11 carrying opening 11b and slot 11a. That is, with the side edge of the strip 11 aligned precisely with the near end edges of members 13 and 17 and the wing nuts tightened sharply down, a precise, right angle U-configuration device is then presented for fixing to the work.

Once the suction cups are mashed into engaging position on the work, then the wing nut 14a on nut 14 may be loosened any small arcuate adjustment made as seen in FIG. 2. This permits the provision of a base line on the work surface of great and accurate precision.

From time to time, the device may be reset on the work to any desired baseline and in any desired position to provide the desired straight drafting lines, lettering base, drafting figure base or the like in conventional manner. With each resetting, the bolt 14 is returned to its base position as seen in FIG. 1 and the member 17 is adjusted along the slot 11a through the optimal desired position for the particular operation in the drafting process desired.

It should be particularly noted that the device in FIG. 1 is not necessarily used in the position of FIG. 1 to provide a left side guiding track. That is, the device may be fixed to the work at any angle or even rotated 90° or 180° to provide, in the first case, vertical lines from a depending T-square and in the second place, horizontal or straight lines from the opposite side of the work surface. This is particularly apt if the draftsman is left handed.

With this versatility, it is particularly noted that the instant device can be used in conjunction with a conventional drafting board which provides the left, right and top side lines whereby to give additional slant lines, lines at right angles to another T-square or the like.

In use of this device, it should be noted that the T-square 27 is inverted from its normal position (with the head depending over the side edge of a drafting table), but this inverting of the conventional T-square does not effect either its manner of use or effectiveness. The head 27a projects outwardly far enough from the strip 11 to be easily grasped a manipulated by the draftsman. The suction cups 16 and 24 are positioned far enough from the depending flange 12 that the head of the conventional T-square can clear same in sliding movement along the beam 10.

Finally, with the three point suspension, even when the member 17 is at either of its extreme positions, the stability of the drafting device is not compromised in any way. Additionally, if it is desired to provide an exceedingly elongate beam member 10, a second support leg analogous to 25 may be provided at the other end of the device without interfering with the sliding movement of the T-square along the member 12.

The presence of the vertical end arm 25 and its associated boot 26 are both optional, but preferred. Same

keep the guide from rubbing on or constricting the movement of the T-square thereunder.

While the cross-section of the main guide 10 may be L, omitting the left hand flange of member 11 (in the view of FIG. 3), the T section best controls wobble of the device (more rigid).

The purpose of the use of carriage bolts (having a square shaft section between the head of the bolt and the threaded cylindrical portion thereof), as well as the oversized hole in member 17 and slot 13b in member 13 is so that the wing nuts 18a and 14a may be tightened and loosened without having to hold the bolt with the operator's finger.

Installers, decorators, designers, architects, field engineers and the like can use this device to advantage. The device may be used on the back of a car trunk by merely wiping off the top of the trunk, taping a piece of paper to the trunk and then applying the suction cups. In the event of substitution of spikes for the suction cups 24 and 16, then same can be punched into a wood or plastic surface for use.

From the foregoing, it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth together with other advantages which are obvious and which are inherent to the apparatus.

It will be understood that certain features and sub-combinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. Removably attachable means for guiding a T-square across a flat work surface comprising, in combination:

an elongate, straight, beam member L-shaped in transverse section thereby to have a first portion thereof positionable substantially parallel to said flat working surface and a second portion thereof simultaneously positionable at substantial right angles to said working surface,

a leg at one end of the beam member fixed to and extending at right angles to the first portion thereof and of sufficient length to space upwardly the beam member from a working surface and a sufficient distance that the rule of a conventional T-square may slide under the second portion of said beam member without contacting same,

a pair of mounting arms pivotably secured to the first portion of said beam member, one adjacent each end thereof and fixable at substantial right angles to the longitudinal axis thereof,

one of said mounting arms transversely adjustable of said beam member, this adjustment provided by virtue of a slot formed in the said mounting arm, the other of said mounting arms longitudinally adjustable of said beam member, said adjustability

achieved by virtue of an elongate slot formed in the first portion of said beam member, said slot extending substantially parallel to the longitudinal axis of the beam member, and

means on each of said mounting arms for removably securing same to said working surface, said securing means of length substantially that of the leg at the end of the beam member,

whereby to permit removable fixing of both said beam member and mounting arms as a U-shaped frame to said working surface, with the second portion of said beam member at substantial right angles to said surface, thereby to receive (inverted) the working head of a conventional T-square in sliding abutment there against with the elongate ruler of the T-square extending under the said second portion of the beam member at right angles thereto.

2. Removably attachable means for guiding a drafting T-square across a flat working surface comprising, in combination:

an elongate straight member T-shaped in transverse section, whereby to have a first portion thereof (the flat of the T) positionable substantially parallel to a flat working surface and a second portion thereof (the leg of the T) simultaneously positionable at substantial right angles to said flat working surface,

a downwardly extending leg provided at one end of the straight member operative to space upwardly the straight member from a working surface a sufficient distance that the rule of a conventional T-square may slide under the second portion of said straight member without contacting same,

a pair of mounting arms pivotably secured to the first portion of said straight member, one adjacent each end thereof and fixable at substantial right angles thereto,

one of said mounting arms transversely adjustable of said straight member, this adjustment provided by virtue of a slot formed in the said mounting arm, the other one of said mounting arms longitudinally adjustable of said straight member, said adjustability achieved by virtue of an elongate slot formed in the first portion of said straight member, said slot extending substantially parallel to the longitudinal axis of the straight member, and

means on each of said mounting arms for removably securing same to a flat working surface, said securing means of length substantially that of the leg at the end of the straight member,

whereby to permit removable fixing of both said straight member and mounting arms as a U-shaped frame to said working surface with the second portion of said straight member at substantial right angles to said working surface, thereby to receive (inverted) the working head of the conventional T-square in sliding abutment thereagainst, with the elongate ruler of the T-square extending under the said second portion of the straight member at right angles thereto.

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