Sept. 17, 1963 C. DE LA SIERRA 3,103,747

DRAFTING MACHINE

Filed Jan. 13, 1960 3 Sheets-Sheet 1

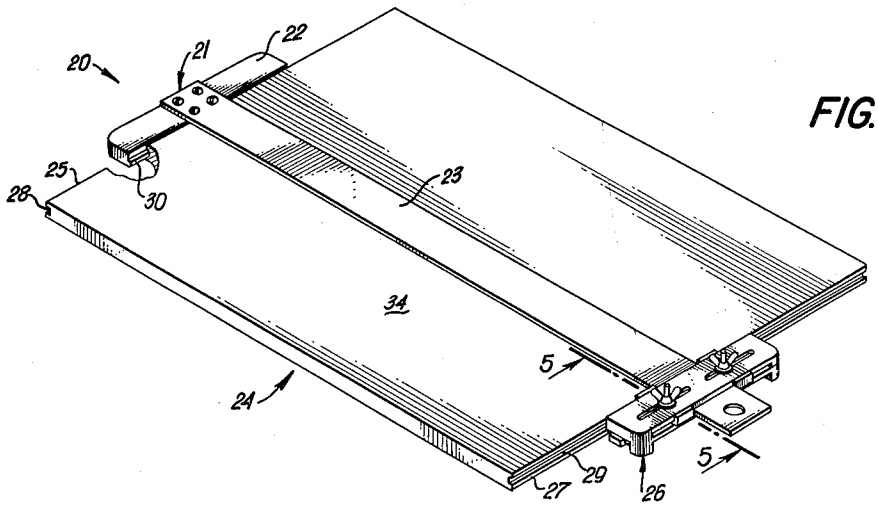


FIG. 1

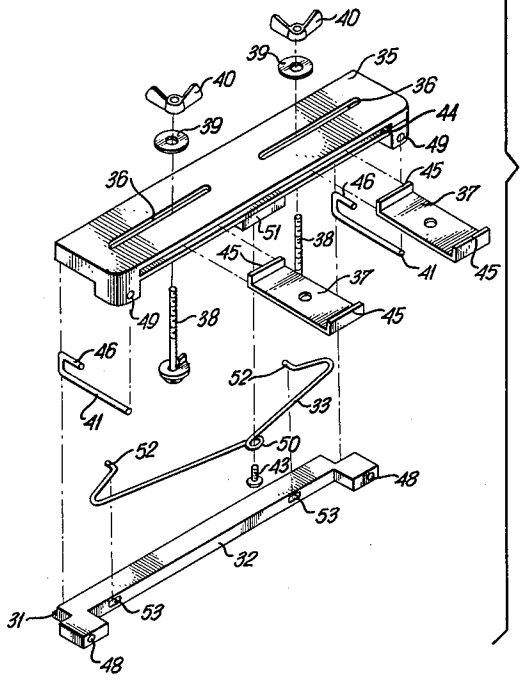


FIG. 2

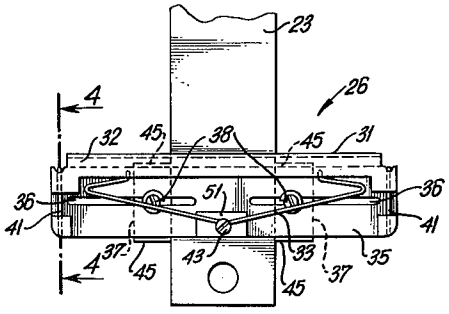


FIG. 3

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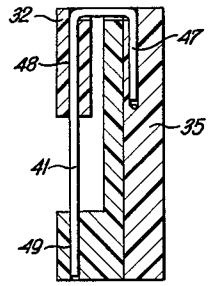


FIG. 4

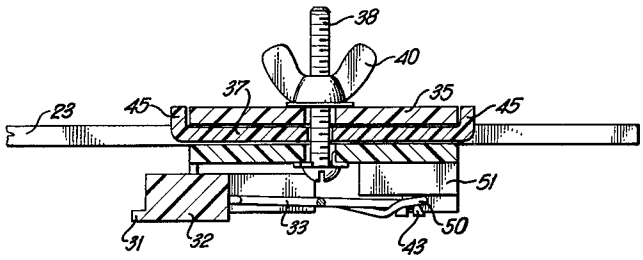


FIG. 5

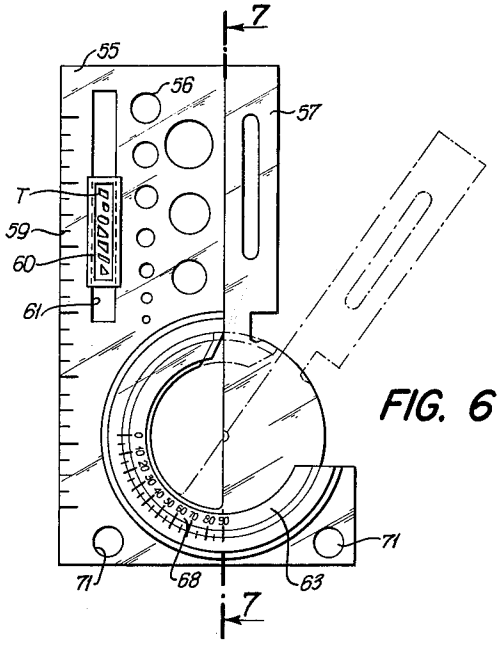


FIG. 6

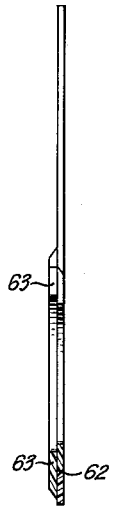


FIG. 7

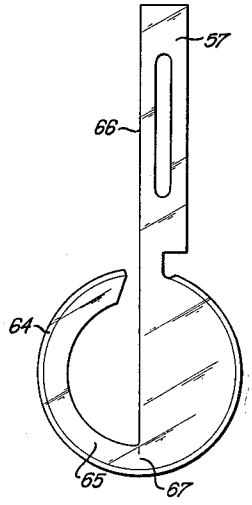


FIG. 8

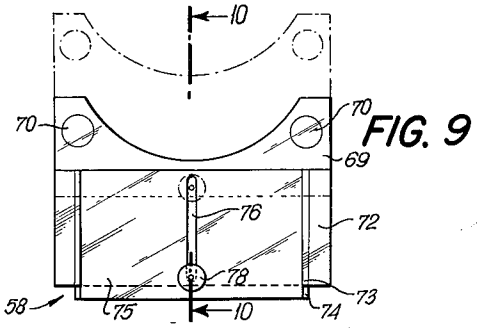


FIG. 9

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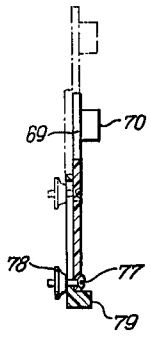


FIG. 10

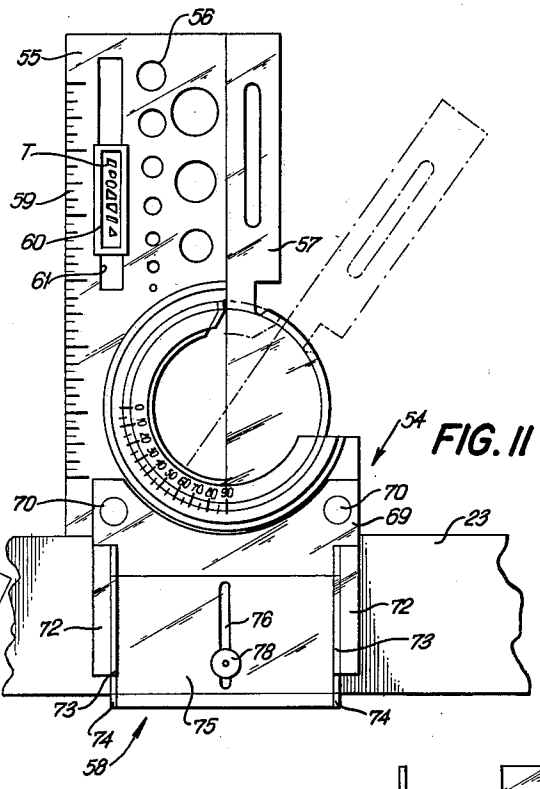


FIG. 11

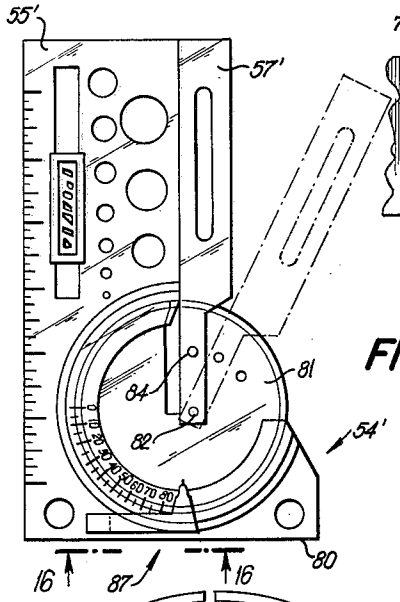


FIG. 12

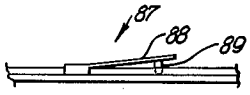


FIG. 16

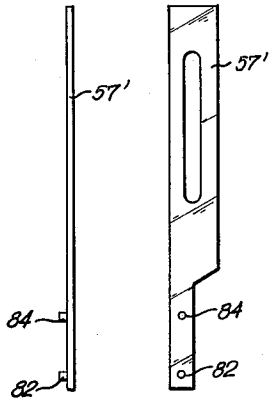


FIG. 14

FIG. 13

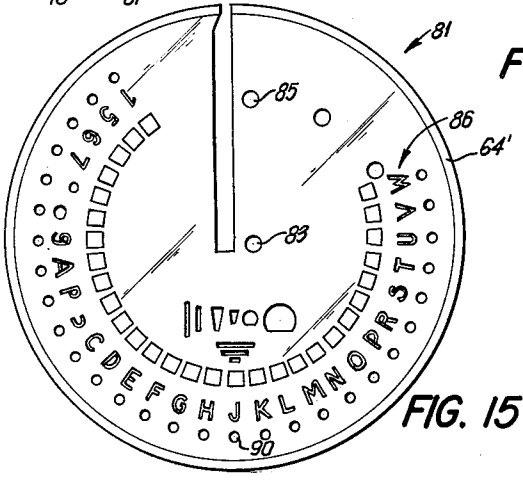


FIG. 15

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United States Patent Office 3,103,747 Patented Sept. 17, 1963

3,103,747

DRAFTING MACHINE

Carlos de la Sierra, San Diego, Calif., assignor of one-tenth to Gadget-Of-The-Month Club, Inc., North Hollywood, Calif., a corporation of California

Filed Jan. 13, 1960, Ser. No. 2,263
8 Claims. (Cl. 33—174)

The present invention consists of an improved drafting machine for use with a substantially rectangular drawing board. In one preferred form, the rectangular drawing board may have grooved parallel side edges, and a T-square portion of the drafting machine of the present invention may include a side-edge-engaging head member provided with an inwardly directed projection adapted to slidably engage one of the grooved side edges of the drawing board, with the other grooved side edge of the drawing board being adapted to be similarly and oppositely engaged by an inwardly directed projecting portion of an attachment member adjustably carried by a transverse board-surface-engageable member of the T-square, whereby to firmly retain the T-square and the attachment member on an upper surface of the drawing board in a manner such that the board can be freely moved about without accidentally dislodging the T-square and attachment member therefrom, and yet in a manner such that the T-square and the attachment member can be forcibly moved along the surface of the drawing board in a direction parallel to the side edges thereof to allow a transverse line to be drawn at any desired location with respect to the drawing board. In other words, this preferred form of the T-square and attachment member of the present invention function with respect to the surface of a drawing board in a manner generally similar to a conventional T-square, but are frictionally resiliently held against the drawing board so that the board can be conveniently moved about or can be transported to a desired remote location and there used for drawing, even though an underlying table or supporting structure is not available, thus greatly increasing the general utility of the drafting machine.

Further, it should be noted that, in this preferred form of the invention, the attachment member may include manually adjustable and controllably lockable engaging means adapted for removably and interchangeably engaging the opposite edges of the transverse board-surface-engageable member of various different sizes of T-square at transverse locations along the transverse length thereof, thus providing an arrangement allowing the use of various sized T-squares and various sized drawing boards.

Also, the preferred form of the invention referred to generally above may include means resiliently inwardly biasing the projecting portion of the attachment member which slidably engages the adjacent grooved side edge of the drawing board whereby to allow it to be forcibly resiliently engaged and disengaged with respect to said adjacent grooved side edge of the drawing board to facilitate removal and re-engagement of the entire T-square and attachment member with respect to the drawing board, when desired. It should also be noted that the T-square side-edge-engaging head member and the inwardly directed projecting portion of the attachment member may engage opposite side edges of a non-grooved drawing board, if desired, and in one specific modified form of the invention, this is additionally facilitated by eliminating the inwardly directed projections, which, in the first form of the invention are adapted to slidably engage the grooves in the opposed side edges, although even the preferred form of the invention first described above may cooperate effectively with opposite non-grooved side edges of a drawing board.

The present invention is also directed to an improved drafting machine of the character set forth above, additionally provided with a protractor attachment means transversely slidably and controllably lockably attachable to the transverse board-surface-engageable member of the T-square and including a board-surface-engageable protractor base member rotatively provided with and carrying a straight edge member, with one of said members being provided with protractor angular scale means arcuately arranged and with the other of said members being provided with an index part cooperable with the protractor angular scale means for indicating the angular orientation of the straight edge means with respect to the transverse board-surface-engageable member of the T-square.

In one preferred form, the protractor base member may be provided with a plurality of drawing template or stencil means.

In one preferred form, the protractor base member may rotatively mount a multiple template-carrying member which in turn rotatively mounts said straight edge member with respect to said protractor base member, with said rotatable multiple template-carrying member including a plurality of concentrically arranged groups of drafting templates or stencils, which, in certain forms of the invention, may be interchangeable although not specifically so limited; the invention also contemplating an arrangement wherein the drafting templates may be permanently and non-interchangeably provided in the rotatable multiple template-carrying member.

Also, in a preferred form, the straight edge member and the above-mentioned rotatable multiple template-carrying member may be provided with controllably engageable means whereby manual rotation of the straight edge member may controllably rotate the multiple template-carrying member with respect to the protractor base member whereby to properly position any desired one of the drafting templates or stencils in a drawing use location. This modification of the invention may also include controllably operable locking means for locking the rotatable multiple template-carrying member with respect to the protractor base member.

It is an object of the present invention to provide a drafting machine of the type generally described above, which is substantially universally adaptable and with which all types of drawings can be made in the same manner as a conventional drafting machine, but including certain improvements which make the machine much more flexible and generally useful and capable of performing in a manner completely impossible of attainment by conventional prior art drafting machines.

It is a further object to provide a drafting machine of the character referred to above, which may be caused to resiliently engage and be retained by a portable drawing board in a manner virtually incapable of accidental dislodgment or disengagement therefrom, thus permitting the easy transport of the entire device and allowing its use in the field or away from an underlying supporting structure, as is required with conventional drawing boards engaged by conventional T-squares and drafting machines of a similar character.

It is a further object to provide a drafting machine of the character set forth above, which is readily adjustable for accommodating various sizes of T-squares and various sizes of drawing boards.

It is a further object to provide a drafting machine of the character set forth above including a protractor attachment of the type generally referred to above capable of rapid and easy engagement and disengagement with respect to the T-square and adapted to greatly faciltiate the drawing of various angular lines, and the like, and

adapted to greatly facilitate drawing letters, symbols, and the like, and/or various geometric shapes by the provision and inclusion of multiple drawing and/or drafting templates and/or stencils.

It is a further object to provide, as a subcombination of the complete drafting machine, a separably usable protractor attachment member of the character set forth in the preceding object, which is adapted to be readily removably engaged with respect to the transverse member of virtually any conventional T-square or drafting machine and not necessarily to the specific T-square of the present invention provided with the opposite board side-edge-engaging attachment member, as referred to hereinabove.

It is a further object to provide a drafting machine of the character set forth above, which does not obstruct any part of a drawing board on which it is used.

It is a further object to provide a drafting machine of the character set forth above which saves much time and effort in drafting practice.

It is a further object to provide a drafting machine of the character set forth above, which is capable of being easily attached to a drawing board without the need of any screws, clamps, or other conventional fastening elements, and wherein this attaching operation takes only a few seconds.

It is a further object to provide a drafting machine of the character set forth above, which is very simple and economical of construction, efficient in its operation, and is relatively foolproof and will not easily get out of order.

Further objects will be apparent to persons skilled in the art after a careful study hereof.

For the purpose of clarifying the nature of the present invention, several exemplary embodiments are illustrated in the hereinbelow-described figures of the accompanying three sheets of drawings, and are described in detail hereinafter.

FIG. 1 is a perspective view illustrating one exemplary embodiment of the drafting machine of the present invention in slidable engagement with opposed grooved side edges of a drawing board.

FIG. 2 is an exploded perspective view of one exemplary form of attachment member adapted to be adjustably carried at the right end of the transverse board-surface-engageable member of the T-square as shown in FIG. 1, and which engages the right grooved side edge of the drawing board.

FIG. 3 is a fragmentary bottom plan view of the right end of the transverse member of the T-square shown in FIG. 1 carrying the attachment member. However, the drawing board is removed for drawing simplification purposes.

FIG. 4 is an enlarged sectional view taken in the direction of the arrows 4—4 of FIG. 3.

FIG. 5 is an enlarged fragmentary sectional view taken in the direction of the arrows 5—5 of FIG. 1.

FIG. 6 is a top plan view of one illustrative form of a portion of the protractor attachment means. This view illustrates both a protractor base member and a straight edge member rotatively mounted with respect thereto, shown in solid lines in one position and shown in broken lines in a second position for illustrative purposes.

FIG. 7 is a view, partly in elevation and partly in section, taken in the direction of the arrows 7—7 of FIG. 6.

FIG. 8 is a top plan view of the straight edge member of FIG. 6 shown alone and with the protractor base member removed therefrom.

FIG. 9 is a top plan view of fastening means for effectively fastening the protractor attachment means portion shown in FIGS. 6 and 7 with respect to a transverse board-surface-engageable member of a T-square of the type shown in FIG. 1, whereby to effectively transversely slidably mount the entire protractor attachment means comprising the portions shown in FIGS. 6 and 9.

FIG. 10 is a vertical sectional view taken in the direction of the arrows 10—10 of FIG. 9.

FIG. 11 is a top plan view of the protractor attachment means portion illustrated in FIGS. 6 and 7 and the fastening means illustrated in FIG. 9 in assembled fastened relationship with respect to a transverse T-square member.

FIG. 12 is a top plan view generally similar to FIG. 6, but illustrating a slightly modified form of protractor attachment means.

FIG. 13 is a top plan view of the modified straight edge member of FIG. 12 shown alone and with the remainder of the apparatus removed.

FIG. 14 is a side elevational view of FIG. 13.

FIG. 15 is a top plan view of a multiple template-carrying member adapted to rotatively interconnect the straight edge member shown individually in FIGS. 13 and 14 with respect to the protractor base member in the manner shown in FIG. 12.

FIG. 16 is a fragmentary elevational view taken in the direction of the arrows 16—16 of FIG. 12 and illustrates one form of controllably operable locking means for locking the rotatable multiple template-carrying member of FIG. 15 with respect to the protractor base member.

More specifically, referring to FIGS. 1–5, one exemplary form of improved drafting machine of the present invention is indicated generally at 20 and comprises a T-square 21 including a head member 22 and a transverse member 23 fastened at its left end by suitable fastener means F in perpendicular relationship to the head member 22. In other words, the T-square 21 is similar to a conventional T-square and is adapted to engage a drawing board, one exemplary form of which is indicated generally at 24, in a conventional manner except for the engagement of the head member 22 with the left side edge 25, which will be explained in greater detail hereinafter.

The drafting machine, indicated generally at 20, also includes an attachment member, one exemplary form of which is indicated generally at 26, adapted to be adjustably and controllably removably carried by the right end of the transverse member 23 in a position such as to be adapted to engage the opposite side edge 27 of the drawing board 24, in a manner which will be explained in greater detail hereinafter.

In the specific example illustrated in FIGS. 1–5, the opposite parallel side edges 25 and 27 of the drafting board 24 are grooved by suitable longitudinal groove means, such as indicated at 28 and 29, respectively, and are adapted to slidably receive an inwardly directed projection 30 carried by the T-square head member 22 and an inwardly directed projection 31 carried by a movable projecting portion 32 of the attachment member 26, with said movable projecting portion 32 being biased by spring means 33 toward the grooved drafting board side edge 27, thus providing an arrangement whereby the left and right projections 30 and 31, respectively, resiliently slidably engage the corresponding grooves 28 and 29 carried by the opposed side edges 25 and 27 of the drafting board 24, whereby to resiliently frictionally position the entire drafting machine 20 in any selected vertical position with respect to the drawing surface 34 of the drafting board 24 and yet to do so in a manner such that the entire drawing board 24 may be picked up and moved about or reoriented in various different drawing positions without in any way disturbing or dislodging the drafting machine 20. This greatly facilitates the use of the drafting machine and portable drafting board under a great variety of use conditions.

Attachment member 26 consists of a main member 35 provided with aligned slots 36, two bracket-like members 37 which, together with the headed fastening screws 38, the washers 39, and the wing nuts 40 effectively comprise manually adjustable and controllably lockable engaging means for removably and interchangeably engag-

ing opposite edges of the transverse board-surface-engageable member 23 of the T-square 21 irrespective of the size and/or width thereof, within certain predetermined limits, in the manner best shown in FIGS. 1 and 3. The attachment member 26 also includes the previously mentioned projecting portion 32 having the inwardly directed projection 31, and includes guide rods 41, the biasing spring means 33, and fastening screw 43, which fastens the biasing spring means 33 in the mounted operative position best shown in FIGS. 3 and 5. It will be understood that the two bracket-like members 37 are adapted to be inserted through transverse slit means 44 in the base member 35 into a position such that the upwardly directed lips 45 at each end of each bracket member 37 extends upwardly on each side of the transverse board-surface-engageable member 23 of the T-square, where said bracket members 37 are controllably adjustably maintained by the threaded engagement of each of the fastening screws 38 with the corresponding wing nut 40. This provides an arrangement where, by loosening either or both the wing nuts 40, either or both of the bracket-like members 37 may be shifted along the corresponding slot 36 to provide a sufficient spacing between the bracket-like members 37 to allow insertion therebetween of the end of the transverse T-square member 23; it being understood that the bracket-like members 37 are pressed against opposite edges of the transverse T-square member 23 whereby to frictionally engage it, after which the appropriate wing nut 40 is (or wing nuts 40 are) tightened so as to firmly and yet controllably releasably fasten the attachment member 26 on the transverse T-square member 23 in the manner best shown in FIGS. 1, 3, and 5. It will be understood that the guide rod members 41 are mounted with portions 46 fixedly mounted in apertures 47 of the base member 35, with the longer portions thereof extending through the holes 48 in opposite ends of the projecting portion 32 and into fixed relationship within the holes 49 carried by the base member 35, whereby to slidably mount the projection or projecting portion 32 for movement toward and away from the board edge 27 under the action of the biasing spring 33, which is mounted by the fastening screw 43 extending through a looped portion 50 at the center of the spring and upwardly into a mounting block 51 carried at the bottom of the base member 35, with forward ends 52 of the biasing spring 33 engaging recesses 53 of the projection portion 32 whereby to bias same inwardly.

FIGS. 6–11 illustrate a protractor attachment means, which is adapted to be transversely slidably mounted on the transverse member 23 shown in FIG. 1, as illustrated in FIG. 11, said protractor attachment means being indicated generally in FIG. 11 by the reference numeral 54 and, in the specific example illustrated, comprising a protractor base member 55 provided with a plurality of template or stencil means 56 and rotatively mounting a straight edge member 57, with the protractor base member 55 being provided with fastening or attachment means, indicated generally at 58, for fastening same with respect to the transverse T-square member 23. In the specific example illustrated, the protractor base member 55 is preferably made of transparent plastic and may include a ruler and scale portion 59 along one edge, a slidably mounted template carrier member 60 slidably carried in a slot 61 and interiorly being provided with a plurality of templates T defining a variety of different shapes suitable for use in lettering, or the like, and with the protractor base member 55 including a portion having an undercut partially circular edge portion 62 and a retaining overlay portion 63 having a smaller effective diameter than the undercut edge 62 whereby to rotatively receive an oppositely bevelled edge portion 64 of a circular element 65 comprising the rotative pivot portion of the straight edge member 57; it being noted that the overlay portion 63, which is transparent, and the undercut edge 62 effectively engage therebetween the bevelled edge 64 in a manner effectively rotatably mounting the straight edge member 57 with respect to the protractor base member 55 so that it can be rotatively moved with respect thereto in the manner indicated in broken lines in FIGS. 6 and 11. It will be noted that the drawing straight edge portion 66 of the straight edge member 57 has an index extension portion 67 which is adapted to cooperate with the arcuate protractor angular scale means 68 carried by the arcuate overlay retaining portion 63 whereby to indicate the angular orientation of the straight edge member 57 with respect to the transverse T-square member 23, as shown in FIG. 11.

In the specific example illustrated in FIGS. 6–11, the fastening means 58 of the protractor attachment means 54 comprises a member 69 having two downwardly directed engaging pins 70 adapted to be removably received within corresponding holes 71 of the protractor base member 55. The member 69 also includes guide portions 72 having undercut edges 73 slidably retaining corresponding bevelled edges 74 of a slide panel 75, which is centrally slotted as indicated at 76 to permit the passage therethrough of an upwardly directed fastening screw 77, which has a knurled fastening nut 78 carried at its upper end, whereby to provide an arrangement allowing vertical sliding movement of the panel 75 in a manner such as to cause forcible engagement of a downwardly projecting lower lip 79, carried by the lower edge of the panel member 75, with one edge of the T-square transverse member 23, while the opposite edge thereof is abutted by the lower edge 80 of the protractor base member 55 whereby to either rigidly lock the entire protractor attachment means 54 on the T-square transverse member 23 or to transversely slidably position it thereon.

FIGS. 12–16 illustrate a slightly modified form of protractor attachment means, indicated generally by the reference numeral 54′, and portions of this modification similar to the form illustrated in FIGS. 6–11 are indicated by similar reference numerals, primed, however. In this modification, the straight edge member 57′ is rotatively connected with respect to the protractor base member 55′ in a manner different from that described and illustrated in the first form of protractor attachment means shown in FIGS. 6–11. In this modified form, the protractor base member 55′ rotatively mounts a multiple template-carrying member, indicated generally at 81, of substantially disc-like shape and having a bevelled edge 64′ generally similar to the bevelled edge 64 carried by the pivot portion 65 of the straight edge member 57 of the first form of the invention, as shown in FIGS. 7 and 8. It should be noted that the bevelled edge 64′ of the rotatable disc-like member 81 is mounted with respect to the base member 55′ in substantially the same manner as the mounting of the pivot portion 65 of the straight edge member 57 in the first form of protractor attachment means illustrated in FIGS. 6–11. However, in this modified form, the straight edge member 57′ is not integrally connected to the rotatable disc-like member 81, but is interconnected thereto by means of a pivot pin 82 which engages a central hole 83 and by means of a second pivot pin 84 adapted to engage any of a plurality of holes 85 whereby to allow manual movement of the straight edge member 57′ to effectively rotate the disc 81 into any selected position such as to locate any of the various drawing templates or stencils, indicated genarally at 86, in the proper location for drawing use. It will be noted that when this occurs, controllably operable locking means, indicated generally at 87, may be operated by pushing the resilient member 88 downwardly whereby to cause the locking pin 89 to engage any one of the locking holes 90 so as to effectively lock the rotatable disc-like member 81 in the selected position. It will readily be understood that the arcuately arranged rows of template means or stencils, indicated generally at 86, may be one, two, three or more in number and suitably concentrically arranged, and may com-

prise various lettering templates, numbering templates, and/or stencils of various sizes, or many comprise various electronic symbols, or the like. This is merely illustratively shown in FIG. 15, wherein one arcuate group of lettering templates or stencils is shown and a second concentrically located group of stencils or templates is indicated by a plurality of squares. This may be taken as a diagrammatic showing or may be considered as a showing of a plurality of apertures adapted to receive interchangeable individual template or stencil members therein.

It should be understood that the figures and the specific description thereof set forth in this application are for the purpose of illustrating the present invention and are not to be construed as limiting the present invention to the precise and detailed specific structure shown in the figures and specifically described hereinbefore. Rather, the real invention is intended to include substantially equivalent constructions embodying the basic teachings and inventive concept of the present invention.

I claim:

1. An improved drafting machine, comprising: a T-square for a rectangular drawing board having a top drawing surface and substantially parallel laterally spaced grooved side edges, said T-square including a side-edge-engaging head member provided with an inwardly directed projection adapted to slidably engage one grooved side edge of the drawing board and including longitudinal board-surface-engageable transverse member adapted to lie upon the top surface of the drawing board perpendicular to said side edges; an attachment member adjustably carried by said board-surface-engageable transverse member of the T-square laterally spaced from the T-square head member and having a side-edge-engaging member provided with an inwardly directed projecting portion adapted to slidably engage the other grooved side edge of the drawing board in opposition to said head member whereby to firmly retain the T-square on the top surface of the drawing board in a manner controllably allowing it to be moved in a direction parallel to the side edges of the drawing board, said inwardly directed projecting portion of said attachment member being resiliently inwardly biased whereby to allow it to be forcibly resiliently engaged and disengaged with respect to an adjacent grooved side edge of the drawing board to facilitate removal and re-engagement of the entire T-square and attachment member with respect to the drawing board, said atachment member including manually adjustable and controllably lockable engaging means for removably and interchangeably engaging opposite edges of board-surface-engageable transverse members of different-sized T-squares; and protractor attachment means for transversely slidable and controllably lockable and removable attachment to the board-surface-engageable transverse member of the T-square and including a protractor base member having a flat bottom surface engageable with the top surface of the drawing board, said protractor base member being provided with a straight edge member having a flat bottom surface engageable with said top surface of said drawing board and being further provided with rotative mounting means effectively rotatively mounting a rear end of said straight edge member within said protractor base member, with one of said members being provided with protractor angular scale means arcuately arranged and with the other of said members being provided with an index part arcuately movably cooperable with the protractor angular scale means for indicating the angular orientation of the board-surface-engageable straight edge means with respect to the board-surface-engageable transverse member of the T-square; said rotative mounting means for rotatably mounting said board-surface-engageable straight edge member comprising a multiple template-carrying member provided with multiple board-surface-engageable templates and having a flat bottom surface engageable with said top surface of said drawing board and means carried by said board-surface-engageable protractor base member for rotatably mounting said multiple template-carrying member for rotation of its bottom surface in the same plane as the bottom surfaces of said protractor base member and said straight edge member immediately above the top surface of said drawing board, said multiple template-carrying member being provided with pivot pin means rotatively provided with and carrying a coupling member connected to said board-surface-engageable straight edge member for rotatably mounting said straight edge member with respect to said board-surface-engageable multiple template-carrying member and with respect to said board-surface-engageable protractor base member.

2. Apparatus of the character defined in claim 1 wherein said rotatable board-surface-engageable multiple template-carrying member includes a plurality of concentrically arranged groups of drafting templates each having a bottom board-engageable surface lying in the common bottom plane of said protractor base member, said multiple template-carrying member, and said straight edge member.

3. Apparatus of the character defined in claim 2 wherein said coupling member attached to said board-surface-engageable straight edge member and said rotatable board-surface-engageable multiple template-carrying member are provided with controllably engageable projection-abutment means positioned for forced abutment during manual rotation of said board-surface-engageable straight edge member whereby said manual rotation will controllably rotate said board-surface-engageable multiple template-carrying member with respect to said board-surface-engageable protractor base member.

4. Apparatus of the character defined in claim 3 including controllably disengageable downwardly spring-biased locking pin means carried by the upper surface of said protractor base member and multiple receiving aperture means annularly carried by said rotatable multiple template-carrying member for locking receiving cooperation with respect to said locking pin means in any of a plurality of circularly adjusted positions of said rotatable multiple template-carrying member with respect to said protractor base member.

5. An improved drafting attachment for a T-square comprising: a protractor attachment means for transversely slidable and controllable lockable attachment to the board-surface-engageable transverse member of a T-square and including a flat protractor base member having a flat bottom surface engageable with the flat top surface of a drawing board, said board-surface-engageable protractor base member being provided with a straight edge member having a flat bottom surface engageable with said top surface of said drawing board and being further provided with rotative mounting means effectively rotatively mounting a rear end of said straight edge member within said protractor base member, with one of said members being provided with protractor angular scale means arcuately arranged and with the other of said members being provided with an index part arcuately movably cooperable with the protractor angular scale means for indicating the angular orientation of the board-surface-engageable straight edge means with respect to the board-surface-engageable transverse member of the T-square; said rotative mounting means for rotatably mounting said board-surface-engageable straight edge member comprising a multiple template-carrying member provided with multiple board-surface-engageable templates and having a flat bottom surface engageable with said top surface of said drawing board and means carried by said board-surface-engageable protractor base member for rotatably mounting said multiple template-carrying member for rotation of its bottom surface in the same plane as the bottom surfaces of said protractor base member and said straight edge member immediately above the top surface of said drawing board, said multiple template-carrying member being provided with pivot pin means rotatively provided

with and carrying a coupling member connected to said board-surface-engageable straight edge member for rotatably mounting said straight edge member with respect to said board-surface-engageable multiple template-carrying member and with respect to said board-surface-engageable protractor base member.

6. Apparatus of the character defined in claim 5 wherein said rotatable board-surface-engageable multiple template-carrying member includes a plurality of concentrically arranged groups of drafting templates each having a bottom board-engageable surface lying in the common bottom plane of said protractor base member, said multiple template-carrying member, and said straight edge member.

7. Apparatus of the character defined in claim 5 wherein said coupling member attached to said board-surface-engageable straight edge member and said rotatable board-surface-engageable multiple template-carrying member are provided with controllably engageable projection-abutment means positioned for forced abutment during manual rotation of said board-surface-engageable straight edge member whereby said manual rotation will controllably rotate said board-surface-engageable multiple template-carrying member with respect to said board-surface-engageable protractor base member.

8. Apparatus of the character defined in claim 5 including controllably disengageable downwardly spring-biased locking pin means carried by the upper surface of said protractor base member and multiple receiving aperture means annularly carried by said rotatable multiple template-carrying member for locking receiving cooperation with respect to said locking pin means in any of a plurality of circularly adjusted positions of said rotatable multiple template-carrying member with respect to said protractor base member.

References Cited in the file of this patent

UNITED STATES PATENTS

1,383,492	Seely	July 5, 1921
1,414,002	Turner et al.	Apr. 25, 1922
1,672,751	Conti	June 5, 1928
2,909,843	Bechtel	Oct. 27, 1959
2,954,609	Goertz	Oct. 4, 1960

FOREIGN PATENTS

168,495	Austria	June 11, 1951