March 15, 1932. D. F. LARKIN 1,849,493

DRAWING BOARD

Filed Feb. 16, 1928

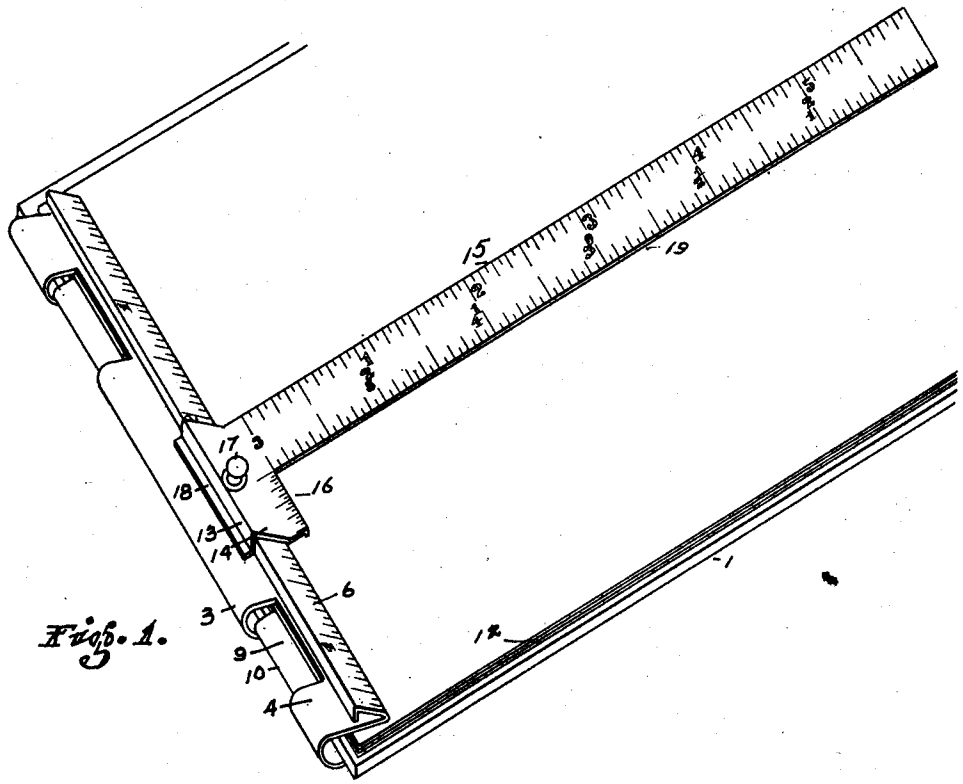


Fig. 1.

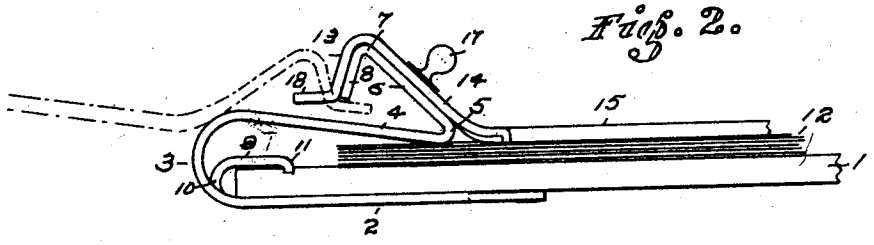


Fig. 2.

Fig. 3.

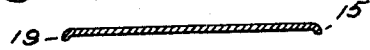
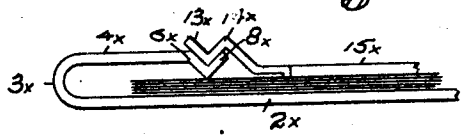


Fig. 4.



Dennis F. Larkin INVENTOR

BY Baldwin Dale

ATTORNEY

Patented Mar. 15, 1932

1,849,493

UNITED STATES PATENT OFFICE

DENNIS F. LARKIN, OF SAN FRANCISCO, CALIFORNIA

DRAWING BOARD

Application filed February 16, 1928. Serial No. 254,739.

This invention relates to improvements in drafting apparatus and more particularly to a combined drawing board, paper holder, straight edge graduated T square, etc.

Among the objects of the invention are to provide a simplified combination of the instruments above enumerated so constructed combined and arranged that the straight edge of guide member will also act as a paper clamp for holding the drawing paper on the drawing board. The guide member and the T square are of such construction and arrangement that the angular straight edge will guide the T square in laying off lines horizontal to the straight edge; and also so formed and arranged that the T square may be used as a lever in prying open the paper holding clamp in inserting or removing the drawing paper from the drawing board. Other objects and advantages will appear as this description progresses.

In this specification and the accompanying one sheet of drawings, the invention is shown in the form considered the best but I do not wish to be understood as confining it to this form because it may be embodied in other forms, and it is also to be understood that in and by the claims following the description it is desired to cover the invention in whatsoever form it may be embodied.

In the drawings, Fig. 1 is an isometrical perspective from above of a drafting apparatus constructed in accordance with this invention, parts of the drawing board being omitted for obvious reasons. Fig. 2 is an enlarged detail in side elevation, illustrating the combination and arrangement of the various parts of the structure, the dotted lines showing the double use of the T square when used as a pry for opening the paper clamp. Fig. 3 is a transverse section of the blade of the T square. Fig. 4, is a simplified modification of the invention in which the lower jaw of the clamp serves as the drawing board.

In detail the construction illustrated in the drawings comprises, a drawing board of any desired dimension, although the invention is illustrated primarily for small portable drafting outfits. Heavy chip board or light veneer board is very suitable for the drawing board 1. The combined paper holder and straight edge guide is preferably formed of a single strip of sheet metal 2 to form the clamp under jaw lying beneath the lateral edge of the drawing board 1, around which edge it is curled as at 3 and extends forward to form the upper clamp jaw 4. At the point 5 it is bent upwardly and rearwardly to form the plane 6, preferably at an angle of about 45 degrees. It is again bent at 7 to form the downwardly extended diverging plane 8, at an angle of about 30 degrees from the plane 6. At intervals the attaching lugs 9, are cut from the body of the plate 2 and curled inward thereover as at 10, and are crimped on to the lateral margin of the drawing board to securely attach the plate 2 thereto. To insure the permanence of this attachment, the inner ends of these lugs 9 may be flanged downwardly as at 11 and forced into the body of the board 1. Punching out these lugs 9 at intervals has the double advantage of providing the lugs 9 for attaching the clamp to the board 1 and also weakens the tensile strength of the curled portion 3, making it more easy to open the clip for the insertion or removal of the drawing paper 12, resting upon the table 1 and held in position by the spring action of the clamp where its bent portion 5 bears upon the topmost sheet 12.

The diverging angles of the plates 6 and 8, being parallel with the lateral edge of the drawing board 1, forms a straight edge or guide for the T square. The T square has a head formed of the plates 13 and 14 bent at the same angles and adapted to fit snugly over and slidably engage the plates 6 and 8, the plane 14 extending downwardly to contact with the paper 12 held beneath the clamp 5. The angular head of the T square has an integral, laterally extending blade 15, extending at 90 degrees to the straight edge guide 6—8. For lateral stability the length of the head of the T square is about double the width of the blade 15, the lower extension of the head presenting the edge 16, 90 degrees to the edge 15 of the blade and parallel with the said straight edge.

For convenience in handling the T square

the head is provided with the peg-like handle 17 riveted through the plate 14 of the head, whereby the T square may be very conveniently handled in placing it upon the straight edge and sliding it back and forth thereon.

The head of the T square is also provided with an angular lateral flange 18 extending at an angle to the plane 13. In springing the paper clamp open this extension 18 is extended under the edge of the plane 8 and above the jaw 4, so that the plane 14 of the head of the T square lies against the bend 3 of the paper holder, see dotted lines Fig. 2. When in this position downward pressure on the blade 15 of the T square, using the bent portion 3 as a fulcrum, tends to pry open the clamp to lift the edge 5 from the surface of the paper 12, so that paper sheets may be very easily inserted or removed from between the top of the drawing board 1 and the clamping edge 5. By thus utilizing the leverage of the T square as described, it is possible to make use of a stronger spring tension in the curled edge 3 to accomplish a stronger clamping action against the paper 12 at 5.

For convenience in laying off any drafting on the paper 12, the length of the T square blade is graduated from the left from zero in inches throughout the length of the blade, with each inch further graduated into equal dimensions as is common to measuring rules. As a further convenience these numerical divisions are reversed on the lower edge 19 of the blade, extending from zero at the right to the last dimension terminating at the edge 16. A further convenience is combined with the blade of the T square by laying off a scale beginning at zero in the center of the T square and extending numerically from one to the last dimension on both sides of the center from the edge 16 to the end of the T square blade. Obviously any system of graduation of inches, meters or the like may be scaled on the T square.

The plane 6 of the straight edge is also divided into inches or any other desired graduation, for convenience in spacing lines horizontal to the straight edge. Smaller graduations than those on the plane 6 may be placed along the edge 16, for very fine measurements. The sheet metal parts forming the combined straight edge and paper clamp and T square are blanked out and formed from sheet metal between forming dies in the usual manner.

Straddling the angular head of the T square down on the angular plates 6 and 8 of the guide tends to hold the T square in very rigid relation to the straight edge by a very slight downward pressure on the handle 17. This form of guide is much more dependable than the usual form of T square in which the head of the square bears against the edge of the drawing board. Such an engagement would be unreliable in an apparatus of this character where the light weight of the T square would tend to cause it to be very easily displaced, unless a very firm pressure to the right is constantly maintained on the head of the T square. By the present angular engagement of the head of the T square with the guide, greater lateral stability and accuracy can be maintained with a very short head on the T square. A further advantage is that the head of the T square extends entirely above the plane of the blade 15 so that it can be used as a straight edge in drawing lines at any desired angle across the plane of the drawing paper, by merely lifting the head of the T square off the guide. The head of the T square in no way interferes with such use of the blade 15, as would be the case if the plane 13 of the head extended below the plane of the blade 15. When the T square is used independently of the guide, the angle between the edges 16 and 19 is also useful in determining 90 degree angles in drafting operations.

In cutting sheet metal in dies as in forming the T square, the edges cut by even the most accurate and sharp dies, leave the sheared edge of the T square rough along the edges 15 and 19. It is desirable, therefore, to flange these edges downward as suggested in Fig. 3, thus presenting a smooth plane along the edges 15 and 19 against which the pencil of the draftsman may be guided without wearing away the pencil and causing a deposit of graphite dust on the surface of the drawing paper, with obvious disadvantages.

A light, compact, simple and cheaply produced drawing apparatus such as shown and described is particularly applicable to the demands of school students, surveyors, field engineers, tool makers, and similar vocations requiring small portable accurate apparatus. The guide being independent of the lateral edge of the drawing board 1, precision between the straight edge and the T square is always maintained. If a central line is drawn along the edge 5 before the drafting operation is started it is always possible then to remove and restore the work sheet under this edge 5 as often as desired, accuracy being maintained by alining this pencil line with the edge 5 each time the sheet is restored thereunder.

To avoid the necessity of using "angles" against the edge 15 of the T square, a second straight edge clamp may be clamped on any of the other edges of the drawing board at 90°, or any desired angle to the first described straight edge guide. In this instance the lugs 9 need not be countersunk into the surface of the drawing board, if it is desired to remove this second clamp.

The designation "T square" is used for identification of this well known instrument, as a matter of fact it need not be a T shape

but may be any desired modification, such as an L head as shown.

Although not so attractive in appearance, the guide clamp and T square head may be modified as shown in Fig. 4. In this modification the angle of the guide is reversed. The planes $6x$—$8x$ are reversed so that the angular head $13x$—$14x$ of the T square rests within the guide. The mode of operation is substantially the same, but the structure can be more cheaply formed.

In the smaller dimensions the board 1, may be dispensed with by extending the underplate $2x$ of the clamp, as in Fig. 4.

Having thus described this invention, what I claim and desire to secure by Letters Patent is:

1. A drafting apparatus comprising an integral strip of spring material bent back upon itself to form a resilient clamp adapted to overhang the edge of a board; lugs struck from the body of said material and adapted to be fixed to said board, an angular longitudinal guide formed in said clamp above said board and a T square having a head formed to slidably engage said guide.

2. A drafting apparatus comprising a strip of sheet metal bent back upon itself to form a resilient clamp, an angular guide formed by bending back one edge of said clamp then flanging it downward; and a T square having an angular head adapted to slidably engage said guide and having an outward extension formed on said head and adapted to be inserted under said guide to open said clamp.

3. A drafting apparatus comprising a strip of sheet metal bent back upon itself longitudinally to form a resilient clamp, one of the jaws of said clamp adapted to extend under a drafting board and the other jaw being bent back to form an angular guide above said clamp; and a T square having an angular head adapted to slidably engage said guide.

4. A drawing board comprising a sheet metal plate having one of its edges bent over to form a resilient clamp to hold paper on said plate, a V shaped guide formed on the end of said bent over portion, the point thereof adapted to clamp the paper on said board, and a T square having a V shaped head adapted to slidably engage and fit said guide and said paper.

5. A drafting apparatus comprising a strip of sheet metal bent back upon itself longitudinally to form a resilient clamp having an angular guide integral therewith, and a T-square having an angular head adapted to rest on and fit said guide.

6. A drafting apparatus in combination with a drafting board, a strip of sheet metal underlying said board and bent around the edge thereof to form a resilient clamp, the upper jaw of said clamp being formed into an angular guide above the plane of said board, and a T square having a raised angular head adapted to slidably fit said guide.

7. A drafting apparatus comprising a strip of sheet metal bent back upon itself longitudinally to form a resilient clamp, one of the jaws of said clamp being formed into an angular guide inclined from the perpendicular, and a T square having an angular head adapted to slidably fit said guide.

In testimony whereof I have hereunto affixed my signature.

DENNIS F. LARKIN.