C. B. ULRICH.

DRAWING BOARD STRUCTURE.

APPLICATION FILED FEB. 11, 1911. RENEWED MAR. 9, 1912.

1,113,263.

Patented Oct. 13, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

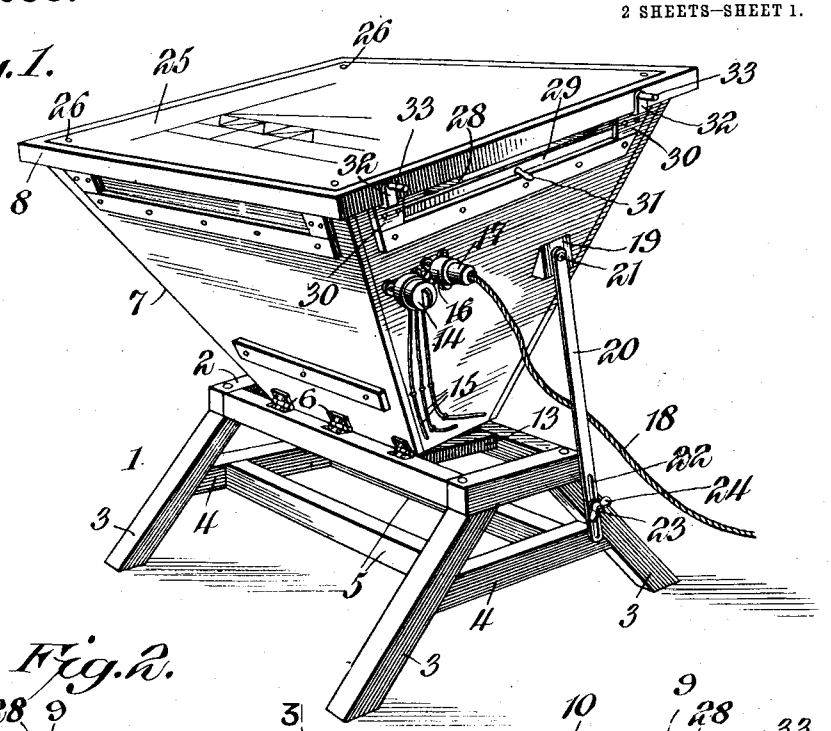
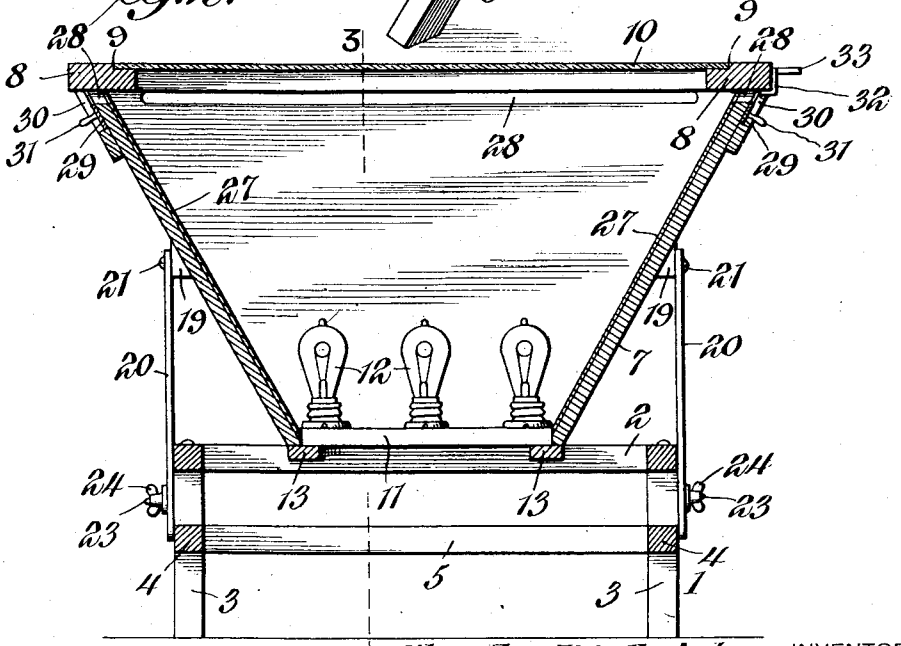


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

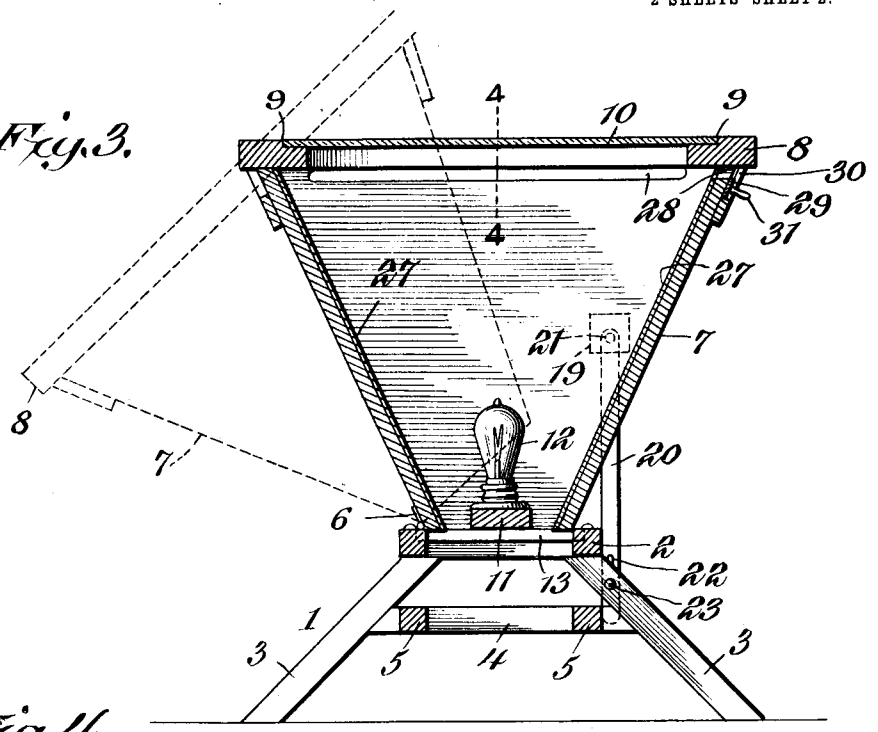


Fig. 4.

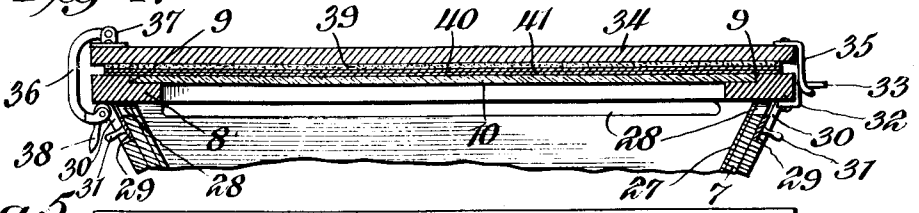
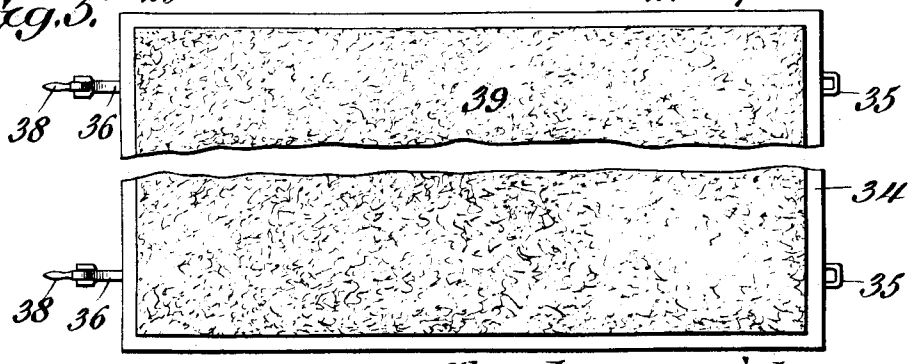


Fig. 5.



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UNITED STATES PATENT OFFICE.

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DRAWING-BOARD STRUCTURE.

1,113,263. Specification of Letters Patent. Patented Oct. 13, 1914.

Application filed February 11, 1911, Serial No. 608,059. Renewed March 9, 1912. Serial No. 682,757.

To all whom it may concern:

Be it known that I, CHARLES B. ULRICH, a citizen of the United States, residing at Hancock, in the county of Houghton and State of Michigan, have invented a new and useful Drawing-Board Structure, of which the following is a specification.

This invention has reference to improvements in drafting boards and is designed particularly for use by draftsmen, whereby drawing paper may be conveniently held in place, tracings may be readily made, the drawing ink may be caused to rapidly dry, and photographic prints, usually blue prints, may be made without change in the structure. For this purpose there is provided a stand having a sufficiently broad footing to render it stable, and mounted on this stand there is a box-like structure having a transparent top with a marginal frame, whereby drawing paper or tracing cloth may be readily attached and light may be produced within the box to shine through the transparent top to facilitate the making of tracings, while provision is made both for the ventilating of the box and for the utilization of the heat of the light elements to cause the drying of the ink used when such is desired. Furthermore, a presser board is provided, whereby the light emanating from the light producing elements in the box may be employed for the making of blue prints or other photographic prints.

The invention will be best understood from a consideration of the following detailed description, taken in connection with the accompanying drawings forming a part of this specification, with the understanding, however, that while the showing of the drawings is that of a practical embodiment of the invention, the latter is susceptible of other practical embodiments, and, therefore, is not limited to the exact showing of the drawings.

In the drawings:—Figure 1 is a perspective view of the improved drafting board structure showing the light box in a partially tilted position. Fig. 2 is a longitudinal central vertical section of the drafting board structure. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is a section on the line 4—4 of Fig. 3, showing the presser board for blue printing in place. Fig. 5 is a bottom plan view of the presser board, the figure being broken longitudinally.

Referring to the drawings, there is shown a stand 1 which may be formed of a rectangular open frame 2 provided at each end with divergent legs 3 stiffened by connecting braces 4, and these latter are connected by longitudinal strips 5 also constituting braces, the stand being of comparatively little height but of sufficient basic extent to be very stable.

Connected to one of the longitudinal members of the frame 2, the latter being longer than wide, by hinges 6, is a box 7 of inverted frusto-pyramidal form, although the particular form is not mandatory. The box is open at its lower end, that is the end hinged to the stand 1, and at the upper end is provided with a rectangular frame 8 provided with a rabbet 9 about its inner edge for the reception of a sheet 10, preferably of plate glass, but this plate may be made of other transparent or translucent material.

At the smaller, lower end of the box 7 there is provided a strip 11 upon which may be mounted light giving elements 12 conventionally shown as ordinary incandescent electric lamps, but, of course, it will be understood that this showing is simply indicative, since in the practical embodiment of the invention either tungsten or mercury electric lamps are to be preferred, the mercury lamps having the highest actinic value, and consequently best adapted for the production of blue prints in the manner which will hereinafter appear, while where the cost of the structure is to be considered tungsten will answer, though a longer exposure is needed for blue printing. However, the invention is not limited to any particular type of light giving element. The lower end of the box 7 may be in part supported on cross pieces 13 mounted in the frame 2, and these cross pieces may also support the strip 11 carrying the lamps 12.

Secured on one end of the box 7 is an electric switch 14 from which extend conductors 15 to the several lamps, and this switch may be interposed between the lamps and a socket 16 designed to receive a terminal plug 17 at one end of a flexible conductor 18 which may be connected to a power circuit.

In order that the box 7 may be tipped on the hinges 6 and held in any desired position of adjustment, blocks 19 are made fast to the ends of the box exterior thereto, and each block carries a link 20 by means of a pivot bolt 21, while the end of the link 20 remote from the pivot bolt is slotted, as indi-

cated at 22 for the passage of a screw stud 23 projecting from the corresponding end of the frame 1, and this stud is provided with a wing nut 24 by means of which the link 20 may be clamped in any position of adjustment to hold the box 7 in any desired degree of tilting.

While two links 20 are shown, it will be understood that unless the structure be heavy a single link will answer, since the hinges 6 form an extended connection with the basic member 1.

The outer or exposed edge of the glass plate 10 is in the same plane as the outer surface of the frame 8, and there is therefore provided a plane surface for the reception of drawing paper, a sheet of which is indicated at 25 in Fig. 1, while the frame 8 may be made of some suitable soft wood adapted for the ready reception of thumb tacks 26, whereby the paper sheet 25 or a sheet of tracing cloth or paper may be held to the glass plate 10. The frame 8 and the glass plate 10 constitute a drawing board of appropriate size with a transparent working area, and when the lamps 12 are caused to emit light, this light will traverse the glass plate 10 and the sheet 25, whether the latter be of drawing or tracing paper or tracing cloth.

In order that the light may be diffused where passing through the glass plate 10, the inner walls of the box may be provided with a lining 27 of light diffusing material, a lining of magnesium or other such white material, or white paint, or any suitable light reflecting material may be used. The diffusion of the light may be brought about even more effectively by having the glass plate 10 provided with a ground surface.

The lamps 12, of course, emit heat as well as light, and in order that the glass plate 10 may not become unduly heated the sides of the box 7, except that side adjacent the operator, are provided with elongated passages 28 immediately beneath the corresponding portions of the frame 8. By this means there is produced a draft through the open lower end of the box 7 and the heated air escapes through the openings 28. It is advisable at times to provide for a heating of the plate 10 whereby ink being used in the making of the drawing will dry more rapidly than it would if the plate were not heated. For this purpose the openings 28 may be partially or wholly closed, and in order that this may be done, slides 29 are provided mounted in guides 30 fast to the corresponding side portions of the box 7 and knobs or handles 31 in the slides facilitate the adjustment thereof. By making these slides to fit with sufficient snugness in their guides, they will remain in the position to which they may be moved.

By means of the heat generated by the lamps as controlled by the slides 29, the ink on a drawing may be made to dry almost as rapidly as it is placed on the drawing material and the making of the drawing is to this extent facilitated.

When it is desired to make tracings, the drawing or print is first placed upon the glass plate 10 and then the material on which the tracing is to be made is placed in overlying relation to the pattern and both are suitably fastened on the frame 8, or if too small to be secured to the frame 8, may be held to the glass plate either by weights or by suction fastening devices, and when the lamps 12 are energized the light traversing the pattern and the tracing material will bring the pattern into brilliant view. The practical embodiment of the invention has demonstrated that the finest lines on a blue print are readily visible and easily traceable.

The device is also practically adaptable for the making of blue prints, and for this purpose one end of the frame 8 has secured thereto spaced brackets 32 from each of which projects a pin 33, and there is also provided a presser board 34 of the same or approximately the same area as the top of the drawing board structure as defined by the frame 8, and the glass sheet 10. This board has fast thereto at one edge loops or eyes 35 adapted to engage the pins 33. The end of the presser board 34 remote from the loops or eyes 35 is provided with swingable arms 36, which are so bent that when pivoted in brackets 37 at the corresponding end of the presser board the free ends of these arms may be moved into underriding relation to the corresponding portion of the frame 8, and these free ends are provided with cam levers 38 designed to engage the under side of the corresponding portion of the frame 8 to lock the presser board 34 in clamping relation to the frame 8. The engaging face of the presser board 34 is covered with a pad 39 of felt or other suitable material which will compress a sheet of blue print or other photographic paper against a tracing or sheet of drawing on the drawing board in such manner that the printing paper is held in engagement with the drawing at all points and will be subject to the effect of light emitted from the lamps 12 and a blue print or other photographic print may be made by suitable exposure to the light of the lamps 12 and the subsequent developing operations incident to the making of such prints. In Fig. 4 the sheet of photographic paper is indicated at 40 in overlying relation to a sheet 41 upon which it is assumed the drawing to be copied has been made.

By making the presser board 34 of suitable material it may be utilized for drawing purposes when secured in position on the

drawing board structure, especially where it is not desired that light or heat be transmitted through the drawing being made.

The drawing board proper composed of the frame 8 and plate 10 is when level of a height convenient to the person using it when standing, but sometimes the user desires to have the drawing surface at a slant, in which case the box 7 is turned on the hinges 6 and secured by the thumb nut or nuts 24 in such slanting position. In either case the recession of that side of the box 7 toward the operator provides ample knee room, so that the shape of the box contributes not only to the reflection of the light from the lamps through the transparent or translucent surface, but to the convenience of the user.

By providing the divergent legs at opposite ends of an extended supporting frame, there is formed a stable support for the light box and drafting surface and the brace bar 5 on the side of the frame toward the operator constitutes a convenient rest for the foot of the operator when standing.

What is claimed is:—

1. A drafting structure comprising a basic member having an extended top portion, a light-box hinged at one edge of one end to one edge of the top portion of the basic member, said box being provided with a light transmitting working surface at the end thereof remote from that hinged to the basic member, light producing means lodged within the box for producing light to be transmitted through the working surface, and holding means between the box and the basic member for holding said box with its working surface level or inclined at will.

2. A drafting structure comprising a suitable support, a light box mounted thereon and open at the end carried by the support, said light box being provided with a light transmitting working surface and with ventilating passages adjacent said surface, and light producing means lodged within the box near the open end thereof.

3. A drafting structure comprising a suitable support, an inverted frusto-pyramidal light box thereon open at the smaller end and provided at the larger end with a light transmitting working surface and with ventilating passages adjacent such surface, and light emitting means within the box adjacent the open end thereof.

4. A drafting structure comprising a basic member, a frusto-pyramidal light box hinged at the smaller end to the basic member and at the larger end provided with a light transmitting working surface, and adjustable holding means between the basic member and the box for holding said box with its working surface level or tilted, as desired.

5. A drafting structure comprising a basic member, a frusto-pyramidal light box having its larger end provided with a light transmitting working surface, hinge connections between one side of the small end of the box and the basic member, adjustable holding means between the basic member and the box for maintaining the box with its surface level or inclined, as desired, and light emitting means within the box at the smaller end thereof.

6. A drafting structure comprising a basic member, a frusto-pyramidal light box having its smaller end open and its larger end provided with a light transmitting working surface, and with ventilating openings adjacent said surface, hinge connections between one side of the small end of the box and the basic member, adjustable holding means between the basic member and the box for maintaining the box with its surface level or inclined as desired, and electric lamps within the box at the small end thereof.

7. A drafting structure including a light box open at one end and at the other end provided with a light transmitting working surface, said box being also provided with ventilating openings adjacent the working surface and with means for closing the ventilating openings to any desired extent.

8. A drafting structure comprising a basic member, a frusto-pyramidal light box at the larger end having a light transmitting working surface, hinge connections between one edge of the smaller end of the box and the basic member, link connections between the box and the basic member, said links having elongated slots and the basic member being provided with clamp screws traversing the slots for the holding of the box with its surface level or tilted at will, and electric lamps within the box at the smaller end thereof.

9. A drafting structure comprising a supporting frame having divergent legs at opposite ends, a frusto-pyramidal light box having the smaller end open and the larger end closed by a light transmitting member forming part of the working surface of the structure, the box also having ventilating openings adjacent the working surface, movable cut off members for closing the ventilating openings to any desired extent and carried by the box, electric lamps carried by the smaller end of the box, the said box having its inner walls covered with light diffusing material, hinge connections between one side of the smaller end of the box and one side of the supporting frame, and adjustable holding means between the box and the supporting frame for holding said box with its working surface level or inclined at will.

10. In a drafting table of the class de-

scribed, the combination of a base, a light transmitting table top, a light box under the table top, a light producing means centrally disposed within the lower end of the box to uniformly illuminate the said light transmitting table top, and a ventilating opening in said light box immediately adjacent said light producing means, substantially as described.

11. In a drafting table of the class described, the combination of a base, a light transmitting table top, a light box of symmetrical pyramidal shape under the table top, a light producing means centrally located in the lower end of the light box to illuminate said light transmitting table top, a ventilating opening in said box adjacent said light producing means, and a ventilating opening in said light box adjacent the table top, thus permitting the circulation of air through said first mentioned ventilating opening up through the light box and out through the other ventilating opening, substantially as described.

12. In a drafting table of the class described, the combination of a base, a light transmitting table top, a light box of substantially symmetrical pyramidal shape under said table top, the inner walls of which have a light diffusing surface, and a light producing means centrally located within the lower end of said light box to illuminate the said light transmitting table top.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

CHARLES B. ULRICH.

Witnesses:

PEARL KENDALL,

DANIEL FISHER.