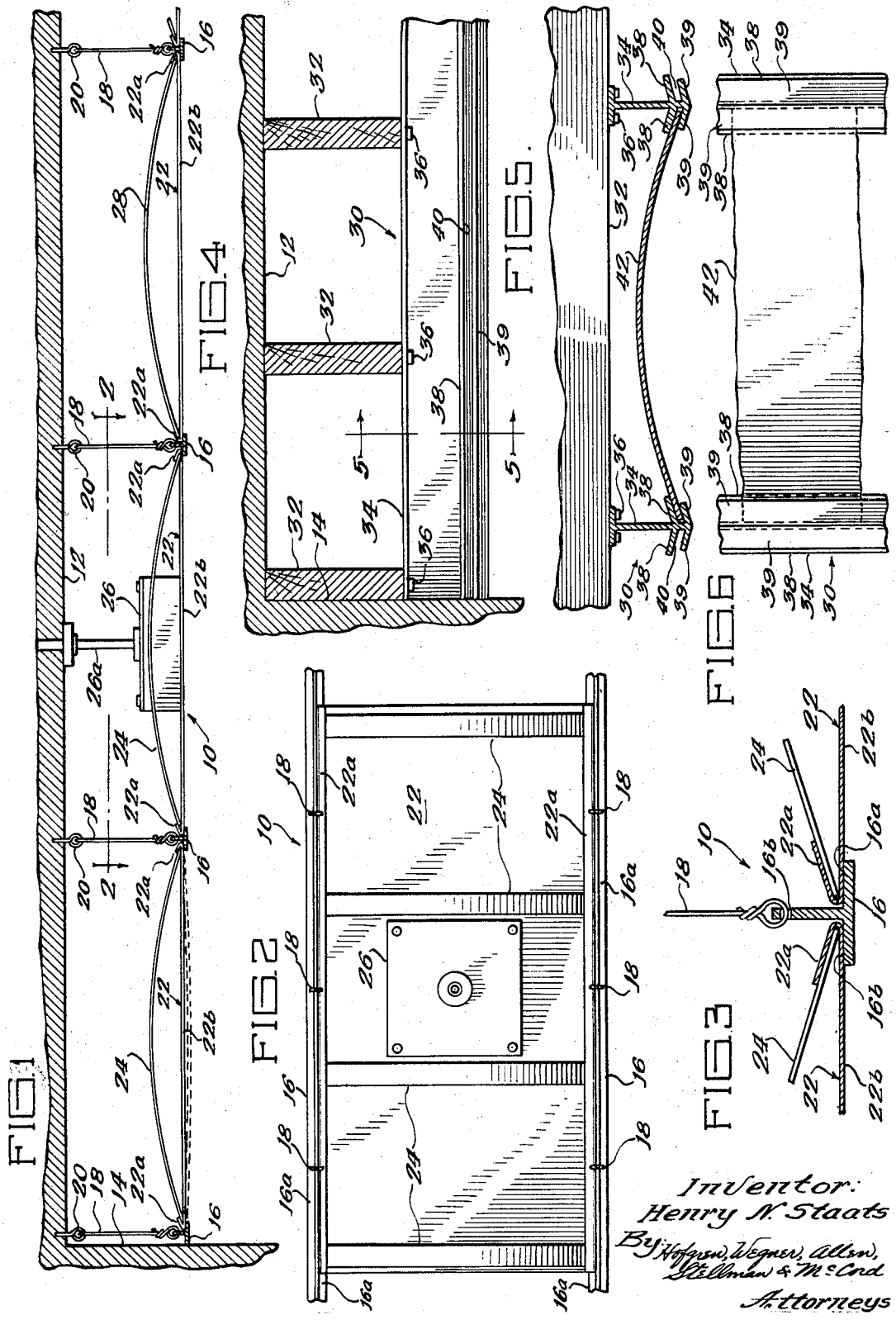
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CEILING PANEL CONSTRUCTION WITH TENSIONING MEANS

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CEILING PANEL CONSTRUCTION WITH TENSIONING MEANS

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ABSTRACT OF THE DISCLOSURE

A ceiling panel construction including mounting beams extending outwardly from a wall surface having laterally extending supporting edges and flexible panels resting on said supporting edges and stiffened by tensioning members which span the panels.

This invention relates to a panel construction for covering wall-like surfaces.

The common practice in the construction art today is the provision of false or suspended ceiling either to mask and/or lower extremely high and perhaps unsightly older ceilings or to mask heating ducts, light fixtures, wiring and the like, suspended from ceilings in new construction. One common form of ceiling suspension is the utilization of a light-weight, grid-like, framework suspended from the existing ceiling by wires, cables, or the like. Panels having peripheral lips are simply thrust into the framework and are held therein with the lips of the panels resting upon flanges formed on the beams of the grid-like framework. However, in present practice, the size and material of the panels is limited. The panels must be formed of relatively rigid materials capable of supporting their own weight and usually not greater in dimension than two feet by four feet.

It is therefore a primary object of this invention to provide a new and improved panel construction for ceilings.

Still another object of this invention is to provide a new and improved panel construction for ceilings which permits the use of panels of increased size, thereby reducing the amount and cost of labor and supporting material involved in installing such a ceiling.

Yet another object of this invention is to provide a new and improved panel construction for ceilings which may also perform the function of serving as a supplementary duct or conduit for carrying ventilating components, light fixtures, or electrical wiring or the like.

A further object of this invention is to provide a new and improved panel construction for ceilings permitting the use of extremely thin panel material and further permitting the use of materials previously considered unsuitable for use as ceiling panels.

Other objects, features and advantages of the present invention will be apparent from the following description of the preferred embodiments illustrated in the accompanying drawings, in which:

FIGURE 1 is a sectional view showing the ceiling panel units of this invention positioned on beam members suspended from a ceiling;

FIGURE 2 is a top plan view of the panel unit shown in FIGURE 1;

FIGURE 3 is a fragmentary enlarged section view showing the connection of a beam member to its supporting cable and the connection between the tensioning members and the panel members;

FIGURE 4 is a section view of a modified embodiment of this invention;

FIGURE 5 is a section view taken along the line 5—5 of FIGURE 4; and

FIGURE 6 is a bottom plan view of the panel unit shown in FIGURES 4 and 5.

Referring now to the drawings, the panel construction **10** of this invention is intended for use in suspension from a ceiling **12** to create a false or suspended ceiling between the walls **14** of a structure. To assist in holding the panel construction of this invention, a plurality of generally T-shaped, light-weight beams **16** having panel supporting surfaces or flanges **16***a* are suspended substantially parallel to each other from the ceiling **12** by means of a wire or cable **18** which is tied at one end through an opening **16***b* in the beam and is secured at the other end to a hook **20** fastened in the ceiling **12**.

The panel construction **10** of this invention includes a main ceiling panel **22** which is a substantially flat, rectangular, elongate member. The material used in forming the panel **22** may be one of several common building materials such as wood laminates, aluminum, many well-known fibrous acoustical materials, plastics, pressed paperboard products or the like. Depending upon the intended function of the panel, it may be opaque, transparent, or translucent and may be decorated with a pattern which may be printed or embossed thereon. The panel is preferably relatively thin so that it normally would sag or would be unable to support its own weight (as shown in dotted outline in FIGURE 1) if inserted between the beams.

The panel **22** is provided with locking means such as small inwardly returned lips **22***a* formed along the two parallel long side edges of the panel, preferably by merely bending the panel edges inwardly upon the panel. The width of the panel between the lips is slightly less than the interior dimension between the beams **16**. The lips **22***a* provide a means for engaging a tensioning member or bowing member **24**.

The tensioning member may be a flat sheet of relatively inexpensive material such as galvanized steel or the like and preferably has a width which is greater than the width of the panel. The tensioning member may be very short as compared to the length of the panel or may be coextensive in length therewith.

When the tensioning members are mounted to the panels so that each end is positioned under the lips **22***a* of the panel, the increased dimension of the tensioning members forces the flat face **22***b* of the panel into a relatively rigid, substantially smooth configuration to strengthen the panels across the width thereof. This not only gives a smooth facial configuration to the panels, but it also permits the panels to be securely held between the beams merely by placing the panels so that the panel edges rest upon the flanges **16***a*. For convenience, the tensioning members **24** may be installed in the panel members **22** prior to the installation of the panels between the beams **16**. After the tensioning member is inserted in the panel, the panel may be substantially flat across the bottom (as shown in the drawings) or slightly bowed. In either event, the insertion of the tensioning member will lend sufficient rigidity to the panel so that it may be supported in the manner illustrated.

The installation of these panel units is relatively simple. All that need to be done is to insert the assembled panel unit between the beams by slightly cocking or angling the panel unit between the beams and lifting the panel unit above the flanges **16***a*. Then the panels need be simply straightened so that they are substantially planar with the ceiling and floor and dropped upon the flanges of the beams where they will be securely held in a finished assembled position. Well-known means, such as taping, may be employed to mask the joint between the panels and flanges, if desired.

As shown in FIGURE 1, a light fixture **26** may be suspended from the ceiling **12** by suspension means **26***a* so that it hangs between the tensioning members **24**. In this instance, the panel **22** could be made of a translucent material or have a translucent portion so that the illumination from the light fixture would shine through the ceiling panel.

Also, as shown in the extreme right of FIGURE 1, the panel **22**, if made of a suitable material, may be combined with a tensioning member **28** which is coextensive in length with the paneling member **22** to serve as a duct. Suitable connections may be made between the duct and the heating or ventilating system at spaced points along the length of the suspended panel structure. The resultant continuous hollow duct can be easily sealed at spaced points along the length thereof so that it could adequately serve as a heating or ventilating duct. Furthermore, such a duct can be used to conceal and carry lighting, wiring or other service conduits. In addition, a tensioning member **28** which is coextensive in length with the panel **22** may be used as the mounting means and reflector for elongate light tubes such as fluorescent lights or the like.

A modified form of this invention is shown in FIGURES 3 through 5 wherein a panel structure **30** is utilized. Here the ceiling **12** is provided with spaced beams **32**, such as the ceiling joists of a typical basement structure. In such a situation, T-bars **34** may be mounted on the beams **32** by suitable fastening means, such as screws **36**, so that the T-bars **34** extend generally perpendicular to the beams and parallel to each other. These T-bars **34** may be continuous beams (as shown in FIGURE 4) or may be in the form of individual units secured to each beam **32**. The T-bars **34** are provided with first and second fingers **38** and **39** at the terminal ends which form a panel receiving notch **40** therebetween. The lowermost finger **39** is preferably shorter than the upper finger **38**. Panels intended for use with this embodiment are also so relatively light-weight and thin that they could not support their own weight if placed between two flanges of ordinary spaced beams such as those shown in FIGURES 1–3. However, the T-bars **34** have their fingers formed so that the notches **40** extend slightly upwardly as well as outwardly and the panel **42** has a width which is greater than the distance betwen the center lines of the T-bars so that a light-weight elongate panel **42** may be held between the bars by pushing the panel up between the bars until the edges of the panel are received in the notches. In this manner, the panel is held in a bowed condition and maintains its smooth configuration in place in the ceiling.

The panels **22** or **42** may be pre-formed in a bowed condition and mounted on the supports with the concave side facing downwardly, eliminating the need for any tensioning members. As the panels began to sag, the side edges would spread outwardly to a point where they abutted the support, thereby preventing further sagging and spreading and firmly holding the panel in place.

This invention provides a ceiling panel construction which may be assembled with the use of materials previously thought to be unsuited for this purpose either due to the flexible nature or relative thinness of the material or a combination of both. The ceiling panel construction of this invention may also serve a utilitarian as well as decorative function in that it may be utilized as a part of a heating and ventilating system, may serve as a lighting fixture, or may be used to carry suitable pipe conduits commonly mounted to the ceiling in the space between the ceiling and the suspended or false ceiling.

The foregoing detailed description has been given for clearness or understanding only, and no unnecessary limitations should be understood therefrom, as some modifications may be obvious to those skilled in the art.

I claim:

1. A panel construction for covering wall-like surfaces, comprising: a plurality of mounting beams extending outwardly from a wall surface in generally spaced relationship to each other, said mounting beams including panel supporting surfaces extending outwardly from the sides of the beam; a plurality of flexible panels having edges spaced apart a distance greater than the distance between said supporting surfaces of said beams to support said panels by facial engagement with said supporting surface, said panels having means on said supporting edges engageable with a tensioning member for locking the same to said panel; and a tensioning member secured to said panels by engagement with said locking means for stiffening said panel to permit said panels to be held by facial engagement with said beam supporting surface in spaced relationship to a wall-like surface, said locking means comprising inwardly directed recesses at the edges.

2. The panel construction of claim **1** wherein the tensioning member is generally coextensive in length with the panel to form a duct-like structure.

3. The panel construction of claim **2** wherein the recesses comprise portions adjacent the edge of each panel bent inwardly over the remainder of the panel.

4. The panel construction of claim **3** wherein said panels are formed of a thin, flexible material generally incapable of supporting its own weight.

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