

July 5, 1938.

E. C. BALLMAN

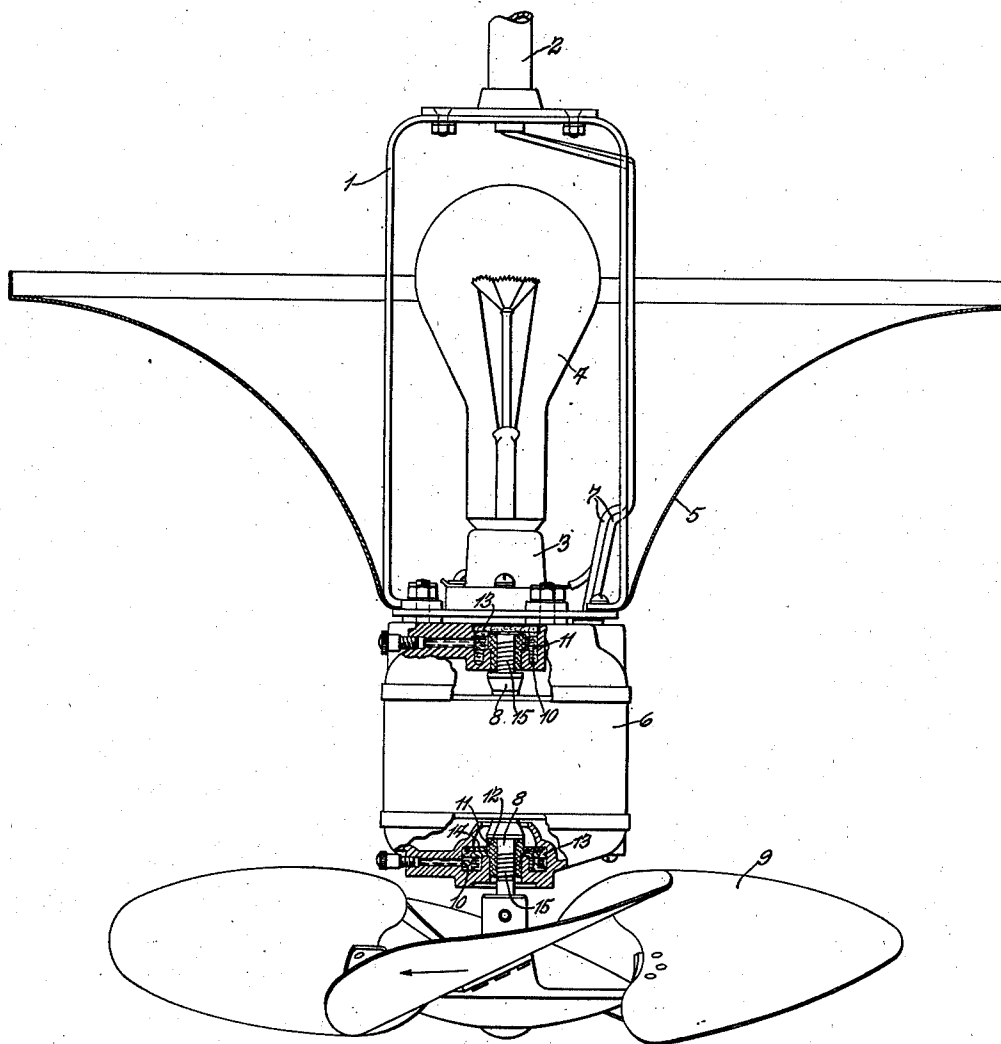
2,123,071

COMBINATION FIXTURE

Filed June 29, 1936

2 Sheets-Sheet 1

Fig. 1.



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Fig. 2.

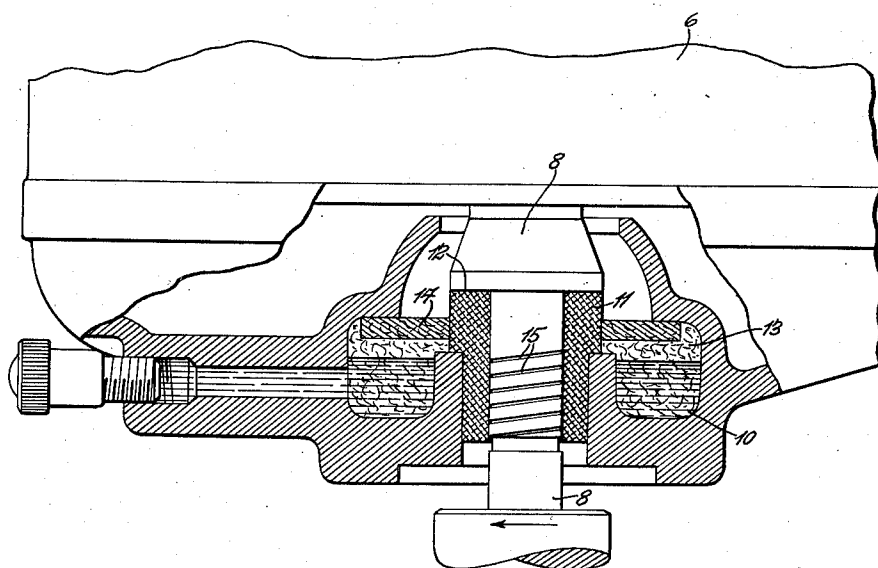
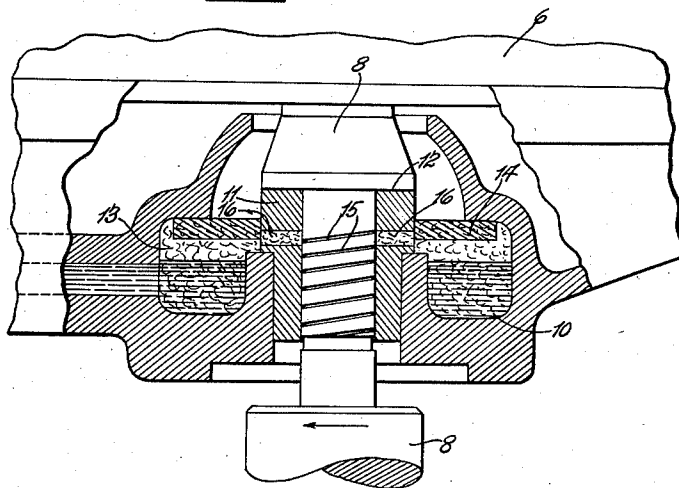


Fig. 3.



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UNITED STATES PATENT OFFICE

2,123,071

COMBINATION FIXTURE

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Application June 29, 1936, Serial No. 87,857

7 Claims. (Cl. 230—249.5)

This invention pertains to a combination lighting and air conditioning fixture.

One of the objects of this invention is to provide a fixture which may be mounted at a suitable elevation in any room, the same being provided with a lamp and shade so as to furnish an efficient lighting unit, and in combination therewith means for distributing the air of a room in an effective manner.

Another object is to provide a combination lighting and fan unit on a single mounting and connected to the same circuit.

Another object is to provide such a combination unit arranged so that the air from the fan will be distributed laterally of the device.

Another object is to provide such a combination fixture having a shade for the lamp which will provide both a reflector for the lamp and a guide for the air moved by the fan so as to direct such air laterally outwardly from the device.

Further, objects will appear from the following description taken in connection with the accompanying drawings in which:

Figure 1 is a view in elevation with parts in section of a combination unit embodying this invention;

Figure 2 is an enlarged detail of the thrust bearing for the vertical motor shaft, and;

Figure 3 is a detail similar to Figure 2 illustrating a modified form of the invention.

Referring now to the drawings 1 designates a hanger which may be arranged to be supported in any suitable manner, as by a suitable conduit 2 from the ceiling or from any other suitable support at a suitable overhead elevation.

The hanger 1 may be in the form of a frame as shown in Figure 1 and have mounted thereon a suitable receptacle 3 adapted to receive a lamp 4. Mounted on the lower part of the fixture 1 is a shade 5 for the lamp. This shade may be constructed of metal, glass or other suitable material and may be translucent or opaque. As shown in the drawings the shade is formed so as to have a convex upper surface and a concave lower surface, the general form of this shade being such as to extend upwardly from its support to enclose the lamp 4. The upper part of the shade is entirely open so that the light of the lamp may be directed upwardly against the ceiling to provide so called indirect lighting. The form of the reflector shown has been found suitable for ordinary service. It will be understood, however, that the form for the shade may be varied so as to provide any desired effects either in reflection from its upper surface or in

directing the flow of air by its under surface as will be more fully explained hereinafter. The upper surface of the shade may be silvered or polished or otherwise finished so as to provide an efficient reflecting surface. If the reflector is made of glass the ordinary polish of a glass surface will provide an efficient reflecting surface. The form of this upper surface is such as to scatter and diffuse the reflected light. The under surface of the shade as shown in the drawings is concave in form and of such shape as to direct an upward flow of air there-against in a direction laterally outwardly from the fixture.

Mounted on the supporting hanger 1, below the shade 5 is a fan motor 6 connected by means of suitable conductors 7 to the same circuit to which a lamp 4 is connected. This motor has a vertical shaft 8 to the lower end of which is attached a fan 9. The direction of rotation of the motor is as indicated by the arrow in Figure 1 so as to move the air upwardly. This upward flow of air passes along the under guiding surface of the shade 5 and is redirected thereby so that the air leaves the shade 5 traveling in a laterally outward direction. The under surface of the shade 5 therefore provides a guide for distributing the flow of air produced by the fan. This air guiding surface may be given any form or shape suitable for producing any type of flow of the air desired. The arrangement illustrated is adapted to set up a circulation which is upward from the fan and then laterally outward from the fixture in all directions. This promotes greater comfort for the occupants of the room as they are not subjected to a direct air blast from the fan.

The shaft 8 of the motor is in a vertical position. It is preferable to provide such a motor with sleeve bearings in order to insure quiet running and for the sake of other advantages. It has been found heretofore, however, that it is very difficult to provide proper lubrication for a sleeve bearing for a vertical shaft without danger of leaking oil from the bearing. The clearance space between the shaft and the bearing sleeve is of capillary dimensions, and if placed in communication with an oil reservoir usually provides a capillary siphon which draws oil out of the reservoir, and as the lower end of the sleeve must be open, the oil usually leaks out at the bottom of the sleeve.

In accordance with this invention a housing for the bearing is provided which has formed therein an oil reservoir 10. This housing also supports a bearing sleeve 11 which has an inner

bearing surface for the journal of the shaft 8 and also a top shoulder adapted to receive the thrust shoulder 12 of the shaft 8. The sleeve 11 is constructed of porous material such as compressed porous phosphor bronze. This provides a good bearing material and at the same time is sufficiently porous to permit the transmission of lubricant through the body thereof.

The reservoir 10 is packed with wool 13 and is closed at the top by a washer 14 of felt or other porous material. The wool packing 13 and also the porous washer 14 quickly becomes saturated with oil by capillary action. Both the wool and the washer 14 are arranged so as to contact with the porous sleeve 11. By such contact the oil held in the wool and the felt is transmitted to the porous structure of the sleeve 11 which by capillary action transmits the same therethrough to the inner bearing surface where the lubricant serves to lubricate the journal of the shaft 8 and is also carried to the thrust shoulder 12.

In order to prevent leakage of oil from the sleeve 11 the journal portion of the shaft 8 is provided with a helical groove 15. This groove is cut in such a direction that with the rotation of the shaft as indicated by the arrow the movement of this groove will operate as a pump to carry upwardly the oil which is fed by capillary action to the inner bearing of the sleeve 11. This oil is carried upwardly along the bearing surface and not only is distributed along that surface but operates to force the oil more positively to the upper extremity of the sleeve 11 so as to lubricate the thrust shoulder 12. Thus while the motor is running the tendency in the groove 15 is continually to counteract the tendency for a downward flow of oil in the capillary space between the shaft and the sleeve 11. Furthermore, the groove 15, is made sufficiently large so as to be non-capillary. Accordingly, when the motor is stopped, air will penetrate into this groove and be carried into the capillary space between the shaft and the sleeve. As this groove is carried to a point above the maximum level of the oil in the reservoir 10, it serves to break any siphon action which may tend to start at this point. By this arrangement the atmospheric pressure is brought to the inner surface of the sleeve 11 and accordingly, while the porosity of the sleeve tends by capillary action to provide a continual supply of lubricant at the inner surface of the bearing, the capillary action from that point on is destroyed by the presence of atmospheric pressure and accordingly all tendency for the bearing to leak is prevented.

In the embodiment of Figure 3 the sleeve 11' may be made of ordinary bearing metal, non-porous, and may be perforated at suitable intervals by transverse passages 16 into which the wool packing 13 is carried. The capillary feed of oil from the reservoir is carried through these passages to the inner surface of the bearing. In this case the groove 15 is carried up to and preferably above the passage 16.

It will be seen that this invention provides a combination lighting and ventilating fixture which may be made highly efficient in both of its functions. The lighting fixture provides a combination of lamp and shade with a reflector well adapted for indirect lighting. With a translucent glass shade highly attractive decorative effects may be obtained in the lighting fixture. The shade at the same time provides an air guide adapted to scatter and distribute a flow of air in such a manner as to promote a rapid circulation

of the air in the room while at the same time avoiding unpleasant drafts. The entire device is arranged in a unitary structure adapted for mounting as a unit in any place where a lighting or ventilating device may be required. The motor and fan being mounted on the same hanger with the lighting fixture greatly simplifies the wiring required to carry the circuit thereto. Suitable control switches may be placed in the circuit according to the usual practice.

While this device has been described as embodying a unitary device it will be understood that individual features or sub-combinations thereof may be useful by themselves without reference to other features or the entire combination, and it is understood, that the employment of such individual features or sub-combinations is contemplated by this invention and within the scope of the appended claims.

No claim is made in this application for the specific bearing structure illustrated in Figures 2 and 3, that structure being covered by a divisional application, Serial No. 187,109, filed January 27th, 1938.

It is further obvious, that various changes in the details of construction may be made within the scope of the appended claims without departing from the spirit of this invention: It is understood, therefore, that the invention is not limited to the specific details shown and/or described.

Having thus described the invention what is claimed is:

1. In combination with a lighting fixture having a hanger, a shade supported thereon, and a lamp mounted in said shade, a fan mounted below said shade, and means for driving said fan so as to move air upwardly along said shade.

2. In combination with a lighting fixture having a support and a lamp thereon, a fan on said support, means for driving said fan so as to move air upwardly, and an air guide on said support adapted to direct the upward flow of air from said fan laterally outwardly from said guide.

3. A ceiling fixture, comprising, a hanger, a lamp thereon, a shade on said hanger below said lamp, a fan on said hanger below said shade, and means for driving said fan to move air upwardly against said shade, said shade providing an air guide adapted to direct the upward flow of air from said fan laterally outwardly from the fixture.

4. A ceiling fixture, comprising, a hanger, a lamp thereon, a shade on said hanger below said lamp and providing a reflector therefor, a fan on said hanger below said shade, and means for driving said fan to move air upwardly against said shade, said shade providing an air guide adapted to direct the upward flow of air from said fan laterally outwardly from the fixture.

5. A ceiling fixture, comprising, a hanger, a lamp thereon, a shade on said hanger below said lamp and providing a reflector therefor, a fan on said hanger below said shade, and means for driving said fan to move air upwardly against said shade, said shade being formed with a concave under face providing an air guide adapted to direct the upward flow of air from said fan laterally outwardly from the fixture.

6. In combination, a hanger, a lamp thereon, a shade for said lamp mounted on said hanger so as to enclose said lamp and providing a reflector therefor, a fan motor mounted on said hanger below said shade, and a fan on and driven by said motor so as to move air upwardly against

said shade, said shade providing an air guide adapted to direct the upward flow of air from said fan laterally outwardly from said guide.

5 7. In combination, a hanger, a lamp thereon, a shade for said lamp mounted on said hanger so as to enclose said lamp and having a convex upper surface providing a reflector therefor, a fan motor mounted on said hanger below said

shade, and a fan on and driven by said motor so as to move air upwardly against said shade, said shade having a concave lower surface providing an air guide adapted to direct the upward flow of air from said fan laterally outwardly from said guide. 5

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