



# Forced-Air Cooling Equipment FOR LIQUID-FILLED TRANSFORMERS

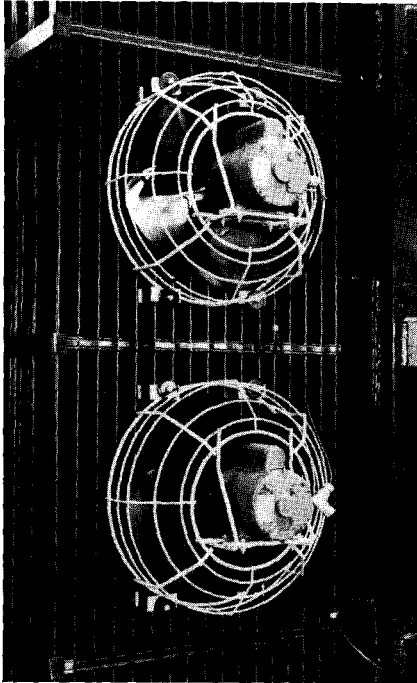


Fig. 1. Typical installation of 20-inch fans

## INTRODUCTION

Fans are used on transformers to increase the rate of heat dissipation and thus permit the transformer to carry an increased load. They are normally removed for shipment and must be properly installed before attempting to operate the transformer at the forced-air-cooled rating shown on the nameplate. Fans are to be used only on those transformers designed to operate with a forced-air-cooled rating.

## DESCRIPTION

Two types of weatherproof fans are supplied, the 20-inch as shown in Fig. 1, and the 12-inch as shown in Fig. 2. Mounting arrangements differ according to the particular application as outlined under "Installation". All fans used on any one transformer are the same size and their motor ratings are given on the motor nameplate. Ratings are also shown on the transformer Outline draw-

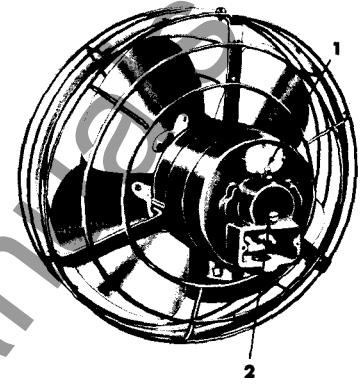
ing, along with the fan catalog number. Fan motors have built-in thermostatic overload protection to prevent overheating and when a motor is shut off by the thermostat, it will automatically start again after cooling.

## CONTROL

One or more switches are furnished to permit manual operation of the fans for test purposes or automatic control by a thermal relay. Two types of thermal relays are available, those which respond to changes in top liquid temperature and those which respond to an equivalent of the winding hot-spot temperature. The temperature at which the fans operate and detailed information concerning the thermal relay is contained in separate instructions covering that device. A magnetic-contactor will be included if the connected load exceeds the rating of the thermal switch or if three-phase motors are used. Refer to the transformer Connection Diagram for details.

## INSTALLATION

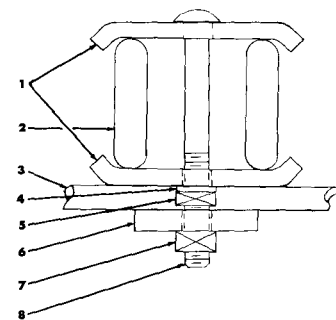
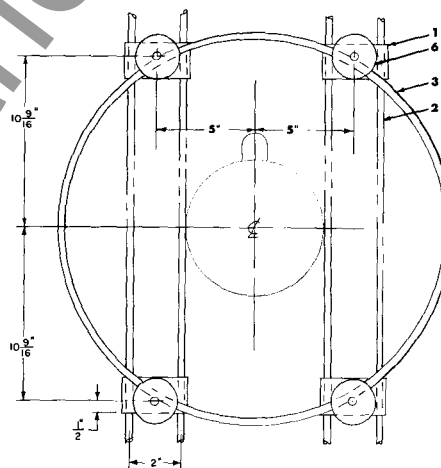
In order to obtain the KVA output given on the transformer nameplate for forced-air-cooled operation, the type,



1. GREASE FITTING
2. GREASE RELIEF PLUG

Fig. 2. 12-inch fan

number and location of fans must be as indicated on the Outline (or Supply Parts Assembly) drawing. Before mounting the fans, make an inspection for shipping damage and check for proper blade alignment. When installing the fans, make sure they blow air toward the transformer cooling tubes. If it should be necessary to change the direction of rotation of a three-phase fan, this can be done by interchanging any two motor leads. Single-phase fan rotation may be reversed by inter-



1. BRACKET
2. COOLING TUBE
3. FAN GUARD
4. WASHER
5. JAM NUT
6. WASHER
7. LOCKNUT
8. CARRIAGE BOLT

Fig. 3. Support assembly for 20-inch fan

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the General Electric Company.

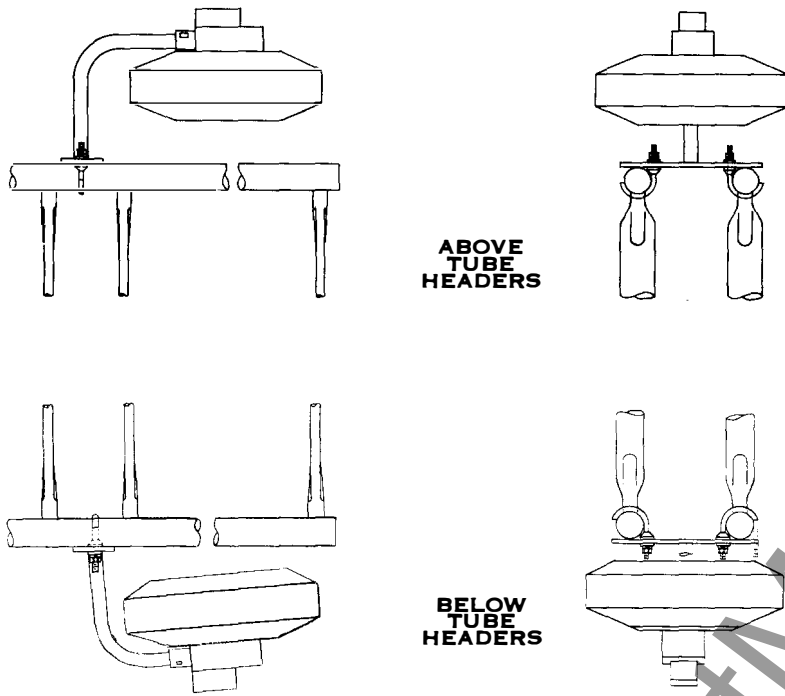


Fig. 4. Support assembly for 12-inch fan mounting

changing appropriate leads as indicated on the back of the motor-wiring access plate.

**20-INCH FANS**

Details of the support assembly for 20-inch fans are shown in Fig. 3. To install a fan, determine its centerline from the Outline drawing and mount the four pairs of brackets (1) using bolts (8), washers (4), and jam nuts (5). Note that brackets (1) have an

off-center hole and are to be mounted with the larger portion toward the fan guard to provide the best support. Particular attention should be given to the spacing of these brackets in order to facilitate attaching the fan guard. With the brackets in place, position the fan with its motor capacitor *at the top* and install washers (6) and locknuts (7).

**12-INCH FANS**

Two mounting arrangements are used

for 12-inch fans, depending on the design of the transformer. On some units the fans are to be mounted above the top tube headers blowing downward, while on others they are to be mounted under the bottom tube headers blowing upward. See Fig. 4. On those mounted under the headers, a swivel-type bracket is provided in order to permit installation of the fan on the required centerline. Refer to the transformer Outline (or Supply Parts Assembly) drawing for proper location.

**WIRING**

The transformer is shipped with the cabling run as far as the first fan. After the fans are mounted, the remainder of the fan wiring is to be installed at assembly as indicated on the Outline drawing and Connection Diagram. Note the "Y" connector and use of straps to attach the cable to the cooling tubes as shown in Fig. 1. When the fans are divided into two or more banks, separate cabling will be provided for each bank.

**MAINTENANCE**

At monthly intervals it is desirable to check the operation of the fans and clean off any dirt which has accumulated on the blades. Motor bearings should be lubricated every two years or 6000 operating hours, whichever occurs first. *Do not grease while the motor is running.* Use G-E ball-bearing grease Cat. No. D6A2C5. To prevent damage to either type of fan motor, be sure to remove the grease relief plug (see Fig. 2) at *each* bearing before adding grease. Add grease slowly until it starts coming out the relief opening.

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**GENERAL  ELECTRIC**

ROME, GEORGIA



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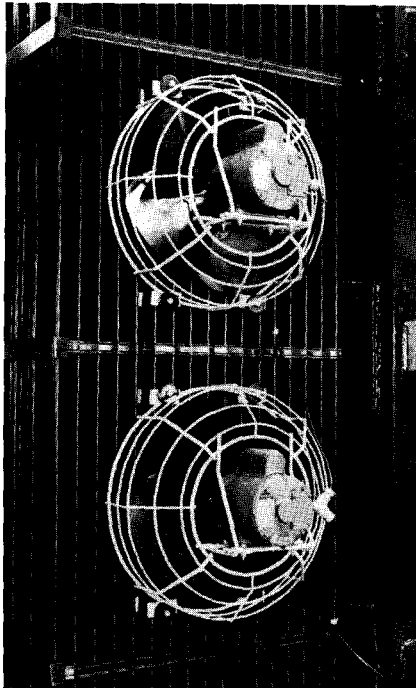


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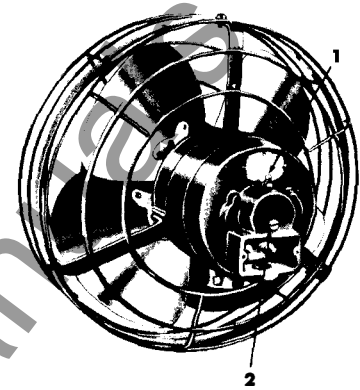
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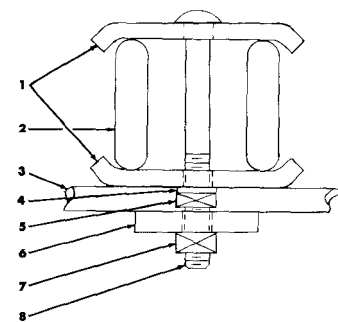
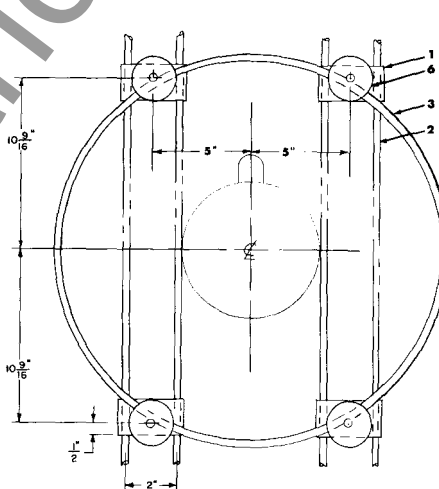
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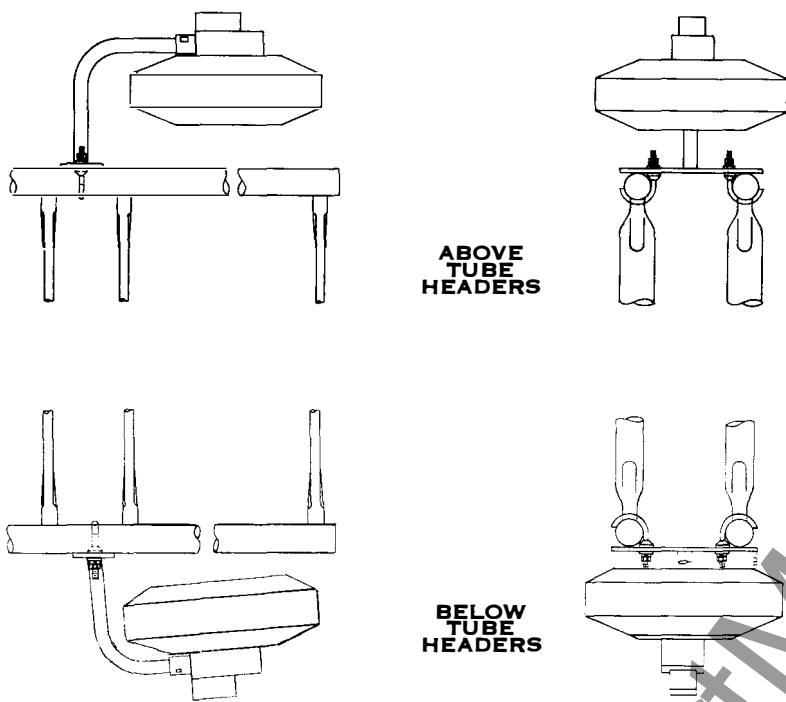


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