Journal Bearing and Thrust Bearing

Figure 1 shows the inlet end journal bearing, the thrust bearing and the bearing pedestal.

Journal Bearing

The journal bearing consists of a shell, split horizontally to facilitate dismantling and assembly, and lined with tin base babbitt. It is bored to give the proper clearance, as given on the "Rotor Clearance" drawing and is grooved and drilled so as to provide proper lubrication, not only for itself but for the thrust bearing as well. This bearing operates equally well with either of two types of lubrication; namely ring oiled or pressure circulation.

When used on units which require an oil pump for other purposes, such as valve operation or gear lubrication, the bearing is lubricated by a pressure circulating system. This is the arrangement shown in the illustration. Oil is supplied by the main pump and enters the bearing at the top. That passing out at the ends of the bearing passes through the thrust bearing, and is then thrown radially by the revolving collars into the guides formed by the ends of the bearing shell, whence it is drained through holes in the bottom into the drain chamber.

During the starting and stopping periods, when the pressure delivered by the main pump is not sufficient to supply the bearings, and when no auxiliary oil pump is used, lubrication is provided by the conventional type of revolving ring. The bottom of the ring dips in oil in the ring cavity and carries it to the top of the journal. The oil ring cavity is automatically kept full of oil from the pressure circulating system after the unit has once been operated. This cavity should be filled with oil prior to starting the first time after installation and after an overhaul or repair.

Needless to say, on units which are equipped with pressure circulating systems and auxiliary oil pumps, the ring oiled feature is of no consequence. In such cases the revolving oil rings are omitted.

When used on units which are not equipped with an oil pump, the bearing is ring oiled at all times. In such cases, a hole is drilled through the bottom of the ring cavity connecting it to the main chamber of the bearing pedestal which serves as a reservoir. The oil inlet and drain connections are plugged, and an oil filling and level gauge fitting is provided on the side of the pedestal. The oil level in the pedestal should be maintained at the height indicated by the filling fitting.

The illustration shows a water cooling chamber cast in the pedestal. This water cooling feature is used only when required by the operating conditions, and, in some bearings, the water chamber is omitted. When used, connections are provided for the circulation of cooling water. The flow may be in either direction, and the quantity required will depend upon the temperature of the water and the results desired.

Leakage of condensation from the gland into the bearing is prevented by the shaft thrower "4". The thrower shown in the illustration is a separate ring secured on the shaft by a set screw. Whenever practical, it is machined integrally with the shaft.

Thrust Bearing

The thrust bearing is of the Kingsbury leveling ring type with two shoes (or segments) at each end of the journal bearing. Each pair of

hoes are supported on a leveling ring which, by means of its rocking mo-
ion, allows the shoes to take a position so that the babbitted faces are
n the same vertical plane. Consequently each shoe takes an equal share
f the load.

The thrust of the rotor is transmitted to the babbitted shoes
y means of the collars "8" which are keyed to the shaft and fit against
houlders formed by the thrower "4" on one end and the overspeed trip body
n the other. The shoes "14" and leveling rings "11" are carried in the
age which is a part of the journal bearing shell. The rings "11" are pre-
ented from rotating relative to the shaft by means of pins projecting from
he shell.

The total clearance between the thrust collars and the babbitted
aces, that is, the axial clearance (or end play) should be between .007
nd .010 of an inch. This clearance can be adjusted by varying the thick-
ess of the shims "5". Increasing the thickness of the shims decreases the
learance. Decreasing the thickness of the shims increases the clearance.

The axial position of the rotor with respect to the casing can be
djusted by shifting shims from one end of the bearing to the other. The
otor should be located axially so that the stationary impulse blades are
entral between the first and second rotating rows when the rotor is push-
d toward the exhaust end as far as it will go. Decreasing shims "5" on
he right of the bearing and increasing shims "5" on the left of the bear-
ng moves the rotor toward the exhaust end. Coversely, decreasing shims
5" on the left of the bearing and increasing shims "5" on the right of
he bearing moves the rotor toward the inlet end. When making this adjust-
ent the shims must be shifted from one end to the other so as to keep the
otal thickness of shims at both ends the same. Any change in this total
hickness will change the thrust clearance adjustment (described in the
aragraph above).

The thrust bearing is lubricated by oil supplied directly from
he inlet chamber through passages drilled in the lower half of the bear-
ng shell and also by the oil which passes out the end of the journal bear-
ng. A vent is provided, as shown in the illustration, to eliminate any
ccumulation of air. Leakage from the thrust bearing is reduced to a mini-
um by seal strips "17" which are carried in the overspeed trip body, and
he bearing is therefore partially flooded in oil at all times.

These seals consist of very thin flat strips and are held in
lace by soft steel locking strips which are rolled into grooves. These
rooves are slightly dovetailed to give the locking strips a greater hold-
ng power. The strips are removable and can be renewed if the clearance
etween them and the thrust bearing cage becomes excessive. The clearance
equirements are given on the "Rotor Clearance Drawing".

The following list has been compiled to facilitate ordering
pare or renewal parts by item number and name, together with the serial
umber of the turbine:

tem No.	Name	Item No.	Name
1	Bearing Pedestal (lower half)	9	Bearing (upper half)
2	Bearing (lower half)	10	Bearing Stop Pin
3	Oil Seal Ring	11	Thrust Bearing Leveling Ring
4	Shaft Thrower	12	Thrust Bearing Shoe
5	Thrust Collar Shims		Disc Seat
6	Bearing Cover	13	Thrust Bearing Shoe Disc
7	Thrust Collar Key	14	Thrust Bearing Shoe
8	Thrust Collar	15	Seal Strip

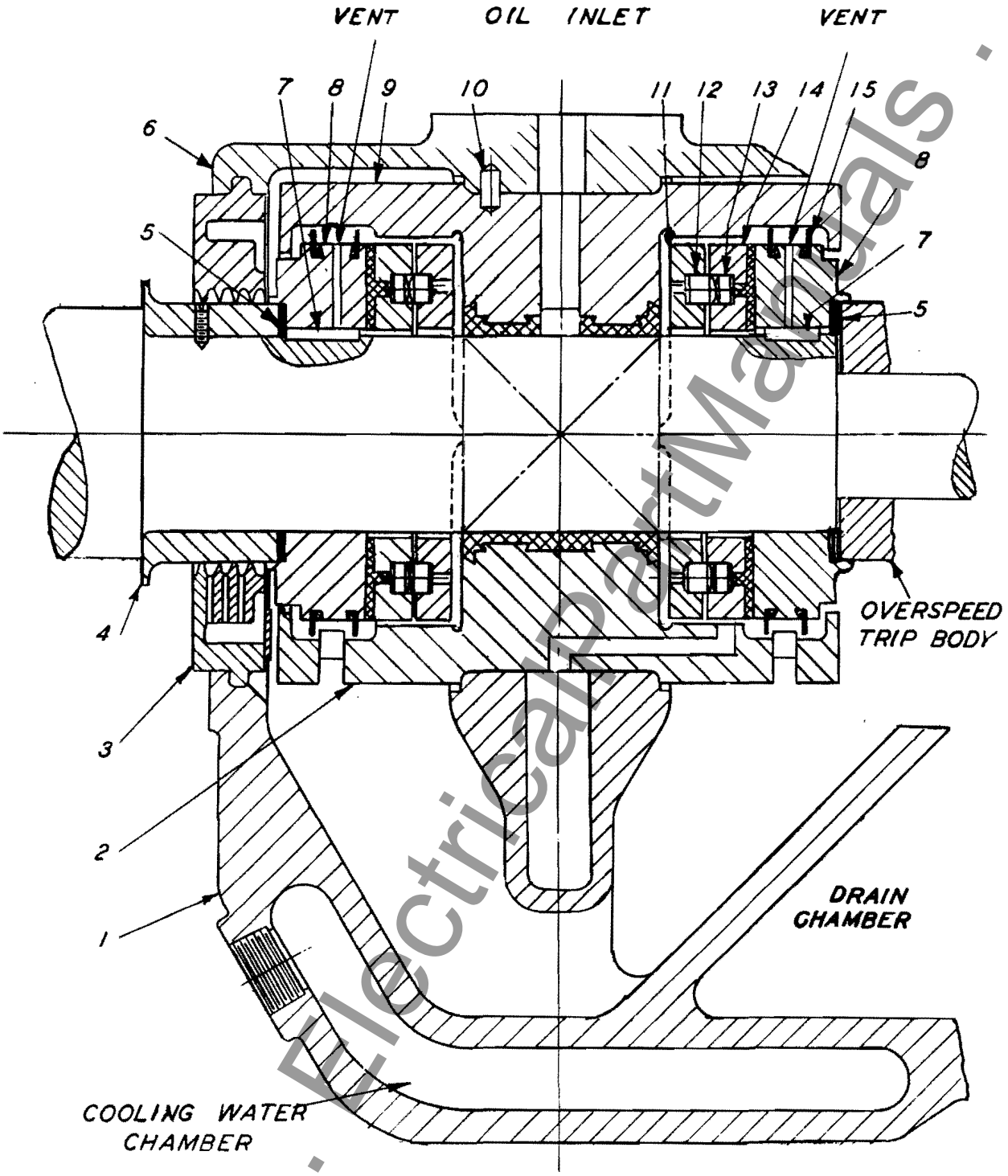

Fig. 1 - Journal Bearing and Thrust Bearing