Thrust Bearing Adjusting Mechanism

This mechanism shown in Figure 1, provides an external means of moving the thrust bearing cage and with it the turbine rotor in an axial direction to obtain the desired rotor setting. Its principal parts are: the handwheel "9", handwheel shaft "4", bevel gears "2" and "22", adjusting stem "23" and yoke "25".

The handwheel is keyed to the shaft "4" which carries the bevel gear (driver) "2". The mating bevel gear (driven) "22" is keyed to the adjusting stem "23". This adjusting stem is held against axial movement by a counterbore in the thrust bearing pedestal cover and the retainer "16". Therefore, rotation of the handwheel also rotates the adjusting stem which is threaded into the crosshead "33" and causes the crosshead to move in an axial direction. Ball bearings "19" are provided on the adjusting stem sleeve "20" to absorb the thrust on the stem and thus reduce the friction in the mechanism.

The stem, as stated above, carries a cross-head which engages lugs at the top of the yoke. The yoke, in turn, extends downward so as to engage lugs formed integrally on each side of the bearing cage. The ends of the yoke are circular in shape and are fulcrumed in the bearing pedestal slightly above the horizontal centerline of the bearing, thus forming a cam, so that axial movement of the crosshead gives a much smaller axial movement at the ends of the yoke. These yoke ends fit closely between lugs on the bearing cage, all lost motion being taken up by liners "26", placed back of shoes "28" which are shaped to fit the cams.

The direction plate "6" indicates the direction of handwheel rotation required to move the rotor to the Running or the Start and Stop position. One complete revolution of the handwheel moves the rotor 5 mils, after all lost motion has been taken up. When the turbine is to be started or stopped, the thrust bearing should be moved to the Start and Stop position, and should never be moved to the Running position, until the unit has had ample time to become heated to its normal operating temperature.

In connection with maintenance work, it is important to note that on some machines it is necessary to move the rotor toward the exhaust end, beyond the Start and Stop position, before raising the cylinder cover or the rotor. When such additional movment is necessary the detailed instructions are given on the rotor clearance drawing.

Assembling and Dismantling

The handwheel unit composed of items "1" to "15" inclusive, can be dismantled without disturbing the pedestal cover. After breaking the joint between the housing "5" and the pedestal cover, the entire assembly may be removed. With this assembly removed, further dismantling is obvious.

As shown in "Section D-D", the yoke trunnion bearings are supported in the pedestal cover only. Consequently the pedestal cover can be raised with the yoke, stem and handwheel assembly complete. The yoke is then removed by removing the bearing caps "29". The stem crosshead "33" engages the yoke loosely and there is no mechanical connection at this point.

Re-assembly is in the reverse order. When lowering the pedestal cover into place, the yoke ends should be guided to make sure that they enter between the cage lugs properly.

Lubrication

The ball bearings "19", used on the adjusting stem sleeve are lubricated by oil supplied from the governor servo-motor cylinder.

The yoke bearings "30" and the surfaces of the cam shoes "28" are lubricated by oil, at bearing supply pressure, delivered through drilled passages.

Adjustments

When assembling this mechanism, the following adjustments should be checked.

1. Adjust the total thickness of liners "17" so that the adjusting stem "23" turns freely but without end play.

2. With the yoke "25" in a vertical position adjust the indicator "8" midway between the Running and Start and Stop marks on the bracket "7".

3. With the above setting correct, adjust liners "26" to hold the rotor midway between its Running and Start and Stop positions. Be sure to install enough liners "26" to take up all lost mostion between the yoke cam and the thrust bearing cage lugs.

The following list has been compiled to facilitate ordering spare or renewal parts by item number and name together with the serial number of the turbine.

Item No.	Name
1	Bevel Gear Key
2	Bevel Gear (Driver)
3	Handwheel Shaft Bushing (inner)
4	Handwheel Shaft
5	Handwheel Shaft Housing
5-A	Handwheel Shaft Bushing (outer)
6	Adjusting Instruction Plate
7	Adjusting Instruction Bracket
8	Adjusting Indicator
9	Handwheel
10	Handwheel Handle
11	Handwheel Handle Pin
12	Handwheel Instruction Plate
13	Handwheel Retaining Nut
14	Handwheel Retaining Nut Washer
15	Handwheel Key
16	Adjusting Stem Sleeve Retainer
17	Adjusting Stem Sleeve Liners
18	Adjusting Stem Sleeve Ball Bearing Housing
19	Ball Bearing
20	Adjusting Stem Sleeve
21	Bevel Gear Key
22	Bevel Gear (Driven)
23	Adjusting Stem

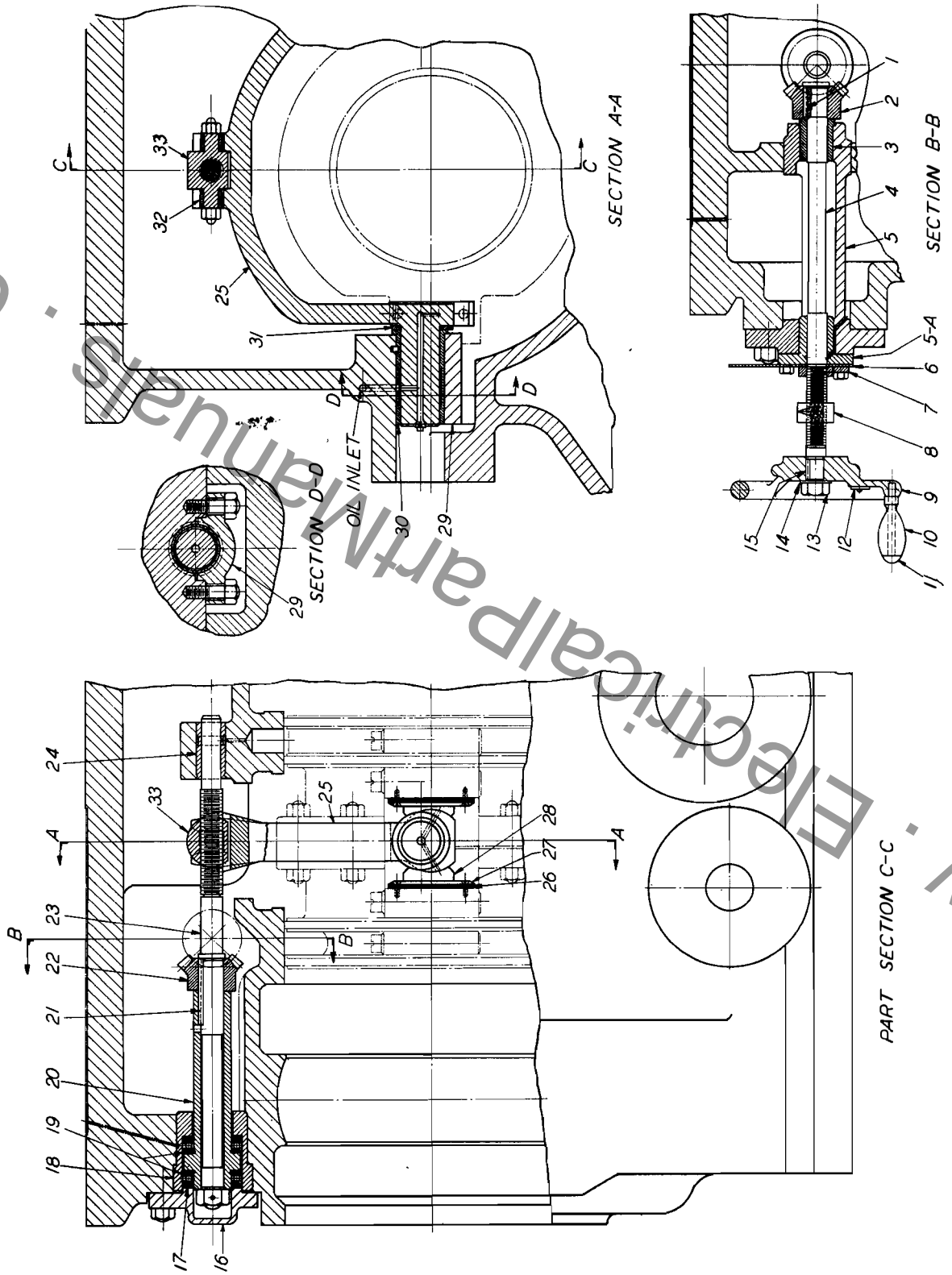

Fig. 1

Item No.	Name
24	Adjusting Stem Bushing
25	Yoke
26	Yoke Cam Shoe Liners
27	Yoke Cam Shoe Liner Retainer
28	Yoke Cam Shoe
29	Yoke Bearing Cap
30	Yoke Bearing
31	Yoke Cam Shoe Retainer
32	Adjusting Stem Crosshead Bushing
33	Adjusting Stem Crosshead