STEAM CHEST

A typical arrangement of the multiple-valve steam chest is shown in Figure 1. The main body and nozzle chambers are cast integrally with the cylinder cover, thus eliminating joints between these parts. The valves are arranged in parallel within the chest; that is, all valves are surrounded with steam at approximately throttle pressure.

These valves are of the single seated, plug type. The seats are pressed into the steam chest body and can be replaced if necessary. The operating mechanism raises and lowers the valve bar "22", keeping it perfectly horizontal at all times. The bar, in turn, lifts the valves by engaging the adjusting nuts "21". As shown in the illustration, the adjusting nuts are threaded on the valves and hence the point at which each valve opens and the amount of opening can be varied by means of these adjusting nuts. Of course, there is an unbalanced steam force tending to close the valves, but in addition, a positive closing force is obtained by the lower edge of the bar "22" engaging the lower shoulder on each valve.

The valve bar stem packing consists of two closely fitting bushings "16" and "18" with suitable leak-off openings. On valves built for 650 pounds pressure or higher, two leak-offs are provided as shown in the Figure, while valves built for 450 pounds pressure or lower have only the lower leak-off, the upper one being omitted or plugged. When two leak-offs are used the upper one is led to a point at atmospheric pressure where a small amount of escaping steam is not objectionable. The lower one is piped to a zone of intermediate pressure in the turbine. When only the lower leak-off is used it is led to a point at atmospheric pressure at all times.

The operating lever "9" is in reality a rock shaft fabricated from two bars which are welded together at one end to form the connection to the governor linkage and at the other end are separated to form the two connections to the valve bar stem links "13". The lever has a center member or shaft, the ends of which fit in the supporting brackets "7" and "8" to form a fulcrum point. Therefore, downward movement of the governor piston opens the valves while upward movement of the piston closes them.

An additional positive closing force is exerted by the balance pistons 3, which are attached to the valve bar stems by the connecting rods 4 and pins "2" and "5". The top of each piston "3" is subjected to full steam pressure while the chambers at the bottom are connected to atmosphere through the leak-off as shown. Therefore, the unbalanced forces on these pistons, exert at all times, a downward force tending to close the valves in case they have any tendency to stick.

As stated above, the illustration shows a typical arrangement in which the first valve is in the center, and the sixth and seventh on the ends. However, the number of valves and the position of each in the chest may vary to suit different steam and load conditions. For each particular turbine, there is a "Steam Chest Valve Diagram" which shows the correct valve locations and the dimensions for setting the valve adjusting nuts "21" to obtain the proper sequence of opening. A Print of this diagram will be found in the instruction book for each particular unit.

The valve lifts as given on this diagram should give satisfactory operation. However, in some cases it may be desirable to adjust the nuts "21" to bring certain valves in earlier or later in order to obtain the correct pressure drop across each. This pressure drop is usually about 4 per cent.

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

Item No.		Name
1	-	Valve Bar Balance Piston Bushing
2	-	Valve Bar Stem Connecting Rod Pin (Lower)
3	-	Valve Bar Balance Piston
4	-	Valve Bar Stem Connecting Rod
5	-	Valve Bar Stem Connecting Rod Pin (Upper)
6	-	Steam Chest Lever Bracket Taper Dowel
7	-	Lever Bracket (Right Hand)
8	-	Lever Bracket (Left Hand)
9	-	Lever (Complete)
10	-	Governor Connecting Link Pin
11	-	Governor Connecting Link
12	-	Valve Bar Stem Link Pin
13	-	Valve Bar Stem Link
14	-	Valve Bar Stem Head
15	-	Valve Bar Stem
16	-	Valve Bar Stem Bushing (Upper)
17	-	Valve Bar Stem Bushing Retainer
18	-	Valve Bar Stem Bushing (Lower)
19	-	Steam Chest Cover
20	-	Valve Adjusting Nut Lock Nut
21	-	Valve Adjusting Nut
22	-	Valve Bar
23	-	Valve Seat
24	-	Valve
25	-	Valve Seat
26	-	Valve
27	-	Valve Seat
28	-	Valve
29	-	Valve Seat
30	-	Valve
31	-	Valve Seat
32	-	Valve
33	-	Valve Seat
34	-	Valve
35	-	Valve Seat
36	-	Valve
37	-	Gasket

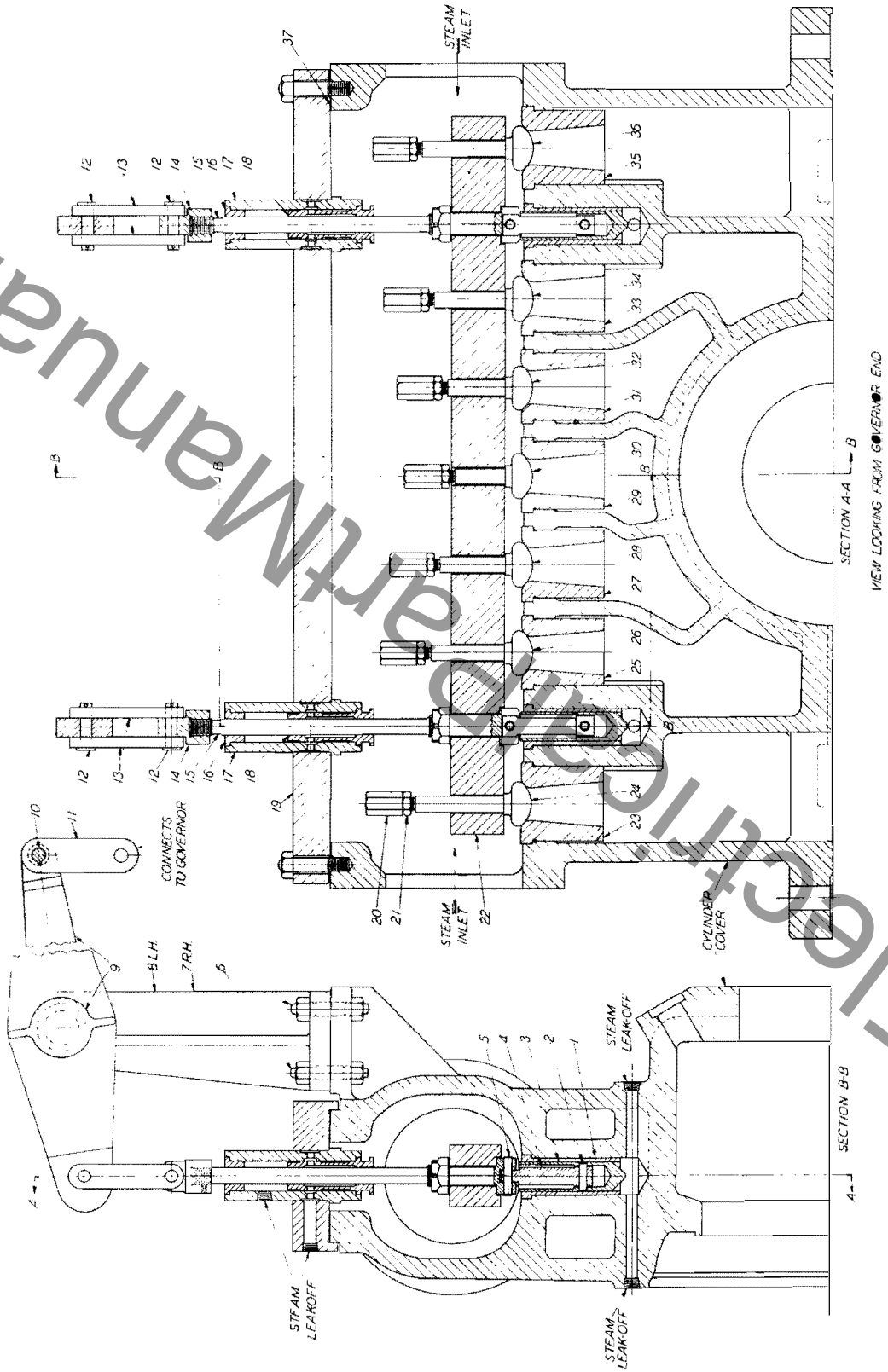

Figure 1