O. JUNGGREN.

SUPPORTING MEANS FOR TURBINES, TURBINE DRIVEN SETS, AND THE LIKE.

APPLICATION FILED MAY 27, 1919.

1,369,668. Patented Feb. 22, 1921.

Fig. 1.

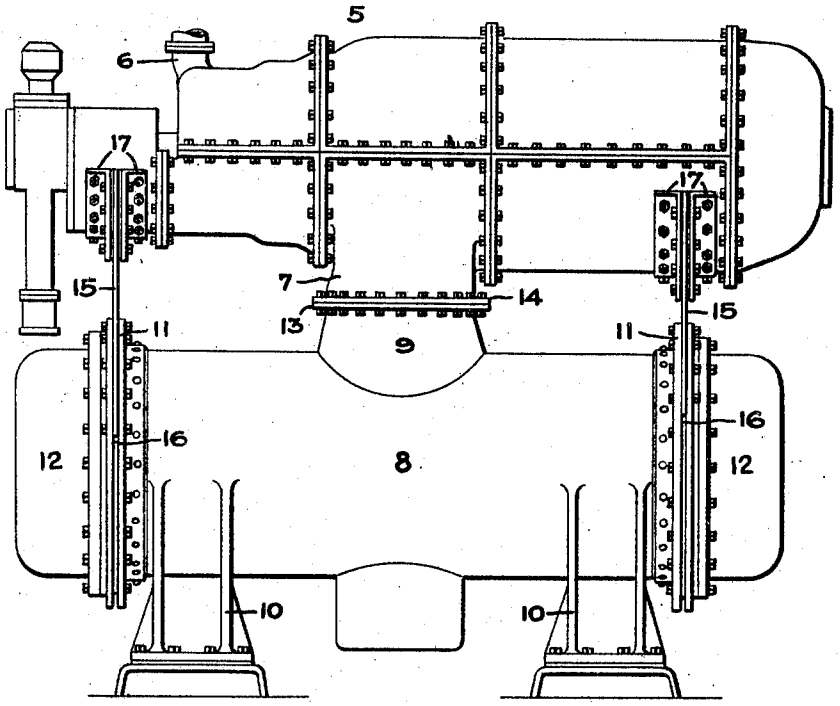


Fig. 2.

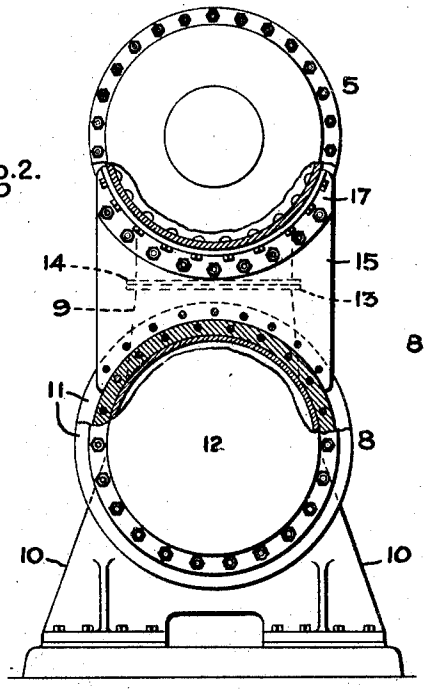
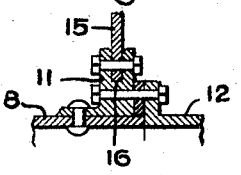


Fig. 3.



Inventor:
Oscar Junggren,
by Albert G. Davis
His Attorney.

UNITED STATES PATENT OFFICE.

OSCAR JUNGGREN, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

SUPPORTING MEANS FOR TURBINES, TURBINE-DRIVEN SETS, AND THE LIKE.

1,369,668. Specification of Letters Patent. Patented Feb. 22, 1921.

Application filed May 27, 1919. Serial No. 300,215.

To all whom it may concern:

Be it known that I, OSCAR JUNGGREN, a citizen of the United States, residing at Schenectady, in the county of Schenectady, State of New York, have invented certain new and useful Improvements in Supporting Means for Turbines, Turbine-Driven Sets, and the like, of which the following is a specification.

The present invention relates to turbines, turbine driven sets and the like. In connection with the operation of such apparatus, it is well known that the same are subjected to great variations in temperature which cause expansion and contraction of the apparatus to take place, and the object of the present invention is to provide an improved supporting means or arrangement which, while firmly supporting the apparatus, will permit of axial expansion and contraction taking place without undue stresses being set up in the apparatus.

For a consideration of what I believe to be novel and my invention, attention is directed to the accompanying specification and the claims appended thereto.

According to my invention, I provide a condenser for the turbine or turbine driven set as the case may be, and support the turbine or turbine driven set directly on the condenser by means of a rigid support and one or more supports which are rigid in a transverse direction and yieldable or flexible in an axial direction. Preferably the rigid support comprises the exhaust conduit of the turbine which is bolted or otherwise fastened directly to the inlet conduit of the condenser, while the other support or supports is or are preferably each formed of a flat plate which extends transversely of the condenser and is fastened thereto at one end, the other end being fastened to the turbine or turbine driven set. Such a plate is rigid crosswise and it is made of such thickness as to give the desired degree of flexibility in an axial direction.

In the drawing, which shows an embodiment of my invention, Figure 1 is a side elevation of a turbine driven set supported in accordance with my invention; Fig. 2 is an end view thereof, partly broken away, and Fig. 3 is a sectional view of a detail.

Referring to the drawing, 5 indicates a turbine driven set, 6 being the inlet conduit for the turbine and 7 the exhaust conduit. The set may comprise, for example, a turbine and one or more generators, compressors or the like driven thereby, and it is to be understood that by the term "turbine driven set" I mean a turbine driving any type of suitable machine or machines. The turbine may be of any suitable design either single or double rotation. 8 indicates a condenser having an inlet conduit 9, and suitable supporting means 10. At the two ends of condenser 8 are flanges 11 to which are bolted the condenser heads 12. The condenser indicated is of a usual surface type.

Now, according to my invention, I support the turbine driven unit directly on the condenser, fastening the exhaust conduit 7 directly to the inlet conduit 9 of the condenser thus forming a rigid central support for the unit; and I then support the ends of the unit on the condenser casing by suitable means which are rigid in a transverse direction but have a certain amount of flexibility in an axial direction. In the present instance the condenser inlet conduit 9 has a flange 13 to which is bolted a flange 14 on the turbine exhaust conduit 7. This forms a connection which is rigid both axially and transversely. The end supports for the unit preferably comprise flat plates 15 which extend transversely of the set and condenser and are suitably fastened thereto. In the case of the condenser, a convenient arrangement for fastening the plates 15 thereto is to provide flanges 11 with grooves 16 in which plates 15 are bolted on as best shown in Fig. 3. Grooves 16 can be easily and conveniently made as is obvious. In the case of the turbine or turbine driven set I may provide spaced flanges 17 between which ends of plates 15 are spaced. Plates 15 are made of suitable width and are curved at their ends to conform to the contour of the casings which they engage as clearly shown in Fig. 2.

With the above described arrangement it will be seen that the condenser with the turbine or turbine driven set mounted thereon forms a complete unit which may be supported on a rigid foundation by supports under the condenser, there being no difficulty in rigidly mounting the condenser since its temperature does not vary widely during operation. The turbine or turbine driven set being supported on the condenser as shown, may expand and contract axially

without undue stresses being set up therein. The arrangement also has the advantage that it is compact and economical of space, particularly floor space which is often a matter of great importance.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiment thereof, but I desire to have it understood that the apparatus shown is only illustrative and that the invention may be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States, is:—

1. In combination, a condenser having an inlet conduit, a turbine having its exhaust conduit fastened directly to said inlet conduit thereby forming a support for the turbine, and a second support for the turbine, said second support being spaced from the first and comprising a member which is rigid in a transverse direction and yieldable in an axial direction.

2. In combination, a condenser having an inlet conduit, a turbine having its exhaust conduit fastened directly to said inlet conduit thereby forming a support for the turbine, and a second support for the turbine, said second support being spaced from the first and comprising a plate extending transversely of the turbine.

3. In combination, a condenser, and a turbine supported thereon, the supporting means comprising a rigid support and a support which is rigid transversely and flexible axially.

4. In combination, a condenser having an inlet conduit, and a turbine comprising an exhaust conduit extending parallel to the condenser and supported directly thereon, said supporting means comprising the exhaust conduit which is fastened to said inlet conduit and a plate which extends transversely of the turbine and engages the condenser at one end and the turbine at the other.

5. In combination, a condenser, and a turbine driven set which is arranged parallel to the condenser and supported directly thereon, the supporting means comprising a rigid support at the central portion of the set and a support at each end thereof which is rigid transversely and flexible axially.

6. In combination, a condenser having an inlet conduit, a turbine driven set having an exhaust conduit at its central portion, and means supporting the set directly on the condenser, said means comprising the turbine exhaust conduit which is bolted directly to said inlet conduit, and members at each end of said set which are rigid in a transverse direction and yieldable in an axial direction.

7. In combination, a condenser having an inlet conduit, a turbine driven set having an exhaust conduit at its central portion, and means supporting the set directly on the condenser, said means comprising the turbine exhaust conduit which is bolted directly to said inlet conduit, and plates which extend transversely of the set with one end in engagement with the condenser and the other end in engagement with the set.

8. In combination, a condenser having an inlet conduit at its central portion, a turbine driven set having an exhaust conduit at its central portion, said set being arranged parallel to the condenser with said exhaust conduit fastened directly to said inlet conduit, and plates which extend transversely of the condenser and support the ends of the set, said plates being rigid transversely and yieldable axially.

9. In combination, a condenser having an inlet conduit at its central portion and bolting flanges at its ends, a turbine having an exhaust conduit, said turbine being arranged parallel to the condenser with said exhaust conduit fastened directly to said inlet conduit, and a plate which extends transversely of the turbine and supports an end of it.

10. In combination, a condenser having an inlet conduit at its central portion and bolting flanges at its ends, a turbine driven set having an exhaust conduit at its central portion, said set being arranged parallel to the condenser with said exhaust conduit fastened directly to said inlet conduit, and plates which extend transversely of the set and support the ends of it, said bolting flanges having grooves in which ends of said plates are fastened.

11. In combination, a turbine driven set, means for rigidly supporting the set at its central portion, and means for supporting the set at its two ends, said last-named means comprising plates which extend transversely of the set at each end and are rigid in a transverse direction and yieldable axially.

In witness whereof, I have hereunto set my hand this 26th day of May, 1919.

OSCAR JUNGGREN.