July 22, 1924.

H. F. SCHMIDT

1,502,062

VERTICAL DESTROYER TYPE BLOWER

Filed Oct. 29, 1920

2 Sheets-Sheet 1

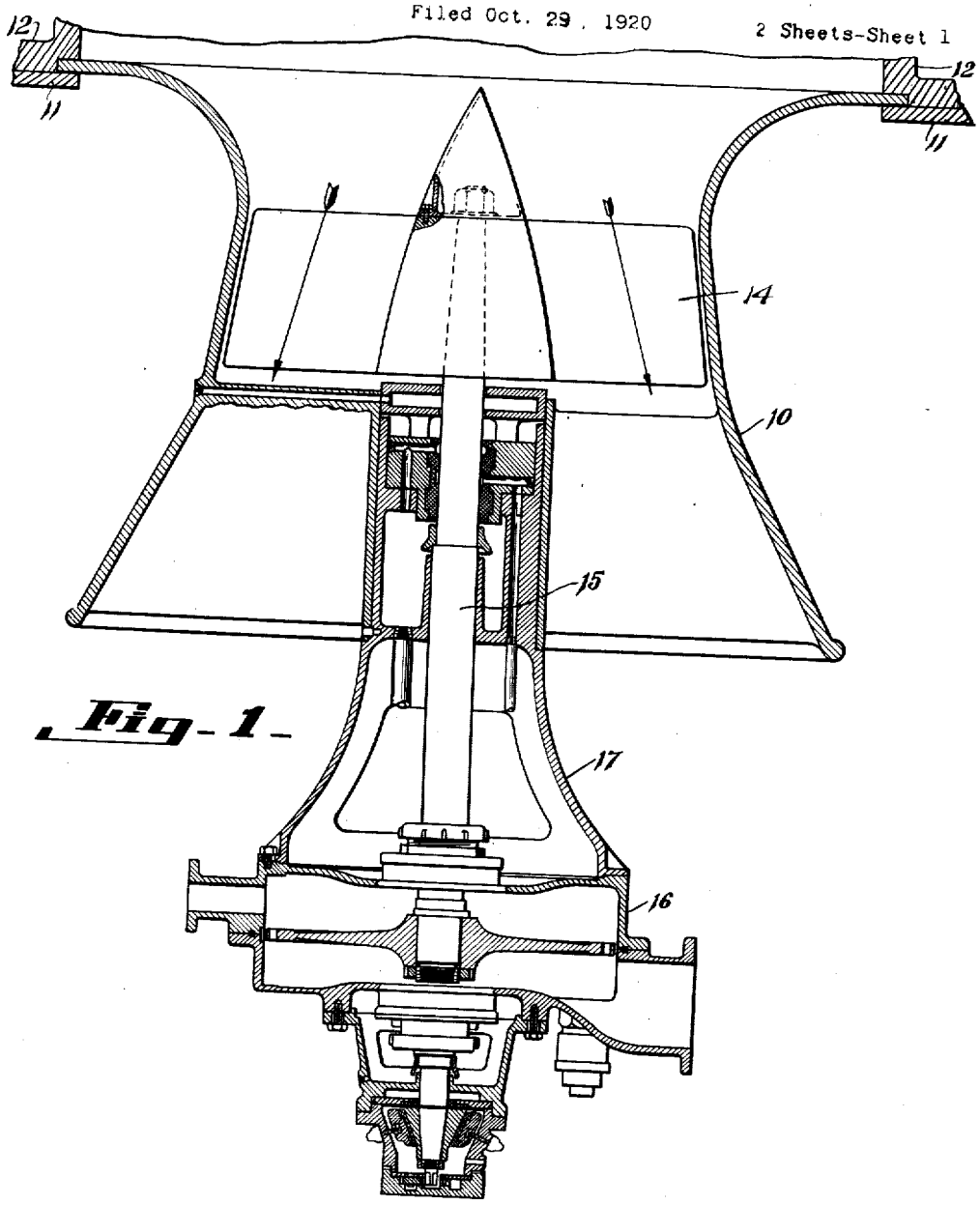


Fig. 1.

Henry F. Schmidt
INVENTOR.

BY D. C. Davis
ATTORNEY

July 22, 1924. 1,502,062

H. F. SCHMIDT

VERTICAL DESTROYER TYPE BLOWER

Filed Oct. 29, 1920 2 Sheets-Sheet 2

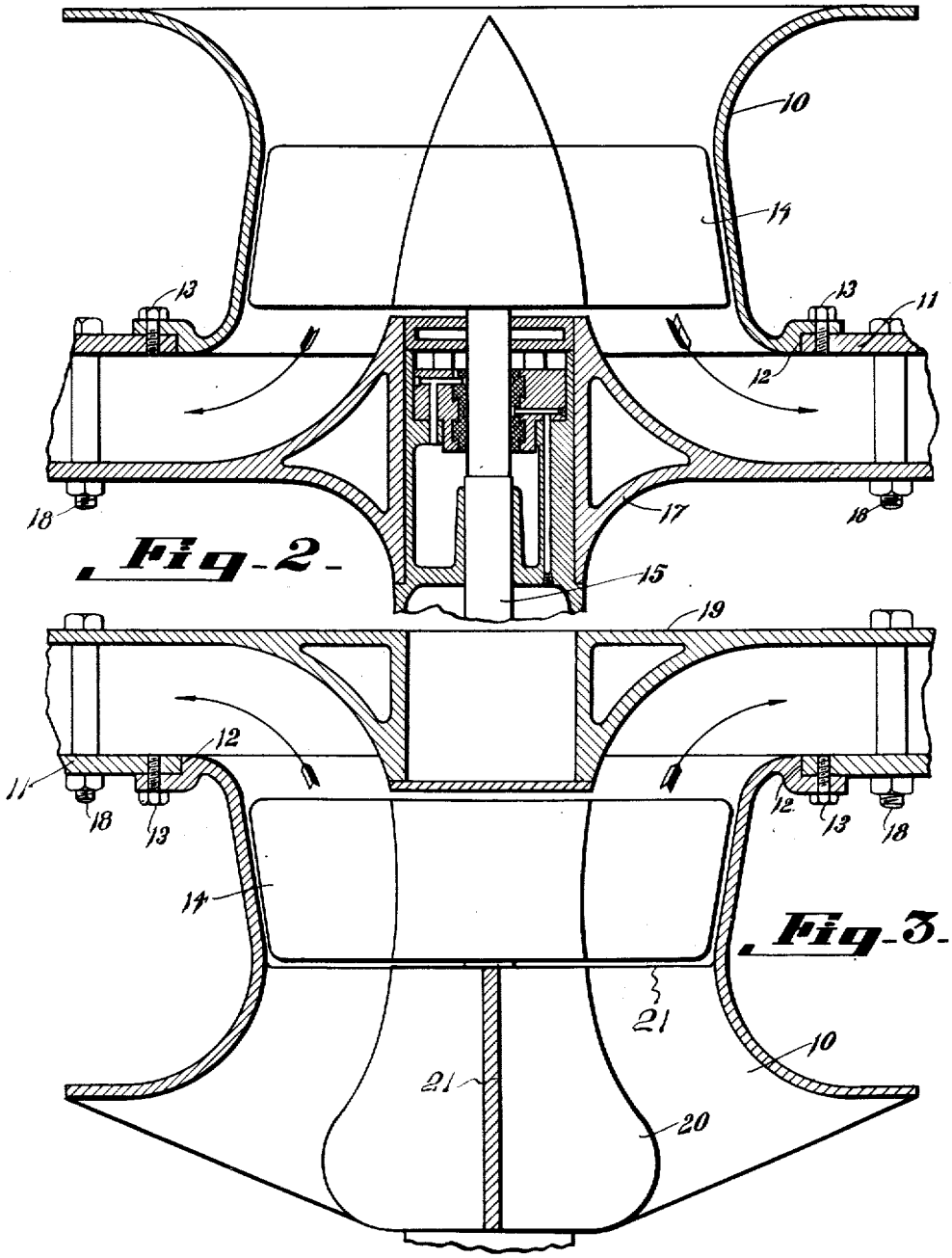


Fig-2-

Fig-3-

Henry F. Schmidt
INVENTOR

BY D. C. Davis

ATTORNEY

Patented July 22, 1924. 1,502,062

UNITED STATES PATENT OFFICE.

HENRY F. SCHMIDT, OF SWARTHMORE, PENNSYLVANIA, ASSIGNOR TO WESTINGHOUSE ELECTRIC AND MANUACTURING COMPANY, A CORPORATION OF PENNSYLVANIA.

VERTICAL DESTROYER TYPE BLOWER.

Application filed October 29, 1920. Serial No. 420,469.

To all whom it may concern:

Be it known that I, HENRY F. SCHMIDT, a citizen of the United States, and a resident of Swarthmore, in the county of Delaware and State of Pennsylvania, have invented a new and useful Improvement in Vertical Destroyer Type Blower, of which the following is a specification.

My invention relates to blowers and has for its object the provision of a blower of the propeller type for the purpose of building up and maintaining pressure in any desired compartment.

Another object of the invention is the provision of a blower of the character specified which may be readily applied and which may be easily assembled and disassembled.

These and other objects which will be made apparent throughout the further description of my invention are effected by means of apparatus embodying the features herein described and illustrated in the drawings accompanying and forming a part hereof wherein Figure 1 is a view, partially in section and partially in elevation, showing the propeller and driving means therefor, and Figs. 2 and 3 are views, partially in section and partially in elevation, showing modifications of the air distributing means forming a part of my invention.

My invention contemplates the application of a blower of the propeller type to any desired compartment wall, such as the bulkhead of a boiler room, in order to maintain the pressure within the compartment or room at any desired point and is designed to handle the air to be translated in the most efficient manner. My invention also contemplates the provision of such a blower comprising parts which may be readily attached to the wall of any desired compartment or room.

As illustrated, the blower comprises a converging-diverging member 10 which is adapted to be placed within an opening of a bulkhead 11. The converging-diverging member, as shown in Figs. 2 and 3, is provided with an annular shoulder 12 of a depth equal to the thickness of the bulkhead wall so that when it is in an assembled position the end of the diverging surface will be flush with the interior wall of the bulkhead into which air is to be drawn. The converging-diverging member is secured to the bulkhead by bolts 13 or other equivalent means.

Arranged within or near the throat of the converging-diverging member is a propeller 14 carried by a driving shaft 15. The driving shaft 15 is driven by a turbine or other convenient motive apparatus forming a component part of my improved blower as indicated at 16 in Fig. 1.

As shown in Fig. 2, the converging-diverging member 10 is fastened to the bulkhead in the manner heretofore described. The propeller 14 and the driving mechanism are carried by a casing 17 formed in such a manner as to aid in the proper circulation and distribution of air handled by the blower and the casing 17 is spaced from the bulkhead wall by struts 18.

As shown in Fig. 3, the converging-diverging member 10 is bolted to the wall as indicated and carries the propeller 14 and driving mechanism which in this case is located outside the compartment to which air is to be supplied by means of the webs 21. A frusto-conoidal distributing member 19, which is designed to permit a smooth flow-line passage of air, is located within the compartment and secured by the struts 18. The converging-diverging member has located therein deflector 20 which is designed to prevent eddy currents.

In each of the figures shown, the smoothly curved surfaces define with the converging portion of the member 10 an inlet passage through which air may be translated to the propeller 14 with a minimum loss of energy due to eddy and cross currents. The air is accelerated as it approaches the propeller because of the convergence of the inlet passage and is, therefore, picked up by the propeller with a minimum amount of shock loss. After leaving the propeller 14 the energy of velocity of the rapidly moving air is transmitted into pressure energy in the diverging discharge passage defined by the diverging portion of the member 10, the inner wall of the bulkhead 11 and the opposing surface of the frusto-conoidal member. It will be seen that the conoidal member and the diverging portion of the member 10 are constituted as stream line surfaces so that air passes therebetween and therefrom with a minimum degree of resistance due to the creation of eddy and cross currents.

The conoidal member has the conoidal portion which extends substantially parallel to the inner bulkhead wall and is secured to the latter, forming with the latter a radially-extending passage which serves to further expand the air received from the curved and divergent discharge passage. The air is discharged from about the outer edges of the conoidal member in order to build up the pressure within the boiler or stoker room to a sufficient degree to maintain combustion in the furnaces and to avoid the possibility of the back flow of combustion gases into the boiler or stoker room.

While I have shown my invention in but three forms, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications, without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are imposed by the prior art or as are specifically set forth in the appended claims.

What I claim is:

1. A blower comprising a converging-diverging member having a flange adapted to be fitted in a compartment wall, fastening means adapted to secure the flange portion to the compartment wall, a propeller within the converging-diverging member, driving means for the propeller including a casing element, said casing element and converging-diverging member forming a symmetrical air passage, means for supporting the casing element from the converging-diverging member, and a frusto-conoidal member contiguous to the discharge side of the propeller for providing a divergent stream line passage of annular cross section for the discharge of air.

2. In a boiler room blower, the combination of a casing element adapted to be secured to a boiler room bulkhead, a propeller within the casing element, and a member adapted to be secured to the opposite side of the bulkhead wall, the surfaces of said members being fashioned to provide stream line passages whereby the formation of eddy currents is avoided.

3. A boiler room blower comprising a converging member adapted to be attached to a bulkhead, a propeller within the member, driving means for the propeller, a casing for supporting the driving means, said casing and said member being provided with smooth curved surfaces to provide for the stream line entrance of air, and a member secured in place on the opposite side of the propeller provided with a stream line surface whereby the formation of eddy currents is avoided.

4. A blower for use in connection with compartments comprising a converging-diverging member adapted to be secured within an appropriate opening in a compartment, a propeller within said converging-diverging member, a symmetrically curved-surfaced casing terminating adjacent the propeller and supporting the driving means therefor, and a member terminating adjacent the other side of the propeller and provided with a divergent curved surface, the convergent surface of the convergent-divergent member and the convergent curved surface of the casing cooperating to form a convergent stream line passage for air to the propeller and the divergent inner surface of the convergent-divergent member and the curved surface of the divergent member cooperating to constitute a stream line outlet passage for air from the propeller.

5. A blower for use in connection with boiler room bulkheads comprising a convergent-divergent member adapted to be secured within an appropriate opening in the boiler room bulkhead, a propeller within the convergent-divergent portion, a convergent casing provided with an exteriorly curved surface cooperating with the convergent inner surface of the convergent-divergent member to constitute a convergent passageway for air for the propeller and a frusto-conoidal casing member in close contiguity to the propeller hub, and adapted to form a component of a divergent passage for the discharge of air from the propeller.

6. A blower for compartments comprising the combination of a convergent-divergent member adapted to be secured in place in an appropriate opening in a well thereof, a propeller within the convergent-divergent member, a member supported by and centrally of the convergent-divergent member and terminating adjacent the hub of the propeller, said central member and the convergent portion of the convergent-divergent member defining a convergent inlet passage for the propeller, and a frusto-conoidal member having its frustum portion arranged closely contiguous to the opposite side of the propeller and defining with the divergent portion of the convergent-divergent member a curved divergent outlet passage and terminating radially to the propeller axis.

7. In a blower for boiler room bulkheads, the combination of a bulkhead having an opening therein and a convergent-divergent member secured within the opening and having its inner divergent surface continuous and flush with the inner surface of the bulkhead, a propeller within the convergent-divergent member, and a frusto-conoidal member secured to a member attached to the bulkhead, the diverging portion of the convergent-divergent member and the curved surface of the frusto-conoidal member defining a curved divergent outlet passage

about the axis of the propeller and the radial portion of said frusto-conoidal member.

8. A blower for boiler room bulkheads comprising a bulkhead, a member adapted to be secured to the bulkhead, a propeller within the member, a member supported by and centrally of the first member and terminating adjacent the hub of the propeller, the surface of the first member and the central member defining a converging inlet passage for air, a member secured to the opposite side of the bulkhead and cooperating with the first member and the bulkhead to provide an expansive discharge for the air discharged from the propeller to the interior of the bulkhead.

In testimony whereof, I have hereunto subscribed my name this 27th day of October, 1920.

HENRY F. SCHMIDT.

Certificate of Correction.

It is hereby certified that in Letters Patent No. 1,502,062, granted July 22, 1924, upon the application of Henry F. Schmidt, of Swarthmore, Pennsylvania, for an improvement in "Vertical Destroyer Type Blowers," an error appears in the printed specification requiring correction as follows: Page 2, line 102, claim 6, for the word "well" read *wall;* and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2d day of September, A. D. 1924.

[SEAL.]

KARL FENNING,
Acting Commissioner of Patents.