No. 877,648. PATENTED JAN. 28, 1908.

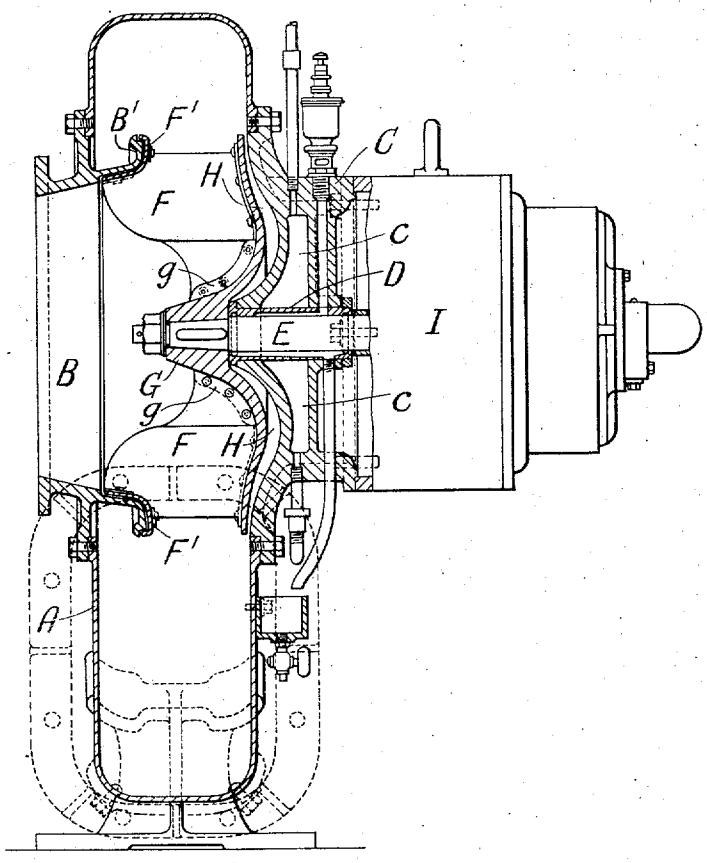
J. KEITH.

CENTRIFUGAL FAN.

APPLICATION FILED MAY 18, 1907.

3 SHEETS—SHEET 1.

Fig. 1.



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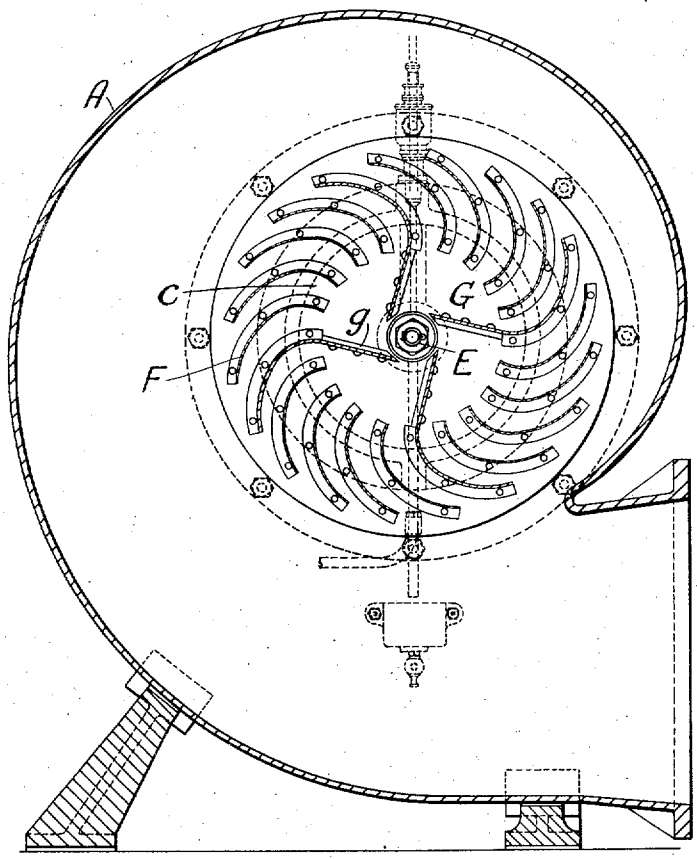
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APPLICATION FILED MAY 18, 1907.

3 SHEETS—SHEET 2.

Fig. 2.



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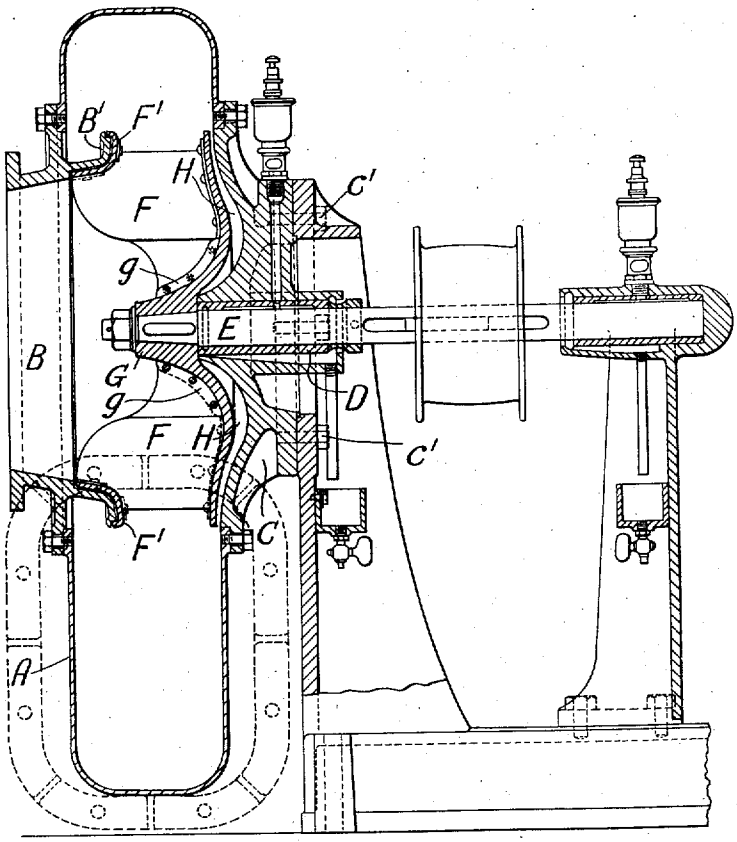
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APPLICATION FILED MAY 18, 1907.

3 SHEETS—SHEET 3.

Fig. 3.



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CENTRIFUGAL FAN.

No. 877,648. Specification of Letters Patent. Patented Jan. 28, 1908.

Application filed May 18, 1907. Serial No. 374,408.

To all whom it may concern:

Be it known that I, JAMES KEITH, a subject of the King of the United Kingdom of Great Britain and Ireland, residing at London, England, have invented certain new and useful Improvements in Centrifugal Fans, of which the following is a specification.

This invention is a development of that described in the specification of Letters Patent No. 847585, and it has for its object to provide an improved construction of centrifugal fan of the type referred to therein but having a single inlet and adapted more particularly for suction or exhausting purposes such for example as for drawing off hot gases in induced draft furnaces, in which case it is desirable to avoid overheating of the bearings in which the fan spindle runs, as also to avoid overheating of the driving motor when the fan is electrically driven.

The fan spindle is carried in hollow journal bearings through which water is circulated for cooling purposes while the driving motor may, if desired, be brought close up to one side of the fan casing which has a single inlet eye on the opposite side, the inlet eye and the fan wheel being each formed with guard cheeks or rings as described in Patent No. 847585, but only on one side.

In the accompanying drawings Figures 1 and 2 are vertical sections at right angles to each other showing one construction of the fan in which a water jacket is fitted around the fan spindle and interposed between the fan wheel and driving motor while Fig. 3 is a vertical section showing a modification in which the water jacket is omitted and the driving pulley or motor is at some distance from the fan casing.

As therein shown the fan casing A is made in one piece and is fitted with a single inlet eye piece B having an inturned guard cheek B^1 while on the opposite side of the casing is secured a central casting C which carries the journal bearings D for the spindle E on which is keyed the fan wheel F. The blades of the latter are secured to a central boss G of the curved formation shown leaving a non-conducting air space H between it and the rear casting C of the casing. At the inlet side adjacent the guard cheek B^1 and closely fitting it a guard ring F^1 is secured around the blades as in the construction described in the Patent No. 847585.

Special attention is drawn to the formation of the fan blades and the mode of mounting the same as illustrated in the drawings inasmuch as the efficiency of the fan depends largely on these features.

As shown, four of the fan blades (or the driving arms) are carried down the face of the curved central boss G and secured by screws to ribs *g* on said boss. These blades are also flanged and secured by riveting to the outer extension of the boss G and to the curved guard ring F^1. The intermediate blades (the thickness of which is of lighter gage than the driving arms) are also flanged and secured in a manner similar to those described with the exception that they are not carried down the face of the curved central boss G.

When the journal bearings are water-jacketed as indicated at Fig. 1, the jacket *c* extends radially outwards to present an extended disk-like cooling surface between the fan casing and the driving motor I.

When the temperature of the hot gases is such as to be liable to affect the insulation of the motor it is preferred to employ an extended shaft and to mount the motor at some distance from the fan, an additional bracket serving to support the shaft as indicated in Fig. 3.

The water jacket is not essential but as above indicated it is usually preferred especially in the case of an electrically driven fan.

In order that the fan may be caused to direct a blast in any desired direction the fan casing may be rotated around an axis coinciding with the axis of the shaft and is secured to the casting C by means of interchangeable bolts c^1 arranged in a ring, as is customary in centrifugal pumps (Fig. 3).

Having now described my invention what I claim and desire to secure by Letters Patent of the United States is:—

The herein described centrifugal fan, comprising, in combination a fan casing made in one piece and having a single central intake eye and a tangential outlet and formed with an inturned annular guard cheek around said eye, a recess being left between said cheek and the inner wall of the casing, a central casting secured on the sides of the casing opposite said eye, a blade wheel comprising a curved central boss having ribs thereon, a guard ring closely fitting said cheek, blades secured to said boss on one side and secured to said ring, and screws securing four of said blades to said ribs, a

spindle carrying said wheel journal bearings for said spindle, said bearings supported by said casting; a motor having its rotary member secured to said spindle and its stator secured to said casting, and a water jacketing device formed in the casting and interposed between the fan casing and the motor.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES KEITH.

Witnesses:

WALLACE CRANSTON FAIRWEATHER,

JNO. ARMSTRONG, Junr.