

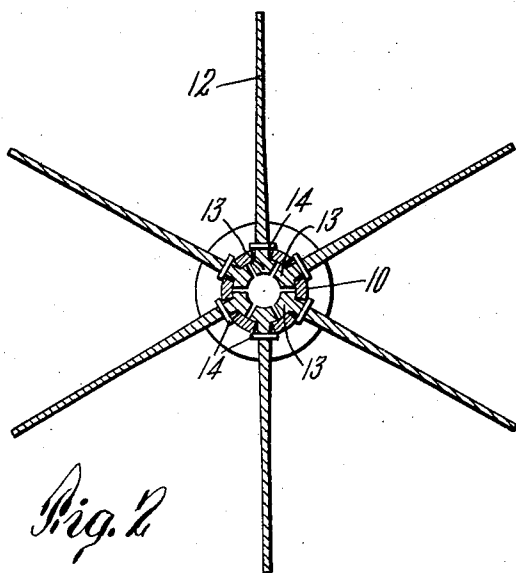
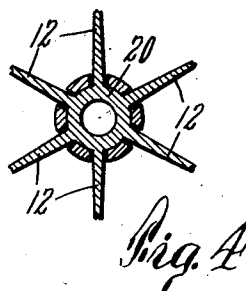
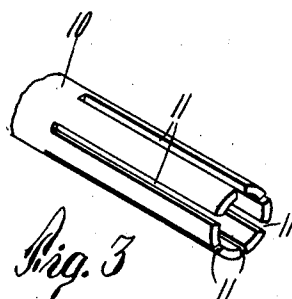
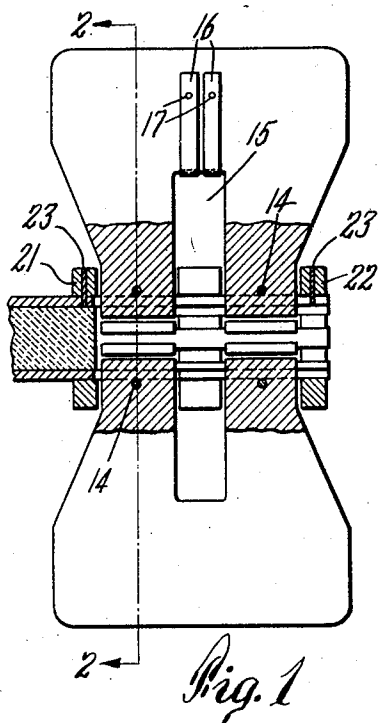
May 16, 1933.

D. P. OGDEN

1,909,885

FAN

Original Filed Dec. 17, 1929



Inventor:  
Dana P. Ogden.  
by  
Hight Brown Quincy May  
Attys.

## UNITED STATES PATENT OFFICE

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## FAN

Original application filed December 17, 1929, Serial No. 414,641. Divided and this application filed April 13, 1931. Serial No. 529,733.

This application is a division of my co-  
pending application Serial No. 414,641, filed  
December 17, 1929. The invention relates to  
fan structure suitable for operation in places  
where highly heated gases may come into di-  
rect contact with the fan. The fan herein-  
after described is intended for use at temper-  
atures of the order of 2000° F., the object of  
the invention being to provide a fan which  
can be operated satisfactorily at those tem-  
peratures, which is easily assembled, and  
which can readily be repaired or renewed.

For a more complete understanding of the  
invention reference may be had to the de-  
scription which follows and to the drawing,  
in which,—

Figure 1 is an elevation, partly in section,  
of a fan embodying the invention.

Figure 2 is a section on the line 2—2 of  
Figure 1.

Figure 3 is a perspective view of the fan-  
supporting end of the fan shaft.

Figure 4 is a fragmentary section, similar  
to Figure 2, showing another form of the  
invention.

The fan shaft 10 is preferably split by sev-  
eral slots 11 extending longitudinally from  
the fan bearing end. The shaft is preferably  
made of high-resistant metal such as chro-  
mium nickel alloys of iron which may be  
capable of satisfactory operation at temper-  
atures of the order of 2000° F. For example,  
one such alloy may comprise chromium 30%,  
nickel 15% and iron 45%. For somewhat  
lower temperatures, that is, around 1400° to  
1600° F., so-called calorized iron can be used,  
this consisting of iron which has been packed  
in aluminum dust and heated for a consider-  
able time.

The fan blades may be individually cast of  
suitable metals such as those hereinbefore re-  
ferred to. As shown in Figures 1 and 2, each  
separate blade 12 may have a segmental bead  
13 at its inner end. The blades are adapted  
to slide into the several slots 11, the beads 13  
being within the hollow shaft 10, as indicated

in Figure 2. The blades are each perforated  
adjacent to the outer surface of the shaft 10  
to receive suitable pins 14 by which the blades  
are secured in place. Each blade is prefer-  
ably formed with a central slot 15 through  
which may be positioned one or more U-  
shaped pieces 16 which are riveted as at 17 to  
the blade. By proper selection of the weight  
of these U-shaped members inequalities in the  
weight distribution of the several blades of a  
fan may be compensated for so that the com-  
pleted fan may be substantial rotative bal-  
ance. This is of particular importance where  
fans having vanes of substantial weight are  
employed and also where they are subjected  
to severe operating conditions occasioned by  
direct contact of the hot gases.

If desired, the blades 12 may be cast to-  
gether integrally with a single hub member  
20, as shown in Figure 4. The blades on the  
hub 20 are angularly spaced so as to enter the  
several slots 11 simultaneously, the hub 20  
being of sufficiently small diameter to fit in  
the interior of the hollow shaft 10. In either  
type of construction, the blades may be held  
against axial movement on the shaft 10 as by  
a pair of suitable collars 21, 22 which may be  
secured on the shaft 10 as by suitable pins or  
rivets 23.

I claim:

1. A mechanism of the class described com-  
prising a hollow shaft having longitudinally  
arranged slots, and fan blades having por-  
tions extending through said slots and por-  
tions engaging the inner wall of said shaft  
adjacent to said slots.

2. A mechanism of the class described com-  
prising a hollow shaft having longitudinally  
arranged slots, and fan blades having por-  
tions extending through said slots and por-  
tions engaging the inner wall of said shaft  
adjacent to said slots, said engaging portions  
of all of said blades together engaging said  
inner wall throughout its entire angular ex-  
tent.

3. A mechanism of the class described com-

prising a hollow shaft having longitudinally  
arranged slots, and fan blades having por-  
tions extending through said slots and por-  
tions engaging the inner wall of said shaft  
5 adjacent to said slots, said blades having per-  
forations adjacent to the outer face of said  
shaft, and keys extending through said per-  
forations.

In testimony whereof I have affixed my  
10 signature.

DANA P. OGDEN.

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**CERTIFICATE OF CORRECTION.**

**Patent No. 1,909,885.**

**May 16, 1933.**

**DANA P. OGDEN.**

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: In the heading to the printed specification, the name of the assignee of one-half interest was erroneously written and printed as "Erwin F. Plumb" whereas said name should have been written and printed as "Ermin F. Plumb" as shown by the record of the case in this office; 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 18th day of July, A. D. 1933.

**M. J. Moore.**

**(Seal)**

**Acting Commissioner of Patents.**