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J. C. HOSCH

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Fig. 1.

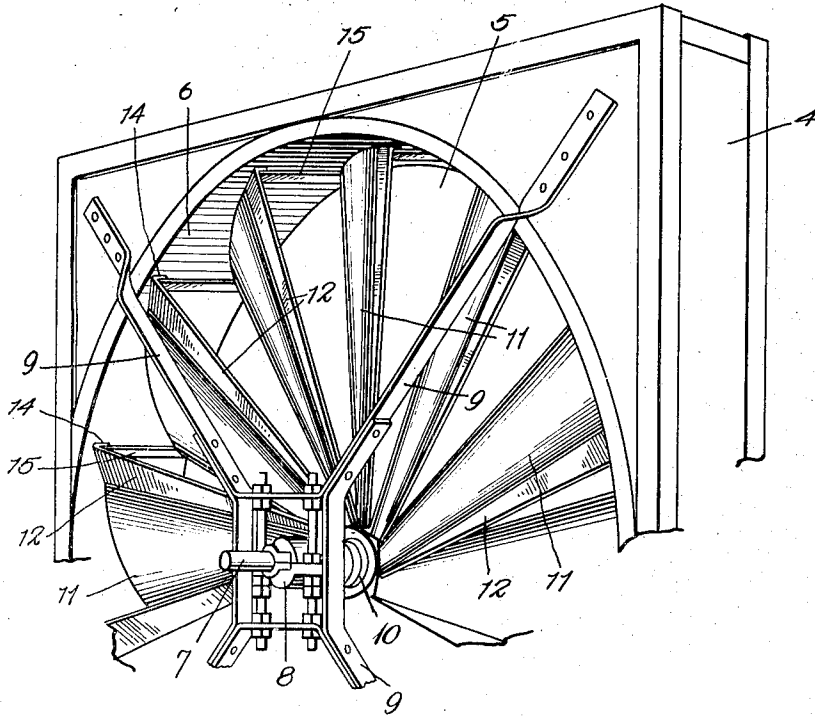


Fig. 3.

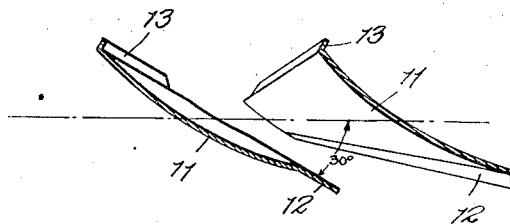
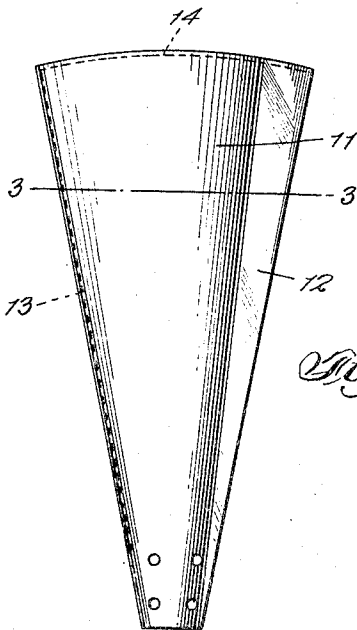


Fig. 2.



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This invention relates generally to fans, and particularly to high pressure power fans used in connection with air supply mechanism for theatres, auditoriums, etc.

5 The primary object of the invention is to provide fan structure of such character that an even and constant body of air is kept moving through the machine, and which is not susceptible to fluctuations due to varia-
10 tion in air pressure.

A further object of the invention is to provide a fan of such construction that blade whip is overcome and the tendency to reduced pressure or partial vacuum at
15 the axis of the fan is eliminated.

A still further and particular object of the invention is to provide a fan characterized by novel means of shaping, assembling and connecting the blades, whereby to provide a
20 most effective fan and one wherein danger of breakage, wear or derangement of the parts is minimized.

With these objects in view, together with others which will appear as the description
25 proceeds, the invention consists in the novel construction, combination and arrangement of parts, all as will be described more fully hereinafter, illustrated in the drawing, and particularly pointed out in the claims.

30 In the drawing:

Fig. 1 is a fragmentary perspective view of a fan constructed in accordance with the invention,

35 Fig. 2 is an enlarged rear elevation of one of the fan blades, and

Fig. 3 is a transverse sectional view taken substantially upon line 3—3 of Fig. 2.

In carrying out the invention, a fan casing 4 of substantially rectangular formation
40 is provided, and this casing has a central aperture 5 within which the fan rotates. The casing 4 may be constructed of any suitable material, and is either set within the wall or within the body portion or frame
45 work of the air supplying mechanism. The frame provides an annular pathway 6 around which the blades of the fan travel.

Arranged centrally and axially within the opening 5 is a fan shaft represented at 7,
50 deriving its rotary movement from any suitable source of power. This shaft is mounted in suitable bearings as at 8 held within a framework 9 secured to the casing 4, and

one end of the shaft is equipped with a fan head 10.

55 The head 10 has radiating therefrom a plurality of fan blades 11, all of which have the same general pitch and which extend at their free ends in close proximity to the path 6 in the casing. These blades are arranged
60 with their edges in overlapping relation, and are constructed in such manner as to operate upon air bodies to move the same in a common and even course through the machine. The blades in the present instance
65 are set at a general pitch of thirty degrees, however, this pitch may be varied as occasion may require. Each blade has its operative or forward face concaved transverse-
70 ly from the inner to the outer end thereof as shown particularly in Fig. 3, and the forward or entrant edge of each blade is straight and flat as represented at 12. These
75 straight, flat portions are substantially co-extensive with the length of their respective blades, and increase gradually in breadth toward the outer end of the blade. The rear
80 edge of each blade is provided with a forwardly extending flange 13, disposed at substantially right angles to the pitch of the blade and co-extensive with the length of
85 the latter. The outer or free ends of the blades are provided with forwardly projecting flanges represented at 14, of substantially the same depth as the flanges 13. The
90 flanges 13—14, in addition to forming pockets at the rear and outer edges of the fan blades, constitute reinforcing ribs for the blades, whereby the latter are stabilized and main-
95 tained rigidly against being flexed. This rigidity of the blades prevents whip of the same when back pressure occurs in advance of the fan. The arrangement of the blades in overlapping relation from the center to the outer ends of the fan maintains an even
100 flow of air through the fan and overcomes the tendency to low pressure or partial vacuum centrally of the fan.

To further stabilize the fan structure and to insure against lateral movements of the
105 blades relative to each other tie members or stays 15 are employed. These stays constitute relatively thin metallic bars riveted or in any other preferred manner secured to adjacent fan blades. It will be observed, furthermore, that the forward edge of one

blade is connected with the rear edge of the next adjacent blade at the extreme outer ends thereof by the tie members 15 so that the entrant portion of each blade is rigidly connected with the reinforced or stabilized portion of the next adjacent blade. This tie and reinforcing arrangement is particularly advantageous where heavy fans are employed and rotated at high speed.

- 10 From the foregoing it is apparent that a fan so constructed will operate to produce a constant unvarying air pressure which is substantially of the same velocity at the center as at the outer periphery of the fan.
- 15 This evenness of pressure is due to the particular shape and construction of the blades, their overlapping relation and the provision of the pockets at the rear edges of the several blades. It has heretofore been stated
- 20 that the pitch of the blades is substantially thirty degrees. This pitch has been found highly effective under most conditions, however, it will be understood that variation of the pitch or angle at which the blades are
- 25 set may be varied as occasion may require.

It will be understood, furthermore, that alteration or changes in the degree of lateral curvature as well as the disposition of the pockets and arrangement of stays may be

30 resorted to if desired without departing from the spirit of the invention as defined by the claims.

Having thus described my invention, I claim:

- 35 1. In a fan structure, a head, outwardly tapering blades radiating therefrom with a flat front edge merging into a concave body,

and deflected portions at the rear edge and free end of each blade to form pockets at such points.

2. In a fan structure, a head, blades radiating from said head and arranged in overlapping relation throughout their lengths, and deflected portions at the rear edges and free ends of each of said blades to form pockets at such points.

3. In a fan structure, a head, blades radiating from said head in common pitch and in overlapping relation throughout their lengths, deflected portions at the rear edges and free ends of said blades to form pockets at such points, and flat portions at the forward edges of said blades coextensive with the length of the latter and of different pitch from the remainder of the blade surfaces.

4. In a fan structure, a casing, a head arranged centrally of said casing, a plurality of blades of common pitch radiating from said head and terminating in close proximity to the said casing, the axial depth of said blades at their free ends substantially equal to the depth of the casing, said blades having straight portions at their forward edges and being curved laterally and disposed in overlapping relation throughout their lengths, flanges projecting forwardly from the rear edges and free ends of said blades, and bars connecting the end flanges of said blades and straight portions at the forward edges of each of said blades.

In testimony whereof I affix my signature.

J. CLAUDE HOSCH.