July 2, 1929. T. B. STILLMAN 1,719,090

OIL BURNER .

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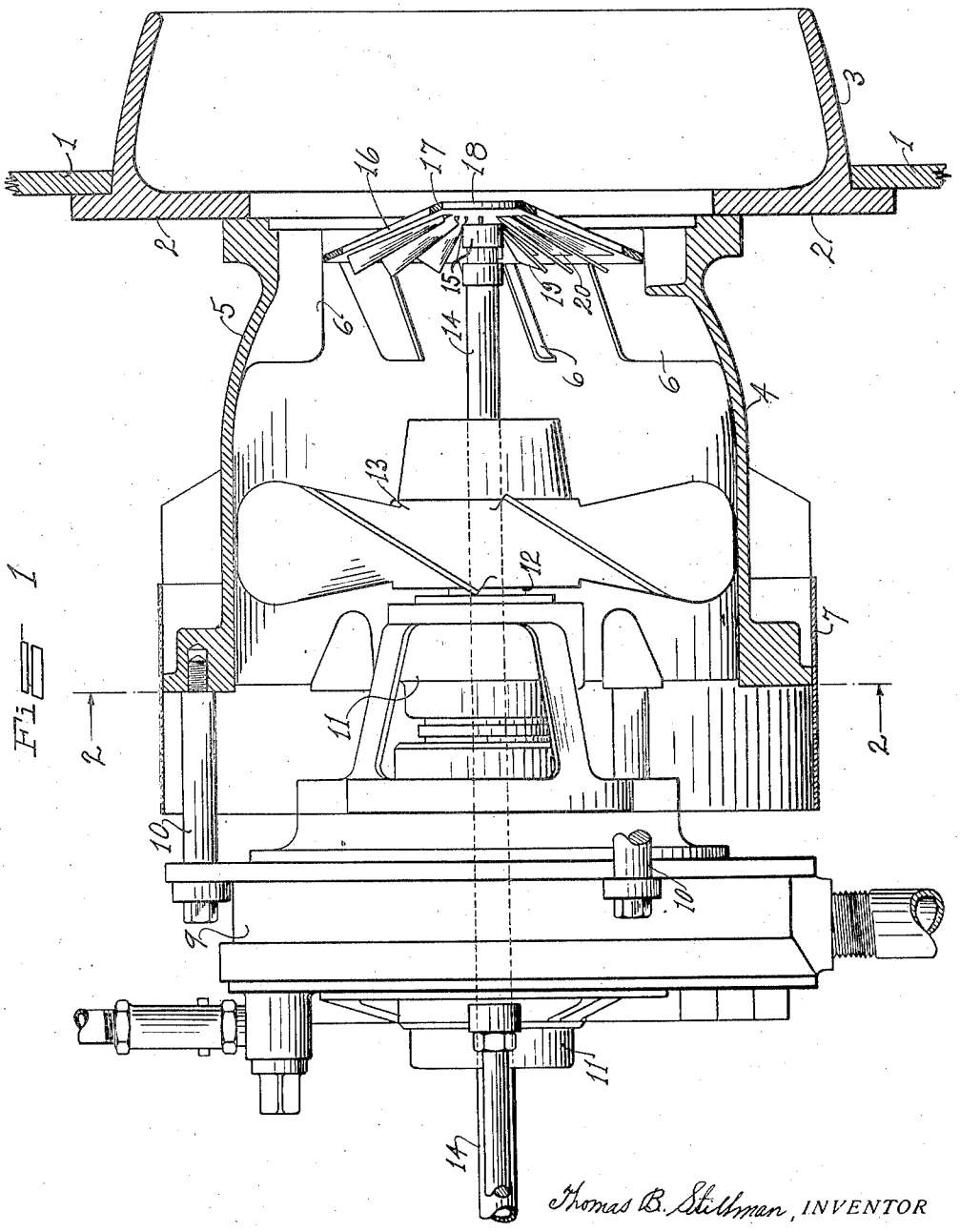


Fig. 1

Thomas B. Stillman, INVENTOR

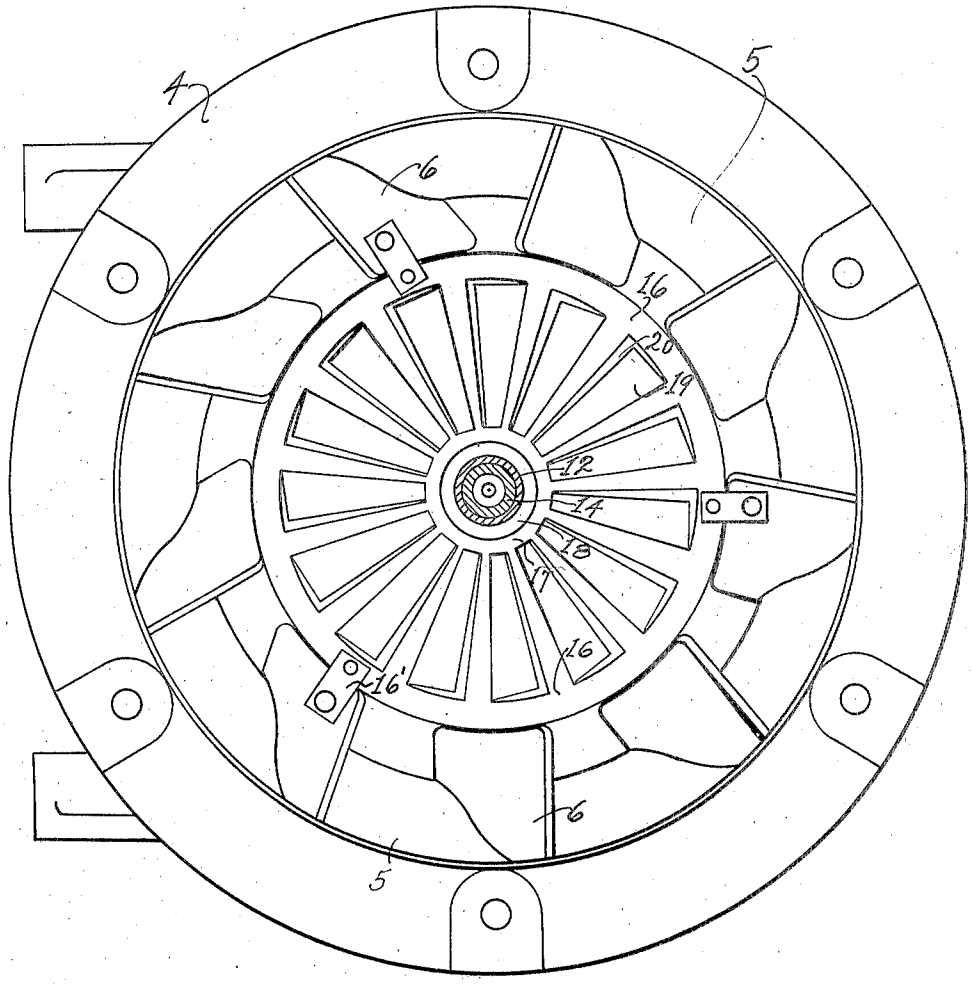
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Fig. 2.



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UNITED STATES PATENT OFFICE.

THOMAS B. STILLMAN, OF SOUTH ORANGE, NEW JERSEY, ASSIGNOR TO THE BABCOCK & WILCOX COMPANY, OF BAYONNE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

OIL BURNER.

Application filed November 21, 1925. Serial No. 70,460.

This invention relates to a device for burning fuel, such as oil, that is forced into a furnace through a sprayer, and will be understood from the description in connection with the accompanying drawings, in which Fig. 1 is a vertical section through an oil burning apparatus embodying my invention, and Fig. 2 is a section along the line 2—2 of Fig. 1, with the fan and its motor parts removed.

In the drawings, reference character 1 indicates the front wall of a furnace, in which is located a member 2 that is preferably circular in cross-section and is provided with an annular flange 3 that projects into the furnace. A casing 4 for the oil burner is attached to the member 2 in any convenient manner, and has a portion or opening 5 at its exit end with converging walls that are preferably circular in cross-section, thus providing a conically shaped exit or outlet into the furnace. Inwardly projecting plates 6 are spaced apart and located along the converging walls back of the nozzle and at an angle to the longitudinal axis of the casing 4, so that air passing through it will be deflected and given a whirling motion. The casing 4 forms a conduit for the passage of air and is provided with an air regulating shutter 7, in the usual manner.

A motor frame 9 is attached to the casing 4 by means of the stud bolts 10, and carries bearings 11 in spiders attached to the motor frame for a hollow shaft 12, to which the motor itself is connected. The shaft 12 carries a fan 13 for forcing air through the casing 4 and the portion 5 into the furnace. A fuel inlet pipe 14 for oil, for example, passes longitudinally through the hollow shaft 12, and is provided at its inner end with an atomizing nozzle 15.

An air deflecting plate 16 that may be in the shape of a hollow truncated cone is mounted in the opening 5 with its periphery contacting with the inner edges of the plates 6. The plate 16 may be attached to the plates 6 by means of clips 16′. The smaller or truncated end of the conical air deflecting plate 16 terminates in a ring 17, having a hole 18 into proximity with which the atomizer 15 of the fuel inlet 14 extends. The air deflecting plate is provided with wings 19, each adjacent a transverse air opening 20. The conically shaped air deflecting plate is so mounted that its small end or top projects toward the furnace, being nearer the discharge end of the casing than the base of the cone. By this arrangement it has been found that pulsation of the flame that would otherwise occur is very much reduced, or entirely obviated.

Liquid fuel, such as oil, is introduced through the pipe 14 and atomizer 15, while the motor within the casing 9 drives the fan 13, so as to force air through the conical portion 5 of the casing 4, and also through the openings 20 in the air deflector 16, thus causing a swirling motion of the air, in the manner that will be readily understood.

It will be noted that the surfaces of the plate 16 which are contacted by the air flowing toward the furnace through casing 4, slope toward the axis of the burner. By this arrangement, some of the air contacting with the plate 16 is directed more or less toward the axis of the cone or toward the opening 18, to supply air practically at the apex of the cone of spray issuing from the atomizer 15, the atomizing nozzle being usually located in front of this opening, or on the side thereof away from the furnace. Some of the air also passes through the openings 20, being given a whirling motion by the wings 19. This arrangement, while useful to direct air to the apex of the fuel cone, regardless of what causes the air to flow through the casing 4, is particularly useful when the air is driven by a fan in the casing, as illustrated, because such a fan tends to concentrate the air along the walls of the casing and causes a consequent deficiency of air around the axis of the casing in which is located the atomizer. With the arrangement described, such deficiency is overcome by the air diverted toward the axis by the plate 16.

I claim:

1. In combination, a casing forming a conduit for the passage of air therethrough, a fuel discharge nozzle disposed in said casing, and a deflecting plate adapted to cause the air passing through said casing to flow towards said nozzle, said plate being in the form of a hollow truncated cone with its top nearer the discharge end of the casing than its base and with its surface provided with a plurality of openings.

2. In combination, a casing forming a conduit for the passage of air therethrough, a fuel discharge nozzle disposed in said casing, and a deflecting plate adapted to cause the

air passing through said casing to flow towards said nozzle, said plate being in the form of a hollow truncated cone with its top nearer the discharge end of the casing than its base, and with its surface provided with a plurality of wings, each adjacent an opening in said surface.

3. In combination, a casing forming a conduit for the passage of air therethrough, a fuel discharge nozzle disposed in said casing, a deflecting plate adapted to cause the air passing through said casing to flow towards said nozzle, said plate being in the form of a hollow truncated cone with its top nearer the discharge end of the casing than its base, and with its surface provided with a plurality of wings, each adjacent an opening in said surface, and a plurality of plates disposed on the wall of the casing back of the deflecting plate.

THOMAS B. STILLMAN.