

No. 809,168.

PATENTED JAN. 2, 1906.

G. M. BOONE.
SMOKE CONSUMER.
APPLICATION FILED JULY 7, 1905.

Fig. 1.

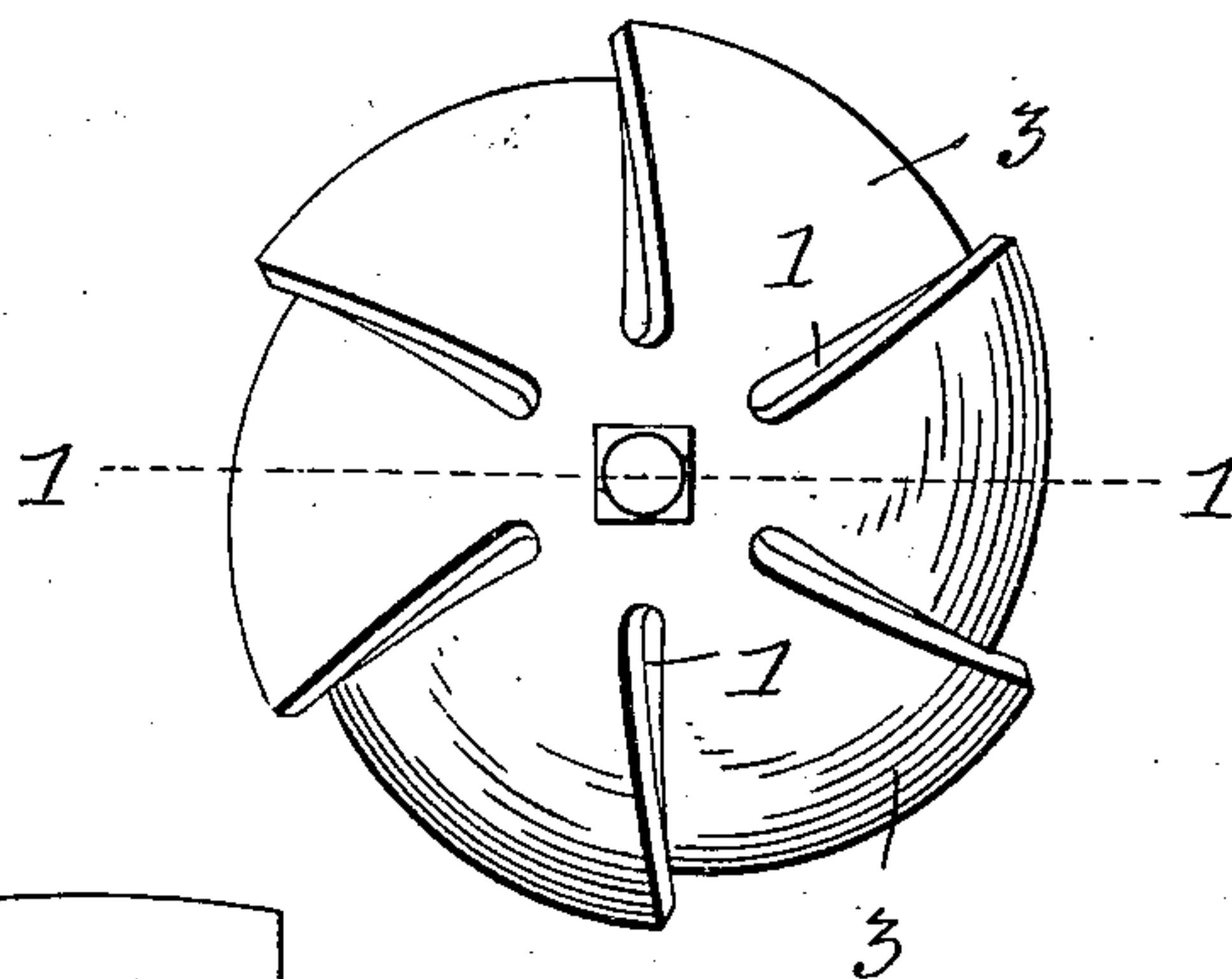


Fig. 2.

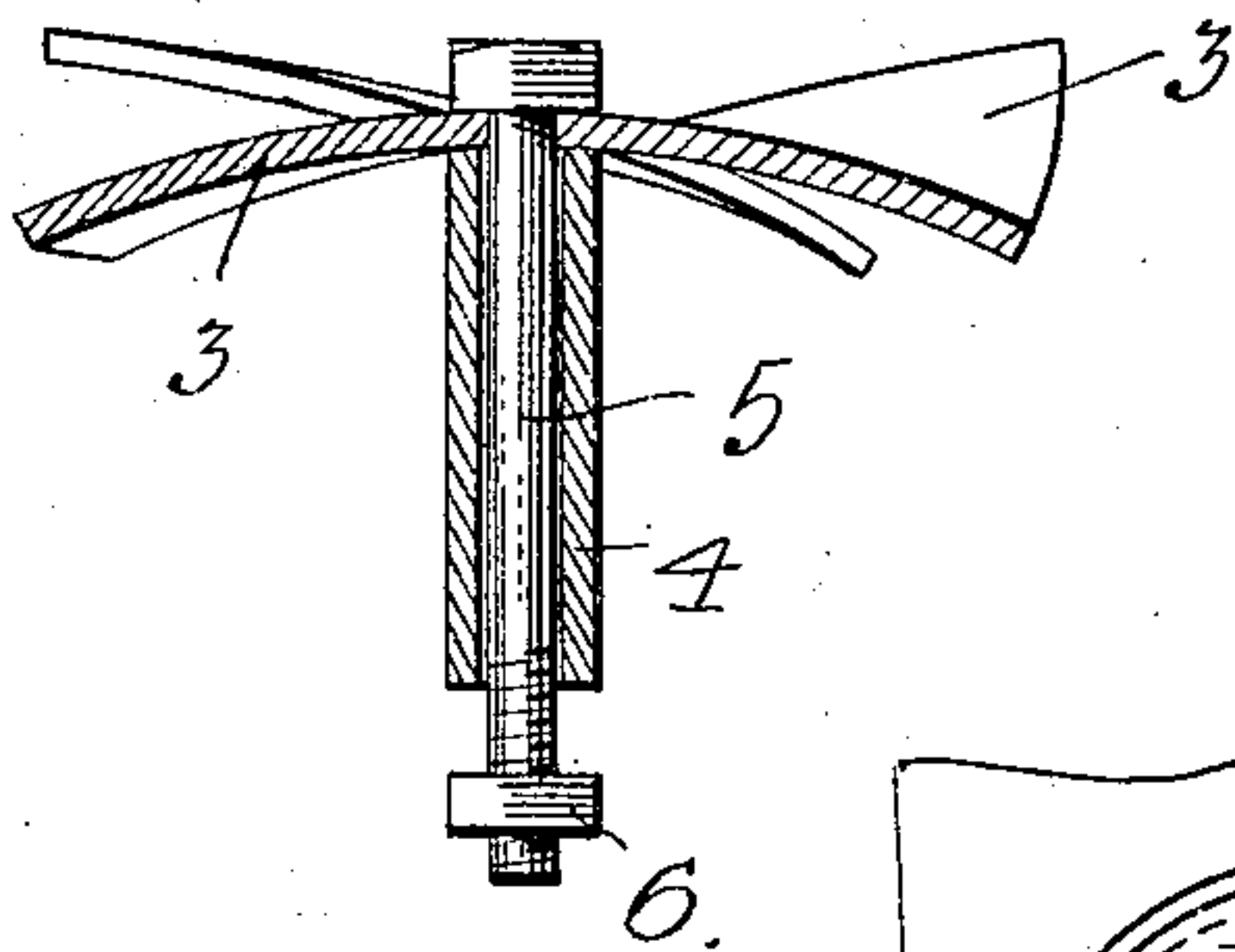


Fig. 5.

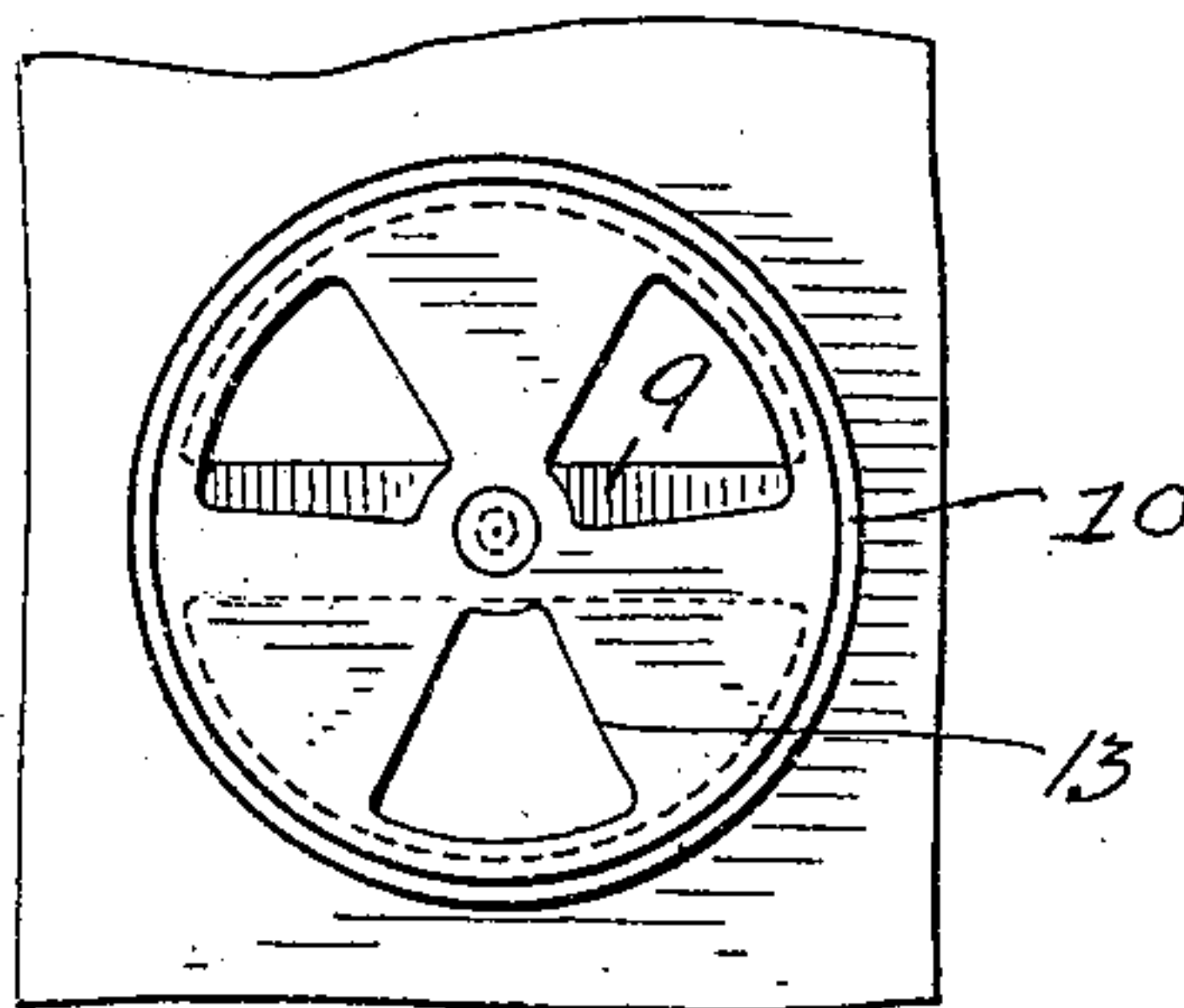


Fig. 4.

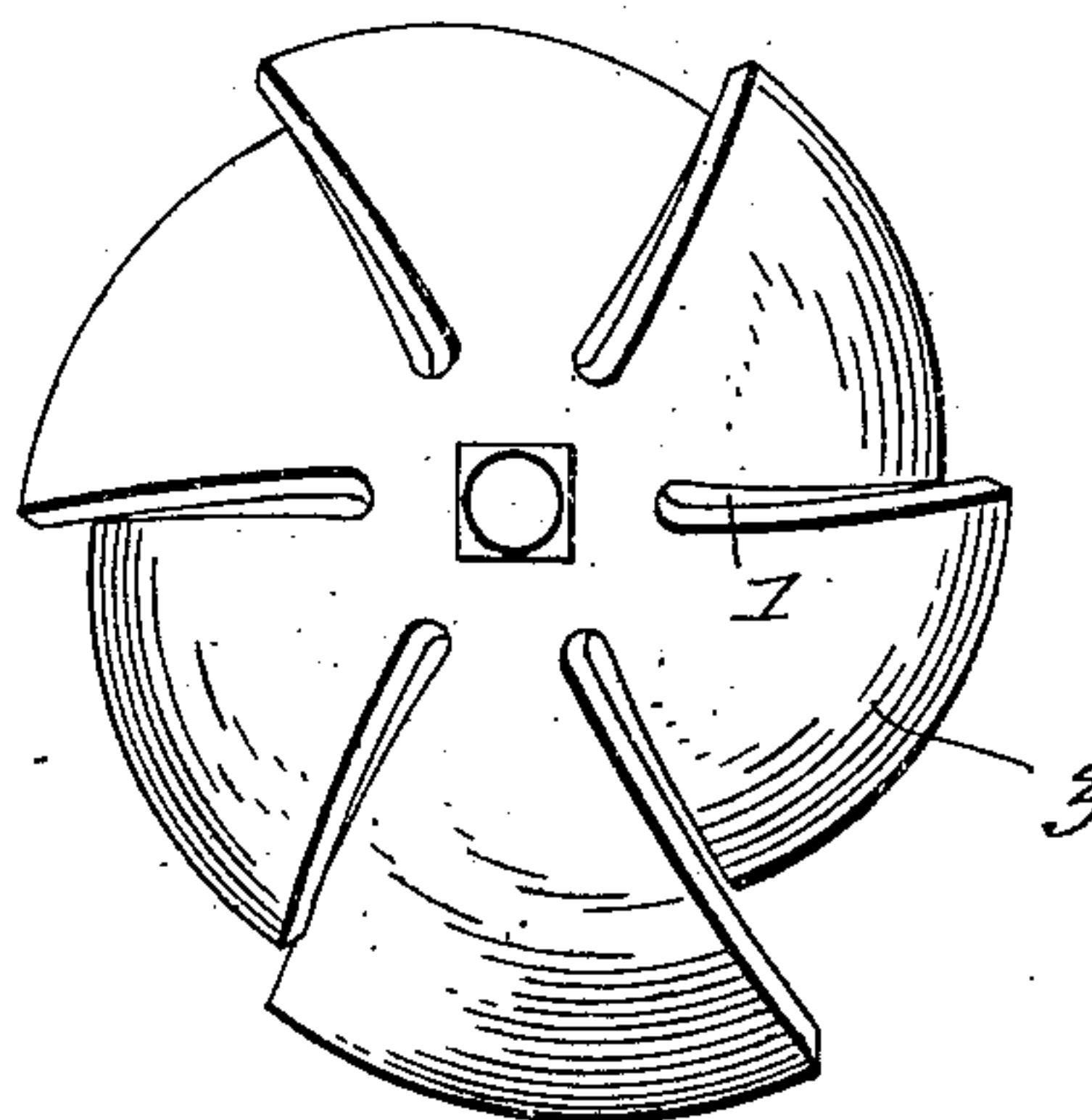
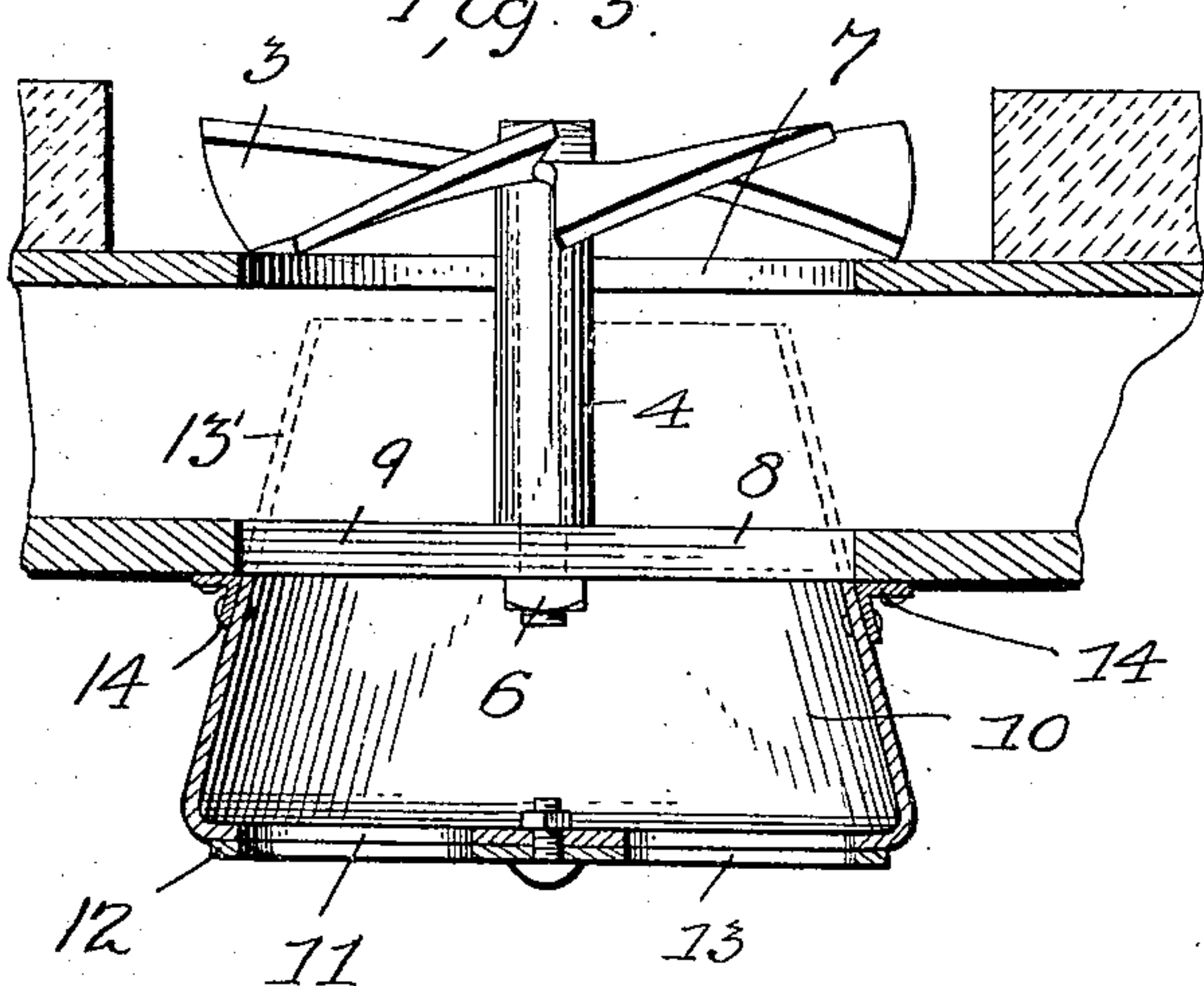


Fig. 3.



Attest:

C. S. Minkison
Edward N. Sartou

Inventor:
George M. Boone.

By Spear, Middleton, Donaldson & Spear
Attys.

UNITED STATES PATENT OFFICE.

GEORGE M. BOONE, OF BALTIMORE, MARYLAND.

SMOKE-CONSUMER.

No. 809,168.

Specification of Letters Patent.

Patented Jan. 2, 1906.

Application filed July 7, 1905. Serial No. 268,626.

To all whom it may concern:

Be it known that I, GEORGE M. BOONE, a citizen of the United States, residing at Baltimore, Maryland, have invented certain new and useful Improvements in Smoke-Consumers, of which the following is a specification.

My invention herein described relates to devices for feeding air to furnaces of that class in which the air as it enters the fire-chamber over the fire-bed is given a whirling movement for the purpose of more thoroughly mixing the air with the unconsumed products of combustion and effecting more thorough combustion, both for economy of fuel and to prevent the nuisance of smoke.

I have sought in this invention to provide a simple and cheap device and one which may be readily applied to any form of furnace and which will set up the required whirling movement in all parts of the fire-box.

My said invention is illustrated in the accompanying drawings, in which—

Figure 1 shows the device in front view. Fig. 2 shows a section on line 1 1, Fig. 1. Fig. 3 illustrates the device in a modified form and as applied to the door in a vertical boiler. Fig. 4 shows an inside elevation of this modified form. Fig. 5 shows a front view of the door with the air-opening and draft-regulator.

The device shown is approximately in the form of a turbine-shaped deflector and is preferably formed out of a plate of stout sheet-steel, substantially circular. It is cut with radial slots 1 from the hub 2 through the edge, which slots form blades 3, and these are struck up, curved approximately in the form of propeller or turbine blades, but preferably with low pitch. I have shown in Figs. 1 and 2 these blades as equal in form and extent, and this is the form adapted to furnaces with horizontal boilers. A sleeve 4 is bolted to the hub of this deflector, on the inside thereof and at right angles to the hub, by a bolt 5, passing through a hole in the hub and held by a nut 6, thus immediately securing the deflector to the door. This is shown in the sectional view, Fig. 2; but the method of attaching the door is more clearly seen in Fig. 3. In this figure the air-passage through the inner wall of the door is shown at 7. A similar opening 8 is made in the outer wall, excepting that a bar is left in the metal at 9 to receive the bolt in the sleeve, which bolt

passes through the bar and is held by the nut. The outer edges of the blades bear at their corners upon the inner surface of the door, to which they are drawn snugly by the nut and with force enough to hold the deflector in place by frictional contact. The curve of the blades is such that the air drawn in from the outside and impinging upon the inner surface of the blades will be directed through the slots, and thus a whirling motion transversely of the chamber and toward the rear is set up. The device is preferably so located in the door as to discharge the air drawn through the hole equally into the fire-space above the coal with a force proportioned to that of the draft.

In Fig. 4 I have shown a modified form of the deflector for vertical boilers, in which form one blade (the lower) is extended to guide the air farther inward and deflect it to prevent too much cooling of the door-frame below.

The device is simply and cheaply made of the ordinary boiler-steel and may be applied readily to any furnace-door. The indraft of air keeps it cool, and, as I have found by practical use, it so increases the combustion of the carbon heretofore ordinarily unconsumed in the smoke that the boiler-tubes are left free from soot and the smoke either materially diminished or prevented altogether. For the purpose of regulating the draft I prefer to fix over the draft-hole a shallow casing 10, provided with air-passages 11 and a valve 12, with registering passages 13. This casing may be cast and affixed to the door in any convenient way; but as the hole in the door for the admission of the air varies with the size of the furnace I cast the casing in the exterior form of a frustum of a cone and cut it to suit the air-hole in the door, as illustrated in the dotted lines 13' in Fig. 3. As this prevents the casting of the box with a flange, I provide lugs 14, which may be bolted to the casing and the outside wall, as shown in Fig. 3.

I claim—

1. In combination with the door of a furnace having a hole for the passage of the air, a turbine-shaped deflector immovably secured to the door on the inside thereof and opposite the hole and arranged to set up a whirling movement of the air and products of combustion substantially as described.

2. In combination with the door of a fur-

nace having a hole for the passage of the air, a turbine-shaped deflector immovably secured to the door on the inside thereof and opposite the hole and arranged to set up a
5 whirling movement of the air and products of combustion, and means for regulating the air-supply thereto, substantially as described.

3. In combination with the door of a furnace having a hole for the passage of the air,
10 a turbine-shaped deflector immovably secured to the door on the inside thereof and opposite the hole and arranged to set up a whirling movement of the air and products of combustion, and a shallow casing provided
15 with air-passages and a valve regulating the

air-supply to said passages, substantially as described.

4. In combination with the door of a furnace having a hole for the passage of the air, a deflector immovably secured to the door
20 opposite the hole and having a series of turbine-blades, one of said blades being of greater length than the other blades, substantially as described.

In testimony whereof I affix my signature
25 in presence of two witnesses.

GEORGE M. BOONE.

Witnesses:

C. S. MIDDLETON,
R. E. OURAND.