

W. H. SCHULTE.
BURNER FOR BLAST FLAMES.
APPLICATION FILED JAN. 16, 1909.

929,252.

Patented July 27, 1909.
3 SHEETS—SHEET 1.

Fig. 1.

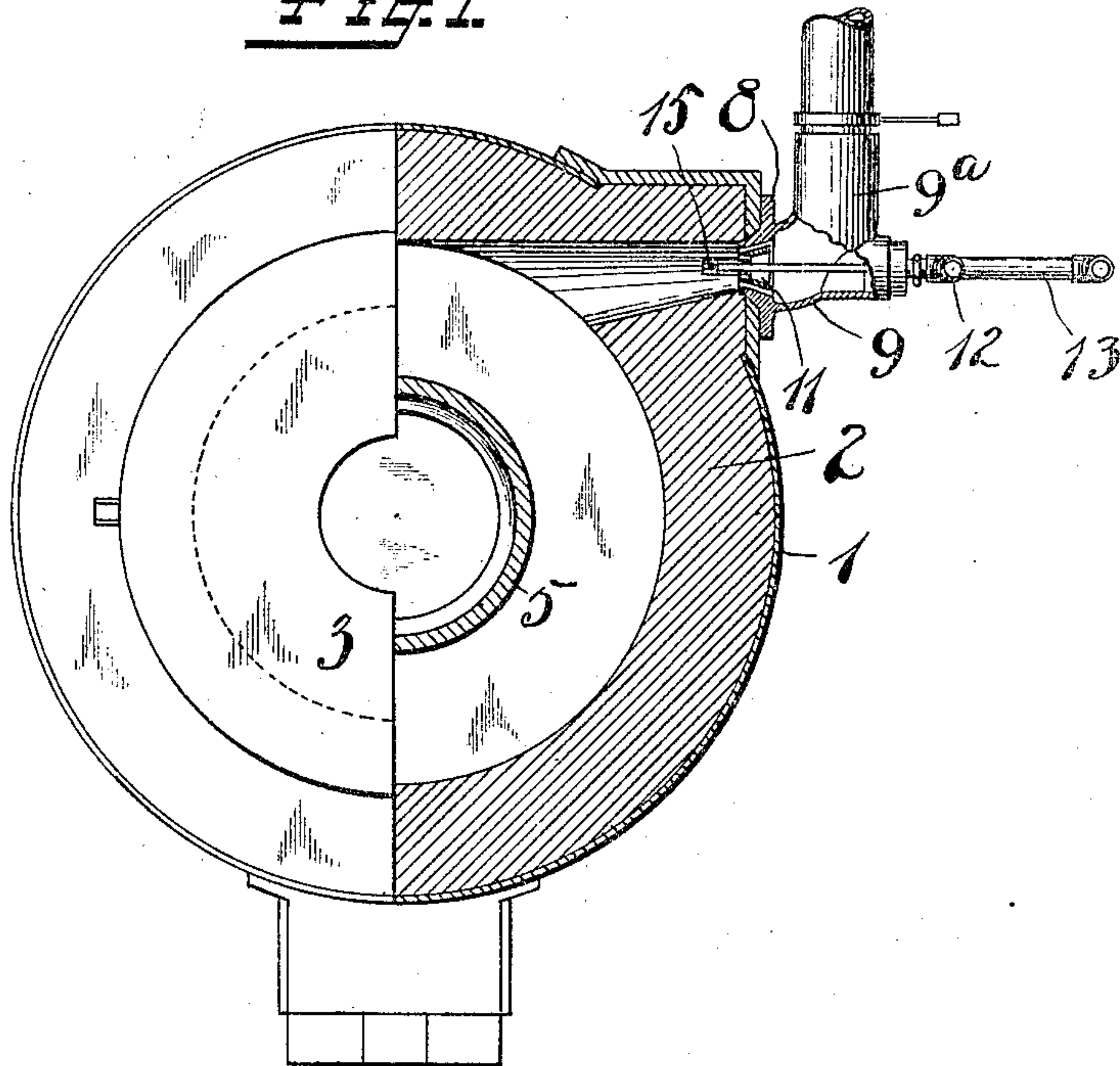
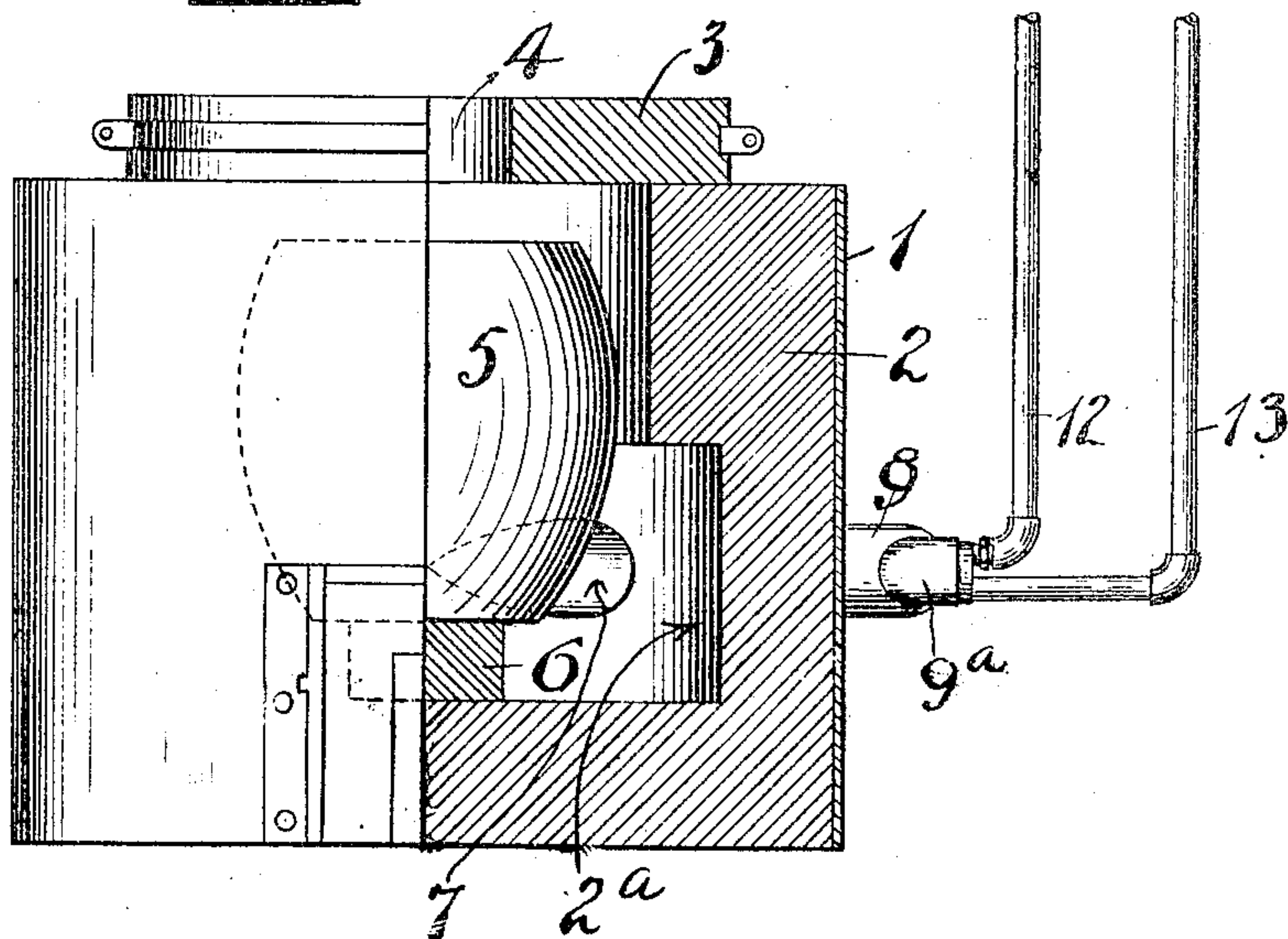


Fig. 2.



Witnesses:
Chas. A. Reed
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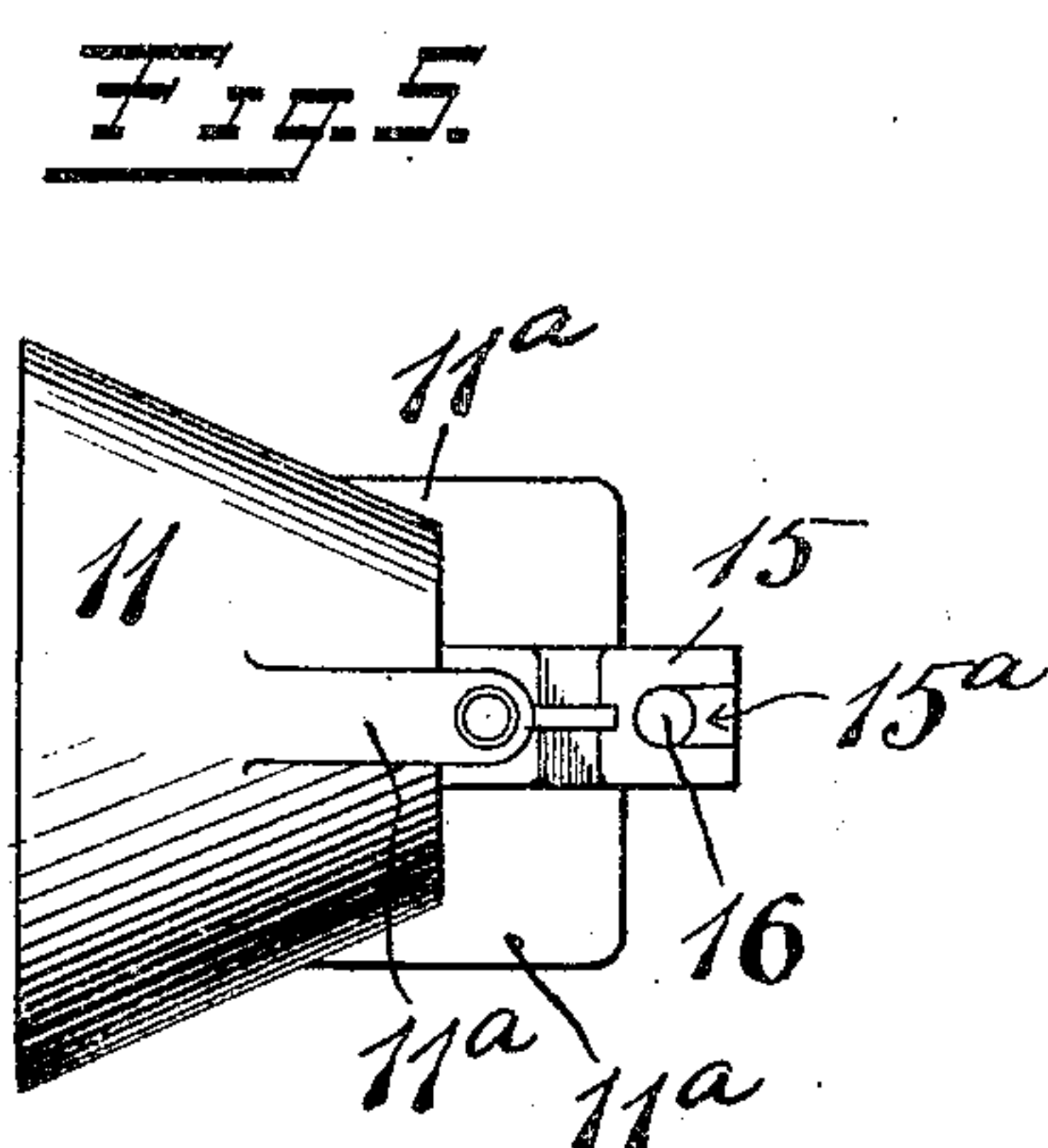
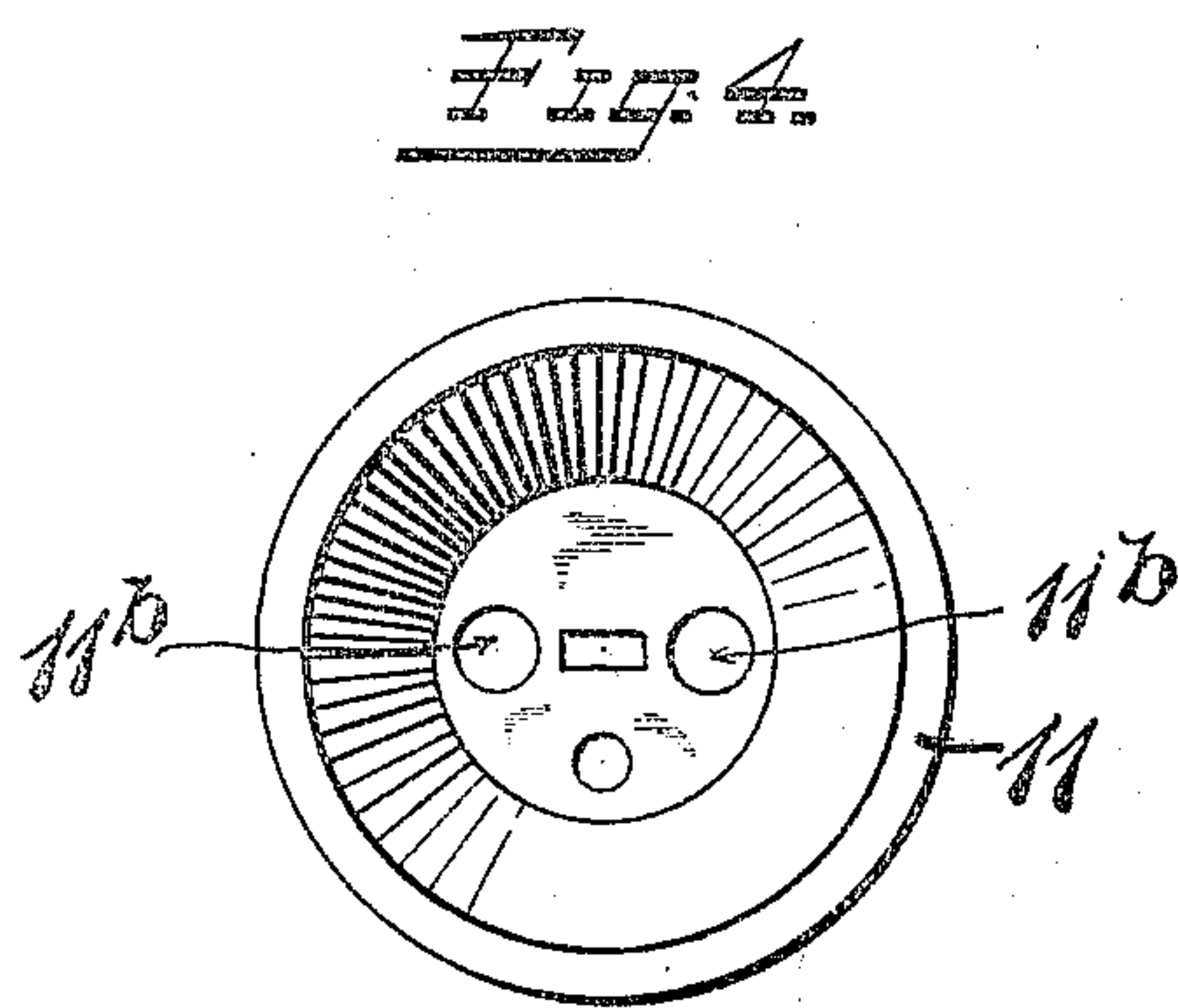
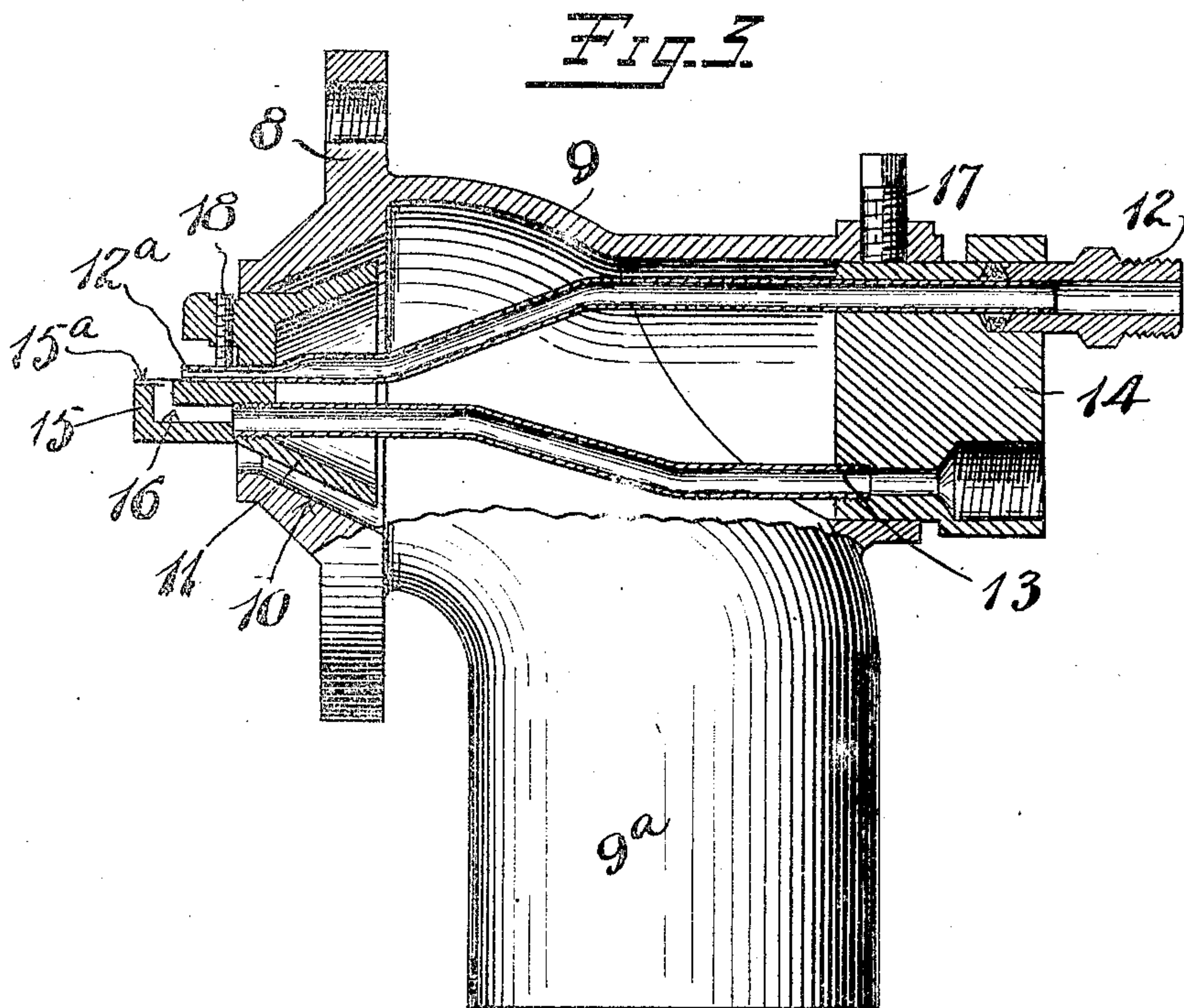
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3 SHEETS—SHEET 2.



Witnesses:
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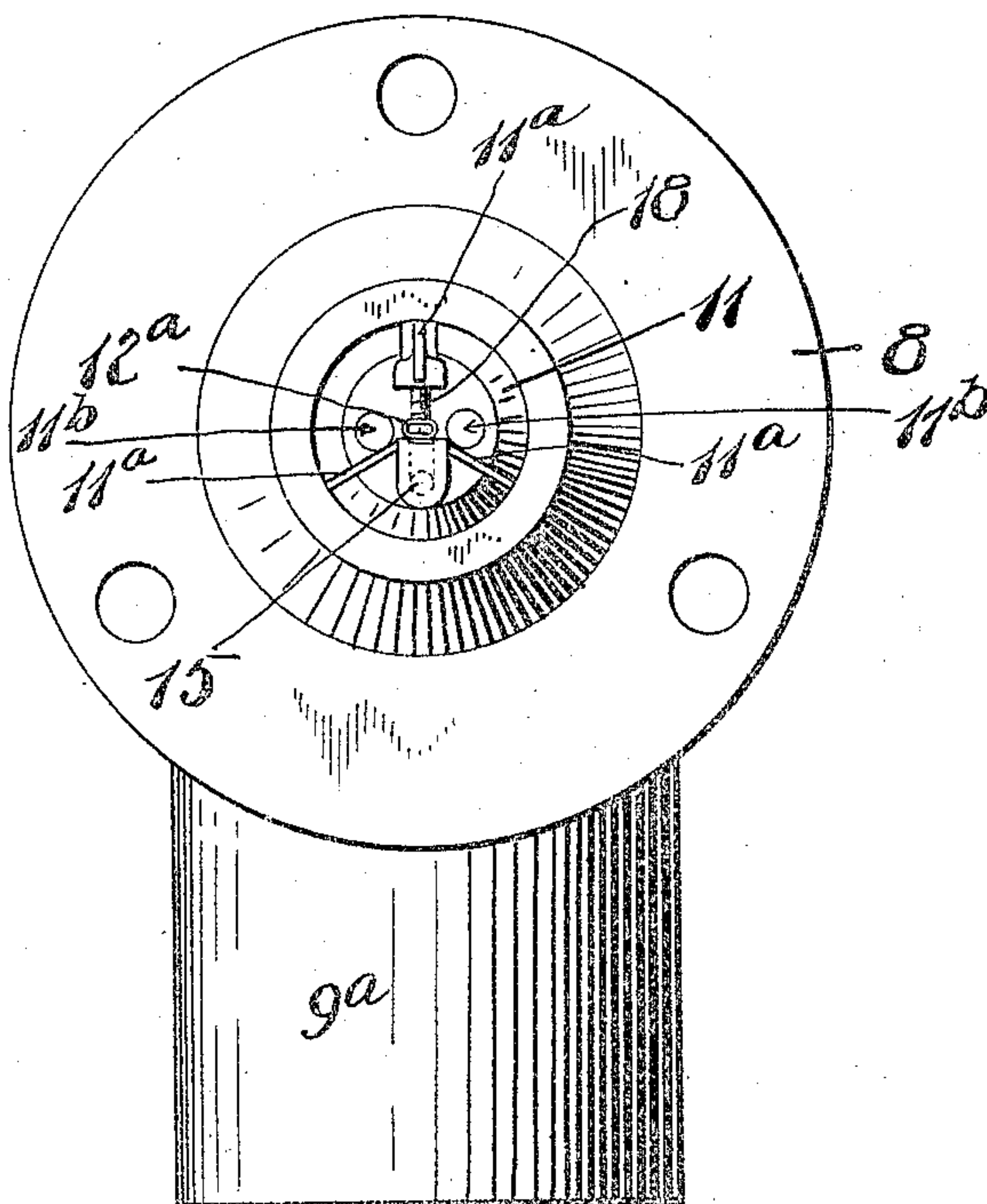
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3 SHEETS—SHEET 3.

Fig. 6



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UNITED STATES PATENT OFFICE.

WILLIAM H. SCHULTE, OF TRENTON, NEW JERSEY.

BURNER FOR BLAST-FLAMES.

No. 929,252.

Specification of Letters Patent.

Patented July 27, 1909.

Application filed January 16, 1909. Serial No. 472,576.

To all whom it may concern:

Be it known that I, WILLIAM H. SCHULTE, a citizen of the United States, residing at Trenton, Mercer county, New Jersey, have
5 invented certain new and useful Improvements in Burners for Blast-Flames, of which the following is a full, clear, and exact description.

My invention relates to an improved
10 burner for a blast flame, the same being particularly useful in the melting of brass and other metals.

In the drawings, Figure 1 is a plan view of my improved burner as applied to a furnace, said view being partly in section.
15 Fig. 2 is a side elevation of the same parts also partly in section. Fig. 3 is a relatively enlarged view of the burner, said elevation being partly in section. Fig. 4 is a view of
20 the inner end of one of the burner parts, detached. Fig. 5 is a plan view of the same part. Fig. 6 is a front elevation of the parts shown in Fig. 3.

1 represents the casing or external wall of
25 a furnace, the same having an inside lining 2, of a suitable fire-resistant material. This lining is provided with an annular recess 2^a, best seen in Fig. 2.

3 represents a cover of any suitable form,
30 having the draft outlet 4.

5 represents a crucible arranged within the furnace and mounted upon a suitable support or base 6.

7 is the flame inlet, the same being coincident with the annular recessed portion 2^a
35 and entering the same tangentially.

The burner is located at the outer end of the flame inlet 7, and is constructed substantially as follows. 8 is the burner bracket for
40 securing said burner to the wall 1 of the furnace. This bracket has a rearwardly extending hollow casing 9. In the particular form shown, 9^a is an entrance pipe for an air supply used to secure a forced draft or
45 blast. At the burner outlet I provide by preference a tapered converging wall 10. 11 is what I will term a truncated cone having suitable guide flanges 11^a, which center and guide said cone in the mouth of the outlet.
50 The forced draft of air entering through the pipe 9^a passes through the space between the external wall of the cone and the wall 10 of the burner flame, said space constituting a tapered annular passage. By
55 moving the cone to and fro, the cross-sectional area of this annular passage may be

varied at will for the purposes of adjustment. 11^b—11^b are openings through the end of the cone 11 to permit air to pass to assist in atomizing the fuel. 12 is what I
60 may term the "high pressure" air pipe. 13 is a fuel pipe. These pipes 12—13 are mounted in an adjustable head 14, and preferably serve as connectors between said head 14 and the cone 11, as best seen in Fig. 3.
65 The nozzle end of the fuel pipe 13 may be constructed in any suitable manner, but is preferably of the construction shown in Fig. 3, said nozzle being indicated at 15. This nozzle may be nothing more than a forward
70 extension from the cone having therein the fuel passage 16 to conduct the fuel entering through pipe 13 up to a point directly in front of the forward end 12^a of the "high pressure" air pipe 12. The forward end of
75 the "high pressure" air pipe is preferably flattened, as shown. The forward end of the nozzle may be somewhat recessed or grooved horizontally, as indicated at 15^a, so that any overflow of the oil will occur directly in front of the air pipe 12. 17 is a
80 set screw carried by the casing 9 of the burner and arranged to lock the block 14 at any desired position of adjustment. 18 is an adjusting set screw for the forward end
85 of the pipe 12, said set screw 18 being carried by the cone and so arranged as to not interfere with the adjustment of the cone.

In operation, fuel is turned on through pipe 13. Air at a desired pressure is turned
90 on through pipe 12. The function of the air passing through pipe 12 is to atomize or finely divide the fuel as it emerges from the nozzle. A blast of air under suitable pressure is introduced through the pipe 9^a. All
95 of these supplies may be varied and suitably proportioned in such a manner as to secure the best results. The quantity of air which is permitted to pass through the space around the cone 11 may be modified and varied, by shifting the position of the cone 11 within the burner outlet so as to increase or decrease the cross-sectional area of the space between the external wall of the cone and the internal wall 10 of the outlet. This adjustment of the cone to and fro may be
100 effected by releasing set screw 17 and moving the block 14 to and fro. The supply of air entering through the pipe 9^a furnishes the flame with the needed amount of oxygen to
105 insure proper combustion, said air supply being uniformly distributed entirely around

and at the root of the flame by reason of the centralizing of the atomizing point relatively thereto. The flame entrance 7 enters the furnace tangentially so that the flame
 5 will take a spiral course entirely around the crucible 5 therein. The recessed portion 2^a confines the flame to a certain extent, so as to prevent its escaping too freely, whereby its energy will be expended in heating the
 10 crucible and the contents thereof before it is permitted to escape. This annular space or chamber is of such area as to insure proper combustion.

What I claim is:

15 1. In a burner of the character described, a casing having a tapered outlet nozzle, two other nozzles arranged therein but slightly in advance thereof, one of the last two nozzles being slightly in advance of the other,
 20 the last two nozzles being adjustable relatively to the first, and means carried thereby for varying the cross sectional area of the tapered outlet nozzle.

2. In a burner of the character described,
 25 a casing having a tapered outlet nozzle, two other nozzles arranged therein but slightly in advance thereof, said two nozzles being adjustable relatively to the first, and means carried thereby for varying the cross sectional area of the tapered outlet nozzle, said
 30 means comprising a truncated cone member

shaped substantially to the tapered wall of the outlet nozzle.

3. In a burner of the character described, a casing having a tapered outlet nozzle, two
 35 nozzles located centrally therein, means for adjusting the last two nozzles to and fro relatively to the outlet nozzle and carrying the former at a point slightly ahead of said outlet nozzle, one of the two adjustable noz- 40 zles being slightly in advance of the other, a carrier for the two adjustable nozzles comprising an adjustable member, the latter being movable to and fro in the outlet nozzle to vary the cross sectional area of the same. 45

4. In a furnace of the character described, a burner comprising a fuel supply nozzle, an air nozzle adjacent thereto for atomizing fuel, an air blast nozzle having an admission opening around the fuel nozzle and the first
 50 mentioned air supply nozzle, and means for varying the cross-sectional area of the air blast nozzle, said means comprising a truncated cone arranged within the frame of the burner, a tapered wall adjacent to said cone, 55 one of said parts being adjustable to and fro relatively to the other, and an additional air blast passage through said cone.

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Witnesses:

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