

No. 803,027.

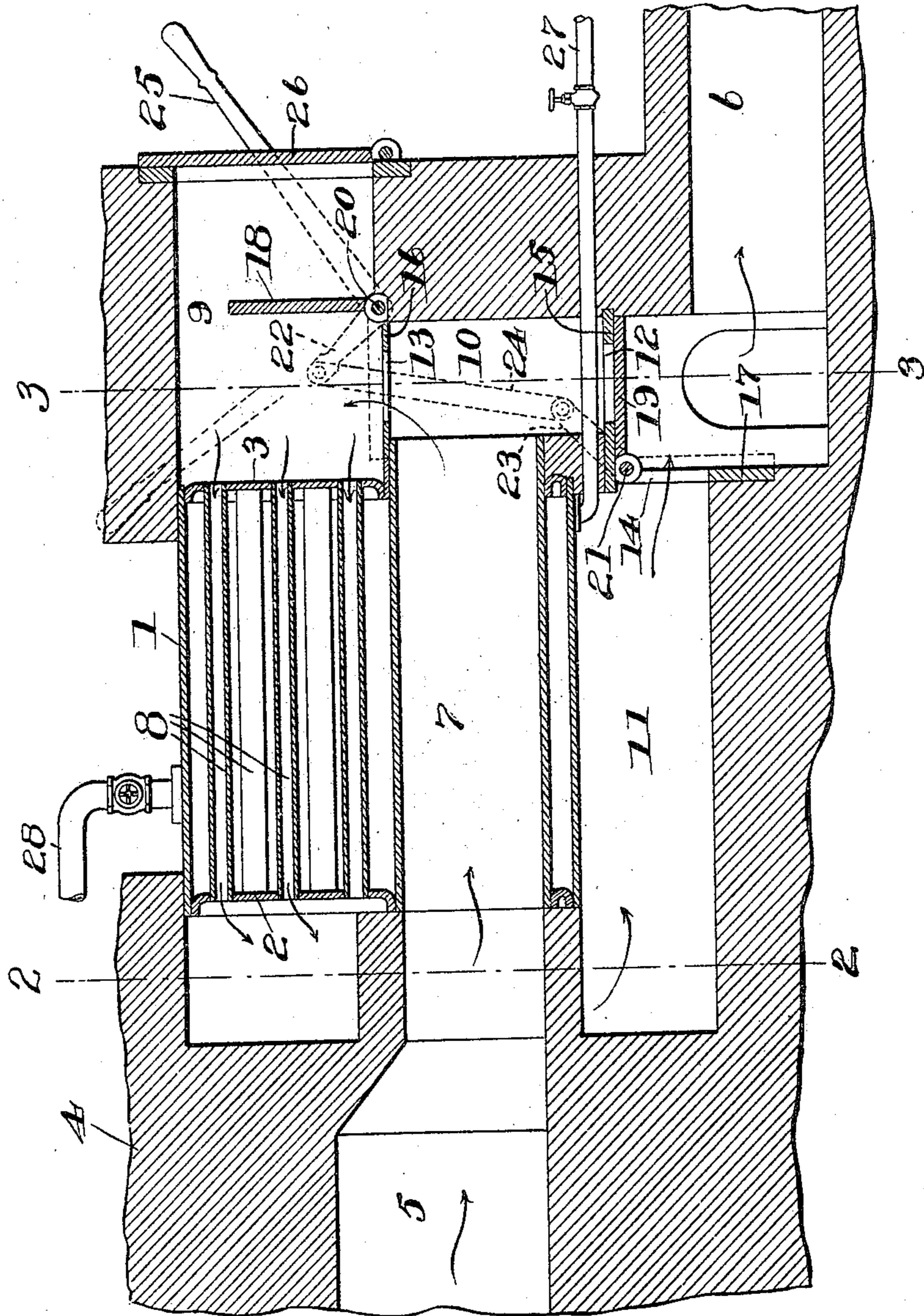
PATENTED OCT. 31, 1905.

T. SUZUKI.
WATER HEATER OR STEAM GENERATOR.

APPLICATION FILED JUNE 7, 1905.

4 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
C. H. Crawford
L. Waldman

Inventor:
Tozaburo Suzuki,
By O. Singer
Att'y.

T. SUZUKI.

WATER HEATER OR STEAM GENERATOR.

APPLICATION FILED JUNE 7, 1905.

4 SHEETS—SHEET 2.

Fig. 3.

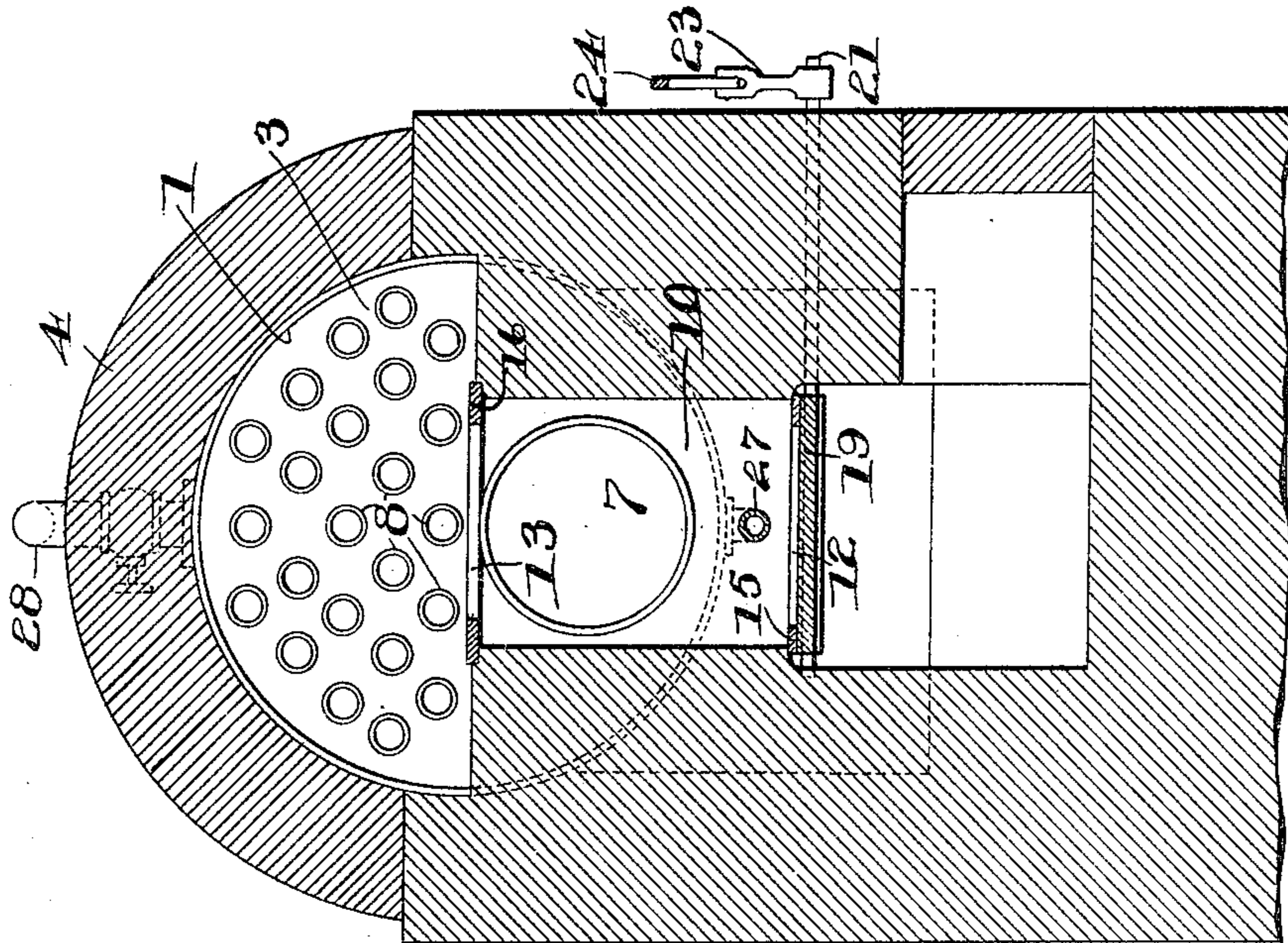
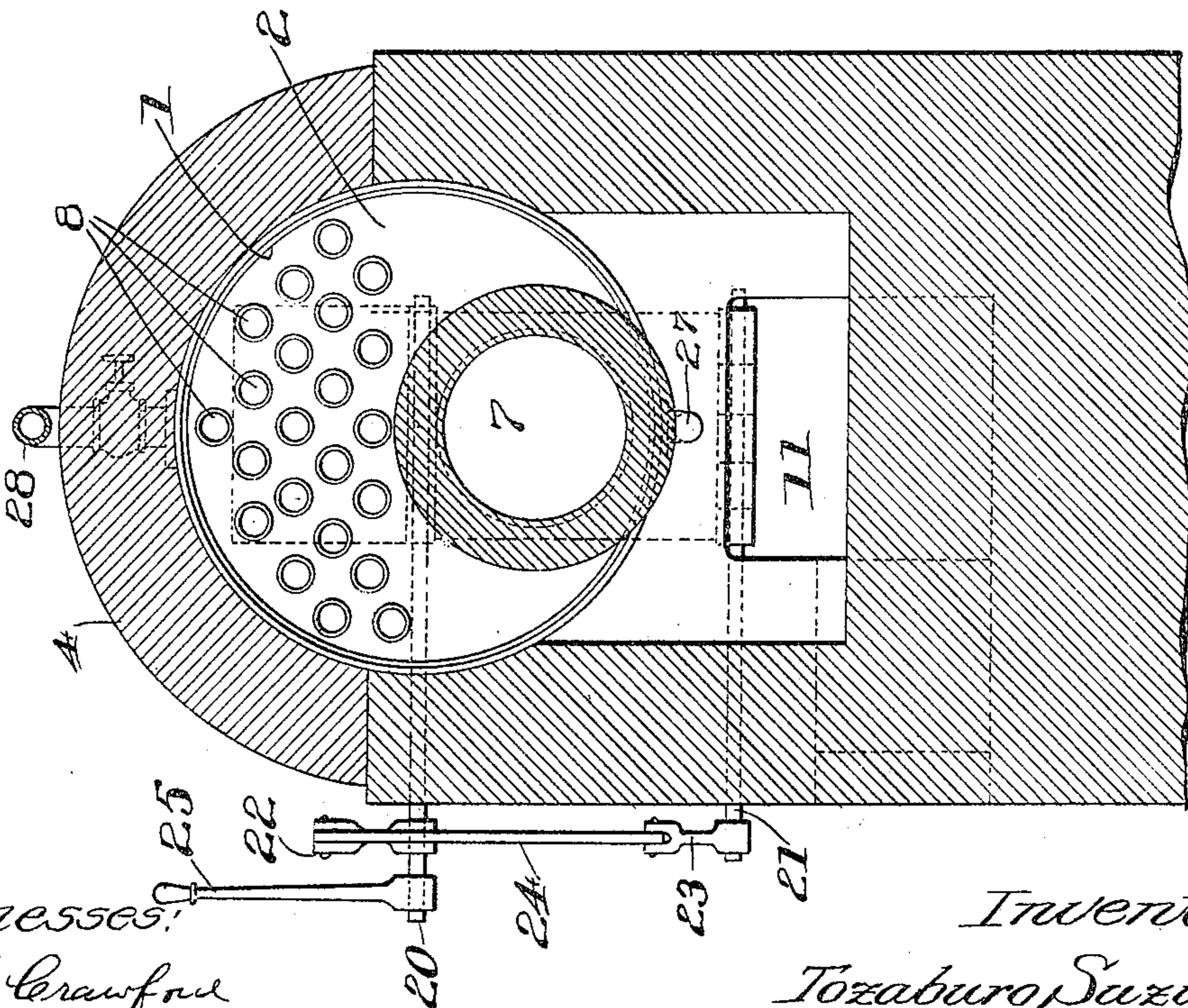


Fig. 2.



Witnesses:
C. M. Crawford
L. Waldman

Inventor:
Tozaburo Suzuki,
By O. Singer
Att'y.

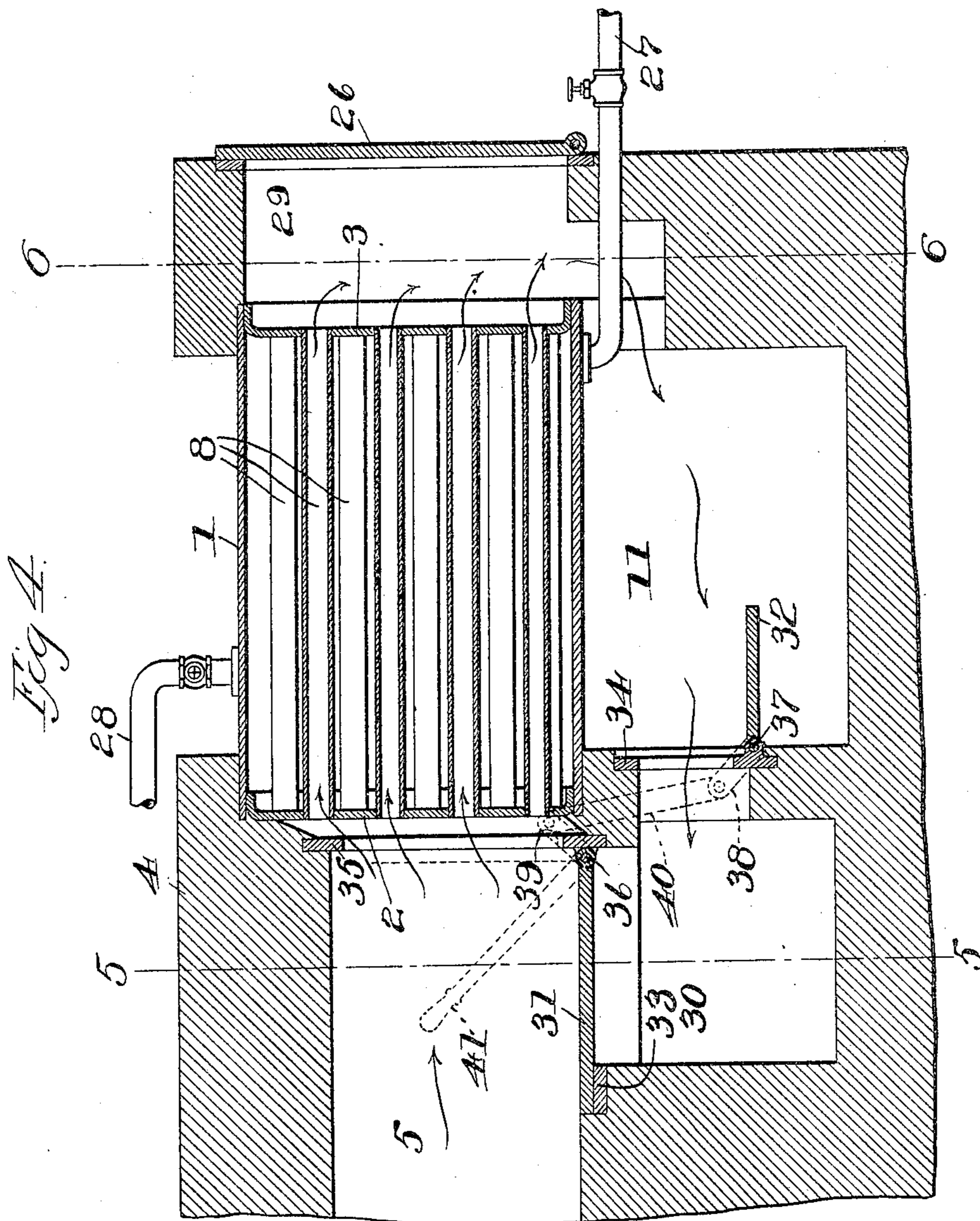
No. 803,027.

PATENTED OCT. 31, 1905.

T. SUZUKI.
WATER HEATER OR STEAM GENERATOR.

APPLICATION FILED JUNE 7, 1905.

4 SHEETS—SHEET 3.



Witnesses:
C. H. Crawford
L. Waldman

Inventor:
Tozaburo Suzuki
By *P. Singer*
Att'y

T. SUZUKI.

WATER HEATER OR STEAM GENERATOR.

APPLICATION FILED JUNE 7, 1905.

4 SHEETS—SHEET 4.

Fig. 6.

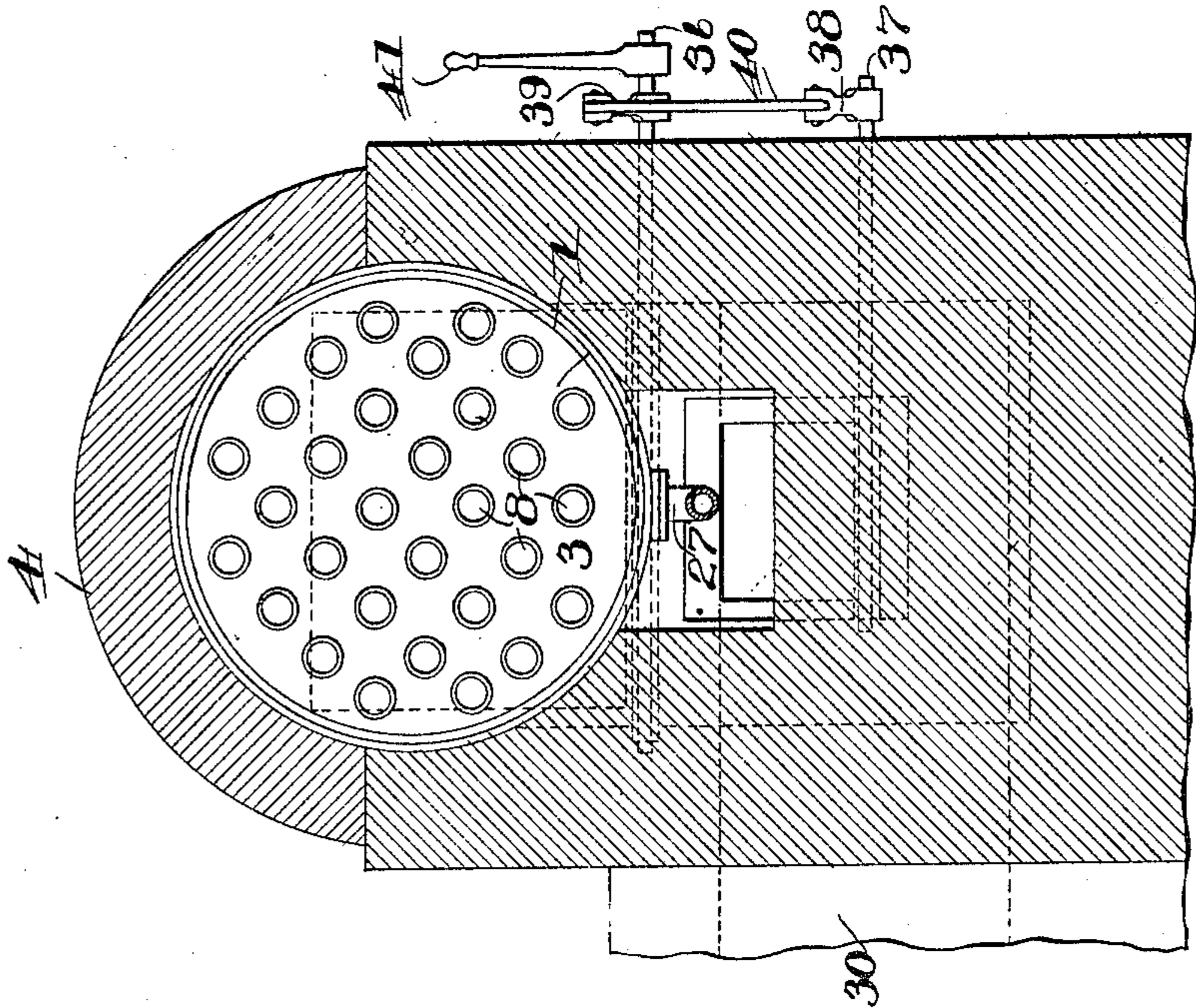
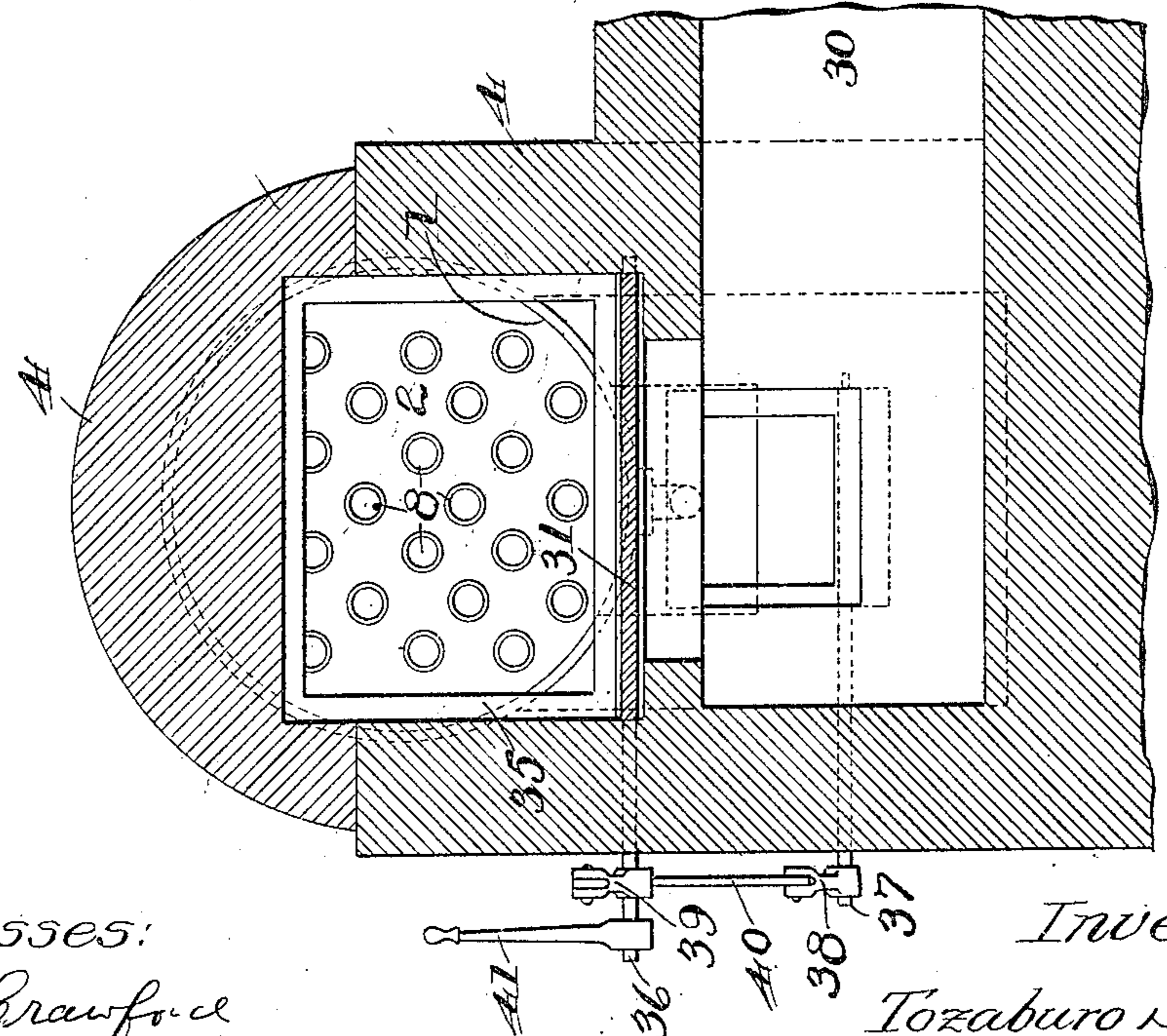


Fig. 5.



Witnesses:
C. A. Crawford
L. Waldman

Inventor:
Tozaburo Suzuki,
By P. Singer
Att'y.

UNITED STATES PATENT OFFICE.

TOZABURO SUZUKI, OF SUNAMURA, JAPAN.

WATER-HEATER OR STEAM-GENERATOR.

No. 803,027.

Specification of Letters Patent.

Patented Oct. 31, 1905.

Application filed June 7, 1905. Serial No. 264,122.

To all whom it may concern:

Be it known that I, TOZABURO SUZUKI, a subject of the Emperor of Japan, residing at No. 401 Jibeishinden, Sunamura, in the county of Minami-Katsushika, in the Province of Tokio, Japan, have invented certain new and useful Improvements in Water-Heaters or Steam-Generators, of which the following is a specification.

My invention relates to water-heaters or steam-generators, and has to do more particularly with that class of generators wherein access of products of combustion to the boiler may be temporarily cut off in case of repair or inspection.

My invention consists in the provision of an inspection-chamber located in close proximity to one end of the boiler and also in the provision of dampers adapted to direct the products of combustion from the furnace direct to the chimney, thereby permitting the operator to inspect the flues and other parts of the boiler without drawing the fires.

My invention will be more fully described in connection with the drawings and will be more particularly pointed out in the appended claims.

In the drawings, Figure 1 represents a longitudinal sectional view of a boiler or heater embodying the main features of my invention. Fig. 2 is a vertical sectional view on line 2 2 of Fig. 1. Fig. 3 is a vertical sectional view on line 3 3 of Fig. 1. Fig. 4 is a longitudinal sectional view similar to Fig. 1, showing a modified form of heater. Fig. 5 is a vertical sectional view on line 5 5 of Fig. 4. Fig. 6 is a vertical sectional view on line 6 6 of Fig. 4.

Like characters of reference designate similar parts throughout the different figures of the drawings.

My invention is herein shown applied to a water-heater, and throughout the description of the drawings the term "water-heater" will be employed, although it will be obvious that the device of my invention could be advantageously used in connection with steam-generators.

As shown in Fig. 1, my invention is applied to a water-heater 1, provided with end walls 2 and 3 and which is mounted in a fire-brick structure 4, provided with an inlet 5, to which the furnace delivers, and a discharge-trunk 6, which conveys the products of combustion to the chimney. Said heater 1 is provided with a primary combustion-flue 7 and a plurality of secondary combustion-flues 8,

Figs. 1, 2, and 3. Said primary combustion-flue 7 registers with the inlet 5 and delivers to the chamber 9, having a lower receiving damper-compartment 10. The products of combustion are delivered from said inspection-chamber to the flues 8 and pass rearwardly therethrough and are delivered to the smoke chamber or trunk 11, extending preferably throughout the length of the heater and below the same and connecting rearwardly therewith by a vertical extension with the flues 8. Said smoke-trunk 11 connects with the discharge-trunk 6 wherefrom the products of combustion are delivered to the chimney or other suitable outlet. The lower or receiving portion 10 of the inspection-chamber desirably communicates with the discharge-trunk 6 and with the inspection-chamber 9 by means of oppositely-disposed openings 12 and 13, while the smoke-trunk 11 communicates with the discharge-trunk 6 through an opening 14. Said openings 12, 13, and 14 are formed in plates 15, 16, and 17, which form seats for dampers 18 and 19. Said damper 18 operates on a pivot 20 and serves to cut off communication between the upper and lower portions 9 and 10, respectively, of the inspection-chamber. Said damper 19 operates on a pivot 21 and seats upon plates 15 and 17, serving to close the openings 12 and 14, respectively, to the discharge-trunk 6. As shown in Fig. 1, the said damper is in a position to cut off communication between the receiving portion of the inspection-chamber 10 and the discharge-trunk 6, whereas when the dampers are adjusted, as shown in dotted lines, communication is cut off between the smoke-trunk 11 and the discharge-trunk 6 and the chambers 10 and 9, leaving the products of combustion free to pass direct from the primary flue 7 to the smoke-trunk 6. I preferably provide means whereby the dampers may be operated in unison from a single lever, which means consists of the following parts: On the pivots 20 and 21 are mounted crank-arms 22 and 23, which are connected by a link 24. Said crank-arms project in opposite directions from their mountings, causing rotation of the pivots in opposite directions and movement of the dampers 18 and 19 in opposite directions. I preferably provide a controlling-lever 25, which is mounted upon the pivot 20 and which is adapted when thrown rearwardly to seat the damper 18 upon the plate 16 and the damper 19 upon the plate 17, opening and closing communication between the various

chambers in a manner clearly shown in Fig.

1. I preferably provide a door 26 for the inspection-chamber to enable the operator to enter the same and inspect the boiler or to
5 clean the flues thereof in the ordinary manner without the necessity of drawing the fire. The boiler is provided with feed-water and discharge pipes 27 and 28.

By means of my improved arrangement of
10 the dampers I am enabled to provide a free and unrestricted passage for the products of combustion from the main flue 7 to the trunk 6 during an inspection of the boiler, which advantage obviates the necessity of provid-
15 ing carefully ground and fitted seats for said dampers. A further advantage consists in the fact that where a free flow is provided for the products of combustion during such inspection combustion in the fire-box is in no
20 sense retarded, but is by my improved arrangement greatly increased, as a direct draft is provided, as shown in dotted lines in Fig. 1.

In the modified form shown in Figs. 4 to 6 the primary flue 7 is dispensed with and the
25 products of combustion pass direct from the inlet 5 to the flues 8, which deliver to the inspection-chamber 29. Below the heater is provided a trunk 11, to which the chamber 29 delivers, which in turn communicates with the
30 chimney through an outlet 30. The outlet 30 is closed to the inlet 5 and the trunk 11 by dampers 31 and 32, which seat upon plates 33 and 34. The damper 31 when the tubes 8 are to be closed seats on a plate 35 and is oper-
35 ated on pivot 36. Said damper 32 is operated by a pivot 37, which carries a crank 38. A crank 39 is provided on the pivot 36, which is connected with the crank 38 by a link 40. The pivot 36 carries a controlling-lever 41,
40 whereby the dampers 31 and 32, respectively, may be operated in unison. The dampers when in the position shown in full lines in Fig. 4 close communication between the inlet 5 and the outlet 30, forcing the products of combus-
45 tion to pass through the flues 8 to the chamber 29 and to the outlet 30 through the trunk 11. When it becomes necessary to inspect or clean the boiler, the lever 41 is thrown forwardly, whereupon the damper 31 is seated
50 upon the plate 35 and the damper 32 is seated upon the plate 34, causing the products of combustion to pass directly from the inlet 5 to the outlet 30.

While I have herein shown and described
55 specific embodiments of my invention, I do not wish to be limited to the same, as changes may readily be made therefrom without departing from the spirit of the invention.

Therefore what I claim, and desire to secure by Letters Patent, is—

1. In a water-heating apparatus the combination of a boiler provided with a primary combustion-flue to which the furnace delivers, a plurality of secondary flues, an inspection-chamber connecting said primary and
65 secondary flues, an inspection-damper located in said chamber for disconnecting said flues, a main smoke-trunk to which said secondary flues deliver, a main discharge-trunk to which said smoke-trunk delivers, said discharge-
70 trunk communicating with the inspection-chamber, and a trunk-damper for closing said smoke-trunk or inspection-chamber to the discharge-trunk.

2. In a water-heating apparatus the combination of a boiler provided with a primary
75 combustion-flue to which the furnace delivers, a plurality of secondary flues, an inspection-chamber connecting said primary and secondary flues, an inspection-damper located
80 in said chamber for disconnecting said flues, a main smoke-trunk to which said secondary flues deliver, a main discharge-trunk to which said smoke-trunk delivers, said discharge-
85 trunk communicating with the inspection-chamber, a trunk-damper for closing said smoke-trunk or inspection-chamber to the discharge-trunk, a controlling-lever, and means
90 whereby the same may be utilized to operate said dampers in unison.

3. In a water-heating apparatus the combination of a boiler provided with a primary
95 combustion-flue to which the furnace delivers, a plurality of secondary flues, an inspection-chamber connecting said primary and secondary flues, an inspection-damper located in said chamber for disconnecting said flues,
100 a main smoke-trunk to which said secondary flues deliver, a main discharge-trunk to which said smoke-trunk delivers, said discharge-trunk communicating with the inspection-chamber, a trunk-damper for closing said
105 smoke-trunk or inspection-chamber to the discharge-trunk, said trunk and inspection dampers being pivotally mounted and having crank-levers secured to said pivots, a link connecting said cranks, and a controlling-lever mounted on one of said pivots whereby the dampers may be operated in unison.

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

TOZABURO SUZUKI.

Witnesses:

GEORGE HAWTHORNE SCIDMORE,
UHACHI ISHIWARA.