

(No Model.)

2 Sheets—Sheet 1.

R. CARTWRIGHT.
GAS FURNACE.

No. 400,827.

Patented Apr. 2, 1889.

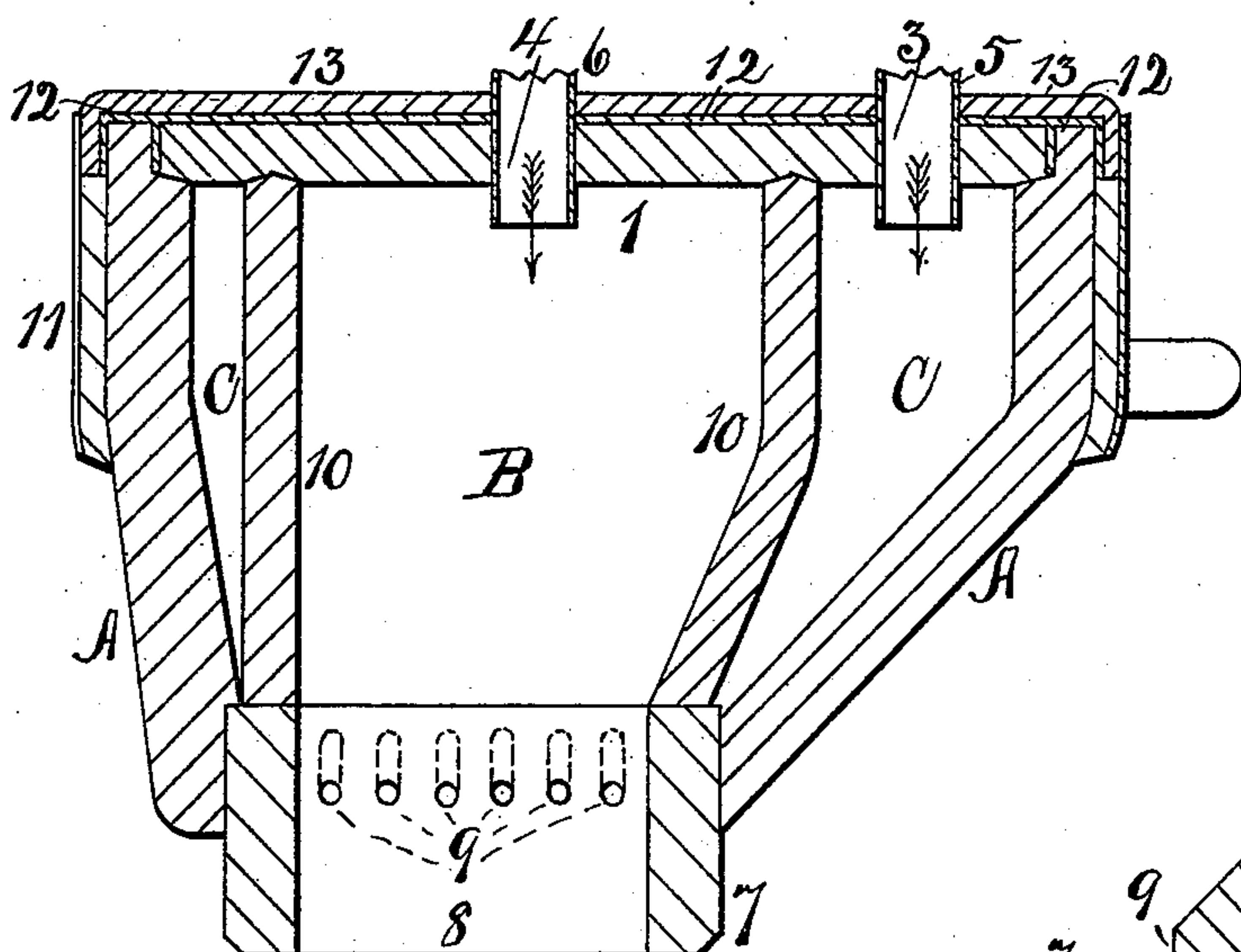


Fig. 1.

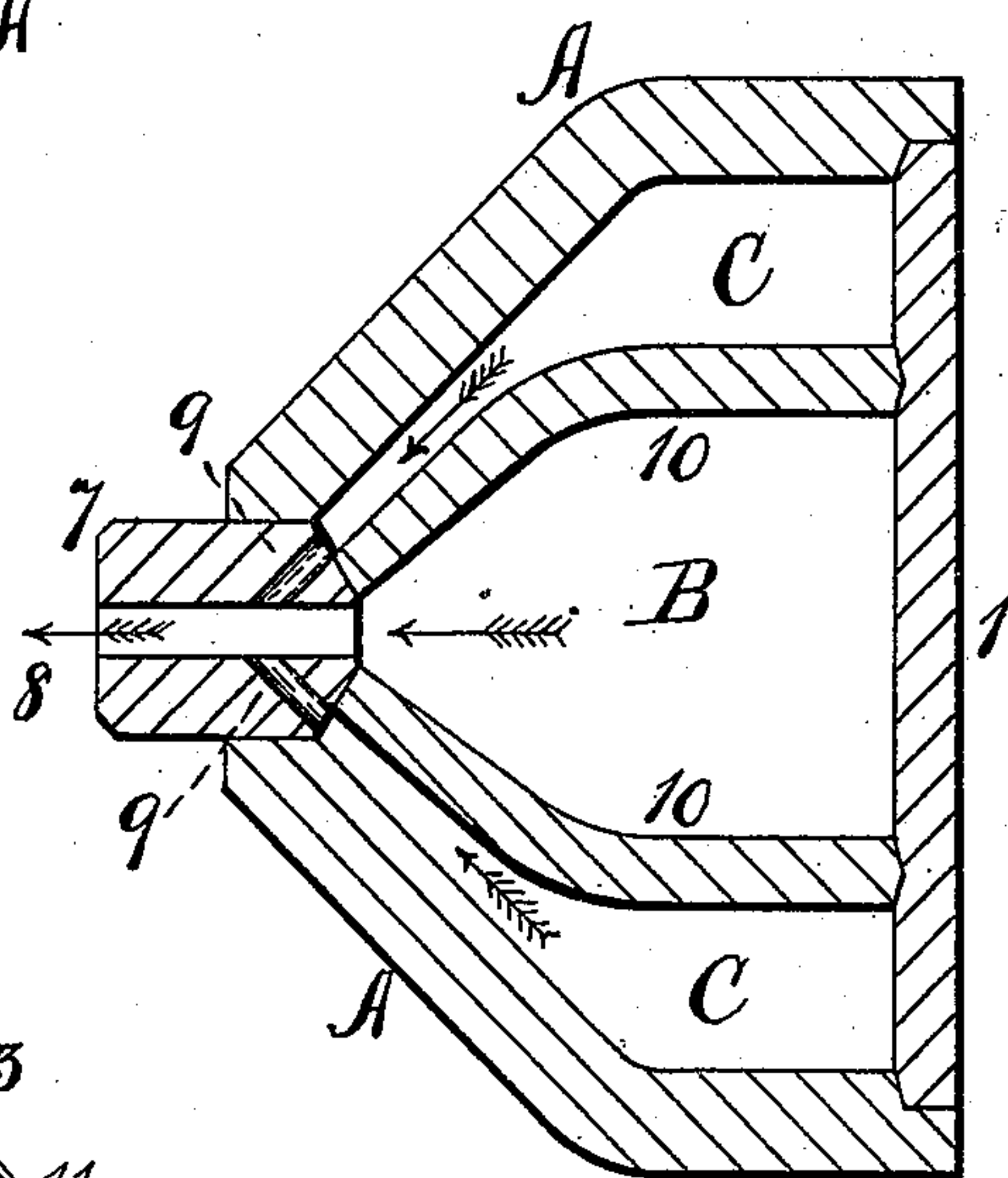
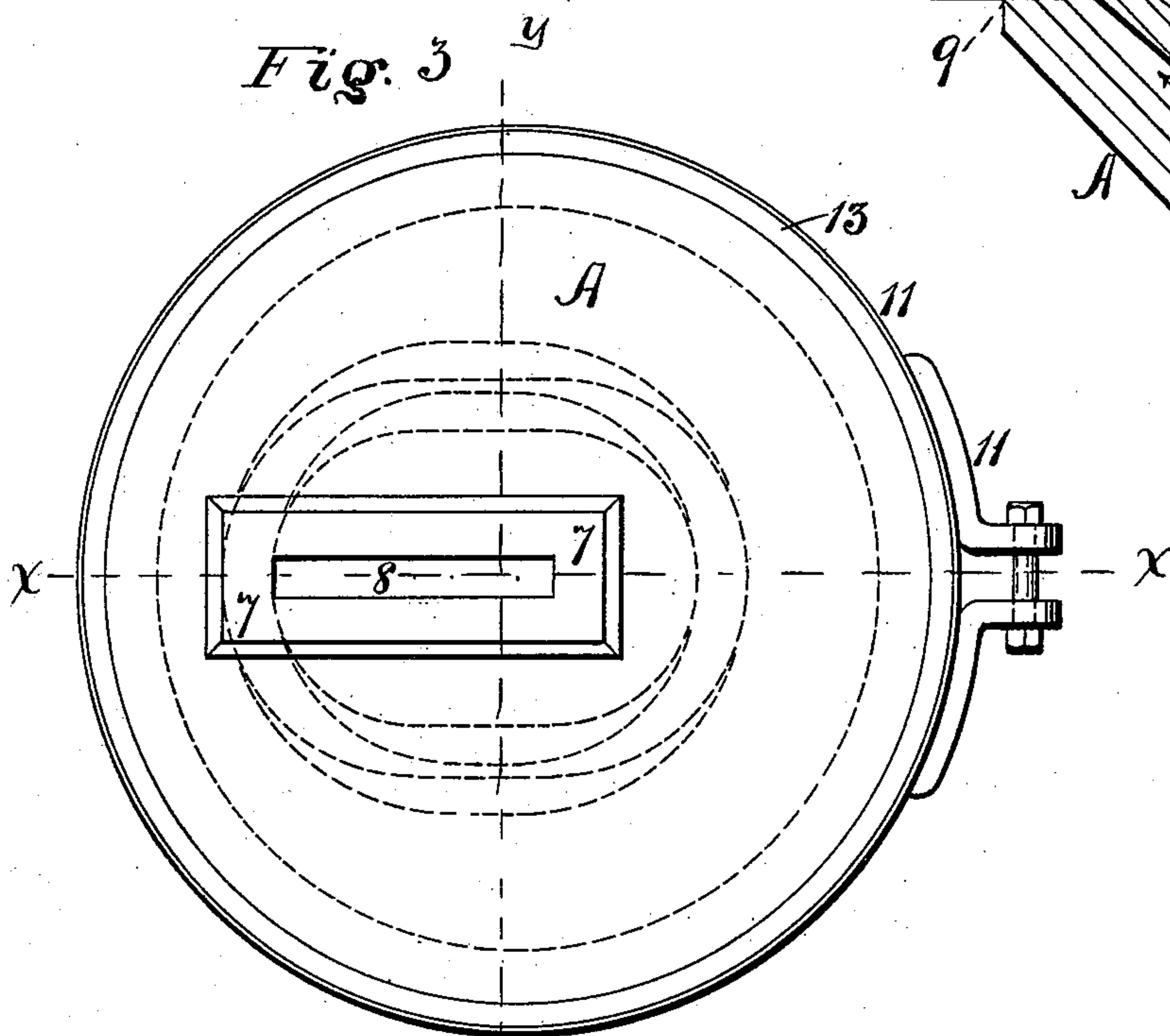


Fig. 2.



Witnesses,

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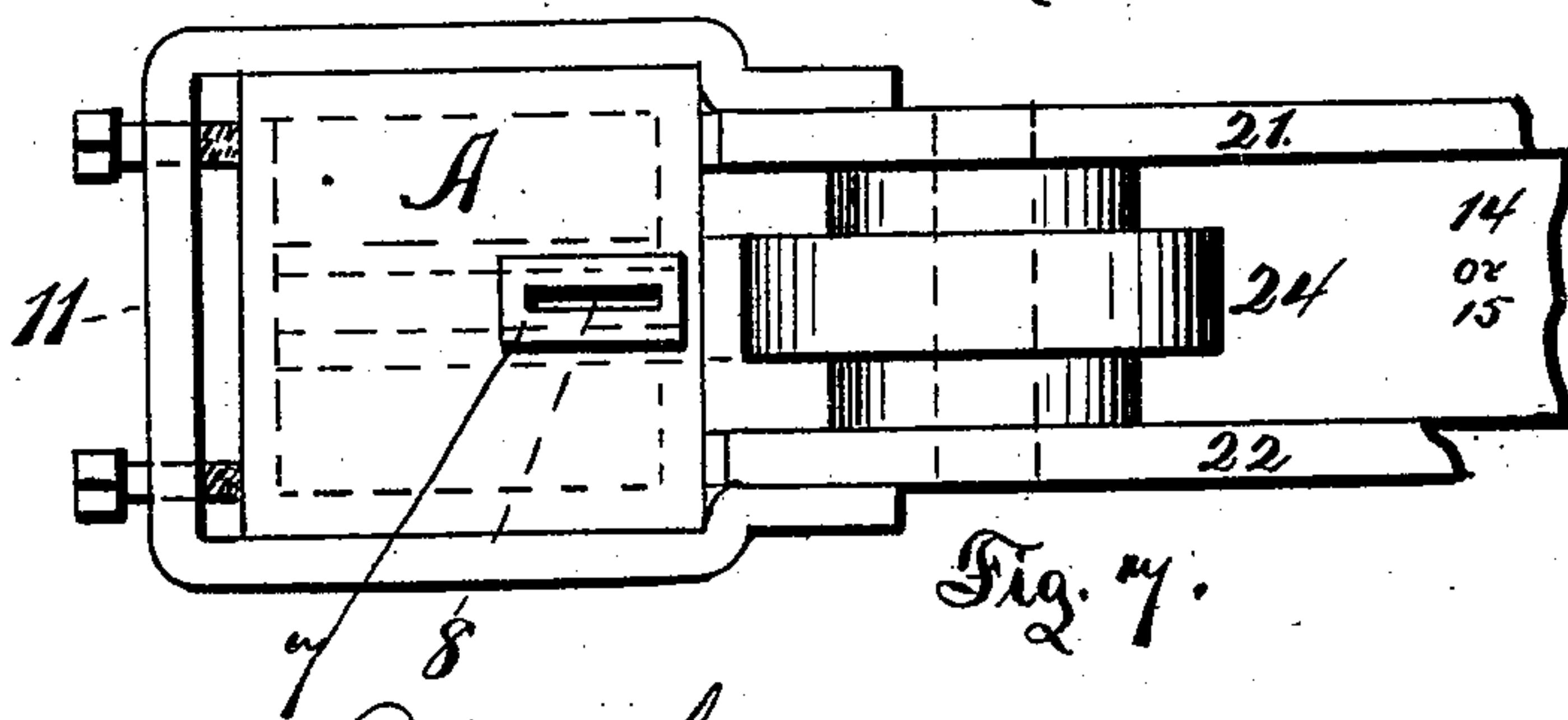
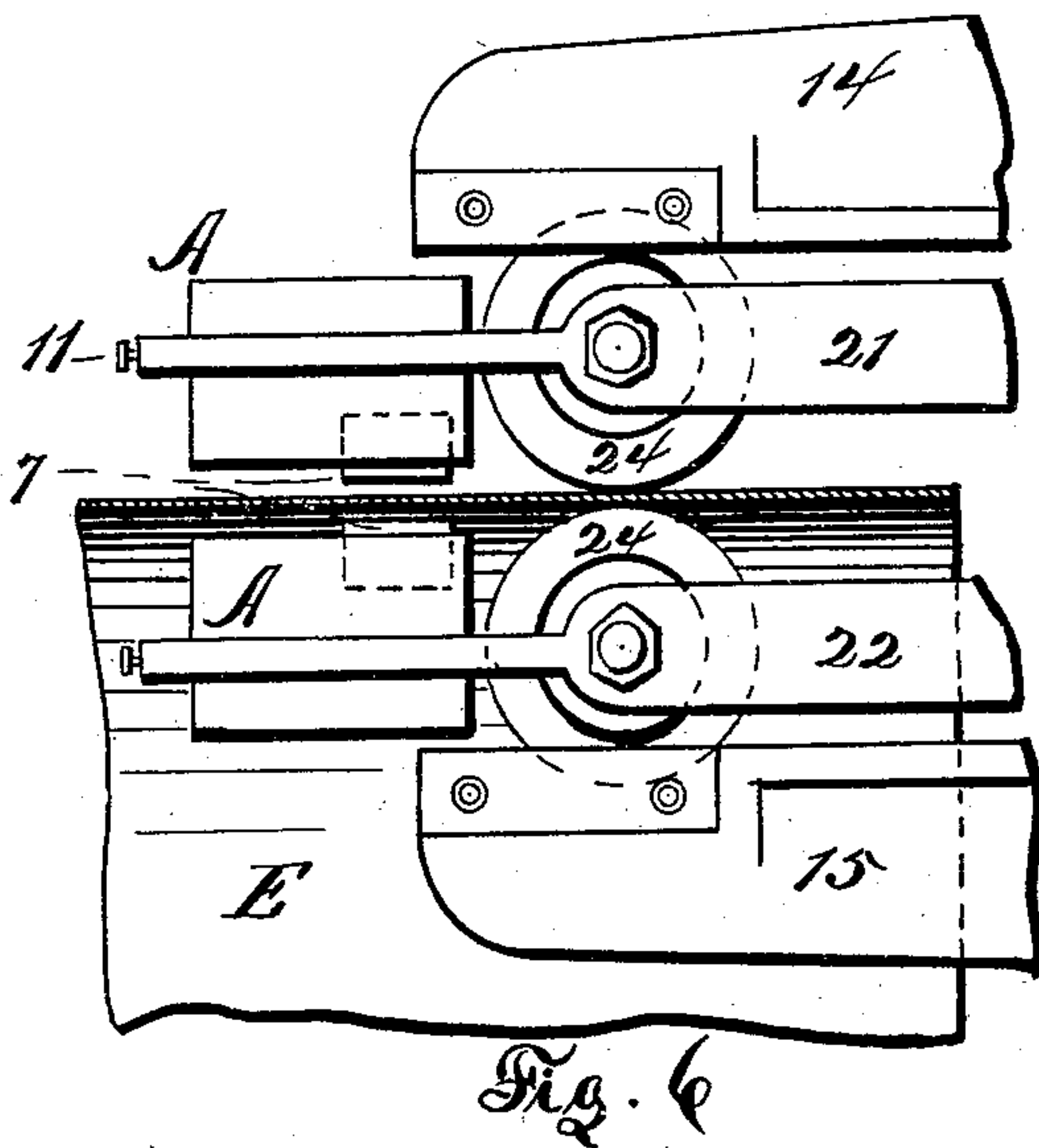
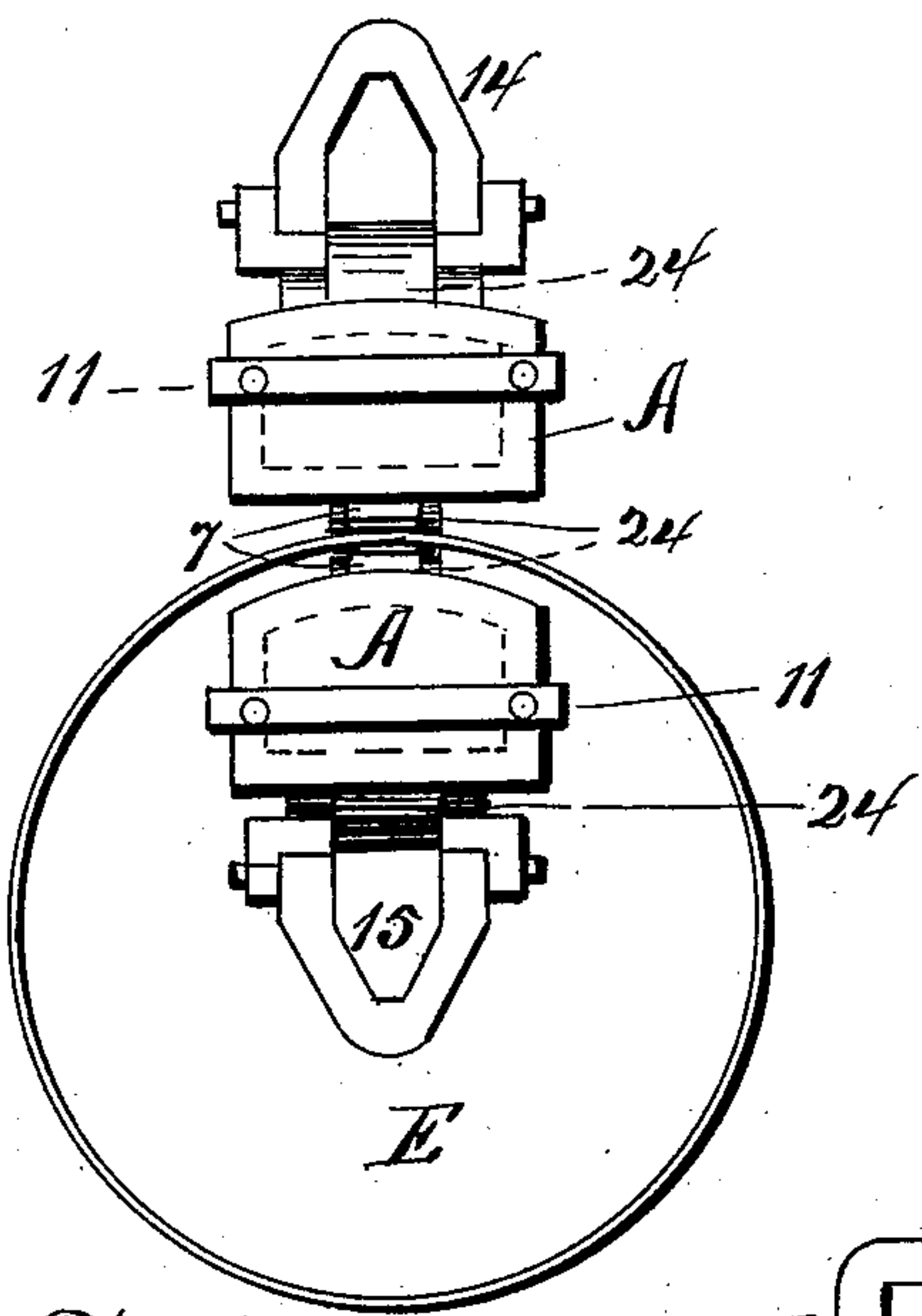
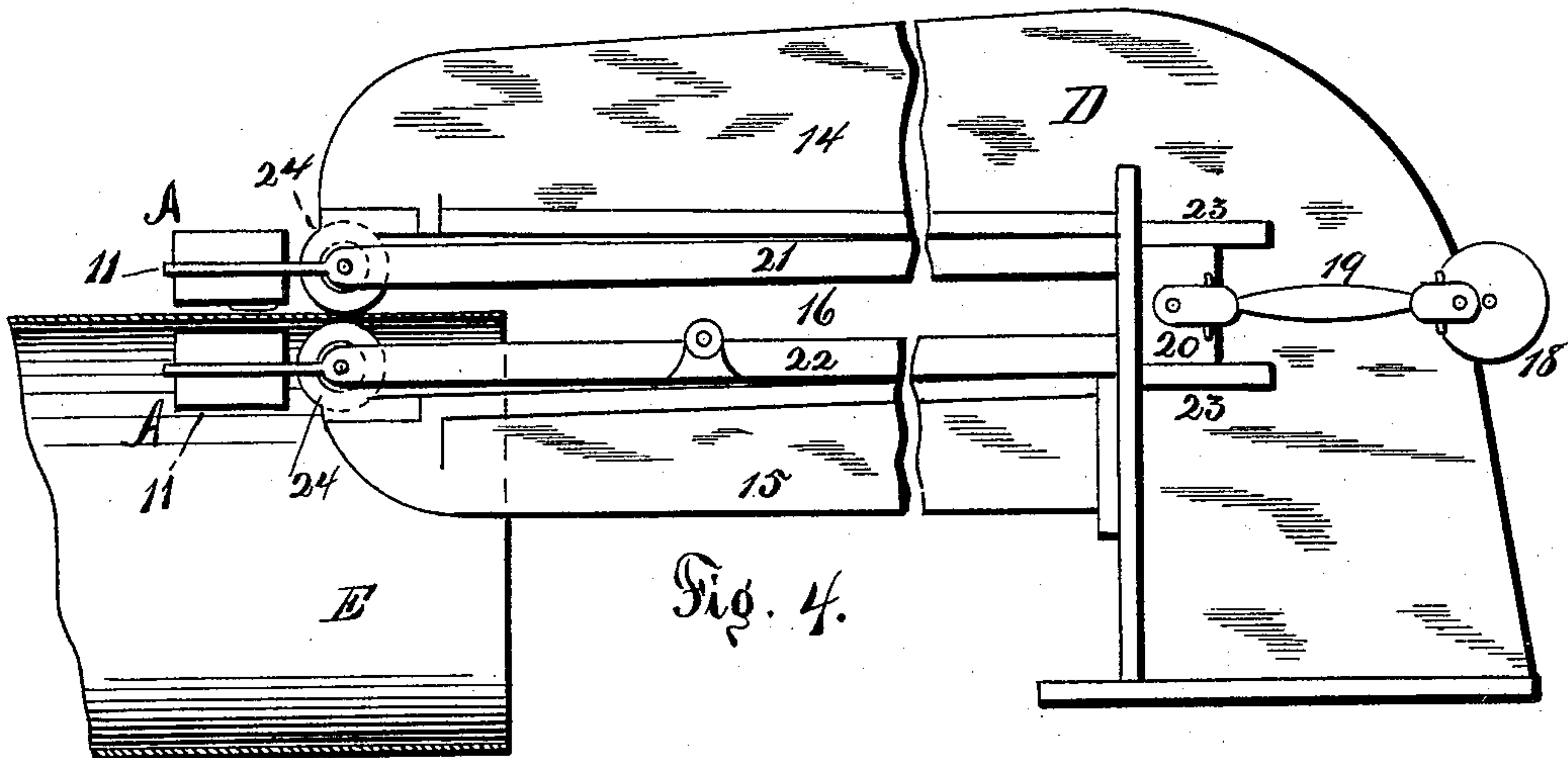
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2 Sheets—Sheet 2.

R. CARTWRIGHT.
GAS FURNACE.

No. 400,827.

Patented Apr. 2, 1889.



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UNITED STATES PATENT OFFICE.

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GAS-FURNACE.

SPECIFICATION forming part of Letters Patent No. 400,827, dated April 2, 1889.

Application filed July 28, 1888. Serial No. 281,317. (No model.)

To all whom it may concern:

Be it known that I, ROBERT CARTWRIGHT, of Rochester, county of Monroe, in the State of New York, a citizen of the United States, have invented certain new and useful Improvements in Gas-Furnaces, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a section on the line *x x* of Fig. 3. Fig. 2 is a section on line *y y* of Fig. 3. Fig. 3 is a plan view of the issue-face of the furnace. Fig. 4 is a side elevation of a pipe-welding machine to which my furnace is attached to heat the weld ahead of the welding-rolls, the pipe being shown in section. Fig. 5 is a front end elevation of Fig. 4. Fig. 6 is an enlarged sectional elevation of the outer end of Fig. 4; and Fig. 7 is a plan view of the inner face of the outer end of either of the machine-arms, showing the frame, the welding-rolls mounted therein, and the furnace in a frame connected to the same frame in which the rollers are mounted and contiguous to the rollers.

This invention relates to heating-furnaces in which a volume of vapor or hydrocarbon gas is mixed within the furnace with the atmospheric air for the purpose of producing the best results of combustion and great heats.

The object of my invention is to produce such a furnace of a practically indestructible form and material and possessing the greatest possible amount of utility in operation.

My invention consists in the several novel features of construction and operation, which are hereinafter described, and which are specifically set forth in the claim hereto annexed. It is constructed as follows:

A is the outer shell, of substantially the form shown in the drawings, being of somewhat frusto-conical form in its general outline. Its base is closed by the top piece, 1, which is a flat disk provided with openings 3 and 4 through it, adapted to receive, respectively, the pipes 5 and 6. The contracted end of the body is adapted to receive the asbestos or soapstone issue-piece 7, through which is the issue 8, and opening into this issue are the multiple gas-ducts 9, substantially opposite to each other. Within the body A, and between the top 1 and the issue-piece 7, I place a shell-

shaped partition, 10, fitting tightly at one end against the top and closed thereby, and at the other end against the issue, and also closed thereby, excepting that the opening in the contracted end of this partition 10 coincides with the issue 8. The space inside of the partition 10 constitutes the air-chamber into which the air-inlet pipes or pipe 6 opens, and within which the air is temporarily stored before being used.

The space between the outside of the partition 10 and the inside of the body A (the outside shell of the furnace, constitutes the gas-chamber C, into which the pipe or pipes 5 enter to admit gas, and the gas-ducts 9 are outlets of the gas therefrom, and they conduct it and discharge it into the issue 8. At 11 I show a band with a screw-tightener embracing the body A, and to this clamp I connect or secure any ordinary device for supporting the furnace in the desired position. At 12 I show a packing of non-conducting material, and 13 is a sort of outside clamp inclosing the whole top of the furnace and protecting it, and this in turn is held in place by or secured to the clamp 11. The base or top 1, the body A, and the shell 10 are constructed, preferably, of fire-clay and burned, and a mouth-piece or issue-piece, 7, is preferably constructed of asbestos or soapstone. The pipes 5 and 6 are provided with suitable valves to regulate and control the supply of both air and gas.

It will be observed that the air passing from the chamber B and the gas passing from the chamber C through the ducts 9 are mixed and commingled in the issue 8, which is, in fact, a mixing-chamber; that the flame of the combustion of this mixed air and gas generates a most intense heat; that such heat heats the body A intensely, which radiates heat inwardly into the chamber C, imparting great heat to the gas therein, especially in the contracted portion of that chamber, and that consequently the gas, when it leaves the chamber C and meets the air from the chamber B, is intensely heated, thereby promoting a proper combustion of the oxygen.

It will also be observed that quite a large amount of heat is radiated through the partition 10 into the chamber B, heating the air therein to quite a considerable degree; and it

will further appear that when the air from the chamber B and the gas from the chamber C commingle in the issue-opening 8 both are heated to a high degree, or substantially up to the point of economical combustion, and readily ignite when they pass together out of the issue-opening 8, and the most intense heat is generated thereby, sufficient to heat iron or steel quickly to the welding heat, and that the heat is readily controllable and uniform.

In Sheet 2 of the drawings I show the furnace attached to my welding-machine, and this machine is constructed and operates with reference to said furnace as follows: D is the welding-machine, consisting of a base, 13, and arms 14 and 15, creating an elongated slotway, 16, opening into the body of the machine, and 18 is a crank-pulley mounted upon the rear end of the body 19, a pitman mounted on the crank-pulley at one end, and to the slide 20 at the other end. To this slide are connected the parallel bars 21 22, and 23 are the guides for the slide, and 24 are the welding-rolls, mounted one in each of the bars 21 22, which bars, with the slide, constitute a frame, and upon the outer ends of these bars I mount a furnace, A, contiguous to the welding-rolls.

E represents a pipe being welded.

The rotation of the crank 18 imparts a reciprocatory motion to the frame, the welding-

rolls, and the furnaces, and the furnaces thus operate in one sense in conjunction with the welding-rolls—that is to say, the process of heating with the furnaces and welding behind the furnaces is substantially simultaneous.

It will also be seen that this process of heating and welding is carried on both inside of and exterior to the pipe.

What I claim as my invention, and desire to secure by Letters Patent, is—

A furnace consisting of an internal air-chamber inclosed within a frusto-conical shell, an outer shell separated therefrom creating a gas-chamber between them, and a mixing-chamber having a direct connection to the air-chamber, and ducts connecting the gas-chamber to the mixing-chamber, a top inclosing the upper ends of the gas and air chambers, an air-inlet pipe opening into the air-chamber, a gas-inlet pipe opening into the gas-chamber, and means for clamping the upper end of the gas-chamber and the top together and for supporting the same, substantially as described.

In witness whereof I have hereunto set my hand this 1st day of May, 1888.

ROBT. CARTWRIGHT.

In presence of—

H. R. DENISON,
C. W. SMITH.