

E. R. MORRISON, J. RIDDELL & R. G. MORRISON.

CONTROLLING VALVE.

APPLICATION FILED OCT. 7, 1908.

Patented Mar. 23, 1909.

2 SHEETS—SHEET 1.

915,991.

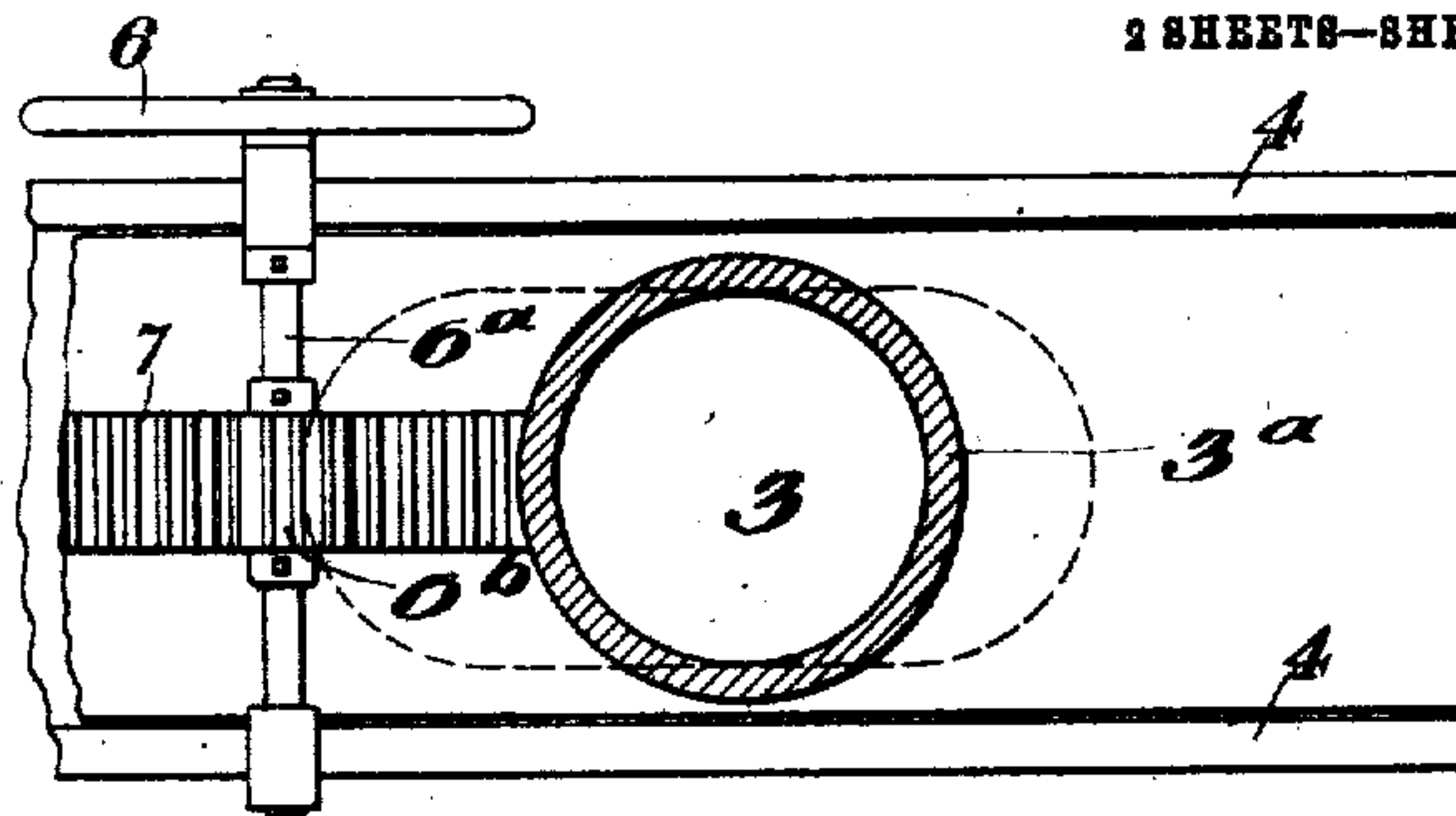


Fig. 1.

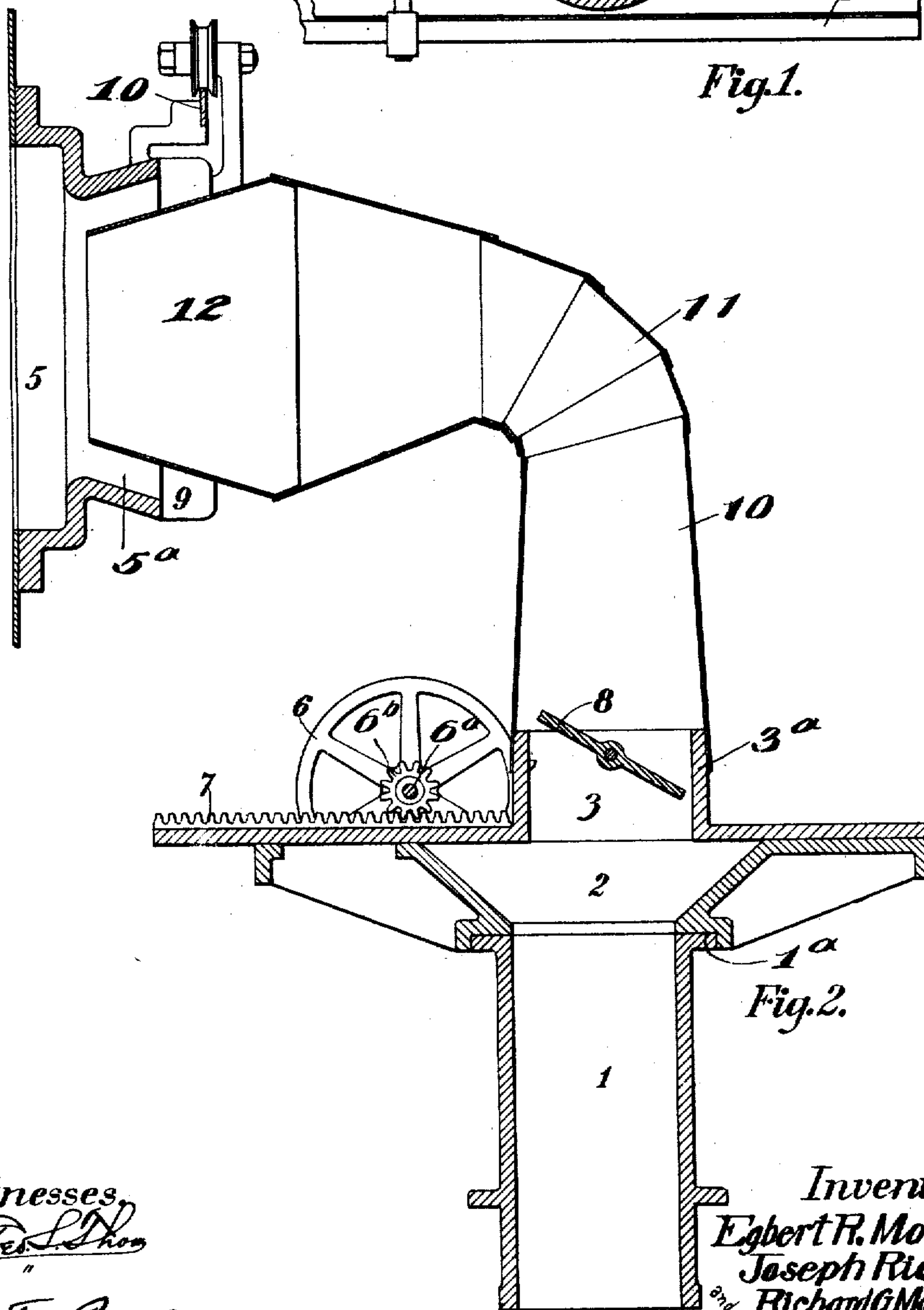


Fig. 2.

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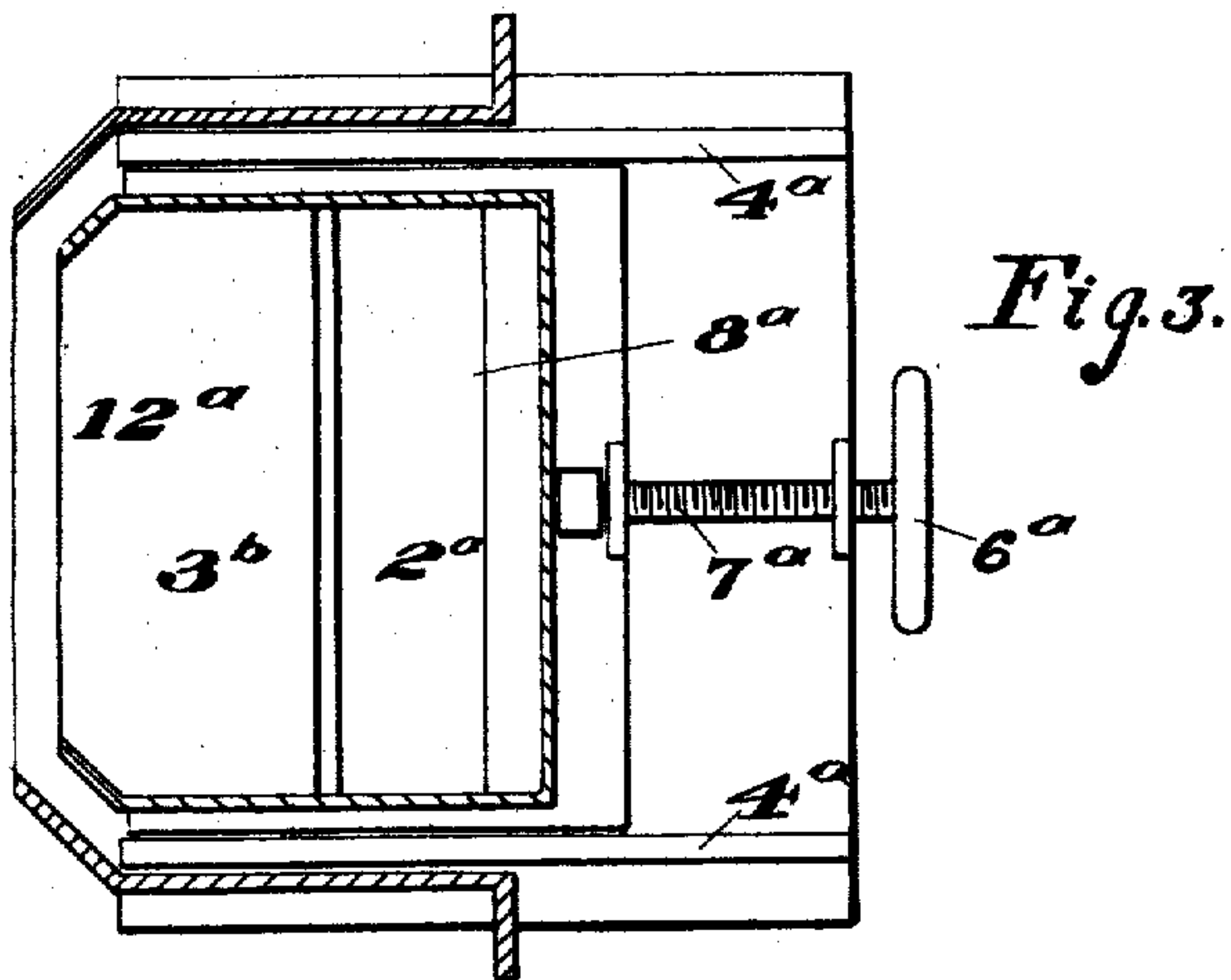


Fig. 3.

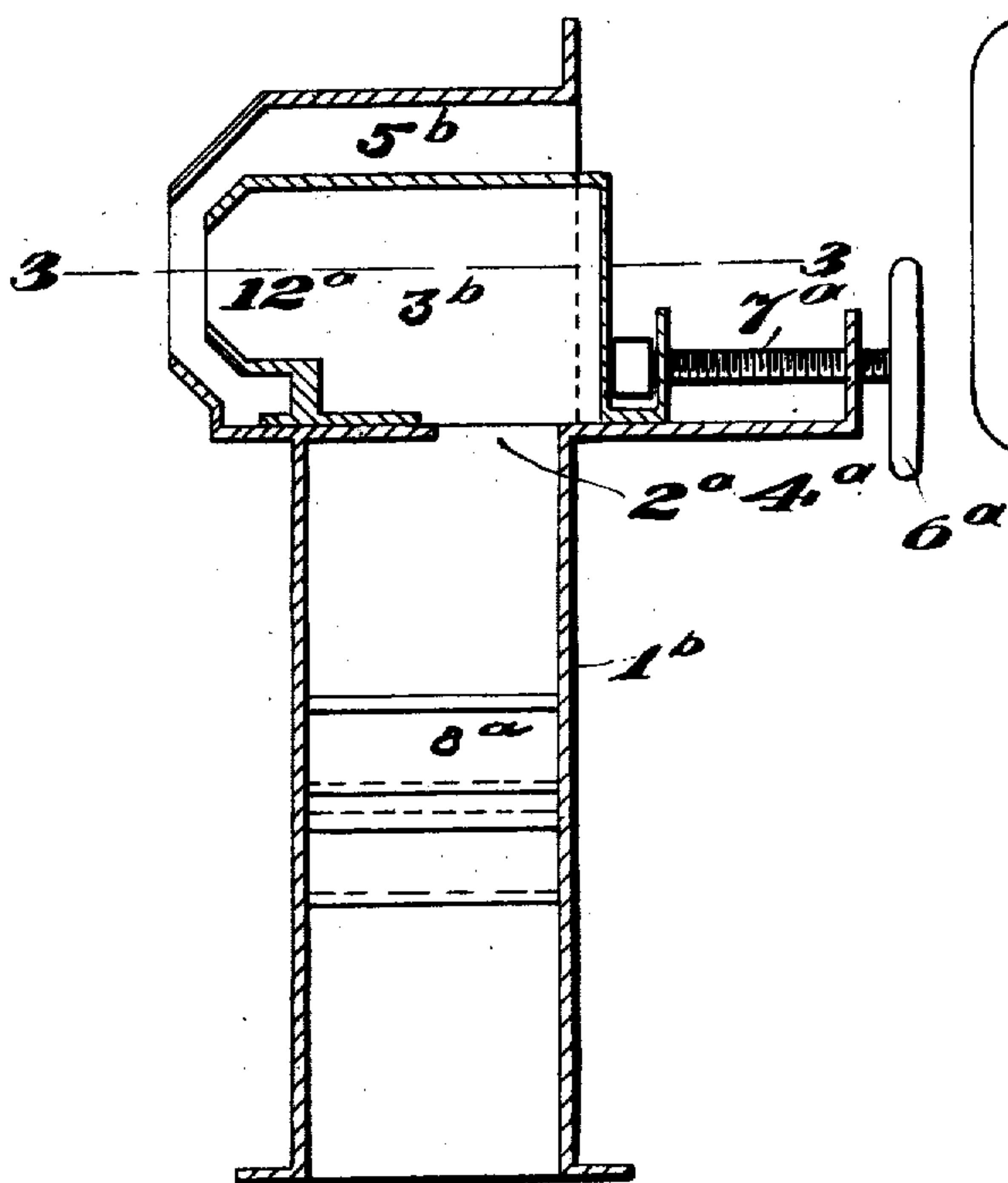


Fig. 4.

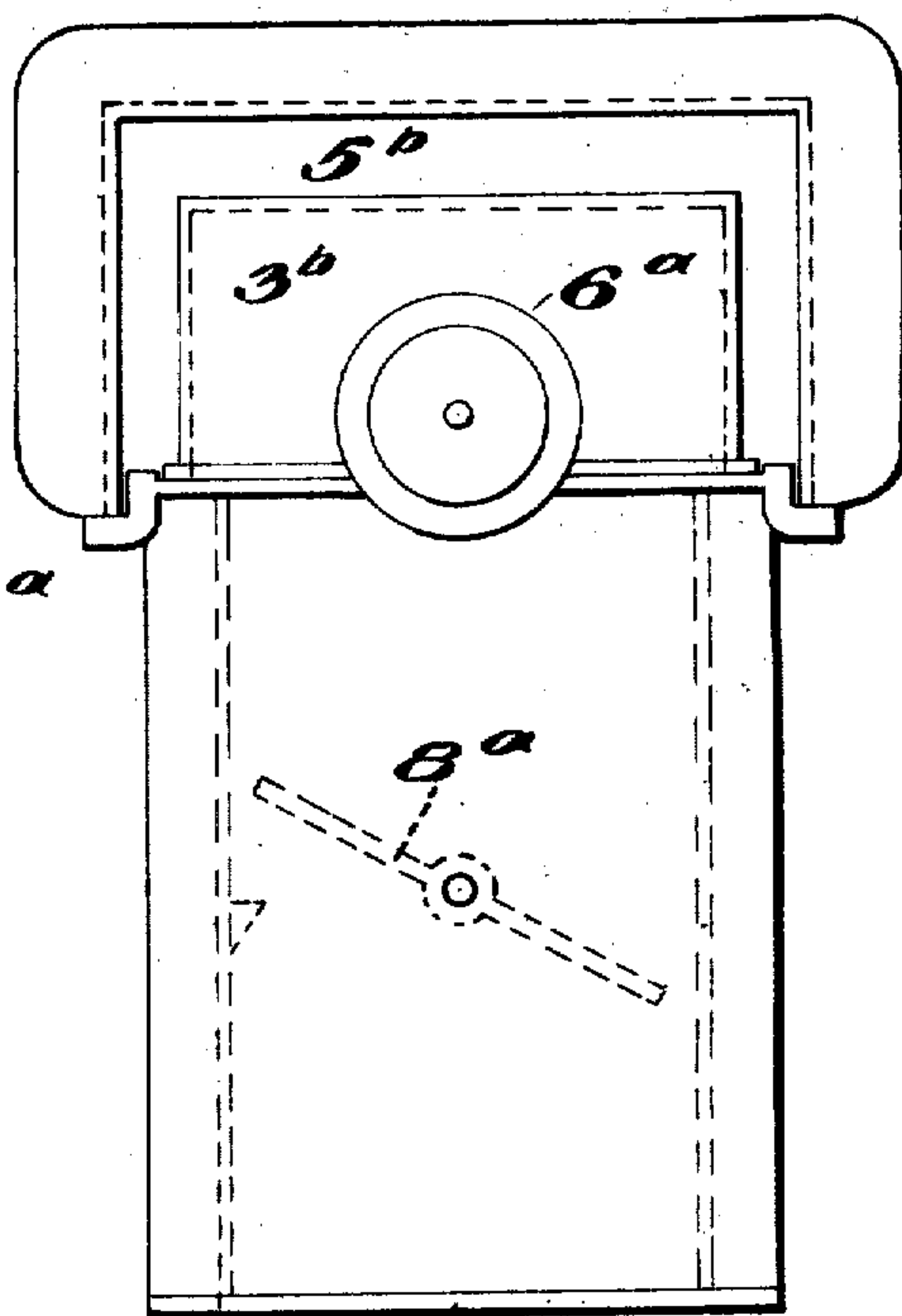


Fig. 5.

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# UNITED STATES PATENT OFFICE.

EGBERT R. MORRISON, JOSEPH RIDDELL, AND RICHARD G. MORRISON, OF SHARON,  
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## CONTROLLING-VALVE.

No. 915,991.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed October 7, 1903. Serial No. 456,543.

*To all whom it may concern:*

Be it known that we, EGBERT R. MORRISON, JOSEPH RIDDELL, and RICHARD G. MORRISON, citizens of the United States, residing at Sharon, in the county of Mercer and State of Pennsylvania, have invented certain new and useful Improvements in Controlling-Valves, of which the following is a specification.

10 This invention is a controlling device or valve structure for regulating the amount of air and gas supplied to a hot-blast oven, stove, or furnace, or any other place where air and gas are burned together.

15 The object of the invention is to construct a controlling device of simple arrangement and construction whereby economy is secured in the cost of the device, and also to provide a perfect regulation of the amount of either gas or air supplied to the combustion chamber.

20 The device provides means for regulating the amount of air without affecting the supply of gas, for regulating the amount of gas without affecting the supply of air, and for regulating both together, so that in any size flame desired, perfect combustion will take place. The device is also convenient of operation and easily manipulated.

25 In the accompanying drawings, Figure 1 is a plan view of the lower part of the structure; Fig. 2 is a vertical section of the complete apparatus; Fig. 3 is a horizontal section of a modification, on the line 3—3 of Fig. 4; Fig. 4 is a vertical section of the same; Fig. 5 is a front elevation of the same.

30 Referring specifically to Figs. 1 and 2, 1 indicates a gas supply pipe provided at the top with a flaring head 2 which rests upon the top of the pipe and forms a swivel joint 1<sup>a</sup>, so that the head can be turned if desired, the parts being circular at the joint. A slide valve 3 rests upon the head 2, said valve comprising a plate having an upwardly projecting neck 3<sup>a</sup> around an opening, which opening is of less area than the opening in the head, which is enlarged or flared, as stated. The slide 3 works back and forth between guides 4 on the head. The neck 3<sup>a</sup> is fitted with a pipe 10 having a curved neck 11 and terminating in a nozzle 12 through which the gas is discharged. The nozzle 12 projects into an outer annular shell or inlet 5 to the combustion chamber. The end of the nozzle

35 12 is of less diameter than the shell, forming

a space 5<sup>a</sup> through which air may enter around the gas nozzle. The valve 3 is or may be operated by a hand wheel 6 on a shaft 6<sup>a</sup> having a pinion 6<sup>b</sup> which meshes with a rack 7 on the top of the plate, to move the slide valve back and forth. 8 is a valve in the neck 3<sup>a</sup>, for regulating the amount of gas without moving any other part of the device. 9 is a sliding door carried by rollers upon a track 10, and which can be closed over the inlet 5 when the gas nozzle is withdrawn thereby closing the inlet to the combustion chamber.

40 In the modified form shown in Figs. 3, 4 and 5 the supply pipe 1<sup>b</sup> for the gas is provided with a contracted opening 2<sup>a</sup> at the top, which leads to a box valve 3<sup>b</sup> having an enlarged opening in the bottom which communicates with the opening 2<sup>a</sup>, and having a nozzle 12<sup>a</sup> which coöperates with the shell 5<sup>b</sup> through which air is admitted around the gas valve. The butterfly valve 8<sup>a</sup> is located in the supply pipe. The box valve 3<sup>b</sup> is moved by means of a screw 7<sup>a</sup>, having a hand wheel 6<sup>a</sup> to regulate the distance of the nozzle 12<sup>a</sup> from the outlet of the shell 5<sup>b</sup> which leads to the combustion chamber, thereby varying the size of the air space or inlet, and producing the same result as the structure above described. The box valve slides on the plate 4<sup>a</sup> at the head of the inlet pipe. The swivel joint 1<sup>a</sup> formed between the pipe 1 and the head 2 allows the device to be turned to any angle, and the flange on the head 2 overlaps the flange at the top of the pipe and this keeps out dirt and water and enables the device to be easily manipulated. This joint may be lubricated in any suitable manner.

45 It will be seen that in either form the amount of air supplied can be regulated by moving the slide valve, without affecting the supply of gas, because of the openings in the pipe and valve, being such as to allow the valve to be moved without varying the gas supply. The relative proportions of the openings allow movement of the valve without variation of the gas supply. Obviously the same result would be produced by having enlarged openings in both parts of the valve, instead of in one part, as shown, the result in either event being that limited movement of the valve will not vary the amount of gas supplied. The arrangement of the communicating openings is such as to allow whatever regulation is desired in the

50 110



distance between the nozzle 12 and the inlet shell 5, the amount of air entering being regulated by moving the nozzle in or out. But by full movement of the slide valve the outlet from the gas supply pipe is completely closed, thereby cutting off the supply of gas.

It is to be understood that the invention is not limited in any respect by the particular embodiments shown. Other means than those shown may be used to move the valves, and the shape of the holes and of the pipes and other parts may be varied in any manner desired. The swivel joint between the pipe and the head may be omitted, or some other kind of joint used. The valve may lie in any plane and be otherwise arranged according to local conditions.

The parts are shown as made of metal, but the invention is not limited to any particular material, as obviously, brick or other material may be used for some or all the parts.

It is to be understood that the communicating openings between the supply pipe and the valve are not necessarily of different sizes or shapes, as both may be of the same size and shape and larger than the inlet opening of the supply pipe and thus allow a regulation of the air without affecting the gas supply. These openings may be of any size or shape independent of each other, as the skilled mechanic may arrange, or as may be desired, as long as they permit of the valve being moved to regulate the air without affecting the gas supply.

We claim:

1. The combination with a gas supply pipe and an inlet to a combustion chamber, of a valve structure connecting the said pipe and inlet and movable toward and from the inlet to vary the air supply thereto, the valve structure and supply pipe having communicating openings one of which is enlarged so that limited movement of the valve will not vary the amount of gas supplied.

2. The combination with a gas supply pipe and an air and gas inlet to a combustion chamber, of a valve between the pipe and the inlet, and through which the gas passes, movable toward and from the inlet, and constructed to control and cooperate with both the pipe and the inlet, and having means to vary the air supply without variation of the gas supply when moved to a certain extent

and to vary the gas supply when moved to an additional extent.

3. The combination with a gas supply pipe and an air and gas inlet to a combustion chamber, of a valve between and controlling both the pipe and the inlet, and through which the gas passes, and movable toward and from the inlet, and having means to vary the air supply without variation of the gas supply when moved to a certain extent and to vary the gas supply when moved to an additional extent, and an auxiliary valve in the gas passage, to independently control the gas supply.

4. The combination with an air and gas inlet to a combustion chamber, of a gas supply pipe, and a valve between the pipe and the inlet and constructed to control both, said inlet and valve having cooperating parts constructed to vary the amount of air admitted without variation of the amount of gas admitted.

5. The combination with an air and gas inlet to a chamber, of a gas supply pipe, and a valve having a gas passage and slidable over the outlet from the pipe, and having the end of the passage movable toward and from the said inlet to vary the amount of air admitted, the pipe and valve having communicating openings one of which is enlarged, so as to permit some movement of the valve without varying the gas supply.

6. The combination with an inlet to a combustion chamber, of a gas supply pipe, a turning head upon the end thereof, and a valve slidable on the head and having a gas passage through the valve with a nozzle at the end of the passage, movable into and out of the inlet.

7. The combination with a gas supply pipe of a valve movable across the end of the pipe and having a gas passage, said pipe and passage having communicating openings one of which is of greater area than the other.

In testimony whereof, we affix our signatures in presence of two witnesses.

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