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PATENTED APR. 25, 1905.

W. L. MILLER.  
BLOWING-OFF APPARATUS FOR BOILERS.

APPLICATION FILED FEB. 23, 1905.

2 SHEETS—SHEET 1.

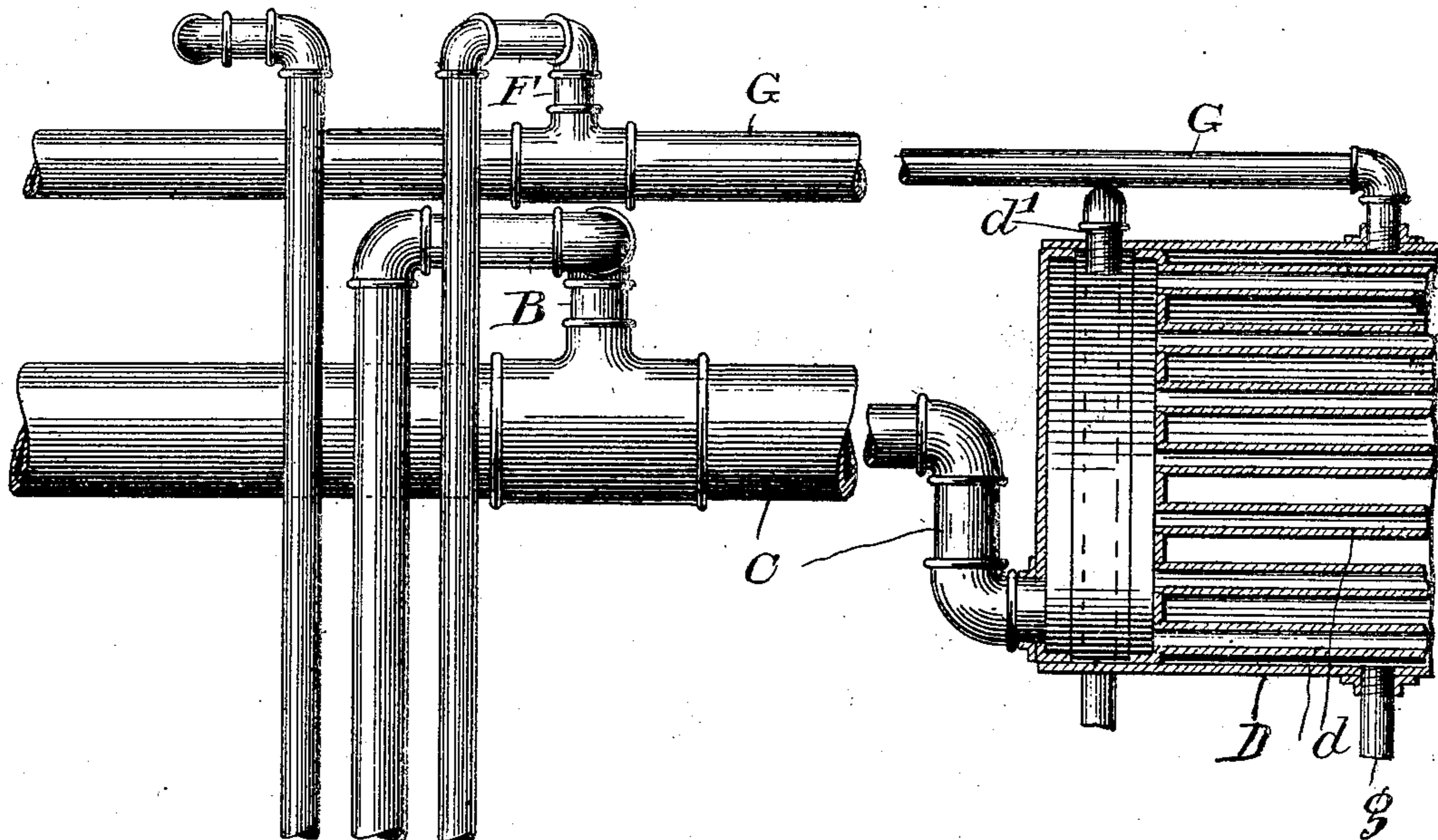
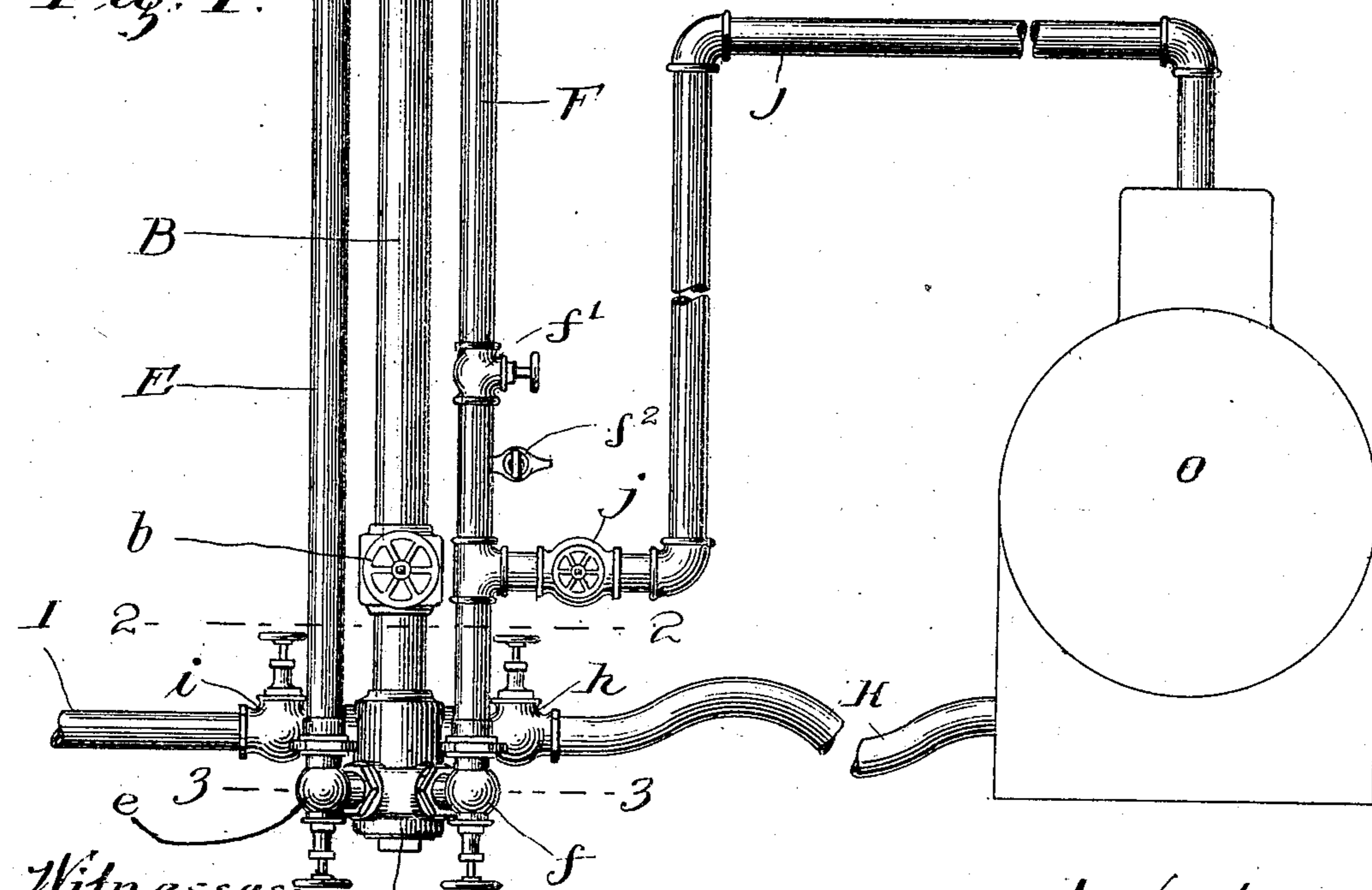


Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2.

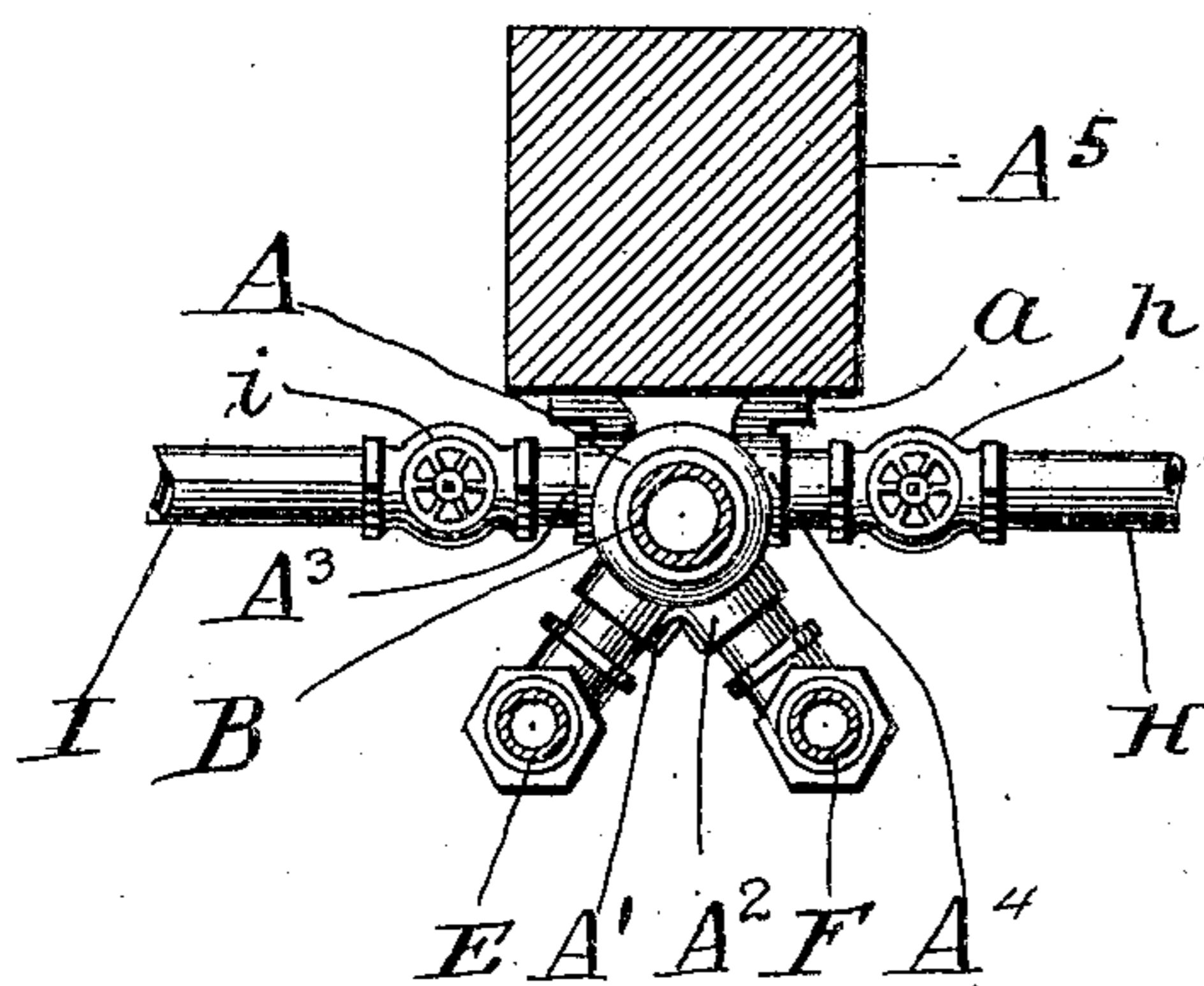


Fig. 3.

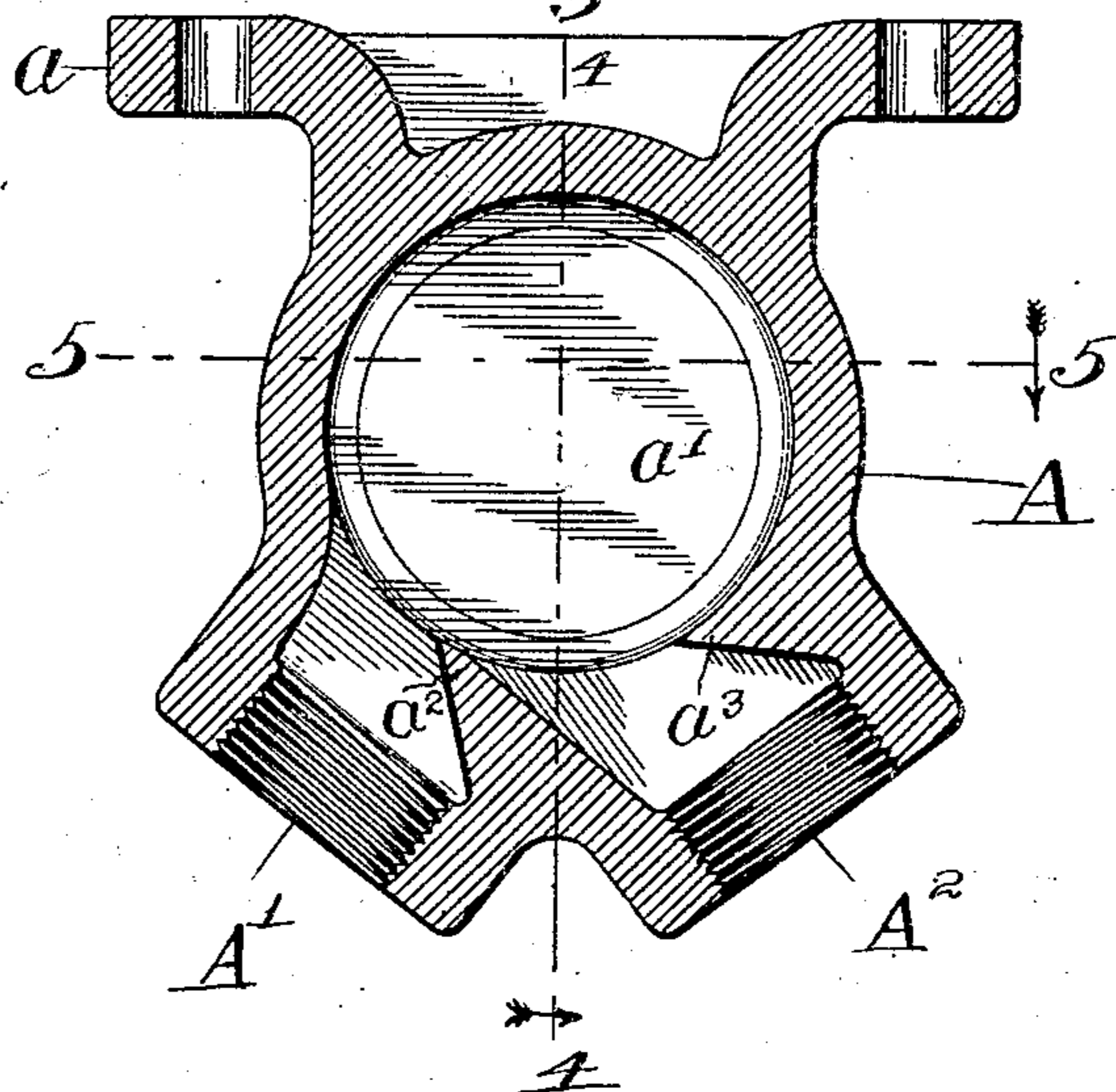


Fig. 4.

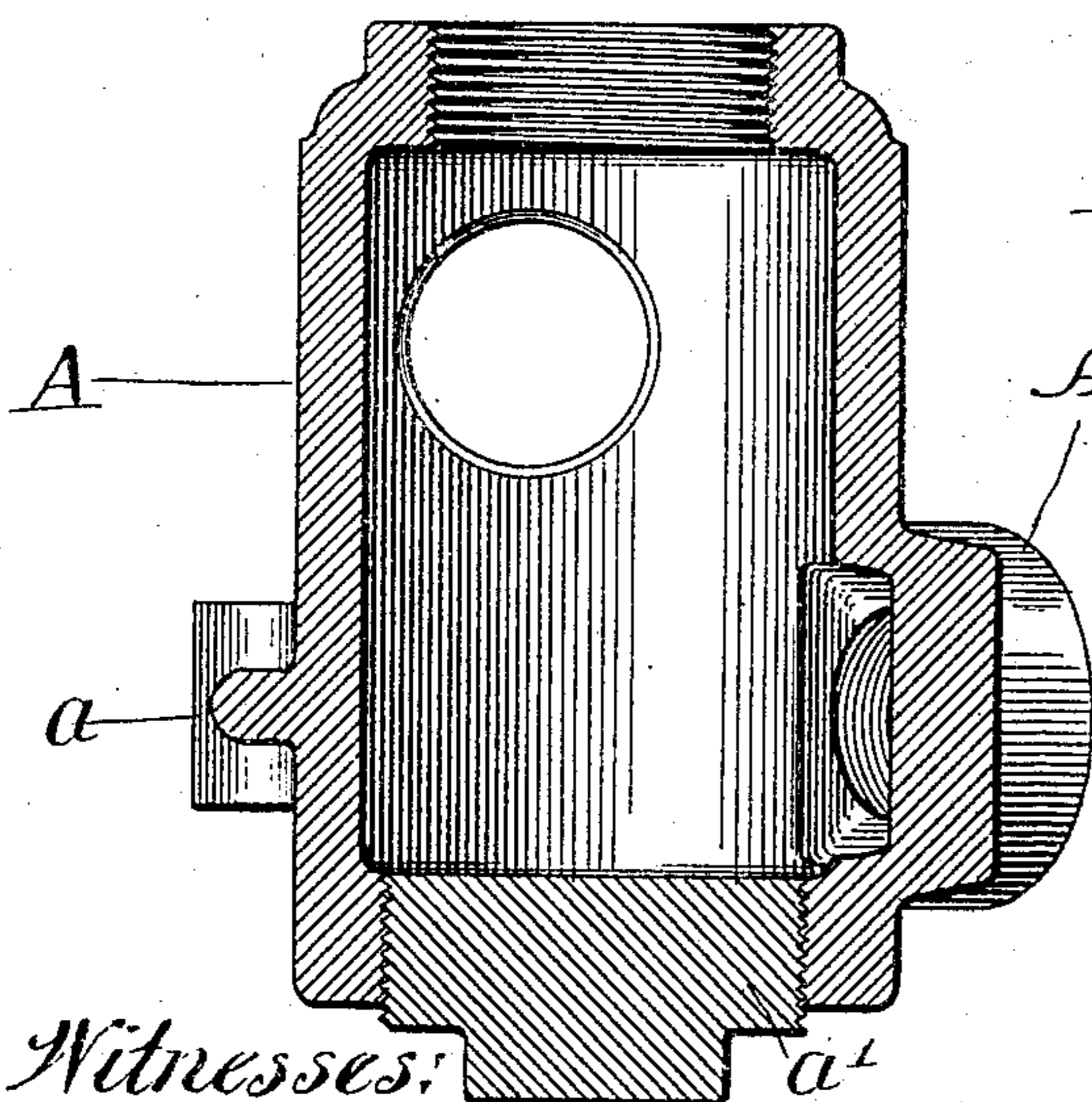
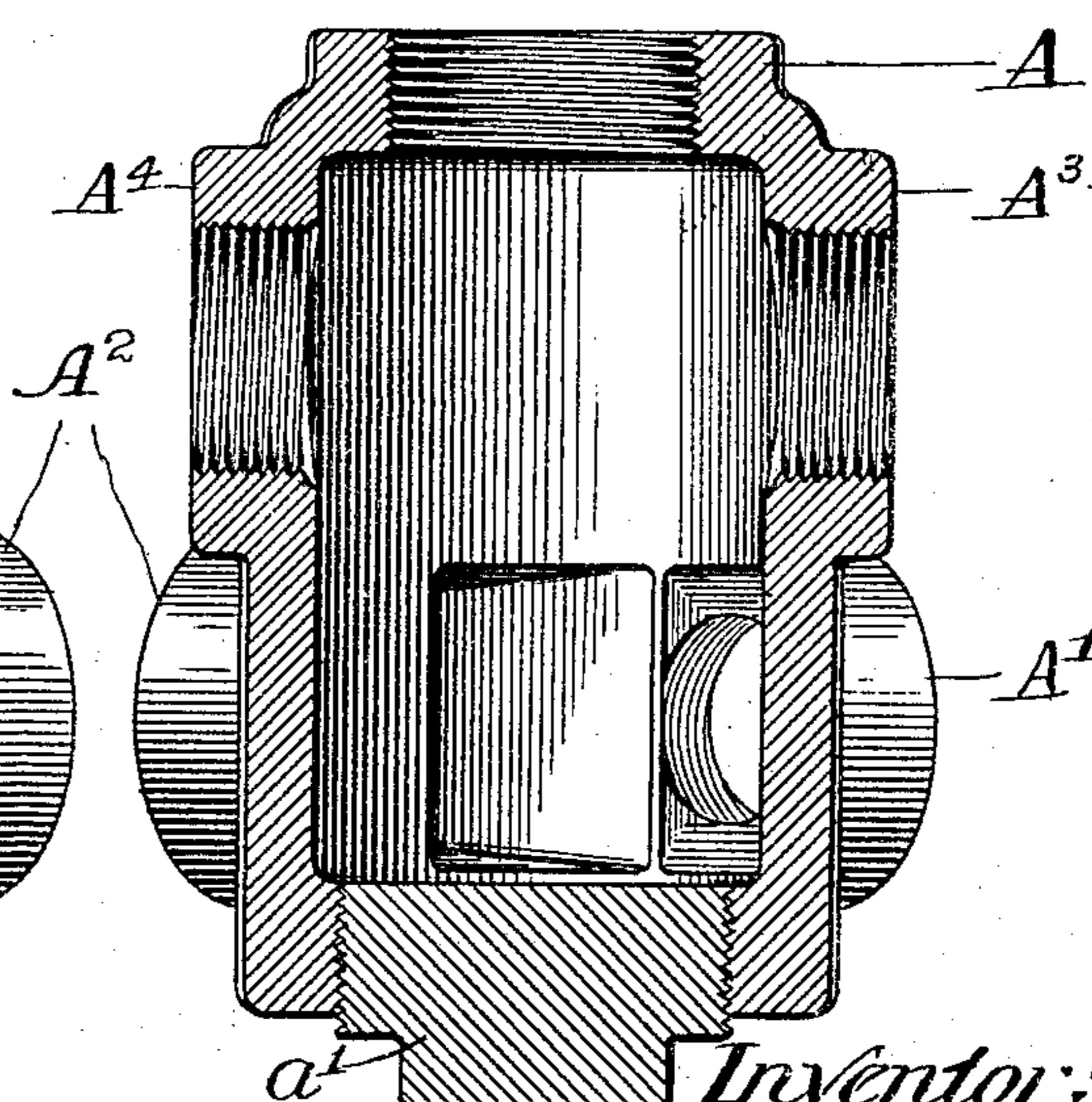


Fig. 5.



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# UNITED STATES PATENT OFFICE.

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## BLOWING-OFF APPARATUS FOR BOILERS.

SPECIFICATION forming part of Letters Patent No. 788,323, dated April 25, 1905.

Application filed February 23, 1905. Serial No. 246,819.

*To all whom it may concern:*

Be it known that I, WILLIAM L. MILLER, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain Improvements in Blowing-Off, Washing, and Filling Apparatus for Boilers, of which the following is a specification.

My invention relates to certain and useful improvements in blowing-off, washing, and filling apparatus for boilers; and its object is to produce a device of this class which shall have certain advantages which will appear more fully and at large in the course of this specification.

To this end my invention consists in certain novel features which are shown in the accompanying drawings as embodied in my preferred form of construction.

In the aforesaid drawings, Figure 1 is a front elevation of my improved device, showing the boiler to be acted upon diagrammatically and the heating apparatus on a greatly-reduced scale, as compared with the remainder of the figure. Fig. 2 is a horizontal section in the line 2 2 of Fig. 1. Fig. 3 is a section through the blow-off box alone in the line 3 3 of Fig. 1. Fig. 4 is a section in the line 4 4 of Fig. 3 looking in the direction of the arrow, and Fig. 5 is a section in the line 5 5 of Fig. 3 looking in the direction of the arrow.

Referring to the drawings, A is a blow-off box, preferably in the form of a cylindrical casting having a flange *a*, by which it can be attached to a suitable support A<sup>5</sup>. This casting is open at the top and bottom and connected by a blow-off pipe B with a blow-off main C, the said main entering a heater D, containing tubes *d*, through which the liquid from the blow-off main passes, being finally discharged from these tubes through a pipe *d'* into a catch-basin. (Not shown.) The blow-off pipe B is controlled by a cock *b*, as illustrated. The lower end of the blow-off box is closed by a plug *a'*. If desired, the blow-off pipe can be made to enter the blow-off box at the bottom and the plug inserted in the top. Near the bottom of the blow-off box are two radial nipples A' A<sup>2</sup>, the channel-box being provided with deflectors *a*<sup>2</sup> *a*<sup>3</sup>, by which water or other

liquid entering through the nipples is turned into a tangential course. The nipple A' is connected with a cold-water pipe E, controlled by a valve *e*, and the nipple A<sup>2</sup> is connected to a hot-water pipe F, controlled by a valve *f* at its lower end and a valve *f'* higher up, a petcock *f*<sup>2</sup> being provided between said valves. The cold-water pipe contains cold water under pressure and the hot-water pipe opens into a hot-water main G, which communicates with a supply of water under pressure in the heater D between the tubes *d*, the water being fed in through a pipe *g*. It will be obvious that hot and cold water entering the blow-off box A through the nipples A' A<sup>2</sup> will be deflected into a circular course and will travel around the blow-off box, being thoroughly mixed as it rises in the same.

In the upper part of the blow-off box A are two nipples A<sup>3</sup> A<sup>4</sup>, one of which communicates with a water-inlet pipe H and the other of which communicates with a pipe I, the said pipes being controlled by valves *h* and *i*, respectively. The pipe H communicates with the lower portion of the boiler to be operated upon, while the upper part of said boiler is connected by a pipe J, controlled by a valve *j* to the water-pipe F.

The operation of my improved device is as follows: Assuming that the boiler, which is indicated by O, is full of water and it is desired to blow it off, the valve *e* in the cold-water pipe, the valve *f* in the hot-water pipe, the valve *i*, and the valve *f'* in the hot-water pipe are closed. The valve *b* in the blow-off pipe and the petcock *f*<sup>2</sup> are open. Thereupon if the valves *h* and *j* are opened the water from the boiler will pass through the blow-off box, up the blow-off pipe B, through the blow-off main, through the tubes *d* in the heater D, and, finally, into the catch-basin, while the steam will pass through the pipe J into the hot-water pipe and out of the petcock *f*<sup>2</sup>. If desired, the valve *j* can be left closed, and the steam will be forced up the blow-off pipe behind the water. The passage of this amount of steam and hot water through the heater will heat the water therein contained, so that a large amount of heat in the boiler which would otherwise be wasted is

utilized. After the boiler has been emptied and it is desired to wash it the blow-off pipe is closed by the valve *b*, the petcock *f*<sup>2</sup> is closed, and the valve *f*' opened. The valves  
 5 *e* and *f* are thereupon opened and hot water from the heater and cold water from the cold-water pipe in the desired proportion enters the blow-off box and is mixed as already set forth, after which it passes through the pipe  
 10 *H* into the boiler, some of the hot water simultaneously passing through the pipe *J* if the valve *j* is open. When the boiler has been sufficiently washed and emptied, the valve *e* is closed and the valve *j* opened. There-  
 15 upon hot water will enter the boiler both at top and bottom through the pipes *H J*, filling it very quickly.

My apparatus is particularly designed for use for locomotive-boilers in roundhouses, in  
 20 which case an apparatus similar to the one herein shown is placed adjacent to each locomotive-pit, a battery of heaters being provided and the connections with the boiler being made by hose connections in the ordinary  
 25 way. In such a case it is frequently desirable to empty a boiler of its contents more rapidly than with the structure so far described. To effect this emptying of a boiler, its opposite side is connected to a pipe *I* on  
 30 the next adjacent apparatus, so that its water passes through two blow-off boxes. Otherwise the operation of the device is the same as above set forth.

I realize that considerable variation is possible in the details of this construction without departing from the spirit of the invention, and I therefore do not intend to limit myself to the specific form herein shown and described.

40 I claim as new and desire to secure by Letters Patent—

1. In a device of the class described, the combination with a blow-off pipe and a valve controlling the same, of a blow-off box into  
 45 which said pipe opens, means for connecting said box to a boiler, and hot and cold water pipes opening into said blow-off box.

2. In a device of the class described, the combination with a blow-off pipe and a valve

controlling the same, of a blow-off box into 50 which said pipe opens, means for connecting said box to a boiler, hot and cold water pipes opening into said blow-off box, and valves for controlling said hot and cold water pipes.

3. In a device of the class described, the 55 combination with a blow-off pipe, of a heater connected therewith through which the blow-off water passes, a valve controlling said blow-off pipe, a blow-off box at the end of said blow-off pipe, a hot-water pipe running 60 through said heater to said blow-off box and a cold-water pipe entering said blow-off box, valves for controlling said hot and cold water pipes, and means for connecting said blow-off box with a boiler. 65

4. In a device of the class described, the combination with a blow-off pipe, a valve for controlling the same, of a blow-off box empty- 70 ing into said blow-off pipe, hot and cold water pipes entering said blow-off box at one end, deflectors for causing a gyratory flow of the water entering through said box, and means for connecting the opposite end of said blow-off box with a boiler.

5. In a device of the class described, the 75 combination with a blow-off box, a blow-off pipe connected therewith and a valve for controlling the blow-off pipe, hot and cold water pipes entering the blow-off box, a pipe adapted to connect the blow-off box with the lower 80 portion of a boiler, two valves in the hot-water pipe, a petcock, and a pipe adapted to connect with the upper portion of a boiler entering said hot-water pipe between said valves.

6. In a device of the class described, the 85 combination with a blow-off box, of a blow-off pipe and hot and cold water pipes entering the same, valves for independently controlling said pipes and means of connection be- 90 tween said blow-off box and a boiler.

In witness whereof I have signed the above application for Letters Patent, at Chicago, in the county of Cook and State of Illinois, this 15th day of February, A. D. 1905.

WILLIAM L. MILLER.

Witnesses:

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 RUSSELL WILES.