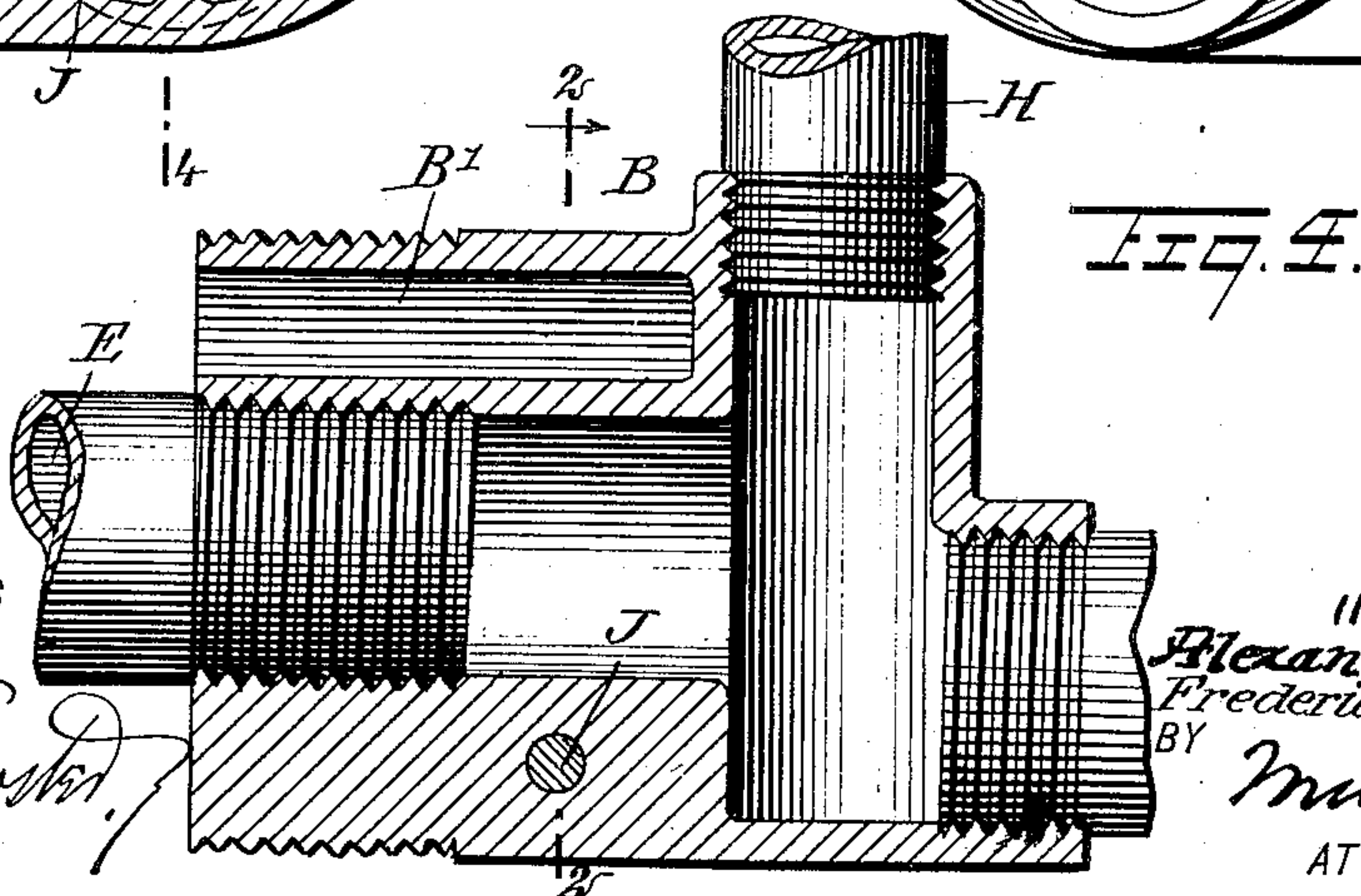
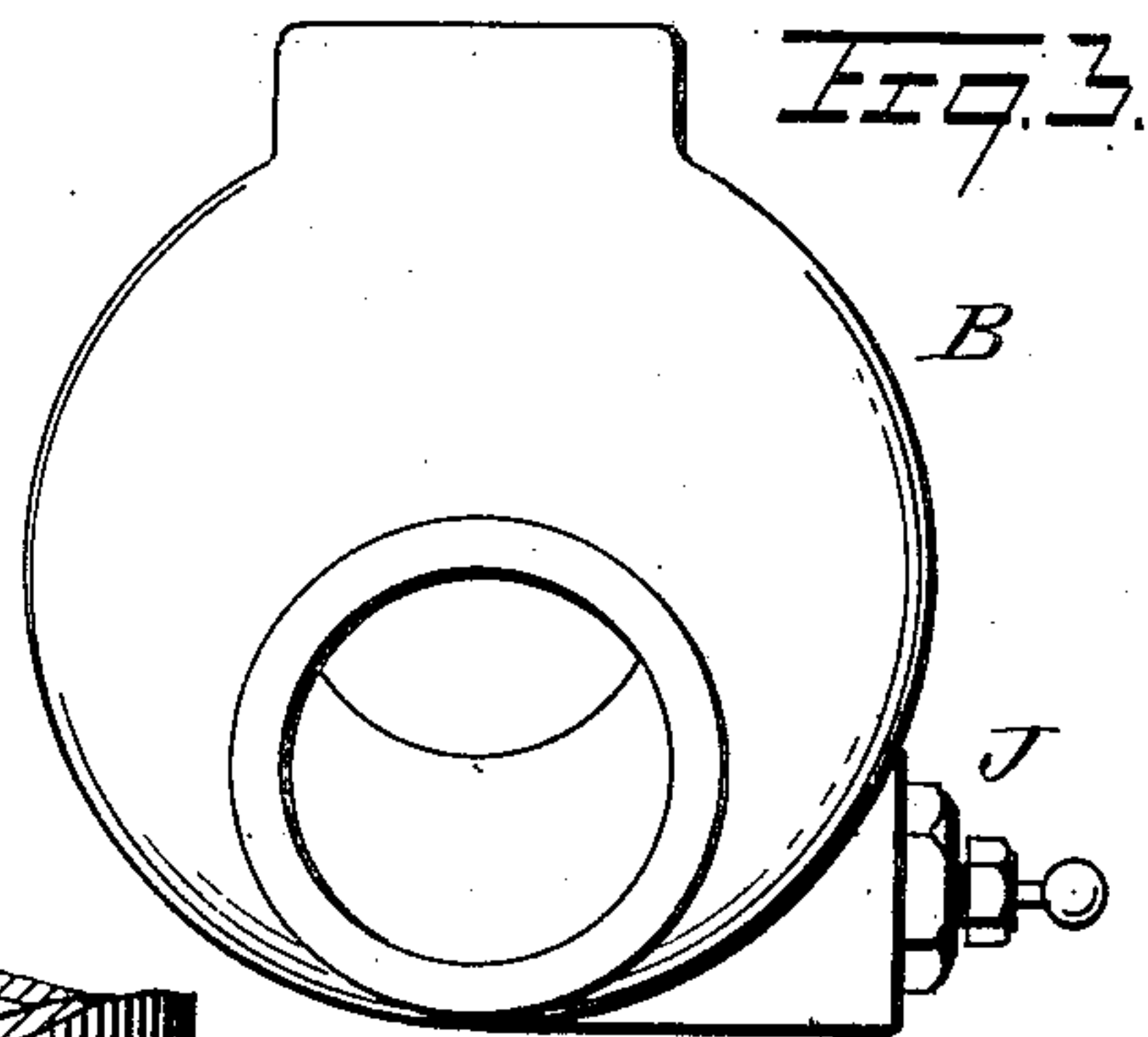
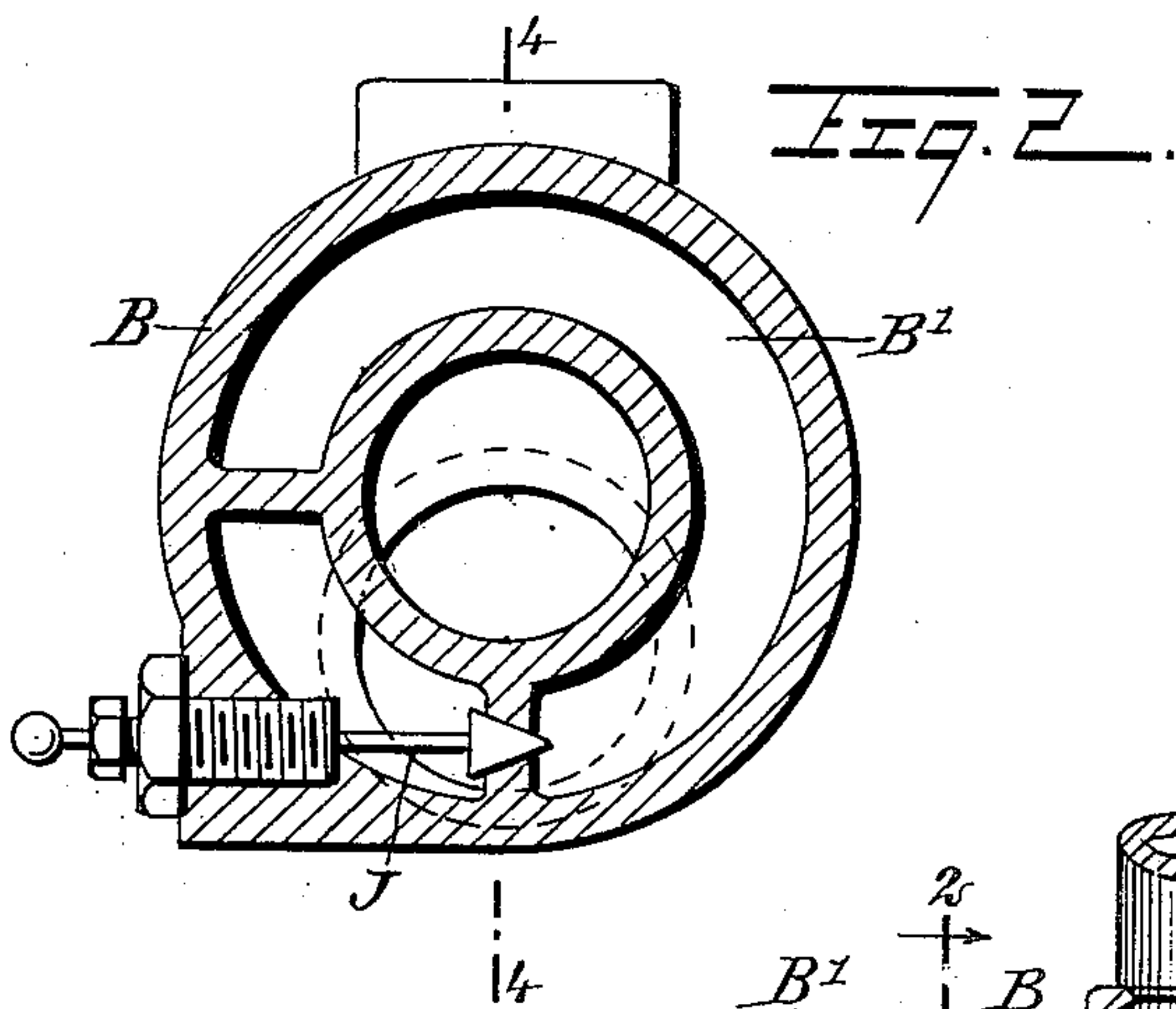
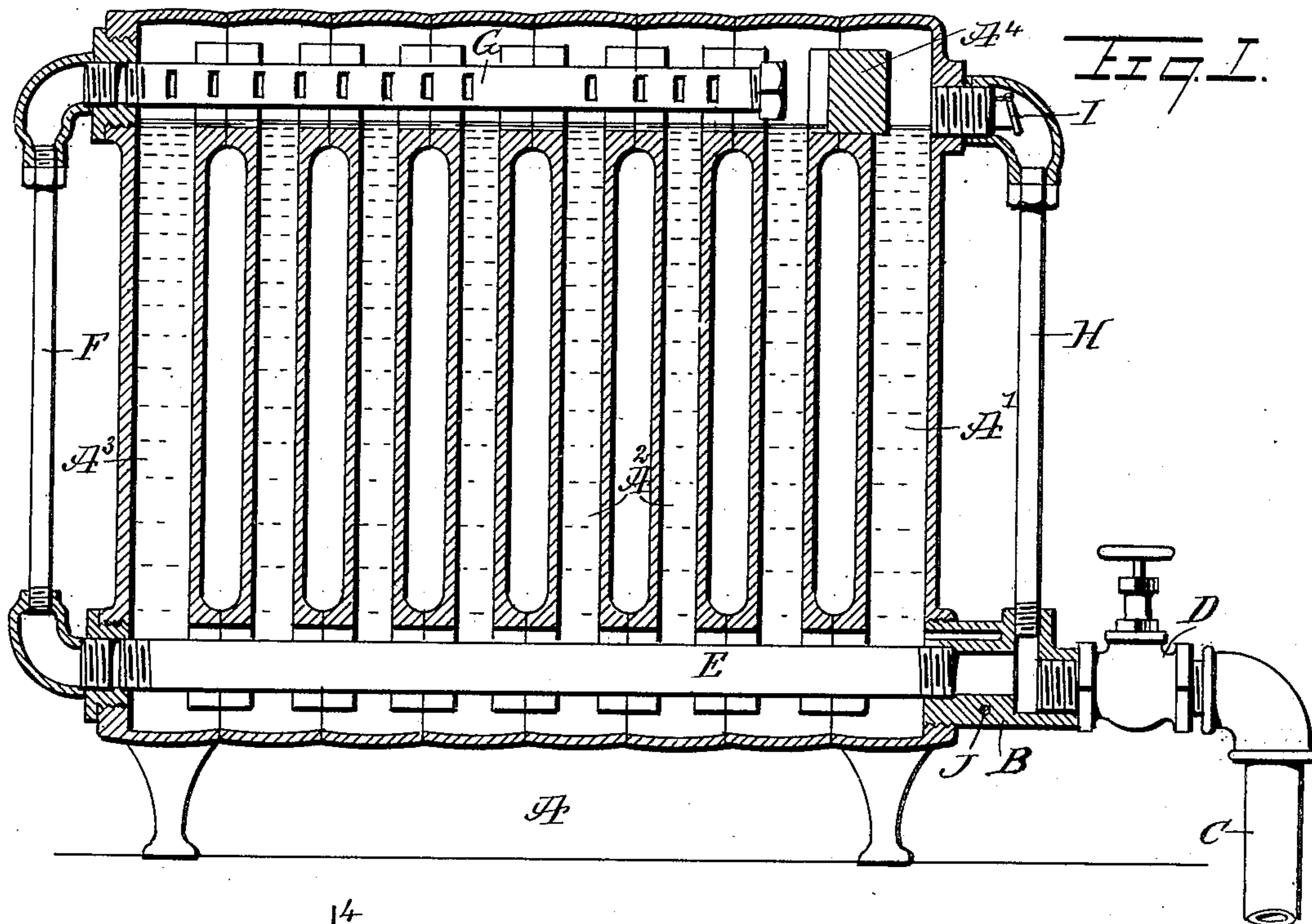


No. 880,954.

PATENTED MAR. 3, 1908.

A. & F. V. ZECK.
HEATING APPARATUS.
APPLICATION FILED JULY 17, 1907.



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ALEXANDER ZECK AND FREDERICK VAN ZECK, OF GRAFTON, WEST VIRGINIA.

HEATING APPARATUS.

No. 880,954.

Specification of Letters Patent.

Patented March 3, 1908.

Application filed July 17, 1907. Serial No. 384,174.

To all whom it may concern:

Be it known that we, ALEXANDER ZECK and FREDERICK VAN ZECK, citizens of the United States, and residents of Grafton, in the county of Taylor and State of West Virginia, have invented a new and Improved Heating Apparatus, of which the following is a full, clear, and exact description.

The object of the invention is to provide a new and improved heating apparatus, arranged to heat the water in a hot water radiator by the use of steam, to keep the hot water radiator supplied with water by the water of condensation of the steam, and to maintain a uniform level of water in the hot water radiator, thus combining steam and water heating in a very effective manner and permitting the use of the apparatus in all classes of buildings, including high buildings in which the excessive pressure from a regular hot water system would prevent its use.

The invention consists of novel features and parts and combinations of the same, which will be more fully described hereinafter and then pointed out in the claims.

A practical embodiment of the invention is represented in the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views.

Figure 1 is a sectional side elevation of the improvement; Fig. 2 is an enlarged cross section of the main fitting, the section being on the line 2—2 of Fig. 4; Fig. 3 is an end view of the same viewed in an opposite direction from Fig. 2, and Fig. 4 is a sectional side elevation of the same on the line 4—4 of Fig. 2.

The hot water radiator A consists of a first or front section A', intermediate sections A² and a rear or last section A³, connected with each other in the usual manner, and to the lower portion of the front section A' of the radiator A is secured a main fitting B, connected with the steam supply pipe C, having a valve D and leading to a boiler or other suitable source of steam supply. To the main fitting B is secured one end of a steam pipe E, extending lengthwise through the lower portion of the hot water radiator A, to connect at its rear end by a pipe F, with the rear end of a perforated steam distributing pipe G, extending lengthwise in the upper portion of the radiator A.

Above the upper inner end of the front section A' is a block or plug A⁴, and the upper end of the said front section A' is con-

nected by an overflow pipe H with the main fitting B, the said overflow pipe H being provided with a suitable check valve I, to prevent the steam from passing by way of the pipe H into the upper end of the first section A' of the radiator A. The block or plug A⁴ serves to obstruct the communication between the first and second sections and to form a seal between the overflow pipe H and the distributing pipe G. Now by the arrangement described, steam can pass from the boiler or other supply by way of the pipe C and valve D into the main fitting B, from which the steam passes through the pipe E to heat the water contained in the radiator A and to insure a rapid circulation of the water in the several sections of the radiator. The steam after passing through the pipe E passes up through the pipe F into the condensing pipe G, in which the steam condenses and passes by way of the perforations in the said pipe into the radiator A, to supply the latter with water. All surplus water is carried off through the overflow pipe H, so that the level of the water in the radiator A is maintained at a uniform height, the overflow water returning to the boiler the same as in an ordinary steam heating apparatus.

From the foregoing it will be seen that the water in the hot water radiator is heated by the use of the steam passing through the pipe E, and by causing the water of condensation of the said steam to pass into the radiator, the latter is supplied with water and the level of the water in the radiator is maintained at a uniform height by the overflow pipe H. By the arrangement described no sudden change of temperature of the water in the radiator takes place, as the same water level in the radiator is maintained and the temperature of the water is raised evenly but very rapidly. The temperature is controlled by the operator manipulating the valve D in the usual manner.

The overflow pipe H enters the radiator a distance from the top thereof, so as to maintain an empty space in the upper portion of the radiator for the pipe G to extend in, and to allow space for expansion of the water without danger of producing an undesirable pressure within the radiator.

The main fitting B is provided with a chamber B', opening into the interior of the front radiator section A', and this chamber B' is adapted to be connected by a suitable valve J, with the chamber into which opens

the supply pipe C, so that the water in the radiator A can be readily drained from the radiator whenever desired.

Having thus described our invention, we claim as new and desire to secure by Letters Patent:

1. A heating apparatus, comprising a hot water radiator, a steam pipe extending horizontally in the lower part of the radiator, a perforated distributing pipe extending horizontally in the upper part of the radiator, and a vertical pipe outside of the radiator and connecting the said pipes.

2. A heating apparatus, comprising a hot water radiator, a steam supply connected with the radiator, a horizontal steam pipe in the lower part of the radiator, a horizontal perforated distributing pipe in the upper part of the radiator, a vertical pipe outside of the radiator and connecting the said pipes, and a valved overflow leading from the upper end of the radiator to the steam supply.

3. A heating apparatus comprising a hot water radiator, a steam pipe extending horizontally through the water in the lower part of the radiator for heating the same, the said steam pipe discharging into the upper portion of the radiator to supply the latter with water, and an overflow for carrying off the surplus water and maintaining the level of the water in the radiator at a uniform height.

4. A heating apparatus comprising a steam supply pipe, a radiator connected with the said supply pipe and filled with water to within a short distance from the top, a steam pipe connected with the said steam supply pipe and extending horizontally through the lower portion of the said radiator, and a steam distributing pipe connected with the first named steam pipe and arranged horizontally in the upper portion of the radiator above the level of the water therein.

5. A heating apparatus comprising a steam supply pipe, a radiator connected with the said supply pipe and filled with water to within a short distance from the top, a steam pipe connected with the said steam supply pipe and extending through the lower portion of the said radiator, a steam distributing pipe connected with the first named steam pipe and arranged in the upper portion of

the radiator above the level of the water therein, and an overflow pipe for the water in the radiator.

6. A heating apparatus comprising a steam supply pipe, a radiator connected with the said supply pipe and filled with water to within a short distance from the top, a steam pipe connected with the said steam supply pipe and extending through the lower portion of the said radiator, a steam distributing pipe connected with the first named steam pipe and arranged in the upper portion of the radiator above the level of the water therein, and an overflow pipe connected with the radiator at the upper portion thereof to maintain the water at a uniform level in the radiator, the said overflow pipe discharging into the said steam supply pipe.

7. A heating apparatus comprising a hot water radiator having an obstructed communication between its first and second sections, an entrance fitting connected with the lower end of the said first end section, a steam supply connected with the said fitting, a steam pipe extending through the lower portion of the radiator and connected at the front end with the said fitting, a perforated distributing pipe in the upper portion of the radiator, a connecting pipe connecting the rear end of the said steam pipe with the said perforated pipe, and an overflow pipe connecting the upper end of the said first radiator section with the said fitting.

8. The combination with a hot water radiator, of a fitting secured to the lower part of the radiator and having two chambers, one opening into the radiator, a valved connection between the chambers of the fitting, and a steam pipe leading from one of the chambers of the fitting through the lower part of the radiator and discharging into the upper part of said radiator.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

ALEXANDER ZECK.
FREDERICK VAN ZECK.

Witnesses:

S. C. POE,
JED W. ROBINSON.