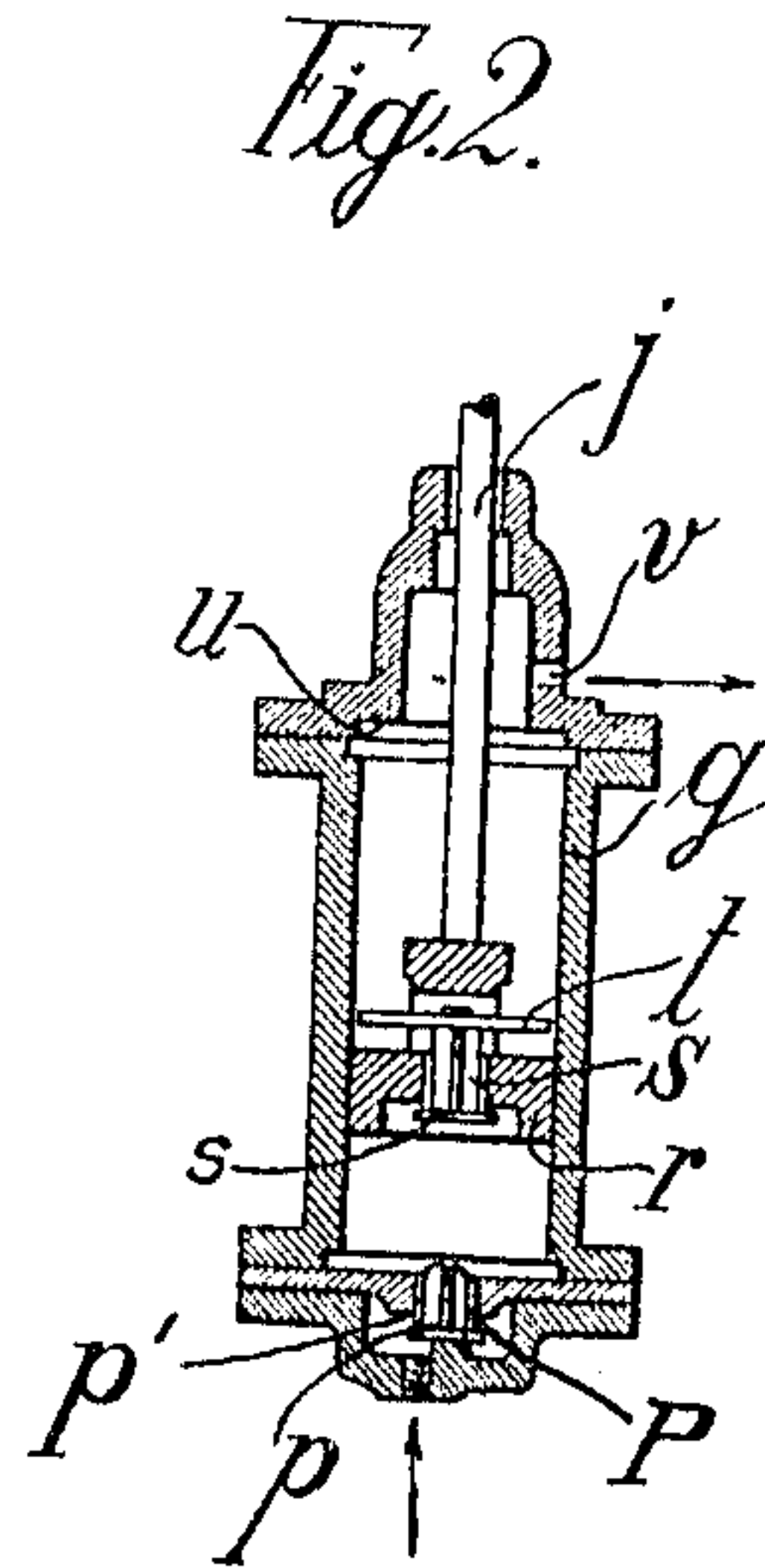
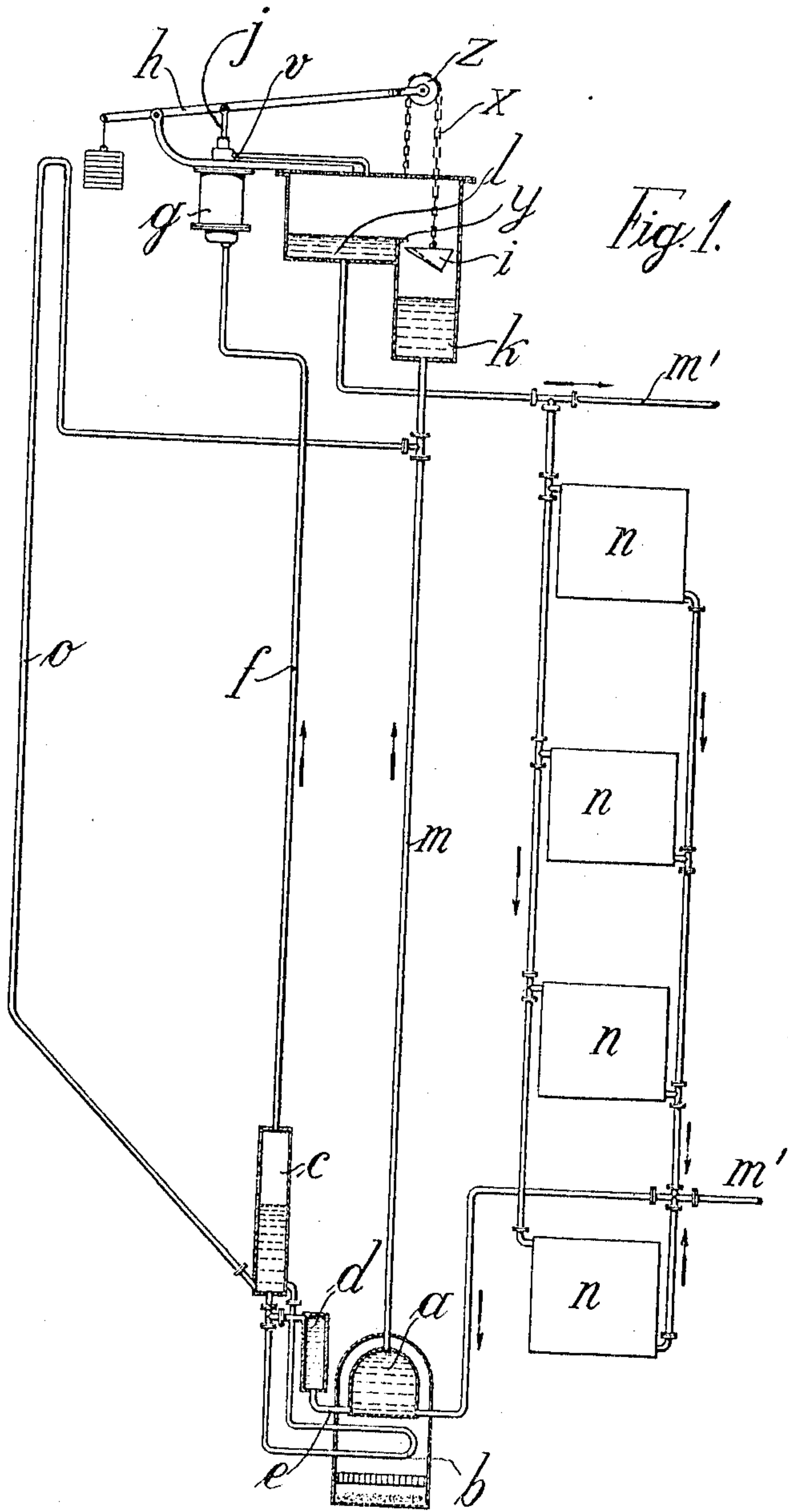


E. SEGESVÁRY.
HOT WATER HEATING SYSTEM.
APPLICATION FILED DEC. 24, 1908.

947,582.

Patented Jan. 25, 1910.



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HOT-WATER HEATING SYSTEM.

947,582.

Specification of Letters Patent. Patented Jan. 25, 1910.

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To all whom it may concern:

Be it known that I, ERNST SEGESVÁRY, engineer, citizen of Hungary, residing at Bremen, Waller-Chaussée 148, in the free town of Bremen, Germany, have invented certain new and useful Improvements in Hot-Water Heating Systems, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to hot water heating systems having a high speed of circulation. The necessary work for circulating the water at high speed is performed by a steam pump, which, like the steam generator used in this invention, is distinguished from similar contrivances by especially simple construction. The steam generator may be connected directly to the hot water system, that is to say, without interposition of an apparatus for securing the level of the water, so that the steam generated may be at a pressure approximately equal to that of the height of the column of water in the hot water heating system.

In the accompanying drawings forming part of this specification, like letters of reference denote like parts wherever they occur, and Figure 1 is a vertical elevation of the heating system, and Fig. 2 is a vertical sectional elevation of the steam cylinder.

In Fig. 1 is shown hot water boiler *a* connected by pipe *e*, having enlargement *d*, to the steam generator *b*, which is arranged as the first heating surface in said boiler, and said generator *b* is connected with steam accumulator *c*. Pipe *f*, extending from accumulator *c*, carries steam to pump *g* which operates, through its piston rod *j*, the lever *h*, suitably hinged and weighted. Said lever *h* carries, at one extremity, a pulley *Z*, over which works chain *X*. One end of said chain is suitably fastened to the framework, and attached at its other extremity to a bucket *i*. On the upward stroke of said piston rod, bucket *i* carries water from return vessel *k* until it is tripped upon projection *Y*, when the water is dumped into feed vessel *l*. Into this feed vessel also empties the exhaust steam from pump *g* through pipe *v*. Hot water pipe *m* leads from boiler *a* to return vessel *k*. The hot water in said return vessel *k* is raised by bucket *i* into feed vessel *l*, passes thence through pipe *m'* to the radiators *n*, or other heating devices, and thence returns to boiler *a*.

The pump *g*, shown in detail in Fig. 2, is

so arranged that at a certain steam pressure it automatically starts, and on the pressure being increased, its speed increases, so that it completely consumes the steam furnished by the steam generator *b*. The operation of the parts of said pump is as follows: When the steam reaches working pressure the pump starts. Steam passes through valve *p* into the cylinder, and raises piston *r* until the cone *S* of outlet valve *s* is prevented by its spring *t*, which is attached to said cone, and projection *u* from moving farther upward. When this position has been reached, and on the increased pressure of said spring *t* against said projection *u*, the cone *S* is forced downwardly by said spring and outlet valve *s* suddenly opens, allowing the steam to flow with full force through the pump, and exhaust through pipe *v* into feed vessel *l*, where it condenses. Inlet valve *p* is, however, so constructed, that it closes when the steam rushes through the pump as just described, and the cone *P* is pressed firmly against its seat *p'*. The steam within the pump *g* escapes through said outlet valve *s*, which has remained open, and the piston descends. When the piston nears the end of its downward stroke the valves *s* and *p* touch one another, the outlet valve *s* closes first, as its cone *S* hangs loosely, and the inlet valve *p* still remains closed by the pressure of the steam. Not until after the outlet valve *s* has closed is the inlet valve *p* opened by the weight of the piston *r*, and the steam raises the piston again, and the movements described are repeated as long as the steam has sufficient pressure.

In order that the pump may be able to fulfil the required condition of being able to work only after a certain working pressure has been reached, and of being able to consume considerably more steam after said pressure has been slightly exceeded, water is raised by means of a bucket *i* from return vessel *k* up to feed vessel *l*. As the quantity in the bucket *i* is always the same, so also is the pressure which the steam must possess in order to be able to raise the piston-rod operating said bucket. The number of strokes per minute is dependent on the quicker or slower feed of the pump by the steam generator. If the generation of steam increases materially the steam pressure rises, and the motion of the piston is accelerated. If the steam forces down the level of the water in the steam accumulator *c*, the pump *g* in

consequence of increased pressure will run faster, and consequently consumes more steam, and as the capacity of the generator *b* to make steam is limited, so, also, is the extent to which the water will sink. The provision of vessel *d* prevents the water from reaching a dangerously low level in the steam generator, which may be connected directly to the hot water heating system, as hereinbefore mentioned, without the necessity of a check-valve, or other similar safety-device. Steam accumulator *c* is arranged as low as possible so that the working pressure may be approximately equal to the water pressure in the boiler, and it is desirable for the steam pressure to be as high as possible because the pump dimensions can then be smaller, and the steam be turned to better account in performing work. A smaller steam generator is then sufficient, which is of advantage because it can be accommodated more readily in the hot water boiler. Steam accumulator *c* is connected at a point above its bottom through safety pipe *o* with the hot water pipe *m*, in order that the steam may escape in case the water level sinks, through extraordinary circumstances, below the point of attachment of said safety pipe *o*.

Having thus described my said invention, what I claim, and desire to secure by Letters Patent is:

1. In a hot water heating system, the combination of a steam generator, a steam accumulator connected thereto, a tank divided into a feed chamber and a return chamber, said feed chamber being located at a substantially higher elevation than said return chamber, said feed and return chambers being in communication with the water circulating system, a pump comprising a lever and a bucket, said bucket being operatively connected to said lever, a motor in communication with said steam accumulator and adapted to operate said pump, means connecting said motor with said lever, and means for tilting said bucket whereby water in said return chamber is conveyed to said feed chamber.

2. In a hot water heating system, the combination of a steam generator, a steam accumulator connected thereto, a tank divided into a feed chamber and a return chamber, said feed chamber being located at a substantially higher elevation than said return chamber, said feed and return chambers being in communication with the water circulating system, a pump comprising a lever and a bucket, a pulley mounted on the end of said lever, a chain operating over said pulley and having one end attached to said tank, said bucket being attached to the other end of said chain, a motor in communication with said steam accumulator and adapted to

operate said pump, means connecting said motor with said lever, and means to cause said bucket to be emptied whereby water in said return chamber is conveyed to said feed chamber.

3. In a hot water heating system, the combination of a steam generator, a steam accumulator connected thereto, a tank divided into a feed chamber and a return chamber, said feed chamber being located at a substantially higher elevation than said return chamber, said feed and return chambers being in communication with the water circulating system, a pump comprising a lever and a bucket, means for tilting the bucket, a pulley mounted on the end of said lever, a chain operating over said pulley and having one end attached to said tank, said bucket being attached to the other end of said chain, a motor, means connecting said motor with said lever, a pipe connecting said steam accumulator and said motor, said motor being provided with a cylinder and a piston operating therein, an inlet valve in said cylinder, an outlet valve in said piston, said outlet valve having a cone, a spring attached to said cone, a projection in said cylinder, said spring being adapted to engage said projection, whereby said outlet valve is opened, said cone being adapted to open said inlet valve, and an exhaust pipe leading from said cylinder to said tank.

4. In a hot water heating system, the combination of a steam generator, a steam accumulator connected thereto, a tank divided into a feed chamber and a return chamber, said feed chamber being located at a substantially higher elevation than said return chamber, said feed and return chambers being in communication with the water circulating system, a pump comprising a lever and a bucket, means for tilting said bucket, a pulley mounted on the end of said lever, a chain operating over said pulley and having one end attached to said tank, said bucket being attached to the other end of said chain, a motor, means connecting said motor with said lever, a pipe connecting said motor and said steam accumulator, an exhaust pipe leading from said motor to said tank, said motor being provided with a cylinder and a piston operating therein, said cylinder having an inlet valve, said piston having an outlet valve, said outlet valve being adapted to open and close alternately to said inlet valve, and means for automatically opening and closing said inlet and said outlet valves.

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

ERNST SEGESVÁRY.

Witnesses:

HANS WOLFF,
OTTO HOFMANN.