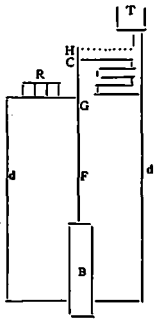


and the system, it should be with the return pipe, and not the flow; but a small connection with the flow pipe may also be taken if the tank is in an exposed position to prevent freezing. The following sketch will illustrate the principle upon which I work: T is connected to return pipe d by a 1/4" pipe, and the same size connection to flow pipe F at H, when the tank is in an exposed or cold position. The flow pipe F decreases as the branches are taken from it as follows: Say, 1 1/2" inch as far as G, and from G to H 1 1/4" inches. This must, of course be determined by the size of the radiator and boiler.



I would not have entered so fully into these elementary details did I not think it necessary to do so in replying to the article in question, as the writer of it seems altogether ignorant of them. In reference to his assertions about the large mains and returning the water to the bottom of the boiler, I will reply later on.

TOM.

HOT WATER HEATING.

Editor CANADIAN ARCHITECT AND BUILDER.

DEAR SIR,—In a recent issue of your paper I notice an article under this head, taken from the *Northwestern Architect*.

The writer of the article in question starts out with the statement that "the motive power which causes circulation in a hot water heating plant is brought into action not by the expansion of the water, but by its contraction. To make this clear," he says, "consider that the normal condition of the plant when in operation is with the hottest water in the place, and that what takes place in the natural starting of the apparatus is a changing condition. Let us then imagine the apparatus to be filled with hot water, and just enough fire to keep the temperature at the top of the boiler constant to be maintained."

In order to explain his new and somewhat crude theory as to the circulation of hot water, he shows a system of pipes and connections, which would never be fixed by any good mechanic who understands hot water heating.

He assumes that the apparatus is filled with hot water, and then notes the changes that take place.

Circulation of hot water is not caused by its contraction, as stated, but it is caused by its expansion.

Take a hot water heating apparatus with its pipes and radiators filled with cold water. Water consists of an innumerable quantity of extremely minute particles, called molecules. These particles have the property of being able to glide over, under and to or from each other almost entirely without resistance or friction.

The action that takes place in a boiler is this: When the heat is applied, the particles nearest the heated surface become expanded or swollen, and are so rendered lighter (bulk for bulk) than their colder fellows, they are therefore compelled to rise to the highest point in the boiler; finding an opening there (the flow pipe), they travel up this also, until the highest point in the circulation is reached. It will be understood that immediately the expanded particles left the heating surface, other cold particles immediately took their places; these become heated in their turn and rise, following their predecessors, and so it continues.

The circulation can be described as a stream of heated particles flowing up one pipe from the boiler, and a stream of cooler particles flowing down the other into the boiler; or it might be defined as a means of automatically transporting heated water from the lower to the upper parts of a building, and providing a down flow of cold water to the boiler, to be heated in its turn.

This circulation goes on indefinitely as long as any fire remains, and even for several hours afterwards, until an equilibrium has been established between the two columns of water.

I entirely agree with the remaining portion of the writer's article wherein he speaks of the slipshod manner in which too much of the work is done nowadays. But while this is unquestionably true, it is equally true that there is such a thing as a taste educated or trained away from the right course by the pernicious influence of depraved familiarity. As Pope expresses it:

"Vice is a monster of each frightful mien
That to be hated, needs but to be seen;
But seen too oft, familiar with her face,
We first endure, then pity, then embrace."

Yours truly,

W. B. FRANCIS.

AMERICAN GAS LIGHT ASSOCIATION MEETING IN TORONTO.

A CONVENTION of members of the American Gas Light Association will be held in this city commencing Wednesday, the 17th inst., at 10 o'clock, and closing on the evening of the 20th. The meetings will be held in Temperance Hall. The programme will include the reading of the following papers:

- "Experience in Distributing Gas Under Extremely Low Temperatures," by D. H. Geggie.
- "Observations During Many Years' Experience in the Gas Business," by Jas. R. Smedberg.
- "Construction of Gas Holders with Wrought Iron or Steel Tanks Above Ground" by Frederick Mayer.
- "The Steam Stoker and Improved Charger," by A. Q. Ross.
- "Daily Experiences and Observations of a Gas Manager," by Jas. Somerville.
- "Goals for Gas Making," by Jas. D. Perkins.
- "Enriching Gas with Naphthaline," by Arthur Kition.

For the Question Box there are the following questions:

- "What is the exact cost on wear and tear of meters where iron purification is used?"
- "What is the best way to treat men who, while working in a trench, are overcome by gas?"

We bespeak for the members of the Association a hearty welcome to Toronto, and trust that their stay amongst us may prove both pleasant and profitable. The quickest way we know of to win the affections of the people of Toronto would be to tell them how to regulate the pace of their gas meters.

SANITATION IN ENGLAND.

UNDER the new English Registration Bill, the sanitary arrangements to be certified are to be in accordance with the following requirements:

- (1.) Each water-closet shall have a flushing service which shall be distinct and separate from every water service other than a water-closet service, and no cistern shall be connected with any pipe which is in direct connection with a soil drain.
- (2.) Each soil pipe shall be ventilated, and the open end of the ventilating pipe shall be at least two feet above the highest window or other opening on the side of the building where the pipe is situated.
- (3.) The drains shall be ventilated by means of a soil-pipe, or by a separate pipe above the highest window on the side of the building where the pipe is situated.
- (4.) Water closets shall be trapped, and they shall be the only arrangements inside the building having pipes directly connected with a soil drain.
- (5.) There shall be an air chamber, with disconnecting siphon trap, which shall be easy of access, on the soil drain between the buildings and the public sewer or cess pool.

In addition to these conditions, every certificate for a building used or to be used as a hospital shall specify the cubic contents of each ward, and set forth in detail the provision made for lighting, warming and ventilating each ward as well as the entire building, and the position of the water closets, sinks and discharge pipes with reference to the wards.

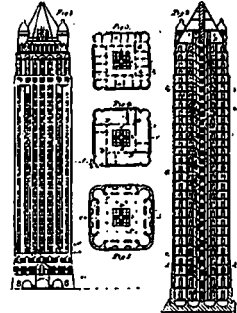
Buildings must not be used without being certified to, under a penalty of £10, and £1 for every day of such occupation, to be recovered of the owner, lessee or occupier. The certificates lapse in five years and must be renewed, as in case of any alterations made during that time.

Continued pumping at a well lowers the ground water level in the earth for a distance of from 100 to 1,000 feet, varying with geological formation and the water-supply. Hence, the greater amount of water taken from a well, the greater distance is the water drawn through the earth and the greater the chance for pollution. —*Wisconsin Water Report.*

In a recent lecture to the Sanitary institution of Great Britain, Dr B. W. Richardson considered the power the human body has been proven to possess of storing up labor to a prolonged period. He stated the conditions favoring such a storage in the following order: Hereditary qualifications, the virtue of continence, maintenance of bodily functions, perfect temperance and purity from implanted or acquired diseases. Temperament has its influence, the bilious and sanguine temperaments being best for long life and the best for long life and the nervous and lymphatic the worst. What he termed all-round temperance is the avoidance of everything that stimulates the heart beyond its natural activity, such stimulation being an unnatural tax that reduces the storage of life.

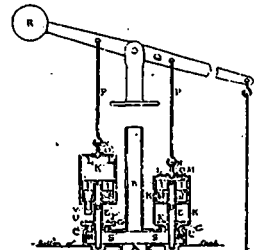


Iron Building Construction.
No. 59,533. Leroy S. Buffington, Minneapolis, Minn., U. S. Pat. dated 23rd July, 1888.



Claim.—1st. A building having a continuous skeleton of metal, n covering or veneer, and a non-conducting packing between the skeleton and veneer, for the purpose set forth. 2nd. In a building frame, a continuous diminishing laminated post formed of layers of metal plates, secured together and arranged to break joints and decreasing in number towards the top. 3rd. In iron building construction, the combination, with a framing composed of continuous laminated posts suitably connected by braces and girts of tie-beams secured thereto and to one another, substantially as set forth. 4th. In iron building construction the combination, with a framing composed of continuous laminated framing posts, suitably connected by braces of an exterior covering of non-conducting material, for the purpose set forth. 5th. In iron building construction, the combination, with a framing composed of laminated posts suitably connected by braces and girts, of an exterior covering of non-conducting material, and a stone or other veneering exterior thereto, and supported on shelves secured to the framing, substantially as set forth. 6th. In a frame for a building of two or more stories, a series of tapering posts extending from base to top of the frame, and formed of metal plates in layers, secured with their flat slides together, and arranged to break joints and braces and girts, for connecting and securing the posts, substantially as set forth. 7th. In a building frame, a series of continuous framing posts, composed of metal plates secured with their flat slides together and breaking joints, in combination with girts and tie-beams secured thereto at each floor, substantially as set forth. 8th. The combination, with the laminated plates, of the continuous girts secured thereto, and the tie-beams also secured thereto, and to one another, substantially as set forth. 9th. The combination, with the framing posts and braces, of the wire-lath, or other suitable coverings, the non-conducting packing and the veneering the purpose set forth. 10th. The combination, with the building supported by the shelves, and anchor rods, substantially as set forth and frame composed of the laminated posts, girts, tie-beams and pillars arranged to form a central well, of the elevator shafts, and stairs arranged therein, substantially as set forth. 11th. The combination, with the building frame constructed with a central well, of elevator shafts arranged in the corners of such well, and flights of stairs rising from opposite sides of such well to a central landing, and other flights rising from said landing to the other sides of such well, substantially as set forth. 12th. The combination, with the posts and girts forming outer frame, of the beams having their outer ends resting on the girts and secured to the posts, and their inner ends secured to beams that are transverse to them, the pillars therefor, and the diagonal tie-rods, substantially as set forth. 13th. The combination, with the posts and girts, of the angle-plates connecting them, and forming supports for the veneer shelves. 14th. The combination, with the posts and their braces, of the plates forming the shelf supports, the shelves, the veneer and the anchor rods, substantially as set forth.

Fresh Patents for Water Closets.
No. 38,790. Thomas Campbell, St. John. N. B., dated 3rd April, 1888.



Claim.—1st. The combination of the cylinder K and the piston I, substantially as and for the purpose hereinbefore set forth. 2nd. The combination, with the two cylinders K, K', and the