

IMPROVED FURNACE FOR BUILDINGS.

The improved heating furnace herewith illustrated serves not only as a means of warming the interiors of buildings, but also as an efficient ventilating apparatus. Its construction is such as to utilize the heat of the fire to the fullest extent, and also to distribute the same uniformly at every point to which the flues may be conducted.

Fig. 1 is a longitudinal and Fig. 2 a transverse section. A is the fire pot, the heated air and gases from which pass up and around the tubes, B, thence down and under a partition, C, and, finally, emerge at the chimney, D. By this means the cold air, which enters the tubes, B, in the direction of the arrows, from the chamber, E, is subjected twice to the hot current; and thus becoming warmed, is led away by such tubes, a prolongation of one of which is shown at F. As there are fourteen of these flues, it will be noted, that if desired, the entire number may be utilized, each as a separate conduit to a single register. Cold air also enters below and outside the fire pot, into spaces, G, Fig. 2, and thence travels to the rear, where it passes into a heating chamber, H, Fig. 2. This reservoir may, by a suitable partition, indicated by the dotted line shown at the rear of the fire pot in Fig. 1, be divided into two compartments, from each of which a separate flue may be led. I, in Fig. 2, shows a section of still another heating chamber, formed by the space between the shell surrounding the flues and the exterior casing. Air enters this from below by the conduits, J, becomes warmed, and exits by the flue, K; or, when desired, this chamber may also be divided by a longitudinal partition, represented in section in Fig. 2, when the hot air will then be led away by the two pipes, shown in dotted lines. It will be here observed that eighteen separate flues are thus provided, each totally independent of the other, and all supplying pure heated air without any admixture of disagreeable gases. The current drawn directly from the outer atmosphere never comes in contact with the fire; but on the contrary, is securely confined in tight flues or chambers, where it is heated and at once supplied to the desired localities. It will also be observed that a uniform quantity is thus, it is claimed, insured, as, each flue or chamber forming a heater by itself, it becomes impossible for a strong current to escape in the lower part of the house while little or no

cularly well suited for hospitals and public buildings, where foul and deleterious gases are freely generated, and its effect is such as to keep the wards or halls perfectly supplied with pure air. Besides, the device aids in quickly heating rooms, as, its openings being placed low down, the cold air near the floor is drawn out, while the hot current from the heating register is continually pouring in.

The furnace, it is claimed, is well adapted to the heating of extension rooms; and by a nearly horizontal pipe, fifty feet long

from cracks. The mass is not hygroscopic, a property making it all the more suitable for pipes in the open air. The cost of the covering per foot of 8 inch pipe is 12 cents.

Concrete Foundations.

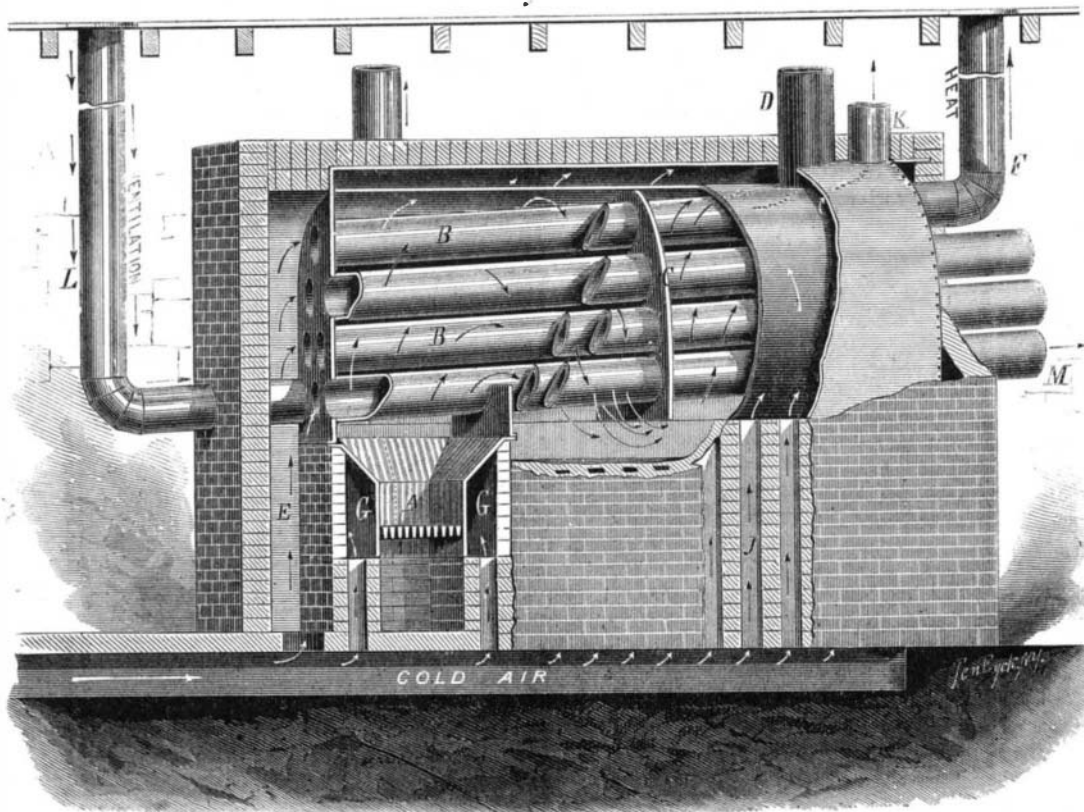
The Delaware and Hudson Canal Company are constructing an immense building on the corner of Church and Cortlandt streets, in this city, for their own use and as a coal exchange. The edifice is to be of brick and stone, nine stories high. Mr. R. M. Hunt is the architect. At the present time the foundations are being laid in concrete, under the superintendence of Mr. David Campbell. The mortar used is made of 1 barrel of Portland cement, 3 barrels sand, and 28½ gallons water. These ingredients are shoveled into an inclined tube, which works a worm blade that incorporates them together and delivers them in a thoroughly plastic mass. Ten cubic feet of this mortar, fifteen of broken stone, and twelve and a half of gravel, are then placed in a box of boiler iron, four feet square, which is hung on bearings attached to diagonally opposite corners and rotated by gearing from a stationary engine. Eight revolutions completes the mixing, when the concrete is removed and transported to the point where it is to be laid. Beds of the mass, six inches thick, are placed, each being rammed down by hand before another layer is applied. The lower bed will, in all, be two feet thick; and above this, to support the walls, the concrete will be packed in bevel form to a height, in all, of six feet seven inches. The piers are of stone, resting on a layer of concrete eleven feet square. The cost of the concrete, as compared with masonry, is estimated to be some thirty per cent cheaper.

LLOYD'S CAR COUPLING.

We present herewith an engraving of a car coupling which presents several points of novelty, while, at the same time it is of very simple design. It is intended to be automatic in action, and therefore to possess the various qualities which we have frequently alluded to in reference to inventions of this description, and which we need not here recapitulate.

A A are the drawbars, in mortises in the ends of each of which are jointed the coupling bars, B. A part of one drawbar is represented as broken away in order to show this connection, the object of which is to allow the bars, B, to be turned upward as much as is necessary, while it prevents them from falling much below a horizontal position. Upon the upper and lower sides of each of the bars, B, are formed shoulders, which are made V shaped and also dovetailed. This is more clearly shown at C C. The V shape prevents the shoulders from slipping apart when coupled, as represented, when the train swings around curves, and the dovetail stops the bars from jarring apart when the cars are run together or when in motion. The general form of the

Fig. 1



FURNACE FOR HEATING BUILDINGS.

and ten inches in diameter, with only ten inches rise, an adequate amount of warm air is easily delivered. Half of the flues may be led vertically and half in a horizontal direction. The heating surface aggregates four hundred square feet, all of which, as we have already pointed out, comes in direct contact with the hot gases. The construction of the apparatus generally is said to be strong and durable, the metal parts being of wrought iron. The flues are eight inches each in diameter. The grate is in two sections, and is very easily controlled, while the air supply, entering through a single pipe, may be regulated at pleasure. The furnace, we are informed, has been in use for the past year, giving in every respect satisfactory results. For further information relative to supplying the apparatus, its cost, etc., address Mr. W. N. Abbott, 40 Cortlandt street, New York city.

To Clear Photo Baths.

When photo printing baths become discolored, various agents are employed in order to decolorize them. Among the best of these is the substance known as China clay or kaolin, which consists almost entirely of silicate of alumina. At the present period, paper is adulterated to a large extent by the admixture of clay, and hence, when a silver bath has become discolored, owing to the presence of organic matter, an effectual remedy is always at hand; for, in the absence of kaolin, all that is necessary is to burn any good, heavy bodied paper and shake up the ashes with the silver. On filtration it will be found to have become pure and bright.

This little bit of useful knowledge may prove beneficial to those who live at a considerable distance from a photographic chemist. Of course we all know, says *The British Journal of Photography*, that there are many agents by which the bath may be decolorized, among which may be named animal charcoal, camphor, citric acid, chloride of sodium, and others. Kaolin, however, is more generally adopted than any other; and many of our readers will be pleased at being made acquainted with the foregoing very simple method of obtaining a supply with no greater amount of trouble than that of igniting a piece of any heavy bodied paper.

Covering for Steam Pipes.

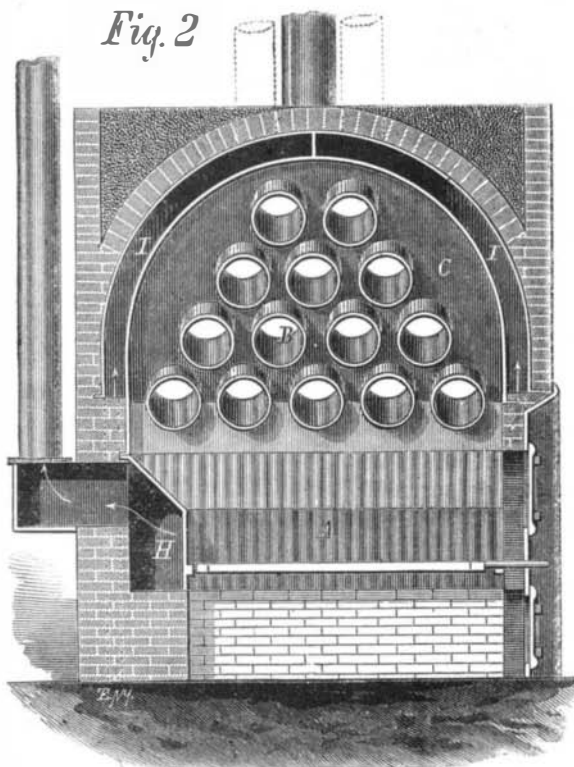
A new method of covering steam pipes is applied in the Saarbrucken district, Germany. A coat of thin loam wash is first given, to increase the adhesion of the mass. The composition consists of equal parts of loam or clay, free from sand and brick dust, with an addition of cow hair. This is well mixed up and put round the pipe in a hot state. For better securing this coating, pieces of board 10 inches long are laid along the whole length of the pipes and fastened by thin iron wire. After applying the loam wash again to the dried mass till all the cracks have disappeared, the pipes receive another coating of the mass, until they feel quite cool, which will be attained after the mass has been laid on to the thickness of from 5 to 6 inches. A coat of linseed oil and cement is finally given. This method answers at present all requirements, the covering being perfectly airtight and free

drawbars, adapting them to slide upon each other, is already shown in the engraving and needs no description. The chain leads up to the platform or top of the car, and serves to lift the bar which is uppermost, and thus effect the uncoupling. The holes shown in the ends of the bars are for connecting them by a pin with the ordinary link coupler. It is claimed that, by this means, cars of the same or of different heights may be connected or run together with facility.

Patented October 21, 1873, through the Scientific American America Patent Agency, by Mr. R. Lloyd, of Lake Shore Railroad Bridge, Cleveland, Ohio, who may be addressed for further information.

It is announced that Mr. Bennett, of the *Herald*, is now organizing a new arctic expedition, to be sent in search of the North Pole.

Fig. 2



heat reaches the upper stories, a frequent trouble in furnaces the parts of which are mutually dependent.

All the tubes, B, need not, in some cases, be used for heating purposes, in which event two or three may be advantageously utilized for ventilating the entire building. It is proposed to place registers close to the floor in the lower stories and to lead therefrom flues, one of which is shown at L, Fig. 1, connecting with the heater tubes used. The other ends of the latter, M, may connect with a shaft which passes up through the edifice, emerging at the roof. The hot air in the tubes will generate an up current in this shaft which, receiving its supply of air from the register and flue, L, will thereby draw from the lower rooms all the foul and heavy gases. The upper apartments, it is stated, need only be connected directly with the shaft, as the same may be arranged to pass in proximity to all. This furnace seems to be parti-

