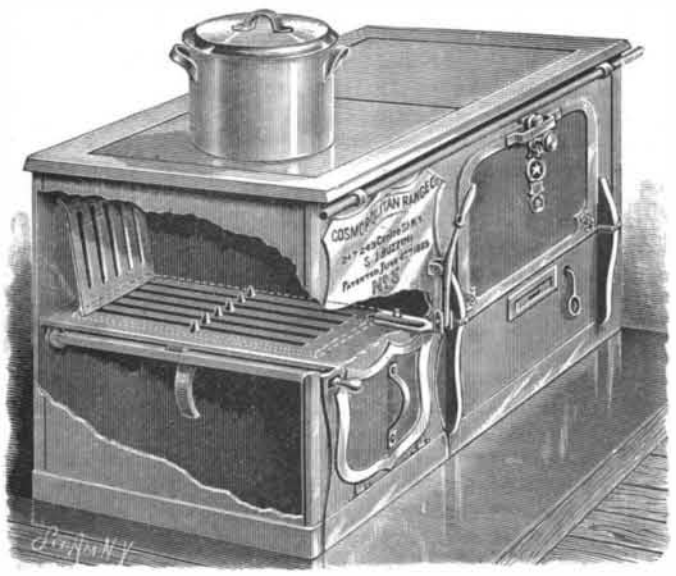
A GRATE FOR FURNACES, RANGES, ETC.

The illustration represents a grate, patented by Mr. Salvatore J. Buzzini, designed to be reciprocated horizontally to free the grate and fuel from the accumulation of ashes, the grate being made to swing down readily at one side, to dump the contents of the fire box into the ash pan when desired. The grate preferably lies below a bed plate of the fire box, and has on its upper surface a number of teeth-like projections, which, as the grate is reciprocated, serve to break up the bed of fuel resting on it. The bed plate of the fire



BUZZINI'S RANGE AND STOVE GRATE.

chamber also has at its ends downward projections to enter between the grate bars and prevent fuel being carried beneath the bed plate by the reciprocating grate, to jam or interfere with the free motion of the grate, which is reciprocated by means of a lever fulcrumed on the front of the range and connected below with the grate. At one margin the grate is hung upon a bar journaled at its ends in the main structure, the rotating or turning of this bar similarly moving the grate, upon the opposite side of which is arranged another bar, on the top of which rests a toe from the other side of the grate. The grate is dumped by swinging this bar laterally from under the supporting toe of the grate.

For further information relative to this invention address the Cosmopolitan Range Co., No. 247 Centre Street, New York City.

AN IMPROVED CASING FOR STEAM PIPES.

The Wyckoff patent steam pipe casing shown in the accompanying illustrations is made of double thicknesses of eight thoroughly seasoned one inch white pine staves to each section. The staves of the inner course are jointed together and wound with

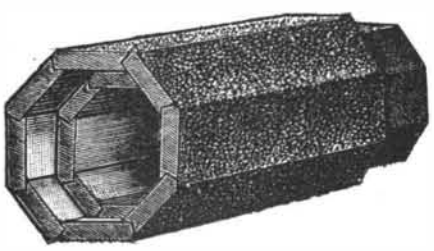


Fig. 1.

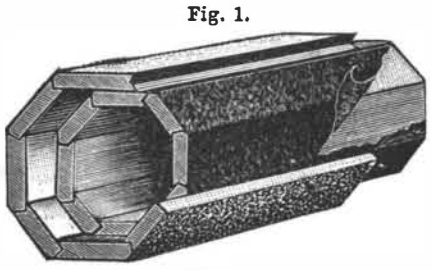


Fig. 2.

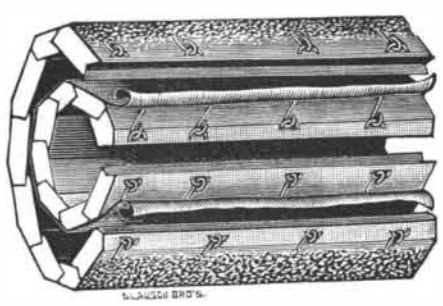


Fig. 3.

THE WYCKOFF STEAM PIPE CASING.

galvanized steel wire, then wrapped with two thicknesses of heavy corrugated paper, after which another casing of staves is put on the outside and wound with galvanized steel wire. The outer casing is then coated with asphaltum. Fig. 1 represents a section of such casing complete, there being two staves removed from the casing as shown in Fig. 2, to disclose the lining between the inner and outer courses. To cut the casing lengthwise, where this is necessary in putting it around pipes in position, the asphalt coating is first removed, when the binding wires are cut by a file or otherwise, and their ends fastened down by a common blind staple. This allows the outside casing to be laid open, as shown in Fig. 3, a similar process being followed in opening the inner casing. Different sections of this casing are conveniently joined by cutting off, at the ends, a small portion of the inner and outer casings, whereby a lap joint is readily formed, and in calculating the sizes of casing required; proper allowance should be made for the pipe couplings.

It is said that in comparative tests of this casing with one made of solid wood, both round and square, in the same line of pipe, the sectional casing has proved greatly superior. The solid wood casing rapidly became checked, and so heated throughout as to cause material loss of heat, while the sectional casing, owing to the interposed non-conducting layers, remained perfectly cool on the outside.

This improved steam pipe casing is made by Messrs. A. Wyckoff & Son, Elmira, N. Y.

Progress of the Great Tunnel under the Hudson River.

In view of the efforts now being made to span the North River with an unsightly cantilever bridge, it is pleasant to record the progress making by the silent workers *under* that noble stream, where, burdened with a pressure of several atmospheres, they burrow their way surely to make what will be in no sense a disfiguring connection between New York and New Jersey. In a total distance of 5,400 feet, there is now complete from the Jersey shore 3,340 feet, with a progress of 10 feet per day, working with three shifts of men in 24 hours.

The last air lock is now 1,200 feet from the heading, and a new one will be placed nearer to the work. This lock will be longer, having a length sufficient to take in three loaded cars instead of the two at present. Three tracks have been substituted for two, to remove the core. Twin hydraulic elevators have also been put up for more rapid removal of loaded cars, and negotiations are pending to substitute electric transit for the cars in lieu of the patient mule. The work is now within about 800 feet of the rock formation.

What is the Temperature of Ice?

In our number for February 14 last we published the following, except that, in the last paragraph but one, an error was made which we now correct.

Authorities differ widely upon this question. A careful investigator recently made some experiments looking to a solution of this, and has sent us the following:

January 23. Atmospheric temperature + 40° F.

(1) In a block of inferior ice, full of bubbles and fissures, an auger hole was bored 6 inches deep. In the cavity thus formed a chemical thermometer was dropped, the borings being used to pack the orifice around the instrument. When fifteen minutes had elapsed, the temperature within the ice was found by aid of a lens to be + 30·5°.

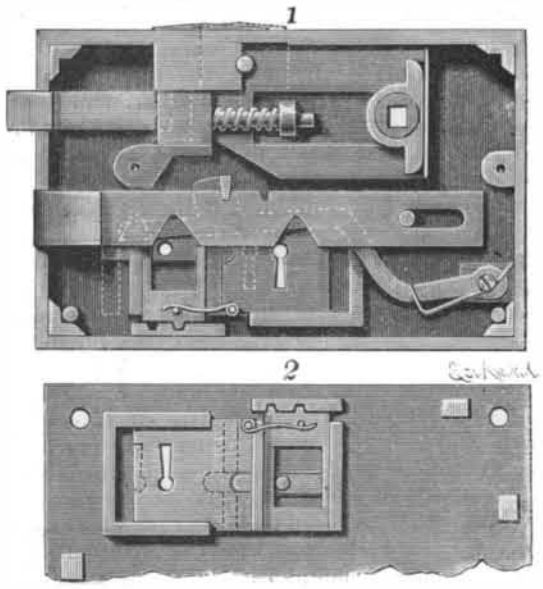
(2) Equal parts of ice and salt being mixed in a wooden pail, they formed a solution at the bottom, in which the thermometer read —10°. In the center of the pail a quart tin cup was placed, nearly full of filtered water. The cup was supported above the bottom of the pail, and in it was suspended a second chemical thermometer, while the water was allowed to freeze into a solid mass around it.

In thirty minutes the water in the cup was converted into ice. At the end of an hour and a half the relative temperatures indicated by the two thermometers had not varied, and now read, respectively: That in the freezing mixture, —5°; that in the ice in cup, 0°. These readings were taken in the office, where the temperature was 74°.

Both thermometers were carefully compared with a valuable standard instrument and with each other, before and after the experiments, and their readings were corrected for variation at different points.

AN IMPROVED LOCK.

The illustration represents a lock so constructed that it is impossible to unlock it from one side when it has been locked on the other side. Fig. 1 is a face view of the lock with the cover plate removed, Fig. 2 being an inside face view of a portion of the cover plate. The locking bolt is supported on its inner end by a pin, sliding in a slot in the bolt, on the under side of which are V-shaped notches, adapted to pass the bit of the key, the outside and inside key holes being arranged a short distance apart, in line with the notches. The bit of the key also operates on the under side of a lever, shown partially in dotted lines, and moving in a vertical slot in the locking bolt, the lever being normally pressed down by a spring. A vertically arranged plate in the casing, forming a rectangular key aperture, is fitted to slide in guideways in a longitudinally sliding plate having a key hole connected with the back of the casing, the vertical plate having a lug adapted to engage notches in a bar in the lower side of the casing. A similar arrangement is provided on the inside of the cover plate, but the positions of the movable plates are such that when the bolt is thrown out, the key aperture of one of the plates registers with its proper outside key hole, and that of the other is disconnected from its key hole, and *vice versa*. The latch, shown in the upper part of the lock casing, has a notched shank and a spring-pressed sliding head, the head being recessed to receive the inner notched



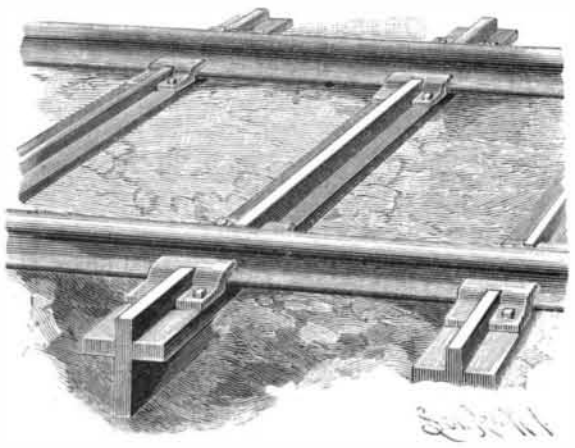
ROGERS' LOCK.

end of the shank of the latch, which may be conveniently removed and replaced at any time to turn it over when it is desired to reverse the latch.

This lock has been patented by Mr. G. T. Rogers, No. 107 Adams Street, Jefferson City, Mo.

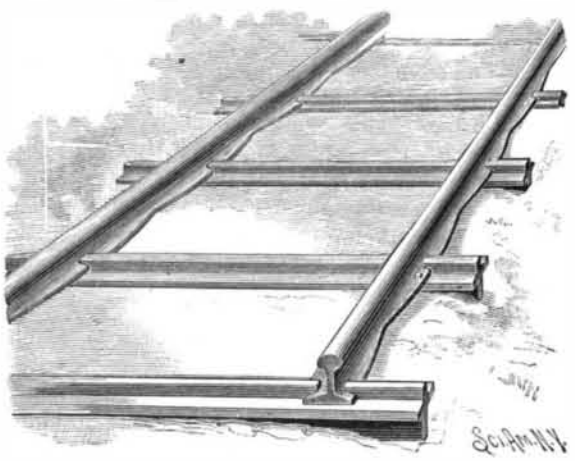
A NEW RAILROAD TIE, RAIL FASTENER, AND RAIL.

The accompanying illustrations represent improvements recently patented by Mr. Michael A. Glynn, of Havana, Cuba, designed to facilitate the laying of railroad rails, and locking them firmly in position, the tie being also readily placed in position and having some degree of elasticity, while it is intended to be inexpensive to manufacture. The tie is cross shaped in section, and the longitudinal rib above its broad portion has a slot near each end to receive a chair in which the rail is seated. The chairs have inwardly extending lugs which fit closely upon the flanges of the rails, and a broad base which rests upon the broad portion of the sleepers. The slots in the ribs of the sleepers are shaped to correspond with the



GLYNN'S RAILROAD TIE AND RAIL FASTENERS.

shape of the chairs, which are slipped into the slots from the side, thus preventing any vertical or lateral movement. A sufficient number of spikes are used in the chairs to prevent creeping of the rails. A modified form of chair is also provided, made in two parts, one to be placed on each side of the rail. The improved



GLYNN'S RAILROAD RAIL.