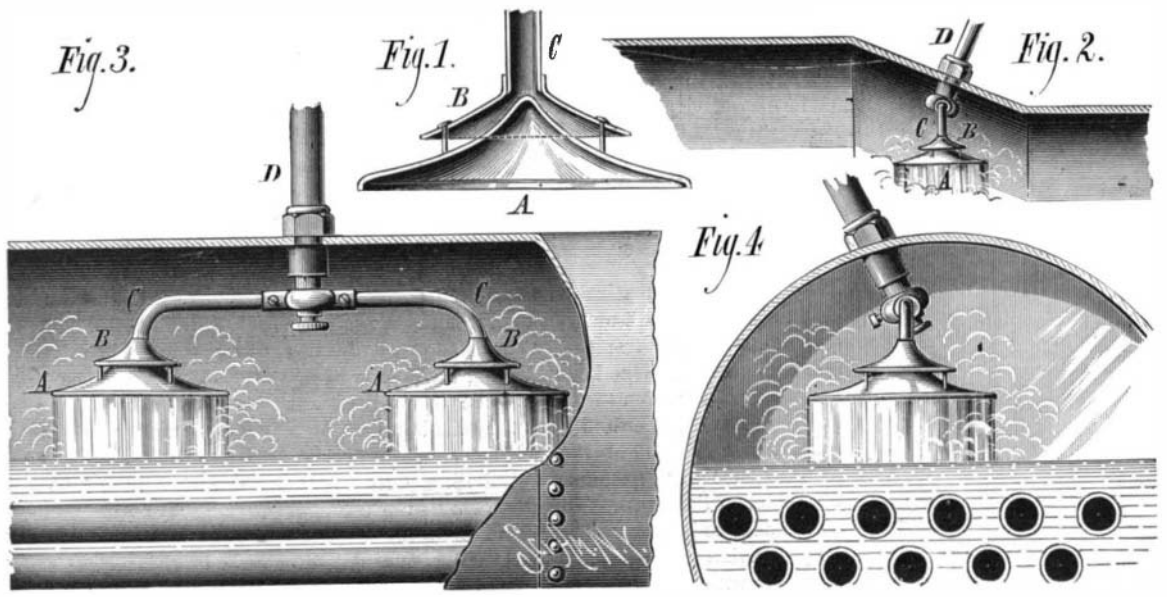
A USEFUL STEAM BOILER APPLIANCE.

Aside from defects in the construction of boilers, undoubtedly the greatest source of expense and danger is the accumulation of sediment and incrustation on the heating surfaces; and while special preparations in some instances prevent the accumulation of scale, the use of such preparations is, to say the least, inconvenient, and, as a rule, they make the water in a boiler to all appearance dirtier than it could be made by natural causes.

Our engraving illustrates a device which obviates the difficulties arising from the use of bad water, by precipitating the mineral salts and other impurities in the feed water before it joins the body of the water in the boiler. This important result is secured by allowing the water to enter the boiler through the steam space in a thin sheet or spray, which is instantly heated to the boiling point, precipitating the impurities before it reaches the surface of the water contained by the boiler. The precipitate goes immediately to the bottom of the boiler, whence it is removed by blowing out two or three times daily. This is a new departure in steam engineering, and it is looked upon with some suspicion on the part of steam engineers who have never investigated the subject, but actual experiment has proved that no more loss is experienced in introducing feed water in this way than any other, while the advantages attending this method are very great.



MOREHOUSE'S ANTI-INCRUSTATOR.

The device by which water is introduced into the boiler is clearly represented in the engraving, Fig. 1 representing the peculiar nozzle for spreading the water injected into the boiler; Fig. 2 shows the application of the device to a locomotive boiler, and Figs. 3 and 4 are respectively longitudinal and transverse sections of a cylindrical boiler provided with the anti-incrustator.

The water distributer consists of a conical plate, A, suspended beneath the flaring end, B, of the pipe, C, by three bolts, which may be adjusted so as to vary the distance between the plate, A, and the flaring pipe end, B, and thus regulate the amount of water entering the boiler. The inventor prefers to arrange two water distributers as shown in Fig. 3, the two pipes, C, being connected with a T whose shank projects through the boiler shell and connects with the feed pipe, D.

With this device, either hot or cold feed water may be used. Among the many important advantages arising from the use of this improvement, the most prominent are, the entire prevention of scale, the absence of foaming or priming, and the obviation of that class of injuries to boilers resulting from the contact of cool feed water with hot iron surfaces.

Further information concerning this useful invention may be obtained by addressing the patentee, Mr. Wm. Morehouse, 147 Mariner street, Buffalo, N. Y.

NEW CEILING AND WALL.

The ordinary method of lathing and plastering the ceilings and interior walls of buildings consists in nailing wooden laths to the joists or studs, then applying two separate coats of mortar; and, lastly, a white coat or "finish," composed of slaked lime and plaster of Paris, the latter being put in to give strength and solidity to the work. This method is objectionable on account of the time required for each coat to become dry before the succeeding one can be applied, and the mortar is liable to crack and become detached; and the inflammable character of the lath is another objection to this method.

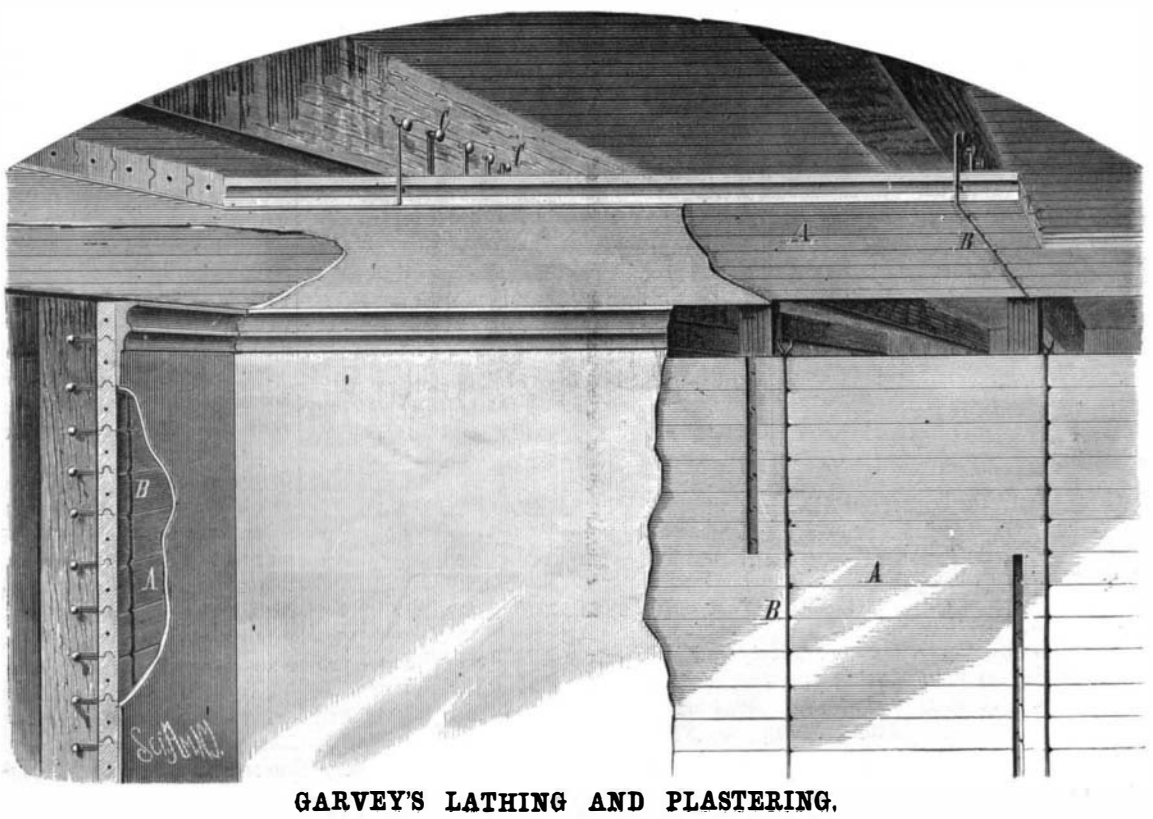
Our engraving shows a novel lath recently patented by Mr. Walter J. Garvey, of 407 Chestnut street, St. Louis, Mo. This lath consists of a bar of plaster of Paris cast in a mould around a stiffening and strengthening wire. The edges are tongued and grooved so that the entire series of laths may be locked together. These laths are made in lengths of 12, 16, 32, or 48 inches, as may be required. In width they may vary between 1½ and 2 inches.

Referring to the engraving, the laths, A, are secured in place by wires, B, looped over nails driven into the sides of the joists or studs. The contiguous ends of the laths are separated a short distance, and the intervening space is filled with plaster, making a smooth joint and at the same time fastening the laths by enveloping the wire core which is allowed to project beyond the end of the lath. As soon as the laths have been thus applied and fastened the white plaster coat or finish may be at once put on, when the work is complete.

This style of wall and ceiling may be made much quicker than by the ordinary methods, thereby saving three fourths of the time required to finish the walls of a house, and when done it is harder and more durable than ordinary lath and plaster walls and ceilings, besides being entirely fireproof.

The inventor informs us that this wall will not crack, as its peculiar construction admits of considerable change in the frame of a building without affecting the walls.

The lath may be manufactured where it is used, or it may be readily shipped to any point where needed.



GARVEY'S LATHING AND PLASTERING.

ENGINEERING INVENTIONS.

Messrs. Gustav Ripp and John Mueller, of Jersey City, N. J., have patented a new and improved automatic apparatus which will shut off the motive element from the engine in case the belts or machinery break or become disordered.

Mr. John H. Gable, of Shamokin, Pa., has patented an improved pipe cleaner for cleaning deposits of sediment from the inner surfaces of the column or pump pipes of mine shafts and slopes, and for cleaning out other pipes. The invention consists of a pipe cleaner formed of a cylinder or frame provided with cutters to loosen the sediment, wheels to crush and pulverize the sediment, and a brush to sweep the inner surface of the pipe.

Mr. Orlo H. Drinkwater, of Cedar Point, Kan., has invented a car coupling which consists mainly of a draw bar having a hook or shoulder and a link or clasp, which is pivoted and adapted to receive and lock with the shoulder or hook of a draw bar attached to the opposite car. The links or hinged clasps are held engaged with the respective draw bars by means of a spring or other suitable devices, and may be opened to allow uncoupling by means of rods, levers, or other means. The hinged loop or clasp is held open by a spring catch until the latter is acted on automatically, thus causing it to release the clasp.

IMPROVED MILL PICK.

The annexed engraving represents an improved mill pick patented by Mr. Edgar F. Lemoine, of Emmerton, Va. The novel feature of this pick is the employment of a thin blade tempered throughout its entire length, and capable of being entirely used up without forging or retempering. The invention consists in a pair of serrated clamping jaws, which receive the thin picking blades, the latter being provided on their inner ends with two or three ratchet teeth for engaging the serrations of the clamping jaws. The outer jaw is perforated with a screw threaded hole for receiving the threaded portion of the handle; the inner jaw has a plain hole through it fitting the plain portion of the handle. By turning the handle, by means of a lever or wrench, the jaws are brought firmly down upon the picking blades, which are as efficient as if they were an integral part of the jaws, having the advantage of being adjustable as they become worn.

The inventor proposes, in some instances, to put ratchet teeth only on one side of the blade, when two blades may be placed in each jaw.

The jaws may be conveniently used to hold the blades while grinding. This improved pick seems to possess many advantages over the ordinary form, it is easily kept in order, and is much cheaper, if the expense and trouble of sharpening and retempering are considered.

LEMOINE'S MILL PICK.

Railways and Population.

A table constructed by Prof. Stürmer, of Bromberg, shows the length of railway in several of the chief countries of the world and its proportion to the population. In Europe, on the average, there are 4·9 kilometers of railway to every 10,000 inhabitants. Greece has the least proportion to the population, having only 0·08 kilometer to every 10,000 of the population. Next comes Turkey, with 1·6; Portugal, 2·3, Roumania, 2·4; Russia, 2·8; Italy, 2·9; and so upward in the scale, France having 6·3; Germany, 7·1; Great Britain, 8·1; and Sweden heading the list with 10·8, though its total mileage is not a fifth of that of Great Britain. In Asia it appears that only 0·16 kilometer is averaged to every 10,000 inhabitants; and in Africa the proportion is only 0·17. In the United States the proportion is heavy—32·9 to every 10,000 of the people; while the whole of America has the average of 17·2, and in Australia the proportion is already 10·6. The thinly-peopled countries, the *Pall Mall Gazette* remarks, necessarily come to the front in this instance; but the table is of some interest as showing the effect of a large or small length of line in effecting