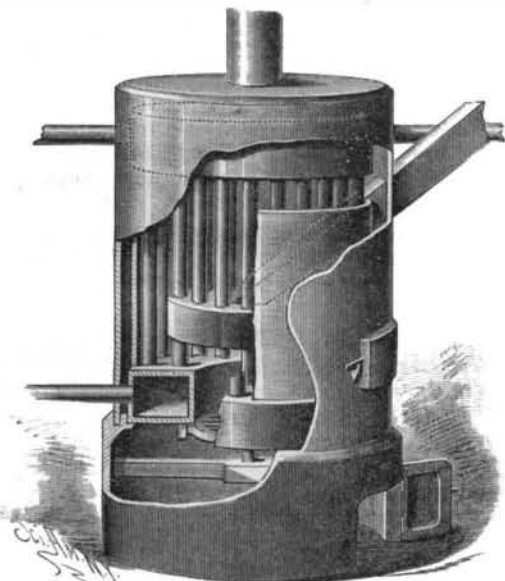


IMPROVED STEAM HEATER.

Resting upon the base is a sheet iron casing, to the center of the top of which the smoke pipe is connected. Upon the inner part of the top of the base rests an annular water chamber, beneath the central aperture of which the grate is supported. With the outer part of the top of this chamber are connected tubes that lead to a circular water chamber, so placed a little below the top of the casing that the products of combustion will have a free passage around the



BRONSON'S IMPROVED STEAM HEATER.

sides and at the top of the chamber. A third chamber is connected by pipes with both the upper and lower ones. A chute connected with a central aperture in the middle chamber passes through an opening in the upper part of the casing, and serves as a magazine for coal, making the heater a self-feeder. The circles of pipes are interrupted for the passage of the chute and to give access to the fire chamber. A feed pipe is connected with the lower chamber, and from the upper one leads one or more pipes, through which steam is conducted to the rooms to be heated. Within the casing, close to the outer circle of tubes, is a second one, whose lower edge rests upon the lower water chamber. The upper edge does not extend quite to the upper chamber, a space being left for the passage of the products of combustion, which pass through the aperture in the middle chamber, between the tubes, and thence around the upper chamber, heating the water and generating steam very rapidly. The inner casing keeps the products of combustion close to the pipes, and prevents waste of heat by radiation.

This invention has been patented by Mr. William C. Bronson, of Saratoga Springs, N. Y.

LEVESQUE'S DIPLOGRAPH.

Every one knows how easy it is to write double with two pens fixed to the end of the same handle; but, in order to make a useful application of the process, it is necessary to find some means of writing upon two different sheets of paper at the same time. The problem has been solved by Mr. Levesque, through a desk which he has just constructed, and which he calls a "diplograph."

The apparatus consists of a board which, through two lateral rabbets, slides in a frame inclined toward the writer. A tablet, placed transversely at a few fractions of an inch above the board, is fixed by its two ends upon two small brackets fastened to the sides of the frame.

The lower sheet of paper is laid flat upon the board, and is held by the pressure of a strip of steel. The upper sheet is grasped at its upper edge by a long clip, whose extremities are fixed at will to the head of two small supports which are themselves fixed at the height of the board.

When a page of writing is begun (the board having been brought to the lower part of its travel), that part of the upper sheet that is to receive the first line rests upon the tablet. The lower portion of this sheet is folded back, and is pressed against the bottom of the tablet by a strip of wood covered with velvet. One of the two pens writes upon that part of the upper sheet that rests upon the tablet,

while the other traces the same characters upon the corresponding part of the lower sheet.

After each line has been written, the tablet is shoved forward. This carries along the two sheets, the upper one of which, being thus drawn upward, and held below by the paper press, remains tightly stretched upon the tablet, while at the same time moving the same distance upward that the lower sheet does. It is thus possible to write the following line upon both sheets at once.

A sheet of stiff cardboard is interposed between the two sheets of paper, so as to prevent the upper one from confusing the writing traced upon the lower.

The board is moved by means of a cord running over a pulley which is placed beneath the frame, and the axle of which is provided at one extremity with a wheel that the writer revolves with his left hand, without having to pay any attention to it. The forward motion is, in fact, regulated line by line by a gearing that may be set at will in such a way as to have differently spaced lines.

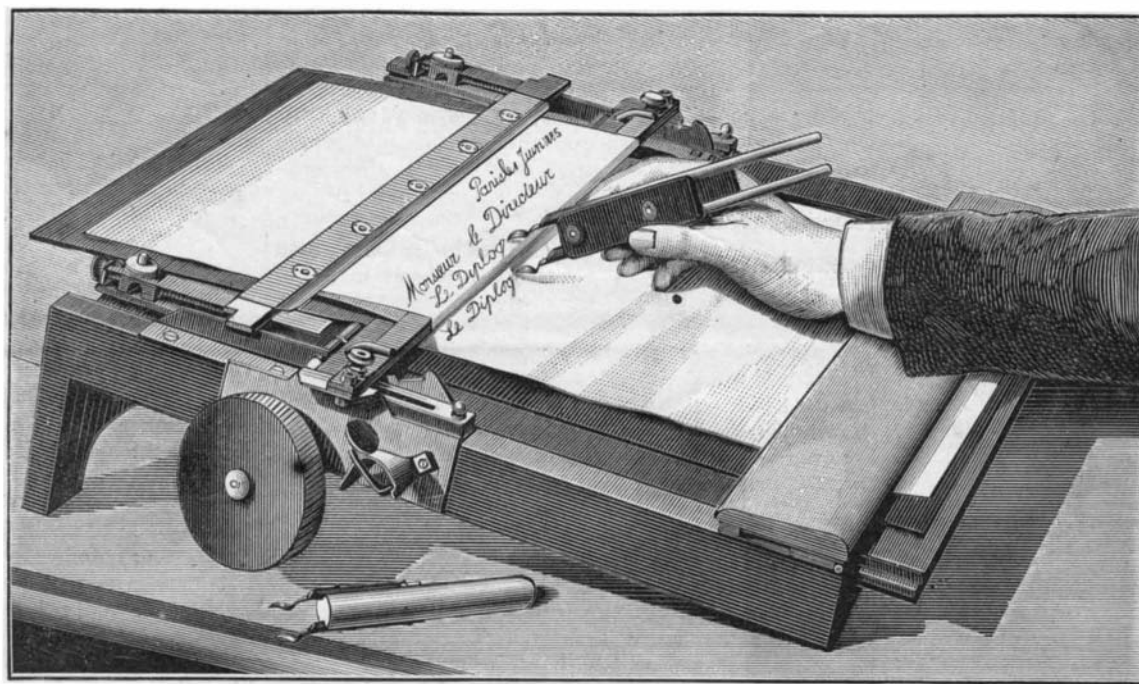
As the instrument contains no delicate parts, it is very strong. Those that a violent shock might break can, moreover, be easily replaced by any one who has ever seen the apparatus.

This desk is certainly ingenious, and can be used in public or private offices, and everywhere where a person needs to obtain, at once and without preparation, two copies exactly identical, word for word, line for line.—*La Nature*.

The Manchester Ship Canal.

The Manchester Ship Canal will extend from the deep water of the Mersey at Eastham—a point on the Cheshire shore just above and almost opposite to Liverpool—and will proceed thence by Ellesmere Port, Runcorn, Warrington, and Barton to Manchester, being in length about thirty-five miles. It will have a minimum depth of 26 feet of water, and will be wide enough for the largest vessels to pass each other at any point, and may be compared with the Suez and Amsterdam canals, in width and depth as follows: Suez, depth 26 feet, bottom width 72 feet. Amsterdam, depth 23 feet, bottom width 89 feet. Manchester, depth 26 feet, bottom width 120 feet. The estimates include docks in Manchester, Salford, and Warrington, as sanctioned by the company's act, with a water area of 85½ acres, containing more than four miles of quays. There will also be a mile of quay space and extensive shed accommodation near Manchester on the ship canal, in addition to wharfs at many places alongside its course. The level of the docks at Manchester, which is 60 feet 6 inches above the ordinary level of the tidal portion of the canal, will be reached by four sets of locks. The locks will, it is asserted, be of a size sufficient to admit the largest merchant steamers.

Each set comprises a large lock, 550 feet by 60 feet; a smaller lock, 300 feet by 40 feet, for ordinary vessels; and one lock 100 feet by 20 feet, for small coasters and barges—and all capable of being worked together. Each set of locks will be worked by hydraulic power, enabling, it is contended, vessels to be passed in fifteen minutes. It is hoped that the rivers Irwell and Mersey—which will be diverted into the upper reaches of the canal—will supply more than

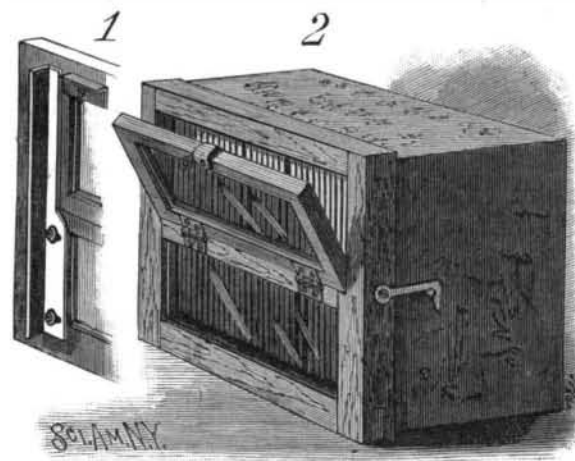


LEVESQUE'S DIPLOGRAPH.

sufficient water for the locks even in the driest season. Vessels will, it is expected, be able to navigate the canal with safety at a speed of five miles an hour, and it is estimated that the journey from the entrance at Eastham to Manchester will be accomplished in eight hours.

CRACKER BOX COVER.

This cover may be readily applied to or removed from the box, and may be adjusted to fit boxes of different sizes. The frame of the cover is provided with a glass panel and a hinged glass door. In the inner edge of the upper crossbar is a staple, and to the inner surface of the door is secured a flat spring, bent around the edge and made convex, so that, when the door is closed, the spring will be brought into engagement with the staple. This spring serves the double purpose of a buffer, preventing the door from being closed too hard, and of a fastener. Along one edge of the under side of the frame, as shown at the top of Fig. 1, is secured an angle plate, and to the ends of the frame



SANDBERG'S CRACKER BOX COVER.

are secured angle plates formed with slots for receiving clamping screws. These plates may be moved in or out, to adapt the distance between them to the length of the box. On the ends of the frame are hooks for engaging nails or eyes in the ends of the box, for holding the cover in place. This cover permits of displaying the contents of the box, while effectually excluding dust and moisture.

This invention has been patented by Mr. C. G. Sandberg, whose address is P. O. Box 103, Helena, Arkansas.

The Dangers of Dust.

Darkness, damp, and dust are potent agencies of disease. Everybody recognizes this; but how many fail to adopt its precepts! If there be sermons in stones, surely the summer dust and its dangers would prove a fruitful subject for medical discourse. There is as great a difference between London and country dust as there is between the corresponding muds. Pulverized matter would be harmless enough if it were deprived of its physical property of ready diffusion. The atmosphere is laden and swarms with particulate matter of highly complex nature. Its chief peril to living beings resides in the organic constituents; largely this organic material consists of minute forms of life in a state of latency, only waiting for a spell of heat and moisture and a favorable amount of light, or it may be darkness, to awaken it into activity. The habits of individuals in every class of society, including the "masses," are not calculated to diminish, but rather to augment, the amount of organic matter in our atmosphere. Mucus, saliva, and humor, popularly known as "matter," must be discharged from the mouth and nostrils to the extent of many gallons daily, and not a little of this comes from infective sources; while we venture to think that the bulk of it mingles with the dust of our streets and courts. If, as seems not unlikely, consumption is largely caused by "germs," then a very ready theory may be advocated concerning the mode in which contagium is caught. Who can estimate the amount of mischief that the shaking of mats may have caused? How many young girls early in the morning on their way to business have, so to speak, received their death blow while inspiring, all unconscious of harm, some of the clouds of dust that always greet them? Who can tell? The abatement of this danger and nuisance

is a difficulty that almost seems insurmountable. Much may be done by personal habits of prevention.—*Lancet*.

THE greatest length of Lake Huron is 250 miles; its greatest breadth, 190 miles; mean depth, 800 feet; elevation, 578 feet; area, 21,000 square miles.