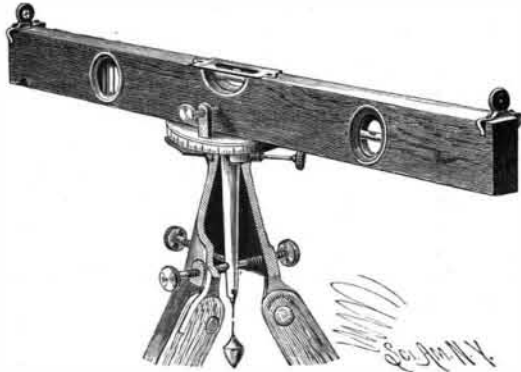


AN IMPROVED LEVELING INSTRUMENT.

The leveling instrument shown in the picture, which has been patented by Mr. Bela G. Merrill, of Oak Park, Ill., is more especially designed for the use of builders, carpenters, masons, and other mechanics, to facilitate the leveling and squaring of walls and other parts of buildings, and insure greater accuracy in such work. It has a hollow conical stand, from the bottom of which project lugs, to which are pivoted the legs, though the latter may be dispensed with and the stand set with its lugs immediately on the wall or sill of a building. The upper end of the stand has a cylindrical bearing engaged by the hub of a pointer, held in place by a set screw, the outer end of the pointer having a knife edge to indicate on a graduation on the outer surface of a circular flange on the

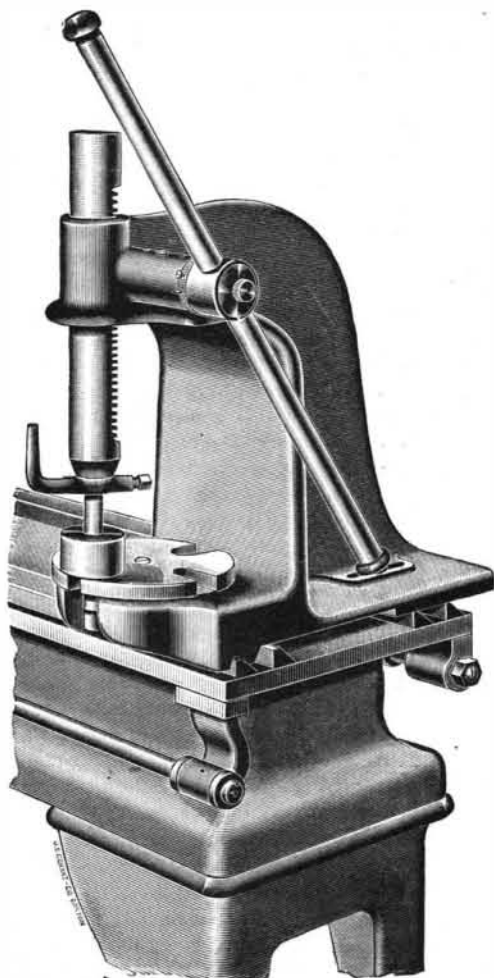


MERRILL'S LEVELING APPARATUS.

transit. The latter has centrally on its under side a tapering stem, and sets on lugs projecting inward from the top of the hollow stand, a cord and plumb being suspended from the lower end of the stem, and the stem being held in adjusted position by set screws. On the top of the transit are lugs, between which the level is held by a set screw, to prevent its slipping, the bottom of the level resting on the top edge of the flange. The sights are held in place by a cross bar, having at its ends downwardly curved springs engaging the sides of the level. The graduation on the peripheral surface of the transit indicates degrees of a circle, to facilitate the obtaining of angles by means of the adjustably held index pointer, the vertical movement of the latter also permitting of the tilting of the transit to obtain the desired inclination of the level.

THE GREENERD ARBOR PRESS.

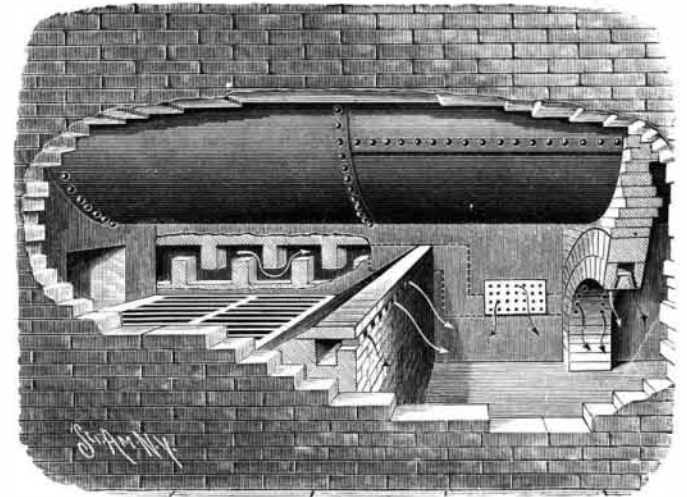
This new arbor press has many advantages over the old method of driving in and out the arbors. It saves moving, upsetting, or springing the arbors, and also saves clearing out the centers and taking off the dogs. It prevents defacing or otherwise damaging finished work. It preserves the arbors, and in their increased life will shortly pay for itself. It can be clamped to the end of the lathe bed, and will always be at hand. A large number are now in use, giving excellent satisfaction. Chandler & Farquhar, 177 Washington Street, Boston, are the manufacturers, and will give any additional information desired on application.



THE GREENERD ARBOR PRESS.

AN IMPROVED FURNACE.

In the furnace shown in the illustration, the products of combustion, after leaving the fire pot and passing over the bridge wall, are supplied with highly heated air taken in and fed through peculiarly arranged flues, causing a more complete combustion and consumption of the gaseous products and the diminution or entire prevention of smoke, with a proportionate economy in the use of fuel. This improvement has been patented by Mr. Lewis Lawton, of No. 202 Bayard Street, Trenton, N. J. The air supply flues are formed in the brickwork at either side of the fire box, as shown in the broken-away portion of one side wall of the fire box, the front ends of the flues being on either side of the fire box door, and there being partial partitions in them to lengthen the air passage, as shown by the arrow. These side flues communicate with a transverse flue in the bridge wall, near its upper edge, the latter flue having air outlets to the combustion chamber at the rear. The side flues are continued, as shown in the dotted lines, and also communicate with air passages opening into the sides of this combustion chamber, as indicated by the arrows, as well as with a transverse flue in an arch at the rear of the chamber, from which likewise heated air is supplied to mingle with the products of combustion. The mouths of the air supply flues at the front of the furnace may be provided with suitable draught regulators to govern the admission of air, the high temperature at which it may be delivered promoting the more perfect combustion of the gases and the production of a more intense heat.



LAWTON'S STEAM BOILER FURNACE.

Color Printing on Leather.

M. Canton, writing in *L'Industrie Textile*, describes a perfected method of printing on leather after tanning. The skins must be free from grease, and if they have been prepared with tannin, must first be steeped in a preparation of sumac. The application of the color can be done in several ways, according to the effect which it is desired to produce, and in one of several colors. It can be done by dyeing the skin and discharging with acids in certain parts, so that the natural color of the leather appears, or printing with a reserve composed of four parts of virgin wax, four of castor oil, one of borax, and one of copal resin, these ingredients mixed together and warmed. The castor oil may be replaced by any vegetable or mineral oil.

NEW BRIDGES AND ELEVATED RAILROAD CONNECTIONS IN NEW YORK.

On the small map we show the locations of two important bridges which it is proposed to construct across the East River between New York and Brooklyn. The idea of the scheme is to connect the elevated railroad systems of the two cities. The East River at the proposed points is about at its narrowest. The upper bridge starts from the Williamsburg or Eastern District of Brooklyn. The lower one starts from the heart of Brooklyn proper. The two converge, and on this side their approaches join at Cannon Street, between Delancey and Rivington Streets, well in the heart of this city. Extensive elevated railroad systems, all of which are shown on the map, are to put the bridges in communication with the New York City surface and elevated railroads.

The bridges are to be of the suspension type. The upper or north bridge will have cables 21 inches in diameter; between anchorages it will be 3,200 feet long, and it will have a clear span of 1,670 feet. At the piers it will be 120 feet, and at its center 140 feet above mean high water. The other bridge will have 18 inch cables, will be 2,700 feet between anchorages, and its span will be 1,470 feet. Its center will be 135 feet above high water. Thus the span of one bridge will be a little longer and of the other a little shorter than that of the present East River bridge. The cables will also be heavier than those of the present bridge, being 15 1/4 inches in diameter. All the piers will be 230 feet high.

The project has the backing of abundant capital and resources. It will

bring two distant points of Brooklyn into connection with New York City and with the railroads and ferries which start therefrom. Thus a passenger can be carried on the proposed system to the West Street ferries of the Pennsylvania and other railroads. The ele-

vated railroad connections will carry passengers to the New York Central and New Haven roads.

THE NEW MAIL SAFETY BICYCLE.

This wheel is manufactured by the old house of William Read & Sons, 107 Washington Street, Boston, established in 1826. The wheel is of the straight Humber pattern, diamond frame, of Credenda tubing, all drop forgings. It has long 10 inch ball head, round 6 1/2 inch cranks, ball bearings and ball head, 60 inch gear, single tangent spokes, is full nickel plated, and is furnished when desired with the inner tube style pneumatic tires. The same firm also have a new pattern lady's wheel with cushion tires or pneumatics,

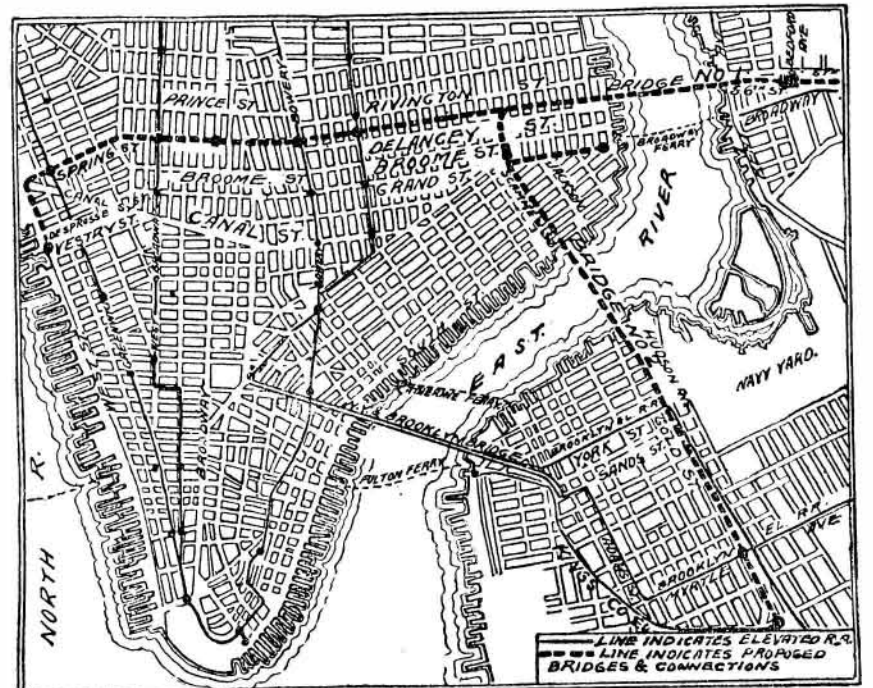


THE NEW MAIL SAFETY BICYCLE.

and a boy's diamond frame. Wheelmen and the purchasing trade should see samples of these wheels before making their decision. The New Mail has been in the market ten years and hence there is nothing experimental about it. Catalogues will be sent upon request.

A Lively Centenarian.

Mrs. James Fellowes, mother of F. Wayland Fellowes, the artist, celebrated her 101st birthday at New Haven, Conn., on the 5th inst. Several generations were represented in the party which gathered to congratulate the old lady. Mrs. Fellowes is smart and a bright talker still.



MAP SHOWING BRIDGES AND "L" CONNECTIONS.