

SPAYTH'S RAFTER SCALE AND BEVEL GAGE.

The annexed engravings represent an attachment to carpenters' bevel squares, whereby the blade of the same can be adjusted and set to any desired angle. The device consists of a quadrant divided on its face into the degrees of a quarter circle, and attached to the square stock by means of a stationary hinge.

The construction of the hinge and of the plate, detached, is shown in Fig. 2, from which it will be seen that the point of intersection of all the divisions on the plate and the tongue varies according to the number of degrees of the angle indicated between them. It will also be observed that a row of fractions is added just inside the outer divided circle. Their object is to enable a carpenter to set the bevel square to any desired inclination or pitch of a roof.

By means of this implement the inventor has been enabled to compute a series of tabulated rafter scales, giving the exact length of rafter required in any building from 4 to 40 feet in width for nine different pitches of roof. These tables are published in convenient form and, with the quadrant bevel gage, will doubtless prove valuable aids to carpenters and builders generally.

For further particulars address Mr. W. O. Spayth, Tiffin, Ohio.

or to outriggers on the same, and is so connected with the tiller as to be readily swung to the right or the left thereby. The propeller shaft projects out through the stern post, and is attached to the propeller axis by a flexible coupling joint, A, which consists of two jaws upon the shaft, circular on their face. Similar jaws are affixed to the propeller, and all are united by joint pins to hold them in place. The joint is made of cast steel and is very strong in construction. For canal and harbor navigation, this invention furnishes a quick and powerful steering apparatus by which boats are enabled

would be easy; while, the sides being constructed of india rubber, a heavy sea would not crack it to splinters against the ship's side, as in the case of an ordinary ship's boat. The main cylinder is hollow, for the purpose of holding oars, sails, and provisions, and the bulwarks are of netting and canvas fixed to iron stanchions.

An Enameled Iron Ceiling.

A ceiling made of thin plates of iron, and enameled, has just been put up in its place in the central refreshment room of the South Kensington Museum, London, and is probably the first experiment of the kind. The decorations of this room were designed to resist all dirt and impurities incident to a public room where food is eaten by an average of 10,000 persons a week. The walls and columns are of majolica, the floor is paved, and the ceilings are of iron enameled. The whole gives an impression of perfect cleanliness, and every part might be washed down by a fire engine weekly, if necessary.

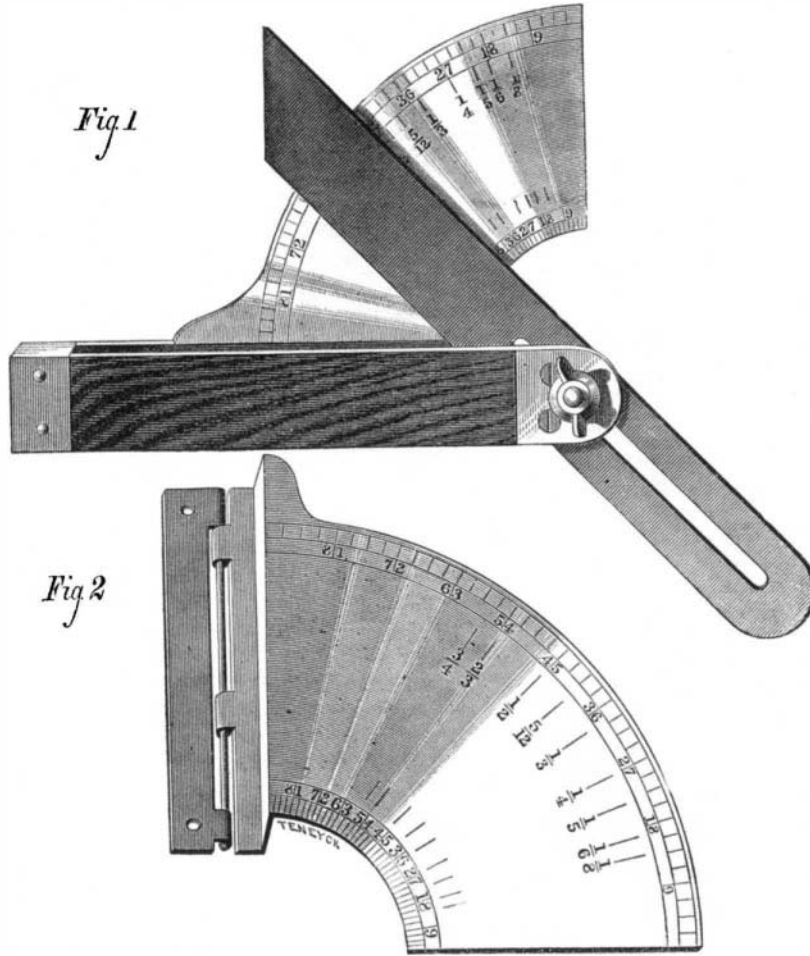
The manufacturing part of this ceiling was done at Birmingham by the Enameled Iron Company, the whole enameled plates being sent from Birmingham, and painted with charming and vigorous arabesques by the artist, Mr. James Gamble. The work is highly effective and the experiment successful. In cases where it is necessary to keep a ceiling clean and to wash it frequently, this material promises to answer perfectly, and the artistic work will last for centuries, as the design is burnt into the enamel.

The New Paris Opera House.]

To raise the temperature with sufficient rapidity before the commencement of a performance, and to provide for a renewal of air at the rate of nearly 3,000,000 cubic feet per hour, fourteen hot water and hot air furnaces are employed. They consume ten tons of coal per diem. To carry off the vitiated air, the upward draft created by the central luster is utilized through several large conduits communicating with different parts of the house, while fresh air is admitted through openings measuring from 26 to 32 square yards. The footlights are arranged to burn upside down, the flame being drawn downwards through sheltering glass chimneys by currents of air.

JONES' IMPROVED BLIND STOP.

The annexed engraving represents a new form of blind stop, the object of which is to retain the slats of the blind in any position in which they may be adjusted. The advantages of the device are that it prevents the rattling of the slats by the wind, and enables them to be kept with the pitch



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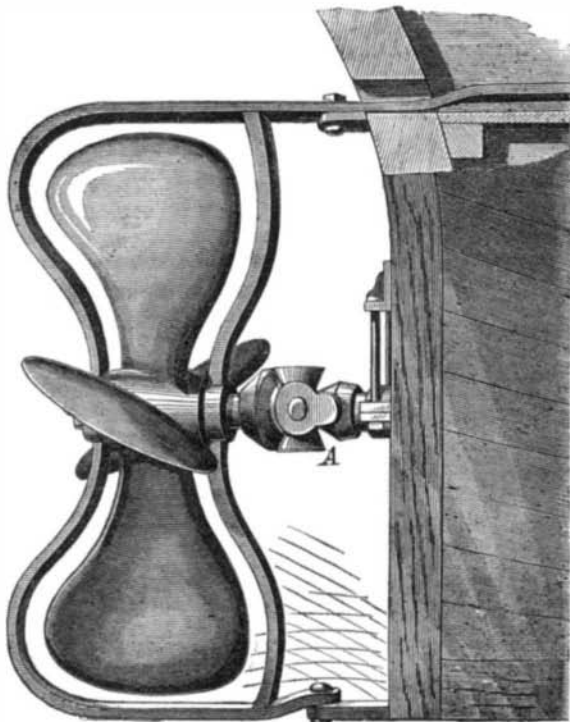
New Plan for Propelling Canal Boats.

A novel method of propelling canal boats has lately been introduced in Belgium, as follows: The towpath is laid with a single rail, weighing some 16 lbs. to the yard, and fixed on traverses a little more than three feet apart. The locomotive has four wheels, two of which are placed directly along the axis of the vehicle, one in advance of the other, and the others one at either side. The first pair are directing and the second driving wheels. The directing wheels are grooved and fit the rail; the others have rubber tyres, which give purchase on the macadamized road, and which press thereon to the extent of 0.07 lbs. to the square inch. By means of a simple mechanism, the weight of the machine may be thrown upon either the driving or directing wheels at will. In the former case the maximum, and in the latter the minimum, of adherence is obtained, to suit the conditions of a loaded or an empty boat.

There is but a single road, with rotary engines provided at suitable distances. Each locomotive tows one boat; and when a meeting takes place of two traveling in opposite directions, the engines change boats and retrace their paths. The locomotives weigh four tons each, and travel about three miles an hour, with full boats carrying a cargo of 150 tons each.

THE HERCULES SCREW PROPELLER.

The annexed engraving represents a new form of screw propeller, so attached to the vessel as to serve the double



purpose of a means of propulsion and a rudder. The wheel may be obtained separate from the rudder attachment when desired. It is claimed that the peculiar curve and shape of the blades causes the water to leave them in a spiral column at the hub. The spread of the water is thus prevented, and the force of propulsion, according to the inventor, is concentrated directly back of and within the diameter of the wheel. The combined wheel and rudder attachment is intended to obviate the resistance offered by the usual form of rudder to the free passage of the water from the screw, causing a loss, it is estimated, of from eight to ten per cent of the motive power.

The axis of the propeller is hung in bearings in a stout metal frame, which is pivoted to the sternpost of the vessel

to round the sharpest curves with ease, and to avoid the frequent danger of collision incident to crowded localities.

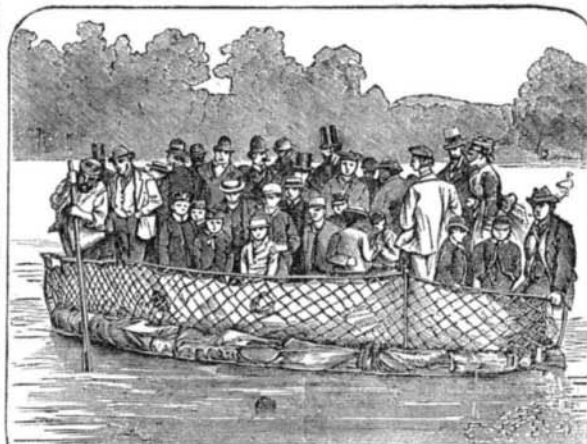
The wheel is guaranteed, under a correct test, to show more power with the same pressure of steam than any other screw of the same size and lead. It is made of the best cast iron, or of cast steel, as desired.

Patented by H. K. Stevens and S. Miller, September 16, 1873. For further particulars address the manufacturers, R. L. Howard & Son, Howard Iron Works, Chicago street, Buffalo, N. Y.

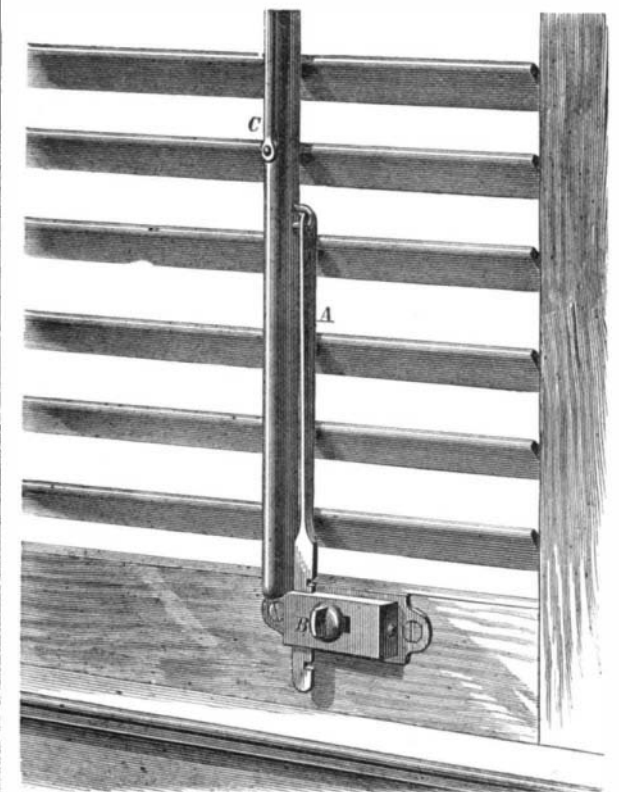
NEW LIFE RAFT.

A trial was lately made in the Thames river, London, of G. F. Parratt's deck seat and life raft, as represented in our engraving.

The apparatus consists of a long metal cylinder with two stretchers, and an oval air tube. Attached to the tube are cork and india rubber floats. Should an accident occur at sea, the cylinders and stretchers can be fixed in two minutes and a half, and the apparatus, being thrown into the water, is then ready for instant use. When the crew of the raft are in her, they increase the buoyancy by inflating the tube by means of eight or ten valves, which are worked by hand. The buoyancy of the raft was satisfactorily shown, for thirty-five men were upon it as it floated down the river from Lambeth to the Temple Pier, casting anchor off the Houses of Parliament, for the purpose of showing the handiness of the craft to a number of honorable members assembled on the Terrace. As a test of buoyancy, the whole of the crew and passengers stood at one side of the craft, yet it remained as trim and even upon the water as if no person were in it.



The raft, which cost \$500, and is capable of holding one hundred persons, can be easily made up into a deck seat, so that very little can be said against it on the score of clumsiness, and, the weight being only 400 lbs., the launching



upward, and thus clean; and being on the inside, it prevents the slats being opened from the exterior, serving in this respect as a protection to the window.

The slat rod is connected to the rod, A, which has several notches near its lower end. Rod, A, passes through slots in a box in which there is a spring catch operated by the thumb piece, B. Said catch engages in the notches of the rod, and so locks it at various points of elevation. The wire, C, serves to connect the panel with the one above, so that the slats of both may be controlled by the single device.

Patented through the Scientific American Patent Agency, February 2, 1875. For further particulars regarding price, also relative to sale of rights, etc., address the inventor, Mr John D. Jones, P. O. Box 523, Omaha, Neb.