

IMPROVED GAINING MACHINE.

Grooves cut at right angles to the fiber of timber are termed gains in the technical language of carpentry. These gains, which in the present method of erecting the heavy work of the period are very numerous, especially in bridges and railroad car timbers, have heretofore been done in a great measure by hand labor, or by rotary cutter heads projected through the surface of a table sufficient for the depth of the gain, over which the timber was carried to complete the gain transversely.

These methods, however, have not the advantages claimed to be attainable by the use of the improved gainer, produced by the extensive wood working tool builders, Messrs. J. A. Fay & Co., of Cincinnati, Ohio, and represented in the annexed engraving.

This is a very massive and substantial machine, occupying an area of ten by twenty feet upon the floor. Timbers of any size to twelve inches thick by twenty-four inches wide can, we are informed, be gained at any desired angle upon it. The limit of

depth of gain is four inches, the width indefinite.

By means of the stops, to be seen in front of the table in connection with the treadle and spring pin through the way, duplicates of timbers may be produced indefinitely, the stops indicating the width and distance apart of the gains.

The depth of the gains is determined by the position of the stops placed in the slots in the cutter slide, and which will indicate four depths of gains. The table is moved longitudinally upon friction rollers by means of a rack and pinion underneath operated by a hand wheel in front. The cutter head, with its slide, has a vertical movement governed by the lever in front and counterbalanced by a combination of springs inclosed in the moving frame. The cutter head can be placed anywhere within its range of movement without changing the position of the governing hand lever. This is accomplished by turning the hand wheel on top of the cutter slide.

The sliding frame, which conveys the cutter head in its traverse movement over the table, is actuated by means of a series of gearing driving a pinion in a fixed rack. This mechanism is contained within the frame, in self stopped at any point by means of a shipper and adjustable stops on the side of the column, and started by the operator turning the handle under the hand lever which engages the belt with the tight pulley. The motion of this sliding frame is at a fixed speed, whether for wide or narrow timber, a peculiarity no other gainer possesses. This equal speed in either direction enables the cutting to be done both ways, the cutter head being so constructed as to facilitate the operation.

The countershaft from which the machine is driven is placed vertically over the center of the distance of the travel of the pulley shaft, in the rear end of the sliding frame. The arc of the circle struck from the countershaft being but slightly different from its chord, the tension of the belt is not affected sufficiently to be any detriment to the working of the machine.

The improvements in this machine consist of the equal traverse movement of the cutter head, the ease of adjustments, the fixed positions of the handles for the operator, and other mechanical refinements introduced where they will be appreciated by every mechanic. Patented January 20, 1874.

MONSON'S IMPROVED AUGER.

Mr. Christian Monson, of Moscow, Iowa county, Wis., has invented a novel and, we should judge, very useful form of auger, which, he states, is capable of boring orifices of different sizes, and is, besides, adapted to making holes for screws.

The bit, as will be remarked from Fig 1, is provided with three distinct sizes of screw, each of which parts is made tapering in form. The larger of the three, A, is provided with a projection by means of which it is rendered

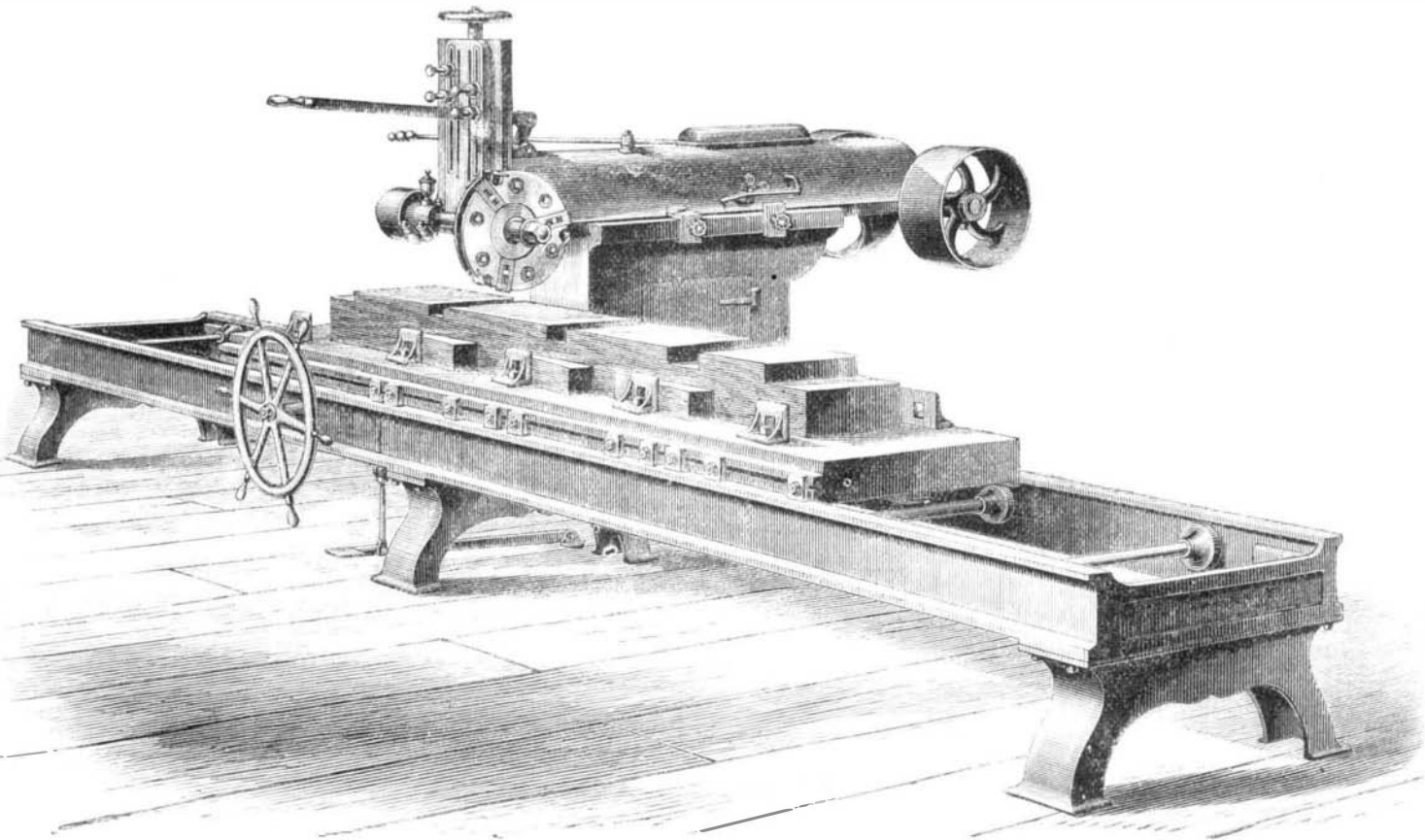
suitable for countersinking. Fig. 2 is a modification of the above and has two sizes of screw and a double thread. The point also, it will be noticed, is somewhat differently constructed, being provided with slight projections which, according to the inventor, are not easily worn or broken. Fig. 3 is still another modification of the first form, having also two sizes of screws but a triangular shaped point. This latter is well suited for easily penetrating wood, and is said not to be liable to become broken or dull.

The tapering form of the tool makes the hole for the blank

other localities, to the existing necessity of improved and simple means for securing constant supplies of pure fresh warm air in crowded apartments. We illustrate in this issue the Galton fireplace, lately introduced in England and strongly commended by high sanitary authority. We herewith present another device of equal timely importance, consisting in a novel adaptation of the furnace flue and register. The apparatus, the construction of which will be readily understood from the annexed engraving, seems to us, judging from the explanation of the inventor as below given, a plan

of much merit and hence worthy of the careful examination of health boards, architects, builders, and property owners generally.

Our illustration, partly in perspective and partly in section, shows the invention quite clearly. A supplementary flue, A, flared at its lower end, surmounts the flue leading from the furnace. Its upper extremity is curved to terminate in the upper half of a register through which the hot air is delivered into the room. It will be observed that the register, though having a sin-

IMPROVED GAINING MACHINE.

gle grating of the usual size, is divided by a horizontal partition, and each portion is provided with a separate set of slats, either of which may be opened or closed at will. While the hot air from the flue, A, pours into the room in an ascending current, as indicated by the arrows, the cold and heavy vitiated air, which sinks to the floor, makes its exit into the lower half of the register, entering the main flue in the space between the supplementary pipe and the brick work, and thence passing up the chimney. By this means, it is claimed, a constant circulation of air is maintained in the apartment.

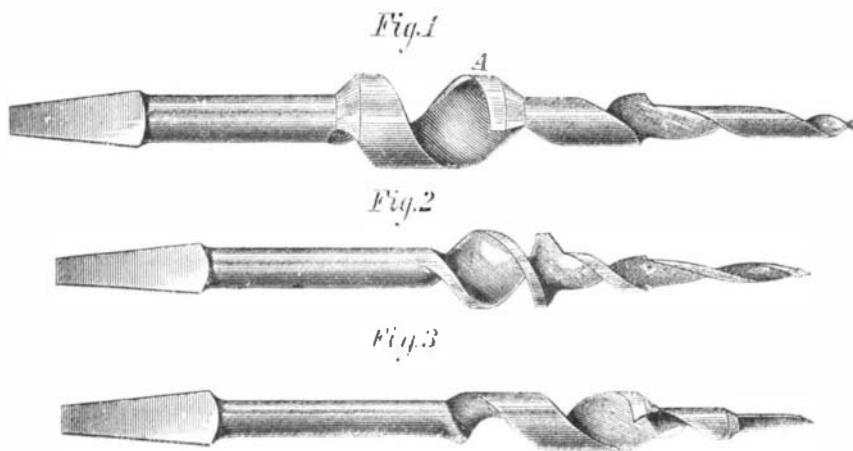
The small pipe, B, arranged above the flue, A, is provided within with a valve operated by a suitable rod and handle, C, outside the register. By this device either a portion or the whole of the hot air rising in the flue, A, may be discharged with the vitiated air flue, the register of the hot air pipe being either opened or closed accordingly, and thus increasing the warmth and consequently the draft of the vitiated air flue, a result of much importance in crowded rooms, where the heat becomes excessive and the air very impure. The inventor informs us that, in practice, the truth of the views above noted is fully proved; a candle or handkerchief held before the two portions of the combined register indicating clearly the

direction of the ingress and egress currents. By a simple modification the device is adapted for floor registers, and in cases where several flues pass up the wall side by side, a metal partition is used to separate each at the point of location of its register, enabling the apparatus to be conveniently and readily applied. The invention has already elicited favorable notice from eminent sanitary authorities in this city, Philadelphia, and Washington. It is covered by four patents of quite recent date. For further information address the inventor, Mr. George R. Barker, Germantown, Philadelphia, Pa.

Gold for Illuminating.

Procure a book of leaf gold, take out of the leaves gently and grind them in a mortar with a piece of honey about the size of a hazel nut, until it is thoroughly intermixed with the gold, then add a little water and re-work it; put the whole into a phial and shake it well. Let it remain an hour or two, and the gold will deposit at the bottom of the phial. Pour off the liquor, and add weak prepared gum in its stead, sufficient to make it flow freely from the pen or camel's hair pencil. When required for use, shake it occasionally.—*Revel's Potichomanie.*

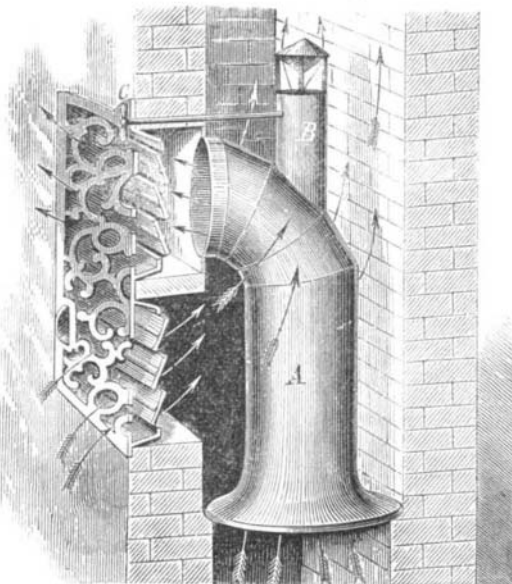
PISCICULTURE IN CANADA.—Several correspondents having sent us inquiries on this subject, we are desired by the author of the letter signed "Canadian" (on page 56 of our current volume) to state that he will be happy to give information and advice to any one interested in the subject. His name is Rev. J. Alexander Morris, Ottawa, Ontario.

**MONSON'S IMPROVED AUGER.**

augers of different sizes. Further particulars may be obtained by addressing the patentee as above.

BARKER'S HEATING AND VENTILATING APPARATUS.

The recent disclosures made concerning the very defective



heating and ventilating arrangements in the public schools and court rooms of this city have, to a considerable degree, aroused the attention of the public, not only in this but in