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IMPROVED SAWING AND GROOVING MACHINE.

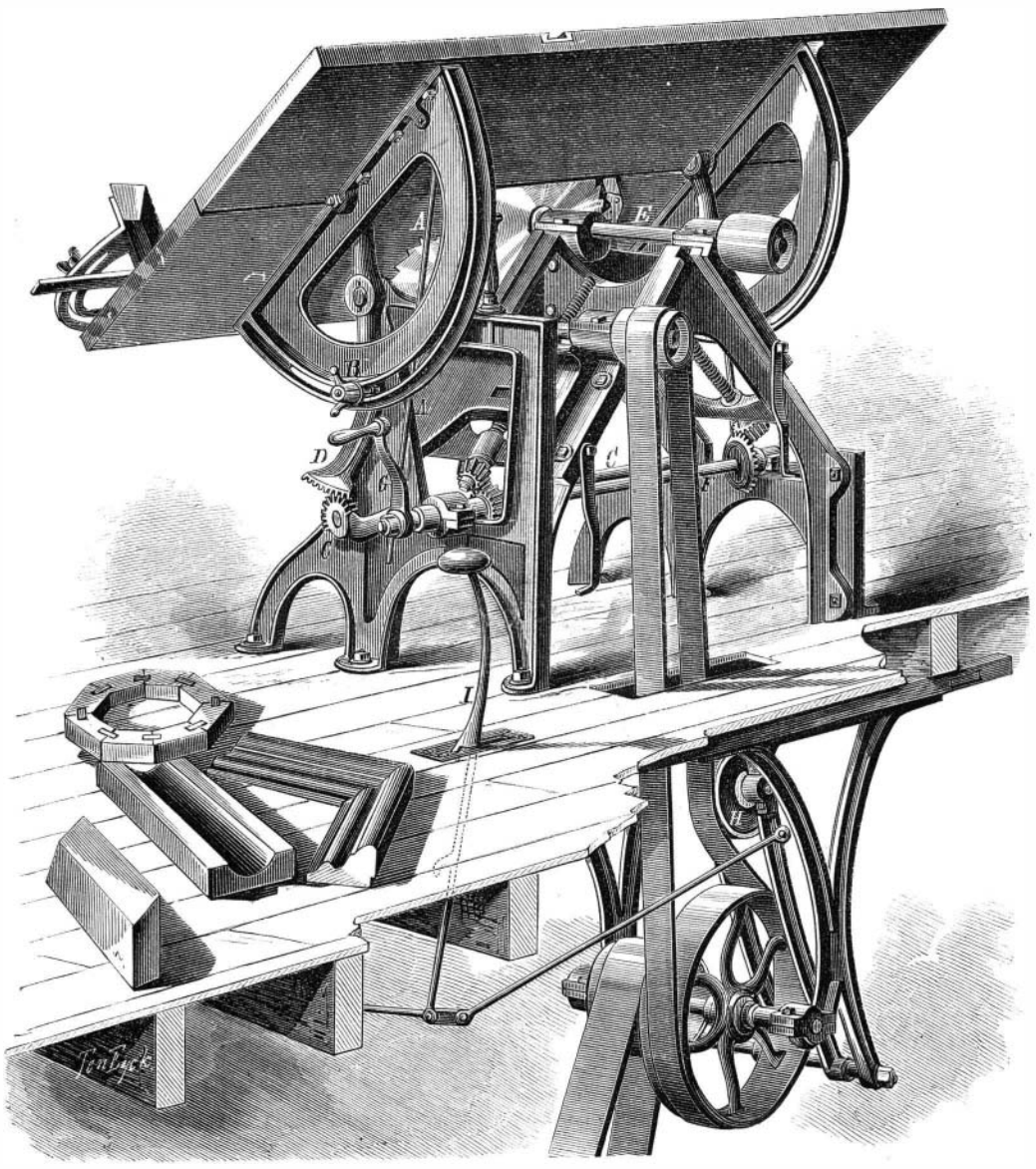
One of the principal difficulties which the inventor has sought to overcome, in constructing the new sawing and grooving machine represented in the annexed engraving, is to hinge permanently the oscillating table, while avoiding the necessity of a wide opening in the latter for the saw to work through, or of repeated adjustments of the table to the saw. The means adopted are simple and effective, and consist in causing the table, when it is placed at any required angle, to be at the same time moved laterally, so that the aperture, which is no larger than the opening in the ordinary stationary saw table, is thus automatically adjusted to proper position with reference to the saw.

As will be seen from the engraving, the table is made in two parts, the rear of which is bolted to the oscillating table bearers, and the front leaf attached to dovetail slides which move over corresponding surfaces on said bearers. The object of the moving part is to allow of enlarging the saw opening in order to use the grooving saw for plowing, rebating, etc., or cutter heads for cutting wide gains, chamfering, raising base-casing panels, plinth blocks, shanking cogs, cutting small tenons, etc. The table has also an independent lateral adjustment, so that the fixed leaf can be set to tange the saw at whatever size it may be placed to operate, and thus rebates can be cut where there is but little wood left to pass between the saw and the gage, without danger of the work being caused to drop through by the downward pressure of the blade. This adjustment is also of advantage when cutter heads are used, as it permits the table to be moved back so as to clear the head when the same is screwed against the fixed collar on the mandrel. It is accomplished very quickly by loosening the set screw in the outer end of a crank pinion wrist, and sliding the latter up or down on the rod, A, which connects it to the table bearer. The screw is tightened, as is also the clamp, B, which prevents the table from turning. The front is then adjusted to tange the saw or cutter head on the outside

The shaft, C, extending from end to end of the machine, carries the pinions which engage with the teeth of the vibrating arms, one of which is shown at D. By these arms the table is evenly moved and kept parallel to the direction of the saw. By means of the pinion and set screw on each end of the shaft, the table can be nicely adjusted to suit the draft of the saws, to prevent wedging or back cutting.

Beneath the table are two frames inclined at equal angles and meeting at their tops. These serve as slides and supports for the carriages which carry the two saw mandrels, E. Said mandrels are of steel, and run in self-oiling Babbitt metal boxes. To them are attached nuts through which pass long screws, which are secured in the inclined frames. By means of bevel gearing, these screws connect with the shaft, F. At one outer end of the latter is a crank, G, which by suitable means may be so placed as to turn either one or both of the screws, so raising either or both of the carriages, and consequently the saws. The latter can thus be set to cut to any required depth. The guide may be adjusted for use on either side of the saw or to any angle with the table; it is provided with adjustable holders for strips or molding. The grooving saw is adapted for plowing and rebating, and is made adjustable for any sized plow, varying in thickness from that of the saw plate to one and a half inches or the limits of the collars; the latter may be adjusted by set screws without unscrewing the mandrel nut.

The general advantages claimed for the machine, in addition to those mentioned, may be summed up as follows: It may be easily arranged to perform either square or angular sawing; the material lies flat on the table and close to the guide; the grooving saw will cut gains of any required size across the grain, either square or at any angle, and will do its work more effectually than heads and cutters, while needing much less time in adjusting and sharpening; the cross cut guide is adjustable for squaring, mitering, and for all kinds of angle work, the table and the guide giving both vertical and horizontal angles in one cut. The table turns toward the operator, the saw remaining at the same hight, so that the work is in full view and is convenient to hold; the saws overhang the frame so that they may be taken off or adjusted without removing any part of the top. The machine is readily adapted to faceplate turning; by placing the table at an angle, the front leaf serves for a rest. The rip saw is provided with a guard to prevent it from throwing sticks, which is arranged to move up and down with the saw, leaving the table clear for the use of the other blade



BAGGS'S SAWING AND GROOVING MACHINE.

In the engraving there is also represented the countershaft and pulleys, exhibiting the mode in which the tightening pulley, H, is operated. The lifting rod, I, has two hooks, which engage with an iron plate screwed to the floor. When the rod is drawn up, and the lower hook is caught, the binder stands clear of the belt, the latter being of sufficient length to allow the saw mandrel to remain at rest. When the hook is disengaged, the binder is, by the action of the weight on the rod, brought forward against the belt. The object of the upper hook is to prevent the binder from dropping in contact with the running pulley. But one mandrel is used at a time, the belt being lifted from one to the other as desired. The inventor informs us that he has devised another arrangement for the countershafting, which admits of the belt being brought to the machine from above instead of from below. Either device is furnished with the machine.

For small shops, using small circular saws, the machine is capable of extended utility, while for large establishments the fact of its being suited for a variety of operations, enabling it to be kept constantly employed, renders the invention equally well adapted.

Patent for improvements now pending through the Scientific American Patent Agency. For further information address the inventor, J. T. Baggs, Bridgeport, Ohio.

THE horse power of waterfalls is found by multiplying the number of pounds of water which fall per minute by the length of the fall in feet, and dividing the product by 33,000

Aniline Black by Electricity.

"If we take a strong solution of sulphate of aniline and submit it to the action of two Bunsen elements, employing platinum electrodes, we soon see the positive pole become coated with a violet blue covering, greenish in places, a fact remarked by Letheby. If the experiment is prolonged for 12 or 24 hours, we find fixed to the positive pole a black mass, easily detached On treating this substance with ether and alcohol, and drying it, there remains a amorphous black body with some greenish reflections, insoluble in most solvents. If this body is treated with sulphuric acid, and spread out upon a porcelain saucer, it takes a greenish coloration, but on treatment with alkalies it resumes its jet black color. It is not affected by nascent hydrogen. To ascertain that the production of this black was due to nascent oxygen, and not to the platinum employed as electrode, I made use of electrodes of gas coke, and obtained in 12 to 24 hours identical results; a black adhesive mass was fixed to the carbon of the positive pole. Nitrate of aniline gave also a black deposit, which, on treatment with alkalies, took a velvet-like appearance; but in presence of sulphuric acid a decomposition took place, and I obtained a brown maroon coloration. The composition of this black is, therefore, different from that obtained with aniline sulphate. Muriate of aniline gave, around the positive pole, a black coagulum, but it is probable that, in this case, the action is complex, and that there may be at the positive pole, besides nascent oxygen, nascent chlorine, which complicates the results.

With the organic salts I have obtained differences which require mention. Aniline acetate gave, at the positive pole, a black glutinous substance, partly soluble in the surrounding salt. Aniline tartrate gave no result, not even the least coloration of the positive pole. Hence it appears that aniline blacks may be obtained without the intervention of any metal, and that the salts of aniline behave in different manners with the nascent oxygen."—*J. J Coquillon, in Comptes Rendus.*

Baryta Green.

Make a mixture of two parts of caustic soda and one part chlorate of potash, and add very gradually two parts of manganese in very fine powder. Raise the temperature gradually to very dull redness. On reaching that point allow the mixture to cool, and after having powdered it exhaust it with water. Filter the liquid thus obtained, and add to it when cold a solution of nitrate of baryta. There is formed a violet-colored precipitate of baryta, which is washed with care. It is then dried and treated with one half to one part of caustic baryta, hydrated, and gradually heated up to the commencement of redness, with consequent stirring. When this operation is at an end, the mass, on cooling, appears of a fine green. It is powdered and finally washed in order to remove any excess of baryta.—*M. Boettger, in Dingler's Journal.*

The Blasting of Diamond Reef.

Diamond Reef, an ugly ledge of rocks lying between Governor's Island and the Battery, in New York harbor, is rapidly disappearing before General Newton's dredging and blasting scow. Five blasts were exploded in the mass of rock during the month of October, which completely shattered what remained of the worst part of it, leaving, however, an immense heap of *débris* to be removed. The reef used to be 400 feet long, and at its highest point was 19 feet below low water. After the fragments are removed, there will be a minimum depth of 26 feet over an area of 6,000 feet of what was originally the highest part of the reef. Should the work proceed without interruption, the whole ledge will have been removed within seven months.

AMONG the best bearings for water wheels are those composed of good oak, rock maple, or lignum vitæ.