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BAND RE-SAWING MACHINE.

As a natural consequence of the practice of transporting lumber in planks or thick boards from the sawmill to the manufactory, and there converting it into forms and sizes suited to the wants of manufacturers, which was formerly done at the sawmill itself, a demand has been created for improved methods of such conversion, which should combine a maximum speed of execution with a minimum waste of material.

This work has hitherto been accomplished by circular saws or reciprocating saws. The former, however, owing to the necessary thickness of the blade, produced a waste of material not compensated for by the amount of work performed, while the latter method, although more economical in the waste of material, was found unprofitable on account of its slow operation.

In the matter of re-splitting lumber, the band sawing machine seems best adapted to meet all the requirements; as its great cutting speed, and the very thin gage of saws which can be used, combine at once the saving of time or labor with the saving of lumber.

The accompanying engravings (Figs. 1 and 2) illustrate a machine of this kind recently perfected by J. A. Fay & Co., Cincinnati, Ohio, which combines in its design and construction many improvements and features which careful study and experiment have convinced the inventors are necessary to its successful and economical operation.

The saw is carried upon two wheels five feet in diameter, placed at a short distance from each other, the upper wheel having a vertical adjustment, shown in Fig. 1, to allow for the decrease in the length of saws caused by breakage and rewelding. The wheels run in long bearings and have an outside bearing to secure additional firmness. The tension of the saw is produced by means of a weighted lever, shown in Fig. 2, in connection with the adjusting screw of the upper wheel, which compensates for any variation in the length of the saw by expansion or contraction caused by changes in temperature.

The patent roller guides, which support the back and sides of the saw above and below the lumber, are made of steel and gibbed to a supporting post. This post has a radial adjustment by which the guides will direct the saw to the center of the required cutting line. The guides can be quickly detached for the removal of the saw, and the upper guide has a vertical movement by means of hand wheel and gears to accommodate different widths of lumber.

The saw may be made to run upon any part of the periphery of the upper wheel by means of a device for tipping the

wheel out of true perpendicular, or by a radial movement of the upright column, which throws the upper wheel out of a true parallel line with the lower one; and the saw being thus made to run on any desired part, there is no danger of its running off the wheel.

The feeding mechanism, consisting of four geared rollers of large diameter, is driven by friction, so arranged that, by different movements of the regulating lever in front of the machine, the operator can instantly stop or start the feed or graduate it from fast to slow. The guiding feed rolls are adjusted by hand wheel and screw, and the pressure feed rolls are governed by a weighted lever acting on a ratchet wheel by means of a pawl, and sufficient pressure may be obtained to straighten any warped boards. The feed rolls can be quickly adjusted to saw through the center or from the side of a plank, as may be desired.

The driving belt is tightened by an idler, attached to a lever swung to the lower wheel shaft, and moving concentrically with the driving pulley. The bearings are all provided with oiling devices, so that the wearing parts of the machine can be kept constantly lubricated. The machine is adapted for resawing lumber 30 inches wide and under, and down to the thinnest materials that admit of re-sawing. Its working capacity is stated at from 10,000 to 15,000 feet per day, depending upon the kind and width of lumber. The saw kerf is about $\frac{1}{16}$ thick; the thickness of the blade is number 19 gage. By this machine a large saving in lumber is effected: as, out of a 1 $\frac{1}{2}$ board, planed on both sides, three $\frac{3}{8}$ panels are obtained. The machine is so arranged as to be at all times under perfect control of the operator.

Several of these machines are in use, giving entire satisfaction. One of them may be seen in daily operation at J. A. Fay & Co's. space in the Centennial Exhibition, section B. 8, columns 61, 62 and 63, Machinery Hall, where they have on exhibition a large number of their labor-saving machines. For further particulars, address the manufacturers, as above.

A New Process for Making Illuminating Gas.

The *Revue Industrielle* describes a new illuminating gas apparatus devised by MM. Kidd & Barff, which is composed of an iron drum into which any kind of carbon is introduced. Carbonized peat gives excellent results; powdered anthracite, coke and wood charcoal may also be employed. In the interior of the cylinder is established a system of circular tubes which are filled with water led from an elevated reservoir. The coal is ignited, and the heat develops steam in the tubes at a pressure corresponding to the height of the

reservoir. A small tube conducts the steam below the fire and allows it to escape into the ash pit. The jet draws in air, and the mixture traverses the burning combustible from below upward. A series of interesting reactions then occur, the watery vapor, air, and carbon acting materially upon each other. The oxygen of the air and steam unites with the carbon to form a certain proportion of carbonic oxide, and a less quantity of carbonic acid. The hydrogen set at liberty and the nitrogen are found in the mixture when it escapes. The nitrogen alone is annoying. The quantity of carbonic acid may be greatly reduced by augmenting the height of the layer of combustible. Carbonic oxide and hydrogen represent about 43 per cent of the mixture. A specimen of the gas obtained from carbonized peat gives on analysis: Carbonic oxide 28.5, hydrogen 14.5, nitrogen 53, carbonic acid 4. The gas contains no sulphur, either free or combined; and in order to use it for illuminating purposes it is only necessary to remove the carbonic acid, an operation of no great difficulty. It is calculated that 1 ton of coal by this process will yield about 98,868 cubic feet of illuminating gas, or, including the nitrogen, about double this volume. The operation is continuous, and there are no retorts to charge and empty. As the coal is consumed, a lever device throws in fresh supplies in closed boxes. The residue is a small quantity of ashes, and all the carbon appears to be mingled in the gas. The gas is remarkably pure, burns without the least odor, and produces only carbonic acid and water; hence it has no deleterious action on paint or gilding.

New Applications of Salicylic Acid.

It has been determined that the addition of from 0.0005 to 0.001 part of salicylic acid to cistern water clarifies the same in a remarkable manner, and that water, which ordinarily, in the space of a month, would become foul and unfit to drink, remains perfectly pure and limpid. This property of the acid will doubtless be found of great value on board vessels making long voyages, as it has been determined that scurvy is often produced by the deterioration of water through too long sojourn in casks and tanks. The combination of salicylic acid with calcareous salts has also been noted by M. Berger to be so intimate that water, thus charged and treated, may be evaporated even to dryness without any lime deposit being formed. The acid is therefore one of the best (if not the best) preventives of steam boiler scale and incrustation; but until some cheaper way of producing it than now is practised is discovered, it can scarcely come into general use for this purpose.

Fig. 1.

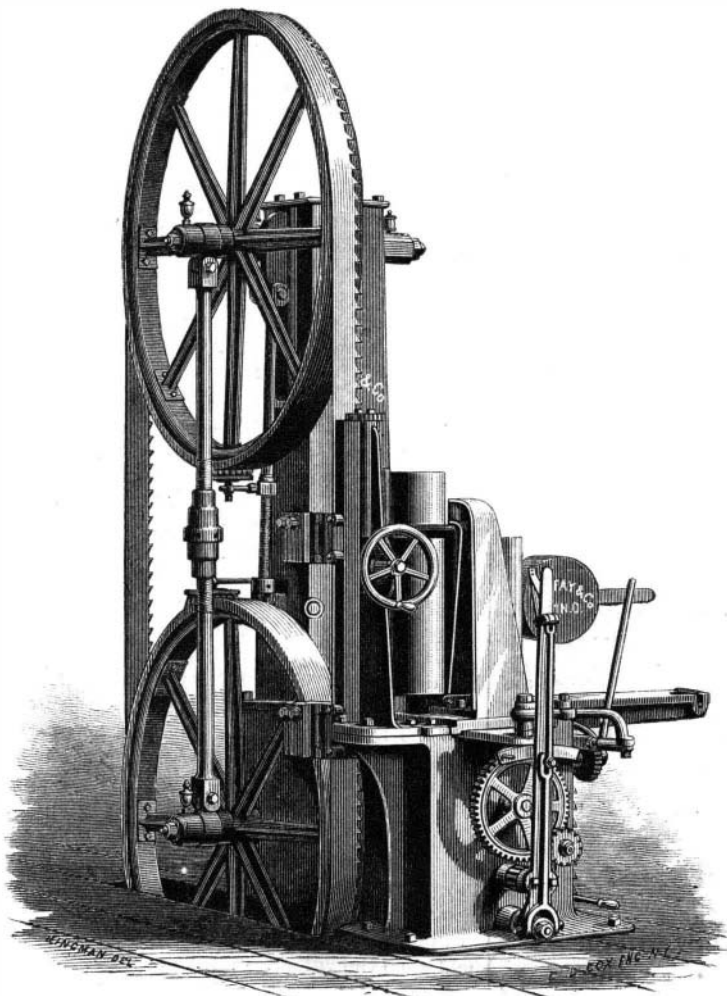
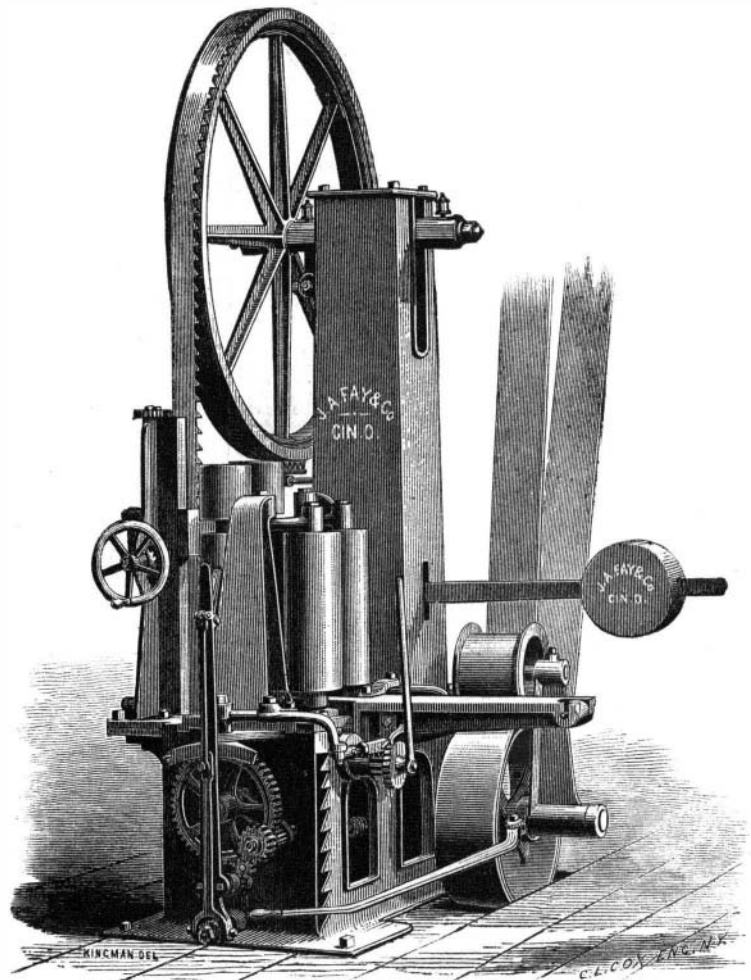


Fig. 2.



J. A. FAY & CO'S BAND RE-SAWING MACHINE.