NEW FRENCH WOODWORKING MACHINES.

In the annexed engravings, we illustrate four new woodworking machines, invented and extensively manufactured by M. Ferdinand Arbey, of Paris, France, which were patented through the Scientific American Patent Agency on January 30 last. They were exhibited, with others from the same manufactory, at the Centennial Exposition, and there attracted considerable attention owing to their difference from the machines for similar purposes here in use and from the perfection of their finish.

Fig. 1 is a machine for jointing staves so as to produce an exact fitting of the joints, according to the curvature and diameter of the barrel. Its main object, however, is to form the staves so that barrels may be made of staves of varying widths, and wood thus economized. The staves are clamped, at D, in a longitudinal arc-shaped frame, E, which is pivoted to the side standards of the lathe, A. By means of the center pins, *b*, the stave and its clamps, D, are adjustable to a greater or less diameter of the barrel, said pins forming the axis of the barrel and being adjustable up or down in the standards. The swing of the frame on its pivots is limited by the set screws, *f*, Fig. 2. For a greater width of staves, the set screws are placed at a greater distance from the center line and *vice versa*. When the frame is thus adjusted to the radius of the barrel and width of the staves, the circular saw, C, which is placed at the end of the vibrating arm, B, and rotated by a belt from the driving shaft, B′, is passed along one side of the stave. Then the frame is swung over, and the saw cuts the opposite side. In this way, the edges are cut true, and those of any two staves will fit together, regardless of the size of the staves.

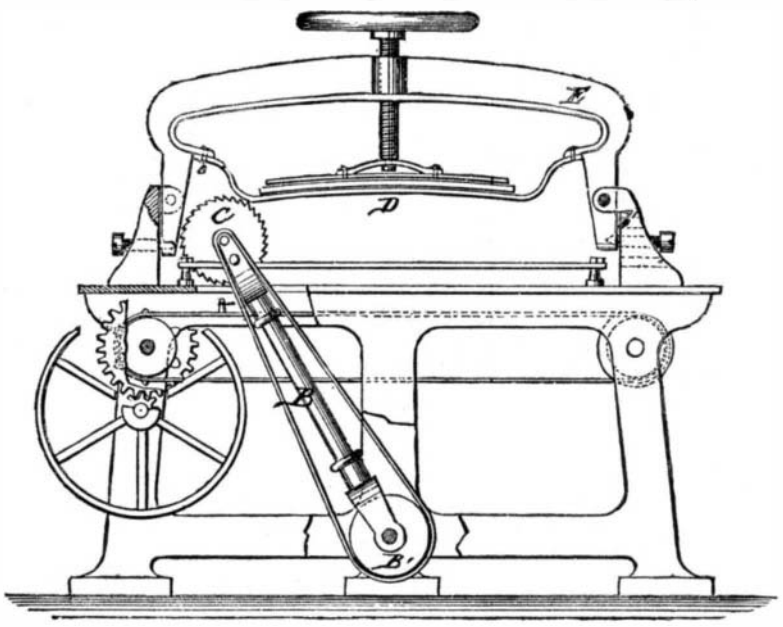

Fig. 1.—STAVE-JOINTING MACHINE.

In Figs. 3 and 4 is represented an exceedingly simple lathe for turning irregular forms, such as sword handles, gun stocks, etc. The tool used is a V-shaped cutter, *e*, which is secured to a pivoted lever, D, the latter being pointed, by a link, *f*, to a second pivoted lever, D′. Lever D′ swings therefore parallel to lever D, and of course transversely to

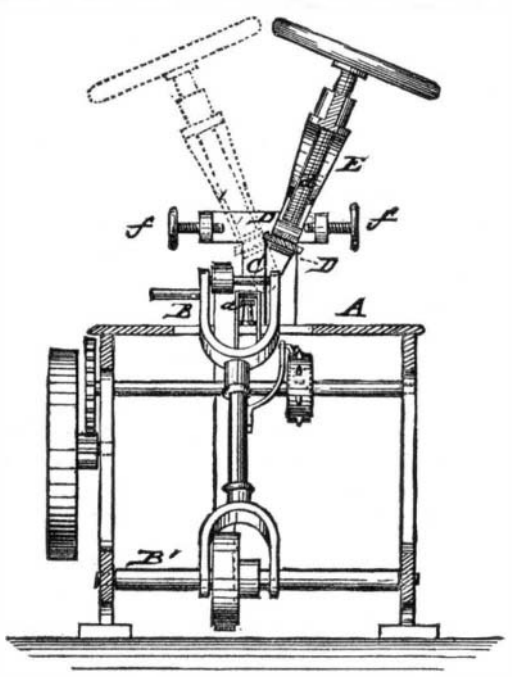

Fig. 2.—STAVE-JOINTING MACHINE.

the longitudinal axis of the lathe. By means of a handle on lever, D, the tool is removed from the wood as desired; while it is pressed up to its work by the action of the powerful leaf spring, E, to which the lever, D′, is attached. At the same time a blunt guide tool, on lever, D′, is pressed against a model, *e*′, the shape of which is to be copied. The pivot levers are attached to a laterally adjustable part of the carriage, F, which travels automatically forward and backward. The joint motion of the cutter tool, produced longitudinally by the carriage travel and laterally by the power of the spring which presses both guide and tool against the bodies, accomplishes in the blank an exact reproduction of the model.

Fig. 3.—LATHE FOR IRREGULAR FORMS.

Fig. 5 represents a new carving attachment for common lathes, for the purpose of grooving, channeling, pearling, and ornamenting balusters, table legs, and other articles of irregular shape, which are fastened in the lathe centers. The cutting tool is attached to a shaft, B, which revolves in bearings at the ends of swinging counter-weighted arms, C. The latter are pivoted in a hollow standard, D, which is secured to the carriage. The mode of rotating the cutter shaft and tool is clearly exhibited in the engraving. The tool passes longitudinally along the object and works out channels in the same, the dividing disk, F, being turned for the distance of one subdivision after each channel is made to produce the next channel by the return motion of the carriage. By slowly rotating the work in the lathe, helicoidal grooves are made.

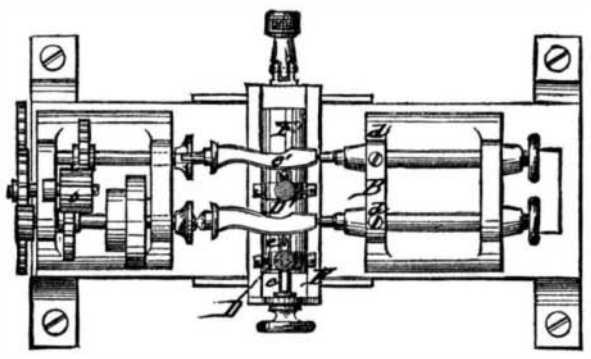

Fig. 4.—LATHE FOR IRREGULAR FORMS.

Fig. 6 represents a novel tenoning and mortising machine, in which the work represented by the dotted lines is first fed to a pair of horizontal saws, and then to a pair of vertically cutting saws, which produce the recesses at both sides of the tenon. The work is fixed to the sliding table, B, and moved up by the lever, B′. The saws are adjustable as to their distances apart, and the upper saw shaft may be moved laterally by the handle, D⁴. Tenons and mortises of different angles are produced by placing the saw bearings on swinging plates of the carriages, and securing the plates by clamp screws, after giving the required degree of inclination. The apparatus may also be used as an ordinary circular sawing machine.

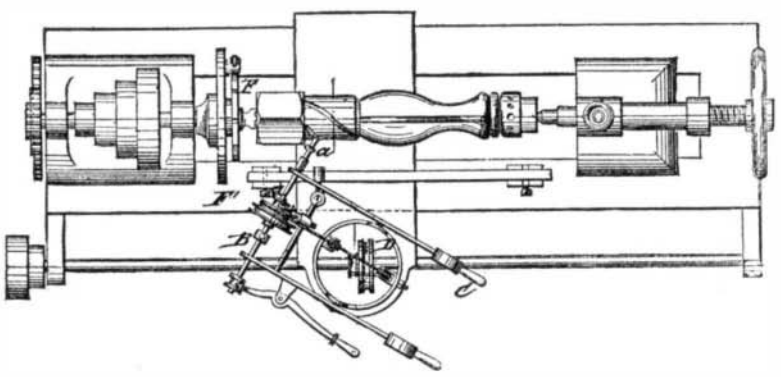

Fig. 5.—CARVING ATTACHMENT FOR LATHES.

Another Soda Ash Process.

Scherbascheff, of Charkow, is using a new and important modification of the ammonia soda process. Instead of producing the bicarbonate, as Solvay's process does, the monocarbonate is formed at once. Ordinary sal soda, which crystallizes with 10 molecules of water, when dissolved in water and heated to over 95° Fah., cannot take up more than 7 molecules of water, and at a still higher temperature it loses by dissociation more water and only retains 1 molecule of water. The higher the temperature of the solution, the more potent this dissociation, and in the presence of common salt the reaction is still more energetic. Consequently when common salt and carbonate of ammonia are dissolved together in one vessel at a high temperature, a double decomposition results, and mono-carbonate of soda is formed with 1 molecule of water, which salt is almost insoluble in water. The reaction is as follows:

$$2\,Na\,Cl + (NH_4)_2\,CO_3 = Na_2\,CO_3 + 2\,NH_4\,Cl.$$

As carbonate of ammonia is also dissociated at a high temperature into carbonic acid and ammonia, the solution should not be heated above 140° or 158° Fah. At a higher temperature the reaction is reversed.

In Scherbascheff's works, a large vat is half filled with brine, which is heated to 140°, and in it is suspended a basket of common salt, and another of carbonate of ammonia. As they dissolve they react on each other; the crystalline, almost insoluble, carbonate of soda is precipitated, while the chloride of ammonia remains in solution. The vat has a cover provided with pipes for conducting the liberated carbonic acid and ammonia gases into the brine of the adjoining vat. The operation is finished when the liquid in the vat becomes saturated with ammonia salt. The baskets of carbonate of soda and salt are at once transferred to the next vat, but a temperature of 140° to 160° is kept up in the first vat for a while until all the soda is precipitated. The solution of sal ammoniac is now drawn off, and the soda shoveled out and dried in a centrifugal apparatus, after being washed with a boiling solution of soda to remove any sal ammoniac or common salt that may be mixed with it. It is now pure enough to put at once on the market.

A New Hydrostatic Safety Lamp.

We recently commented upon the danger of explosion in kerosene lamps, due to the ignition of the vapor which forms in the space above the oil when the latter runs low. This ignition is liable to take place directly from the wick, especially when the latter is too short. A new lamp has recently been exhibited to us, which seems to be wholly free from possibility of explosion from the above cause. It is so constructed that water placed in a central reservoir constantly tends to lift the oil up a tube to the wick. In this way the oil is kept at a level at a short distance below the burner until it is wholly burned away; and at no time can any large space be formed wherein inflammable vapor can accumulate. The lamp is known as Kendall's "Hydrostatic Safety Lamp," and is manufactured by the Union Machine Company, 89 Liberty street, New York.

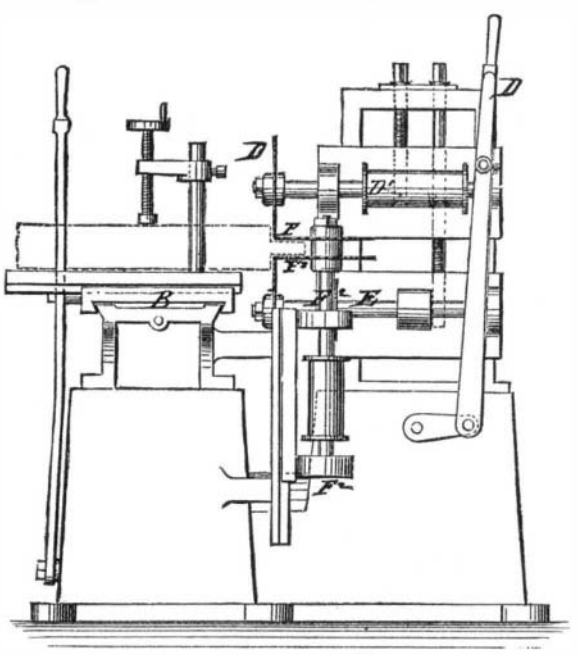

Fig. 6.—TENONING AND MORTISING MACHINE.

Evolution of the Brain.

In a recent lecture at Glasgow on "Evolution of the Brain," Professor Allen Thompson stated that we have no direct evidence from anatomy, physiology, or pathology, of any mental act being performed apart from the brain; and as to the question whether the human brain had been directly formed, and was constantly maintained by an act of creative wisdom, or whether, according to the Darwinian view, it had gradually assumed its complex structure and lofty powers exhibited in presently existing man, he preferred the latter view, because it was the one which was most consistent with all that was known of the coincident development of the mental powers and the cerebral organization.