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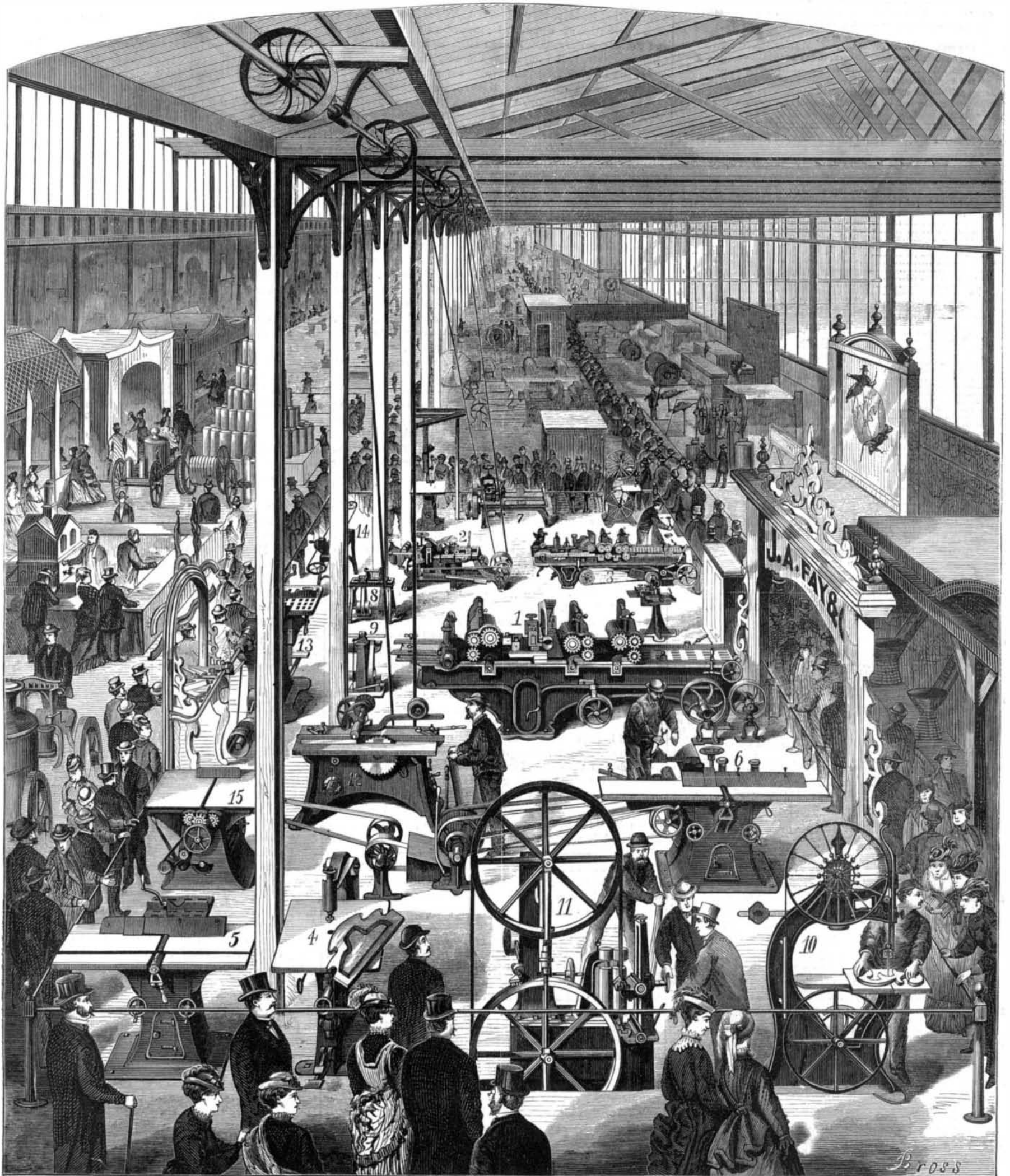
J. A. FAY & CO.'S EXHIBIT OF WOODWORKING MACHINERY AT THE CENTENNIAL.

It is generally admitted that the display of woodworking machinery at the Centennial Exposition has never been equaled in any previous world's fair, either in point of variety, of efficiency, or of numbers of the implements exhibi-

ted. The policy of exhibitors has been to give in every case the fullest possible representation of their products; and in lieu of one or two prominent machines working, while the remainder in any one exhibitor's space remain idle, all are shown in operation. In very few instances, moreover, were special machines made for the Exposition, the general rule

being to select good examples from the stock on hand. Thus the visitor saw the average tools under ordinary conditions of trial, and at the same time could draw his own inferences as to the excellence of the material used, and the design employed in construction.

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J. A. FAY & CO.'S CENTENNIAL EXHIBIT OF WOODWORKING MACHINERY.

Continued from first page.

The large engraving which occupies our initial page this week represents one of the most complete exhibits in the whole magnificent array of woodworking machinery. It is that of Messrs. J. A. Fay & Co., of Cincinnati, Ohio, with many of whose excellent machines our readers are already familiar through the illustrated descriptions which have appeared in these columns. In the manufacture of these implements, extensive experience, talent, and the greatest care are brought to bear. All shafts and turned fittings are finished to standard sizes, screws are turned, heads and threads made on a regular system, holes are bored and tapped exactly to correspond, every revolving part is carefully and accurately balanced, all bearings are reamed and scraped, none but the best materials are used, and finally a rigid trial and inspection renders each machine, before issuing from the factory, in the best possible condition. The implements exhibited at the Centennial are by no means all of the different productions of Messrs. J. A. Fay & Co., but are selected with much discrimination, so as to typify generally the variety manufactured by this firm. We describe them below in detail, referring to each, as will be seen, by a distinguishing number placed on the engraving.

THE NO. 6 PLANING, MATCHING, AND BEADING MACHINE is marked 1 in the illustration. It is claimed to be the most important implement of the class displayed, on account of its admirable construction and the speed with which it finishes the work it is designed to accomplish. The principal advantages are enumerated as follows:

There are 6 feed rolls, 8 inches in diameter. The weight of the No. 6 machine is 10,600 lbs., and it surfaces two sides 24 inches wide, 6½ inches thick, and matches 14 inches thick. For a more detailed description, the reader is referred to page 147, Volume XXXV of the SCIENTIFIC AMERICAN. At No. 2 in the engraving is represented the

NO. 4 LARGE SIZE OUTSIDE PATENT MOLDING MACHINE.

This will work any size of molding up to 9 inches wide, also plane, match, and bead narrow flooring, etc. The main spindle is 1½ inches in diameter, provided with an outside bearing; it is made from best English cast steel, and runs in patent self-oiling boxes, lined with the lining metal. The side spindles have patent self-oiling steps and bearings, and adjust vertically. The outer spindle adjusts laterally, and swings to any angle desired. The inside vertical spindle is arranged to adjust to and from the stuff, without altering the cutters. The under cylinder has a vertical movement, also a peculiar arrangement enabling the operator to take a greater or less cut without altering the cutters. The cylinder is combined with the rear bed, and is adjusted on the main bed, the false or rear bed moving with the cylinder, making it very convenient to adjust. The feed works are driven by improved gearing, which is heavily weighted, and has two changes of speed. The feed rolls are hung in swinging cranes, and, by the means of a lever at the rear of the machine, are instantly elevated from the stuff, when it is desired to withdraw it before passing the cutter heads. The bed drop is 13 inches. The machine is furnished with pressure bars, springs, steel wrenches, guides, and every thing needed for speedy adjustments. It is made to work either 3 or 4 sides, as may be desired, of 8, 9, and 10 inches wide or under.

THE NO. 2 INSIDE PATENT MOLDING MACHINE, WITH BEADING ATTACHMENT,

is represented at 3. This machine will work moldings on one or both sides, 12 inches wide and under, and up to 5 inches in thickness, also plane, tongue, groove, and bead 12 inches wide.

The cutters may be set at varying angles and are capable of sticking any style of molding, by using cutters on all four sides, thus equalizing the cut and utilizing the power. The under cylinder has a vertical adjustment, graduated to different thicknesses of cut while in motion; and by simple loosening one bolt, the pressure bar and stands can be swung entirely clear of the cylinder, giving free access to the cutters for purposes of sharpening or adjusting.

A patent beading attachment upon the pressure bar, over the under cylinder, gages the depth of the bead from the surface of the board, thus securing an automatic adjustment of the beading shaft at all times.

The upright spindles can be moved vertically or horizontally while in motion, the outer spindle to any angle desired. Devices are provided for preventing the possibility of movement after the heads are brought to the desired position; and there is a chip breaker for holding the fiber of the wood while the side cuts are being made. An equal pressure is maintained on the lumber being worked, regardless of any equalities in the thickness. The rolls are connected by expansion gearing, which allows the upper roll to adapt itself to the varying angles on irregularly sawn lumber.

At 3 is represented the

PATENT CARVING AND PANELING MACHINE,

the object of which is to produce carvings and recessed or relieved panels on the surface of lumber, edge molding, ornamenting, fret and bracket work, etc. It is especially adapted for fine furniture, coffin and piano manufactories, etc. A hollow iron column gives an ample support for the cutter spindle and also for the table, which is adjusted and regulated to form the required depth of moldings or carvings by means of hand wheel and screw, and has sufficient vertical movement to admit of working stuff of four inches thick and under.

THE NO. 2 VARIETY WOOD WORKER

is represented at 5. This is one of those remarkable tools

capable of performing the work of several machines. It is adapted to planing out of wind, surfacing straight or tapered work, rabbeting door frames, etc., rabbeting and facing inside blinds, jointing, beveling, gaining, chamfering, plowing, making glue joints, squaring up bed posts, table legs, newels, etc., raising panels, either square, bevel, or ogee, sticking beads, working circular molding, ripping, cross-cutting, tenoning, etc.

When facing or planing out of wind, the vertical and lateral adjustments can be made simultaneously, thus constantly retaining the proper distance between periphery of cut and the edge of table. All of the different functions of the machine are secured by the use of two tables. For sawing, an extra table can be inserted between the other two, making a solid and continuous saw table. The arbor is of steel, of large diameter, and revolves in bearings supported on the column. One bearing is cast solidly to the column, and the other is movable, and is readily detachable for the purpose of substituting different heads. This is a very advantageous feature.

Another combination, possessing a still wider range of capabilities, is depicted at 6. This is the

NEW PATENT UNIVERSAL WOOD WORKER,

claimed to be the only wood worker built in which both sides may be operated, and either side started or stopped without interfering with the other. As a planer, it is adapted for ordinary surfacing and thickening, planing out of wind, surfacing square, beveling, or tapering pieces, facing up bevels and baluster, etc. As a molding machine, it will work moldings, either simple or complex, up to 8 or 9 inches in width, stick sash and doors, tongue and groove; and on the wood worker side it will produce waved, oval, elliptical, circular, and serpentine and rope or twist moldings. Among its other uses are chamfering, cornering, rabbeting and jointing window blinds, gaining, panel-raising on one or both sides, tenoning, ripping, cross cutting, grooving, hand watching, making glue and table joints, mitering, nosing, squaring up, and a multiplicity of other operations limited only by the skill of the operator.

The molder and wood worker sides are securely connected upon one solid column with a substantial base, and the two sides of the machine are driven from one countershaft, which conveys power either separately or simultaneously.

The molding side is so arranged as to form a complete four-side molder. The side spindles are fixed to and move with the table, which has a vertical movement of 16 inches. The feeding rolls are arranged for fast or slow feed.

The wood worker side is constructed on the same principle and embraces the same general features as the patent variety wood worker above described.

At 7 we represent the

NO. 3 SASH AND DOOR TENONING MACHINE,

adapted for sash and door, cabinet, wheel, car, and railroad shops. The upper and lower cutter heads are adjustable so as to vary the thickness of the tenon or depth of shoulder, the carriage remaining stationary. Gages and stops with the carriage render setting out unnecessary. The copes are raised and lowered with the cutter heads, but may be independently set. Both cope and cutter head shafts are protected against endwise vibration. The upper cutter head is arranged to cut one shoulder of the tenon longer if desired, saw spurs are used in lieu of knife spurs, and the cutters operate with a drawing stroke. There is a binding pulley which keeps the belt right and self-adjusting, and the bonnet may be conveniently swung back out of the way to afford access to the cutters. The

ELLIS PATENT BLIND SLAT TENONING MACHINE,

shown at 8, is adapted to any length or width of slat, working both ends, cutting the shoulder and rounding the tenons simultaneously at one and at the same operation. The machine, which has a hand feed, is provided with two adjustable arbors and frames, carrying a set of circular saws for forming the shoulder and rounding the tenon. Connected to the arbor frames are revolving disks, into which the slat is inserted and rotated in contact with the saws or cutting tools. We are informed that it is capable of working 20,000 slats per day.

At 9 is shown the

PATENT SELF-FEED BLIND SLAT TENONING MACHINE,

which differs from the machine last described. It differs somewhat from the Ellis machine, as the slat is fed endwise through rotating chucks, the shoulder being pressed against an adjustable gage for regulating the length of slat. By the peculiar construction of the revolving cutting tools, two tenons are cut and divided with one cutter head, simultaneously and at one operation. A pressure upon the treadle causes a rotation of the slat, and at the same time depresses the chucks, carrying the slat against the cutting tools, enabling them to form a perfect tenon on each end. It will work any length of slat from 1½ inches up to 24 inches, and will make any size of tenon desired.

TWO PATENT BAND SAWING MACHINES

are depicted in the engraving, one for ordinary curve sawing, the other (10) intended for the furniture, wagon, sash and door, and agricultural shops, etc. An important feature is the method of keeping the saw at its proper tension, allowing at the same time some flexibility to the parts, to compensate for any sudden impact, and prevent breaking of the saws by buckling or friction upon the back or sides. There is also a shipper with frictional brake for arresting the saw motion, and the table is provided with irregular adjustment for bevel sawing.

At 11 is represented a

PATENT BAND RESAWING MACHINE

It will re-saw lumber up to 30 inches in width, and from 6 inches in thickness down to the thinnest stuff that admits of re-splitting. It is also arranged for sawing boards from the side of a plank, and is equally well adapted for hard or soft wood. Its working capacity is said to be from ten to fifteen thousand feet per day, depending on the kind and width of material. The saw kerf is about ⅛ inch thick, and a saving of 20 per cent in lumber is claimed to be effected, shown by the fact that, by the use of this machine, two ¾ inch panels, planed on both sides, can be produced from 1 inch lumber, whereas, by other methods, 1½ inch lumber is required.

The wheels are 5 feet in diameter, and the distance between their centers is such that there is but a comparatively small portion of the saw blade left unsupported, and there is consequently less liability to deviate from a straight course. The upper wheel revolves on a 2½ inch shaft running in long self-oiling bearings, has a vertical adjustment of 13 inches, and can be adjusted so that the saw will run at any desired point on its periphery.

The feed rolls are connected by expansion gears, operated by friction. This friction is operated by a shaft connected with a lever in front of the column, by different movements of which the feed is instantly started or stopped, and graduated from fine to coarse. The feed is strong and powerful, and is under complete and immediate control of the operator.

There are also improved devices for cleaning the saw, etc. For full particulars, the reader is referred to the description previously published in these columns. The machine represented at 12 is a

PATENT COMBINATION EDGING AND RIPPING SAW TABLE.

designed for edging and ripping up lumber for the flooring machine. It is claimed to have all the advantages of a good self feed edging saw; and at the same time, the feet can be thrown off and the stuff passed by the saw in the ordinary manner. By a novel device, when slitting lumber, the operator is enabled to elevate the saw so as to just cut through the board, thus economizing the power by a reduction of the friction on the saw, presenting a better cutting angle of the teeth, and consequently making a smoother cut and requiring less sharpening of the teeth. The fence or gage has a parallel movement of 8 inches, and is quickly adjusted for different widths without the necessity of measuring, the table being provided with a gage spaced into inches and parts of an inch.

It is also provided with a binder pulley, hung in a swinging frame, operated from the front of the machine by means of a rod and handle by which it can be raised or lowered to slacken or tighten the belt, and thus stop or start the saw. The machine will make a straight cut without any guide, by simply letting the feed roll take the board through as started. This feature will be appreciated when sawing boards with a crooked edge, which require straightening before other strips can be sawn from them.

In order to meet the need of a cheap and good boring machine, for either straight or angular boring, the

UNIVERSAL HORIZONTAL BORING MACHINE,

represented at 13, has been designed. The table is adjustable for boring at any desired upward or downward angle and the fence for any lateral angle.

The traversing steel spindle is operated by means of a powerful jointed treadle, fitted with an improved step, which is provided with a steel point, forming a bearing for the end of the spindle, thus greatly reducing the wear, caused by the spindle pressing against a shoulder. The treadle has a weighted counterbalance, giving a quick return to the spindle. The spindle is fitted with cone pulley, with three changes of speed, and adjusting collars to graduate the depth of the hole to be bored.

At 14 is shown a novel

PATENT BAND SAW SETTING AND FILING MACHINE,

which, it is claimed, will set an ordinary band saw blade in three minutes, more accurately than can be done by hand in an hour. The saw being adjusted, the wheels are set far enough apart to straighten the blade, which is then pinched by a cam and wedges. The dies are set on the points of the teeth, and are adjusted with set screws on top. This sets the points over without bending them at the roots, preventing the warping of the saw which is liable to occur in setting by hand.

Lastly at 15 we illustrate a

HAND AND POWER FEED SURFACE PLANING MACHINE.

This is provided with steel-lipped cylinder, pressure bar, shaving bonnet, and adjustable tables. It will surface 24 inches wide up to 6 inches in thickness.

This completes our list of machines, which, as embodiments of the new and ingenious devices, and as showing admirable adaptation to their several purposes, may justly be regarded as representing the best work of both inventor and manufacturer. It is hardly necessary to add that their superior qualities are appreciated in foreign countries as well as in our own, and that the large trade which their makers now control, with Japan, Australia, South America, England, New Zealand, and elsewhere, is one which reflects great credit upon our home industries. The machines have received the largest premiums at local fairs in this country, a medal at the Vienna Exposition, a medal for excellence and superiority at the late Chilean Exposition, Santiago, Chili, South America, and also medal of honor and special commendatory reports from the Centennial jurors of awards.