The Twenty-ninth Annual Fair of the American Institute.

FOURTH WEEK.

Each week seems to bring increasing success to the Fair at the Crystal Palace, the floors and galleries of which are nightly crowded with admiring visitors who, if we may judge from the pleasure and good humor beaming on every one's countenance, appear to be charmed with all they see. Those who have not already visited the Fair during the evening can form no adequate conception of the magnificence of the *tout ensemble*, when seen under the effect of the illuminating power of five thousand gas lights, irradiating the multifarious objects on exhibition, which, combined with the throng of gayly dressed, bustling human beings, form a scene of enchantment rarely equaled, and one which should be viewed by all who can obtain a leisure evening.

The illumination of the Palace is effected through sixteen meters, which, of course, measure the flow of gas into the building; and if figures do not lie, 159,200 cubic feet of gas were consumed during a single week, which quantity cost $319 40. There are over 25,000 linear feet of gas-pipes employed throughout the structure.

So far as the number, variety, ingenuity, merit, judicious arrangement and display of articles is concerned, the present Fair is indisputably the best ever yet held by the American Institute in this city. We are happy to learn that, financially, it is also successful—the average receipts, last week, amounting to about $1,000 per day. We will now proceed to resume our descriptions in the order we adopted last week, namely, to describe together each class of machines for similar purposes, commencing with the

ROPE MACHINES.

There are three machines for making rope on exhibition, namely, that of Arad Woodworth, of Boston, Mass., patented May, 1855; Thomas Boone, of Brooklyn, N. Y., patented July, 1856 (illustrated on page 193, Vol. XII., SCIENTIFIC AMERICAN), and W. R. Dutcher, of Lansingburg, N. Y., patented on the 9th of June last. The old method, and that which is at present generally practised in making rope, is to spin the hemp into yarn in one machine, then form the yarn into strands by twisting several of them together in another, then *laying* several strands into rope by other machinery. The laying of rope required long sheds called rope-walks of such length as the rope to be manufactured. A rope of six hundred feet in length required a rope-walk six hundred feet long. The object of the three machines referred to above is to manufacture rope of any length, from a few feet up to a hundred miles, in a very limited space, not more than from six to ten feet! Besides this object, two of these machines combine the operations of forming strands from the yarn, and laying them into rope by one continuous operation. The machine of Thomas Boone is designed for laying rope from strands only—a series of strand flyers being placed one above the other in separate frames, rotating in the same direction, and guiding the strands into a *laying top*, where they are twisted into rope. It is a compact machine, and occupies but a small space. For a full description of its construction and operation, we refer our readers to the page in our last volume mentioned above.

The machine of Arad Woodworth is horizontal, and makes rope from the yarn. Several yarn bobbins are placed on a flyer inside of another flyer which revolves in a contrary direction. The yarns are guided at one end through tubes, and twisted together into a strand, which is conducted to the outside flyer at one end, and receives another twist, thence along the arm of this flyer to its other end, where it receives another twist, and thus for every single revolution of the flyers three twists are put into each strand. Three strands are formed in this machine, and are conducted through revolving tubes and laid into rope. By the peculiar construction and operation of the flyers—one being placed inside of another, and revolving in contrary directions—three twists are put into each strand during each revolution of the laying-top. Excellent small rope of one and a half inches in circumference is made in this machine, at the rate of five hundred pounds per day. The same principle of twisting by combined flyers is applied by Mr. Woodworth to a spinning-jenny and a cordage machine, which are also exhibited here for the first time.

The third rope machine, that of W. R. Dutcher, is vertical, and, like Woodworth's, combines two separate operations, making strands from the yarn and forming them into rope at one continuous operation. The nature of this improvement consists in a self-adjusting thimble, combined with a grooved cone, through the grooves of which the yarns are run and kept at a proper tension. It has also the advantage of being arranged to make rope from strands as well as from yarn, and is compact and simple in construction. As rope-walks are very liable to take fire, owing to the great amount of combustible materials used—tar and grease—it appears to us that as these short machines can be placed in compact fireproof buildings, they will ultimately supersede, at least in many cases, the long rope-walk machinery now in use.

WOOD PLANERS.

A compact and neat planer adapted for joiners and cabinet-makers, to reduce short lengths of boards, plank, &c., to any desired thickness, is exhibited by H. B. Smith, of Lowell, Mass. It is built on the Woodworth principle, with rotary cutter and feed pressure rolls. It is capable of planing stuff twenty inches wide to any thickness. The feed table is raised and lowered by a screw, and an index and pointer indicates its exact distance in inches and fractions from the cutter; and as the lower feed roll is attached to this table, it follows that the board can be fed in exactly and conveniently to be reduced to any degree of thickness. It is well adapted for small shops, as it can be operated with a very small amount of power, by running a board through once or several times, and taking a limited cut on each occasion. It occupies but a few feet of space, and produces excellent work. This is but the second machine of the kind yet manufactured.

There are four large planing machines exhibited. The most peculiar of the number is that of C. H. Denison, of Green River, Vt., patented Feb. 12, 1856, and illustrated on page 57, Vol. XII., SCIENTIFIC AMERICAN. It has a large circular ring bed or feed table, and a rotating plane with pressure rollers on each side. This machine is of large dimensions, capable of executing an immense amount of work, and is manufactured at Fitchburg, Mass., by the Fitchburg Foundry Machine Company. A full description is given of it on the page referred to above.

James A. Woodbury, of Sudbury street, Boston, has his "Edge Cutter" for notching boards and planks on the planer which he exhibits. This tongueing and grooving device was patented on the 21st November, 1854, and illustrated on page 169 of our last volume.

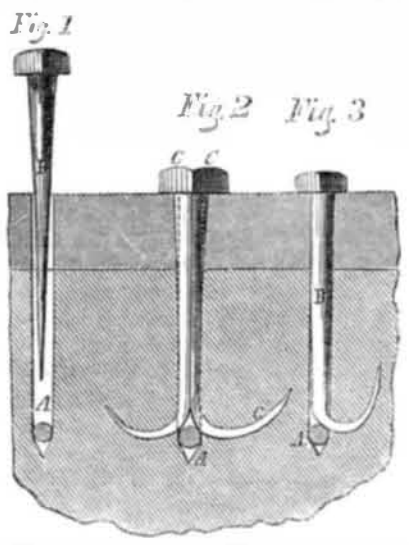
Messrs. Jones & Crowell, corner of Elm and Franklinstreets, this city, and Messrs. Ball & Ballard, of Worcester, Mass., are exhibitors of the other two planers. All these machines have rotary cutters and pressure feed rollers, and are well constructed to execute good work. There is not a single *line cutter* in the Fair, if we recollect rightly; either one or more line cutters have been exhibited at every previous occasion of the same kind.

DOUBLE BRICK MACHINE.

There is but one brick machine in the Fair, and it is only a large working model. It is that of W. T. Wood, of Hartford, Conn., patented on the 3d of February last. It presses and discharges a set of molds at each side, and is therefore "double action." The clay and sand are fed into a pug mill, the vertical shaft of which passes down through the bottom, and has two cams on it which discharge a mold from each side at every revolution. At the same time that a mold is filled from the pug mill, a plunger is also forced down at each side by a cam, and presses the tempered clay in the mold box, which has gates upon it for discharging stones, &c., that may be in the clay. It is a very simple machine of the kind, and is capable of pressing forty thousand brick per day.

BATES' SELF-CLINCHING SPIKE.

The accompanying engravings represent a very simple and cheap mode of securely clinching spikes when driven but partly through timber. It is the invention of Mr. Horatio Bates, of this city, and was secured by patent on the 7th of March last. It consists in boring in the timber a hole of lesser depth than the spike or nail to be received, and dropping or inserting therein in advance of the



spike or nail a ball or other piece of iron or any hard material represented by A. When the spike, B, is driven, the point coming in contact with A is deflected, and the end is caused to curl up in the timber in the form of a hook, and thus to clinch itself as shown in Figs. 2 and 3.

Fig. 3 shows a single spike thus driven. The point can be made to turn itself in any desired direction, to avoid running out of the stuff, or to avoid contact with any other spike or bolt, by simply touching the point with the hammer, and giving it a slight bend in the the desired direction before inserting it.

Fig. 2 represents two spikes, C, similar to the last, except that each carry a head on one side only. On driving two such spikes at the same time, each with the point turned slightly away from the other, the clinched points are securely anchored on each side as represented.

Corpus Christi, Texas.

A correspondent, Mr. D. S. Howard, of Albany, N. Y., the inventor and patentee of the Dredging Machine described and engraved on page 304, Vol. 11, SCIENTIFIC AMERICAN, has sent us a communication in regard to Corpus Christi and its adjacent country, from which we condense the following: "The country is fast filling up with emigrants of the most reliable kind, as they pay for their land in advance. Cattle of the finest description are easily reared in this region with no more care than simply marking them and turning them out to graze where they can. Horses seem an almost spontaneous production of the soil, although from their roving habits they are not of so fine a quality as the cattle. The settlers make water holes by damming up the ravines, which fill with rain, and they never become stagnant in the hottest weather. The climate is genial and a healthy breeze blows from the sea during the warm weather. The nearest port to the Pacific is Corpus Christi, being 100 miles nearer than any other on the Atlantic or Gulf coast. It contains 2000 inhabitants who are daily becoming more numerous. The country is subject to droughts, but heavy dews supply the place of rain, so that seed time and harvest come in their appointed seasons. A canal is now being cut between Aransas and Corpus Christi bays, which will admit sea-going vessels to the wharves of the latter city." This is being done by one of Mr. Howard's machines which is working to great satisfaction, as it does its duty cheaply and well.

THE EMPEROR OF RUSSIA IN THE HANDS OF YANKEES.—This distinguished personage is at loggerheads with Colonel Colt in relation to a contract for fire-arms. Both parties have sensibly agreed to submit the matter in controversy to Adjutant General Cooper, U. S. A., George S. Hillard, Esq., of Boston, and Hon. Loren P. Waldo, of the Supreme Court of Connecticut, who are now hearing the case in Hartford.

CORN AND WHISKEY.—At a recent convention of whiskey makers held in Cincinnati, O., it appeared that twenty-three establishments (a small part of the whole) consume daily 14,000 bushels of grain—in round numbers over 5,000,000 bushels a year. This is using bread to destroy bread. Thousands, by using the whiskey thus made, find themselves and children starving for want of the grain of which it is made.

CLOSE GUESSING.—Some time ago, the editors of the Mobile *Tribune* offered a handsome silver service, worth $300, to the person who could make the best guess as to the amount of the cotton crop of 1856-7. W. B. Hamilton, of Mobile, estimated 2,939,537 bales. The total crop is 2,939,515 bales; the estimate being being only 22 bales above the actual receipts.

FIRE.—The town of Columbia, Cal., was nearly destroyed by fire on the 26th of August, within the space of three hours. The fire was caused by an opium smoker, and originated in a brothel. Several lives were lost, and property valued at $600,000 destroyed.

THE CAPITOL AT WASHINGTON is to be a magnificent structure when completed. The old buildings cost $3,000,000, and it is estimated that the extension will cost $7,000,000 more. $1,500,000 is to be expended on the new dome. It will be a work of great architectural beauty.

MORMONS.—This interesting band of modern Tarquins are preparing to fight the general government. Rumor says that Brigham Young has been arrested for treason, and hurried off to Washington for trial. We hope this may prove true.

PATENT OFFICE.—The newly appointed Examiners are reported as being very liberal in their views towards inventors, and will give them the benefit of any doubts that may arise in the examination of their cases. This will be good news for inventors.

COAL MINES.—A large party of men have commenced to work the San Diego coal mines. It is thought that in a short time these mines will yield a better quality of anthracite coal than is now sent to California from Pennsylvania and New York.

A RICH INVENTOR.—Mr. Muntz, patentee of an improved yellow metal for sheathing of ships, recently died in England, and left personal property, wholly irrespective of his real estate, amounting to $3,000,000.

EARTHQUAKES AND GOLD.—Gold countries seem to be as full of earthquakes as of precious metals. New mines have been discovered in California, and another earthquake has visited that country.

HONEY BEES.—A practised aparian recommends that bees should be covered up in the winter, giving a small vent for the air. They live on one-third less food by so doing.

STRAW BONNETS.—There are annually manufactured, in the town of Franklin, Mass., 7,000,000 straw bonnets; and in the town of Foxboro', near to it, as many more.

GOLD.—The steamer *Star of the West* arrived at this port on the 4th inst. with treasure to the amount of $1,268,734.