

described in our columns quite recently. Perhaps, for the benefit of subscribers in foreign countries, who may not have received their numbers regularly, it may be well to say that it is a ball governor, the balls being very small, and revolving with much greater velocity than is usual, their centrifugal force being partly counteracted and balanced by a weight hung around the shaft. It is exceedingly sensitive and prompt in its action.

Sanborn's book-binders backing machine is a capital thing for the purpose. The machine on exhibition is as finely finished a piece of work as one would care to see, and it has the advantage over the one made last year, of being much stronger throughout. Mr. Sanborn also shows a book-piercing machine for power. A cam on a shaft raises a crossbeam, in a slot in which are fixed piercers at any required distance apart, and the work is done with neatness and dispatch. For binders who do not require a machine run by power, there is one of a smaller size to be worked by a treadle.

J. B. Mooney, of Cincinnati, has a machine for cutting bolts. The bolts are passed through a hollow spindle and into a pair of clamps, and the dies are so constructed as to cut with one motion. It obviates the fitting-up of dies, as a straight steel will do by putting a thread on. The barrel machinery of Smith & Gouchers must be capable of doing capital service in the oil region of Pennsylvania, if the specimens, consisting of cisterns and tanks on exhibition here, are of its production. Certainly no one could desire neater nor better fitted work than they exhibit. Steptoe & McFarlane show a tanning and a molding machine of elegant workmanship; and John Lemon, of Cincinnati, a hoisting apparatus which merits a notice. The platform travels up and down between the guides by means of a rack and pinion, while an endless belt running from the top to the bottom of the building is driven by the engine. All danger of the falling of the platform in case the belt should break is obviated, since it is sustained by the rack and pinion; and supposing that the belt shifter should fail to work when it might be desired to stop at a given point, the man on the platform can still control its progress by slacking the belt by means of an ingeniously contrived lever placed close at hand.

Attracted by a knot of persons gathered about some object of interest, I pushed my way through and found one of your foster children at its work. The machine for making stove pipe, invented by M. C. Root, of Toledo, and patented through your office, seems to be capable of doing at one operation what our tin-smiths are now doing at five. The usual routine followed in making a length of stove pipe, is, first, to turn the edge with one machine; second, to form the pipe with another; third, to make the seam by hand; fourth, to draw the end in by hand; and fifth, to put on the swedge or bead. These various details are merged into one operation by the ingenious Mr. Root. He has arranged four rollers—three in a line, and one back of them. The sheet is passed between the middle and lower rollers where it gets its edge and groove, then it goes over the middle and back rollers, and under the top one by which time the pipe has been formed, its seam flattened, been bearded or swaged, and the end contracted, which completes the operation, and turns it out as neat a joint of stove pipe as you ever saw in your life. The machine is worked by a crank and treadle, does the work of three men, and costs only \$40.

One corner of the grand saloon, up stairs, is occupied by an extensive display of carved rose-wood and walnut furniture, from the shops of Mitchell & Rammelsberg. In the very foreground of this collection of household luxuries, is a walnut arm-chair, in which the Cincinnati people hope Baron Renfrew may sit when he comes here in the course of his travels. The back is surmounted by the royal arms of Great Britain, carved in the wood, and supported by graceful columns around which are entwined various appropriate emblems. The covering is of silken damask, and in the piece which covers the stuffed back, are woven the same insignia of royalty.

William Wood & Co., of this city, make a fine show of paints, which are said to be fair samples of the articles they sell. One of the jury of award who has had this department under investigation, informs me that in quality and tone these paints are, if anything, superior to those we make in New York, and that there is actu-

ally no necessity for western men to be any longer dependent upon the metropolis for their supplies. The cases of philosophical instruments from the manufactory of James Foster, Jr., would do credit to Pike, or even old Sol Gills, that wonderful gentlemen, who, we are told by Cap'n Ed'ard Cuttle Mariner, of England, could make a watch. Mr. Foster's skill is further shown in the "chronograph" invented by Professor Mitchell, for measuring time during his astronomical observations at the Cincinnati Observatory.

T. Bass, whose sign-card hung on the heap of baskets here, shows that "they are home-made," certainly deserves credit for his selection of the willows from which the large and small baskets and bird-cages are made, as well as for the admirable workmanship which they indicate him to possess. It may well be a question for our farmers to discuss, whether it is worth our while to pay Germany and France something like a million dollars annually, for willow and willow-ware, when the articles can be produced as cheaply and good as they are abroad.

Miles Greenwood for some cause or other, doubtless from press of more important business, makes a small show of his goods this year. There is a case and some loose samples of beautiful brass castings, and a new valve in the lot is both novel and excellent, but in comparison with what he might have done, his contribution to the Institute this year, is but a drop in a bucket. Mr. Greenwood took hold of Fawkes's steam plow last year, and improved it very materially, I hear. The plow-frame is now made of angle iron instead of wood, as formerly, and works much better both for raising and lowering as well as draft. The machine has been down to Mr. Sullivan's mammoth farm in Illinois, where Fawkes has contracted to break a thousand acres this season. He has finished threshing about ten thousand bushels of wheat for Mr. Sullivan, and has more work of the same sort laid out.

#### RECENT AMERICAN INVENTIONS.

##### COMPASS PROTRACTOR

The object of this invention is to produce an instrument which enables an inexperienced hand, and also a person not acquainted with the manner of making a calculation, to take the necessary observations for the purpose of determining the ship's course to a given point, or the bearings of surrounding objects, or the position of the ship from bearings; and the invention consists in the combination with ordinary parallel rules of a movable circle, graduated as a compass and provided with a semicircular opening with the exact center of the circle, marked therein in such a manner, that by the combined operation of said circle and the parallel rules, all the operations for the purposes above stated, can be made in a simple and easy manner, and without the necessity of any calculation. F. H. West, of San Francisco, Cal., is the inventor of this instrument, and he has assigned his full right to F. S. Seabury, of Stoney Brook, N. Y.

##### SADDLE TREE.

The object of this invention is to obtain a gig saddle tree, by which a saddle tree may be constructed to fit any horse, and thereby avoid injuring or galling the back of the animal, a contingency of frequent occurrence as saddles have been previously constructed. The invention has for its object the simplifying of the manufacture of gig saddles, especially those of a superior kind, and to render the same more elastic and neat in appearance, stronger and more durable than usual, the invention being applicable to all kinds of gig saddles, such as silvered and japanned seats, jocky-covered seats, &c. This invention was patented to S. E. Tompkins, of Newark, N. J.

##### ATTACHING HANDLES TO SAWS.

The object of this invention is to attach handles to a cross-cut saw in such a manner that they may be firmly secured to the saw, and at the same time admit of being readily removed when necessary, in order that the saw may be drawn longitudinally from the kerf when the log presses or binds against its upper surface, and prevents a vertical withdrawal of the same, a contingency which always occurs where the log is not supported so that its outer ends will fall when the cut is made, and this cannot always be effected, especially with large logs, which are mostly sawed on the ground. This improvement was designed by Isaac Pelham, of Ithica, N. Y.

#### REPORT OF THE TRIAL OF STEAM FIRE ENGINES AT RENSSELAER COUNTY FAIR, TROY, N. Y.

[Reported expressly for the Scientific American.]

On Thursday of last week, the principal steam fire-engine builders assembled at Troy, N. Y., for the purpose of testing the merits of their several machines, and to arrive, if possible, at some definite conclusions respecting the merits of the various plunger and rotary pumps employed by them. The day set apart for the trial was the 27th ult., and at the hour specified the several engines made their appearance on the grounds, drawn either by hand or horse-power. We have not room for the meteorological report of the Smithsonian Institute, which was taken for us, but the wind was light through the day, except at intervals, when it blew quite fresh from the West; indeed, had the day been specially selected from the year, it could hardly have been finer for the purpose. The sky was covered with sullen clouds until nine o'clock, when, having relieved themselves of a slight shower, they partially cleared away. The prizes to be awarded by the Fair Committee, of which William E. Hagan, Esq., was chairman, amounted to \$100, \$75 and \$50. In addition to these, it was announced from the judges' stand that the citizens had contributed \$200, to be awarded as the Fair Committee thought proper. Two tests of each engine were to be had—one to play from the pipe through 50 feet of hose, using such nozzles as the exhibitors pleased, for 30 minutes from signal. The other test was in the case of first-class engines, to pump, through 800 feet hose, 18 inches against time, out of a tank 15 by 22 feet in measurement, and not quite three feet in depth. In respect to the second class pumping on quantity, they were to work on the tank for 15 minutes from signal; the amount of water discharged in that time to be estimated by the judges. The exhibitors were allowed 15 minutes from the tap of the bell to get ready. At the second tap they were to start fire and play for 30 minutes, as previously set forth.

The engines entered for competition were as follows, in the order of playing:—Messrs. Lee & Larned, Novelty Works, New York City.—Self-propelling steamer *Niagara*; weight, 11,500 lbs.; size of steam cylinders, 7½ inches diameter by 14 inches stroke; capacity of pump (Carey's rotary), 1,200 gallons per minute. Hand engine No. 5, of this city, same makers—horizontal steam cylinder, 7 inches diameter by 8½ stroke; capacity of pump, 220 gallons per minute; weight, 4,448 lbs.; with one gage of water in boiler and no water tank. *Mechanics' Own*, same makers; same size cylinder and pump; weight, 4,278½ lbs.; water in boiler; no tank. Steamer *Southwark*, Philadelphia (this engine played last), same makers—horizontal steam cylinder, 9 in. diameter by 8½ in. stroke; capacity of pump, 600 gallons per minute. Amoskeag Manufacturing Company, Manchester, N.H.—Hand engine No. 2, weight, 4,858½ lbs.; size of steam cylinder (vertical), 8 in. diameter by 12 in. stroke; size of pump (plunger pattern), 4½ in. diameter by 12 in. stroke; capacity of pump, 251 gallons per minute; no air chamber on pump. Steamer *Huron*, same makers, first-class engine—size of steam cylinders, two direct acting vertical engines, respectively 8 in. diameter by 12 in. stroke; two plunger pumps, 4½ in. diameter of plunger by 12 in. stroke; weight, without fuel or water, 6,030 lbs.; wood and water, 7,100 lbs.; capacity of pumps collectively, 600 gallons per minute. Silsby, Mynderse & Co., Seneca Falls, N. Y.—One first-class engine, rotary pump and engine (Holly's patent); weight, 6,049 lbs.; air chamber on pump; size of steam cylinders not given; capacity of pump, 600 gallons per minute.

These are all that were entered by prominent manufacturers; others were expected, but failed to arrive. We must not omit, however, to notice one machine entered for competition, which will certainly, if it grows a little, create a great revolution; this is the handwork of Charles Fichtel, of Philadelphia. Size of steamer built by Charles Fichtel, horizontal steam cylinder, 4-8ths of inch diameter by 6-8ths of an inch stroke; capacity of pump, one nut-shell. This was really the neatest specimen of workmanship we have seen for some time. The whole affair weighed but 2½ pounds, and was an exact *fac-simile* of the Lee-Larned engine, even to the Worthington pump which supplied (?) the boilers with water, whose cylinder was only ¼th of an inch in