

[For the Scientific American.]

EXHIBITS OF FOREIGN TECHNICAL SCHOOLS AT THE CENTENNIAL.

Although technical education in Europe is far more general than in the United States, the importance of presenting its methods, for study at the exhibition, seems to have been overlooked by most of the countries represented. The exhibits from foreign technical schools, however, although quite limited in extent, possess many interesting features, and are worthy of at least a brief record. The schools represented may be classed as those for artisans, which are designed to supply, as far as possible, the place of the old apprenticeship, which now exists only in name, and the schools for engineers, in which a higher grade of education is attempted, combined with extensive practice in the details of the profession which the student proposes to adopt. It is not improbable that the directors of our own technical schools can derive many valuable hints from a study of the methods adopted abroad.

RUSSIA.

The elegant manner in which Russia displays her exhibits at the Centennial is suggestive of an imperial exhibitor, and will go far to atone for the delay in opening them to the inspection of visitors. Those persons, however, who have been accustomed to look upon Russia as the abode of barbarians will find that civilization has much to learn from her display. But at present attention must be given to the technical exhibits, which occupy a prominent place in the Russian section in Machinery Hall.

1.—*The Imperial Technical School of Moscow.*—This school, under the direct patronage of the government, is richly endowed, and is provided with ample resources for both practical and theoretical instructions. There are school workshops, in which students are instructed until they are prepared to enter the general shops, in which skilled workmen are employed and machinery is regularly manufactured for sale. The course is 3 years, and the annual expenses are \$225 for students who board in the school, and \$75 for day scholars. The methods adopted for practical instruction are worthy of careful study. The professors recognize the fact that practical manipulation can best be taught by proceeding in a regular system of graded steps. If, for instance, a student is to acquire a knowledge of the art of filing, he first is shown the peculiarities of different kinds of files, as illustrated by models 24 times the size of the originals. He then passes to cleaning and chipping castings, is taught to file thin edges to given lines, and is advanced, as he becomes proficient, to filing plane surfaces, two rectangular planes, planes making acute and obtuse angles with each other, cubes, and so on, through a variety of steps, the full enumeration of which must be omitted for want of space. The same system, which is briefly described above, is pursued for the course of instruction in forging, in turning in wood and metal, in fitting up machinery, and the like. The results of such a system, carefully followed, cannot fail to be most gratifying. Not the least among its meritorious features is the plan of representing cutting tools on a very large scale, so that their peculiarities can readily be recognized by the students. The cases of tools and models on a large scale, as exhibited at the Centennial, are made at this institution for sale. They would be a useful addition to any of our technical schools; and the present exhibits at least should be secured, if possible, for some one of our industrial workshops.

2.—*The Practical Technological Institute of St. Petersburg.*—The exhibit of this school admirably supplements the one described above, the results of the methods, which are essentially the same as at the Moscow school, being practically illustrated. Thus, the consecutive tasks in finishing cast iron, wrought iron, turning, and fitting, are all displayed, the last being represented by a good assortment of machine tools, consisting of planers, lathes, slotters, drill presses, and vises. A careful examination of these tools will show that they compare quite favorably with the average work turned out from regular establishments in this country.

The course at the St. Petersburg school covers five years, and has two departments, mechanical and chemical. In the mechanical department, 648 hours of the course are devoted to labor in the workshops. The other technical schools represented at the exhibition, of which brief mention will be made, are designed for the sons of artisans, and give instruction which is chiefly practical, with courses in elementary mathematics, physics, and drawing, such as will be of substantial service to the workman who desires to rise in his profession.

SWITZERLAND.

The Free School of St. Gall, for Merchants' and Artisans' Apprentices.—The students of this school are instructed in drawing, modern languages, book keeping, woodworking, and modeling. Specimens of their work, in wood, plaster of Paris, and clay, with drawings made by them, are exhibited.

HOLLAND.

The Artisans' School, Rotterdam.—This school is supported by subscriptions, and grants from the government. It was founded in 1869, in order to instruct boys in the rudiments of the trades which they proposed to follow. The tuition fee is merely nominal, being about ten dollars a year. The course covers a period of 3 years, and students on entering must be between the ages of 12 and 15. After they leave the school, the authorities endeavor to find places for them as workmen, and exercise a general supervision over them for five years longer. During the time they are at school, the boys are made to work at their several trades,

the brazier manufacturing kettles, basins, etc.; the smith, nails, locks, etc., and so on; and each is instructed in drawing, with reference to his special profession. Numerous articles constructed by students are exhibited. A few hours every day are devoted to the study of arithmetic, algebra, geometry, and mechanics. The results of this course of instruction are stated to be most gratifying, the boys being eagerly sought after by manufacturers on leaving school, and receiving much higher wages than other boys of the same age who have not been to a practical school.

Philadelphia, Pa.

R. H. B.

Incendiary Telegraph Wires.

The building of the Western Union Telegraph Company in Philadelphia recently caught fire in a curious manner. The flames broke out in the receiving box—a large cupola-like structure on the roof, into which over three hundred telegraph wires pass in their way from the operators' room to the poles in the street. The fire was quickly subdued, without material damage other than the destruction of the wires and the drenching of the building with water. Subsequent investigation into the cause gives rise to the belief that a short line wire must have touched the earth and made a return circuit, possibly communicating with a sixty-five cell Grove battery of great intensity, which speedily rendered the wire white hot, and thus ignited the adjoining woodwork.

A New Use for Iron.

One of the most inappreciable discoveries—if it be true, which is questionable—that we have ever encountered is announced in a recent French journal by M. Massie. He says that the mere introduction of an iron bar, in the box in which barley, rice, bran, biscuit, and like farinaceous materials are stored, is sufficient to prevent either the ravages of decay or the attacks of insects. Full details of the experimental investigation are given. An iron bar 3 lbs. in weight is reputed to have protected 40 gallons of grain; and certain biscuits were preserved for seven months in excellent condition, while others, under like circumstances but without the iron, were totally destroyed by weevils.

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]

From June 27 to July 13, 1876, inclusive.

AUTOMATIC TELEGRAPH.—R. E. House, Binghamton, N. Y.
BINDING GRAIN.—Johnson Harvester Company, Brockport, N. Y.
CHAIN SWIVEL, ETC.—V. Draper, North Attleborough, Mass.
COUPLING, ETC.—S. Poole, Boston, Mass.
FASTENING BOOT SOLES, ETC.—G. V. Sheffield *et al.*, Brooklyn, N. Y.
FLOURING PROCESS, ETC.—V. B. Ryerson, New York city.
HAMES, ETC.—W. Robinson, Newburgh, Minn.
HARVESTER.—W. E. Kelly, New Brunswick, N. J.
HORSESHOE MACHINE.—H. J. Batchelder, Fitchburg, Mass.
KNITTING MACHINERY.—M. Marshall, Lowell, Mass.
LAMP BURNER, ETC.—H. A. Chapin *et al.*, New York city.
OIL TANK, ETC.—C. A. Munger, New York city.
PREPARING FLAX, ETC.—J. Good (of Brooklyn, N. Y.), Leeds, Eng., *et al.*
RAILWAY COUPLING.—J. C. Mitchell *et al.*, Lancaster, N. H.
RAILWAY WHEEL.—W. A. Miles, Copake, N. Y.
REAPER AND MOWER.—G. Pye, Hyde Park, Mass.
REAPER COMPRESSOR, ETC.—S. Johnston, Brockport, N. Y.
REDUCING IRON ORES.—T. S. Blair, Pittsburgh, Pa.
REFINING IRON, ETC.—W. Sellers, Philadelphia, Pa.
REVOLVING PISTOL.—O. Jones, Philadelphia, Pa.
SAW FILE GUIDE.—E. Roth, New Oxford, Pa.
SEAMING KNIT GOODS.—C. J. Appleton, Elizabeth, N. J.
SEWING MACHINE.—F. D. Ballou, Marlboro', Mass.
SEWING MACHINE CUTTER.—L. L. Barber, Boston, Mass.
SIGNAL, ETC.—J. Gordon, Cal.
SMELTING ZINC.—F. L. Clerc, Bethlehem, Pa.
STEAM ENGINE.—H. S. Maxim, New York city.
TRAVELLER.—S. Poole, Boston, Mass.
UMBRELLA FRAME.—R. G. Radway *et al.*, New York city.

Recent American and Foreign Patents.**NEW WOODWORKING AND HOUSE AND CARRIAGE BUILDING INVENTIONS.****IMPROVED WAGON STANDARD.**

Jacob Metz, Vernon, Ill.—This is an improved standard for the bolsters of wagons, so constructed that it may be readily and quickly attached and detached. It also enables a pair of bolsters to be ironed with less labor. It consists in castings bolted to the bolster and the base of the standard, connected with the said castings by tongues and grooves, and with the bolster by a spring bolt.

IMPROVED CHIMNEY AND VENTILATING FLUE.

Amos H. Bourne, Fort Scott, Kan.—This invention consists of a chimney and ventilating flue constructed of plastic material, the smoke flue being a clay pipe, which is placed in the center of the ventilator, the last being a cement case surrounding the pipe. There are four ventilating passages between, and at two opposite sides are ribs fitting in grooves of the pipe to secure it in place. The exterior case with passages is also for protecting the building from the heat of the smoke pipe.

IMPROVED SAW CLAMP.

Joseph Shelly, Mariposa, Cal.—This consists of clamping jaws, that are adjusted by stationary and sliding clamp pieces, screw bolts, and nuts, to the saw, in connection with a central spring pin, and grinding and locking bars for holding and turning circular saws in the clamp.

IMPROVED SAW MILL.

William E. Hill, Erie, Pa.—The logs are fed against the saws, and cut by the downstroke of the same, producing, by the slight inclination during the downstroke, the equal cutting of all the teeth, until at the lower part of the downstroke the saws are carried back far enough to give the sawdust a chance to drop or fall out before the saws get any perceptible upward motion. This prevents the teeth from carrying the sawdust back up into the cuts, and avoids thereby the choking or clogging of the saw teeth while coming down for the next cut. The receding of the saws from the cuts admits the regular forward feed of the logs during the rearward oscillation of the saws, and brings the saw teeth, at the completion of the upward stroke, forward again, to meet the cleared cuts and cause the cutting of the logs exactly at the commencement of the downstroke. The cutting is thus accomplished in the shortest

time compatible with the clearing of the cuts. The feed rollers are geared to prevent the cant or log from rising or lowering when it feeds up.

IMPROVED FENDER FOR CAR WINDOWS.

Raphael P. Proctor, Edinburg, Va.—This improvement is in the form of a hood or funnel converging to a cylindrical tube at its lower extremity, and pivoted to a bracket beneath the car window, to adapt it to be turned to either side thereof, and then secured by a catch, which is likewise pivoted to said bracket.

NEW HOUSEHOLD INVENTIONS.**IMPROVED WELL AND CISTERN TOP.**

John M. Bull, Sidney, O.—This invention consists of a platform with hinged door and recess and pump arranged at the top part of a sediment-collecting pot at the bottom of the cistern or well.

IMPROVED LAMP BRACKET FOR SEWING MACHINE TABLES.

Frank T. Knauss, Scranton, Pa.—This is a folding lamp stand, arranged so as to be vertically adjustable on a bracket, which is to be attached to the sewing machine table by screwing to the under side. The object of folding the stand is to dispose of it compactly when not in use.

IMPROVED SASH FASTENER.

Gustavus H. Reck, Bethlehem, Pa.—This consists of a bolt for locking the sash, and a spring presser for holding the sash up by friction, so combined that the locking bolt is thrown out of action by the act of unlocking it and raising the sash. It does not interfere with the function of the presser, nor act upon the jamb so as to injure it, and is put in action again by the closing of the sash down. The invention also consists of a novel contrivance of the spring presser and the handle for working it, to apply the pressure and release.

IMPROVED CHAIR.

William T. Doremus, New York city.—The back frame of this chair is so constructed as to hide the springs and the devices by which the seat is connected with the pedestal.

IMPROVED WASHING MACHINE.

William H. McFarlen, Dysart, Iowa, assignor to himself and G. Aschenbrenner, of same place.—This is an improvement in that class of washing machines in which an endless carrier, formed of slats placed side by side and attached to belts, or otherwise flexibly connected, is arranged to travel in contact with one side of a rotating drum, and thus rub and cleanse the clothes by their combined action. The improvement relates to so arranging the endless carrier that it nearly encircles the drum, space only being left for the introduction and removal of the clothes.

IMPROVED LAMP REFLECTOR.

Martin P. Warner and Jabez F. Warner, Morrison, Ill.—This is a reflector covered at the reflecting surface with a thin layer of mica. The device is applied to the lamp by spring clamps at the lower end, which are bent of one piece of wire and attached by forward extending arms to the lamp at the juncture of burner and bowl.

IMPROVED OSCILLATING CHAIR.

Stephen C. Osgood, Georgetown, Mass.—In this device there is a combination of the knife-edged pivots of the seat frame with the spring-cushioned bearings of standards, to produce the giving of the seat when sitting down.

IMPROVED WASHING MACHINE.

Joseph Klein, Allentown, Pa.—This consists of a revolving endless belt made of hinged, grooved, or corrugated sections set into a wash tub, and of a reciprocating rubber with elastic ribs working thereon.

IMPROVED MOSQUITO NETS AND CANOPIES.

Mrs. C. Ballou, Watervliet, and G. G. Lee, Paw Paw, Mich.—This invention is an improvement in that class of nets or canopies which are applied to beds and other articles of household furniture, to exclude mosquitoes, flies, and other insects, and consists of a series of folding frames having their respective arms or end bars pivoted to common centers to adapt the frames to open and close like the leaves of a fan, and in a clamping device for adjusting and holding the pivoted frames in the desired position, also in the construction of the longitudinal main bars of the frame, also in other features.

IMPROVED STOVE POLISH.

Charles H. Curfew and Alfred Hall, Fiskedale, Mass.—This is a compound of plumbago, nitrate of silver, salt, and cream of tartar, said to produce a brilliant polish with little labor.

IMPROVED MEAT TENDERER.

John Roemer, Champion, Mich.—This consists of a handle and corrugated squeezing plate, pivoted to a stationary corrugated plate by means of a vertically sliding pivot block. Over the latter is a strong spring, to allow the pivot block to rise in case the steak is thick and hard, and an adjusting stop screw to limit the rise of the pivot block, as required for steaks of different thicknesses. Under the block is a light spring, to prevent the block from dropping down too low when the steak is removed.

IMPROVED CLOTHES LINE SUPPORTER.

Smith M. Knapp, Hoboken, N. J.—This is a crank for clothes lines, so constructed that the clothes may be put upon the line within the room, so as to avoid all danger of falling out of the window while putting out or taking in the clothes, and which will allow the window to be closed while the clothes are upon the line.

IMPROVED AUTOMATIC FAN.

Mrs. Laura E. Haack, St. Louis, Mo.—This invention consists of a spring with a gearing of spur wheels, contained in a suitable box or suitable frame, and operating a suitable fan, the said box being located in a convenient position above the bed, and supports in a detachable and peculiarly constructed frame, which consists of legs, having at the bottom forked feet, which fit upon the head and foot boards, and have in the top tenons, which fit into sockets attached to the box.

IMPROVED COOKING RANGE.

Thomas A. Carrington, Baltimore, Md.—This invention relates to an improved double cooking range, and it consists in the particular construction and arrangement of the ovens and furnaces, so arranged with respect to a common flue, and controlled by dampers, that the heat may be variously applied, at the top or bottom of the ovens, and either side of the range, with its oven and furnace operated and controlled as to its heat, independently of the other.

IMPROVED PETROLEUM COOKING STOVE.

Fredrick Hildebrandt, New York city.—The invention consists of a perforated sheet metal body resting directly on the lamp, and supporting an interior chimney that is connected at the top by an inverted conical diaphragm with the body. It is provided at the base with a burner-encircling cone inside of the chimney, to conduct the air both at the inside and outside of the cone to the flame of the burner.