

bards and hilts, and other ornamental parts of the sword, are also polished in much the same manner. In the case of scabbards, a larger wheel is used instead of the ordinary lathe brushes. When polished, the blade is ready for the hilt and scabbard; so we will now see how these are made. And first for the scabbard.

MAKING THE SWORD SCABBARDS.

In making a scabbard, the workman takes a piece of flat steel cut to the required size. He first places it on the top of an open vise, and beats it with a wedge-shaped wooden mallet, bringing the two edges closer together each time it passes along the vise. It is then beaten on both sides until they almost meet; a mandrel is then put down it, and the steel beaten close round the mandrel, both edges being hammered over. The edges are then soldered. It is next beaten on an anvil all round, the mandrel is withdrawn, and the scabbard is ready for the drag, which is a piece of iron fitted to, and fastened on, the bottom of the scabbard. The bands are then put on, and the scabbard, after being filed and smoothed, is ready to be polished.

MAKING THE SWORD GRIPS.

The making of the grips is also a very interesting bit of work. These are the handles by which the sword is gripped, hence the name. A grip at first is a bit of walnut, oblong in shape, but narrower at the end than the top. The back, which is made of metal, is placed on it, and the wood is worked into the required shape by files. A large number of different shapes, sizes, and cutting powers are used in this work. When the top has been cut, the grip shaped, and the tenon for the ferrule made, it is then "balled." For this purpose it is fastened in a vise, a three-sided file cuts a deep indentation at regular intervals, each division is rounded or balled by a file, and the indentations connected by slanting interstices cut by a handsaw. The grip is then drilled through in a lathe, for the purpose of receiving the tang. When this has been done, a piece of the skin of a dog fish, which has been a long time soaked in water, is cut off. Every bit of flesh on the inside of the skin is then carefully cut off, and a piece of pure skin is left. This is put round the grip, a piece of string or wire is fixed by a loop to a piece of steel fastened in the vise, and the workman binds the skin tightly round the grip by winding the string or wire round the space between each ball. It is then filed and the back fitted on again. In making a grip, it passes through the workman's hands no fewer than thirteen times.

DRESSING THE HILTS.

A hilt is at first a flat bit of metal of a peculiar shape, and may be cut to any pattern. A large number of these are used, which are all made to a regulation size. The pattern used is placed on the metal, which is then marked. They are then filed and cut by hand, beaten on blocks and knobs into the shape of the hand, and afterwards polished, and made ready to be fixed to the sword.

This is called mounting. In the cheaper swords, the blade is bought from one person, the hilt from another, the scabbard from a third, and so on. But in this manufactory every part is made in the works, and each piece is prepared to suit and fit the other parts, so that when fitted together the sword is firm and sound; and the parts never give way or become loose, as they do when stuck on to the tang of a blade without any reference to their weight or suitability for each other and the blade to which they are attached. In such cases the parts with little wear become loose and rickety, and depend only upon the small rivet at the top for their security. In ordinary swords the blades and hilts, after having been ground, filed, and polished, are taken into the mounting shop. There the tang is placed in the grip. The hilt is fastened on by passing a rivet into the top of the grip, and fastening it to the tang. The hilt is drawn over this rivet, which passes through a hole at the top. It is then filed and broken off at a short distance from the hilt. The rivet is then welked by being filed, and smoothed until it has the appearance of an ornamental knob, forming an integral part of the hilt. These swords are now complete. In the mounting of best work, great care and skill are required. In the mounting shop, a very ingenious tool is used, called a float. It is a long bit of steel, shaped almost like a tang, with a series of blades along its surface. The grip is worked to and fro on the float until it is cut to the exact size and shape of the tang on which it is to be fixed. Great skill is required in this delicate operation. In this mounting room the swords are proved. This is done by placing the point of the blade on the floor, and bending it backwards and forwards. After it has stood this test, it is subject to another. The workman strikes the blade strongly on a wooden block, both on the edge and back, and can tell by thering whether it is of true and perfect quality. By these tests the slightest fault or flaw would be detected, for a very small fault, indeed, would cause the blade to break.

The scabbards are lined. In the ordinary sword, two thin strips of wood of the shape of the scabbard are placed on either side, and they must fit so accurately that neither in drawing nor in sheathing the sword must the slightest obstruction be perceptible. In the better swords, leather is used in lining.

In the mounting and ornamenting of swords, any amount of artistic work can be employed either on the blade, the hilt, or the scabbard. The rank of the officer is indicated in this manner, and naval swords are ornamented differently to military. The work put on presentation swords is often most elaborate and expensive.

A NEW PAVEMENT, by Charles Pennington, of London, consists of a bed of concrete covered with an elastic layer, such as tar and tan bark. On this layer the blocks of stone are set, the crevices being filled with concrete.

A NEW SCIENTIFIC MUSEUM.

Operations have begun for the erection of the Peabody Museum in New Haven, which, when completed, will contain some of the largest and richest zoological, geological, and mineralogical collections in the world. The institution is founded under a bequest of \$150,000 from the late George Peabody, and is designed to bear the same relation to Yale College as the present Museum of Comparative Zoology does to Harvard.

The building will consist of a central edifice and two wings. For the present, only one of the latter is to be erected, with a frontage of 115 feet on one street and 100 feet on another. It will cost \$160,000, be built of brick with stone trimmings, fireproof, and contain, including basement four available stories.

The fourth story is assigned to archaeology and ethnology, the third to zoology, the second to geology, the first to lecture rooms and mineralogical collections, and the basement to working apartments and a large class of heavy specimens, showing fossils, foot prints, etc.

The Brazilian Telegraph.

The great ocean cable between Lisbon, Portugal, *via* the Azores, and Rio Janeiro, Brazil, is now complete and open for business. The charges from New York to Rio Janeiro are about \$2.50 per word. The message goes *via* England, and through some eight thousand miles of submerged cables. Complimentary messages have been exchanged between President Grant, the Emperor of Brazil, the President of the Argentine Republic, and the President of Uruguay.

Last year the section of the above cable between Lisbon and Madeira was broken, and so remained until the present summer, when the two ends were fished up, joined, and relaid. The depth of water at the place of fracture was 2,500 fathoms, or about 2½ miles deep, and the successful finding, raising, and joining of the broken ends at sea, shows the great perfection of mechanism and skill that has been acquired in ocean telegraph engineering.

Fast Trotting.

At the Buffalo, N. Y., races, August 7, the famous horse "Goldsmith Maid" trotted the mile in 2m. 15½s. After the race, the Maid was stripped and led in front of the judges' stand, when the immense crowd arose and greeted her with deafening cheers. Her driver, Budd Doble, was ordered on the judges' stand, where he received a becoming ovation. In 1867, the racer "Ethan Allen" trotted a mile in 2m. 15s. But both these performances were surpassed by one of "Goldsmith Maid's" three one mile heats at Rochester, N. Y., on August 12, which was trotted in 2m. 14½s.

Running horses make much quicker time than trotters. In 1850, the English horse "Black Doctor" is reported to have run the mile in 1m. 40s.

The Chassepot as Altered.

Two years ago, the French government decided to adopt the metallic cartridge in its military equipments, and an official commission was appointed to ascertain the best plan for altering the Chassepot rifles, one million or more in number, so as to receive the new ammunition. The commission has just decided to adopt the plan of alteration proposed by M. Gras, Captain of Artillery. The altered Chassepots will have a range of from one and a half to two miles. At a range of one and a half miles, the bullet has force enough to flatten against an iron plate. The accuracy of fire is very satisfactory.

The August Meteoric Shower.

In the vicinity of New York, clouds obscured the heavens on the evening of August 10, and few observations of meteors were made. But we learn from a correspondent at Martha's Vineyard, Mass., that, near Edgartown, many beautiful meteors were seen.

DECISIONS OF THE COURTS.

United States Circuit Court.—District of Massachusetts.

BOTTLE FASTENER.—PATENT OF H. W. PUTNAM, GRANTED MARCH 15, 1869 AND EXTENDED FOR SEVEN YEARS, FROM MARCH 15, 1873.—HENRY W. PUTNAM vs. EPHRAIM D. WEATHERBEE, et al.
[Heard at Portland, Me., July 10, 1874.]

Shepley, Judge:

In the view which I take of the first claim of this patent, which is "forming the fastener at the part that comes over the cork of a piece of wire of U form, with the ends returned and connected to the bottle, in order that the pressure on the cork or stopper may cause the fastener to hold more securely," as specified, "considering it in connection with the specification in the patent, it is not necessary that the wire which forms the U should be returned upon itself in a direction directly the reverse of that in which it is before the turn; but it is a sufficient compliance with the first claim of that patent if the wire, instead of being returned in a reverse direction from that which it had before, is returned at right angles, or approximately so, so as to be connected with the wire which encircles the neck of the bottle in the manner specified in the patent. In the construction which I give to this first claim there can be no question that the defendant's contrivance is an infringement. The only question, therefore, for consideration is whether the first claim of this patent be or be not a valid claim, and that question is one of significance, principally in its relation to the Alexander contrivance. The Alexander contrivance was considered by the Commissioner of Patents when this patent was granted. The disclaimer of the patentee clearly has reference to a contrivance like the Alexander contrivance; and, taking that into consideration, the Patent Office granted the patent. It has since been sustained by the adjudications of several of the federal courts, it has been in existence a long time, and it has been renewed by the Patent Office after the expiration of the original term. Under these circumstances I think this is a clear case, in which the patentee is entitled to the presumption, *prima facie*, which his patent gives, aided as it is by the long enjoyment and by the adjudications of the courts, and is entitled to protection by a preliminary injunction.

In the construction which I give of the claim, the only defence which could be maintained would be to destroy the validity of the plaintiff's patent, and I think, when the patent has been in existence so long, has been renewed after a contest, and has been adjudicated in favor of the patentee by the courts, he is entitled to the benefit of it until the adjudication of some tribunal shall decide that his patent is invalid. This case is pending in the Massachusetts district, and when the court is in session there, the order for a preliminary injunction will be issued. I do not express any opinion as to the question which has been presented in the hearing on this case as to the validity of the issue of this patent, with reference to the existence of the Alexander contrivance; but, as I have before said, I think the position in which the patent stands entitles the patentee, upon well established principles, to the benefit of the legal presumption in his favor on all that question decided.

[John E. Hatch and Fisher & Duncan, for complainant.
Benjamin F. Thurston, for defendant.]

United States Circuit Court, Southern District of Ohio.

PATENT BOILER FURNACE.—GIDEON BANTZ vs. JACOB ELSAS et al.
[In equity.—Before Swing, J.—Decided June, 1874.]

Swing, Judge.

The bill in this case alleges that the complainant was the original and first inventor of an "improvement in boiler furnaces for burning wet fuel," for which he received a patent, June 22, 1853; that he surrendered said letters patent February 6, 1872, and obtained new letters patent therefor, which were afterward extended for seven years from June 22, 1872. The bill then prays that defendants may be compelled to account for and pay over the profits of the infringement, and may be enjoined from making, vending, or in anywise using the patented improvement. It is claimed, by respondents, that there is no infringement, because the combustion chamber or reservoir of the complainant is one having a *cyma-reversa* bottom, with narrow throat, whereas the combustion chamber or reservoir of the respondents has not the *cyma-reversa* bottom, but has one which is flat and set inclined, and has a wide throat instead of a narrow one.

I think, however, that the leading idea of the complainant is found in a combustion chamber or reservoir arranged in its relations with the fire chamber and boiler, for a particular purpose, rather than in the particular form of the back or throat of such chamber or reservoir.

Decree for complainant.

[John E. Hatch and Fisher & Duncan, for complainant.
Jacob Schrader, for defendants.]

United States Circuit Court.—District of Massachusetts.

PATENT TABLE TRAY.—LUCY A. DHERTY, ADMINISTRATRIX, vs. JAMES G. HAYNES.
[In equity.—Before Clifford, Judge.—Decided May 29, 1874.]

Clifford, Judge.

Letters patent were granted to Nathaniel Waterman, on May 12, 1863, for an invention consisting of an improved table tray or waiter, as fully described in the specification, and the record shows that the original letters patent were subsequently surrendered and reissued, as alleged in the bill of complaint, and that the complainant is the sole owner of the described invention, as secured in the reissued patent on which the suit is founded. Various defenses are set up in the answer, of which the following are the only ones which require to be noticed:

First. That the invention is not patentable.
Second. That the person named in the original patent, as the patentee, was not the original and first inventor of the improvement.
Third. That the reissued letters patent were fraudulently obtained in violation of the rights of the respondent, and that the patent as reissued "covers more than was contained" in the original patent.

Decree for complainant.

[A. A. Ranney, for complainant.
C. D. Wright, for defendant.]

NEW BOOKS AND PUBLICATIONS.

AN ILLUMINATED HISTORY OF THE WORLD.

We have lately received an educational novelty, which, after examination, we can recommend to the notice of teachers and students as a valuable and useful aid to study. It is a chart, handsomely mounted and printed in colors, and in dimensions twenty-two feet long by thirty inches wide. Its aim is to teach the history of the world, biblical, ancient, medieval, and modern, ranging over the entire period of human knowledge, from 4004 B.C. to 1874 A.D., or 5,878 years of historic time. The plan adopted, which is a very ingenious one, is to represent the progress of time by a continuous black line, which is divided into centuries, decades, and years. Parallel with this are other lines, or streams, representing nations, and the division or flowing together of these indicates conquests, foundations of new States, and similar events. The arrangement of the map is such that the student sees at a glance exactly the condition of the world at any given date; and by the aid of colors, pictures, and similar helps, he is given an idea of the progress of arts, names and succession of rulers, and similar facts important to be remembered. We need not point out the obvious utility of this remarkable production, since it is well known that, while a person may readily master the history of one people, he frequently, in taking up that of another nation, is at a loss to connect contemporaneous events, and hence the various records remain detached in his mind, instead of uniting to form a single and detailed history of mankind. With the chart under review, such a difficulty need not be encountered, since the student, while at work upon the history of a single nation, need only glance at the map to be informed at once as to what the rest of the world was doing during the periods passed over. The execution of the work is excellent, and indicates an immense amount of labor and research on the part of the author, which should not go unrewarded. The length of the map necessitates its mounting upon rollers and arrangement in a neat frame, in which it is hung against the wall so as not to occupy more than three feet of space, suitable cranks on the ends of the rollers allowing the chart to be unrolled like a panorama. The author is Mr. S. C. Adams, of Cincinnati, Ohio. The price is \$15.

MANUAL OF PATENT LAW, with an Appendix upon the Sale of Patents. By William Edgar Simonds, Counsellor in Patent Cases. Hartford, Conn.: Published by the Author.

A concise and useful little book, explanatory of the patent law and practice.

Inventions Patented in England by Americans.

(Compiled from the Commissioners of Patents' Journal.)

From July 22 to July 30, 1874, inclusive.

CORSET CLASP.—J. P. McLean, Brooklyn, N.Y.
ELECTRIC TELEGRAPH.—R. K. Boyle, New York city.
ELECTRO-MAGNETIC GOVERNOR.—J. M. Bradford, Portland, Me.
FASTENING SEAMS.—J. W. Davis et al., San Francisco, Cal.
FAUCET.—F. Roach, Boston, Mass.
MATTRESS.—G. N. Torrance (of Philadelphia, Pa.), London, England.
NEEDLE-THREADING HOOK.—H. Wells, Woburn, Mass.
OIL FROM PETROLEUM.—H. W. C. Twiddle (of N. Y. city), London, Eng.
PACKING FOR BOTTLES, ETC.—O. Long, Boston, Mass.
REAPING MACHINE.—W. A. Wood Company, Hoosick Falls, N. Y.
SAFETY LAMP.—B. Tappan, Steubenville, Ohio.
SOLAR COMPASS.—C. T. Pierson, Ramapo, N. Y.
SPECTULUM.—E. D. Pappe, New York city.
STEAM PUMP.—W. Atkinson, Gardner, Ill.
STEEL MANUFACTURE.—T. S. Blair, Pittsburgh, Pa.
TAPE WEAVING MACHINE.—F. F. Burlock, Birmingham, Conn.
TRANSMITTING MUSIC BY ELECTRICITY.—E. Gray, Chicago, Ill.

Recent American and Foreign Patents.

Improved Fireproof Roof.

Frederic J. Hoyt, Batavia, N. Y.—The object of this invention is to render the roofs of buildings in blocks, or where built close to one another, not only waterproof but fireproof. The ordinary flat roof is built on an incline from front to rear, and is covered with a waterproof composition. The front wall is extended a foot or more above the roof. The side walls and rear wall are brought to a level with the front wall, leaving spaces in the side walls near the top, for fitting in joists three feet apart, on which, from front to rear, strips of wood are fastened on edgewise, one fourth inch apart. This is covered with a waterproof composition, on top of which is placed two to three inches of loose gravel, screened so that none will pass through the openings into the lower roof. The water passing through this upper roof falls on the lower roof, and runs off by conductors arranged through the wall and into the lower roof in the ordinary manner, which also serve as air holes to ventilate the space between the two roofs.

Improved Lantern.

Daniel Lordon, Fremont Center, Mich.—The bottom of the lantern is made double, with a series of holes connecting with a hollow space for purposes of ventilation, a chamber beneath the wick chamber, and a tube, connected therewith, which passes upward through the globe. An oil tube on the globe connects the oil chamber with the wick chamber. A wick in the end of the oil tube may be adjusted to allow the oil to flow to the wick chamber fast or slow. There is an inverted funnel over an opening through the oil chamber connected with the tube by which heat is conducted down beneath the wick chamber. A strong current of heated air passes up through the opening, and is caught by the inverted funnel. The oil in the wick chamber is thus soon heated, and the burners consequently afford a clear and bright flame.