



R. S. B., of Ill.—The best chemists regard it as settled that nitrogen forms a part of steel.

J. B. F., of Conn.—"Anastatic Printing" is a term which has been used for printing with plates of zinc, prepared by etching and transferred copies of prints.

G. W. C., of N. Y.—You will find full information respecting the examination of engineers for the navy, the amount of their salaries, and a great deal of useful information about the American navy.

M. C., of Pa.—Soluble glass would not answer, we believe, for coating the inside of petroleum oil barrels, as it would be liable to crack off when the barrels are rolled.

C. L. D. G., of Me.—Three pounds of salt and half a pound of white copperas (sulphate of zinc) are sufficient for mixing with a bushel of lime in making good whitewash for out-houses.

G. Q. J., of Mass.—A knowledge of elementary chemistry would be a great advantage to you in practicing the art of varnish-making.

M. C. L., of C. W.—It is generally estimated that 5-horse power will drive one run of mill-stones; though at the Metropolitan Mills in this city it takes just 10-horse power to each run with the bolting machinery.

E. S., of N. Y.—Fulton's first war steamer was provided with appliances to discharge steam and hot water into the vessel of an enemy, and thus convert it into a huge steaming-pan.

S. G. & Bros., of Ohio.—We are not acquainted with any other method of tempering the steel mold boards of plows to prevent their warping, than the exercise of care in the common mode of operation.

MULEY SAWS.—A correspondent desires to obtain information respecting the best length of pitman for muley saws. Different opinions and practices prevail among sawyers respecting the length of pitman to length of stroke.

Money Received

At the Scientific American Office on account of Patent Office business, during one week preceding Wednesday, Sept. 4, 1861:—

- D. C. S., of Conn., \$53; L. S., of N. Y., \$10; R. L., of Mass., \$20; A. A., of Ohio, \$20; F. L. H., of Vt., \$40; G. J., of N. Y., \$20; J. M. O., of N. Y., \$20; J. B. B., of Cal., \$20; L. A. B., of N. Y., \$20; W. S. M., of N. Y., \$45; H. G. S., of N. Y., \$20; G. F., of N. Y., \$40; C. Van H., of Mass., \$25; C. McW., of Cal., \$30; E. T. & J. H., of N. Y., \$22; J. J. K., of Ill., \$15; W. R. P., of Ohio, \$15; S. & P., of Conn., \$15; T. W., of Ill., \$15; J. M. F., of Ill., \$15; W. M., of Mass., \$20; J. P. R., of Iowa, \$25; L. B. L., of Cal., \$30; C. H. B., of Mass., \$30; T. J. P., of Pa., \$15; A. W., of Pa., \$15; C. L. N., of N. Y., \$15; S. & R., of N. Y., \$30; W. H. A., of Conn., \$15; C. B., of N. Y., \$15; E. F., of N. Y., \$15; J. E., of Conn., \$25; J. G. W., of N. Y., \$250; J. L. L., of N. Y., \$15; W. M., of Ohio, \$25; W. P., of N. Y., \$25; H. J. P., of N. Y., \$25; T. J. W., of England, \$70; C. & M., of N. Y., \$30; W. O. L., of N. Y., \$25.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from Aug. 29, to Wednesday, Sept. 4, 1861:—

- J. C. C., of Conn.; C. McW., of Cal.; N. B., of Ky.; G. A. R., of Germany (2 cases); C. & M., of N. Y.; J. G. W., of N. Y.; C. A. W., of Mass.; L. B. L., of Cal.; J. P. R., of Iowa; G. F., of N. Y.; C. L., of Ohio; W. M., of Mass.; W. M., of Ohio; E. P. R., of N. Y. (2 cases); J. H. S., of N. Y.; C. H. B., of Mass.; L. T., of N. Y.; C. Van H., of Mass.; J. W. H., of N. S.; W. P., of N. Y.; T. J. W., of England (2 cases); W. O. L., of N. Y.; H. C., of England; O. B., of Ohio; H. J. P., of N. Y.

New Books and Periodicals Received.

THE UNION FOREVER.—We have received from the publisher, James D. Torrey, No. 13 Spruce street, this city, the first number of a history of the war, which is published in weekly parts, at ten cents each.

INSTRUCTIONS ABOUT EUROPEAN PATENTS, With a Synopsis of the Patent Laws of the Various Countries.

AMERICAN INVENTORS SHOULD BEAR IN MIND that, as a general rule, any invention which is valuable to the patentee in this country is worth equally as much in England and some other foreign countries.

It is generally much better to apply for foreign patents simultaneously with the application here; or, if this cannot be conveniently done, as little time as possible should be lost after the patent is issued, as the laws in some foreign countries allow patents to any one who first makes the application, and in this way many inventors are deprived of valid patents for their own inventions.

Many valuable inventions are yearly introduced into Europe from the United States, by parties ever on the alert to pick up whatever they can lay their hands upon which may seem useful.

Models are not required in any European country, but the utmost care and experience is necessary in the preparation of each case.

GREAT BRITAIN.

Patents for inventions under the new law, as amended by the act of Oct. 1, 1852, and now in operation, include the United Kingdom of Great Britain and Ireland in one grant, which confers the exclusive right to make, use, exercise or vend. This is conceded to the inventor, or the introducer, for a period of fourteen years, subject, after the patent is granted, and the first expenses paid, to a government tax twice during its existence—once within three years, and once again within seven. The purchaser of a patent would assume the payment of these taxes.

There is no provision in the English law requiring that a patented invention should be introduced into public use within any specified limit. Under the Patent Act of October, 1852, the British government relinquished its right to grant patents for any of its colonies, each colony being permitted to regulate its own patent system.

FRANCE.

Patents in France are granted for a term of fifteen years, unless the invention has been previously secured by patent in some other country; in such case, it must take date with and expire with the previous patent.

Patents in Belgium are granted for twenty years, or if previously patented in another country, they expire with the date thereof. The working of the invention must take place within one year from date of patent; but an extension for an additional year may be obtained on application to the proper authorities.

BELGIUM.

Patents in Belgium are granted for twenty years, or if previously patented in another country, they expire with the date thereof. The working of the invention must take place within one year from date of patent; but an extension for an additional year may be obtained on application to the proper authorities.

THE NETHERLANDS.

Patents are granted by the Royal Institute of the Netherlands to natives or foreigners represented by a resident subject, which extend to a period of about two years, within which time the invention must be brought into use, and upon payment of an additional tax, a patent will be granted to complete its whole term of fifteen years.

PRUSSIA.

Applications for patents in Prussia are examined by the Royal Polytechnic Commission, and unless there is novelty in the invention, the applicant's petition will be denied; and if it is granted, the invention must be worked within six months afterward.

AUSTRIA.

Austrian patents are granted for a term of fifteen years, upon the payment of 1,000 florins, or about \$500 in American currency. This sum, however, is not all required to be paid in advance.

SPAIN.

The duration of a Spanish patent of importation is five years, and can be prolonged to ten years; and the invention is to be worked within one year and one day.

RUSSIA.

Since the close of the Crimean war, considerable attention has been given to Russian patents by Americans. Russia is a country rich in mineral and agricultural products, and there seems to be a field open for certain kinds of improvements.

CANADA.

Patents of invention are granted only to actual residents of Canada and British subjects. Under the general Patent Law of Canada, an American cannot procure a patent for his invention there.

BRITISH INDIA.

The date of the law, Feb. 23, 1856; duration of a patent, fourteen years. Invention must be worked within two years from date of petition. Privilege granted only to the original inventor or his authorized agent in India.

SAXONY.

Duration of patent, from five to ten years. Invention must be worked within one year from date of grant. Careful examination made before granting a patent.

HANOVER.

Duration of patent, ten years; and in case of foreign patent having been previously obtained, an authenticated copy of said patent must be produced. Invention must be worked within six months from date of grant.

SARDINIA.

Duration of patent, from one to fifteen years. Patents for five years or less must be worked within one year, and all others within two years.

NORWAY AND SWEDEN.

Duration of patent, three years, at least; fifteen at most, according to the nature and importance of the invention. Patents for foreign inventions not to exceed the term granted abroad, and to be worked within one, two or four years.

AUSTRALIA.

Date of law, March 31, 1854. Careful examination made by competent persons previous to issue of patent, which, when granted, extends to fourteen years. Imported inventions are valid according to duration of foreign patent.

GENERAL REMARKS.

While it is true of most of the European countries herein specified, that the system of examination is not so rigid as that practised in this country, yet it is vastly important that inventors should have their papers prepared only by the most competent solicitors, in order that they may stand the test of a searching legal examination; as it is a common practice when a patentee finds a purchaser for his invention for the latter to cause such examination to be made before he will accept the title.

It is also very unsafe to entrust a useful invention to any other than a solicitor of known integrity and ability. Inventors should beware of speculators, whether in the guise of patent agents or patent brokers, as they cannot ordinarily be trusted with valuable inventions.

Messrs. MUNN & CO. have been established fifteen years as American and Foreign Patent Attorneys and publishers of the Scientific American, and during this time they have been entrusted with some of the most important inventions of the age; and it is a matter of pardonable pride in them to state that not a single case can be adduced in which they have ever betrayed the important trust committed to their care.

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Parties desiring to procure patents in Europe can correspond with the undersigned, and obtain all the necessary advice and information respecting the expenses of obtaining foreign patents.

All letters should be addressed to Messrs. MUNN & CO., No. 37 Park-row, New York.

CHANGE IN THE PATENT LAWS.

NEW ARRANGEMENTS—PATENTS GRANTED FOR SEVENTEEN YEARS.

The new Patent Laws, recently enacted by Congress, are now in full force, and promise to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the government fee required on filing an application for a patent is reduced from \$30 down to \$15. Other changes the fees are also made as follows:—

- On filing each caveat.....\$10
On filing each application for a Patent, except for a design...\$15
On issuing each original Patent.....\$20
On appeal to Commissioner of Patents.....\$20
On application for Re-issue.....\$20
On application for Extension of Patent.....\$50
On granting the Extension.....\$50
On filing Disclaimer.....\$10
On filing application for Design, three and a half years...\$10
On filing application for Design, seven years.....\$15
On filing application for Design, fourteen years.....\$30

The law abolishes discrimination in fees required of foreigners, except in reference to such countries as discriminate against citizens of the United States—thus allowing English, French, Belgian, Austrian, Russian, Spanish, and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs on the above terms).

During the last sixteen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN; and as an evidence of the confidence reposed in our Agency by the Inventors throughout the country, we would state that we have acted as agents for more than FIFTEEN THOUSAND Inventors!

Rejected Applications.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of their case, inclosing the official letters, &c.

Scott Russell's Iron War Ships and Batteries.

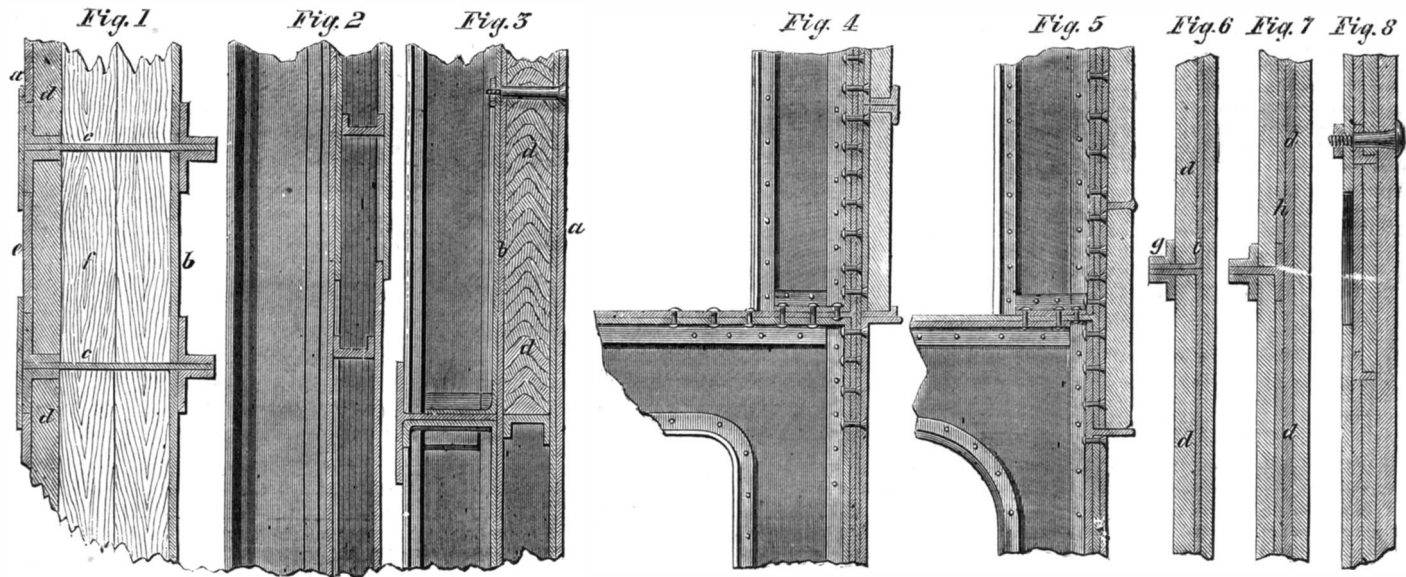
On page 138 of the present volume of the SCIENTIFIC AMERICAN, we directed attention to "improvements wanted" in the construction of iron-plated ships, and we said: "What is wanted is some better mode of fastening iron plates to a ship's side." Since then our London cotemporaries, the *Engineer* and *Mechanics' Magazine*, have come to hand, illustrated with engravings of recent improvements relating to this very subject, for which no less eminent a person than Mr. Scott Russell, builder of the *Great Eastern*, has lately obtained patents. As iron shipbuilding, especially as it relates to iron-plated war vessels, is almost a new art, and as it is probable that it will become universal, it opens up a very extensive prospect to inventors for making new improvements.

By thus using the requisite plates of iron to resist shell and shot, they will be found to increase, and, not as heretofore, to reduce the strength of the structure; and such protecting plates will not be injured by bolt holes being made through them, in order to their being fixed by bolts to the structure, as heretofore has been the practice. Or, instead of filling the cells with a combination of thick protecting plates of iron and wood filling, the cells may be entirely filled with iron plates of such a thickness as may be required, in which case it may be found desirable to have longitudinal cells only, and to arrange the butts of the filling plates in such a manner that the butts of no two strakes in the same cell are in the same plane, technically called "breaking the joints."

Fig. 2 shows a vertical section of the side of a ship

the skin or plating of the side of a ship, a number of recesses will be formed, each of a depth suitable for receiving a thick protecting plate or plates, at the same time allowing sufficient material to be hammered or bent over the edges of the thick protecting plates. The holding of the protecting plates to the skin or plating of the structure may, by these means, be very advantageously accomplished, and in a superior manner to that heretofore practiced, when holes have been formed in the protecting plates, and also in the frame to receive bolts, thus tending to weaken both the plates and the frame.

Figs. 4 and 5 show two sections of means of fixing protecting plates to the outer skin of a vessel or of a fortification. In these figures, the outer skin is shown to be of more than one thickness. In some cases,



CONSTRUCTING IRON WAR VESSELS.

The British government has expended hundreds of thousands of dollars in experimenting with iron-plated vessels, and yet there are many defects in their great frigates, the *Warrior* and *Black Prince*. It requires practice to develop defects, and inventive genius to provide remedies. Mr. Scott Russell, in the accompanying illustrations, has presented a new method of fastening and plating war vessels. The improvements, he states, are also applicable to floating and land batteries.

They are constructed double, with an inner and outer skin or plating, and the space between the two skins is divided by longitudinal partitions only, or upright partitions only, as may be required, which connect the two skins and produce numerous cells. Suitable angle iron is used in the structure. Into each of these cells, which come near to or above the line of flotation of a ship or floating battery, or which in a land battery is desired to be rendered more or less strong to resist shell and shot, a thick protecting plate of iron, in size suitable to fit into the cell, is introduced. The space between the inner surface of the thick protecting plate and the outer surface of the inner skin or plating is filled with wood, so that the thick protecting plate of iron introduced into the cell will be securely retained in position without other fastenings. The inner as well as the outer skin or plating, as well as the longitudinal and upright partitions, should, when for ships or floating batteries, be made watertight in all parts.

Fig. 1 of the accompanying engravings shows a traverse section of a part of the side of a ship; *a* is the outer plating or skin of the vessel, and *b* is the inner plating or skin, and they are shown to be connected by longitudinal partitions, *c c*, and it is preferred that both longitudinal and upright partitions and angle iron should be used; *d d* is the protecting plate, there being a filling plate, *e e*, intervened between the outer skin and the protecting plate, or the surface of the protecting plate may be planed or otherwise formed to fit close to the angle iron and the outer skin; *f f* are fillings of wood or of any other suitable and comparatively elastic material. In place of using one thick plate of iron in a cell, the requisite thickness and substance may be obtained by introducing two or more plates in like manner to what is above described in respect to a single protecting plate.

or of a fortification wherein protecting plates are employed one over the other, in such manner as to break joint. The plating of the inner and outer skin is riveted in the ordinary manner, and, if desired, these may be applied "through" bolts or rivets, so that the outer skin and inner skin, together with the interposed protecting plates, may be all fixed together, and to the inner ribs or framing of angle iron, whether of **L** or **T**, or other form. In certain cases, upright webs only are used, and the cells are then filled with bars or plates of iron placed with their edges against the inner surface of the outer skin or plating, and the outer surface of the inner skin or plating; these bars or plates may be placed close together, thus entirely filling up the cells, or there may in some cases be spaces left between the bars. These spaces may be filled with cement, wood or other substance desired, and the bars may be of any shape or size that may enable them to add strength to each other and to the general structure.

Fig. 3 shows a section which may either represent a horizontal or a vertical section, according as the angle iron or other partitions are used in a vertical or horizontal direction. *a* is the outer plating or skin, and *b* is the inner plating or skin, having between them angle iron partitions; *d d* are the projecting bars or plates, which are bent so as to fit into and on each other. The edges of the plates or bars, *d d*, it will be seen, come against the inner and outer platings.

Thus, in using two or double angle irons back to back in this way, one will be hammered or folded over or bent in one direction to hold one edge of one thick protecting plate or plates, and the other will be hammered or bent over in the opposite direction, so as to hold one edge of a neighboring thick protecting plate or plates, the other edges of the protecting plate or plates being held in a similar manner by other angle or other irons. Or, by using a single angle or **T**-iron, the edges of the thick protecting plates being rounded or chamfered at the angle farthest from the skin or plating, that part of the angle or **T**-iron that projects beyond the thick protecting plate or plates may be hammered or riveted down so as to hold the adjoining edges of two thick protecting plates.

From the above description, it will be understood that by thus using angle or suitably-formed iron on

the requisite plates of iron for protecting a ship or battery from shell and shot are fixed by means of angle or suitably-formed iron fixed to the skin or plating, the projecting ribs of such angle iron being made suitable not only for receiving the desired thickness of protecting plate on either side of each of such ribs, but also to allow of the rib to project beyond the protecting plates on either side.

Fig. 6 shows a section of an arrangement where two angle irons, *c c*, are used back to back, to which the outer skin or plating is riveted; these angle irons extend beyond the protecting plates, *d d*, which may be single plates of considerable thickness, as shown, or two or more plates may be used to make up the required thickness; *g g* are other angle irons, which, being riveted on either side, securely hold the whole together.

Fig. 7 shows another section where, in place of using two single angle irons back to back, **L** or **T** angle iron may be used; and this figure also shows the use of protecting plating outside of the skin, *a*, as well as the inside thereof, the direction of the inner and outer protecting plates being reversed, and, by through bolts or rivets, the outer and inner protecting plates may be secured to each other; and to the angle iron, *h*, is a filling plate, when a single thick inner protecting plate is used, such filling plate, *h*, making up for the thickness of the angle iron. The great object is to avoid the injurious effects of having the protecting plates and the structure to which they are fixed perforated with numerous holes for the reception of bolts; and with this object, through bolts are employed as sparingly as may be. Screw bolts may be used, introduced from the interior, the inner surfaces of the thick protecting plates, in such cases, being tapped to receive the screws; the screws, when thus introduced from the interior, should not pass through the protecting plates, so as to appear on the outer surface thereof.

The edges of the other plates may be connected together by means of tongues and feathers formed on their edges, or by means of iron dowels, and then a certain number of through bolts used to tie the whole structure together. This will be understood by reference to Fig. 8, which represents a section of part of a ship or vessel, or of a fortification so constructed or put together.