

- C. M. F., of Conn.-The way to calculate the actual er of your engine, or any other, is to multiply the steam pressure in pounds per square inchinto the area of piston in inches, and velocity of piston in feet per minute, and kilvide by 44,000. The result is the horse power. The power varies with the pressure of steam. You must take the average steam pressure during the stroke. More friction is involved in a large than a small engine, because the parts are more massive. The cylinder of an engine should always be sufficiently large to obtain the benefit arising from using a cut-off. We advise you to get an engine with a 3%-inch cylinder and 9-lnch stroke, in preference to using a second cylinder, combined with your present engine of 2-lnch bore and 5-inch stroke.
- D. E. B., of Pa.—We cannot tell where you can obtain Dingler's Polytechnic Journal containing the receipt for making Prussian blue to which you refer. It is not republished in the En lish language, so far as we know.
- J. K., of Pa.—The best cement known to us for fixing leather coverings on iron pulleys is made with gum shellac and indis rubber, dissolved in rectified naphtha. The pulley should be heated to the temperature of the cement when the lather is applied. A temperature of about 150° Fah, will be sufficient, but we are not positive whether the cement will adhere while the leather endures.
- G. W. S., of Conn.—A gun can be made weighing no more than 50 pounds, which will carry a few grape shot, and kill at a mile distant. We have recently examined a divided bullet, formed in three sections, and secured in a cloth cartridge that was fired from a secession rifle musket at the fight of Big Bethel. A convenient and portable steam apparatus, capable of being drawn by one horse, and cooking for a whole company, beside warming all their tents, would be a very desirable improvement we believe for camp life. The gun and incendiary shell which are represented in your sketch are new to us, but incendiary shells charged with phosphorated naphtha are well known, and were invented for burning ships and woodbuildings
- A. G. A., of Ind .- In tempering mill picks the first object is to get the proper quality of steel, as all the tempering processes in the world cannot make a good pick of a poor piece of steel. Use the best cast steel only. Do not heat it above a cherry red for hammering, and then hammer the points till the grains of steel are driven compactly together, then file the ends sharp. Put the end in the fire and keep it therein until it acquires a low red heat, then take it out and dip it in to cold water, when it will be found fit to work the pest burr stones. Avoid raising the heat of the steel above a cherry
- H. B. F., of Ill.—There is no published work on millwrighting which is up to the practice of the present day. If your supply of water on a fall of five feet is irregular, we believe that a good overshot wheel is the best you can use. If well made, it will be found durable and well adapted for your flouring mill. On high falls with a steady supply of water, we recommend a good turbine, as large overshot wheels are very expensive
- E. J. B., of Pa.—The best way for you to use your old copper is to melt it with some zinc and convert it into brass for your journal boxes. Melt the copper in a crucible first, then add the zinc in small pieces, stir up until the whole becomes homogeneous, then run it into ingots. Babbitt's metal is composed of 25 parts tin, 2 of antimony and 5 of copper. You may also use your old copper in making this alloy. Sum shellac varnish is the best we can recommend for coating patterns; by mixing a little red lead with it we think its quality is improved.
- C. S., of Pa.-Dr. Gesner's work on coal oil, published by Balliere Bros., 440 Broadway, this city, contains information respecting the refining of coal oils. A variety of chemical processes are practiced by different refiners of such oils.
- J. W. P., of England.—We do not know the address of Charles McBurney. A letter will probably reach him if you address it to the care of the Boston Belting Company, Boston, Mass.
- O. R. H., of Wis.-We do not remember the apparatus to which you refer. Mr. J. D. Prindle, of East Bethany, N. Y., obtained a patent through this office not long ago for the best boiler for cooking food for cattle we have ever seen. Address hum, as above,
- S. H. F., of Canada.-We think it would be of great advantage to Mr. A. to advertise his coal oils in our journal. It canno cted of us to give space for gratuitous advertising.
- N. D., of N. Y .- We are always glad to receive contribu tions for our paper, and are much obliged for the one you have sen us, but its publication would do you no credit whatever. We want sound practical ideas. No matter if they are rudely stated, we can put them into proper shape for publication. Mere vague theories re of very little account at this time.
- Z. K., of Mass .- A patent was obtained by B. Wood, of Nashville, Tenn., on March 20, 1860, for a very fusible alloy, coposed of lead, cadmium and tin.
- A. J. S., of Pa.—We do not know the address of Mr. Coon You had better address him at the place given in the list of Patents G. A. S., of N. Y. asks the following questions:—I have a deed of a patent right for Oneida county, and gave, in consideration a contract agreeing to pay a certain amount on each machine sold Now, if a man who owns the right for another county wishes to pur chase machines of me, to sell in his territory, would I be obliged to pay the commission on machines sold to him? Ans.—Yes. The inten-tion of the purchaser has nothing at all to do with your contract. If I sell a machine to a man who lives in this county, and then after a oves away to another county, would he have full right to us it there? Ans.-No. He must get the consent of the owner of the county to which he moves before he can lawfully use the invention
- J. A. C., of C. W.—Yourinduced current might be strong er than the primary; stillon the remov 1 of the battery, all of the currents would cease. A caveat is not received at our Fatent office

At the Scientific American Office on account of Patent Office business, during one week preceding Wednesday, Nov. 13,

1861:J. F. Q, of Del., \$20; C. E. P., of Wis., \$20; A. S. D, of N. Y., \$20; J. M., of N. Y., \$20; J. M. M., of N. Y., \$20; C. H. A., of Conn., \$20; B. D. P., of Pa., \$20; W. H. A., of Conn., \$20; W. R. S., of N. Y., \$15; J. P., of N. Y., \$15; I. C., of N. Y., \$15; E. D. L., of R. I., \$25; S. H., of Conn., \$25; W. W. F., of Iowa, \$25; H. M., of N. Y., \$25; H. R., of Ill., \$15; W. J. S., of Ohlo, \$15; O. M. T., of N. Y., \$25; S. J. S., of N. Y., \$15; A.. G. B., of N. Y., \$10; W.O. H., of Pa., \$30; A. S. F., of N. Y., \$15; J. M., of Ill., \$15; S. & P., of Conn., \$60; O. E. M., of Ill., \$15; W. A. B., of Wis., \$25; II. & H., of Ill., \$15; B. T., of Ill., \$15; M. E. L., of N. Y., \$15; E. R., of N. Y., \$40; L. W. P., of Mass., \$25; J. B. D., of Conn., \$10; J. D. H., of Pa., \$15; A. S. K., of Mich., \$15; C. M., of N. Y., \$25; F. C. P., of N. Y., \$15; W. H. S., of Conn., \$15; S. S. W., of Pa., \$725; J. C., of Mass., \$15; T. J. B., of N. Y., \$15; T. & R., of N. Y., \$25; J. F. B., of Coun., \$15; J. R. A., of Pa., \$25; D. J. S., of N. Y., \$25; S. P. C., of Conn., \$20; A. B., of N. J., \$25; T. F. L., of N. Y., \$25; S. W, of N. Y., \$25; N. A., of N. Y., \$40; M. & B., of N. Y J. H. S., of N. J., \$20 : R. G. H., of Mass., \$45 : J. W. S., of N. Y., \$45.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from Oct. 30, to Wednesday, Nov. 13, 1861 :-

W. A. B., of Wis.; D. J. S., of N. Y.; H. W. M., of N. Y.; G. & Co., of Paris; E. & P., of N. J.; C. • P., of Mass.; S. H., of Conn.; J. P., of N. Y.; O. M. T., of N. Y.; S. P. C., of Conn.; E. D. L., of R. I.; N. W. F., oi Iowa; A. B., of N. J.; T. F. L., [of N. Y.; T. & R., of N. Y.; S. & P., of Conn., 2 (cases); C. M., of N. Y.; B. M. S., of N. J.; A. G. B., of N. Y.; K. & H., of Wis.; N. A., of N. Y.

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Models are required to accompany applications for Patents under the new law, the same as formerly, except on Design Patents. when two good drawings are all that is required to accompetition, specification and oath, except the government fee.

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CHANGE IN THE PATENT LAWS.

PATENTS GRANTED FOR SEV-ENTEEN YEARS

The new Patent Laws enacted by Congress on the 4th of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the newact is prolonged to SEVERTEEN years, and the government fee required on filing an applion fora patentis reduced from \$30 down to \$15. Other changes in the fees are also made as follows :-

On filing each Caveat	
On appeal to Commissioner of Patents\$20	
On application for Re-issue	
On application for Extension of Patent	
On granting the Extension	
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, seven years	
On filing application for Design, fourteen years\$30	

The law abolishes discrimination in fees required of foreigners, ex cept in reference to such countries as discriminate against citizens o 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 patentsystem (except in c on the above terms.

During the last sixteen years, the business of procuring Patents for ew inventions in the United States and all foreign countries has been conducted by Mesars, MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN; and as an evidence confidence reposed in our Agency by the Inventors throughout the FIFTERN THOUSAND Inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of Inventors and Patentees at home and abroad. Thousands of Inventors for om we have taken out Patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the Inventors whose Patents were secured through this Office, and afterward illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than are employed at present in our extensive Offices, and we are prepared to attend to Patent business of all kinds in the quickest time and on the most liberal terms.

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The annexed letters, from the last three Commissioners of Patents, we commend to the perusal of all persons interested in obtaining Pat-

Messrs. Munn & Co.:—I take pleasure in stating that, while I held the office of Commissioner of Patents, more than one-fourth of All the business of the office came through your hands. I have no doubt that the public confidence thus indicated has been fully deserved, as I have always observed, in all your intercourse with the Office, a marked degree of promptness, skill and fidelity to the interests of your employers.

Yours, very truly,

CHAS MASON.

CHAS MASON.

Immediately after the appointment of Mr. Hoit to the office of Postmaster-General of the United States, he addressed to us the subjoined very graitfying testimonial:

Messrs. MUNA & CO.:—It affords me much pleasure to bear testimony to the able and efficient manner in which you have discharged your dules of Solicitors of Patents while I had the honor of holding the office of Commissioner. Your business was very large, and you sustained (and, I doubt not, justly descred) the reputation of energy, marked ability and uncompromising fidelity in performing your professional engagements.

Very respectfully,

Your obedient servant,

J. HOLT.

MESSES, MUNN & Co. —Gentleman: It gives me much pleasure to as that, during the time of my bolding the office of Commissioner of Paeuls, a very large proportion of the business of inventors before the Paeul Office was transacted through your seency, and that I have ever found you faithful and devoted to the interests of your cleinus, as we as eminently qualified to perform the duties of Patent Attorneys with skill and accuracy. Very respectfully,

Your obedient servant, WM. D. BISHOP.

Preliminary Examinations at the Patent Office.

The advice we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of \$5, accompanied with a model or drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a Patent &c., made up and mailed to the Inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh-streets, Washington, by experienced and competent persons. Over 1,500 of these examinations were made last year through this Office, and as a measure of prudence and economy, we usually advise Inventors to have a preliminary examination made. Address MUNN & CO., No. 37

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Every applicant for a Patent must furnish a model of his invention. If susceptible of one; or if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the government fee by express. The express charge should be prepaid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to the order of Munn & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little riskin sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & Co., No. 37 Park-row, New York.

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Persons having conceived an idea which they think may be patent able, are advised to make a sketch or model of their invention, and submittt to us, with a full description, for advice. The points of novelty are earefully examined, and a reply written corresponding with the acts, free of charge. Address MUNN & CO., No. 37 Park-row, New

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Persons desiring to file a Caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The government fee for a Caveat, under the new law, is \$10. A pamphlet of adviceregardingapplications for Patents and Cave gratis on application by mail. Address MUNN & CO., No. 37 Park-row.

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We are prepared to undertake the investigation and prosecution of renable terms. The close proximity of our Washected cases, on reas ington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

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limit the issue of Patents to Inventors. Anyone can take out a Patent

Circulars of information concerning the proper course to be p in obtaining Patents in foreign countries through our Agency, the requirements of different Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park-row, New York, or either

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Persons who are about purchasing Patent property, or Paten are about erecting extensive works for manufacturing under their Patents, should have their claims examined carefully by competent attorneys, to see if they are not likely to infringe some existing Patent, be fore making large investments. Written opinions on the validity of Pateuts, after careful examination into the facts, can be had for a ressonable remuneration. The price for such services is always settled upon in advance, after knowing the nature of the invent and being informed of the points on which an opinion is solicited further particulars, address MUNN & CO., No.37 Park-row, New York

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Impressed with these facts, and in compliance with the suggestions and wishes expressed to them by several of their continental and colonial friends, the undersigned have decided on establishing an International Agency in connection with the Exhibition of 1862, which they will spare no trouble or expense to render truly supplemental and auxiliary to that great undertaking and in every way worthy of it. Having correspondents in most of the principal continental cities, the name and character of their firm must be well known to many of the intending exhibitors; and to those to whom they may as yet be unknown, they are prepared to offer ample guarantees and references. The arrangements entered into will enable them to place at the service of exhibitors subscribing to the agency—

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2. Storage premises for stowing away empty boxes, cases, &c., until required for re-packing.

3. Reception rooms, and all the conveniences of a home in connection with

4. An old-established club house, in the very center of London. THE INTERNATIONAL EXHIBITION OF 1862.—THE

Z. Storage premines.

Z. Storage premines.

3. Reception for re-packing.

3. Reception rooms, and all the conveniences of a home in connection with

4. An old-established club house, in the very center of London, within five minutes' walk of the Central Clice of the International Exh bition at Charing-cross, with dinfus, smoking and dressing rooms, and separate apartments for the accommodation of the female members of exhibitors' lamilies who may visit London. Also, a reading saloon, supplied with all the English and the principal foreign newspapers and periodicals.

The great and peculiar advantages of this part of the undertaking affording exhibitors during their stay in London the enjoyment of the convenience and comfort of a private establishment. Open only to them and the members of the club, are self-evident, and need, therefore, not be further expatitated upon here.

An office of inquiry, reference and advice, where the most reliable information may be obtained, more particularly about hotels and their accommodation and charges, private apartments, conveyances, routes, &c., ilkewise, proper directions for exchanging foreign coin and notes, &c., and where the services of interpretars and commissionaires may also be procured at moderate charges.

The advantages which this feature of the undertaking offers to strangers visiting London, will, no doubt, also be readily appreciated by them.

e 1862 International Exhibition Agency will be placed under the GENERAL MANAGEMENT

of our Mr. W. V. Morgan (member of the Society of Arts and one of the guarantors of the exhibition fund), who will be assisted in his arduous duties by an ellicient staff of sub-managers, clerks, interpreters, commissionaires, &c.

It is proposed not only to supplement the action of the Royal Commissioners in the business arrangements of the exhibition, but also to attend in all other respects, such as negotiating sales, arranging for advertisements, and other aids to publicity, providing assistants &c. to the interests and requirements of those exhibitors who shall avail

avertisements, and other sids to publicity, providing assistants &C. to the interests and requirements of those exhibitors who shall avail themselves of the services of the agency.

THE TERMS OF SUBSCRIPTION

will be arranged for two classes of subscribers, viz:—

1. Exhibitors who propose visiting England, and availing themselves of the services of the agency, will be charged a subscription of £3, which will entitle them to the free use and enjoyment of all the advantages of the establishment during the whole or any part of the year 1892, the only additional charge being a commission of ten per cent on all such outlays above £5.

2. Exhibitors who do not intend to visit England will simply be charged the above commission of 10 per cent or 5 percent made on outlays on their behalf.

A full program me of the arrangements, with the names of the wind.

charged the above commission of the periodic state of the principal members of the staff engaged, &c., has been published, and will be forwarded on application.

It is requested that all communications up to December 31st next, be addressed to Mr. W. V. Morgan, at 21 Bow-lane, London, E. C., after which date, at Arundal street, Strand, London, W. C., as all preliminary arrangements will be fully carried out by that time.

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NEW YORK OBSERVER FOR 1862.—IN ASKING New York Observer, it is proper for us to state distinctly the position it occupies with reference to the present condition of public affairs in our beloved country.

Having always maintained the duty of good citizens in all parts of the land to stand by the Constitution, in its spirit and letter, when that Constitution was assailed and its overthrow attempted, we accord ingly at once gave a cordial support to the Government in its patriotic endeavor to assert its lawful authority over the whole land. Belleving accession to be rebellion, and when attempted, as in this case, without adequate reasons, to be the highesterime, we hold

1. That the war was forced upon us by the unjustifiable rebellion of

2. That the Government, as the ordinance of God, must put down

rebellion and uphold the Constitution in its integrity.

3. That every citizen is bound to support the Government under which he lives, in the struggle to reestablish its authority over the

3. That every citizen is bound to support the Government unner which he lives, in the struggle to reestablish its authority over the whole country.

4. That the Constitution of the United States is the supreme law of the Government as well as of the people; that the war should be prosecuted solely to uphold the Constitution and in strict subordination to its provisions: and the war should be arrested, and peace concluded, just so soon as the people now in revolt will lay down their arms and submit to the Constitution and laws of the land.

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Mr. Fairbairn on High Pressure Steam.

At the opening of the Liverpool School of Science Mr. Fairbairn said :- "As a laborer in the field of science, more particularly practical science, I am sure you will allow me to give you a few examples of the great advantages which the industrial arts receive from the exact sciences, and particularly from those constructions which are of much greater advantage to the industry and property of the community. With regard to steam I am quite sure every person here present, must be aware of the very great advantages of that source of power, that immense power we see daily before us; and if we look back to the days since James Watt lived, to the present time, everybody will be convinced of the great improvements that have taken place by the application of science to that particular element. I recollect well, in the early part of my own history, that the steam engine never worked above 7 bs to 8 bs upon the square inch; it then reached 20 hs, then 50 hs. But now if we look at the locomotive engine, the pressure is upwards of 150 hs and even 200 hs, upon the square inch. This is a great advantage, and if we may judge by the great improvements which are taking place with regard to the steam engine, the locomotive as well as the condensing engine, I am inclined to think that we are not by any means arrived at the full economy of the production of steam in this country and all other countries. Instead of working at the rate of 200 hs upon the square inch, I think it is very likely that it will reach 500 lbs." Mr. Fairbairn said he would next allude to the application of iron to all the purposes of the industrial arts. That application was, he said, by no means limited, and it would continue to extend. He instanced the construction of the Conway and Britannia bridges in proof of the principle of construction by experimental research. He had every confidence that the institution which they had inaugurated would be highly productive, and prove of benefit to the people of Liverpool, and to the rising generation, and that it would add to our knowledge of science.

Smoke House-How it Should be Built.

A smoke house should be square, its size varying from four to eight feet in diameter, according to the quantity of meat required to be smoked; the lower portion to the hight of five feet should be of brick, the through bolts, S, which bolts, passing through

better flavor from hard than from the soft woods. while the amount of creosote, which is the preservative property, will be the same.

Improved Armor for Ships.

On pages 266 and 267 of the current volume of the Scientific American we gave an illustration of J. F. Winslow's mode of constructing iron-plated ships and securing the armor upon their sides. We now present an illustration of an improvement upon the plan made by the same inventor, who claims, as one of the advantages of his principle of armor construction, that it admits of various modifications.

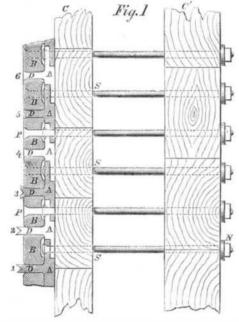
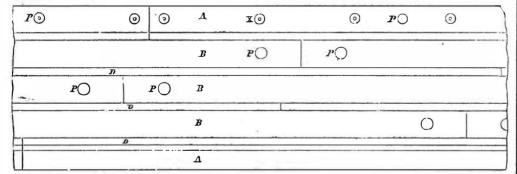


Fig. 1 represents a portion of the transverse section of the vessel, showing the armor attached. C C shows the internal and external planking of the vessel; AAAAA represent a series of rolled chairs from 12 to 20 feet long, and 5 inches broad. The form of these chairs, A, admits of their lapping and form ing a continuous sheet next to the hull or sides of the vessel, of any desired thickness not exceeding 1 inches. The chairs are held together by spikes and

Fig. 2



WINSLOW'S IMPROVED ARMOR FOR SHIPS.

with a door lined with sheet iron. This part may | both parts or lapped part of the chairs, and through serve both as an ashhouse and as the proper place for the fire to furnish the smoke. Fire should be placed in the middle and covered with the material to be burned, so that the mass, being surrounded by ashes, may maintain the ignition for a long time, giving off the smoke with regularity. The upper part may be wood, and the separation from the lower part by joists, covered with scantling, so as to leave spaces averaging three inches in diameter, for the ascent of the smoke. The hight of this upper portion may be four feet, beside the ascent of the roof, and should be furnished with a door that may be locked, so that the door to the lower portion will not give ingress to the meat room. This separation between the two portions will catch any piece of meat which may accidentally fall, while the lower portion need not be locked, so as to enable the frequent removal of ashes from the house, and the proper attention to the fire to be more readily performed. Sawdust placed over a few ignited coals, will furnish the necessary material for smoking the meat. The sawdust, however, should be from such wood as is most free from resinous matter; the pyroligenous acid evaporated is of a sunk bolts, P, (Fig. 1).

to the inside of the vessel, are then secured by nut and screw, N. 'These spikes and through bolts may be alternate or in any other relative position to meet the exigency. These chairs, A, are armed with a tongue, D, also a rolled portion of the chair; and between these tongues are placed the bars, B. The angles or sharp corners being removed in the process of rolling to form a countersink to be filled by setting over that portion of the tongue which protrudes beyond the plane, as shown respectively in the stages 1 2 3 and 4; 1 and 2 show the bar between two tongues, V-shaped at the end, also formed in the rollers; 3 shows the tongue flanched over and filling the countersink, and 4 5 and 6 show the finished stage. In addition to this rivetsecurement the bolts, P, are introduced every 6 or 7 lineal feetapart. These bolts pass through to the inside of the vessel and are secured with nut and screw, as shown.

Fig. 2 represents an external view of the armor when complete. The holes, X, represent the points through the chair, A, to receive the spikes and holts, and P P represent the points to receive the counter-

The object of having these narrow bers and chairs is to obviate the necessity of tonguing and grooving plates, and it will readily suggest itself that these narrow chairs and bars will accommodate their forms to the most difficult curves in the hull of a vessel, and in cases of repair can be removed at comparatively little cost.

This plan is as novel as it is ingenious and facile of attachment, and not least among its recommendations ranks economy of construction. Measures have been taken to secure it by Letters Patent.

In an address delivered recently before the Glasgow, (Scotland) Philosophical Society, Dr. Taylor suggested the use of the electric light for coal mines, so as to avoid the danger of explosion from fire damp with miners' common lamps. He proposed that the light be contained in sealed glass tubes hung from the roof of the mine, and that the current should be obtained from a Ruhmkorff coil.



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