

On the south end, the segmental portion of the arch above the brick wall will be faced with cast iron trimmings and plate glass.

The north end will be closed with a beautiful cast iron front highly ornamented. The east side, along the Fourth avenue, will be finished with cast iron pilasters acting as casings set in front of each truss. These pilasters are to have bases and caps, supporting a main cornice along the front, and crowned by a cast iron balustrade; a line of balconies will run along the west side and across the south end, connecting with the offices in the second story. The trusses are placed in heavy cast iron shoes, sixty-four in number. To permit free expansion and contraction of the trusses, without interference with the side walls crossed by them, there will be placed cast iron boxes or casings perforated by a series of cores, and fitted together by means of bars and angles in such a manner as to insulate entirely the mason work from the trusses.

The rafters will consist of five-inch deck beams, secured to the top chord by double angle iron studs, 3½ by 3½ inches, and stiffened by diagonal braces of same size, riveted together and fastened on the chord by means of bent lap plates one half inch thick, and riveted to the former.

The doors and windows will have cast iron trimmings, all ornamented, the windows to be glazed with rough half inch glass. The whole of the north front will be of cast iron, the width to be 203 feet 10 inches, and raised 112 feet 6 inches in extreme height. The windows and doors of the first story will have rolling shutters.

The ends of the structure will be occupied for offices on the first floor, while the ground floor will be set apart for ticket offices, passengers' rooms, baggage lockers, restaurants, news-stands, etc.

Pennsylvania iron, of the best welded quality, will be used for plates, flat or square bars. Round bars and rods for braces to be of Ulster iron: rivets and bolts, of charcoal iron. Sheet iron, best welded and refined Pennsylvania. Cast iron, mixed in the following proportions, viz.: American pig No. 1, and Scotch pig No. 1, 5 per cent of each for shoes, casings, lintels, box, angle, studs, and braces. American pig No. 1, 10 per cent, and Scotch pig No. 1, 15 per cent, for columns and pilasters. American pig, No. 1, 15 per cent, and Scotch pig No. 1, 20 per cent, for hanging cornices, friezes, and flat pannelings. American pig No. 1, 30 per cent, and Scotch pig No. 1, 30 per cent, for small moldings and ornamented work. All rolled and welded iron to be subject to a strain of 30,000 pounds per sectional inch.

BILL TO AMEND THE PATENT LAWS NOW PENDING BEFORE CONGRESS.

We have now before us the completed bill pending before Congress to amend the patent laws, to which reference was made in No. 8 of the current volume. It amounts substantially to a codification of our entire present patent system, and we feel bound to confess, that in many respects the bill is a great improvement upon the old law, reflecting credit upon the Committee, of which Hon. T. A. Jenckes is chairman.

The bill came up for discussion in the House on the 15th inst., but went over under the rules, and before the discussion was concluded. The provisions of the bill embrace patents, designs, trade-marks, and copyrights, and are too voluminous to print in our columns.

We regret to notice, however, that the provisions relating to appeals from the Commissioner to the Supreme Court of the District, have been stricken out. We trust that the House will insist upon its restoration.

In explaining the various features of the bill, Mr. Jenckes says:

"In the law with regard to patents, which appears as chapter two of the bill, there are four principal propositions of amendment. One is the requirement of a fee to be paid at the expiration of seven years from the date of the patent, and another at the end of the twelfth year as a condition of keeping the patent alive. Such a provision is found in the patent laws of almost all other countries. The proposition had met the commendation of the Commissioner and of persons doing business at the Office. Its adoption will increase the revenues of the Office, and will weed out those worthless patents which are sometimes taken hold of by speculators near the expiration of their terms for the purpose of harassing the public with ingenious reissues. One great annoyance and evil will be removed and positive good obtained in its place.

"Another source of difficulty, and which was becoming a great one, arose from the fact that there is a large number of what are called rejected applications in the Patent Office. During the past year there were over five thousand of final rejections, and the year before nearly as many, and since the constitution of the Office there are perhaps twenty thousand remaining in the Office; most of these rejections have been acquiesced in and the claims abandoned. But some of these have been rejected improperly, and contain descriptions of valuable inventions. In course of time it has been discovered in many cases the rejection was wrong and that the examiner had made a mistake, and the applicant has again made application for his patent, and pressed it, and it has sometimes been allowed and sometimes rejected. If allowed, he would go and try its validity in the courts. If refused, the further difficulty arose on the provision in the existing law for the revision of the decisions of the Commissioner.

"As the law now stands an appeal may be taken to one of the judges of the Supreme Court of the District of Columbia, or remedy be had in a suit in equity in that or any other circuit court. This led to a conflict in the jurisdiction exercised by the Commissioner and that exercised by a single judge in

this District court, and exposed behind it a further and greater cause of difficulty. That is, the law as it now stands, contains no provision absolute in itself, clearly and distinctly defining what should constitute the abandonment of an invention to the public. We heard the solicitors at great length on the question, and the conclusion the committee arrived at is expressed in two short provisions of the proposed bill. The substance of them I will state. Each and every party whose application has been refused is allowed two years to renew that application before the Commissioner, but this provision is not allowed to revive any application for an invention which has been, as a matter of fact, abandoned to the public. In other words, it says a mere lapse of time in the prosecution of an application of a patent shall not be conclusive evidence of abandonment; that the right to a patent for a first and original invention is a vested right, and can only be lost by the inventor in not proceeding in accordance with the provisions of law, or in his forfeiting that right in accordance with those provisions; and to those in this condition, not cut off by any positive existing statute of limitation a new statute of limitation is proposed, defining the time within which such new application shall be made. Thus all the rights are preserved and the mode of prosecuting them is pointed out. The field of controversy concerning these old applications, whether abandoned or not, is fully and satisfactorily provided for."

"The Committee also propose to amend and enlarge the provisions as to relief between interference patents, and to provide relief in cases where a patent has been improperly obtained or improperly reissued, or where the validity of a patent is contested by persons using the things patented.

"There is now no means provided by which a person thus injured or threatened to be injured by a suit can turn around on his prosecutor and test his right to the patent. We propose to give that remedy, so that a single suit can determine the question and avoid the extended litigation and expense now attending controversies upon patents. Heretofore it has sometimes happened that persons have obtained reissues of old patents, and then gone around the country threatening suits against persons; sometimes commencing a suit in a court, and if not liking the temper of the judge, or from some untoward circumstance connected with the trial, abandoning it and commencing another somewhere else, with the hope of obtaining a decision in their favor. And when they have succeeded in obtaining a single decision they will go around again and levy a tax upon all who do not feel able to go to the expense of contesting the validity of the patent.

"That has been a great burden and a great wrong, which has many times been sought to be amended. But the difficulty has been to do it without injuriously affecting rights conferred and established. The committee propose to do it by recommending that where any party has been sued for the infringement of a patent, and he thinks the patent is invalid for any reason or should not be enforced against him for any cause, he may commence a suit against the owners of the patent who have sued him, in order to test the validity of that patent, and the final decision in that case shall be conclusive upon the right of all parties claiming the right to use the thing claimed to be patented.

"I know one case where after a defendant had succeeded in a suit upon a patent, the patentee turned around and brought upwards of a hundred suits all over the United States upon that very patent, subjecting each of the parties sued to as much expense as the one who had defeated him, in the hope of obtaining a reversal of the former decision. That is an evil to be prevented; and we think we have provided a remedy which will reach the case, so that the expense of one suit shall be all that is required to test the validity of any patent or the right of any party under it.

"The committee have recommended also certain provisions which are entirely new concerning trade-marks. These have not heretofore been the subject of any national law. It is a subject embraced within the common law jurisdiction of all the courts of the country, and also within the general equity jurisdiction of all the State courts. This bill does not propose to interfere at all with the local and State jurisdictions. A person, standing upon his common law rights, may still go into the State courts and defend a trade-mark, exactly as he may do now; but if he chooses to register his claim at the Patent Office, pay his fee, and take his certificate of registration, it will protect him throughout the United States, in the same way as a patent for a design or a copy-right is protected.

"Concerning trade-marks, we are at present in an anomalous condition, which perhaps is not understood by the House generally. By certain treaties or conventions with Belgium, France, and Russia, we have agreed to recognize the validity of the trade-marks of those countries upon their being registered in the Patent Office of the United States, and to give them the same effect throughout the United States that they have in the country where they originated; and trade-marks recognized by the law of this country have the same effect throughout those European countries as the trade-marks secured by the citizens or subjects of those countries.

"A *fac simile* of the trade-mark is to be sent to the Patent Office. The kind of business, as well as the kind of goods, to be protected, is to be described briefly and correctly. A fee of \$25 is to be paid into the Treasury of the United States. A certificate of such registration, with a *fac simile* of what is filed in the office, is to be delivered, under the seal of the Patent Office, to the person causing such registration. It is to be in effect for thirty years from the date of registration, and if it be copied by a person not having a right to do it, or if it be copied by a person in such a manner that the imitation is calculated to deceive the public, then the party may

have his remedy in any court of the United States for the injury done him."

ELECTRIC FORCES.

There is no fact connected with the electric agencies, by which distant communication is secured, more suggestive than the minuteness of the power by which it is sustained. To project a ball at a distant ship with certainty of aim, to blast the sunken rock that impedes navigation, to impel the giant ship that splits the storm with its defiant bow, forces are presented to the eye which bear some natural comparison with the work accomplished. But when a message has to be sent thousands of miles beneath the ever fretting sea, from one continent to another, force seems ignored. We look in vain for any machine hissing with a vigor such as the mind deems necessary to eject the electric current from America to Europe quick as the sunlight comes to the earth. There is even an absence of the usual forces for communication upon the land, where nitric and sulphuric acids, zinc and mercury, are busy in numerous cells brewing the electric fire. The power employed bears more truthful comparison with the action of the brain wherein human thought is evolved. The thought may be one which shall change the destinies of a nation; it may be the sweetest idyl that ever warbled from angelic lips; but both come from within the dome of a brow notable only for its repose.

The battery which operates the Atlantic cable is composed of five cells, although for some time it used only one. Each cell is composed of a glass tumbler, a small disk of sheet copper, and a similar one of zinc, a few pellets of sulphate of copper and moist sawdust filling the tumbler. This is all. It has no smell. A spoonful of water upon the sawdust now and then is all it needs for support. It seems insignificant and powerless, yet does its work efficiently and well. The French cable uses only seven such cells, although twice as long as the other.

We have before us, as we write, a battery which was used to transmit a message by the Atlantic cable—the minutest, we presume, ever employed. It has a fascination to us inexpressible. It is composed of a simple gun cap soldered to a piece of copper wire, and a narrow strip of zinc. These, with a drop of water from the ocean, were all the forces that were needed to send a message from continent to continent. Here is a sketch of its actual size:

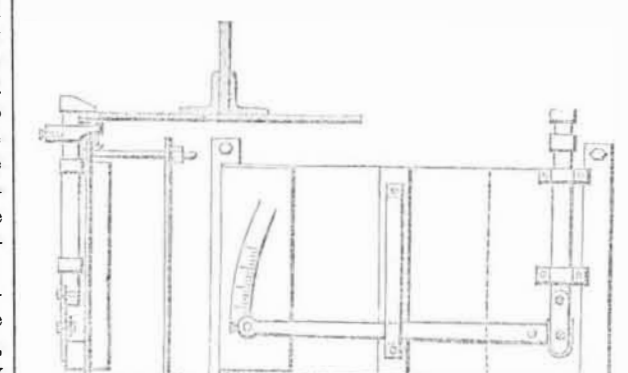
Had the ocean drop been a tear, it would have generated the same current which thus thrilled between two worlds and made them one. Were we disposed to moralize on the salt of this tiny battery and its mysterious agency, we might be excused did we regard it as typifying the power of sorrow which touches the universal heart and makes it throb. It is the alembic of the world's deepest and most omnipotent emotions, and yet may find its rise in the stopping of a single pulse, in the quenching of a single life.

This tiny battery has in it, indeed, a vast moral. We despise the lesser forces of our lives, and measure our influence by an unwise disparagement. From these, however, when true and pure, come the sunlight of the efflorescence of the earth. Let us hold our light high and honored, however small may be its flame. It may reach the radius of another light, and help the dawning of a brighter day—not to ourselves alone, but to thousands who never knew us. A single kind word has ere now planted a seed that has burst its blossoms upon the "infinite meadows of heaven."—*Journal of the Telegraph.*

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INSTRUMENT FOR MEASURING THE DEFLECTION OF GIRDERS.

The accompanying engraving represents an instrument which has been used by the Western Railway Company, of France, in testing the bridges of the new Dieppe line *via* Pontoise and Gisors.



Wrought-iron bands together with bolts, serve to secure a plank, carrying the whole apparatus to a rigid structure independent of the girder. A clutch is then screwed on to the flange of the girder. A lever works on a pivot, and the shorter end—one tenth of the longer arm—is attached to a clutch bar. The other end carries a pencil which traces the deflection on a card. By means of the unequal division of the lever it is manifest that a small deflection will produce a comparatively large movement of the pencil. In point of fact, a deflection of 1-10,000th of a meter can be detected with this instrument.

BREAD POWDERS, EXTENSION.—The patent of Professor Horsford for pulverulent phosphoric acid, to be used in making bread, has been extended for seven years from April 22, 1870.