

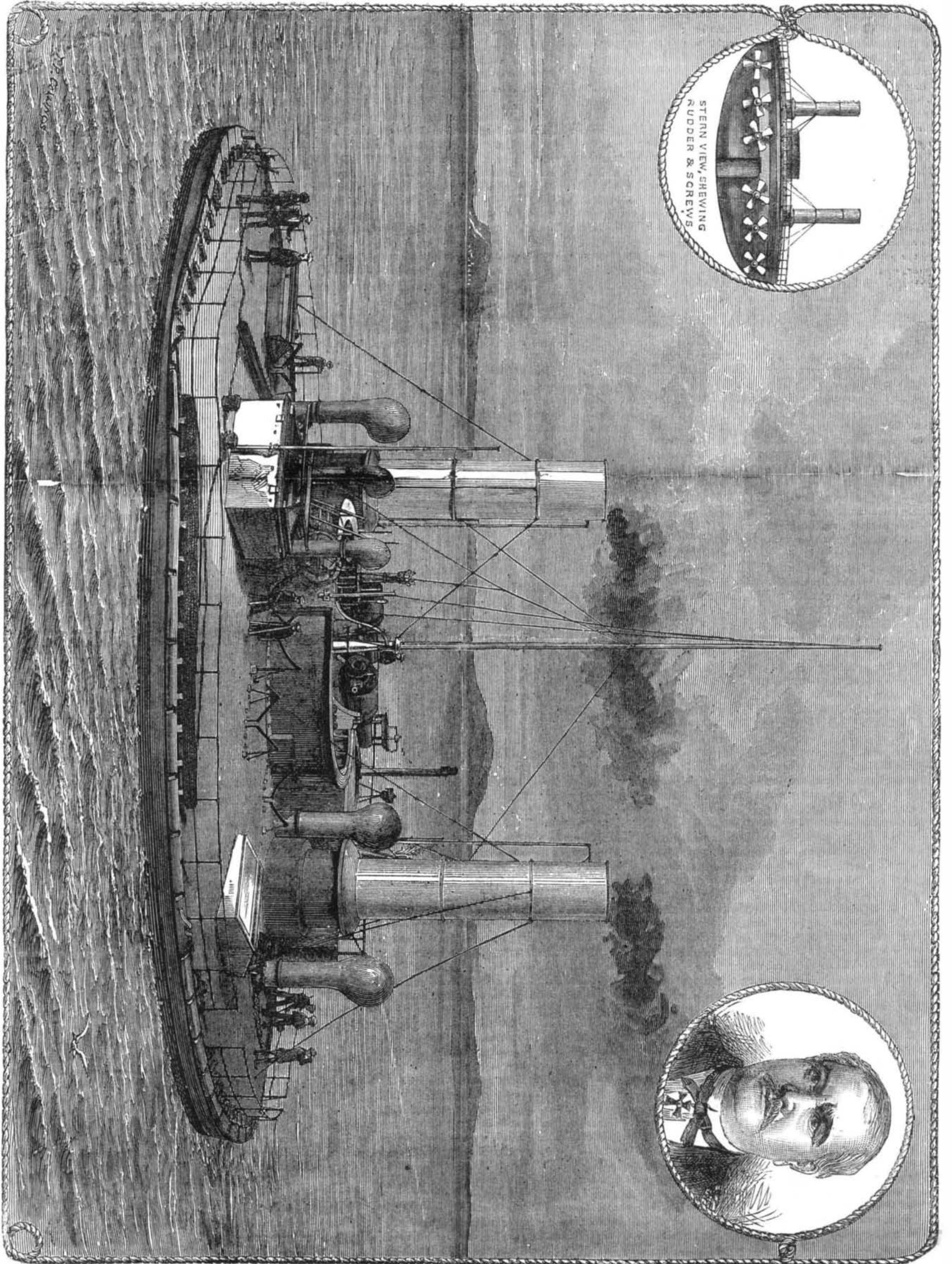
THE RUSSIAN CIRCULAR SHIP.

We have heretofore informed our readers of the construction by the Russian government of a circular ironclad man of war, intended chiefly for defensive purposes and harbor service. The form of the vessel was chosen to secure maximum tonnage with compactness, and to present as little broadside as possible to the enemy. Moreover, it would be necessary to strike the vessel nearly point blank to produce any effect on her sides, as a very slight angle of inclination would cause shot and shell to glance off her at a tangent. Owing to the greater displacement in comparison with the weight of hull, vessels thus built can carry much heavier armor and weightier guns that would be possible with those of the longitudinal form. This principle, which has been partly carried out by Mr. Reed in his broadening of vessels to ob-

tain greater displacement, has been found to answer most satisfactorily, and notwithstanding that the tonnage of the Novgorod is 2,491, she only draws 13 feet 2 inches of water, with all weights on board, and with a longitudinal false keel. The armor plates are 9 inches thick, and are backed with channel iron to the amount of 2 inches, so that the armor is virtually 11 inches thick. Moreover, from her circular form, the Novgorod is of an uniform strength throughout, and presents no weak point. The deck, which measures 101 feet in diameter, is also plated to the depth of 2 1/4 inches, while a thickly armored breastwork protects the guns, which are worked in an open turret so as to ensure greater precision of fire, and which can be moved and fired either independently or together, as may be required. The guns are two in number, of 11 inches bore, and weigh 28 tons each. The vessel is pro-

pelled by six screws worked by engines of 480 nominal horse power (see the small engraving in the left hand upper corner of our picture). The speed attained is said to be equal to that of the monitors; but as the vessel is said to be used for defending the mouths of rivers and weak portions of the coast line, a high speed, though desirable, is scarcely absolutely necessary. The rolling and pitching of the Novgorod are said to be far less perceptible than in vessels of an ordinary type, owing to her flat bottom. She was launched in the early part of last year, at Nicolaieff, on the Black Sea. Another vessel of the same type is being constructed. She will be of a larger tonnage, and will bear armor 18 inches thick.

Vice-Admiral A. A. Popoff, the designer of this type of ironclad, whose portrait we give in the upper right hand corner of the engraving, is the son of a Russian naval architect, and is



THE RUSSIAN CIRCULAR IRONCLAD "POPOFFKA NOVGOROD"

about fifty years of age. During the Crimean war he served with the fleet in the Black Sea, and distinguished himself by burning several of the storeships of the allied fleet. At the close of the war he superintended the construction of a large number of fast steaming vessels, and the most powerful ironclads of the Russian navy have been built according to his designs. Thus, in addition to the circular ironclads (which are called Popoffkas after him), he is the designer of the Peter the Great, concerning which there was so much controversy last year, and of the fast corvettes of the Duke of Edinburgh class, with armor along the water line, similar to our Nelson and Northampton. In addition to his shipbuilding labors, Admiral Popoff has cruised several times round the world in command of the Russian squadron.

The Proposed Changes in the English Patent Laws.

At a recent meeting held under the auspices of the Institution of Mechanical Engineers, to take into consideration the proposed bill for amending the British patent law:

Mr. Bramwell, the president, said there could be nobody so interested in inventions as was the body of mechanical engineers. Among that body were to be found many of the greatest inventors of the age, and men who in their manufacturing were day by day carrying out the results of inventions of themselves, or of others; and thus in the two-fold capacity of inventors and producers, the members of the institution were deeply interested in inventions. He thought that the majority of the press and the public had determined that invention had gone on as it had done in consequence of the existence of a good patent law, which was essential for the protection and for the increase of inventions. The law of 1852 was perhaps not faultless, but it worked very well. A commission sat in 1865 to consider it, and a committee sat in 1871 to consider it, and both recommended certain legislation upon the patent law. Nothing had been done until the present year, when the Lord Chancellor brought in a bill which at the present time formed the subject of the attention of Parliament and of the attention of the members that day. In many respects it would be found that it departed from the recommendations both of the commission and of the committee; and therefore it might be taken that those two bodies, who each had before them a quantity of extremely good evidence, in investigating the matter with the greatest care, had to a large extent their labors thrown away by the present bill, without due attention being paid to their recommendations.

Mr. E. A. Cowper proposed a resolution: "That this meeting is decidedly of opinion that the Patents for Inventions Bill, 1875, proposed by the Lord Chancellor, would be much worse in its operation than the act of 1852." He thought that the patent laws had proved the greatest possible stimulus in this country to the progress of manufacture and invention. He scarcely thought it necessary to go into the merits of the patent laws, because he thought all were agreed that the patent laws were most important. He had looked through the bill and found ten distinct places where the Lord Chancellor had power given to him to refuse all patents, and the way in which it was done seemed at first sight plausible. There might in this way be an absolute destruction of the patent laws. It only depended on how far public opinion would tolerate such a thing as the Lord Chancellor putting his foot down upon every patent applied for. The Lord Chancellor had absolute power, he had power to make rules and regulations, and power even to settle any cases of dispute about licenses; in that way he had full power to destroy a patent whenever he thought proper. He believed they were all agreed that the provisional specification was a good thing, and yet the proposed bill swept it away. Then there were examiners to be appointed who would be entirely irresponsible; they would be something like the examiners of the Patent Office in America, and he must say that the action of those examiners was not very satisfactory. There was a staff of about 400 persons appointed. If an invention was reported upon adversely, there was then a reference to other examiners, then to the commissioners, and finally it was referred to the head commissioner, and sometimes, after having gone through several steps at great expense and great delay, the head commissioner reversed everything that had been done before. He had great pleasure in proposing the resolution.

Mr. William Smith, in seconding the resolution, said he entirely concurred in what had fallen from Mr. Cowper. He had looked into the contents of the bill, and had made some inquiries as to its history. He found also that the Attorney and Solicitor General had never been consulted, and curiously enough, Mr. Woodcroft, a gentleman in whom was centered the whole of the information in connection with the Patent Office and the administration of the patent law, had not been considered. He was not, therefore, surprised that a bill should be introduced which gave no satisfaction to any one except to the enemies of patent laws. It was clear that the measure had been framed entirely for the purpose of neutralizing those laws. It was, in truth, "a delusion, a mockery, and a snare," a snare it most certainly was. Mr. Cowper had mentioned ten, but he believed there were in reality seventeen, cases in which the administration of the patent law was placed solely and exclusively in the hands of the Lord Chancellor. Anything more opposed to public policy than the Lord Chancellor's bill it was scarcely possible to conceive. He maintained that the present eminence of this country was to a great extent due to the wise provision that had been made in regard to patents, but the Lord Chancellor's bill would take away all protection from that important class of property known as invention; and unless a strong effort were made by all the important interests of the

country to stop the progress of the bill, the results would be very disastrous.

Mr. Carpmael said if the country desired inventions to be made it must pay for them in some form or other. There must be room for the inventor to succeed in the battle of life, in the competition that goes on, otherwise the race of inventors may soon become extinct. In the House of Lords, from the debates which took place on the second reading of the bill, they learned that public opinion was not at present sufficiently educated to allow of the abolition of patents, but this was a bill which would pave the way for this not very desirable consummation. No bill which was introduced to the notice of Parliament on the subject of patents could be satisfactory to inventors or those who sympathized with them. For example, he was one of those who considered that examination and investigation of applications for letters patent in some form or another was desirable; but when he asked himself the question: "Is the examination contemplated by the promoters of this bill a fair and *bona fide*, honest examination, or is it not, on the contrary, the wholesale rejection of applications for letters patent which will be expected at the hands of examiners?" he really knew not what to reply. There was nothing whatever in the bill to prevent its being used as an instrument of wholesale slaughter of patents.

Mr. Smith did not think that Mr. Carpmael thoroughly expressed the opinions of a large section of the class of inventors, and of those who had an interest in invention, in saying that some system of examination was desired. He believed if all the inventors in the country were polled, it would be found that rather than have such an examination as was provided for in the bill, or even as that shadowed forth by Mr. Carpmael, they would prefer to take their chance. They were the best judges of what they wanted, and the question of whether there was any infringement of a patent could easily be dealt with. The best method to employ, in the opinion of a large number of persons, was to have a larger number of libraries offering facility of examination to all inventors, so that everything that had been done could be easily ascertained. This would be far better than the employment of an expensive staff of examiners, who after all might not thoroughly understand the inventions submitted to them.

Mr. Camplin said he believed there was great feeling among inventors in favor of a proper system of examination; but he thought that an examination into the novelty of an invention must always be a matter of considerable difficulty; and unless there were at the Patent Office full and complete indexes, giving an opportunity to the examiners of going into the different inventions that had been already passed, the office of examiner would be a useless one—it would be impossible for them to do their work satisfactorily without having all those appliances at hand. If, however, those indexes and appliances were placed at the service of inventors, they might enable them to do for themselves the very thing which the expensive examiners were appointed to effect. The provisional specification was of great importance to the working class of inventors for two or three reasons. In the first place, they were not likely to be able to put their ideas into such a form as would satisfy the requirements of the law. They would therefore require professional assistance, which would entail considerable expense at the outset; during all that time they would be waiting for any protection which might enable them to negotiate with employers or capitalists with a view of getting their inventions carried out. Nearly all the petitions that had been sent to the House of Commons on the subject spoke of the abolition of the provisional protection as a thing that would be greatly detrimental to the class of inventors.

Mr. E. Newton said that the object of the resolution, which was passed, appeared to him to have been to get rid of the bill altogether; and perhaps that was cutting the Gordian knot in the right way, because unless some very serious alterations were made in the bill, there was no doubt that it was intended for the purpose of abolishing patents altogether. But inasmuch as they must be prepared for the bill passing the second reading and getting into committee, it became necessary first to consider in what way the bill should be amended, or whether they should or should not point out some things that really required excision from the bill and that some others should be introduced in their stead. He quite agreed that it would be better to retain the provisional specification. It was all very well to say that England was the only country that gave provisional protection. It was the only country in which a general description of an invention could be deposited, and a protection of some kind or other obtained for it. In all other countries a detailed description had to be given, illustrated with drawings, and sometimes with a model, setting forth the whole nature and object and scope of the invention; but those who stated that forgot one thing. In the first place, for instance, in America patents were much less expensive than they are here; in France and Belgium they were also less expensive; but beyond that, in France, during the existence of the patent, various improvements and additions could be added on to the original invention, and therefore if something has been omitted in the original specification it could be added on from time to time as these things occur. In America the patent could be re-issued, the original patent could be delivered up if it was found defective in some points, and anything that had not been properly described in the drawing could be included in the re issue. Under these circumstances it appeared to him that England was in a totally different position to foreign countries in regard to this question.

As regards examination, he was one of those who originally strongly objected to it, because he had seen the absurd-

ity of it in the United States. The examination there was supposed and theoretical. The law was as good as it could be, but it worked exceedingly badly. He had seen instances in which inventions had been patented over and over again. Mr. Cowper, he knew, had before him a number of extraordinary instances in which inventions had been patented over and over again in the United States, notwithstanding the boasted examinations which these things are supposed to have gone through. He agreed with Mr. Carpmael that an examination of some kind would be an advantage. He would move: 1. That any preliminary examination of applications for letters patent that may be hereafter instituted should not extend beyond the questions whether the specifications are clear, and whether the invention is open to objection on the ground of want of novelty, regard being had to prior publications in the Patent Office. 2. That an adverse report should not disqualify an applicant to a patent. 3. That in lieu of the proposed publication of reports (which would in many instances operate unjustly) the applicant should merely be required to insert in his specification an acknowledgment of the existence of the prior matter found and pointed out by the Patent Office officials, with a clear statement of what he claims notwithstanding.

Mr. Lloyd Wise said the proposal that, notwithstanding the adverse opinions of examiners, patents would be allowed, had been supported by the Associated Chambers of Commerce, the Society of Arts, the Society for the Promotion of Scientific Industry, and others, and was a very good one if taken in conjunction with the proviso, in Mr. Newton's resolution, that adverse reports should not be published, the examination being one as to novelty alone. If the insertion of acknowledgment of prior matter in the specification was required, the public would be effectually informed as to the nature of the invention.

Dr. Siemens said he thought they had all learned a lesson within the last few months. It was not more than two or three months ago since they had an important paper by the president, before the Society of Arts, on the question of the patent law, and at that time the voices were many and loud against the existing patent law. He was, perhaps, in a great minority in saying that he thought the existing law not bad, and that before they lifted a stone against it they should be very careful as to what they got in its stead. They had got something in its stead now, and he thought they ought to be very grateful to Lord Cairns for having attacked the question so boldly. He had benefited both classes, both the applicants for patents and those opposed to them; the former in showing them they really had a valuable patent law, which might be susceptible of improvement in detail, but which contained many important provisions which distinguish the English patent law before the patent laws of other nations. Opponents of patents would have learned by this time that it was not so easy to knock patents on the head. The opposition that had been raised against the provisions of the bill now before Parliament was so decided, and so well supported by reason, that he doubted very much whether the bill would go on, and perhaps next year or at some future time there would be a bill which would not attempt to undermine the patent laws, but which would be conceived with a view of improving them. In that case he was sure that all true friends of industrial progress, whom he would identify with friends of patent administration, would support such a measure. There seemed now to be very little difference of opinion with regard to the main features of such a patent law as would satisfy all classes. The most difficult point, and one on which they had that day heard different opinions expressed, was that of preliminary examination. Looking to the working of that system in other countries, it was found that it existed in America and in Prussia. In America it existed with a bias in favor of inventors. The American legislature favored the applicant, and, if any abuses arose, they were abuses inherent to that system of examination with power of rejection. In Prussia there was a system of examination with a bias against patent laws altogether. It appeared to him if the bill of Lord Cairns was to pass into law, the examinations would approach more nearly to the Prussian. The commissioner appointed would be instructed to seek for an excuse to refuse them, rather than try to modify the application in such a way as to give the applicant the benefit of the patent; and that being the case, he thought they should be very careful how to accept this clause of the bill. The question was involved in difficulty, and he must say that he had not found a formula that would altogether satisfy his own mind. Examination was decidedly useful; it gave the applicant information which must be useful, if it would stop there. Would it not therefore be sufficient for the examiner to point out to him clearly what had been done and what had been proposed to be done, and to warn him that in his claims he must avoid those breakers ahead? Nothing more was necessary. They need not go the length of printing a condemnation upon his very door. They might tell him, "This, that, and the other, is known, is published; avoid it; but we do not advise you to proceed or not proceed with your application." Some such medium course would probably get rid of the difficulty, which was a real one; but in all other respects he thought that the friends of the patent law, and those who had had experience of patents, seemed to be all agreed. So that it was unnecessary for him to enlarge upon any portion of the bill. He could only therefore concur with the resolution that had been proposed and seconded, and he hoped it would be carried.

Mr. Napier thought the bill should not pass in its present form. There was a strong feeling in favor of patents. He had been connected with them for many years as manufacturer and patentee, and when he read the bill he was very sorry to think that the Lord Chancellor should have framed

t. As far as he could judge, it seemed to be ignorantly framed. Having had to do with a large number of patents, he thought it was really necessary to have a provisional specification. He thought it was undesirable in any way to limit and tie up the patentee. It had been said that the patentee should be looked after, that he should be patronized; but he was afraid that in the House of Lords there was no real intention of patronizing the patentee. Indeed, the patentee did not require patronage; he required to be left alone, to have freedom. Speaking for himself, if he wanted any one to examine what he considered an invention, he would ask them. If the patentee wanted assistance, it should be furnished to him for nothing, and if that were done then the patentee would be in a right position. A patentee was naturally anxious to know whether there had been a previous patent which he would infringe upon. He did not want to take out a patent which had been taken out before, because he knew that the result would be to ruin himself in that particular thing. Therefore he was very anxious for his own safety. He therefore thought it very desirable to leave the patentee alone. He was a very useful person, in fact the whole of the progress of the country depended upon the inventor. That was saying a great deal, but if they looked into the library of the Patent Office and scanned the amount of mind that they found there shown in print, and if they could only suppose how in any other way but by patent law that mind had been used for the improvement which they found there indicated, he thought it would be impossible to conceive how by any other means than by patent law there should have been so much progress made.

Mr. Smith said it might be well to adopt the French system and require payment of, say £5 on application, and £5 a year afterwards. He did not wish to see the patentees patronized, but every means should be given them to enable them to judge for themselves, and also to employ such men as Mr. Carpmael, from whom they would get more assistance than they could from a large staff of examiners. He would give inventors the full benefit by taking off the enormous taxation in the third and seventh years, and making the payment an annual one, so that the patent could be dropped at any time.

Mr. Carpmael said there were, no doubt, abuses in the American system, but they had been often exaggerated. There was a reason for those abuses that did not exist in England. The American civil service was entirely political, and every one of the staff of the Patent Office had to subscribe a part of his salary to keep his party in office. With regard to the search, Dr. Siemens said that a search by a patent agent was expensive, and it could not be otherwise. When a patent was instructed to make a search, he had to build a scaffolding for the purpose, but in a government department there would be a scaffolding available for the public generally. He had taken out patents in America, France, and Belgium. In France and Belgium there was nothing to do but to ask for a patent, and he valued it according to the facility with which it was given. In America the process was very long; and separate patents were required for different details that would be included in one patent in England. That brought up the cost to about the same amount as in this country. He did not see how they could do much better than carry out the act of 1852 in its integrity. The bill of the Lord Chancellor was wholly uncalled for. Patentees had not agitated for it, and he did not regard the House of Lords as a body well qualified to judge of their requirements. He thought the bill would have very little chance in the House of Commons.

Mr. Smith thought it advisable to pass such a resolution as the following:—"That this meeting is of opinion that many of the provisions in the Lord Chancellor's Bill are contrary to public policy, and an interference with the admitted rights of inventors and others connected with property in invention."

Mr. Newton seconded the resolution, which was carried. The President said that the bill, as they were aware, had passed the House of Lords. He had the highest respect for that body, but he did not think it was a tribunal he would select for the purpose of determining upon the policy of the patent laws. He believed that the Lord Chancellor, in the very speech in which he introduced the bill, showed that he was not very practically acquainted with manufactures. His recollection was that, when the Lord Chancellor alluded to the new process of toughening glass by steeping it when hot in oil, he spoke of it as being in contradistinction to that process, ordinarily pursued in glass manufacture, by steeping it in cold water. He thought it would be found, on reference to his speech, that that was the Lord Chancellor's opinion on one of the processes in glass manufacture. Lord Somerset, who, having been at the head of the Admiralty, should, he thought, have had a little respect for inventions, was very jocose. He said that an inventor came and made a screw wide at one end, and another came and made it narrow at that end, and that gave him the right of patent, on which there was great laughter. It might have occurred to his lordship that the whole difference between a good screw and a bad one lay in the form of it, and that it was not until after years of experiment that a good propeller was obtained. Even at the present day they knew it was a disgrace to mechanics that they could not get a propeller that would utilize a greater percentage of power than was got by the screw. But he thought it was a matter of complaint that the patent law was made the property of lawyers. The bill had been framed by a lawyer without consultation with those who did know something about it; it entirely passed by several of the recommendations of the commission of 1865 and the committee of 1871-2, and it contained clauses that were in themselves most prejudicial. He was glad that the opponents of the bill

had been furnished with powerful arguments against it at the present meeting. They might not be wanted for the present session, for he hoped the bill would be not among the "innocents," but among the wicked, that would be slaughtered; but as it might revive next session, he hoped that the proceedings of that day would have their due weight; and he hoped, if needful, that the members of the Institution of Mechanical Engineers would meet another year to protest against a bill so injurious to the interests, not only of inventors, but of the country.

In Memoriam.

He used to make his appearance at our desk about once a week, for nearly ten years. He always carried a musty roll of drawings, which seemed to be a little more worn and a little more yellow at each visit. Eventually they came to look like the part of his coat against which they rubbed—dirty black and shiny. He was very patient; perhaps he gave us credit for being so likewise; besides, he was deaf. Therefore, he could wait and glare benignly though vacantly, over his rubicund nose, upon us until we had finished with some preceding visitor. Our part of the conversation was confined to nods, interjected whenever we became aware that he had stopped for breath.

Some years ago we understood a little of his story, but it departed from our recollection. It was too complicated: we either had to forget that or everything else. We did not tell him so, however, and consequently he supposed we were blessed with a stupendous memory; for after he had finished his invention and begun on the improvements, of which he had a new one to describe every time he appeared, he assumed that we remembered all of his previous oration. He improved his original notion out of existence several times, so that in the end his dilapidated drawings had nothing to do with the subject of his remarks. That idea occurred to him eventually, and he neglected to show them. This was after a great many people got impatient in attempting to reconcile them with his description. He would talk none the less, however, making enormous drafts on our imaginary faculties for comprehension, and on his own for facts. He believed that alcohol was food, and practically tested his theories frequently, which did not improve the coherence of his remarks nor the aroma which pervaded his presence. We found out, after a while, that we were a kind of mental safety valve for him. So long as we would listen he was happy; and doubtless, when he slowly departed toward the nearest bar room, his moral refreshment was equaled in degree only by his physical dryness.

This article is an obituary. It may be a peculiar one, but not more peculiar than its subject. We have missed him and his roll of drawings for about one week. There is a competition in progress, before a committee which sits daily, of schemes for a great city improvement. He entered the lists of competitors with that roll of drawings. Somehow he became possessed of the idea that he had distanced all rivals, when upon he indulged in a too prolonged banquet. Then he tumbled down stairs and broke his neck.

In the above will be recognized a character well known about New York city, a genius of more than ordinary cleverness, and an engineer of practical skill; but his hobby and his habits killed him.

City Bee Culture.

A manufacturer of a summer drink, which seems to be quite popular during the present heated weather, has taken a store in the neighborhood of our offices, and placed in the show window a beehive, in which, in full view of the crowd which constantly gathers, the busy insects make the honey which, it is asserted, is mingled with the cooling beverage. The window is open at the top, and the bees are allowed to collect their materials from the street refuse. The honey seems to be of excellent quality, and the bees require no further care nor attention than if foraging among their favorite clover fields.

At the Fair of the American Institute last fall, a very fine case of honey was exhibited, the contents of which, we were informed, had been obtained by the bees entirely from the swill barrels, the sugar-house waste, and the flowers in the public parks of the city. There was nothing about the material to distinguish it from the best honey made from clover, and it undoubtedly should and probably did find a market just as readily. The quantity of such honey-yielding refuse wasted in the metropolis is enormous. Why then should it not be more widely utilized through the bees? Private apiculture can be carried on just as well on a house top or in a back yard as upon a farm, and any one with such space at his disposal might easily manage a few hives and build up a paying business, and it would afford amusement to the experimenter and his friends. There are many people, out of the thousands seeking work here just at present, to whom some such new occupation—for such bee culture would be, thus carried on in the city—might be of considerable assistance in eking out a support during the stagnation of business peculiar to the heated term.

A contemporary suggests bee culture as an excellent employment for women, an idea with which we fully concur. A case is mentioned of a lady who started with four hives purchased for \$10, and in five years she declined to sell her stock for \$1,500, it not being enough. Besides realizing this increase on her capital, she sold 22 hives and 436 pounds of honey. Another instance is on record, of a man, who, with six colonies to start with, in five years cleared 8,000 pounds of honey and 54 colonies. Fine honey readily fetches, at retail, from 25 to 40 cents a pound.

MR. WILLIAM EDMOND LOGAN, the distinguished geologist, died recently at the age of seventy-seven years.

DECISIONS OF THE COURTS.

United States Circuit Court—Southern District of New York.

GILBERT & BARKER MANUFACTURING COMPANY vs. OAKES TIRRELL.—PATENT GAS APPARATUS.

[In equity.—Before WOODRUFF, Circuit Judge.—Decided June, 1874. WOODRUFF, F. J.:

The bill herein is filed to restrain the infringement of a patent granted to J. F. Barker and C. N. Gilbert on the 3rd of August, 1869, for an approved apparatus for carbureting air.

By means of this apparatus, it is claimed that gas is produced from petroleum and similar volatile oils employed for carbureting atmospheric air, thus rendering it combustible, light-producing, and suitable for lighting houses, manufactories, etc.

Neither the process nor the chief parts of the apparatus are claimed to be new. The claim in the patent which the defendant is charged with infringing is in these words:

"The arrangement of the carbureter with a motor wheel, said motor wheel being driven by a descending weight or other equivalent mechanical power applied to force the air through the carbureter to the burners, said carbureter being placed within a vault by itself, separate from the building to be lighted, the whole arranged and connected with pipes, substantially herein—that is, in the specification—described and set forth."

It appears by the proofs that, prior to the invention of the patentees, attempts to produce and bring into general use gas manufactured by forcing atmospheric air through or in contact with volatile oils under such pressure that it was suitably impregnated or carbureted were liable to two difficulties:

The chief of these was that, under any already devised arrangement, the danger of explosion, as an incidental result of the escape of gas from the carbureter, was very great; and this not only *per se* hindered its use, but made it difficult or impossible to procure insurance upon buildings so lighted. Another difficulty lay in the fact that, in passing the gas from the carbureter through the distributing pipes, whenever the temperature of the pipes was lower than that of the atmospheric air, condensation occurred, leading into the pipes not an obstruction merely, but a highly inflammable liquid, greatly inconvenient and dangerous.

If an attempt was made to obviate these objections by locating the apparatus in apartments separated from the building lighted, there was a necessity to provide for the changes of temperature in our ever-varying climate, which were liable to cool the carbureter to a degree which made it practically inoperative; or, if the apartment was artificially heated, the danger of explosion was not avoided.

I shall not enter very fully or minutely into discussion of the details of the patented apparatus, since most of them are confessedly old. The chief feature of the improvement is in the placing of the carbureter underground, in a vault separate from the building to be lighted, at any desired or convenient distance therefrom, while the power and the motor, by means whereof the atmospheric air is forced through pipes leading into the carbureter, is placed in an apartment in the building, or near thereto, conveniently accessible with or without a light, as occasion may require, whenever for adjusting the motive power or machinery thereof it is desired to do so. Such apartment being thus wholly separated by walls or intermediate earth, or both, no gas from the carbureter pervades it, and no danger of explosion arises.

Besides this result, which may be claimed to be purely incidental, and perhaps not novel, because it would result from any mere separation of the two parts of the apparatus by placing them in different apartments, a most important result is effected in making such separation practicable, and at the same time producing an even, regular supply of the gas by the carbureter unaffected by changes of temperature above ground, and effecting also a preliminary condensation before the gas enters the distributing pipes, which relieves the operation of the apparatus from the objection secondly above named.

Three questions are hereupon raised. Was this new arrangement patentable? Was it new, and were the patentees the first inventors? Does the defendant infringe?

1. Upon the first question it is insisted that the patentees merely changed the location of the carbureter, and that the mere change in the location of an old device is not patentable.

In *Marsh et al. vs. The Dodge and Stevenson Manufacturing Company*, in the Northern District, at the June term, 1873, (5 *Official Gazette*, 395) I had occasion to say that "mere change of location is not invention." But it was also held that "where change of location involves the employment of new devices to adapt an apparatus for use in the new position, and a beneficial result is produced, then this location, in its connection with such new devices—that is the means by which the result is produced, and not the result itself—is patentable; and where such change of location brings into existence a new combination to produce a new and useful result, such new combination is patentable."

This illustrates the nature and patentable character of the arrangement described in the patent in this case. By the new arrangement the patentees bring into contributory and effective cooperation, with a carbureter and the machinery for supplying atmospheric air thereto, the earth and its even temperature below the surface, and obtain protection from the efflux of gas from the carbureter and its accumulation in the frequently visited location of the motor, and from the danger of consequent explosion, and secure, by the passage of the gas from the carbureter through a cooler medium, the preliminary condensation, which makes the use of the gas in the building, and its passage through the distributing pipes safe, convenient, and valuable.

It is no impeachment of the patent to say that this is only making use of the natural laws which, operating below the surface, make such new location desirable as a matter of mere judgment. It is more than that. It brings into conjoint operation and effect new elements, working actively and also operating passively to produce the result, and to produce the ultimate and final result in a better manner—in a manner which combines safety with convenience and utility as had never before been.

The most important inventions ever made consist in subordinating natural elements or controlling natural laws to the production of useful results.

I cannot doubt that the invention of the patentees was patentable, as truly so as it is abundantly proved to be greatly useful and valuable.

The question of fact—was this arrangement new, and were the patentees the first inventors—must be answered in the affirmative.

I cannot, in a brief opinion, review in detail the evidence. I must content myself with saying that, after a careful examination of the testimony and attention to the very full argument of the counsel, the conclusion seems to me clear that no prior devices or arrangements anticipated the patentees. 2. Does the defendant infringe? It was felt, if at all, insisted that, if the arrangement of devices by the patentees was entitled to be called an invention, and was patentable, as above explained, the defendant did not employ the distinguishing features or characteristics. The details in the construction of his carbureter were not precisely like that used by the complainant, but those specific features were not claimed. The substantial operation of his carbureter and the mode of impregnating the atmospheric air are alike in both.

The difference between the apparatus of the defendant and that of the patentees chiefly relied upon is that, whereas the latter make the cavity below the ground a vault having surrounding walls, the defendant, having inserted his carbureter in the cavity, surrounds it with earth in direct contact therewith, and carries up to the surface a pipe through which to replenish the carbureter with oil, instead of having a removable opening to the vault below employed by the patentees.

The substance of the invention the defendant uses. The means of its effective useful operation are the same. The even moderate temperature of the earth, the underground passage of the gas, and the effect thereof are alike used in both. The difference in the construction of the carbureter used by the patentees, as described in the drawings, may make a more permanent opening about its sides desirable; but I cannot regard these details as of the substance of the invention. The apparatus of the defendant does substantially operate by the same means, in the same way, and to produce the same result.

The complainant must have a decree for an injunction and account in the usual form.

(*E. W. Stoughton and William Stanley*, for complainant. *Edmund Wetmore*, for defendant.)

Inventions Patented in England by Americans.

[Compiled from the Commissioners of Patents' Journal.]

From June 4 to July 5, 1875, inclusive.

- BACKING ELECTROTYPES.—J. S. Brooks, Pittsburgh, Pa.
- BAG FASTENER.—A. M. Miller *et al.*, Sturgis, Mich.
- BASSEMER CONVERTER.—J. E. Fry, Johnstown, Pa.
- BOTTLE STOPPER.—N. Thompson (of Brooklyn, N. Y.), London, England.
- BOTTLE STOPPER, ETC.—N. Thompson (of Brooklyn, N. Y.), London, Eng.
- BRAKE.—G. Westinghouse, Jr. (of Pittsburgh, Pa.), London, England.
- COMB.—A. Poppenhusen, College Point, N. Y.
- COTTON OPENER, ETC.—R. Kitson, Lowell, Mass.
- CUTLERY.—J. W. Gardner, Shelburne Falls, Mass.
- DOOR FASTENER, ETC.—E. C. Bacon (of Boston, Mass.), London, England
- FIRE ARM.—J. D. Greene, London, England.
- FRICTIONAL ELECTRIC BATTERY.—G. M. Mowbray, North Adams, Mass.
- GAS STOVE.—J. L. Sharp, New York city.
- GLAZING LEATHER, ETC.—R. Lee (of Phila., Pa.), Huddersfield, England.
- GRAINING LEATHER, ETC.—R. Lee (of Phila., Pa.), Huddersfield, England.
- GRATE BAR.—F. S. Smith, New York city, *et al.*
- HOT AIR FURNACE.—S. Smith *et al.*, Worcester, Mass.
- LAMP REFLECTOR.—C. M. Murch, Cincinnati, Ohio.
- LEATHER PULP, ETC.—B. James, Worcester, Mass.
- LIFE RAFT, ETC.—J. Cone, Bristol, Pa.
- LOOM, ETC.—T. A. Dodge, Cambridge, Mass.
- MACHINE GUN.—W. B. Farwell, New York city
- METAL TUBE, ETC.—G. J. Brooks, Brattleboro', Vt.
- NUMERICAL TOY.—W. Rose, New York city.
- ORDNANCE.—D. Davison, New York city.
- PAVING COMPOSITION, ETC.—J. R. McClintock, New Orleans, La.
- POISON YESSSEL, ETC.—W. M. Caterson, Philadelphia, Pa.
- POLISHING COMPOSITION, ETC.—F. Atwater, Norwood, N. J.
- REAPING MACHINE.—Gammon *et al.*, Chicago, Ill.
- SIVETING MACHINE.—J. F. Allen, New York city.
- REFLE TARGET.—J. G. Bennett, New York city.
- WOOD SCREWS, ETC.—T. J. Sloan, New York city.
- WRITING DESK.—W. S. Wooton *et al.*, Indianapolis, Ind.