

disappeared with the records of its performance. The managers of the Camden & Amboy were rather given to experiments in locomotives, and the old shops at Bordentown would have furnished material for an interesting study had full records of the work done there been preserved."

The photograph from which our engraving was made was taken by Schreiber & Sons, of Philadelphia, from the original Talbotype. This original has been well preserved during the 43 years since it was taken, the only defect being the blur on the lower right hand corner of the plate, which has wiped out a part of the pilot.

The Balsam-bog.

A correspondent of the *Commercial Bulletin*, writing from the Falkland Islands, which are situated in the South Atlantic, near the extreme end of South America, says: Approaching the low grounds in many of the islands, you think they are scattered all over with huge gray boulders, from five to ten feet across. To heighten the illusion, the blocks are covered with lichens, and grass is seen growing in their crevices where dust has collected, precisely as it would in rifts of rock. Each boulder-like mass is a single umbelliferous plant—*bolax-glebaria*—which has been so slow in growing, and the condensation in constant branching so great, that it has become almost as hard as the rock it resembles—so hard that it is difficult to cut a shaving from its surface with a sharp knife. Examine closely a lump of balsam-bog, and you will find it covered with tiny hexagonal markings, like the calices of a weathered piece of coral. These are the circlets of leaves and leaf buds, terminating a multitude of stems, which for centuries have gone on growing with extreme slowness—ever since the now enormous plant started out—a single shoot from a tiny seed. When the sun shines warm, it gives forth a pleasant aromatic odor, and the yellowish, astringent gum that exudes from the top is prized by the shepherds as a vulnerary.

On most of the islands a shrub abounds which the people use for tea, though it bears no resemblance to the Chinese plant or to the famous mate of Paraguay and Brazil. It is a species of *Adiantum*, bearing a fragrant white berry, and the leaves, infused in boiling water, make an agreeable beverage. In the Falklands, as in all Antarctic America, celery grows in wild luxuriance.

A Swedish Railway Project One Hundred Years Ago.

Close upon forty years before Stephenson's victory, a Swedish engineer, Karl Hogstrom by name, not only constructed a locomotive on similar lines to the one of Trevithick and Vivian, but also conceived the plan of a regular railroad. His first notion was that his locomotive should be used on ordinary roads, but soon realizing the insurmountable difficulties attending this style of locomotion, he, in the year 1791, brought out his railroad scheme. The rails were to be of cast iron and perfectly smooth, and in order to prevent derailment, the wheels were to have a projecting edge. Convinced of the insufficiency of friction between the smooth wheels and rails for the propelling of heavy trains, Hogstrom proposed that a tooth wheel on his locomotive should work on a central toothed bar or rail placed between the other rails—a plan which of late has been adopted in several instances where the gradient has been exceptional. Hogstrom's plan was laid before several scientists, who were unanimous in denouncing it as utter madness, as it was absurd to imagine that a carriage could ever be propelled by steam alone. The plan was entirely shelved, and nothing more appears to be known as to the fate of Hogstrom, who afterward went abroad.

Coloring Brass a Deep Blue.

A cold method of coloring brass a deep blue is as follows: 100 grammes of carbonate of copper and 750 grammes of ammonia are introduced in a decanter, well corked, and shaken until dissolution is effected. There are then added 150 cubic centimeters of distilled water. The mixture is shaken once more, shortly after which it is ready for use. The liquid should be kept in a cool place, in firmly closed bottles or in glass vessels, with a large opening, the edges of which have been subjected to emery friction and covered by plates of greased glass. When the liquid has lost its strength, it can be recuperated by the addition of a little ammonia. The articles to be colored should be perfectly clean; especial care should be taken to clear them of all trace of grease. They are then suspended by a brass wire in the liquid, in which they are entirely immersed, and a to-and-fro movement is communicated to them. After the expiration of two or three minutes they are taken from the bath, washed in clean water, and dried in sawdust. It is necessary that the operation be conducted with as little exposure to the air as possible. Handsome shades are only obtained in the case of brass and tombac—that is to say, copper and zinc alloys. The bath cannot be utilized for coloring bronze (copper-tin), argentine, and other metallic alloys.

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PATENT BILLS AND PETITIONS NOW BEFORE CONGRESS.

The number of bills for the modification of patent laws, now before Congress, is considerably more than usual. Heretofore, on the assembling of Congress a large number of bills have been proposed. The most important now under consideration is bill No. 233, which is understood to present the views of the present Commissioner of Patents, H. A. Simonds. Its main object is to make sundry necessary corrections in existing laws, as for example: to make the American patent run for seventeen years from the date of the earliest foreign patent for the same invention; at present, the American patent, if first patented abroad, expires with the date of the earliest foreign patent; hence an American citizen who takes a foreign patent before the issue of his American patent often-times shortens the term of his American patent. The object of this amendment is to prevent such shortening.

Another correction relates to caveats. At the present time, only citizens of the United States may file caveats; this bill corrects the statute by substituting the word "person" for "citizen of the United States," so that under the corrected statute any person will be able to file a caveat. To this no reasonable objection can be made.

The most radical change proposed by this bill relates to interfering applications. It provides that each interfering applicant shall, within a time specified by the Commissioner, file a preliminary statement under oath, giving the history of his production of the invention, in such detail as the Commissioner shall deem reasonable. After the applicant who first filed his application for a patent has filed his preliminary statement, the Commissioner may issue a patent to him for the invention. Nothing is said in this section about issuing a patent to the first inventor, but only to the party first to file his application.

Any interfering applicant who fails to file his preliminary statement, as aforesaid, shall thereby forfeit his right to a patent for the invention in controversy.

This change in the law would inflict a serious hardship upon the first original inventor who happened, by reason of sickness or poverty, to be unable to file a proper preliminary statement. There is no reason why he should be wholly deprived of his right to a patent. He might, at least, be left in the position of being able to present reasons for his omission. To cut him off altogether, and give away his invention to others and deny him hearing or right to make another application for a patent seems to be unjust and uncalled for. It may be well enough to provide that that particular application for a patent shall be forfeited, but to enact that the inventor shall have no right to a patent for his original invention seems to be contrary to our notions of equity.

Another section imposes a fee of \$10 and appeals from the Primary Examiner to the Commissioner, which is another step making it more difficult and expensive for inventors to get justice at the Patent Office.

Senate bill No. 235 provides that the President may appoint three Commissioners to revise and amend those statutes that relate to the protection of industrial property affected by the convention of Paris and Madrid. The Commissioners are to state the reasons for any amendment they may make, also to designate such parts of the statutes as in their judgment ought to be repealed, with their reasons for such repealing, and they are to report on such other matters relating to industrial property as they shall deem proper.

House bill No. 606 is an old and familiar scheme, one of a class that formerly were very often introduced in Congress. It provides for the protection of infringers of patents, and enables any man or company to make use of any patented article, free of charge, provided that they aver that they bought the article in good faith, without any knowledge that it was patented. No damages or costs are to be awarded against the infringer who makes such averment. This bill would be a practical nullification of the patent laws, and especially would benefit the Eastern Railroad Association.

Among the petitions presented to Congress is that of Mr. William K. Tubman, of Maryland, who sets forth in brief, that he brought suit against the Wason Manufacturing Co., of Springfield, Mass., for infringement of his letters patent for a railroad car, and that the said suit is now pending; but he finds that instead of being met by the Wason Company, he is obliged to contend with a corporation called the Eastern Railroad Association, which corporation has assumed and is maintaining the defense of the suit. This association, he says, is a secret combine or conspiracy, composed of nearly all the railroads east of Pittsburg, Pa., and it has offices in Washington. He says it is organized and maintained for oppression and injustice, and for spoliation for railroad uses, of private property of inventors.

The petitioner avers that this association is nothing less than a permanent conspiracy created in the interest of trade and commerce. Its constitution requires unity of action by all its members in opposing individual patentees. It is organized and operated for

the express purpose of ruining patentees by defeating their suits brought against railroad companies for infringement of patented inventions.

The petitioner says that an extension of his patent is the sole means by which he can obtain relief, inasmuch as the term of his patent has nearly expired, and after its expiration he will be unable to secure injunctions, nor will he be able to prove profits or damages, for the Eastern Railroad Association previous to infringement closed the market against him, advised and bound the infringers not to pay any royalty whatever for the use of his patent, as such payments would serve as a measure of damages should your petitioner ultimately win his suit in the court of last resort.

That in case an extension as prayed be not recommended, that the House will direct its committee to specify some adequate relief for your petitioner.

That the House will instruct its committee to report whether the President failed to execute the law by refusing to order a *quo warranto* proceeding to be instituted against the Eastern Railroad Association, as petitioned on August 12, 1890.

That a select committee be created to investigate the Eastern Railroad Association, and that means be adopted to destroy this conspiracy.

That the patent act may be so amended as to secure proper relief where the present rule regarding profits or damages is inoperative or insufficient.

That the patent act may be further amended so as to make wanton infringement a criminal act, as under the new patent law of Germany.

That the patent act may also be amended by providing that wanton infringers shall not be permitted to give bond and continue the infringement.

Legislation is certainly needed to put a stop to combinations formed like the Eastern Association, for the express purpose of nullifying the privileges granted to inventors by Congress.

One Hundred Miles an Hour by Electricity.

The latest electrical scheme is for an electrical railway between Chicago and St. Louis. The following is from the prospectus of the Chicago & St. Louis Electric Railroad Co., working under the patents of Dr. Wellington Adams:

The proposed road will be operated from one central station, located at the mouth of a coal mine somewhere near the center of the road. The railway company will operate this mine by means of electric mining locomotives, electric drills, electric cutters, and electric lights, which will greatly cheapen the present cost of the ordinary system of mining coal. The possibility and economy of this method of mining has already been established beyond dispute. The company will sell the good coal that it mines at a handsome profit, and use only the waste dust or slack to run the engines which develop the power for operating the mine and road, in connection with its distributing system of light and power for consumers along the line of the road. At the present time, such dust and slack is not only valueless, but has to be hauled away at the expense of the mining company. The road will be divided up into twenty-five sections of ten miles each, which will constitute a complete block system, making it impossible for any two cars to run at a high speed upon any single section at the same time, thus making collisions impossible. There will be a complete block signaling system by means of incandescent electric lights, with telephonic communication between cars upon the same section, whether running or standing still. The road will be illuminated by incandescent electric lamps for one mile ahead and one mile behind every car while running. It will be built in a practically straight line, and as far as possible will avoid grade crossings of other roads. At all grade crossings, whether wagon or railroad, a red electric light will be displayed and an electric bell rung for two minutes before it is time for the train to pass. It is intended to ultimately construct four tracks, two outside tracks for local traffic and high class freight, while the two inner tracks will be used exclusively for through passenger traffic, mail and high class express. The through cars will not stop anywhere between the two terminal cities between which they run. Spurs or branches will be run, connecting the large cities along the line of the road with the main through tracks, and from these cities individual through cars will run to and from the cities of St. Louis and Chicago without stop. Ultimately a street will be run along the sides of these tracks, along which dwelling houses and stores will be built. On both sides of these avenues the land will, ultimately, be laid out in building lots one hundred feet front by two hundred feet deep, giving an area of half an acre to each lot. These lots will be bought by people from town seeking the healthy air of the country and pleasant homes within quick and clean access of the city. Back of them, they will have the open farm lands, and in front of them the boulevard with the electric railway, telephone and electric light; practically uniting Washington Ave., St. Louis, with Michigan Ave., Chicago, by one grand electric highway or boulevard, along which the farmer

may secure electric light and power for pumping, plowing, thrashing, chopping and mixing fodder, shelling and grinding corn, and harvesting at night in case of emergency; and the rural resident may secure electric lights for the illumination of his dwelling, and electricity for heating and cooking, and electric power for domestic purposes. Along this road there will ultimately be a constant stream of travel. The population will be scattered out into the country, and the centers of trade and business relieved of their surplus, leaving more room for business establishments near the great centers of trade, taking out of the great bustle and crowd of the city those who are not immediately engaged in trade, and leaving room for those who are. The result will be of incalculable benefit to the whole population and land holders throughout the district through which the proposed road will traverse. It will bring into use and market a large amount of real estate hitherto of but little value.

Either of the three routes which this road proposes to take between St. Louis and Chicago will be at least thirty-three miles shorter than the shortest of the existing steam routes. The standard schedule time of all through cars will be one hundred miles per hour. The trip from St. Louis to Chicago can, therefore, be made in from two and a half to three hours. It will be unnecessary to travel at night, therefore no through passenger cars will be run after 9 o'clock P. M., the tracks being reserved at night for high class freight, express, and mail. This does away with the necessity of running Pullman cars, and the expense to the company attendant thereon, as well as to the traveling public. No man will care about traveling at night when he can travel in the day time over a cleanly road which will land him so quickly at his destination. Farmers along the line can build cheap side switches with light rails which will enable cars to be run directly to the doors of their barns and granaries, to facilitate the transportation of the produce of their land, thus rendering them largely independent of the condition of the ordinary wagon roads, which, by the way, have become very poor through neglect since the inauguration of the railroad system. Thus will the large markets of St. Louis and Chicago be practically at the door of every farmer throughout this district, for the sale of his perishable produce. The moment the proposed road is completed and put in operation, all lands throughout the district traversed by the road will be increased in value from one to two hundred per cent, and ultimately, and that at a day not very far distant, the land immediately contiguous to the road will be selling by the front foot instead of, as at present, by the acre, with very little demand for even this.

It will, of course, be to the highest interest of this company to build this road and get it in operation in time for the World's Fair, so as to secure the immense traffic incident thereto. It is entirely practicable, says the prospectus, to build such a road within the time allotted. Steam roads of a much more difficult character have been built much more rapidly: for instance, the Texas and Pacific Extension was built a distance of 615 miles in twenty-two months; four hundred miles of which was through a region entirely destitute of railroads and even of population, the cattle men at that time having failed even to penetrate the greater portion with their herds. The country was of a rough and hilly character, many summits being as high as three and four thousand feet, with such modifications of climate as to make a trip across the country a series of continual surprises. For a great portion of the road a rate of two miles for every working day was maintained for several months. Ties, fuel, and bridge timber had to be transported from East Texas, a distance of from four to six hundred miles; rails from Pennsylvania, seventeen hundred miles; and water from wherever it could be gotten along the line. The present proposed road will have none of these difficulties to contend with. It will have a practically level country over which to build its road, which will be crossed at intervals by steam roads which can be utilized for the transportation of its materials. An interesting fact may be stated in this connection, that contracts can be made for the delivery of rails for the entire road within six weeks from the day of giving the order.

The electric carriage or car that will be run upon this proposed electric road is a long, low, compact, light but strong car, having two pairs of driving wheels, each of which are driven by a separate and distinct electric motor. The whole weight of the car with its passengers, and of the two electric motors, comes upon these two pairs of driving wheels, and is, therefore, all available for traction or adhesion between the rails and the wheels, through the agency of which the car is propelled. The top of the car stands only nine feet from the rail, which is three feet lower than the ordinary street car. This brings the center of gravity very low and near to the track, which decreases immensely the danger of jumping the track. It has a wedge-shaped nose or front for cutting the air, which has the effect of decreasing the air resistance and of helping to keep the car down upon the track. The motor man

stands immediately back of this wedge-shaped front, and between his department and the rear wheels is the compartment for the accommodation of passengers. In the rear of this is a separate compartment for mail and high class express. The driving wheels are six feet in diameter, and are capable of making five hundred revolutions in one minute. The weight of the entire car with its motors is but ten tons. It may be interesting in this connection to state that a steam locomotive to make the same speed, if it were practicable, would have to weigh in the neighborhood of one hundred tons, and the present locomotive weighs from sixty to ninety tons. These electric carriages or cars will be illuminated and heated by electricity, and will contain all the modern appointments for the comfort of passengers. There will be no conductors and no brakemen. It will be possible to stop the car within half a mile by means of the motors themselves and auxiliary electric brakes.

Formulas for Making Different Colored Photographic Prints.

Mr. A. Lizzard, in *Anthony's Bulletin*, gives a translation from a French work on the different processes for producing prints in various colors.

"Process with nitrates of uranium and copper." By means of this process, which is as rapid as that of the salts of silver, prints of a brown tone are obtained very warm, very agreeable and of an artistic stamp.

The sensitizing bath is composed of:

A.	
Nitrate of uranium.....	23 grammes.
Distilled water.....	80 cubic cm.

B.	
Nitrate of copper.....	7 grammes.
Distilled water.....	80 cubic cm.

Mix these two solutions in a tray and immerse in it the gelatine sized paper, for about two minutes; then dry it in the dark. The paper thus prepared will keep for a considerable length of time, and it becomes also very leathery. The exposure to the sun requires not longer than ten minutes, a weak image showing in the printing frame. It is then developed by immersing in a solution of

Yellow prussiate of potash	16 grammes.
Distilled water.....	700 cubic cm.

The image will instantly appear with a rich red brown tone, with metallic reflection and bronzed. When the immersion has been sufficient, the image will appear with a nearly equal intensity on both sides, because it is in the body of the paper. By this means very fine transparent pictures are easily obtained. As soon as the print reaches the desired tone, wash it in pure water until the whites have become clear and pure, and all soluble salts eliminated; then hang it up to dry. No other fixing will be necessary.

In place of the yellow prussiate bath, if one is used composed of 2 parts chloride of platinum to 100 parts water, the prints will be a beautiful black.

In the same book is given a "process with nitrate of silver and uranium" which promises very fine results. Float a sheet of paper on a sensitizing bath composed of the following:

A.	
Nitrate of uranium.....	60 grammes.
Distilled water.....	50 cubic cm.

B.	
Nitrate of silver.....	8 grammes.
Distilled water.....	50 cubic cm.

Mix the two solutions, float the paper for two or three minutes and hang it up to dry in a dark room. Expose it under the negative and immerse in a bath composed of

Proto-sulphate of iron.....	16 grammes.
Tartaric acid.....	8 "
Sulphuric acid.....	a few drops.
Distilled water.....	200 cubic cm.

The development is very rapid and the print is fixed by washing in pure or rain water. The sensitiveness of this paper is so great that in diffused light a print is visible and black in eighteen seconds, and in half an hour before a kerosene light of moderate size at 5 inches distant from the flame. The process is very simple, and the chemicals of the ordinary kind to be found in every well conducted dark room.

Fireproofing Receipts.

Prizes were awarded for the following finishing processes for fireproofing, respectively diminishing the combustibility of tissues, curtain materials, and theatrical scenery. For light tissues: 16 pounds ammonium sulphate, 5 pounds ammonium carbonate, 4 pounds borax, 6 pounds boric acid, 4 pounds starch, or 1 pound dextrine, or 1 pound gelatine, and 25 gallons water mixed together, heated to 86° F., and the material impregnated with the mixture, and then calendered as usual. One quart of the mixture, costing about three pence or fourpence, is enough to impregnate 15 yards of material. For curtain materials, theatrical decorations, wood, furniture. 30 pounds ammonium chloride are mixed with so much floated chalk as to give the mass consistency; it is then heated from 125 to 140° F., and the material given one or two coats of it by means of a brush. A pound of it is sufficient to cover five square yards.