

president of the association, was delivered on Wednesday night, in the library hall, before a large and appreciative audience. His subject was "A Decade of Evolution," and he reviewed with great earnestness and enthusiasm the work that had been done in the last ten years, especially by American naturalists, to prove and illustrate the Darwinian theory of the derivation of species. The address abounded in facts of the most curious and instructive nature, and was well received, except that the speaker felt impelled to retaliate on the church for its alleged obstruction of the progress of modern science. The entire speech will be printed in the proceedings of the association, and will have a high degree of value as a contribution to the history of scientific progress. Next week we shall give an outline of the more important work done in the various sections.

It should be added that the members of the association, while fairly diligent in their allotted duties as scientists, availed themselves of the privileges of the metropolis and enjoyed a reasonable amount of sight-seeing. The excursions around the harbor and to West Point and Long Branch are popular features. The general reception on Thursday evening at the Metropolitan Opera House was a brilliant affair, and brought together a delightful company representing all parts of the nation.

#### REVIVAL OF PATENT EXTENSIONS.

The last Congress may be said to have revived the almost obsolete custom of extending patents beyond the original time for which they were granted, and the probability is that the Congress which meets in December next will be strongly urged to pass a new general law upon the subject.

By the amendment of the patent law passed March 2, 1861, the term for which letters patent are granted was changed from fourteen years to seventeen years, and the provision of the statute for the extension of patents was altogether struck out, the additional period of three years on the original term being held to be tantamount to an extension of all new patents for that much time. Patents granted subsequent to March 2, 1861, were issued without any privilege of extension, and the only way in which they can be lengthened is by a special act of Congress in each individual case. Hundreds of applications for extensions have been made to the Congressional committees, but, except in two or three cases, they have always been refused, and it had come to be generally understood by patentees that there was little or no chance of getting a Congressional extension. But Mrs. Henrietta H. Cole, of New York, inventor of the fluting machine patented June 12, 1866—twenty-one years ago—has been more fortunate. The last Congress granted her petition, authorizing an extension. The Commissioner of Patents has heard the required evidence, and has granted the extended patent. So this patent monopoly, after having expired and become free to the public for four years, is again revived and put in force for seven years, dating from June 12, 1883, the date of the expiration of the first term of the patent.

The grant of this extension will be a justifiable encouragement for all patentees whose patents already have or are about to expire to besiege Congress for special acts of relief in each particular case; and we hope no one will hesitate or be backward in filing their applications. There are undoubtedly many cases involving the greatest hardship to the inventor, in which an extension would be a relief. There are many inventions, of most extraordinary value, for which the inventors have not received a tithe of reward as compared with the benefits their devices have conferred upon the nation. Congress should either hear and determine each individual petition, and grant it, if just; or it should pass a general law, under which all patents may be extended; or it should put a stop to the grant of any patent extensions.

Last year a bill was introduced, but failed to pass, providing for the extension of all expired patents, and this, under proper conditions, would seem to be the easiest and fairest way of disposing of the matter. But it must not be forgotten members of Congress are politicians, and many of them seem rather to like to have their constituents run to them with their little private bills, as in that way a certain home influence and power is secured.

At present, the way to proceed for any one desiring to obtain an extension of a patent is to make application by petition to Congress, to be presented and pressed by the senators and members from the State in which the petitioner resides. No official fees are required to be paid. Personal interviewing of members to explain the particular merits of the case is often of great assistance, particularly so if the lobbyist be a woman. Tears and tresses are a power at the Capitol.

SUNFLOWERS are used in Wyoming Territory for fuel. The stalks when dry are as hard as maple-wood and make a hot fire, and the seed heads with the seeds in are said to burn better than the best hard coal. An acre of sunflowers will furnish fuel for one stove for a year.

#### A Great Bell for Cologne Cathedral.

An official notice has been published of the great bell for the Cathedral of Cologne, the solemn inauguration of which took place some days ago with great pomp. The bell weighs 27,000 kilos., or about 26 tons 13 cwt. The clapper alone weighs 800 kilos., or nearly 15½ cwt. Its perpendicular height is almost 14½ feet; its diameter at the mouth nearly 11½ feet. Twenty-two cannons taken from the French were assigned by the Emperor William for its manufacture; 5,000 kilos. of tin were added. It was cast by Andreas Hamm, of Frankenthal, and £21,000 m. (£1,050) were paid for the casting. It will be known as the Kaiserglocke, or Emperor's bell; and as the two other large bells in the cathedral bear the epithets respectively of Pretiosa (precious) and Speciosa (beautiful), this one is styled Gloriosa. It bears above an inscription recording that "William, the most august Emperor of the Germans and King of the Prussians, mindful of the heavenly help granted to him whereby he conducted the late French war to a prosperous issue, and restored the German empire, caused cannons taken from the French to be devoted to founding a bell to be hung in the wonderful cathedral then approaching completion." A likeness of St. Peter, the name patron of the church, is on the side, beneath which is a quatrain in the style of the mediæval conceits, praying that, as devout hearts rise heavenward at hearing the sound of the bell, so may the doorkeeper of heaven open wide the gates of the celestial mansion. On the opposite side is inscribed a sestet in German, of which the translation is:

"I am called the emperor's bell;  
I proclaim the emperor's honor;  
On the holy watch tower I am placed.  
I pray for the German empire,  
That peace and protection  
God may ever grant to it."

The bell was solemnly blessed in the cathedral by the Archbishop of Cologne, according to the elaborate ritual set out in the *Pontificale Romanum*. The ceremony was very long, many psalms being chanted by the clergy and choristers while the bell was being sprinkled with blessed water and anointed with chrism, and the portion of St. Luke, x. 38-42, was chanted by a deacon. Incense and myrrh were burnt within it, and many symbolical rites performed. The opinions of experts are divided as to whether the note which the bell sounds is C sharp or D.

#### A Million Dollar Diamond—the Largest Brilliant in the World.

A model of the Victoria, the Great White Diamond or the Imperial, has been sent to this city lately, and Mr. G. F. Kunz gives in *Science* the following:

Concerning its early history very little is known; in fact, where the stone was found is only a matter of conjecture—a remarkable circumstance when we consider that this is the largest brilliant in the world.

An explanation by a letter in the *London Times* was given, as follows: "That this stone was not found in English dominions at all, but in the neighboring Orange Free State; that it had been found by a boor on his farm, who, knowing it to be a diamond, but fearing being turned out of his farm by a mob, kept the secret a whole year, until a Mr. Allenberg of Port Elizabeth saw it, and forwarded it to London."

It is, however, believed that it was found by some one in one of the Kimberley mines, South Africa. The first intimation that any of the various mining companies had of its existence was when they heard of its safe arrival in London. It is generally supposed that in the month of June or July, 1884, the stone had been found by one of the surveillance officers of the Central Mining Company in the Kimberley mines. It being his duty to search others, he had the privilege of not being searched himself, and so the stone was passed through the searching house, and he was afterward supposed to have found means of communicating with four illicit diamond buyers. Owing to the stringency of the diamond laws of Griqualand West, the trading in rough diamonds is forbidden anyone not owning one of the "patents" or "licenses," as they are called, costing £200 and a guarantee of £500. All purchases made by them must also be entered in a special registry, and are duly signed every week by the police authorities. £3,000 was the price paid to obtain the stone from the first possessor. To prepare themselves for the ordeal of transporting the stone out of the district, they assembled at night, commenced drinking, then gambling, and after a night's debauch two of the party lost their share in the big stone. The other two reached Cape Town in safety, where the diamond laws are not in force, and from a dealer there received £19,000 cash for their stone. An outward duty of one-half per cent is collected on all shipments of diamonds from Cape Colony; but this diamond is said to have been carried by one of the passengers of a mail steamer, and was hence undeclared. We next hear from it in London, causing considerable sensation at Hatton Garden, the great diamond market. After considerable time had been spent in trying to find a capitalist who could afford to buy such a gem, it was at last arranged by a former resident of the Cape mines to form a company of eight persons, who bought the stone together for

£45,000 cash, on condition that if they should dispose of it each should receive a ninth share in the eventual profits.

Before cutting, it was estimated that the crystal would furnish either of the following gems: If cut as a brilliant, 300 carats; as a drop, 230 to 240 carats; as a lozenge, 250 carats; and as a mathematically perfect brilliant, 150 carats. If cut in the latter form, it would have furnished cleavages that would cut into one 40 carat, one 20 carat stone, and 40 carats of smaller stones. It was finally decided to cut it into the largest possible brilliant, still preserving a good shape, and Amsterdam was selected as the place where the gem could best be cut.

It was accordingly sent to the polishing mills of Jacques Metz, who erected a special workshop for the purpose. In order to better obtain the brilliant form of cutting, a piece was cleaved off which furnished a 19 carat diamond, and was sold to the King of Portugal for £4,000. The cutting of the large stone, which was commenced on the 9th of April, in the presence of the Queen of Holland, took about twelve months, since, instead of being cut by abrasion with another diamond, as diamonds are usually cut, it was polished down on the scaif; and a great amount of time was consumed by the cooling of the stone, as it heated after an hour's running on the wheel. The cutter of the stone was M. B. Barends. The stone in its finished condition weighs 180 carats, and is a beautiful, perfect, steel blue diamond, and is the largest brilliant in the world.

It is 39.5 mm. (1 9-16 inches) long, 30 mm. (1 11-64 inches) wide, and 23 mm. (15-16 of an inch) thick, being exceeded in size by one diamond only, the Orloff, belonging to the Russian crown, which weighs 194¼ carats, but is a large deep rose, and not a brilliant. The Victoria exceeds the Regent in weight by 44½ carats. The Kohinoor weighs only 106 1-16 carats.

The form of the Imperial is not entirely even. On one side of the girdle there is quite a flat place, a natural unpolished surface, necessary, in cutting, to preserve the large weight of the stone. It is, however, a perfect 58 facet brilliant.

The original weight of the stone was 457½ carats, 3 1-60 ounces troy. The stone to-day is held by a London syndicate for £900,000.

#### Treatment of Dysentery.

In a correspondence from Bombay, Dr. C. MacDowall, physician in the British army of East India, speaks with great enthusiasm of the treatment of dysentery by *ipecaquanha*. Like other friends of this treatment, such as Docker, Ewart, Cunningham, Malun, etc., he says that it is almost a specific, renders the disease easy to cure, and prevents the complication most feared, *i. e.*, hepatic suppuration. But he emphasizes, particularly, that "the remedy be given early in the disease, at the proper time, and in the proper manner." The principles of the treatment are:

1. To give a large dose of ipecac, at least thirty grains for an adult.
2. To prepare the stomach to accept and retain such a large dose by about twenty drops of laudanum *an hour before* giving the ipecac; also the application of a sinapism over the stomach, and to administer the ipecac in the form of large pills, not in solution. It must also be given at night, at the time of going to sleep, never in the morning, and not during the day, and no liquid is to be taken after the dose has been given.

Sometimes the patient vomits a little mucus toward the morning hours, but the greater portion of the remedy has by that time been absorbed. This treatment must be renewed every night, and usually the improvement is marked by the third morning, or sooner; blood, mucus, pain, all three having disappeared. A disease which formerly made us despair now has lost its terror to us.

The opium may be substituted by a hypodermic injection of morphia. Bismuth subnitrat. may be given during the day. Small doses of ipecac are more than useless; they have been tried in India for over two centuries without lessening the mortality in dysentery. Since more than twenty years the above has been adopted as almost the only treatment in British India, and has given the best results.—*Progres Medical*.

#### Electric Meteorology.

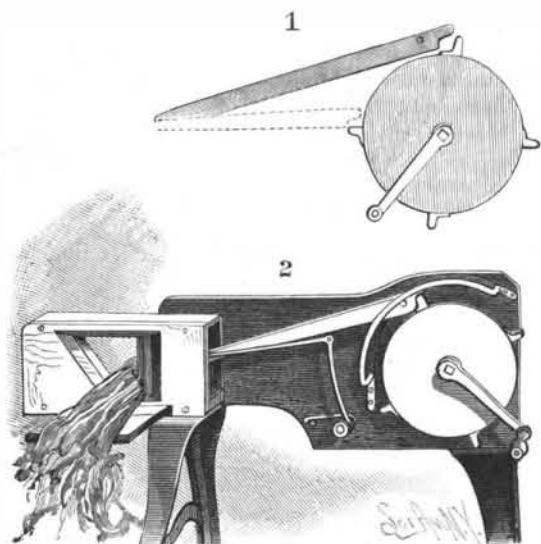
Mr. G. A. Rowell, of Oxford, says the *Electrician*, sends us a pamphlet with the above title, in which he discusses the cause of the changes in magnetic declination. He adduces evidence to show that the European and American magnetic poles are coincident with the centers of greatest cold for the two continents. Hence he attributes the shifting of the magnetic poles to the same series of astronomic and geologic causes which produce the secular changes in climate. This theory leads to the uncomfortable conclusion that as the magnetic declination in this country continues to decrease, so our winters will increase in length and severity. Without laying undue stress on the point, the author is certainly able to appeal to our recent melancholy experiences as an argument upon his side.

**Railway Sand Blast.**

The Hinckley Locomotive Works, of Boston, are building an express locomotive with a single pair of driving wheels. This engine is built to the order of a Boston syndicate, and is intended to run the fast express, the Flying Yankee, on the Boston & Maine. The engine will not be completed until Sept. 1. It is understood to embody many new features, and considerable interest will be felt in its performance. Any difficulty from slipping can probably be overcome by the use of the sand blast now successfully used on many English roads, and undergoing trial on the Chicago, Burlington & Quincy. The sand being thrown on the rail by a jet of compressed air, cannot be blown off before the wheel reaches it. Experience in England goes to prove that the success of engines with a single pair of drivers depends entirely upon the character of the sand supplied. If dry and delivered fairly on the rail close to the driving wheel tread, no time is lost from slipping, even where the tractive power of the engine is 94 lb. per lb. pressure on the pistons.

**IMPROVED MECHANISM FOR RECIPROCATING PLUNGERS.**

A novel means of imparting a reciprocating motion to a plunger, applicable for use in connection with a hay or vegetable cutter, or a hay press, or for other purposes, is shown in the accompanying illustration, and has been patented by Mr. George McCarn, of Goodland, Ind. The drum or disk, which may be operated by a crank arm or a sweep, has bosses or projections on its peripheral face, and a pitman, connected at one end to a plunger, is held against the peripheral face of the drum by circular guides, concentric with the axis of the drum. As the drum is revolved the pitman is forced to the position shown in dotted lines in Fig. 1, by one of the lugs upon the drum; and as the lug passes from engagement with the pitman, the latter is returned to its first position by

**MCCARN'S MECHANISM FOR RECIPROCATING PLUNGERS.**

a spring and link. In Fig. 2 the plunger is represented as being provided with a knife, arranged to be thrown against the cutting edge of another knife carried by a casing, within which the plunger is mounted, as the invention may be utilized for cutting hay, roots, etc.

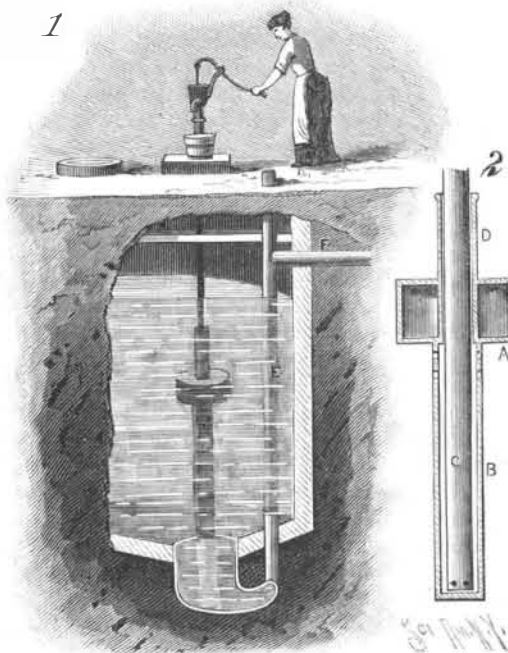
**The British War Ship Undaunted.**

H. M. S. Undaunted (12), belted cruiser, lately steamed out of Plymouth Sound into the channel for a final contractors' four hours' trial of her machinery with forced draught. The vessel was ballasted with heavy weights in order to bring her down to her deep load line draught, the same as if she had all her stores, guns, ammunition, coals, and crew on board ready for sea. Her draught of water forward was 20 ft. and aft 22 ft. The result of the trial was as follows:

Starboard engine horse power, 4,204; port engine horse power, 4,398; for both engines, 8,602, or 102 over the power contracted for, which was 8,500. The highest power obtained was 9,020, or 520 above what was contracted for. The speed of the ship on the measured mile was 19.4 knots per hour, which is the highest speed attained by any of her Majesty's heavily armed ships of war. The wave line was measured, and the curve proved that the protective belt was above and below the water line in the position as originally intended in the design. The Undaunted is the second of five vessels of the same class ordered about two years ago by the Admiralty. Messrs. Palmer & Co. have done important work in completing the two vessels entrusted to them to build, and which are the first two of the five. This vessel previously had a natural draught trial, when she attained a speed of over 17 knots, and indicated 5,640 horse power during the four hours' run, the maximum horse power being 5,890, or 390 horse power above the contract, which was 5,500.

**AN IMPROVED CISTERN DEVICE.**

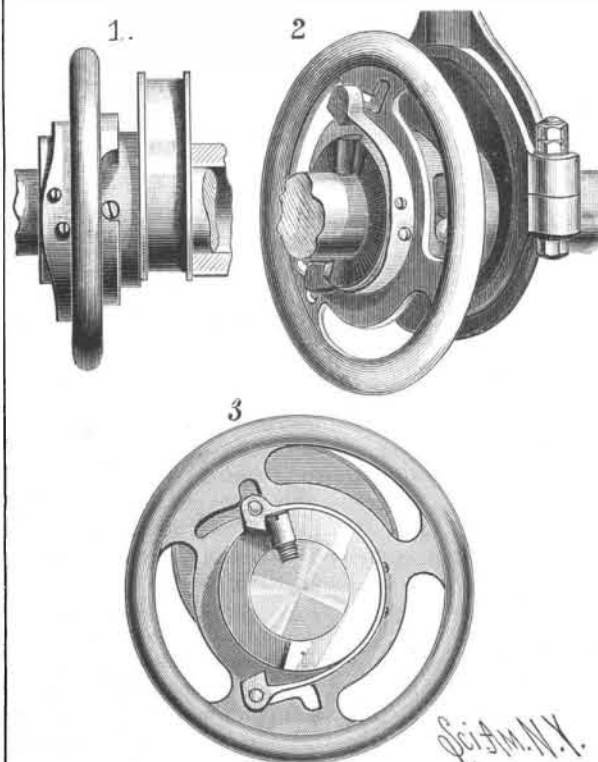
The illustration herewith shows a form of cistern and pumping arrangement by which water can always be drawn from the interior of the water in a cistern, avoiding both the scum on the surface and the sediment at the bottom. It has been patented by Mr. George A. Allen, of Madison, N. J. The cistern is made with a

**ALLEN'S CISTERN.**

bottom trap or elbow, this portion being preferably of glazed earthenware, and with it is connected an overflow pipe and branch, E, F. The open top of the pipe, E, prevents siphoning, and provides for the insertion of a suction pump, whereby sediment may be withdrawn. The pump pipe, C, is fitted, over its lower portion, with a slip tube, D, having an enlarged lower portion, B, and a float, A, the latter always locating the height of the slip tube in such way that the supply of water taken by the pump will be drawn from the holes in the slip tube beneath it in the body of the water, the slip tube being closed at the bottom.

**AN IMPROVED REVERSING GEAR FOR ENGINES.**

The invention herewith illustrated provides a novel form of reversing gear for engines, which has been patented by Mr. Edwin H. Whitney, of Providence, R. I. Fig. 1 shows a side elevation of the reversible eccentric, with hand wheel for operating it, Fig. 3 being a front elevation showing the engine shaft in cross section, and Fig. 2 a perspective view illustrating the application of the invention to an upright engine. The eccentric is formed with a hub having shoulders to engage a stop pin on the shaft, in combination with an operating wheel placed on the hub of the eccentric, and having a limited rotary motion thereon. The eccentric has a limited independent motion upon the shaft, and the hand wheel has a rotary motion

**WHITNEY'S REVERSING GEAR FOR ENGINES.**

independent of the eccentric, combined with spring catches arranged to lock the hand wheel to the shaft. Further information relative to this invention may be obtained of the American Ship Windlass Company, George Metcalf, treasurer, Providence, R. I.

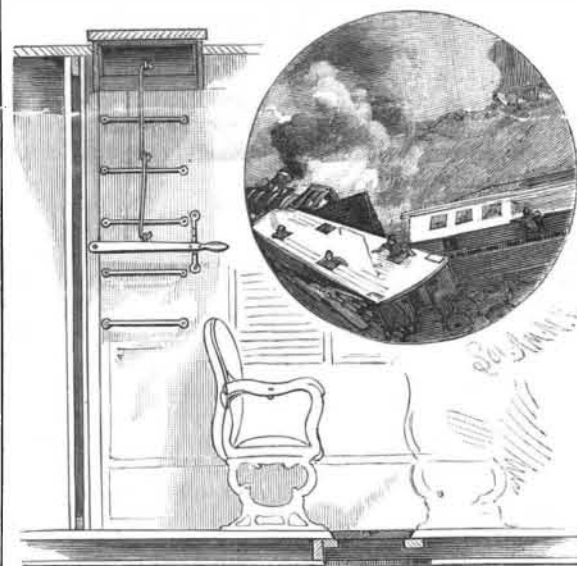
**Electricity a Form of Matter.**

Mr. Carl Hering, writing to the *Electrical World*, says:

"It is a well-known fact that quantity of electricity measured in coulombs never is generated, never is consumed, and never does grow less, excepting leakage. The current flowing out of a lamp is exactly the same in quantity as that going into it; the same is true of motors and of generators, showing that electricity of itself is neither consumed while doing work nor is it generated. After doing work in a lamp or motor, it comes out in precisely the same quantity as it entered. A battery is not able to generate quantity or coulombs of electricity; all it is able to do is to take the quantity which pours in at one pole and send it out at the other pole with an increased pressure, or E.M.F. Electricity, therefore, is not merely force (or a form of energy), but matter. It is precisely analogous to water in a water circuit. The water is neither consumed nor generated. The pump merely increases the pressure of the water which flows in at one end. The water motor merely consumes the pressure, and converts it into mechanical work of another kind. It does not consume the water. The quantity of water, measured in units of quantity, is the same in all parts of a closed circuit of water," etc.

**A SAFETY APPLIANCE FOR RAILROAD CARS.**

The invention herewith illustrated provides means by which escape can easily be made from railroad cars in case of accident, and has been patented by Mr. Thomas G. Gilfillan, of Union, Oregon. Openings are formed in the roof of the car, which are fitted with trap doors, from each of which depends a hooked bar, the lower end of which is engaged by the head of another bar, the latter being held down, to keep the trap door closed, by a hand lever, engaged by a vertical toothed bar. Upon releasing the lever from the toothed bar, the trap door may be readily raised or removed,

**GILFILLAN'S SAFETY CAR.**

and, iron steps or rails being attached to the side of the car, on both the inside and outside, a ready means of escaping from the car is thus afforded when other methods of egress might be cut off. In addition to these openings in the roof, similar openings, provided with trap doors, are arranged in the floor of the car.

**Banana Liquor.**

The *Indian Agriculturist* calls attention to the fact that India abounds in bananas or plantains, and wonders that the fruit has never been employed in the distillation of a fermented liquor. The common prickly pear has been utilized for this purpose in Malaga, and with considerable advantage to the distillers; and it now appears that missionaries in the Congo region have discovered that a beverage made of bananas is a preventive of malarial fevers. A banana liquor company has recently been started in India for producing banana liquor in either an alcoholic or non-alcoholic form, and which can be used with equal advantage as an ordinary liquor or diluted with hot or cold or soda water. For the temperatures of northern regions, including England, it will probably be best esteemed in conjunction with brandy or other spirits.

**A New Torpedo Boat.**

The Secretary of the Navy invites proposals for the construction of one first-class torpedo boat, complete, exclusive of torpedoes and their appendages, the vessel to be of the best and most modern design, to be constructed of steel of domestic manufacture, having a tensile strength of not less than 60,000 pounds per square inch, and an elongation in eight inches of not less than 25 per cent, and to have the highest attainable speed. Proposals will be received until November 1 next. Premiums will be paid or penalties exacted according as the speed of the vessel shall be above or below 22 knots per hour. The cost of the vessel, exclusive of premiums, is limited to \$90,000.