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Interior of first Edison central station.

The first Edison central station—1882.

This earliest central station in the United States was built in

Appleton, Wis. It had a capacity of two hundred and fifty lamps.

When Electricity Was Really in Its Infancy

By Prof. Francis B. Crocker

DR. WHEELER and I first turned our attention to electricity about 1874, which was forty years ago. Of course it was only the play of two boys who had the same bent, but we actually began to make crude forms of electric batteries, etc., at that time.

In the early days general knowledge of electricity was very limited. Few persons, in fact, not one in 10,000, knew anything about the subject. Even the books were largely confined to frictional or static electricity. For many years after that time there was a general notion that the dynamo acted by friction.

Quantitative ideas were particularly vague. For example there were no voltmeters or ammeters. During my career there have been three different kinds of ohms and volts with somewhat different values, that is, the B. A., Legal and International ohms. One inventor whose ideas were submitted to me claimed that his dynamo generated *better quality* of electricity which would produce more light, although it did not measure more; the same way that better quality of coal would produce more steam per pound burned under a boiler.

When we first began to study electricity, the telegraph was the only practical application. It was before the telephone was invented or any commercial forms of dynamo-electric generator or motor; arc or incandescent lamps; electric railway; power transmission or electro-chemical apparatus were used or even seriously considered. At that time the only important electrical plant in New York city was the main Western Union Telegraph Office on Broadway at Dey Street, in which one whole floor was filled with cells of gravity battery. The maximum output was about one eighth watt per cell, and there were, I think, 20,000 cells, which would give a total of $2\frac{1}{2}$ kilowatts. Yet that was the largest electrical generating plant in commercial operation in America!

The telephone was first exhibited at the Philadelphia Exposition in 1876. The first ones that I ever saw were those we made ourselves from descriptions in the *SCIENTIFIC AMERICAN*. For a long time the telephone was regarded as merely an interesting toy. A friend of ours who owned the exclusive rights for New York city and vicinity sold them for \$20,000, and thought he had done well.

The first arc lamps were those of Brush, Weston, and Thomson-Houston. I remember that one of the first practically used in New York was in the Equitable Building, where it was visited by thousands as a great curiosity. The "sub-division of the electric light" had been a great bugbear until Brush was able to run a number of arc lamps in series on the same circuit, without interference between them. Before that time each lamp had to have its own generator! How would the

Edison dynamo of 1883.

New York Edison Company like to operate on that plan to-day?

I remember very distinctly that I saw at Menlo Park the first successful incandescent lamp ever produced. There were only a few of them in Edison's laboratory. They could all have been easily put in a small basket. When they were brought out publicly they created a great sensation, and the gas stocks tumbled in price to the extent of millions of dollars throughout the country, and the Edison Company's stock went up to \$2,500 per share; that is, twenty-five times the par value. They reached this enormous figure on the theory that the Edison stock had gained all that the gas stocks had lost! Edison "sub-divided" the electric light by putting his incandescent lamps in parallel. He devised the safety fuse, but at first it was single pole, that is in one wire only. At that time the sockets, switches, and fuse blocks had wooden bases which were so many pieces of kindling wood for starting fires. The so-called "underwriter's wire," then generally used, was miserably insulated and for that reason soon came to be known as "undertaker's wire."

For a long time the generators were all bi-polar even up to 100 kilowatts or more. With the exception of a very few so-called "Jumbo" Edison machines they were high speed and belted.

Long after electric lighting started there were practically no motors. Central stations objected to having them on their circuits for fear of affecting the lights. It took years to overcome this prejudice. To-day the motor load is considered much more desirable than the lighting load because it lasts longer and is more nearly constant. Motors began to be used commercially just about the time the Crocker-Wheeler Company was started in 1888, which was about ten years after electric lighting was introduced. At first it was hard to convince people of their value. People would ask, "Why turn the mechanical power of steam, gas or water into electricity and then back again into mechanical power?" That simple question seemed almost unanswerable.

When each new application of electricity came out, and for applications in general, the public has always taken the wrong view or applied the wrong test. The new way was expected to be *cheaper* immediately, and nearly every one thought that the whole story. In point of fact electric lighting from central stations cost more than gas light up to the advent of tungsten lamps, certainly more than from kerosene oil. Convenience, cleanliness and many such advantages are really the reasons why it was preferred. The same is true of electric motors. Each new application of electric drive had to overcome the same old opposition. Apparently there was no great advantage in cheapness, and few could see the other fifteen merits which are really more important. Even if it was successful for other service each man thought that it was not good enough for the peculiar conditions of his particular work. This was notably true of carpet and silk looms. It was awfully hard to get people to try the first motor, but in a year or two you could not take away their electric drive for love nor money. The first induction motors were described in Tesla's paper at the A. I. E. E. meeting in May, 1888. I remember distinctly seeing there the only induction motors in the world—two small specimens lying on the table. Tesla did not invent the poly-phase system or generator, or even the rotary field. Deprez in 1883 laid down the theory. Charles S. Bradley applied for a patent in May, 1887, a year ahead of Tesla. This patent covered too a rotary converter and the double-current machine, that is, it may be employed as a double-current, single or polyphase generator or motor.

The electric railway also came in about that time, that is, 1888 and 1889. At first there was much trouble with burning out of motor armatures. I remember that in one case a man in charge of repairing them was asked if they did not often burn out. He answered "Oh, no, only three to-day," and it was then about noon! In all the earlier forms of electric motors, even those used for traction, the working parts, coils and connections were much exposed, with little or no protection. The partly and wholly inclosed types of machine were not generally adopted until ten or fifteen years after motors had been in commercial use.

I was present when the first important power transmission system in the country was started. The power was generated at Niagara Falls and transmitted to Buffalo, the line being less than twenty miles long, but it was considered long distance transmission. The pressure used at first was 11,000 volts, which later was raised to 22,000 volts. The former voltage ranked as the highest in the world at that time in commercial service, and was regarded as so extraordinary that all sorts of precautions and special arrangements were required to handle it. It seemed to involve as many problems then as the 110,000 volts of to-day.

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The Editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are sharp the articles short, and the facts authentic, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

The purpose of this journal is to record accurately, simply, and interestingly, the world's progress in scientific knowledge and industrial achievement.

What Sank the "Lusitania" ?

IN its endeavor to becloud the issue, official Germany has claimed that the ammunition carried by the "Lusitania" contributed largely to the swift sinking of that great ship.

Now this is a technical question, and to anyone who is technically qualified to judge the matter, the explanation offered is, on the face of it, absurd.

This war has proved over and over again that one submarine torpedo of the German type, carrying 420 pounds of high explosive, is sufficient to sink a warship—even a battleship which, exclusive of the double bottom deck, is divided into no less than two hundred and fifty separate watertight compartments, big and small.

The question of the length of time a ship fully subdivided will remain afloat after being torpedoed, depends largely upon where the blow gets home. In the case of a battleship, especially a thoroughly modern ship like the "Audacious," the blow of a mine or a torpedo, in addition to the local damage, may so badly shake up and loosen her internal structure, that gradual seepage of water will occur through the bulkheads, and she will eventually sink several hours after the attack. But should the blow strike in the region of a magazine, as in the case of the Russian "Petrovavlovsk" and the Japanese "Hatsuse," the explosion of the torpedo warhead may instantly be succeeded by the far greater explosion of the whole magazine, and the ship, no matter what her size, will go down in two or three minutes' time.

Now the fact that the "Lusitania" remained afloat eighteen or twenty minutes after being torpedoed completely disproves the assertion of the Germans that her cargo of ammunition exploded—and nobody knows this so perfectly well as Admiral von Tirpitz himself and the subordinate in command of the submarine which sank the ship.

To be convinced of this, let us consider the case of two warships in which the ammunition exploded, and see what happened. In the case of the U. S. S. "Maine," when the flame and shock of the mine which contributed to her swift sinking reached the forward magazines, they exploded and the enormous force of the gases lifted her forward deck and rolled it back upon the after part of the ship just as one would turn the leaf of a book. Again, take the case of the French battleship "Liberté," whose forward magazine exploded through deterioration of her smokeless powder. Exactly the same thing happened as in the case of the "Maine," but on a larger and more destructive scale. The decks of this great ship lying above her magazine were torn loose from the hull, lifted high in air and rolled back, upside down, upon the after part of the ship.

If the cargo of ammunition carried by the "Lusitania" had been set off by the torpedo which struck her, similar results would have followed. The enormous expansive force of the gases of the explosion would have blown out the sides of the ship above the waterline and torn open her decks above, folding them back upon themselves. Did any such destruction occur? Was there any evidence whatsoever of such an explosion? The very fact that the ship remained afloat as long as she did proves that nothing of the kind happened, and

that the ammunition in her hold had no part in the sinking of the ship.

So enormous is the charge of explosive carried by the submarine torpedo of the Germans that the single torpedo which struck her not only tore a vast opening in the outer skin of the ship, but the disruptive effects of the gases let loose under high pressure within her hull structure were sufficient to wreck the inner wall of the side bunkers and produce an immediate and enormous inrush of water, besides loosening up the frames and bulkheading in the neighborhood of the explosion to such an extent that less than half an hour was sufficient to put the great ship below the surface.

A battleship not only carries a heavy watertight protective deck, but the underwater portion of the ship below this deck is divided and subdivided transversely and longitudinally until she contains, as we have said, over two hundred and fifty separate watertight compartments, big and little.

The "Lusitania" contained below the waterline only thirty-four such compartments—and this was all that could be conveniently accommodated within a ship whose primary purpose was for the uses of commerce and not to face the perils of modern submarine warfare. Since she was designed the explosive charge in the warheads of torpedoes, at least of those used on submarines, has been more than doubled. The commander of the German submarine, when he discharged his torpedo at point-blank range and saw it strike home, knew that the "Lusitania" would probably go down fast and long before her helpless passengers could take to the boats. This was expected and so intended by the Imperial German Admiralty.

The War and the Scholars

BUT for the fact that philosophers have so often, in the past, proved to be anything but philosophic when put to the test, we should view with much astonishment the efforts made by the savants of a certain belligerent country of Europe to disparage the intellectual achievements of their erstwhile friends and colleagues among the enemy.

German scholars had so long been in the habit of taking their own intellectual superiority for granted that there was little left for them to say on the subject when the war broke out. French scholarship was somewhat tinged with chauvinism before the war, and the French temperament serves to explain many things. The scholars of England, however, who had for some time been living under the spell of the supposed pre-eminence of things German, suddenly executed so complete a *volte-face* as to suggest, first, that the English are a more volatile race than we had supposed them to be, and, second, that if these same scholars are now sincere, they must have been amazingly deficient in good judgment prior to the first of last August.

We hasten to say that this criticism does not apply to all English scholars, though it does apply to some who are very highly placed in the learned world. The purpose of the present article is, indeed, to contrast the attitudes of two classes of Englishmen, viz., those who have completely lost their heads in their eagerness to dispraise the enemy, and those who have not permitted their patriotism to get the better of their good sense.

It may be admitted that German scholarship had become a somewhat extravagant cult in England before the war, and that a return to normal-mindedness in this respect was altogether desirable. Normal-mindedness is not, however, evinced in the following onslaught which Prof. Sayce of Oxford recently delivered in the *Times*:

"It is astonishing that British scholars and politicians should still be found speaking of 'our intellectual debt to Germany.' It is worth while, therefore, examining in the dry light of reason what Germany has really done for culture and scientific progress.

"As to music, I can say nothing, for I am not a musician. In literature Germany has Goethe, who occupies the first rank. Heine was a Jew, who regarded the Germans as barbarians. Schiller, the most characteristically German of German writers, was a milk-and-water Longfellow. In philosophy there are Kant and Hegel, but Kant was more than half Scottish in origin, and it is difficult to say what the Hegelian philosophy would have been had the German language been more cultivated. In science none of the great names is German. We look in vain for any that can be put by the side of those of Newton, Darwin, Faraday, Laplace, or Pasteur. In my own departments of study it is the same tale. . . . On the artistic side perhaps the less said the better. German taste in architecture and dress is proverbial."

Is it necessary to comment on this extraordinary diatribe? We regret that Prof. Sayce is not a musician, for his authoritative opinion of German music would undoubtedly have been interesting. As to the rest, let us frankly admit that German culture has been overrated in some quarters. Does it not remain true that the whole world owes an "intellectual debt to Germany," and a heavy one?

It is pleasant to turn to a more temperate estimate

of German achievements, from the pen of a British man of science who has always been imbued with the spirit of world-wide solidarity in intellectual matters. Dr. Hugh Robert Mill, director of the British Rainfall Organization, writes in *Symons's Meteorological Magazine*:

"At this time, when it is as fashionable to ridicule and decry all things German as it was to ridicule and decry all things pertaining to other nations a century or sixty years ago, we feel it to be a matter of scientific duty to acknowledge our equal indebtedness in the past fifty years to all these nations. Whatever may be the opinion of some men of science as to the inferiority of Germans in their particular studies, we and our readers cannot fail to remember how much we owe to German and Austrian meteorologists. While we yield to no one in our detestation of the war which Germany and Austria-Hungary have forced upon the world, or in our determination to do all that is possible to defeat the aggressions and ambitions of those governments, we cannot be so false to our own consistency as to stigmatize as poor or contemptible those vast and noble acquisitions to knowledge made in the last half century by those Germans, whom, up to last summer, all our learned societies delighted to honor. Although for the present we carry on our work without the aid of the subjects of enemy-empires, we trust that our pages in years to come will once again rejoice in the brotherhood of the men of science of a re-made Europe and a world at peace."

"Inventions Wanted"

INVENTIONS wanted." You see it often at the head of articles in newspapers, calling the attention of inventors to needed improvements. It also appears in the literature sent out by patent fakers and by some agents who are not fakers. Probably every inventor has scanned such lists in the hope that he might find there some idea of real value. Ideas there are in plenty, but they resemble the bunches of "out-law" horses which some unscrupulous dealers a few years ago were wont to gather on the prairies and ship east to be sold to unsuspecting farmers. These collections of "long-felt wants" represent what is left over after all the tractable, easy-to-handle ideas have been caught, harnessed, and put to work.

In the majority of cases as much invention is displayed in discovering the need of a new device or machine as in perfecting the mechanism by which the need is supplied.

Take, for example, half a dozen American inventions in common use—the telegraph, telephone, typewriter, phonograph, sewing machine, and harvester. From the point of view of the inventor of mechanisms, the sewing machine and the self binder are perhaps as ingenious as any of them. What is remarkable about them as a group is not mechanical ingenuity; it is the prophetic foresight of the inventors who saw, imperfectly, no doubt, but clearly enough to be inspired thereby, a vision of a world transformed. They saw the housewife relieved of endless drudgery; the farmer's capacity for production multiplied; the slaves of the pen set free.

But the chief difficulties they surmounted were not mechanical. They arose from the lack of proper means of perfecting their inventions and from the apathy and indifference of those whom the inventions were intended to benefit. Many a student has set before him more intricate problems than were there in their primary form. But a student knows his task is possible; the inventor believes his is also, but often he cannot get anyone else to think so. The ingenuity displayed in perfecting these devices is less wonderful than the fact that the world was so long content to plod along without them.

People did not know that they wanted these things. Some, who had little else to do, vaguely dreamt of them, perhaps, but the world at large was quite satisfied. Mankind wants everything in sight, but what is not in sight it assumes to be impossible of attainment.

But the inventor knew that his devices were needed and in his mind's eye he saw the operation of the particular law or coincidence of several laws by which his dream was to be realized. Therein lay his genius. Were there no such thing as a telephone in existence we could pick a hundred men perfectly competent to invent and perfect it, could we convince them of its possibility and importance. But most of us cannot pick the next man who is to pierce the future and banish some burden we now labor under because we can see no hope of relief and have no faith in such relief.

As a general rule, inventors will find that the problems set for them in "Inventions Wanted" are not usually the most promising avenues to success. Having resisted the efforts of other minds, such problems are often destined to remain unsolved until the discovery of a wholly new principle or some often apparently unrelated fact opens the way to a solution.

The inventor's best chance lies in filling unfelt needs, not in wrestling with "long-felt wants."

Science

Wrapped and Unwrapped Bread.—A considerable amount of recent literature has been devoted to the subject of wrapping bread. An elaborate chemical and bacteriological investigation of the subject was reported some time ago by Jacobs, Leclerc and Mason in the *American Journal of Public Health*. These investigators sought to determine the kind of paper most suitable for wrapping, the length of time after baking that bread should be wrapped, and the bacteriological condition and weight of both wrapped and unwrapped bread. For breads whose crusts are to be kept dry and firm, such as Vienna and French breads, porous paper is better than waxed paper. Bread reaches the temperature of the room about three hours after baking, and this is the best time to wrap it. Further delay entails the danger of contamination with bacteria and molds. If wrapped too soon—say, one hour after baking—it retains sufficient heat and moisture to favor the growth of organisms, especially when waxed paper is used. The crust of the loaf as it leaves the oven is practically sterile. The same writers examined a large number of samples of both wrapped and unwrapped bread bought in retail stores. Of the unwrapped loaves 62 per cent showed organisms of the *B. coli* type, as compared with only 7 per cent of the wrapped loaves. Another contribution to this subject is an article by Barnard and Bishop in the *American Food Journal*, dealing with the effect of wrapping upon the chemical composition of the loaf. It was found that wrapping in either semi-porous waxed or paraffin paper prevents the escape of moisture and tends to preserve the colloidal condition and physico-chemical equilibrium, the destruction of which produces staleness. The effects of wrapping vary considerably for different kinds of bread.

A Guide to Our Edible Fungi.—As everybody knows, a deplorable amount of good food goes to waste because the public is familiar with but few of the many edible species of fungi. It is true that the nutritive value of fungi has been much exaggerated; they are by no means comparable in dietary value to meat, as is often claimed; but on the other hand, they are more nutritious and, when properly cooked, decidedly more palatable than many things that enter into the everyday menu. A desultory propaganda in behalf of mycophagy has been carried on for years, both in this country and abroad. The latest contribution to this campaign is Bulletin No. 175, just issued by the Department of Agriculture, entitled "Mushrooms and Other Common Fungi." In this useful manual, the authors, Flora W. Patterson and Vera K. Charles, tell us, among other things, of the efforts which certain European governments have made to teach their citizens the food value of mushrooms. All over France exhibits of the more desirable species are held; while at Rome during the season there are daily lectures on this subject illustrated by fresh specimens. In Saxony systematic instruction concerning mushrooms is given in the public schools. The French have taken to canning many wild mushrooms, in addition to the familiar *Agaricus campestris* grown in mushroom cellars, and these are now exported to the United States, which also receives tons of dried wild mushrooms from China. The new bulletin contains descriptions, in language as non-technical as the circumstances admit, of more than 150 species of fungi, together with splendid photographs of at least half of the species described. The poisonous species are carefully pointed out, and several recipes for cooking the other kinds are appended. There is a simple key to the genera and a glossary.

The Chemistry of the Pacific Kelps.—We have recently noted the appearance of a bulletin of the Department of Agriculture giving full statistics as to the extent of the giant kelp beds on the Pacific coast, and suggestions regarding their exploitation. A further important contribution to this subject is an article by Guy R. Stewart, of the California Agricultural Experiment Station, on the "Availability of the Nitrogen in Pacific Coast Kelps," published in the *Journal of Agricultural Research*. As a result of extensive experiments the author finds that in using dried and ground kelp as a fertilizer the readiness with which the nitrogen in it is changed to ammonia and nitrates in fresh field soil varies with different species and with the mode of preparation. The nitrogen of *Nereocystis luetkeana* is relatively very available, but this species is of minor commercial importance. The principal commercial species, *Macrocystis pyrifera*, is very slowly changed in the soil, the availability of its nitrogen being greatest when the kelp is added in a fresh or only partly dried condition. *Macrocystis* must, however, be dried till crisp in order to grind readily. This drying should not be continued longer than necessary, and the kelp should not be scorched or overheated. In the same *Journal* another California chemist, D. R. Hoagland, gives a detailed account of the "Organic Constituents of Pacific Coast Kelps." In connection therewith he deals with certain interesting economic phases of the kelp question; viz., the possible feeding value of kelps for man or animals, the utilization of its organic by-products, and the destructive distillation of kelp for commercial purposes. In all three directions the possibilities appear to be very slight.

Astronomy

The Spectrum of Mellish's Comet was observed at Lowell Observatory with the slit spectrograph on April 20th, and according to a telegram from Director Lowell, published in *Popular Astronomy*, was found to consist of the usual series of cometary bright bands, but with a relatively intense background of continuous, i. e., solar, spectrum of the emission bands. The group of bands about wave-length 4040 was brighter and those of hydrocarbons fainter than in most comets. A photograph of the comet on the same morning showed a tail of two divergent branches, $1\frac{1}{2}$ and $\frac{3}{4}$ degrees long, respectively.

The Time Service at Antwerp, or Bureau de l'Heure, located at the Pilotage, continued its work up to the date of the German bombardment, last October. This office normally gets its time by telephone from the Royal Observatory at Uccle, but after the latter institution was seized by the Germans on August 20th communication with it was cut off. Thereafter the service was maintained without astronomical observations, as the Riefler clock at the Antwerp office was known to have a very regular rate, and it was checked with the aid of a number of good chronometers. The small observatory of the Antwerp Astronomical Society is reported to have suffered no harm in the bombardment.

The Astronomical Society of Pomona College, at Claremont, California, consists of students of astronomy and members of the faculty of the college, together with resident college graduates engaged in astronomical work or study; there are also associate members, including alumni and others. Considering the local character of the society, its quarterly journal, known as the *Publication* of the Astronomical Society of Pomona College, now in its fourth volume, is a remarkable production. It is printed on the best paper, fully illustrated with photographs, charts, etc., and, last but not least, is replete with interesting astronomical literature. Besides original articles, each number contains signed abstracts of the most important current astronomical articles in other journals. The editor of the *Publication*, president of the society, and director of the college observatory is Prof. Frank P. Brackett.

An Association of Amateur Telescope Builders.—There has recently been organized in the Society for Practical Astronomy a Section for Construction of Astronomical Instruments, and efforts are being made to enroll therein as large a number as possible of amateur constructors of telescopes and other astronomical apparatus in all parts of the world. Builders of home-made telescopes are very numerous. The new association offers them an opportunity of aiding one another with suggestions, besides which something in the nature of a correspondence course in telescope building is to be given by the director of the section, Prof. M. T. Fullan, of the Alabama Polytechnic Institute, Auburn, Ala. Persons who wish to become members should write to Prof. Fullan. Although the section is interested primarily in the making of telescopes, especially reflectors, it will also devote attention to such accessories as photographic cameras, spectroscopes, eyepieces, sidereal clocks, and other kindred apparatus.

Suggestions for Observing Mars.—Prof. W. H. Pickering's latest Report on Mars (No. 9) consists entirely of suggestions for the guidance of amateur and professional observers of the planet at its next opposition. No one who intends to make drawings of Mars can afford to ignore this report (given in full in *Popular Astronomy* for May). For studies of color a large aperture is desirable, but the definition of the surface markings is satisfactory, under good atmospheric conditions, with an aperture of 5 inches, while many canals were clearly seen by Prof. Pickering at the last opposition in his 3-inch finder with a magnification of 180. For comparison of the "seeing" at different stations or on different nights a standard scale is recommended, defined by the appearance of the image or disc of a bright star and the diffraction rings. Perfect seeing is designated 10 in a 5-inch refractor, 11 in a 7-inch, 12 in a 10-inch, and 13 in a 14-inch. It is of little use to observe Mars when the seeing is below 6 or the altitude is below 30 degrees. The writer uses water colors for the groundwork of the disk, the yellow ochre, orange and reds, but for the greens, blues and browns he finds colored pencils, in connection with lead pencils of various degrees of hardness, more satisfactory. In order to apply the correct tints it is very important that the source of light illuminating the paper should be of the same color as the sun seen from a distant body. Prof. Pickering used small tungsten lamps at the last opposition, and at the next proposes to have the light of the same lamps transmitted through pale blue glass, thus giving the paper an illumination of very nearly the same color as the illumination of the surface of Mars by the sun. It is especially desired to secure as many drawings as possible of the planet in certain standard aspects; viz., when the Martian longitudes 0, 60, 120, 180, 240, and 300 are central at the point of observation. This plan was followed by a few observers at the last opposition, and comparisons of the drawings have given very interesting results.

Notes for Inventors

Woman Patentee Abroad.—It is believed that Sybilla Masters was the first American woman to secure a foreign patent, she having, through Thomas Masters, secured a British patent No. 401, dated November 25th, 1715, for a Process for Treating Corn.

Lighting the Key-hole.—August Sundh of Hastings-Upon-Hudson, New York, has patented, No. 1,136,378, an illuminated door knob having an electric lamp which may be lighted by a suitable button to give light to a key-hole or to the dial of a safe.

Deck Seats Convertible to Life Boat.—David Davies of North Carlton, Victoria, Australia, has obtained patent No. 1,134,672 in which are shown two longitudinal half sections adapted to be used separately as deck seats on a ship and to be united and secured together to form a life boat.

A Golfer's Exerciser.—A patent, No. 1,137,349, has been issued to Frances E. Patterson of Wilmington, Del., for an apparatus in which a golf grip or handle is connected at one end to a flexible cord which is wound on a spring spool and operates with tension on the grip in the successive movements representing the swing of a golf club.

Apparatus for Cooling and Agitating the Air.—Herman E. Baumgartner of Osage, Iowa, has patented, No. 1,133,255, an apparatus in which a pan supports a block of ice alongside of which is formed a housing for an electric fan, the infeed of which opens toward the block of ice so that the air is sucked over the block of ice and the cool air is forced into circulation.

Influencing Unemerged Teeth.—Patent No. 1,137,298 to W. E. Walker of New Orleans, La., is for a device for influencing the alveolar process seeking to develop artificially a pressure simulating lip pressure and thereby exert an influence through the gums upon unemerged but wrongfully disposed teeth, or counteract the influence of the tongue in a patient predisposed to press the same against the gums as frequently occurs in mouth breathing.

Adjustable Golf Stick.—D. & K. Roberts of Grantham, England, in patent No. 1,135,621 present a golf club the head of which is formed to permit the convenient interchangeability of heads or striking faces, each of the head pieces having two faces either of which may be adjusted into playing position and the several different forms of head being interchangeably applied to the head of the club so that each loose head is the equivalent of two ordinary clubs and by carrying a number of loose heads the necessity of carrying numerous clubs will be avoided.

Oscillation-receiving Devices for Wireless.—Four patents, Nos. 1,136,044 to 1,136,047, inclusive, have been issued to the Wireless Specialty Company of Boston as assignee of Greenleaf Whittier Pickard of Amesbury, Mass. In the first patent the receiving device has a member containing silicon with a contacting member containing metal antimony; in the second patent the contacting member contains arsenic and antimony; in the third patent the contacting member contains metal bismuth and in the fourth patent the contacting member contains metal arsenic.

A Golf Patent for Keeping the Eye on the Ball.—C. T. Ramsay of Liverpool, England, patent No. 1,135,921, shows an optical instrument which can be worn over the eyes like a spectacle and by which the sight of the player is concentrated on the ball, the opaque "blinkers" having a relatively small aperture through which, and through which alone, the wearer can see and thus the distance in front and behind the ball is so small that he must see it definitely and he is thus compelled to keep his eye on the ball. The blinkers are adjustable so they can be set to suit the eyes of different persons.

Novel Hat Brush.—A hat brush which is carried within the hat itself is a recent Paris novelty. It can be used with felt or silk hats. The brush is of small size and very light weight, and is provided with a clamp which allows of fixing it inside the hat, and in this position it is out of the way and does not add materially to the weight of the hat. Such a little device will prove most convenient either for ordinary times or in traveling. Two kinds of brush can be used according to the case, that is, a fine brush for felt hats or a plush makeup for use with silk hats. The brush in any case does not weigh more than half an ounce.

War's Effects on Foreign Patents.—It is sometimes asked by Americans whether patents can be obtained at the present time from the nations at war and it is somewhat remarkable how little difficulty is experienced in transacting business with the foreign Patent Office. Nevertheless, the number of applications filed abroad has been greatly reduced as illustrated, for instance, in the United Kingdom, reports giving the number of applications received in the British Patent Office in 1914 as smaller than in any other year of the last decade, the number of applications for 1914 being 24,820, while in 1913 it was 30,077. Design applications in 1914 were 34,354 and in 1913 were 40,429 and trade-mark applications in 1913 were 9,689 as against 8,317 in 1914.