HARVESTING ICE ON THE HUDSON.

As we promised in our last, we herewith give engravings of the interior of one of the many great ice houses on the banks of the Hudson river, and of the method employed for raising the ice from the river and storing it in these buildings. As the ice accumulates near the shore, being towed thither by horses as described in our former article, it is hoisted as described below. The ice houses are constructed with every regard for atmospheric changes, and are models of simplicity. The large one shown in our illustration contains six rooms, four of which are 75x50 feet in area, and of an altitude sufficient to allow a packing of ice 30 feet high, and an open space of 20 feet for air. The two remaining rooms are 150x50 feet in dimension, and the entire building has a capacity of 48,000 tuns of ice. The walls of the houses are double, and filled in with sawdust and tan. At the end of the houses nearest the canal, the apparatus for raising the blocks is constructed, extending from the water to the roof. From a distance this looks like two heavy ladders laid upon an inclined plane, each furnished with a pair of hand rails. At the base of each are two pairs of wheels, over which pass endless chains, stretching to the summit. To these, bars are attached, at a respective distance of six feet, which with the chains form the "apron." On a level with each floor of the building, a platform connects the plane and door sill, on which the blocks are deposited in order to fill each story in succession.

As the ice reaches the base of the plane, the blocks are pushed one by one close to the lower pairs of wheels. Then the o ffedges are depressed, and, as the chains force the bars along' they catch the blocks—like the safety cars that grasp the passenger trains on the famous switch-back railroad leading to the summit of Mount Pisgah, at Mauch Chunk, Pa.—and carry them up to the second floor, where the removal of several slats, forming the surface of the plane, allows them to fall on the platform before mentioned. A strong staging is built in the interior of the house, extending to the different rooms, on which the blocks are pushed to the apartment intended for their storage. From this staging an incline extends to the highest layer of ice. As the blocks are deposited on the platform, the first is pushed towards the incline in the nearest apartment, the second in the next, and so on, the entire floor filling up evenly.

In order to prevent the blocks crushing against each other, as they slide from the plane, a number of large headed nails called "scatchers" are driven in it, and greatly diminish their velocity and render their "shooting" of short range.

When the first story is thoroughly packed, the slats are replaced in the plane, and those by the second platform removed, when the rooms are filled like those below.

Five per cent of all ice received into the building becomes useless by cracking and scratching. After a layer of blocks is completed, the workmen shovel from the surface all the loose pieces and the snow, and throw them out of the building through the high, narrow air passages, shown on its sides.

Railway Tunnel under the British Channel.

The successful completion and operation of the Mont Cenis railway tunnel through the Alps has given new impetus to the project of establishing railway communication between England and France, by means of a tunnel under the British Channel. The distance is 22 miles. If a railway tunnel can be carried seven miles through the hard schist and quartz of the Alps, why not for three times seven miles, through the softer chalks under the Channel?

A joint stock company has been formed in London for the purpose of solving the problem. It is called the "Channel Tunnel Company," and the tunnel is to extend from Dover, England, to Calais, France. The capital of the company is $150,000, which is being privately subscribed with the immediate object of making a trial shaft and driving a driftway on the English side about half a mile beyond low water mark, with the view of proving the practicability of tunnelling under the Channel. The completion of this work will furnish data for calculating the cost of continuing the driftway from each shore to a junction in mid-channel, and capital will then be subscribed for that purpose, or for enlarging it to the size of an ordinary railway tunnel, as the engineers may deem most expedient. The engineers are Messrs. John Hawkshaw, Thomé de Gamond, James Brunlees, and William Low. The tunnel will be made through the lower or gray chalk, chiefly, if not entirely; and by the adoption of machinery, of which the promoters of this company have recently made practical trials, it is expected the passage can be opened from shore to shore within three years from the time of commencing the work, and at a cost very considerably less than any previous estimates.

COST OF TUNNELLING.

The Mont Cenis Tunnel cost $975 per linear yard. The three most costly tunnels made in England have been the Kilsby, the Saltwood, and the Bletchingley, each of which was executed in treacherous strata, giving out large quantities of water. The Kilsby tunnel cost $725 per yard. The Saltwood tunnel cost $590 per yard, and the Bletchingley, $360. The cost of the railway tunnels in France has varied from $150 per yard, being that of Terre Noire, on the Paris, Lyons, and Mediterranean Railway, to $475 per yard, that of Batignolles, near Paris, on the Chemin de Fer de l'Ouest. In Belgium, Braine le Compte tunnel cost $230 per meter, and the tunnels on the Liège and Verviers line $250 per meter. In Switzerland, the very difficult Hauenstein tunnel, between Basle and Berne, cost $400 a yard. In America, the Hoosac tunnel in Massachusetts, through mica slate mixed with quartz, has up to this time cost $900 per yard, and the Moorhouse tunnel, in New Zealand, through lava streams and beds of tufa, intersected by vertical dykes of phonolite, cost $345 per yard. It will be a convenient standard of comparison for these amounts if we remember that $125 per yard would represent very nearly $5,000,000 for the 22 miles. Any estimate for the Channel tunnel must at present be purely conjectural, and an estimate professing to embrace contingencies must be more conjectural than any other; but it is reckoned that the work, if practicable at all, could be completed within five years of time and for $25,000,000.

Caliber Compass.

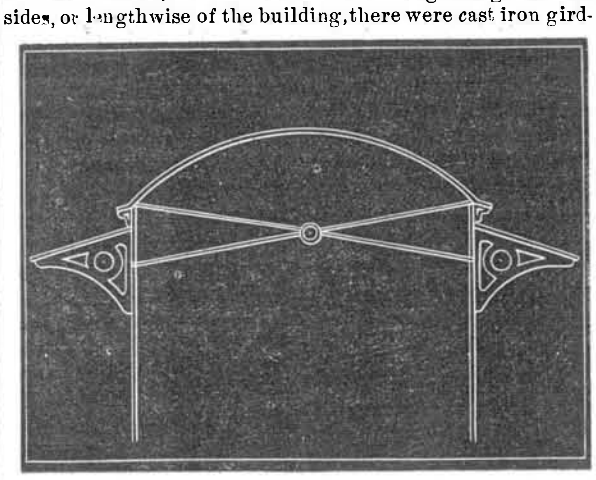
M. J. Koch explains the construction of his caliber compass, illustrated, as follows: The distance of the lower points is 3·1416 times as great as that of the upper points. (This number is the well known π used in the mathematical calculations of circles.) Hence, if the upper points are adjusted to any circular bar or other object, so as to measure its diameter, the distance of the lower points gives the circumference without any further calculation.

FALL OF THE ROOF OF THE RAILROAD DEPOT AT SARATOGA SPRINGS.

We are indebted to our old friend E. J. Huling for the sketch and brief account of the destruction of the new passenger depot, at Saratoga Springs, N. Y., on December 18, 1871.

The iron depot of the Rensselaer and Saratoga railroad, at Saratoga Springs, was a beautiful structure; but, in planning it, the builder seems to have sacrificed everything to make it airy in appearance and beautiful to the eye, neglecting plain rules which the architect of a common shed should have borne in mind. Because the materials used were iron, the builder seemed to think that such ordinary things as internal bracings were unnecessary.

The following is an illustration of one bent of the structure as it stood. The structure was an open arcade, supported by cast iron columns, four inches in diameter, standing fifteen feet apart on the sides, and thirty feet apart across the building. The roof was of corrugated iron, arched, the base of the arch resting on the top of the columns. The columns were tied together crosswise by iron rods five eighths of an inch in diameter, crossed as shown in the engraving. On the sides, or lengthwise of the building, there were cast iron girders of a light and ornamental character between the columns; but there was no internal bracing to prevent the columns from falling in, unless the five-eighth tie rods were considered as such. Along the side of the building was a shed ten feet wide, supported by light cast iron brackets fastened to the columns; these brackets extended ten feet from the side of the column, and their bearing on the column was about six feet ten inches, or, in some cases, three feet ten inches below where the lower ends of the cross tie rods were fastened into the columns. These brackets are reported to have been tested to sustain over ten tuns; and by their combined weight, with the iron roof which they sustained, they must have exerted a heavy and continuous pressure inwards on the sides of the iron columns. The iron columns were anchored at their foot into square blocks of stone. There was a solid rock, underlying the whole depot and parts surrounding, only a few feet below the surface. The railroad track ran along beside the structure, partially beneath the piazza or shed, supported by the brackets.



On the day of the fall of the structure, the ground was hard frozen, and there had been a light fall of snow. A heavy freight train ran up so that the locomotive stood about against the first column, and stuck there, the snow obstructing it so that the wheels turned without going ahead. After some abortive efforts to go along, the engine driver reversed his machine and backed down. He had scarcely got below the corner of the arcade when the column, near which his machine had stood, crumbled inwards, and the whole affair fell nearly together. Three men who were under the roof escaped, but one lad was caught and crushed, his back being broken so that instant death seemed to have occurred. An inquest was held on the boy killed, and, among others, Mr. Cummings, of Troy, the architect employed by the railroad company to supervise the building, was sworn, and testified that he relied upon the experience of the builders, the American Corrugated Iron Company, Springfield, Mass., and did not make the plans or drawings for the building; that he had feared somewhat that the wind might lift the roof, but had not thought that it would fall inwards. The opinion of other builders was that the leverage of the heavy brackets, bearing upon the outside of the columns, without anything inside to counteract them, had caused the columns to break. The locomotive, running up beside the column and stopping there, had seemed to cause a vibration; and, as the train backed down, the first column, where the vibration commenced, was pushed inwardly, and then the others fell nearly together. The coroner's jury censured the builders for not properly doing their work.

Now that the building has fallen, it is considered somewhat wonderful that it stood as long as it did.

Correspondence.

The Editors are not responsible for the opinions expressed by their Correspondents.

The Davenport Tricks.

To the Editor of the Scientific American:

Allow me, in answer to the note of Mr. W. M. Patton, page 84, in No. 6 of this paper, to state that when the Davenports stick their hands and naked arms through the hole of the center door, they are no more tied down by the knots made by persons selected by the spectators, but have got loose, shown this, and then tied themselves again in their own way, as described by me on page 68. The spectators are very apt to overlook this, and not to notice that, ordinarily, very few tricks are performed as long as the brothers are tied down by others, and less in proportion as this has been done more thoroughly.

In regard to the number of hands shown, I have heard persons in the audience who assured me they saw five or six of them, while I am sure there were only four, having carefully watched the whole proceeding; but when four hands and arms are rapidly moving about through a hole, one may be easily mistaken and count five. If there really were more, it would only prove that they had one or more false hands hidden in their sleeves, but I think this improbable, because, when I tied one up, I carefully examined his arms and sleeves, and am sure there was nothing hidden about the individual. The ringing of the bell is not more wonderful than the taking off of their coats, which I explained on page 68.

Mr. Patton asserts they use no teeth in their execution; how does he know? And why should they not use them if expedient? To satisfy himself, let him tie up two school boys, of ordinary intelligence, opposite one another, so that each, by stooping forward, can reach with his teeth the knots wherewith his fellow is tied down, exactly as is the case with the Davenports, and let him see how expertly they will use their teeth for mutual delivery.

On page 100, Mr. Patton gives, as *his explanation*, that the Davenports "have false hands and wrists, made of gum and so closely resembling nature as to mislead by the feeble light," and says further that these are inflated and have hoops or rings imbedded, "so as to prevent a collapse under the pressure of the cords," that these are tied down, and that they slip their real hands out of them to perform the tricks. This explanation is very ingenious, but rather far fetched and unfortunately not in agreement with the facts. When I tied up one of the Davenports, I am sure I was not deceived in such a way, as the hall was fully lighted with some 300 gas jets; and besides I felt the pulse of both of them, before and after the tying up, in order to find if the individuals got excited by my careful watching, and I doubt if even those whose confidence in M.Ds is least, would suppose that I would be so obtuse as to be cheated by a gum arm when feeling the pulse, or not able to distinguish true skin, flesh and bone from gum, extended with hoops and painted flesh color. The sealing up of the knots at the ends of the rope does not amount to anything, as they can slip their hands out of the loop just as well, whether the knots are sealed or not, when only they have tied themselves in the manner described by me on page 68. They do positively not cut the cords, but unfasten every knot, for I used my own hemp ropes, and got all back in the original condition; while finally, in justice to them, I must state that they have no "capacious pockets," and no ropes either whole or cut in them. I have examined also this point.

If Mr. Patton had seen and watched the performance as closely as I have done, he would be satisfied that his hypothesis is untenable.

New York city. P. H. VANDER WEYDE, M.D.

Motion.

To the Editor of the Scientific American:

What is motion? This question might be confronted with another, namely: What is not motion? The latter would be the most difficult to answer. It is certain that we do not know of any condition of matter wherein there is no motion. Until the universe comes to a standstill, everything must be in motion. The idea of cessation of motion is inconceivable, as much so as is a limit to infinity, or similarly, an end to eternity. Motion is universal, so is matter, and motion and matter are inseparable; one cannot exist without the other. Motion is the primordial condition of matter, and Herbert Spencer, in his "First Principles," invests even nebulous matter—that which is sometimes denominated chaotic, such as was "void and without form"—with the function of motion, or that of possessing the power of contraction and expansion.

Physical or mechanical forces can only be the result of a transfer of motion; and this transfer of motion can only be made at the expense of matter. The combustion of the fuel under the steam boiler is only a transfer of the force which had been employed in the formation of the wood and coal; and it is so with every other motor that can be used. The ball propelled from the cannon had its force-equivalent transferred from the labor of the manufacturer of the powder. Not only the powder but the ball as well, in its rounded or elongated shape, had to contribute its part in the play of projection. This system of compensation, as manifested in the correlation of forces, holds its equivalents to as strict a m asure of relation as the fulcrum of the scale beam does the things that are weighed in the balance. The seven or eight p r cent of the units of heat, which are all that are at present utilized in the transfer of motion from the fire under the boiler to the machinery in the mill, so far from invalidating the science of mechanical forces as correlated, only goes to prove that we are far behind the constructive perfection which ought to give us much more, and which ought to stimulate the inventive genius of all mechanical engineers. The conduction and conveyance of power, that is the transfer of it from the fuel to the propelling wheel, is much, in the condition as to economy, as that of carrying water in a sieve. There is too much lost on the way side. The bushel of oats put in the horse's combustion chamber does a great deal more work than the bushel of oats (with its steam included) will do when burned under the steam boiler; and yet the force-equivalent in both cases must be the same.

The economizing of motion is a good deal like going a fishing. He that understands the nature and the habits of the fish that he goes for will be likely to succeed the best. So in the mechanical profession: he that understands the law of motion and mechanical forces will be most likely to get the most work out of a certain expenditure of motion-transferring appliances. There is yet a broad domain and a wide track for the exercise of mechanical and engineering skill; and the man who adds a single increment of improvement in the economy of the transfer of motion becomes a benefactor to the human family.

The *inertia* of the old doctors has given way to the *vis viva* of modern scientists. The old *inertia* was defined to do and not to do: not a very comprehensive definition. The ball, when it stops rolling on the philosopher's board, goes only to show that it has played out the motion that was transferred to it by the motor, whatever that motor may have been.

There can be no such thing as increasing the amount of force in a given quantity of matter; but there is such a thing as economizing that power, that is to say, enabling it to do more work through one instrumentality than through another; and the perpetual motion makers ought to take it to themselves that they will not succeed in the solution of their problem by simply adding wheels and levers, unless they hope to move them by the psychic force; a force whose existence can be called into action somewhat in the way that the sailor whistles up a wind. Mr. Crookes is of the opinion that a force, without the intervention of cognizable matter, does exist and that it can be called into action. Mr. Dauskin, an estimable gentleman and spiritualist of Baltimore, told the writer of this article that he had witnessed such phenomena with his own eyes; but Mr. Coleman Sellers. President of the Franklin Institute, gave an illustrated lecture, at the Philadelphia Central High School the other evening, on "the Science of Delusion," in which he demonstrated that it is not altogether safe to trust implicitly to our eyes.

Motion, like matter, is constant and universal. It cannot be annihilated, nor can it be increased or diminished; but it is transferable, and the best we can do is to devise means through which this transfer can be accomplished by the least cost of labor and material.

Philadelphia, Pa. JOHN WISE.

London International Exhibition.

To the Editor of the Scientific American:

It may be of considerable interest to many of your numerous readers to be informed that articles for the London International Exhibition of 1872, which opens May 1st, must be delivered at the buildings at South Kensington, London, if belonging to the class including "Machinery and Raw Material," on the first day of March, and, if included in the class comprising "Recent Scientific Inventions and Discoveries" on Saturday, March 2. Other classes have other specified days for the delivery of the articles for exhibition, but the list would be too long to trouble you with in this letter. The above information is officially promulgated by Major General Scott, Secretary of Her Majesty's Commissioners.

HAMILTON E. TOWLE.

COLORED CANDLE LIGHT.—Wax candles are made of different colors, but they all emit a white light. Why may not candles be manufactured, by introducing certain chemicals into the material from which they are made, so as to show a variety of colors, such as blue, red, green, etc.? By arranging such candles in tasteful groups, beautiful effects may be produced in illuminating buildings. If some ingenious chemist will devise a way of embracing a cheap chemical with any of the material used for illuminating candles so as to render the light emitted from them of any desired color, he will make a fortune by his discovery.—*Commercial Bulletin.*

[This is what we told our chemists several years ago, and still no advance has been made in this direction. If chemicals could be introduced into any safe illuminating material so as to produce a variety of colors, the discoverer would reap a rich harvest for his invention.—ED.]

[Correspondence of the Scientific American.]

JAPAN.

Interesting Letter from Professor Griffis--Establishment of a Scientific School at Fukuwi--General View of the Japanese Status--Rapid Progress of the Japanese in European Knowledge and Arts --Mineral and Agricultural Resources of Japan.

FUKUWI, Province of Echezen, Japan, Nov. 25, 1871.

One of the constant readers of the SCIENTIFIC AMERICAN, responding to the invitation extended by you to the American citizens to keep you informed of the progress they are making, would send greetings to you from this end of the earth, and would hope to point out a few signs of progress among the people now beginning their "second life in the history of nations."

The writer, who had been an instructor in chemistry in America, and had among his pupils thirteen of the Japanese students, received an invitation from the Prince of the Province of Echezen, to come to Japan, organize a scientific school, and give instructions in the physical sciences. It seemed rather a discouraging place to go to (nearly the antipodes of New York); but, being earnestly urged by the young men from Japan, the writer came to Fukuwi, arriving here March 4th. To a pioneer in the interior of Japan (foreigners not being allowed to penetrate more than twenty-five miles from the treaty ports) it seemed at first like beginning in the stone age. However, we found that several of the young men had been diligently studying medicine and chemistry through the Dutch language, which has been for centuries the language of high culture in Japan. As fruits of this, I found that vaccination was practiced, dissection slily carried on, a powder manufactory with a national reputation established, also a gun factory in which very fair specimens of smooth bores and rifles were made and finished, and even a creditable attempt made to construct a breakwater at Mikuni, the sea port of this city.

In visiting the mines, we found that blasting was known, but not yet fully applied. Pumping was not in vogue, though it has been estimated that fully one third of the profitable mines of Japan have been abandoned by reason of the invading water. The Japanese are very quick to apply machinery, however, and in several provinces we know of pumping machines, driven by steam, being applied. In several of the provinces, foreign engineers are engaged on contracts of three years, and are revolutionizing the old methods of mining. There seems to be abundance of copper, mercury, zinc, tin, and iron, the latter being mainly in the form of magnetic iron ore.

Manufactures are not backward. The Japanese, while welcoming the foreigner and eager to get his knowledge, his inventions and productions, are yet anxious to be independent and to "do it themselves." They not only run their own steamers, and drive their own factories, but each mechanic seems desirous of trying his skill at something foreign, when said foreign thing is undoubtedly worth making. Hence, glass blowing, drug manufacture, wood carving, leather working, furniture, silk winding machinery, etc., etc., though in their infantile stages, are yet striding on towards perfection.

In fitting up our own laboratory, many pieces of apparatus and peculiarities of building, etc., requiring great patience and considerable mechanical skill, were furnished by workmen who were eager to learn; and, considering their rude tools and appliances, they succeeded remarkably well.

It must be remembered that the normal Japanese house, not excepting those of the Daimios and rich men, are excessively plain, walls and neatly matted floor under a roof being the main necessities; no furniture, no chairs, nothing suggests the luxurious civilization of Europe or America. In the city in which we dwell, the only chimneys are those upon the chemical laboratory, and our own dwelling house—a house, by the way, built by a Japanese carpenter under our directions, and exceedingly American and complete in every respect.

We do not propose to speak of the railroads now building, or of those projected, or of the telegraphs and steamships owned and worked by the Japanese. These evidences of advancing civilization are most visible at the sea ports, and will be duly chronicled. We speak only of the pulsings of the new civilizations in the interior, two hundred miles from any foreigners. We may say in passing, however, that we have seen the "report" or "Blue Book of the Department of Civilization" of the Imperial Government, and find in their schedules full preparations made for light houses, railroads, telegraphs, a postal system, introduction of machinery, cattle breeding, scientific farming, navy yards, coast and inland survey, road making, and numerous other enterprises. Of course, it will require years even to fully organize these plans; but when it is remembered that all this apparatus of civilization has been suddenly grafted on a nation hitherto hermetically sealed to the world, the marvel will be that such gigantic enterprises can be entertained. The Japanese, while liberally engaging professors, engineers and agents, are yet determined not to let Japan become as India, nor be passive recipients. They have now at least three hundred picked young men studying in America and Europe, and on their return they will personally engage in the business of superintending the great public works of the country.

The timber of Japan is marvellously rich and abundant, and is mainly grown on the mountains. Indeed this is the land of "the everlasting hills," and the practically waste land is in very great proportion to the cultivated soil. The latter, however, is very fertile, and the whole country is cultivated like a garden. The tools are pretty much the same as those used ten centuries ago. The plows are simply sticks pointed with iron. The rice is cut by hand with a small hook, and threshed by drawing it through iron teeth. They get very good crops on their irrigated lands; but much reclaimable soil exists neglected, and scientific farming is entirely unknown as yet, except in one or two provinces in which American farming machinery has been introduced. Cattle breeding claims much attention, and we can assure your readers that the superstitious fanaticism concerning beef and pork is rapidly vanishing.

In many provinces beef is eaten, and in the large cities it is sold at the corners of the streets as a delicacy, and devoured with gusto by gray heads and urchins. Whenever our cook slaughters a cow, he has no trouble to sell the meat; and five magnificent specimens of California cattle, recently brought here, promise to leave offspring more promising than the stunted native cattle. Several sharp Japs, who read the signs of the times, have herds of swine, and our local government is very desirous of having works on cattle rearing and breeding translated, and have imported the cattle spoken of.

We are trespassing on your crowded columns, and will, therefore, hasten to a close. We forgot to mention the coal which is found here near Fukuwi; it is not very abundant, nor of first class, though extended exploration might reveal formations of a better, quality. However, were you to come to our house, Mr. Editor, and see our sparkling grate heaped with the black diamonds of Japan, you would think civilization had really begun.

As Rome was not built in a day, nor our country settled in an hour, we must have patience to await fully the flowering of this nation. Patient toil and faith are needed, but even in the everyday prose of the pedagogue we feel something of the glow of poetry, while reading the faces of our Japanese scholars. We have nearly 125 promising pupils in chemistry and physics, and with two good interpreters, apparatus from America, a printing press up, and earnest young men to help in translating and applying the knowledge gained in school, we hope to make the "Fukuwi Scientific School" one of the centers whence shall radiate the new civilization. In conclusion, I cheerfully acknowledge the great help in practical hints, etc., from your valuable paper, which we are glad to tell our pupils is the SCIENTIFIC AMERICAN.

WILLIAM E. GRIFFIS,
Professor of Chemistry, Fukuwi, Japan.

[Reported for the Scientific American.]

MEETING OF THE SOCIETY OF ARTS OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

HELD IN THE INSTITUTE IN BOSTON, JANUARY 11, 1872, THE PRESIDENT, J D. RUNKLE, IN THE CHAIR.

AUTOMATIC REGISTERS.

Dr. Sternberg, U. S. A., exhibited and described a new application of electromagnetism. He uses this subtile agent for the automatic regulation of temperature. His apparatus is applicable wherever artificial heat is employed, as in the warming of buildings, and also in various processes in the laboratory and the arts.

To watch a thermometer and operate a damper or register by following its indications, is, to say the least, unscientific, besides requiring more time and attention than can ordinarily be given. The attempt has frequently been made to effect the automatic regulation of temperature by using the expansion of a metallic bar or of a volume of confined air to operate a damper; but satisfactory results have never been obtained by these methods, and their application is limited, as the regulator must be placed near the furnace, and the expansion of a metallic bar for a variation of a few degrees of temperature is so slight that it would be impracticable to use a bar long enough to regulate the temperature to a nice point. The use of confined air for this purpose is still more unsatisfactory, as the air is affected by barometric changes. And though such an apparatus might regulate the temperature of the hot air chamber of the furnace with sufficient exactness, it could not control the temperature of distant apartments, which is far more important.

Dr. Sternberg's invention is intended to obviate these difficulties, and is at once simple and efficient.

The battery wires are so adjusted in connection with a thermometer that when the temperature reaches the desired point, the mercury in the thermometer establishes a circuit, by which the register or damper is shut; upon the slightest reduction of the temperature, the mercury falls, the circuit is broken and the register or damper opened.

It is obvious that the thermometer may be placed at any distance from the furnace, and may regulate the temperature of an apartment by controlling either the register or the damper of the furnace.

If the wires from the thermometer be made to operate a damper which controls the supply of air to the furnace, fuel will be saved.

Automatic ventilation may be secured by the same apparatus—electricity controlled by a thermometer.

Where a number of rooms are warmed by one furnace, he would let the thermometer in the room most used control the damper of the furnace; and the temperature of other rooms would be regulated by automatic registers controlling the flow of heated air to them.

The mechanism for operating the registers and dampers is simple and requires but little power; one battery cup being sufficient to perform any of the operations.

The point of contact between the wire and the mercury is easily adjusted to any required temperature, and a change of a fraction of a degree will make or break the circuit and cause the apparatus to act.

ELECTRIC CLOCKS.

Mr. James Hamblett addressed the Society upon the sub-