ground, devoted to a roof garden. The span of the main trusses is 158 feet. The roof which they support is 92 feet from the ground.

The main entrance is surmounted by a dome, 46 feet in diameter and 132 feet high. On each corner of the main building is a pavilion or tower, 50 feet square, covered by a dome. The roof is covered with Spanish metal tiles and glass. The building is surmounted with a series of flagstaffs, bearing national standards and coats of arms of the various States. The total cost of the building, which is constructed of wood, iron, glass, and staff, was $120,000.

The decoration is in bright colors, but the effect is not so garish as might be expected, and the building is withal very pleasing, and adds to the Oriental effect of the whole.

In this great building thirty-eight nations have exhibits, so that the Fair can really lay claim to being a true international exhibition. The United States is well represented, while California is, of course, in the lead with her manufactures and the exhibition of her wonderful resources.

Pilgrims from the remotest corners of the West coast flock to San Francisco to behold the wonders of the great Fair. Among them are many of the pioneer settlers, who for years have been hidden away in quiet hamlets, seldom emerging from their retreats, and knowing but little of the wonderful growth and doings of modern civilization. The awe and astonishment of these good people on arriving at the Fair is well expressed in one of the photographic groups we herewith present.

JUST ARRIVED AT THE FAIR.

IMPROVED HIGH PRESSURE AIR COMPRESSORS.

The air compressor which we illustrate is one of a type introduced and constructed by Messrs. Elwell Fils, of Paris. We are indebted to the *Engineer*, London, for our illustration and the following particulars:

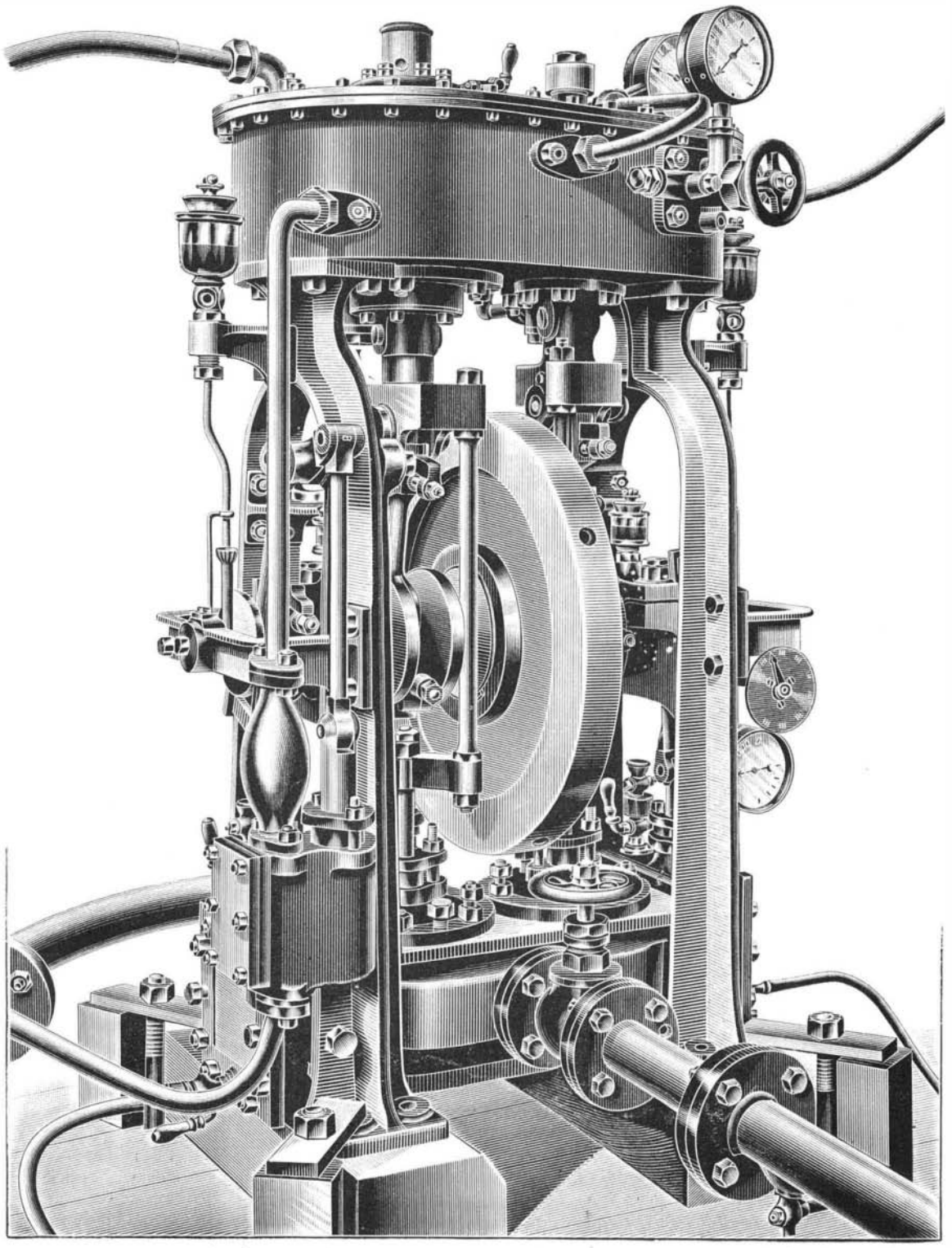
The machine consists in effect of two double-acting compressing pumps, in which the air is compressed in four stages. The capacities are so calculated that the pressures shall be equalized on each side of the pistons. The pistons are provided, it will be seen, with trunks, and the first stage raises the pressure to about 57 pounds. In the second stage this is brought up to 142 pounds, in the third to 430 pounds, and in the fourth stage to 1,430 pounds per square inch. The two compressing cylinders are cast together, with a casing or jacket to contain water, in which are placed two coils of piping. The first serves as an intermediate receiver for the first cylinder, and the second coil, connected with the small cylinder, serves to cool the air before it is delivered into the storage reservoir. The air to be compressed is drawn into the large cylinder at the top through eight valves in the cover, and kept closed by helical springs. A spray of water is introduced at the same time, while a small quantity of oil is drawn in from the lubricator on the top of this cover.

When the piston ascends it compresses the air in the cylinder. When a certain pressure has been reached valves in the piston are forced down, and the air then enters an annular space between the sides of the cylinder and the trunk. On the return stroke the air is forced into a coil. The action of the two pistons is identical. The process just described is repeated in the small cylinder. It is to be noticed that the water introduced into the first cylinder passes through all the stages and is always above the valves. It is claimed by the makers that this is a feature of much importance in machines running at a high speed, because then there is no danger of knocking a cylinder end out, or breaking a piston if too much water should chance to be admitted.

It is in reality a quadruple compression engine, the final pressure attained amounting to 1,400 pounds per square inch. The machines are made in several sizes. One to deliver 17·65 cubic feet of air per hour at the stated pressure has the following dimensions: Diameter of large air piston, 7⅜ inches; diameter of trunk, 6⅜ inches; diameter of small piston, 2⅝ inches; diameter of trunk, 1 1/10 inch; diameter of steam pistons, 6½ inches; stroke of all pistons, 4¾ inches; revolutions per minute, 300 to 350; steam pressure, 43 pounds to 71 pounds per inch. The following advantages are claimed for this system: (1) The use of a low pressure to begin with reduces the loss due to clearance; (2) the division of the work into four stages permits the air to be effectively cooled between the two cylinders; (3) the last stages of compression being effected by a very small piston, it is easy to make the piston tight, and the space over which leakage could take place is reduced to a minimum; (4) the whole machine can be taken to pieces and put together again in a very short time; (5) the delivery of the machine is independent of the pressure in the storage reservoir.

The quantity of water admitted amounts to about 15 cubic inches for every 200 cubic inches of compressed air delivered.

This compressor has been specially designed for charging torpedoes, and has, we understand, been adopted by the French naval authorities for that purpose.



IMPROVED HIGH PRESSURE AIR COMPRESSOR.

Silvester's Remedy against Dampness.

The process consists in using two washes or solutions for covering the surface of the walls—one composed of Castile soap and water and one of alum and water. The proportions are three-quarters of a pound of soap to one gallon of water and half a pound of alum to four gallons of water, both substances to be perfectly dissolved in water before being used. The walls should be perfectly clean and dry and the temperature of the air not above 50 degrees Fah. when the compositions are applied. The first, or soap, wash should be laid on when boiling hot, with a flat brush, taking care to form a froth on the brickwork. This wash should remain twenty-four hours, so as to become dry and hard before the second, or alum, wash is applied, which should be done in the same manner as the first. The temperature of this wash, when applied, may be 60 or 70 degrees Fah., and this also should remain twenty-four hours before a second coat of the soap wash is put on. These coats are to be applied alternately until the walls are made impervious to water. The alum and soap thus combined form an insoluble compound, says *Architect and Building*, filling the pores of the masonry and entirely preventing the water from entering the wall.

A Mahogany Pavement.

The dealer in hardwood who tenderly handles his stock of mahogany with kid gloves for fear of losing a splinter now and then will undoubtedly be shocked, says the *Mississippi Valley Lumberman*, to hear that mahogany is being used by the Paris Municipal Council for roadways. This sounds almost like a dream of oriental magnificence, yet it is true. A portion of the Rue Lafayette has been pulled up and workmen are laying down blocks of real Brazilian mahogany of a fine texture and color. It is, however, an experiment, as mahogany is dearer than other woods usually used for this purpose, but it is expected that the extra outlay will be more than compensated for by the greater durability of the mahogany.

Progress of the Bell Telephone.

The Committee on Mercantile Affairs, at Boston, Mass., was recently addressed by ex-Governor Long, of that State, on behalf of the American Bell Telephone Company, which asked the privilege of increasing its present capital of $20,000,000 to $50,000,000. The address is full of interesting data relating to the telephone business, and we make the following extracts:

The telephone is the most wonderful discovery of this half of the century. No invention for that period will compare with it in magnitude, in extent and in the largeness of the business which it immediately began to do, and which hereafter it will continue to do.

At first, you will remember, it was a string with a piece of flat metal at either end. It then developed into a means of local communication, speaking from house to house or from street to street. Very soon its larger capabilities were seen, though many were doubtful with regard to its ultimate perfection or value.

In 1880, however, such was the recognition of the greatness of this discovery and of its possibilities for commercial and social benefits that application was made to the Legislature for a charter, and a charter was granted.

The Legislature recognized, even at that time, the unusual value of the invention by incorporating the company with $10,000,000 capital, which was ten times the amount allowed by the general statutes. That charter provided not merely for the incorporation of the company, but also, to a certain extent, the manner in which it should do business.

It provided that it might do it directly, or carry it on through local companies organized in this and other States throughout the Union, which were its licensees, and might take stock in such companies to the extent of 30 per cent of their capital.

These local companies cover the whole length and breadth of the United States, and the American Bell Telephone Company is doing business directly and also through those companies, its licensees.

To-day this corporation, which Massachusetts created, which is a child of the commonwealth, and which in every way has shown itself worthy of its parentage, is doing a work that embraces the whole Union, and is bringing all the people of the United States, or will soon bring them, within speaking distance of one another.

From year to year, after the incorporation of 1880, the company went on developing its connections, enlarging its plant, discovering new methods of carrying on its work, at the same time creating a demand and supplying and meeting the demand, so that in 1889 it came here again, showed what it had done with its capital, what its business was, what the prospects for the future were, and asked for an increase.

In response, its capital was doubled, making the capital $20,000,000.

On the first day of January, 1885, the company, in itself and through its licensees, had expended the sum of $31,000,000. That amount had been expended for materials and for labor; a great corporation had been made subject to your taxation, and was aiding in what is the real solution of the great present question of political economy—the distribution of the wealth of the world.

Since January 1, 1885, this company, through itself and its licensees, has expended $14,500,000 in the one item of subways and the cables contained in them, over $10,000,000 for subways or conduits underground, and over $4,000,000 for cables; that is, these great wires, which are woven together and run underground. Let me ask your attention one moment to this matter of subways.

It was early found that there might be some intricacy of wires. You have wires for street cars and wires for electric lighting in addition to these wires for telephones.

To-day you are considering the question of putting all wires underground. Let me remind you that the Bell Telephone Company, without legislative suggestion, without compulsion from the Legislature, but carrying its original and constant purpose of an honest, true development, itself initiated the system of subways. It has spent since January 1, 1885, $14,500,000 in that one item, in addition to all previous expenditures.

Next, a subway running through a great city terminates somewhere. It comes up to the top of the ground. It must enter a building. You can see at once that it is desirable that the company should not have their subway, which had been constructed at this enormous expense, come up in a building which they rent, which belongs to some one else, and which they may have to part with.

Therefore, in the development of this great enterprise, it was soon apparent that it is necessary for the company to own their buildings. They have erected them in the various cities.

They have one in Boston, on Milk Street, on which they are paying taxes. It cost nearly $1,000,000. They have erected buildings in New York and in other cities.

In the one item of real estate, since January 1, 1885, they have expended $5,884,400—call it $6,000,000, which is probably the sum to-day. Thus $6,000,000 more has gone into real estate, and the most substantial kind of property.

That money has been expended in materials and labor, and has gone into the great work of the distribution of the wealth of the world.

Next is the aerial equipment and exchange. The wires are not all underground and cannot all be underground. Part of the work is still above ground. In the matter of overhead or aerial equipment and exchange there has been expended since January 1, 1885, $12,349,000—call it $12,500,000, for it is probably that by this time, as the work is going on continually.

Now you come to what is, perhaps, the most interesting and the most important part of the work and development of this invention, the one which strikes the imagination with the most force, and that is the development of the long distance telephone. The long distance telephone runs wide over the country, and is entirely controlled and paid for by the American Bell.

It was a somewhat hazardous experiment, but just as soon as we began to talk from here to Lowell, and from here to Worcester, somebody said, "Why not talk to New York?"

The effort was made, and the line was established to that city, first working imperfectly, to-day working so well that you can talk with a man in New York as I talk to you across this table. Then came the line to Philadelphia and other cities.

Then came the desire at once to reach what is nowadays the center of the universe, and that is Chicago. It required some courage and some faith (I ask you to bear that in mind) to start that enterprise, and to ask people to put their money into the attempt to establish talking with Chicago and at such long distances. But the attempt was made, and to-day there is a perfect system of telephonic communication with that city.

What does that mean? It means 1,200 miles of copper wire from New York to Chicago. This wire is copper, one-sixth of an inch in diameter, weighing 435 pounds to the mile. One circuit to Chicago—that is, a wire there and back—takes 1,044,000 pounds of copper wire.

This long distance system is still, of course, in its early infancy. It has been established for only two or three years. I cannot give yon the exact date, but it is of very brief establishment.

There have already been put into it and other toll lines an expenditure of $10,000,000.

When anybody says, "I can buy a telephone for $2," let me suggest this to you: When you put that telephone to your ear, you are holding in your hand not merely a little piece of wood worth $2, but you are holding in your hand and are in touch with millions of dollars of property for which honest money has been paid, which furnishes the foundation for additional taxation, and which has aided in the distribution of the world's wealth by the purchase of material and the employment of labor.

Stand in New York City, and you can talk with a man in Boston to the east, in Chicago or Milwaukee to the west, in Buffalo to the north, in Washington to the south. In other words, you are covering by the sound of your voice an area which contains half the people of the United States.

Consider what that means, and what the nature of the enterprise is which puts half the people of the United States in speech with one another.

Of course, the long distance system must be extended, and preparations are already made toward extending it. You must extend to Kansas City. You must extend to Omaha. You must ultimately reach San Francisco. You must go down largely into these developing Southern States, cities like Atlanta and Galveston and New Orleans, and still farther east and still farther north.

Foot up these sums. Since January 1, 1885, there has been spent in hard cash, for real estate—I will give round figures—$6,000,000; overhead equipment and exchange, $12,500,000; underground subway, conduits and cables in them, $14,500,000; long distance and toll lines, $10,000,000. These make something like $43,000,000 which has been spent since 1885.

Add the $31,000,000 spent before 1885 and you have an expenditure in the neighborhood of $75,000,000 to which the commonwealth has never been asked to contribute a penny.

The company stands committed to the expenditure right away of $10,000,000 more to perfect its existing plans in the long distance line, to say nothing of further needs.

As I say, there must be an immediate extension of the system still farther west and still farther south, to the great cities of the neighboring country.

Let me give you one or two illustrations of our growth.

For instance, in 1881, the year after the first charter was granted, the number of miles of wire in use for telephonic purposes on January 1 was 29,714; on January 1, 1894, it was 488,521, more than fifteen times as large. Is that the end? Ask yourself. Is that all, or is more going to be expended?

Take the number of miles of underground wire. That did not begin until 1885. Without legislative compulsion, of its own motion, the company then began to establish subways, and on January 1, 1885, there were in use 1,225 miles of underground wire; on January 1, 1894, 115,000. In other words, about a quarter of all the miles of wire have been put underground since 1885.

Is that work going to stop? Is that the end of it, or is it going on? If it is going on, is not money necessary?

Take the number of telephones in use. Starting with 5,000, to-day there are 566,491—more than one hundred times as many. Is that going to stop?

How many people are supplied with telephones, numerous as they are to-day, valuable as they are in performing the business of your office? Is this use going to stop, or is it going on, going to increase?

If it is going to increase, is not more capital necessary? If it is, and it is a good business which is developed, shall the company have the capital, or shall they be told they cannot have it, and if they want more capital they must either shut up shop or go to some State that will let them have it.

Take the number of telephone subscribers. In 1881, the year after the incorporation of the company, 47,800; to-day, 237,000.

Another interesting table is this—the number of talks. It is interesting for you to know how far people are using the telephone as a means of communication with one another. In 1884 there were 215,000,000 talks over the telephone. In 1893 there were 600,000,000 talks; in 1894, 650,000,000. That is nearly 2,000,000 talks a day. One has to stop and deliberate to get into his mind such a sum.

How many messages are sent over the telegraph lines? My memory is that there are about 63,000,000, and the telegraph has been developed a great many years. On the other hand, telephone communication is in its infancy, and yet your telegraphic messages during the year are 60,000,000, while your telephonic messages are 650,000,000.

To subscribers, that has amounted to from 2 to 11 cents for each message. You pay 30 cents for a talk, say, to and from Haverhill or Worcester, or even $2 from here to New York; but to telephonic subscribers the average has amounted, on the average, to from 2 to 11 cents for each talk. And you are not limited to ten words.

You have two or three minutes' talk, and you know how much you can do in a very few minutes, unless you are unfortunate enough to be addressing a committee and taking more time than you ought. In other words, the cost is reduced toward the cost of the United States mail.

The number of persons employed will interest you; that has increased, so that to-day there are over 10,000 persons employed.

At the building where we shall go in a few minutes, I desire to show not only the beginning of the subway and these enormous cables, but to call your attention to some details which are suggestive of the magnitude of the whole thing.

Take, for instance, the switchboard. In the city of New York, one switchboard is 264 feet long, at which sit the operators. Each operator attends to perhaps 50 subscribers. There are 10,000 subscribers in the city of New York. Any one of them, by ringing his bell and calling up the central office, can be put into communication with the other 10,000.

Gentlemen, think for one moment what this system already enables us to do. You will hear, as you hear with regard to other enterprises—I think less here than usual—complaint as to some little detail here or there; but is there, do you feel, do you know, that there is in the community any real or general restiveness under the existence of the telephone company?

Is it not recognized as a great, a very great invention, and a matter of inestimable commercial and business convenience and value? You can communicate with any part of the city, with any part of the State, and soon with any part of the United States.

You send for your doctor and communicate with your lawyer. You communicate with your business partner. Your wife orders her groceries and talks with her friends.

A man will growl, perhaps, because he has to pay twenty-five cents for a telegraphic message, because he has to pay twenty-five cents for a telephonic message, or whatever the sum may be; and yet, ask him whether it is not of advantage that, staying in his home thirty or forty miles away, he has been able to communicate with Boston and perform an important piece of business, and thus save the expense of travel and the loss of a day's time, and he will answer at once that the advantage is worth everything to him.

Who are the stockholders of this company? There are 200,000 shares of stock. There are 5,277 stockholders, and of these 3,721 are stockholders who have holdings of less than 25 shares each; in other words, three-quarters of the stockholders in this great company have less than 25 shares each.

We are asking the State to do something for its own

advantage. The corporation is paying into the State treasury $150,000 a year in the way of taxes.

We ask you to retain this corporation in Massachusetts, that its headquarters shall be here, that its employment of a clerical force and of operatives shall be here, so that Massachusetts shall get the benefit of having its citizens employed, its supplies furnished from Massachusetts sources.

The Brilliance of a Candle Flame.

That the luminosity of a candle can be calculated direct from the dimensions of its flame is the rather striking theorem of Herr P. Glan, who gives the results of his measurements in the current number of *Wiedemann's Annalen*. The volumes of the bright portions of various candle flames were measured by taking the length by means of a scale placed behind the flame, and the breadth at various points by gauging it with calipers or compasses. These bright portions have approximately the shape of cones, each of these cones being penetrated from below by a truncated cone, consisting of the dark central portion. The difference between the volumes of the two cones gave the volume of the brilliant portion. Stearine and paraffin candles of various thicknesses, and provided with different wicks, were compared by means of a rod photometer. It was soon found that the height of the flame was not the only factor determining the brightness. A stearine candle of 5·88 cm. circumference had, on the other hand, a higher luminosity than another 6·49 cm. in circumference. But a determination of the ratio of the volume to the illuminating power showed that this ratio is very nearly constant, the difference between the actual luminosity and that calculated from its volume never exceeding 3 per cent. In other words, equal volumes of the bright flame of any two candles give out the same amount of light.

Soap Suds for Calming Waves.

The remarkable action of oil upon waves is well known. This phenomenon led the officers of the steamship Scandia, of Hamburg, to make an experiment upon the same principle that was very successful, and that appears to us worthy of mention. During its last trip to the United States the vessel, while in mid-ocean, was attacked by a very heavy storm. It then occurred to the officers to dissolve a large quantity of soap in tubs of water. Having thus obtained several hundred gallons of soap suds in a very short time, they threw it overboard in front of the ship. The effect was almost instantaneous, and the vessel soon began to navigate without difficulty. Her officers at once addressed a long report to the Hydrographic Bureau of the United States, giving an account of their voyage, the storm, and the means that they employed to still the waves. They conclude by saying that although soap suds does not produce absolutely all the effects upon water that oil does, it at least suffices to break the force of waves in most cases. Besides, this method recommends itself to transportation companies careful of their interests. Soap suds is much cheaper than oil, and a relatively large quantity of soap can be carried without encroaching too much upon the space set apart for passengers and merchandise.—*La Nature.*

EOLIAN HARPS.

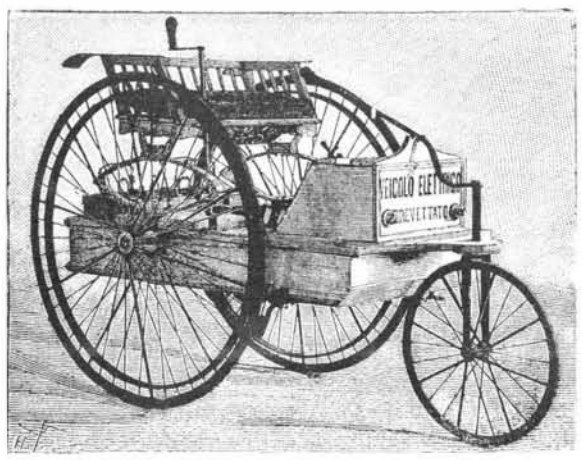
The following experiment, although performed as long ago as 1855 by Mr. Wheatstone at the Polytechnic Institution, is of sufficient interest to reproduce. Upon the center of the stage were arranged, in a semicircle, four Erard harps, which, at the pleasure of the experimenter, vibrated as if they were made to resound by invisible hands. To this effect, there had been fixed to the sounding boards of each of them four vertical rods of firwood, which descended perpendicularly, passed through the floor of the stage and the ceilings beneath, and in the deep cellar of the Institution were fixed, one of them upon the sounding board of a piano, another upon the sounding board of a violoncello, and the two others upon the sounding board of violins. In order to render it possible to interrupt the vibrations between these instruments and the harps, the rods supporting the latter had been divided at a few centimeters above the floor. A revolving motion of the harps caused either their juxtaposition with or their separation from the rod.

This thoroughly scientific experiment was taken up under the name of Eolian harps by Robert Houdin, who introduced several scenic modifications into it. A stage elevated in the very midst of the spectators was traversed by two firwood rods, which, after passing through the floor, rested upon harps placed in the hands of instrumentalists. At the command of the skillful prestidigitator, two other instruments, supported by the upper extremity of the rods, executed a concert whose success was immense, thanks to the careful and very elegant *mise en scene*. Certain operators further surprised their spectators through the pretended intervention of mediumistic spirits very much in fashion at the time.—*La Nature.*

CARLI'S ELECTRIC CARRIAGE.

The question of small automobile vehicles for streets and highways is at present the preoccupation of the manufacturers and inventors of all countries. The competition instituted by the *Petit Journal* will certainly bring to Paris all the systems that have been devised for the solution of the problem—steam, gas, petroleum, and electricity produced by batteries or stored up in accumulators. This latter solution, which to us appears to offer the brightest future for an application in large cities that are provided with central stations of distributions of electric energy, is, nevertheless, the one that answers the least to the programme drawn up by our daily contemporary, and too hasty and too absolute conclusions must not be deduced from the check that electricity will necessarily suffer.

We do not generally take a vehicle upon roadways for



CARLI'S ELECTRIC CARRIAGE.

trips of 60 miles. For such journeys the railway is the proper mode of conveyance. But we do take a coach for making excursions, and visits and doing business for a few hours, in returning sensibly to the starting point, and it is for such applications, which are the most numerous, that the use of energy stored up in accumulators comes in.

However this may be, researches in this direction continue, and we shall now make known to our readers a new electric carriage, of which a description has been kindly communicated to us by Prof. G. Milani, of the University of Pisa. The essential part of the description that he sends is as follows:

This carriage was constructed at Castelnuovo (Garfagnana) in the power loom weaving establishment of Count Joseph Carli, deputy to the Italian parliament. The Carli electric carriage is actuated by accumulators of the Verdi type, this having been selected because it possesses a great specific capacity and can best resist the shocks always inevitable in a vehicle designed to run upon all sorts of roads. The battery consists of 10 elements each having a capacity of 100 amperes-hour, say 200 watts-hour. There is thus at one's disposal 2 kilowatts-hour. The model employed weighs 11 pounds and contains five plates. Under conditions of normal discharge, the battery furnishes a current of 5 amperes, say about a half ampere per pound. The plates are arranged horizontally in a wooden cage, are held in place by small bars of ebonite and are separated from each other by a fabric of paraffined jute. The whole is inclosed in small ebonite boxes hermetically closed by an ebonite cover, in order that the liquid may not slop over through the effect of jolting. The inventors have found it of a certain advantage to have recourse to a system of very slow charging. To this effect, they employ very feeble currents of a duration of from twenty-five to thirty hours, and this permits of using primary batteries. This circumstance is favorable to the best rendering and to the best rate of discharge of these accumulators, even when the external resistances vary in a large measure. Experiments have proved that the rapid discharge presents no inconvenience and leads to no alteration of the positive surfaces. The rendering alone drops from 97 to 63 per cent, if we pass from a half to one ampere per pound of plates. The battery of 10 accumulators of the type described above confines an energy equal to 2 kilowatts-hour. The vehicle weighs but 350 pounds in running order.

The motor actuates the hind wheels directly by means of gearings. It absorbs about 550 watts and the battery is capable of supplying it for a four or five hours' trip. The excitation is in derivation. The motor is capable of serving for the recharging of the accumulators, by virtue of the well known principle of reversibility. It is only necessary to apply a winch or a belt. There is a train of gearings between the axis of the motor and that of the wheels. By means of this gearing, it is possible, by turning a winch, to reduce the angular velocity of the motor from 1,000 revolutions per minute to 100 or to 30. On another side, a rheostat permits of varying the angular velocity of the motor from 1,000 to 300 revolutions per minute. It is thus possible to develop the greatest power corresponding to every speed, to run at slow speed upon ascending roads, at high speed upon declivities, etc.

For starting and for unforeseen obstacles on the way, recourse is had to an impulsion box that is held in reserve. This consists of a system of rubber tension springs that are stretched by revolving a small wheel, even during the running of the carriage. When an energetic impulsion is necessary, the springs are relaxed by means of the foot, and produce upon the axle an impetus equal to double the power of the motor itself, and sufficient for a run of at least 160 feet.

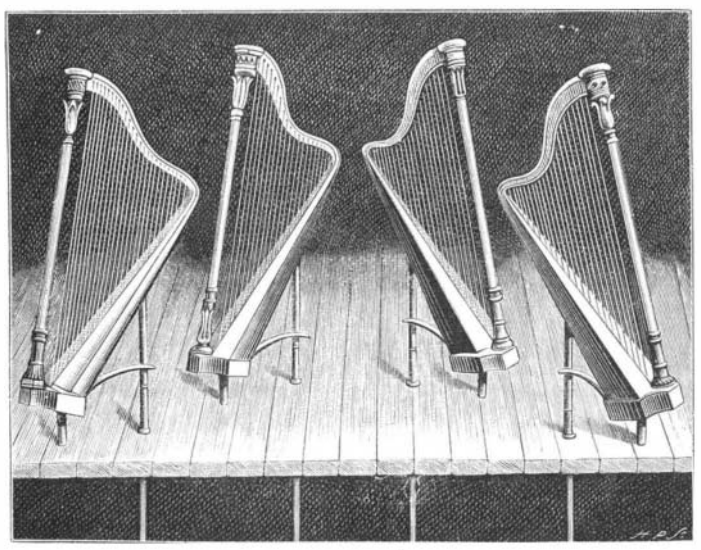
The Carli establishment, under the able superintendency of Mr. F. Boggio, is constructing two types of this carriage, one of them simple and cheap and the other more elegant and more elaborate in detail. It is the second type that is represented in our figure.

We have cared to publish this note in order to well show that the electric coach, such as we conceive it, is not a utopia. The electric carriage of Mr. Pouchain and that of Mr. Carli are already realizing the majority of the conditions necessary to this kind of exploitation. The questions of form will soon be solved by the art of the coach builder and that of the electrician.

A few more improvements in accumulators, and central stations will, in the charging of coach accumulators during the day and a part of the night, have an important market that will improve their annual rendering as well as their present conditions of exploitation.—*La Nature.*

American Fire Arms.

Some time ago we published the statement that the German Mauser rifle was an American invention, and we are now asked as to our authority for that statement. Those familiar with the facts are aware that Mr. Mauser, at the time the weapon having his name was invented, was a skilled mechanic in the employ of the E. Remington & Sons, Ilion, N. Y., and that the first Mauser gun was constructed at the expense of the Remingtons, and under the supervision of their master mechanic. The Remingtons had an interest of one half or more in the invention, but Samuel Remington, who for many years represented the company in Europe, had such an unfortunate experience of the German government's illiberality to inventors that he sold his interest in the gun to Mr. Mauser for $500. These facts fully justify our statement, referred to, that the Mauser is an American invention. The Lee rifle was also invented and constructed originally at Ilion, and it furnishes the essential idea of most if not all of the rifles now in use in European arms, with the exception of the improved Chassepot or Gros. It certainly excites surprise in the mind of any one who is familiar with the history of small arm invention to find our government going abroad for its service weapon. The kingdom of Sweden and Norway, from one of whose subjects we obtain our new army rifle, was the first foreign government to adopt and purchase an American breech-loader, the Remington. With proper encouragement from the government our small arms manufacturer might hold the field against the world. The design and essential idea of the breech-loader and magazine gun, wherever it is found, is American. The machinery used in the manufacture of modern arms in all foreign countries manufacturing their own arms is of American invention and in large measure of American manufacture. The machinery in the armories of Germany was manufactured by the Pratt & Whitney Co., of Hartford, Conn., and the German workmen were instructed in its use by Yankee mechanics, sent out by that company and remaining in Germany for one or more years.—*Army and Navy Journal.*



EOLIAN HARP EXPERIMENT.

THE farmer in Japan who has ten acres of land is looked upon as a monopolist.