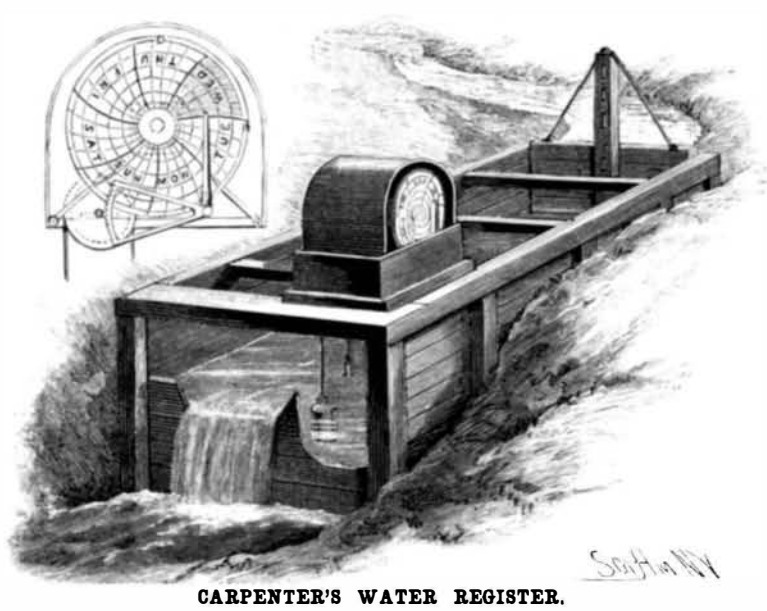
AN IMPROVED WATER REGISTER.

The accompanying illustration represents an apparatus for indicating and recording the rise and fall of a body of water, and is designed to be especially useful in localities where irrigation is resorted to, the machine being placed in a flume leading from the irrigating ditch, and keeping an accurate record of all variations of the depth of the water. This improvement has been patented by Mr. Don A. Carpenter, of Fort Collins, Col. The mechanism of the machine, as shown in the small sectional view, is preferably inclosed by a case. Upon a shaft carrying a grooved pulley is a cable, to one end of which is attached a float and to the other end a counterpoise, the counterpoise taking up all the slack of the cable, so that the shaft is moved with every rise and fall of the float. A pinion on the shaft meshes with a segmental rack on another shaft carrying an arm to which is secured a bar having at its upper end a stylus or pen. The point of this stylus presses against a dial, preferably of paper, secured to a metallic disk by clips, the disk having a hollow hub on its back secured to the spindle of a clock, an eight-day clock being preferably used, and the clockwork being so timed that the disk will make but one complete revolution a week. The dial is divided into seven equal segmental parts, to represent the days of the week, other subdivisions representing the hours, while the dial is also adapted to indicate the height of the water in feet. The dial for use in connection with the machine has also been copyrighted by the inventor, it being designed to furnish a standard size machine to be used with a standard size of weir, say three feet, when the dial slips will furnish the means of determining the discharge of water, in cubic feet, for any desired period.



CARPENTER'S WATER REGISTER.

MR. TESLA'S EXPERIMENTS ON ALTERNATING CURRENTS OF GREAT FREQUENCY.

Mr. Nikola Tesla, to whom the English and French scientific public has just accorded a very warm reception, is a pioneer in electric science, and one of those who will have influenced future progress through an almost radical transformation of the old processes and old methods.

Some day we shall have occasion to describe the two alternating current motors devised by Mr. Tesla as long ago as 1888. At present, we shall content ourselves with recurring to his magnificent experiments on high potentials and alternating currents of great frequency, of which we have already given a complete idea in summarizing the communication made by the author on the 20th of May, 1891, before the American Institute of Electrical Engineers.

In the train of this communication, which made a very great sensation in the scientific world, Mr. Tesla, acceding to the pressing solicitations of his friends and admirers, came to Europe and performed at London on February 3d, and at Paris on the 19th of the same month, before the French Society of Physics and the International Society of Electricians, assembled in the hall of the Society of Encouragement, the remarkable experiments of which we were witness and of which we propose to give an idea, despite the dryness of the subject, its very special character, and our inability to make a clear exposition of it.

Mr. Tesla did not content himself with a simple repetition of the experiments made in America, but he extended them and rendered them complete, and the communications made in Europe may be considered as the second part of a long and remarkable study of which the first part was presented in the New World last year.

In the first place, let us briefly recall the processes employed by Mr. Tesla for the production of alternating currents of great frequency. The simplest consists in the use of an alternator of special form, which is represented herewith in Fig. 2. This consists of a steel disk 30 inches in diameter, upon which are mounted 384 small bobbins, or, more accurately, 384 small zigzag windings. This disk revolves in the interior of a fixed ring carrying 384 inductor poles. The result is that the frequency of the alternating currents engendered by the revolution of the armature before the inductors produces 192 periods per revolution, and that at the normal maximum velocity of 3,000 revolutions per minute, or 30 per second, a frequency of 9,600 periods per second is obtained, instead of the hundred solely that ordinary alternators give. The alternating current thus engendered is collected through the aid of two rings against which two brushes rub, as in all alternators with movable armature. A separate excitation permits of varying at will the alternator's electro-motive force, which, under full excitation, may reach 200 volts. In the second process employed by Mr. Tesla for obtaining much greater frequencies, which may reach and even exceed a million per second, he utilizes an ordinary alternator. In the experiments of February 19, he employed a Siemens alternator, whose frequency did not exceed fifty periods per second.

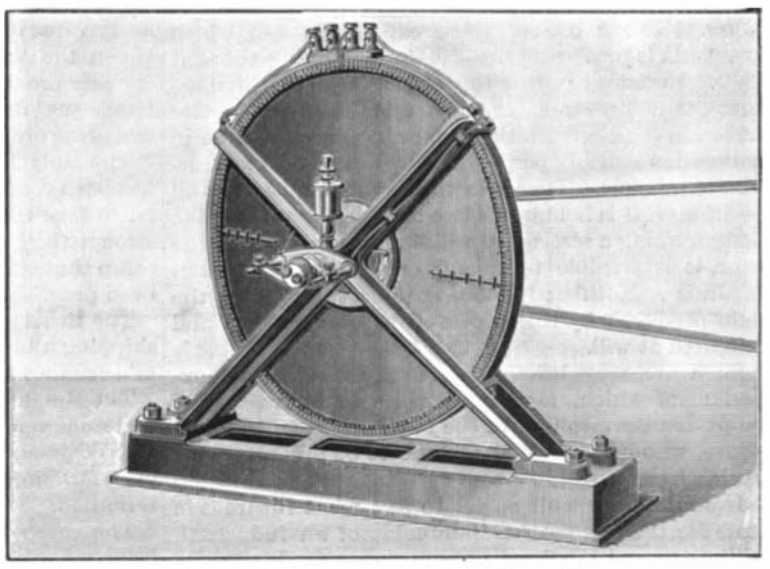


Fig. 2.—TESLA'S RAPID ALTERNATOR.

The alternating current thus produced is sent to an induction coil by establishing in derivation, upon the primary circuit, a disruptive discharge apparatus formed of a condenser and two polished bars whose distance apart may be varied. This spacing regulates the frequency of the discharges, and, consequently, the frequency of the currents traversing the inductor of the bobbin. The sparks of the disruptive discharges burst forth in a powerful magnetic field which facilitates their rapid production, as well as the cooling of the space wherein they are produced with so great a rapidity. Whatever be the process employed for obtaining great frequencies, the potential is always inadequate, and it is increased by transforming the alternating current by the aid of a suitable bobbin. This latter consists of an internal inductor winding and an external armature winding, formed of relatively coarse wire, and of a number of quite small spirals; for it must not be lost sight of that, seeing the great frequency of the currents, the electromotive force developed for a given length of wire is incomparably higher than with ordinary bobbins. These bobbins have no iron core, and are completely submerged in boiled linseed oil; the object of which is to secure perfect insulation and to prevent the presence of air, which, in this particular case, would be very prejudicial through the considerable heating that it would produce under the action of the enormous and frequently reversed electrostatic tensions to which it would be submitted.

In order to obtain powerful effects, Mr. Tesla overcomes the prejudicial effects of self-induction by utilizing the properties of condensers properly interposed in the circuit of the alternator or in derivation upon the terminals of the disruptive discharge apparatus.

A certain number of the experiments made by Mr. Tesla on Feb. 19 were merely a reproduction of those that we have spoken of before. We shall therefore not reproduce them, but shall dwell more especially upon those that present a character of novelty.

The first experiments were made with the disruptive discharge apparatus, that which gives the greatest frequencies at present obtainable by the means at our disposal. In these conditions, the electrostatic discharges traverse the air under the form of luminous discharges, as if the air were rarefied. On interposing an ebonite plate, the electrostatic capacity of the system formed by the two balls between which the discharge takes place and the ebonite plate is increased by the interposition of a dielectric whose specific inductive capacity is greater than that of the air, and the brightness of the discharges is thereby intensified. These discharges easily traverse long tubes containing rarefied gases, which they illuminate with a bright light, each rarefied gas giving to the light its own distinctive color. The discharges occur likewise between two cotton-covered wires insulated from each other and put in connection with the two terminals of the bobbin. These wires emit a violet light throughout their entire length, and even render luminous the space comprised between them.

All the other experiments were made with the alternator shown in Fig. 2, which gives from 9,000 to 10,000 periods per second. Mr. Tesla first showed the discharges in the form of a flame.

In order to prove that these discharges of high potential and great frequency are not dangerous, he was able, on taking in his hands two metallic balls designed to prevent his being burned by the spark, to receive the entire discharge from the bobbin, the discharge passing through his body interposed between the two balls. Mr. Tesla afterward showed that the return wire is absolutely useless for making the discharge current pass. The latter may be established by the air, and pass more easily if care be taken to connect one of the extremities of the wire of the bobbin with a conducting plate insulated in space. The molecular bombardment heats the part which presents but little sur-

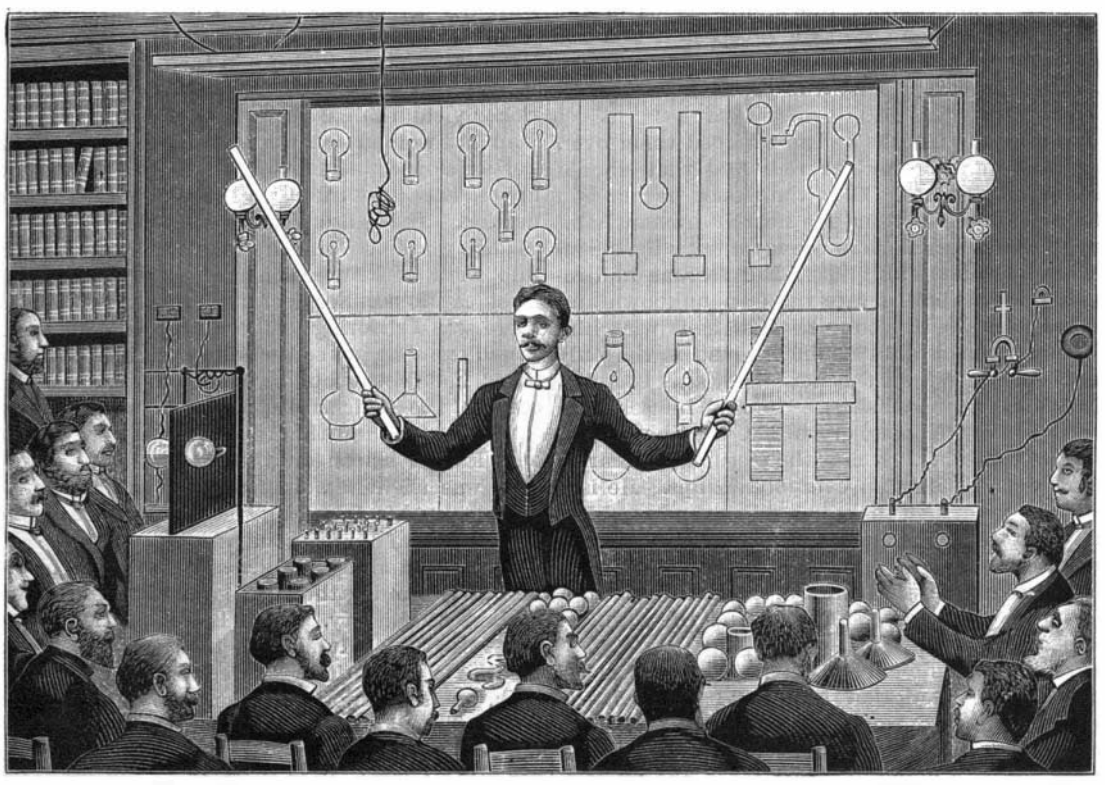


Fig. 1.—PARIS—MR. TESLA LECTURING BEFORE THE FRENCH PHYSICAL SOCIETY AND THE INTERNATIONAL SOCIETY OF ELECTRICIANS.

face put in communication with the second pole of the bobbin, and it was thus that Mr. Tesla showed us the incandescence of a thin platinum wire or of a carbon filament inclosed in a globe of rarefied air.

Every increase in the capacity of the system increases the discharge current, and, consequently, the incandescence. It suffices, for example, to bring the hand near the globe containing the incandescent body, and to place a metallic shade above the latter, or even (an effect paradoxical in appearance) to place the shade alongside of the globe, to produce an increase of brightness resulting from the increase of the electrostatic capacity.

The wire to which the filament is attached is connected, as we have said, with the secondary wire of the bobbin, whose other wire communicates with an insulated metallic plate. Such metallic communication is not indispensable. In fact, if the wire is covered with lead, a layer of gutta percha entirely insulating the copper wire and the leaden tube that envelops it, the lamp with a single filament becomes lighted as brilliantly when it is put in communication with the copper wire or the leaden tube.

Mr. Tesla thus actuated a Crookes electric radiator, and even a special single wire motor, to describe which would lead us too far. He afterward illuminated certain bodies that are but mediocre conductors, such as alumina, carbon, lime, "carborundum," and a few phosphorescent bodies, such as sulphide of calcium, yttria, sulphide of zinc, and the ruby, the marvelous effects of which several times gained the unanimous applause of the spectators. Mr. Tesla finally terminated with a few experiments in the illumination of tubes of rarefied gases without wires or electrodes, the tubes being simply placed in the periodical electrostatic field produced between one of the insulated poles of the bobbin on the one hand and an insulated metallic plate placed above the experimenter and communicating with the other pole of the bobbin on the other hand.

Fig. 1 shows one of these experiments, in which Mr. Tesla is producing the illumination of two tubes at once. In order to effect the extinction of one of these tubes, it suffices to interpose a middlingly conductive screen in the electrostatic field, or to place the tube in a direction sensibly perpendicular to the flux of induction of the field. The same tube remains dark in all positions if it is held by its two extremities at once, the body forming a screen. On sliding the hand along the tube, it is possible to render one of its extremities luminous. Nothing is more curious than to see the light produced by this process thus extinguished and relighted at will.

Such are, very briefly described, the principal experiments which, for more than two hours, deeply interested the members of the two societies mentioned above, who had the good fortune to be present at Mr. Tesla's lecture.

It would be difficult as yet to say what future is in store for them from the standpoint of an industrial, utilitarian and practical new mode of production of light. The more so as the dream of the inventor is broader and his views more exalted than the experiments that he presented to us allow to be seen. His final ambition appears to be to transform the energy of the medium that environs us, and which is very evident by its numerous manifestations, into light, or at least to obtain therefrom radiations of the same wave length and same frequency as those that produce luminous sensations. Crookes' radiometer has already proved that it is possible to convert the radiant energy of a medium directly into mechanical energy, and although, from the standpoint of rendering, this radiometer is the most detestable of all transformatiou apparatus, it is none the less the most admirable, by the fact that it affords us a tangible demonstration of the possibility of such transformation.

On the other hand, Mr. Tesla, in his memorable experiments, has shown us that, on periodically varying, with very great frequency, an electrostatic field, it is possible to place apparatus of great simplicity therein, such as tubes of rarefied gases, which collect a portion of such energy and render it luminous. To the philosopher and savant nothing more is necessary to establish the possibility, if not the probability, of the realization of Mr. Tesla's final views. To him the light of the future resides in the incandescence of solids, gases, and phosphorescent bodies excited (if we may use a somewhat vague expression) by high potentials varying with very great frequency.

The young scientist is convinced of this as a precursor, and almost as a prophet. He introduces so much warmth and sincerity into his explanations and experiments that faith wins us, and, despite ourselves, we believe that we are witnesses of the dawn of a near-by revolution in the present processes of illumination. —*E. Hospitalier, in La Nature.*

THE philosopher known to fame as Sir William Thomson has joined the ranks of the British aristocracy under the new name of Lord Kelvin. This lord lately took his seat in the House of Lords, being introduced by scientific nobleman Lord Rayleigh.

Creede, the New Mining Town of Colorado.

Creede, though only six months old, is to-day the banner mining town of Colorado. The railway reached there in October last, but passenger trains did not run until December. The camp is situated in a narrow gulch on Willow Creek, among the mountains, 9,500 feet above the sea level. The rugged mountains rear their summits 4,000 feet above the town. The new camp is without any definite government, for by a blunder of the State officials it is No Man's Land, belonging to no county or town.

The town proper is about one and a half miles long, and varies in width from 100 to 2,000 feet.

The extent of the mineral belt is unknown, but men who have prospected through all this country express the belief that it runs as far northwest as Carson, forty miles distant, and at least five miles southwest, by ten miles in width.

The principal mines of the camp and the dates of their discovery are as follows: The Last Chance and Amethyst are located on the same vein, adjoining end to end. Both the Last Chance and Amethyst are mines without dumps.

All the ore taken out is shipped, and every bit of mineral between the walls is mined. The vein shows a maximum width of twenty feet, with an average of eight. On the Last Chance a level run from the ore house is 200 feet in length. At the breast five feet of ore are exposed, averaging 185 ounces silver per ton. At the mouth of this tunnel a shaft has been sunk sixty feet, and another level run in from that 130 feet, all in pay ore. At the breast of this tunnel the assay value is only $40 worth of silver to the ton. A million dollars' worth of ore is now blocked out in this mine, and they are shipping seventy tons per day that will average $120 worth of silver to the ton.

In the Amethyst the ore is identical. They have been running north, and have a larger body of ore exposed than in the Last Chance. A drift in this mine 250 feet long shows ore the entire distance of an average assay value of $225 to the ton, and a width 12 feet between the walls. No stoping has yet been done, as enough ore is mined in simple development to pay handsome dividends. These two mines constitute one great ore body, showing over $2,000,000 in sight.

The Holy Moses was discovered in June, 1891, and has been continuously worked since. The ore is similar to Last Chance, but of much poorer grade. It is strongly believed by many experienced miners in the camp that the body of pay ore in the Holy Moses has been practically worked out.

The Ethel mine was discovered in June, 1890. It is shipping a little ore, but of so low a grade that the mine cannot be classed yet as a dividend payer.

The Mammoth was discovered in May, 1890. It has had some very rich ore, but is not shipping at present. It is commonly accounted a huge property, but some of the pessimists express the belief that the ore body is limited.

The camp is named from W. C. Creede. His has been an eventful career. Of all the thousands who have crowded to the new mines not one has a more interesting history or personality than this modest, unassuming miner. He is as timid and bashful as a schoolgirl. He is a reserved, taciturn man, but his whole air is commanding. The few words he speaks are characterized by great good sense.

He is well built and muscular, and is now 49 years old. Fort Wayne, Ind., is his birthplace. At 19 he became a scout in the regular army, and served for seven years in the Indian country. Thus he acquired considerable knowledge of the mining lands of the West. In 1869 he began life as a prospector, and has since heard the music of nearly every rill in Colorado. The mountains possess a peculiar fascination for him.

For months and months he has tramped them over, hoping and working for the rich find that should make him independent. More than once he has lain sick unto death, miles from the nearest human habitation. Twice when alone in the mountains the pneumonia has had him in its grasp. But fortune had reserved him for a kindlier fate than an unknown and unmarked grave. His young nephew lives with him in his humble mountain cabin, and he is the only human being in whom the new silver king confides. Mr. Creede has no bad habits. He says himself that he does not know the taste of whisky. Neither knows he aught of gambling. Such is the picturesque character whose name is now on everybody's lips. He is a general favorite among the rough miners and gamblers of this conglomerate settlement. Modest, pure-minded, courageous, generous to a fault, yet the possessor of untold millions and the acknowledged leader of a settlement of cutthroats, gamblers and the scruff of civilization generally.

His great find was made in May, 1890. This is his own interesting description of it: "I climbed the mountains along the trail of the float all day. The sun was beating down on me and the glint of the float under my feet was blinding. Just when the western sky was tinged with that gorgeous red we see here sometimes, I lifted my head, and there was, projecting out in front of me, a huge bowlder of silicate, big as a house. Good God! I almost screamed with delight. I knew it was bound to come some day, but the idea of finding it in such shape was appalling to me. I staked off a mine and called it the Mammoth. I slept sounder that night than I had for years before. In June I discovered the Ethel and the Holy Moses. I gave the latter that name because I like odd names." Mr. Creede's income is now about $1,000 a day, none too great a reward for a lifetime of toil and perseverance.

Only a little less remarkable has been the life of Captain L. E. Campbell, Creede's partner. In 1861 he joined the army and did good service during the rebellion. At the close of the war he became a second lieutenant in the Indian service. His Western experience has given him a great knowledge of mineral lands. He married the daughter of Colonel Fred Dent, brother-in-law and confidential friend of General Grant. As a girl she spent much of her time at the White House. She now displays the same charming grace in her husband's rude cabin that she did at the White House. For years Captain Campbell has been supporting his family on the scanty pittance allowed an army officer. Henceforth he will enjoy an income almost fabulous. Creede is a typical Western town. Its seething, diversified population has come from everywhere. Never since the palmiest days of California in '49 has anything of the like been seen. The scum of Western life is here, along with much of its sturdiest element. Faro dealers, arm in arm with Denver speculators, may be seen in the streets at any hour. The tenderfoot lately from the East is an easy prey to the gamblers and sports. Assassins and honest men hobnob like old acquaintances. Desperadoes from Kansas, confidence men, horse thieves, a Harvard graduate of law, and an escaped convict from Texas, may be seen sitting together on a footing of democratic equality at the faro tables. Such is the drama of Western life as seen here. Every one is engaged in a wild scramble for money. The shining metal has attracted all—fallen women, gaming men, lawyers, miners, desperadoes and tenderfeet.

Excitement reigns among all classes. The camp now numbers 15,000 souls, and fully one-half of that number are gamblers. It is a gambler's paradise. The tables are crowded night and day. Fortunes are made and lost in an hour. Faro, keno, stud poker, and craps are the popular games. The miners make about $3 a day and 500 out of the 600 employed hereabouts spend every cent of their wages over the green cloth on Saturday night. Billy Woods, the champion heavy weight prize fighter of the West, runs one of the gambling hells. Every bartender in the town is an ex-pugilist.

Thus far fairly good order has been preserved in camp. Beyond the frequent killing of a stake jumper, and innumerable saloon brawls, the deeds of lawlessness have been comparatively few. It is highly improbable that this quiet state of things shall long continue. Bob Ford, the murderer of Jesse James, is here. He professes to have come to make money. But in a recent interview he was careful to let it be known that he is still able to take care of himself in any quarrel. Bat Masterson, a noted frontier marshal, is the manager of a gambling house. He is one of the nerviest men in the West, and it will go hard with any gambler who raises a row in his establishment. Masterson has already killed twenty men. Others equally well known are in town, and the future peace and order of the place does not look assuring.

There are now published in Creede three dailypapers—the *Amethyst*, *News*, and *Candle*. They are all sprightly little sheets and are a daily reflex of camp life. Let a new claim be staked off in the snow, and the local papers write it up in the most elaborate style, being always scrupulously careful to predict for it a richer yield than Comstock or Molly Gibson. Every man and woman in camp of any note considers the reporters slow or incompetent if his or her name doesn't appear in each of the papers every evening in some connection. The editors know what class of news their readers want, too, and are careful that nothing creeps into their columns calculated to give offense to the most captious. For instance, about two weeks ago there was a shooting scrape in the Orleans saloon, in which one man got seven bullets put into him and another had both thumbs shot off. This is the account of the affair as it appeared in one of the papers:

"We understand that several shots were fired near a well known saloon on Cliff Street, last night. One man was slightly wounded and has been carried to Pueblo by his friends. The boys will have fun, but don't mean to hurt anybody."

Notwithstanding the general prevalence of wickedness and disorder, there is a strong law and order population in the city. Capitol Hill is the residence of Creede's Four Hundred. The residences are not palatial or pretentious. Three of them are two stories high, but the majority of them are only one, and the most commodious contains only three rooms. They are built of green lumber, and, of course, when the summer sun gets a fair whack at them, there will be a shriveling and a shrinking that will make them all the more picturesque. And, too, their foundations are rather

groggy affairs, but they fulfill all the present conditions, and that's all the most exacting of the Creede 400 demand at this chrysalis stage of the young metropolis' development. On the evening of February 22 a grand ball was given by the *elite* of the town.

All the ladies were dressed in handsome ball costumes, and the *decolleté* gown was there in force. The men—or a great many of them—wore the conventional swallowtail broadcloth.

Living in Creede is very expensive. A meal costs $1. Beer costs 15 cents a glass, or 80 and 40 cents a bottle. Whisky that will not kill cannot be got for less than 25 cents a drink, and the bartender is careful that your libation is not too large at that. Horses or burros to ride over the mountains are hired at 50 and 25 cents an hour. The streets are so terribly sloppy that one dares not walk around much, and a ride to any part of the city will cost you 50 cents. Cabmen have driven over from Pueblo, a distance of twenty miles, with their rigs and are reaping a richer harvest than the prospectors. Labor is high. Any man who can drive a nail can command $4 a day, and in some extreme cases they are paid $1 an hour. Boss carpenters get $8 a day and are talking of raising the scale of wages. Laundry costs three times as much as in St. Louis, and no Chinamen are allowed in camp.

Hotels are numerous, there being nearly 100. It does not, however, take much for a hotel, as a plain board shanty, 16 ft. square, with a blanket for a door, is dignified with the name "Palace Hotel." Until a short time ago the hotels were similar to this one, although many of them were made larger. In all, the sleeping room held from twenty to sixty cots, the use of which was granted the tenderfoot at $1.50 each a night, with blankets furnished, or without blankets only 50 cents. The Pullman company has also entered the hotel business, leaving on the side track from three to ten sleepers, in which the anxious speculator could find a bed on payment of $1, provided he could catch the conductor in time to pay in his money and secure his ticket.

A shocking state of sanitation prevails. Water for washing, cooking, and drinking is obtained from Willow Creek, which is also a sewer and dumping place for all the refuse of the camp. An epidemic of dysentery has just broken out. It is claimed the trouble comes from the arsenic and antimony from the ores poisoning the water. There are 200 persons in town afflicted to-night, and many cases are quite serious.

The peculiar cough which catches hold of nearly everybody who comes to Creede is attributed to the arsenic in the air.

Speculation in town lots still continues. The latest report is that the United States land commissioner has ordered a discontinuance of all land sales. Governor Routt and other State officers assisted at the sale on February 25. The claim holders intimidated outsiders and had things pretty much their own way. Women were among the bidders.

A lot was put up, the minimum price being $50. Some one said, "A woman occupies it;" then the crowd shouted, "Give it to her." One man bid $50. The crowd groaned and hissed, and the man bid $1, announcing that it was for the woman, and that no man had the temerity to raise the bid. The lot was knocked down to the woman amid a storm of cheers.

A lot occupied by a poor woman was bid in by a liberal man and given to her. This established a bad precedent. A corner lot on block 17 sold for $1,100. The next lot was claimed for a "lady." One or two people began to bid, but the crowd hissed them down. The lot was knocked down for her at $160. It was stated that she made her first appearance only the day before on the grounds.

A few minutes later a woman got up on the Squatters' Committee stand and made her own showing. Mrs. Barry was her name. She said she had been begging for two days and was living on the lot. The woman wore an astrakhan fur jacket and her fingers resembled a jeweler's showcase. First she was cheered by a clique, and then a roar went up to give her the lot. She got it. It was certainly surprising to know that there was so many "lady squatters" in Creede. No one was aware that there were half so many in town.

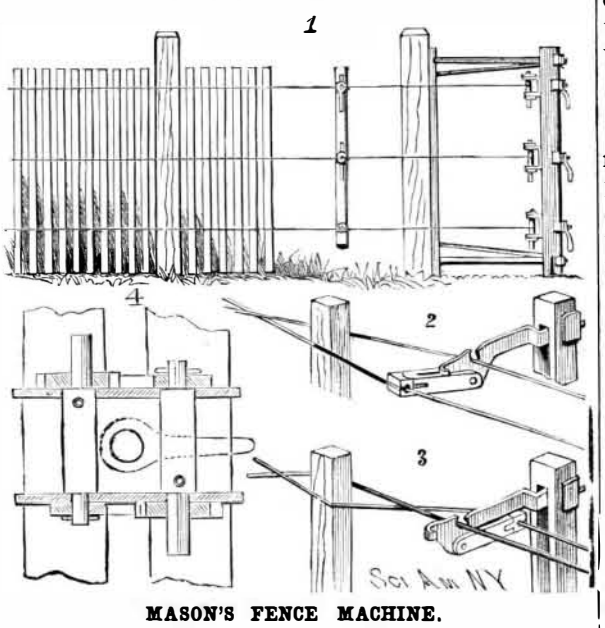
The highest price paid was for a corner, which sold for $2,700.

In all $225,000 was realized. An attempt was made to rob the State officials of the money. But a mob of 1,000 men, armed to the teeth, immediately surrounded the governor's train and guarded it overnight.

Mrs. Marie Love is among the women who are making thousands at Creede. Almost any day, when the sun's rays are playing hide and seek with the snow crystals on the mountains and cliffs, Mrs. Love can be seen astride a burro riding over the hills in search of leads. She has staked off five claims, some of which old prospectors declare will make her the silver queen. Woe to the man who would dare jump one of her claims, for the camp would rise up *en masse* and tear him limb from limb.

Mrs. Love is a finely educated woman, of majestic bearing and business-like deportment. She is of magnificent physical development and her face is of a decidedly classic mould. She dresses in severely modest colors, her large hat with its great black plume being the only conspicuous feature of her attire. She is splendidly posted on all current topics, and discusses politics and politicians with the intelligence and originality of a veteran statesman. She is closely related to some of the most distinguished people of Ohio, Indiana and Pennsylvania, and as soon as she can convert her newly acquired mining property into anything like its cash value, she intends to purchase an elegant home in Washington, so that her children may enjoy the advantages of the social life of the national capital.

The law and order element of the population of Creede is growing stronger daily. At a citizens' meeting held the other night resolutions were passed providing for the public safety. New strikes of silver are being opened daily.

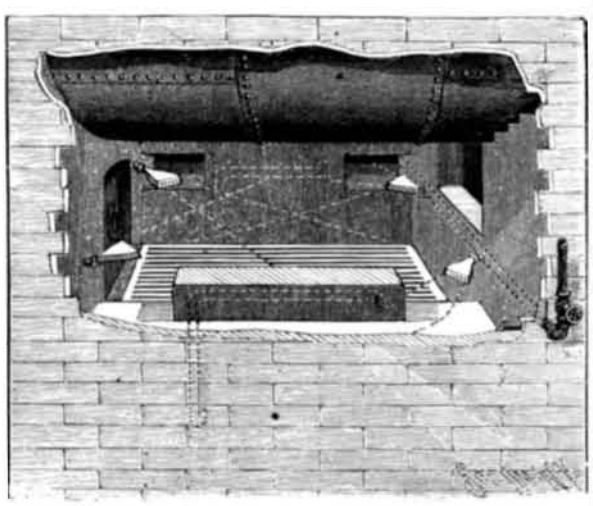


MASON'S FENCE MACHINE.

Word comes from Cripple Creek that that camp is enjoying much the same scenes as Creede. There, too, gamblers of all sorts are reaping a rich harvest. Neither has it a government. A vigilance committee runs the town.

The foregoing is from the *N. Y. Press* and the following we find in the *Electrical World:* Many have read the announcement which has been made that "Creede, Colo., has electric lights," but few are aware of the phenomenal time occupied in the construction of the plant, due to that element of vitality and grit which is most noticeable in Western people.

The idea of equipping the plant was conceived at noon, Feb. 1, by John W. Flintham, general manager of the Denver Consolidated Electric Light Company. Before the day was over, the Creede Electric Light and Power Company was organized and incorporated, supplies were ordered and placed aboard a special train of cars at Denver that had been chartered from the Denver & Rio Grande Railway Company, and everything necessary for the complete equipment of a model electric light plant, for arc and incandescent lighting, by midnight of the same day was on its way to the modern mining camp. Creede was in sight Tuesday night, Feb. 2, and by daybreak the following morning a gang of laborers was put to work breaking ground and getting the foundations of the power house ready. By this time the town was alive with interest in the work and pool sellers were offering odds on the time to be occupied in completing the plant. The work progressed night and day and the electric current was turned on at 11:15 P. M. Saturday, Feb. 6. The actual time occupied in completing the plant, erecting the buildings and placing the machinery in position, was from Feb. 3, 7 A. M., to Feb. 6, 11:15 P. M., less than a week after the machinery was purchased in Denver, over 300 miles away, and this young town was given the latest luxury of civilization. Arc and incandescent lamps illuminate gorge and mountain side, and the hum of the dynamo recalls the mind of the seeker after riches to an occurrence without a parallel in electrical history.



HUGHES' FURNACE.

The magnitude of the undertaking will be understood from the following inventory of the plant: Two boilers, 100 horse power each; one Armington & Sims high speed engine, 100 horse power; one pump; one dynamo of 30 arc lights; one 400 incandescent light dynamo and two 50-foot iron smokestacks.

Since the house was completed another dynamo of 60 arc light capacity has been added, and the company will increase the capacity for incandescent lamps to 1,000 as quickly as the machinery can be set, and the capacity of the plant will be increased as quickly as there is any demand for more light or power. The value of the plant is said to be from $35,000 to $50,000.

AN IMPROVED FENCE MACHINE.

The illustration represents an apparatus designed to facilitate the building of picket fences, in which the pickets are held between strands of wire secured to suitable supporting posts, one man readily working the apparatus to quickly and nicely build a fence. The improvement forms the subject of a patent issued to Mr. William H. Mason, of East Monroe, Ohio. Fig. 1 shows the apparatus connected with a partially built fence, Figs. 2 and 3 showing details of the wire twister, and Fig. 4 being a sectional view of the tension regulator. The latter consists of a frame carrying rollers, to which the ends of the wires are attached, one end of each roller being adapted to be turned by a crank, and the rollers being carried in pairs by U-shaped clips. Each roller has at one end a ratchet wheel, and at the opposite end a pawl, the pawl of one roller engaging the ratchet wheel of the opposite roller, the two pawls serving to prevent the rollers from turning in the wrong direction. When the tension regulator is secured in position opposite to one of the end posts of the fence, the free ends of the wires are secured to the rollers, and these are turned by cranks to tighten the wires to any desired extent. The twister has projecting main arms, with recesses in their upper edges to serve as hooks to receive strands of wire, and on each main arm is pivoted another arm, having a joint recessed to receive a strand of wire. One strand of each wire is placed in the recess of the main arm, and the opposite strand in the recess of the pivoted arm, and after the twister is once adjusted it need not be taken from the wires until the fence is built, as it may be pushed along in front of the pickets as fast as they are placed in position. Fig. 2 shows the twister in position to force two wires apart, to allow a picket to be placed, and Fig. 3 shows the wires crossed by the twister after the picket has been inserted. Should the wires become too taut after the insertion of many pickets, the tension may be slackened by loosening the nuts on the bolts to which the roller-supporting clips are pivoted.

AN IMPROVED FURNACE.

The furnace construction of which a section is shown in the illustration is designated by the inventor as a steam blower smoke consumer, and is designed for use in connection with steam boilers, puddling and heating furnaces, etc., or for any similar purpose where steam pressure is available. It has been patented by Mr. Christian B. Hughes. In the front end of the fire box is the usual inlet door, and at the rear is the usual bridge wall, while in the side walls are arranged longitudinally extending chambers or channels opening at their ends into the fire box above the grate. In the front wall of the fire box are nozzles for the discharge of superheated steam obliquely above the grate about in line with the longitudinal chambers, there being in the rear of the fire box a similar set of nozzles below the upper end of the bridge wall and in line with the rear openings of the channels. In the wall between the longitudinal channels and the fire box are air pipes or ducts leading from the ash pit into the channels, to supply the latter with heated fresh air. The amount of superheated steam passing to the nozzles is regulated by a valve, the jets from the front nozzles driving the burning gases, smoke, etc., rearwardly, while the jets from the rear nozzles force the smoke, etc., into the rear openings of the longitudinal channels, where they are mixed with hot air from the ash pit, the mixture again entering the front end of the fire box to be passed over the burning fuel. The smoke and gases not thus consumed are again driven through the side channels, to be forced again over the burning fuel by the jets from the front nozzles, the continuous operation insuring a complete combustion of all the gases.

Further information relative to this improvement may be obtained of the Niles Electric Light and Power Company, Niles, Ohio.

BELTING having joints cemented only is as good as if the belt were formed of solid leather from end to end. It lasts much longer, and drives better than when cut up with sewing.