The Electrical Salesman.

Perhaps no other industry has developed so many peculiar conditions surrounding the disposal of its product as has the electrical field. A unique genius is the fruit of this set of conditions. The genius is known as "the electrical salesman." The causes for his being have been natural only to a certain extent. There were things, peculiar things, to be disposed of by barter and trade to the people, and some one had to be found to do it. The electrical salesman was not born—he has evoluted.

In ancient days, ten years ago, the difference between the office boy and the electrical salesman was merely one of age; each knew about as much regarding electrical apparatus and its sale as did the other. But as the business grew, conditions arose which acted as the pyro solution on a photographic negative—they developed. Existing manufacturing companies attained greater proportions, alliances with other companies were made, contracts were drawn up, subcontracts were let and relet, territories were defined, cut, recut and defined all over again, price lists changed nearly every hour, and at last combinations, consolidations, and complications (for the salesman) were effected, bringing us down to the present day, and all the time competition kept getting keener. During this tremendous advance the factories were belching forth thousands of tons of all kinds of electrical apparatus, which must be disposed of. It was then that the electrical salesman began to evolute. He was the all-important medium between producer and consumer, employed to tell the merits of apparatus to the buyer and to report defects, as they came under his notice, to the manufacturers, that they might apply the remedy.

The electrical salesman, in all truth, has been *the* factor on the commercial side of electrical development: he is the king pin of the electrical car of progress. He has been maligned, insulted, given the lie, and generally maltreated by the public at times, but only at times, because he has many friends, and deserves more. It is only the absurd few who do not understand his genius that have abused him, and even these few, we dare say, will change their opinions of him ere long.

There are many electrical salesmen who hold responsible and valuable positions to-day, all owing to the experience acquired during their evolution. These will move up higher and others will follow along after them. It is probably true that nine-tenths of our electrical brethren have been or will be salesmen before they die.

To be the *beau ideal* of electrical salesmen, a man should begin with perfect confidence in himself, supreme assurance as to his certainty of victory, and a *quantum sufficit* of technical knowledge. In addition, he must possess the detective's instinct in ferreting out "jobs," the reporter's "nose for news," so that he will know a customer when he sees one, an ability for making and keeping friends, good conversational powers, the wiles of a diplomat, the silver tongue of an orator, and the sincere and convincing arguments of a practiced debater. And he must be always resourceful and ready at any and all times to have recourse to expedients to overcome his competitors. As we said before, an electrical salesman is not born with all these attributes of genius, but he assimilates them as he evolutes and ends by surprising himself at his own abilities.—*Electrical Review.*

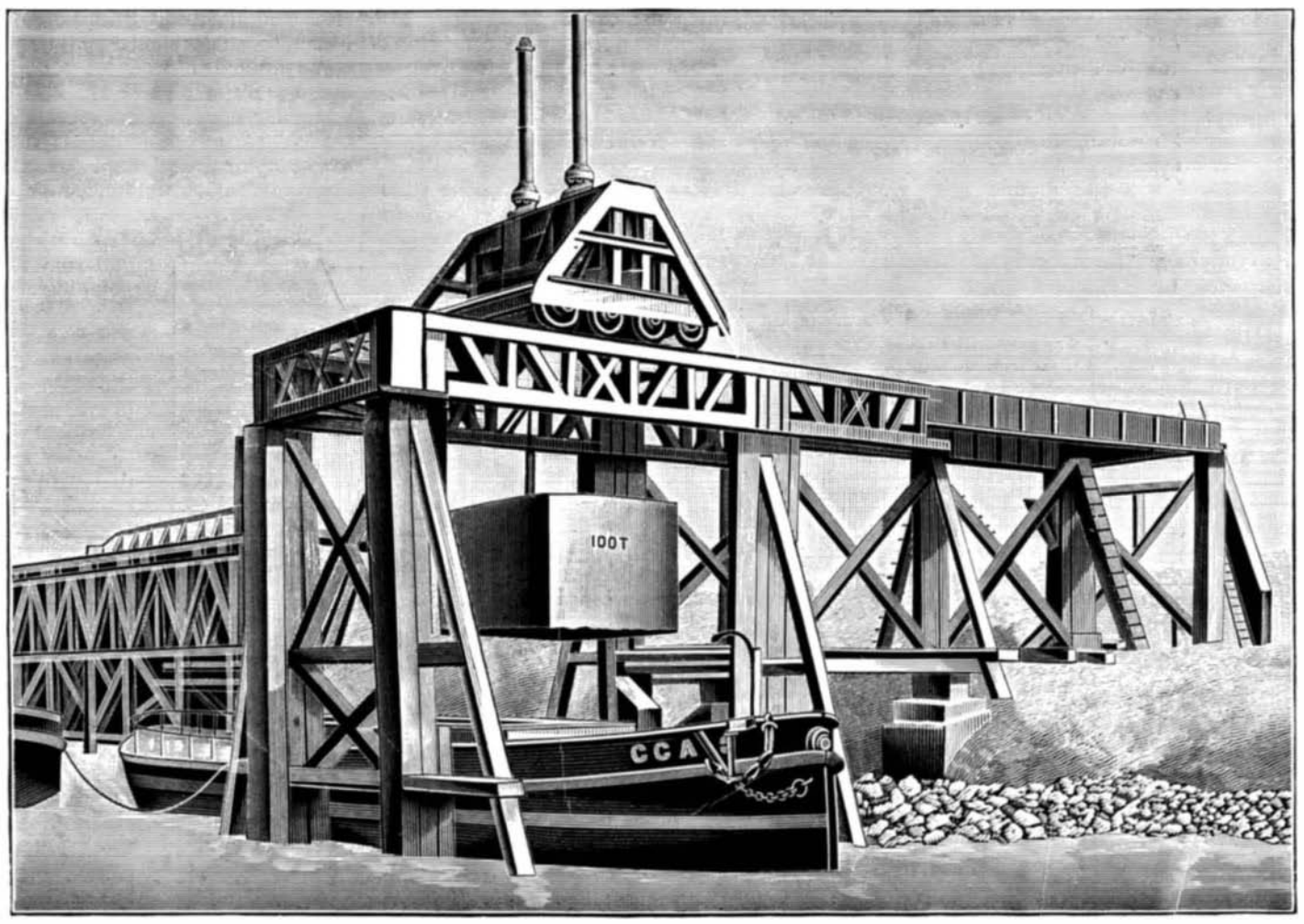

Fig. 1.—WORK AT THE PORT OF BILBAO—FRAMEWORK AND APPARATUS FOR LIFTING BLOCKS OF BETON AND LOADING THEM ON A BARGE.

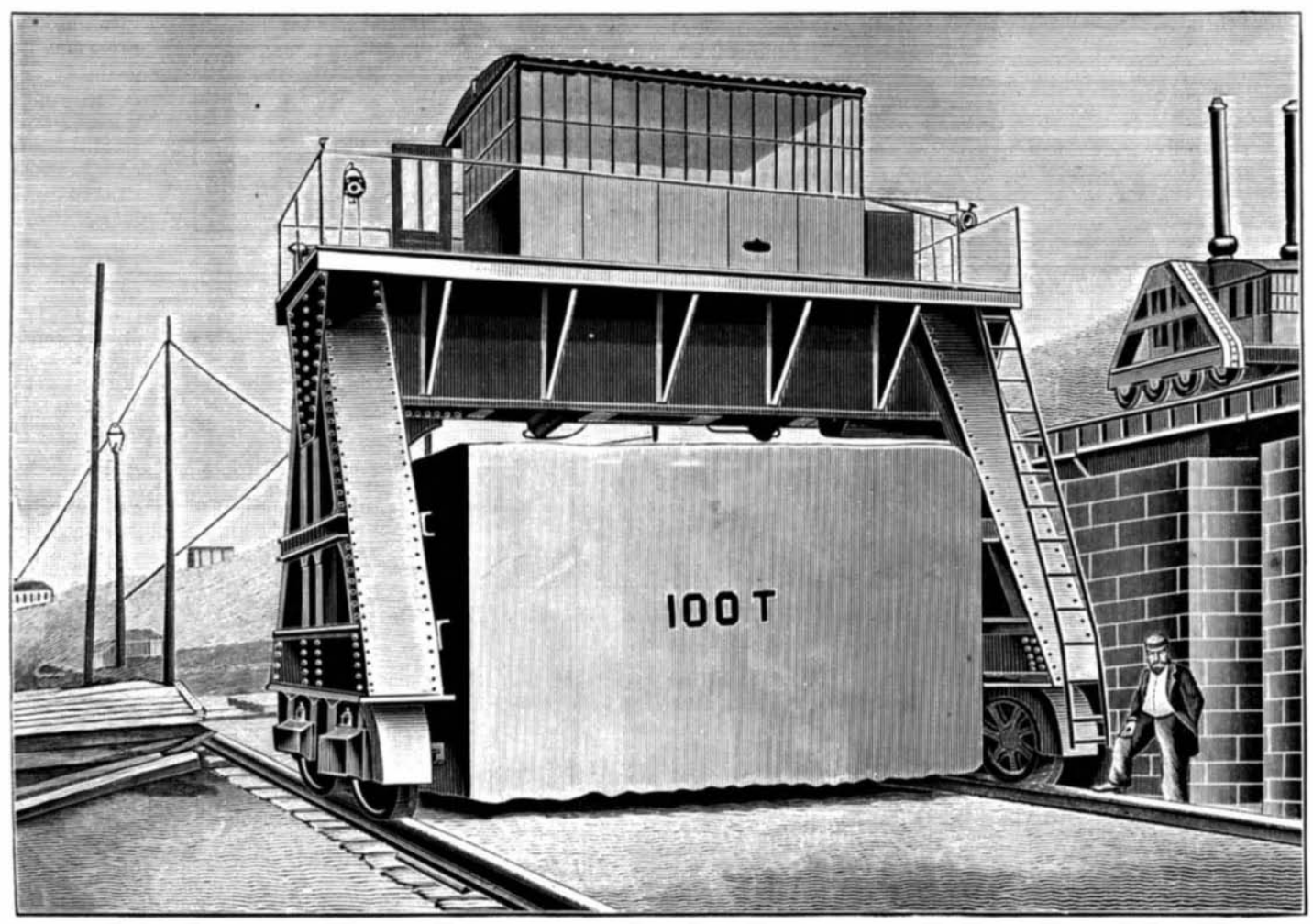

Fig. 2.—FRONT VIEW OF THE APPARATUS FOR LIFTING BLOCKS OF BETON AND CARRYING THEM TO THE CAR.

APPARATUS FOR MANUFACTURING AND LIFTING BLOCKS OF BETON AT THE PORT OF BILBAO.

As the method of manufacture of the blocks of beton used in the construction of an external port at Bilbao, and the apparatus employed for lifting and carrying them, present some novelty, we propose to enter into some detail upon the subject.

The beton apparatus, constructed by Carey & Lathan, an English firm, consists of a cylinder 3 meters in length and 0·91 meter in internal diameter, movable around its axis, which makes an angle of about 3° with the horizontal. In the interior of this cylinder there operate sixteen helicoidal paddles fixed upon a tubular axis, which makes fifteen revolutions per minute, while the external cylinder makes twenty. Into the interior of the latter, two chains of buckets, though lateral hoppers, empty the stone and sand in the proper proportions. The cement is put into a hopper placed upon a covered platform, whence it is taken up by a screw and carried to the interior of the cylinder in which the beton is under preparation. The velocity of this screw is independent of the general motion of the apparatus. It is so regulated that the quantity of cement that it introduces into the cylinder may be varied at will.

The materials, that is to say, the stone, sand, and cement, enter simultaneously at the top of the cylinder, and, during the first third of their travel, are mixed, while dry, through the motion of the paddles and that of the external cylinder. The water, the quantity of which can be regulated at will, enters continuously through a tube that debouches in the second third of the length of the cylinder, so that the elements that form the beton are intimately incorporated before leaving the apparatus. When finished, the beton falls into Decauville cars, which carry it to the spot where the blocks are to be manufactured. The

apparatus is capable of furnishing from 15 to 18 cubic meters per hour, and this permits of manufacturing four blocks of 50 cubic meters or seven of 30. The power of the motor is 18 horses.

The contractors arrange upon the platform for preparing the blocks 517 moulds, 120 of which are of 50 cubic meters and 397 of 30, representing a total volume of 17,910 cubic meters. With the method of carrying that they employ, they are capable of submerging, in a period of three months, all the blocks that the platform can hold.

Let us now pass to the apparatus employed for lifting, carrying, and shipping the blocks.

The frame of the rolling crane for lifting the blocks consists of two strong trestles of plate and angle iron connected at the upper part by two cross pieces that support a flooring 2·6 meters in width, upon which is installed the entire motive mechanism. This crane is provided with four pairs of wheels and runs upon tracks of 5·7 meters gauge formed of Vignole rails supported by strong wooden ties. It differs but little, as a whole, from the cranes that have hitherto been constructed for the same purpose; but up to the present only manual or steam power has been used, while in this case it is electricity that actuates the lifting and shifting mechanisms and that gives motion to the various apparatus serving to carry the blocks to the place of shipment. To this effect there is installed at a certain point of the field of operations a dynamo actuated by a 60 horse power compound engine making 300 revolutions per minute. This dynamo develops an e. m. f. of 220 volts and produces a current of 200 amperes. The e. m. f. is transmitted by a non-insulated copper wire strung upon wooden poles. This conductor is established all along the beton yard, and the current may be received by the dynamo carried by the rolling crane, whatever be the spot occupied by the latter upon the tracks. To this effect, upon the sides of the platform there are two bamboo canes 3·6 meters in length movable around a joint situated at 1·1 meters from the lower extremity.

At the upper part of each bamboo there is fixed a small iron pulley which bears constantly against the wires of the circuit, owing to a counterpoise at the base of the bamboo canes. Communication between these pulleys and the receiving dynamo is established by means of copper conductors covered with gutta percha. The circuit is closed through this dynamo. The current traverses a resistance apparatus which allows of the passage of the whole or a part of the e. m. f., according to the work to be effected.

The receiving dynamo makes 600 revolutions per minute, and effects the rotation of a horizontal shaft that transmits power either to the pistons of the hydraulic presses that serve to lift the blocks and that have a maximum stroke of 0·4 meter, or to another horizontal shaft situated at right angles with the other, and upon which are mounted pinions that gear with two endless chains. The latter transmit the power to drums fixed to the front wheels of the crane. These wheels produce the motion of the entire apparatus upon the tracks at the velocity of 10 meters per minute.

The pistons of the hydraulic presses are connected by joints with the hooks that serve to suspend the blocks. The length of the hooks varies with the size of the blocks to be lifted. Each block carries two lewisons, that are set into the block at the time of its manufacture, and with which the suspension hooks engage.

When the apparatus is placed over the block to be lifted and carried, the hooks are introduced into the lewisons, then the machine is set in motion, and the suction pipe of the pump is opened in order to allow water to enter the cylinders of the hydraulic presses. As soon as the pistons of the latter have lifted the block about 30 centimeters, the pipe is closed, and the wheels that control the motion of the crane upon the rails are thrown into gear. The crane, once in motion, is led over a truck or car that runs upon a transverse track. At this moment, the cylinders of the presses are emptied and the block slowly descends upon the platform of the truck. This operation finished, the hooks are disengaged and the crane moves backward over another block, which it carries to the truck as before.

The truck or car that carries the block is likewise moved by electricity. To this effect, it is provided with a receiving dynamo analogous to that of the lifting apparatus. This dynamo receives the current through copper wires. The latter are not insulated, so that at every point of their length communication may be established with the receiving apparatus and the circuit be closed through the generating dynamo.

This car is hauled under a framework consisting of two strong horizontal iron trusses supported by cross-braced wooden posts, each surmounted by a cast iron cap. The bases of these posts are set into masonry. At the upper part of the framework is situated the apparatus designed to lift the block and bring it directly over the lighter that is to carry it to the point where it is to be submerged. This apparatus is set in motion by electricity. It is constructed upon the same principles as the other lifting apparatus, but its frame is not of so large dimensions, and the stroke of the pistons of its hydraulic presses is different, being seven meters.

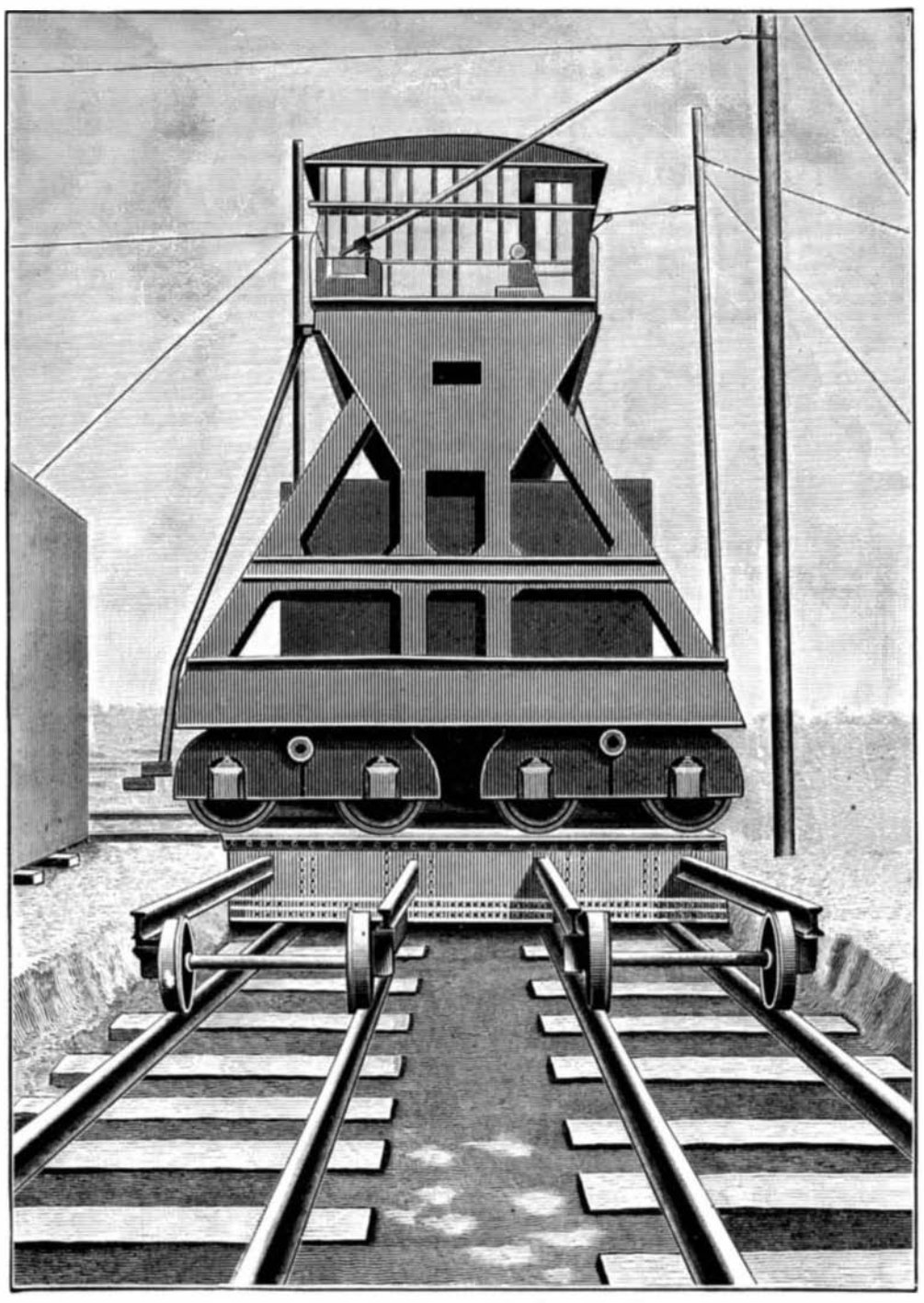

Fig. 3.—SIDE VIEW OF THE LIFTING APPARATUS.

The pumps that send the water into the cylinders and the shifting mechanism receive their motion from the dynamo that the apparatus carries with it.—*Le Genie Civil.*

The Logan Storage Battery.

The Grand Trunk Railway Company gave the Standard Electric Company permission to run an electric car over its tracks on August 23, from Milwaukee Junction, near Detroit, to Mt. Clemens, and return. The car was of the regular open-face type of tram car, with seats placed back to back. The car was propelled by a Shawan motor, the electricity being furnished by the Logan storage battery, 108 cells of nine plates each. This battery, by its construction, is peculiarly adapted for use where it will be subjected to jarring. The electricity with which the batteries were charged was nearly all generated on July 5. The car and its load weighed eleven tons, and the Detroit *Tribune* says that an examination made after the trip showed that the battery would carry the load about 100 miles without recharging. In spite of some delays at the various switches, the average running speed was about 12 miles an hour, and the best mile was done in 3:35. The trial seems to have been very satisfactory.

Fibrous Clay.

Clay, in every respect, resembles very closely the fundamental and natural principles of oxides and ores of metals, and maintains the same characteristics with remarkable relations all the way through its formation after manufacture. But the closest of all metals of which it assumes similarity is iron.

For example: Iron ore ground and smelted and cast into pig metal is short or brittle, not having any particular grain, except slightly lengthwise, the way the metal flows in casting. If this same pig metal is reheated into a workable or pliable condition, and put under rollers and for a number of times rolled in the same direction, then by compression the crystals, which in dimensions are almost equal in every direction, and join only at geometrical points, are being first flattened, then drawn or pressed oblong. The process of cooling again acts upon them to slightly separate the crystals, but leaving them in groups closely adhered to each other, and wherever these breaks or contraction cavities occur there will take place a sliding of the particles upon each other in the process of rolling.

The effect of this is that the construction of the original pig metal, which appears much like compressed salt, becomes a series of fibrous-formed material, overlapping each other like brick masonry, excepting that the longitudinal sections are probably hundreds of thousands of times smaller in diameter.

In many instances the formation of rolled iron may be compared with oak timber in its formation of grains or fibers, which has at the same time throughout its longitudinal structure a large amount of cross fibers.

Comparing the same with the continuous working of the clay into one direction produces the same effect of forming a fibrous grain as can be seen in a bar of rolled iron. For instance, take a sewer pipe when it first comes from the press; it would be difficult to tear it sideways, while it can be torn into small shreds lengthwise, the course it passed through the die. The same with a brick being made on a spiral or plunger brick machine. If the brick is an end cut, it will be almost impossible to break it evenly crossways, while there would be but little trouble to split it lengthwise into any number of parts. Therefore, in bricks which are expected to carry much transverse strain, the lengthwise grain is much preferable over all others.

In the forming of grain in clay, water plays a very important part. As the wedging of the clay goes forward, the molecules of clay become closer attached to the moving particles, and the water and air find their way into the horizontal layers, forming the lubricator between the strata.

This is easily witnessed by a simple practical experiment. If a block of plastic clay of about twenty-five pounds be taken and rolled for several times in one direction, forming the grain in length, then the block set on end, and slabs cut from it about one inch thick, will make tiles about 9 in. ×9 in. ×1 in. in size. If these are put to dry, the probability is that 90 out of 100 will crack through the middle; the same as if a slab be cut off the end of a log crosswise, which would be sure to go to pieces before it became dry.

On the other hand, if the clay slabs or tiles were cut from the side of the former mentioned blocks, the effect of rapid drying would simply be warping, the same as a green board would turn up if placed in the sun.—*Clay Journal.*

A NEW aluminum alloy, with titanium, is made in Pittsburg. It sells at from 25 cents to $1 per pound more than pure aluminum. It is an excellent material for making tools. About 10 per cent of titanium is used.