

Correspondence.

Negotiable Paper in Tennessee.

To the Editor of the SCIENTIFIC AMERICAN:

The writer of the article on "Negotiable Paper for Patent Rights," which appeared in the SUPPLEMENT of June 11, overlooked the fact that the odd statutory provision, making it a penal offense to fail to insert in a note given for a patent right, words showing that it is given for a patent right, has crept into the statutes of this State (Tennessee), and that, too, as late as the legislative session of 1897. Chapter 77, Acts 1897, provides as follows:

"Hereafter it shall be unlawful for any person, either in his own behalf or in a representative capacity, to take or receive for the sale of a patent right or any interest therein, a note or other written security given for such right or any interest therein, unless it shall clearly appear upon the face of the note or other security that the same is given in the purchase of a patent right or an interest therein."

The remarkable feature of this act is that, by the second section, the offense is made a felony and punishable by imprisonment in the penitentiary not less than one nor more than three years.

We already had a statute making a note subject to all defenses in the hands of an otherwise innocent purchaser, where it contains words showing that it was given for a patent right.

T. A. STREET.

Nashville, Tenn., June 14, 1898.

Instinct or Superstition?

To the Editor of the SCIENTIFIC AMERICAN:

Three days ago, one of our maids came to tell us that the cockroaches were streaming out of the houses in one of the streets of our village, marching in whole companies across the backyards and gardens toward the shores of the lake.

The village where we live consists of about 400 cottages, mostly built of logs and thatched with straw. They are built on both sides of a street about two miles long and 400 feet broad, in nests of four homesteads each, separated by cross streets some 40 feet broad. The village is divided into two unequal halves by the gardens and courts surrounding our house, the house of another gentleman whose property adjoins ours, and by a large common or square, where the village church, schoolhouse and a few other buildings are situated. On the south, the long line of homesteads is bordered by an open field; on the north, by the shores of a long, but shallow lake.

We have had a very dry spring this year, no rain having fallen for nearly three weeks, so that everything was very dry. The weather has been unusually hot (up to 40° Reaumur in the sun), and only during the last three or four days a north wind has rather cooled down the atmosphere.

The strange migration of cockroaches that I have mentioned took place at about 11 A. M. on the 31st of May. These nocturnal insects infest the wooden cottages of our peasants in vast numbers, hiding in the chinks and crevices of the walls and ceilings or behind the large stoves, and sallying out at night in search of food. Whether from a kind of respect for their usefulness as scavengers, or rather from a general dislike of killing any living thing that is so characteristic of the Russian peasant, our villagers never destroy these pests, and it is a perfect torture for any one of a sensitive constitution to pass a night in a peasant's cottage, because of the swarms of cockroaches that race over the floor, walls and furniture as soon as night sets in.

Constant intimacy with these insects has made our peasants thoroughly acquainted with their habits, likes and dislikes, and they have come to put a faith in many of their observations that seems mere superstition to less habitual observers. Among these beliefs the most common is, that cockroaches have an infallible prescience of the immediate fortunes of the homestead they choose to inhabit. Any unusual activity in the cockroach colony, or a sudden reduction of their numbers, is interpreted as a certain sign of some impending danger to the family or the home. When, however, a general migration of cockroaches takes place—especially in the day time—our peasants have always understood it to portend nothing else than a destructive fire.

Consequently, when I was told that the roaches were marching to the lake in broad daylight three days ago, we had a lively discussion of the subject at our family lunch, and the general opinion was, that such a superstition could have no real foundation, unlike the well known one of rats leaving an unsafe ship in port; for a fire, especially in summer, is generally the result of an accident that has no preceding or gradually developing cause. Still, I was interested enough to inquire in what particular part of the village this migration had been observed. I was informed that the stampede was by no means general, but was confined to a row of cottages in the extreme eastern end of the main street.

To-day, June 2, at 4:30 P. M., we hurried out of our house at the cry that fire had broken out in the village, and the great bell of our church was tolling its rapid and violent appeal for help as I drove our fire-engine

in the direction of a great column of black smoke ascending in the eastern end of our village.

After a battle with the flames that lasted for about three hours, our four engines managed to arrest and control the conflagration; and as I write, the embers of more than thirty houses, barns and farmyards are yet sending up lurid clouds of smoke and steam in the soft summer night.

The cockroaches had left precisely those cottages that have just been destroyed, and are now enjoying the fruits of their foresight in other houses, many of the dwelling houses on my own estate being perfectly infested with them.

As a constant reader of the SCIENTIFIC AMERICAN, I thought this communication might be of general interest. Perhaps others may have heard or witnessed facts that may help to give an answer to the question that heads this letter.

I must add that the cause of the fire has not yet been ascertained, but as it originated in the porch of a cottage where an old woman was left in charge of six small children (the rest of the family being at work in the fields), it was very probably due to some of the children playing with fire.

NICOLAS SHISHKOV, J. P.

Archangelskoe, near Simbirsk, Russia, June 2, 1898.

How Firecrackers are Made.

Mr. John Goodnow, Consul General of the United States at Shanghai, has sent to the Department of State at Washington an interesting report on the method used in the manufacture of firecrackers and the extent of this industry in China. During the year ended June 30, 1897, there were exported from China 26,705,733 pounds of firecrackers, valued there at \$1,584,151 in gold. The largest part of the total shipment was sent to New York, to be in turn shipped throughout the United States, to give the patriotic American boy the means by which he can show his appreciation of the Fourth of July.

The exports represent only a small fraction of the quantity of these small explosives manufactured in China, for the use of firecrackers, says Mr. Goodnow, "is universal in China, and has been as far back as history records." "It is most probable that in the beginning they were used to frighten away evil spirits; now they are most frequently an expression of good feeling or of ceremonious compliment. They are used at weddings, births and funerals; at festivals; religious, civil and military ceremonies; at new year; to salute persons about to make a journey; and, in fact, on all occasions out of the ordinary routine."

According to Mr. Goodnow, there are no large manufacturing factories. The crackers are made in small houses and in the shops where they are sold. In the latter places the proprietor of the shop, his wife (or wives) and children do the work. No record is kept of the number made and sold, and no estimate of their cost is possible.

In making crackers, only the cheapest kind of straw paper which can be produced in the immediate locality is used for the body. A little finer paper is used for the wrapper.

The powder is also of the cheapest grade, and manufactured in the locality where used. It costs 6 to 7 cents gold per pound. For the fuse, a paper (called "leather" in Shanghai) is employed, which is imported from Japan, and is made from the inner lining of the bamboo. In other places a fine rice paper is used, generally stiffened slightly with buckwheat-flour paste, which, the Chinese say, adds to its inflammability. A strip of this paper one-third of an inch wide by fourteen inches (a Chinese foot) long is laid on a table and a very little powder put down the middle of it with a hollow bamboo stick. A quick twist of the paper makes the fuse ready for use.

Mr. Goodnow says that it is not easy to persuade the Chinese to exhibit their modes of manufacture to a foreigner, but Vice-Consul Williams saw the work going on, and thus describes it:

The straw paper is first rolled by hand around an iron rod, which varies in size according to the size of cracker to be made. To complete the rolling, a rude machine is used; this consists of two uprights supporting an axis, from which is suspended by two arms a heavy piece of wood, slightly convex on the lower side. There is just room between this swinging block and the top of the table to place the cracker. As each layer of paper is put on by hand the cracker is placed on the table and the suspended weight is drawn over the roll, thus tightening it until no more can be passed under the weight. For the smallest "whip" crackers, the workman uses for compression, instead of this machine, a heavy piece of wood, fitted with a handle like that of a carpenter's plane. In filling crackers, 200 to 300 are tied together tightly in a bunch. Red clay is spread over the end of the bunch, and forced into the end of each cracker with a punch. While the clay is being tamped in, a little water is sprayed on it, which makes it pack closer. The powder is poured in at the other end of the cracker. With the aid of an awl the edge of the paper is turned in at the upper end of the cracker, and the fuse is inserted through this

The long ends of the fuses are braided together in

such a way that the crackers lie in two parallel rows. The braid is doubled on itself, and a large, quick-firing fuse inserted and the whole bound with a fine thread. The bundle is wrapped in paper and in this shape sent to the sea coast.

A variety of cracker I do not remember to have seen in the United States, continues Mr. Goodnow, but which is popular here, is the "twice sounding." It has two chambers, separated by a plug of clay, through which runs a connecting fuse. There is also a fuse extending from the powder in the lower chamber through the side of the cracker. When the cracker is to be fired it is set on end and fire set to the fuse. The powder exploding in the chamber throws the cracker high in the air, where the second charge is exploded by fire from the fuse extending through the plug between the two chambers. In the manufacture of these the clay is first tamped in with a punch, to form the separating plug. The lower chamber is then loaded with powder and closed by turning over the paper at the end. The upper chamber is loaded and closed with clay. A hole is punched in the side of the lower chamber with an awl and the fuse inserted through this opening.

At Canton the ordinary size cracker (1½ inches long by ¼ of an inch in diameter) costs 1 tael (62 cents) for 10,000 for export. At Hankow the best quality of this size cost 1 tael for 5,000; while of the second quality 20,000 can be bought for 1 tael. At Chungking 15,000 of the ordinary crackers can be bought for 1 tael. At Shanghai 1 tael will purchase 5,000 of the ordinary size, while the largest sell for \$5 per thousand. These prices are probably only a shade above the actual cost of manufacture. The small manufacturers sell to Chinese compradores, who buy as agents of foreign firms and ship the crackers in bundles to the sea coast, where they are packed in boxes which cost about 4 taels (\$2.50) per hundred, and hold 250,000 firecrackers.

Aside from the fact that all the material used is native and produced where the crackers are manufactured, and that transportation does not enter into cost, the wonderful cheapness of manufacture is accounted for by the kind of labor used and the wages paid. The items of cost of plant and interest on it are eliminated by the fact that the crackers are made in the homes of the workmen and in the shops where they are sold. The hours of labor are from 6 A. M. to 11 P. M., and there are seven working days in each week. Four-fifths of the crackers consumed in China are made by the families of those who sell them, these people, of course, receiving no wages. Of the paid work, a very large proportion is done by women and children who are paid by the piece. It is estimated that thirty women and ten men can make 100,000 crackers per day, for which work the women will receive 5 cents each and the men about 7 cents each. An apprentice is bound for four years, and during that time receives only his board. At the end of that period he will receive, if he is a fairly good workman, 150 cash per day, or 7 cents in United States money. An expert at the trade receives 200 cash per day, or 10 cents gold.

* Workmen at this trade receive about the average rate of wages paid here for common labor. The trade is considered unhealthy and dangerous, and therefore not desirable.

An Electrical Exhibition in Como in 1899.

Como, Italy, will ever be famous as the birthplace of Alessandro Volta, and it is gratifying to note that this city is preparing to worthily celebrate the hundredth anniversary, which will take place in 1899, of the invention of the Voltaic battery. The International Electrical Exhibition will be opened at Como on the 15th of May and will continue open until the 15th of October, and annexed to it will be the National Exhibition of the Manufacture of Silk and an International Exhibition of the Machinery, Preparation and Process of Working the Same. As Como is in the heart of an important silk district, the latter part of the exhibition cannot fail to be of interest. Foreign electricians are invited to the Electrical Congress which will be held, and every opportunity will be given them for the discussion of all the papers read.

Como is beautifully situated on the lake of the same name, at the foot of the Alps, and easily reached from Milan or Switzerland. This is an excellent place for holding an exhibition, owing to its central location. Italy has abundant hydraulic power, which should induce manufacturers to try to develop it. There will be exhibited Volta's original apparatus, his manuscripts, autographs, portraits, etc. An attempt is to be made to illustrate the history of electricity during the century. Particular attention will be paid to the methods of teaching electricity. The bulk of the exhibits will fall into the twelve sections into which they are classified.

In Paris accident insurance policies are issued guaranteeing the holder against the consequences of the damage he may inflict on others. They are taken out chiefly by cab drivers.