Correspondence.

Connections for Magneto Telephones.

To the Editor of the SCIENTIFIC AMERICAN:

Your reply to query No. 7,007, G. G. Y., has been shown me. As I have had, in connection with other parties in this place, practical experience with a telephone circuit, I take the liberty to make you a statement of what our experience has been, and a few suggestions, which I think will assist any one who is desirous of establishing an inexpensive and fairly satisfactory telephone circuit, that can be used without danger of infringing any patent. We have had sixteen magnetos and thirty-two standard Bell telephones in use, as you suggest, in series. We did not get, when the number of sets was first brought up to twelve, results that were satisfactory, until we had applied cut-outs for the telephones, the resistance of the coils interfering with both the service of the magnetos and rendering it difficult, for those who had weak ones, to call satisfactorily, as well as the telephone service. After applying a variety of simple cut-outs to all the magnetos, we were able to increase the number to sixteen. For the most convenient use (unless automatic cut-outs have already been applied), I favor a style of burglar alarm (usually applied to windows) which always has the circuit closed, unless it is pressed, set either in the floor, just below the magneto, where the circuit can be broken by pressing it with one's foot, or, if in a carpeted room, it may be set into a small block of suitable wood that will not disfigure the carpeting, and fastened to the floor with screws, so that it may be easily removed when occasion may require. The wires leading from this should be connected with the two binding posts of the magneto that the telephone cord is attached to, and will keep the telephones out of circuit except when they are in use, when the knob should be pressed. Wire of good size should be used if the circuit is a long one, and copper is preferable to iron. Unless a set of instruments is located in a noisy place, very good service can almost always be had. The resistance of the extremely fine wire with which the coils are wound interferes very much with satisfactory service, while that of No. 14 galvanized iron or No. 16 hard drawn copper is not sufficient to interfere seriously on a line several miles in length.

C. C. CAPRON.

Cotton Seed Industry in the South.

BY EDWIN LEHMAN JOHNSON.

The magnificent opportunities which exist at the South for making and building of homes by immigrants, for the profitable investment of capital, and the practical application of the arts and sciences, are now so well known to reading and observant men that it is almost a waste of time to call attention to detailed conditions in the South.

If any one is skeptical on the subject, he need only look at the small population per square mile, the fertility of the lands, the climate, the small cost of living, and the numerous natural advantages and resources of the South to see that a condition must necessarily exist there more favorable for comfortable living for the frugal and industrious poor, for accumulation of wealth for the intelligent small capitalist, and for the doubling of fortunes for those already wealthy, than in any other part of the United States to-day.

Instead of dealing, therefore, with the general subject, I wish to give a practical illustration of one of the lines of future development of the South, which is characteristically Southern and with which I happen to be very familiar from a long business connection.

In short, I wish to point out where a practically inexhaustible source of wealth exists in a product of which the general public outside the South knows almost nothing. I allude to what is familiarly known in the South by the name of cotton seed hulls. The name itself belittles the character and value of the product to such an extent that one is almost tempted to turn away from it in disappointment, without investigation, on simply hearing it mentioned.

"Hulls" is a term we associate in our minds with husks, or the outer covering of some valuable nut, fruit, or grain, which serves the purpose nature intended it for, of protecting and preserving the kernel, but which in itself, for all purposes of commerce, is worthless.

While such in part is the definition, such is not the character of "cotton seed hulls." It bears more the relation of bran to wheat than of husk to kernel; but even this description is not adequate; for the hull of the cotton seed both in weight and value bears a much more important relation to the kernel of the seed than bran does to wheat.

The hull comprises 45 to 50 per cent of the weight of the seed. As turned out by the oil mills, this article consists of little capsules, more or less broken up, of which the outer or convex part consists of a closely adhering short cotton fiber, comprising about 25 to 33⅓ per cent of the weight; and the inner, or concave part, of a tough, dark brown shell of mucilaginous matter resembling the covering of apple seeds. This is not quite all, for these fiber-covered and broken capsules capture and retain, during the oil mill processes of hulling and separation, however well performed, a portion of the kernels in a finely divided state. The proportion of the kernel thus caught, and forming a real portion of the hulls as marketed, varies from 1½ to 5 per cent and is rich in oil and nitrogenous matter.

In the dry, loose and somewhat matted condition in which the hulls are usually seen, they present a very unpromising appearance, but years of experience have demonstrated conclusively that they form a perfect and entire feed for cattle. It is only for the purpose of rapidly fattening cattle that other more highly concentrated feed stuffs, generally cotton seed meal, are added to the hulls.

There are now annually "crushed" in the oil mills of the South about 1,500,000 tons of cotton seed, giving a product of hulls of about 675,000 to 700,000 tons. There are annually grown and passed through power gins, to obtain the 8,000,000 to 10,000,000 bales of cotton which are annually marketed, an additional quantity of 2,500,000 to 3,500 000 tons of cotton seed which are not as yet hauled out to the oil mills, which are generally located at some distance from the gins and plantations.

The total seed crop is by weight twice as great as the cotton crop. If all these seed were manufactured, the weight of the hulls might be taken, speaking roughly, as equivalent to the weight of the cotton, or if put up into 500 lb. bales like cotton, as 8,000,000 to 10,000,000 bales of hulls—the same quantity as the cotton crop. This gives the present productive limit of this useful article and makes it pretty certain that, with such a large seed and hull supply not now worked available as new mills are opened, no great or rapid advance in the price of hulls need be expected.

Owing, as already stated, to their unpromising looking appearance and unfortunate name, for long years no attempt was made to dispose of the hulls commercially; and until about ten years ago, when the experiment was made of feeding them to cattle, they were literally thrown away or burned for fuel at the mills.

This article has had the hardest kind of a fight against ignorance and prejudice to find its way into profitable consumption; but such intrinsic merit has it that to-day, out of 300 or more oil mills in the South, I do not know of a single one that is burning its hulls. A considerable supply of crude potash, in which the hulls are rich, was taken away when these ashes were no longer obtainable.

In many States, particularly Texas, many thousand head of cattle are annually fed, and with the addition of cotton seed meal are fattened upon cotton seed hulls. Much of the Chicago dressed beef shipped all over the country in refrigerator cars is simply concentrated cotton seed hulls. The price at which hulls sell is far below their intrinsic value as a feed stuff and varies from $2.50 to $5 per ton at the mills, though as high as $10 per ton has been paid for it in some cases when the demand unexpectedly exceeded the supply, when the mills were not running, and this is about its real value. I believe that every dairy in or about the cities, like Memphis, Altanta or New Orleans, is now feeding its milch cows on cotton seed hulls.

Competent chemists figure that 90 per cent of the value of the hulls is available for fertilizer after being used for feed. Hulls are little known or used outside the South, but there is a new enterprise at Memphis, the Tennessee Fiber Company, working under letters patent, that is successfully taking the hulls from the oil mills and concentrating, in more suitable form for shipment, the nutritious portion of the hulls, which is termed "cotton seed bran," and separating the lint for use of paper makers and packers, which is turned out in small compressed bales.

Having now shown what cotton seed hulls really are, their value, their great actual and numerous possible production, we are prepared to consider the merits of this article as a wealth producer. It will first be necessary to say something in regard to the location of the cotton oil mills. Though some of the large cities, like Memphis, Atlanta, Houston, New Orleans, have more than one mill each, they are, as a rule, very widely distributed over the Southern States, and generally in the towns which vary in population from 2,500 up. The average price at which cotton seed hulls can be obtained at the mills is about $3.25 per ton. Their intrinsic value as a feeding stuff is about $10, say $8. The average freight from the South to the New England and Middle States is about $6 per ton. It could hardly be possible, therefore, unless under exceptional circumstances, to use cotton seed hulls in their ordinary form outside the South.

From the fact that the oil mills are located in the towns and cities, and that the lands near them have been cultivated longer and more closely than those at a distance, thus being more in need of fertilizers, it is evident that the most profitable use to be made of the hulls is by farmers or stock raisers on the lands near the oil mills. A farmer, therefore, located on land which needs fertilizing, near an oil mill, who also raises cattle or keeps a dairy, and who has a market ready to his hand for his farm products, is prepared to make an astonishing profit upon this article.

Estimating the cost of freighting to the farm at 75 cents per ton, the average cost of the hulls at the mills at $3.25 per ton, and the intrinsic value of the hulls as compared with other feed stuffs or fertilizers as only $8 per ton, the farmer will make a profit of $4 per ton on every ton of hulls he consumes. If we add to this 90 per cent of the intrinsic value, which percentage the chemists allow for it after feeding, he would have $11 per ton as the total profit, or $7.60 per ton as the net profit over and above other feeding stuffs and fertilizers. It is difficult to conceive of any situation in which a farmer could be placed in populous territory in the United States where he starts out with conditions so favorable to success, or where he has a finer opportunity of producing wealth from using an undervalued product which can be had in practically unlimited quantity. Add to this that such lands as have been described can be had at a very low price, because of their more or less worn condition and also because of the present general depreciation in real estate, the probability of a large profit from the enrichment of the land, and the unearned increment from the probably rapid growth of all Southern cities in the near future, and it is scarcely possible to point out any better illustration which the South offers of her many and great opportunities than is contained in this long despised and still greatly undervalued article cotton seed hulls.

They All Do It.

The wanderer had returned after many years, and was inquiring about his old friends.

"Brown," he said, "is in the wholesale clothing business, I believe."

"Wholesale clothing and bicycles," corrected the native. "The firm carries a side line of bicycles, you know."

"And Jones has a grocery store, I'm told."

"Yes. Full line of groceries and Bull Run bicycles. He's the agent for the Bull Run wheel."

"Smith went into the manufacturing business, didn't he?"

"Oh, yes. He got interested in a sewing machine manufactory, and a little later they took up bicycles and are doing a rushing business. I understand they have a capacity of over a hundred wheels a day."

"And what's White doing?"

"He's the agent of a famous gunmaker, and is doing well. Sells all kinds of guns, pistols and bicycles."

"And Johnson?"

"Oh, he's a manufacturing jeweler, and he turns out a mighty good wheel, too."

"Billings, I suppose, is still in the furniture business?"

"Yes; but I understand that he turns out a better bicycle than he does desk or bureau."

The returned traveler began to betray some surprise.

"Is—is Wilson still in the livery business?" he asked with some hesitation.

"Certainly, but he devotes most of his time to the little bicycle repair shop in the rear of his stable."

"Ah, there goes old Bones, the sexton. The old fellow is—"

"Oh, he's agent for an automatic pump for inflating tires."

"Is there any one who isn't in the bicycle business?" asked the returned traveler sadly.

"I don't think of any one just now," replied the native. —Chicago Post.

Employer's Liability—Machinery.

The Supreme Court of Minnesota held, in the recent case of Harris vs. Hewitt, that where a servant has knowledge of the defective instrumentality furnished for his use by the employer, and gives him notice thereof, and the employer promises that it shall be remedied, but neglects to do so, and induces the servant to remain in his employ, and the servant is subsequently injured by reason of such defect within the time fixed when such defect was to be remedied, or within which time it might reasonably be remedied, the employer is liable if the instrumentality was not so imminently and immediately dangerous that a man of ordinary prudence would have refused to longer use it, and that the question of contributory negligence by reason of such use by the servant after such notice and promise of repair is not one of law, but of fact to be settled by the jury.—Bradstreet's.

The German Kite Balloon.

Experiments have just been made in Berlin with a so-called "kite balloon," invented by a German officer. The principal part of the balloon has a cylindrical form, widening out below so as to form a kind of rudder or tail, which is intended to steer the cylindrical part in a certain direction. The balloon is surrounded in the usual way with a net, to which the car is attached. Some twenty yards above the large balloon is a small aerostat, in the shape of a "kite," which serves to indicate the direction of the wind in the upper strata of the atmosphere. The experiments have given quite satisfactory results.—L'Avenir Militaire.