ANTIQUE CHAIN ARMOR IN THE CAUCASUS MOUNTAINS.

BY E. O. HOVEY.

The mountain defiles of the Caucasus ranges are so deep and so completely isolated from one another that the tribes which inhabit them have preserved their distinctive characteristics much more decidedly than most parts of the world which have felt the touch of European civilization. Some of these tribes boast of great antiquity and certain families have preserved for many generations ancestral heirlooms, such as armor and weapons, furniture and garments. The photograph herewith reproduced shows some men of the Pchaves, a Georgian tribe living at and near Ananoor, in the southern part of the mountains, on the Georgian military road, who donned their ancestral chain armor and gave an exhibition of ancient broadsword combats for the benefit of the members of the Caucasus excursion of the International Geological Congress last summer. The armor was made of small round links of iron or steel wire woven together to form a long-sleeved shirt or tunic which reached to the knees. The head was protected by a small round skull cap of steel or iron from which hung another piece of chain armor, coming down to the shoulders and breast. The shield was small and round, shaped like a bowl, with a point projecting from the center. The sword was long, double-edged, and so heavy that exercise with it soon exhausted the strength of the men giving the exhibition of their skill. Another antique weapon carried by these men was a musket with a barrel about six feet in length, the whole weapon being protected by a goatskin case. The others on each end, as shown in the picture, are Cossacks. These form the quasi-volunteer cavalry troops of southern Russia. They provide themselves with horses, uniforms, and weapons and serve as guards to the highways and perform certain other military duties, on demand of the governor of the district in which they live, in return for which service they are relieved from taxation to a certain extent. On the breast of the figure on the right will be seen the cartridge pouches. Their costumes are picturesque, and they have a worldwide reputation for the excellence and daring of their horsemanship.

COSSACK CAVALRY SOLDIERS AND THEIR ANTIQUE CHAIN ARMOR.

Some Badly Needed Inventions.

According to the authority of the grave digger in Hamlet, an act has three branches—to act, to do, to perform; and the same may be said of inventing—financially successful inventing, that is. It has three branches. The first is the idea conceived; the second, the idea achieved; and the third, and most important, the idea received, that is, selling on the market, says a writer in The London Standard. We might almost say that invention has four branches, the extra branch being knowing what to invent, and it is proposed here to deal more particularly with the fourth branch. The general idea that inventions in a small way are exhausted is erroneous, as is likewise the popular impression that inventions of the greater kind need technical knowledge. A man may make a fortune out of a useful penny article or out of an accidental discovery, and that without technical knowledge. No special knowledge of any kind was needed to invent the bent wire safety pin, the inventor of which is supposed to have made a fabulous fortune, nor could it be said that the invention of the anchor with flukes hinged at the middle required either genius or technical knowledge. The idea was the invention, the actual carrying out of it was practically nothing, and both ideas could as easily have occurred to a plowboy as to an Edison. The mud from our streets, some thousand of tons of which are scraped up daily, ought to be put to some use other than building suburban residences, for which it is not well-suited. In this case it is wanted to know what profitable use it can be put to, and once the idea is formulated, and is practicable and profitable, the detail is soon worked out. This is an invention badly needed, and would make a large fortune if it were discovered. There is another article which is wasted hugely, and that is wood. The present method of sawing lumber produces a large quantity of sawdust, only a very little of which is used. Every saw-cut wastes a plank the thickness of the saw and length and breadth of the log, whether the resulting planks be thick or thin, and the surface so left has in most cases to be planed, which wastes about half as much again as is wasted in sawdust. Now an invention is badly needed which will obviate this waste. The wood must be cut, not rasped through, so as to leave a clean surface, and waste nothing in dust or shavings.

Electricians badly need a perfect insulator. It must stand heat, cold, water, air, and all atmospheric conditions and be quite flexible, have great strength and electric resistance, and, above all, must be cheap. Rubber at present fulfills the bulk of these conditions, but it is worth some 15s. per pound. But then, on the other hand, worn-out rubber is an almost valueless commodity, as it cannot be made up again. This is due to the sulphur used in manufacturing the raw material. An inventor is wanted who can devise a cheap process of extracting the sulphur from the old wornout rubber and rendering it as serviceable as new. Probably an accident will show the method of doing this, and when it does it will be rash to invest in rubber companies. Ships, nowadays, are built so as to defy almost everything, save the carelessness of man. One or two things they lack, however. They need something which will effectually protect the parts under water from barnacles and other fouling pests of the sea, and that for an indefinite period. They need an invention which will warn a ship in a fog of the proximity of other ships, say within a distance of two miles. Not only that, but the warning must be in such a form that each ship will know the exact course that the other ship is steering, so that she can lay out her own accordingly. Of course this is practically a sea telegraph, and it is possible that the wireless telegraphy we have heard so much about recently may apply. The method in vogue among the drivers of expresses upon our big lines in the case of thick fog is to trust to the officials to keep the line clear and go ahead. So, at least, the writer has been told by one of them, and the fact that expresses mostly arrive punctually on foggy nights, or even before their time, would seem to support the assertion. Under existing circumstances, this possibly is the best that can be done, as fogs often make it impossible for drivers to see signals even when close beneath them. Still it cannot be denied that the practice is dangerous, and, consequently, as we are given to having fogs in this "nook shotten isle of Albion," it would be better if a system could be devised by which communication could be made with the driver direct upon the engine. In this it is not so much the communication to the driver to stop which is the difficulty—that can easily be done. But the problem is how to effect the communication to him to go on again. Something which will effectually do away with the smoke nuisance is badly needed, especially in such cities as London, Manchester, etc. Of course, smokeless coal has done away with much, but there is still room for an invention which will do away with the rest.

In the matter of town improvements, too, there is the much-felt need of a really good permanent roadway. Asphalt is good, when either wet or dry, but a sprinkling of rain makes it as greasy and slippery as ice. Wood blocks have the same objection and wear into holes too quickly, while granite sets are noisy, liable to settle, and do not give a very good foothold. The best roads for horses are, doubtless, the macadamized variety; but, unless they are relaid every other day or so, the city roads, where there is much traffic, would soon be as bad traveling as frozen plowed fields. What is wanted, therefore, is a road with the holding advantages of macadam, and the permanency of asphalt, and the silence of wood. It must be as cheap as any of them, and will therefore be made from the refuse of some manufacture or other which is practically worthless. We suggested above that worn-out rubber is useless and that the mud from our streets is useless. Could they be combined in some way so as to make a useful road? The lighting of our roads, too, needs much improvement. The arc lamp at present used is inefficient on account of its flickering—in fact, for many purposes arc lighting cannot be used, because of this fault, although it would be the very best light were it perfect. Therefore, invent a perfect arc lamp—O ye geniuses! Much as it is needed, there is no good preservative for iron and woodwork which is exposed to the atmosphere. Paint is but a makeshift, and a poor one at that, having to be constantly renewed, and the same may be said of all other preservatives save one—cement. We have seen pieces of iron which have been embedded in cement for centuries, dug out of the same, without the least suspicion of rust, and still retaining the bluish color of the forge. What is wanted is the application of this knowledge to air-exposed ironwork. Another kind of paint is needed for inside woodwork. It is one which will render the article to which it is applied uninflammable. Some of the salts of strontium would accomplish this, but they are two expensive at present. There is, therefore, another alternative, and that is to devise a way of obtaining the strontium salts more cheaply; and to make assurance double sure, houses should be built with a perfectly fireproof brick—a brick which can have a fierce fire built upon it and have its under surface quite cool, although only about an inch in thickness. Such a brick has been an existing fact, is now, but its inventor is dead, and he, and only he, knew what the ingredients of that brick were.

A Typewriter Wanted for the Blind.

Those who are interested in the welfare of the blind will be pleased to hear of a great improvement in the method of printing for the blind, devised by Dr. A. Mascaró, a Spanish medical man, long a resident in Lisbon, who has hit upon a very ingenious method which enables people who can see to read books prepared for the blind, or to correspond with them or to teach them to read without any previous training in the blind alphabet. This is accomplished by a modification of the Braille embossed alphabet, which consists of a grouping of dots in relief. Dr. Mascaró has succeeded in connecting these dots by means of dark lines, thus exhibiting the complete outline of each letter. This is done by printing on the reverse side of the porous paper, so that the type which produces the bosses can also lay on the ink, and this in its turn passes through the porous paper to the other side, making a distinct mark. Thus, the letter L is represented by four dots, three of the dots being in a vertical line and one at the right, while they are all connected by a fairly black line. This enables the person with eyesight to read easily while a blind person feels his way over the same surface. In practice it was found necessary to twist the visible lines somewhat out of shape, but the effect is perfectly plain and readable. Writing by hand is done with the aid of a guide with perforations, which also enables the connecting lines to appear on the lower surface of the paper, which lies against a sheet of carbon paper used for the purpose. The great desideratum is a typewriter for this work, and, in view of the fact that this instrument originated in America, in an attempt to help the blind (for we refer to the typewriter invented by the late Alfred Ely Beach), the Rev. Robert H. Moreton, of Oporto, Portugal, thinks it will not be strange if some one in the same part of the world does solve the problem, by producing a machine which will print embossed lines with carbon outlines complete. There would certainly be a field for a machine of this kind, though naturally the number of them which could be sold would be limited. Heretofore books which have been printed for the blind have been so expensive and bulky that their use has been limited. We have some examples of the Mascaró system, and we shall be glad to send a sample of the work to those interested in producing such a machine.