

Finger Print Detection by Chemical Means

By "Delta"

THE common method of making finger prints clearly visible is to sprinkle talcum powder, or aluminium powder or a preparation of chalk and mercury over the suspected spot, and then brush the spot slightly with a soft camel's hair brush, when the lines of the finger tip show up in white. The writer has recently discovered another way to secure these impressions in black or brown black, by chemical means. If a finger print is made upon a piece of hard-surface paper, or an impression of the thumb or both, a very fine powder of dried acetate of lead may be scattered over the places where these impressions have been made and then the paper should be tapped so as to free the surface of the superfluous powder, after which the spot should be submitted to the fumes of sulphide of ammonium. The markings will then develop immediately into bold clear lines of a brown black color, due to the formation of sulphide of lead.

If finely powdered dry chloride of silver be used instead of acetate of lead, the surplus powder being removed in the same way by tapping the paper, it will be found that on exposing the paper to the action of light (sunlight if possible) the finger prints will develop perfectly. Of course from these developed impressions a negative may be made and prints made therefrom, either by direct printing, or by development.

It has been found by testing that if the paper employed for this class of work is coated with plain collodion so as to make it non-absorbent the impressions become very brilliant, and can be fixed by floating the paper back down upon a mixture of sulphuric ether and alcohol in equal parts, the penetration of which softens the collodion surface, causing the sulphide of lead, or reduced silver chloride to adhere. A finger print upon a glass tumbler, a glass pane, or upon office brass work can be brought out distinctly in black by placing a piece of white paper in the tumbler in cylinder form. A negative can be readily made from the impression. Acetate of lead appears to give blacker impressions with the sulphide of ammonium. The accompanying photographs show finger prints rendered visible by sulphide of lead and by chloride of silver developed by light.

How Telegrams are Sent in China

By R. E. Chambers

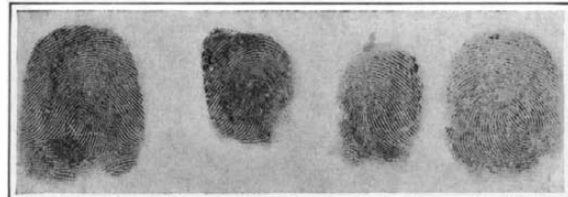
THE Chinese written language has several hundred thousand different characters. None of these can be spelled so as to indicate accurately how they are pronounced. Besides there are hundreds of ways of pronouncing each character, as there are hundreds of spoken dialects in China, although the book language is the same throughout the country. How is it possible to send a telegram in such a country and in such a language? The difficulties have been overcome, and it is really less trouble, and less expensive to send a message in Chinese than in English.

The telegram published herewith will help to make the matter plain. There is in every Chinese telegraph office a special dictionary, or catalogue, or code book, whatever you may choose to call it, in which the characters are numbered from one on up. A total number of 9,999 may be catalogued under the present system.

Chinese telegram showing the number code.

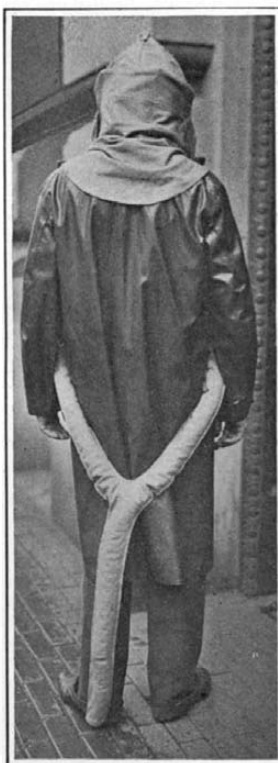


Finger prints rendered visible by sulphide of lead.



Finger prints developed by light after treatment with chloride of silver.

A certain number of blank spaces have been reserved to add special characters from time to time. The sender of the telegram simply writes his message in the usual way. The operator will probably know the numbers of most of the characters. If not he can readily find them in the catalogue. For each character he sends five Morse signals, e. g., 5913, 0013, 0414, which represent the characters "Yuan Shi Kai," the name of His Excellency, the president of China, who sent the telegram here reproduced. It will at once appear that only ten different signals are needed for telegraphing 9999 different characters in Chinese. By splitting up an unusual character into its common parts it may be easily sent. Private codes are readily prepared with



Fireman's smoke helmet with intake near the floor.

this system. Already the chief cities of the country, and many small places have telegraph offices. It is hoped that under the republican form of government the whole service will be extended, improved and made less expensive. It may be of interest to mention that the telegram published herewith is an appreciative reply of President Yuan to a telegram which the writer as president of the China Baptist Conference sent to him upon the occasion of the call for special prayer for China. In addition to the ordinary wire service, China now has several powerful wireless stations, and arrangements are being made to cover the country with them.

Transforming a Schooner into a Grain Lighter

SHORTLY after the directors of the port of Boston succeeded in getting the Hamburg-American Line to shift a part of its business to Boston, it was discovered that there was no grain lighter in the harbor with sufficient elevation to load the new liners.

In this emergency the schooner "Ellen M. Golder" was secured and practically stripped. She is 163 feet long overall, by 35-foot beam and 650 tonnage. Bins with a capacity of 22,000 bushels were built in the hull. An engine was then installed in the stern and geared to a shaft running forward to a point about half way to the bow where a rope sheave transmitted power to the head shaft of the two main 20-inch bucket elevators, 70 feet above the deck.

At two points between the engine and the rope drive,

power is taken off through gears—at one point to drive two cross shafts provided with niggerheads which serve to move the lighter backward or forward to a better position to load, and at another to drive a vertical shaft which in turn operates a secondary shaft running lengthwise of the schooner. The latter serves at each end as a head shaft for the two 16-inch distributing elevators.

The lighter is loaded to its full capacity at a grain elevator and towed alongside of the liner to be loaded. The capacity of the lighter is equal to a day's work for the main elevators which draw from the bins amidships, and the smaller distributing elevators fore and aft deliver grain to the main bins at a rate which insures all the hoppers' emptying simultaneously.

Smoke Helmets for Firemen

By J. R. Schmidt

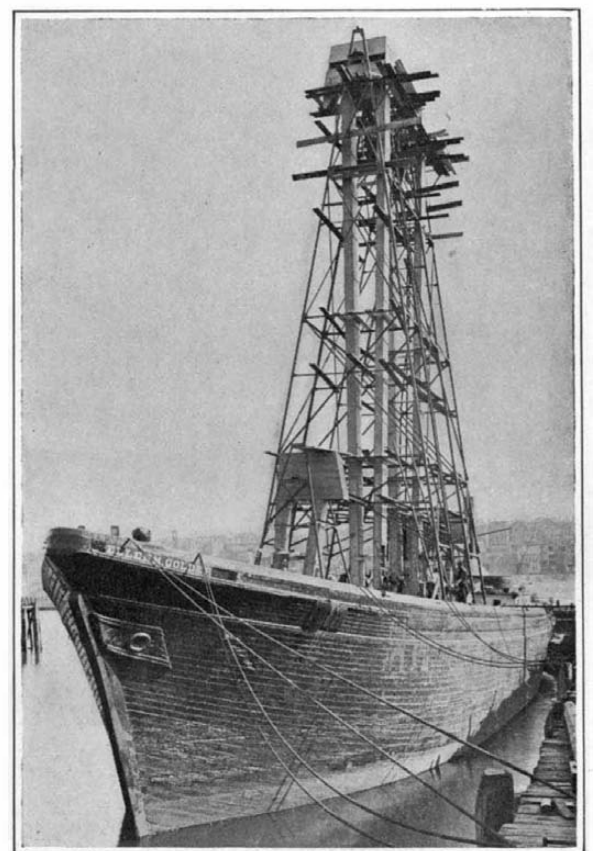
THE helmets pictured herewith enable a fireman to remain in a smoke filled room for an indefinite length of time without resorting to the use of oxygen tanks to sustain life. They have recently been adopted by the fire department of Cleveland. The new device consists of a canvas hood, somewhat similar in appearance to a diver's helmet, with mica squares admitting light. This fits closely over the head and shoulders. From it trails a hose which reaches down to the floor, through which air is carried to the wearer.

As heated smoke, fumes, etc., have a tendency to rise, there is, ordinarily, more free oxygen in the smoky room close to the floor. In walking around in a smoke filled room the wearer of the helmet breathes the air taken from the floor by the trailing hose. Air valves in the top of the helmet afford escape for the exhaled air so that a fresh supply is always received from the floor. To prevent the hose from collapsing a spiral spring runs its entire length and a heavy end keeps the hose always near the floor. Experiments have shown that a person can remain in a smoke laden room for 20 minutes after the end of the hose is closed. The advantages of this helmet are that it dispenses with heavy oxygen tanks and may be worn by man or woman of any size, to whom it may be adjusted in less than a minute's time.

The French Prohibition of Inflammable Celluloid Films

AFTER December 1st the ordinary celluloid moving picture may not be used in France. Instead an unflammable film must be used. Thomas A. Edison issued the following statement when informed of the new French law:

"There is no possible material known that takes the place of the present celluloid film. In this country the insurance companies have been so strict that everything pertaining to the film and machine is incased in iron and asbestos so that the chance of a fire is reduced almost to immunity. Out of 13,000 moving picture theaters we scarcely ever hear of a fire, although the theaters are running almost continuously. The amount of film stored in the fireproof booth at any one time is so small that it is difficult to imagine any danger to the theater even if the whole amount should burn up. A properly designed machine provides immunity aside from the fireproof booth."



Schooner converted into a grain lighter.