

USE OF PHOTOGRAPHS AS EVIDENCE.

BY JAMES G. MCCURDY.

Ever since its inception, photography has rendered valuable assistance to justice by the popular nature of the data it is capable of producing. One of its earliest services along this line was the improvement of the various "Rogues' Galleries" scattered throughout the country, where efforts were being made to keep a record of portraits of leading lawbreakers. Prior to the advent of photography, likenesses of criminals, as sketched by the artist and reproduced by the wood engraver, offered but little aid to the officers of the law for purposes of identification. The camera, however, capable of catching each facial characteristic and fleeting expression, together with the ease with which its results could be duplicated without loss of any essential qualities, proved a most effectual help in the detection of criminals.

The United States government endeavored for many years to perfect a system of identification by description merely, in the matter of Chinese certificates. But so many frauds were perpetrated that at last Congress was compelled to adopt the amendment of November 3, 1893, requiring every such certificate to have attached to its face the photograph of the person applying for the same. This clause in the Exclusion Bill was very distasteful to the Chinese, who fought it with great energy throughout the country, but without avail.

When at last the Chinese found that they must comply with the new regulation or suffer deportation, the photographers of the Pacific Coast could hardly meet the demands of the excited Celestials, all of whom had become very anxious to be photographed before the expiration of the time limit. Certificate photographs are not retouched, and any scar or other prominent marking upon the face is made as conspicuous as possible, to aid identification. The effect of the new law was most salutary, and while frauds are still occasionally attempted, they are rarely successful.

When the foregoing facts are taken into consideration, it is not at all surprising that the camera is held in wholesome respect by those who would seek to break or evade the law. This point was emphasized last winter during the great teamsters' strike in Boston, where policemen riding with the drivers found cameras more formidable weapons than firearms would have been. Somehow, when those bent on mischief realized that any act of violence on their part would be duly recorded by the all-seeing lenses, to be brought up against them later, the very boldest among them shrank from making a demonstration.

Although the photograph has been used for years as a means of identification, it is still looked upon in many courts with a degree of suspicion, when submitted in general evidence. This is largely due to the fact that photographic negatives, in the hands of skillful manipulators, are capable of much "doctoring," and can readily be made to bear witness to untruths.

Yet realizing that all evidence is open to question and must be thoroughly sifted, and trusting to photographic experts to unearth attempted fraud, the photograph is being admitted in courts of justice as evidence more extensively each year.

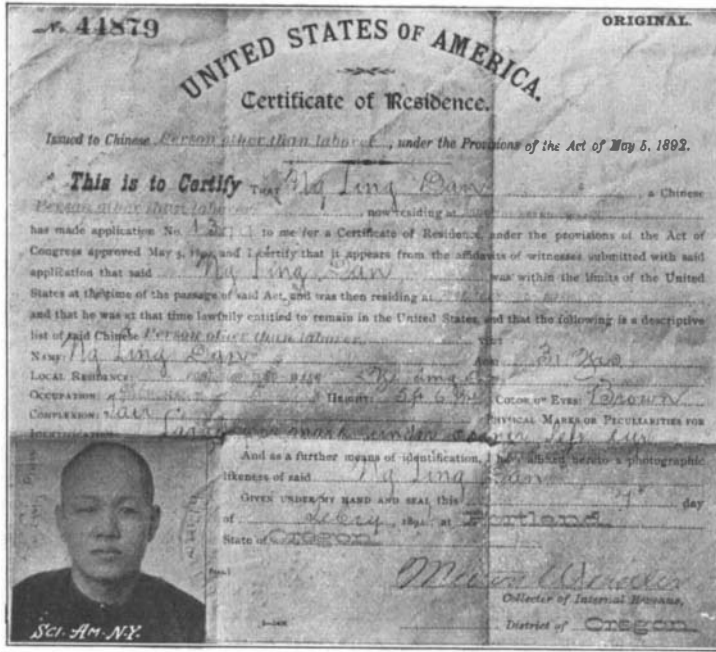
Finding by experience that a well-taken, untouched photograph bearing upon a case in point often makes valuable evidence, many railroads, steamship companies and other corporations are making it a practice to keep cameras within easy reach of their employes, to be used when necessity arises.

It has been decided to establish wireless telegraphy apparatus on all stations and on all passenger trains on Italian railroads. King Victor Emmanuel, of his own initiative, has, it is reported, recently appointed Signor Marconi a Chevalier of the Order of Industrial Merit.

ACETYLENE SEARCHLIGHTS FOR AUTOMOBILES.

One of the essential conditions for the speeding of automobiles at night is the proper lighting of the road. Ordinary side lanterns are inadequate, and therefore headlights which throw bright rays in advance of the vehicle must be used. Acetylene is well adapted for obtaining a brilliant light. It is by no means uncommon to see carriages provided with two searchlights, placed at the right and at the left of the vehicle. Such lights should have a common generator.

We shall consider some of the types of French



CHINESE CERTIFICATE OF IDENTIFICATION USED IN THE UNITED STATES.

searchlights at present most used; of the generators little is to be said, for the lighting system is the same for all, viz., a burner with adjacent jets, placed in the focus of a reflector, and a more or less intricate system of simple or compound lenses.

The generator of the Blériot light (Fig. 1) may be regarded as a typical example of the generators usually employed. It requires the employment of a special chemical compound of carbide and glucose, which is called by its inventors, Messrs. Letang and Serpollet, "acetylithé." The compound has the great advantage over ordinary carbide of being less sensitive to moisture, and of not leaving any solid residuum.

In order to introduce it into the lantern without difficulty, the generator is made in the form of a cylinder which slips into the receptacle behind the reflector when the cover of the searchlight has been raised.

The generator is charged by unscrewing the cover, B. When this is lifted it draws with it the cylinder, C,

which contains the basket that holds the carbide. The bottom of the basket is perforated and furnished with vertical partitions, S, which prevent the carbide from packing too solidly and facilitate the access of the water. The generator cylinder terminates on top in a gas conducting tube, A, into which is introduced a tin cartridge containing ordinary carbide between two plugs of wadding, and which serves as a purifier. The gas is obliged to pass through this tube before escaping by the cock, R, and in so doing it is purified. The water is poured into the cylinder, E, up to the proper level, after which generator cylinder is put in place and the cover screwed on. The lamp operates on the same principle as those that use the Gay-Lussac briquette, in which the gas pressure forces the water out of the bell as soon as sufficient gas is generated. It is only necessary, therefore, to shut the cock, R, in order to stop its generation, but it is recommended that the charge be used up within three days.

In the Ouvrard lamp (Fig. 2) ordinary carbide is used in the generator. The cover rests upon a rubber washer, J, which it compresses when the handle attached to it is turned down.

The crushed carbide is placed in B first, after which the water is introduced into A through the threaded stopper, L. Its flow into the carbide is stopped by a center plug, C, which may be opened gradually by means of the small hand-wheel, H. It attacks the carbide therefore from below. The purifier, D, is placed above the carbide and contains broken pumice stone. The outlet pipe for the gas passes from the center of the purifier. It is at this point that the clearing up through the top of the generator starts. Its lower extremity is fitted with a strainer, O, in order to prevent the entrance of solid matter. Another purifier of the same kind is placed just below the burner, which is also fitted with a strainer at its lower end. A rubber bulb, K, communicating with the gas outlet tube regulates the pressure, and a cock, G, serves to regulate the supply of gas. When the center plug, C, is closed the flow of water ceases, and the flame is extinguished as soon as the supply of gas in the tube and pressure bulb is exhausted.

The Jupiter (Fig. 3), constructed by Messrs. Desponts and Godéfray, makes use of any carbide, and constitutes a part of the lantern. In order to charge it, the water reservoir, C, which is held in place above the cylinder, K, by thumb-screws, is removed. The basket contained in the cylinder, K, is half filled with carbide and replaced in its position on the spring, J. The tube, A, perforated with small holes and containing a cotton wick, passes through the center of the carbide basket, from top to bottom. The tube is closed at the bottom but open at its upper end, which connects with the water reservoir, but is hermetically closed by the needle-valve, P, against which the spring, J, presses it. The needle-valve can be raised or lowered by means of the button, D, which therefore serves to control the flow of water into the tube. The reservoir, C, is filled through a hole covered by the threaded cap, E, and is hermetically fastened to the generator by thumb-screws as shown in the right-hand illustration. As soon as the needle-valve plug is raised, the wick becomes saturated and acetylene gas commences to generate. To put out the light the needle-valve is closed and the flow of gas soon ceases. A metal tube extends from the generator to the burner and passes through the purifier, B. There are two interesting particulars with reference to the burner of this apparatus: the first is, that if it becomes broken and there is no duplicate on hand, or if the carbide becomes exhausted, the burner may be immediately replaced by a spring candle holder, such as is used in carriage lamps. This is a resource which allows a journey to be continued under the best conditions possible with an ordinary lantern, since it utilizes the lens system of

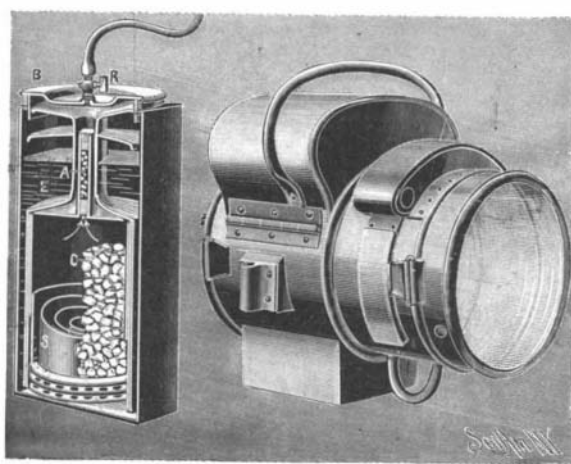


Fig. 1.—The Blériot Searchlight.

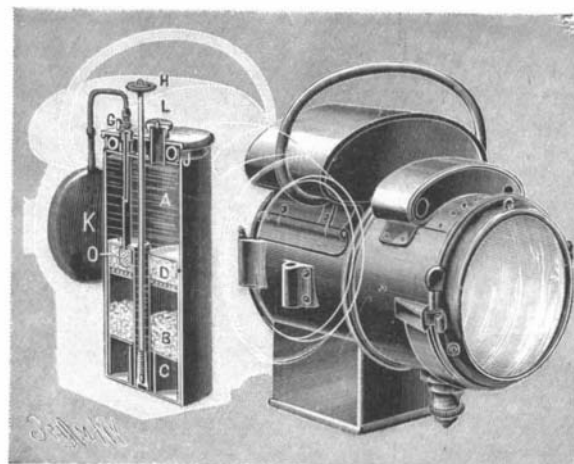


Fig. 2.—The Ouvrard Searchlight.

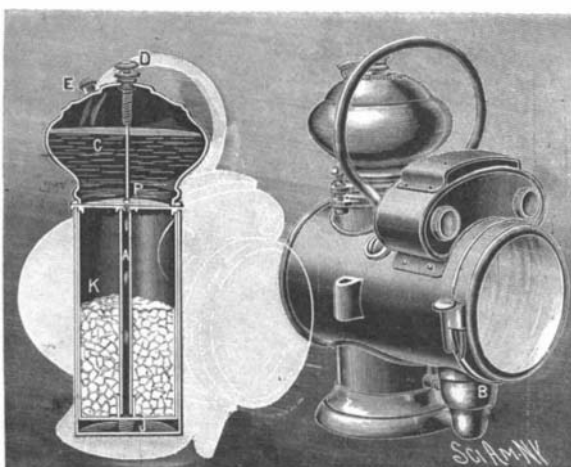


Fig. 3.—The Jupiter Searchlight.

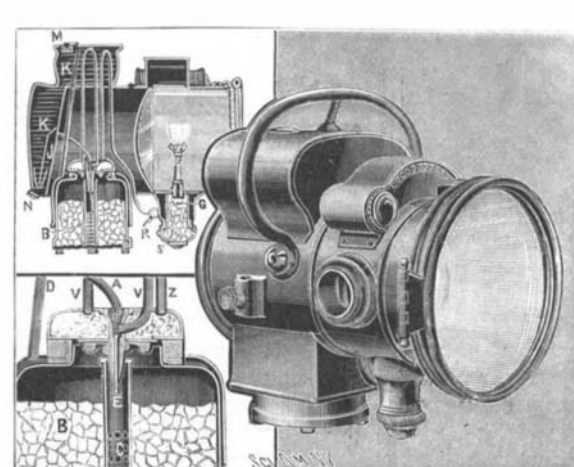


Fig. 4.—The Ducellier Searchlight.

ACETYLENE SEARCHLIGHTS FOR AUTOMOBILES.

the searchlight. Another interesting detail is that if the burner is changed, it may, after it has been put in place, be turned in such a way that the plane of the light will be parallel with the lens. For this purpose it is furnished with a holder analogous to that employed on a jointed gas fixture. Anyone who has set up a butterfly burner and discovered after having sealed it, that the slot was not set right, will appreciate the special importance of this point.

The Ducellier searchlight (Fig. 4) makes use of any carbide. The generator is integral with the lamp, and the carbide basket is the only part made removable, in order that it may be charged and cleansed.

The details of the lantern may be seen in the two diagrams on the left. The upper of these gives a general view of the system and the lower an outline of the different tubes. The carbide basket, *B*, has a vertical tube perforated with holes, passing through its center and arranged so that the attack on the carbide shall take place from below. A capillary tube, *E*, feeds the water drop by drop from the reservoir, *K*, whence it is conveyed by the tube, *A*, which ends in the chamber, *J*. The reservoir is filled with water through the hole, *M*, which is closed by a cap. After the operator has first closed the plug, *N*, and the cock, *R*, of the burner, the chamber, *J*, fills with air which cannot escape. The air closes the orifice of tube, *A*, and the water cannot flow upon the carbide.

It is only when the cock, *R*, is again opened that the air can escape by passing through the tube, *A*, and the tube, *Z*, which leads to the burner. The water may then pass through *A* and *E*, and the gas generated escapes through the same tube, *Z*, after having passed through the purifier made of horse-hair and carbide. When, in order to extinguish the light, the cock, *R*, is closed, the gas passes through the bent tube, *V*, and the tube, *A*, and forces the water back into the chamber, *J*. As the

water then ceases to trickle down on the carbide, the production of gas soon ceases. In case of over-production the gas passes from the chamber, *J*, through the water of the reservoir, *K*, and collects in its upper part whence its escape is provided for by the tube, *D*. A

In thus summarily reviewing these different models of searchlights we do not pretend to have exhausted the subject, but have only wished to inform our readers as to the application of acetylene to automobile locomotion by taking as a type the systems which have been called to our attention, as being in actual use.—Translated for the SCIENTIFIC AMERICAN from La Nature.



One of the Electrograph Machines, Showing Morse Key.

second generator composed of horse-hair and carbide is placed under the burner.

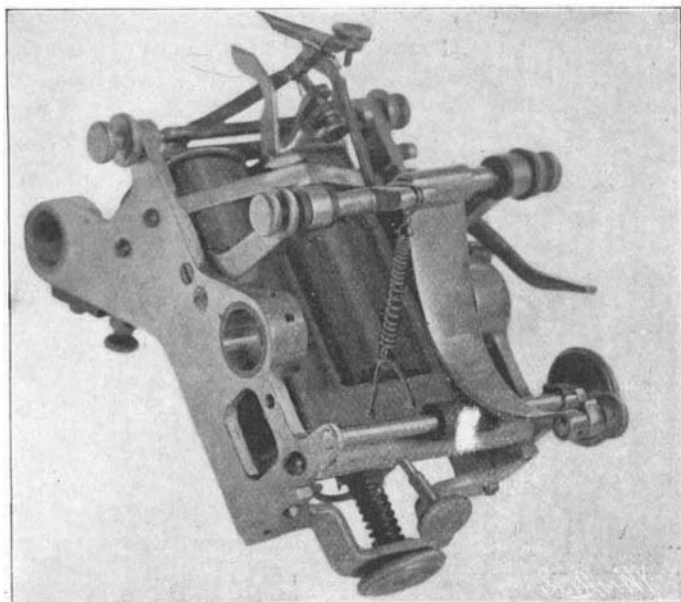
For small vehicles M. Ducellier manufactures the lanterns separate, and arranges them to be connected to a separate generator.

the device has been changed in design with the result that difficulties met with have been overcome.

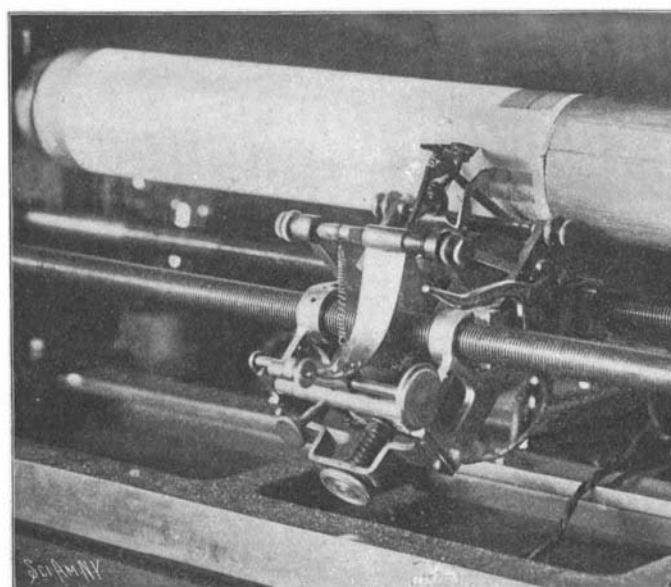
The principle of the electrograph's operation, as in all other electrical devices for the transmission of signals over great distances, is to be found in the

making and breaking of an electrical circuit at predetermined intervals.

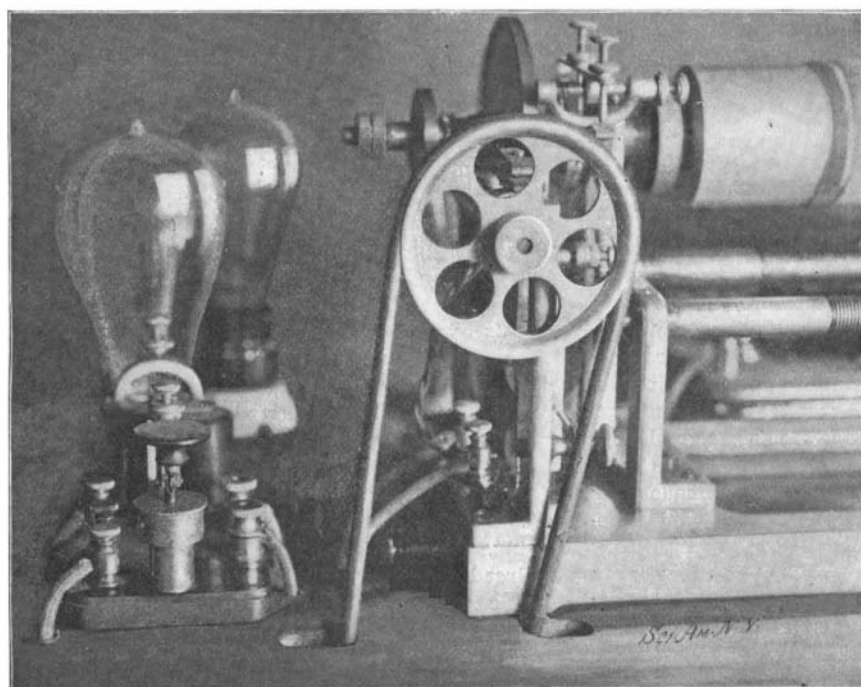
The transmitting and receiving machines are exactly similar in construction. The driving power is obtained from a 1-6 horse power electric motor supplied by a 20-volt storage battery and controlled by suitable switches and resistances. The motor is belted to a worm gear connected with a friction clutch, which ro-



The Carriage, with the Pen Thrown into Operative Position.



The Carriage, Lead-Screws, and Paper-Wrapped Receiving Cylinder.



Automatic Switch (to the Left); Driving-Gear; and Rocker-Arm Switch.



An Electrogram—Portrait of President McKinley. (Reduced.)

Cylinder Bearing McKinley's Portrait.

THE IMPROVED ELECTROGRAPH—A FACSIMILE TELEGRAPH.