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# APPLICATION OF MAGNETIC PRINCIPLES TO THE RESTORATION OF SERIAL NUMBERS

D. A. WOLFER AND W. J. LEE

The authors comprise the staff of the Firearms and Explosive Unit, Criminalistic Section, Scientific Investigation Division of the Los Angeles Police Department. This article is based upon a report given by them at the 13th Semi-annual Seminar of the California Association of Criminalistics sponsored by Los Angeles State College. Mr. Wolfer has been a member of the Los Angeles Department since 1950 and the Scientific Investigation Staff since 1951 and is a part time instructor and lecturer on scientific investigation subjects at Long Beach State College. Mr. Lee likewise joined the Department in 1950 and the Scientific Investigation Staff as a safe and lock expert in 1951. His assignment with the Firearms Unit came about three years ago, and he likewise serves as a part time instructor in scientific investigation in subjects at El Camino College, Los Angeles.—EDITOR.

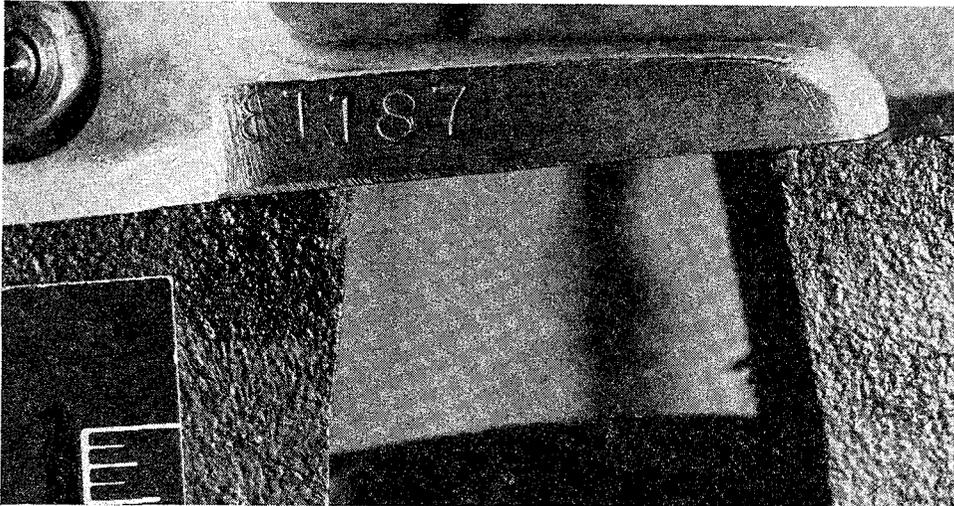
The purpose of this article is to provide persons interested with a simple and inexpensive method based on basic magnetic principles for restoring obliterated serial numbers and identification marks. This technique is applicable to guns, business machines, hub caps, small motors, and other metal objects. Although in many cases it produces the desired results where acid etching fails, the reverse is also true wherein acid etching will be found to be more desirable. A specific case where this is known to be true is in the case of carbines and submachine guns where acid etching usually fails, but this technique is successful.

## MATERIALS

1. One horse shoe magnet (approx. 125 lbs. pull). Cost ranges from \$8.00 to \$18.00
2. One small vibrator (hand type). \$4.00 to \$25.00
3.  $\text{Fe}_3\text{O}_4$  (OUS) Magnetite—screened through 300 or finer mesh and suspended in a carrier such as Base Oil "C". Usual cost \$.50 per gallon or one (1) Magnaflux prepared bath "9 BM". \$2.25 per pint

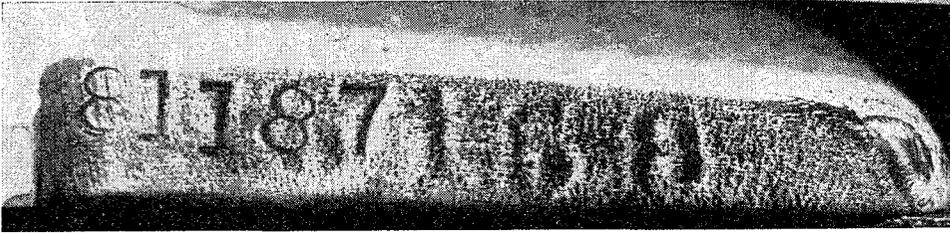
## PROCEDURE

The surface to be restored is prepared in the same manner as is necessary for acid etching (re-



*Figure 1*

A metal piece from a sewing machine, in which there is suspicion that a serial number was removed and a new number stamped is shown in position at the tips of the magnet.



*Figure 2*

The restored serial number reading 5158 is shown developed by this magnetic process. A partial outline of the first five can be detected in the area under the second 8 of the new serial number 81187.

removal of gross markings and polish surface). Finer details in this method appear better on highly polished surfaces. It is recommended that crocus cloth and steel wool be used as a final polishing medium.

The object is then placed directly on the magnet so that the concerned area is centered between the two poles (see figure 1). The vibrator is then held directly on the magnet *or* the object and the solution applied in moderation to the concerned area. Restoration occurs almost instantaneously; how-

ever, longer vibration may be required. A convenient dispenser for the magnetite bath is an 8 oz. polyethylene wash bottle with a polyethylene spout.

After the formation of the numbers, photographs can be taken immediately or the object may be allowed to set until the carrier has evaporated and then photographed. (See figure 2). This technique eliminates the destruction normally accompanying the use of acids or heating.