

1954

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Recommended Citation

David J. Purtell, Identification of Checkwriters, The, 45 J. Crim. L. Criminology & Police Sci. 229 (1954-1955)

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THE IDENTIFICATION OF CHECKWRITERS

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The modern day checkwriter has had an interesting development since its inception in about 1872. This machine was developed to protect the amount line on checks and bank drafts from clever forgers who added a numeral and a few letters in an attempt to raise a handwritten check from a small amount to a very large sum. Each manufacturer has strived to keep his product superior to that of his competitors as well as combat the fraudulent check artist. Competition developed between manufacturers and advanced the checkwriter far beyond the feats performed by the check artists. In the demonstration and selling of each maker's product, the good features of their machine and the ease with which a competitor's machine might be altered or raised was exhibited. Consequently, each and every new model produced was an improvement on all previous machines.

The manner of impressing the amount on a check by a machine has differed radically since the inception of the checkwriter. The early machines punched small round holes to form each numeral. Later the edges of the holes were inked to make the amount more legible. Afterwards came the full numerals which appeared as a stencil marking being punched out. At the turn of the century came the machines that were known as the "Not Over" models because they impressed in the paper the wording "Not Over \$ (certain amount) Dollars". This machine was followed by the "Written Word" model, or the sometimes called "Amount in Words" model. Finally, we come to the present day method of showing the amount in numerals. (See Figure 1.)

In the "Written Word" and the present day numeral machines we find a similar manner of shredding the paper being used by all manufacturers but differing in the manner of grooving the type and platen to make the impression. Type is that which imprints the readable numerals and letters while the platen gives the form or shape by perforating the impression. These parts may have either an angular or vertical groove, or a pin point arrangement. All of these methods use metal for both the type and platen. One manufacturer who since has discontinued making checkwriters used a flat face type and printed through a ribbon to obtain the impression. A few innovations, one being a plastic type face while the other using a rubber platen to obtain the shredding effect, have been used in the last few years but were short lived.

This paper will present the defects as points of identification which occur in the

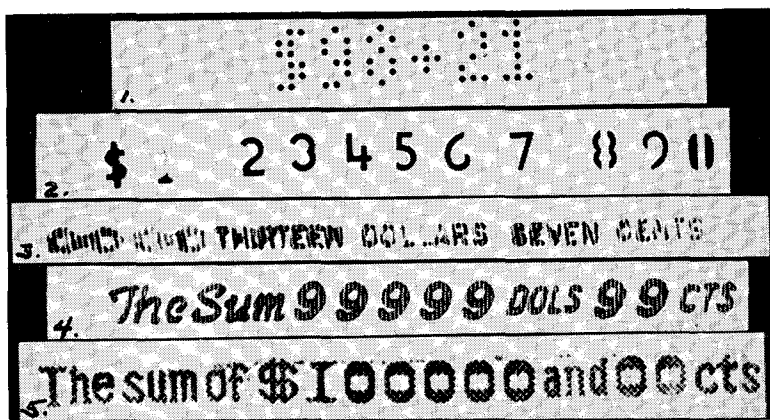


Figure 1

Development and Changes in Checkwriter Impressions

1. Punched round holes, 2. Punched numerals, 3. Written words, 4. Groove numerals, and 5. Pin hole numerals.

type of machines that shred the paper and use metal type and platen systems. Of approximately three million checkwriters manufactured, those using these principals constitute about ninety-eight percent. All the present day products incorporate these principals.

THE TYPE AND PRINTING PARTS

There are as many methods of preparing the type for checkwriters as there are methods of making impressions in the paper. At present most type is either cast or forged, the material used being brass or an alloy of zinc or aluminum. Engraving and etching of type faces have been used, but due to high cost of operation they have been discontinued except for preparing prefixes on one make machine.

The platen and the part that perforates the written name on the check, called the payee perforator, are usually made of brass and are milled with grooves or pin points. (See Figure 2.)

Type faces are either cast onto the operating arm, or forged and then riveted to the arm. Each method has its advantages as well as its disadvantages. The cast type is made of a weaker metal than the forged type. However, the forged and riveted type may become loosened from the operating arm due to wear.

After the type is joined to the operating arm, the face of the type is grooved by a milling process. These grooves are vertical or angular. Either style of grooving gives a character a weak edge which may easily be broken or worn.

A second method of shredding the paper uses a pin hole style of type. This type is made with many small holes while the platen contains an equal number of pin points. These two parts mesh and perforate the paper with the desired amount. It is claimed that this style of type is stronger because the metal is continuous across the face. However, this style is similar to the grooving method in that its edges, too, might be weakened and may be damaged through wear. (Figure 3.)

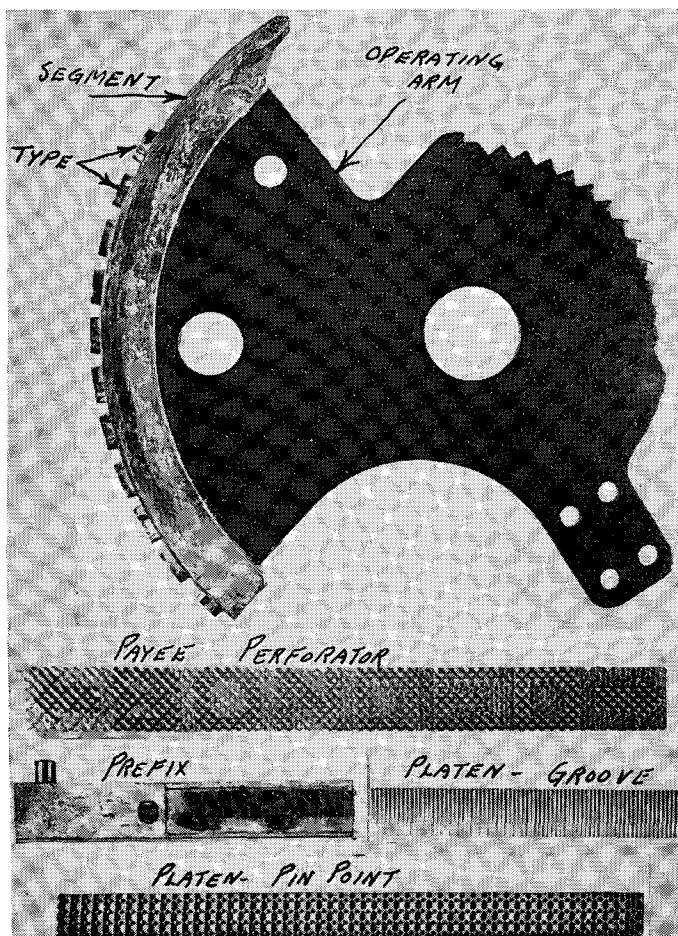


Figure 2
Checkwriter Parts

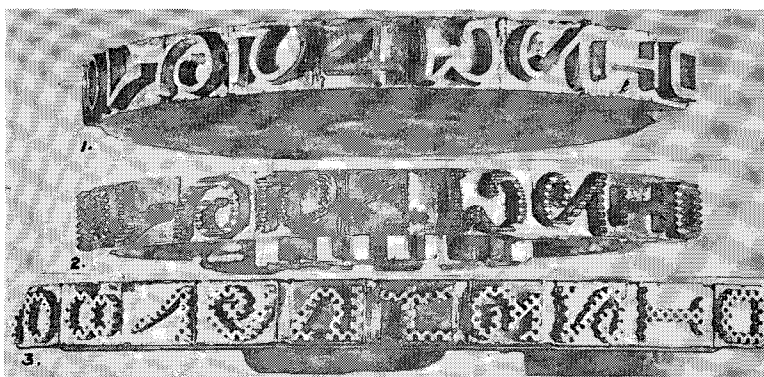


Figure 3
Present-Day Checkwriter Type
1. Cast type, 2. Groove type, and 3. Pinhole type.

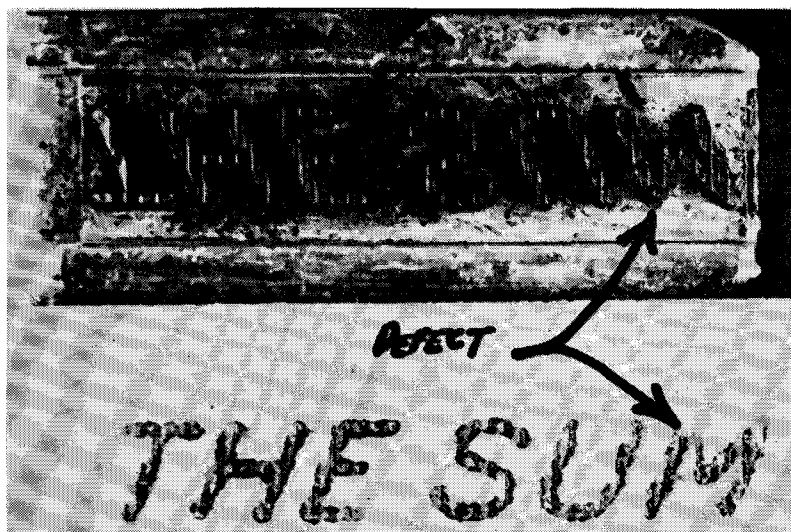


Figure 4

Identifiable Manufacturing Defects

The defect indicated by the arrow on the type and print impression below is caused by an air bubble in the cast prefix.

DEFECTS LEAD TO INDIVIDUALITY

One group of defects that appear on checkwriters and can be used as points of identification occur during the manufacturing of the machine. The outstanding defects occur during the milling of the grooves where the ends and tails of digits are sometimes cut off. Grooves may also vary in size as to width and depth. Also, defects may be left in the type face during the forging or casting process. In the casting process a segment of type may become warped, and if mounted in a machine, most of the numerals will be out of position. During the handling and assembling of the 1600 to 1800 parts in a checkwriter the type face may become nicked or marred. The type may also be assembled out of alignment and on an uneven plane. The mounting of the platen and the testing of the density of the impression is adjusted by feel and by making test impressions on checks. (Figure 4.)

High standards are maintained and rigid tolerances are adhered to throughout the manufacturing. On one certain machine approximately 250 test impressions are taken, and all adjustments are made before the outer covers are assembled. After completion most machines receive at least two final inspections. All tests and inspections are made for ease of operation and for legible impressions. Moreover, machines are approved by all these inspections and tests, although they have their own individual differences which would be unnoticed by an owner but are of utmost value to the document examiner in identifying a checkwriter.

As it functions in a business office many things happen to a checkwriter which may be used as points of identification. To identify it, then, one would study the type, the platen, and the payee perforation. These parts are made of metal that is

softer than that used on typewriters and show wear faster. Besides wear, these parts may become flattened, bent, chipped, or broken from being pressed together when such things as paper clips, pins, etc., left on checks, come in contact with the type and platen. If these crucial parts are out of adjustment or alignment, the impression will be faint or illegible and will not penetrate the paper.

On the end figures of a type segment, at times we get what is called a collapsed figure, flattened and elongated, which results from lack of support. Also, on the end figures that strike a stop bar, an incorrect or a split figure impression may result due to the bar becoming worn or knocked out of position. If a stop is arranged on another part of the machine, it may also become worn and make incorrect imprints.

The inking mechanism also comes into consideration in an examination. The ink may cake or mix with lint to fill in the type. On a roller machine there is a possibility of over-inking of certain characters and smudging of the paper. Under-inking, maladjusted, or worn rollers cause a faint or illegible imprint. In a ribbon machine, where over-inking is not possible, a worn or twisted ribbon may develop similar defects.

Wear of moving or operating parts may leave some identifiable points, such as the name die or prefix not sliding next to the amount, when on a machine constructed for such a movement. Also, the wear of the safety paw that requires a full stroke of the handle may be in such condition as to slip and allow a very faint impression. Oil and dirt from the mechanism may soil or spot a specific section of a check.

PREPARING STANDARDS

To obtain standards for comparison use blank check paper when possible or make the impression on the amount line of a check. Standards taken on check paper render ideal conditions when photographed with the questioned checks. The impression should always be taken on smooth flat paper and never over printed matter.

Since this could be a point of identification, the first standards impression taken from a questioned checkwriter should be at the settings on the machine when received. A person preparing fraudulent checks might not have the knowledge to operate a machine properly and may leave the machine set at one amount. In a case a few years ago, the passer of a series of fraudulent checks practiced with old newspapers and tissue paper before writing the checks. This thin paper was shredded by the machine and became clogged in the mechanism, and only one amount could be printed on that particular machine.

In making standards, all the characters on the machine should be utilized as well as the amount in question. At least five impressions should be taken of each amount in question so as to demonstrate that the identifiable defects are reproducible and not caused by chance.

OPERATOR IDENTIFICATION

Besides identifying a checkwriter or an impression made from a checkwriter, it is believed that in some cases the person using a machine can be identified. The old "Written Word" machines lent themselves to the identity of the user better than the modern day machines. In the old machines, many different ways of making an

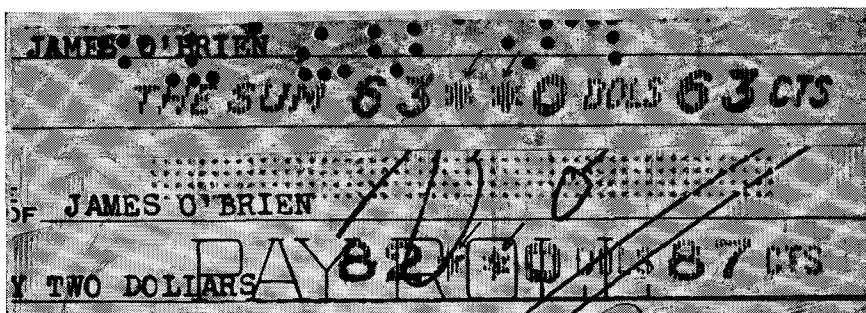


Figure 5

Incorrect Amount Set-Up Identifying User

The arrows indicate the incorrect positioning of stars within the amount.

amount set-up could be arranged. In the last year, the Chicago laboratory received a number of fraudulent checks with the amount imprinted as follows:

"FORTY XXX XXX XXX DOLLARS XXX XXX XXX CENTS"

It indicated to us that one person had prepared all the checks.

In another case, checks were taken from seven different firms during burglaries and were prepared in similar manner on two different checkwriters. All the numerous checks were made payable to the same person and the amount was set up incorrectly. (Figure 5.) Again, this definitely indicates that only one person prepared all these checks.

METHOD OF EXAMINATION

All examinations and comparisons concerning the identification of checkwriters should be conducted scientifically, and all the facilities of a laboratory should be utilized. The handling of a checkwriter case should not be limited to mere visual examination. If a visual inspection is the only examination given, then the possibility of error is great.

Impressions on the paper should be examined on both the face and the reverse side, for the reverse side will disclose all of the defects while on the face they might be covered with ink and overlooked. The impressions should also be examined while held at various angles and by transmitted and reflected light. This will show the angle of penetration into the paper by the type, the platen, and the payee perforator.

When the questioned checkwriter is available it should be studied and the identifiable parts, such as type face, platen, and payee perforator, photographed if accessible. If the actual machine in question cannot be obtained, it is suggested that a similar make and model be employed. This can be used for study and court demonstration.

In some cases the background or history of one individual checkwriter is desired for investigative purposes. If the machine has been equipped with a prefix which contains either a number or a company's name, the manufacturer will be able to furnish the name and address of the purchaser.

One firm in advertising their checksigners, which are made similar to their checkwriters, states that two signature plates are as different as two "JOHN HANCOCKS". The display demonstrates that neither this firm nor any other one can successfully counterfeit, duplicate, or forge a signature plate. This also holds true for all checkwriters; no firm can make two alike for the differences in each machine coming off the assembly line and the defects occurring from usage make for a positive identification of checkwriters.