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William J. Davis

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# AMERICAN JOURNAL of POLICE SCIENCE

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## AUTOMOBILE ARSON INVESTIGATIONS

William J. Davis

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(In this interesting article Mr. Davis brings to light a number of salient facts and conclusions relative to an important phase of criminal investigation: that of automobile arson. Mr. Davis is Assistant Manager of the *Automobile Protective & Information Bureau* (offices of which are at 166 West Van Buren Street, Chicago, Illinois) and is an Associate Editor of the *Journal of Criminal Law and Criminology*. His account is a resultant of many years of experience in this field of investigating action.—EDITOR.)

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In presenting any material covering this important subject, it should be noted that no outline, manual, article or series of suggestions can cover every situation arising in the investigation of an automobile fire. In the final analysis each case must be handled in the manner which the individual law enforcement official, with a full knowledge of local conditions, considers most effective to secure the desired results. Nevertheless, as the result of experience gained in the actual investigation of these cases, certain basic principles have been developed which may be of assistance to investigators handling this difficult assignment.

The rapid enlargement of insurance underwriting in the past ten years to cover automobiles has brought about a proportionate increase in the number of questionable fires. A majority of such losses result from the premeditated and wilful burning of property, "incendiary fires" according to the records, "arson" according to the criminal investigator.

The automobile, due to its movability, varying value and its ability to carry a mortgage greater than value, lends itself particularly well to those individuals who seek to derive a profit or escape an obligation by the wilful destruction of insured property. The prevalence of this vicious practice indicates both a disregard for the law and a lack of fear of detection in the minds of the offenders.

Law enforcement officials or investigators stand between the act of arson and its successful culmination, between the criminal and the public and are the individuals who are in a position to prevent or reduce the number of fraudulent fire losses.

Many officers and investigators have the idea that nothing can be done to prove a case of arson in connection with the burning of an automobile. Conceding that the investigation of automobile arson is among the most difficult of all possible

investigations, the fact remains, as demonstrated by state fire marshals, law enforcement officials and special agents of the Automobile Protective & Information Bureau, that these cases can be broken and valuable information uncovered in an encouraging number of cases provided the individual conducting the investigation has the patience and perseverance required for this type of work. It is evident that there is no single rule for securing arson confessions and convictions unless it be unrelenting hard work.

The modern automobile is constructed of steel, iron and metal and, except for the wiring, tires and upholstery, has few parts which can be considered inflammable. There are legitimate instances recorded where a car has been constructively destroyed as the result of a garage fire or as the result of a collision with another object. But there are few cases where the modern automobile has been completely destroyed by fire originating in the automobile.<sup>1</sup>

If there is some doubt in the mind of the investigator as to the difficulties presented in totally destroying the modern automobile by fire and without the use of inflammables, it is suggested that a wrecked car be taken to a suitable location and individual experiments conducted. As a result of tests conducted to date by disinterested witnesses, the conclusion has been reached that most total automobile fires are of questionable origin and had some human assistance to create the damage observed.

The investigation of an automobile fire is similar to the investigation of any other criminal case. There is first of all proof that a crime has been committed; second, evidence showing how the crime was committed; and third, evidence linking the crime with its commission by some individual.

Successful investigations of automobile fires come from the following basic lines of inquiry: first, the inspection of the salvage to secure evidence of the origin of the fire; second, an investigation into the car owner's history to secure evidence of motive and opportunity; third, the locating and questioning of witnesses who might have information concerning the loss; and fourth, the cross-examination of the owner to the point of certainty that he is relating the true facts relative to the fire.

The salvage is most important in helping to establish the corpus delicti of the crime, and the investigation therefore begins with a careful and thorough inspection of the car. There is one rule that it is well to hold above all others in every phase

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<sup>1</sup> These conclusions have been reached as the result of a number of experiments conducted by Fire Marshals, Bureau Special Agents, the writer and other interested individuals. Some of these experiments have been photographed in color and the results recorded on a sound motion picture film available for showing without charge before Fire Marshal and Law Enforcement Officers.

of this investigation and that is: "Absolute attention to detail." As he inspects, a trained investigator sees a multitude of incriminating points that an ordinary observer overlooks. The careful observer remembers to look for little things and learns to associate the irregular ones with their causes.

It is generally considered most practical to inspect the burned automobile before contact is made with the owner. It is of great importance that this inspection be made as soon as possible after the fire to prevent the destruction or loss of important evidence.

### GENERAL INSPECTION

As a rule the general inspection should start at the point where the fire originated in the vehicle. This feature usually identifies itself in that fire or heat is most intense at the point of origin. An accidental fire spreads normally in diminishing degrees away from the point of origin in accord with the conditions, i.e., the direction and velocity of wind or drafts, or the type of material consumed by the fire.

As the inspection proceeds, look for any variation of this rule. An incendiary fire where inflammables are used is likely to show undue intensity of heat in more than one place. Note carefully the extent of the fire and the path of its progress for use later in making a comparison with the statement taken from the owner. In many cases where such action is indicated, it is wise to determine the general running condition of the car and whether or not there is a damaged motor, faulty transmission or differential. Also look for recent removal of extra equipment, whether it be the radio, heater, air horn, fog lights or other accessories. Notice any irregularities in the usual equipment, such as old tires on a new car, tires of the wrong size, bumpers missing or spare tire missing. In one investigation a block of wood was found in the depression for the spare tire indicating the owner had not been carrying this usual equipment. The spare wheel was present and although a spare tire would have burned in the fire, there were no skeleton remains in the shape of fine wires, proving either that the owner had no spare tire or that he had removed it prior to the fire.

Following a general scrutiny of the salvage it is, as a rule, important to make a specific inspection and such an inspection can best be conducted through a check by units or specific parts.

### SPECIFIC INSPECTION

*The Fuel System.* Determine whether the filler cap was in place at the time of the fire and whether the gas line leading from the tank was in order, or if it shows signs of tampering. Often gasoline is siphoned from the tank to start the fire and the gasoline tank cap is carelessly left off the tank. A tank cap

blown off shows the effects of an explosion. A cap removed after the fire shows the effects of the fire.

Check the drain plug in the bottom of the gas tank. If the plug is still in place, look for fresh plier marks on the plug or scratches around the collar. If the drain plug is missing and the collar is still intact, the drain plug has been removed, because when the plug is blown out the collar usually goes with it. The same thing usually occurs when it is melted out. If the engine has an air cleaner, this acts as a flame arrester and fire caused from backfire is practically impossible.

*The Gas Line.* Look for breaks in the line from the tank to the fuel pump. Look for plier marks — get an explanation for any breaks or disconnections.

Often the line below the tank is disconnected to obtain gasoline and is not replaced. If it is replaced, the top will show fresh scratches and perhaps fresh grooves where it has been tightened.

*The Fuel Pump.* Gasoline is sometimes obtained by disconnecting the line from the fuel pump and running the starter. Therefore, check for any missing parts of the fuel pump and evidence of tampering. If the fuel pump is melted there should be evidence of fire on the side pans. If the fuel pump was disconnected to allow the gasoline to run out and then set afire, there may be carbon deposits inside the gas line at the fuel pump. If parts of the fuel pump are missing, be sure to secure an explanation when taking the owner's statement. If any parts of the fuel system are missing at the top of fire and the owner says the car was running when the fire started, be sure to include this in his statement.

*The Electrical System.* Shortage in the electric wiring is the most common excuse offered for the origin of an automobile fire. The chances of a modern automobile developing a fire from a short in the wiring sufficient to destroy it are practically negligible. Engineers have virtually eradicated this hazard through design, conduit and the use of fireproof materials. Evidence of a short can be located if the wires are not melted away completely.

- 1.) Inspect the wiring in the vicinity where the short is supposed to have occurred.
- 2.) Bear in mind that the small blaze that starts from a short must be close enough to an inflammable substance to spread the fire.
- 3.) A short will melt the strands of wire apart and cause small beads or knots of melted wire to form on the ends. Wires that are burned in two will be sharp pointed.
- 4.) Check the battery. Check its connections. If there is no battery in the car, see if the evidence shows it was in the

car before the fire. If there has been a metallic substance which has joined the positive and negative cables or posts, this is evidence of deliberate intent to short the electrical system.

5.) A short in the wiring sufficient to cause a fire will usually exhaust the battery.

6.) If the fire started from a short while the motor was running, the distributor points will be stuck or fused.

*Motor, Radiator and Parts Under and Near the Hood.* There is not much here for the flames to feed on. The only possible place for an accidental fire at this location is around the fuel pump, carburetor or at the wiring. Check for the cause of any other heat. Any evidence of a fire on the front lower part of the motor not attributable to the above parts indicates the use of inflammables.

1.) Check the motor by turning it with a crank to see if compression is good. Consider the fact that serious motor trouble may have been the motive for the fire. Examine the cylinder head and motor block for cracks.

2.) Lead melted from any lower or outside seams of the radiator is definite evidence of inflammables.

3.) The fan belt will not usually burn in an accidental fire.

4.) When gasoline is poured on the motor, the rubber cushions for the front of the motor will sometimes show evidence of fire. This is not so in an accidental fire.

5.) When gasoline is poured on a motor it is sometimes spilled in spots on the front fenders. This causes burned blotches on the paint. Burned spots on the paint not in the direct line of fire always indicates the presence of an inflammable.

6.) Check muffler, manifold and tail pipes for breaks or leaks. Such breaks or leaks may be evidence of the origin of a legitimate fire.

7.) Look for soot deposits on the underside of the frame and springs. The presence of soot indicates use of inflammables.

8.) Check the water in the radiator. If the radiator is empty, fill it with water. If the radiator core is burned badly on the right lower corner, it indicates that the gas line from the fuel pump to the carburetor was disconnected and that the starter was run to pump out gasoline through the fuel pump and then set on fire.

9.) Check the wheels and tires for signs of recent removal and substitution. If the tires burned on the wheels, strands of wire should be left.

10.) To check the differential, drive shaft and transmis-

sion, jack up the rear wheels, put the car in gear and turn the wheels. This will divulge breaks or other mechanical damage that might have existed prior to the fire.

11.) Check the rear end for a loose or broken axle. This may establish a motive for setting the fire.

12.) Check the oil level in the crank case and determine whether it has been diluted. If it contains water, the car may have a broken block, establishing a motive for setting the fire.

13.) Check paint blisters on top of hood. This may show place where fire was greatest.

*Body, Running Boards, Floor Boards and Accessories.* The body of the car is usually so badly burned it affords little evidence. However, a consideration of the intensity of the heat will sometimes point the way to the fact that the car was burned by the use of some inflammable. If an excessive amount of inflammable is used, it will run through the floor of the car and burn underneath, causing an oil or gasoline soot to form on the underside of the car. Look for this soot.

Check the paint blisters on top of the hood. This may show the place where the fire was greatest. If the blistering does not correspond closely with the course of the fire, this is evidence of irregularity. The hood, for example, may have been removed or raised to permit air to get to the fire. Check the manner in which the hood shows the effect of the fire. If it was raised during the fire, the paint on the top panels may be blistered but will not be burned off where the two panels were touching each other. If the wind was blowing from the rear of the car toward the front, the paint should be burned almost the length of the hood, and the radiator core will be burned but there will not have been enough fire at the rear of the car to do much damage to the gasoline tank. If the paint on the hood is burned only an inch or so from the rear towards the front, it indicates that the wind was blowing from the front of the car toward the rear, in which case the gasoline tank may be badly damaged but the radiator will be intact.

Gasoline dropped on the running boards will be evidenced by heat blisters, which are not explainable from the normal progress of the fire. When dirt has been thrown on the car, presumably to put the fire out, look under the dirt to see at what stage of the fire it was thrown. If sand has been thrown on the car, check to see if the sand has been burned. Burned sand takes on a lighter, greyer appearance. Frequently, such efforts to put out the fire are made after it is out.

Were the tools or the spare tire in the car — if not, why not?

Check the underside of the floor boards, if they are not destroyed and if the owner says the flames came through them. Many times the owner will say that he first saw the fire under

the floor boards and a check will show that these have never been burned or that the fire was confined to the top side.

What accessories are missing and why? If the car was deliberately burned, these will generally have been removed.

If any defects in the condition of the car are determined to refute the owner's statement concerning its condition, consider securing a sworn statement or an affidavit for later use in possible court proceedings, or take such other steps as are necessary in your jurisdiction to secure the introduction, from a disinterested witness, of such important evidence.

Upon completing the foregoing inspection and arriving at the conclusion that the particular fire was of questionable origin, a careful and minute inspection of the scene of the fire should be made for the purpose of securing evidence as to its origin. Containers used to pour gasoline on the upholstery or match boxes may be found and later traced to the owner. Measurements might be taken at this time for later comparison with the owner's statement. In one actual case, by timing and measuring distances it was found that the owner had passed within thirty feet of his car with a hay mower less than three minutes before he looked around and found it to be a mass of flames. In the same case an unlighted match was found imbedded in some solder which had melted out of the rear deck lid. An investigation at the scene of the fire frequently discloses neighborhood witnesses who can give additional information.

### INTERROGATION OF CAR OWNER

After inspecting the salvage and taking notes on discrepancies found, it is suggested that the owner of the car be interviewed. If the owner of the car was not in possession at the time of the fire, it is suggested that the driver be interviewed prior to your contact with the owner. Although the first part of the investigation is important, the handling of these individuals is more important and also more difficult. There is now the human element to deal with and it is certain the owner or driver is not going to give evidence easily or submit to close examination passively.

Although each individual requires a different method of handling, the following general rules may be found effective:

- 1.) In the first interview, do not betray your suspicions of the party interviewed.
- 2.) Do not bluff, threaten, insinuate or bear down so that he gets on the defensive. Do not be "hard boiled." In preliminary interviews the experienced investigator frequently finds it desirable to act "dumb."
- 3.) Handle him easily and in a complimentary way. If guilty, he may display a characteristic arrogance.

4.) Encourage him to talk — let him lie all he wants to — “give him enough rope and he’ll hang himself.”

5.) Don’t ask pointed questions about facts which would be directly incriminating unless it becomes necessary. Properly framed questions will usually get the desired information without putting him on the defensive.<sup>2</sup>

The owner or driver should be interviewed in a private place where there will be no interruptions. It is essential that this phase of the work be privately conducted. Before taking the owner’s statement it is well to consider what is needed in order to establish your suspicions. While a motive is not an essential element in the crime of arson, the establishment of a motive will be of valuable assistance to you in constructing your case against the defendant. It is axiomatic that sufficient evidence must be developed to support criminal proceedings, and in securing such evidence absolute and close attention to detail will be of invaluable assistance. The more items of information secured from the person interviewed the better chance of trapping this witness at a later date. The following general form is suggested:

#### INFORMATION TO BE OBTAINED

Secure details of the purchase of the car, such as date, cost, trade in, down payment, amount of mortgage due, payments past due and name of salesman.

Determine the general condition of the car at the time of the fire, such as its defects, mileage, and the presence or absence of extra or usual equipment. Did the owner have any trouble with the car? Did he have any repairs made? If so, what, when and where? In these items the motive may be found. In many cases it will be found that the motive is not obvious and often is as difficult to obtain as the arson confession itself. There have been many instances where the motive has not been uncovered until after the confession was obtained. Motives fall under three main classifications: Dissatisfaction with the car, domestic or financial difficulties.

Dissatisfaction with the car includes:

1. Mechanical trouble.
2. Car oversold to the owner.
3. Car is a source of grief.
4. Car depreciated due to hard use.
5. Car owner’s belief that the insurance company will pay more for the car than it is worth.
6. Car not suited to the needs of the owner.

<sup>2</sup> For an excellent book on interrogation techniques see, “Lie Detection and Criminal Interrogation,” by Fred E. Inbau, Williams and Wilkins Co., Baltimore, Maryland (1942).

7. Owner has no further need for the car.

Domestic difficulties include:

1. Divorce pending.
2. Husband or wife uses car for extra marital activities.
3. Husband or wife disapproved of car's purchase.
4. Excessive drinking or gambling.

Financial difficulties include:

1. Owner becomes unemployed or income is reduced.
2. Crop failure or low price for commodities.
3. Sickness in family, hospital and doctor bills.
4. Judgment against owner.
5. Gambling debts.
6. Business reverses.
7. Other women making financial demands on owner.
8. Refusal of dealer to repurchase car when owner meets financial reverses.
9. The finance company demands full payment or surrender of the car, in which case the owner suspects he will get nothing for his equity.
10. Owner of car lives beyond his income.
11. Owner unable to sell his equity in car and desires to liquidate mortgage. If liquidation of the mortgage appears to be the motive, get the owner's record of past and present employment and financial status.

Start the owner's recitation of the details of the loss covering the period of several hours before the loss occurred and lead him through where he went, who he saw and what he did. His actions preceding the fire often indicate, when they are checked, that he intended to burn the car. If such were his intentions, he will attempt to conceal these movements and will resort to falsehoods. Determine where he usually buys gas. When, where and how much did he purchase before this fire?

When you get to the recitation of the fire itself, have him give definite details, for here the owner has to improvise his story from imagination. Secure every possible detail. Was the owner alone? If not, who was with him? Where were the occupants seated in the car and what were they doing? Did he smell or see the fire first? Usually one smells a fire before he sees it. Where did he see the fire first? Remember fire does not flash up through the floor boards. Floor mats are made of jute and rubber and will burn very slowly and only when severe heat or direct flames are applied to them.

Have him describe the progress of the fire. Remember most fires are discovered before much progress has been made. Likewise fire spreads slowly in a car (except on clipped mohair upholstery) and can usually be extinguished. Details immediately before and during the fire should be most painstaking.

ing. If the owner says the fire came through the floor boards, have him describe the exact location. Did they come through the brake pedal opening? The clutch pedal opening? When he got out, on which side did he get out? Did he leave the car door open? Did he shut off the motor? Did he raise the hood? If so, which side? Did he observe any fire under the hood? If so, where? What kind of flame? How large was the flame? If fire came from under the dash was it preceded by sparks? Was the motor running at the time? How long was the flame?

Secure the owner's actions after the fire — how long did he stay and how did he get home or back to town after the fire? Bear in mind that when an owner burns a car in an isolated spot he usually makes arrangements for return transportation.

Get the names and addresses of any witnesses. Get any facts that would lead to the identification of witnesses.

Other facts to be included in the statement may be indicated by data gathered from the inspection of the salvage and previous information.

As previously mentioned, consider the advisability of taking a sworn statement. When the salvage has been inspected and the owner's statement taken, it is time to determine the course of further investigation. What that course should be will be indicated by the evidence obtained in the first two steps. The investigator may need corroboration of evidence already obtained, refutation of the owner's alibi or statement concerning loss, additional physical facts or statements of additional witnesses.

The following actions should usually be taken in further investigations:

1. Interview other witnesses before the owner has a chance to instruct them what to say. What should be included in their statements is made obvious from the owner's statement and the evidence already developed. If possible take written statements, but be careful not to leave the impression that you are doubtful of the cause of the fire's origin.
2. Visit the scene of the fire a second time, if you have previously inspected it. Again look for physical facts which may have been overlooked on your first visit. Check for possible eye witnesses by visiting the fire scene at the time when the fire is alleged to have occurred. You may then encounter individuals who by reason of occupation or habits are accustomed to pass this location at this particular time.
3. Follow all clues through to a conclusion. Often the development of a small clue will break a case wide open. The success of many law enforcement officials is due to

- their attention to detail, their development of small clues and their perseverance in following them.
4. If the car was purchased as a used car, check the dealer's reconditioning records. If possible, find out why the former owner disposed of the car. Consider interviewing the former owner to learn the condition of the car when it was traded in.
  5. Check the terms of the down payment and get a copy of the sales invoice.
  6. Check the chattel mortgage records. If there is a second mortgage, check with local credit agencies, local banks and county records for this information.
  7. Check the owner's title to the car to see if he has an insurable interest. Does the owner actually own the car or is he holding a dummy title?
  8. Follow through on all leads with as little delay as possible.
  9. Interview the wrecker driver and get a statement from him. He very often can furnish good leads on conflicting information.
  10. Check the fire department records if the loss occurred in corporate limits.

The course to be followed when incriminating facts are found depends upon the extent of your findings. If you have tangible indication of arson and some corroboration of your evidence, the State Fire Marshal, County Attorney or other local enforcement officials primarily responsible for arson prosecutions should be consulted, the selection of the particular medium being dependent on results that might be contemplated from past experience to be most effective in the particular locality.

If the evidence is insufficient to prove your suspicions to the prosecutor but is sufficient to convince you, the investigator; that the fire is of incendiary origin, it would be a good idea to have a further interview with the owner. At this time you may, with certain limitations, be firm with this individual in cross examination to the end that a dishonest claimant may become involved in contradictions or furnish enough information to assist in uncovering the true facts. Care must be exercised in conferences with the owner not to make accusations, cast aspersions or threaten him in the presence of witnesses unless you are willing to assume possible civil liability for slander or defamation of character.

Should evidence of a postal violation be secured during the course of your investigation, be sure that mailing evidence is carefully preserved for subsequent reference to a postal inspection and presentation in court.

It is important that the investigator secure his first arson

confession. Success creates confidence and confidence, plus patience and hard work, combine to form the winning combination for the successful investigation of succeeding arson cases.

It would seem that all of the foregoing information constitutes detail too burdensome and technical for human memory and further that the time element reduces the suggested routine to an impractical point. However, when all of it is summed up, it resolves itself into a few general truths. Once committed to memory and then expanded by the use of reason, as individual cases dictate, a guide is obtained for the efficient investigation of automobile fires. A successful solution to many of these losses will follow as a natural result.

It can be safely said that if an investigator (1) develops capacity for detail, (2) reasons from effects to causes, (3) uses his inherent knowledge of human psychology to trap the owner, (4) perseveres in his efforts to prove his suspicions with facts and (5) follows each logically to a conclusion of the case and a confession or conviction, there will soon develop a new consciousness among the arson minded.

The investigator's value is directly dependent, first upon the extent to which he is equipped by mentality, training, and personality to conduct an arson investigation; and second, upon his patience, perseverance and determination when confronted with disappointment.

If he is lacking in the first, he fails in ability. If he is lacking in the second, he fails in his duty. If he fails in either, he fails as an investigator.