

United States Court of Appeals
FOR THE EIGHTH CIRCUIT

No. 07-3846

Jeannine Presley, Individually and
as Personal Representative of the
Estate of George Presley, Deceased;
Shelter Insurance Company, as
Subrogee of Jeannine Presley and
George Presley,

Appellants,

v.

Lakewood Engineering and
Manufacturing Company,

Appellee.

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* Appeal from the United States
* District Court for the
* Western District of Arkansas.
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Submitted: September 22, 2008
Filed: January 21, 2009

Before RILEY, HANSEN, and MELLOY, Circuit Judges.

RILEY, Circuit Judge.

Jeannine Presley (Jeannine), individually and as the personal representative of her late husband George Presley (George), and Shelter Insurance Company (Shelter) (collectively, plaintiffs) sued Lakewood Engineering and Manufacturing Company (Lakewood) on theories of negligence, breach of warranty, and strict products liability.

Plaintiffs alleged a space heater manufactured by Lakewood (Lakewood heater) caused a fire in the Presleys' home which resulted in property damage and personal injury. Upon motion by Lakewood, the district court¹ excluded the testimony of plaintiffs' causation expert, Raymond D. Arms (Arms), and granted Lakewood's motion for summary judgment. We affirm.

I. BACKGROUND

Because we review de novo the evidence and testimony involved in a motion for summary judgment in the light most favorable to the non-moving party, we cast the facts and reasonable inferences of this case in the light most favorable to plaintiffs.² See Hickerson v. Pride Mobility Prods. Corp., 470 F.3d 1252, 1256 (8th Cir. 2006).

A. The Fire

On the night of January 30, 2004, Jeannine was reading and George was watching television in the den of their house. Near George's chair was the Lakewood heater, an oil-filled space heater, model 7096, manufactured by Lakewood in 1998. George regularly used the Lakewood heater to warm his feet while sitting in his den chair. According to plaintiffs' expert Martin Gallaher (Gallaher), George said he used the Lakewood heater on the night of January 30, 2004. Around 10 o'clock, Jeannine went to bed. George remained in the den watching television, and went to bed around

¹The Honorable Jimm Larry Hendren, United States District Judge for the Western District of Arkansas.

²Because we cast the facts in the light most favorable to plaintiffs, our recitation of the facts includes the testimony of Arms given in his affidavit submitted to the district court opposing Lakewood's motion for summary judgment. In the district court, a dispute arose about the admissibility of some of the affidavit's information which related to testing, reports, and discovery responses submitted by plaintiffs, but stricken as untimely. The district court admitted the affidavit to the extent the information did not conflict with the court's ruling, and our recitation of the facts only includes the information deemed admissible by the district court.

midnight. According to Gallaher, in a June 20, 2005 letter to plaintiffs' counsel (Gallaher letter), George said it was possible he left the Lakewood heater on that night.

At around 3 o'clock, Jeannine arose to use the restroom and did not notice anything unusual in the house. At approximately 6 o'clock, Jeannine again awoke to use the restroom and, as she exited her bedroom, was engulfed in smoke. Jeannine immediately woke up George, and George ran to the den to investigate the fire. Jeannine saw fire coming from the kitchen of the house, called 911, and exited the house. George remained in the house.

The Fayetteville Fire Department responded to Jeannine's call and rescued George from the house. By that time, the fire had spread throughout the house. Jeannine and George were taken to the hospital where both were treated for smoke inhalation. Jeannine remained in the hospital for three days, and George was released from the hospital thirteen days after the fire. The Presleys' home experienced extensive damage from the fire.

B. Fire Investigation

After the fire, two fire inspectors from the Fayetteville Fire Department, Kyle Curry (Inspector Curry) and Dennis Ledbetter (Inspector Ledbetter), examined the Presleys' home and gathered evidence from the scene. In an attempt to identify the origin and cause of the fire, Inspector Curry and Inspector Ledbetter examined the burn and damage patterns on the interior and exterior of the home. The inspectors also gathered several items from around George's chair for examination by an electrical engineer. The items collected included the Lakewood heater, a carbon monoxide detector, several pieces of wiring, a floor lamp, candle remnants, and chair remnants. The inspectors also investigated possible electrical sources of the fire, noting there was an extension cord running from the area around George's chair to an outlet on the east wall of the den into which the Lakewood heater, the floor lamp, a cordless phone, and

a hand-held massager were plugged. These findings were documented in a report prepared by Inspector Curry.

After examining the fire scene, Inspector Curry and Inspector Ledbetter concluded the fire began in the den next to George's chair. However, Inspector Curry and Inspector Ledbetter could not specify an exact cause of the fire. Inspector Curry's report stated the cause of the fire was "undetermined at this time," with the evidence obtained at the scene to undergo "further evaluation."

C. Plaintiffs' Expert Arms

Plaintiffs employed Arms, a fire expert and electrical engineer, to investigate the cause of the fire and formulate a theory of fire causation. To guide his investigation and reasoning, Arms generally relied upon NFPA 921: Guide for Fire and Explosion Investigations (2001) (NFPA 921), other treatises and handbooks, the scientific method, and his knowledge of electrical engineering and related disciplines. Arms also developed his theories through his own observation and testing.

Within a few months after the fire, Arms personally observed the fire scene and the evidence collected by Inspector Curry. After observing the fire scene, Arms agreed with Inspector Curry that the fire started in the den near George's chair. Arms's observations also ruled out the cordless phone and hand-held massager as causes of the fire because these artifacts were not collected from the fire scene and were plugged into an extension cord outside the area of origin. Further, Arms's examination of the Lakewood heater identified acute damage at the double wire neutral connection which was unlike the damage to other connections in the heater.

In addition to his own observations, Arms had metallurgical testing performed on the evidence collected from the fire scene. The metallurgical testing included macrophotography, stereoscopy, SEM imagery, X-ray, and EDS analysis. Although Arms was not present for these tests, Arms reviewed the results and discovered (1)

the double neutral wire connection had experienced severe corrosion from extreme heat and chlorine emitted by the heated wire insulation; (2) the double neutral wire had been improperly crimped resulting in a loose connection and production of heat; (3) the extension cord into which the Lakewood heater was plugged and the male end of the Lakewood heater power cord demonstrated burn patterns suggesting the Lakewood heater was drawing electricity at the time of the fire; and (4) the extension cord remnants collected at the scene were not the cause of the fire because they demonstrated “arc through char.”

Following the metallurgical tests, Arms also analyzed flammability tests conducted by Clayton and Associates on components of an exemplar heater (C&A flammability tests). To conduct these tests, Arms was provided exemplar heaters. During the C&A flammability tests, samples of wire insulation and plastic from the exemplar heaters were suspended twelve inches above a cotton ball and subjected to a five second, 3/4 inch flame. If, after applying the flame, the component burned or ignited the cotton ball by dripping, the test was concluded. However, if initially there was no sustained combustion, the flame was applied up to three times for an additional five seconds each time. After these tests had been conducted, Arms discovered all of the components would burn to consumption after the heat from the flame was applied.

Based upon his observation and the results of the metallurgical and C&A flammability tests, Arms hypothesized a manufacturing defect in the Lakewood heater caused the fire. Arms’s theory is summarized as follows:

1. George left the Lakewood heater “on” when he went to bed on January 30, 2004;
2. While the Lakewood heater was left “on,” a high resistance wire connection in the control panel on the neutral double wire became hot due to a defective crimp on the connection;

3. The heat from the improperly crimped connection caused wire insulation in the heater control panel to emit flammable gases, or “off gas”;
4. The released gases were then ignited through arcs created by the normal operation of the thermostat in the control panel;
5. The ignited gases created a fire on the insulation of the power cord in the heater’s control panel;
6. The flame on the power cord insulation ignited the insulation on a second power cord in the control panel;
7. The fire then burned up the insulation of the second power cord to the heater’s switch;
8. The heater’s switch ignited and spread the fire to the plastic around the heater’s lifting handle above the switch;
9. The fire from the lifting handle ignited the front cover of the heater;
10. The front cover of the heater melted away from the screw affixing it to the heater, fell on the carpet in the den, and spread the fire to other combustibles in the room including the drapes, the carpet, and George’s chair;
11. As the fire spread, it attacked the extension cord where the Lakewood heater was plugged in and spread the fire down the extension cord to the south wall of the den; and
12. Finally, the fire spread to the east wall of the den, and eventually to other parts of the house.

In an affidavit submitted to the district court, Arms stated he put his theory “together in pieces.” Arms explained he used a “piecemeal” approach because it would be impossible to recreate the fire scene and his ignition scenario. Arms claimed the extended period of time over which the Presley fire scenario developed, and the high cost of recreating the fire scene, made it impractical to “sit down and develop a scenario where you actually heat up the wire with the resistance heating to

cause gassing, to cause ignition, and the fire's progress." Thus, Arms believed the fire events "could not be replicated in a laboratory experiment."

Arms testified "no additional scientific testing was required to prove" his theory, because each step of his theory was substantiated by either his observation and testing or established scientific principles. Arms believed the heater was "on" because the metallurgical testing revealed burn patterns on the extension cord and the male end of the Lakewood heater power cord which were indicative of electricity pull. Further, the Gallaher letter indicated George said he could have left the heater on. Arms also stated, "The metallurgical testing and the flammability testing support the scenario of off-gassing and ignition by a competent source, i.e., the parting arc of the thermostat, the ignition of the insulation gases produced by the heated insulation, and sustained burning of the insulation until the plastic of the switch housing, the thermostat knob, and outer control cover are ignited." Additionally, Arms cited six NFPA 921 sections which set forth scientific principles consistent with portions of his theory, and provided a study by John Shea (Shea study) which documented the ignition of PVC insulation by a parting arc. Finally, Arms stated his observations and metallurgical testing ruled out other causes for the fire and substantiated his theory of fire spread outside the heater. Based on these findings and principles, Arms asserted he was able to construct his theory "cognitively."

D. District Court Proceedings

After discovery, including Lakewood's deposition of Arms, Lakewood moved the district court to exclude Arms's testimony and grant Lakewood summary judgment. Lakewood argued Arms failed to test adequately or provide scientific support for his causation theory, and absent Arms's testimony, plaintiffs lacked evidence of causation for their claims. In response to the motion, the district court conducted a Daubert³ hearing on Arms's testimony and allowed oral arguments on

³Daubert v. Merrell Dow Pharm., Inc., 509 U.S. 579, 592–93 (1993).

the motion for summary judgment. During this hearing, Arms testified about his causation theory and methodology, and was subjected to examination by Lakewood, plaintiffs, and the district court. At the end of the hearing, the district court made preliminary remarks that the motion to exclude Arms's expert opinion and the motion for summary judgment would be granted.

On December 4, 2007, the district court issued an order granting both of Lakewood's motions. The district court (1) excluded Arms's expert opinion because Arms failed to apply reliably the standards of NFPA 921 to his theory, and (2) granted summary judgment because, without Arms's testimony, plaintiffs could not produce sufficient evidence that the Lakewood heater was either "on" or the cause of the fire. Plaintiffs now appeal.

II. DISCUSSION

Plaintiffs argue the district court erred in excluding Arms's testimony and in granting summary judgment to Lakewood. We review the exclusion of expert testimony for abuse of discretion. Pro Service Auto., L.L.C. v. Lenan Corp., 469 F.3d 1210, 1214 (8th Cir. 2006). "We review the district court's grant of summary judgment de novo, viewing the evidence and testimony in a light most favorable to the non-moving party and drawing all reasonable inferences of fact in that party's favor." Hickerson, 470 F.3d at 1256.

A. Exclusion of Arms's Expert Opinion

Under Federal Rule of Evidence 702, an expert opinion is admissible "if (1) the testimony is based upon sufficient facts or data, (2) the testimony is the product of reliable principles and methods, and (3) the witness has applied the principles and methods reliably to the facts of the case."

When determining the reliability of an expert's opinion, the district court examines the following four non-exclusive factors: (1) "whether it can be (and has

been) tested”; (2) “whether the theory or technique has been subjected to peer review and publication”; (3) “the known or potential rate of error”; and (4) “[the method’s] ‘general acceptance.’” Daubert, 509 U.S. at 593–94. The above listed factors are not exhaustive or limiting, and a court must use the factors as it deems fit to tailor an examination of the reliability of expert testimony to the facts of each case. Shuck v. CNH America, LLC, 498 F.3d 868, 874 (8th Cir. 2007) (citing Jaurequi v. Carter Mfg. Co., 173 F.3d 1076, 1083 (8th Cir. 1999)). In addition, the district court can weigh “whether the expertise was developed for litigation or naturally flowed from the expert’s research; whether the proposed expert ruled out other alternative explanations; and whether the proposed expert sufficiently connected the proposed testimony with the facts of the case.” Sappington v. Skyjack, Inc., 512 F.3d 440, 449 (8th Cir. 2007) (quoting Lauzon v. Senco Prods., Inc., 270 F.3d 681, 686–87 (8th Cir. 2001)). While weighing these factors, the district court must continue to function as a gatekeeper who “separates expert opinion evidence based on ‘good grounds’ from subjective speculation that masquerades as scientific knowledge.” Glastetter v. Novartis Pharm. Corp., 252 F.3d 986, 989 (8th Cir. 2001).

On appeal, plaintiffs argue the district court abused its discretion in excluding Arms’s opinion because the court solely relied upon an erroneous interpretation and application of Fireman’s Fund Ins. Co. v. Canon U.S.A., Inc., 394 F.3d 1054 (8th Cir. 2005). Plaintiffs maintain the district court interpreted Fireman’s Fund to require testing at every step in fire cases. Plaintiffs claim this court’s discussion in Hickerson and Shuck establish that testing is not the only way to provide reliability. Plaintiffs posit our cases allow observation and expertise to be bases for reliability. Thus, plaintiffs conclude the district court applied an overly rigid standard of reliability to Arms’s opinion, and when Arms’s opinion is analyzed under a less rigid standard, the district court abused its discretion by finding Arms’s opinion was unreliable and similar to the expert opinions in Fireman’s Fund.

Because interpretation and application of Fireman's Fund drives plaintiffs' appeal, a brief discussion of the opinion is necessary. In Fireman's Fund, experts who claimed to follow NFPA 921 proffered two alternative theories to support the conclusion that defendant's copier caused a fire. 394 F.3d at 1057–59. In their first theory, the experts hypothesized the copier's upper fixing heater assembly started on fire after the heater's control circuitry and thermal fuse safety device malfunctioned. Id. at 1058. The experts claimed this theory was substantiated by tests in which the heater control circuitry in an exemplar copier was bypassed and electrical current was applied directly to the copier's heating element to produce a thin brown scorch on paper affixed to the copier's heating element. Id. at 1058. On appeal, our court affirmed the district court's exclusion of the expert opinion. The panel stated the experts "did not apply [NFPA 921] reliably to the facts of the case" because (1) the tests did not explain any malfunction sufficient to produce an open flame, (2) the tests did not explain or replicate a specific malfunction, and (3) the theory was inconsistent with evidence from the fire scene that the heating element was not receiving electricity at the time of the fire. Id. at 1058–59.

In the second theory, the experts opined the copier's power supply board caused the fire. Id. at 1059. The experts based this theory on the following three factors: burn patterns in the copier, new evidence obtained from two other separate incidents in which the power supply board emitted sparks and a flame, and a test which created sparks after DC voltage was applied to similar AC voltage components on the power supply board. Id. at 1059. On appeal, our court determined it was not an abuse of discretion for the district court to find this theory was inconsistent with and did not reliably apply the standards of NFPA 921, because (1) the experts failed to specify a specific defect, (2) the new theory contradicted earlier explanations that the burn patterns proved the upper fixing heater caught on fire, and (3) the experts did not explain how DC voltage would get to AC voltage components. Id. at 1059–60.

We agree with plaintiffs' contention that Fireman's Fund does not establish a bright-line rule for testing in fire cases. See Shuck, 498 F.3d at 875 n.3. In certain circumstances, a fire expert can offer a reliable opinion based upon specific observation and expertise. See id. at 874–75 (concluding expert opinion that engine failure caused a fire was reliable when based upon observation and expertise, because experts for both plaintiff and defendant relied on this methodology and the engine components were too damaged to be tested); Hickerson, 470 F.3d at 1256–58 (holding a fire expert's method reliable when he examined burn and damage patterns, considered testimony, and identified a point of origin).

Although we agree Fireman's Fund does not mandate testing in all fire cases, plaintiffs' assertion the district court improperly interpreted Fireman's Fund to require testing is wrong. At the end of the Daubert hearing, the district court made preliminary remarks regarding its exclusion of Arms's opinion. During these remarks, the court summarized the facts, reasoning, and holding of Fireman's Fund, and expressed the belief that Fireman's Fund discredited Arms's testimony regarding the impossibility of testing in plaintiffs' case. The district court declared Arms's lack of testing was "troubl[ing] as to whether there's any scientifically reliable basis for any opinions that he might give." The court noted Fireman's Fund served as a basis for being concerned with Arms's application of NFPA 921. The district court echoed these preliminary remarks in its order, finding:

Similar to the facts of Fireman's Fund [], Arms purported to follow the guidelines and standards established by [NFPA 921]. However, although "NFPA 921 requires that hypotheses of fire origin must be carefully examined against empirical data obtained from fire scene analysis and appropriate testing," Arms "did not apply this standard reliably to the facts of this case." Arms did not perform testing to prove his ignition scenario; and, this Court is troubled by Arms' testimony that such testing would be impossible. Additionally, Arms failed to effectively point to any scientific studies or research to support his ignition scenario. Finally, this Court finds that Arms failed to exclude

the other possible ignition sources present at the fire origin including extension cords, a cordless phone, floor lamp, and hand-help [sic] massager. (quoting Fireman's Fund, 394 F.3d at 1057–58).

The language of the district court, both in its preliminary remarks and its order, gives no indication the district court interpreted Fireman's Fund to require testing. Rather, the district court stated it found Fireman's Fund to be a comparable basis for the court's reliability determination and analogous to the facts of plaintiffs' case. Although the district court noted Arms's testimony regarding his lack of testing, mere reference to this testimony does not establish the district court was requiring Arms to test. Instead, the court properly weighed Arms's lack of testing in assessing the reliability of Arms's opinions. See Daubert, 509 U.S. at 593 (stating, a "key question" to theory reliability is "whether it can be (and has been) tested"). Thus, the district court did not abuse its discretion or err in interpreting Fireman's Fund.

Similarly, the district court did not abuse its discretion when it found Arms, like the experts in Fireman's Fund, failed to apply the standards of NFPA 921 reliably to the facts of this case. NFPA 921 requires appropriate data analysis and testing. See Fireman's Fund, 394 F.3d at 1058. Further, NFPA 921 suggests that fire theories involving an appliance be substantiated by testing of exemplar appliances. Arms failed to follow these aspects of the standards he purported to follow.

Arms testified he did not perform, and was not privy to, any testing showing an improperly crimped connection would produce conditions for ignition. See Daubert, 509 U.S. at 593 (holding testing is an important inquiry for theory reliability). Arms also testified he did not test either the amount or rate of gas produced by heated wire insulation from the exemplar heaters. Likewise, Arms failed to provide a scientific study which supported his ignition theory. The Shea study cited by Arms was performed on different wiring than the wiring involved in plaintiffs' case, and Shea stated the type of wiring in plaintiffs' case would be more difficult to ignite than the wiring tested in Shea's study. See Daubert, 509 U.S. at

594 (stating peer review is a “consideration in assessing the scientific validity of a particular technique or methodology on which an opinion is premised”). The Shea study also conflicted with Arms’s testimony regarding the possibility of testing his scenario of off-gassing and ignition by a parting arc. Arms said this theory was substantiated by similar testing in the Shea study, but Arms also said this type of testing would be impossible in plaintiffs’ case.

Finally, Arms’s fire spread theory was inconsistent with NFPA 921. Arms testified his theory of fire spread inside the heater involved no specific testing. However, Arms said it would be possible to ignite the first power cord in an exemplar heater to determine whether the fire would travel as he theorized. In addition, Arms based his theory of fire spread outside the heater on general observations regarding proximity of the heater to other combustibles. No evidence in the record indicates Arms used an exemplar heater to start the outside cover of the heater on fire to determine whether the cover would melt and spread to another combustible as Arms theorized. Further, the record is devoid of any reference to a scientific study substantiating Arms’s theory of fire spread either inside or outside the heater.

Although plaintiffs contend Arms’s observations, the metallurgical tests, the C&A flammability tests, and the references to NFPA 921 sections are adequate bases for reliability, it was not an abuse of discretion for the district court to find Arms’s theory required too great an inferential leap from these bases. Arms’s observations and the references to NFPA 921 sections were applications of general observations and general science which led to “vague theorizing based upon general principles.” Pro Service, 469 F.3d at 1216. Our court has previously held opinions formulated merely upon general observations of the evidence and general scientific principles were unreliable. See id. at 1215–16 (deciding an expert opinion was inadmissible when the expert “provided no testing or other engineering analysis to support his causation opinion”); Weisgram v. Marley Co., 169 F.3d 514, 519 (8th Cir. 1999) aff’d 528 U.S. 440 (2000) (concluding an expert opinion was inadmissible because

the opinion was based on general observations regarding the origin of the fire rather than specific evidence in the record substantiating the chain of events in the expert's fire causation theory).

Further, the metallurgical tests and C&A flammability tests were not adequate bases for Arms's theory. Testing, which is actually performed, must be appropriate and must analytically prove the expert's hypothesis. See Shuck, 498 F.3d at 875 n.3 (stating, "testing, if performed, must be appropriate in the circumstances and must actually prove what the experts claim it proves"); Fireman's Fund, 394 F.3d at 1058–60 (holding expert testimony unreliable where the tests were inconsistent with the theory proffered). The metallurgical tests simply established corrosion and arc through char, and the C&A flammability tests merely applied a flame to small portions of exemplar heater components. These tests did not establish ignition or spread. The ignition and spread in Arms's theory were the product of Arms's speculation based upon his expertise analyzing the basic results of the metallurgical tests and the C&A flammability tests. An expert generally cannot formulate a theory through supposition based on his or her own expertise. See General Elec. Co. v. Joiner, 522 U.S. 136, 146 (1997) (stating, neither "Daubert [n]or the Federal Rules of Evidence requires a district court to admit opinion evidence that is connected to existing data only by the *ipse dixit* of the expert" because "[a] court may conclude that there is simply too great an analytical gap between the data and the opinion proffered"). The general bases provided by Arms for his theories did not match the complexity of the theories, and the district court did not abuse its considerable discretion in excluding Arms's expert testimony.

B. Summary Judgment

In their reply brief, plaintiffs concede summary judgment was appropriate if Arms's testimony is excluded. We agree. Summary judgment is proper when "the pleadings, the discovery and disclosure materials on file, and any affidavits show that there is no genuine issue as to any material fact and that the movant is entitled to judgment as a matter of law." Fed. R. Civ. P. 56(c). Without Arms's testimony, plaintiffs cannot create a genuine issue of material fact regarding whether the Lakewood heater caused the fire. Because we find the district court did not abuse its discretion in excluding Arms's opinions, the district court's grant of summary judgment was proper.

III. CONCLUSION

For the foregoing reasons, the district court is affirmed.
