

# **Fire Safety**



**for Jugglers  
& Spinners**

**Fourth Edition**

**Eric Bagai**

"How to disarm the M-1 Antipersonnel Mine.  
1. Cut the blue wire. But first, . . ."

As read to Cpl. Walter "Radar" O'Reilly  
4077 M\*A\*S\*H, Korea

***Fire Safety for Jugglers & Spinners***  
**Fourth Edition**

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## Introduction

**Jugglers and spinners tend to believe** that adding fire to a prop is a straightforward matter of learning a few more techniques and being "careful." But if you don't know what to be careful about, you can be badly hurt or hurt someone.

**Spinners sometimes believe** that fire is their friend, or that they have a special relationship with it. Fire has no friends. Only constant attention to the right things will keep you from harm. This pamphlet shows what you should pay attention to, and why.

**You won't learn "how to do it" here.** This is a summary of the risks of fireplay, what's dangerous and why, and how best to keep yourself and others from harm when you spin or juggle fire. You will have to decide for yourself exactly what kinds and degrees of risk you are willing to take. Learn your technique and performance skills directly from an experienced teacher who is right there to put you out or stop you from making serious errors.

This is not to say that you can't or shouldn't learn fireplay technique from books, videos, or Web sites. But what you learn there will be filtered through the author's ability to teach clearly and your ability to understand perfectly. Print and pictures can't give you essential feedback or make the demands of a live teacher. A book can't tell you that you're not ready.

If you are going to play with fire, read everything you can find, trust nothing and no one completely, and find the best teacher you can.

## **Waiver of Liability**

What follows is the result of more than fifteen years of research, correspondence, and interviews. But it is still simply my best guess, and I cannot guarantee the accuracy, reliability, or usefulness of any of it. Despite my very best efforts I may have made errors. Deadly errors. Please assume that I have and question everything.

My only advice is, don't play with fire.

This material is not warranted to serve any purpose whatsoever, and any inference made on the basis of your understanding of it is entirely your own responsibility.

E.B., May 2008

## What You Must Have

**1. Spotters.** When your shoes are on fire or you are panicked because of intense pain, you need someone who is not afraid of fire, who knows how to use the towel and extinguisher (see below), and who won't hurt you more than the fire will. Another fireplayer is your best spotter, and you can learn much by spotting for others. Spotters should be invisible, yet close enough to help immediately.

You'll need one spotter for every three fire players, but an extra spotter or so never hurts. Larger groups will need extra spotters as well as security to guard the fuel depot and to control the crowd.

The responsibility of the spotter is to protect the audience, then the venue, and then the performer.

**2. Towels & Buckets.** Spotters use a damp 100% cotton towel or a dry Duvetyne towel (or both) to put out wicks and crush any remaining embers when a player is finished. Either towel can smother the flames if your hair or clothes catch fire, but a damp towel will also help cool the burns.

Cotton towels should be white and washed regularly to get rid of mold and soot. Duvetyne should never be washed or dampened because water removes the fire retardant, but it should be sun-dried and regularly brushed clean of soot.

Use a five-gallon bucket, a quarter-full of clean water, to cool burns and to dampen your cotton towels. Have at least one towel for each performer. The spotter kneels just outside the performance area and spreads the towel on the ground, waiting until needed.

**3. Fire Extinguishers.** If anything else catches fire, or if the towel isn't big enough to cover the flame, aim the fire extinguisher at the base of the flames and sweep the area. Never aim an extinguisher at or near anyone's face.

CO<sub>2</sub> extinguishers are safest and best, but they are large, heavy, and relatively expensive to buy and recharge.

Dry-powder ABC extinguishers may contain caustic or toxic compounds and so shouldn't be used on people. If they are, send the extinguisher with the victim so that Emergency Medical Technicians will know how to treat the burns. After *any* use a dry-powder extinguisher will rapidly lose pressure and must be replaced or recharged.

Water-air extinguishers are most useful out-of-doors. Be very aware of electrical outlets and cables when using them. Water does nothing to stop electrical, chemical, or fuel fires, and may help to spread them. Add a teaspoonful of automobile antifreeze before pressurizing so that the water doesn't freeze and rupture the tank in winter.

Only ABC-rated extinguishers put out all types of fires, and only when used according to directions. Kitty litter is useful to absorb large spills, indoors or out, but then becomes a fire hazard itself and so must be disposed of carefully.

**4. Fuel Containers.** Local fire regulations usually require that fuel be stored in its original container. You will also need a small but stable container for dipping and soaking wicks. A clean paint can, with lid and handle, is perfect for this purpose. Keep the lid on the dip can when you're not soaking or dipping wicks, and use only as much fuel as necessary. When you are done performing, pour any re-remaining fuel back into the original container.

Never use glass containers. Plastic containers must be rated to hold fuel or they will slowly leak and turn your prop bag or your car into a large torch. Wide-mouthed, fuel-rated Nalgene bottles are often favored by jugglers because they fit their torch heads nicely; however they are very tippy. All containers should be strong enough to withstand being kicked or stomped on without bursting or blowing off their caps. Containers with self-closing lids and vapor-recovery systems are safest.

**5. Fire-resistant clothing.** Nothing is fireproof. Sometimes a fireman's used Nomex™ or Kevlar™ approach suit, or a racing driver's old suit is available for a few bucks. The next safest clothing is leather (unwaxed), pure wool, untreated 100% cotton, and your own skin, in about that order. Jeans and a T-shirt (both 100% cotton) are common fireplay garb and are relatively safe.

A few vendors make costumes of Duvetyne or other cloth treated with fire retardant—they must always be dry-cleaned, never washed, or they lose their fire-proofiness.

Plastics and artificial fibers (rayon, nylon, Dacron, etc.) catch fire almost instantly and will melt and then form hard nodules under your skin. Natural materials (cotton, leather, wool, silk) will eventually be absorbed.

Don't wear loose clothing, wide skirts, bloused sleeves or fringe. If your hair is long, tie it back or wear a cap or do-rag. Don't use hair spray, body oil, lotion, or cologne before performing. If you use contact lenses, wear safety glasses over them.

**6. Wipe towel.** A dry, colored towel (to distinguish it from your damp white towel) is useful for wiping up fuel spills on yourself, your clothing, the floor, or on anything where the paint or finish might be damaged. Do not use your damp white towels for this purpose.

Air-dry and wash (or dispose of) your wipe towel after each fire session—a fuel-sodden towel can ignite spontaneously, without the presence of fire.

**7. Fire starters.** At fire jams where many spinners and jugglers gather, a single open-flame candle or oil lamp is commonly provided for everyone's use.

Elsewhere, book matches and cigarette lighters are standard equipment. But don't put that plastic lighter in your pocket after lighting up. If your pants catch fire the lighter may explode, as a number of one-legged ex-firemen know.

Use matches rather than a lighter if you have to hold the flame above a prop's wick. A lighter enveloped in flame can blow up, which is why you often find the curious warning: "Do not use near fire" on disposable butane lighters. The best practice is to never light anything from above.

**8. Airtight metal container.** A metal tool chest or ammo box will store your fire toys safely and will keep them from spreading soot over everything. Cylindrical metal food-storage canisters will hold fireballs, diabolos, and coiled jump-ropes nicely. If they are truly airtight, these containers can also be used to extinguish or isolate flames in an emergency. It's worth experimenting with.

**9. Travel light.** Carry only as much fuel with you as you plan to use, and never keep fuel in the passenger compartment of a vehicle: in an accident it will spray over everything and may ignite. For long trips, don't take any fuel with you—buy it when you arrive.

All public transportation forbids fuel and fuel additives, even in checked luggage. Bagging your props (especially the wicks) in clear plastic, sealing them tightly, and packing promotional fliers and pictures of your props in use will usually get them through checked luggage.

Assume that any carry-on props will be confiscated. Even beanbags. And don't use capped PVC pipe to protect firewands, fingers, or staff—it looks just like a pipe bomb.

Expect airline inspections to get more strict as the “terrorist threat” remains unresolved. Shipping your props ahead of time can prevent some or all of the hassle.

## **10. Analyze Your Surroundings**

**a. Audience separation.** Require at least ten feet of open space between performers and audience, depending on the tools used (released, in-hand, whip vs fire fingers, etc.) and the nature of the audience (seated, undirected traffic, inebriated, unsupervised children, etc.) Unruly audiences may require barriers and extra security. Spotters may set up in this area but other security should work outside it.

**b. Fuel and spin-off areas** should be ten feet or more away from the performance area and the audience, preferably separated from both by a solid barrier or wall. The path from stage to fuel area must be kept clear of all non-performer traffic.

**c. Fire areas** should be free of flammable draperies, decorations, vegetation, and dust. Lighting, rigging, hanging flats, and ceiling fixtures should be higher than the flame or heat can reach. Check the fire alarms for type and sensitivity, and know how the heating and air conditioning system affects and is affected by your fire performance.

**d. At public spin jams** and in the absence of trained security, performers should be prepared to stop all action on cue if the performance space is repeatedly violated. Similarly, if a clearly unsafe performer cannot be persuaded to leave the stage, all spotters should be prepared to pick up their towels, buckets, and extinguishers on cue, and leave the performance area until it is safe to continue. You are there to perform, not to argue with people or needlessly put yourself in danger. Your only power is to withhold service.

## LIQUID FUEL

**ALL FUELS** are most safely stored and transported in their original containers. Intermediate containers (dip cans, spit bottles) should only be used for holding small amounts of fuel before charging wicks.

**KEROSENE** (called liquid paraffin in some countries) is preferred by many because of its high flash point. That is, it's hard to light. But rapid changes in barometric pressure or the presence of dust, feathers, or even wood chips can induce fumes from kerosene and make its flash point much lower.

Pure kerosene is not particularly toxic. If you splash it on

yourself it should be wiped promptly or it may dehydrate your skin and give you a rash. Moisturizer may help, but check it for flammability. If kerosene gets in your eyes, rinse with water for several minutes. If you swallow some, drink a glass of water or milk to reduce indigestion, gas, and diarrhea—but **do not induce vomiting** because of the possibility of accidentally inhaling kerosene.

Few brands of kerosene are 100% pure, with no additives. Lamplighter brand Ultrapure lamp oil is not “pure” kerosene, but it is closer to “pure” than any others we know.

Almost all of the several hundred other brands and types of kerosene (aviation fuel, coal oil, heating oil, lamp oil, fuel oil, etc.) contain a variety of variously toxic ingredients, principally benzene and naphtha. These are absorbed through the skin and mucous membranes, and accumulate in the liver and kidneys. Some ingredients directly attack the corneas.

What this means is that all types of kerosene, including Biodiesel, K1, and fuel oil, should be treated as if they are highly toxic. If the Manufacturers Safety Data Sheet (MSDS) for a particular brand of kerosene says that it is 100% pure, or food-grade, then you might trust it.

In addition to the risk of poisoning, you can get chemical or mechanical pneumonia from inhaling kerosene as a liquid, vapor, or mist. This is similar to regular pneumonia in that your lungs' ability to absorb oxygen is severely impaired. The molecular size of kerosene matches the size of the alveoli that transfer oxygen to the lungs from the blood, and plugs them up like a cork. This makes breathing difficult or impossible.

Scented and unscented lamp oil is kerosene without the bad smell. But contrary to popular belief, the additives that make it smell nice can also make it more poisonous. The exception again appears to be Lamplighter's Ultrapure brand lamp oil, though for liability reasons the manufacturer won't recommend its use for fireplay.

Because it produces more smoke, many performers use lamp oil outdoors and Coleman fuel indoors. Some fire departments even require this.

**COLEMAN CAMP FUEL**, lighter fluid, white gas, and other brands of camp fuel, all consist mostly of naphtha, with various additives to control smell and appearance, and to inhibit rust. These are preferred by many jugglers and spinners because they are not as smoky or smelly as kerosene, and they light quickly.

Naphtha has a much lower flash point than kerosene, so that it lights immediately on contact with fire. You should completely extinguish all flames and smoldering and wait at least thirty seconds before refueling your wicks when using naphtha as your fuel.

Naphtha is also highly toxic, principally because of its large proportion of benzene. Though Coleman does not induce pneumonia, it can damage the sphincter that controls acid reflux, which can eventually make singing or public speaking difficult.

Some performers feel that despite the greater toxicity, Coleman is safer than kerosene because it is not as affected by changes in barometric pressure or temperature, and is therefore more predictable in actual use.

**CHARCOAL STARTER** is a mix of kerosene and naphtha and is illegal in some states. Some burners prefer a similar mixture of Coleman (naphtha) and kerosene to make a brighter flame with less smoke and stink than kerosene, but a “safer” fuel than pure Coleman because of its slightly higher flash point. Others think this just gives Coleman fuel the unreliability of kerosene.

**GASOLINE, PAINT THINNER, AIRPLANE FUEL,** and similar highly volatile fuels are extremely toxic, have very low flash points, and produce large amounts of fumes which are also volatile. The fuel vapor remaining in a one-gallon can that has been emptied of gasoline can ignite with the force of a stick of dynamite.

When it is very hot and humid, gasoline fumes will not readily disperse and may be ignited as much as a half hour after all the original products are capped and stored.

Anyone using these fuels or pretending to use these fuels in any public performance should be stopped. If that is not possible, they should be reported to the fire marshal immediately.

**ETHANOL**, usually produced by fermentation, is the basic ingredient in beer, wine, and liquors. (Not to be confused with methanol, which is poisonous.) Beverages with an alcohol content of 70% (140 proof) or higher are volatile enough to be used with fire props.

Fire-eaters and fire-breathers sometimes use rum or 150 proof or 190 proof Everclear. The problem with this is that between the fumes and what you absorb from doing a few blasts of fire even without swallowing any can get you quite

drunk. That's not a reasonable condition to be in if you are blowing or eating fire. And blowbacks are much more common with ethanol than with lamp oil. Spinners sometimes prefer >90% ethanol for indoor work, but the same cautions apply.

**ISOPROPYL ALCOHOL (IPA).** At 70% strength the flame is relatively cool and almost invisible. IPA at 95-100% can be purchased from printers' supply stores and some drugstores. Its flame is quite hot and bright, and may get you or your audience nauseated from the fumes. It's also mildly poisonous.

If you leave the cap off for any length of time, IPA will suck the moisture from the surrounding air as it evaporates, so that it becomes 30-50% water.

**ANTIDOTES TO FUEL POISONING.** There aren't any. Let me say that again: *there are no antidotes to fuel poisoning.* Some believe that drinking milk, olive oil, butter, or other liquids will line the stomach or the skin on the inside of the mouth, and prevent poisoning. Not only is this untrue, but also many oils, including olive oil and butter, will actually increase your absorption of fuel and toxins.

Home and “natural” remedies such as thistle, milkweed, Tums, and Prilosec, appear to help but in fact only prevent the indigestion, gas, and diarrhea that often result from fire-eating or -breathing. *They will not prevent poisoning, and may enhance it.*

It may take weeks, months, or years for your body to get rid of the effects of fuel poisoning or pneumonia.

## DRY FUEL

The two main types are **LYCOPodium POWDER** and **CUSTARD POWDER**, and they are used for fire-breathing. Some magicians also use lycopodium for small flashes and fire effects. Lycopodium is the spore of Club Moss, and resembles a fine yellow powder. Instant-custard powder (also powdered sugar) is the stuff you find in the grocery store. Either can be blown into a cloud and then lit into a ball of flame.

The usual procedure with powder is to hold a small amount in a short tube or straw, blow through it, and then light the cloud of powder. The MSDS on lycopodium is not very informative: it kills frogs when ingested at 6 gm/kg of body weight—the equivalent for a 150-pound human is nine pounds of lycopodium. That much of anything is toxic. As with all fireplay, the best way to learn to blow powder is directly from an expert.

The hazards of using powder are much less severe than those of liquid fuel. I haven't heard of any serious physical or medical injuries. I *have* heard reports of asthma attacks in people with pre-existing conditions.

Prolonged breathing of coal dust gets you black lung disease, and prolonged breathing of bakery flour gets you white lung disease, both of which are debilitating or fatal. And I have too much imagination (and I've read too much science fiction) to be comfortable with putting any amount of a vegetable spore into my lungs.

Lycopodium can be purchased through magic supply stores as "Dragon's Breath" and other fanciful brand names, and in some pharmacies.

Magicians commonly use **FLASH PAPER**, **FLASH COTTON**, or **FLASH STRING** to produce bright flashes of fire. These are all forms of nitrocellulose and are extremely dangerous. When not in use, all flash products should be stored in water in a sealed plastic bag, and locked in a fireproof box. Air-dry only what you are going to use within 24 hours.

Making your own flash stuff is like making your own dynamite, and a number of fingerless ex-magicians can tell you all about it.

Of course you can't juggle or spin flash paper, but you can fire it out of a hand cannon or from an electronically controlled pyro cannon or flash pot, all of which are available at most magic shops.

**FURTHER FUEL INFORMATION.** For Manufacturer's Safety Data Sheets (MSDS), ask your retailer, contact the manufacturer, see <http://hazard.com/MSDS/>, or see [www.nafaa.org/msds](http://www.nafaa.org/msds).

## WICK

Almost all fire props need wick, and these days all wick for fireplay is made of a para- and meta-aramid fibers with a cotton or fiber glass core, woven in various widths and thicknesses, as cloth, webbing, or rope.

When Dupont invented aramid fiber, they patented it as Kevlar™, Nomex™, and other essentially fireproof materials. These patents have expired and many other companies now make comparable material. Dupont still controls the brand

names, and they get fussy when other manufacturers call their aramids Kevlar or Nomex. Still, almost all burners and prop vendors call their wick Kevlar™.

The differences, if any, between aramids made by Dupont and by other companies are in the weave and the proportion of reinforcements and strengtheners blended with the aramid fiber. The most common reinforcement is fiberglass, though cotton is often preferred for use with ethanol and IPA.

Wick holds fuel in suspension until it is released at the surface as a vapor and consumed by flame. The wick itself is not burned, though it will char, clog with soot, fray, and unravel until it needs to be replaced. Fraying and unraveling happens more readily when wick is flexed, so the more tightly the wick is wrapped around or bound to the prop, the longer it will last. Similarly, if the wick is often hit or brushed against anything, it will gradually lose its integrity and come apart.

Pure woven fiberglass wick stays white if you use only Coleman or white gas, but it will irritate your skin if touched. It's also very fragile and doesn't last as long.

Some believe that web belting or rags are an acceptable substitute for aramid wick. They are wrong. Web belting and rags begin disintegrating immediately after being lit, and will shower you and your audience with bits of flaming cotton or blobs of molten plastic.

## WICK + FUEL

To fuel your wicks, put them in the bottom of your dip can, pour enough fuel into it to cover your wicks, and close the original fuel container.

When you remove your wicks, put the lid back on the dip can. Before leaving, pour any remaining fuel back into the original container, and cap it, and cap your dip can. Never move an uncapped fuel container. Leaving a fuel container or dip can open while performing is taking a large risk for no good reason.

**Most fire accidents involve open containers of fuel.**

## SPINNING OFF EXCESS FUEL

Always remove the excess fuel from your wicks. If you don't, when you light up and spin a stream of fire will fly off your props, perhaps onto other performers or into the audience. This is not only bad manners and dangerous, it will get you banned from some fire jams.

Move away from the fuel container and dip can and get rid of the excess fuel by swinging or spinning the unlit prop. This is most safely done by covering the wicks with a plastic baggie or plastic bottle (see <http://nafaa.pbwiki.com/SpinOut/Tips>) and shaking or spinning the prop, then removing the bags or bottles and pouring the excess fuel back into the dip can.

Spinning off the fuel into the air will cover you and everything else in the area with a fine film of fuel. This will eventually evaporate, but a busy evening at a fire jam can turn your clothes into potential torches.

## PUTTING IT OUT

Experienced spinners prefer to have a spotter put out their torches for them using a damp (not wet) towel or a treated cloth like Duvetyne. Spotters kneel or squat just outside the burn area, with their towels spread out before them. When done spinning, the performer puts their still-lit props on the towel they prefer, and the spotter folds the towel over it and briefly squeezes each wick to crush any remaining embers.

More commonly, amateur spinners will continue until the fuel in their wick is used up and the flame is out, or wait until their wicks are almost out of fuel and blow them out. This is not the best theater, and allowing wicks to continue to smolder will wear them out rather quickly.

## PROPS

### and a bit of history

**BATON** is an art form and competitive sport associated with high school and college sports. Like any complex physical skill, it can be addictive.

**DEVIL STICK**, **DIABOLO** and **METEORS** are some of the many object-manipulation skills developed by the Chinese around 1000 C.E. The name Diabolo has no diabolic associations, and simply means “to toss across.” Diabolo has had several periods of popularity in Europe amounting almost to mania. Meteors were revived from obscurity in the 1990s by the American juggler, Rhys Thomas. The name Devil Stick comes from the days when all forms of magic and juggling tricks were suspected of being the Devil's work. So watch out.

**FIRE STAFF** and **FIRE POI** originated in Polynesia, though staff without fire is used worldwide.

**CLUB-SWINGING** was invented in India, brought to Europe by the British, was an Olympic event for a brief period, and became associated with fire in American vaudeville.

**FIRE SWORDS, FIRE WHIP, FIRE WINGS, FIRE FINGERS, FIRE FLOGS, etc.**, are the product of medieval re-enactment, fantasy enactment, fetish drama, and 21<sup>st</sup> century showmanship.

**FIRE HOOP** comes directly from the hula hoop, but borrows heavily from Mediterranean belly dancing.

**FIRE JUMP ROPE** is an extension of regular jump rope, which is now a competitive sport as well as a children's game.

American fireplay comes largely from Carny, Circus, and Vaudeville traditions as well as from the 1960's revival of hobby juggling. The sudden popularity of poi spinning is responsible for the adoption of modern fireplay in all its forms. The Internet, international juggling festivals, and transnational events such as Burning Man have made fire-play an international phenomenon.

A prop should always be learned and mastered dry, without fire; and every fire routine should be set and learned to perfection before fire is added.

## **CHOOSING PROPS**

In choosing or making your fireplay equipment, keep in mind that every connection point is also a potential point of failure, and heat makes metal weaker. Poi and Meteors develop a high rate of momentum, and if any part fails, the flaming wick can fly quite a long distance.

Each fire toy uses a different amount and kind of wick. Look

for industrial strength ratings and specifications. Props that have unwelded chain-link, aluminum ball-chain, split rings, snap-hooks, nonlockable carabiners, or plastic parts cannot be used safely. Wick attached by wire is apt to fly off. Hand-held spinning props that develop torque require a swivel to prevent metal fatigue, joint failure, and excessive wear on handles.

Check your fire props before each use. All bolts, screws, and nuts should be tightened and anchored with a drop of red Loctite or the equivalent. Test everything with a solid yank before and after each performance.

Every year somebody discovers that they can dip FUZZY TENNIS BALLS in fuel, light them, and juggle for a few seconds. In a few more seconds they discover that the rubber has melted onto their hands or gloves, or that the balls have popped, and splattered hot rubber all over themselves.

I have seen a single blister from a flaming tennis ball that covered an entire hand, front and back, and welded all the fingers together.

## **CONTACT FIRE**

**FIRE EATING** consists of using one or more flaming wands to transfer flames to the tongue and then light another wand with them, extinguish a wand, transfer small amounts of lighted fuel to the skin, hold a lighted wand in the mouth, and so on. Correct breathing technique is not obvious, but is essential to minimize the inevitable burns you will suffer.

Fire eating exposes your mouth and lips to a significant amount of fuel, so the use of anything other than the purest kerosene or grain alcohol will quickly result in poisoning. Even

though most performers know the dangers, Coleman fuel is often preferred.

Fire-eating wands are usually made by the performer and typically consist of welding rod, with aramid string wick or surgical cotton tightly wrapped around one or both ends for about two inches. This wick is then fixed in place by whipping, sewing with Kevlar thread, sealing with white glue, or using several of the above methods.

Wands should never be used for toss juggling, because they are not designed for that purpose and the wicks fly off quite easily.

Many fire eaters keep a small bowl of fuel on stage to recharge their wands during performance. These bowls should be of metal and have a tight-fitting or self-closing cover. Never move the bowl without first covering it.

**FIRE-SPITTING, -BLOWING, or -BREATHING** consists of putting a small quantity of fuel in your mouth (usually less than an ounce), spraying a fine mist into the air, and lighting that mist into a cloud of flame. The necessary technique is very specific, and any errors can be fatal or permanently damaging.

The danger to yourself and your audience in fire breathing is several times greater than in any other form of fire performance. Unlike all other fireplay, breathing fire is even *more* dangerous than it appears to be.

If you use kerosene you can get **chemical pneumonia** from a single cough, sneeze, or hiccup, or just from using bad technique. If you are doing repeated daily shows, regardless of the fuel you use, poisoning and organ damage are inevitable and unavoidable.

An immediate risk in fire-breathing is the **blowback**, where the cloud of fire flows back down the stream of spray to your mouth, igniting any fuel remaining there and any fuel vapor in your lungs. This is not always fatal, but if it happens to you, you may wish it were.

Blowbacks are much less likely when using kerosene because of its relatively low volatility. But the technique is also harder to learn with kerosene, so some use Coleman or ethanol instead, and risk the greatly increased danger of blowback and poisoning simply to compensate for not having learned the correct technique in the first place.

Most fire breathers will not teach others how to breathe fire, for obvious reasons. Anyone willing to teach without being intimately familiar with the learner's existing fire skills, safety habits, and temperament should be avoided.

Fire breathers bring three pieces of equipment with them on stage: a small fuel bottle, a wipe towel, and a lit torch. The fuel bottle should be heavy and made of metal, and have an attached or self-closing cap.

The wipe towel can be either a damp cotton or a dry Duvetyne towel, and is always held when blowing fire. The towel is used for wiping spray from your face and chest, cutting off the fire stream in case of blowback, and (if using damp cotton) cooling your burns before they blister.

You'll notice that three things to hold in two hands is awkward, especially when two of them don't go together very well. Each fire breather needs to envision this problem, think about how to deal with it, and establish an invariable ritual of the sequence of necessary movement. Your teacher will have a solution to this problem.

## VOLUNTEERS

Performers love to use volunteers. But if those volunteers are burned they will almost always do the wrong thing, making their injury worse, endangering or harming others, or even burning the whole venue down.

Rather than use a real volunteer, use a shill. Your audience will assume it's a shill anyway.

Watch for unexpected and unintended volunteers in the front row of the audience. Few things catch fire faster than the clothing of someone in nylons and a rayon dress. And more than one feral fair-child has jumped on stage and kicked over a fuel bottle or grabbed and run away with a lit prop.

Many people believe fireplay is done with fake or “stage” fire, and some drunks are so sure of this that they will try to prove it. Your spotter should stop them, using any means necessary.

This page is dedicated to  
the feral children of the Oregon Country Fair,  
and to all the customers at Dante's and Berbati's Pan.

## SO, NOW WHAT?

Well, if you use Lamplighter Ultrapure lamp oil to fuel your fire-juggling props, you don't have to worry about medical problems unless you get it on your skin, in your eyes, breathe it, swallow it, or get burned. All other fuels are more volatile and distinctly more poisonous. Careful attention to the rituals of safety may keep you from harm, but fire is fire.

Practice your routines and your safety procedures to perfection, and insist that your spotters and partners do the same. Habit allows you to make decisions automatically, which lets you devote more attention to your performance and to your relationship with the audience.

Working with fire is not a test of bravery or proof of worthiness or spiritual achievement. Those who believe otherwise should be restrained. However, in this age of extreme sports and the adrenaline rush, few things match the thrill or the glory of dancing in the midst of dragons, hearing their roar, and feeling their breath on your skin.

I hope I have dispelled some of the popular myths and assumptions about working with fire, including a few that I perpetrated in earlier editions of this work. As I said, read everything, trust nothing and no one completely, and find the best teacher you can.

## MORE INFORMATION

You can find further safety information at <http://www.nafaa.org>, the site of the North American Fire Arts Association. This organization recognized a need for its services with the popularity and growth and of fire-spinning, though it is just as needed by hobby jugglers and variety-arts performers.

NAFAA is attempting to influence fire marshals locally and nationally to be more friendly toward and understanding of fire performers, and to keep fire regulations realistic and reasonable for both commercial and community fire events. NAFAA maintains a library of local regulations for many cities, a set of model safety guidelines, and a free Power Point presentation for fire officials. They also have a good first-aid guide for fire performers.

Every large city in the US has regular gatherings of both spinners and jugglers, but they are often unaware of each other. Some spinner communities have regular spotter training and safety programs, and jugglers' clubs should take advantage of these. Communities of fire performers and jugglers can also be found all over the Web, on Usenet, and through many e-mail lists. Here are some I happily recommend:

<http://www.tribe.net>  
[circus-arts\\_subscribe@yahoogroups.com](mailto:circus-arts_subscribe@yahoogroups.com)  
rec.juggling

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**The trouble with people is not what they don't know,  
but what they do know that ain't so.**

Josh Billings, Will Rogers, Artemus Ward, . . .

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