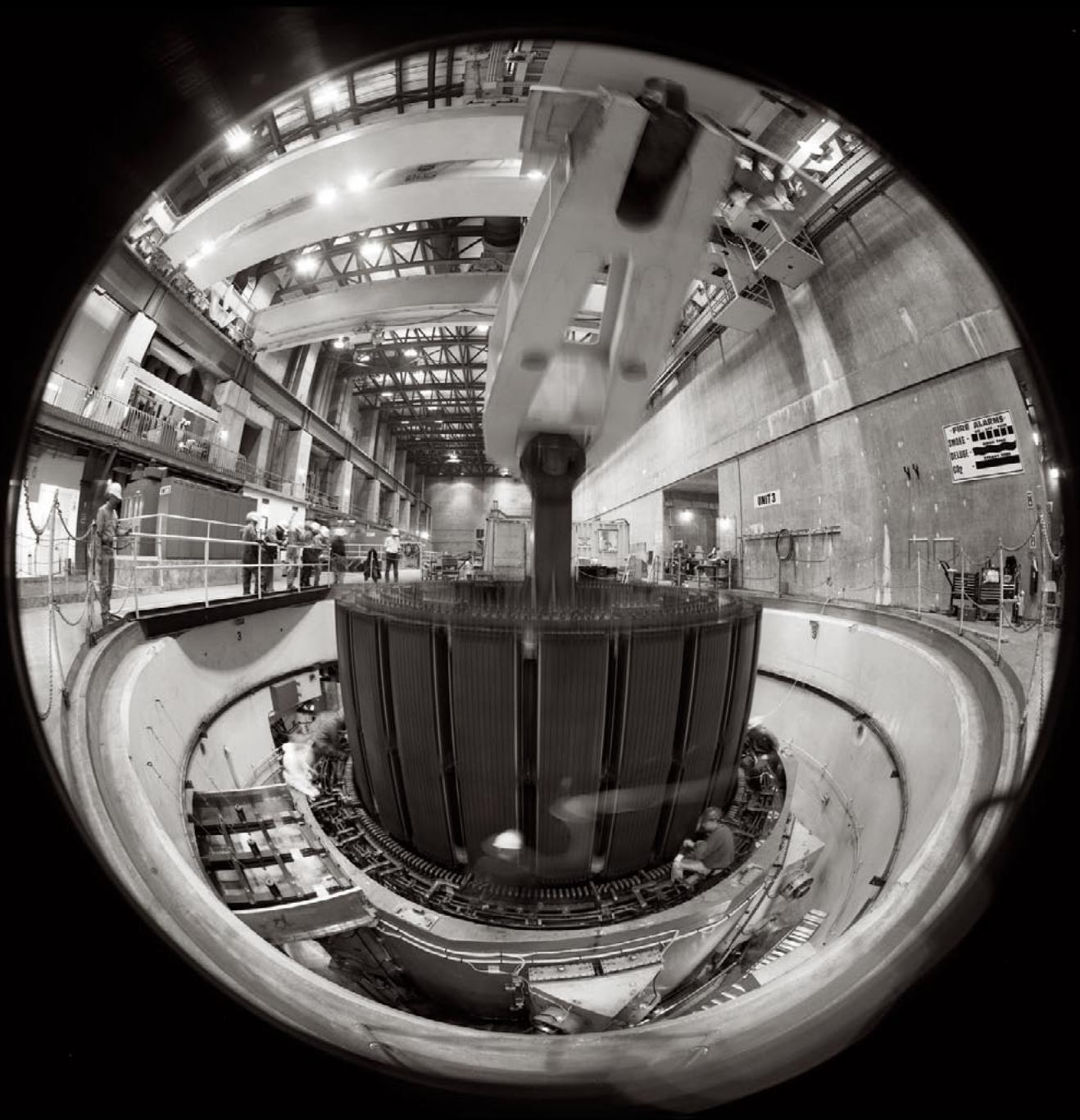
The Large Format Journal



JOHN SISKIN
CAMERA BUILDING

Based in Southern California John Siskin not only manages to work with both digital and film equipment for just about any type of photography for business or advertising, product, jewelry, fashion, architiecture, micro and food, John also finds the time to teach!

Find out more at John's website www.siskinphoto.com

There are a couple of good reasons for making your own photography equipment. I think that the best reason is that it extends your creativity as a visual artist; you will be able to make photographs you couldn't before! Making your own gear also helps you to think outside the possibilities of normal image making. Your own gear gives you new tools to extend your creativity. The cameras I am showing with this article have made me look for new opportunities to use their unique capabilities; I visualize different pictures because I have the ability to take them. You may also save some money.

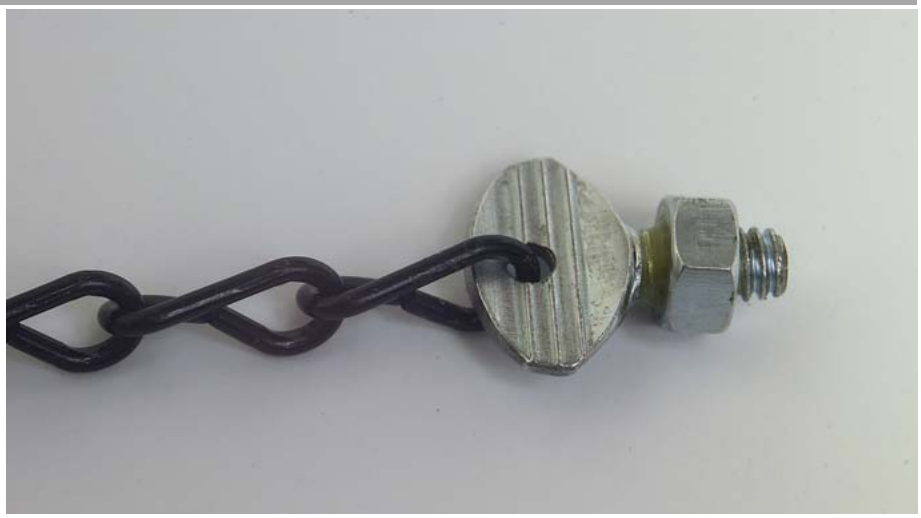


Figure 1: This shows how the chain-pod is assembled from a thumb-screw and chain.
Image ©John Siskin

I would like to begin by offering a simple and incredibly useful photo tool. I didn't invent this tool; I wish I had! It's called the chain-pod and it is a simple lightweight substitute for a monopod. I have successfully taken photos at a 1/15th of a second with this tool. You will need a 1/4 X 20 thumbscrew; you can get this at any hardware store. 1/4 X 20 is the size of the tripod socket in your camera. The threads on the thumbscrew should be about 1/2 inch long. You will also need about 6 feet of chain, more if you are very tall. Drill a hole through the flat part of the thumbscrew and attach the end of the chain into the hole (see figure 1). You may want to glue a nut on the thumbscrew to prevent over tightening the thumbscrew into the camera. You have just made a chain-pod! Now in order to use this, attach it to the tripod socket of your camera, step on the chain, and pull up. The tension you create on the chain serves to stabilize your camera (figure 2).

This project only requires a drill to complete. Most of my projects required a few more tools, but less than you would expect! The tool I use most often is called a Dremel tool. It is a very small electric drill with hundreds of wonderful attachments. You could use it to build the chain-pod. It helps to have a spanner wrench (available from www.skgrimes.com) to modify lenses. I also use a combination belt/disc sander a lot. This helps me to get parts to the right size. If you are going to want flash sync on your projects you will need a soldering iron. I have a lot of other tools, but I don't actually use them much. Another resource is on the web, http://groups.yahoo.com/group/cameramakers/ this group discusses issues with camera building and offers help. Building cameras is simpler than you might think!

Of course building an actual camera is more involved than making a chain-pod. In order to make a working camera we need to accomplish three things: focus light, control exposure and hold film. If we build something as simple as a pinhole camera from a box of oatmeal, we use the pinhole to focus light. The oatmeal

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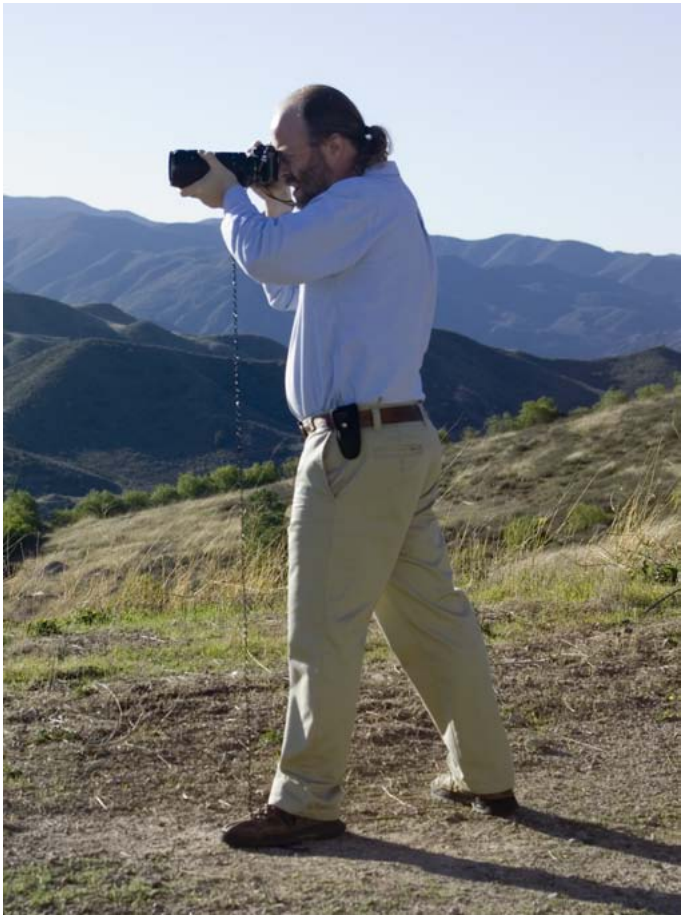

Figure 2: John Siskin using a chain-pod
Image©John Siskin

container serves to control exposure from stray light and tape or foil controls the time of exposure. It's important to keep the film protected from light leaks! Finally in a pinhole camera a little tape can hold the film in place if the curvature of the container doesn't do the job. The problem is that a pinhole camera is very limited, image-wise! I try to use as much existing equipment as I can to overcome these limitations. All the cameras presented in this article use modern lenses to focus light. It is possible to build your own lenses, but, as with pinholes, the results are not as sharp as pictures taken with a modern lens. I have used many sources for shutters in various cameras. One of my favourites is the Packard-Ideal shutter from the Packard Shutter Company (www.packardshutter.com); you can often find them on EBay. These are air driven shutters; you use an air bulb to trigger them. These are simple to use, simple to install and cheap, but they don't have real speed control. Building a film holder is usually very difficult; remember the film should lie flat. I have designed my projects to use Graflok accessories; this means I can interchange 120 and 4X5 film as well as Polaroid material.

There are additional things I want a camera design to do. I would like to have aperture control. I will need focus control. A viewfinder is a big help to picture making. I want a camera to attach to a tripod, or a chain-pod. I like it when a camera is capable of being hand-held. I want it to be portable and easy to assemble, and to fit into some kind of case. It is nice if the camera doesn't weigh a ton.

I have found that certain factors are likely to result in a successful project for me. First the project should not need 6 months of detailed construction, this never works. Second the project should not have multiple parts that I need to get someone else to make. Third I should be able to explain the function of the project simply. For instance, "I want to make a camera that will shoot fisheye images on 4X5 film" that works; "I want to build a camera with flexible geometry based on internal supports" didn't work. In general I am not going to build a camera I could buy on EBay for a few hundred dollars, it takes too much time to make a

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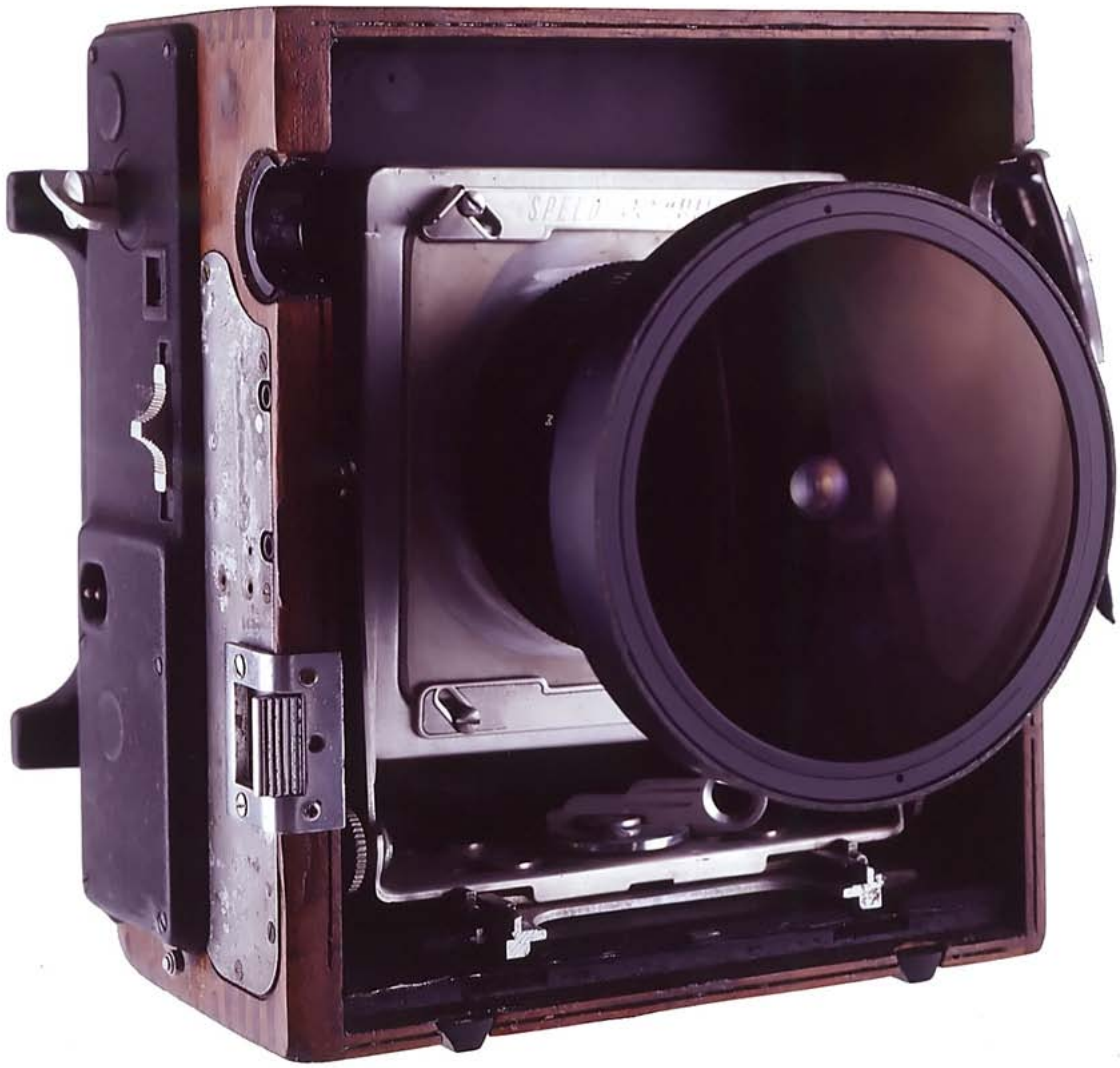

Figure 3: The finished Fisheye Camera, this camera sees 180°, everything in front of the camera.
Image©John Siskin

successful camera. This process is part of designing the camera. A good design should let me know what parts I need, and what I need someone else to do.

I am not a great draftsman, so I don't start by drawing pictures of the camera. I start by asking questions: "What will it use for a lens? What will it use for a shutter?" and "How will it hold film?" I will answer these questions for each of the cameras in this article. Next I try to prototype the camera, to see if the idea of the camera will work. This is very important, but it presents an important problem. When I build a prototype I use cheap poor quality parts, hey I'm just trying to see if it will work. Then, if the prototype works, I have two choices: use the prototype, with the lousy parts, or build another model, when I already have one that works. I have used some of my prototypes for years. Finally I map out the process of building on paper, this includes written notes and my drawings, such as they are. Finally I build the project.

The first camera is all about the lens, a Zodiak-8, 30mm f3.5 that I got with a Kiev body. Unfortunately the body was junk. So I got to thinking about what I could do with the lens. I had the body mount from an

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Fish-eye camera, prototype image: This image shows the camera bed from an unmodified Speed Graphic. This showed the value of making the complete camera.
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extension tube welded onto a metal Speed Graphic lens board. I should point out that this is tricky aluminum welding, get someone good to do it. Then I was able to mount the lens on my Speed Graphic. The Speed Graphic provided the shutter and a Graflok back! This was a successful prototype, but you see the camera front bed in the picture. First I had to remove the front lens element from the lens, cover the interior elements and saw off the wings (lens hood) from the front of the lens. I was really glad the lens worked as well after this operation as before! In order to create the camera in figure 3 I had to cut off the front bed. I also needed to permanently attach the remainder of the focusing track, so I could mount the front standard to it. I made a special bellows so that I could get the lens as close to the film as possible. I had to do maintenance on the camera shutter (Speed Graphics have a focal plane shutter with speeds from 1/ 30^{th} to $1/1000^{th}$ as well as time) since I would be using the camera shutter. I removed the camera leather because it was trashed, but the camera looks great in the mahogany

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Fish-eye camera, Griffith Observatory: Taken at the entrance of the observatory in Los Angeles. The image looks great big! The camera is balanced on a railing.
Image©John Siskin

that is underneath the leather. The camera can be hand held, but I use it most often on a tripod. I have to use an extension arm on the tripod to bring the lens out in front of the tripod legs, as the lens sees everything in front of the camera! The image is a circle, of course, about 80mm across. I have used it to shoot architecture and landscape; I have even done commercial tabletop work with it. I can use the camera ground glass to compose and check focus on the image. The camera is focused with the focusing ring, on the lens, and the lens apertures help to control light.

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Fish-eye camera, San Fernando Mission: Taken with a tripod, this image makes a small space appear enormous. Image©John Siskin

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Fish-eye camera, Wat Thai Temple. This is an image of a Buddhist temple in Los Angeles. The lens has a fine ability to capture detail in both the lightest and darkest area of the image. Image©John Siskin

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Fish-eye camera, Rotor Pull 1: This image was taken while the hydro generator at the Castaic Power Plant was undergoing maintenance. Image©John Siskin

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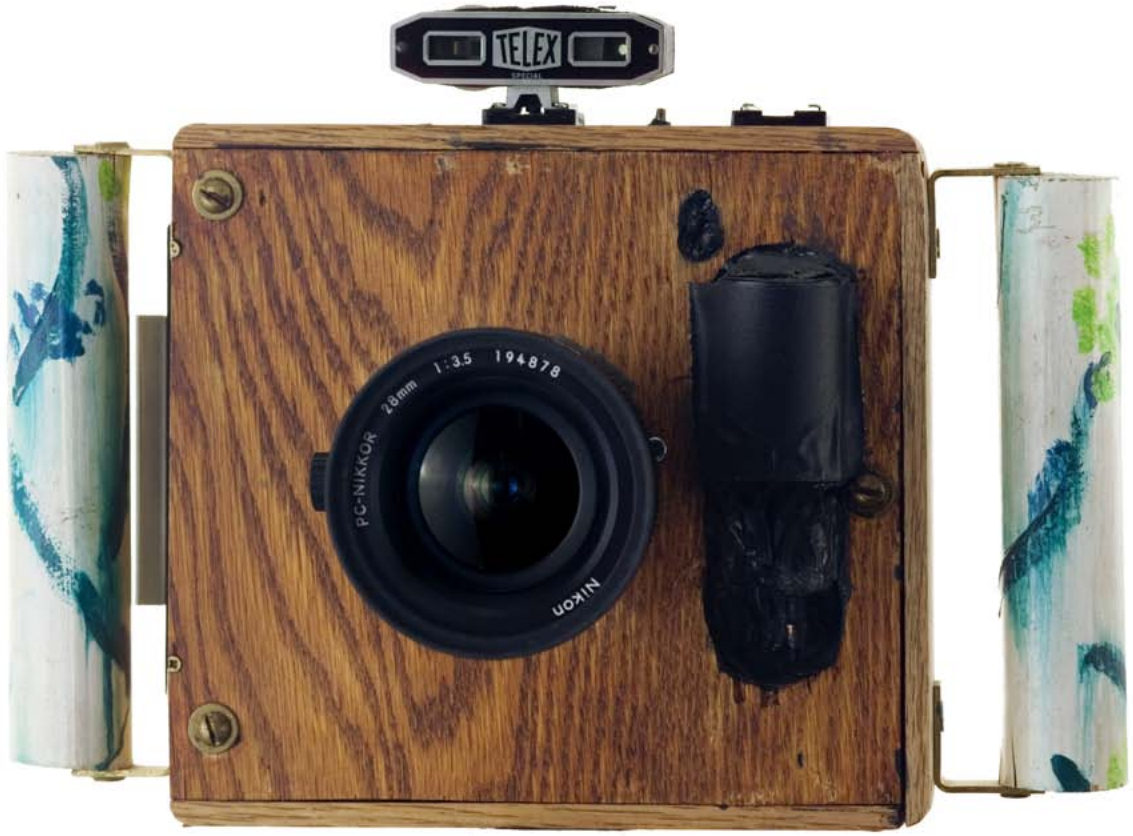

Figure 4: This shows the finished camera with the Nikor 28mm PC mounted on it. The piston of the Packard shutter is on right side of the image. Image©John Siskin

The next camera is also inspired by a lens (figure 4). This camera is built to utilize the full image circle of a Nikon 28mm Perspective Control lens. Since this lens is designed to allow shift and rise/fall movements on a 35mm camera it must have a much larger image circle than is actually used by a 35mm film. This camera is much more complex to build than the last one. The back of the camera is a home-built Graflok back. It holds a Graflex RH/12 back that holds a 6cm square negative. The lens does not completely cover the corners, so you can print either a vertical or horizontal panorama image or a smaller square image. The camera uses a Packard shutter; a smaller shutter would cut off some of the image. The piston of the Packard shutter needed to be mounted in front because the distance between the front and back boards of the camera is so small. You can see the piston cover on the side of the camera

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Super-wide camera, Carousel: Taken at the Los Angeles County Fair. I was able to pan the camera with the horse to keep it in focus. Image©John Siskin

body. The Nikon mount is taken from an old set of Nikon K-rings (early Nikon extension tubes), this is a very simple and cheap way to get a Nikon body mount. You can also try a Nikon or other camera rear lens cap for a body mount. The distance between the boards is critical; this camera uses the distance scale on the lens for focusing. There is a non-coupled rangefinder on top to give me an accurate distance. I have the two boards mounted on 3 separate screws I use them to adjust the distance. I check the focus with a ground glass placed inside the film holder. I also use the three screws and two bubble levels to make sure the boards are parallel with each other. After the boards are set up I used aluminum tape from Home Depot to make a light seal on the sides. Then I attached the side pieces. An extra piece with a tripod mount is attached to the bottom and the handles were put on. I also have sync wires

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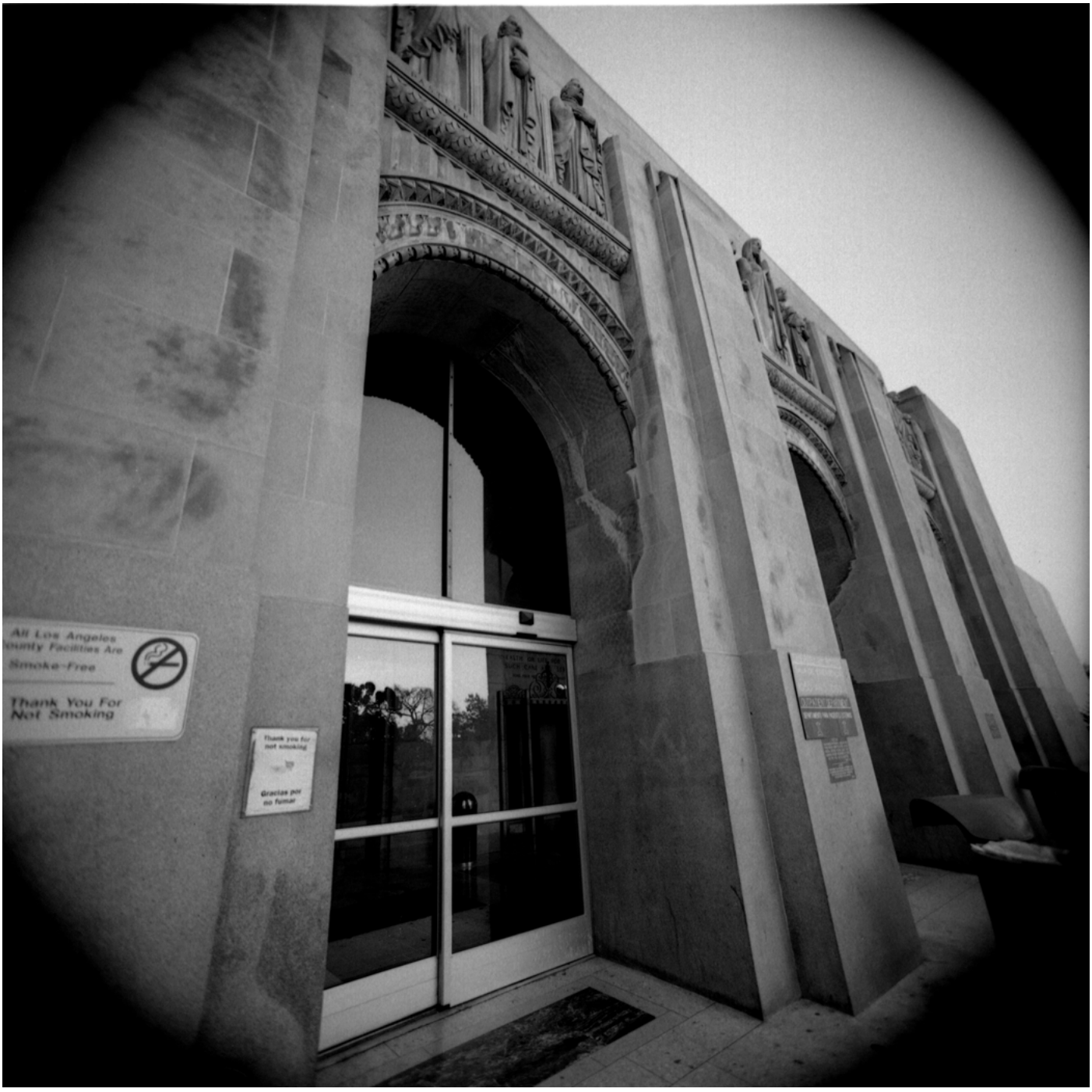

Super-wide camera, Complete Negative. This is a scan of the whole negative, showing how much of the film is covered. The image is of the Downtown Los Angeles Post Office. Image©John Siskin

running to a PC socket on the top of the camera; the camera evolved from a Polaroid proofing camera for 35mm lenses, so I needed a sync terminal. On a camera like this it's good to have a plan.

I have had more fun with this camera than any of the others I've built. I have also made more really good images with it than with the other home-built cameras; partially this is since I use it more. The fact that you never really know exactly what will be on the film, there is no viewfinder, makes each negative a special exploration. Also I just really like a wide-angle perspective, and this lens/film combination works like a 15mm lens would on 35mm film, with the advantage of a bigger piece of film.

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Super-wide camera, El Matador #1: The image is made at El Matador State Beach in California. The camera makes a terrific panorama image. Image©John Siskin

Super-wide camera, El Matador #2: The second image made at El Matador State Beach in California. Image©John Siskin

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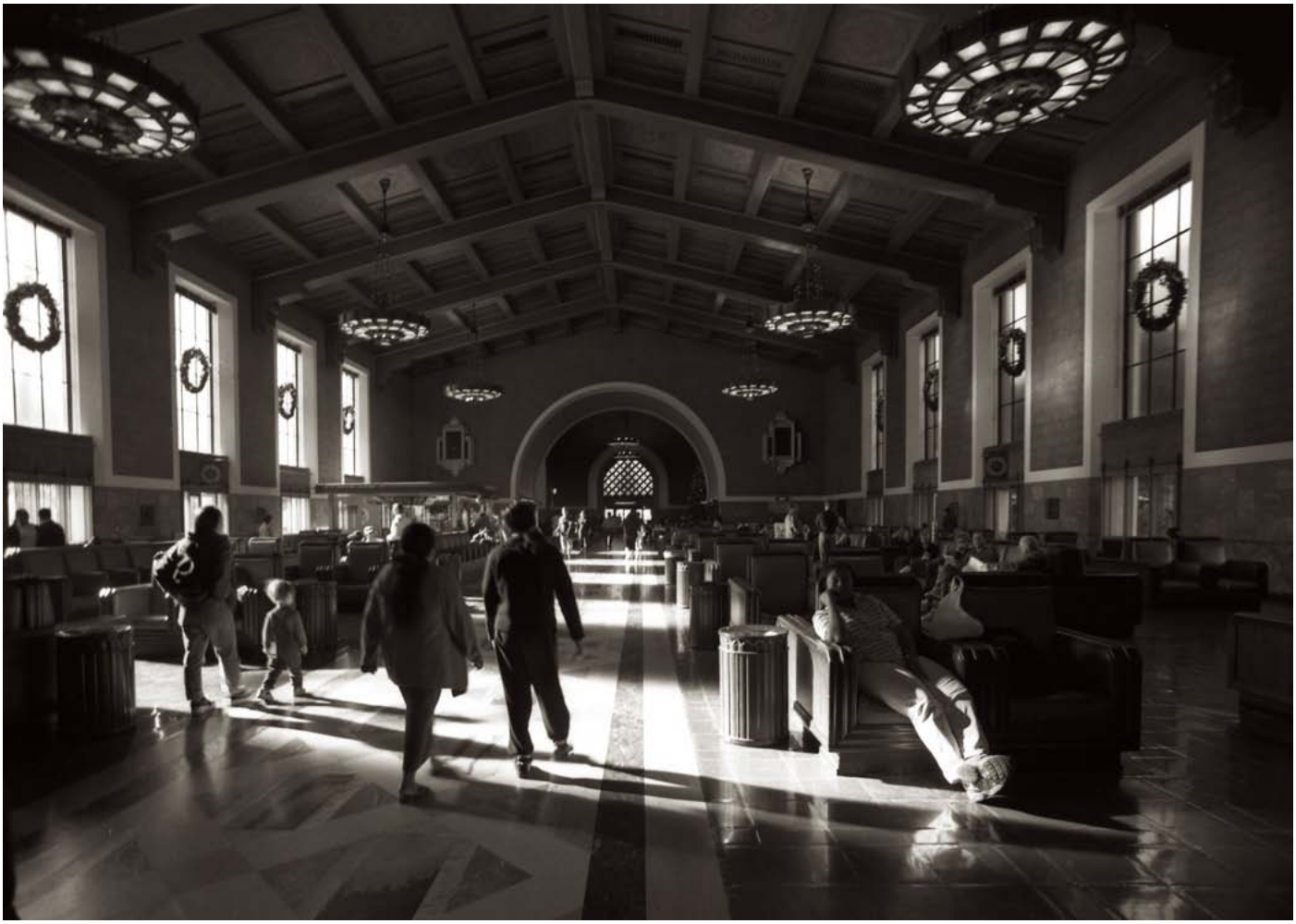
Super-wide camera, Union Station #1: The camera makes great interior images, when there is a great interior. Image©John Siskin

Super-wide camera, Union Station #2: This photograph was actually hand-held. I put the air bulb in my mouth to trigger the shutter! Image©John Siskin



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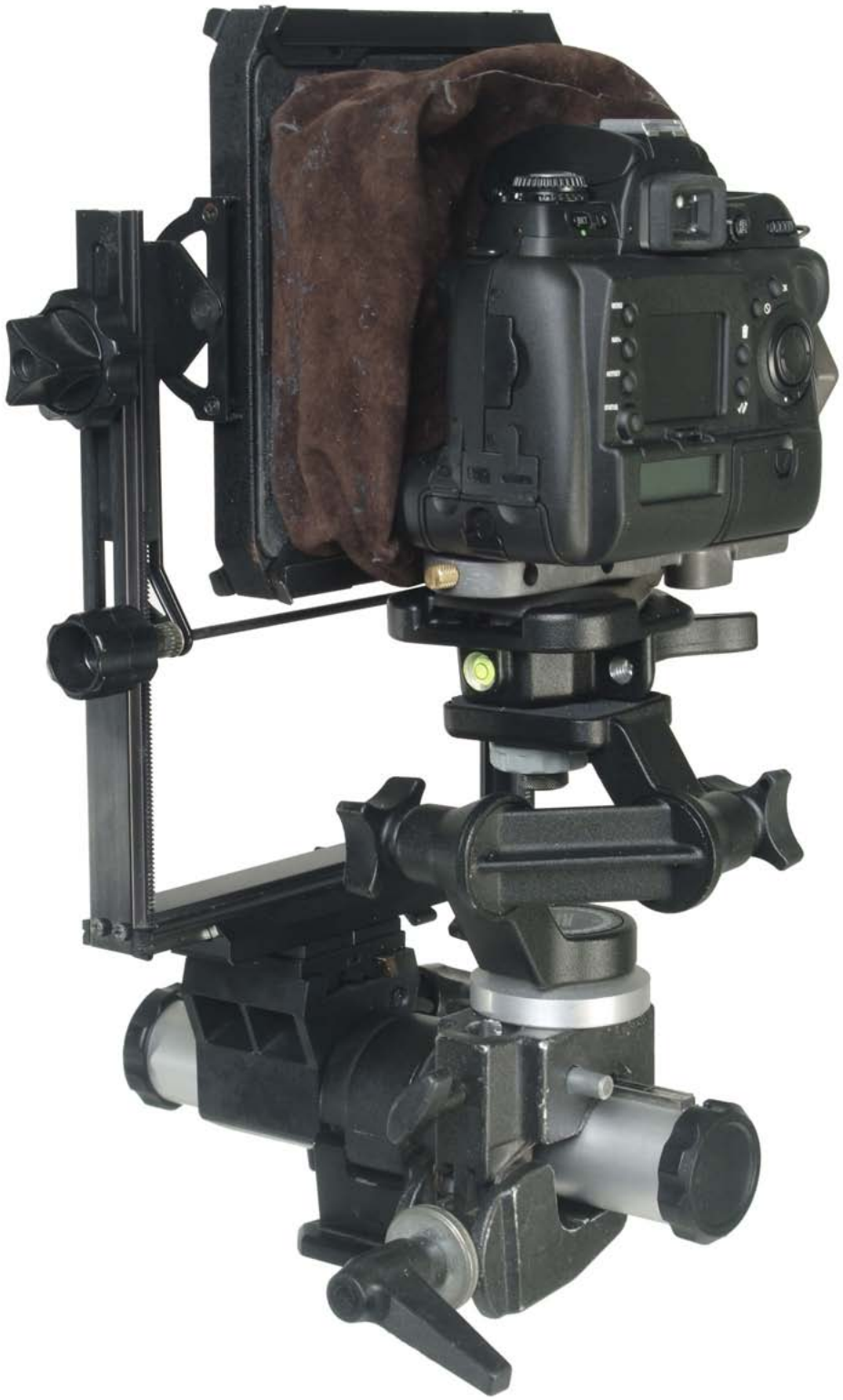
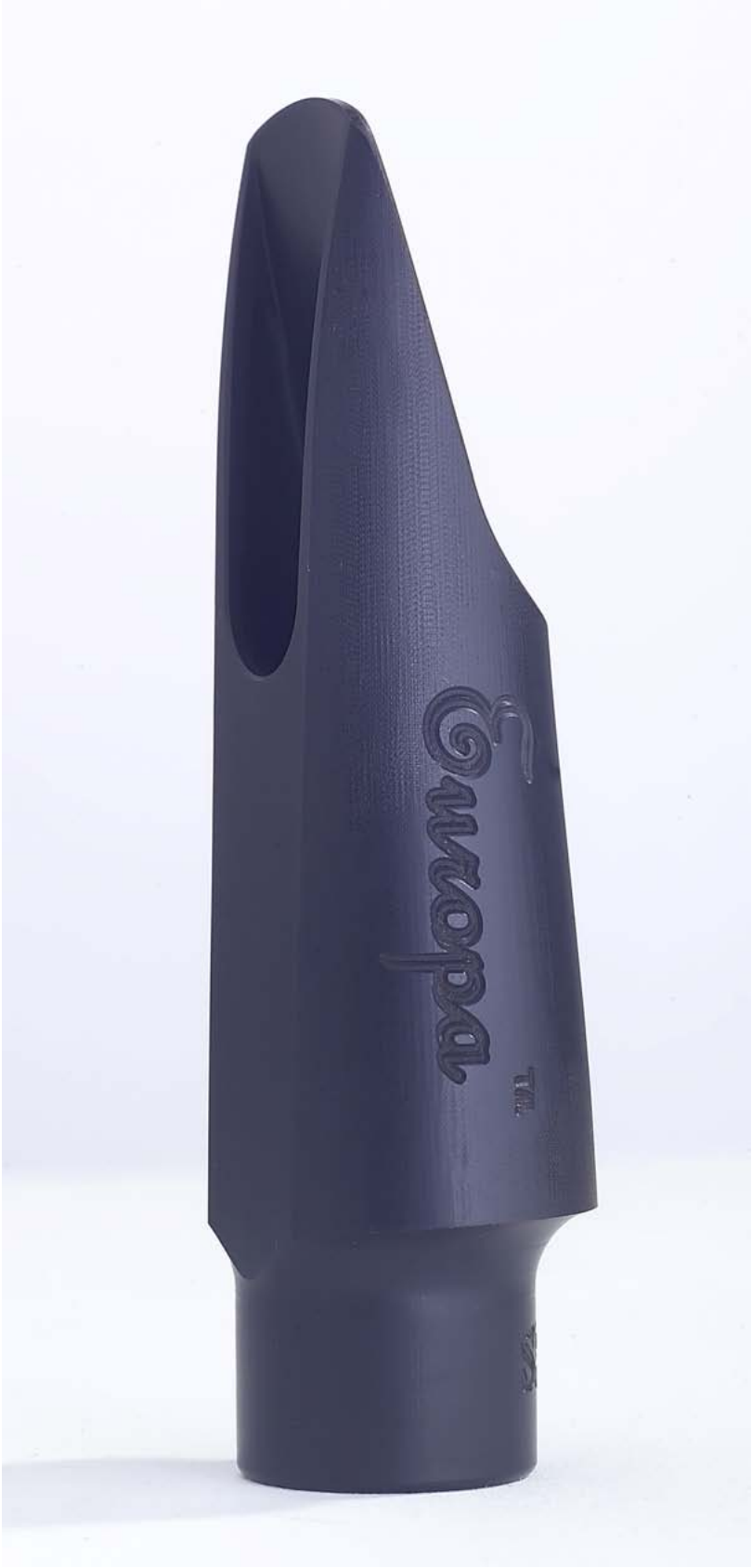


Figure 5: This shows the camera from the back. Building the bellows is the hardest part of making this camera. Image©John Siskin

This last camera was inspired by a friend who wanted to mate a DSLR to a view camera in order to make large composite images (figure 5). Unfortunately the images did not mate together perfectly, but the camera is excellent for macro or close-up work. It also allows you to manipulate depth of field very creatively. I have used it on several occasions for commercial jobs, great results. It has another advantage for commercial work: it is so complex that it makes clients think you are really doing something special! A complete description of how to build this camera is on my website: www.siskinphoto.com in the camera design pages, so I'll just point out the highlights here. There is really only one thing you have to build for this camera: the custom bellows. The rest of the camera is assembled from your view camera and Manfrotto/Bogen tripod parts! The tripod parts allow you to make a rear standard, which can move in all three spatial dimensions. When I use my camera with an 80mm enlarging lens I can focus to infinity if I use a recessed lens board. While I can't focus to infinity with a wide-angle view camera lens, because of the protruding rear

element, I can use a wide-angle lens from a 120 camera. These lenses are retrofocus designs to give more distance between the rear element of the lens and the film, perfect for this camera. I have mounted a Zeiss 50mm Flectogon on a recessed board; it works well, with plenty of movements. Something I should mention about using this camera is that if you use a lot of movements you may not be able to see through the viewfinder, but the sensor will still record a useable image. The viewfinder has a different tolerance for off axis light than the digital sensor. The viewfinder and shutter are provided by the DSLR body and focusing is on the front standard of your view camera. The two standards are close together so this is easy. I find that the focusing cloth I used for the view camera is very helpful with critical focusing.

There has been a lot of literature on making photographic equipment. There are projects for almost every level of builder. The most important aspect of making your own gear is that it makes it more your own photography, more part of what you do for yourself. I hope you will find a project, at least a chain-pod, to do for yourself.



Digital view-camera, Saxophone Mouthpiece: A commercial image made with the Digital View Camera. Image©John Siskin

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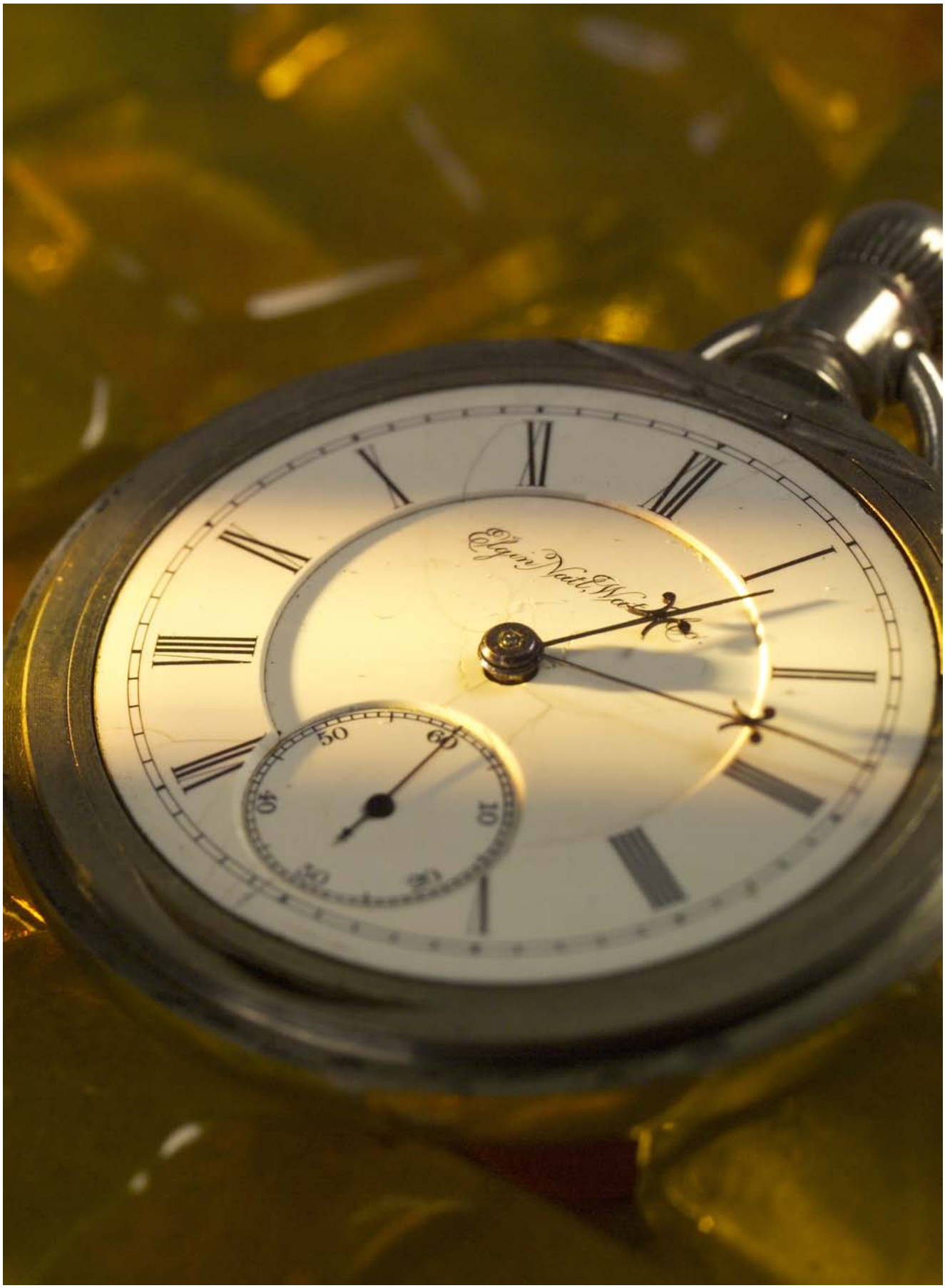

Digital view-camera, Watch: This image shows the two best things about this camera, close-up and selective focus. Image©John Siskin