

WILLIAM J. CHRISTY'S PATENT DERRINGER

"ADDING COMPLEXITY"

By Fred W. Clough & Warren P. Sellke



"What if all the good ideas are spoken for?"

Perhaps this thought was on the mind of Philadelphia gunsmith William J. Christy in the mid-1860s. Christy, born about 1838, had emigrated from his native Ireland a few years earlier and was soon followed by his wife Elizabeth and two infant sons. As a young man in his mid-20s trying to become established in the gun trade, Christy undoubtedly felt pressure to distinguish himself in a city with a rich gun-making tradition. But how would he do that? What better way to make a name for himself than to invent his own pistol?

But there was one problem, and it was a major one. Competition at the time was fierce.

Many inventors were creating unique versions of small pistols which fired the new, self-contained metallic cartridges – but staying clear of the single barrel with “bored-through” cylinder patented by Rollin White in 1855. These guns are known today by the generic term “derringer” – concealable, breech-loading pistols, including single-shot and pepperbox pistols, but excluding revolvers. And the manufacturers of these varied “derringers” had an enormous head start.

Consider the competitive landscape faced by the aspiring inventor William J. Christy. Numerous single-shot pistols had been patented by the likes of Ethan Allen, Daniel Moore, and Joseph Rider. A few double-shot pistol designs included patents awarded

to William Elliot, Samuel Perry, and Henry Wheeler. And by the mid-1860s, several significant-scale manufacturers were producing over twenty versions of multi-barrel “derringer” pistols from the designs of eight prominent inventors with over a dozen patented ideas. Those inventors and their patents included:

- William W. Marston (Marston's Patent Repeater); Patent No. 17,386, May 26, **1857**; vertically-arranged, upward-tipping fixed barrels fired sequentially, exploding punch (firing pin) attached to rotating cylinder and elevates upon external hammer cocking. (Figure 1)
- Christian Sharps (Sharps' Patent Repeater); Patent No. 22,753, January 25, **1859**; forward-sliding fixed barrels fired sequentially, nipple (firing pin) mounted on face of external hammer and rotates upon cocking. (Figure 2)
- William H. Elliot (Elliot's Pocket Revolver – aka Remington “Zig-Zag”); Patent No. 21,188, August 17, 1858; Patent No. 28,461, May 29, **1860**; Patent No. 33,382, October 1, **1861**; Revolving barrels loaded through breech plate and fired sequentially, sliding ring trigger rotates barrels and cocks internal pivoting hammer. (Figure 3)

- William H. Elliot (Remington's Repeating Pistols); Patent No. 28,460, May 29, **1860**; Patent No. 33,382, October 1, 1861; Patent 42,648, May 10, **1864**; Patent No. 42,649, May 10, **1864**; Patent No. 50,232, October 3, **1865**; Forward-tipping fixed barrels fired sequentially, sliding ring trigger rotates breech-mounted firing pin and cocks internal hammer. (Figure 3)
- Thomas K. Bacon (Bacon Arms Co.'s Improved Cartridge Revolver); Patent possibly an 1863 assignment of Elliot's Patent No. 28,461, May 29, **1860**; Revolving barrels removed for loading by unscrewing center pin, external hammer rotates barrels upon cocking.
- Eben T. Starr (Starr's Repeating Four-Shooter); Patent No. 42,698, May 10, **1864**; Forward-tipping fixed barrels fired sequentially, breech-mounted plunger (firing pin) rotates upon external hammer cocking. (Figure 4)
- Jacob Rupertus (Rupertus Patent Eight-Shot Revolver); Patent No. 43,606, July 19, **1864**; Revolving barrels loaded through door in circular breech-piece and fired sequentially, external hammer rotates barrels upon cocking.
- James Reid ("My Friend" Knuckleduster); Patent No. 51,752, December 26, **1865**; Revolving "short barrels" removed for loading by unscrewing center pin, fired sequentially, external hammer rotates barrels upon cocking. (Figure 5)
- Charles A. Converse and Samuel S. Hopkins (Continental Arms "Ladies Companion"); Patent No. 57,622, August 28, **1866**. Revolving barrels loaded through breech and fired sequentially, external hammer rotates barrels upon cocking.

So were all the good ideas taken? The simple and most elegant solutions involving either revolving barrels or revolving firing pins were already utilized in all the commercially successful "deringer" pistols of the day. If William Christy remained intent on inventing a compact multi-shot pistol, what could he do? The answer? Add massive complexity! Four firing pins, four hammers, four mainsprings, four sears – 56 parts in total – all incorporated into a four-barrel pepperbox pistol that would be cocked once and then could discharge four shots sequentially in single-action, semi-automatic rapid fire. Rest assured, nobody else in their wildest dreams could come up with something quite like this!



Figure 1. The Competition - W.W. Marston's three-barrel pepperboxes, in .22 caliber with knife blade, and .32 caliber in 3" and 4" barrel lengths.



Figure 2. The Competition - Christian Sharps' four-barrel pepperboxes, in .22 caliber, .30 caliber, and .32 caliber.



Figure 3. The Competition - William Elliot's pepperbox designs manufactured by Remington, the .22 caliber six-barrel "Zig-Zag," .22 caliber five-barrel, and .32 caliber four-barrel.

The William J. Christy Patent for Improvement in Many-Barreled Fire-Arms

On September 18, 1866, The United States Patent Office granted Patent No. 58,064 to William J. Christy of Philadelphia, Pennsylvania for an "Improvement in Many-Barreled Fire-Arms." The patent itself was relatively "complex" – two full pages of text and two pages of illustrations with 10 separate sketches (Figure 6). Although the patent describes a highly complicated mechanism, Christy's actual claim can be distilled to three principal innovations:

An "arm" attached to a "tenon" beneath the barrels and extending into the frame above the trigger which will pivot when tipping the barrels forward to load and "will press upon the four hammers at the same time and force these hammers back to full cock."



Figure 4. The Competition - Eben T. Starr's four-barrel pepperboxes in .32 caliber.



Figure 5. The Competition - James Reid's "knuckleduster" pepperboxes, a .22 caliber seven-shot, .32 caliber five-shot, and .41 caliber five-shot.

A "vibrating trigger arm" which presses upon each sear upon successive pulls of a "box-form trigger" and "passes from one sear to another until all the hammers are released."

A "safety-guard" which is "locked in position over the trigger" during loading and acts upon a "trigger lever" that resets the "vibrating trigger arm" to its starting position. The guard also prevents "accidentally discharging the pistol in handling or carrying it in the pocket" and can "only be moved when the barrels are locked in position for firing."

So what was Christy's next move after his patent was granted? It seems likely he went back to his shop and diligently worked away until soon thereafter he produced ... a gun. But it was only "a" gun in the sense that one, and only one, of these pistols is known to exist. Why was that the case?

William J. Christy's Patent Derringer

The product of Mr. Christy's passion was by no means the "dog of the dance." He created a unique but also highly attractive pis-

tol which could hold its own aesthetically with other competitive offerings of the day (Figure 7). The silver-plated brass frame shrouded the four hammers and was fully covered in scroll engraving, including the frame extensions beneath the barrel block. The four blued barrels could fire short or long .32 caliber rimfire cartridges and were recessed at the breech-end to allow seating for the cartridge rims. The barrels were released by pressing downward with the thumb on the checkered barrel-release slide located on the left-side of the frame, and the box trigger was protected by a swiveling brass trigger guard that was scroll-engraved on its bottom flat. The backstrap of the frame was fully comprised of a gold-washed and engraved inspection plate that was inscribed in two-lines "W.J. Christys. / Patent 1866". The one-piece ivory grips displayed a raised carving of a dog head on the left side and a flying duck on the right.

Dimensionally, Christy's pistol was large but not excessively so. The barrel block was 3 3/16" (81mm) in length, consistent with many pocket pistols of the day. The overall length of 5 1/2" (140 mm) was larger than all the Remington offerings, but was the same size as the Sharps Model 2 and shorter than the Sharps Model 3 and the offerings of Marston or Starr. The overall height of 3 1/4" (84mm) was taller than the Remington pistols but was exceeded by almost all the other contemporary competitors. The frame width was the largest of the day at 15/16" (24mm) to house four hammers side-by-side (Figure 8), but it was the equivalent of the Starr four-barrel, and the mid-size and large-frame Sharps four-barrels were close behind at 7/8". Lastly, Christy's pistol was relatively heavy at 14.4 ounces (408.2 grams), exceeded slightly by only the Starr four-barrel and the "giant" Reid .41 knuckleduster. But with the average derringer pistol weighing 11 to 13 ounces, it doesn't seem as if Christy's weight disadvantage would have been a significant impediment to broad appeal.

An examination of the appearance and dimensions of the William J. Christy Patent derringer provides few clues to the mystery of why such an attractive pistol was never produced in any quantity. After having expended the time and effort to transform his innovative genius into patented reality, what was holding Christy back? Perhaps the answer can be found by conducting a thorough review of the actual operation of Christy's pistol. Did the patent claims describe a level of mechanical complexity that could not be counted upon to function as intended?

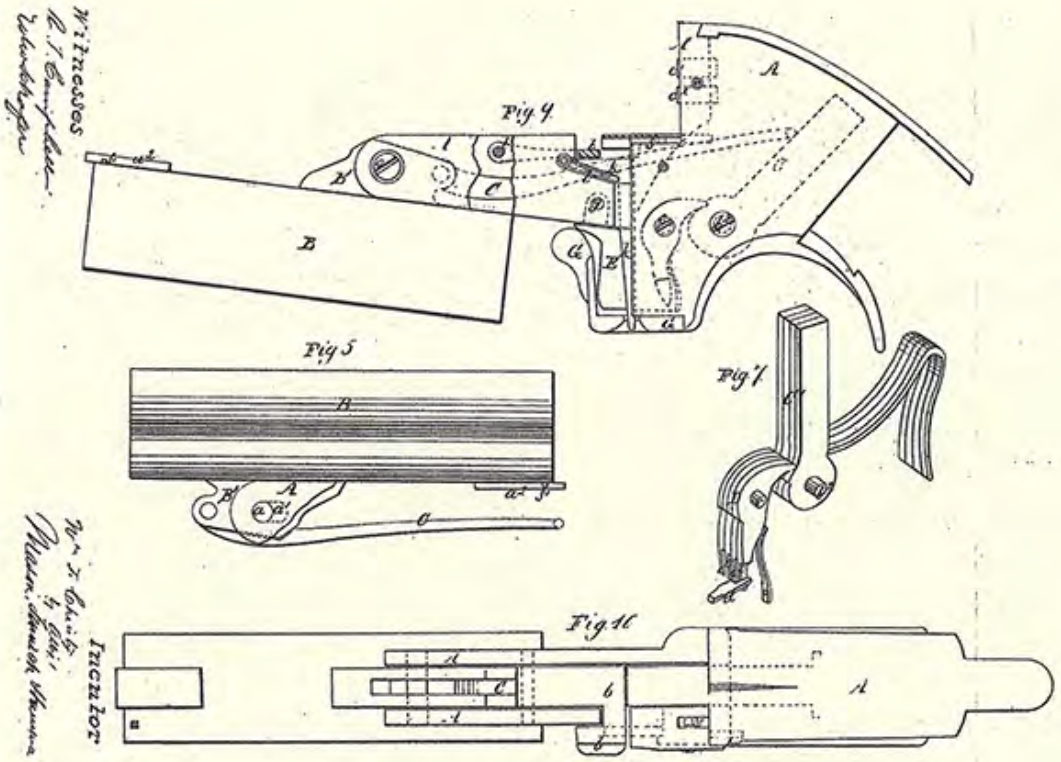
Operating the Pistol – Cocking

Upon first glance, cocking the Christy derringer seems fairly straightforward (Figures 9 to 11). Position the trigger guard over the trigger, press the checkered barrel-locking slide downward, lift the barrel block and tilt it fully forward, observe the cocking arm beneath the barrels moving rearward into the frame with its T-bar end pressing against the hammers, listen for the hammers to click into full-cock position, load four cartridges, and lower the barrel block until it locks firmly into place. What could be easier than that? Well nothing, other than the small inconvenience of actually trying to fire the gun and discovering – with some frequency – that not all hammers will drop, re-cocking will be impossible, and the whole gun will need to be disassembled! Is this a terminal design flaw, or a mere quirk to be overcome with careful operation?

W. J. CHRISTY.
Breach-loading Fire-arm.

Patented Sept. 18, 1866

2 Sheets—Sheet 2.



W. J. CHRISTY.
Breach-loading Fire-arm.

Patented Sept. 18, 1866.

2 Sheets—Sheet 1.

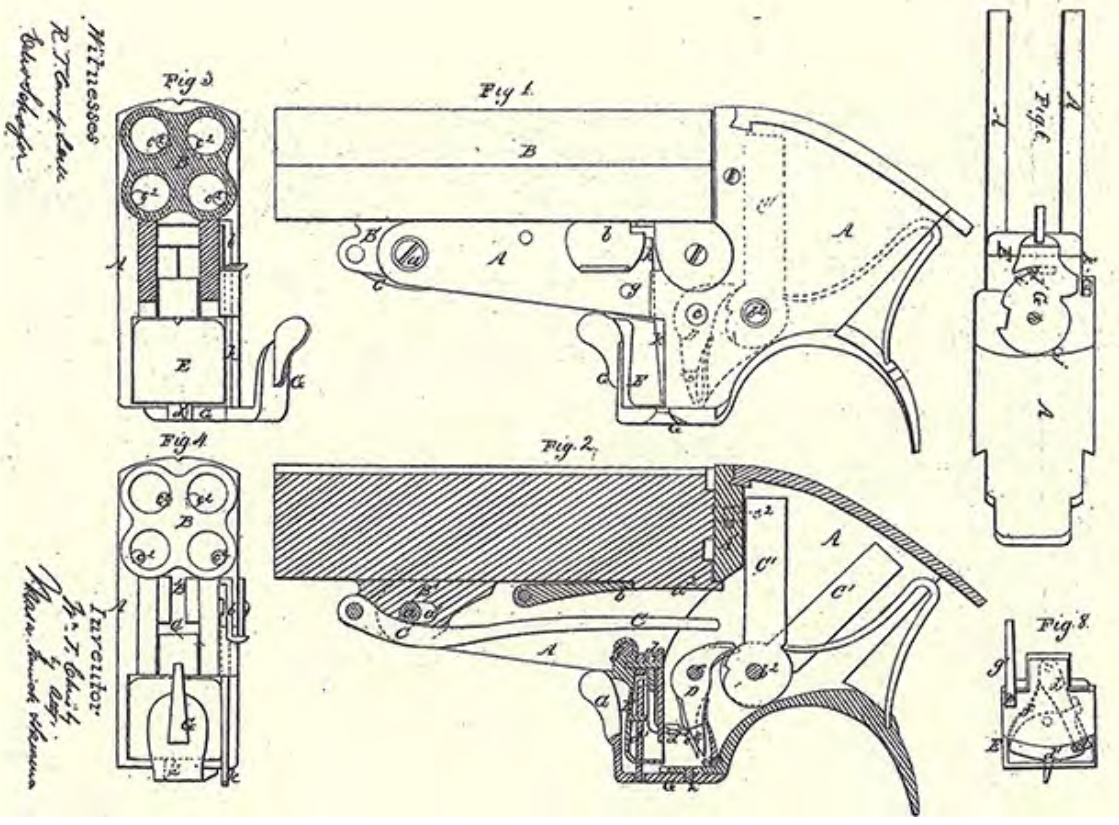


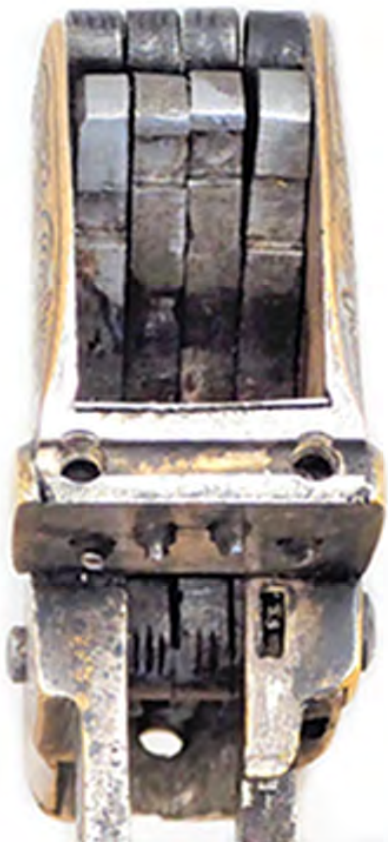
Figure 6. The W. J. Christy Patent for Improvement in Many-Barreled Fire-Arms, No. 58,064, dated September 18, 1866. Two pages of illustrations with 10 drawings describe a design of immense complexity.



Figure 7. Christy's Patent Derringer.



FOUR FIRING PINS



**FOUR COCKED HAMMERS
AND THE BARREL-END OF
FOUR FIRING PINS**



**FOUR FIRING PINS,
FOUR COCKED HAMMERS,
AND FOUR MAINSPRINGS
WITH SLASH MARKINGS**

Figure 8. Inside the frame of Christy's Patent Derringer.



Figure 9. Cocking the pistol. Curved slot on the interior bottom of the trigger guard positions the trigger lever.



Figure 10. Cocking the pistol. Interior of the box trigger showing the spring-loaded trigger lever (protruding from bottom) which controls the vibrating trigger arm (right).

To answer this question, a good starting point might be to review past research. In March of 1987, *The Gun Report* published an article by Eric Vaule entitled “The W.J. Christy Patent Derringer.”¹ Vaule’s work is the only published examination of this gun known to the authors, and he was not very charitable to Mr. Christy. To quote his first paragraph: “... in actual practice it just doesn’t work.” But Vaule was only getting started: “the trigger system is a very bad design and fabrication problem in itself, but the cocking bar is possibly worse... it is not enough to cock the hammers unless the user is very strong.” And finally: “... after carefully examining the pistol, it really cannot effectively function in any reliable fashion.” Although Vaule’s candor is commendable, was his assessment an accurate depiction of a failed invention, or could a thorough re-examination of Christy’s gun lead to a more generous conclusion?

With Vaule’s criticism in mind, can cocking the pistol be done in a consistent manner that will enable the gun to function correctly? The answer is a resounding “yes” but requires an understanding of two nuances of operation, beginning with the “vibrating trigger arm” referenced in the patent. This critical component of the internal mechanism will be addressed later in greater detail, but suffice to say that at the time of cocking, this arm needs to be positioned against the inside left wall of the frame so it can act upon all four sears in sequence, dropping the hammers one at a time from the left side of the gun to the right. If the vibrating trigger arm is not in this initial position, it will “miss” one or more sears when the gun is cycled, one or more hammers will fail to drop, and the gun will need to be disassembled and reset. The “vibrating trigger arm” is positioned initially by a spring-loaded assembly within the box trigger and a “trigger lever” which protrudes from the base of the trigger and is toggled by a “curved slot” cut in the trigger guard.

Operational Nuance One – holding the trigger guard slightly to the right of center during cocking will correctly position the “vibrating trigger arm” to the left of the first sear every time.

Operational Nuance Two – the correct cocking motion – is also easy to replicate. With the trigger guard pushed right and the barrel release slide pushed down, the barrel block needs to be pulled slightly forward to disengage from its locked position. This motion shifts forward the “oblong slot” in the barrel “tenon” (both identified in the patent) relative to the barrel-retention screw at the front end of the frame extensions. When the barrel block is tilted (rotated upward) to about 45 degrees, it stops – a problem noted in Vaule’s critique. But a slight upward pull shifts rearward the “oblong slot” relative to the barrel retention screw, thus providing ample leverage to continue tilting the barrels – without undue strength – a full 180 degrees forward. The cocking arm can then continue its rearward motion and press against the hammers until the sears engage each of the hammer notches, locking the hammers in full-cock position.

Following these two simple steps enables all four hammers in the pistol to be cocked consistently every time. The loaded pistol can then be carried in the pocket ready to fire but protected from accidental discharge by the trigger guard blocking any unintentional pressure on the trigger.

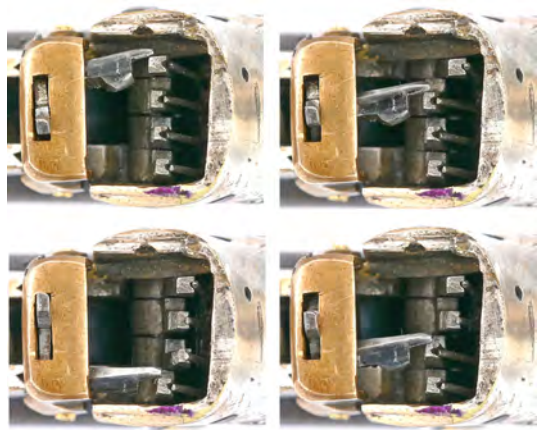
Operating the Pistol – Firing

Once the William J. Christy Patent Derringer is cocked correctly, the magic begins! The trigger guard is swiveled to the left side of the frame, and the pistol is fired by a slight rearward tug on the box trigger. The first tug drops hammer #1 on the left side of the frame, and subsequent tugs will drop hammers #2 through #4 in sequence. The pistol can fire four shots as fast as the trigger can be pulled, or the trigger guard can be repositioned in front of the

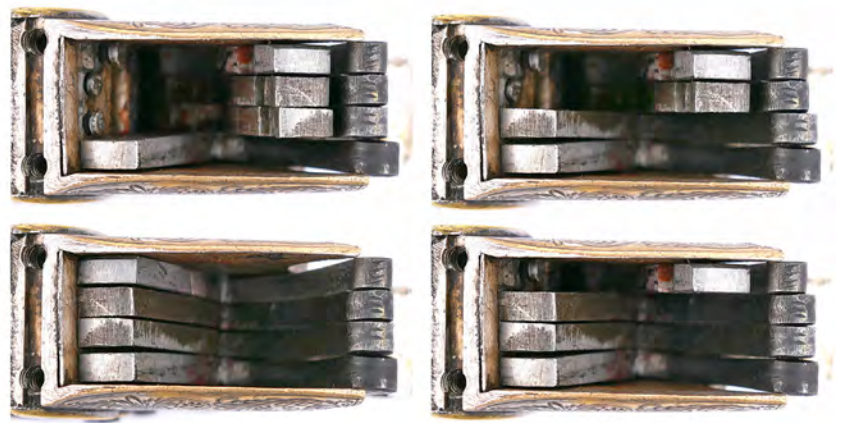


Figure 11. Cocking the pistol by tilting the barrel. Clockwise from top: barrel block with tenon, oblong slot, and cocking arm with a T-bar end within the frame which presses against the hammers; With the trigger guard positioned slightly toward the right over the trigger, depressing the barrel-release slide and lifting the barrels to a 45-degree angle begins the rearward motion of the cocking arm; After pulling the barrels upward, the barrels can continue in a 180-degree arc, moving the cocking arm rearward into the frame and fully cocking the four hammers.

Figure 12. Firing the pistol. The firing mechanism, including box trigger, vibrating trigger arm, sear with sear-return spring, hammer, and mainspring.



Figures 13. Firing the pistol. Upon four pulls of the box trigger, the vibrating trigger arm moves from left to right across the frame (clockwise from upper left) engaging the lower end of each of the four sears and pushing it rearward in sequence.



Figures 14. Firing the pistol. When the upper end of each of the four sears is disengaged from the trigger notch, each of the four hammers will drop in sequence from left to right across the the frame (clockwise from upper left), striking the four firing pins.

trigger and the pistol can be safely carried with one or more shots remaining to be fired. Thus, William J. Christy created the first-and-only single-action, semi-automatic derringer – an achievement which seems wholly unrecognized today.

The magic of Christy's rapid-fire pistol can be explained by the "vibrating trigger arm" which is controlled by a spring and a "trigger lever," both of which are contained within the box trigger (Figure 12). When the correct cocking procedure is followed, the "trigger lever" is moved to the far right by the "curved slot" in the trigger guard, thus positioning the "vibrating trigger arm" against the inner left wall of the frame. At this starting point, a cut-out notch at the end of the "vibrating trigger arm" is seated against the base of sear number one, which has locked hammer number one in its cocked position by engaging a notch in the hammer during the cocking procedure. When the trigger is pulled, the "vibrating trigger arm" pushes straight back on the sear which drops the hammer (Figures 13 and 14). Now with sear number one moved out of the way, the spring in the box trigger positions the "vibrating trigger arm" so that its notch is seated against sear number two. When hammer number two is dropped and sear number two is moved out of the way, the "vibrating trigger arm" is moved to engage the next sear. This process repeats itself until all four sears have been pressed, all four hammers have been dropped, and the "vibrating trigger arm" has been moved by the spring across the frame from left to right and now sits against the inner right wall of the frame.

When the correct cocking procedure has been followed, the firing of Christy's Patent Derringer is consistent and repeatable without any of the malfunctioning found by Eric Vaule in 1987. So why wasn't Christy's pistol a commercial success?

Bibliography

- Ancestry, online genealogical and city directory database. www.ancestry.com
- Drummond, D. S., R. H. Johnson, E. J. Williams and J. W. Barnard. *Dr. William H. Elliot's Remington Double Derringer*. Graphic Publishers. 2008
- Dunlap, Jack. *American, British, & Continental Pepperbox Firearms*, H.J. Dunlap, Los Altos, CA. 1964
- Eberhart, L. D. & R. L. Wilson. *The Derringer in America, Vol. II*, Andrew Mowbray, 1993
- Laidacker, John S. *Early Cartridge Handguns, .22 Calibre*. Susquehanna House. 1994
- Winant, Lewis. *Pepperbox Firearms*, Greenberg, New York. 1952
- United States Patent and Trademark Office
- For single-shot derringers: Patent Nos. 25470, 31473, 40887, 46617, 53543
- For two-shot derringers: Patent Nos. 43259, 50760, 51440, 55752
- For multi-barrel derringers: Patent Nos. 17386, 21188, 22753, 28460, 28461, 33382, 42648, 42649, 42698, 43606, 50232, 51752, 57622, 58064

William J. Christy – Purveyor of Musical Instruments

We may never know the full story of why William Christy's magnificent pistol was not produced in any quantity. Did the "operating nuances" discussed above make the pistol too "finicky" for the average customer? Was Christy unable to fine-tune the pistol to eliminate any quirks? Would the manufacturing of a 56-piece pocket pistol be too complex, take too long, or cost too much? Did the production quantities and brand recognition enjoyed by the well-known competitors present barriers to entry that were too large to overcome?

What we do know is that William J. Christy was listed as a "gunsmith" in the Philadelphia City Directories in only two years – 1867 and then again in 1872². Perhaps a failure to differentiate himself in Philadelphia's competitive firearms industry – plus responsibility for four more sons – convinced him to take his career in a different and more stable direction. Beginning in 1873 and continuing for nineteen straight years until his death in 1891, William J. Christy was listed in the Philadelphia City Directories as being in the business of "musical instruments."³

If only he could have "made music" in the pistol trade.

Endnotes

1. Vaule, Eric. "The W. J. Christy Patent Derringer," *The Gun Report*, March 1987
2. *McElroy & Co.'s Philadelphia City Directory for 1867*
3. *Gopsill's Philadelphia City Directory for (the year)*

