

MORE ON CANNON LOCKS AT THE U.S. ARMY ARTILLERY MUSEUM

by Frederick Gaede



Figure 1. Part of the diorama at the entrance to the U.S. Army Artillery Museum, showing a section of artillery with reproduction Hidden 1842-patent field artillery cannon locks in place (left). Close up of a Hidden lock mounted on a M1841 tube, ready for the lanyard to be pulled and the charge ignited (right). Unless otherwise noted, all illustrations courtesy Gordon Blaker.

Recently an article was included in the American Society of Arms Collector's *Bulletin* on cannon locks.¹ After a general discussion on their introduction to improve the firing of naval cannon, a dozen examples of locks used by different nationalities were illustrated and described. An example of Enoch Hidden's 1842-patent lock was included, a reproduction of which is displayed in Figure 1 mounted on a M1841 six-pound Gun, Model of 1841. As is often the case, soon after the article's publication the existence of two unique cannon locks associated with the U.S. Army's artillery was brought to the author's attention. Each is so singular this follow-up was warranted to bring the membership's attention to them.

Both examples were formerly in the Rock Island Arsenal Museum. Although formally established in 1905, items had been in an informal collection at the arsenal before 1876. Both of these locks were subsequently listed in a 1909 catalog of the museum's extensive collection.² Page 152 of the 1909 catalog lists eight examples of cannon locks, six by Hidden and two by R.S. Perkins, as follows:

152 Section XI—Ordnance Models

- 11010. Cannon Lock. Hidden's. Marked "U.S., E. Hidden, New York, Pat."
- 11011. Cannon Lock. Hidden's. Patented 1842. Presented to the Military Academy by the inventor.
- 11012. Cannon Lock. Marked "E Hidden patent, New York, W.A." [sic; T.]
- 11013. Cannon Lock. Similar to and probably one of Hidden's patents. Marked "258."
- 11014. Cannon Lock. With rope attached. Marked "E. Hidden Patent, N. York, 13, W.A.T."
- 11015. Cannon Lock. With rope attached. Marked "E. Hidden Patent, N. York, 16, W.A.T."
- 10116. Cannon Lock. Perkins, with automatic sliding vent cover.
- 11017. Cannon Lock. Perkins, with automatic sliding vent cover. Marked "U.S. Arsenal, Ft. Monroe, Va., April 13, 1837, R. S. Perkins, maker."

In 2021 the two subjects of this article, Nos. 11011 and 11017, were transferred to the U.S. Army Artillery Museum, Ft. Sill, Oklahoma.

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Figure 2. Overall image of Lock No. 11011, hammer closed, E. HIDDEN / PATENT / PENDING mark on neck of the hammer (upper left). Hammer closed, other side of lock (upper right). The hammer is open and the closure cushion for the vent is obvious (lower left). 1842 presentation plaque for this lock (lower right).

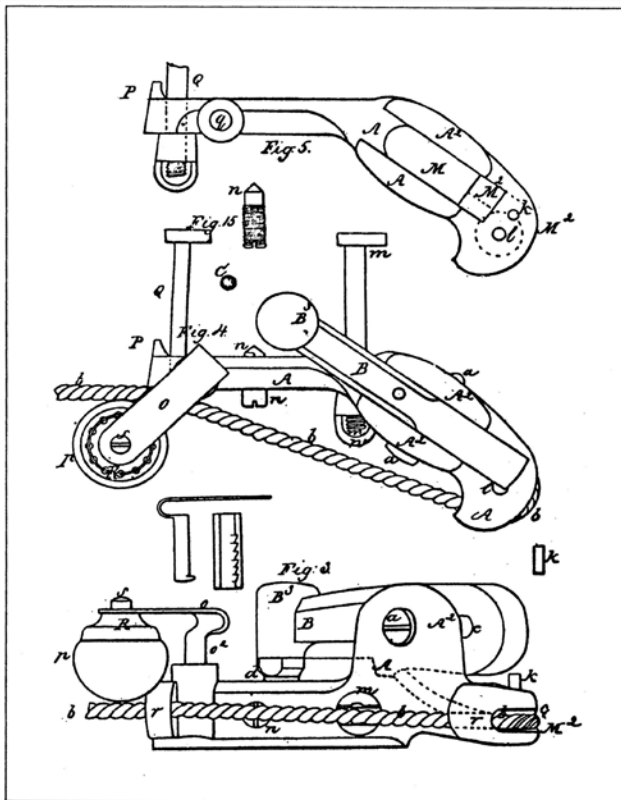


Figure 3. Part of the 1842 patent drawings for the Hidden lock.

The 1842 Hidden lock was also the lock used on the Flying Batteries of artillery in Mexico by U.S. field artillery batteries,⁶ and various views of lock 11011 are shown in Figure 2. Batteries using these locks were commanded by such notables as Bvt. Majors Samuel Ringgold⁷ (Figure 5) and Braxton Bragg⁸ (Figure 6, fourth from left) during the Mexican-American War. A Paulson Bros. reproduction has been placed on each of the original six-pounder tubes now displayed in the entrance diorama to the U.S. Army's Artillery Museum at Ft. Sill, as shown in Figure 1.

The plaque attached to the stand on which the original lock is mounted (Figure 2) was hand stamped with individual letters and states "Hidden's Patent Cannon Lock / 1842 / Presented to the Military Academy by the Inventor". What prompted the presentation to the U.S. Military Academy has not been determined.⁹ Why and how it was apparently transferred to Rock Island Arsenal also remains unclear, although that could have happened in the aftermath of the International Exhibition held in Philadelphia in 1876, where the lock was on display in the U.S. Army Ordnance Department section.¹⁰

The second example (11017; formerly RIA 08804; Figure 7) is the first example of a Perkins' cannon lock to be illustrated in print. In a semi-circular, hand-struck imprint on one side, it is identified as "U.S. ARSENAL. FORT. MONROE. V.A. / APRIL. 13. / 1837 / R.S. PERKINS. MAKER." The "13" was apparently added after the rest of the inscription, which may indicate when the lock was examined at Ft. Monroe,¹¹ the site of the Army's Artillery School

of Practice. A check in archival sources for the Army available to the author found only one mention of a “Perkins” in correspondence of the era, but fifteen years later, in 1852. Thus, it was possibly not the same individual who had this lock made. He was issued no U.S. patents during that time, so the date of April 13, 1837 is not a patent date.¹² If working with the Army’s Ordnance Department, no routine correspondence has been located at that time. That may indicate he was working more closely with the U.S. Navy; or, if working with the Army, any surviving records may be in obscure NARA Ordnance files, such as RG 156, E 1012, Reports & Correspondence of Ordnance Boards, 1827-1870; or E 994, Correspondence Relating to Inventions, 1812-70; and E 1001, Correspondence and Reports Relating to Experiments, 1818-70.¹³ The 1852 reference to a “Perkins” is in an enclosure to a letter Lieutenant Colonel Rufus L. Baker, commanding Watervliet Arsenal, wrote to Richard M. Bouton, explaining the latter had not been selected to be the superintendent of the consolidated percussion cap manufacturing operation being established at Frankford Arsenal: “Major Hagner ... had selected Mr. Perkins, to superintend the cap manufactory at Frankford Arsenal – and that Maj. Hagner had selected for removal from Watervliet to Frankford four or five of the machines made by Bouton”¹⁴ while Master Armorer at Watervliet Arsenal.



Figure 5. Lieutenant Samuel Ringgold, ca. 1825 by John Vanderlyn (1775-1823). National Portrait Gallery, Smithsonian Institution, gift of the William Woodville Estate, 1996.

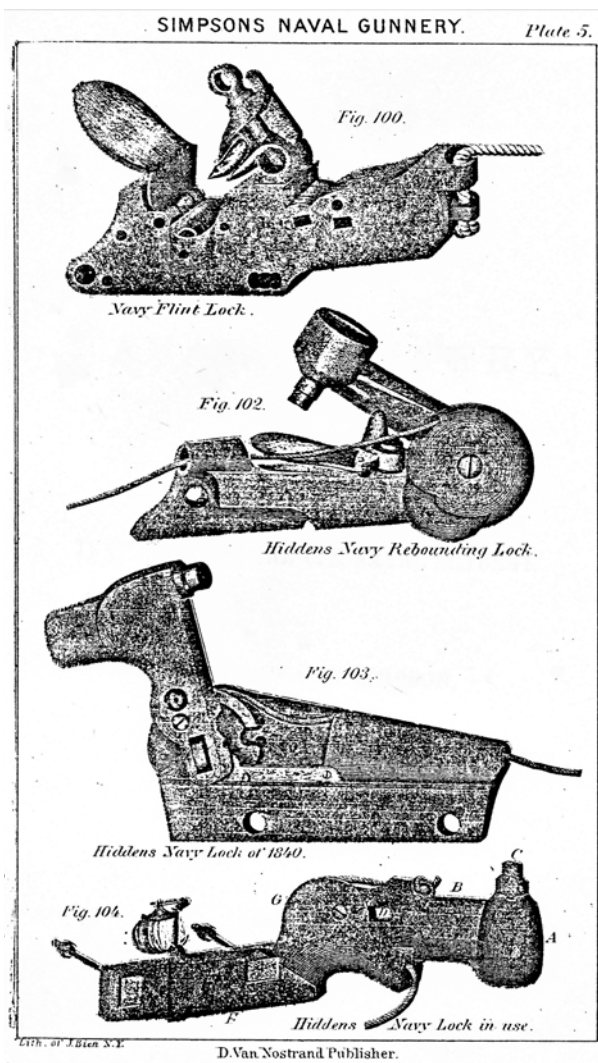


Figure 4. Illustration of the 1842 Hidden patent lock at bottom of Simpson’s 1862 *Treatise*.



Figure 6. Captain Braxton Bragg, 1847, standing fourth from left, in a detail from “Zachary Taylor at Walnut Springs” by William Garl Brown, Jr. (1822-1894). National Portrait Gallery, Smithsonian Institution, Purchase, NPG, 1971.

George Moller notes a “Rufus Perkins” of Bridgewater, Connecticut, fabricated muskets and rifles for the Massachusetts militia. He also entered into contracts for Indian trade guns in January 1808 and muskets in October 1808, but was unsuccessful in completing his deliveries under either contract. As above, it could not be determined conclusively if this Rufus Perkins and the cannon lock designer R.S. Perkins were the same individual.¹⁵ One side

of the lock has markings of “No. 1” and “J. COUCH.” It could be reasonably assumed Couch was the machinist who actually constructed this piece, with possibly a serial number indicating the first of a potential series. Although he would have had to been a master, nothing further about Couch could be located.



Figure 7. Overall view of a unique cannon lock designed by R.S. Perkins. Note the double-headed hammer, and the vent cover retracted. The likely machinist’s name “J. COUCH” can be seen at the bottom edge of the lock (top left). Perkins’ lock opened, with the vent cover automatically extended over the vent (top right). The marking of Perkins on the lock body, with an indication the lock was at Ft. Monroe, Virginia in April of 1837 (bottom).

Only one mention related to this particular lock has been located. Metcalfe’s International Exhibition publication noted above included, among other cannon locks displayed, “PERKINS CANON LOCK, 1837 (2 specimens; 1 very heavy of iron).” A further description included “The hammer plays in a plane at right angles

to the axis of the gun. As it falls, a spur on its lower part moves back a slide in the frame, the forward part of which forms the vent cover. When the hammer is raised, the weight of the slide carries it forward over the vent, over which it may also be pushed by hand. The eye in the frame serves to lead the lanyard to the rear.”¹⁶ The movement of the vent cover is clear in Figure 7, although the mechanism which moves it automatically is hidden. This description and the 1837 date confirm this example was the same one in the exhibition, designated “No. 33.” The location of the second lock, if it is still extant, is unknown.

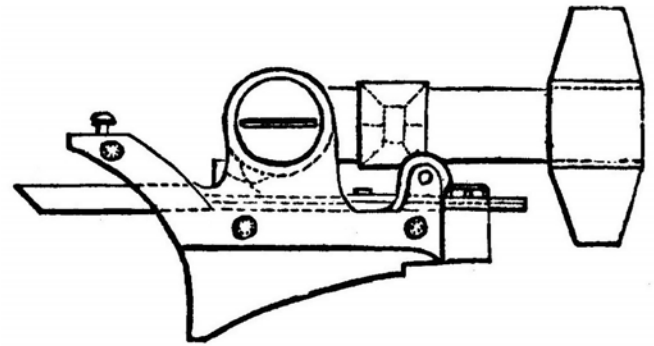


Figure 8. Sketch of a French lock from the 1850 Aide Mémoire Naval.¹⁷

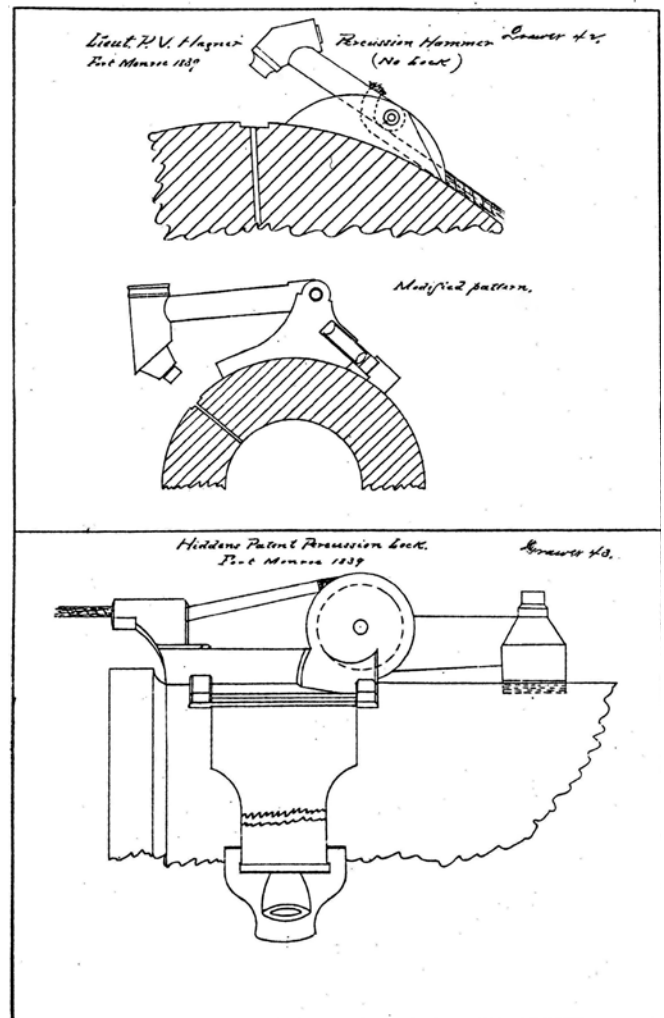


Figure 9. Sketches of the locks tested at Ft. Monroe, 1839. Hidden’s is at the bottom

The Perkins lock raises another conundrum about the origins of its design. In his 1853 publication on Naval percussion locks and primers, Dahlgren notes the French origins of a lock based on “*the plan of allowing the hammer to recoil freely before the impulse from the vent. . . . It was invented by an officer of the French marine artillery, and was at once adopted into the French navy, and has ever since constituted the lock of that service to the exclusion of any other.*” One is described in 1833 simply “as simple, economical, durable; easy of application, sure and instantaneous in its effects.” Dahlgren then notes in the Aide Mémoire Navale of 1850:

“and from a sample of the lock just at hand,” that “*Since its inception a change has been made in the material, and some slight alterations in the arrangement of the subsidiary parts; the hammer, for instance, is provided with a double face. . . . [The changes] in nowise touch the principle of the lock, nor, indeed, the structure of its essential parts. To preserve the primer when placed in the vent from exposure or displacement, a thin iron plate is inserted in the body of the lock, which has a horizontal sliding motion; when the primer is in the vent, this plate is drawn over it; as the lock [i.e., hammer] descends, the plate is made to recede from the vent by means of two cams attached to the rear end of the hammer. The whole structure of the French lock is massive, and its action powerful.*”¹⁷

A sketch of the lock in its open position, as included in the 1850 Aide Mémoire Navale, was provided by Dahlgren, and included here as Figure 8. Except for its material “*of wrought-iron, except the head of the hammer, which is of gun-metal,*” and weight of 5½ pounds,¹⁸ the resemblance to the Perkins lock is remarkable.

Endnotes

- ¹ Salzer, Dick and Sears, Matt . “Flintlock Cannon Igniters,” *American Society of Arms Collectors Bulletin* 123:54-62. 2021. See also Dick Salzer, “Naval Cannon Ignition Locks,” *Arms Heritage*, Vol. 10, No. 2 (April 2020), which included examples from the collection of Matt Sears.
- ² *Descriptive Catalogue of the Ordnance Museum, Rock Island Arsenal*. Drifill Printing Co., Rock Island, IL 1909), p. 152.
- ³ Hidden later purchased Sawyer’s patent rights, before he sold the rights to the Navy. U.S. Patent No. 2494, Patent Office Records, RG 241, NARA.
- ⁴ Lt. Edward Simpson, *A Treatise on Ordnance and Naval Gunnery, Compiled and Arranged as a Text Book for the U.S. Naval Academy*. (New York, D. Van Nostrand, 2nd Edition, 1862), Plate 5; hereafter referred to as Simpson, *Treatise*.
- ⁵ [Lt. J.A. Dahlgren], *Naval Percussion Locks and Primers, Particularly those of the United States* (Philadelphia: A. Hart, 1853), 51, U.S. Percussion Lock & Primer; and 96, Friction Primer. Hereafter referred to as Dahlgren, *Percussion Locks*.
- ⁶ After complaints during the Mexican-American War that the locks were affixed so insecurely to the brass tubes that there was concern even to fire salutes with them, the friction primers tried experimentally during that war were improved and adopted soon thereafter. See Lieutenant Peter V. Hagner’s notes prepared in Mexico City, enclosed in Captain Benjamin Huger to Colonel George Talcott, April 20, 1848, E 21, LR H184 1848, RG 156, OCO, NARA.
- ⁷ A native of Maryland, Captain Samuel B. Ringgold was personally selected by Secretary of War Joel R. Poinsett to establish a ‘flying battery’ within the artillery branch of service. Ringgold’s command, Co. C, 3rd Regiment of Artillery, perfected its equipment, drill and horsemanship at Ft. McHenry, Maryland. He was mortally wounded during the Battle of Palo Alto, May 8, 1846, and died three days later. The skill in which the artillery was handled that day contributed to the defeat of superior numbers of the enemy.
- ⁸ Words to the effect of “A little more grape Captain Bragg” were uttered by General Zachary Taylor during the Battle of Buena Vista on February 23, 1847, and would be a campaign slogan that put Taylor in the White House a few years later. Although Captain Braxton Bragg showed competence during the Mexican-American War, he was considerably less so as a general for the Confederacy. See the author’s “A Key to ‘Zachary Taylor at Walnut Springs.’” *Military Collector & Historian*, Vol. 67, No. 1 (Spring 2015; New Index No. 265), 33-7.
- ⁹ By 1842 the Ordnance Department had established a Model Shop at the Washington Arsenal, which maintained samples of both adopted patterns and experimental pieces. As accustomed as Hidden was to working with departmental officers, it might have been more logical for this piece to have ended up in the Model Shop than at West Point.

Equally remarkable is the similarity to a lock by Enoch Hidden that was tested at Ft. Monroe in 1839.¹⁹ (Figure 9, bottom) Based on the evidence at hand, it can only be speculated that both Hidden and Perkins had observed a French lock as just described and incorporated some of its features into their 1839 and 1837 designs. It should be noted Hidden’s design is similar to that shown as Hidden’s “Navy Rebounding Lock” in Simpson’s *Treatise on Ordnance and Naval Gunnery*.²⁰ (Figure 4., second from top) It clearly preceded the bottom lock in that illustration, which is what Hidden and Sawyer patented in 1842. Since Perkins did not patent the lock in this article, whatever were his claimed improvements remain unclear. Perkins may have had the lock discussed above made in 1837 for potential participation in the lock trials that occurred in 1839, but for whatever reason may have decided not to proceed. For now Perkins’ connection to U.S. cannon lock development will remain enigmatic.

In their coming to general notice after so many years, both examples fill in parts of the story about applying cannon locks to U.S. field artillery.

Acknowledgements

Thanks to Member Gordon Blaker, Director, U.S. Army Artillery Museum; the late Ray Darida for the loan of his 1876 International Exhibition publications; and Duffy Neubauer for sharing pictures of the original vent on his M1841 12-pound Howitzer that appear in a sidebar to this article.

- ¹⁰ Lt. Henry Metcalfe, *The Ordnance Department, U.S. Army, at the International Exhibition, 1876* (Washington: GPO, 1884); hereafter Ordnance Dept., *International Exhibition*. See also *Official Catalogue of the International Exhibition of 1876, Revised Edition* (Philadelphia: Centennial Catalogue Co., licensee from the U.S. Centennial Commission, 1876), “Military and Naval Armaments, Ordnance, Firearms, and Hunting Apparatus,” 133-4.
- ¹¹ The earliest trial of “percussion primers” noted by the author was at the fort in the summer of 1828, conducted by Lieutenant William Bell with a “6-pdr. Gun, new pattern” Lieutenant William Bell to Colonel George Bomford, November 10, 1828, Special Files, Experiments, Class 3, RG 156, OCO, NARA, Washington, DC. See also by the author, *Arms Collecting*, Vol. 36, No. 4 (November 1998) and Vol. 39, No. 2 (May 2001).
- ¹² After the Patent Office fire of 1836, many patents were not renewed, as required to continue their validity. In this case, if it were a patent date it should have been recorded the following year and not been affected by the renewal requirement.
- ¹³ The National Archives is currently closed to in-person research activities. Please check on the records’ availability before traveling to Washington.
- ¹⁴ Lieutenant Colonel Rufus L. Baker to Colonel Henry K. Craig, August 5, 1852, enclosure to Richard M. Bouton to Craig, July 27, 1852, E 21, LR Bxx 1852, RG 156, OCO, NARA. Bouton had developed machinery to make the standard military ‘top hat’ percussion cap while at Watervliet and thus felt qualified to run the new operation at Frankford. Where Perkins worked and why he was felt to be more qualified has not been determined. It might be noted that at Washington Arsenal a second set of machinery to make caps was developed, and possibly Perkins was employed there. See also “The Cap Pouch in the United States Service, 1833-1896,” 19, ms. in preparation by the author, which includes a chapter on the adoption of the percussion cap as well as the creation of the machinery to manufacture them within the Ordnance Department.
- ¹⁵ George D. Moller, *American Military Shoulder Arms, Vol. 2: From the 1790s to the End of the Flintlock Period*. The University Press of Colorado, Niwot, CO, 1993. pp. 174, 230-2, 383-4. It might be noted that one militia musket by Perkins has his initials only as “RP” on the lock tail, in place of the year.
- ¹⁶ Ordnance Dept., *International Exhibition*, No. 33.
- ¹⁷ Dahlgren, *Op. Cit.* p. 23-7.
- ¹⁸ Dahlgren, *Op. Cit.* p. 25.
- ¹⁹ Portfolio of Drawings of Guns and Ammunition, 1814-1870, Special Files, RG 156, OCO, NARA.
- ²⁰ Simpson, *Op. Cit.*, Plate 5.

VENT DAMAGE FROM CANNON LOCKS

In the collection of Duffy Neubauer is a M1841 24-pounder Howitzer (Figure 1.) that exhibits wear on and around the vent field that is consistent with a cannon lock that included a sliding hammer. These are characteristics of the standard lock in the era of the Flying Battery that was patented in 1842 by Enoch Hidden and Samuel Sawyer, which included this type of hammer. One conclusion of the lock trials conducted at Ft. Monroe in 1839 was that hammers which rebounded from the gasses escaping from the vent, after the main charge was ignited, subjected both lock and vent to extremes of percussion and gases. A solution was to have the hammer slide out of the way when primer ignition occurred and before escaping gases could come back up the vent hole to strike the bottom of the hammer and throw it violently out of the way.

This was considered a fault of the Hidden and Perkins designs described in the previous article. Even the French did not like that part of the ignition process, but did little to find a solution. American ingenuity was revealed in the just mentioned Hidden & Sawyer patent of 1842, which included a slot in the piece that had the hammer head at one end. Courtesy of Jack Melton and *The Artilleryman* magazine, a recovered piece of one of these



Figure 1. M1841 24-pounder Howitzer, the sixth cast and finished by Ames in 1847. Unless noted, all photos courtesy Duffy Neubauer, Starkville Civil War Arsenal, Starkville, Mississippi.

locks is included here (Figure 2.) that shows the construction of this ingenious piece. Assembled, a bolt ran through the slot. When the lanyard was pulled, this piece both rotated on the bolt and slid away from the vent, precluding the forces of the exploding primer and subsequent discharge of gases through the vent from the main charge.



Figure 2. A field-recovered sliding hammer from a M1842 Hidden cannon lock. Courtesy Jack Melton and *The Artilleryman* magazine (left). Sideview of a M1842 Hidden lock, without a vent closure device (right).

However, after multiple firings, the force of the hammer pounding on the soft copper vent would beat it down. The result can be observed on the original vent on Mr. Neubauer's M1841 24-pounder Howitzer, cast by Ames in January 1847 and bearing the Registry No. 6.¹ (Figure 3. right) The tube has been drilled for an 1842 pattern Hidden percussion lock, and the vent has been depressed by the repeated blows from the face of the hammer. Further, there is evidence of the sliding motion of the hammer as the lanyard pulled it out of the way. Although difficult to see, there are scratches on the tube and some abrasion from repeated slides by a hammer, which was pulled onto the tube by the lanyard tension after being pulled.

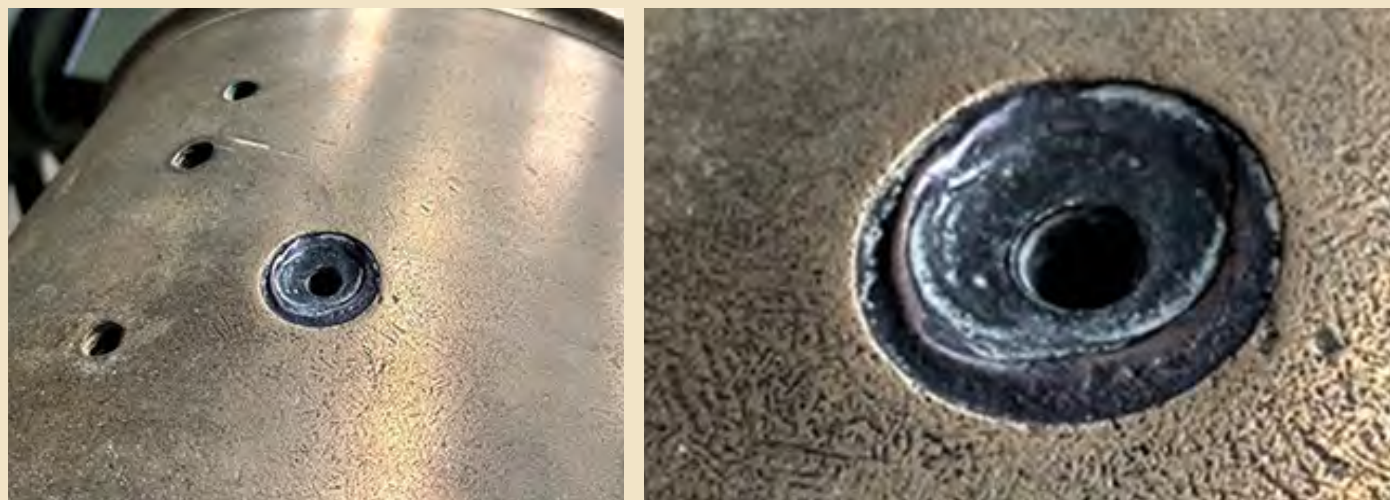


Figure 3. Entire vent field of the 24-pounder howitzer (left), showing the three bolt holes to secure the lock, and depressed vent orifice caused by repeated firings (right). Directly straight-up from the vent can be seen a slight depression, likely caused by the sliding movement of the hammer after repeated firings.

These effects are well described by Bvt. LTC Braxton Bragg in a letter written at Jefferson Barracks, Missouri, which he sent to Chief of Ordnance COL George Talcott, dated August 10, 1852:

“Sir, The letter from your office of the 29th July in relation to friction tubes, is received... The suggestions from your office call to my mind some observations made by me in service which may not be uninteresting to the department. I am now using my third battery, received new, and in each case I have found after a little practice with the percussion lock, the exterior orifice of the vent becomes so contracted that the percussion primer and common priming wire are used with difficulty, and sometimes even the priming wire could not be forced in. The vent field, being of soft metal, also becomes so roughly and irregularly battered—the hammer having a motion of [horizontal] translation with that of rotation—that the percussion caps become very uncertain [in their fire]. For security, they require a regular, hard field.

In two of these batteries the difficulty was almost entirely removed by substituting steel vent fields which resist the action of the hammer.

The third battery was turned over to Maj [Thomas W.] Sherman before the battle of Buena Vista, with the copper vent field, and I was told by one of his officers that the fire with percussion caps was so uncertain that they were abandoned for the port fire. In my battery on the same field I do not recollect a single failure. . . . [Bragg then makes suggestions regarding an increase in the allowance of watering buckets and also regarding alterations to harness].”²

Interestingly, neither LT Hagner nor CPT Ramsay specifically mention the vent condition in their informal reports on Ordnance-related matters sent to the Chief of Ordnance at the end of the war, while the Army occupied Mexico City and set up an arsenal of repair, construction and storage. LT Hagner’s comments did include several that pertained to percussion locks on artillery, worth noting here for the record: *“To Siege Guns, They have done well, with Lanyards of Raw Hide frequently greased; to field Guns, they are more exposed to the action of the recoil—breaking the [lock’s mounting] screws—so that some officers think them too uncertain [even] for salute firing. For Field Guns, the lock piece should be cast on the guns, as recommended by me in 1839—There is then nothing to break by the shock [of the ignition]—The Friction Tube has answered perfectly well with the Mountain Howitzer and may replace all other means of firing [cannon]. . . .”³*

These suggestions may have been reviewed, but no official action on them was taken. The primary reason was, within a few years an improved friction tube (or primer, as later designated) would indeed be adopted to fire field artillery cannons.

Endnotes

- ¹ See also <https://www.starkvillecivilwararsenal.com> (last accessed Jan. 12, 2022) for additional information on Mr. Neubauer’s unique collection of antique artillery artifacts. The howitzer is under Featured Items.
- ² Box 61, Special File; Experiments, Class 8, RG 156, OCO, NARA. It might be noted the author has not been able to locate the text of the July 29, 1852 letter from Talcott to Bragg.
- ³ LT Peter V. Hagner’s informal notes were enclosed in CPT Benjamin Huger’s letter to Chief of Ordnance COL George Talcott, April 20, 1848, Entry 21, Letters Received H-184 1848, RG 156, OCO, NARA. It had been preceded by CPT George Ramsay’s report, also informal, to the Chief, May 10, 1847, E 21, LR R-132 1847, RG 156, OCO, NARA.

