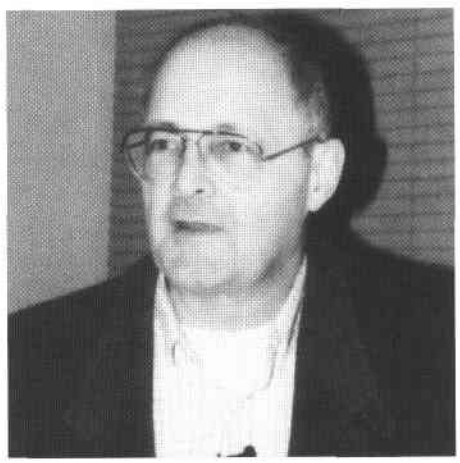
Alvan Clark and the False Muzzle

John D. Hamilton

In the course of my research on New England rifle-maker Edwin Wesson (1811-1849), an interesting story emerged concerning efforts that were made in the 1840s to improve the accuracy of percussion target rifles. To appreciate the fervor devoted to that quest, one must also understand that the 1830s and 1840s were marked as a period in which the innovative application of higher technologies were applied to the making and use of firearms. New factors that enhanced rifle performance during this period included the use of homogeneous cast steel for barrels, gain-twist rifling, the freed bore, widespread use of precision machine tools, development of gunpowders having special characteristics, changes in bullet design to improve ballistics, and development of the telescopic sight. As if that weren't enough, add to this equation a gadget known as the false muzzle. It is in connection with this last kink [**kink***n*—a clever and often unusual idea or method of doing something] that we meet the multitalented Alvan Clark (1804-1887).

Born in Ashfield, Massachusetts, Clark first started his multifaceted career in 1827 as an engraver of calico textile prints in East Chelmsford, Massachusetts, and Fall River, Rhode Island. This work lasted until 1836, when he settled in Cambridge, Massachusetts, and became a successful miniature portrait painter (Fig. 1). The Boston City Directory of 1844 listed Clark as practicing this profession in a studio located at 15 Tremont Row. About 1845, he became interested in refracting telescopes and is credited with being the first person in the United States to make achromatic lenses (William Malcolm of Syracuse, New York, notwithstanding). Clark and his sons made numerous equatorial refracting astronomical telescopes, which were manufactured at his Cambridge factory and purchased by leading colleges, universities, and foreign observatories. He also made auxilliary instruments for measuring celestial arcs, and was able to figure near perfect lenses for which he devised a method of local correction. Clark's interest in astronomy led him to discover a number of new stars. For these efforts and others, he was the recipient of awards from the American Academy of Arts and Sciences and holder of Master of Arts degrees from Amherst, Chicago, Princeton, and Harvard. Although Alvan Clark is listed in Appleton's *Cyclopaedia of American*



Biography as a world-famous maker of telescopes whose optical work was unexcelled anywhere in the world, he also gained renown in the tight little world of match shooting, especially at what was then the standard distance of 40 rods (220 yards). He was once quoted as saying, "Well, I think I am then the best rifle shot in the world," and often supported that claim by accepting challanges that involved some rather heavy side bets. In this activity, he was particularly partial to rifles made by gunsmith Edwin Wesson (1811-1849) of Northboro, Massachusetts, which were then considered among the most accurate made (Fig. 2).

In his search for ever greater accuracy, Clark exchanged many ideas with Wesson on improving the state of the art as it then existed for rifling barrels, loading methods, and the design of sights. In this regard, Clark devised and patented what he termed a "moveable loading muzzle for rifles" (Fig. 3). This device was a removeable, or false, muzzle that prevented damage, during loading, to that critical portion of the rifling that makes last contact with the bullet before it exits the barrel. As specified in his patent application that was filed on February 7, 1840, "It has been the practice to enlarge or round the corners of the muzzle of the barrel of the patch rifle, to prevent injury to the patch in loading, and in thus rounding or enlarging the muzzle, the probability or almost certainty, is, that the quality of the piece for accurate shooting will be impaired" (Fig. 4).

One sovereign remedy of the time was to cut off about half an inch from the muzzle, which made loading more difficult but maintained control over the bullet as it departed

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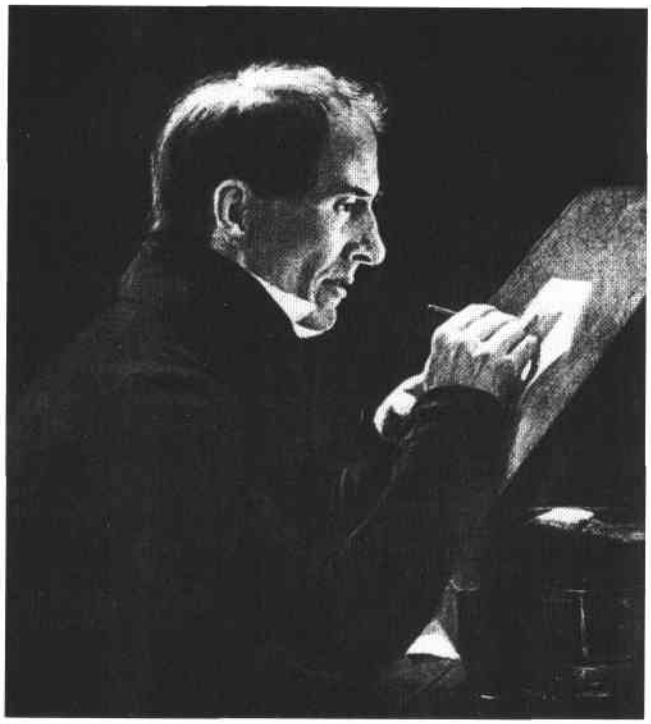
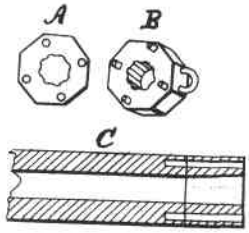


Figure 1. Alvan Clark as an artist, painted by George Hollingsworth (1813-1882). (Fogg Art Mueum, Cambridge, Massachusetts.)

A. CLARK.
Loading Muzzle.

No. 1,565. Patented April 24, 1840.



Inventor.
Alvan Clark

Figure 3. Alvan Clark's "Movable Loading-Muzzle for Rifles," U.S. Patent No. 1,565, issued April 24, 1840. Clark termed his device a "new and useful Improvement in Rifles, which I call a "Loading-Muzzle. . . .

Figure 2. Heavy match rifle with extra barrel by Edwin Wesson (1811-1849) of Northboro, Massachusetts, ca. 1840-45. Accessories include false muzzle, bullet starter, bullet mold, patch cutters, and nipple wrench. (Courtesy of the late John Bicknell, Jr.)

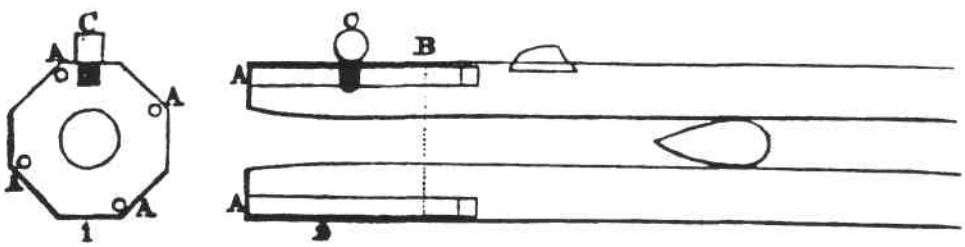


Figure 4. Clark's muzzle "arrangement" (*American Repertory* 1841). The enlargement of the false muzzle is exaggerated for emphasis.

Clark's Muzzle "Arrangement"

the bore. This solution was only temporary, for by the time 200 shots had been fired, there would have been a perceptible enlargement of the bore again (Fig. 5). Clark's analysis on rifle shooting in *The American Repertory* related how his device "secured the patch from injury, facilitated loading as tight as can be wished, and obtained and preserved as perfect a delivery as possible." His method of doing all this was to "drill four holes in the muzzle, and after dressing them out with a suitable instrument to round and straighten them." He then cut the barrel off:

> both pieces are then faced at right angles with the calibre [bore]; after which I fix steady pins in the piece which is taken off, and which is called the loading muzzle. . . . This muzzle is enlarged at the entrance . . . , and may be taken off and replaced at any time. This piece is griped firmly in its place during the operation of boring and rifling, and serves to steady the tools.

Lest this all carry us away on a crest of enthusiasm for false muzzles, we should remember that in 1909, Dr. Franklin W. Mann published the results of his experimental ballistic trials, which indicated that muzzle mutilations that had demoralized riflemen for years did not throw the bullet from the line of the bore to any greater degree than any first-class barrel. This meant that muzzle defects merely produced a consistant error that could be compensated for by simply changing sight settings. Dr. Mann showed us that undetected bullet abnormalities were the true cause of error.

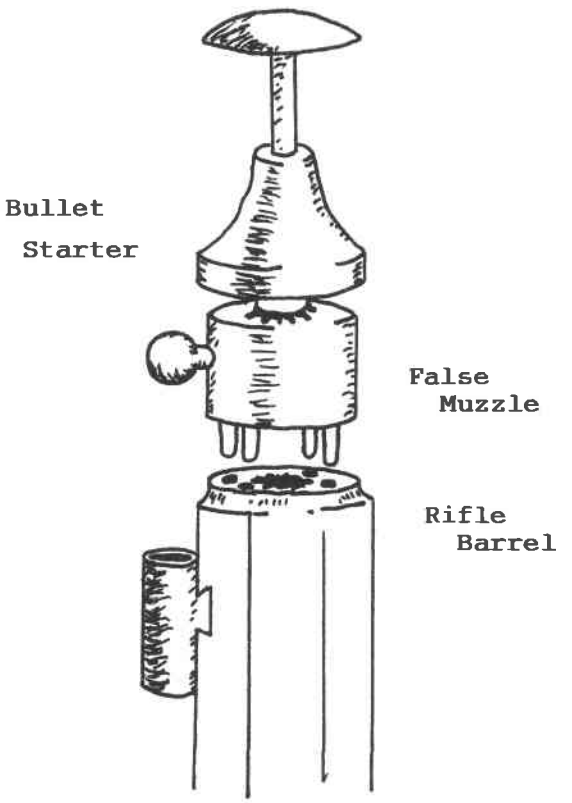


Figure 5. Diagram of the alignment sequence of bullet starter, false muzzle, and barrel.

On the same date that Clark's patent was issued (April 24, 1840), Edwin Wesson purchased the exclusive license to make and market the device. Clark relinquished "all my right, title, and interest in said invention to the full end of the term of the patent," which under the law would expire in 1854. The agreement with Clark called for eight annual payments to be made in installments of $100.00 each. Only two of the installments were ever paid, but Alvan never pressed Edwin for full payment. In addition to purchasing exclusive rights, Edwin was also required to render a $2.00 fee each time the device was made.

Evidently the bookkeeping became rather confused, because Alvan suggested that "I think it will be best for you to number the muzzles, for convenience in settling our accounts from time to time: I can then say, in my receipts, settled up to such a number" (Fig. 6). Edwin had already begun to serialize his barrels and record them in an *Order Book,* so, commencing with barrel no. 72, a separate serial number for the matching false muzzle (stamped *CLARK'S PATENT*) was also recorded when ordered. Thus, serial numbers of the barrels and false muzzles *never* match, representing as they do two unsynchronized sequential systems of accountability.

Edwin allowed a number of "agents" to use the muzzle patent, but initially this right was not widely granted. Instead he attempted to sell franchises that would reserve muzzle rights within a specific state or region. This was not successful. The price, ranging from several hundred dollars, or more, was too great for most gunsmiths to bear. As an alternative, Edwin sanctioned individual usage fees, but after paying Alvan's royalty, each one only netted a dollar profit and were more trouble to monitor and collect than they were worth. Edwin's standard $3.00 fee for use of the patent muzzle added significantly to the average $35.00 match rifle and drove many gunsmiths to infringe on Clark's patent.

Widespread unauthorized use of the Clark patent became particularly rampant in upstate New York. In a letter dated June 13, 1842, John M. Caswell, Jr., and P. Waggoner, Jr., both of Lansingburgh, New York, advised Alvan that "there are without doubt many rifles of the kind being made in this section of the country, for which you receive no compensation." They proposed that "the progress of infringement might be checked" if Alvan would grant *them* the privilege of manufacturing the muzzle for Rennselaer County. However, such concessions were Edwin's exclusive right to arrange. On return from a trip to that region in April 1843,

Figure 6. Detail of false muzzle stamped "Clark's/Patent/606." Heads of the four alignment pins are clearly visible, having passed entirely through the length of false muzzle. Photo courtesy of Ron Gable.

Edwin informed Alvan that "I find gunsmiths are making great exertions to get something to compete with the muzzle." Edwin further noted "I received a letter from my agent in Syracuse [Joel Owen]. He says there are constant infringements upon the muzzle in that place." Another Syracuse correspondant, noted marksman and customer Albert A. Hudson, informed Edwin that the growing list of infringers included the much respected Morgan James of Utica, and two others in Oneida [believed to have been Sewell Newhouse and S. A. Van Horn].

In January 1843, Hartford gunsmith Philo S. Newton applied to Edwin for the priviledge of using Clark's patent muzzle. Edwin's notation in the margin of the letter indicates that it was "answered by a refusal." It was seldom that Edwin refused outright to sell the use of Clark's patent, but Newton had given Edwin cause to regard him as "treacherous." A report from one of Edwin's customers in Hartford, Charles E. Williams, stated that Newton had kept one of Edwin's rifles in his shop and used it to copy the Wesson gain-twist rifling. After being refused, Newton then attempted to form an alliance with Hartford gunsmith J. S. Rice and thereby fraudulently obtain use of the patent under Rice's name. Meanwhile, Newton worked to obtain a patent for his own version of a false muzzle that was intended to circumvent the Clark patent (Fig. 7). It was termed an "Attached Muzzle for Firearms" (U.S. Patent no. 3,115, issued June 1, 1843) and was described by Edwin as "2 inches of the muzzle cut from the barrel and screwed in like a chamber. After rifling it is

P. S. NEWTON

Muzzle-Loading Fire-Arm.

No. 3,115 Patented June 1, 1843.

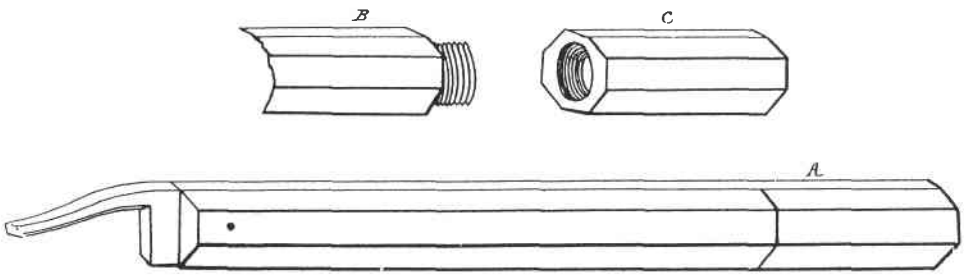


Figure 7. Philo S. Newton's "Attached Muzzle for Firearms," U.S. Patent No. 3,115, issued June 1, 1843. Newton called this device a "new and improved attached muzzle to firearms for the purposes of the more accurate discharge of the ball or shot of the firearms and the prevention of the wear of the orifice of the barrel consequent upon its frequent discharge and long use. . . ."

taken off and hardened for the purpose of contracting and giving it durability, and they say they make them work very well."

Newton was not the only evader of the Clark patent. Others were able to devise gimmicks by which the muzzle could be attached by a different method, or made to serve a dual purpose, that made it eligible to qualify for a different category of patent.

In November 1845, Edwin set out on a westward tour to visit his brothers Rufus and Martin, who were then living in Auburn, New York, and also to seek out a number of known infringers and collect patent fees to which he was entitled. His tactic was to literally catch them red-handed with rifles in the rack, fitted with false muzzles for which the royalty had not been paid. At Pittsfield, Massachusetts, Edwin called on William Deeds Miller, "who had put on 9 muzzles which he settled for & I gave him the right to put on more. His rifles are good for nothing either with or without muzzles." Also on that trip Edwin "fell in with a man by the name of Stevens [Abijah C. Stevens] who owns puting on 5 or 6 muzzles which he says he will pay for & wants the right, he is in Hudson" [Columbia Co., New York]. In Auburn, Edwin collected about $60.00 in fees and made contracts with two other makers (probably either Hugh McClellen, Chauncey Snell, Morgan L. Olmstead, James A. Schrivener, or John Vanderheyden). He then proceeded to Syracuse in an attempt to collect still more fees. Rochester was also on his itinerary, presumably to call on William Billinghurst.

In December Edwin spent 3 days in Syracuse, where he must have had an encounter with local gunsmith John H. Rector (1807-1867). Later, in a letter dated July 6, 1846, Rector offered to pay Edwin $15.00 for muzzles made up to that date, but apparently this was not accepted because Edwin instituted legal proceedings against Rector in the Western New York U.S. District Court. Although the suit was entered as *Rector vs. Clark,* Edwin shouldered the burden of upholding Clark's patent. In his defense plea, Rector contended that the muzzle had been in public usage in the late 1830s, and was not "discovered" by Clark. Under the U.S. Patent Law of 1836, patentees had to satisfy an examiner that their inventions included new and novel features and had not previously been described in a published printed work; a doctrine that evolved into the legal concept of "prior art."

In his lawyer's brief, Rector implicated a number of gunsmiths whom he cited as having had prior knowledge of, or having previously employed, the false muzzle; but none of whom had published their ideas. Among those cited by name were Ariel Fraser of Syracuse; a gunsmith named McLaughlin of Jackson, Tioga Co., Pennsylvania; and another gunsmith named White of Ypsilanti, Michigan. Rector did not implicate himself, although a rifle is known with a two-pin false muzzle marked "J.H. Rector/ Senaca Falls" and must date after 1837 and before 1840, when Rector left Senaca Falls and moved to Manlius. This rifle was viewed in the collection of the DeWitt Historical Society of Ithaca by ASAC member Holman J. Swinney.

In November 1846, Morgan James corresponded with Edwin concerning an exclusive license to manufacture the Clark muzzle in the State of New York. When quoted a price of $800.00, James responded (December 16th) with a sobering assessment of the target shooting climate in upstate New York by explaining that most of the "muzzled" rifles he made were being sent westward, out of the state—an indication of declining local interest. Those muzzles that James knew were made in the Utica region that year would only yield $132 in fees. James admitted that he had made 12 since the previous winter, and was aware that six each had been made at Cedarville (Lewis Devendorf), Syracuse, and Rochester. He viewed the trade of gunsmithing as "going down," noting

that "ten to twelve years ago there were forty gunsmiths within forty miles of Utica, now there are but three." In years gone by, an element of luck with the old soft iron barrels afforded tyro shooters a chance to win, but top marksmen, firing rifles having fresh cast steel barrels and patent muzzles, had scared off the ill-equiped and underfinanced competition.

Prompted by the sobering reality of James's assessment of few matches and even fewer serious competitors, Edwin became more receptive to allowing New York State gunsmiths such as James, William Billinghurst, S. B. Armory of Goshen, and William H. Church of Norwich (Chenango Co.) to use the patent, provided they pay the appropriate fee. Others, such as Nelson Lewis of Utica, discovered it was less trouble to order Wesson barrels that were already fitted with muzzles. Edwin still continued to press infringers to render their fees when their transgressions were brought to his notice by informers. However, without solid proof, routine disavowals received from such gunsmiths as McClallen of Auburn, and William L. Hudson of Cincinnati, were impossible to refute, and impractical to prosecute.

In December 1847, Rector obtained a patent for a "moveable protecting muzzle piece" that could be quickly removed for firing, by means of guiding knobs that slid along longitudinal grooves cut into the *outside* surface of the barrel (Fig. 8). In February 1849, Daniel Smith of Scipio, New York, also edged around Clark's patent with an "attachment method for loading-muzzles for rifles," which consisted of a hinged arrangement that connected the muzzle to the barrel, so as to also use the muzzle as a ramrod thimble (Fig. 9). Rather than being an evasion, this brainstorm qualified as a dual use.

As the year 1849 began, the arms industry was shocked by the news that Edwin Wesson had died suddenly, having staked all his resources on establishing a modern rifle manufacturing facility in Hartford, Connecticut. His heavily indebted estate included a pending patent application for a bevel-gear to revolve the cylinder of Leavitt's revolver, but the right to Clark's patent had been used as collateral in purchasing property and buildings for the rifle factory. Consequently, the patent belonged to the bondholders. In an effort to recoup their investment, they ventured into a short-lived attempt to manufacture quality rifles along the lines envisioned by Edwin. This undercapitalized enterprise, styled as The Wesson Rifle Company, was soon declared a failure, and the legal right to Clark's patent lay dormant until it expired in 1854. None of the bondholders felt obliged to come forward and defend it.

In conclusion, it is fair to say that even before the patent was due to expire, other gunsmiths were already freely using the device, without even bothering to take out evasive patents. The noted marksman, author, and chief proponent of Wesson rifles, John Chapman, once observed that Edwin's solicitor in Syracuse had been less than capable in handling the suit, and that it would probably be ruled out of court. In reality, the suit against Rector remained unresolved. It is

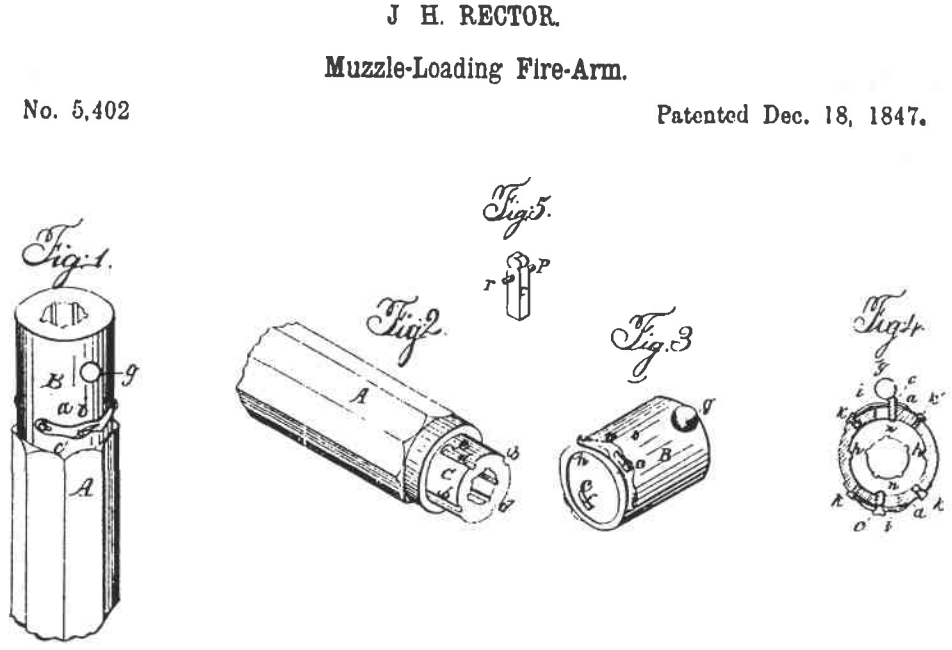
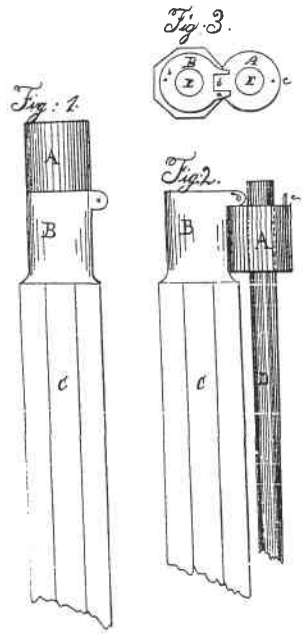


Figure 8. John H. Rector's "Muzzle for Rifles," U.S. Patent No. 5,402, issued December 18, 1847. Rector termed his device a "Movable Protecting Muzzle-Piece for Rifles or Creased Guns."


D. SMITH.

Muzzle-Loading Fire-Arm.

No. 6,124. Patented Feb. 21, 1849.

Fig. 3.

Fig. 1.

Fig. 2.

Figure 9. Daniel Smith's "Attachment of Loading-Muzzles for Rifles," U.S. Patent No. 6,124, issued February 21, 1849. This was termed "a new and Improved Loading Hinge-Muzzle for Cut Rifles."

interesting to note, however, that Rector did not publicly advertise his use of "loading muzzles" until the autumn of 1854, perhaps still fearful of renewed legal action from some other quarter.

For his part, Alvan Clark never looked back on his creation, as his attention became focused on the heavens.

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