

1. "Colt on Revolving Chambered-Breech Fire Arms", speech by Sam Colt before the Institution of Civil Engineers, November 25, 1851, London, England.

# Colt's Efforts at Double Action

Richard C. Marohn, M.D.

## INTRODUCTION

This article will describe in depth the development of the first Colt double action revolver. Although the double action revolver is the accepted standard of revolvers today, there were significant difficulties in its development and perfection. Despite Sam Colt's entrepreneurial propensities and skills, his own efforts, and those of the Factory that was his legacy, were conservative, never moving too quickly with refinements and innovations until they were proven money-makers. For example, the metallic cartridge came to Colt's late, as did the double action or "self cocker."

I will present here the reasons for Colt's conservatism and how he and they met the challenge of a potentially unfriendly market.

There was no such difficulty with that gem of Colt production, the Single Action Army. It is the "safe" collector and historian who limits his interests to this well-tested and well-accepted Colt device. The single action mechanism had not changed significantly for 26 years when the SAA was introduced in 1873. This was a tried and true Colt product, but as the United States moved through the era of industrialization into the 20th Century, some changes needed to be made. Was the slide ejector satisfactory, even though reliable on the plains? Could one continue to hand-form wooden grips? What could be provided for the ordinary citizen, who needed a revolver that was reliable and lethal, yet of smaller caliber and more readily concealed? Would firearms continue to be embellished by master engravers? What mass-marketing techniques could be used to sell guns, yet preserve a commitment to quality materials and manufacturing?

Many of these questions were answered initially, and eventually, by the introduction of the Double Action Model of 1877 revolver, the "Lightning" and "Thunderer" of gun lore.

## SAM COLT AND THE DOUBLE ACTION

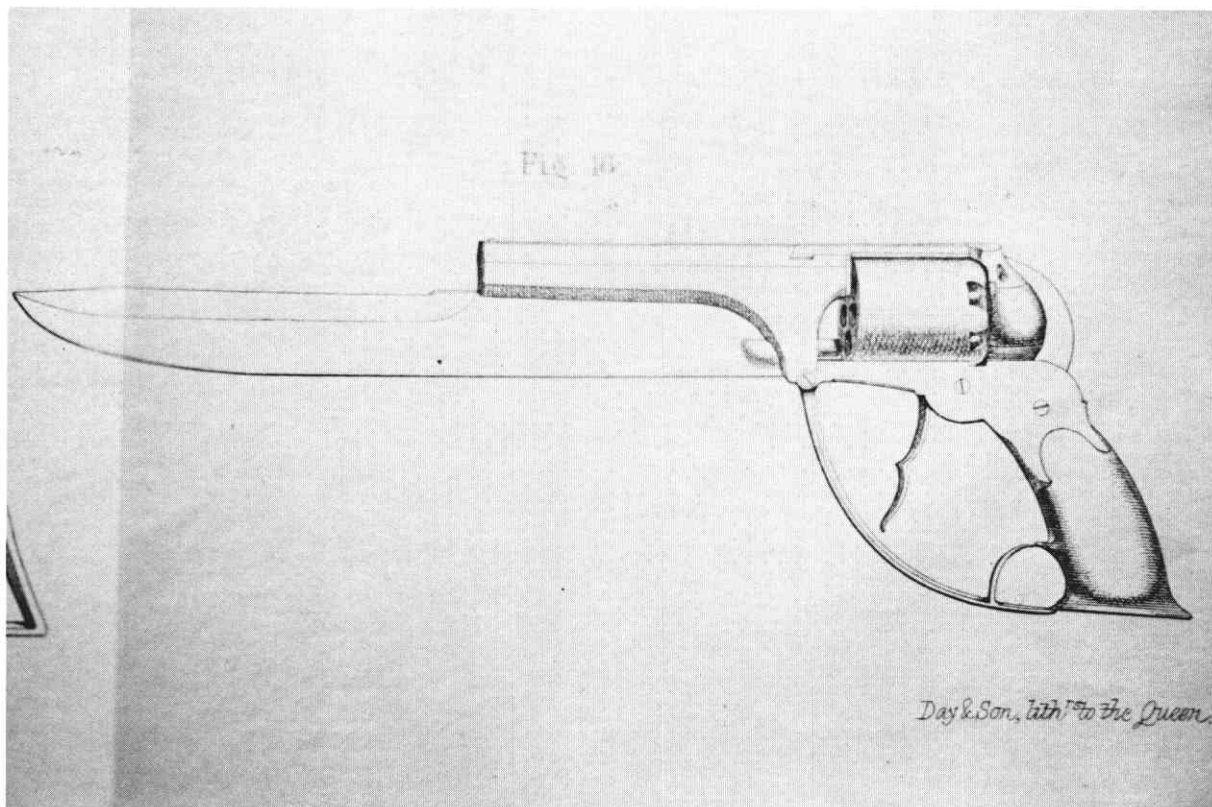
After exhibiting his revolver at the Great Exhibition of 1851 in London, Sam Colt spoke before the Institution of Civil Engineers on November 25, 1851 (figure 1) and emphasized that he did not favor double action revolvers because the trigger pull was so substantial that it interfered with an accurate aim. In responding to questions, he said that his "first weapons also were made to be cocked and fired by the same action of pulling the trigger,



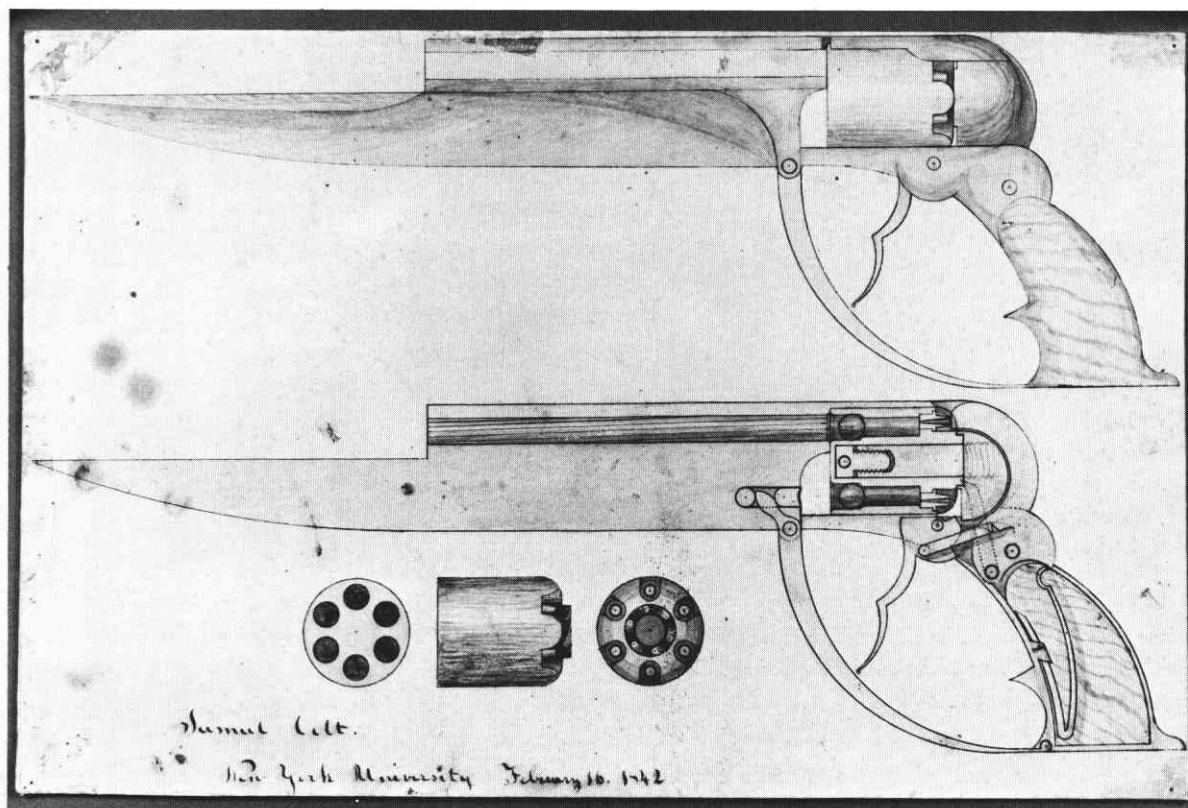
but it was found impossible to take certain aim with them, as it was necessary to exert as much force with the finger as would overcome the resistance of the main spring in cocking, and the weapon deviated from the line of sight; besides which it could not be carried on half cock, and was liable to explode the cap if it received an accidental concussion (1). "Figure 16, Plate 1," a combination of Bowie knife and repeating pistol made in 1836 (figure 2) would explain what he meant, and show how objectionable such an arrangement was in practice. Another modification consisted in having a ring trigger beneath the lock, on pulling which the hammer was raised and the chamber rotated, whilst the gun was fired by pulling an ordinary trigger. This construction required four or five additional parts in the lock. At last, the present simple (single action) arrangement was arrived at . . ." (5).

Henry Barnard, in *Armsmear* (2), his tribute to Colonel Colt after his death, writes, "Among many experiments tried by Col. Colt, one was to both cock a piece and fire it by the same drawing of the trigger. But with arms formed on this principle, it was found impossible to take and to keep a steady aim. Another was a ring trigger beneath the lock, to raise the hammer and rotate the cylinder; but in this way the complexity of the lock was doubled."

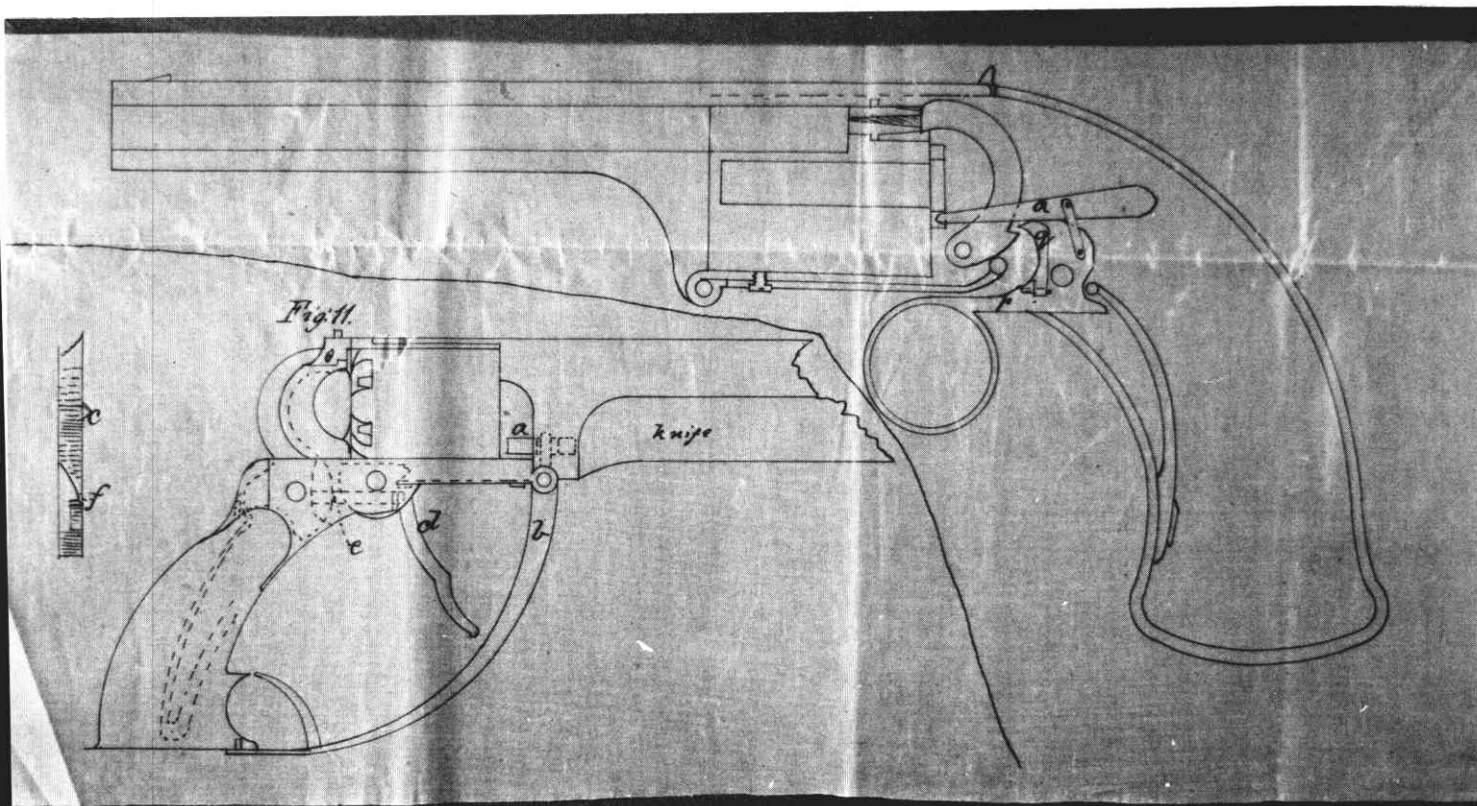
Joseph Rosa, in describing the rivalry of the London-made Colt Navy with the Adams revolver (23), notes that, initially, the Adams revolver was not acceptable to the British Government because of "the self-cocking action. Many thought it positively dangerous . . ." because of the accidental shooting of an officer in handing the revolver to another; later, the introduction of the Beaumont



2. "Fig. 16, Plate 1, a combination of a Bowie-knife and repeating pistol, made in 1836 . . ." from Colt's 1851 London speech.



4. Water color drawing of the double action Bowie knife revolver, inscribed "Samuel Colt, New York University, February 16, 1842."



3. A pen and ink scale drawing (upper) of a double action revolver with a ring trigger and a half-scale drawing (lower), marked "Fig. 11" showing a double action trigger Bowie knife pistol; drawn in 1842-3 by Sam Colt and Pliny Lawton.

double action mechanism helped the Adams become acceptable by 1856. However, Rosa comments that it "is well known that Colt experimented with a form of self-cocking action in the mid 1840's but discarded it as unsafe. Subsequent events proved him right." There is no evidence that Colt discarded his early double action mechanisms because they were unsafe, as the Adams might have been, but he did discard some early single and double action designs because of problems with lateral fire and simultaneous multiple chamber explosions. Colt did state that his revised single action design enabled the revolver to be carried on half-cock, rather than having the hammer resting on a cap, but that problem and this solution are not related to double action design.

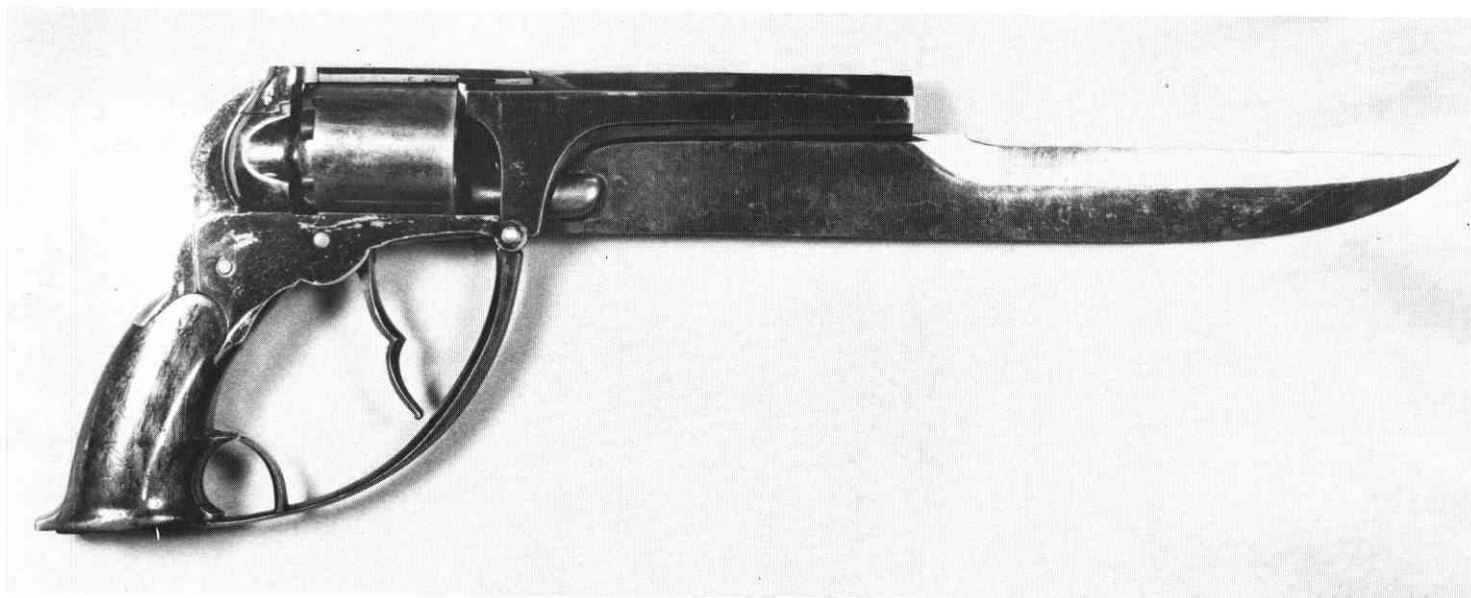
It may be that Colt criticized the double action design in his 1851 speech because he feared competition from the Adams, and was doing his best to disparage his competitor. Several authors (7, 20, 28) speculate that Sam Colt misled his listeners so that he would not appear to be still experimenting with a double action mechanism in recent years.

In both 1841 and 1858, Sam Colt did experiment with double action mechanisms, but produced only one prototype. The evolution of Colt's double action revolver begins with experimental modifications of the 1836-7 ring lever rifle attempted in 1839-40 and involves a transition from a front ring lever and trigger, to a rear

ring lever and trigger, to a double action compound trigger, to a double action compound ring trigger (all on the rifle), and then to a double action revolver with a component ring trigger, and finally to the Bowie knife double action revolver.

In 1842-3, a series of drawings were prepared by Sam Colt and Pliny Lawton, Superintendent of the Factory, to be used in conjunction with a Patent Caveat filed by Colt (1, 11). During this period, Colt, an engineer, was living in New York City in rented quarters at the University of the City of New York; these drawings were later retained in the engineering section of the Hartford factory, and could have been studied in 1876 when the first production double action revolver was being planned. Later, they became part of the Stephen F. Grancsay collection and were part of a Metropolitan Museum exhibition of Colt revolvers in 1942.

Shown in figure 3 is a pen and ink scale drawing (upper) of a double action revolver with a ring trigger and a half-scale drawing (lower), marked "Fig. 11", showing a double action trigger Bowie knife pistol; this is similar to a water color drawing (figure 4) of the double action Bowie knife revolver in the Connecticut State Library, inscribed "Samuel Colt, New York University, February 16, 1842", probably in Colt's handwriting (9, 20, 24, 28.) Out of these developed the lone specimen of the 1844 Bowie knife double action revolver, now in the Colt Collection of the Connecticut State Library (figure 5).



5. The 1844 double action Bowie knife revolver.

Double action revolvers were first introduced in England in 1855 (3) in the Beaumont-Adams revolver and in the United States by Starr in 1858 (3). Eventually, double action revolvers proved to be popular, especially in England, where they were the norm; accuracy could always be improved by firing them single action.

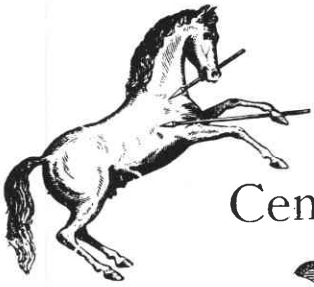
#### THE INTRODUCTION OF THE COLT DA M1877 REVOLVER

In January, 1877, Colt's announced (figure 6) the Double Action Model of 1877 (1), although specimens did not begin reaching suppliers until February through May of that year. Colt factory gauges stamped "1876" (Figure 7) and its apparent showing at the 1876 Philadelphia Centennial Exhibition suggest that at least a prototype was already available in 1876 (25). It is pictured (Figure 8) and described in the Connecticut Centennial Exhibition handbook as "... the new double-action, self-cocking, central fire revolver, combining all the latest improvements and devices. Such a weapon as this is of inestimable value to its possessor, who can deliver his fire with the greatest celerity and effect, for its ease of action, accuracy, and penetrative powers are unsurpassed." The revolver was developed by William Mason, Factory Superintendent (figure 9), who participated in the development of the Single Action Army (19, 26). No special patents for the double action mechanism were necessary because the mechanism had been in use for years and was in the public domain. Mason came to Colt's from Remington in 1869 and left in 1882 to join Winchester, retiring in 1910 (4, 27). Before he left Colt's, Mason was responsible for a number of important patents in double action design and refinement, including Colt's swingout cylinder designs. He was described as a "... modest, kindly man, little known outside his

immediate associates, but of singular fertility in invention and almost unerring in mechanical judgment" (21). About 125 patents were granted him during his lifetime, most related to firearms and firearms manufacture. He was brilliant in modifying and improving an original idea or invention so that it could be put into production successfully. This was particularly shown in his ability to modify Browning's ideas so that they could be manufactured by Winchester.

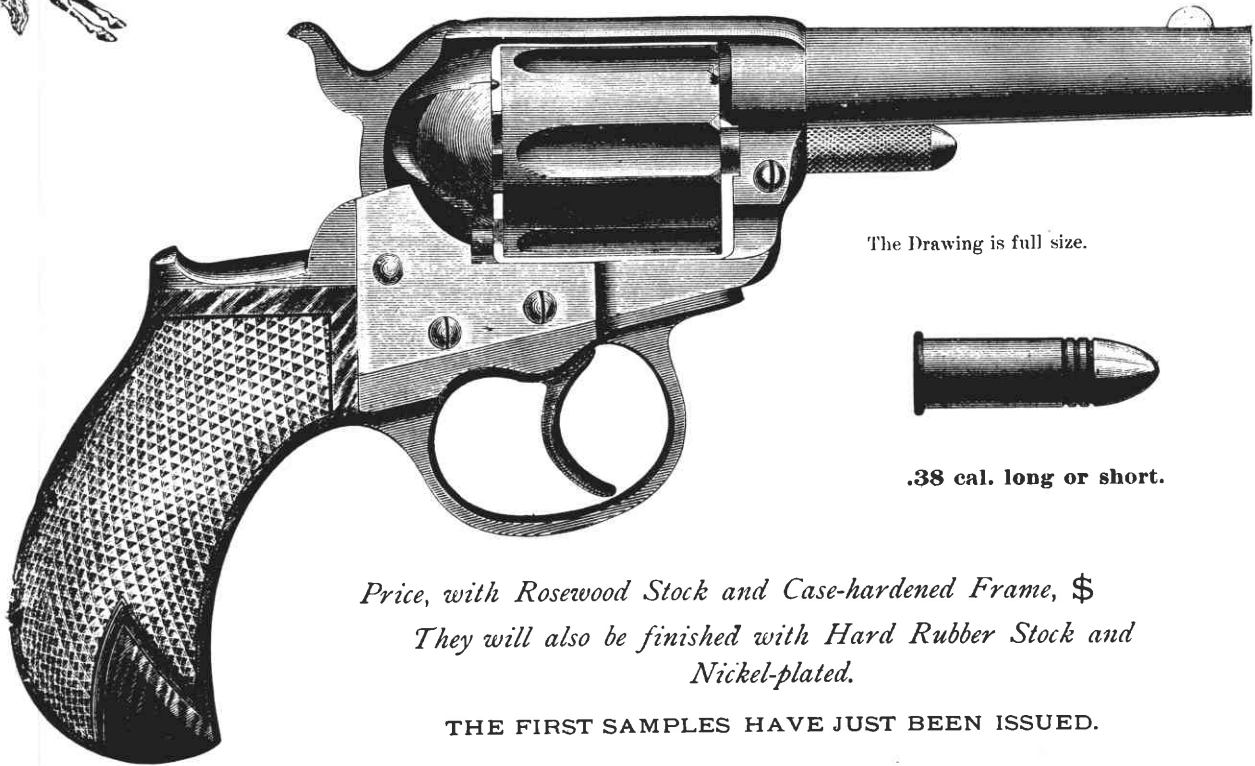
The patent dates of 1871, 1874, and 1875 stamped on the frame refer to earlier developments. The September 19, 1871, patent was taken out by C.B. Richards and describes the double-handed pawl or hand which was introduced on the Clover Leaf Revolver. The September 15, 1874, patent date refers to the patent by William Mason for the centerpin catch and the cylinder stops on the back of the cylinder, introduced on the New Line revolver. The January 19, 1875, date refers to a William Mason patent covering the flat loading gate trunion, the spherical recoil frame and loading gate, and the ejector tube mounting, introduced on the Single Action Army.

The Double Action Model of 1877 looks like the Single Action Army, but is smaller, as Colt's attempted to capitalize on the popularity of the Model of 1873. It has, however, a distinctive birdshead grip. The introduction of this model virtually ended sales of the New Line and New House pistols. Despite the alleged difficulty of repairing its lock mechanism (though most competent gunsmiths seem to have no trouble with it), this revolver was very popular, with almost 167,000 produced and sold between 1877 and 1909. The fame and notoriety of the Colt Single Action Army have all but eclipsed the history of the Colt DA M1877. Certainly, the Single Action Army represents the epitome of Colt's single action manufacture, but the M1877 initiated a long series of Colt Double



# COLT'S

New, Double Action, Self Cocking,  
Central Fire, SIX SHOT REVOLVER.



The Drawing is full size.

.38 cal. long or short.

*Price, with Rosewood Stock and Case-hardened Frame, \$  
They will also be finished with Hard Rubber Stock and  
Nickel-plated.*

THE FIRST SAMPLES HAVE JUST BEEN ISSUED.

This pistol has the double hand or pawl, which makes the revolution more free, and adds to the endurance of the arm. It is the only self-cocking pistol which has this advantage. It exceeds in accuracy and penetration any pistol of its class. The materials and workmanship cannot be surpassed, and its manipulation is easier than that of any other self-cocking pistol.

*The pistol should be carried with the hammer resting in the safety-notch.*

TERMS CASH.

ALL COMMUNICATIONS MUST BE ADDRESSED TO

Colt's Patent Fire-Arms Manufacturing Company,  
HARTFORD, CONNECTICUT.

JANUARY, 1877.

6. January, 1877, Colt broadside announcing the Double Action Model of 1877 Revolver.



7. "1876" stamped on an inspection gauge.

Action models. Colt introduced hardrubber grips on this model and boasted that the double hand or pawl guaranteed freer cylinder revolution and greater endurance. This was the last non-solid (i.e. attached backstrap and trigger guard) frame produced by Colt's.

In the United States, the DA M1877 was purchased by a number of important people, by police, by express companies, and by citizens who felt no need for the stopping power of the Colt .45 or Frontier. Elmer Keith (12) describes the 1877 as "well balanced and a very fast gun fighting weapon. In the .41 long with a 200 grain slug, they were also a very effective man stopper, far better than the .38 Special of today." In .41 caliber, it was the

choice of Billy the Kid, and of John Wesley Hardin who would practice daily with his Colt "Self-Cockers." His El Paso landlady described in 1895 that he would draw them "as quick as lightning . . . and have them clicking in unison." (13)

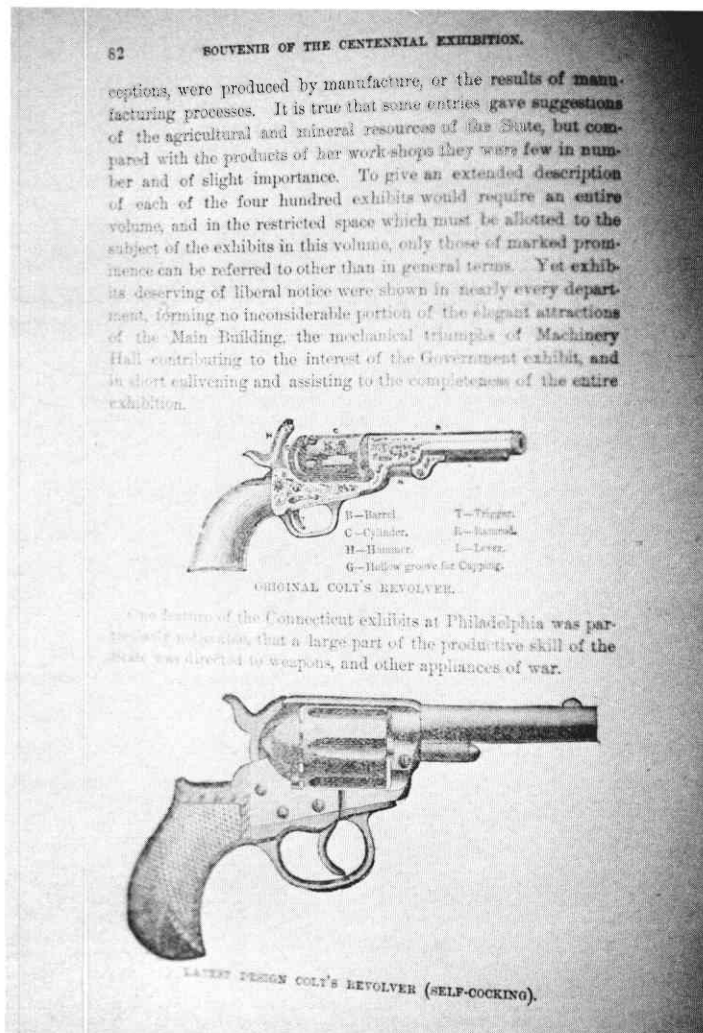
The London Colt agent, Baron Frederick von Oppen, criticized the ejector system and the weakness of the .38 caliber cartridge (22), but nonetheless a substantial number were shipped to London. In fact, Colt's was so proud of this self-cocking revolver that in its 1896 London Catalog it boasted that it had been chosen in 1892, in .380 caliber, 3½ inch barrel without ejector, as the official "constabulary revolver" of the Chicago Police Department, and that the DA M1877 had been awarded "the prize medal of 1878 . . . for excellence of workmanship & construction . . ." with a "Lock Frame . . . made of the best procurable wrought iron, Case-hardened, not of cast iron, or of inferior iron simply blued or Nickel-washed, as are the Lock Frames of cheap and unreliable arms." (8)

This model was included in the Hartley and Graham display board of 1877 and was shown at the St. Louis Exposition in 1877 by Henry Folsom and Company, for which they won a prize. It was also promoted at the 1893 World's Columbian Exposition in Chicago, and at the 1895 and 1896 Sportsman's Shows in Madison Square Garden, New York.

In his *Annual Report for 1877* (18), O.E. Michaelis, Captain of Ordnance, Chief Ordnance Officer, Military Department of Dakota, headquartered in St. Paul, Minnesota, praised his personal .38 caliber "Double-Action Colt's revolver" because it was "simple in construction, and strong in its parts" so much so that "it has been enthusiastically received by every officer who has seen it." Because it "delivers its fire most rapidly and most surely . . . (it) is the best for the military service" and consequently "is the future pistol of the Army."

Nonetheless, neither the .38 nor the .41 caliber cartridge proved to be substantial enough for military use. Yet this first Colt Double Action was used extensively, and recently has received increased interest among collectors. It can still be purchased more reasonably than many other models of Colt and is truly an antique because it was introduced substantially before 1898. It spans a very interesting period in United States history, and the factory records on shipment are virtually complete. Furthermore, there are many variations in grips, sights, markings, engravings, finishes, casings, etc. that spur collector interest. Similarly, there are many accoutrements and related Coltiana that can be found and collected.

This revolver initiated a long tradition of Colt Double Action revolvers, continuing to the present day.



8. "Latest design Colt's revolver (self-cocking)" as shown at the 1876 Philadelphia Exhibition (see reference #25, p. 82).

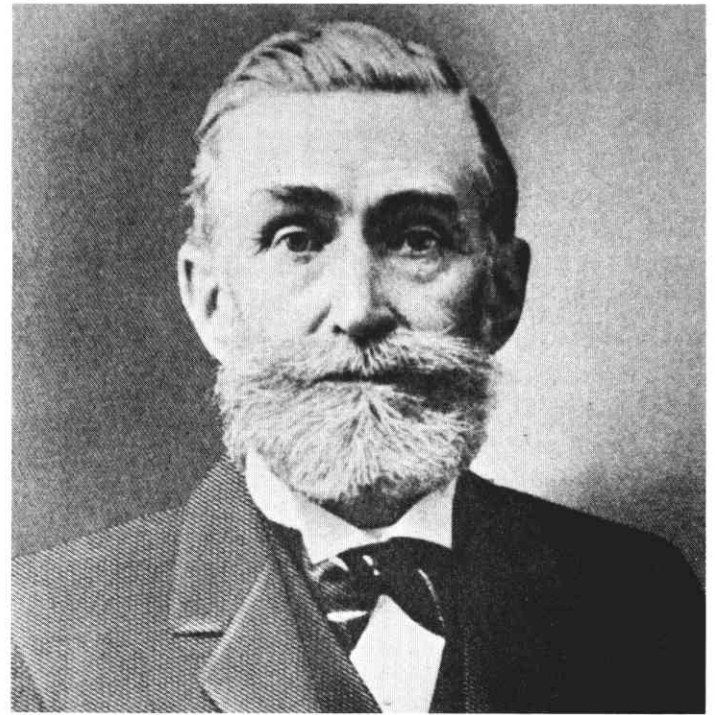
## THUNDERER/LIGHTNING

The Double Action Model of 1877 was nicknamed the “Lightning” (.38 caliber) and “Thunderer” (.41 caliber) by B. Kittredge and Company of Cincinnati, a major Colt dealer or “ally.” In their May 4, 1877, announcement of the “Lightning Colt” in the *Turf, Field and Farm* (1), a weekly national sporting newspaper published in New York City (figure 10), Kittredge explains that they named it the “Lightning” because it can shoot “six thunder-bolts in two seconds.” They compared it favorably to the Colt Navy of 1851, being about half its weight but shooting with twice the power. It was a “thumb-cocker” and therefore could be “shot with slow, deliberate aim and accuracy, the same as the Old Navy” but was also “self-cocking . . . always ready, either way, and operates easily. Central fire — sure fire.” The workmanship and the quality of material was praised, and Kittredge noted that except for those which had been shipped to the London Agency, they had “arranged for the entire production of this pistol for some months” to be shipped to them. In fact, factory records tend to support this claim that most revolvers produced through May, 1877, were sent to Kittredge, except for a few sent to some New York dealers and the London Agency. Initially, they offered the “Lightning” for sale at \$18, with \$3.50 extra for ivory grips, \$6.50 for pearl.

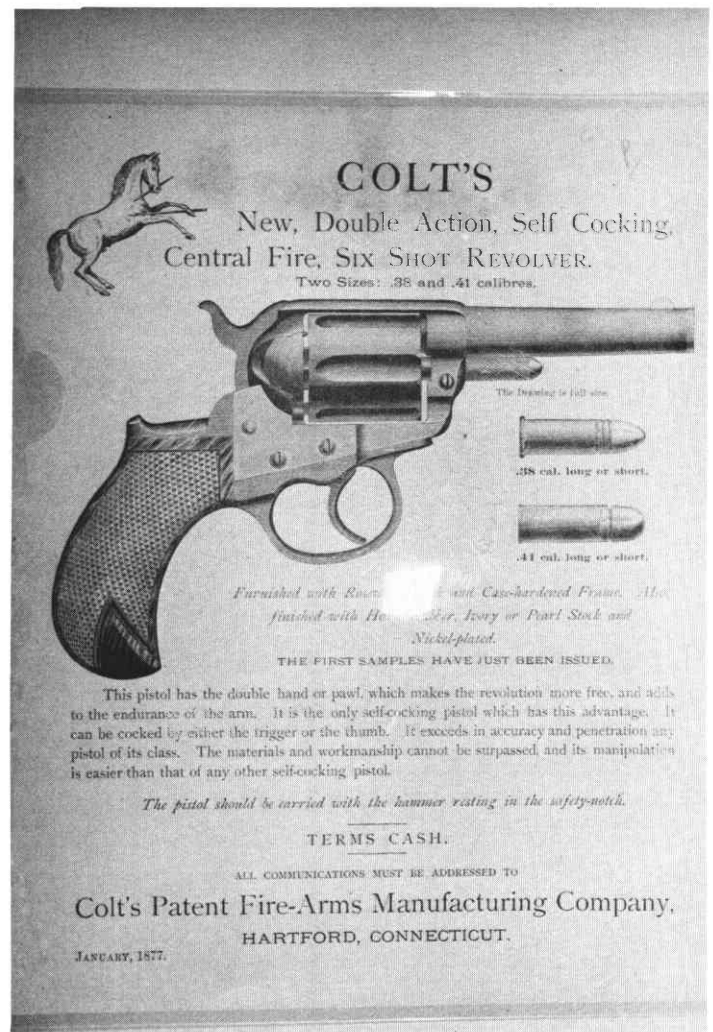
Later, in 1877, Colt’s distributed a new broadside (1), still dated “January, 1877” but now presenting the .41 caliber option as well (figure 11). In its September 14, 1877, ad (1) (figure 12), Kittredge announced the “Thunderer” in .41 caliber for “officers and frontier men who ask for something more portable than the Peacemaker or Army pistol, and yet are willing, for the sake of greater capacity for destructiveness, to carry an arm a little larger than the ‘Lightning’ Colt. To meet this call the Colt Arms Co. have made an intermediate size which we call the ‘Thunderer’ . . . In range or penetration it surpasses the Smith & Wesson Army and all pistols of less than .44 calibre. It will serve a good purpose for Buffalo shooting from horseback.”

## MANUFACTURE

Most early Lightnings were in .38 caliber, with a 3½ inch barrel without ejector, blue and casehardened finish, with a small half moon German silver front sight, acid-etched caliber cartouche on the barrel, Hartford Factory address stamped on the barrel, patent dates stamped on the frame, serial number stamped on the butt, trigger guard, and frame, under the barrel, and on the cylinder, inspector marks stamped on the hammer slot and cylinder, one-piece checkered rosewood grips, no main-spring tension adjustment screw, and the caliber designation stamped on the left triggerguard flat (while later it



9. William Mason, Colt's Factory Superintendent, who developed the DA M1877 revolver.



11. Colt broadside, probably August, 1877, announcing the DA M1877 in .41 caliber; note the continued use of the “January, 1877” date.



# B. KITTREDGE & CO.,

DEALERS IN GUNS, PISTOLS AND THEIR ADJUNCTS,  
AGENTS FOR THE COLT ARMS CO.,  
166 MAIN STREET, CINCINNATI, O.



## COLT'S NEW PISTOL---THE LIGHTNING COLT.

The Colt Arm Co., with the New Year, have brought forth a new Colt, that is certain, from its merit, to take at once a high position among firearms.

The **Lightning Colt** is a double-action pistol—that is to say, it can be used either as a self-cocking or as a thumb-cocking pistol. It is always ready, either way, and operates easily. Central fire—sure fire.

It is the same calibre (.38) as the famous old loose ammunition Colt Navy. It is a little over half the weight, yet its aim is with twice the power of that arm. It can be shot, all the six chambers, in two seconds, six rounds in two seconds. Hence we call it the **Lightning Colt**. It can also, as a thumb-cocker, be shot with slow, deliberate aim and accuracy, the same as the Old Navy. Excellently well adapted to the use of officers who wish the efficiency without the bulk of a heavy arm. It is good material and good work, not like the English self-cocking, "a good quality of cast iron." Or, as a reputable English maker expresses it, "a high grade of malleable iron." The **Lightning Colt** is very best wrought iron frame, with steel cylinder and barrel, all forged and wrought. There never has been so good material and work put into a self-cocking pistol. No first-class mechanic of whatever nation will question this statement. Competent, durable and efficient, it combines all the requisites for a perfect arm.

Except when ordered to go to London (and one small order), we have arranged for the entire production of this pistol for some months. Price \$18; ivory handle extra, \$3.50; pearl, \$5.50. And we propose, farther, to deliver the pistol free if within 1,200 miles, 25 cents extra over 1,200 in the United States. Send us post-office order, and the pistol will come to you without charge.

### PRICE LIST FOR OTHER PISTOLS.

Colt's New Line.	Price.	Ivory Extra.	Pearl Extra.	Nick'l Extra.
.22 Little Colt.....	\$5.00	\$1.25	\$2.50	50 cts.
.25 Pony Colt.....	8.75	1.50	3.00	60 cts.
.32 Ladies' Colt.....	9.00	2.00	3.50	60 cts.
.38 Pat Colt.....	10.00	2.00	3.50	60 cts.
.41 Big Colt.....	10.50	2.00	3.50	60 cts.
45 Army Peacemaker \$17.00 extra for ivory, \$5.00 with nickel plating, \$1.50; Carbine Revolver, \$5 extra. We have a lot of Peacemakers, Army finish, 45 regular model weapons, but rejected for Army use. Price \$13.00.				

The following is a good assortment of Colts Old Line: 41 Army, \$10.00; 41 Home, \$7.00; 38 New Pocket, \$8.00; 38 Value, \$12.00; for Loose Ammunition, Army, \$10.00; Navy, \$10.00, etc., etc.

We also Offer  
**SMITH & WESSON,**  
No. 2 1-2,  
Or .36 Calibre,  
At \$12;  
Ivory, \$2.50;  
Nickel, 75 Cent;



Exact Size of Pistol and Cartridge.

Smith & Wesson, No. 1, at \$7.00; \$1.00 for ivory, 50 cents for nickel.

Smith & Wesson, No. 3, or Army, \$17; nickel, \$1.50.

.32 Terror, \$6; Bull-dog, .38, \$6.50; Swamp Angel, .41, \$7.00; Sharps 21, with forged frame, a good, compact arm and very strong shooting, at \$5.00; tall plate, \$5.50; ivory, \$6.50. We are also, to meet all demands, obliged to keep the

### POOR PISTOLS,

by which we mean poorly-made pistols with cast-iron or less frames, and we are sorry to say that consumers are often induced to buy these, believing them to be good arms. A little reflection will enable most consumers to understand how little it costs to make a pistol with a cast-iron frame, compared to producing

an arm by first forging and then working out the metal. With this warning we have to add that our business, as merchants, is to keep what is called for, and we have for sale a long list, among them Alert, Favorite, Little Joker, Crestmore, Distance, Continental, Perse, Trojan, Blue Jacket, Whitney, Buffalo Bill, Captain Jack, Spit Fire, at from \$2.00 to \$3.75 each. Nickel plate, each 50 cents extra. Also, Standard .22, \$5.75; Standard .38, \$6.50; Standard .32, \$7.50.

Then a recently-produced pistol known as "Hood's" .38 calibre, \$6.50; Hood's .41 calibre, \$7.00. The best we can say of these pistols is that they are made with cast-iron frames, and are counterfeit of the Colt's New Line. We say counterfeit, because saying that they are an imitation does not express what we mean. They are beyond all question intended to be sold to the unwary, as if they were of the quality of the beautifully-made forged and wrought Colt's New Line. We endeavor to dispel them so that consumers will detect them when they are offered.

Several of the names used with the cast-iron pistols are obnoxious; that is, a pistol is "run" for a time with one name, until the arm is known, and then a new name is put upon them, and so on. This is true of several of the names above. The only safe course is to insist upon having only forged and wrought frames, and the best of these are Colt's and Smith & Wesson's.

**CALIBRES**—In purchasing cartridges for a Colt's New Line, insist upon having .22, .38, .35 and .41 loads. These sizes are best intended for pistols with cast-iron frames. All will fit in Colt's New Line but the long are required for best penetration. We may here mention that there is a way in leaving cast-iron pistols, which is to make the barrel the size, or nearly the size, of the cylinder. The barrel of the Colt's cast-iron may stand it, but it does not do so.

We repeat to you, that in order to get all our customers on our footing, we will for the present deliver all the above pistols free of charge for 30 days. We receipt of money or post office order the pistol will come to you.

For further details see future issues of this paper.

10. B. Kittredge & Co., Cincinnati, advertisement of May 4, 1877, naming the DA M1877 in .38 caliber the "Lightning".

# B. KITTREDGE & CO.,

Cincinnati, Ohio,

DEALERS IN

## Guns, Pistols, Sporting, Mining and Blasting Powder,

&c., &c.

### AGENTS FOR COLT ARMS CO.

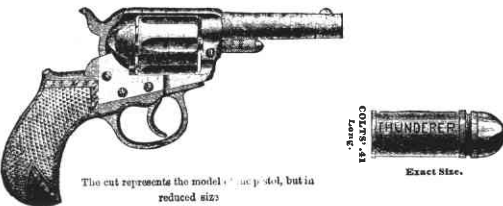
We wish to notify our Customers that we are about to offer them Colts'

THUNDERER:



### THE THUNDERER.

The double-action "Lightning" Colt pistol has proved to be a great success. Yet, notwithstanding its favorable reception, both in this country and in England, there is a class of officers and frontier men who ask for something more portable than the Peacemaker or Army pistol, and yet are willing for the sake of greater capacity for destructiveness to carry an arm a little larger than the "Lightning" Colt. To meet this call the Colt Arms Co. have made an intermediate size which we call the "Thunderer." This pistol is a



The cut represents the model as depicted, but in reduced size.

Exact Size.

self-cocking or thumb-cocking pistol. It is given by the Examining Committee why the highest award should be given to the Colt Arms Co. were (we quote verbatim):

"Extracting the discharged shells singly, combining strength with simplicity of action, not liable to get out of order, readily taken apart, easily cleaned, having extra interchangeability, &c."

We are aware that medals and diplomas of the U. S. Centennial Commission were so gromisciously given for fire-arms as to depreciate their value. But with the highest award the Colt Arms Co. have also the fact that for nearly 40 years the Colt's pistols have been famous

the world over. The "Thunderer" will help to increase their fame and land it down.

### PRICE LIST.

	Price.	Ivory Extra.	Pearl Extra.	Nick'l Extra.
.22 O. M. Colt.....	\$3.75			
.22 Little Colt.....	5.00	\$1.25	\$2.50	60 cts.
.30 Pony Colt.....	7.00	1.25	2.50	40
.32 Ladies' Colt.....	9.00	1.75	3.00	50
.38 Pat Colt.....	8.50	1.75	3.00	50
.41 Big Colt.....	10.00	1.75	3.00	50
.45 Peacemaker (Army).....	17.00	3.50		1.00
.44 Army Old Line.....	8.00			
.38 Navy.....	5.00			
.41 House.....	7.00			
.38 D. A. Lightning.....	18.00	3.00		60
.41 D. A. Thunderer.....	18.00	3.00		60
.36 S. & W. Army.....	15.00	3.50		1.00

Also a full line of low-priced pistols—a multitude of names and makers.

We deliver at above prices on receipt of price at cost for delivery, if within 500 miles.

12. B. Kittredge & Co., Cincinnati, advertisement of September 14, 1877, naming DA M1877 in .41 caliber the "Thunderer."



13. The "M" or Model gun, Factory prototype developed by William Mason; .38 cal., 3 9/16 inch barrel, without ejector, one-piece checkered rosewood grips, finished "in the white" (polished); "M" stamped on barrel, frame, cylinder, inside grip strap, and on hammer; "M" and "DA" stamped on cylinder pin; no patent dates, barrel address, or other markings; no checkering on hammer spur.

appears of the left rear bow of the triggerguard). During the first year of production, 62% were finished in nickel, 29% blue and casehardened, and a few in silver plate or gold wash.

The "M" or Model gun, developed by William Mason as the Factory prototype, shows some interesting variations from the standard production item (figure 13). In addition to the designation "M" stamped on all the parts, there are no patent dates, barrel address, or other markings; there is no checkering on the hammer. There are a number of differences in dimensions from the production specimens, including a larger front sight. A bored-through hole on the right side of the frame was meant to be a mirror image of the hole bored in the left frame for the cylinder stop pivot; apparently, the machinist who made this prototype was unaware of this subtlety of design, and made four holes on both sides of the frame. The "M" gun was probably first shown at the 1876 Philadelphia Centennial Exhibition.

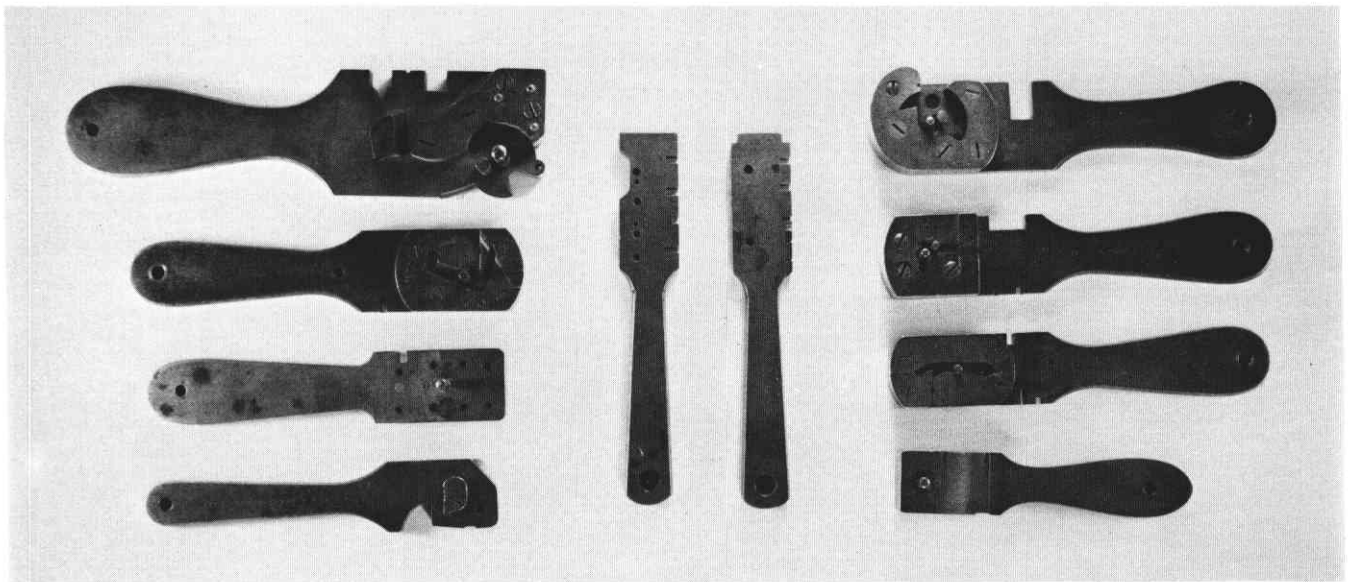
Eventually, when placed into production, each revolver was meticulously measured and inspected by Colt workmen (10, 28). Inspection gauges (figure 14) were used to check each detail of the lock mechanisms as well as the barrel plugs and the cylinder chambers. Such gauges guaranteed the interchangeability of parts in a mass production operation and eliminated the need for extensive hand-fitting. Inspection involved measuring, filing, fitting, and reinspection. A cylinder might require

15 separate gauges, and one inspector might use as many as 16 gauges. According to factory inventory ledgers (7), some parts — such as the hand, sear, and bolt — would be kept in stock as "filed" or "ready to file"; tolerances permitted in certain inspections were no greater than .0005 inch; in others, .003 inch. When an inspector was satisfied with the part, he would stamp his initial on it, especially the larger parts. Many of the inspection gauges are stamped "1876", also indicating that the factory was being prepared for production during the latter part of that year.

Many early Lightnings were shipped to the London Agency and marked with British proofs, but stamped with the Hartford Address. It was not until mid-1878, somewhere between serial number 5000 and 5300, that the London Pall Mall Address began to be used.

### EJECTION

Apparently, Colt's was not happy with the ejector-rod system of the Single Action Army, which was not introduced in the DA M1877 until around serial number 6000 in May 1878 (16, 17), despite the fact that the .41 caliber had already been introduced. Several specimens demonstrate further ongoing work at the Factory: the experimental gas ejection model from the Colt Museum Collection, and several extant specimens of an experimental swingout ejector model, a few of which were apparently put into production and sold.

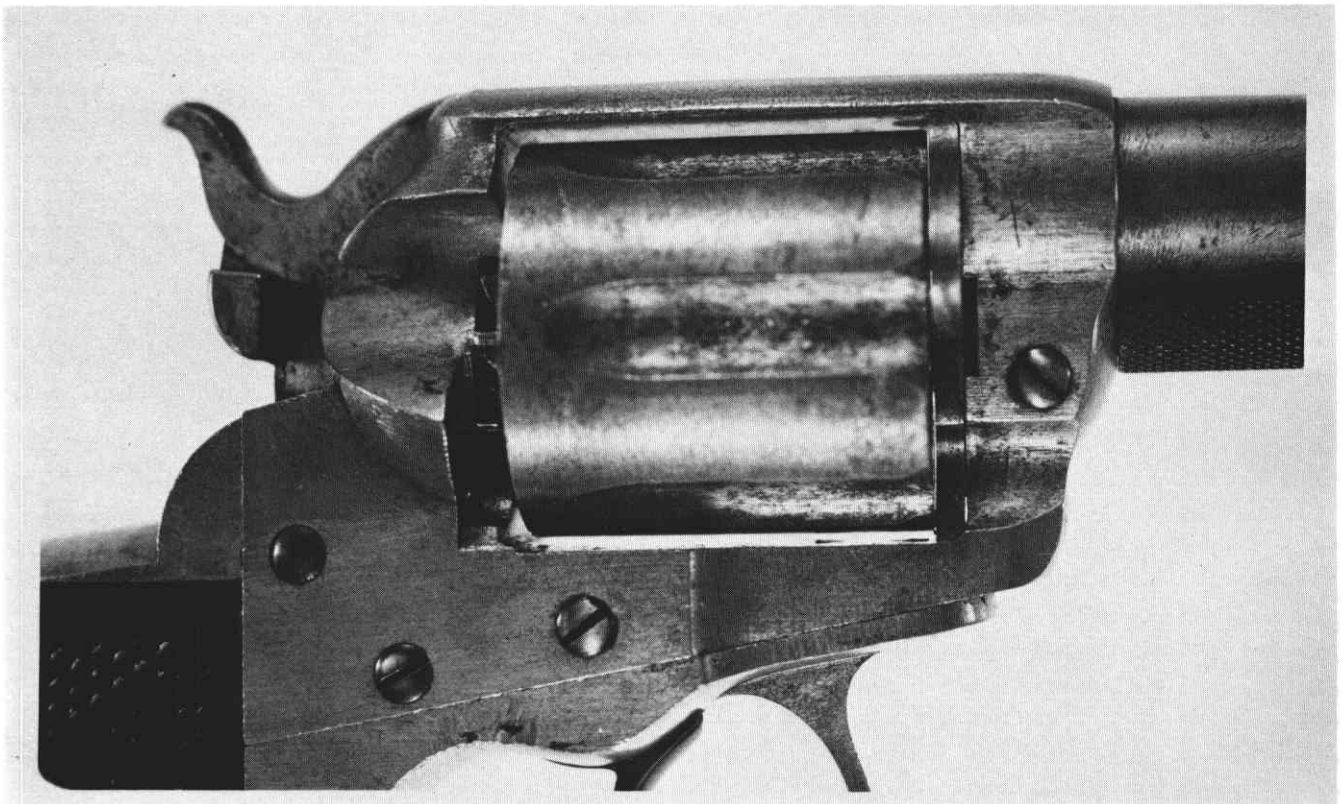


14. Original Colt Factory inspection gauges to measure and calibrate the DA M1877 lock mechanism, some stamped "1876."

The experimental gas ejection system revolver, (figure 15), #430 in the Colt Museum Collection 1887 Inventory (6), described as "... ejection by gas of succeeding shot, model un(finished)", had been taken out of production and modified so that gas from the exploding cartridge would be diverted to the right and expel backwards through the loading gate the previously fired empty casing. The gate had been removed and a deflector added to keep the shell from striking the shooter. This

design is similar to an 1875 patent by O.F. Cole, (16) in that a similar gas diversion plate is used, and to an 1877 patent by H.L. Gardner, (16) in that a projecting piece of metal deflects the expelled cartridge from striking the shooter.

A swing-out cylinder pin ejection system is also represented in the Colt Museum Collection: #428, serial #206, and #429, serial #3014 (Figure 16). The full cylinder pin swings out and to the right on a crane, after



15. Experimental gas ejection system, no serial number, .38 cal., 3 7/16 inch barrel, unfinished (unpolished), one-piece checkered rosewood grips; listed as #430 on p. 23 of the 1887 Inventory of the Colt Factory Museum Collection. Gas from the exploding cartridge is to be diverted by a channel in the chamber cover plate to the right to expel the empty casing in the previously fired chamber backwards through the loading gate, where the deflector prevents the shell from striking the shooter.



16. Swing-out cylinder pin ejection, serial #3014, .41 cal., 3 1/2 inch barrel, blue and casehardened finish; listed in Colt Museum Inventory as #429. (George S. Lewis, Jr., Photograph).



17. Swing-out cylinder pin ejection, serial #3463, .38 cal., 3 1/2 inch barrel, nickel finish, one-piece hardrubber grips, shipped November 22, 1877, to Spies, Kissam, & Co., New York, in a shipment of six; similar to other designs in the Colt Factory Museum Collection, except that this design uses an inner pin extractor inside a tubular cylinder pin which remains in place. (Dean Ives Photograph).



18. Extra long knurled cylinder pin to be used for shell extraction, serial #2700, .41 cal., 5 inch barrel with ejector, nickel finish, one-piece checkered rosewood grips, shipped September 29, 1877, to Spies, Kissam & Co., New York, shipment of 4, in a refurbished 1849 Pocket Revolver walnut casing.

being unscrewed from its housing, and can then be used to manually expel the spent cartridge. Serial #3463, shipped November 22, 1877, to Spies, Kissam, & Co., New York City, in a shipment of 6 (figure 17), is a later refinement of the Colt Museum specimens because a more delicate extracting pin of smaller diameter inserts into a tubular cylinder pin housing which anchors the cylinder during reloading. Apparently a number of these

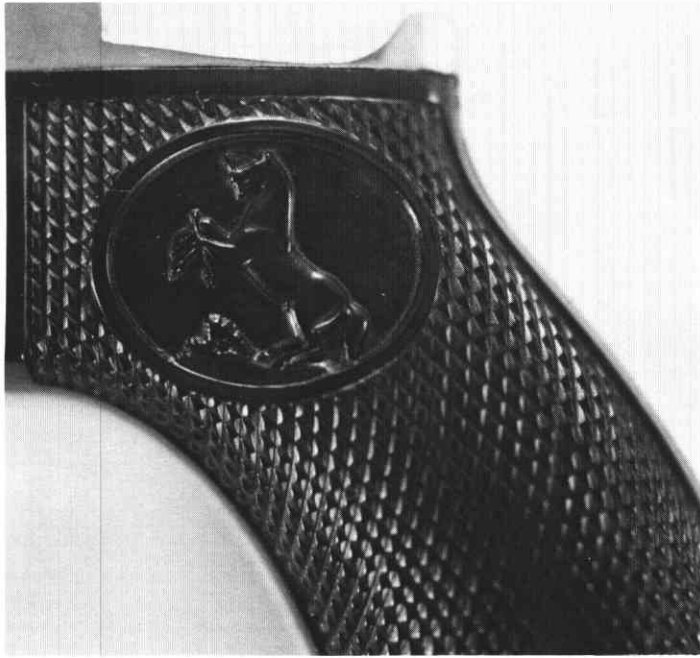
extraction designs were shipped to dealers, but did not survive the test of experience. Colt's decided to continue using the knurled cylinder pin as a removable ejector, sometimes producing it in an extra long length (Figure 18), and delayed using the sturdy and reliable Single Action Army sliding rod ejection system until the second year of production.

### GRIPS

The Model 1877 was introduced with one-piece checkered rosewood grips (15) (figure 19). The checkering, from coarse to fine, was done by hand, and the rosewood, imported from Brazil, showed color variations from yellow to brown to black. Ebony was not used, nor apparently was any other wood used by the Factory. The complete or last few digits of the serial number of the fitted revolver was often written in pencil or ink on the backstrap groove of the rosewood grips and inside the later hard rubber grips. Because checkering was hand work, mass production concepts spurred a search for grips manufactured more cheaply, and, as a result, hard rubber grips were first introduced on the Model 1877 around May, 1877; they were not used on the Single Action Army until 1882. One-piece hard rubber grips were introduced around serial #700 and used through #3500 (Figure 20), while around serial #2300, in August, 1877, two-piece rubber grips were introduced (Figure 21). One-piece hard rubber grips are rarities and collectible; the rampant Colt medallion is different from the one that was used on the two-piece hard rubber grips, and the



19. One-piece rosewood grips, coarsely (top) and finely (bottom) checkered; note upper revolver without the mainspring tension adjustment screw and the lower with the tension screw.



20. One-piece hardrubber grips; note the coarse checkering and compare the rampant Colt medallion with that in Figure 21.



21. Two-piece hardrubber grips.

checking is coarser; the manufacturer is unknown. The two-piece grips were easier to fit and assemble on the finished revolver, and with their introduction a pin or dowel was inserted into the frame butt in order to anchor them, beginning around the same time that the mainspring tension adjustment screw was installed in the grip strap, although the two do not necessarily occur together. The mainspring tension screw was introduced around #1900, and about 23% of the surviving specimens from the first year of production have them (Figure 19).

There was extensive correspondence between Colt's and manufacturers of two-piece hard rubber grips or "scales", as they were called, beginning with the India Rubber Comb Company of New York City in August, 1877, with whom an order was placed for 5000 pair. Some two-piece hard rubber grips from this early order apparently survive, basically like all the grips seen in later manufacture, but different in one important aspect to distinguish them: inside each grip, there are no indented sections, with a band across the screw hole; rather the inside of each grip is perfectly flat, as in revolver #2310, shipped on September 17, 1877. Because the color of these grips is dark brown throughout, these may be from a small trial order of "mottled or imitation rose-wood" grips sent to the Colt Factory on August 18, 1877. These grips, and those later manufactured by other companies, have identical Colt medallions, apparently made from similar dies. These dies were apparently cut by Gustave Young. In October, Colt's entered into negotiations with another manufacturer, the Rubber Comb and Jewelry Company, and in November with the Hard Rubber and Cane Company, both of New York City, as the Factory sought to find the most favorable price and the most satisfactory product. On Novem-

ber 6, 1877, Otto Partisch, proprietor of the Hard Rubber and Cane Company, wrote, describing two possible ways of manufacture. The first is to warm the previously vulcanized scales, to subject them under pressure into dies, and thus to stamp and form them to the accurate shape and pattern; these grips would be exactly alike in shape and size, requiring no additional labor, but they would not resist warm temperatures or the heat of the sun without losing their shape and design. The second process was achieved "after many years of careful study and experiments" and involved giving the scales their shape and design while the rubber is still soft, and then vulcanizing them; these would preserve their original fine shape and not be affected by warm temperatures, but would not be uniform in size because, as the rubber shrinks when cooling, it would not shrink uniformly, and these scales would have to be made slightly larger than needed and then filed down by workmen when fitted to the revolver. However, Mr. Partisch noted that this process was favored by several important Belgian, French, and German arms manufacturers who had been purchasing scales from him for two years. Colt's responded that his price of 25 cents was too high, and even though he promised to lower the price, there is no record of Colt's purchasing from him. By April, 1878, Colt's had the price down to 13 cents a pair!

Evaluating the existent specimens from the year 1877 suggests that in this first year of production, 46% of the grips were one-piece checkered rosewood, 25% one-piece hard rubber, 5% two-piece hard rubber, 8% pearl, and 11% ivory. The initial Factory broadsides announced that the Model 1877 would be available in .38 caliber, long or short, "with Rosewood Stock and Case-hardened Frame . . . They will also be finished with Hard Rubber



22. Serial #1031, .38 cal., 4 1/2 inch barrel without ejector, British proofs, one-piece ivory grips, shipped July 10, 1877, to Colt's London Agency and cased in original cherry box lined with red baize or felt.

Stock and Nickel-plated." Later, in 1877, after introducing the .41 caliber, long or short, they were "Furnished with Rosewood Stock and Case-hardened Frame. Also, finished with Hard Rubber, Ivory or Pearl Stock and Nickel-plated."

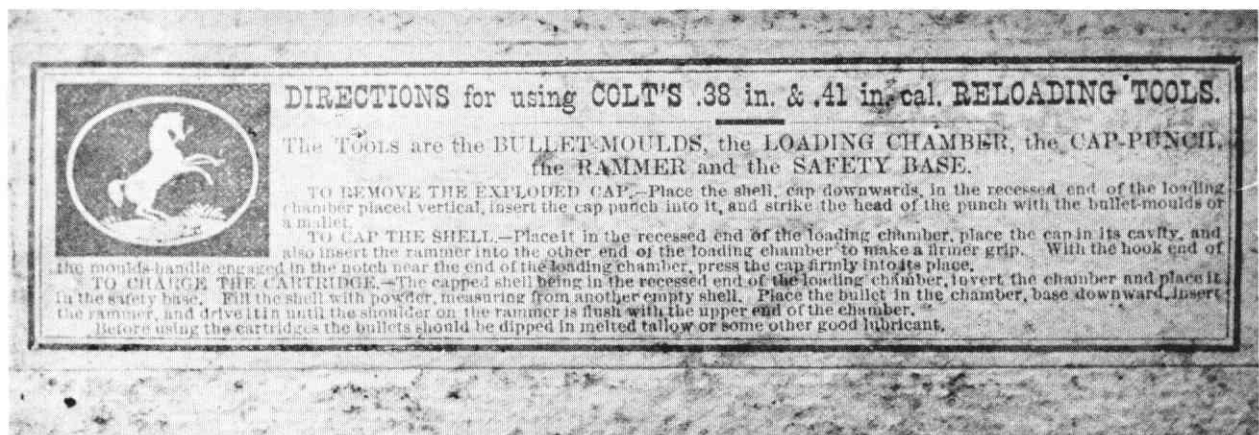
### CASINGS

About 4% of the revolvers shipped in 1877 were cased, most commonly in an oak London Agency casing (figure 22) or London gunshop casing, sometimes in leather. On this side of the Atlantic, a reused and remodeled 1849 Pocket walnut case with baize or felt lining (figure 18) was used in early production, before the later introduction of a typical "Hartley and Graham" (Teweles) black leather casing (14). Most specimens were shipped in cardboard cartons which pictured the rampant

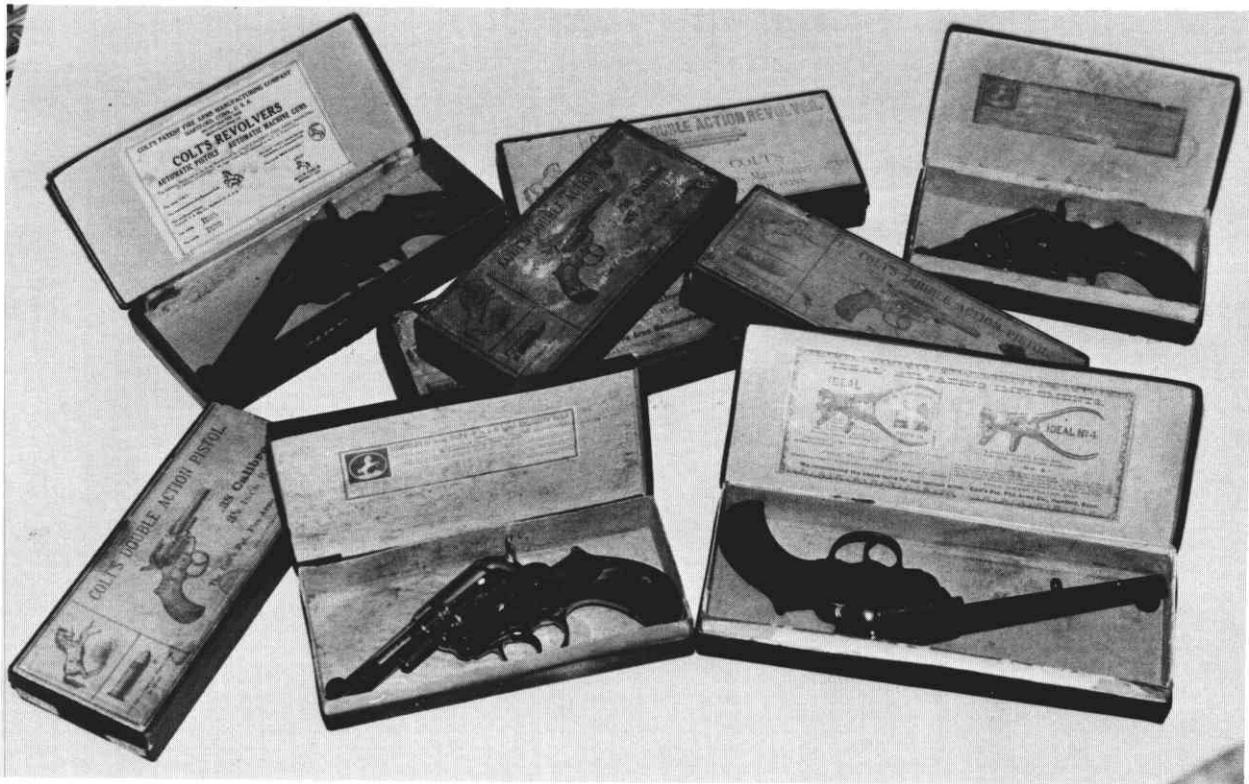
Colt, the cartridge, the revolver, and listed the caliber and barrel size on the outer lid label (figure 23). Early boxes also included an inside lid label (figure 24) which gave instructions for using "Colt's .38 in. & .41 in. cal. reloading tool," which were really modifications of earlier percussion bullet molds (Figure 25). Later, Colt promoted Ideal Reloading Tools.

### ENGRAVING

About 11% of the first year production were engraved either at the factory or by other prominent engravers (29). Gustave Young joined the Colt factory as Master Engraver in 1852, but moved to Springfield, Massachusetts, in 1869 to work primarily for Smith and Wesson. Nonetheless, there is evidence that Young continued to do some work for Colt's, including on the Model



24. Label from inside the lid of an early Factory cardboard box, giving "Directions for using COLT'S .38 in. & .41 in. cal. RELOADING TOOLS."



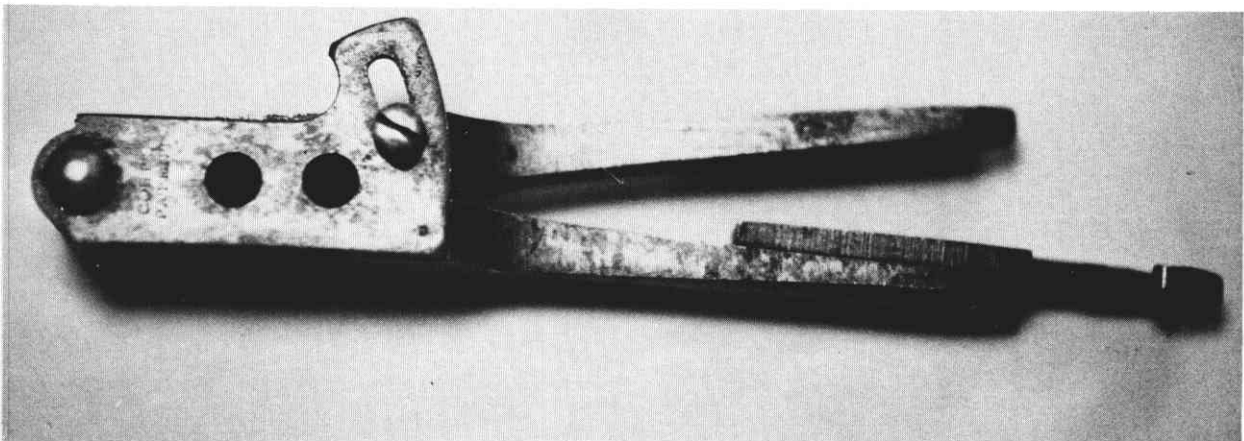
23. A variety of Factory cardboard boxes for the DA M1877 revolver, of early and late production.

1877. For example, in his engraving materials (1) is a pull of the Rampant Colt grip medallion, suggesting that he cut the die for the grips. Furthermore, #2376 (figure 26), cut in a "special scroll" by Young (29), was shown at the 1877 St. Louis Exposition and won a prize for the H. & D. Folsom Arms Company. Louis D. Nimschke, active as a freelance engraver in New York City from 1853 to 1904, engraved many 1877s, many of which were sent in a "soft" condition to Hartley and Graham for custom engraving and plating. For example, #128 (figure 27), the earliest known engraved 1877, is attributed to Nimschke and was probably used as a promotional piece. Most of the engraved Model 1877s were factory engraved in the shop of Cuno A. Helfricht, who replaced Young in 1871 as Master Engraver at Colt's. As the 19th Century

closed, Colt's engraving was increasingly affected by mass production philosophy, with engraved barrels, for example, being kept in stock for future orders (7).

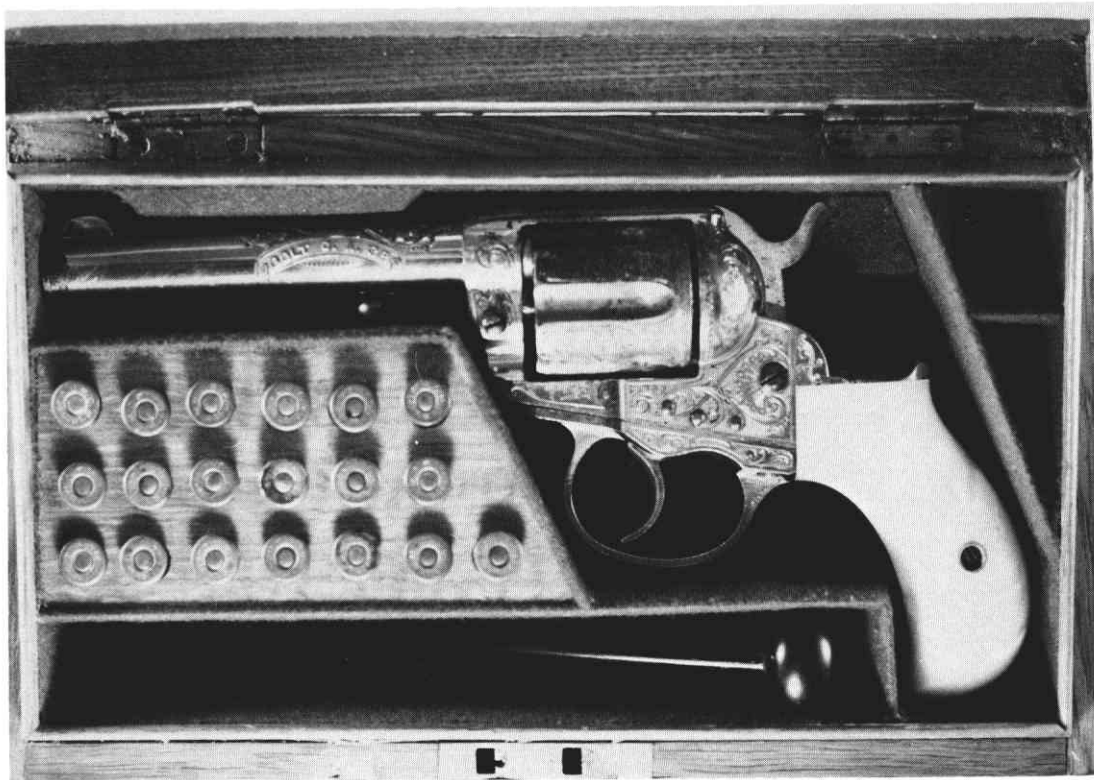
### CALIBERS

When the Colt DA revolver was introduced in January, 1877, it was first chambered for the .38 caliber, Short or Long Colt centerfire cartridge, outside lubricated (figures 28 & 29). Around August, 1877, the first .41 caliber models were introduced for the .41 caliber Long Colt centerfire outside lubricated cartridge (figure 30). Pictures of the Colt Lightning revolver on the cartridge box label were popular, attesting to this model's widespread use. About two dozen different labels for Union Metallic Cartridge Company, Winchester, Dominion, and



25. Colt .38 caliber reloading tool with recapping hook, modified by the Factory from an earlier percussion bullet mold.





26. Serial #2376, .38 cal., 4 1/2 inch barrel without ejector, nickel two-piece pearl grips, factory engraved by Gustave Young in the "special scroll" and shown by H. & D. Folsom Arms Co., New York, at the 1877 St. Louis Exposition; cased in English style oak casing.

U.S. Cartridge picture the Lightning. As evidence of the close cooperation with the various cartridge manufacturers around Hartford, Colt's readily endorsed and promoted these cartridges on the box label. For example, on August 6, 1877, The Union Metallic Cartridge Co., of Bridgeport, Connecticut, sent Colt's a proof for the side paper label to be used on the .41 caliber cartridge boxes, containing the Colt endorsement. This letter indicates not only the close cooperation between the two, but also the plans in process in August, 1877, to produce the .41 caliber model (6). In England, the DA M1877 was used with the .380 cartridge, but not with the .410 caliber. Apparently there were no 1877s sent to London in .41 caliber.

In the first year of production, 84% of the extant specimens were produced in .38 caliber, and 12% in .41 caliber; 73% were manufactured with 3½ inch barrels, the remainder with 4, 4½, 5, and 6 inch barrels, all without ejector. Until about #2700, the undersurface of the barrels beneath the cylinder pin was stamped with the serial number, later giving way to 2 or 3 digits of the serial number, with or without the inspection mark "P". Of the extant specimens, 76% had small German silver half moon front sights, and about 24% single-action steel blades.

## SURVEY

I am in the process of analyzing survey questionnaires submitted by various collectors throughout the world (17). This survey was begun by John Kopec and now numbers about 2000 entries, slightly over 1% of the total production. Data from the first year is taken from 135 entries, about 4% of that year's production of 3500. This survey, as well as a hoped-for analysis of the Colt Factory shipping records, will form the basis for a book, *Thunderer/Lightning, A Study of the Colt DA M1877 Revolver*. I hope that this book will convey a sense of the fun of collecting, as well as contribute to the scholarship of the arms field.

## CONCLUSION

Emerging from the precision workmanship tradition of the Colt Patent Fire Arms Manufacturing Company, Colt's first "self-cocker" maintained that heritage. Widely used by men on the frontier, expressmen, police of the cities, and the ordinary citizen, it initiated a long tradition of Colt Double Action revolvers and burned forever in the pages of the history of this country the romance of the "Thunderer" and the "Lightning."



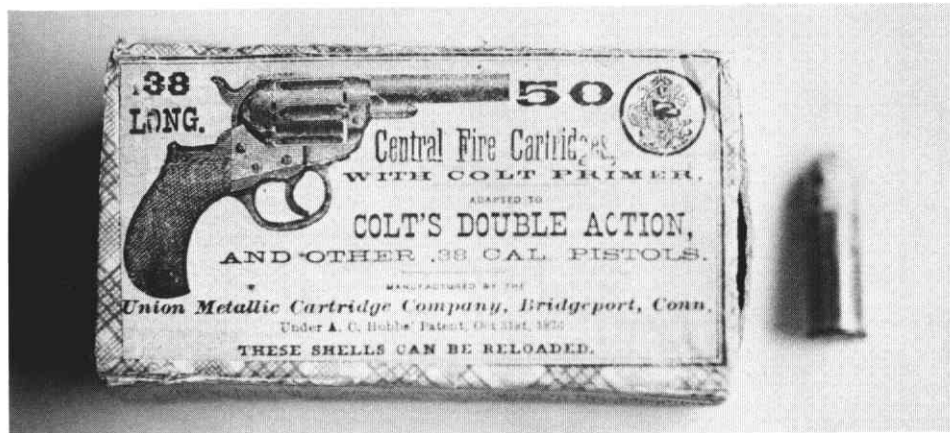
27. Serial #128, .38 cal., 3 1/2 inch barrel without ejector, nickel finish, one-piece checkered ivory grips, probably engraved by L.D. Nimschke and selected as a promotion piece; earliest known engraved Lightning.

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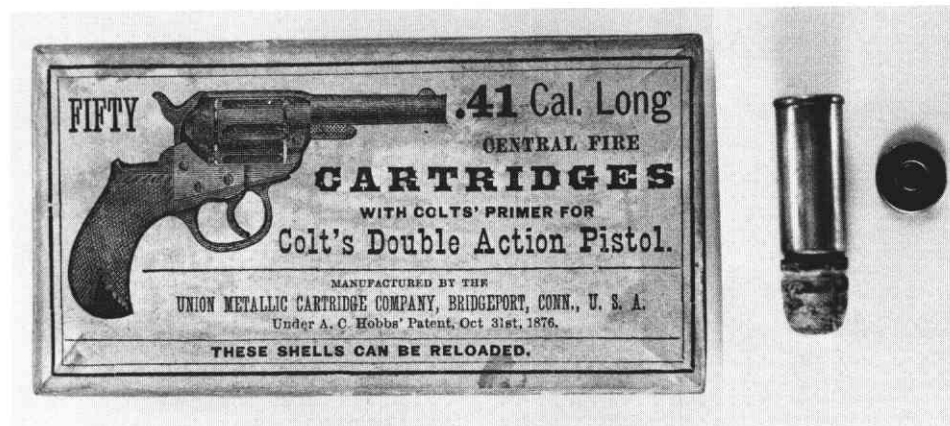
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All photographs are from the author's collection unless otherwise indicated.