

manner the barrel, forged solidly from a bar of cast steel, is bored and completed to caliber, and is then submitted to the various operations of planing, grooving the lower projection beneath the barrel, with which the base pin is ultimately connected, tapped, and then rimmed. The barrel goes through forty-five separate operations on the machines. The other parts are subject to about the following number: lever, 27; rammer, 19; hammer, 28; hand, 20; trigger, 21; bolt, 21; key, 18; leaf spring, 12; fourteen screws, seven each, 98; six cones, eight each, 48; guard, 18; handle-strap, 5; stock, 5. Thus it will be observed that the greater part of the labor is completed in this department. Even all the various parts of the lock are made by machinery, each having its relative initial point to work from, and on the correctness of which the perfection depends.

As soon as completed the different parts are carried to the story above, which, with the exception of the machinery and the columns through the center, is an exact counterpart of the room below. It is designated the Inspecting and Assembling Department. Here the different parts are most minutely inspected; this embraces a series of operations which in the aggregate amount to considerable; the tools to inspect a cylinder, for example, are fifteen in number, each of which must gauge to a hair; the greatest nicety is observed, and it is absolutely impossible to get a slighted piece of work beyond this point. On finishing his examination, the inspector punches his initial letter on the piece in-

spected, thus pledging his reputation on its quality.

The mountings, consisting of the handle-strap and guard, which are composed of gun-metal, are cast and afterward worked up in the machines in the same manner as the other metal work. The woodwork of the stock is also shaped by machinery.

Each part having been thus far completed in itself, now comes the first uniting or *assembling*, as the workmen term it. Let us get our navy pistol in shape; to do so we will want a cylinder barrel, lock-frame, hammer, trigger, bolt, key, main-spring, hand, sear-spring, lever, rammer, guard, back-strap, stock, and a number of peculiar screws. These are readily united by the assembler, and our pistol assumes its material shape. It is now numbered; to make it special, we will designate our number as 138,565; the imprint of the establishment, "Address Colonel Sam. Colt, Hartford, Conn.," is also stamped on at this time. It is now carefully taken apart, all the pieces being stamped the particular number of the arm; and thus our barrel, cylinder, etc., each with a quantity of his fellows, are taken away for their final finishing.

Most of the metal work is carried to the dry polishing shop—a room 60 feet square, located in the third story of the center building. Here it is polished on emery and other wheels, about half a yard in diameter, the operatives sitting at their work as observed in the illustration. After inspection, the barrels and cylinders are



ASSEMBLING.

handed over for the bluing process—an operation that requires nicety and practical experience. The ovens for this, as well as for the case-hardening—to which process all the iron work is submitted—as well as the forges for tempering the springs, etc., are located in the forge shop. From the polishers, the mountings go to the electroplaters—who occupy a room 25 by 40, in the basement of the office building, where they are plated with silver, and afterward burnished. The wood work returns to the stock-maker's shop—a room 60 by 80, in the third story of the center building. This is supplied with power saws, planes, morticing and shaping machines, for wood work, and, as throughout the whole establishment, every means is adopted for labor-saving. The stock then comes back for varnishing and the final finishing.

On their final completion, all the parts are delivered to the general store-keeper's department, a room 60 feet wide by 190 feet long, situated in the second story of the central building, and extending over the rear parallel. All the hand-tools and materials (except the more bulky kinds) are distributed to the workmen from this place; several clerks are required to parcel the goods out and keep the accounts; in fact, it is a store, in the largest sense of the term, and rather on the wholesale principle at that. On the reception of finished, full sets of the parts of the pistols, they are once more carried up to



DRY POLISHING.

the assembling room; but this time to another corps of artisans. Guided by the numbers, they are once more assembled; and now, although each portion has associated with scores of its fellows, and gone through many distinct operations in distant parts of the establishment, our particular pistol, number 138,565, is re-assembled as first united, and the finished arm is laid on a rack, ready for the prover; of course many others accompany it to the department of this official, which is located in the third story of the rear building. Here each chamber is loaded with the largest charge possible, and practically tested by firing; after which, they are wiped out by the prover and returned to the inspection department. The inspectors again take them apart, thoroughly clean and oil them, when they are for the last time put together and placed in a rack for the final inspection. This is done by Mr. William Tuller, a gentleman who has been in the constant employment of Colonel Colt since the manufacture commenced in Hartford. The parts having been so thoroughly examined and tested, it would seem that this last inspection was scarcely necessary; but, after a short observation, we saw several laid aside. Taking up one with a small mark on the barrel, "Why do you reject this?" we inquired. "Pass that to-day, and probably much larger blemishes would appear to-morrow," replied Mr. T. The order from the Principal is perfection; and a small scratch in the bluing or varnish is sufficient to prevent the arm passing. The finished arm is now returned to the store room; from whence, after being papered, they are sent to the ware-room—situated in the basement of the office building; from this they are sent to nearly every portion of the habitable globe. We



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materials; there are some other parts of the buildings that are not fully occupied; in fact, should the whole capacity of the establishment be brought into use, there is ample room, power, etc., to produce one thousand arms per diem.

Bullet-molds, powder-flasks, and the accoutrements to accompany the arms, are all manufactured on the premises—the greater portion of the labor, as in the arms, being performed by machinery.

Among the late inventions of Colonel Colt is one that has already proved of vast practical advantage in operating small arms of every description. We allude to his Patent Lubricator, by the use of which a gun or pistol can be discharged almost *ad libitum* without fouling the barrel. In a communication to the principal of his bureau, Major Bell, of the United States Ordnance Department, says: "It is a hollow iron cylinder at the end of the ramrod of the diameter of the bore, of various lengths according to the arm, being four and a half inches long for the Yager rifle, on which it was tried; the capacity of the hollow, filled with common whale oil, was about sufficient for fifty rounds; conical at the end, so as to receive the head of the Minie ball, in ramming vertically down, which admits of the upward pressure of the ball upon a small valve in the bottom of the cone of the lubricator, which pressure opening the valve, by compressing the valve spring, admits one or two drops of oil through the valve upon the top of the ball, and spreading down the sides thereof, affects the lubrication or cleansing of the bore in the passage of the ball through it at each fire. By means of a screw at the top of the valve, the quantity of oil admitted on the ball may be increased or decreased at pleasure. The structure of the thing is altogether solid and strong, and cannot easily get out of order.

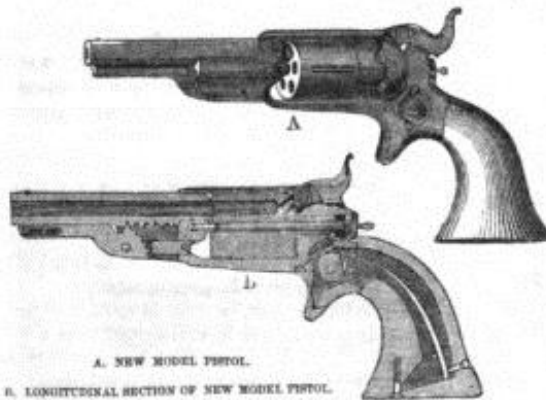
It was tried by firing forty rounds, as rapidly as possible, from the Yager rifle, Minie ball, musket powder, fifty grains charge, in comparison with another Yager, with Minie ball smeared with wax and tallow as in our cartridges, same charge and kind of powder, and fired by the same man. The result was that the lubricator performed sensibly the best of the two." These lubricators are attached in several ways, and are appended to most of the larger arms manufactured in the armory.

Another of the numerous inventions of Colonel Colt is the Metallic Foil Cartridge, a contrivance that always insures "dry powder" to the possessor. Tin foil, cut in the required shape, is formed in an inverted cone, which is charged with gunpowder; the ball is oval, with a flat end; a circle is pierced near the edge, on this flat end, to receive the edge of the foil; on the cone and ball being brought together, the joint is closed by pressure; they are then inclosed in paper wrappers, so arranged that this covering can be instantly removed when the cartridge is about to be used. The whole operation is completed so perfectly that the cartridge is entirely impervious to water, as by experiment they have repeatedly been fired after having been immersed for hours. Owing to the peculiar shape of the bore of the nipple in Colt's fire-arms, the fire from the percussion caps readily penetrates the foil, without pricking.

They are manufactured in a building erected expressly for the purpose, situated about half a mile south of the armory. No fire is allowed in any part of the works, heat being furnished by steam generated in an out-building. Nearly the whole labor here is performed by females, about thirty of whom were at work during our visit—the foreman, engineer and charger making the complement of employees.

Parties who once get a trial of these cartridges, will scarcely fail of possessing a supply thereafter. Major William H. Bell, of the United States Ordnance Department, says: "I beg leave respectfully to call your attention generally to the superior advantages of Colonel Colt's Metallic Foil Cartridges, for small arms, over our present awkward and very inconvenient cartridges."

The principal officers of the company consist of Colonel Colt as President; E. K. Root, Esq., Superintendent, and Luther P.



A. NEW MODEL PISTOL.

B. LONGITUDINAL SECTION OF NEW MODEL PISTOL.