

L. C. ALLIN.

Processes of Bronzing Gun-Barrels, &c.

No. 151,647.

Patented June 2, 1874.

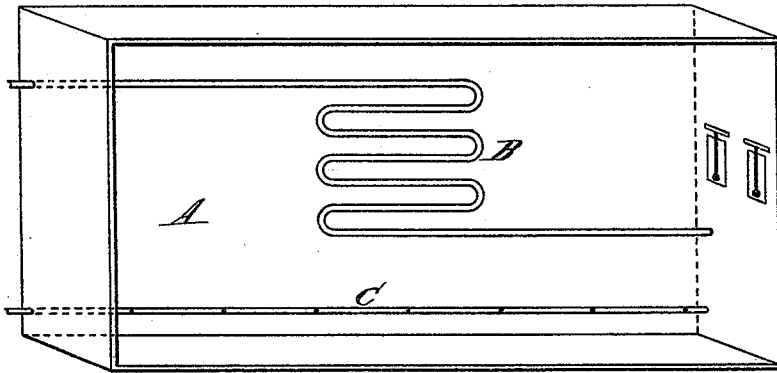


Fig. 1

Witnesses,

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LUCIUS C. ALLIN, OF SPRINGFIELD, MASSACHUSETTS.

IMPROVEMENT IN THE PROCESSES OF BRONZING GUN-BARRELS, &c.

Specification forming part of Letters Patent No. 151,647, dated June 2, 1874; application filed January 20, 1874.

To all whom it may concern:

Be it known that I, LUCIUS C. ALLIN, of Springfield, in the county of Hampden and State of Massachusetts, have invented a new and useful Improvement in Process of Browning Gun-Barrels, Scabbards, and other articles; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description, and which said drawings constitute part of this specification, and represent, in—

Figure 1, a case supplied with a coil of steam-pipe, by means of which to heat the atmosphere within the case, when closed, to the desired degree, and supplied also with a perforated steam-pipe, by means of which to impart the desired degree of humidity to said atmosphere.

My invention relates to the process of browning gun-barrels, scabbards, and other articles, its object being to impart a permanent dark-brown color to articles in a more even and uniform manner, and also to secure uniformity in the time employed to give such color to different articles or sets of articles, the process substantially as follows being found to accomplish the best results as to the time of submitting the articles to treatment:

I use, first, two tanks, which may be of any desirable form and capacity, made preferably of copper, and supplied with a steam pipe or coil; second, a case, similar to that shown in the drawing, of any suitable size to receive the desired number of articles to be treated, and which case is supplied with a coil of steam-pipe, B, to give the desired degree of temperature to the atmosphere within the case—say, about (90°) ninety degrees—and is supplied also with a perforated steam-pipe, C, by which to give the desired degree of moisture to said atmosphere in the case when closed, the steam, when admitted to the pipe C, escaping through the holes or perforations therein, and both pipes being provided with suitable valves or cocks, placed outside of the case, to admit the desired amount of steam. The case is also supplied with a psychrometer, consisting of a wet-bulb thermometer and a dry one, placed in the case at one side, and with a glass set in the case, so that the indications thereon may be

read from the outside, this being used to register the temperature and moisture, and indicate the proportionate amount of each. Third, I use a wheel—say, about twelve inches in diameter and four or five inches thick—the periphery of which is provided with several rows of Russia bristles. Fourth, I use a wheel of about the same size as the above, and covered upon its periphery with card-cloth, beneath or just inside the card being placed some soft material, to give the card a padded or somewhat elastic bearing upon the body of the wheel, thereby avoiding liability of scratching the articles to be burnished thereon, and both said wheels are made to revolve at a high rate of speed when in use—say, eight or nine hundred revolutions per minute—the one supplied with the card revolving with the card-teeth bent backward in a direction opposite to that of its rotation. One of the tanks is partially filled with hydrate of lime, which may be heated to the boiling-point by means of the steam-pipes with which the tank is supplied, and I boil the articles to be browned in this hydrate of lime about thirty (30) minutes, and then, with a sponge, wet or coat them over with any of the known "browning mixtures" which it is desired to use. I then place them in the case A, which is then closed, and the atmosphere of which is heated by the steam-pipe B to from eighty-five (85°) to ninety-five (95°) degrees, ninety (90°) degrees being the average, and, by means of the perforated pipe C, is made to contain from seventy-seven (77°) to eighty-seven (87°) degrees of humidity, eighty-two (82°) degrees being the average, as indicated by the psychrometer, and I let them remain in this case exposed to the action of the atmosphere for about two and a half hours. I then place them in the tank of pure water, which is heated to about two hundred and twelve (212°) degrees, and let them remain for about fifteen minutes, then take them to the brush-wheel, revolving at a high rate of speed, and brush off all the loose particles of oxide. I then take them to the padded card-wheel, which is also made to revolve at a high rate of speed, and with the card-teeth bent in a direction opposite that in which the wheel revolves, and burnish them ready for the second coat of the browning mixture. This process

is again repeated from one to three times, the latter number of repetitions making the best and most durable color, omitting, however, in the repetitions the boiling of the articles in the hydrate of lime, this being done necessarily only before the first application of the browning mixture. The articles thus treated should then be oiled with olive-oil, when they are finished and ready for use.

Articles browned by the above-described process are ready for use and finished in one-third the time required by any other process known, and will be found to be more uniform in color and durable than when colored by other processes.

It will be seen that the time of exposure to the manufactured atmosphere within the case A is, in all, about ten (10) hours, although a slight variation from that time, either way, would not probably affect the result; and by giving the atmosphere within the case the same degree of heat, and the same proportionate amount of humidity, when articles are placed therein at different times for treatment, the same time may be relied upon in which to complete the whole process, whereas in the other processes practiced the time which the articles browned are exposed to the atmosphere varies with the changes of the weather, the articles being completed very much sooner in a wet or damp condition of the atmosphere than in a dry one, and the difference in time being oftentimes three or four days, the variation being so great that no specific time can be calculated in which to complete the process.

Articles previously prepared as herein described, and submitted to the action of the atmosphere specially prepared within the case, are covered uniformly with a coating of oxide and other substances of a reddish-brown color. Pure water heated is an agent of great energy, and if the articles, when removed from the case, are placed in the boiling water, it drives the acid from the coating, decomposes the minerals in the browning mixture, and changes the color to a beautiful black or peroxide.

The burnishing may be done by hand or other means than the card-wheel, if desired; but I prefer to use the padded card-wheel, as

it greatly enhances the durability of the browning, and makes a beautiful finish, and obviates much of the dust and dirt which result from other methods of finishing.

The browning may be given any desirable color by using the different formulas of browning mixtures, and by adding salt to the water before boiling.

I am aware that gun-barrels and other articles have heretofore been given a brown color by just applying a browning mixture thereto, and then allowing them to stand from three to five days; but by exposing them to the action of an atmosphere specially prepared, as above described, within a case or compartment, I am enabled to do the same work in half the usual time, and am enabled to insure uniformity in the time of doing the work, and also in the appearance and durability of color.

The other parts of the process I do not consider as of so very great importance, although the whole process, as above described, gives the best results I have yet known; but I do consider the exposure of the articles, after having the browning mixture applied, to the action of the specially-prepared atmosphere within the case or compartment as new, and as an essential and important improvement in the process of browning gun-barrels and other articles.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

The treatment of gun-barrels and other articles, in giving a brown color thereto, hereinbefore described—that is to say, by submitting them, properly prepared with the browning mixture, to the action of an atmosphere specially prepared for the purpose, within a case or compartment containing the required amount of heat and humidity, for the purpose of securing greater uniformity in the time of doing the work, and also in the appearance and permanency of the color.

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Witnesses:

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