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30 May

C. S. Central Laboratory, (Ordn.)

MACON, GA., May 30, 1863.

ADDITIONAL RULES

FOR THE LABORATORIES OF C. S. ARSENALS AND ORDNANCE DEPOTS.

Small-Arms' Ammunition.

1st. Greater care is needed at some of the Laboratories with regard to the charges of powder in small-arms' cartridges. Much irregularity in this respect is observable.

When the *regulation charger* (as described in Ord. Man. ed. 1863), cannot be obtained, it is recommended that a little straight-edge of copper be soldered to the outside of the funnel used in filling cartridges (at right angles to the axis of the funnel), so that the workman—holding the funnel in the left hand and the little cylindrical powder measure in the right—may scoop up an amount of powder sufficient to fill the measure over the edge, and then “strike” off the excess of powder against the straight-edge attached to the funnel in his left hand.

2d. There are some discrepancies with regard to charges for small-arms' cartridges &c. between the directions of the Ordnance Manual (ed. 1863), those of the “Field Manual,” and of the “Rules to be observed in Laboratories of C. S. Arsenals and Ordnance Depots” issued August 27, 1862.

In such cases of discrepancy it is directed by the Chief of Ordnance that the “Rules” &c., are to be regarded as authority until changed by special orders.

3d. Attention should be paid to the form and size of buck-shot. Samples have been received from some arsenals exhibiting much irregularity in the form of the shot, arising from defective moulds and careless cutting off of the “gate.” Other samples have been met with of shot too large to “chamber” in the smooth-bore musket, for which the cartridges were intended—from which fault, distortion of the cartridge, delay in loading, and inferior accuracy of fire will result.

4th. An effort should be made to invariably send away small-arms' ammunition with caps in the bundles. The frequent demands from the Field for separate supplies of caps are partly evidence of and partly the cause of much waste of caps, which might be to a large extent prevented by their uniform issue with the cartridges.

5th. Increased attention to “bundling” is needed. The use of folding boxes, as now arranged at Macon Arsenal, is recommended for the production of neat, compact bundles.

No loose powder should appear in the bundles—its presence is sometimes caused by careless “pinching” of the cartridges, and sometimes by excessive pressure upon them in bundling.

Friction Primers.

- 1st. It appears to have been proved by experience that a friction primer of the length hitherto generally made, though answering well for light guns, cannot always be relied upon with certainty to fire guns of the heaviest calibre in use. The length of the tube should therefore be increased to $2\frac{3}{4}$ inches, of which two inches should enter the vent of the gun.*
- 2d. Friction primers of this increased length would project into the bore of the 12-pdr. mountain howitzer. For this howitzer, tubes of such a length as not to allow more than 1.4 inch to enter the vent should alone be issued.
- 3d. The best available copper should be selected for the tube, which should be well annealed not only during the process of drawing, but after it is finished. Neglect of this precaution increases the danger of splitting the tube or blowing off its head.
- 4th. The wire used should always if possible be of brass, soft, and of good quality.

If copper wire be unavoidably used it should be thicker than the regular brass wire.

The wire should be well annealed after the end has been serrated or jagged. The flattened end of the wire should be filed or cut away to a very small width, and this narrow end alone turned over the edge of the small (side) tube, so that the resistance offered to pulling out the wire may not be so great as to endanger pulling it in two.
- 5th. The loop on the free end of the wire should be made round, not oval, and should have a clear interior diameter of not less than .2 of an inch. Lanyard hooks in service are not strictly uniform in size, and it is obviously very important that no delay should occur in passing the hook through the primer loop.
- 6th. An excess of friction composition should be avoided, as it tends to blow off the head of the tube, leaving the tube itself in the vent, to be extracted with difficulty.
- 7th. It is of the first moment that the primers should be *thoroughly* dried in a heated room, or better in a steam-bath. They should be twice subjected to this drying process—once after the introduction of the friction composition, and again after the varnishing of the upper end of the tube and the introduction of the powder.
- 8th. Coarse (musket) powder should always be used for filling the tube.
- 9th. The last step should be the closing the lower end of the tube with wax and pitch, of which but very little should be used. Care should be taken however that the tube is effectually closed—some samples of friction primers have been examined, from which a considerable proportion of the pow-

*This increase of length will require an alteration of the machines used for “drawing” the tubes—the stroke of the punch must be increased. This alteration should be made as soon as possible—until it can be effected, the tubes of length hitherto used must be made, but their issue for service with heavy sea-coast guns should as far as possible be avoided.

der had sifted, thus greatly weakening the force of the primer on explosion.

Priming Tubes ("spur" tubes).

1st. The end of the little side or "spur" tube should be so covered with a cap of water-proof paper, that the latter may be easily pulled off without disturbing the quick-match—or the paper cap should be made so thin and combustible as to be instantly pierced by the flame of a port-fire.

2d. The remarks made above, with regard to closing effectually the lower end of friction primers, and thoroughly drying them, apply equally to paper or quill priming tubes.

Percussion Caps.

These also demand great care in drying as upon this process to a large extent depends their remaining serviceable after any considerable length of time. They should—like friction primers—be subjected to two dryings by artificial heat—the first immediately after the introduction of the fulminating composition—the second after the cap is finished and ready for issue.

This second drying should be effected at a tolerably high temperature, and should succeed the gentle drying of the varnish (immediately after its introduction) in the sun or a moderately warm room.

Fuzes.

Driven fuzes, as now in use, should invariably be *primed* with fine grained or mealed powder.

Labels of fuzes, friction Primers, &c.

It being desirable to preserve some record of the age of fuzes, friction primers, priming tubes, rockets, and other Laboratory products liable to deterioration by time, all packages of such products should hereafter be marked, not only with the year, but the *month*, of their preparation—the name of the Arsenal at which they have been prepared being of course added as usual. There is reason to believe that fuzes, &c., which were carefully inspected and found to be good at the date of their issue have turned out to be unserviceable when needed, after a considerable length of time. It is important to ascertain the facts in such cases, and to distinguish inherent defects from those caused by careless storage or transportation.

Precautions against accident.

In some of the Arsenal Laboratories, iron tools—hammers, drifts, wedges of fuze and portfire-moulds, &c.—are still in use in rooms where explosive materials are employed. These should be replaced by tools of gun-metal in all cases in which it is possible, and iron tools should be as far as possible inaccessible to the workmen in such rooms.

J. W. MALLET, Capt.,

Supt. C. S. Laboratories.

Approved :

J. GORGAS, Col.,

Chief of Ordnance.

Richmond, Va., June 11th, 1863.

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