To Joseph E. Brown

Sir,

As Commissioners, appointed by your Excellency, in obedience to an act of the Legislature, to inquire into the expediency and necessity of building an Armory and Foundry in Georgia for the manufacture of fire-arms and munitions of war, we beg leave to report.

That we have visited the principal Armories in the United States and after a full and careful examination of the whole subject, submit the following to the Legislature.

Armory

Estimates for Building, Machinery, Tools, Shop Fixtures and men required for the manufacture of 5,000 Rifle Muskets per annum.

1st. The size and cost of building to manufacture 5,000 arms?

Answer: One brick shop, two stories high, 250 feet long, 50 feet wide, and 31 feet high, for boring, turning, milling, filing, rifling, and finishing Barrels— for stocking machinery and finishing
stocks - Milling and drilling the components of the
Musket and for a Machine room for making and
repairing tools etc

$41,250.00

One brick shop, one story high, 250 ft by
50 ft, for a forging, polishing, tempering,
grinding and carpenter shop.

$25,000.00

One brick shop, to connect the two shops above-
named, 90 by 50 ft, for Inspectors, Offices,
store room or steam power, if used

$9,000.00

One stone house of brick, one story high
50 ft by 50 ft for stock, lumber etc

$2,000.00

One Proof House of Timber, 24 ft by
20 for moving barrels

$600.00

One loading house of brick, one story high
50 by 20 ft

$1,500.00

One brick store house, 100 by 50 ft high

Total cost for Buildings

$89,350.00
2. Which is the most desirable, steam or water power? Which power is steam and what power first cost?

2. Answer. Water power is decidedly the best and the cheapest, if reliable, as it will save $1500 per annum in the cost of an Engineer and Fireman and the cost of about two tons of coal per day. The relative cost of obtaining the two methods of power is about the same.

An Engine of 125 Horsepower with Boiler and Machinery complete would cost about $13,500.00.

If a small ground plan for the shops and other buildings, as above specified, is appended to the statement, which it is believed would make a good arrangement of either methods of power. The shops are in the form of a the letter H, which is the most suitable for applying the power from the center, as is therein represented for steam power, if adopted.
3° The cost of Machinery for making 5,000 Guns and fit and place the machinery to use?

Answer. The cost for machinery to manufacture 5,000 Guns per year, in the same manner as done at the Springfield Armory, so that the parts will interchange would be as follows:
For 17 Machine for stocking $26,500.00
97 do  a Limbwalk 48,175.00
18 do  a Forging forge 11,050.00
11 do  a Machine Shop 4,800.00
For Shop fitting complete 20,000.00
do Machine do  do  20,000.00
do Tools for components 20,000.00
Total $142,325.00

4th. What number of Officers and Operators, and what their Salaries?

Answer 13 Officers
1 Draughtsman
1 Pattern maker
1 Carpenter & Millwright
4 Mechanits
1 Distiller
83 Piece workmen
8 Hatchmen & Shop tenders
Total 114

The Salaries for the Officers which follow are such as are now paid, but are deemed to be too small, and
with the Tariff of prices paid for the operations, would not be applicable for another place, for obvious reasons.

1 Superintendent, Salary $2500 with Quarterly

1 Master Asst, do 1500 

3 Clerks, do 800 

4 Foreman, do 275 per diem

4 Inspectors, do 250 

1 Draughtsman, do 275 

1 Patternmaker, do 250 

1 Carpenter & Millwright, do 250 

4 Machinists, do 200 

1 Distiller, do 225 

1 Full Hammerman, Tariff price 200 per diem

2 Barrel Holders, do 250 

8 Lock & Mountain forgus, do 200 

1 Temper, " " 200 

8 Welders, " " 1.25 

3 Barrel Reamers, " " 2.00 

1 Barrel Turner, " " 2.00 

1 Screw Finisher, " " 2.00 

15 Miller of Components, " " 1.75 

5 Drilling, " " 1.75 

21 Filers, " " 1.75
6 Stockers & Assembler Tariff price 1.75
10 Lock Assemblies " " 2.00
6 Polishing " " 1.75
1 Ripper " " 2.00
1 Grinder " " 2.00
1 Barrel Tapper & Screw Cutters " " 2.00
2 Profiles of Mountings " " 2.00
1 Hatchmen & Shortinders " " 1.10

Total number, including Offices.

Note: The amounts under the head of "Tariff price", are for piece work.

5th. What kind of Iron is used, and what the Value?

Answer: English Iron (Marshall brand) is used for the barrels, and Norway Iron for the Components. (C.T.W brand) and (R.W. brand) Each of the above are of the first quality, and are suitable for Barrels & Components. Price $2.00 per Gross Ton.

6th. The probable quantity of Steel, Brass, Brass, etc. with the cost for
Completing the Gun?

Answer,

There are but twenty components of stock in the present Rifle Market, with the
Magnum primer lock, and in the Percussion
Market Model of 1842. Fifteen, including
the Airprizes, which would require
about two pounds each, market cost 3 cents
viz.: Limb; Lock spring; (Feed-spring);
Finger spring; Cone catch; Leaf; Airspring;
Main spring; three Bank springs; Ramrod;
Rear Sight; Screw driver; Rifle; Balloon;
Cone; Tumbler; Band spring punch; The
Bayonet blade. In the percussion Market
the Ramrod spring is added. The three
parts enclosed in brackets are for the
Magnum primer lock.

The Tip for the Stock is of Mallenda
Arm and costs about one and a half cents.
The Stock is Black walnut and contains
a rough State twenty seven cents each.
The Tompion is of Rock Maple and
costs complete three cents each.
All other parts not enumerated in
The foregoing statement, one of iron.

It requires two pounds to make a barrel.

The cost for "completing the gun" depends upon the cost of stock as well as labor, and therefore only an approximate estimate can be made. It also depends upon the kind of arm to be manufactured.

The Rifle Musket with the Magazine Primer lock, costs about $14.00.

The Percussion Rifle Musket without the Magazine Lock, would cost about $12.00.

The labor on each arm should not exceed one half the entire cost.
<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundry</td>
<td></td>
</tr>
<tr>
<td>View and estimate of the work required for turning out 100 iron cannon per year.</td>
<td></td>
</tr>
<tr>
<td>Moulding House Buildings</td>
<td>$20,000</td>
</tr>
<tr>
<td>2 Air Furnaces</td>
<td>$8,000</td>
</tr>
<tr>
<td>1 Cupola Furnace</td>
<td>$5,000</td>
</tr>
<tr>
<td>Cranes, one large $2,000, one small $1,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>Stoves, Carriages, etc.</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>$34,100</td>
</tr>
<tr>
<td>Boring Mill Building</td>
<td>$20,000</td>
</tr>
<tr>
<td>Cranes and other fixtures</td>
<td>$8,000</td>
</tr>
<tr>
<td>5 Gun beds or boring lathes</td>
<td>$1,500</td>
</tr>
<tr>
<td>2 Lathes</td>
<td>$1,800</td>
</tr>
<tr>
<td>Turret Shaping Machines</td>
<td>$2,000</td>
</tr>
<tr>
<td>Pattern Shop with Tools</td>
<td>$7,000</td>
</tr>
<tr>
<td>Blacksmith Shop</td>
<td>$4,000</td>
</tr>
<tr>
<td>Office</td>
<td>$3,000</td>
</tr>
<tr>
<td>Sheds, outbuildings and railroads</td>
<td>$5,000</td>
</tr>
<tr>
<td>Power Engine $5,000, spacing, shafting</td>
<td>$15,000</td>
</tr>
<tr>
<td>Blowers, pulleys, belts to $10,000</td>
<td></td>
</tr>
<tr>
<td>Contingencies</td>
<td>$10,000</td>
</tr>
<tr>
<td>Total</td>
<td>$124,900</td>
</tr>
</tbody>
</table>
The Commissioners find it impossible to make other than a general estimate for work, which depend so much upon locality and other circumstances, for their cost. They do not doubt that a suitable establishment for making 100 heavy iron cannon per annum could be erected for $100,000, exclusive of the cost of the site.

With regard to the cost of the manufacture, it may be assumed that for heavy iron cannon, it will be from 6 to 7½ d. per pound, according to cost of workmanship and quality of metal cut off in finishing. For lighter guns of iron the cost is increased and iron field guns of iron come to 10 to 12 d. per pound. Projectiles, if shot, will cost 3½ d. per lb. and shell, 4½ to 6 d. per lb; according to weight. The cost and manufacture of brass cannon will vary from that of the iron according to the difference in the price of the metal and labor expended. It may be well to remark that the establishment of a successful gun foundry usually costs a few years of experience and this is not obtained without expenditure or account of losses and failures. Besides the command of the best metal is indispensable.
Remark.

Accompanying the above report are drawings of the size of the buildings, as well as their relative position to each other, necessary for a Foundry and Armory to manufacture 100 Iron Cannon and 5,000 stand of small arms per year. Works capable of turning out a smaller number of arms can be established at a less expense, but it must be remembered in curtailing the expense, the completeness of each set of machinery is broken, causing double work, delays, and, by such shift, increasing the cost of the arms.

It is a well-known fact that where machinery is employed and it can be kept to work, the larger the establishment, the better and cheaper is the work done; and it would be very doubtful policy which, under any circumstance, would recommend the establishment on so small a scale as to be subject to any inconvenience. Still the estimates made above only involve an outlay of about $250,000 at once for an Armory and about $150,000 for a Foundry with an annual sum of $100,000.

An Armory for small arms is considered of more importance than a Foundry for Artillery. Infantry, besides being the most reliable arm, is also the most easily collected and disciplined. Artillery plays a very important part.
but the basis of all military organization is the Infantry and in a country, like the South, will always be the most effectual. While it would be well to keep attention fixed upon the proper establishment of Foundries for Artillery, the more necessary manufacture should be first put into successful operation. In nearly all countries Artillery is cast by private Manufacturers under the inspection of Military officers. There is no difficulty in the matter except in the preparation of the Iron according to those rules, which experience has demonstrated to be the best and the outlay necessary for the large machinery required for handling and finishing the mass of metal, whether Bronze or Iron, used in cannon.

It has become the settled policy of almost every nation to manufacture small arms by public Armories. Formerly, native small guns for the service were manufactured by private establishments under contract. In all the Countries of Europe, except Russia, this was the case until within a few years and they did not always confine themselves to artigiane of their own Country, but frequently imported large supplies. Paris keep with the march of humanity and the successes of the age public armories have been erected and are elements of strength, security and protection to any nation.
England completed in 1856 a National Armory at Enfield at an outside cost of £600,000 Sterling. And to bring the trade to the same method of manufacture as that adopted by the Government, the War Department, insisted in the establishment of a Company of £60,000 capital by giving a contract for 50,000 stands of arms and it was at once put into operation.

In the United States, prior to the revolution, the manufacture of large quantities of arms was unknown. According to the trade it was carried on in shops and confined to the fabrication of the rifles and hunting weapons of the period. The armament of the troops were always sent across the water and when the war of the revolution commenced to obtain a supply was of the greatest necessity. Old British and French muskets were used and such as could be picked up in the country and a few imported from France. Serviceable arms were scarce and so in the history of the war, it is common to hear of Regiments having "fixed bayonets" as an exception. Profiting by this experience, Congress immediately after independence was won, began the discussion of the manufacture of fire arms by the General Government and in the year 1800 established the National Armories at Springfield & Harpers Ferry.
They were at first inexpensive establishments and every part of the musket manufactured by hand. Now every piece is finished by machinery. The National Armories having to manufacture arms in sufficient quantities to meet the requirements of the service, private companies contracted with the Government to supply the deficiency as well as meet the wants of some of the States. And we find in the Northern States, private armories capable of more than doubling the quantity of arms produced from Springfield, both of the standard and numerous patent models, while in the Southern State, there is only one respectable private establishment (not yet completed) South of the Potomac. To meet the exigencies of the times, to supply the voluntary and militia forces of the South, to place her upon a footing with the North, to fulfill the high destiny that awaits her, to make her stand in the achievements of science and war, and worthy her proud name and fame, her patriotic sons should not hesitate as to the course that prudence and a wise fore-sight in reference to her military system would direct. Should Virginia build an Armory, manufacturing 5,000 stand of arms per year, her Sixth Southern State would purchase from her, if there was a surplus after supplying her own troops.
Besides, the improvements going on from time to time in the manufacture of arms, renewing old guns monthly and unfit for service, is a strong reason for building an Armory, as it would be easy to remodel the arm (thus saving expense) and later Georgia will be able to undertake this enterprise. A wise policy would suggest it. Boasting of the small tax she requires from her citizens, her magnificent domain, her splendid resources, her well filled treasury, her grand scheme of internal improvement, the means are within her reach to add an additional monument to her prosperity and enterprises and while affording protection, security and safety to her citizens by supplying her military force with arms and munition it was, exalted to the civilized world the spirit of manhood and independence at the South, which met dare reach oppression and muscle and uphold freedom, justice and law through the fires paid by the baptismal blood of her sons.

Ira R. Foster

John M. Anderson

O. H. Coltquitt
This will
Keep all Come on

Telamon Cuyler Collection
University of Georgia

Robert Cren 1860

Military