

cisely alike, and any difference between them must have arisen from the impurity of one or both. The following may serve as good practical tests of the comparative value of different parcels. If the chlorate (oxy-muriate) of potash be mixed with sugar, and the mixed powder be touched with a thread, or stick, dipped in sulphuric acid, (oil of vitriol,) combustion will take place; that which will burn most rapidly and completely with the smallest portion of the salt, is the best. The chlorate and the loaf sugar also should be trituated in a mortar, and the two mixed together intimately in given quantities. If the quantity of chlorate be sufficient, there will be so complete a combustion of the sugar as to leave scarcely any residuum. With a smaller portion the residuum will be greater, and with a portion just sufficient to produce ignition, it will be considerable.

Chlorate of potash and sulphur mixed together, explode by the blow of a hammer on an anvil. This property also may supply a test. That salt which will, in the smallest proportionate quantity produce an explosion, is the best.

The largest quantity of this salt which we ever saw together, was of our own manufacture; it weighed eight pounds, and was of the utmost purity; the process was continued for four days. This was 17 years ago, when chemical manufactories were but little known here, and war interfered with the importation of the article. We would willingly give the process for the information of any one who wished to essay it, but do not think this now necessary. Any of the chemical laboratories at which the chlorate of lime (bleaching salts) is manufactured, could readily supply this salt, and we have no doubt would undertake to make it in a quantity not exceeding ten or twelve pounds. The process is one which does not present any difficulty to the chemist, but to one not habituated to chemical manipulation, it would be not merely difficult, but extremely unpleasant.

The salt, when good, is in thin scales of a beautiful pearly appearance.

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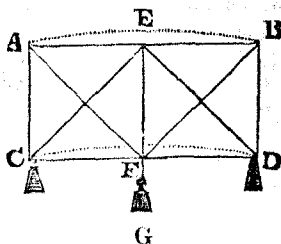
*Remarks on the Jackson Bridge. By Lt. Col. S. H. LONG, the patentee.*

A description and drawings of this bridge have already been given in the April number of this Journal. We now take occasion to offer the following remarks explanatory of the principles and manner of action that take effect in consequence of the peculiar arrangement of the parts of this structure.

The principles aimed at in the construction of this bridge, are such, that the strain to which the truss frames are subjected, by the heaviest load that is admissible upon the bridge, is no greater than that exerted upon it without any load at all. Paradoxical as this may appear, it is, nevertheless, demonstrably the fact, with respect to all parts of the bridge, except the arch braces, and those parts

merely which are in contact with the sleepers or bolsters, upon which the bridge is sustained.

In demonstration of the truth of this proposition, we have only to inspect the annexed diagram, which may be regarded as representing one of the truss-frames, and in which AB represents the upper, and CD the lower string; AC, EF, and BD, three posts, EC and ED the main braces; and FA and FB, the counter braces. Suppose the frame deprived of the counter braces, and the strings occupying the position of the curved dotted lines, let a weight, G, be suspended at F, heavy enough to depress the frame to the straight line AB and CD, as represented in the figure. Let the counter braces FA and FB be now inserted; after which let the weight G be removed. It is obvious that the strings AB and CD will still retain their straight direction, and the addition of the weight will have no other effect upon the truss-frame, than merely to relieve the counter braces of their action, the stress or strain upon the truss-frame remaining the same, whether the weight is sustained by it or not.



If keys or wedges be applied at A and B, over the heads of the counter braces, and driven in such a manner as to communicate an appropriate thrust from A and B, towards F, we have the strain upon the truss-frame completely exemplified, without the use of the weight.

However the number of spaces in the truss-frame may be multiplied, if the additions be made equally on both sides of the centre, or in both directions from E and F, the same system of action will be communicated to all parts of the truss-frame situated between the abutments of the bridge.

The timber best adapted to the construction of a frame bridge, is white pine. The qualities which entitle it to this distinction are, its lightness, stiffness, and exemption from the ravages of worms, insects, &c. Cypress, yellow pine, white cedar, hemlock, poplar, and chesnut, are to be regarded as among the most valuable substitutes afforded within the limits of the United States. Yellow, or hard pine, is probably better adapted for the necessary keys and wedges than any other material; but when those are not to be had, white ash, white oak, locust, or chesnut, may be used to advantage. The timber employed, especially in the frame work of the bridge, should be perfectly sound, free from sap, knots, shakes, splits, twists, and all other defects calculated to impair its strength, tenacity, and durability; and should be of the character denominated "quartered timber," or timber cut through, and deprived of the heart or pith.

The splicing pieces, when constructed of wood, should be of the same timber as that of which the strings are composed. Splices of cast iron are, however, deemed more efficient and economical, when they can be procured with convenience.

The flooring should be of yellow, or white pine, if practicable; and in all cases, the material of which it is made should be the light-

est attainable. The exterior covering, should it be applied, ought also to be constructed of the lightest materials.

The wrought iron employed on the bridge is intended merely to clamp, or bind together, the parts of the structure, and is to operate exclusively by tension, independently of any transverse strain, or leverage, upon the bolts, &c.

*Table showing the dimensions of string pieces for spans of different lengths; as also the area of the floor, and the weight that may be sustained, if distributed over the surface, independently of the weight of the bridge.*

No.	STATEMENTS.		Height of Truss Frames.	Transverse dimensions of the string pieces, exclusive of notches, holes, and defects of all kinds.										Area of the bridge floor.	Load that may be sustained on the bridge.	Aggregate transverse area of each string.
	Feet.	Length of Span.		For single action.				For double action.								
				2 side string pieces.		1 centre st'g p'ce.		2 side st'g pieces.		1 centre st'g p'ce.						
				Width in inch. & pts.	Depth in inch. & pts.	Width &c.	Depth in inch. & pts.	Width in inch. & pts.	Depth in inch. & pts.	Width in inch. & pts.	Depth in inch. & pts.	Width in inch. & pts.	Depth in inch. & pts.			
1	60	13.5	3	3.25	5.5	3.25										
2	70	13.5	3	4.5	5.5	4.5										
3	80	13.5	3.5	5.33	5.5	5.33										
4	90	13.5	4	6.25	5.5	6.25										
5	100	13.5	4.75	6.5	6.5	6.5										
6	110	14	5.5	7	6.5	7										
7	120	14	6.5	7.87	6.5	7.87	3.75	6	5.5	6						
8	130	14.5	7	8	6.5	8	4	6	5.5	6						
9	140	14.5	8	8.25	7	8.25	4.75	6	6.5	6						
10	150	15	8	9.13	7	9.13	4.87	6.5	6.5	6.5						
11	160	15.5	8	9	7.5	9	5.62	6.63	6.5	6.63						
12	170	16	8.25	10.63	7.5	10.63	6.5	6.63	6.5	6.63						
13	180	16.5	8.25	11.63	7.5	11.63	6.5	7.13	6.5	7.13						
14	190	17	8.5	12	8	12	6.5	7.75	6.5	7.75						
15	200	17.5	8.5	13	8	13	7	8	6.5	8						
16	220	18	"	"	"	"	8	8.25	7	8.25						
17	240	18.5	"	"	"	"	8.13	9.5	7	9.5						
18	260	19	"	"	"	"	8.25	10.5	7.5	10.5						
19	280	19.5	"	"	"	"	8.25	12	7.5	12						
20	300	20	"	"	"	"	8.25	13.5	7.5	13.5						

NOTE.—In the last column of the foregoing table, the statements, No. 1 to No. 6, inclusive, exhibit the areas of the strings as computed for "single action," while the residue of the statements represent the areas for "double action."